

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

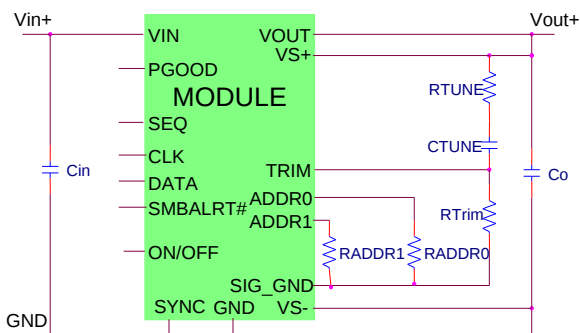
3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current



## RoHS Compliant

## Applications

- Distributed power architectures
- Intermediate bus voltage applications
- Telecommunications equipment
- Servers and storage applications
- Networking equipment
- Industrial equipment



## Features

- Ultra low height design for very dense power applications.
- High technology encapsulation for improved thermal performance, electrical insulation, and easy manufacturing.
- Small size: 20.32 mm x 11.43 mm x 3 mm (Max) (0.8 in x 0.45 in x 0.118 in)
- Output voltage programmable from 0.6Vdc to 5.5Vdc via external resistor. Digitally adjustable down to 0.45Vdc
- Wide Input voltage range (3Vdc-14.4Vdc)
- Wide operating temperature range [-40°C to 105°C]. See derating curves
- DOSA approved footprint
- Digital interface through the PMBus™ # protocol
- Tunable Loop™ to optimize dynamic output voltage response
- Flexible output voltage sequencing EZ-SEQUENCE
- Power Good signal
- Remote On/Off
- Fixed switching frequency with capability of external synchronization
- Output overcurrent protection (non-latching)
- Overtemperature protection
- Ability to sink and source current
- Compatible in a Pb-free or SnPb reflow environment
- UL\* 60950-1 Recognized, CSA† C22.2 No. 60950-1-03 Certified, and VDE‡ 0805:2001-12 (EN60950-1) Licensed
- Compliant to RoHS II EU "Directive 2011/65/EU"
- Compliant to REACH Directive (EC) No 1907/2006
- Compliant to IPC-9592 (September 2008), Category 2, Class II
- ISO\*\* 9001 and ISO 14001 certified manufacturing facilities

## Description

The 12A Digital SlimLynx™ power modules are non-isolated dc-dc converters that can deliver up to 12A of output current. These modules operate over a wide range of input voltage ( $V_{IN} = 3\text{Vdc}-14.4\text{Vdc}$ ) and provide a precisely regulated output voltage from 0.45Vdc to 5.5Vdc, programmable via an external resistor and PMBus control. Features include a digital interface using the PMBus protocol, remote On/Off, adjustable output voltage, over current and over temperature protection. The PMBus interface supports a range of commands to both control and monitor the module. The module also includes the Tunable Loop™ feature that allows the user to optimize the dynamic response of the converter to match the load with reduced amount of output capacitance leading to savings on cost and PWB area.

\* UL is a registered trademark of Underwriters Laboratories, Inc.

† CSA is a registered trademark of Canadian Standards Association.

‡ VDE is a trademark of Verband Deutscher Elektrotechniker e.V.

\*\* ISO is a registered trademark of the International Organization of Standards

# The PMBus name and logo are registered trademarks of the System Management Interface Forum (SMIF)



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3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only, functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

| Parameter                                                             | Device | Symbol    | Min  | Max | Unit |
|-----------------------------------------------------------------------|--------|-----------|------|-----|------|
| Input Voltage<br>Continuous                                           | All    | $V_{IN}$  | -0.3 | 15  | V    |
| SEQ, SYNC, VS+                                                        | All    |           |      | 7   | V    |
| CLK, DATA, SMBALERT#                                                  | All    |           |      | 3.6 | V    |
| Operating Ambient Temperature<br>(see Thermal Considerations section) | All    | $T_A$     | -40  | 85  | °C   |
| Storage Temperature                                                   | All    | $T_{stg}$ | -55  | 125 | °C   |

## Electrical Specifications

Unless otherwise indicated, specifications apply over all operating input voltage, resistive load, and temperature conditions.

| Parameter                                                                                                                                          | Device                | Symbol            | Min | Typ | Max  | Unit             |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------|-----|-----|------|------------------|
| Operating Input Voltage                                                                                                                            | All                   | $V_{IN}$          | 3   | —   | 14.4 | Vdc              |
| Maximum Input Current<br>( $V_{IN}=3V$ to 14V, $I_O=I_{O,max}$ )                                                                                   | All                   | $I_{IN,max}$      |     |     | 10A  | Adc              |
| Input No Load Current<br>( $V_{IN} = 12Vdc$ , $I_O = 0$ , module enabled)                                                                          | $V_{O,set} = 0.6 Vdc$ | $I_{IN,No load}$  |     | 50  |      | mA               |
|                                                                                                                                                    | $V_{O,set} = 5Vdc$    | $I_{IN,No load}$  |     | 220 |      | mA               |
| Input Stand-by Current<br>( $V_{IN} = 12Vdc$ , module disabled)                                                                                    | All                   | $I_{IN,stand-by}$ |     | 20  |      | mA               |
| Inrush Transient                                                                                                                                   | All                   | $I^2t$            |     |     | 1    | A <sup>2</sup> s |
| Input Reflected Ripple Current, peak-to-peak<br>(5Hz to 20MHz, 1μH source impedance; $V_{IN}=0$ to 14V, $I_O=I_{O,max}$ ; See Test Configurations) | All                   |                   |     | 50  |      | mAp-p            |
| Input Ripple Rejection (120Hz)                                                                                                                     | All                   |                   |     | -55 |      | dB               |

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Electrical Specifications (continued)

| Parameter                                                                                                                                                                                                                                        | Device                                                                                                                                             | Symbol                                                   | Min                  | Typ                                | Max                   | Unit                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------|------------------------------------|-----------------------|------------------------------------------|
| Output Voltage Set-point (with 0.1% tolerance for external resistor used to set output voltage)                                                                                                                                                  | All                                                                                                                                                | $V_{O, set}$                                             | -1.0                 |                                    | +1.0                  | % $V_{O, set}$                           |
| Output Voltage (Over all operating input voltage, resistive load, and temperature conditions until end of life)                                                                                                                                  | All                                                                                                                                                | $V_{O, set}$                                             | -3.0                 | —                                  | +3.0                  | % $V_{O, set}$                           |
| Adjustment Range (selected by an external resistor)<br>(Some output voltages may not be possible depending on the input voltage – see Feature Descriptions Section)                                                                              | All                                                                                                                                                | $V_O$                                                    | 0.6                  |                                    | 5.5                   | Vdc                                      |
| PMBus Adjustable Output Voltage Range                                                                                                                                                                                                            | All                                                                                                                                                | $V_{O, adj}$                                             | -25                  | 0                                  | +25                   | % $V_{O, set}$                           |
| PMBus Output Voltage Adjustment Step Size                                                                                                                                                                                                        | All                                                                                                                                                |                                                          | 0.4                  |                                    |                       | % $V_{O, set}$                           |
| Remote Sense Range                                                                                                                                                                                                                               | All                                                                                                                                                |                                                          |                      |                                    | 0.5                   | Vdc                                      |
| Output Regulation (for $V_O \geq 2.5Vdc$ )<br>Line ( $V_{IN}=V_{IN, min}$ to $V_{IN, max}$ )<br>Load ( $I_O=I_{O, min}$ to $I_{O, max}$ )                                                                                                        | All<br>All                                                                                                                                         |                                                          |                      | —<br>—                             | +0.4<br>10            | % $V_{O, set}$<br>mV                     |
| Output Regulation (for $V_O < 2.5Vdc$ )<br>Line ( $V_{IN}=V_{IN, min}$ to $V_{IN, max}$ )<br>Load ( $I_O=I_{O, min}$ to $I_{O, max}$ )                                                                                                           | All<br>All                                                                                                                                         |                                                          |                      | —<br>—                             | 5<br>10               | mV<br>mV                                 |
| Temperature ( $T_{ref}=T_{A, min}$ to $T_{A, max}$ )                                                                                                                                                                                             | All                                                                                                                                                |                                                          |                      | —                                  | 0.4                   | % $V_{O, set}$                           |
| Output Ripple and Noise on nominal output<br>( $V_{IN}=V_{IN, nom}$ and $I_O=I_{O, min}$ to $I_{O, max}$ $C_O = 3 \times 47nF // 2 \times 47 \mu F$ ceramic capacitors)<br>Peak-to-Peak (5Hz to 20MHz bandwidth)<br>RMS (5Hz to 20MHz bandwidth) | All<br>All                                                                                                                                         |                                                          | —                    | 50<br>20                           | 100<br>38             | mV <sub>pk-pk</sub><br>mV <sub>rms</sub> |
| External Capacitance <sup>1</sup><br>Without the Tunable Loop™<br>ESR $\geq 1 m\Omega$<br>With the Tunable Loop™<br>ESR $\geq 0.15 m\Omega$<br>ESR $\geq 10 m\Omega$                                                                             | All<br>All<br>All                                                                                                                                  | $C_{O, max}$<br>$C_{O, max}$<br>$C_{O, max}$             | 2x47<br>2x47<br>2x47 | —<br>—<br>—                        | 2x47<br>1000<br>10000 | $\mu F$<br>$\mu F$<br>$\mu F$            |
| Output Current (in either sink or source mode)                                                                                                                                                                                                   | All                                                                                                                                                | $I_O$                                                    | 0                    |                                    | 12                    | Adc                                      |
| Output Current Limit Inception (Hiccup Mode)<br>(current limit does not operate in sink mode)                                                                                                                                                    | All                                                                                                                                                | $I_{O, lim}$                                             |                      | 130                                |                       | % $I_{O, max}$                           |
| Output Short-Circuit Current<br>( $V_O \leq 250mV$ ) (Hiccup Mode)                                                                                                                                                                               | All                                                                                                                                                | $I_{O, s/c}$                                             |                      | 1.5                                |                       | Arms                                     |
| Efficiency<br>$V_{IN} = 12Vdc$ , $T_A = 25^\circ C$<br>$I_O = I_{O, max}$ , $V_O = V_{O, set}$                                                                                                                                                   | $V_{O, set} = 0.6Vdc$<br>$V_{O, set} = 1.2Vdc$<br>$V_{O, set} = 1.8Vdc$<br>$V_{O, set} = 2.5Vdc$<br>$V_{O, set} = 3.3Vdc$<br>$V_{O, set} = 5.0Vdc$ | $\eta$<br>$\eta$<br>$\eta$<br>$\eta$<br>$\eta$<br>$\eta$ |                      | 72<br>81<br>85<br>87.5<br>89<br>92 |                       | %<br>%<br>%<br>%<br>%<br>%               |
| Switching Frequency                                                                                                                                                                                                                              | All                                                                                                                                                | $f_{sw}$                                                 | —                    | 800                                | —                     | kHz                                      |

<sup>1</sup> External capacitors may require using the new Tunable Loop™ feature to ensure that the module is stable as well as getting the best transient response. See the Tunable Loop™ section for details.

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Electrical Specifications (continued)

| Parameter                       | Device | Symbol         | Min | Typ | Max | Unit |
|---------------------------------|--------|----------------|-----|-----|-----|------|
| Frequency Synchronization       | All    |                |     |     |     |      |
| Synchronization Frequency Range | All    |                | 760 | 800 | 840 | kHz  |
| High-Level Input Voltage        | All    | $V_{IH}$       | 2   |     |     | V    |
| Low-Level Input Voltage         | All    | $V_{IL}$       |     |     | 0.4 | V    |
| Input Current, SYNC             | All    | $I_{SYNC}$     |     |     | 100 | nA   |
| Minimum Pulse Width, SYNC       | All    | $t_{SYNC}$     | 100 |     |     | ns   |
| Maximum SYNC rise time          | All    | $t_{SYNC\_SH}$ | 100 |     |     | ns   |

## General Specifications

| Parameter                                                                                            | Device | Min | Typ        | Max | Unit    |
|------------------------------------------------------------------------------------------------------|--------|-----|------------|-----|---------|
| Calculated MTBF ( $I_O=0.8I_{O,max}$ , $T_A=40^{\circ}\text{C}$ ) Telecordia Issue 2 Method 1 Case 3 | All    |     | 15,233,204 |     | Hours   |
| Weight                                                                                               |        | —   | 1.8 (0.06) | —   | g (oz.) |

## Feature Specifications

Unless otherwise indicated, specifications apply over all operating input voltage, resistive load, and temperature conditions. See Feature Descriptions for additional information.

| Parameter                                                                                                                                                                                                | Device | Symbol   | Min  | Typ | Max          | Unit          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|------|-----|--------------|---------------|
| On/Off Signal Interface<br>( $V_{IN}=V_{IN,min}$ to $V_{IN,max}$ ; open collector or equivalent,<br>Signal referenced to GND)<br>Device code with suffix "4" – Positive Logic (See Ordering Information) |        |          |      |     |              |               |
| Logic High (Module ON)                                                                                                                                                                                   |        |          |      |     |              |               |
| Input High Current                                                                                                                                                                                       | All    | $I_{IH}$ |      | —   | 1            | mA            |
| Input High Voltage                                                                                                                                                                                       | All    | $V_{IH}$ | 2    | —   | $V_{IN,max}$ | V             |
| Logic Low (Module OFF)                                                                                                                                                                                   |        |          |      |     |              |               |
| Input Low Current                                                                                                                                                                                        | All    | $I_{IL}$ | —    | —   | 1            | mA            |
| Input Low Voltage                                                                                                                                                                                        | All    | $V_{IL}$ | -0.2 | —   | 0.6          | V             |
| Device Code with no suffix – Negative Logic (See Ordering Information)<br>(On/OFF pin is open collector/drain logic input with<br>external pull-up resistor; signal referenced to GND)                   |        |          |      |     |              |               |
| Logic High (Module OFF)                                                                                                                                                                                  |        |          |      |     |              |               |
| Input High Current                                                                                                                                                                                       | All    | $I_{IH}$ | —    | —   | 1            | mA            |
| Input High Voltage                                                                                                                                                                                       | All    | $V_{IH}$ | 2    | —   | $V_{IN,max}$ | Vdc           |
| Logic Low (Module ON)                                                                                                                                                                                    |        |          |      |     |              |               |
| Input low Current                                                                                                                                                                                        | All    | $I_{IL}$ | —    | —   | 50           | $\mu\text{A}$ |
| Input Low Voltage                                                                                                                                                                                        | All    | $V_{IL}$ | -0.2 | —   | 0.6          | Vdc           |

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Feature Specifications (cont.)

| Parameter                                                                                                                                                                           | Device | Symbol          | Min   | Typ  | Max   | Units            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------|-------|------|-------|------------------|
| Turn-On Delay and Rise Times                                                                                                                                                        |        |                 |       |      |       |                  |
| ( $V_{IN}=V_{IN, nom}$ , $I_O=I_{O, max}$ , $V_O$ to within $\pm 1\%$ of steady state)                                                                                              |        |                 |       |      |       |                  |
| Case 1: On/Off input is enabled and then input power is applied (delay from instant at which $V_{IN} = V_{IN, min}$ until $V_O = 10\%$ of $V_{O, set}$ )                            | All    | $T_{delay}$     | —     | 0.9  | —     | msec             |
| Case 2: Input power is applied for at least one second and then the On/Off input is enabled (delay from instant at which Von/Off is enabled until $V_O = 10\%$ of $V_{O, set}$ )    | All    | $T_{delay}$     | —     | 0.8  | —     | msec             |
| Output voltage Rise time (time for $V_O$ to rise from 10% of $V_{O, set}$ to 90% of $V_{O, set}$ )                                                                                  | All    | $T_{rise}$      | —     | 2    | —     | msec             |
| Output voltage overshoot ( $T_A = 25^\circ\text{C}$<br>$V_{IN}=V_{IN, min}$ to $V_{IN, max}$ , $I_O = I_{O, min}$ to $I_{O, max}$ )<br>With or without maximum external capacitance |        |                 |       |      | 3     | % $V_{O, set}$   |
| Over Temperature Protection<br>(See Thermal Considerations section)                                                                                                                 | All    | $T_{ref}$       |       | 130  |       | $^\circ\text{C}$ |
| PMBus Over Temperature Warning Threshold *                                                                                                                                          | All    | $T_{WARN}$      |       | 120  |       | $^\circ\text{C}$ |
| Tracking Accuracy (Power-Up: 2V/ms)                                                                                                                                                 | All    | $V_{SEQ} - V_O$ |       |      | 100   | mV               |
| (Power-Down: 2V/ms)                                                                                                                                                                 | All    | $V_{SEQ} - V_O$ |       |      | 100   | mV               |
| ( $V_{IN, min}$ to $V_{IN, max}$ ; $I_{O, min}$ to $I_{O, max}$ $V_{SEQ} < V_O$ )                                                                                                   |        |                 |       |      |       |                  |
| Input Undervoltage Lockout                                                                                                                                                          |        |                 |       |      |       |                  |
| Turn-on Threshold                                                                                                                                                                   | All    |                 | 2.475 |      | 3.025 | Vdc              |
| Turn-off Threshold                                                                                                                                                                  | All    |                 | 2.25  |      | 2.75  | Vdc              |
| Hysteresis                                                                                                                                                                          | All    |                 |       | 0.25 |       | Vdc              |
| PMBus Adjustable Input Under Voltage Lockout Thresholds                                                                                                                             | All    |                 | 2.5   |      | 14    | Vdc              |
| Resolution of Adjustable Input Under Voltage Threshold                                                                                                                              | All    |                 |       |      | 500   | mV               |
| PGOOD (Power Good)                                                                                                                                                                  |        |                 |       |      |       |                  |
| Signal Interface Open Drain, $V_{supply} \leq 5\text{VDC}$                                                                                                                          |        |                 |       |      |       |                  |
| Overvoltage threshold for PGOOD ON                                                                                                                                                  | All    |                 |       | 108  |       | % $V_{O, set}$   |
| Overvoltage threshold for PGOOD OFF                                                                                                                                                 | All    |                 |       | 110  |       | % $V_{O, set}$   |
| Undervoltage threshold for PGOOD ON                                                                                                                                                 | All    |                 |       | 92   |       | % $V_{O, set}$   |
| Undervoltage threshold for PGOOD OFF                                                                                                                                                | All    |                 |       | 90   |       | % $V_{O, set}$   |
| Pulldown resistance of PGOOD pin                                                                                                                                                    | All    |                 |       |      | 50    | $\Omega$         |
| Sink current capability into PGOOD pin                                                                                                                                              | All    |                 |       |      | 5     | mA               |

\* Over temperature Warning – Warning may not activate before alarm and unit may shutdown before warning

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Digital Interface Specifications

Unless otherwise indicated, specifications apply over all operating input voltage, resistive load, and temperature conditions. See Feature Descriptions for additional information.

| Parameter                                                               | Conditions                    | Symbol           | Min      | Typ    | Max  | Unit    |
|-------------------------------------------------------------------------|-------------------------------|------------------|----------|--------|------|---------|
| <b>PMBus Signal Interface Characteristics</b>                           |                               |                  |          |        |      |         |
| Input High Voltage (CLK, DATA)                                          |                               | $V_{IH}$         | 2.1      |        | 3.6  | V       |
| Input Low Voltage (CLK, DATA)                                           |                               | $V_{IL}$         |          |        | 0.8  | V       |
| Input high level current (CLK, DATA)                                    |                               | $I_{IH}$         | -10      |        | 10   | $\mu A$ |
| Input low level current (CLK, DATA)                                     |                               | $I_{IL}$         | -10      |        | 10   | $\mu A$ |
| Output Low Voltage (CLK, DATA, SMBALERT#)                               | $I_{OUT}=2mA$                 | $V_{OL}$         |          |        | 0.4  | V       |
| Output high level open drain leakage current (DATA, SMBALERT#)          | $V_{OUT}=3.6V$                | $I_{OH}$         | 0        |        | 10   | $\mu A$ |
| Pin capacitance                                                         |                               | $C_0$            |          | 0.7    |      | pF      |
| PMBus Operating frequency range                                         | Slave Mode                    | F <sub>PMB</sub> | 10       |        | 400  | kHz     |
| Data hold time                                                          | Receive Mode<br>Transmit Mode | $t_{HD:DAT}$     | 0<br>300 |        |      | ns      |
| Data setup time                                                         |                               | $t_{SU:DAT}$     | 250      |        |      | ns      |
| <b>Measurement System Characteristics</b>                               |                               |                  |          |        |      |         |
| Read delay time                                                         |                               | $t_{DLY}$        | 153      | 192    | 231  | $\mu s$ |
| Output current measurement range                                        |                               | $I_{RNG}$        | 0        |        | 18   | A       |
| Output current measurement resolution                                   |                               | $I_{RES}$        | 62.5     |        |      | mA      |
| Output current measurement gain accuracy at 25°C (with $I_{OUT,CORR}$ ) |                               | $I_{ACC}$        |          |        | ±5   | %       |
| Output current measurement offset                                       |                               | $I_{OFST}$       |          |        | 0.1  | A       |
| $V_{OUT}$ measurement range                                             |                               | $V_{OUT(rng)}$   | 0        |        | 5.5  | V       |
| $V_{OUT}$ measurement resolution                                        |                               | $V_{OUT(res)}$   |          | 15.625 |      | mV      |
| $V_{OUT}$ measurement accuracy                                          |                               | $V_{OUT(ACC)}$   | -15      |        | 15   | %       |
| $V_{OUT}$ measurement offset                                            |                               | $V_{OUT(ofst)}$  | -3       |        | 3    | %       |
| $V_{IN}$ measurement range                                              |                               | $V_{IN(rng)}$    | 3        |        | 14.4 | V       |
| $V_{IN}$ measurement resolution                                         |                               | $V_{IN(res)}$    |          | 32.5   |      | mV      |
| $V_{IN}$ measurement accuracy                                           |                               | $V_{IN(ACC)}$    | -15      |        | 15   | %       |
| $V_{IN}$ measurement offset                                             |                               | $V_{IN(ofst)}$   | -5.5     |        | 1.4  | LSB     |

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Characteristic Curves

The following figures provide typical characteristics for the 12A Digital SlimLynx™ at 0.6V<sub>o</sub> and 25°C.

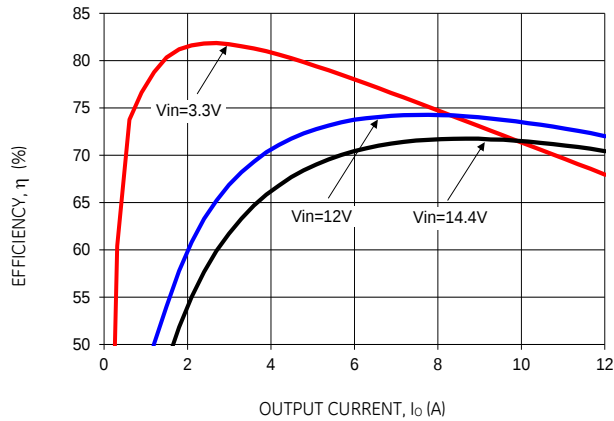


Figure 1. Converter Efficiency versus Output Current.

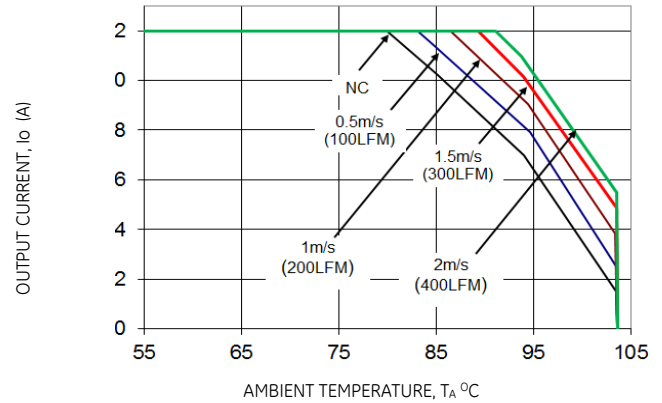


Figure 2. Derating Output Current versus Ambient Temperature and Airflow.

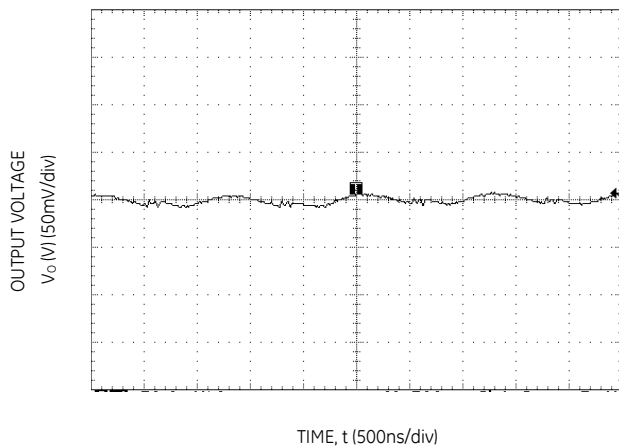


Figure 3. Typical output ripple and noise ( $C_o=2 \times 47\mu\text{F}$  ceramic,  $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

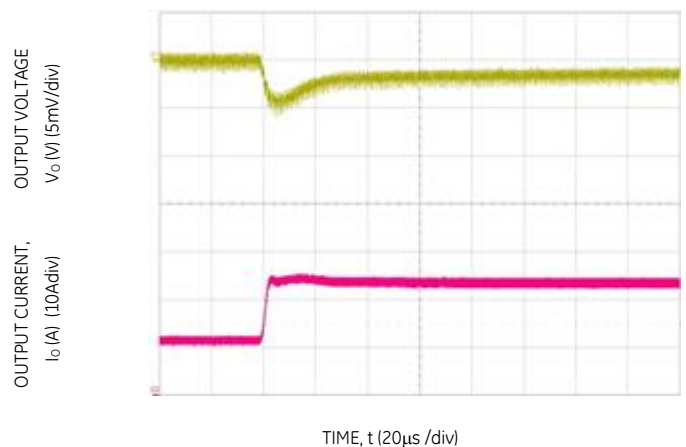


Figure 4. Transient Response to Dynamic Load Change from 50% to 100% at 12Vin,  $C_{out}=1 \times 47\mu\text{F}+11 \times 330\mu\text{F}$ ,  $C_{Tune}=47\text{nF}$ ,  $R_{Tune}=180\Omega$

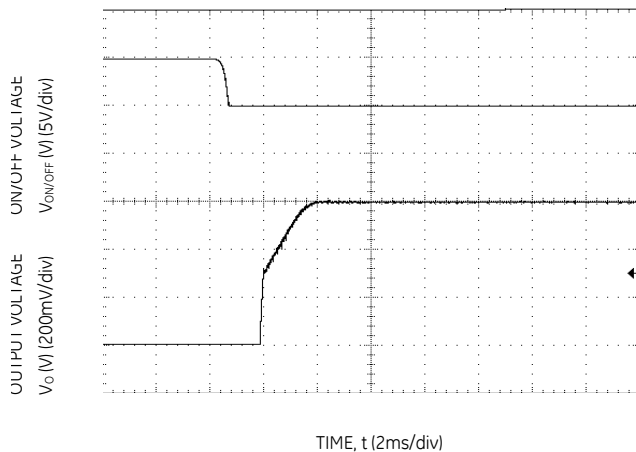


Figure 5. Typical Start-up Using On/Off Voltage ( $I_o = I_{o,max}$ ).

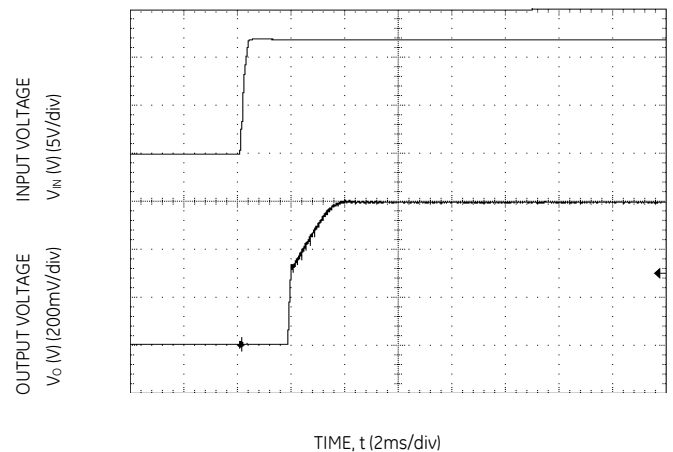


Figure 6. Typical Start-up Using Input Voltage ( $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Characteristic Curves

The following figures provide typical characteristics for the 12A Digital SlimLynx™ at 1.2V<sub>o</sub> and 25°C.

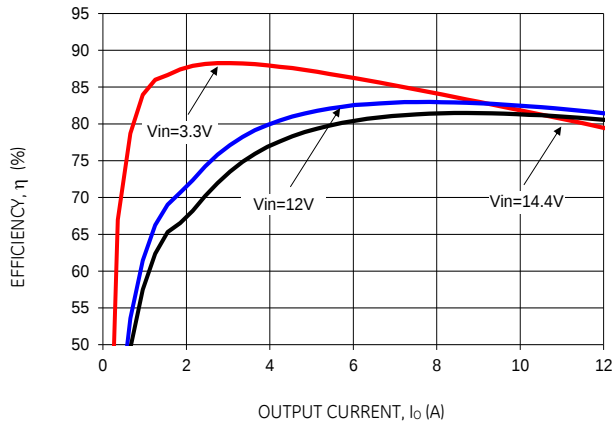


Figure 7. Converter Efficiency versus Output Current.

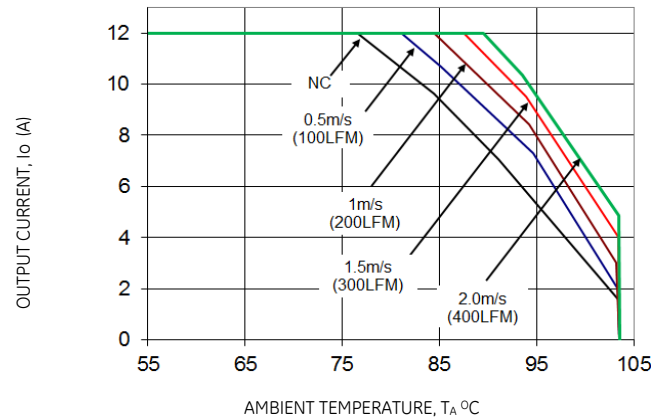


Figure 8. Derating Output Current versus Ambient Temperature and Airflow.

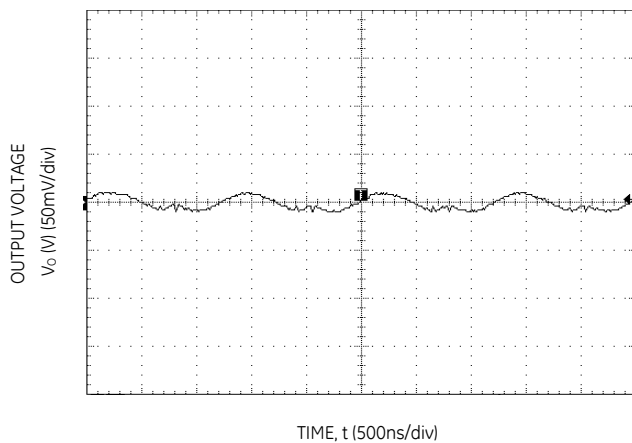


Figure 9. Typical output ripple and noise ( $C_o=2 \times 47\mu\text{F}$  ceramic,  $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

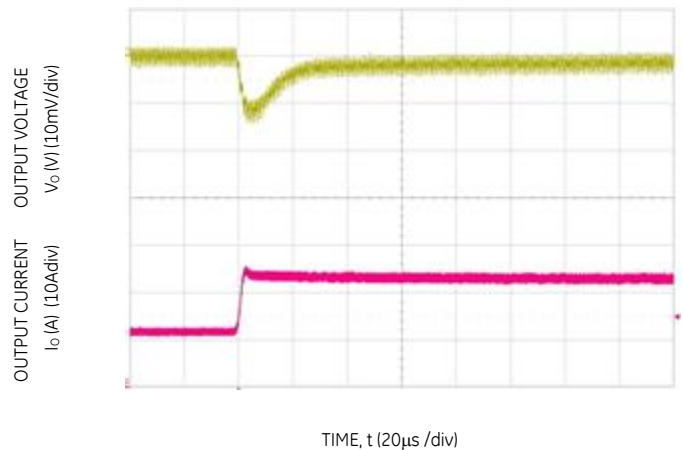


Figure 10. Transient Response to Dynamic Load Change from 50% to 100% at 12Vin,  $C_{out} = 3 \times 47\mu\text{F} + 3 \times 330\mu\text{F}$ ,  $C_{Tune} = 12\text{nF}$  &  $R_{Tune} = 220\text{ohms}$

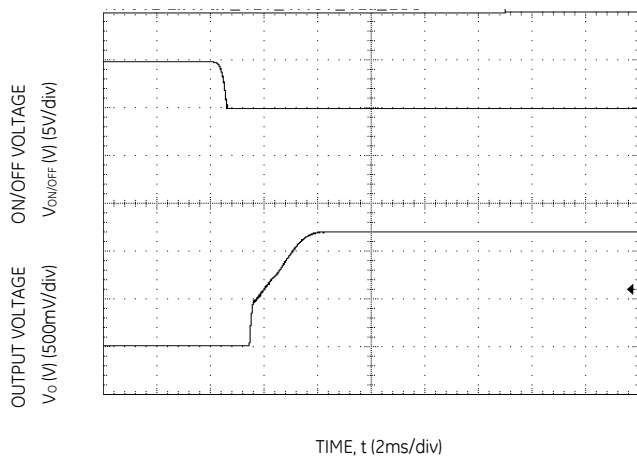


Figure 11. Typical Start-up Using On/Off Voltage ( $I_o = I_{o,max}$ ).

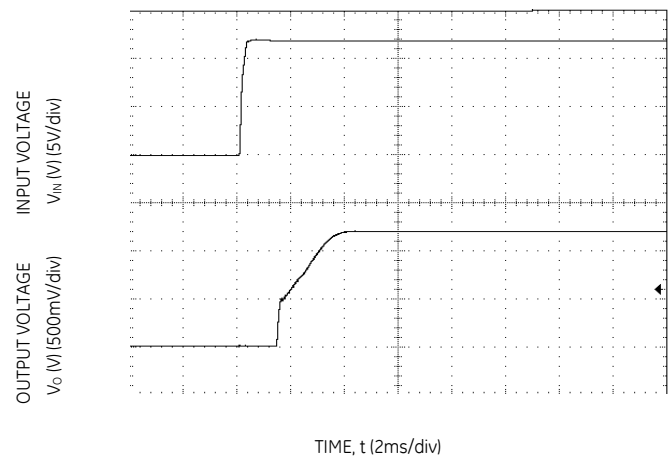


Figure 12. Typical Start-up Using Input Voltage ( $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Characteristic Curves

The following figures provide typical characteristics for the 12A Digital SlimLynx™ at 1.8V<sub>o</sub> and 25°C.

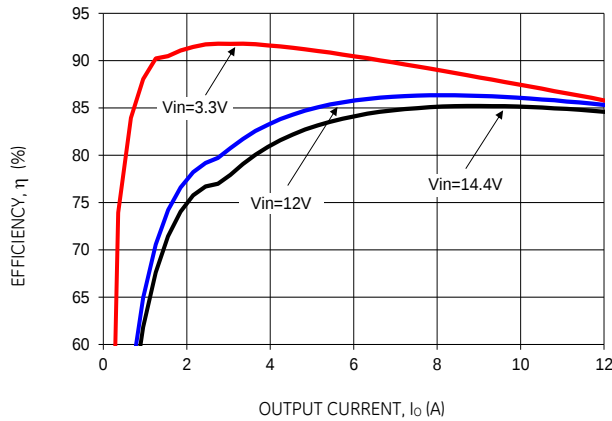


Figure 13. Converter Efficiency versus Output Current.

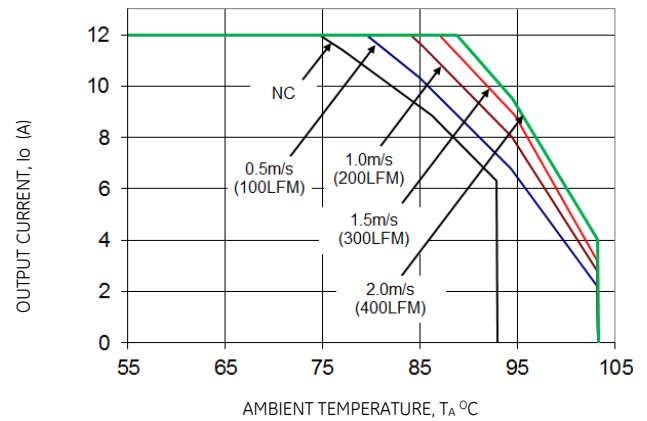


Figure 14. Derating Output Current versus Ambient Temperature and Airflow.

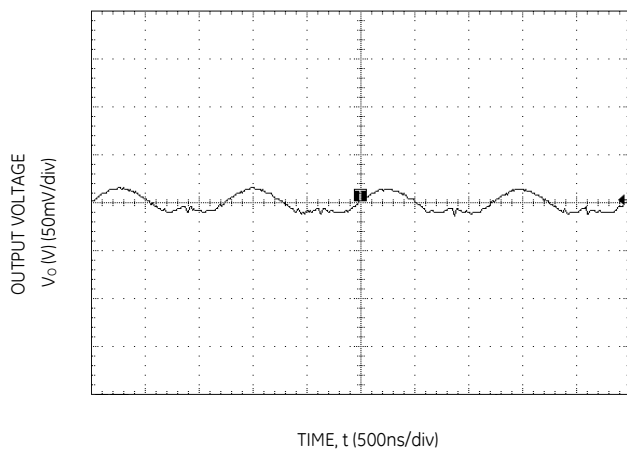


Figure 15. Typical output ripple and noise ( $C_o=2 \times 47\mu\text{F}$  ceramic,  $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

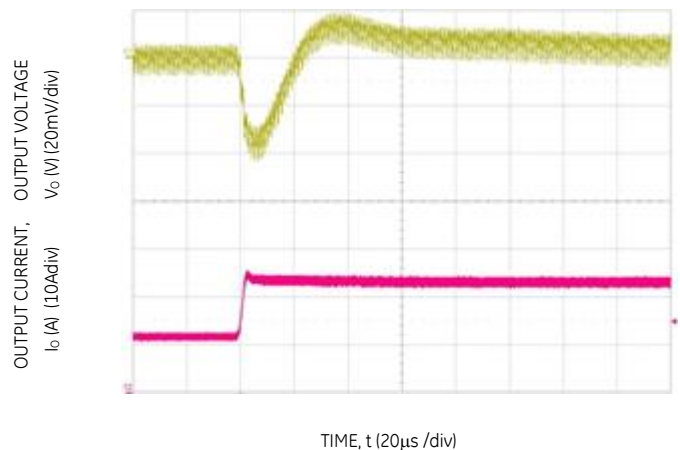


Figure 16. Transient Response to Dynamic Load Change from 50% to 100% at 12Vin,  $C_{out} = 2 \times 47\mu\text{F} + 2 \times 330\mu\text{F}$ ,  $C_{Tune}=5600\text{pF}$  &  $R_{Tune}=220\Omega$

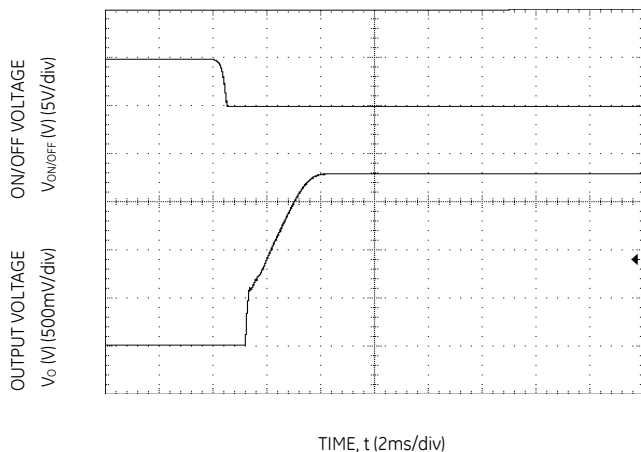


Figure 17. Typical Start-up Using On/Off Voltage ( $I_o = I_{o,max}$ ).

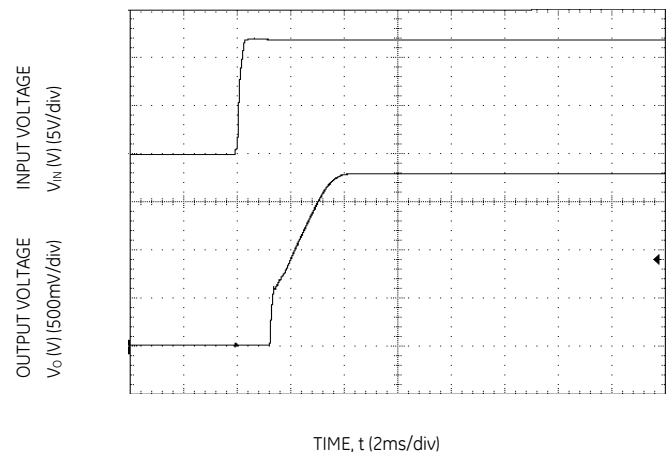


Figure 18. Typical Start-up Using Input Voltage ( $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Characteristic Curves

The following figures provide typical characteristics for the 12A Digital SlimLynx™ at 2.5V<sub>o</sub> and 25°C.

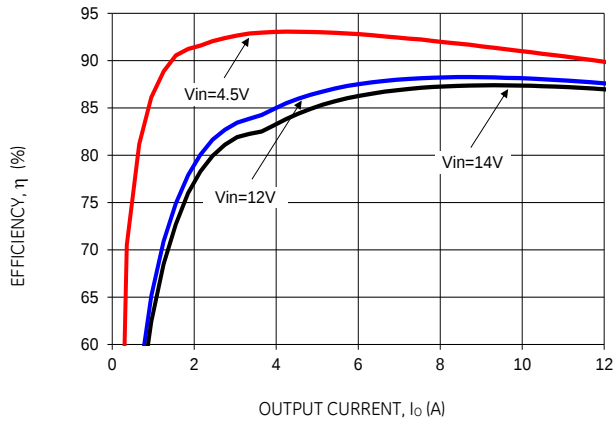


Figure 19. Converter Efficiency versus Output Current.

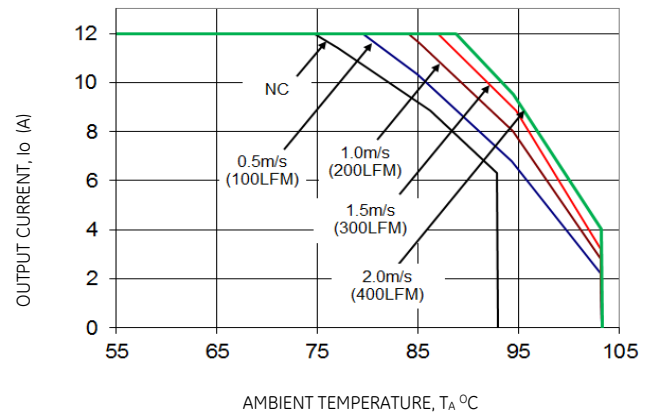


Figure 20. Derating Output Current versus Ambient Temperature and Airflow.

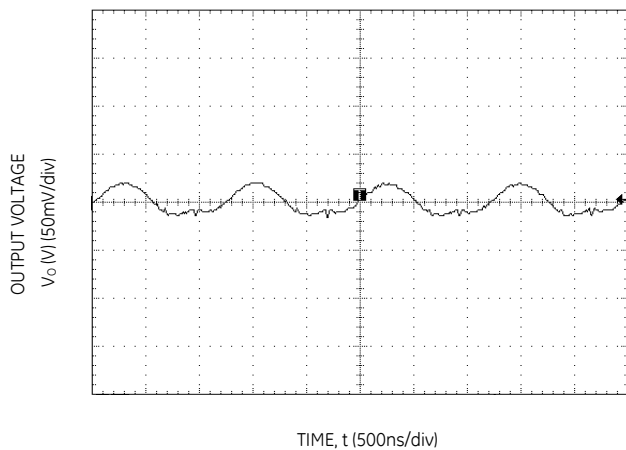


Figure 21. Typical output ripple and noise ( $C_o=2 \times 47\mu\text{F}$  ceramic,  $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

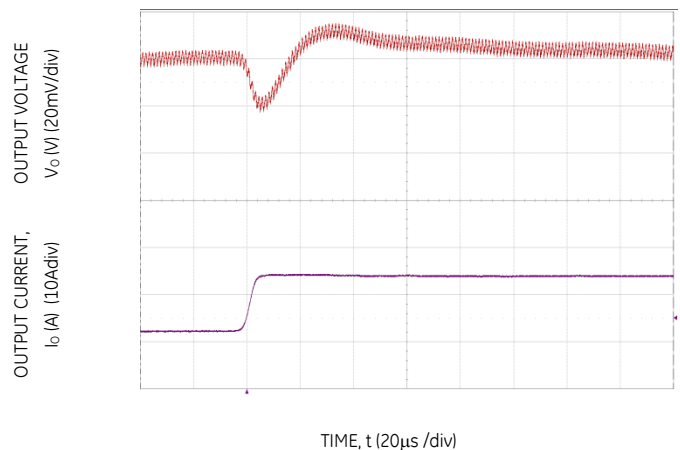


Figure 22. Transient Response to Dynamic Load Change from 50% to 100% at 12Vin,  $C_{out} = 2 \times 47\mu\text{F} + 1 \times 330\mu\text{F}$ ,  $C_{Tune}=3300\text{pF}$  &  $R_{Tune}=240\Omega$

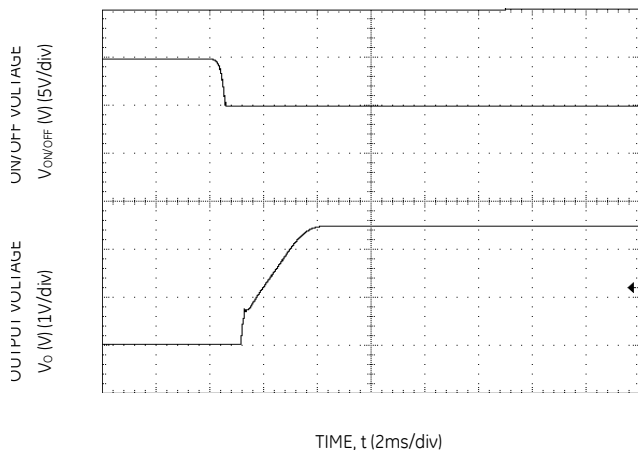


Figure 23. Typical Start-up Using On/Off Voltage ( $I_o = I_{o,max}$ ).

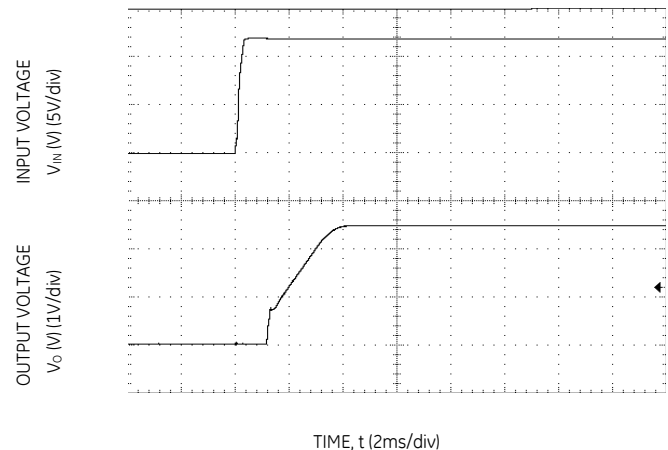


Figure 24. Typical Start-up Using Input Voltage ( $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Characteristic Curves

The following figures provide typical characteristics for the 12A Digital SlimLynx™ at 3.3V<sub>o</sub> and 25°C.

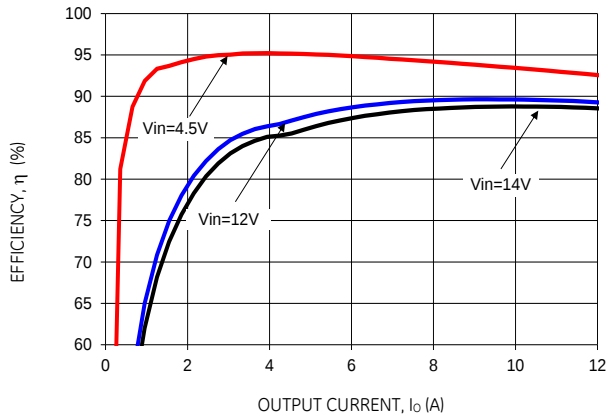


Figure 25. Converter Efficiency versus Output Current.

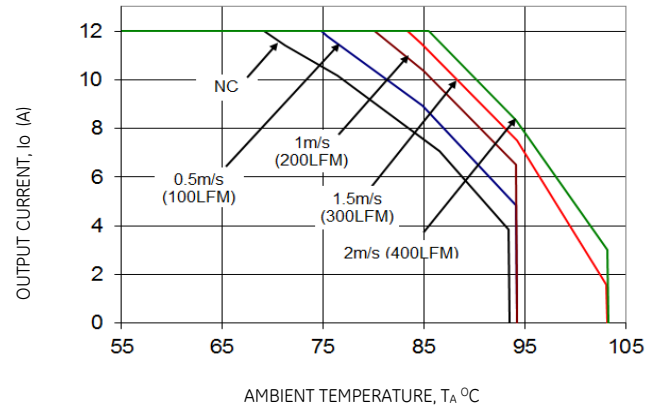


Figure 26. Derating Output Current versus Ambient Temperature and Airflow.

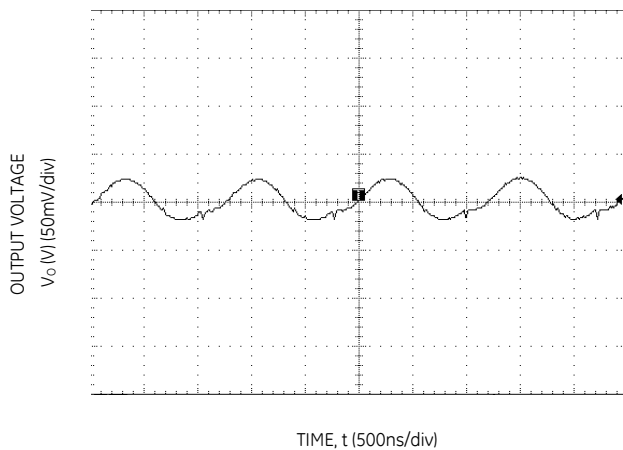


Figure 27. Typical output ripple and noise ( $C_o=2 \times 47\mu\text{F}$  ceramic,  $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

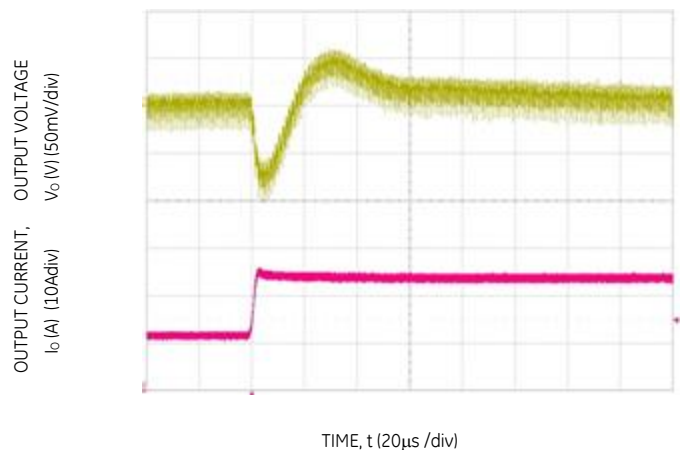


Figure 28 Transient Response to Dynamic Load Change from 50% to 100% at 12V<sub>in</sub>,  $C_{out} = 2 \times 47\mu\text{F} + 1 \times 330\mu\text{F}$ ,  $C_{Tune}=2700\text{pF}$  &  $R_{Tune}=300\Omega$

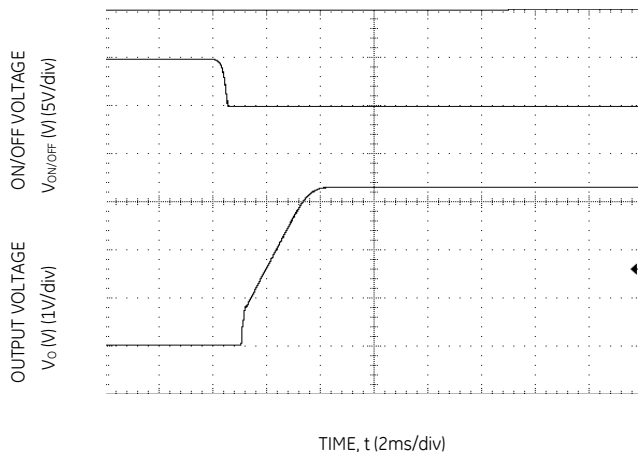


Figure 29. Typical Start-up Using On/Off Voltage ( $I_o = I_{o,max}$ ).

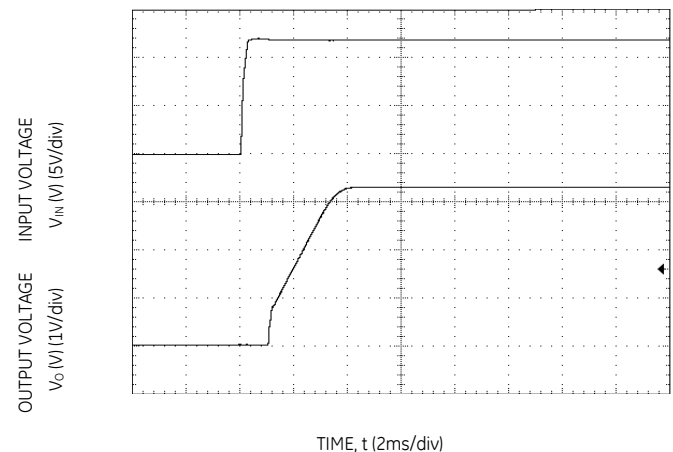


Figure 30. Typical Start-up Using Input Voltage ( $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Characteristic Curves

The following figures provide typical characteristics for the 12A Digital SlimLynx™ at 5Vo and 25°C.

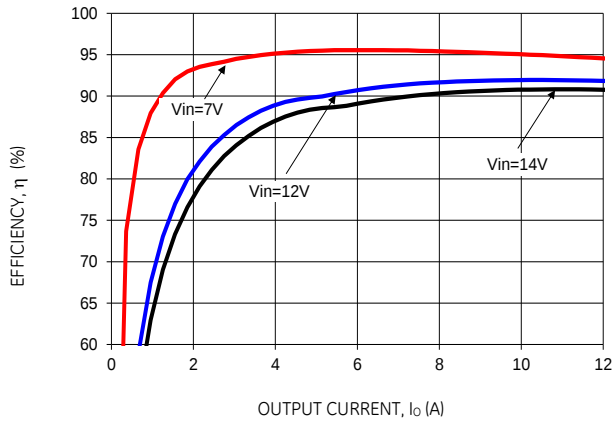


Figure 31. Converter Efficiency versus Output Current.

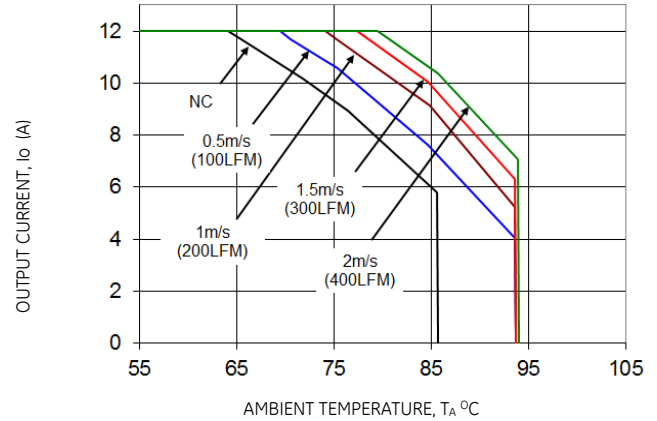


Figure 32. Derating Output Current versus Ambient Temperature and Airflow.

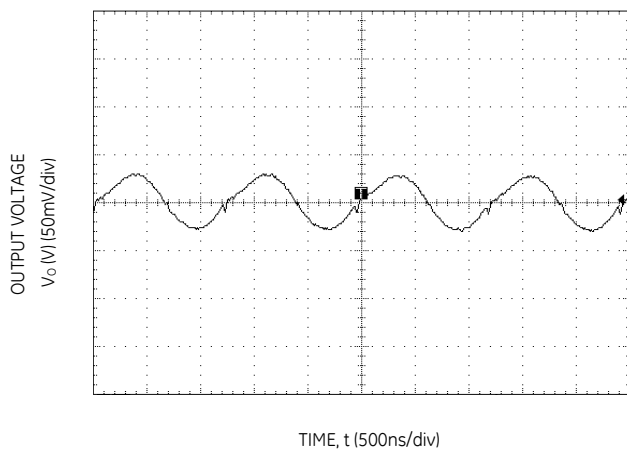


Figure 33. Typical output ripple and noise ( $C_o=2 \times 47\mu\text{F}$  ceramic,  $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

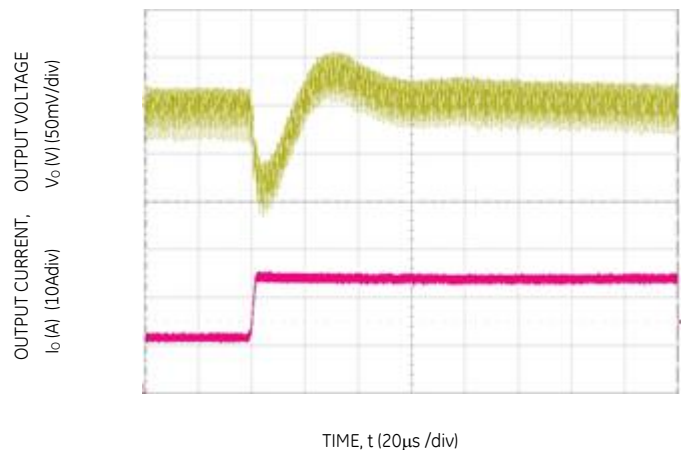


Figure 34. Transient Response to Dynamic Load Change from 50% to 100% at 12Vin,  $C_{out} = 1 \times 47\mu\text{F} + 1 \times 330\mu\text{F}$ ,  $C_{Tune}=2200\text{pF}$  &  $R_{Tune}=300\Omega$

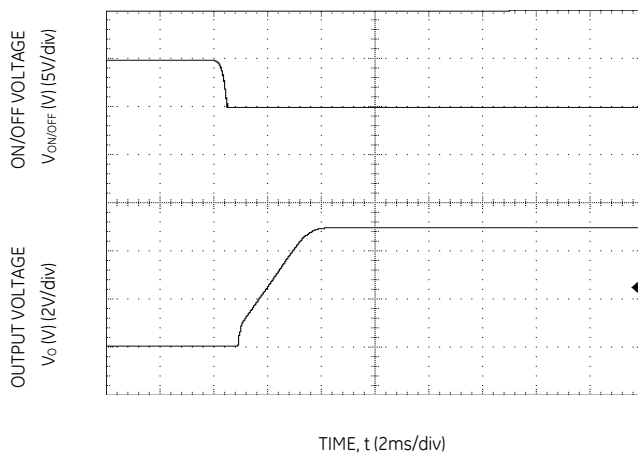


Figure 35. Typical Start-up Using On/Off Voltage ( $I_o = I_{o,max}$ ).

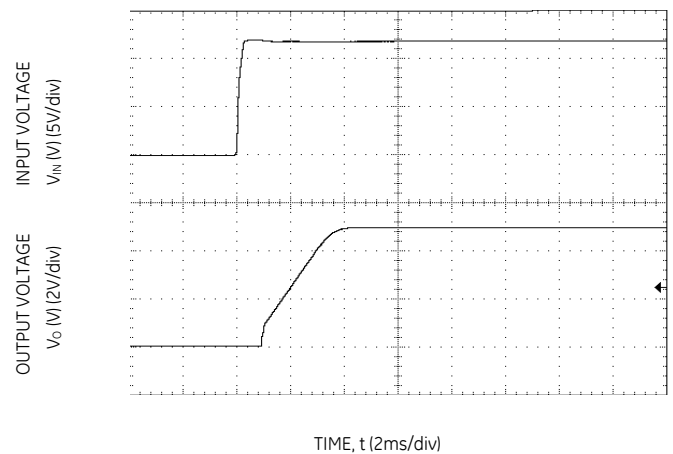


Figure 36. Typical Start-up Using Input Voltage ( $V_{IN} = 12\text{V}$ ,  $I_o = I_{o,max}$ ).

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

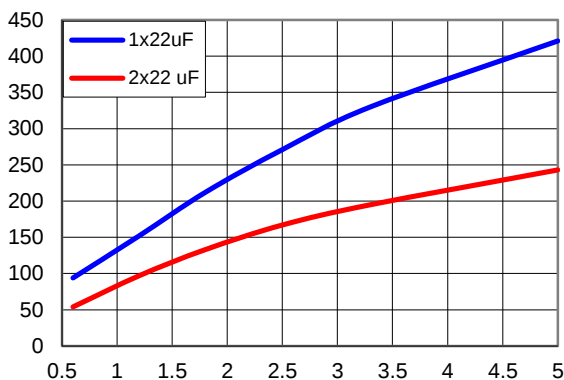
3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Design Considerations

### Input Filtering

The 12A Digital SlimLynx™ module should be connected to a low ac-impedance source. A highly inductive source can affect the stability of the module. An input capacitance must be placed directly adjacent to the input pin of the module, to minimize input ripple voltage and ensure module stability.

To minimize input voltage ripple, ceramic capacitors are recommended at the input of the module. Figure 37 shows the input ripple voltage for various output voltages at 12A of load current with 2x22  $\mu$ F or 3x22  $\mu$ F ceramic capacitors and an input of 12V.

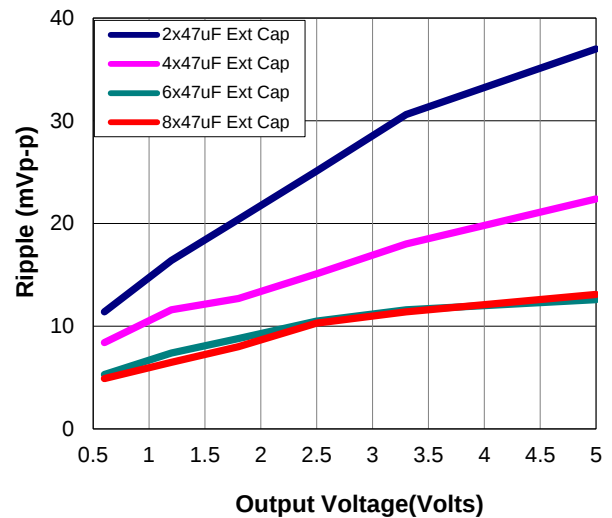


**Figure 37. Input ripple voltage for various output voltages with 2x22  $\mu$ F or 3x22  $\mu$ F ceramic capacitors at the input (12A load). Input voltage is 12V.**

### Output Filtering

These modules are designed for low output ripple voltage and will meet the maximum output ripple specification with 3x0.047  $\mu$ F ceramic and 2x47  $\mu$ F ceramic capacitors at the output of the module. However, additional output filtering may be required by the system designer for a number of reasons. First, there may be a need to further reduce the output ripple and noise of the module. Second, the dynamic response characteristics may need to be customized to a particular load step change.

To reduce the output ripple and improve the dynamic response to a step load change, additional capacitance at the output can be used. Low ESR polymer and ceramic capacitors are recommended to improve the dynamic response of the module. Figure 38 provides output ripple information, measured with a scope with its Bandwidth limited to 20MHz for different external capacitance values at various  $V_o$  and a full load current of 12A. For stable operation of the module, limit the capacitance to less than the maximum output capacitance as specified in the electrical specification table. Optimal performance of the module can be achieved by using the Tunable Loop™ feature described later in this data sheet.



**Figure 38. Output ripple voltage for various output voltages with external 2x47  $\mu$ F, 4x47  $\mu$ F, 6x47  $\mu$ F or 8x47  $\mu$ F ceramic capacitors at the output (12A load). Input voltage is 12V.**

## Safety Considerations

For safety agency approval the power module must be installed in compliance with the spacing and separation requirements of the end-use safety agency standards, i.e., UL 60950-1 2nd, CSA C22.2 No. 60950-1-07, DIN EN 60950-1:2006 + A11 (VDE0805 Teil 1 + A11):2009-11; EN 60950-1:2006 + A11:2009-03.

For the converter output to be considered meeting the requirements of safety extra-low voltage (SELV), the input must meet SELV requirements. The power module has extra-low voltage (ELV) outputs when all inputs are ELV.

The input to these units is to be provided with a fast acting fuse (e.g. ABC Bussmann) with a maximum rating of 20 A in the positive input lead.

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Analog Feature Descriptions

### Remote On/Off

The module can be turned ON and OFF either by using the ON/OFF pin (Analog interface) or through the PMBus interface (Digital). The module can be configured in a number of ways through the PMBus interface to react to the two ON/OFF inputs:

- Module ON/OFF can be controlled only through the analog interface (digital interface ON/OFF commands are ignored)
- Module ON/OFF can be controlled only through the PMBus interface (analog interface is ignored)
- Module ON/OFF can be controlled by either the analog or digital interface

The default state of the module (as shipped from the factory) is to be controlled by the analog interface only. If the digital interface is to be enabled, or the module is to be controlled only through the digital interface, this change must be made through the PMBus. These changes can be made and written to non-volatile memory on the module so that it is remembered for subsequent use.

### Analog On/Off

The 12A Digital SlimLynx™ power modules feature an On/Off pin for remote On/Off operation. Two On/Off logic options are available. In the Positive Logic On/Off option, (device code suffix “4” – see Ordering Information), the module turns ON during a logic High on the On/Off pin and turns OFF during a logic Low. With the Negative Logic On/Off option, (no device code suffix, see Ordering Information), the module turns OFF during logic High and ON during logic Low. The On/Off signal should be always referenced to ground. For either On/Off logic option, leaving the On/Off pin disconnected will turn the module ON when input voltage is present.

For positive logic modules, the circuit configuration for using the On/Off pin is shown in Figure 39. When the external transistor Q2 is in the OFF state, the internal transistor Q7 is turned ON, which turns Q3 OFF which keeps Q6 OFF and Q5 OFF. This allows the internal PWM #Enable signal to be pulled up by the internal 3.3V, thus turning the module ON. When transistor Q2 is turned ON, the On/Off pin is pulled low, which turns Q7 OFF which turns Q3, Q6 and Q5 ON and the internal PWM #Enable signal is pulled low and the module is OFF. A suggested value for  $R_{pullup}$  is 20k $\Omega$ .

For negative logic On/Off modules, the circuit configuration is shown in Fig. 40. The On/Off pin should be pulled high with an external pull-up resistor (suggested value for the 3V to 14V input range is 20k $\Omega$ ). When transistor Q2 is in the OFF state, the On/Off pin is pulled high, transistor Q3 is turned ON. This turns Q6 ON, followed by Q5 turning ON which pulls the internal ENABLE low and the module is OFF. To turn the module ON, Q2 is turned ON pulling the On/Off pin low, turning transistor Q3 OFF, which keeps Q6 and Q5 OFF resulting in the PWM Enable pin going high.

### Digital On/Off

Please see the Digital Feature Descriptions section.

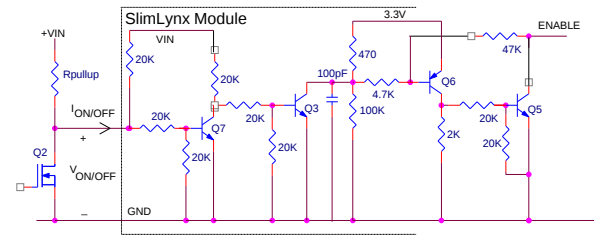


Figure 39. Circuit configuration for using positive On/Off logic.

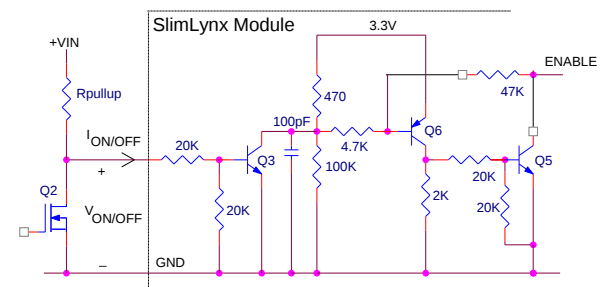


Figure 40. Circuit configuration for using negative On/Off logic.

## Monotonic Start-up and Shutdown

The module has monotonic start-up and shutdown behavior for any combination of rated input voltage, output current and operating temperature range.

### Startup into Pre-biased Output

The module can start into a prebiased output as long as the prebias voltage is 0.5V less than the set output voltage.

## Analog Output Voltage Programming

The output voltage of the module is programmable to any voltage from 0.6Vdc to 5.5Vdc by connecting a resistor between the Trim and SIG\_GND pins of the module. Certain restrictions apply on the output voltage set point depending on the input voltage. These are shown in the Output Voltage vs. Input Voltage Set Point Area plot in Fig. 41. The Upper Limit curve shows that for output voltages lower than 1V, the input voltage must be lower than the maximum of 14.4V. The Lower Limit curve shows that for output voltages higher than 0.6V, the input voltage needs to be larger than the minimum of 3V.

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

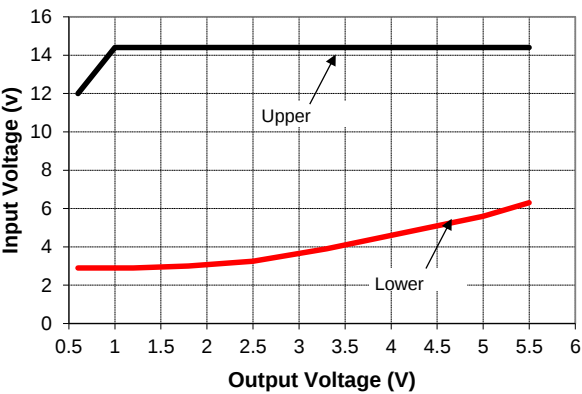
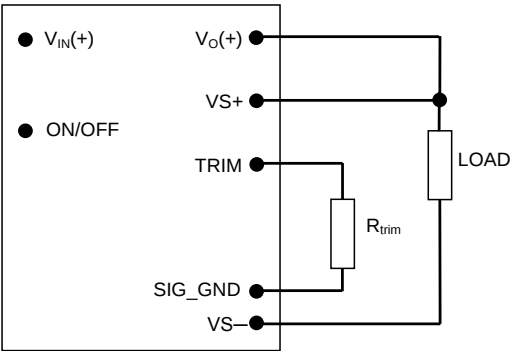


Figure 41. Output Voltage vs. Input Voltage Set Point Area plot showing limits where the output voltage can be set for different input voltages.



**Caution** – Do not connect SIG\_GND to GND elsewhere in the layout

Figure 42. Circuit configuration for programming output voltage using an external resistor.

Without an external resistor between Trim and SIG\_GND pins, the output of the module will be 0.6Vdc. To calculate the value of the trim resistor,  $R_{trim}$  for a desired output voltage, should be as per the following equation:

$$R_{trim} = \left[ \frac{12}{(V_o - 0.6)} \right] k\Omega$$

$R_{trim}$  is the external resistor in  $k\Omega$

$V_o$  is the desired output voltage.

Table 1 provides  $R_{trim}$  values required for some common output voltages.

Table 1

| $V_{o, set} (V)$ | $R_{trim} (k\Omega)$ |
|------------------|----------------------|
| 0.6              | Open                 |
| 0.9              | 40                   |
| 1.0              | 30                   |
| 1.2              | 20                   |
| 1.5              | 13.33                |
| 1.8              | 10                   |
| 2.5              | 6.316                |
| 3.3              | 4.444                |
| 5.0              | 2.727                |

## Digital Output Voltage Adjustment

Please see the Digital Feature Descriptions section.

## Remote Sense

The power module has a Remote Sense feature to minimize the effects of distribution losses by regulating the voltage between the sense pins (VS+ and VS-). The voltage drop between the sense pins and the VOUT and GND pins of the module should not exceed 0.5V.

## Analog Voltage Margining

Output voltage margining can be implemented in the module by connecting a resistor,  $R_{margin-up}$ , from the Trim pin to the ground pin for margining-up the output voltage and by connecting a resistor,  $R_{margin-down}$ , from the Trim pin to output pin for margining-down. Figure 43 shows the circuit configuration for output voltage margining. The POL Programming Tool, available at [www.lineagepower.com](http://www.lineagepower.com) under the Downloads section, also calculates the values of  $R_{margin-up}$  and  $R_{margin-down}$  for a specific output voltage and % margin. Please consult your local GE Critical Power technical representative for additional details.

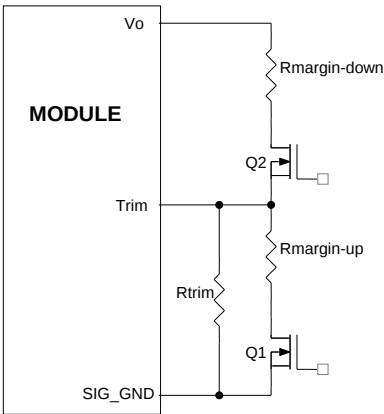


Figure 43. Circuit Configuration for margining Output voltage.

## Digital Output Voltage Margining

Please see the Digital Feature Descriptions section.

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

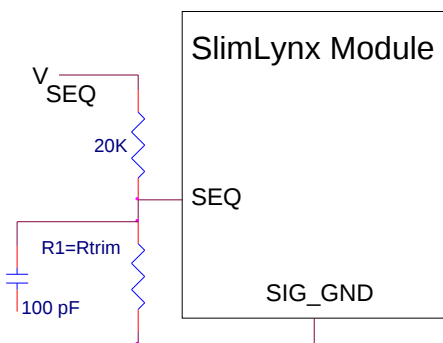
3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

### Output Voltage Sequencing

The power module includes a sequencing feature, EZ-SEQUENCE that enables users to implement various types of output voltage sequencing in their applications. This is accomplished via an additional sequencing pin. When not using the sequencing feature, leave it unconnected.

The voltage applied to the SEQ pin should be scaled down by the same ratio as used to scale the output voltage down to the reference voltage of the module. This is accomplished by an external resistive divider connected across the sequencing voltage before it is fed to the SEQ pin as shown in Fig. 44. In addition, a small capacitor (suggested value 100pF) should be connected across the lower resistor R1.

For all SlimLynx modules, the minimum recommended delay between the ON/OFF signal and the sequencing signal is 10ms to ensure that the module output is ramped up according to the sequencing signal. This ensures that the module soft-start routine is completed before the sequencing signal is allowed to ramp up.



**Figure 44. Circuit showing connection of the sequencing signal to the SEQ pin.**

When the scaled down sequencing voltage is applied to the SEQ pin, the output voltage tracks this voltage until the output reaches the set-point voltage. The final value of the sequencing voltage must be set higher than the set-point voltage of the module. The output voltage follows the sequencing voltage on a one-to-one basis. By connecting multiple modules together, multiple modules can track their output voltages to the voltage applied on the SEQ pin.

The module's output can track the SEQ pin signal with slopes of up to 0.5V/msec during power-up or power-down.

To initiate simultaneous shutdown of the modules, the SEQ pin voltage is lowered in a controlled manner. The output voltage of the modules tracks the voltages below their set-point voltages on a one-to-one basis. A valid input voltage must be maintained until the tracking and output voltages reach ground potential.

Note that in all digital SlimLynx series of modules, the PMBus Output Undervoltage Fault will be tripped when sequencing is employed. This will be detected using the STATUS\_WORD and STATUS\_VOUT PMBus commands. In addition, the SMBALERT# signal will be asserted low as occurs for all faults

and warnings. To avoid the module shutting down due to the Output Undervoltage Fault, the module must be set to continue operation without interruption as the response to this fault (see the description of the PMBus command VOUT\_UV\_FAULT\_RESPONSE for additional information).

### Overcurrent Protection

To provide protection in a fault (output overload) condition, the unit is equipped with internal current-limiting circuitry and can endure current limiting continuously. At the point of current-limit inception, the unit enters hiccup mode. The unit operates normally once the output current is brought back into its specified range.

### Digital Adjustable Overcurrent Warning

Please see the Digital Feature Descriptions section.

### Overtemperature Protection

To provide protection in a fault condition, the unit is equipped with a thermal shutdown circuit. The unit will shut down if the overtemperature threshold of 150°C(typ) is exceeded at the thermal reference point  $T_{ref}$ . Once the unit goes into thermal shutdown it will then wait to cool before attempting to restart.

### Digital Temperature Status via PMBus

Please see the Digital Feature Descriptions section.

### Digitally Adjustable Output Over and Under Voltage Protection

Please see the Digital Feature Descriptions section.

### Input Undervoltage Lockout

At input voltages below the input undervoltage lockout limit, the module operation is disabled. The module will begin to operate at an input voltage above the undervoltage lockout turn-on threshold.

### Digitally Adjustable Input Undervoltage Lockout

Please see the Digital Feature Descriptions section.

### Digitally Adjustable Power Good Thresholds

Please see the Digital Feature Descriptions section.

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

### Synchronization

The module switching frequency can be synchronized to a signal with an external frequency within a specified range. Synchronization can be done by using the external signal applied to the SYNC pin of the module as shown in Fig. 45, with the converter being synchronized by the rising edge of the external signal. The Electrical Specifications table specifies the requirements of the external SYNC signal. If the SYNC pin is not used, the module should free run at the default switching frequency. **If synchronization is not being used, connect the SYNC pin to GND.**

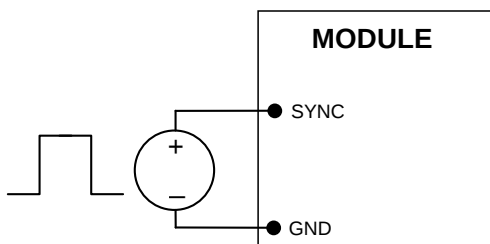


Figure 45. External source connections to synchronize switching frequency of the module.

### Measuring Output Current, Output Voltage and Input Voltage

Please see the Digital Feature Descriptions section.

### Tunable Loop™

The module has a feature that optimizes transient response of the module called Tunable Loop™.

External capacitors are usually added to the output of the module for two reasons: to reduce output ripple and noise (see Figure 38) and to reduce output voltage deviations from the steady-state value in the presence of dynamic load current changes. Adding external capacitance however affects the voltage control loop of the module, typically causing the loop to slow down with sluggish response. Larger values of external capacitance could also cause the module to become unstable.

The Tunable Loop™ allows the user to externally adjust the voltage control loop to match the filter network connected to the output of the module. The Tunable Loop™ is implemented by connecting a series R-C between the VS+ and TRIM pins of the module, as shown in Fig. 46. This R-C allows the user to externally adjust the voltage loop feedback compensation of the module.

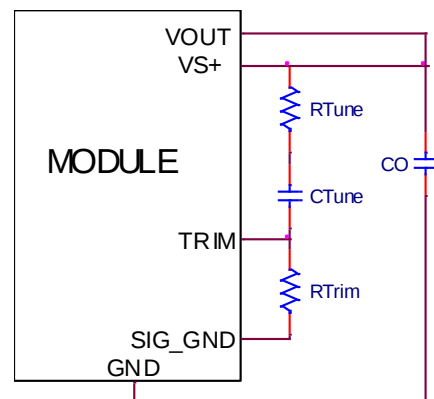


Figure 46. Circuit diagram showing connection of  $R_{TUNE}$  and  $C_{TUNE}$  to tune the control loop of the module.

Recommended values of  $R_{TUNE}$  and  $C_{TUNE}$  for different output capacitor combinations are given in Table 2. Table 2 shows the recommended values of  $R_{TUNE}$  and  $C_{TUNE}$  for different values of ceramic output capacitors up to 1000uF that might be needed for an application to meet output ripple and noise requirements. Selecting  $R_{TUNE}$  and  $C_{TUNE}$  according to Table 2 will ensure stable operation of the module. In applications with tight output voltage limits in the presence of dynamic current loading, additional output capacitance will be required. Table 3 lists recommended values of  $R_{TUNE}$  and  $C_{TUNE}$  in order to meet 2% output voltage deviation limits for some common output voltages in the presence of a 6A to 12A step change (50% of full load), with an input voltage of 12V.

Please contact your GE Critical Power technical representative to obtain more details of this feature as well as for guidelines on how to select the right value of external R-C to tune the module for best transient performance and stable operation for other output capacitance values.

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**Table 2. General recommended values of  $R_{TUNE}$  and  $C_{TUNE}$  for  $V_{in}=12V$  and various external ceramic capacitor combinations.**

| Co         | 2x47 $\mu$ F | 4x47 $\mu$ F | 6x47 $\mu$ F | 10x47 $\mu$ F | 10x47 $\mu$ F |
|------------|--------------|--------------|--------------|---------------|---------------|
| $R_{TUNE}$ | 430          | 390          | 300          | 240           | 180           |
| $C_{TUNE}$ | 390pF        | 1500pF       | 2700pF       | 3300pF        | 8200pF        |

**Table 3. Recommended values of  $R_{TUNE}$  and  $C_{TUNE}$  to obtain transient deviation of 2% of  $V_{out}$  for a 6A step load with  $V_{in}=12V$ .**

| Vo         | 5V                                 | 3.3V                               | 2.5V                               | 1.8V                                 | 1.2V                                 | 0.6V                                  |
|------------|------------------------------------|------------------------------------|------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|
| Co         | 1x47 $\mu$ F + 330 $\mu$ F Polymer | 1x47 $\mu$ F + 330 $\mu$ F Polymer | 2x47 $\mu$ F + 330 $\mu$ F Polymer | 1x47 $\mu$ F + 2x330 $\mu$ F Polymer | 3x47 $\mu$ F + 3x330 $\mu$ F Polymer | 1x47 $\mu$ F + 11x330 $\mu$ F Polymer |
| $R_{TUNE}$ | 300                                | 300                                | 240                                | 220                                  | 220                                  | 180                                   |
| $C_{TUNE}$ | 2200pF                             | 2200pF                             | 3300pF                             | 5600pF                               | 12nF                                 | 47nF                                  |
| $\Delta V$ | 55mV                               | 54mV                               | 47mV                               | 31mV                                 | 21mV                                 | 8mV                                   |

**Note:** The capacitors used in the Tunable Loop tables are 47  $\mu$ F/4 m $\Omega$  ESR ceramic and 330  $\mu$ F/12 m $\Omega$  ESR polymer capacitors.

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## Digital Feature Descriptions

### PMBus Interface Capability

The 12A Digital SlimLynx™ power modules have a PMBus interface that supports both communication and control. The PMBus Power Management Protocol Specification can be obtained from [www.pmbus.org](http://www.pmbus.org). The modules support a subset of version 1.1 of the specification (see Table 6 for a list of the specific commands supported). Most module parameters can be programmed using PMBus and stored as defaults for later use.

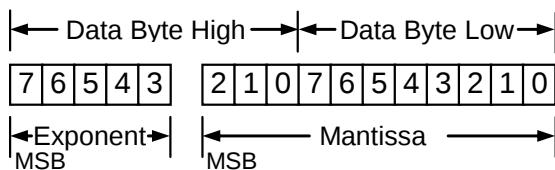
All communication over the module PMBus interface must support the Packet Error Checking (PEC) scheme. The PMBus master must generate the correct PEC byte for all transactions, and check the PEC byte returned by the module.

The module also supports the SMBALERT# response protocol whereby the module can alert the bus master if it wants to talk. For more information on the SMBus alert response protocol, see the System Management Bus (SMBus) specification.

The module has non-volatile memory that is used to store configuration settings. Not all settings programmed into the device are automatically saved into this non-volatile memory, only those specifically identified as capable of being stored can be saved (see Table 6 for which command parameters can be saved to non-volatile storage).

### PMBus Data Format

For commands that set thresholds, voltages or report such quantities, the module supports the “Linear” data format among the three data formats supported by PMBus. The Linear Data Format is a two byte value with an 11-bit, two’s complement mantissa and a 5-bit, two’s complement exponent. The format of the two data bytes is shown below:



The value of the number is then given by

$$\text{Value} = \text{Mantissa} \times 2^{\text{Exponent}}$$

### PMBus Addressing

The power module can be addressed through the PMBus using a device address. The module has 64 possible addresses (0 to 63 in decimal) which can be set using resistors connected from the ADDR0 and ADDR1 pins to SIG\_GND. Note that some of these addresses (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 40, 44, 45, 55 in decimal) are reserved according to the SMBus specifications and may not be useable. The address is set in the form of two octal (0 to 7) digits, with each pin setting one digit. The ADDR1 pin sets the high order digit and ADDR0 sets the low order digit. The resistor values suggested for each digit are shown in Table 4

(1% tolerance resistors are recommended). Note that if either address resistor value is outside the range specified in Table 4, the module will respond to address 127.

Table 4

| Digit | Resistor Value (KΩ) |
|-------|---------------------|
| 0     | 10                  |
| 1     | 15.4                |
| 2     | 23.7                |
| 3     | 36.5                |
| 4     | 54.9                |
| 5     | 84.5                |
| 6     | 130                 |
| 7     | 200                 |

The user must know which I<sup>2</sup>C addresses are reserved in a system for special functions and set the address of the module to avoid interfering with other system operations. Both 100kHz and 400kHz bus speeds are supported by the module. Connection for the PMBus interface should follow the High Power DC specifications given in section 3.1.3 in the SMBus specification V2.0 for the 400kHz bus speed or the Low Power DC specifications in section 3.1.2. The complete SMBus specification is available from the SMBus web site, [smbus.org](http://smbus.org).

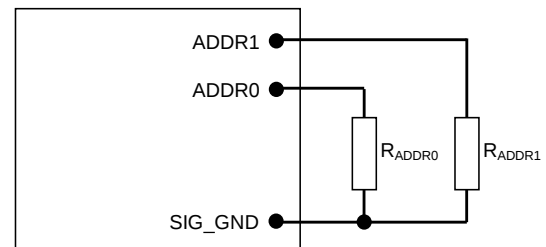


Figure 47. Circuit showing connection of resistors used to set the PMBus address of the module.

### PMBus Enabled On/Off

The module can also be turned on and off via the PMBus interface. The OPERATION command is used to actually turn the module on and off via the PMBus, while the ON\_OFF\_CONFIG command configures the combination of analog ON/OFF pin input and PMBus commands needed to turn the module on and off. Bit [7] in the OPERATION command data byte enables the module, with the following functions:

- 0 : Output is disabled
- 1 : Output is enabled

This module uses the lower five bits of the ON\_OFF\_CONFIG data byte to set various ON/OFF options as follows:

| Bit Position  | 4   | 3   | 2   | 1   | 0   |
|---------------|-----|-----|-----|-----|-----|
| Access        | r/w | r/w | r/w | r/w | r   |
| Function      | PU  | CMD | CPR | POL | CPA |
| Default Value | 1   | 0   | 1   | 1   | 1   |

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PU: Sets the default to either operate any time input power is present or for the ON/OFF to be controlled by the analog ON/OFF input and the PMBus OPERATION command. This bit is used together with the CP, CMD and ON bits to determine startup.

| Bit Value | Action                                                                                                                                                 |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0         | Module powers up any time power is present regardless of state of the analog ON/OFF pin                                                                |
| 1         | Module does not power up until commanded by the analog ON/OFF pin and the OPERATION command as programmed in bits [2:0] of the ON_OFF_CONFIG register. |

CMD: The CMD bit controls how the device responds to the OPERATION command.

| Bit Value | Action                                                 |
|-----------|--------------------------------------------------------|
| 0         | Module ignores the ON bit in the OPERATION command     |
| 1         | Module responds to the ON bit in the OPERATION command |

CPR: Sets the response of the analog ON/OFF pin. This bit is used together with the CMD, PU and ON bits to determine startup.

| Bit Value | Action                                                                                                           |
|-----------|------------------------------------------------------------------------------------------------------------------|
| 0         | Module ignores the analog ON/OFF pin, i.e. ON/OFF is only controlled through the PMBUS via the OPERATION command |
| 1         | Module requires the analog ON/OFF pin to be asserted to start the unit                                           |

### PMBus Adjustable Soft Start Rise Time

The soft start rise time can be adjusted in the module via PMBus. When setting this parameter, make sure that the charging current for output capacitors can be delivered by the module in addition to any load current to avoid nuisance tripping of the overcurrent protection circuitry during startup. The TON\_RISE command sets the rise time in ms, and allows choosing soft start times between 600µs and 9ms, with possible values listed in Table 5. Note that the exponent is fixed at -4 (decimal) and the upper two bits of the mantissa are also fixed at 0.

Table 5

| Rise Time | Exponent | Mantissa    |
|-----------|----------|-------------|
| 600µs     | 11100    | 00000001010 |
| 900µs     | 11100    | 00000001110 |
| 1.2ms     | 11100    | 00000010011 |
| 1.8ms     | 11100    | 00000011101 |
| 2.7ms     | 11100    | 00000101011 |
| 4.2ms     | 11100    | 00001000011 |
| 6.0ms     | 11100    | 00001100000 |
| 9.0ms     | 11100    | 00010010000 |

### Output Voltage Adjustment Using the PMBus

The VOUT\_SCALE\_LOOP parameter is important for a number of PMBus commands related to output voltage trimming, margining, over/under voltage protection and the PGOOD thresholds. The output voltage of the module is set as the combination of the voltage divider formed by RTrim and a 20kΩ upper divider resistor inside the module, and the internal reference voltage of the module. The reference voltage  $V_{REF}$  is nominally set at 600mV, and the output regulation voltage is then given by

$$V_{OUT} = \left[ \frac{20000 + RTrim}{RTrim} \right] \times V_{REF}$$

Hence the module output voltage is dependent on the value of RTrim which is connected external to the module. The information on the output voltage divider ratio is conveyed to the module through the VOUT\_SCALE\_LOOP parameter which is calculated as follows:

$$VOUT\_SCALE\_LOOP = \frac{RTrim}{20000 + RTrim}$$

The VOUT\_SCALE\_LOOP parameter is specified using the "Linear" format and two bytes. The upper five bits [7:3] of the high byte are used to set the exponent which is fixed at -9 (decimal). The remaining three bits of the high byte [2:0] and the eight bits of the lower byte are used for the mantissa. The default value of the mantissa is 00100000000 corresponding to 256 (decimal), corresponding to a divider ratio of 0.5. The maximum value of the mantissa is 512 corresponding to a divider ratio of 1. Note that the resolution of the VOUT\_SCALE\_LOOP command is 0.2%.

When PMBus commands are used to trim or margin the output voltage, the value of  $V_{REF}$  is what is changed inside the module, which in turn changes the regulated output voltage of the module.

The nominal output voltage of the module can be adjusted with a minimum step size of 0.4% over a ±25% range from nominal using the VOUT\_TRIM command over the PMBus.

The VOUT\_TRIM command is used to apply a fixed offset voltage to the output voltage command value using the

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“Linear” mode with the exponent fixed at –10 (decimal). The value of the offset voltage is given by

$$V_{OUT(offset)} = VOUT\_TRIM \times 2^{-10}$$

This offset voltage is added to the voltage set through the divider ratio and nominal  $V_{REF}$  to produce the trimmed output voltage. The valid range in two's complement for this command is –4000h to 3999h. The high order two bits of the high byte must both be either 0 or 1. If a value outside of the +/-25% adjustment range is given with this command, the module will set its output voltage to the nominal value (as if  $VOUT\_TRIM$  had been set to 0), assert  $SMBALRT\#$ , set the CML bit in  $STATUS\_BYTE$  and the invalid data bit in  $STATUS\_CML$ .

### Output Voltage Margining Using the PMBus

The module can also have its output voltage margined via PMBus commands. The command  $VOUT\_MARGIN\_HIGH$  sets the margin high voltage, while the command  $VOUT\_MARGIN\_LOW$  sets the margin low voltage. Both the  $VOUT\_MARGIN\_HIGH$  and  $VOUT\_MARGIN\_LOW$  commands use the “Linear” mode with the exponent fixed at –10 (decimal). Two bytes are used for the mantissa with the upper bit [7] of the high byte fixed at 0. The actual margined output voltage is a combination of the  $VOUT\_MARGIN\_HIGH$  or  $VOUT\_MARGIN\_LOW$  and the  $VOUT\_TRIM$  values as shown below.

$$V_{OUT(MH)} = (VOUT\_MARGIN\_HIGH + VOUT\_TRIM) \times 2^{-10}$$

$$V_{OUT(ML)} = (VOUT\_MARGIN\_LOW + VOUT\_TRIM) \times 2^{-10}$$

Note that the sum of the margin and trim voltages cannot be outside the  $\pm 25\%$  window around the nominal output voltage. The data associated with  $VOUT\_MARGIN\_HIGH$  and  $VOUT\_MARGIN\_LOW$  can be stored to non-volatile memory using the  $STORE\_DEFAULT\_ALL$  command.

The module is commanded to go to the margined high or low voltages using the  $OPERATION$  command. Bits [5:2] are used to enable margining as follows:

|      |                              |
|------|------------------------------|
| 00XX | : Margin Off                 |
| 0101 | : Margin Low (Ignore Fault)  |
| 0110 | : Margin Low (Act on Fault)  |
| 1001 | : Margin High (Ignore Fault) |
| 1010 | : Margin High (Act on Fault) |

### PMBus Adjustable Overcurrent Warning

The module can provide an overcurrent warning via the PMBus. The threshold for the overcurrent warning can be set using the parameter  $IOUT\_OC\_WARN\_LIMIT$ . This command uses the “Linear” data format with a two byte data word where the upper five bits [7:3] of the high byte represent the exponent and the remaining three bits of the high byte [2:0] and the eight bits in the low byte represent the mantissa. The exponent is fixed at –1 (decimal). The upper five bits of the mantissa are fixed at 0 while the lower six bits are programmable. Note that the actual value for  $IOUT\_OC\_WARN\_LIMIT$  will vary from module to module due

to calibration during production test. The resolution of this warning limit is 500mA. The value of the  $IOUT\_OC\_WARN\_LIMIT$  can be stored to non-volatile memory using the  $STORE\_DEFAULT\_ALL$  command.

### Temperature Status via PMBus

The module can provide information related to temperature of the module through the  $STATUS\_TEMPERATURE$  command. The command returns information about whether the pre-set over temperature fault threshold and/or the warning threshold have been exceeded.

### PMBus Adjustable Output Over and Under Voltage Protection

The module has output over and under voltage protection capability. The PMBus command  $VOUT\_OV\_FAULT\_LIMIT$  is used to set the output over voltage threshold from four possible values: 108%, 110%, 112% or 115% of the commanded output voltage. The command  $VOUT\_UV\_FAULT\_LIMIT$  sets the threshold that causes an output under voltage fault and can also be selected from four possible values: 92%, 90%, 88% or 85%. The default values are 112% and 88% of commanded output voltage. Both commands use two data bytes formatted as two's complement binary integers. The “Linear” mode is used with the exponent fixed to –10 (decimal) and the effective over or under voltage trip points given by:

$$V_{OUT(OV\_REQ)} = (VOUT\_OV\_FAULT\_LIMIT) \times 2^{-10}$$

$$V_{OUT(UV\_REQ)} = (VOUT\_UV\_FAULT\_LIMIT) \times 2^{-10}$$

Values within the supported range for over and undervoltage detection thresholds will be set to the nearest fixed percentage. Note that the correct value for  $VOUT\_SCALE\_LOOP$  must be set in the module for the correct over or under voltage trip points to be calculated.

In addition to adjustable output voltage protection, the 12A Digital SlimLynx™ module can also be programmed for the response to the fault. The  $VOUT\_OV\_FAULT\_RESPONSE$  and  $VOUT\_UV\_FAULT\_RESPONSE$  commands specify the response to the fault. Both these commands use a single data byte with the possible options as shown below.

1. Continue operation without interruption (Bits [7:6] = 00, Bits [5:3] = xxx)
2. Continue for four switching cycles and then shut down if the fault is still present, followed by no restart or continuous restart (Bits [7:6] = 01, Bits [5:3] = 000 means no restart, Bits [5:3] = 111 means continuous restart)
3. Immediate shut down followed by no restart or continuous restart (Bits [7:6] = 10, Bits [5:3] = 000 means no restart, Bits [5:3] = 111 means continuous restart).
4. Module output is disabled when the fault is present and the output is enabled when the fault no longer exists (Bits [7:6] = 11, Bits [5:3] = xxx).

Note that separate response choices are possible for output over voltage or under voltage faults.

### PMBus Adjustable Input Undervoltage Lockout

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The module allows adjustment of the input under voltage lockout and hysteresis. The command VIN\_ON allows setting the input voltage turn on threshold, while the VIN\_OFF command sets the input voltage turn off threshold. For the VIN\_ON command, possible values are 2.75V, and 3V to 14V in 0.5V steps. For the VIN\_OFF command, possible values are 2.5V to 14V in 0.5V steps. If other values are entered for either command, they will be mapped to the closest of the allowed values.

VIN\_ON must be set higher than VIN\_OFF. Attempting to write either VIN\_ON lower than VIN\_OFF or VIN\_OFF higher than VIN\_ON results in the new value being rejected, SMBALERT being asserted along with the CML bit in STATUS\_BYTE and the invalid data bit in STATUS\_CML.

Both the VIN\_ON and VIN\_OFF commands use the “Linear” format with two data bytes. The upper five bits represent the exponent (fixed at -2) and the remaining 11 bits represent the mantissa. For the mantissa, the four most significant bits are fixed at 0.

### Power Good

The module provides a Power Good (PGOOD) signal that is implemented with an open-drain output to indicate that the output voltage is within the regulation limits of the power module. The PGOOD signal will be de-asserted to a low state if any condition such as overtemperature, overcurrent or loss of regulation occurs that would result in the output voltage going outside the specified thresholds. The PGOOD thresholds are user selectable via the PMBus (the default values are as shown in the Feature Specifications Section). Each threshold is set up symmetrically above and below the nominal value. The POWER\_GOOD\_ON command sets the output voltage level above which PGOOD is asserted (lower threshold). For example, with a 1.2V nominal output voltage, the POWER\_GOOD\_ON threshold can set the lower threshold to 1.14 or 1.1V. Doing this will automatically set the upper thresholds to 1.26 or 1.3V.

The POWER\_GOOD\_OFF command sets the level below which the PGOOD command is de-asserted. This command also sets two thresholds symmetrically placed around the nominal output voltage. Normally, the POWER\_GOOD\_ON threshold is set higher than the POWER\_GOOD\_OFF threshold.

Both POWER\_GOOD\_ON and POWER\_GOOD\_OFF commands use the “Linear” format with the exponent fixed at -10 (decimal). The two thresholds are given by

$$V_{OUT(PGOOD\_ON)} = (POWER\_GOOD\_ON) \times 2^{-10}$$

$$V_{OUT(PGOOD\_OFF)} = (POWER\_GOOD\_OFF) \times 2^{-10}$$

Both commands use two data bytes with bit [7] of the high byte fixed at 0, while the remaining bits are r/w and used to set the mantissa using two's complement representation. Both commands also use the VOUT\_SCALE\_LOOP parameter so it must be set correctly. The default value of POWER\_GOOD\_ON is set at 1.1035V and that of the POWER\_GOOD\_OFF is set at 1.08V. The values associated with these commands can be stored in non-volatile memory using the STORE\_DEFAULT\_ALL command.

The PGOOD terminal can be connected through a pullup resistor (suggested value 100KΩ) to a source of 5VDC or lower.

### Measurement of Output Current, Output Voltage and Input Voltage

The module is capable of measuring key module parameters such as output current and voltage and input voltage and providing this information through the PMBus interface. Roughly every 200μs, the module makes 16 measurements each of output current, voltage and input voltage. Average values of these 16 measurements are then calculated and placed in the appropriate registers. The values in the registers can then be read using the PMBus interface.

### Measuring Output Current Using the PMBus

The module measures current by using the inductor winding resistance as a current sense element. The inductor winding resistance is then the current gain factor used to scale the measured voltage into a current reading. This gain factor is the argument of the IOUT\_CAL\_GAIN command, and consists of two bytes in the linear data format. The exponent uses the upper five bits [7:3] of the high data byte in two's complement format and is fixed at -15 (decimal). The remaining 11 bits in two's complement binary format represent the mantissa.

The current measurement accuracy is also improved by each module being calibrated during manufacture with the offset in the current reading. The IOUT\_CAL\_OFFSET command is used to store and read the current offset. The argument for this command consists of two bytes composed of a 5-bit exponent (fixed at -4d) and a 11-bit mantissa. This command has a resolution of 62.5mA and a range of -4000mA to +3937.5mA. During manufacture, each module is calibrated by measuring and storing the current gain factor and offset into non-volatile storage.

The READ\_IOUT command provides module average output current information. This command only supports positive or current sourced from the module. If the converter is sinking current a reading of 0 is provided. The READ\_IOUT command returns two bytes of data in the linear data format. The exponent uses the upper five bits [7:3] of the high data byte in two's complement format and is fixed at -4 (decimal). The remaining 11 bits in two's complement binary format represent the mantissa with the 11<sup>th</sup> bit fixed at 0 since only positive numbers are considered valid.

Note that the current reading provided by the module is not corrected for temperature. The temperature corrected current reading for module temperature  $T_{Module}$  can be estimated using the following equation

$$I_{OUT,CORR} = \frac{I_{READ\_OUT}}{1 + [(T_{IND} - 30) \times 0.00393]}$$

where  $I_{OUT,CORR}$  is the temperature corrected value of the current measurement,  $I_{READ\_OUT}$  is the module current measurement value,  $T_{IND}$  is the temperature of the inductor

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winding on the module. Since it may be difficult to measure  $T_{IND}$ , it may be approximated by an estimate of the module temperature.

### Measuring Output Voltage Using the PMBus

The module can provide output voltage information using the READ\_VOUT command. The command returns two bytes of data all representing the mantissa while the exponent is fixed at -10 (decimal).

During manufacture of the module, offset and gain correction values are written into the non-volatile memory of the module. The command VOUT\_CAL\_OFFSET can be used to read and/or write the offset (two bytes consisting of a 16-bit mantissa in two's complement format) while the exponent is always fixed at -10 (decimal). The allowed range for this offset correction is -125 to 124mV. The command VOUT\_CAL\_GAIN can be used to read and/or write the gain correction - two bytes consisting of a five-bit exponent (fixed at -8) and a 11-bit mantissa. The range of this correction factor is -0.125V to +0.121V, with a resolution of 0.004V. The corrected output voltage reading is then given by:

$$V_{OUT}(Final) = [V_{OUT}(Initial) \times (1 + VOUT\_CAL\_GAIN)] + VOUT\_CAL\_OFFSET$$

### Measuring Input Voltage Using the PMBus

The module can provide output voltage information using the READ\_VIN command. The command returns two bytes of data in the linear format. The upper five bits [7:3] of the high data form the two's complement representation of the exponent which is fixed at -5 (decimal). The remaining 11 bits are used for two's complement representation of the mantissa, with the 11<sup>th</sup> bit fixed at zero since only positive numbers are valid.

During module manufacture, offset and gain correction values are written into the non-volatile memory of the module. The command VIN\_CAL\_OFFSET can be used to read and/or write the offset - two bytes consisting of a five-bit exponent (fixed at -5) and a 11-bit mantissa in two's complement format. The allowed range for this offset correction is -2 to 1.968V, and the resolution is 32mV. The command VIN\_CAL\_GAIN can be used to read and/or write the gain correction - two bytes consisting of a five-bit exponent (fixed at -8) and a 11-bit mantissa. The range of this correction factor is -0.125V to +0.121V, with a resolution of 0.004V. The corrected output voltage reading is then given by:

$$V_{IN}(Final) = [V_{IN}(Initial) \times (1 + VIN\_CAL\_GAIN)] + VIN\_CAL\_OFFSET$$

### Reading the Status of the Module using the PMBus

The module supports a number of status information commands implemented in PMBus. However, not all

features are supported in these commands. A 1 in the bit position indicates the fault that is flagged.

STATUS\_BYTE : Returns one byte of information with a summary of the most critical device faults.

| Bit Position | Flag                     | Default Value |
|--------------|--------------------------|---------------|
| 7            | X                        | 0             |
| 6            | OFF                      | 0             |
| 5            | VOUT Overvoltage         | 0             |
| 4            | IOUT Overcurrent         | 0             |
| 3            | VIN Undervoltage         | 0             |
| 2            | Temperature              | 0             |
| 1            | CML (Comm. Memory Fault) | 0             |
| 0            | None of the above        | 0             |

STATUS\_WORD : Returns two bytes of information with a summary of the module's fault/warning conditions.

#### Low Byte

| Bit Position | Flag                     | Default Value |
|--------------|--------------------------|---------------|
| 7            | X                        | 0             |
| 6            | OFF                      | 0             |
| 5            | VOUT Overvoltage         | 0             |
| 4            | IOUT Overcurrent         | 0             |
| 3            | VIN Undervoltage         | 0             |
| 2            | Temperature              | 0             |
| 1            | CML (Comm. Memory Fault) | 0             |
| 0            | None of the above        | 0             |

#### High Byte

| Bit Position | Flag                     | Default Value |
|--------------|--------------------------|---------------|
| 7            | VOUT fault or warning    | 0             |
| 6            | IOUT fault or warning    | 0             |
| 5            | X                        | 0             |
| 4            | X                        | 0             |
| 3            | POWER_GOOD# (is negated) | 0             |
| 2            | X                        | 0             |
| 1            | X                        | 0             |
| 0            | X                        | 0             |

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

STATUS\_VOUT : Returns one byte of information relating to the status of the module's output voltage related faults.

| Bit Position | Flag          | Default Value |
|--------------|---------------|---------------|
| 7            | VOUT OV Fault | 0             |
| 6            | X             | 0             |
| 5            | X             | 0             |
| 4            | VOUT UV Fault | 0             |
| 3            | X             | 0             |
| 2            | X             | 0             |
| 1            | X             | 0             |
| 0            | X             | 0             |

STATUS\_IOUT : Returns one byte of information relating to the status of the module's output voltage related faults.

| Bit Position | Flag            | Default Value |
|--------------|-----------------|---------------|
| 7            | IOUT OC Fault   | 0             |
| 6            | X               | 0             |
| 5            | IOUT OC Warning | 0             |
| 4            | X               | 0             |
| 3            | X               | 0             |
| 2            | X               | 0             |
| 1            | X               | 0             |
| 0            | X               | 0             |

STATUS\_TEMPERATURE : Returns one byte of information relating to the status of the module's temperature related faults.

| Bit Position | Flag       | Default Value |
|--------------|------------|---------------|
| 7            | OT Fault   | 0             |
| 6            | OT Warning | 0             |
| 5            | X          | 0             |
| 4            | X          | 0             |
| 3            | X          | 0             |
| 2            | X          | 0             |
| 1            | X          | 0             |
| 0            | X          | 0             |

STATUS\_CML : Returns one byte of information relating to the status of the module's communication related faults.

| Bit Position | Flag                        | Default Value |
|--------------|-----------------------------|---------------|
| 7            | Invalid/Unsupported Command | 0             |
| 6            | Invalid/Unsupported Command | 0             |
| 5            | Packet Error Check Failed   | 0             |
| 4            | X                           | 0             |
| 3            | X                           | 0             |
| 2            | X                           | 0             |
| 1            | Other Communication Fault   | 0             |
| 0            | X                           | 0             |

MFR\_VIN\_MIN : Returns minimum input voltage as two data bytes of information in Linear format (upper five bits are

exponent – fixed at -2, and lower 11 bits are mantissa in two's complement format – fixed at 12)

MFR\_VOUT\_MIN : Returns minimum output voltage as two data bytes of information in Linear format (upper five bits are exponent – fixed at -10, and lower 11 bits are mantissa in two's complement format – fixed at 614)

MFR\_SPECIFIC\_00 : Returns information related to the type of module and revision number. Bits [7:2] in the Low Byte indicate the module type (000001 corresponds to the UxDT012 series of module), while bits [7:3] indicate the revision number of the module.

### Low Byte

| Bit Position | Flag        | Default Value |
|--------------|-------------|---------------|
| 7:2          | Module Name | 000001        |
| 1:0          | Reserved    | 10            |

### High Byte

| Bit Position | Flag                   | Default Value |
|--------------|------------------------|---------------|
| 7:3          | Module Revision Number | None          |
| 2:0          | Reserved               | 000           |

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Summary of Supported PMBus Commands

Please refer to the PMBus 1.1 specification for more details of these commands.

**Table 6**

| Hex Code      | Command              | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Non-Volatile Memory Storage |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
|---------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------|-----|-----|-----|-----|---|---|---|--------------|---|---|---|---|---|---|---|---|----------|--------------|-----|-----|----------|-----|-----|-----|---|---------------|------|------|--------|----|-----|-----|-----|-----|---------------|---|---|---|---|---|---|---|---|-----|
| 01            | OPERATION            | Turn Module on or off. Also used to margin the output voltage<br><table><tr><th>Format</th><th colspan="8">Unsigned Binary</th></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r</td><td>r</td></tr><tr><th>Function</th><td>On</td><td>X</td><td colspan="4">Margin</td><td>X</td><td>X</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>X</td><td>X</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Format                      | Unsigned Binary |     |     |     |     |   |   |   | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access   | r/w          | r   | r/w | r/w      | r/w | r/w | r   | r | Function      | On   | X    | Margin |    |     |     | X   | X   | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | X | X |     |
| Format        | Unsigned Binary      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                    | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4               | 3   | 2   | 1   | 0   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                  | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | r/w                         | r/w             | r/w | r/w | r   | r   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Function      | On                   | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Margin                      |                 |     |     | X   | X   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                    | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0               | 0   | 0   | X   | X   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 02            | ON_OFF_CONFIG        | Configures the ON/OFF functionality as a combination of analog ON/OFF pin and PMBus commands<br><table><tr><th>Format</th><th colspan="8">Unsigned Binary</th></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r</td></tr><tr><th>Function</th><td>X</td><td>X</td><td>X</td><td>pu</td><td>cmd</td><td>cpr</td><td>pol</td><td>cpa</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Format                      | Unsigned Binary |     |     |     |     |   |   |   | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access   | r            | r   | r   | r/w      | r/w | r/w | r/w | r | Function      | X    | X    | X      | pu | cmd | cpr | pol | cpa | Default Value | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | YES |
| Format        | Unsigned Binary      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                    | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4               | 3   | 2   | 1   | 0   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Access        | r                    | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | r                           | r/w             | r/w | r/w | r/w | r   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Function      | X                    | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | X                           | pu              | cmd | cpr | pol | cpa |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                    | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 1               | 0   | 1   | 1   | 1   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 03            | CLEAR_FAULTS         | Clear any fault bits that may have been set, also releases the SMBALERT# signal if the device has been asserting it.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 10            | WRITE_PROTECT        | Used to control writing to the module via PMBus. Copies the current register setting in the module whose command code matches the value in the data byte into non-volatile memory (EEPROM) on the module<br><table><tr><th>Format</th><th colspan="8">Unsigned Binary</th></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r/w</td><td>r/w</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><th>Function</th><td>bit7</td><td>bit6</td><td>bit5</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr></table><br>Bit5: 0 – Enables all writes as permitted in bit6 or bit7<br>1 – Disables all writes except the WRITE_PROTECT, OPERATION and ON_OFF_CONFIG (bit 6 and bit7 must be 0)<br>Bit 6: 0 – Enables all writes as permitted in bit5 or bit7<br>1 – Disables all writes except for the WRITE_PROTECT and OPERATION commands (bit5 and bit7 must be 0)<br>Bit7: 0 – Enables all writes as permitted in bit5 or bit6<br>1 – Disables all writes except for the WRITE_PROTECT command (bit5 and bit6 must be 0) | Format                      | Unsigned Binary |     |     |     |     |   |   |   | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access   | r/w          | r/w | r/w | x        | x   | x   | x   | x | Function      | bit7 | bit6 | bit5   | X  | X   | X   | X   | X   | Default Value | 0 | 0 | 0 | X | X | X | X | X | YES |
| Format        | Unsigned Binary      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                    | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4               | 3   | 2   | 1   | 0   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                  | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | x               | x   | x   | x   | x   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Function      | bit7                 | bit6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | bit5                        | X               | X   | X   | X   | X   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                    | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | X               | X   | X   | X   | X   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 11            | STORE_DEFAULT_ALL    | Copies all current register settings in the module into non-volatile memory (EEPROM) on the module. Takes about 50ms for the command to execute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 12            | RESTORE_DEFAULT_ALL  | Restores all current register settings in the module from values in the module non-volatile memory (EEPROM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 13            | STORE_DEFAULT_CODE   | Copies the current register setting in the module whose command code matches the value in the data byte into non-volatile memory (EEPROM) on the module<br><table><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td></tr><tr><th>Function</th><td colspan="8">Command code</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Bit Position                | 7               | 6   | 5   | 4   | 3   | 2 | 1 | 0 | Access       | w | w | w | w | w | w | w | w | Function | Command code |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                    | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4               | 3   | 2   | 1   | 0   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Access        | w                    | w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | w                           | w               | w   | w   | w   | w   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Function      | Command code         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 14            | RESTORE_DEFAULT_CODE | Restores the current register setting in the module whose command code matches the value in the data byte from the value in the module non-volatile memory (EEPROM)<br><table><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td><td>w</td></tr><tr><th>Function</th><td colspan="8">Command code</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Bit Position                | 7               | 6   | 5   | 4   | 3   | 2 | 1 | 0 | Access       | w | w | w | w | w | w | w | w | Function | Command code |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                    | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4               | 3   | 2   | 1   | 0   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Access        | w                    | w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | w                           | w               | w   | w   | w   | w   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Function      | Command code         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                 |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| 20            | VOUT_MODE            | The module has MODE set to Linear and Exponent set to -10. These values cannot be changed<br><table><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Function</th><td colspan="3">Mode</td><td colspan="5">Exponent</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bit Position                | 7               | 6   | 5   | 4   | 3   | 2 | 1 | 0 | Access       | r | r | r | r | r | r | r | r | Function | Mode         |     |     | Exponent |     |     |     |   | Default Value | 0    | 0    | 0      | 1  | 0   | 1   | 1   | 0   |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                    | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4               | 3   | 2   | 1   | 0   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Access        | r                    | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | r                           | r               | r   | r   | r   | r   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Function      | Mode                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             | Exponent        |     |     |     |     |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                    | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 1               | 0   | 1   | 1   | 0   |   |   |   |              |   |   |   |   |   |   |   |   |          |              |     |     |          |     |     |     |   |               |      |      |        |    |     |     |     |     |               |   |   |   |   |   |   |   |   |     |

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

Table 6 (continued)

| Hex Code      | Command                         | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Non-Volatile Memory Storage |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
|---------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|----------|-----|-----|-----|--|--|--|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|-----------|--|--|--|----------|--|--|--|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|----------|--|--|--|--|--|--|--|---------------|---|---|---|---|---|---|---|---|-----|
| 22            | VOUT_TRIM                       | <div>Apply a fixed offset voltage to the output voltage command value. Exponent is fixed at -10. The offset is <math>VOUT\_TRIM \times 2^{-10}</math></div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">High Byte</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Low Byte</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>                                                                             | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | High Byte |  |  |  |          |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Low Byte |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | High Byte                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0                               | 0        | 0   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Low Byte                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0                               | 0        | 0   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 25            | VOUT_MARGIN_HIGH                | <div>Sets the target voltage for margining the output high. Exponent is fixed at -10. The offset is <math>(VOUT\_MARGIN\_HIGH + VOUT\_TRIM) \times 2^{-10}</math></div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">High Byte</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Low Byte</td></tr><tr><td>Default Value</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr></table>                                                                   | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | High Byte |  |  |  |          |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Low Byte |  |  |  |  |  |  |  | Default Value | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | High Byte                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0                               | 0        | 1   | 0   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Low Byte                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0                               | 0        | 1   | 1   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 26            | VOUT_MARGIN_LOW                 | <div>Sets the target voltage for margining the output low. Exponent is fixed at -10. The offset is <math>(VOUT\_MARGIN\_LOW + VOUT\_TRIM) \times 2^{-10}</math></div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">High Byte</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Low Byte</td></tr><tr><td>Default Value</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>                                                                     | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | High Byte |  |  |  |          |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Low Byte |  |  |  |  |  |  |  | Default Value | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | High Byte                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0                               | 0        | 1   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Low Byte                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 1                               | 0        | 0   | 0   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 29            | VOUT_SCALE_LOOP                 | <div>Sets the scaling of the output voltage – equal to the feedback resistor divider ratio. <math>VOUT\_SCALE\_LOOP = 0.6(V)/VOUT(V)</math></div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="4">Exponent</td><td colspan="4">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>                                                                       | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r/w | r/w | Function | Exponent  |  |  |  | Mantissa |  |  |  | Default Value | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | r                           | r                               | r        | r   | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 | Mantissa |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                           | 1                               | 1        | 0   | 0   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0                               | 0        | 0   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 35            | VIN_ON                          | <div>Sets the value of input voltage at which the module turns on. This must be higher than VIN_OFF. Supported Values are</div> <ul style="list-style-type: none"><li>2.75V</li><li>3V to 18V in increments of 0.5V</li></ul> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="4">Exponent</td><td colspan="4">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td></tr></table> | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r   | r   | Function | Exponent  |  |  |  | Mantissa |  |  |  | Default Value | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | r                           | r                               | r        | r   | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 | Mantissa |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                           | 1                               | 0        | 0   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                           | 0                               | 1        | 0   | 1   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

Table 6 (continued)

| Hex Code      | Command                                  | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Non-Volatile Memory Storage              |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
|---------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------|-----|----------|-----|-----|--|--|--|--------------|---|---|---|---|---|---|---|---|--------|---|-----|-----|-----|-----|-----|-----|-----|----------|-----------|--|--|--|--|----------|--|--|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|----------|--|--|--|--|--|--|--|---------------|------------------------------------------|---|------------------------------------------|---|---|---|---|---|-----|
| 36            | VIN_OFF                                  | <p>Sets the value of input voltage at which the module turns off This must be lower than VIN_OFF. Supported Values are</p> <ul style="list-style-type: none"><li>2.5V to 17.5V in increments of 0.5V</li></ul> <table><tr><th>Format</th><td colspan="8">Linear, two's complement binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Function</th><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><th>Default Value</th><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><td colspan="8">Mantissa</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table> | Format                                   | Linear, two's complement binary |     |          |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r   | r   | r   | r   | r   | r   | r   | Function | Exponent  |  |  |  |  | Mantissa |  |  | Default Value | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0                                        | 0 | 0                                        | 0 | 1 | 0 | 1 | 0 | YES |
| Format        | Linear, two's complement binary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r                                        | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                                        | r                               | r   | r        | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | Exponent                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     | Mantissa |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | 1                                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                                        | 1                               | 0   | 0        | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r                                        | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                                      | r/w                             | r/w | r/w      | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | Mantissa                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | 0                                        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                        | 0                               | 1   | 0        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| 38            | IOUT_CAL_GAIN                            | <p>Returns the value of the gain correction term used to correct the measured output current</p> <table><tr><th>Format</th><td colspan="8">Linear, two's complement binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r/w</td></tr><tr><th>Function</th><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><th>Default Value</th><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>V</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><td colspan="8">Mantissa</td></tr><tr><th>Default Value</th><td colspan="8">V: Variable based on factory calibration</td></tr></table>                                                                                                                              | Format                                   | Linear, two's complement binary |     |          |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r   | r   | r   | r   | r   | r   | r/w | Function | Exponent  |  |  |  |  | Mantissa |  |  | Default Value | 1 | 0 | 0 | 0 | 1 | 0 | 0 | V | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | V: Variable based on factory calibration |   |                                          |   |   |   |   |   | YES |
| Format        | Linear, two's complement binary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r                                        | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                                        | r                               | r   | r        | r   | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | Exponent                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     | Mantissa |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | 1                                        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                        | 0                               | 1   | 0        | 0   | V   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r/w                                      | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                                      | r/w                             | r/w | r/w      | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | Mantissa                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | V: Variable based on factory calibration |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| 39            | IOUT_CAL_OFFSET                          | <p>Returns the value of the offset correction term used to correct the measured output current</p> <table><tr><th>Format</th><td colspan="8">Linear, two's complement binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r/w</td><td>r</td><td>r</td></tr><tr><th>Function</th><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><th>Default Value</th><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>V</td><td>0</td><td>0</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><td colspan="8">Mantissa</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td colspan="6">V: Variable based on factory calibration</td></tr></table>                                                                                                            | Format                                   | Linear, two's complement binary |     |          |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r   | r   | r   | r   | r/w | r   | r   | Function | Exponent  |  |  |  |  | Mantissa |  |  | Default Value | 1 | 1 | 1 | 0 | 0 | V | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0                                        | 0 | V: Variable based on factory calibration |   |   |   |   |   | YES |
| Format        | Linear, two's complement binary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r                                        | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                                        | r                               | r   | r/w      | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | Exponent                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     | Mantissa |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | 1                                        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                                        | 0                               | 0   | V        | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r                                        | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r/w                                      | r/w                             | r/w | r/w      | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | Mantissa                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | 0                                        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | V: Variable based on factory calibration |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| 40            | VOUT_OV_FAULT_LIMIT                      | <p>Sets the voltage level for an output overvoltage fault. Exponent is fixed at -10. Four fixed percentages of 108%, 110%, 112%and 115% are available</p> <table><tr><th>Format</th><td colspan="8">Linear, two's complement binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><td colspan="8">High Byte</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><td colspan="8">Low Byte</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table>                                                                  | Format                                   | Linear, two's complement binary |     |          |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | High Byte |  |  |  |  |          |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Low Byte |  |  |  |  |  |  |  | Default Value | 0                                        | 0 | 0                                        | 0 | 1 | 0 | 1 | 0 | YES |
| Format        | Linear, two's complement binary          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r                                        | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                                      | r/w                             | r/w | r/w      | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | High Byte                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | 0                                        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                        | 0                               | 0   | 1        | 0   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Bit Position  | 7                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                                        | 4                               | 3   | 2        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Access        | r/w                                      | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                                      | r/w                             | r/w | r/w      | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Function      | Low Byte                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                 |     |          |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |
| Default Value | 0                                        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                        | 0                               | 1   | 0        | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |                                          |   |                                          |   |   |   |   |   |     |

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

| Hex Code      | Command                         | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Non-Volatile Memory Storage |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
|---------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|----------|-----|-----|-----|--|--|--|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|-----------|---------|-------|-------|----------|---|---|---|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|----------|--|--|--|--|--|--|--|---------------|---|---|---|---|---|---|---|---|-----|
| 41            | VOUT_OV_FAULT_RESPONSE          | <p>Instructs the module on what action to take in response to an output overvoltage fault. The options are: RSP[1:0]</p> <p>00 - Module continues without interruption</p> <p>01 - Module continues operation for 4 switching cycles and shuts down if fault persists</p> <p>01- Module shuts down and responds to RS[2:0]</p> <p>11 - Module shuts down and attempts to restart</p> <p>RS[2:0]</p> <p>000 - Module does not attempt to restart</p> <p>111- Module goes through normal startup continuously</p> <table><tr><th>Format</th><th colspan="8">Unsigned Binary</th></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Function</th><td>RSP [1]</td><td>RSP [0]</td><td>RS[2]</td><td>RS[1]</td><td>RS[0]</td><td>X</td><td>X</td><td>X</td></tr><tr><th>Default Value</th><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr></table>         | Format                      | Unsigned Binary                 |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r   | r   | r   | Function | RSP [1]   | RSP [0] | RS[2] | RS[1] | RS[0]    | X | X | X | Default Value | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | YES          |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | r/w                         | r/w                             | r/w      | r   | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | RSP [1]                         | RSP [0]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RS[2]                       | RS[1]                           | RS[0]    | X   | X   | X   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                           | 1                               | 1        | 1   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 44            | VOUT_UV_FAULT_LIMIT             | <p>Sets the voltage level for an output undervoltage fault. Exponent is fixed at -10. Four fixed percentages of 92%, 90%, 88%and 85% are available.</p> <table><tr><th>Format</th><th colspan="8">Linear, two's complement binary</th></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><th colspan="8">High Byte</th></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><th colspan="8">Low Byte</th></tr><tr><th>Default Value</th><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td></tr></table>           | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | High Byte |         |       |       |          |   |   |   | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Low Byte |  |  |  |  |  |  |  | Default Value | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | High Byte                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                           | 0                               | 0        | 1   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Low Byte                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                           | 0                               | 1        | 1   | 1   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 45            | VOUT_UV_FAULT_RESPONSE          | <p>Instructs the module on what action to take in response to a output undervoltage fault.</p> <p>The options are: RSP[1:0]</p> <p>02 - Module continues without interruption</p> <p>03 - Module continues operation for 4 switching cycles and shuts down if fault persists</p> <p>02- Module shuts down and responds to RS[2:0]</p> <p>11 - Module shuts down and attempts to restart</p> <p>RS[2:0]</p> <p>000 - Module does not attempt to restart</p> <p>111- Module goes through normal startup continuously.</p> <table><tr><th>Format</th><th colspan="8">Unsigned Binary</th></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Function</th><td>RSP [1]</td><td>RSP [0]</td><td>RS[2]</td><td>RS[1]</td><td>RS[0]</td><td>X</td><td>X</td><td>X</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr></table> | Format                      | Unsigned Binary                 |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r   | r   | r   | Function | RSP [1]   | RSP [0] | RS[2] | RS[1] | RS[0]    | X | X | X | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | YES          |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | r/w                         | r/w                             | r/w      | r   | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | RSP [1]                         | RSP [0]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RS[2]                       | RS[1]                           | RS[0]    | X   | X   | X   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                           | 0                               | 0        | 1   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 46            | IOUT_OC_FAULT_LIMIT             | <p>Sets the output overcurrent fault level in A (cannot be changed)</p> <table><tr><th>Format</th><th colspan="8">Linear, two's complement binary</th></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Function</th><th colspan="4">Exponent</th><th colspan="4">Mantissa</th></tr><tr><th>Default Value</th><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Function</th><th colspan="8">Mantissa</th></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr></table>                                                                                             | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r   | r   | Function | Exponent  |         |       |       | Mantissa |   |   |   | Default Value | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r   | r   | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | r                           | r                               | r        | r   | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 | Mantissa |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                           | 1                               | 1        | 0   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | r                           | r                               | r        | r   | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0                           | 1                               | 1        | 1   | 1   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |           |         |       |       |          |   |   |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

| Hex Code      | Command                         | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Non-Volatile Memory Storage |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
|---------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|----------|-----|-----|-----|--|--|--|--------------|---|---|---|---|---|---|---|---|--------|---|-----|-----|-----|-----|-----|-----|-----|----------|-----------|--|--|--|----------|--|--|--|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|----------|--|--|--|--|--|--|--|---------------|---|---|---|---|---|---|---|---|-----|
| 4A            | IOUT_OC_WARN_LIMIT              | <div>Sets the output overcurrent warning level in A</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="4">Exponent</td><td colspan="4">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td></tr></table>                                                                                                                                                        | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r   | r   | r   | r   | r   | r   | r   | Function | Exponent  |  |  |  | Mantissa |  |  |  | Default Value | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r        | r   | r   | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 | Mantissa |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                           | 1                               | 1        | 0   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 1                               | 1        | 1   | 0   | 1   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 5E            | POWER_GOOD_ON                   | <div>Sets the output voltage level at which the PGOOD pin is asserted high. Exponent is fixed at -10.</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">High Byte</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Low Byte</td></tr><tr><td>Default Value</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table> <div>POWER_GOOD_ON LEVELS</div> <div>LOWHIGH</div> <div>95%105%</div> <div>92%108%</div> <div>90%110%</div>    | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | High Byte |  |  |  |          |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Low Byte |  |  |  |  |  |  |  | Default Value | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | High Byte                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 0                               | 0        | 1   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Low Byte                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                           | 0                               | 1        | 0   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| 5F            | POWER_GOOD_OFF                  | <div>Sets the output voltage level at which the PGOOD pin is de-asserted low. Exponent is fixed at -10.</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">High Byte</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Low Byte</td></tr><tr><td>Default Value</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td></tr></table> <div>POWER_GOOD_OFF LEVELS</div> <div>LOWHIGH</div> <div>92%108%</div> <div>90%110%</div> <div>88%112%</div> | Format                      | Linear, two's complement binary |          |     |     |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | High Byte |  |  |  |          |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Low Byte |  |  |  |  |  |  |  | Default Value | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | High Byte                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 0                               | 0        | 1   | 0   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3        | 2   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                         | r/w                             | r/w      | r/w | r/w | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Low Byte                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |          |     |     |     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 1                               | 0        | 0   | 1   | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |     |     |     |     |     |     |     |          |           |  |  |  |          |  |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |     |

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

Table 6 (continued)

| Hex Code      | Command                         | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Non-Volatile Memory Storage |                                 |          |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
|---------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|----------|------|-----|-------|--|--|--|--------------|---|---|---|---|---|---|---|---|--------|---|---|---|---|---|---|---|-----|----------|----------|---------|--------------|---------|----------|------|-----|-------|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|----------|-----|---------|---------|--------|------|-----|-------|---------------|---|---|---|---|---|---|---|---|-----|
| 61            | TON_RISE                        | <div>Sets the rise time of the output voltage during startup. Supported values are 0.6ms, 0.9ms, 1.2ms, 1.8ms, 2.7ms, 4.2ms, 6.0ms, 9.0ms</div> <table><tr><th>Format</th><td colspan="8">Linear, two's complement binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r/w</td></tr><tr><th>Function</th><td colspan="4">Exponent</td><td colspan="4">Mantissa</td></tr><tr><th>Default Value</th><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><th>Function</th><td colspan="8">Mantissa</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table>                             | Format                      | Linear, two's complement binary |          |      |     |       |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r/w | Function | Exponent |         |              |         | Mantissa |      |     |       | Default Value | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |     |         |         |        |      |     |       | Default Value | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                 |          |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                           | 4                               | 3        | 2    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | r                           | r                               | r        | r    | r   | r/w   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                 | Mantissa |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                           | 0                               | 0        | 0    | 0   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                           | 4                               | 3        | 2    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | r/w                         | r/w                             | r/w      | r/w  | r/w | r/w   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                 |          |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                           | 0                               | 1        | 0    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| 78            | STATUS_BYTE                     | <div>Returns one byte of information with a summary of the most critical module faults</div> <table><tr><th>Format</th><td colspan="8">Unsigned Binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Flag</th><td>X</td><td>OFF</td><td>VOUT_OV</td><td>IOUT_OC</td><td>VIN_UV</td><td>TEMP</td><td>CML</td><td>OTHER</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Format                      | Unsigned Binary                 |          |      |     |       |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r   | Flag     | X        | OFF     | VOUT_OV      | IOUT_OC | VIN_UV   | TEMP | CML | OTHER | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                 |          |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                           | 4                               | 3        | 2    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | r                           | r                               | r        | r    | r   | r     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Flag          | X                               | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | VOUT_OV                     | IOUT_OC                         | VIN_UV   | TEMP | CML | OTHER |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                           | 0                               | 0        | 0    | 0   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| 79            | STATUS_WORD                     | <div>Returns two bytes of information with a summary of the module's fault/warning conditions</div> <table><tr><th>Format</th><td colspan="8">Unsigned Binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Flag</th><td>VOUT</td><td>IOUT_OC</td><td>X</td><td>X</td><td>PGOOD</td><td>X</td><td>X</td><td>X</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Flag</th><td>X</td><td>OFF</td><td>VOUT_OV</td><td>IOUT_OC</td><td>VIN_UV</td><td>TEMP</td><td>CML</td><td>OTHER</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> | Format                      | Unsigned Binary                 |          |      |     |       |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r   | Flag     | VOUT     | IOUT_OC | X            | X       | PGOOD    | X    | X   | X     | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r   | r   | Flag     | X        | OFF | VOUT_OV | IOUT_OC | VIN_UV | TEMP | CML | OTHER | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |     |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                 |          |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                           | 4                               | 3        | 2    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | r                           | r                               | r        | r    | r   | r     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Flag          | VOUT                            | IOUT_OC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | X                           | X                               | PGOOD    | X    | X   | X     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                           | 0                               | 0        | 0    | 0   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                           | 4                               | 3        | 2    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | r                           | r                               | r        | r    | r   | r     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Flag          | X                               | OFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | VOUT_OV                     | IOUT_OC                         | VIN_UV   | TEMP | CML | OTHER |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                           | 0                               | 0        | 0    | 0   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| 7A            | STATUS_VOUT                     | <div>Returns one byte of information with the status of the module's output voltage related faults</div> <table><tr><th>Format</th><td colspan="8">Unsigned Binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Flag</th><td>VOUT_OV</td><td>X</td><td>X</td><td>VOUT_UV</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Format                      | Unsigned Binary                 |          |      |     |       |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r   | Flag     | VOUT_OV  | X       | X            | VOUT_UV | X        | X    | X   | X     | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                 |          |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                           | 4                               | 3        | 2    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | r                           | r                               | r        | r    | r   | r     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Flag          | VOUT_OV                         | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | X                           | VOUT_UV                         | X        | X    | X   | X     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                           | 0                               | 0        | 0    | 0   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| 7B            | STATUS_IOUT                     | <div>Returns one byte of information with the status of the module's output current related faults</div> <table><tr><th>Format</th><td colspan="8">Unsigned Binary</td></tr><tr><th>Bit Position</th><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><th>Access</th><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><th>Flag</th><td>IOUT_OC</td><td>X</td><td>IOUT_OC_WARN</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><th>Default Value</th><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Format                      | Unsigned Binary                 |          |      |     |       |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r   | Flag     | IOUT_OC  | X       | IOUT_OC_WARN | X       | X        | X    | X   | X     | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                 |          |      |     |       |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                           | 4                               | 3        | 2    | 1   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | r                           | r                               | r        | r    | r   | r     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Flag          | IOUT_OC                         | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | IOUT_OC_WARN                | X                               | X        | X    | X   | X     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                           | 0                               | 0        | 0    | 0   | 0     |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |     |          |          |         |              |         |          |      |     |       |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |          |     |         |         |        |      |     |       |               |   |   |   |   |   |   |   |   |     |

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

Table 6 (continued)

| Hex Code      | Command                         | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Non-Volatile Memory Storage |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
|---------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|---|----------|------------------|---|--|--|--|--------------|---|---|---|---|---|---|---|---|--------|---|---|---|---|---|---|---|---|---------------|-----------------|--------------|----------|---|---|----------|------------------|---|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|---|---|---|---|---|---|---|---|----------|----------|--|--|--|--|--|--|--|---------------|---|---|---|---|---|---|---|---|--|
| 7D            | STATUS_TEMPERATURE              | <div>Returns one byte of information with the status of the module's temperature related faults</div> <table><tr><td>Format</td><td colspan="8">Unsigned Binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Flag</td><td>OT_FAULT</td><td>OT_WARN</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>                                                                                                                                                                                                                                                                                                                                                | Format                      | Unsigned Binary                 |   |          |                  |   |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Flag          | OT_FAULT        | OT_WARN      | X        | X | X | X        | X                | X | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Flag          | OT_FAULT                        | OT_WARN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | X                           | X                               | X | X        | X                | X |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 0                               | 0 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| 7E            | STATUS_CML                      | <div>Returns one byte of information with the status of the module's communication related faults</div> <table><tr><td>Format</td><td colspan="8">Unsigned Binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Flag</td><td>Invalid Command</td><td>Invalid Data</td><td>PEC Fail</td><td>X</td><td>X</td><td>X</td><td>Other Comm Fault</td><td>X</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>                                                                                                                                                                                                                                                                                                            | Format                      | Unsigned Binary                 |   |          |                  |   |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Flag          | Invalid Command | Invalid Data | PEC Fail | X | X | X        | Other Comm Fault | X | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Flag          | Invalid Command                 | Invalid Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PEC Fail                    | X                               | X | X        | Other Comm Fault | X |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 0                               | 0 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| 88            | READ_VIN                        | <div>Returns the value of the input voltage applied to the module</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> | Format                      | Linear, two's complement binary |   |          |                  |   |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Function      | Exponent        |              |          |   |   | Mantissa |                  |   | Default Value | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   | Mantissa |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 1                               | 1 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 0                               | 0 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| 8B            | READ_VOUT                       | <div>Returns the value of the output voltage of the module. Exponent is fixed at -10.</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>          | Format                      | Linear, two's complement binary |   |          |                  |   |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Function      | Mantissa        |              |          |   |   |          |                  |   | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 0                               | 0 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 0                               | 0 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| 8C            | READ_IOUT                       | <div>Returns the value of the output current of the module</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>        | Format                      | Linear, two's complement binary |   |          |                  |   |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Function      | Exponent        |              |          |   |   | Mantissa |                  |   | Default Value | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   | Mantissa |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1                           | 0                               | 0 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 0                               | 0 | 0        | 0                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| 98            | PMBUS_REVISION                  | <div>Returns one byte indicating the module is compliant to PMBus Spec. 1.1 (read only)</div> <table><tr><td>Format</td><td colspan="8">Unsigned Binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Format                      | Unsigned Binary                 |   |          |                  |   |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r | r | r | r | Default Value | 0               | 0            | 0        | 1 | 0 | 0        | 0                | 1 | YES           |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                                 |   |          |                  |   |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5                           | 4                               | 3 | 2        | 1                | 0 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | r                           | r                               | r | r        | r                | r |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                           | 1                               | 0 | 0        | 0                | 1 |  |  |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |               |                 |              |          |   |   |          |                  |   |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |  |

## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

Table 6 (continued)

| Hex Code      | Command                         | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Non-Volatile Memory Storage |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
|---------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|-----|----------|----------|-----|--|--|--|--------------|---|---|---|---|---|---|---|---|--------|-----|---|---|---|---|---|---|-----|----------|----------|--|--|--|--|----------|--|--|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|----------|-------------|--|--|--|--|--|----------|--|---------------|---|---|---|---|---|---|---|---|-----|
| A0            | MFR_VIN_MIN                     | <div>Returns the minimum input voltage the module is specified to operate at (read only)</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr></table>                                                                                               | Format                      | Linear, two's complement binary |     |          |          |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r | r | r | r | r | r | r   | Function | Exponent |  |  |  |  | Mantissa |  |  | Default Value | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r   | r   | Function | Mantissa    |  |  |  |  |  |          |  | Default Value | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     | Mantissa |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                           | 1                               | 0   | 0        | 0        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 0                               | 1   | 1        | 0        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| A4            | MFR_VOUT_MIN                    | <div>Returns the minimum output voltage possible from the module (read only)</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr></table>                                                                                                                                        | Format                      | Linear, two's complement binary |     |          |          |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r | r | r | r | r | r | r   | Function | Mantissa |  |  |  |  |          |  |  | Default Value | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r   | r   | Function | Mantissa    |  |  |  |  |  |          |  | Default Value | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 0                               | 0   | 0        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                           | 0                               | 0   | 1        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| D0            | MFR_SPECIFIC_00                 | <div>Returns module name information (read only)</div> <table><tr><td>Format</td><td colspan="8">Unsigned Binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Reserved</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="6">Module Name</td><td colspan="2">Reserved</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>X</td><td>X</td></tr></table>                                                                                                                                                    | Format                      | Unsigned Binary                 |     |          |          |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r | r | r | r | r | r | r   | Function | Reserved |  |  |  |  |          |  |  | Default Value | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r   | r   | r   | r   | r   | r   | r   | Function | Module Name |  |  |  |  |  | Reserved |  | Default Value | 0 | 0 | 0 | 0 | 0 | 1 | X | X | YES |
| Format        | Unsigned Binary                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Reserved                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                           | 0                               | 1   | 0        | 0        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Module Name                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          | Reserved |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 0                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 0                               | 0   | 1        | X        | X   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| D4            | VOUT_CAL_OFFSET                 | <div>Applies an offset to the READ_VOUT command results to calibrate out offset errors in module measurements of the output voltage (between -125mV and +124mV). Exponent is fixed at -10.</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>V</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td></tr></table>        | Format                      | Linear, two's complement binary |     |          |          |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r | r | r | r | r | r | r   | Function | Mantissa |  |  |  |  |          |  |  | Default Value | V | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa    |  |  |  |  |  |          |  | Default Value | V | V | V | V | V | V | V | V | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | V                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 0                               | 0   | 0        | 0        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                         | r/w                             | r/w | r/w      | r/w      | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | V                               | V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | V                           | V                               | V   | V        | V        | V   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| D5            | VOUT_CAL_GAIN                   | <div>Applies a gain correction to the READ_VOUT command results to calibrate out gain errors in module measurements of the output voltage (between -0.125 and 0.121)</div> <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r/w</td></tr><tr><td>Function</td><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>V</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td></tr></table> | Format                      | Linear, two's complement binary |     |          |          |     |  |  |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r   | r | r | r | r | r | r | r/w | Function | Exponent |  |  |  |  | Mantissa |  |  | Default Value | 1 | 1 | 0 | 0 | 0 | 0 | 0 | V | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r/w | r/w | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa    |  |  |  |  |  |          |  | Default Value | V | V | V | V | V | V | V | V | YES |
| Format        | Linear, two's complement binary |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r                               | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | r                           | r                               | r   | r        | r        | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Exponent                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     | Mantissa |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | 1                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                           | 0                               | 0   | 0        | 0        | V   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Bit Position  | 7                               | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5                           | 4                               | 3   | 2        | 1        | 0   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Access        | r/w                             | r/w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/w                         | r/w                             | r/w | r/w      | r/w      | r/w |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Function      | Mantissa                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                 |     |          |          |     |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |
| Default Value | V                               | V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | V                           | V                               | V   | V        | V        | V   |  |  |  |              |   |   |   |   |   |   |   |   |        |     |   |   |   |   |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |     |     |     |     |     |     |     |     |          |             |  |  |  |  |  |          |  |               |   |   |   |   |   |   |   |   |     |

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

Table 6 (continued)

| Hex Code      | Command        | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Non-Volatile Memory Storage |                                 |                                 |     |     |     |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|---------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|---------------------------------|-----|-----|-----|----------|-----|-----|--|--------------|---|---|---|---|---|---|---|---|--------|---|---|---|---|-----|---|---|-----|----------|----------|--|--|--|--|----------|--|--|---------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|---|---|--------|---|---|-----|-----|-----|-----|-----|-----|----------|----------|--|--|--|--|--|--|--|---------------|---|---|---|---|---|---|---|---|
| D6            | VIN_CAL_OFFSET | Applies an offset correction to the READ_VIN command results to calibrate out offset errors in module measurements of the input voltage (between -2V and +1.968V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | YES                         |                                 |                                 |     |     |     |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r/w</td><td>r</td><td>r</td><td>r/w</td></tr><tr><td>Function</td><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>0</td><td>1</td><td>V</td><td>0</td><td>0</td><td>V</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td></tr></table> |                             | Format                          | Linear, two's complement binary |     |     |     |          |     |     |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r/w | r | r | r/w | Function | Exponent |  |  |  |  | Mantissa |  |  | Default Value | 1 | 1 | 0 | 1 | V | 0 | 0 | V | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r/w | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | V | V | V | V | V | V |
|               |                | Format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             | Linear, two's complement binary |                                 |     |     |     |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Bit Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             | 7                               | 6                               | 5   | 4   | 3   | 2        | 1   | 0   |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Access                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             | r                               | r                               | r   | r   | r/w | r        | r   | r/w |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             | Exponent                        |                                 |     |     |     | Mantissa |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Default Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             | 1                               | 1                               | 0   | 1   | V   | 0        | 0   | V   |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Bit Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             | 7                               | 6                               | 5   | 4   | 3   | 2        | 1   | 0   |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Access                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             | r                               | r                               | r/w | r/w | r/w | r/w      | r/w | r/w |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             | Mantissa                        |                                 |     |     |     |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
| Default Value | 0              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | V                           | V                               | V                               | V   | V   | V   |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
| D7            | VIN_CAL_GAIN   | Applies a gain correction to the READ_VIN command results to calibrate out gain errors in module measurements of the input voltage (between -0.125 and 0.121)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | YES                         |                                 |                                 |     |     |     |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | <table><tr><td>Format</td><td colspan="8">Linear, two's complement binary</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r</td><td>r/w</td><td>r</td><td>r</td><td>r/w</td></tr><tr><td>Function</td><td colspan="5">Exponent</td><td colspan="3">Mantissa</td></tr><tr><td>Default Value</td><td>1</td><td>1</td><td>0</td><td>0</td><td>V</td><td>0</td><td>0</td><td>V</td></tr><tr><td>Bit Position</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Access</td><td>r</td><td>r</td><td>r</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td><td>r/w</td></tr><tr><td>Function</td><td colspan="8">Mantissa</td></tr><tr><td>Default Value</td><td>0</td><td>0</td><td>0</td><td>V</td><td>V</td><td>V</td><td>V</td><td>V</td></tr></table>   |                             | Format                          | Linear, two's complement binary |     |     |     |          |     |     |  | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r | r | r/w | r | r | r/w | Function | Exponent |  |  |  |  | Mantissa |  |  | Default Value | 1 | 1 | 0 | 0 | V | 0 | 0 | V | Bit Position | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Access | r | r | r   | r/w | r/w | r/w | r/w | r/w | Function | Mantissa |  |  |  |  |  |  |  | Default Value | 0 | 0 | 0 | V | V | V | V | V |
|               |                | Format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             | Linear, two's complement binary |                                 |     |     |     |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Bit Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             | 7                               | 6                               | 5   | 4   | 3   | 2        | 1   | 0   |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Access                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             | r                               | r                               | r   | r   | r/w | r        | r   | r/w |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             | Exponent                        |                                 |     |     |     | Mantissa |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Default Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             | 1                               | 1                               | 0   | 0   | V   | 0        | 0   | V   |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Bit Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             | 7                               | 6                               | 5   | 4   | 3   | 2        | 1   | 0   |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Access                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             | r                               | r                               | r   | r/w | r/w | r/w      | r/w | r/w |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
|               |                | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             | Mantissa                        |                                 |     |     |     |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |
| Default Value | 0              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                           | V                               | V                               | V   | V   | V   |          |     |     |  |              |   |   |   |   |   |   |   |   |        |   |   |   |   |     |   |   |     |          |          |  |  |  |  |          |  |  |               |   |   |   |   |   |   |   |   |              |   |   |   |   |   |   |   |   |        |   |   |     |     |     |     |     |     |          |          |  |  |  |  |  |  |  |               |   |   |   |   |   |   |   |   |

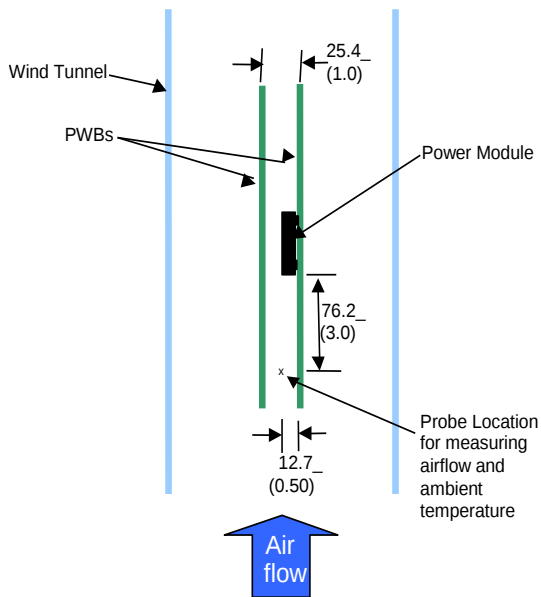
## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

### Thermal Considerations

Power modules operate in a variety of thermal environments; however, sufficient cooling should always be provided to help ensure reliable operation.

Considerations include ambient temperature, airflow, module power dissipation, and the need for increased reliability. A reduction in the operating temperature of the module will result in an increase in reliability. The thermal data presented here is based on physical measurements taken in a wind tunnel. The test set-up is shown in Figure 48. The preferred airflow direction for the module is in Figure 49.

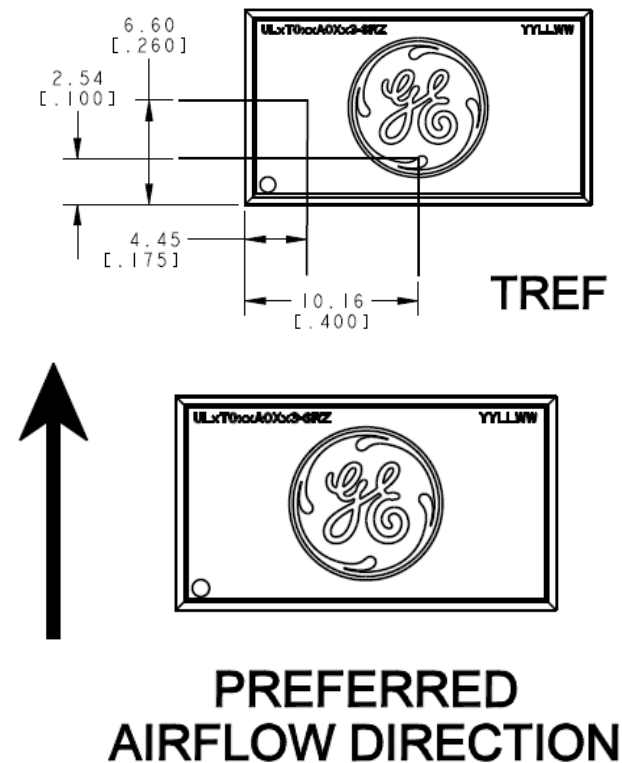


**Figure 48. Thermal Test Setup.**

The thermal reference points,  $T_{ref}$  used in the specifications are also shown in Figure 49. For reliable operation the temperatures at these points should not exceed 120°C. The

output power of the module should not exceed the rated power of the module ( $V_{o,set} \times I_{o,max}$ ).

Please refer to the Application Note "Thermal Characterization Process For Open-Frame Board-Mounted Power Modules" for a detailed discussion of thermal aspects including maximum device temperatures.



**Figure 49. Preferred airflow direction and location of hot-spot of the module ( $T_{ref}$ ).**

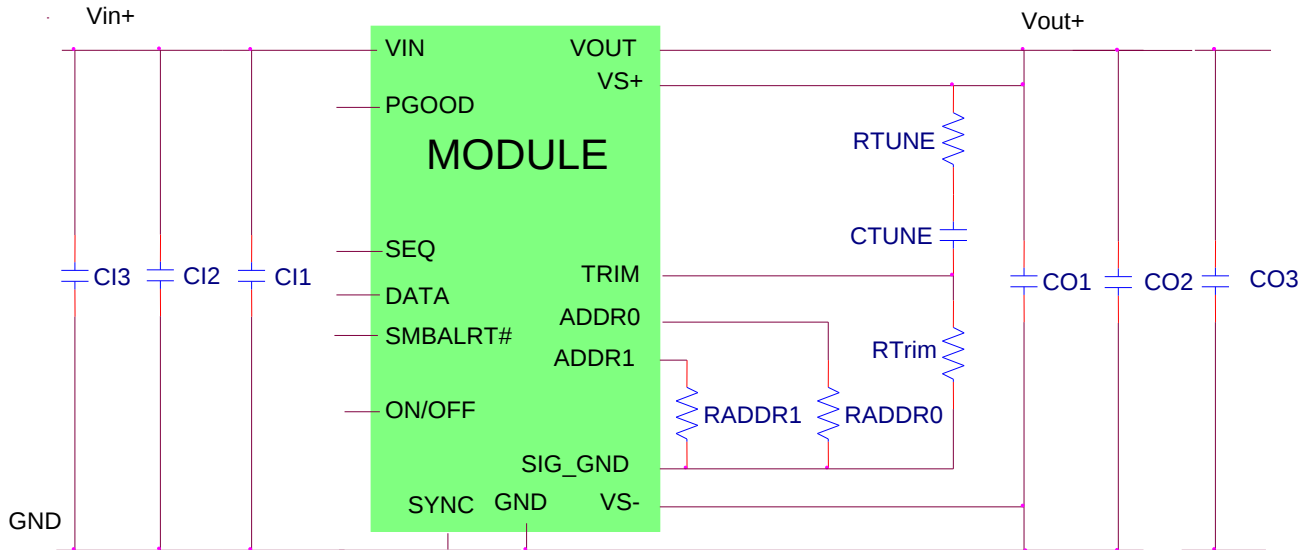
# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Example Application Circuit

### Requirements:

|             |                                                     |
|-------------|-----------------------------------------------------|
| Vin:        | 12V                                                 |
| Vout:       | 1.8V                                                |
| Iout:       | 9A max., worst case load transient is from 6A to 9A |
| ΔVout:      | 1.5% of Vout (27mV) for worst case load transient   |
| Vin, ripple | 1.5% of Vin (180mV, p-p)                            |



|       |                                                                                                                         |
|-------|-------------------------------------------------------------------------------------------------------------------------|
| CI1   | Decoupling cap - 1x0.047μF/16V ceramic capacitor (e.g. Murata LLL185R71C473MA01)                                        |
| CI2   | 2x22μF/16V ceramic capacitor (e.g. Murata GRM32ER61C226KE20)                                                            |
| CI3   | 47μF/16V bulk electrolytic                                                                                              |
| CO1   | Decoupling cap - 1x0.047μF/16V ceramic capacitor (e.g. Murata LLL185R71C473MA01) + 0.1uF/16V 0402size ceramic capacitor |
| CO2   | 1 x 47μF/6.3V ceramic capacitor (e.g. Murata GRM31CR60J476ME19)                                                         |
| CO3   | 1 x 330μF/6.3V Polymer (e.g. Sanyo Poscap)                                                                              |
| CTune | 2700pF ceramic capacitor (can be 1206, 0805 or 0603 size)                                                               |
| RTune | 221 ohms SMT resistor (can be 1206, 0805 or 0603 size)                                                                  |
| RTrim | 10kΩ SMT resistor (can be 1206, 0805 or 0603 size, recommended tolerance of 0.1%)                                       |

**Note:** The DATA, CLK and SMBALRT pins do not have any pull-up resistors inside the module. Typically, the SMBus master controller will have the pull-up resistors as well as provide the driving source for these signals.

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

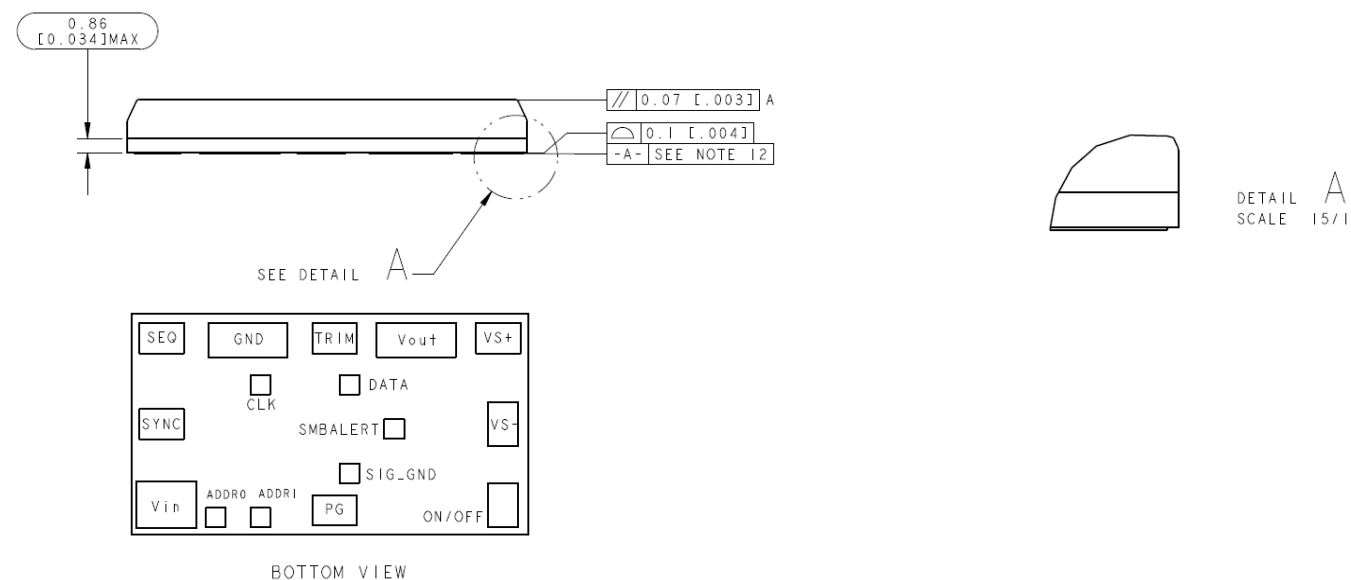
3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Mechanical Outline

Dimensions are in millimeters and (inches).

Tolerances: x.x mm  $\pm$  0.5 mm (x.xx in.  $\pm$  0.02 in.) [unless otherwise indicated]

x.xx mm  $\pm$  0.25 mm (x.xxx in.  $\pm$  0.010 in.)



# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

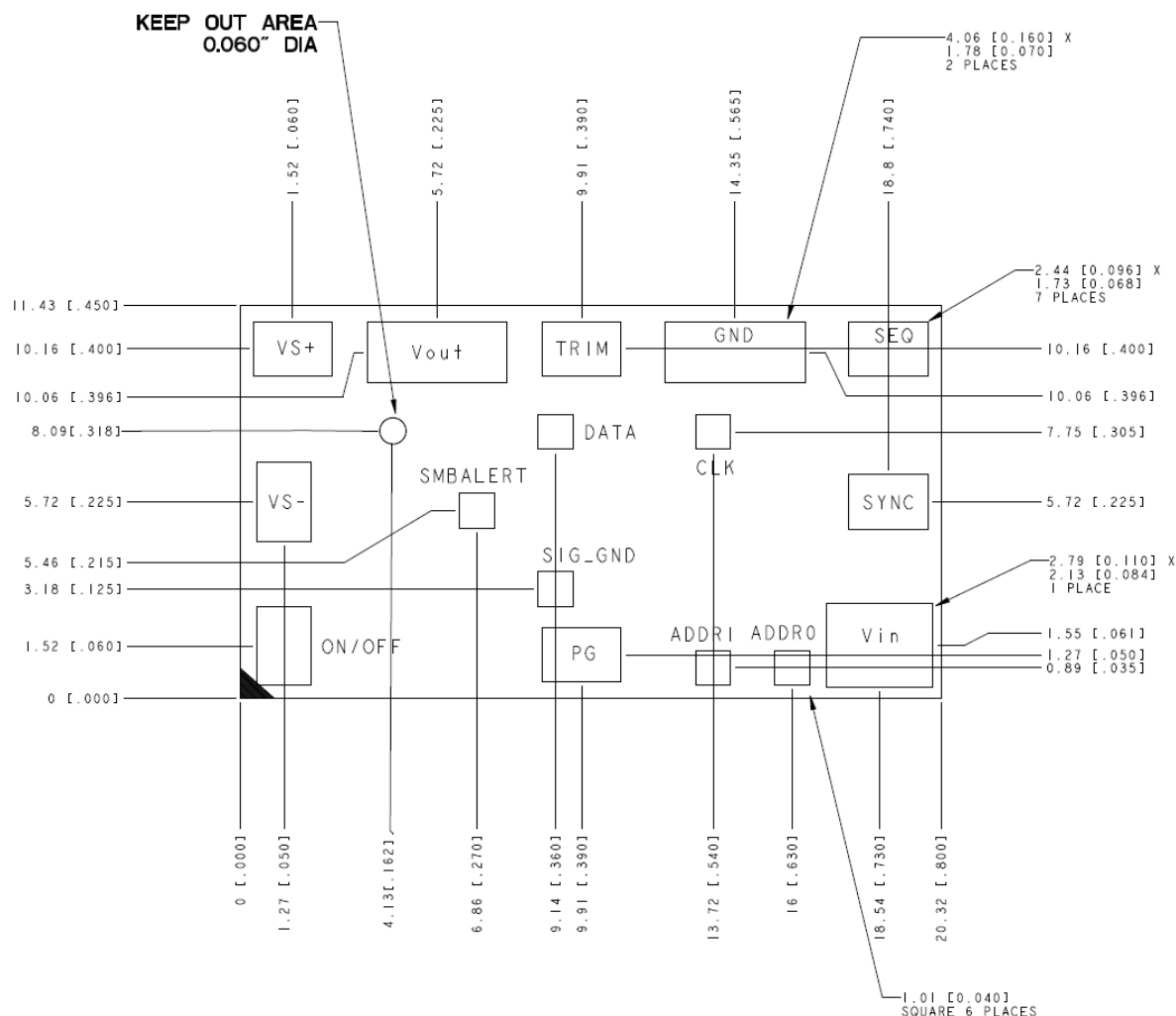
3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Recommended Pad Layout

Dimensions are in millimeters and (inches).

Tolerances: x.x mm ± 0.5 mm (x.xx in. ± 0.02 in.) [unless otherwise indicated]

x.xx mm ± 0.25 mm (x.xxx in ± 0.010 in.)



RECOMMENDED FOOTPRINT  
-THROUGH THE BOARD-

| PIN | FUNCTION | PIN | FUNCTION          |
|-----|----------|-----|-------------------|
| 1   | ON/OFF   | 10  | SYNC <sup>2</sup> |
| 2   | VIN      | 11  | CLK               |
| 3   | SEQ      | 12  | DATA              |
| 4   | GND      | 13  | SMBALERT#         |
| 5   | TRIM     | 14  | SIG_GND           |
| 6   | VOUT     | 15  | ADDR1             |
| 7   | VS+      | 16  | ADDR0             |
| 8   | VS-      |     |                   |
| 9   | PG       |     |                   |

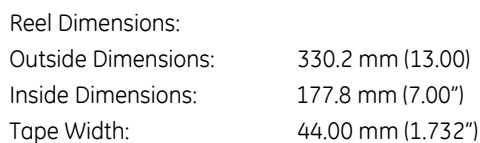
<sup>2</sup> If unused, connect to Ground

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

The 12V Digital SlimLynx™ 12A modules are supplied in tape & reel as standard. Modules are shipped in quantities of 600 modules per reel.

Diagram of the front of the device showing dimensions and features:

- PIN 1: ON/OFF**: Points to the top-left corner of the device.
- 5.72 [ .225 ]**: Dimension indicating the width of the device.
- 10.16 [ .400 ]**: Dimension indicating the height of the device.
- PICK LOCATION**: Points to the center of the circular logo.



## 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc –14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

### Surface Mount Information

#### Pick and Place

The 12A Digital SlimLynx™ modules use an open frame construction and are designed for a fully automated assembly process. The modules are fitted with a label designed to provide a large surface area for pick and place operations. The label meets all the requirements for surface mount processing, as well as safety standards, and is able to withstand reflow temperatures of up to 300°C. The label also carries product information such as product code, serial number and the location of manufacture.

#### Nozzle Recommendations

The module weight has been kept to a minimum by using open frame construction. Variables such as nozzle size, tip style, vacuum pressure and placement speed should be considered to optimize this process. The minimum recommended inside nozzle diameter for reliable operation is 3mm. The maximum nozzle outer diameter, which will safely fit within the allowable component spacing, is 7 mm.

#### Bottom Side / First Side Assembly

The encapsulated SlimLynx product can be assembled on the bottom side of a customer board. The surface tension of the solder connections between the customer board and the module are sufficient to hold the module during the top side reflow process. No additional glue or adhesive is required.

#### Lead Free Soldering

The modules are lead-free (Pb-free) and RoHS compliant and fully compatible in a Pb-free soldering process. Failure to observe the instructions below may result in the failure of or cause damage to the modules and can adversely affect long-term reliability.

#### Pb-free Reflow Profile

Power Systems will comply with J-STD-020 Rev. D (Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices) for both Pb-free solder profiles and MSL classification procedures. This standard provides a recommended forced-air-convection reflow profile based on the volume and thickness of the package (table 4-2). The suggested Pb-free solder paste is Sn/Ag/Cu (SAC). The recommended linear reflow profile using Sn/Ag/Cu solder is shown in Fig. 50. Soldering outside of the recommended profile requires testing to verify results and performance.

#### MSL Rating

The 12A Digital SlimLynx™ modules have a MSL rating of 3.

#### Storage and Handling

The recommended storage environment and handling procedures for moisture-sensitive surface mount packages is detailed in J-STD-033 Rev. A (Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices). Moisture barrier bags (MBB) with desiccant are required for MSL ratings of 2 or greater. These sealed packages should

not be broken until time of use. Once the original package is broken, the floor life of the product at conditions of  $\leq 30^{\circ}\text{C}$  and 60% relative humidity varies according to the MSL rating (see J-STD-033A). The shelf life for dry packed SMT packages will be a minimum of 12 months from the bag seal date, when stored at the following conditions:  $< 40^{\circ}\text{C}$ ,  $< 90\%$  relative humidity.

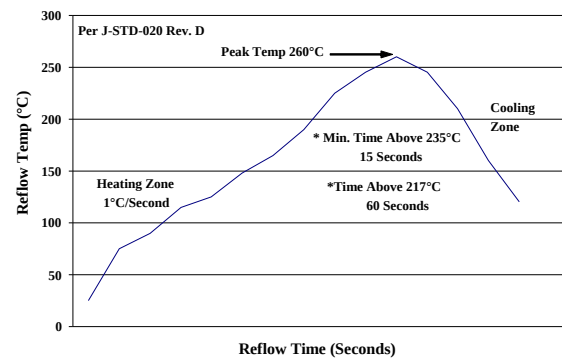


Figure 50. Recommended linear reflow profile using Sn/Ag/Cu solder.

#### Post Solder Cleaning and Drying Considerations

Post solder cleaning is usually the final circuit-board assembly process prior to electrical board testing. The result of inadequate cleaning and drying can affect both the reliability of a power module and the testability of the finished circuit-board assembly. For guidance on appropriate soldering, cleaning and drying procedures, refer to *Board Mounted Power Modules: Soldering and Cleaning* Application Note (AN04-001).

# 12A Digital SlimLynx™: Non-Isolated DC-DC Power Modules

3Vdc – 14.4Vdc input; 0.45Vdc to 5.5Vdc output; 12A Output Current

## Ordering Information

Please contact your GE Sales Representative for pricing, availability and optional features.

**Table 7. Device Codes**

| Device Code      | Input Voltage Range | Output Voltage | Output Current | On/Off Logic | Sequencing | Comcodes    |
|------------------|---------------------|----------------|----------------|--------------|------------|-------------|
| ULDT012A0X3-SRZ  | 3 – 14.4Vdc         | 0.45 – 5.5 Vdc | 12A            | Negative     | Yes        | CC109159703 |
| ULDT012A0X43-SRZ | 3 – 14.4Vdc         | 0.45 – 5.5 Vdc | 12A            | Positive     | Yes        | 150037553   |

-Z refers to RoHS compliant parts

**Table 8. Coding Scheme**

| Package Identifier                    | Family                                                              | Sequencing Option                          | Output current | Output voltage          | On/Off logic                        | Remote Sense     | Options                              | ROHS Compliance |
|---------------------------------------|---------------------------------------------------------------------|--------------------------------------------|----------------|-------------------------|-------------------------------------|------------------|--------------------------------------|-----------------|
| <b>U</b>                              | <b>LD</b>                                                           | <b>T</b>                                   | <b>012A0</b>   | <b>X</b>                |                                     | <b>3</b>         | <b>-SR</b>                           | <b>Z</b>        |
| P=Pico<br>U=Micro<br>M=Mega<br>G=Giga | LD=SlimLynx Digital Encapsulated<br>LV=SlimLynx Analog Encapsulated | T=with EZ Sequence<br>X=without sequencing | 12A            | X = programmable output | 4 = positive<br>No entry = negative | 3 = Remote Sense | S = Surface Mount<br>R = Tape & Reel | Z = ROHS6       |

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