



**NOT RECOMMENDED FOR NEW DESIGNS**  
See product selection chart  
for alternatives

The HPR1XXVC Series uses advanced circuit design and packaging technology to deliver superior reliability and performance. A 170kHz push-pull oscillator is used in the input stage. Beat-frequency oscillation problems are reduced when using the HPR1XXVC Series with high frequency isolation amplifiers.

Reduced parts count and high efficiency add to the reliability of the

HPR1XXVC Series. The high efficiency of the HPR1XXVC Series means less internal power dissipation, as low as 190mW. With reduced heat dissipation the HPR1XXVC Series can operate at higher temperatures with no degradation. In addition, the high efficiency of the HPR1XXVC Series means the series is able to offer greater than 10 W/inch<sup>3</sup> of output power density. Operation down

to no load will not impact the reliability of the series, although a  $\geq 1$ mA minimum load is needed to realize published specifications.

The HPR1XXVC Series provides the user a low cost converter without sacrificing reliability. The use of surface mounted devices and advanced manufacturing technologies make it possible to offer premium performance and low cost.

**SPECIFICATIONS** All specifications are typical at  $T_A = +25^\circ\text{C}$  nominal input voltage unless otherwise specified.

### PRODUCT SELECTION CHART

| Model                                 |          | Nominal<br>Input<br>Voltage | Rated<br>Output<br>Voltage | Rated<br>Output<br>Current | Input Current |                    | Reflected<br>Ripple Current | Efficiency | Recommended Alternatives |
|---------------------------------------|----------|-----------------------------|----------------------------|----------------------------|---------------|--------------------|-----------------------------|------------|--------------------------|
|                                       |          |                             |                            |                            | No Load       | Rated Load<br>Typ. |                             |            |                          |
|                                       |          | V <sub>DC</sub>             | V <sub>DC</sub>            | mA                         | mA            |                    | mAp-p                       | %          |                          |
| NOT<br>RECOMMENDED<br>FOR NEW DESIGNS | HPR117VC | 15                          | ±15                        | ±25                        | 8             | 63                 | 5                           | 79         | MEA1D1515DC              |
| OBSOLETE                              | HPR100VC | 5                           | 5                          | 150                        | 20            | 216                | 10                          | 69         | NKE0505DC / NME0505DC    |
|                                       | HPR105VC | 5                           | ±15                        | ±25                        | 20            | 200                | 5                           | 75         | NMA0515DC / MEA1D0515DC  |
|                                       | HPR101VC | 5                           | 12                         | 62                         | 20            | 212                | 5                           | 70         | NKE0512DC / NME0512DC    |
|                                       | HPR102VC | 5                           | 15                         | 50                         | 20            | 212                | 5                           | 71         | NKE0515DC / NME0515DC    |
|                                       | HPR103VC | 5                           | ±5                         | ±72                        | 20            | 218                | 5                           | 68         | NMA0505DC / MEA1D0505DC  |
|                                       | HPR104VC | 5                           | ±12                        | ±30                        | 20            | 212                | 5                           | 68         | NMA0512DC / MEA1D0512DC  |
|                                       | HPR106VC | 12                          | 5                          | 150                        | 10            | 90                 | 5                           | 69         | NKE1205DC / NME1205DC    |
|                                       | HPR107VC | 12                          | 12                         | 62                         | 10            | 81                 | 5                           | 77         | NKE1212DC / NME1212DC    |
|                                       | HPR108VC | 12                          | 15                         | 50                         | 10            | 81                 | 5                           | 77         | NKE1215DC / NME1215DC    |
|                                       | HPR109VC | 12                          | ±5                         | ±72                        | 10            | 88                 | 5                           | 71         | NMA1205DC / MEA1D1205DC  |
|                                       | HPR110VC | 12                          | ±12                        | ±30                        | 10            | 81                 | 5                           | 74         | NMA1212DC / MEA1D1212DC  |
|                                       | HPR111VC | 12                          | ±15                        | ±25                        | 10            | 81                 | 5                           | 77         | NMA1215DC / MEA1D1215DC  |
|                                       | HPR112VC | 15                          | 5                          | 150                        | 8             | 72                 | 5                           | 69         | MEV1S1505DC              |
|                                       | HPR113VC | 15                          | 12                         | 62                         | 8             | 72                 | 5                           | 69         | MEV1S1512DC              |
|                                       | HPR114VC | 15                          | 15                         | 50                         | 8             | 72                 | 5                           | 69         | MEV1S1515DC              |
|                                       | HPR115VC | 15                          | ±5                         | ±72                        | 8             | 72                 | 5                           | 69         | MEA1D1505DC              |
|                                       | HPR116VC | 15                          | ±12                        | ±30                        | 8             | 63                 | 5                           | 76         | MEA1D1512DC              |
|                                       | HPR118VC | 24                          | 5                          | 150                        | 8             | 48                 | 15                          | 65         | NME2405DC / MEV1S2405DC  |
|                                       | HPR119VC | 24                          | 12                         | 62                         | 8             | 48                 | 15                          | 65         | NME2412DC / MEV1S2412DC  |
|                                       | HPR120VC | 24                          | 15                         | 50                         | 8             | 45                 | 15                          | 76         | NME2412DC / MEV1S2415DC  |
|                                       | HPR121VC | 24                          | ±5                         | ±72                        | 8             | 45                 | 15                          | 69         | MEA1D2405DC              |
|                                       | HPR122VC | 24                          | ±12                        | ±30                        | 8             | 45                 | 15                          | 67         | MEA1D2412DC              |
|                                       | HPR123VC | 24                          | ±15                        | ±25                        | 8             | 45                 | 15                          | 69         | MEA1D2415DC              |



### SPECIFICATIONS, ALL MODELS

Specifications are at  $T_A = +25^\circ\text{C}$  nominal input voltage unless otherwise specified.

|         | PARAMETER                                                                                                                          | CONDITIONS                            | MIN   | TYP | MAX     | UNITS |
|---------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------|-----|---------|-------|
| INPUT   | <b>INPUT</b>                                                                                                                       |                                       |       |     |         |       |
|         | Voltage Range                                                                                                                      |                                       | 4.5   | 5   | 5.5     | VDC   |
|         |                                                                                                                                    |                                       | 10.8  | 12  | 13.2    | VDC   |
|         |                                                                                                                                    |                                       | 13.5  | 15  | 16.5    | VDC   |
| OUTPUT  |                                                                                                                                    |                                       | 21.6  | 24  | 26.4    | VDC   |
|         | Voltage Rise Time See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters" |                                       |       |     |         |       |
|         | <b>OUTPUT</b>                                                                                                                      |                                       |       |     |         |       |
|         | Rated Power                                                                                                                        |                                       |       |     | 750     | mW    |
| GENERAL | Voltage Setpoint Accuracy                                                                                                          | Rated Load, Nominal $V_{IN}$          |       |     | $\pm 5$ | %     |
|         | Ripple & Noise                                                                                                                     | BW = DC to 10MHz                      |       | 150 | 200     | mVp-p |
|         |                                                                                                                                    | BW = 10Hz to 2MHz                     |       | 30  | 40      | mVrms |
|         | Voltage (Over Input Voltage Range)                                                                                                 | 1mA to Rated Current, $V_{OUT} = 5V$  | 4.75  |     | 7       | VDC   |
| GENERAL |                                                                                                                                    | 1mA to Rated Current, $V_{OUT} = 12V$ | 11.40 |     | 15      | VDC   |
|         |                                                                                                                                    | 1mA to Rated Current, $V_{OUT} = 15V$ | 14.25 |     | 18      | VDC   |
|         | Temperature Coefficient                                                                                                            |                                       |       | .01 | .05     | %/°C  |
|         | <b>REGULATION</b>                                                                                                                  |                                       |       |     |         |       |
| GENERAL | Load Regulation (All other modes)                                                                                                  | Rated Load to 1mA Load                |       | 3   |         | %     |
|         | <b>GENERAL</b>                                                                                                                     |                                       |       |     |         |       |
|         | ISOLATION                                                                                                                          |                                       |       |     |         |       |
|         | Rated Voltage                                                                                                                      |                                       | 750   |     |         | VDC   |
| GENERAL | Test Voltage                                                                                                                       | 60 Hz, 10 Seconds                     | 750   |     |         | Vrms  |
|         | Resistance                                                                                                                         |                                       | 10    |     |         | GΩ    |
|         | Capacitance                                                                                                                        |                                       |       | 25  | 100     | pF    |
|         | Leakage Current                                                                                                                    | $V_{ISO} = 240VAC, 60Hz$              |       | 2   | 8.5     | μArms |
| GENERAL | Switching Frequency                                                                                                                |                                       |       | 170 |         | kHz   |
|         | Frequency Change                                                                                                                   | Over Line and Load                    |       | 24  |         | %     |
|         | Package Weight                                                                                                                     |                                       |       |     | 3       | g     |
|         | MTTF per MIL-HDBK-217, Rev. F*                                                                                                     | Circuit Stress Method                 |       |     |         |       |
| GENERAL | Ground Benign                                                                                                                      | $T_A = +25^\circ\text{C}$             | 7.9   |     |         | MHr   |
|         | Fixed Ground                                                                                                                       | $T_A = +35^\circ\text{C}$             | 1.9   |     |         | MHr   |
|         | Naval Sheltered                                                                                                                    | $T_A = +35^\circ\text{C}$             | 1.2   |     |         | MHr   |
|         | Airborne Uninhabited Fighter                                                                                                       | $T_A = +35^\circ\text{C}$             | 300   |     |         | kHr   |
| GENERAL | <b>TEMPERATURE</b>                                                                                                                 |                                       |       |     |         |       |
|         | Specification                                                                                                                      |                                       | -25   | +25 | +85     | °C    |
|         | Operation                                                                                                                          |                                       | -40   |     | +100    | °C    |
|         | Storage                                                                                                                            |                                       | -40   |     | +110    | °C    |

### SOLDERING INFORMATION

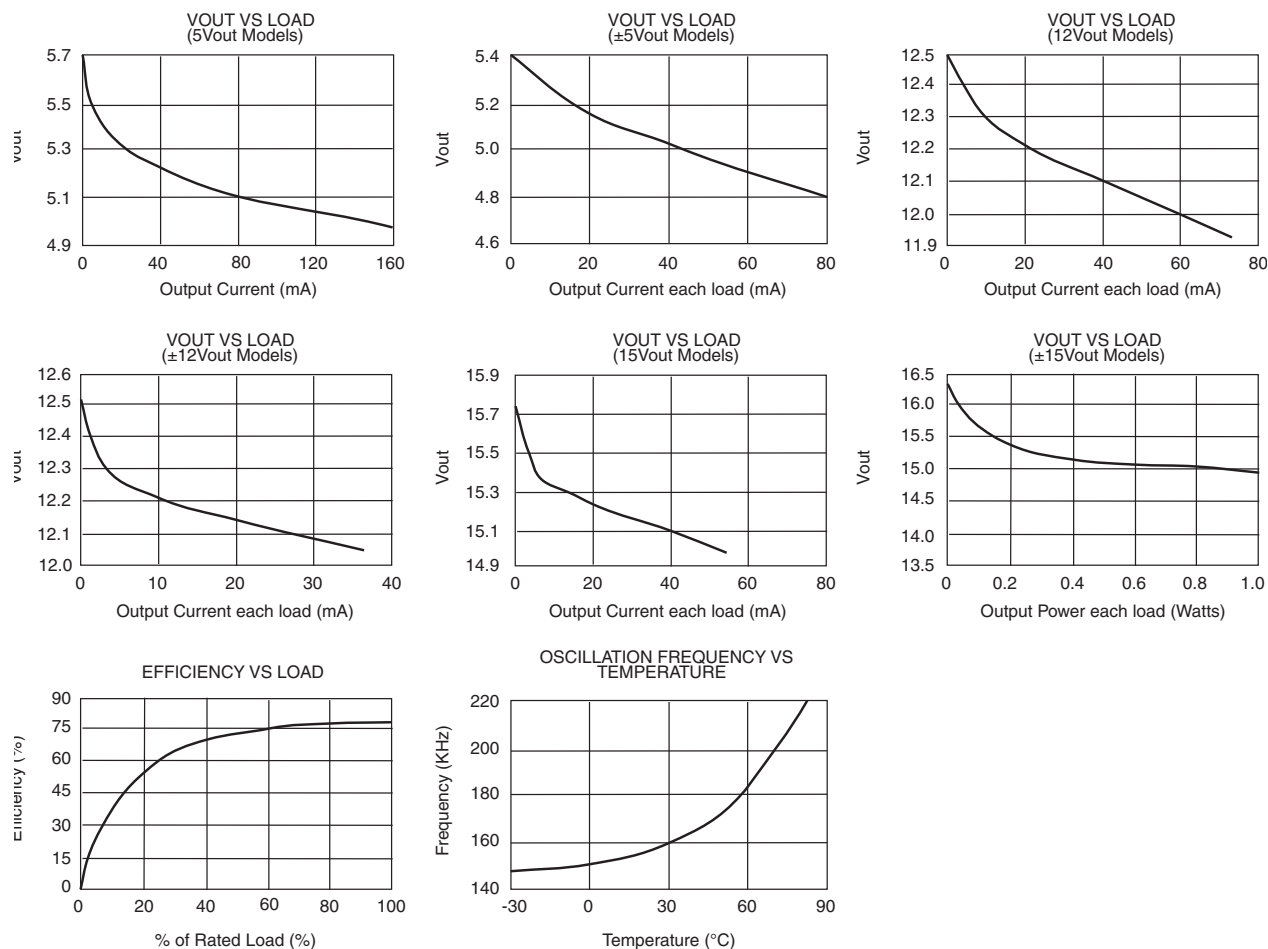
The HPR1XXVC devices are intended for wave soldering or manual soldering.

**They are not intended to be subject to surface mount processes under any circumstances.**

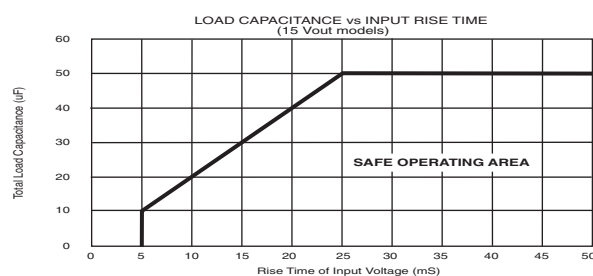
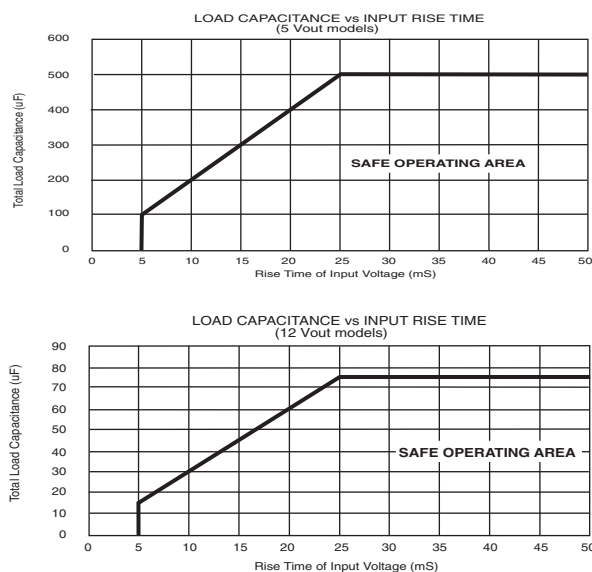
The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of  $260^\circ\text{C}$  for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures within the converter will not exceed  $175^\circ\text{C}$ . Care should be taken to control manual soldering limits identical to that of wave soldering.

## TYPICAL PERFORMANCE CURVES

Specifications are at  $T_A = +25^\circ\text{C}$  nominal input voltage and nominal load.



## SAFE OPERATING AREA



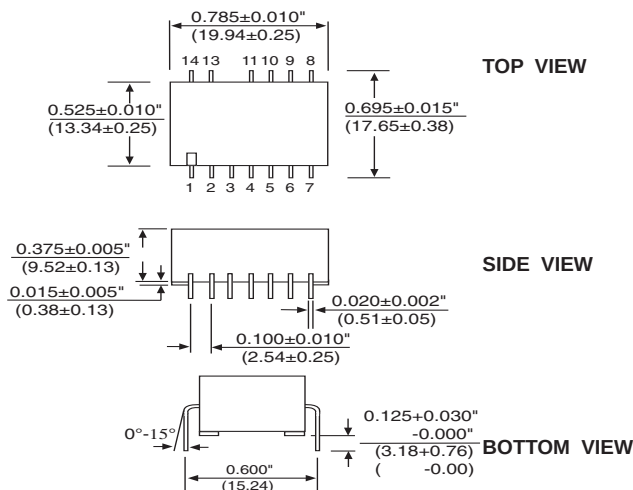
### NOTES:

- 1.) When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of HPR1XXC devices is guaranteed to be within 95% of its steady-state value within 100 milliseconds after the input voltage has reached 95% of its steady-state value.
- 2.) For dual output models, total load capacitance is the sum of the capacitances on the plus and minus outputs.

### MECHANICAL

#### PACKAGE/PINOUT "V"

##### DIP PACKAGE



#### PIN CONNECTIONS

| PIN# | SINGLES | DUALS  | PIN# | SINGLES | DUALS |
|------|---------|--------|------|---------|-------|
| 1    | +VIN    | +VIN   | 7    | +VOUT   | +VOUT |
| 2    | -VIN    | -VIN   | 8    | NC      | NC    |
| 3    | NC      | NC     | 9    | NC      | NC    |
| 4    | NC      | NC     | 10   | NC      | NC    |
| 5    | -VOUT   | -VOUT  | 11   | NC      | NC    |
| 6    | NC      | Common | 13   | NC      | NC    |
|      |         |        | 14   | NC      | NC    |

#### NOTES:

NC = Do Not Connect.

Duplicate pin functions are internally connected.

All dimensions are in inches (millimeters).

GRID: 0.100 inches (2.54 millimeters)

MATERIAL: Lead material is phosphor bronze; lead finish is 100-300 microinches of matte tin over a nickel barrier layer of 5-40 microinches.

### ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation ..... 450mW  
Short Circuit Duration..... Momentary

### ORDERING INFORMATION

Device Family **HPR** **1XX** **V** **C**  
 HPR Indicates DC/DC Converter  
 Model Number \_\_\_\_\_  
 Selected from Table of Electrical Characteristics  
 Package Option \_\_\_\_\_  
 V = DIP Package  
 RoHS Compliant Version \_\_\_\_\_

Murata Power Solutions, Inc.  
11 Cabot Boulevard, Mansfield, MA 02048-1151 U.S.A.  
ISO 9001 and 14001 REGISTERED

Murata Power Solutions, Inc. makes no representation that the use of its products in the circuits described herein, or the use of other technical information contained herein, will not infringe upon existing or future patent rights. The descriptions contained herein do not imply the granting of licenses to make, use, or sell equipment constructed in accordance therewith. Specifications are subject to change without notice.  
© 2010 Murata Power Solutions, Inc.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Murata:

[HPR122V](#) [HPR120V](#) [HPR121V](#) [HPR123V](#) [HPR109V](#) [HPR105V](#) [HPR104V](#) [HPR103V](#) [HPR107V](#) [HPR101V](#)  
[HPR112V](#) [HPR118V](#) [HPR114V](#) [HPR110V](#) [HPR113V](#) [HPR115V](#) [HPR111V](#) [HPR116V](#) [HPR117V](#) [HPR119V](#)  
[HPR100V](#) [HPR102V](#) [HPR108V](#) [HPR106V](#) [HPR106VC](#) [HPR110VC](#) [HPR118VC](#) [HPR102VC](#) [HPR114VC](#)  
[HPR108VC](#) [HPR112VC](#) [HPR100VC](#) [HPR104VC](#) [HPR116VC](#) [HPR103VC](#) [HPR115VC](#) [HPR119VC](#) [HPR111VC](#)  
[HPR107VC](#) [HPR105VC](#) [HPR117VC](#) [HPR113VC](#) [HPR101VC](#) [HPR109VC](#) [HPR122VC](#) [HPR120VC](#) [HPR123VC](#)  
[HPR121VC](#)