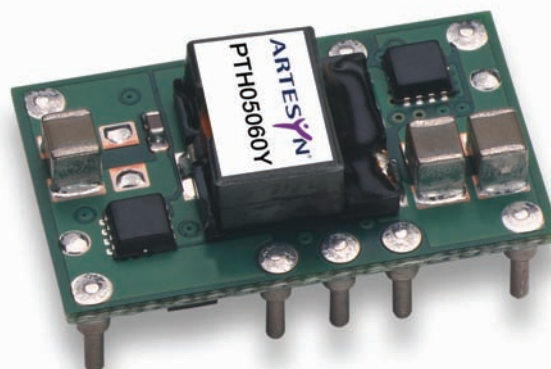


## PTHxx060Y 3.3/5/12 Vin

**Total Power:** 18 Watts  
**# of Outputs:** Single



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PTHxx060Y  
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### Special Features

- $V_{TT}$  bus termination output (output the system  $V_{REF}$ )
- 10 A output current
- 3.3, 5 or 12 Vdc input voltage
- DDR and QDR compatible
- ON/OFF inhibit (for  $V_{TT}$  standby)
- Under-voltage lockout
- Operating temperature range: -40 °C to +85 °C
- Efficiencies up to 91%
- Output overcurrent protection (non-latching, auto-reset)
- Point-of-Load-Alliance (POLA) compatible
- Available RoHS compliant
- 2 Year Warranty

### Safety

- UL/cUL CAN/CSA-C22.2 No. 60950, File No. E174104
- TÜV Product Service (EN60950) Certificate No. B 04 06 38572 044  
CB Report and Certificate to IEC60950, Certificate No. US/8292/UL

### Specifications

| Input                                      |                                     |                                                      |
|--------------------------------------------|-------------------------------------|------------------------------------------------------|
| Input current:                             | No load                             | 10 mA                                                |
| Input voltage range:                       | PTH03060Y<br>PTH05060Y<br>PTH12060Y | 2.95 - 3.65 Vdc<br>4.5 - 5.5 Vdc<br>10.8 - 13.2 Vdc  |
| Undervoltage lockout:                      |                                     |                                                      |
|                                            | PTH03060Y                           | Vin increasing<br>Vin decreasing                     |
|                                            |                                     | 2.45 V typ., 2.80 V max.<br>2.20 V min., 2.40 V typ. |
|                                            | PTH05060Y                           | Vin increasing<br>Vin decreasing                     |
|                                            |                                     | 4.30 V typ., 4.45 V max.<br>3.40 V min., 3.70 V typ. |
|                                            | PTH12060Y                           | Vin increasing<br>Vin decreasing                     |
|                                            |                                     | 9.5 V typ., 10.4 V max.<br>8.80 V min., 9.0 V typ.   |
| Input capacitance:<br>(See Note 3, page 3) | PTH03060Y & PTH05060Y<br>PTH12060Y  | 330 $\mu$ F<br>560 $\mu$ F                           |
| Remote ON/OFF:                             |                                     | Positive logic                                       |

All specifications are typical at nominal input,  $V_{ref} = 1.25$  V, full load at 25 °C unless otherwise stated.  
 $C_{in}$ ,  $C_{O1}$  and  $C_{O2}$  = typical value



## Specifications Continued

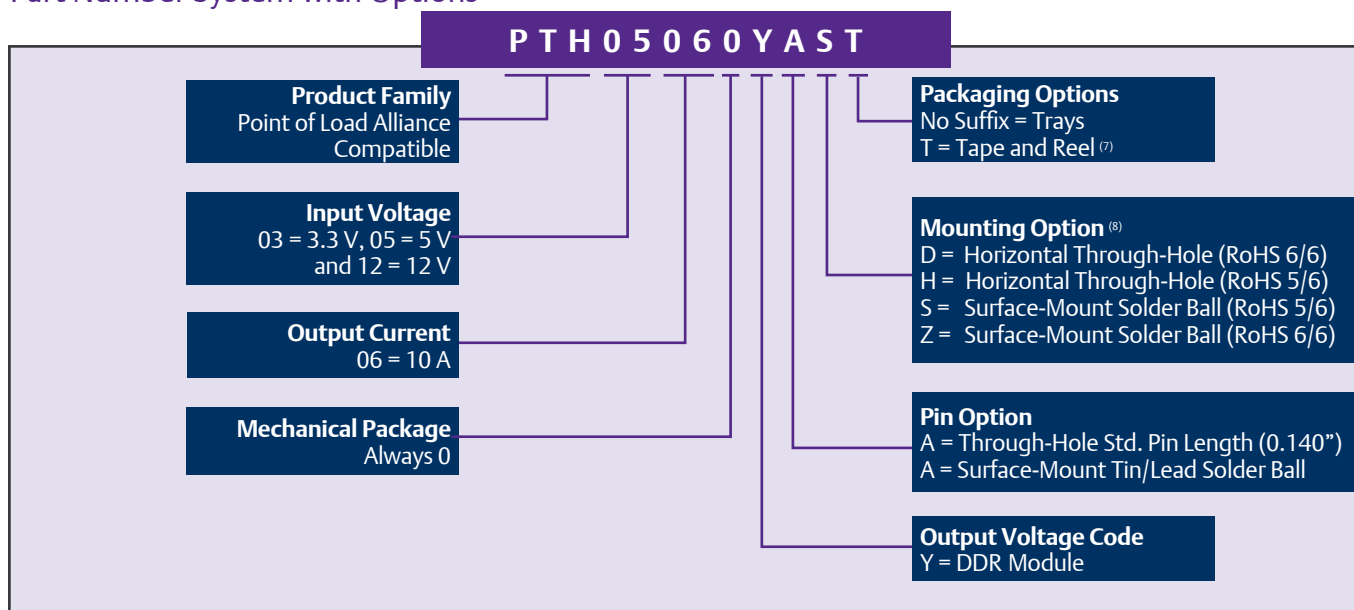
| Output                                                                                     |                                     |                                                                                                                      |
|--------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Output current:<br>(See Note 1, page 3)                                                    | (over $V_{REF}$ range)              | $\pm 10$ A                                                                                                           |
| Tracking range for $V_{REF}$ :                                                             |                                     | 0.55 - 1.8 V                                                                                                         |
| Tracking tolerance to $V_{REF}$ ( $V_{TT} - V_{REF}$ ):<br>(over line, load & temperature) |                                     | -10 mV to + 10 mV                                                                                                    |
| Ripple and noise:                                                                          | 20 MHz bandwidth                    | 20 mV pk-pk                                                                                                          |
| Load transient response:<br>(See Note 4, page 3)                                           |                                     | 30 $\mu$ s settling time<br>Overshoot/undershoot 25 mV typ.                                                          |
| Output capacitance:                                                                        |                                     |                                                                                                                      |
| Non-ceramic values<br>(See Notes 4 & 5, page 3)                                            | PTH03060Y<br>PTH05060Y<br>PTH12060Y | 470 $\mu$ F typ., 5,500 $\mu$ F max.<br>470 $\mu$ F typ., 5,500 $\mu$ F max.<br>940 $\mu$ F typ., 5,500 $\mu$ F max. |
| Ceramic values<br>(See Note 4, page 3)                                                     | PTH03060Y<br>PTH05060Y<br>PTH12060Y | 200 $\mu$ F typ., 300 $\mu$ F max.<br>200 $\mu$ F typ., 300 $\mu$ F max.<br>400 $\mu$ F typ., 600 $\mu$ F max.       |
| (See Note 6, page 3)                                                                       | ESR (non-ceramic)                   | 4 m $\Omega$ min.                                                                                                    |

| General Specifications               |                                                 |                                                     |
|--------------------------------------|-------------------------------------------------|-----------------------------------------------------|
| Efficiency:<br>$I_o = 8$ A           | PTH03060Y<br>PTH05060Y<br>PTH12060Y             | 86% typ.<br>86% typ.<br>83% typ.                    |
| Insulation voltage:                  |                                                 | Non-isolated                                        |
| Switching frequency:                 | PTH03060Y<br>PTH05060Y<br>PTH12060Y             | 550 - 650 kHz<br>550 - 650 kHz<br>200 - 300 kHz     |
| Approvals and standards:             |                                                 | EN60950<br>UL/cUL60950                              |
| Material flammability:               |                                                 | UL94V-0                                             |
| Dimensions:                          | (L x W x H)                                     | 25.27 x 15.75 x 9.00 mm<br>0.995 x 0.620 x 0.354 in |
| Weight:                              |                                                 | 3.7 g (0.13 oz)                                     |
| MTBF:                                | Telcordia SR-332                                | 6,000,000 hours                                     |
| Environmental Specifications         |                                                 |                                                     |
| Thermal Performance:<br>(See Note 2) | Operating ambient, temperature<br>Non-operating | -40 °C to +85 °C<br>-40 °C to +125 °C               |
| MSL ('Z' suffix only):               | JEDEC J-STD-020C                                | Level 3                                             |
| Protection                           |                                                 |                                                     |
| Overcurrent threshold (auto reset):  | All models                                      | 20 A typ.                                           |

## Ordering Information

| Output Power<br>(max) | Input<br>Voltage | $V_{TT}$<br>Range | Output Currents |       | Efficiency<br>(max) | Model Numbers <sup>(8,9)</sup> |
|-----------------------|------------------|-------------------|-----------------|-------|---------------------|--------------------------------|
|                       |                  |                   | Min             | Max   |                     |                                |
| 18 W                  | 2.95 - 3.65 Vdc  | 0.55 - 1.8 Vdc    | 0 A             | ±10 A | 86%                 | PTH03060Y                      |
| 18 W                  | 4.5 - 5.5 Vdc    | 0.55 - 1.8 Vdc    | 0 A             | ±10 A | 86%                 | PTH05060Y                      |
| 18 W                  | 10.8 - 13.2 Vdc  | 0.55 - 1.8 Vdc    | 0 A             | ±10 A | 83%                 | PTH12060Y                      |

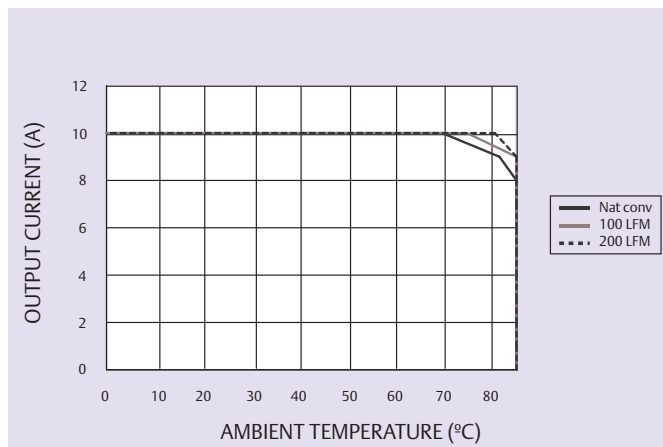
## Part Number System with Options



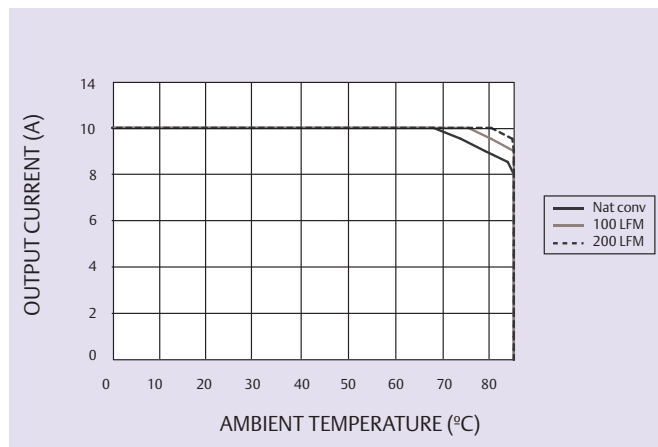
## Notes

- Rating is conditional on the module being soldered to a 4 layer PCB with 1 oz. copper. See the SOA curves or contact the factory for appropriate derating.
- This control pin has an internal pull-up to the input voltage  $V_{in}$ . If it is left open-circuit the module will operate when input power is applied. A small low-leakage (<100 nA) MOSFET is recommended for control. For further information, consult Application Note 179.
- An input capacitor is required for proper operation. The capacitor must be rated for a minimum of 500 mA rms (1000 mA for 12 V input) of ripple current. For further information, consult Application Note 179 on capacitor selection.
- The typical value of external output capacitance value ensures that  $V_{TT}$  meets the specified transient performance requirements for the memory bus terminations. Lower values of capacitance may be possible when the measured peak change in output current is consistently less than 3 A. Test conditions were 15 A/μs load step, -1.5 A to +1.5 A.
- This is the calculated maximum. The minimum ESR limitation will often result in a lower value. Consult Application Note 179 for further details.
- This is the typical ESR for all the electrolytic (non-ceramic) output capacitance. Use 7 mΩ as the minimum when using max-ESR values to calculate.
- Tape and reel packaging only available on the surface-mount versions.
- To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTHXX060YAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTHXX060YAD.
- NOTICE: Some models do not support all options. Please contact your local Emerson Network Power representative or use the on-line model number search tool at <http://www.PowerConversion.com> to find a suitable alternative.

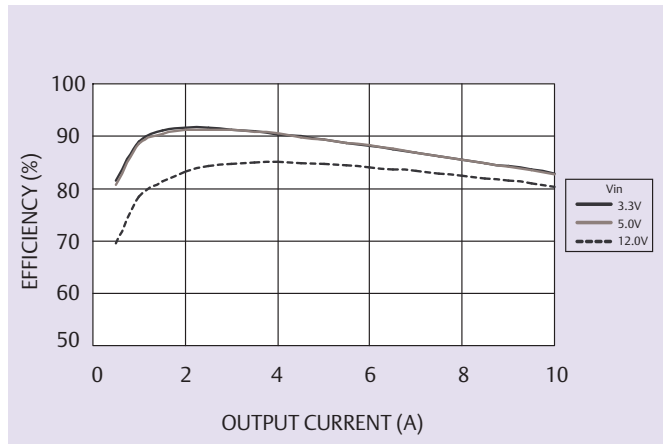
## PTHxx060Y Characteristic Data



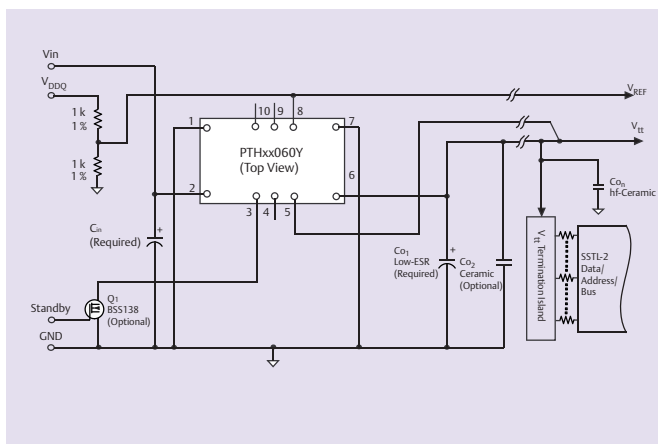
**Figure 1 - Safe Operating Area**  
 $V_{in} = 5.0 \text{ V}$ ,  $V_{REF} = 1.25 \text{ V}$ ,  $I_{out} = 10 \text{ A}$  (See Note A)



**Figure 2 - Safe Operating Area**  
 $V_{in} = 12 \text{ V}$ ,  $V_{REF} = 1.25 \text{ V}$ ,  $I_{out} = 10 \text{ A}$  (See Note A)



**Figure 3 - Efficiency vs Load Current**  
 $V_{REF} = 1.25 \text{ V}$  (See Note B)



**Figure 4 - Standard Application**

### Notes

- A SOA curves represent the conditions at which internal components are within the Emerson Network Power derating guidelines.
- B Characteristic data has been developed from actual products tested at 25 °C. This data is considered typical data for the converter.

## Mechanical Drawings

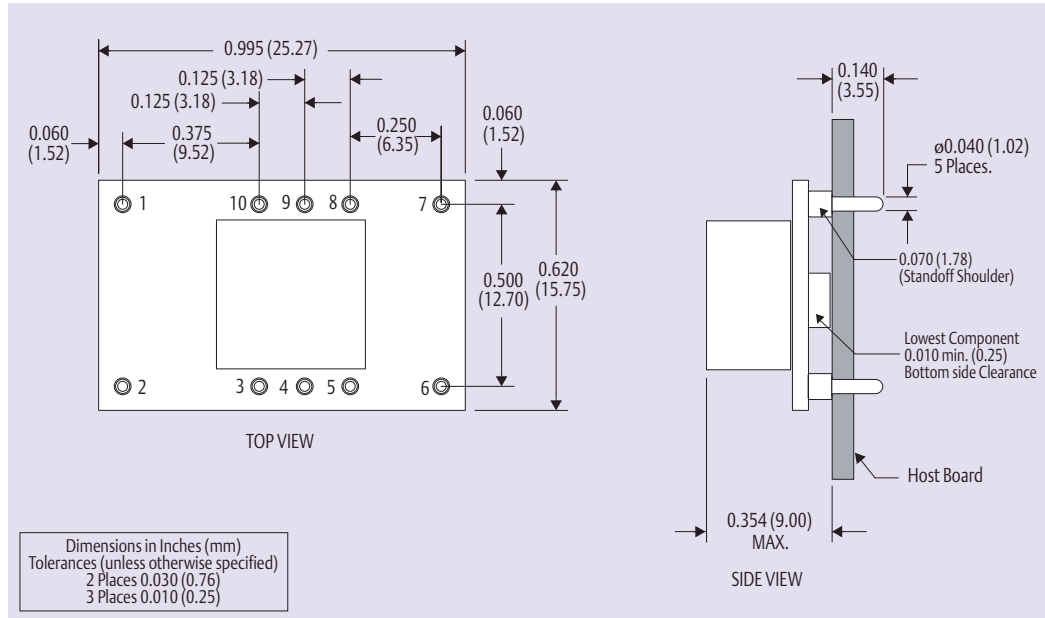


Figure 5 - Plated Through-Hole

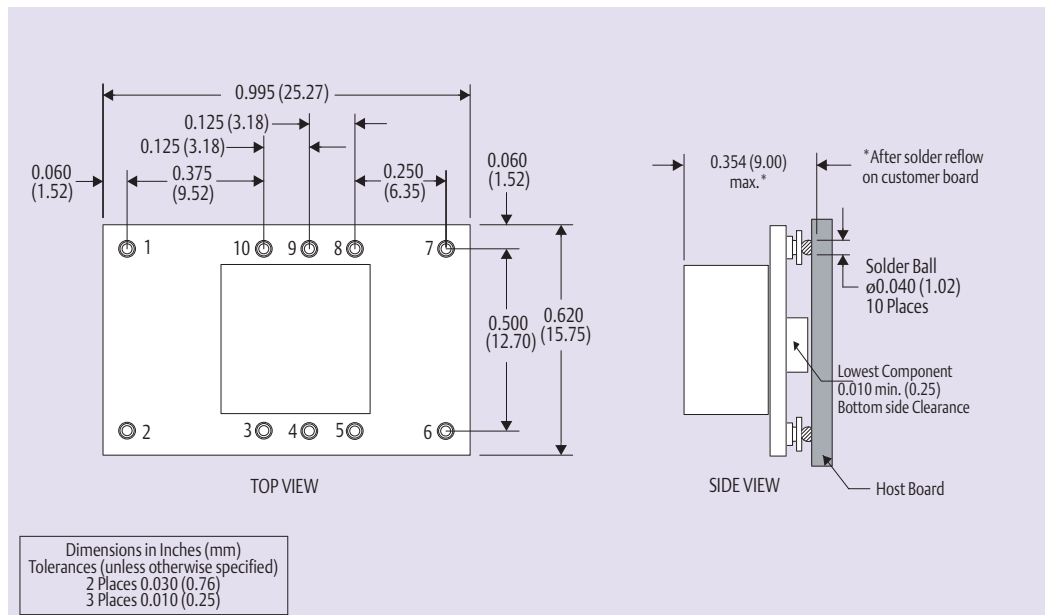


Figure 6 - Surface-Mount

| Pin Connections |                 |
|-----------------|-----------------|
| Pin No.         | Function        |
| Pin 1           | Ground          |
| Pin 2           | V <sub>in</sub> |
| Pin 3           | Inhibit*        |
| Pin 4           | N/C             |
| Pin 5           | Vo sense        |

| Pin Connections cont. |                  |
|-----------------------|------------------|
| Pin No.               | Function         |
| Pin 6                 | V <sub>TT</sub>  |
| Pin 7                 | Ground           |
| Pin 8                 | V <sub>REF</sub> |
| Pin 9                 | N/C              |
| Pin 10                | N/C              |

\*Denotes negative logic:  
Open = Normal operation  
Ground = Function active

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