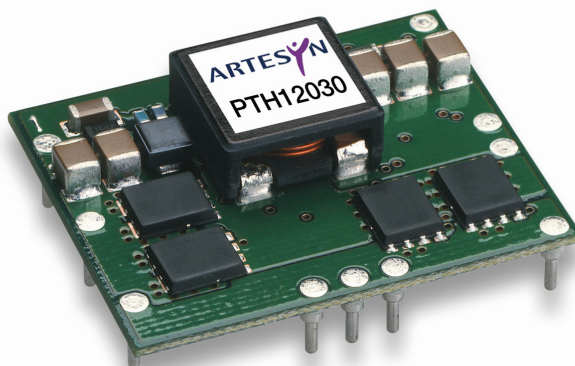


## PTH12030 12 Vin

**Total Power:** 143 Watts  
**# of Outputs:** Single



Rev. 3.10.09\_167  
PTH12030 Series  
1 of 5



### Special Features

- 26 A output current
- 12 V input voltage
- Wide-output voltage adjust
  - 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L'
- Auto-track™ sequencing\*
- Margin up/down controls
- Efficiencies up to 94.5%
- Output ON/OFF inhibit
- Output voltage sense
- Point-of-Load-Alliance (POLA) compatible
- Available RoHS compliant
- 2 Year Warranty

### Safety

- UL/cUL CAN/CSA-C22.2 No. 60950-1-03/UL 60950-1, 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 voltage range:                                          | (See Note 3, page 3)        | 10.2 - 13.8 Vdc                                    |
| Input current:                                                | No load                     | 10 mA typ.                                         |
| Remote ON/OFF:                                                | (See Note 1, page 3)        | Positive logic                                     |
| Start-up time:                                                |                             | 1 V/ms                                             |
| Undervoltage lockout:                                         |                             | 8.5 - 9.5 V typ.                                   |
| Track input voltage:                                          | Pin 11 (See Note 6, page 3) | ± 0.3 Vin                                          |
| Output                                                        |                             |                                                    |
| Voltage adjustability:<br>(See Note 4, page 3)                | Suffix '-W'<br>Suffix '-L'  | 1.2 - 5.5 Vdc<br>0.8 - 1.8 Vdc                     |
| Setpoint accuracy:                                            |                             | ± 2.0% Vo                                          |
| Line regulation:                                              |                             | ± 5 mV typ.                                        |
| Load regulation:                                              |                             | ± 5 mV typ.                                        |
| Total regulation:                                             |                             | ± 3.0% Vo                                          |
| Minimum load:                                                 |                             | 0 A                                                |
| Ripple and noise:<br>20 MHz bandwidth<br>(See Note 8, page 3) | Suffix '-W'<br>Suffix '-L'  | 25 mV pk-pk<br>15 mV pk-pk                         |
| Temperature co-efficient:                                     | -40 °C to +85 °C            | ± 0.5% Vo                                          |
| Transient response:<br>(See Note 5, page 3)                   |                             | 50 µs recovery time<br>Overshoot/undershoot 150 mV |
| Margin adjustment:                                            |                             | ± 5.0% Vo                                          |

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated  
Cin = 560 µF, Cout = 0 µF

\* Auto-track™ is a trade mark of  
Texas Instruments



## Specifications Continued

| EMC Characteristics      |                       |
|--------------------------|-----------------------|
| Electrostatic discharge: | EN61000-4-2, IEC801-2 |
| Conducted immunity:      | EN61000-4-6           |
| Radiated immunity:       | EN61000-4-3           |

| General Specifications   |                                |                                                     |
|--------------------------|--------------------------------|-----------------------------------------------------|
| Efficiency:              |                                | See efficiency table on page 3                      |
| Insulation voltage:      |                                | Non-Isolated                                        |
| Switching frequency:     | Over $V_{in}$ and $I_o$ ranges | 575 kHz typ.                                        |
| Approvals and standards: |                                | EN60950, UL/cUL60950                                |
| Material flammability:   |                                | UL94V-0                                             |
| Dimensions:              | (L x W x H)                    | 34.80 x 28.45 x 9.00 mm<br>1.370 x 1.120 x 0.354 in |
| Weight:                  |                                | 7g (0.25 oz)                                        |
| MTBF:                    | Telcordia SR-332               | 2,821,000 hours                                     |

## Environmental Specifications

|                                              |                                |                   |
|----------------------------------------------|--------------------------------|-------------------|
| Thermal performance:<br>(See Note 2, page 3) | Operating ambient, temperature | -40° C to +85 °C  |
|                                              | Non-operating                  | -40° C to +125 °C |
| MSL ('Z' suffix only):                       | JEDEC J-STD-020C               | Level 3           |

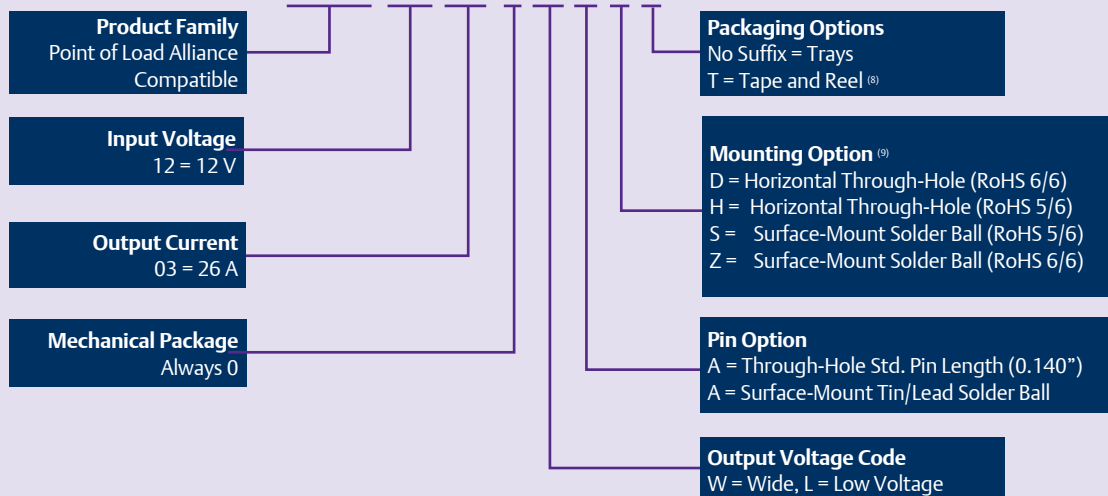
| Protection     |            |               |
|----------------|------------|---------------|
| Short circuit: | Auto reset | 40 A typ.     |
| Thermal:       |            | Auto recovery |

## Ordering Information

| Output Power<br>(max) | Input<br>Voltage | Output<br>Voltage | Output Currents |      | Efficiency<br>(max) | Regulation |       | Model Numbers <sup>(9, 10)</sup> |
|-----------------------|------------------|-------------------|-----------------|------|---------------------|------------|-------|----------------------------------|
|                       |                  |                   | Min             | Max  |                     | Line       | Load  |                                  |
| 143 W                 | 10.2 - 13.8 Vdc  | 0.8 - 1.8 Vdc     | 0 A             | 26 A | 89%                 | ±5 mV      | ±5 mV | PTH12030L                        |
| 143 W                 | 10.2 - 13.8 Vdc  | 1.2 - 5.5 Vdc     | 0 A             | 26 A | 94.5%               | ±5 mV      | ±5 mV | PTH12030W                        |

### Part Number System with Options

**PTH12030WAST**



### Output Voltage Adjustment of the PTH12030 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH12030. It is no longer necessary to purchase a variety of modules in order to cover different output voltages. The output voltage can be trimmed in a range of 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L'. When the PTH12030 converter leaves the factory the output has been adjusted to the default voltage of 1.2 V for the PTH12030W and 0.8 V for the PTH12030L.

Efficiency Table - PTH12030W ( $I_O = 18$  A)

| Output Voltage | Efficiency |
|----------------|------------|
| $V_O = 5.0$ V  | 94.5%      |
| $V_O = 3.3$ V  | 92.7%      |
| $V_O = 2.5$ V  | 91.4%      |
| $V_O = 2.0$ V  | 90.3%      |
| $V_O = 1.8$ V  | 89.5%      |
| $V_O = 1.5$ V  | 88.2%      |
| $V_O = 1.2$ V  | 86.2%      |

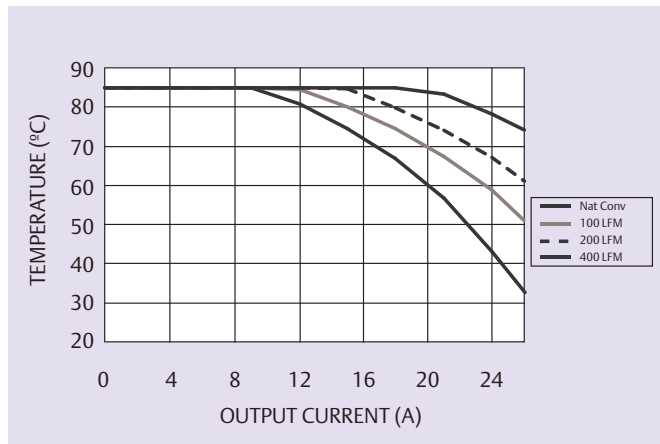
Efficiency Table - PTH12030L ( $I_O = 18$  A)

| Output Voltage | Efficiency |
|----------------|------------|
| $V_O = 1.8$ V  | 89%        |
| $V_O = 1.5$ V  | 87%        |
| $V_O = 1.2$ V  | 85%        |
| $V_O = 1.0$ V  | 83%        |
| $V_O = 0.8$ V  | 80%        |

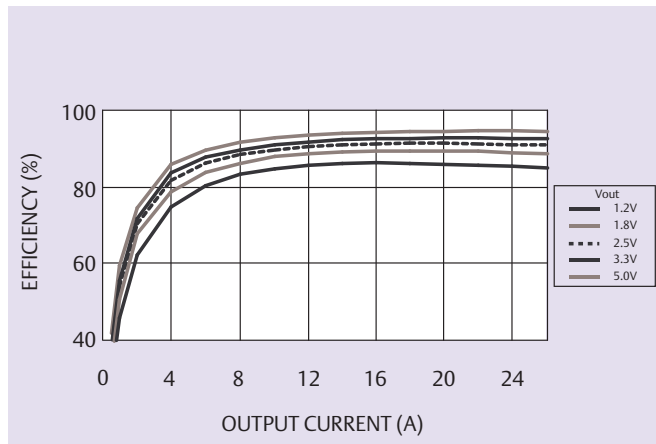
### Notes

- Remote ON/OFF. Active High  
ON: Pin 4 open; or  $V > V_{in} - 0.5$  V  
OFF: Pin 4 GND; or  $V < 0.8$  V (min - 0.2 V).
- See Figure 1 for safe operating curve of the PTH12030W and Figure 4 for safe operating curve of PTH12030L.
- A 560  $\mu$ F electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 800 mA rms of ripple current.
- An external output capacitor is not required for basic operation. Adding 330  $\mu$ F of distributed capacitance at the load will improve the transient response.
- 1 A/ $\mu$ s load step, 50 to 100%  $I_{Omax}$ ,  $C_{out} = 330$   $\mu$ F.
- If utilized  $V_{out}$  will track applied voltage by  $\pm 0.3$  V (up to  $V_O$  set point).
- Tape and reel packaging only available on the surface-mount versions.
- The pk-pk output ripple voltage is measured with an external 10  $\mu$ F ceramic capacitor. See Figure 3 Standard application schematic on the following page.
- To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH12030WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH12030WAD.
- 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.

## PTH12030W Characteristic Data

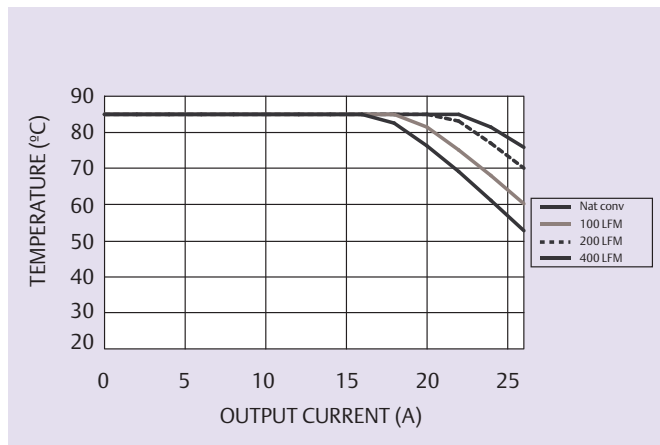


**Figure 1 - Safe Operating Area**  
 $V_{in} = 12\text{ V}$ , Output Voltage = 3.3 V (See Note A)

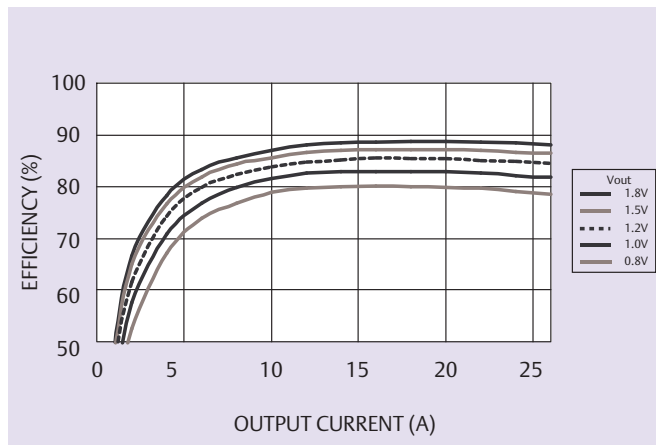


**Figure 2 - Efficiency vs Load Current**  
 $V_{in} = 12\text{ V}$  (See Note B)

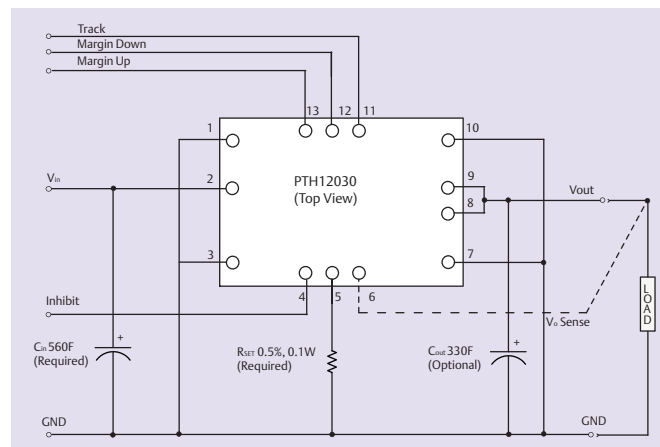
## PTH12030W Characteristic Data



**Figure 3 - Safe Operating Area**  
 $V_{in} = 12\text{ V}$ , Output Voltage  $\leq 1.8\text{ V}$  (See Note A)



**Figure 4 - Efficiency vs Load Current**  
 $V_{in} = 12\text{ V}$  (See Note B)



**Figure 5 - Standard Application - All Models**

### 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

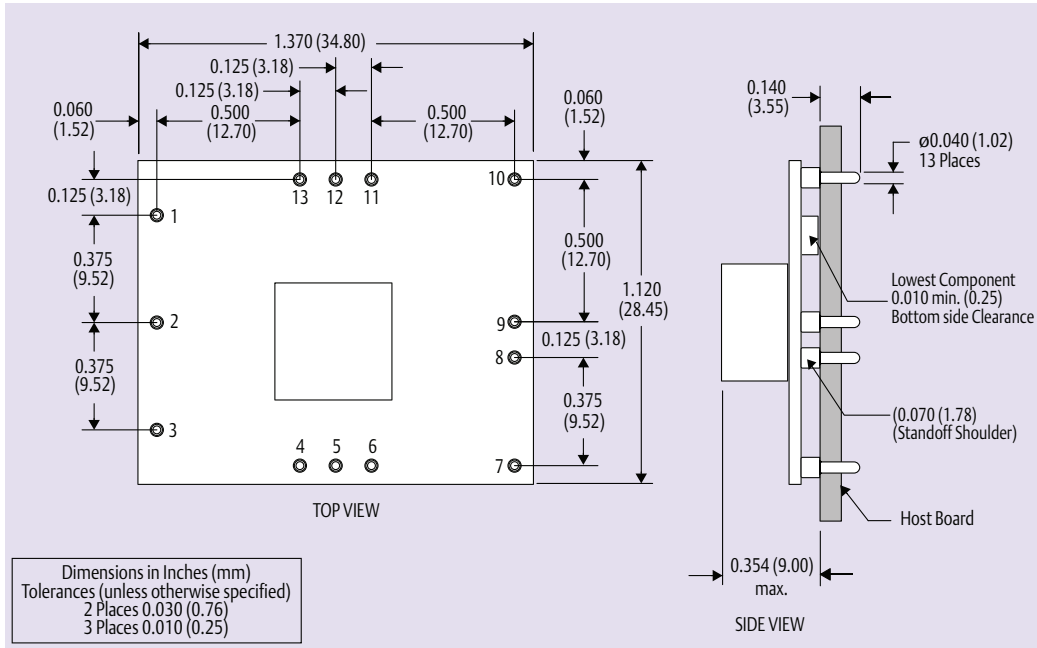


Figure 6 - Plated Through-Hole

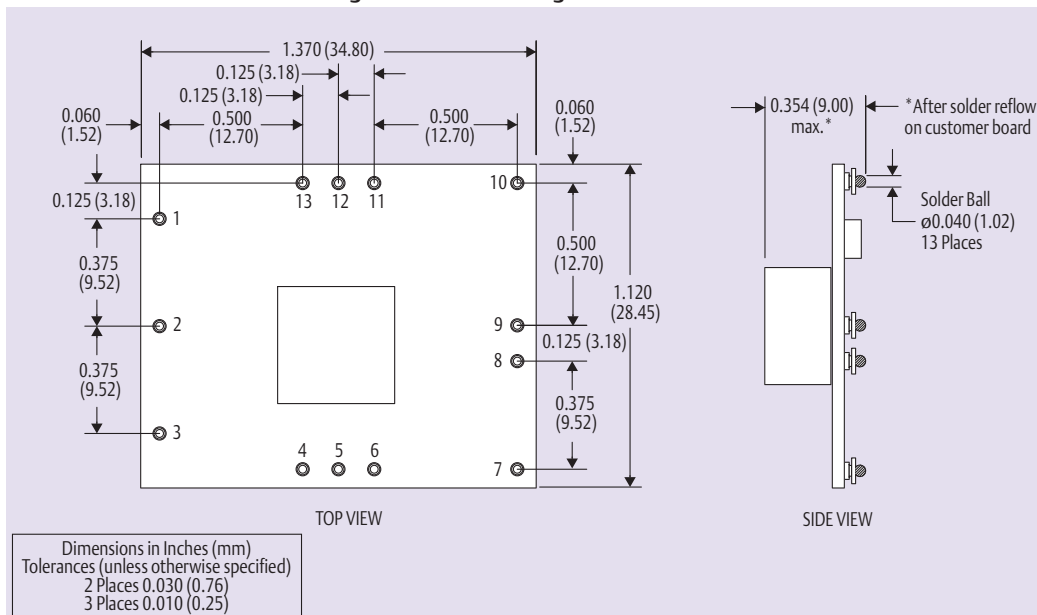


Figure 7 - Surface-Mount

| Pin Connections |           |
|-----------------|-----------|
| Pin No.         | Function  |
| Pin 1           | Ground    |
| Pin 2           | Vin       |
| Pin 3           | Ground    |
| Pin 4           | Inhibit*  |
| Pin 5           | Vo adjust |

| Pin Connections cont. |          |
|-----------------------|----------|
| Pin No.               | Function |
| Pin 6                 | Vo sense |
| Pin 7                 | Ground   |
| Pin 8                 | Vout     |
| Pin 9                 | Vout     |
| Pin 10                | Ground   |

| Pin Connections cont. |              |
|-----------------------|--------------|
| Pin No.               | Function     |
| Pin 11                | Track        |
| Pin 12                | Margin down* |
| Pin 13                | Margin up*   |

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

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