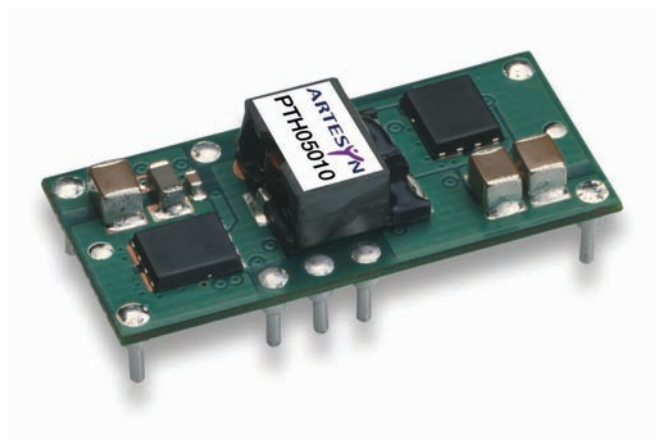


## PTH05010 5 Vin

**Total Power:** 54 Watts  
**# of Outputs:** Single



Rev. 3.23.09\_55  
PTH05010 Series  
1 of 5



## Special Features

- 15 A output current
- 5 V input voltage
- Wide-output voltage adjust 0.8 Vdc to 3.6 Vdc
- Auto-track™ sequencing\*
- Margin up/down controls
- Pre-bias start-up capability
- Efficiencies up to 95%
- 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)           | 4.5 - 5.5 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:                       |                                | 3.7 - 4.3 V typ.                                   |
| Track input voltage:                        | Pin 8 (See Note 6 & 7, page 3) | ± 0.3 Vin                                          |
| Output                                      |                                |                                                    |
| Voltage adjustability:                      | (See Note 4, page 3)           | 0.8 - 3.6 Vdc                                      |
| Setpoint accuracy:                          |                                | ± 2.0% Vo                                          |
| Line regulation:                            |                                | ± 10 mV typ.                                       |
| Load regulation:                            |                                | ± 12 mV typ.                                       |
| Total regulation:                           |                                | ± 3.0% Vo                                          |
| Minimum load:                               |                                | 0 A                                                |
| Ripple and noise:                           | 20 MHz bandwidth               | 30 mV pk-pk                                        |
| Temperature co-efficient:                   | -40 °C to +85 °C               | ± 0.5% Vo                                          |
| Transient response:<br>(See Note 5, page 3) |                                | 70 µs recovery time<br>Overshoot/undershoot 100 mV |
| Margin adjustment:                          |                                | ± 5.0% Vo                                          |

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated  
C<sub>in</sub> = 470 µF, C<sub>out</sub> = 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 | 95% max                                             |
| Insulation voltage:      |                                | Non-Isolated                                        |
| Switching frequency:     |                                | 275 kHz to 325 kHz                                  |
| Approvals and standards: |                                | EN60950, UL/cUL60950                                |
| Material flammability:   |                                | UL94V-0                                             |
| Dimensions:              | (L x W x H)                    | 34.80 x 15.75 x 9.00 mm<br>1.370 x 0.620 x 0.354 in |
| Weight:                  |                                | 5g (0.18 oz)                                        |
| MTBF:                    | Telcordia SR-332               | 7,092,000 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           |

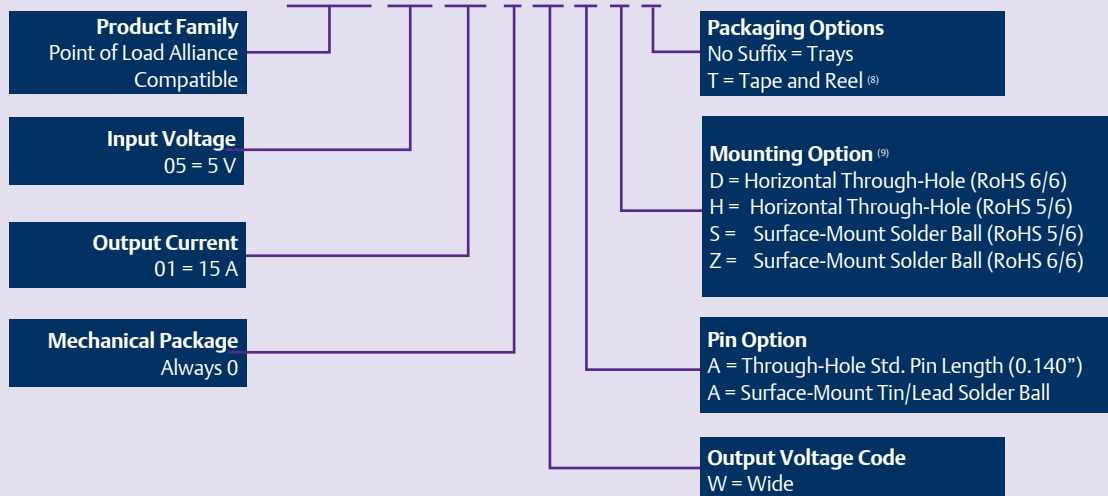
| Protection     |            |               |
|----------------|------------|---------------|
| Short circuit: | Auto reset | 27.5 A typ.   |
| Thermal:       |            | Auto recovery |

## 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    |                                  |
| 54 W                  | 4.5 - 5.5 Vdc    | 0.8 - 3.6 Vdc     | 0 A             | 15 A | 95%                 | ± 10 mV    | ± 12 mV | PTH05010                         |

## Part Number System with Options

**PTH05010WAST**



## Output Voltage Adjustment of the PTH05010 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH05010. 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 0.8 Vdc to 3.6 Vdc. When the PTH05010 converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

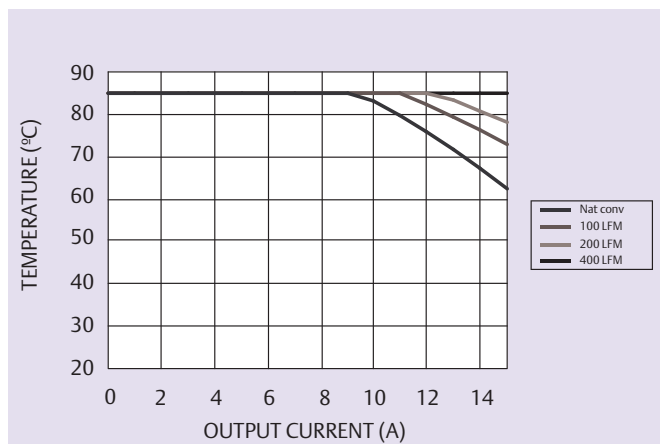
Efficiency Table ( $I_O = 10$  A)

| Output Voltage | Efficiency |
|----------------|------------|
| $V_O = 1.0$ V  | 86%        |
| $V_O = 1.2$ V  | 88%        |
| $V_O = 1.5$ V  | 90%        |
| $V_O = 1.8$ V  | 91%        |
| $V_O = 2.0$ V  | 92%        |
| $V_O = 2.5$ V  | 93%        |
| $V_O = 3.3$ V  | 95%        |

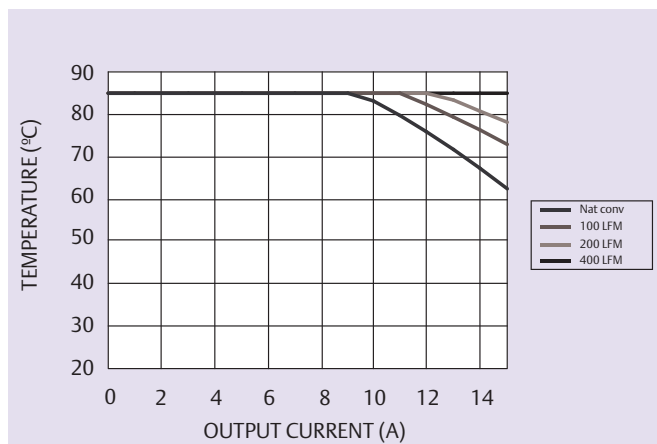
## Notes

- Remote ON/OFF. Positive Logic  
ON: Pin 3 open; or  $V > V_{in} - 0.5$  V  
OFF: Pin 3 GND; or  $V < 0.8$  V (min - 0.2 V).
- See Figures 1 and 2 for safe operating curves.
- A 470  $\mu$ F electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 700 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).
- The pre-bias start-up feature is not compatible with Auto-Track™. This is because when the module is under Auto-Track™ control, it is fully active and will sink current if the output voltage is below that of a back-feeding source. Therefore to ensure a pre-bias hold-off, one of the following two techniques must be followed when input power is first applied to the module. The Auto-Track™ function must either be disabled, or the module's output held off using the inhibit pin. Refer to Application Note 155 for more details.
- 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. PTH05010WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH05010WAD.
- 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.

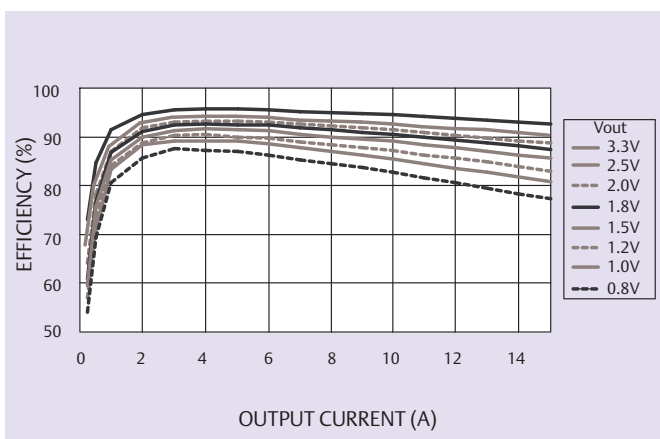
## Characteristic Data



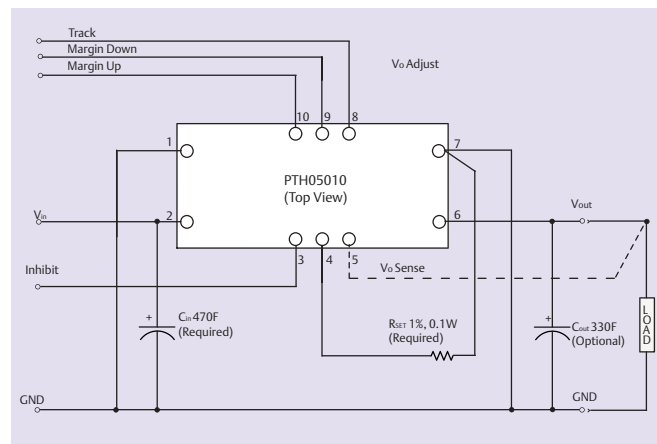
**Figure 1 - Safe Operating Area**  
**Vin = 5 V, Output Voltage = 3.3 V (See Note A)**



**Figure 2 - Safe Operating Area**  
**Vin = 5 V, Output Voltage = 1.0 V (See Note A)**



**Figure 3 - Efficiency vs Load Current**  
**Vin = 5 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

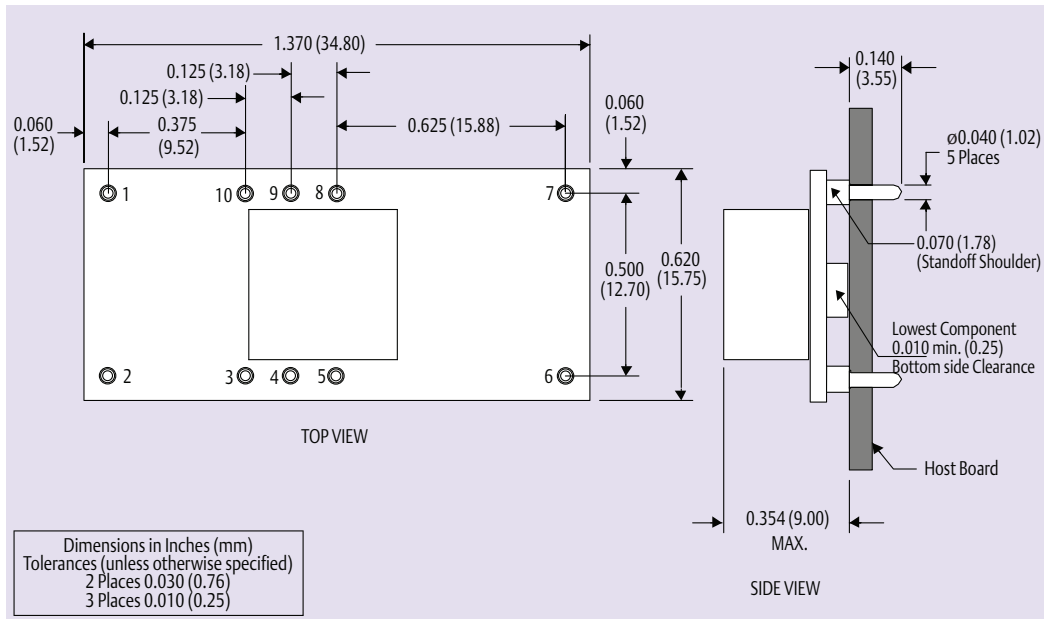


Figure 5 - Plated Through-Hole

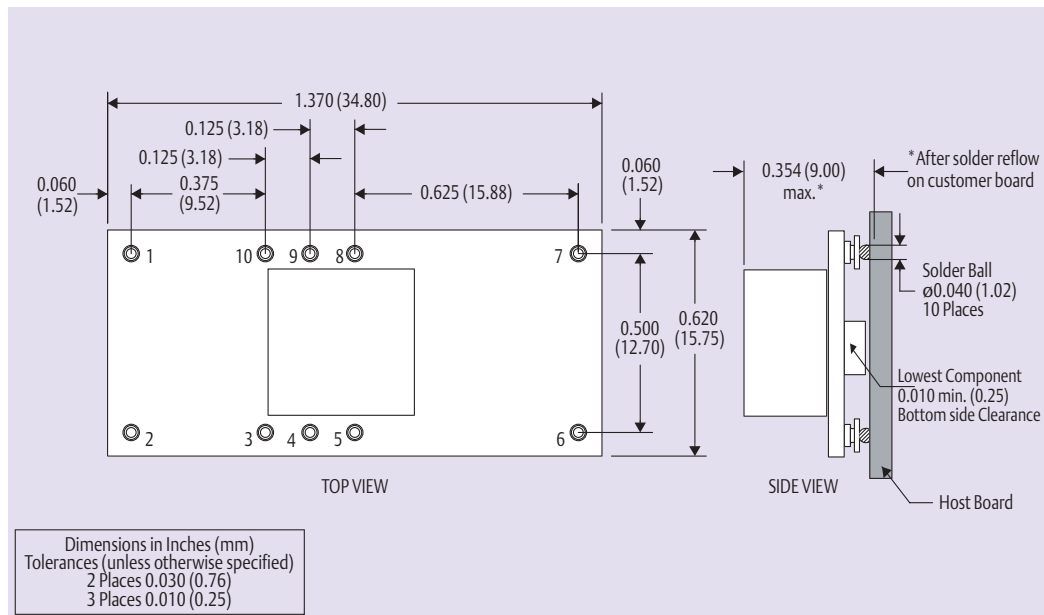


Figure 6 - Surface-Mount

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

| Pin Connections cont. |              |
|-----------------------|--------------|
| Pin No.               | Function     |
| Pin 6                 | Vout         |
| Pin 7                 | Ground       |
| Pin 8                 | Track        |
| Pin 9                 | Margin down* |
| Pin 10                | Margin up*   |

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

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