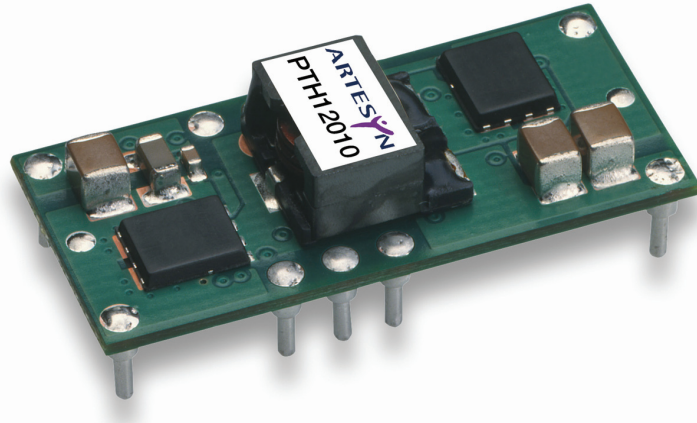


## PTH12010 12 Vin Single Output

Total Power: 66W  
# of Outputs: Single



### Special Features

- 12 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%
- 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)               | 10.8 - 13.2 Vdc                                    |
| Input current:                         | No load                    | 10 mA typ.   |
| Remote ON/OFF:                         | (See Note 1)               | Positive logic                                     |
| Start-up time:                         |                            | 1 V/ms   |
| Undervoltage lockout:                  |                            | 9.0 - 9.5 V typ.                                   |
| Track input voltage:                   | Pin 8 (See Note 6)         | ± 0.3 Vin  |
| Output                                 |                            |  |
| Voltage adjustability:<br>(See Note 4) | Suffix '-W'<br>Suffix '-L' | 1.2 - 5.5 Vdc<br>0.8 - 1.8 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           | 25 mV pk-pk  |
| Temperature co-efficient:              | -40 °C to +85 °C           | ± 0.5% Vo  |
| Transient response:<br>(See Note 5)    |                            | 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  
Cin = 560 μF, Cout = 0 μF

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



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

| General Specifications   |                            |   |
|--------------------------|----------------------------|---|
| Efficiency:              |                            | See tables on page 3                                |
| Insulation voltage:      |                            | Non-Isolated  |
| Switching frequency:     | Suffix '-W'<br>Suffix '-L' | 300 kHz to 400 kHz<br>200 kHz to 300 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

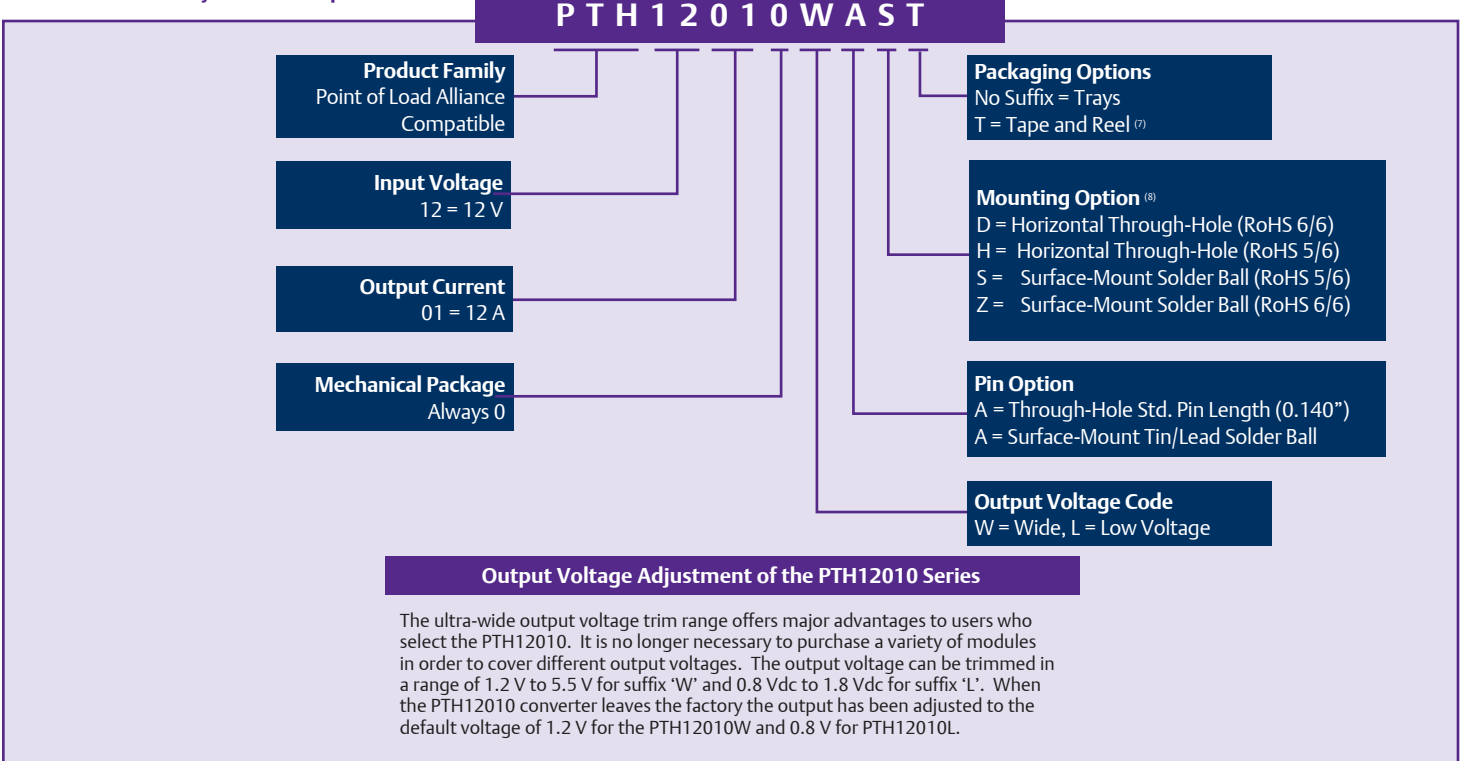
|                       |   |                                       |
|-----------------------|---|---------------------------------------|
| Thermal performance:  | Operating ambient, temperature<br>Non-operating | -40° C to +85 °C<br>-40° C to +125 °C |
| MSL ('Z' suffix only) | JEDEC J-STD-020C  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

| Protection     |            |           |
|----------------|------------|-----------|
| Short circuit: | Auto reset | 20 A typ. |

## Ordering Information

| Output Power (max) | Input Voltage   | Output Voltage | Output Currents |      | Efficiency (max) | Regulation |        | Model Numbers <sup>(8,9)</sup> |
|--------------------|-----------------|----------------|-----------------|------|------------------|------------|--------|--------------------------------|
|                    |                 |                | Min             | Max  |                  | Line       | Load   |                                |
| 66 W               | 10.8 - 13.2 Vdc | 0.8 - 1.8 Vdc  | 0 A             | 12 A | 89%              | ±10 mV     | ±12 mV | PTH12010L                      |
| 66 W               | 10.8 - 13.2 Vdc | 1.2 - 5.5 Vdc  | 0 A             | 12 A | 94%              | ±10 mV     | ±12 mV | PTH12010W                      |

### Part Number System with Options



Efficiency Table - PTH12010W ( $I_O = 8 A$ )

| Output Voltage | Efficiency |
|----------------|------------|
| $V_o = 5.0 V$  | 94%        |
| $V_o = 3.3 V$  | 93%        |
| $V_o = 2.5 V$  | 91%        |
| $V_o = 2.0 V$  | 90%        |
| $V_o = 1.8 V$  | 89%        |
| $V_o = 1.5 V$  | 88%        |
| $V_o = 1.2 V$  | 86%        |

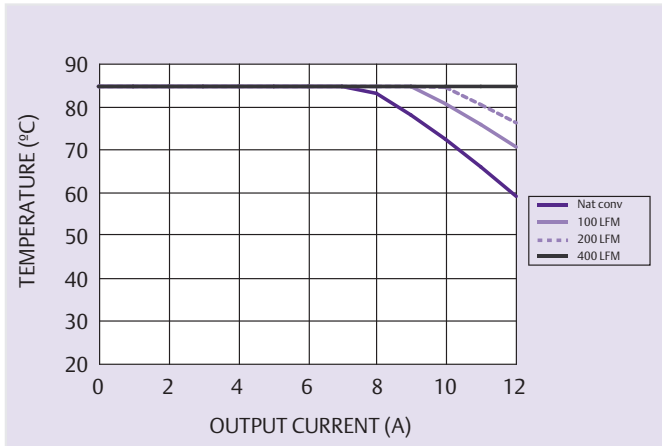
Efficiency Table - PTH12010L ( $I_O = 8 A$ )

| Output Voltage | Efficiency |
|----------------|------------|
| $V_o = 1.8 V$  | 89%        |
| $V_o = 1.5 V$  | 88%        |
| $V_o = 1.2 V$  | 86%        |
| $V_o = 1.0 V$  | 84%        |
| $V_o = 0.8 V$  | 82%        |

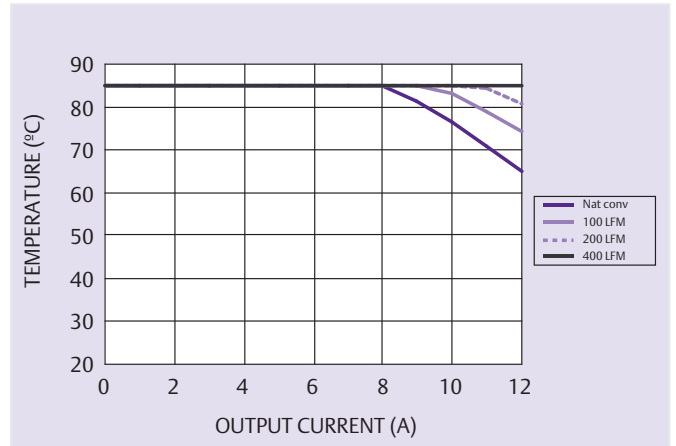
### Notes

- 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, 2 and 3 for safe operating curves for the PTH12010W and Figures 6 and 7 for PTH12010L.
- 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.
- To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH12010WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH12010WAD.
- 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.

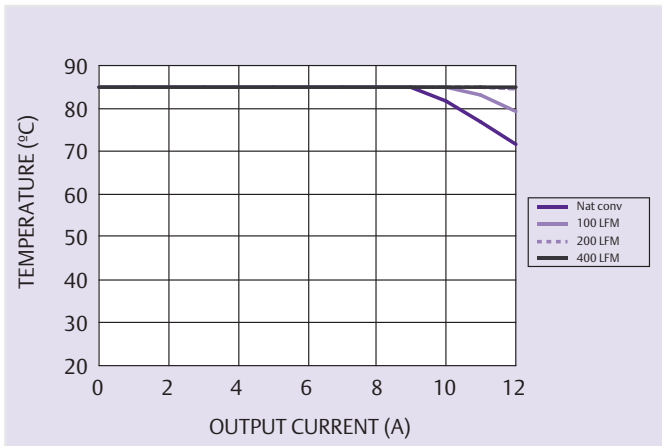
# PTH12010W Characteristic Data



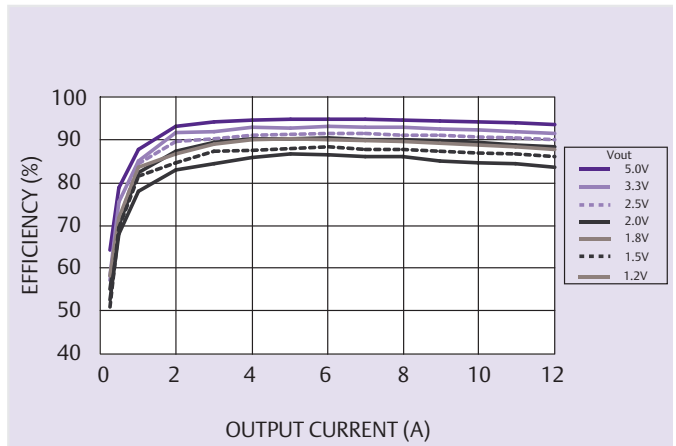
**Figure 1 - Safe Operating Area**  
Vin = 12 V, Output Voltage = 5 V (See Note A)



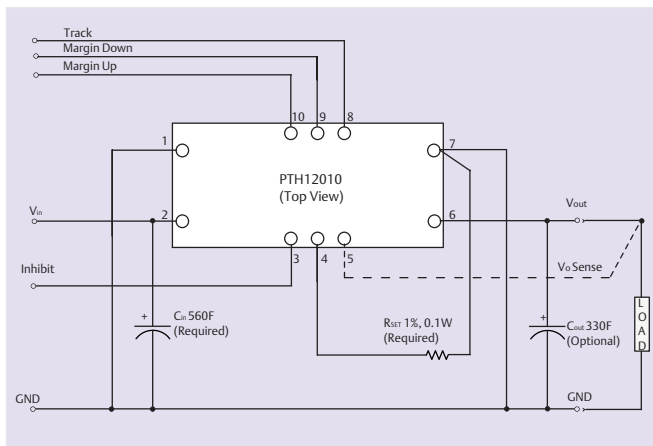
**Figure 2 - Safe Operating Area**  
Vin = 12 V, Output Voltage = 3.3 V (See Note A)



**Figure 3 - Safe Operating Area**  
Vin = 12 V, Output Voltage ≤ 1.8 V (See Note A)



**Figure 4 - Efficiency vs Load Current**  
Vin = 12 V (See Note B)

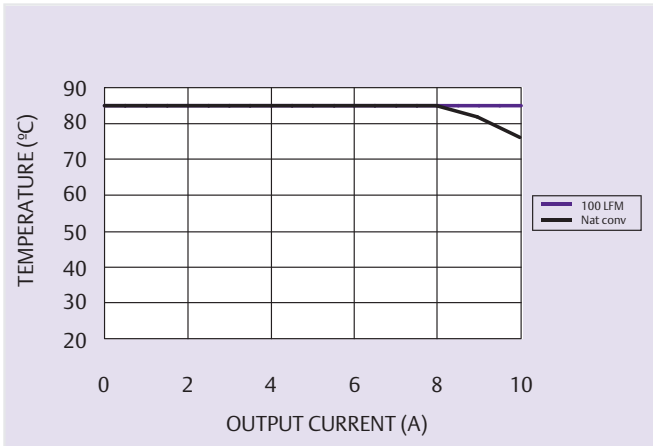


**Figure 5 - Standard Application**

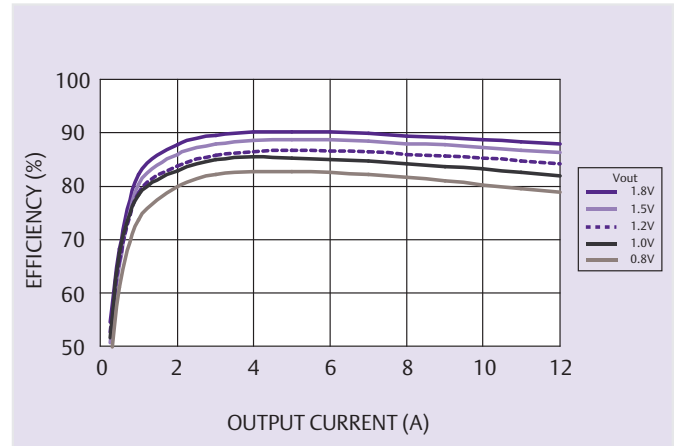
## Notes

- 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.

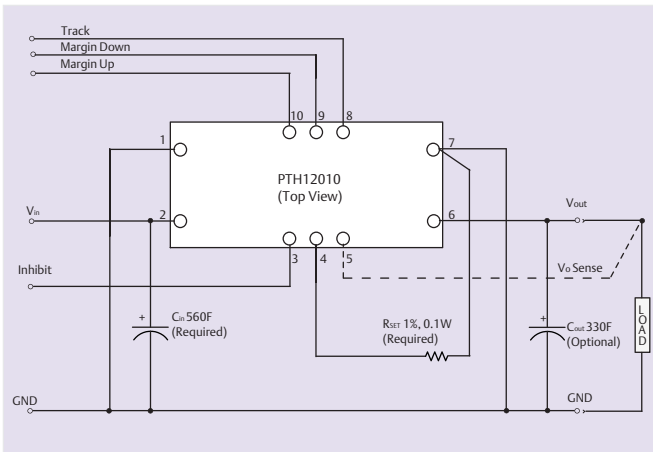
# PTH12010L Characteristic Data



**Figure 6 - Safe Operating Area**  
Vin = 12 V, Output Voltage ≤ 1.8 V (See Note A)



**Figure 7 - Efficiency vs Load Current**  
Vin = 12 V (See Note B)



**Figure 8 - 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

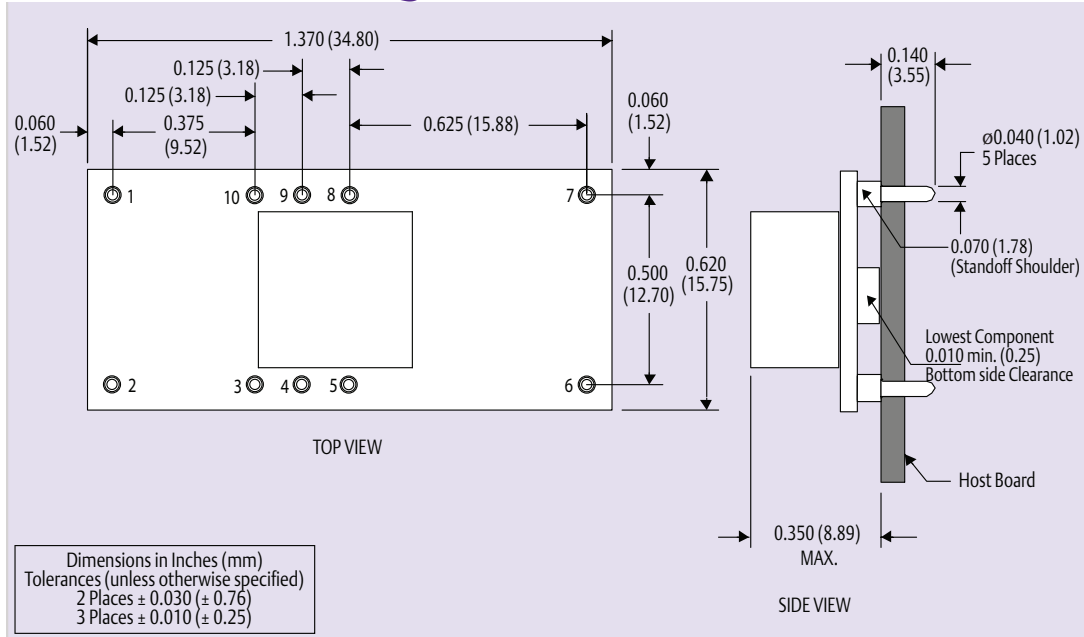


Figure 9 - Plated Through-Hole

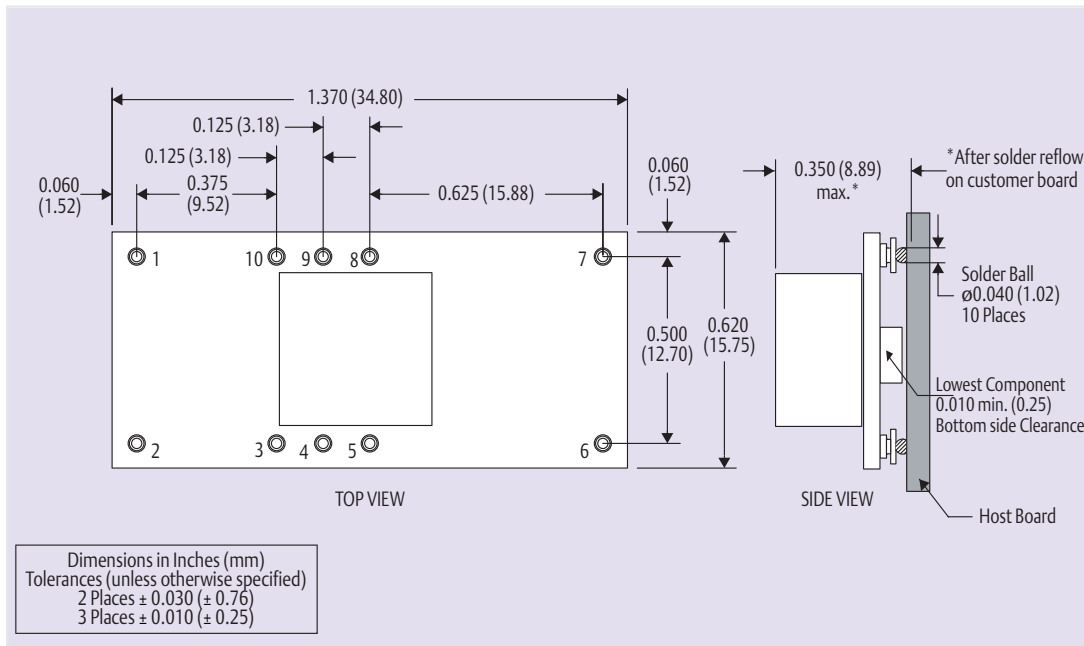


Figure 10 - Surface-Mount

| Pin Connections |           | Pin Connections cont. |              |
|-----------------|-----------|-----------------------|--------------|
| Pin No.         | Function  | Pin No.               | Function     |
| Pin 1           | Ground    | Pin 6                 | Vout         |
| Pin 2           | Vin       | Pin 7                 | Ground       |
| Pin 3           | Inhibit*  | Pin 8                 | Track        |
| Pin 4           | Vo adjust | Pin 9                 | Margin down* |
| Pin 5           | Vo sense  | Pin 10                | Margin up*   |

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

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