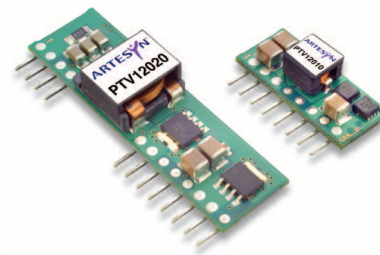




- 8 A output current
- 12 V input voltage
- Wide-output voltage adjust
  - 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L'
- Auto-track™ sequencing\*
- Pre-bias start-up
- Efficiencies up to 93%
- Output ON/OFF inhibit
- Vertical through-hole mounting
- Point-of-Load-Alliance (POLA) compatible
- Undervoltage lockout
- Available RoHS compliant



The PTV12010 is a non-isolated dc-dc converter from Artesyn under the Point of Load Alliance (POLA) standard. The vertical mounting option of the PTV12010 module provides performance in less than 20% of the space that is required by alternative solutions. The Auto-Track™ feature provides for sequencing between multiple modules, a function, which is becoming a necessity for powering advanced silicon including DSP's, FPGA's and ASIC's requiring controlled power-up and power-down. The PTV12010 has an input voltage of 10.8 Vdc to 13.2 Vdc and offers a wide 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L' output voltage range with up to 8 A output current, which allows for maximum design flexibility and a pathway for future upgrades.



2 YEAR WARRANTY

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated  
C<sub>in</sub> = 100 µF and 10 µF (Ceramic), C<sub>out</sub> = 0 µF

## SPECIFICATIONS

### OUTPUT SPECIFICATIONS

|                                       |                          |                                                    |
|---------------------------------------|--------------------------|----------------------------------------------------|
| Voltage adjustability<br>(See Note 4) | Suffix 'W'<br>Suffix 'L' | 1.2-5.5 Vdc<br>0.8-1.8 Vdc                         |
| Setpoint accuracy                     | (See Note 8)             | ±2.0% Vo                                           |
| Line regulation                       |                          | ±10 mV typ.                                        |
| Load regulation                       |                          | ±12 mV typ.                                        |
| Total regulation                      | (See Note 8)             | ±3.0% Vo                                           |
| Minimum load                          |                          | 0 A                                                |
| Ripple and noise<br>20 MHz bandwidth  | Suffix 'W'<br>Suffix 'L' | 20 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)    |                          | 70 µs recovery time<br>Overshoot/undershoot 100 mV |

### INPUT SPECIFICATIONS

|                       |                           |                |
|-----------------------|---------------------------|----------------|
| Input voltage range   | (See Note 3)              | 10.8V-13.2 Vdc |
| Input standby current |                           | 10 mA typ.     |
| Remote ON/OFF         | (See Note 1)              | Positive logic |
| Undervoltage lockout  | (Increasing)              | 9.5 V typ.     |
| Track input current   | Pin 5 (See Notes 6 and 7) | -0.13 mA       |

### 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 2   |                                                    |
| Insulation voltage      | Non-isolated           |                                                    |
| Switching frequency     |                        |                                                    |
| Suffix 'W'              | 250-400 kHz            | 325 kHz typ.                                       |
| Suffix 'L'              | 200-300 kHz            | 250 kHz typ.                                       |
| Approvals and standards | EN60950<br>UL/cUL60950 |                                                    |
| Material flammability   | UL94V-0                |                                                    |
| Dimensions              | (L x W x H)            | 22.86 x 8.38 x 10.16 mm<br>0.90 x 0.330 x 0.400 in |
| Weight                  | 2.6 g (0.09 oz)        |                                                    |
| MTBF                    | Telcordia SR-332       | 5,000,000 hours                                    |

### ENVIRONMENTAL SPECIFICATIONS

|                                     |                                   |                   |
|-------------------------------------|-----------------------------------|-------------------|
| Thermal performance<br>(See Note 2) | Operating ambient,<br>temperature | -40 °C to +85 °C  |
|                                     | Non-operating                     | -40 °C to +125 °C |

### PROTECTION

|             |            |           |
|-------------|------------|-----------|
| Overcurrent | Auto reset | 16 A typ. |
|-------------|------------|-----------|

### International Safety Standard Approvals



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

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

| OUTPUT POWER (MAX.) | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT (MIN.) | OUTPUT CURRENT (MAX.) (2) | EFFICIENCY (MAX.) | REGULATION |        | MODEL NUMBER (9,10) |
|---------------------|---------------|----------------|-----------------------|---------------------------|-------------------|------------|--------|---------------------|
|                     |               |                |                       |                           |                   | LINE       | LOAD   |                     |
| 15 W                | 10.8-13.2 Vdc | 0.8-1.8 Vdc    | 0 A                   | 8 A                       | 87%               | ±10 mV     | ±12 mV | PTV12010L           |
| 44 W                | 10.8-13.2 Vdc | 1.2-5.5 Vdc    | 0 A                   | 8 A                       | 92%               | ±10 mV     | ±12 mV | PTV12010W           |

## Part Number System with Options

**P T V 1 2 0 1 0 W A H**

**Product Family**  
Point of Load Alliance Compatible

**Mounting Version**  
V = Vertical

**Input Voltage**  
12 = 12 V

**Output Current**  
01 = 8 A

**Mechanical Package**  
Always 0

**Mounting Style (9)**  
D = Horizontal Through-Hole (Matte Sn)  
H = Horizontal Through-Hole (Sn/Pb)

**Pin Style**  
A = Through-Hole Std. Pin Length (0.150")

**Output Voltage Code**  
W = Wide  
L = Low Voltage

## Output Voltage Adjustment of the PTV12010 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTV12010. 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 PTV12010 converter leaves the factory the output has been adjusted to the default voltage of 1.2 V for the PTV12010W and 0.8 V for PTV12010L.

EFFICIENCY TABLE - PTV12010L ( $I_O = I_{O\text{MAX}}$ )

| OUTPUT VOLTAGE        | EFFICIENCY |
|-----------------------|------------|
| $V_O = 1.8 \text{ V}$ | 87%        |
| $V_O = 1.5 \text{ V}$ | 86%        |
| $V_O = 1.2 \text{ V}$ | 84%        |
| $V_O = 1.0 \text{ V}$ | 81%        |
| $V_O = 0.8 \text{ V}$ | 78%        |

EFFICIENCY TABLE - PTV12010W ( $I_O = I_{O\text{MAX}}$ )

| OUTPUT VOLTAGE        | EFFICIENCY |
|-----------------------|------------|
| $V_O = 5.0 \text{ V}$ | 92%        |
| $V_O = 3.3 \text{ V}$ | 90%        |
| $V_O = 2.5 \text{ V}$ | 88%        |
| $V_O = 1.8 \text{ V}$ | 85%        |
| $V_O = 1.5 \text{ V}$ | 83%        |
| $V_O = 1.2 \text{ V}$ | 80%        |

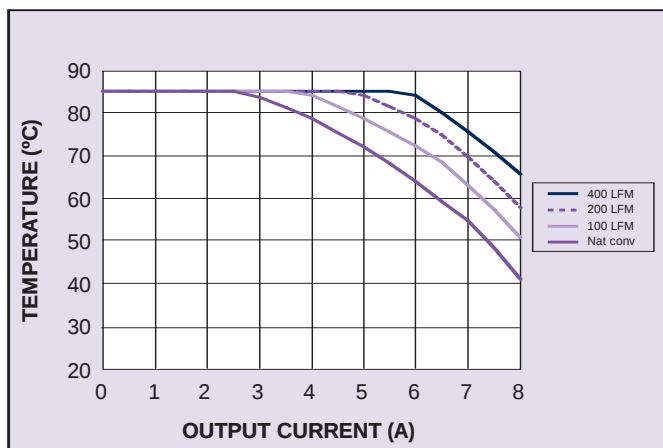
## Notes

- Remote ON/OFF. Positive logic  
ON: Pin 7 open; or  $V > 2 \text{ V}$   
OFF: Pin 7 GND; or  $V < 0.6 \text{ V}$
- See Figures 1, 2, 3 and 6 for safe operating curves.
- A 100  $\mu\text{F}$  electrolytic input capacitor is required for proper operation as well as a 10  $\mu\text{F}$  high-frequency ceramic capacitor. The electrolytic capacitor must be rated for the minimum rms of ripple current.
- An external output capacitor is not required for basic operation. Adding 100  $\mu\text{F}$  of distributed capacitance at the load will improve the transient response.
- 1 A/ $\mu\text{s}$  load step, 50 to 100%  $I_{O\text{MAX}}$ ,  $C_3 = 100 \mu\text{F}$ .
- If utilized  $V_{\text{out}}$  will track applied voltage by  $\pm 0.3 \text{ V}$  (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

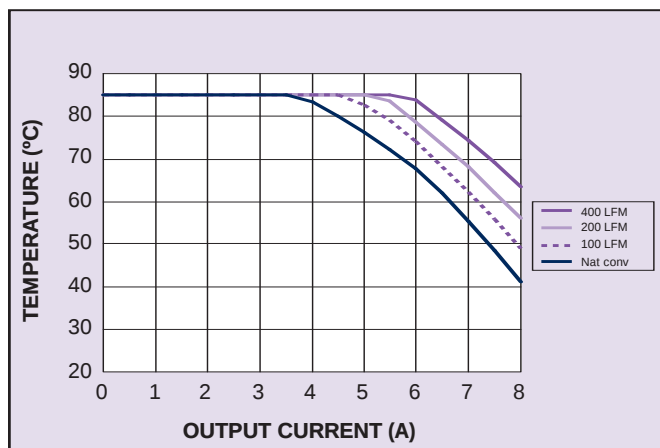
source. Therefore to ensure a pre-bias hold-off, one of the following two techniques must be followed when input power is first applied to the module. The Auto-Track™ function must either be disabled, or the module's output held off using the Inhibit pin. Refer to Application Note 196 for more details.

- The set-point voltage tolerance is affected by the tolerance and stability of  $R_{\text{set}}$ . The stated limit is unconditionally met if  $R_{\text{set}}$  has a tolerance of 1% with 100°C or better temperature stability.
- To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTV12010WAD.
- NOTICE: Some models do not support all options. Please contact your local Artesyn representative or use the on-line model number search tool at <http://www.artesyn.com/powergroup/products.htm> to find a suitable alternative.

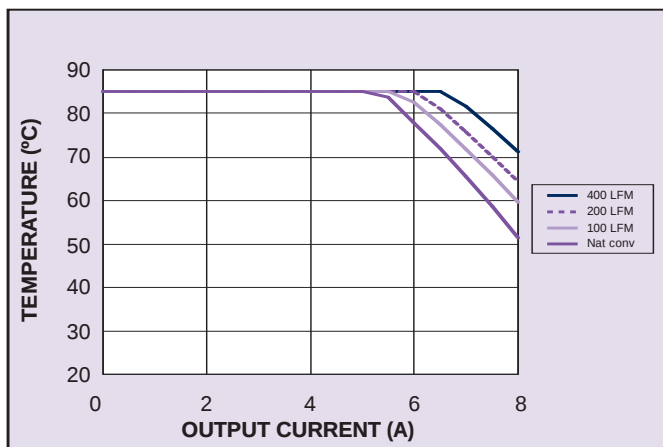
## PTV12010W Characteristic Data



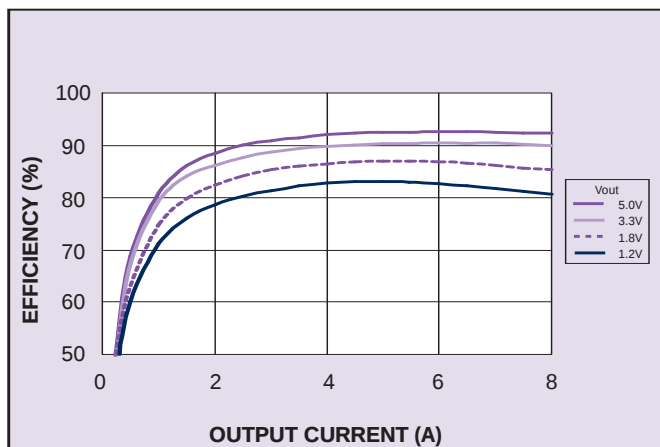
**Figure 1 - Safe Operating Area**  
Vin = 12 V, Output Voltage = 5 V (See Note A)



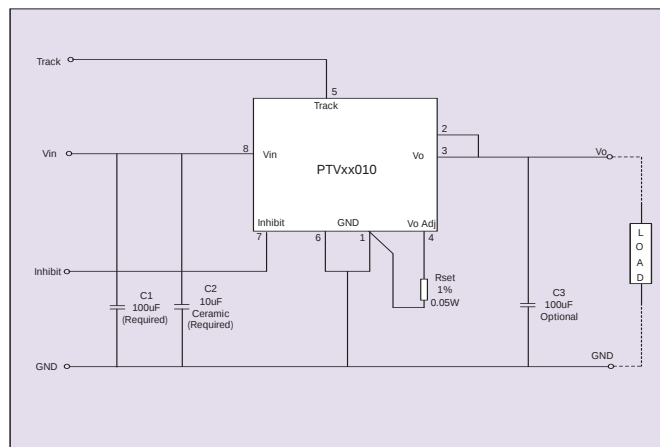
**Figure 2 - Safe Operating Area**  
Vin = 12 V, Output Voltage = 3.3 V (See Note A)



**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)

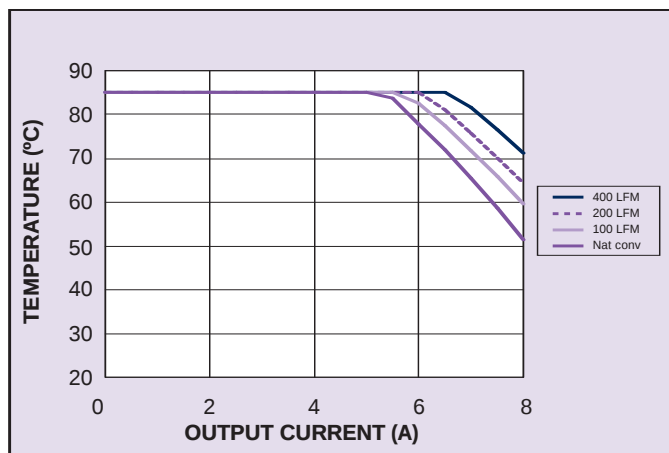


**Figure 5 - Standard Application**

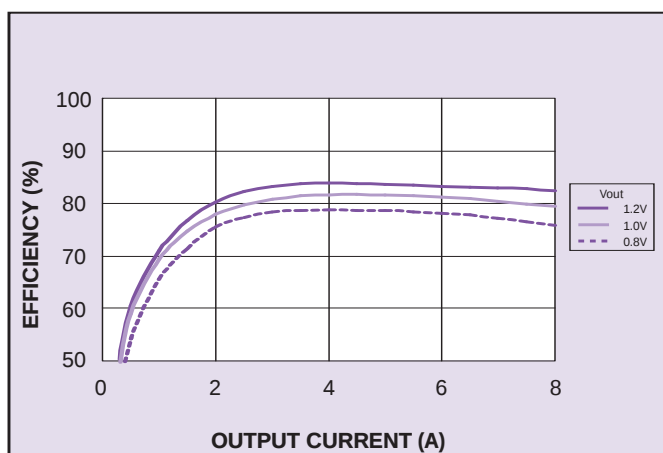
## Notes

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

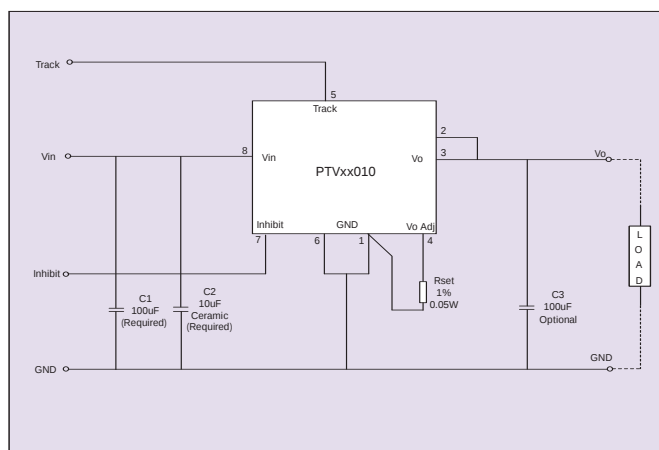
## PTV12010L Characteristic Data



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



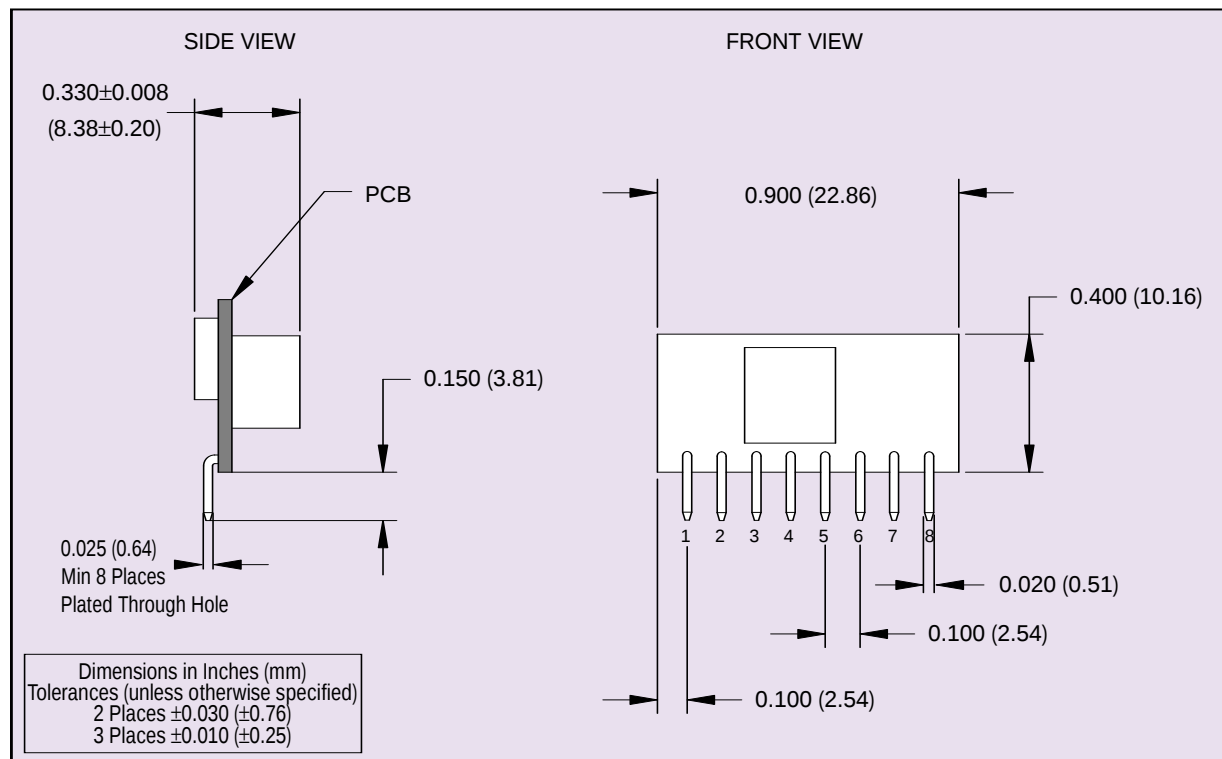
**Figure 7 - Efficiency vs Load Current**  
Vin = 12 V (See Note B)



**Figure 8 - Standard Application**

## Notes

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



| PIN CONNECTIONS |           |
|-----------------|-----------|
| PIN NO.         | FUNCTION  |
| 1               | Ground    |
| 2               | Vout      |
| 3               | Vout      |
| 4               | Vo Adjust |
| 5               | Track     |
| 6               | Ground    |
| 7               | Inhibit   |
| 8               | Vin       |

**Figure 9 - Mechanical Drawing and Pinout Table**