

NEW Product



- 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

The PTH05010 is a next generation series of non-isolated dc-dc converters offering some of the most advanced POL features available in the industry. The primary new 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. Other industry leading features include margin up/down controls, pre-bias start-up capability and efficiencies up to 95%. The PTH05010 has an input voltage of 4.5 Vdc to 5.5 Vdc and offers a wide 0.8 Vdc to 3.6 Vdc output voltage range with up to 15 A output current, which allows for maximum design flexibility and a pathway for future upgrades.

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated
 $C_{in} = 470 \mu F$, $C_{out} = 0 \mu F$

SPECIFICATIONS

OUTPUT SPECIFICATIONS

| | | |
|------------------------------------|--|-------------|
| Voltage adjustability | (See Note 4) | 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 (See Note 5) | 70 µs recovery time Overshoot/undershoot 100 mV | |
| Margin adjustment | | ±5.0% Vo |

INPUT SPECIFICATIONS

| | | |
|----------------------|-----------------------|----------------|
| Input voltage range | (See Note 3) | 4.5-5.5 Vdc |
| Input current | No load | 10 mA typ. |
| Remote ON/OFF | (See Note 1) | 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) | ±0.3 Vin |

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) | 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 1.370 x 0.620 x 0.354 in |
| Weight | | 5 g (0.18 oz) |
| MTBF | Telcordia SR-332 | 7,092,000 hours |

ENVIRONMENTAL SPECIFICATIONS

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

International Safety Standard Approvals



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

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

| OUTPUT POWER (MAX.) | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT (MIN.) | OUTPUT CURRENT (MAX.) | EFFICIENCY (MAX.) | REGULATION | | MODEL NUMBER ^(9,10) |
|---------------------|---------------|----------------|-----------------------|-----------------------|-------------------|------------|--------|--------------------------------|
| | | | | | | 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

Product Family
Point of Load Alliance Compatible

Input Voltage
05 = 5 V

Output Current
01 = 15 A

Mechanical Package
Always 0

Packaging Options

No Suffix = Trays
T = Tape and Reel ⁽⁸⁾

Mounting Option ⁽⁹⁾

D = Horizontal Through-Hole (Matte Sn)
H = Horizontal Through-Hole (Sn/Pb)
S = Surface-Mount (63/37 Sn/Pb pin solder material)
Z = Surface-Mount (96.5/3.0/0.5 Sn/Ag/Cu pin solder material)

Pin Option

A = Through-Hole Std. Pin Length (0.140")
A = Surface-Mount Tin/Lead Solder Ball

Output Voltage Code

W = Wide

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.

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 μF 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 33 μF of distributed capacitance at the load will improve the transient response.
- 1 A/ μs load step, 50 to 100% $I_{o,max}$; $C_{out} = 330 \mu F$.
- 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 Artesyn representative or use the on-line model number search tool at <http://www.artesyn.com/powergroup/products.htm> to find a suitable alternative.

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% |

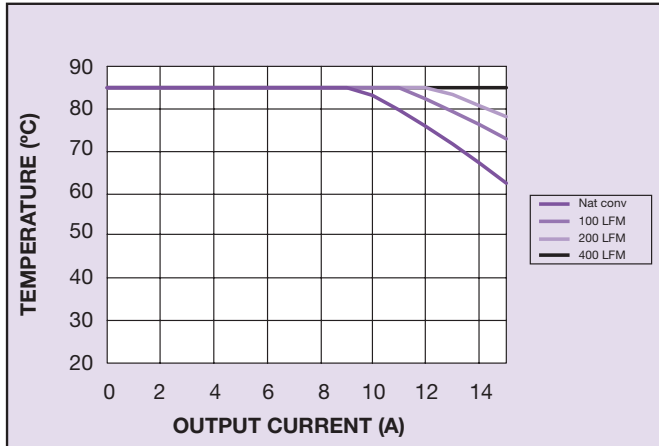


Figure 1 - Safe Operating Area
Vin = 5 V, Output Voltage = 3.3 V (See Note A)

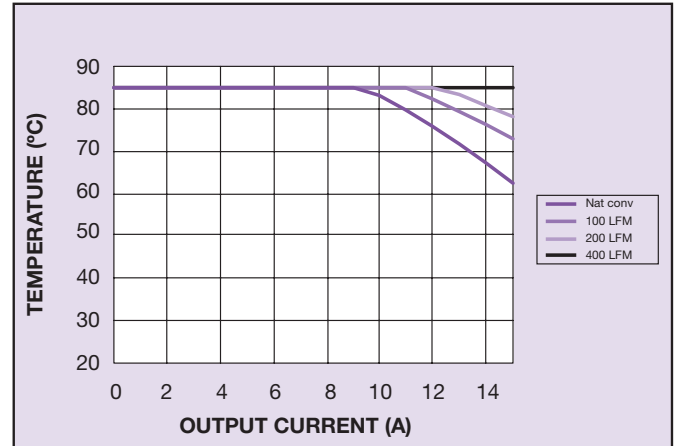


Figure 2 - Safe Operating Area
Vin = 5 V, Output Voltage = 1.0 V (See Note A)

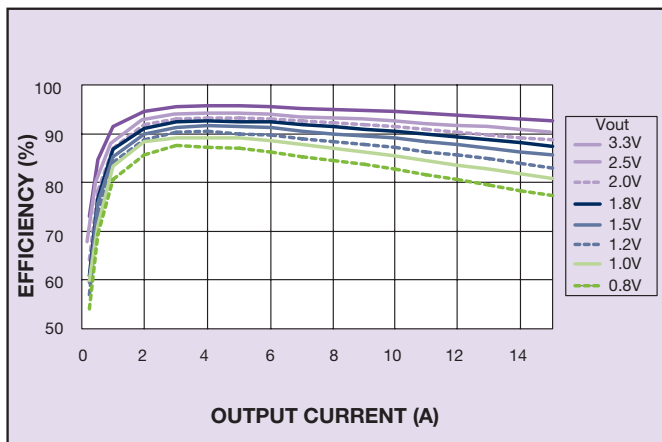


Figure 3 - Efficiency vs Load Current
Vin = 5 V (See Note B)

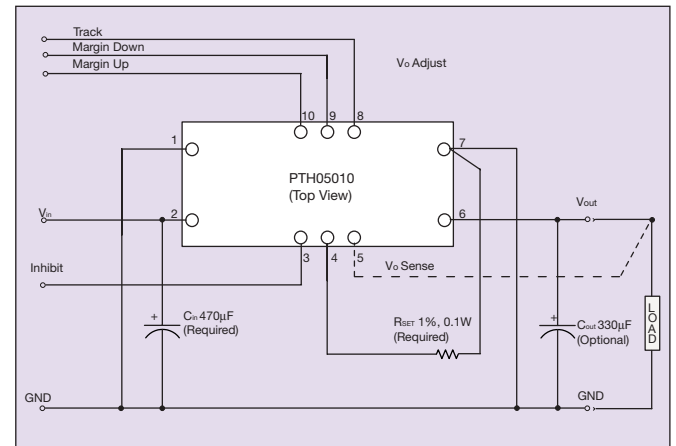


Figure 4 - Standard Application

Notes

- A** SOA curves represent the conditions at which internal components are within the 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.

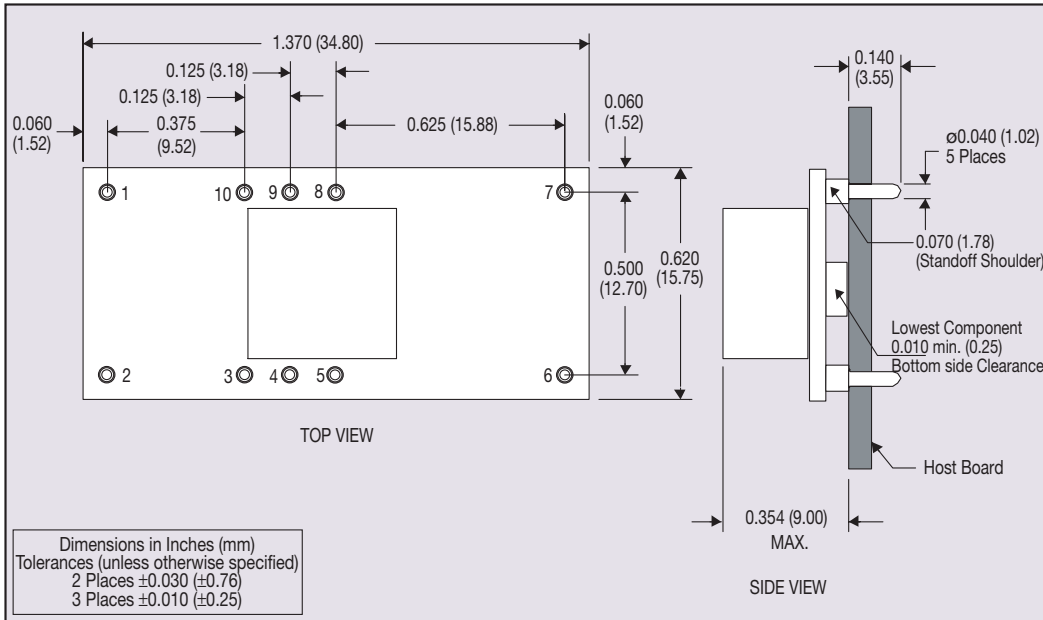


Figure 5 - Plated Through-Hole Mechanical Drawing

| PIN CONNECTIONS | |
|-----------------|--------------|
| PIN NO. | FUNCTION |
| 1 | Ground |
| 2 | Vin |
| 3 | Inhibit* |
| 4 | Vo adjust |
| 5 | Vo sense |
| 6 | Vout |
| 7 | Ground |
| 8 | Track |
| 9 | Margin down* |
| 10 | Margin up* |

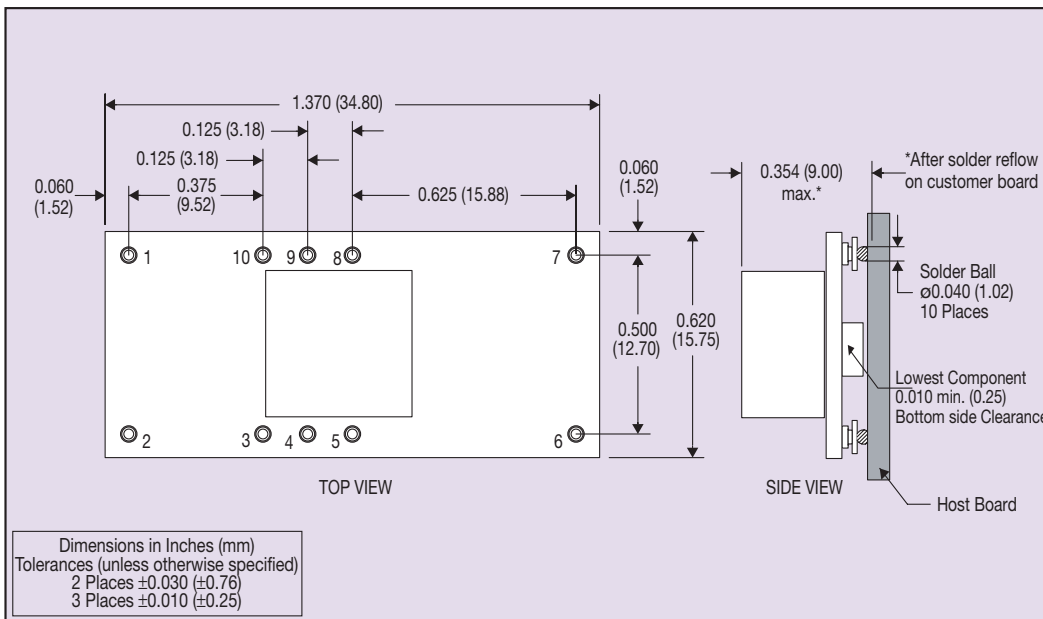


Figure 6 - Surface-Mount Mechanical Drawing

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