

NEW Product

DC-DC CONVERTERS POLA Non-isolated

- 6 A output current
- 3.3 V input voltage
- Wide-output voltage adjust (0.8 Vdc to 2.5 Vdc)
- Auto-track™ sequencing*
- Pre-bias start-up capability
- Efficiencies up to 94%
- Output ON/OFF inhibit
- Output voltage sense
- Point-of-Load-Alliance (POLA) compatible
- Available RoHS compliant

The PTH03050 is a next generation series of non-isolated DC-DC converters offering some of the most advanced POL features available in the industry. A primary new feature provides for sequencing between multiple modules, which is becoming a necessity for powering advanced silicon including GPUs and ASIC's requiring controlled power-up and power-down. Other key features include pre-bias start-up capability and efficiencies up to 94%. The PTH03050 has an input voltage of 2.95 Vdc to 3.65 Vdc and offers a wide output voltage range with a 6 A output current, which allows for easy integration and a pathway for future upgrades.

All specifications are typical unless otherwise noted. $C_{in} = 100 \mu F$, $C_{out} = 0 \mu F$

OUTPUT SPECIFICATION

Voltage adjustability	0.8-2.5 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 20 mV pk-pk
Temperature co-efficient	-40 °C to +85 °C ±0.5% Vo
Transient response	70 µs recovery time
(See Note 5)	Overshoot/undershoot 100 mV

INPUT SPECIFICATIONS

Input voltage range	(See Note 3)	2.95-3.65 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 Vdc typ.
Track input voltage	Pin 2 (See Note 6, 7)	±0.3 Vin

International Safety Standard Approvals

UL 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

Efficiency	94% max.
Isolation	Non-isolated
Switching frequency	typ. ±50 kHz
Applicable standards	EN60950 UL/cUL60950
Material	UL94V-0
Dimensions	7 x 8.50 mm 95 x 0.335 in
Weight	9 g (0.10 oz)
MTBF	92,000 hours

ENVIRONMENTAL

Thermal performance	-40 °C to +85 °C
(See Note 2)	-40 °C to +125 °C
MSL ('Z' suffix only)	Level 3

PROTECTION

Short-circuit	Auto reset	12 A typ.
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OUTPUT POWER (MAX.)	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (MIN.)	OUTPUT CURRENT (MAX.)	EFFICIENCY (MAX.)	REGULATION		MODEL NUMBER ^(9,10)
						LINE	LOAD	
15 W	2.95-3.65 Vdc	0.8-2.5 Vdc	0 A	6 A	94%	±10 mV	±12 mV	PTH03050

Part Number System with Options

PTH03050WAST

Product Family
Point of Load Alliance Compatible

Input Voltage
03 = 3.3 V

Output Current
05 = 6 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 PTH03050 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH03050. 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 2.5 Vdc. When the PTH03050 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 Figure 1 for safe operating curve.
- A 100 μF electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 300 mA rms of ripple current.
- An external output capacitor is not required for basic operation. Adding 100 μF of distributed capacitance at the load will improve the transient response.
- 1 A/ μs load step, 50 to 100% $I_{o,max}$, $C_{out} = 100 \mu F$.
- 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 153 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. PTH03050WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH03050WAD.
- 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 ($I_o = 4 A$)

OUTPUT VOLTAGE	EFFICIENCY
$V_o = 1.0 V$	87%
$V_o = 1.2 V$	88%
$V_o = 1.5 V$	90%
$V_o = 1.8 V$	91%
$V_o = 2.0 V$	92%
$V_o = 2.5 V$	94%

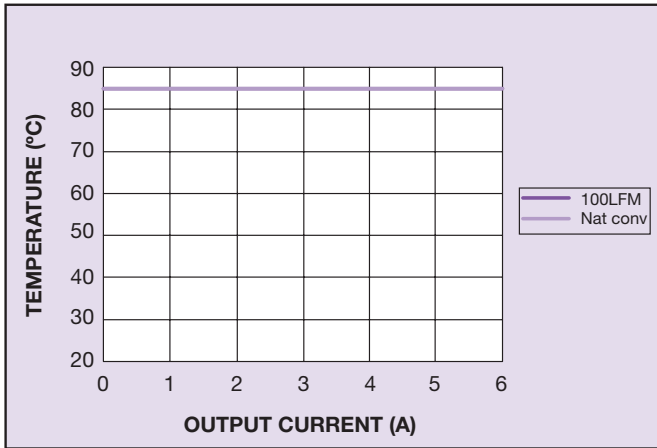


Figure 1 - Safe Operating Area
Vin = 3.3 V, Output Voltage = 2.5 V (See Note A)

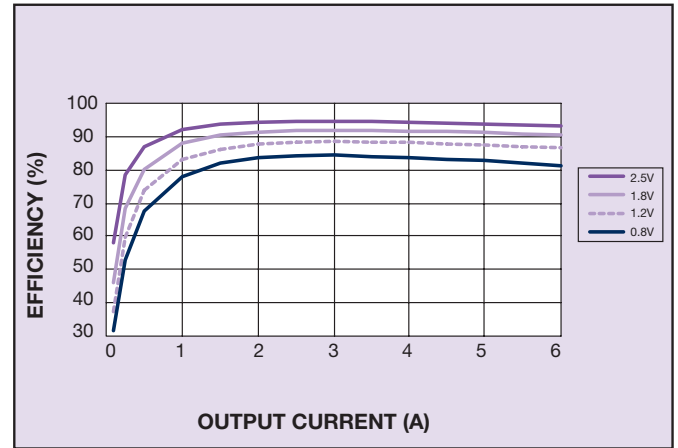


Figure 2 - Efficiency vs Load Current
Vin = 3.3 V (See Note B)

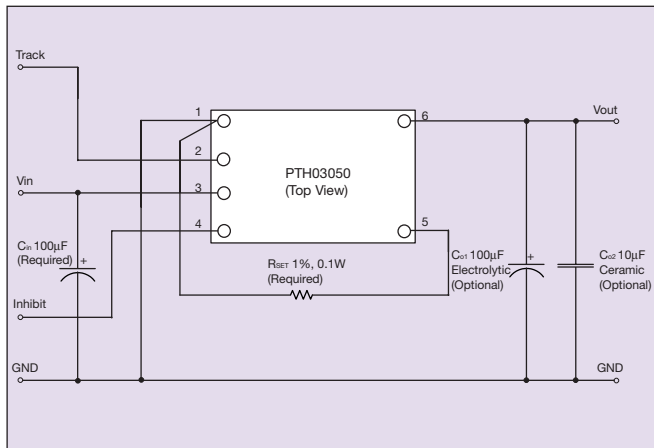


Figure 3 - Standard Application

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.

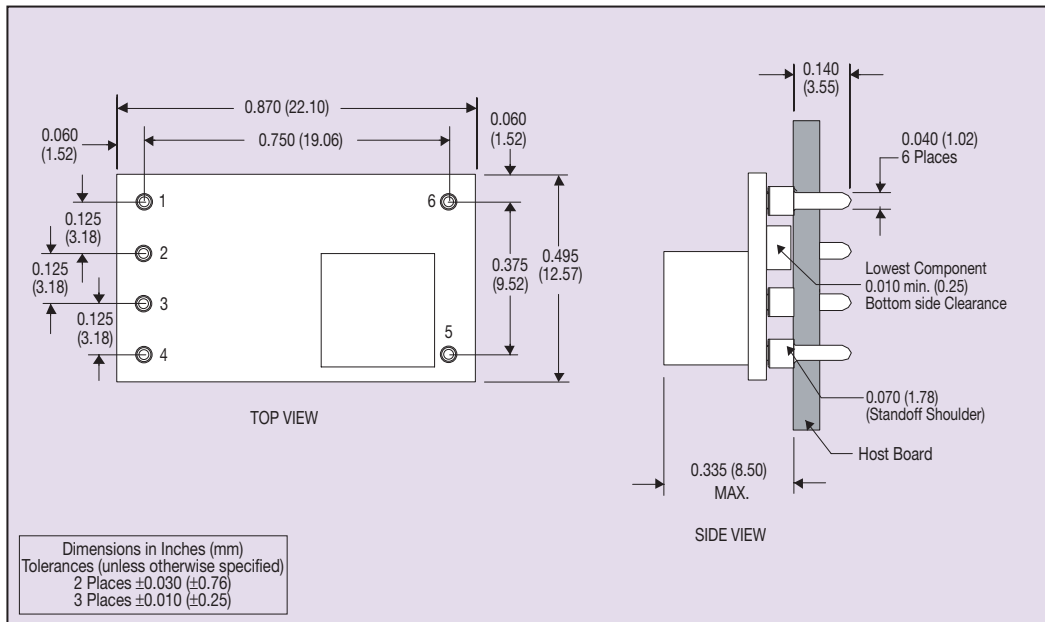


Figure 4 - Plated Through-Hole Mechanical Drawing

PIN CONNECTIONS	
PIN NO.	FUNCTION
1	Ground
2	Track
3	Vin
4	Inhibit*
5	Vo adjust
6	Vout

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

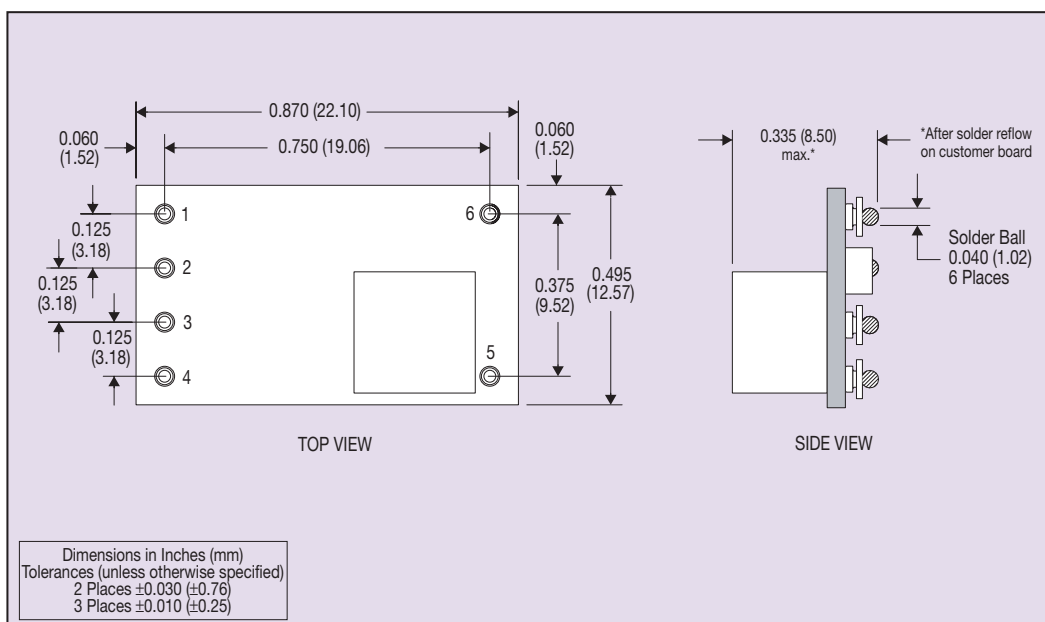


Figure 5 - Surface-Mount Mechanical Drawing

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