PTH03060

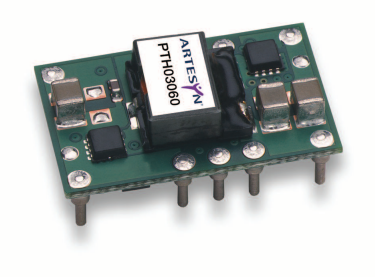
3.3 Vin single output

POLA Point-of-Load Alliance

ARTESYN TECHNOLOGIES

NEW Product

- **10 A output current**
- **3.3 V input voltage**
- **Wide-output voltage adjust (0.8 Vdc to 2.5 Vdc)**
- **Auto-track™ sequencing***
- **Margin up/down controls**
- **Pre-bias start-up capability**
- **Efficiencies up to 93%**
- **Output ON/OFF inhibit**
- **Output voltage sense**
- **Point-of-Load-Alliance (POLA) compatible**
- **Available RoHS compliant**



The PTH03060 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 93%. The PTH03060 has an input voltage of 2.95 Vdc to 3.65 Vdc and offers a wide 0.8 Vdc to 2.5 Vdc output voltage range with up to 10 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_{in} = 330 µF, C_{out} = 0 µF

SPECIFICATIONS

OUTPUT SPECIFICATIONS

Voltage adjustability	(See Note 4)	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 ºC to +85 ºC	±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)	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		2.8-2.95 Vdc typ.
Track input voltage	Pin 8 (See Note 6, 7)	±0.3 Vin

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

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)	93% max.
Insulation voltage		Non-isolated
Switching frequency		300 kHz typ. ±25 kHz
Approvals and standards		EN60950 UL/cUL60950
Material flammability		UL94V-0
Dimensions	(L x W x H)	25.27 x 15.75 x 9.00 mm 0.995 x 0.620 x 0.354 in
Weight		3.7 g (0.13 oz)
MTBF	Telcordia SR-332	7,092,000 hours

ENVIRONMENTAL SPECIFICATIONS

Thermal performance (See Note 2)	Operating ambient, temperature	-40 ºC to +85 ºC
	Non-operating	-40 ºC to +125 ºC
MSL ('Z' suffix only)	JEDEC J-STD-020C	Level 3

PROTECTION

Short-circuit	Auto reset	20 A typ.

*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	
25 W	2.95-3.65 Vdc	0.8-2.5 Vdc	0 A	10 A	93%	±10 mV	±12 mV	PTH03060

Part Number System with Options

P T H 0 3 0 6 0 W A S T

Product Family
Point of Load Alliance Compatible

Input Voltage
03 = 3.3 V

Output Current
06 = 10 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 (95.5/3.8/0.7 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 PTH03060 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH03060. 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 PTH03060 converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

Notes

1 Remote ON/OFF. Positive Logic
ON: Pin 3 open; or V > Vin - 0.5 V
OFF: Pin 3 GND; or V < 0.8 V (min - 0.2 V).
2 See Figure 1 for safe operating curve.
3 A 330 µF electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 700 mA rms of ripple current.
4 An external output capacitor is not required for basic operation. Adding 330 µF of distributed capacitance at the load will improve the transient response.
5 1 A/µs load step, 50 to 100% I_{omax}, C_{out} = 330 µF.
6 If utilized Vout will track applied voltage by ±0.3 V (up to Vo set point).
7 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 154 for more details.
8 Tape and reel packaging only available on the surface-mount versions.
9 To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH03060WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH03060WAD.
10 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 = 7 A)	
OUTPUT VOLTAGE	EFFICIENCY
Vo = 1.0 V	85%
Vo = 1.2 V	87%
Vo = 1.5 V	89%
Vo = 1.8 V	91%
Vo = 2.0 V	92%
Vo = 2.5 V	93%

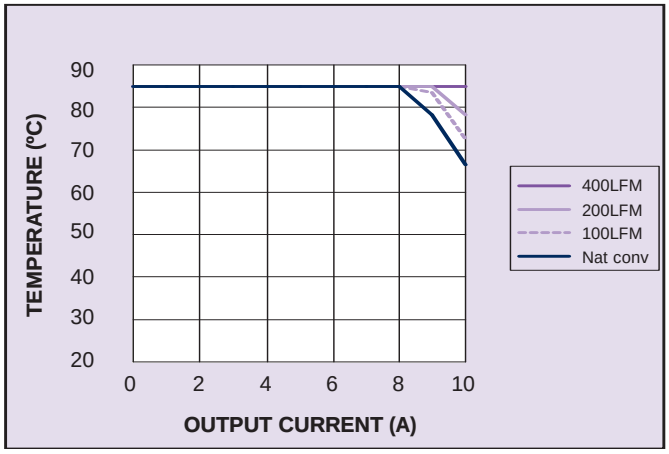


Figure 1 - Safe Operating Area
Vin = 3.3 V, Output Voltage = 2.5 V (See Note A)

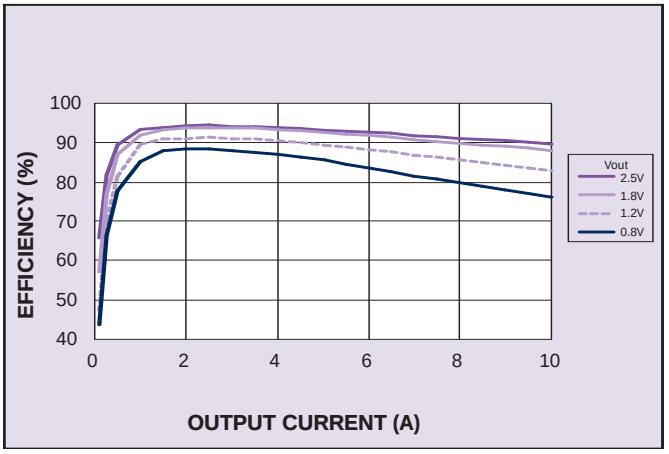


Figure 2 - Efficiency vs Load Current
Vin = 3.3 V (See Note B)

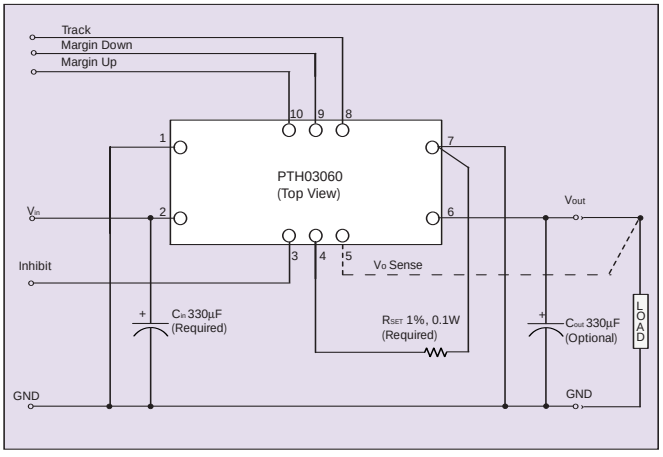


Figure 3 - Standard Application

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.

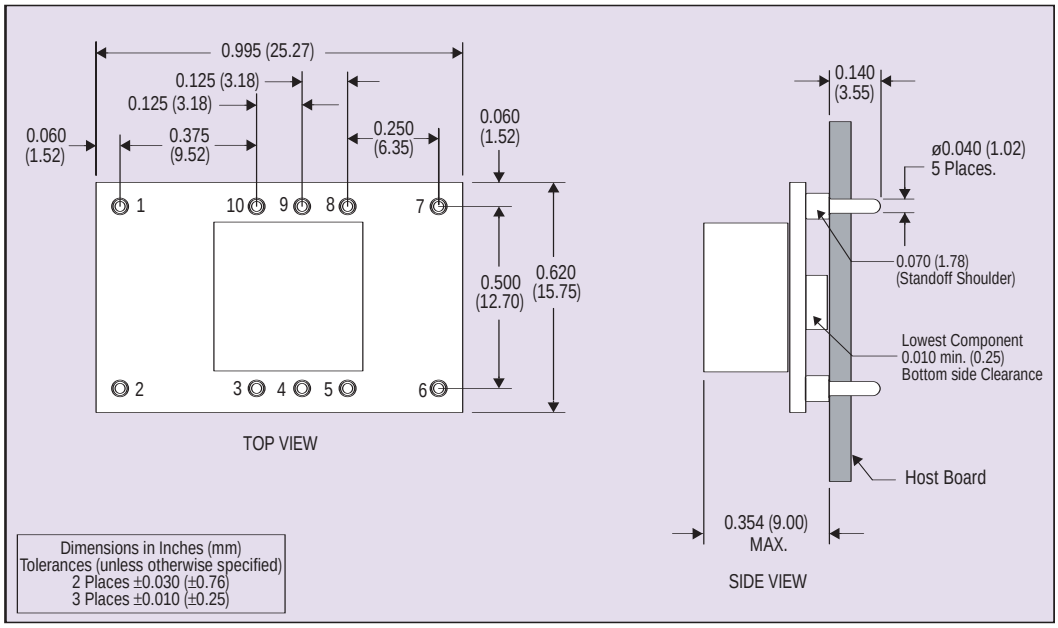


Figure 1 - Plated Through-Hole Mechanical Drawing

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*

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

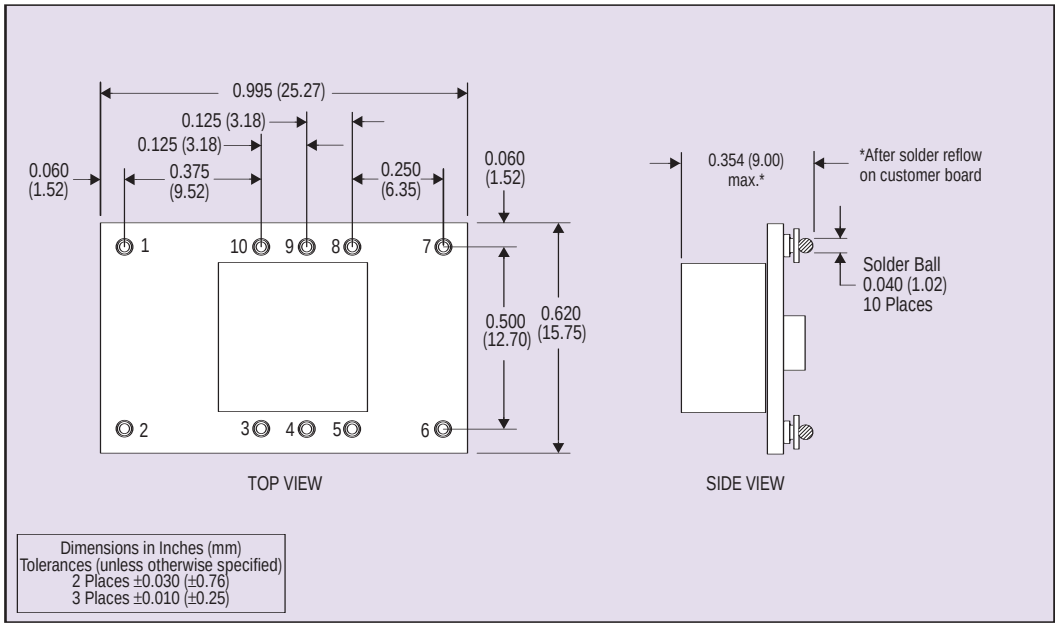


Figure 2 - Surface-Mount Mechanical Drawing