PTH05020

ELECTRICAL SPECIFICATIONS

Input		
Input voltage range	(See Note 3)	4.5 - 5.5 Vdc
Input current	No load	10 mA typical
Remote ON/OFF	(See Note 1)	Positive logic
Undervoltage lockout		3.7 - 4.3 V typical
Track input voltage	Pin 8 (See Note 6 & 7)	±0.3 Vin
Output		
Voltage adjustability	(See Note 4)	0.8 - 3.6 Vdc
Setpoint accuracy		±2.0% Vo
Line regulation		±5 mV typical
Load regulation		±5 mV typical
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	(See Note 5)	70 μs recovery time Overshoot/undershoot 120 mV
Margin adjustment		±5.0% Vo

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated. Cin = 1000 μF, Cout = 0 μF.

GENERAL SPECIFICATIONS

Efficiency	(See Efficiency Table)	96% max.
Insulation voltage		Non-isolated
Switching frequency		250 - 340 kHz
Approvals and standards		EN60950, UL/cUL60950
Material flammability		UL94V-0
Dimensions	LxWxH	37.97 x 22.10 x 9.00 mm 1.495 x 0.870 x 0.354 in
Weight		7 g (.25 oz)
MTBF	Telcordia SR-332	5,236,000 hours

EMC CHARACTERISTICS

Electrostatic discharge	EN61000-4-2, IEC801-2		
Conducted immunity	EN61000-4-6		
Radiated immunity	EN61000-4-3		

ENVIRONMENTAL SPECIFICATIONS

Thermal performance (See Note 2)	Operating ambient temperature Non-operating temperature	-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	41 A typical
Thermal		Auto recovery

ORDERING INFORMATION

Model	Output Power	Input	Output	Output Current	Output Current	Efficiency	Regu	lation
Number ⁽⁹⁾	(Max.)	Voltage	Voltage	(Min.)	(Max.)	(Typical)	Line	Load
PTH05020	79.2 W	4.5 - 5.5 Vdc	0.8 - 3.6 V	0 A	22 A	96%	±5 mV	±5 mV

PART NUMBER SYSTEM WITH OPTIONS

Product Family	Input Voltage	Output Current	Mechanical Package	Output Voltage Code	Pin Option	Mounting Options	Pin Option
PTH	05	02	0	W	Α	S	Т
Point-of-Load Alliance compatible	05 = 5 V	02 = 22 A	Always 0	W = Wide		D = Horizontal through- hole (Matte Sn) Z = Surface-mount (96.5/3.0/0.5 Sn/ Ag/Cu pin solder material	No Suffix = Trays T = Tape and Reel ⁽⁸⁾



OUTPUT VOLTAGE ADJUSTMENT

The ultra-wide output voltage trim range offers major advantages to users who select the PTH05020. 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 PTH05020 converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

Efficiency Table (Io = 10 A)		
Output Voltage	Efficiency	
Vo = 1.0 V	88%	
Vo = 1.2 V	90%	
Vo = 1.5 V	91%	
Vo = 1.8 V	92%	
Vo = 2.0 V	93%	
Vo = 2.5 V	94%	
Vo = 3.3 V	96%	

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 Figures 1 for safe operating curves.
- $3. A 1000 \, \mu F$ 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/ μ s load step, 50 to 100% lomax, Cout = 330 μ F.
- 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 156 for more details.
- $8.\,\mathrm{Tape}$ and reel packaging only available on the surface-mount versions.
- 9. 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 to find a suitable alternative.



OUTPUT VOLTAGE ADJUSTMENT (CONTINUED)

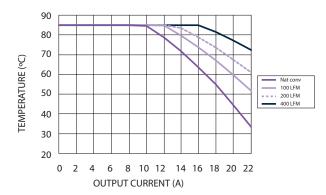


Figure 1 - Safe Operating Area
Vin = 5 V, Output Voltage = 3.3 V (See Note A)

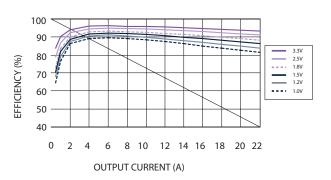


Figure 2 - Efficiency vs Load Current Vin = 5 V (See Note B)

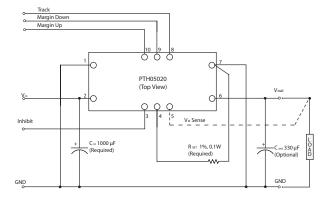


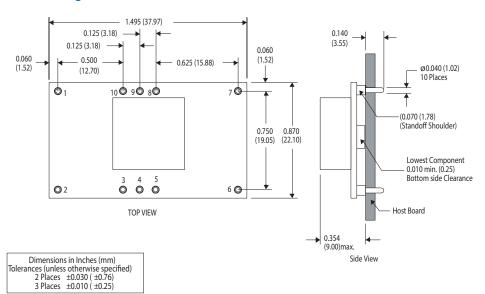
Figure 3 - Standard Application

Notes:

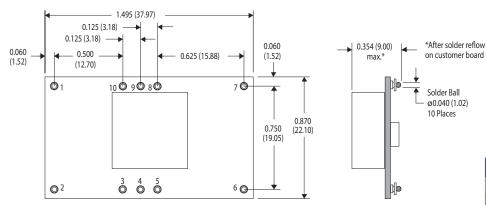
- A. SOA curves represent the conditions at which internal components are within the Artesyn derating guidelines.
- $B.\ Characteristic\ data\ has\ been\ developed\ from\ actual\ products\ tested\ at\ 25\ ^{\circ}C.\ This\ data\ is\ considered\ typical\ data\ for\ the\ converter.$

MECHANICAL DRAWINGS

Plated through-hole



Surface-mount



SIDE VIEW

Dimensions in Inches (mm)
Tolerances (unless otherwise specified)
2 Places ±0.030 (±0.76)
3 Places ±0.010 (±0.25)

TOP VIEW

ments		
Function		
Ground		
Vin		
Inhibit*		
Vo adjust		
Vo sense		
Vout		
Ground		
Track		
Margin down*		
Margin up*		
*Denotes negative logic: Open = Normal operation Ground = Function active		



ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

Specifications are subject to change without notice. Not responsible for errors or omissions. ©2020 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy®, AE® and Artesyn™ are U.S. trademarks of Advanced Energy Industries, Inc.



For international contact information, visit advancedenergy.com.

powersales@aei.com (Sales Support) productsupport.ep@aei.com (Technical Support) +1 888 412 7832