

## PTH05020

### 5 Vin Single Output

#### Data Sheet

**Total Power:** 79.2 Watts  
**# of Outputs:** Single

#### SPECIAL FEATURES

- 22 A output current
- 5 V input voltage
- Wide-output voltage adjust (0.8 V - 3.6 V)
- Auto-track™ sequencing\*
- Margin up/down controls
- Pre-bias start-up capability
- Efficiencies up to 96%
- Output ON/OFF inhibit
- Output voltage sense
- Point-of-Load-Alliance (POLA) compatible
- RoHS compliant
- Two year warranty

#### SAFETY

- UL/cUL CAN/CSA-C22.2 No. 60950-1-03/UL 60950-1, File No. E174104
- TÜV Product Service (EN60950) Certificate No. B04 06 38572 044
- CB report and certificate to IEC60950, Certificate No. US/8292/UL



#### 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.

\*Auto-track is a trademark of Texas Instruments.

### 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	L x W x H	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	-40 °C to +85 °C
	Non-operating temperature	-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 Number <sup>(9)</sup>	Output Power (Max.)	Input Voltage	Output Voltage	Output Current (Min.)	Output Current (Max.)	Efficiency (Typical)	Regulation	
							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
<b>PTH</b> <small>Point-of-Load Alliance compatible</small>	<b>05</b> <small>05 = 5 V</small>	<b>02</b> <small>02 = 22 A</small>	<b>0</b> <small>Always 0</small>	<b>W</b> <small>W = Wide</small>	<b>A</b>	<b>S</b> <small>D = Horizontal through-hole (Matte Sn)  Z = Surface-mount (96.5/3.0/0.5 Sn/Ag/Cu pin solder material)</small>	<b>T</b> <small>No Suffix = Trays T = Tape and Reel<sup>(8)</sup></small>

### 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 (I<sub>o</sub> = 10 A)

Output Voltage	Efficiency
V <sub>o</sub> = 1.0 V	88%
V <sub>o</sub> = 1.2 V	90%
V <sub>o</sub> = 1.5 V	91%
V <sub>o</sub> = 1.8 V	92%
V <sub>o</sub> = 2.0 V	93%
V <sub>o</sub> = 2.5 V	94%
V <sub>o</sub> = 3.3 V	96%

#### Notes:

- Remote ON/OFF, Positive Logic  
ON: Pin 3 open; or V > V<sub>in</sub> - 0.5 V  
OFF: Pin 3 GND; or V < 0.8 V (min - 0.2 V).
- See Figures 1 for safe operating curves.
- A 1000 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 330 µF of distributed capacitance at the load will improve the transient response.
- 1 A/µs load step, 50 to 100% I<sub>omax</sub>, C<sub>out</sub> = 330 µF.
- If utilized V<sub>out</sub> will track applied voltage by ±0.3 V (up to V<sub>o</sub> 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 156 for more details.
- Tape and reel packaging only available on the surface-mount versions.
- 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/power> to find a suitable alternative.

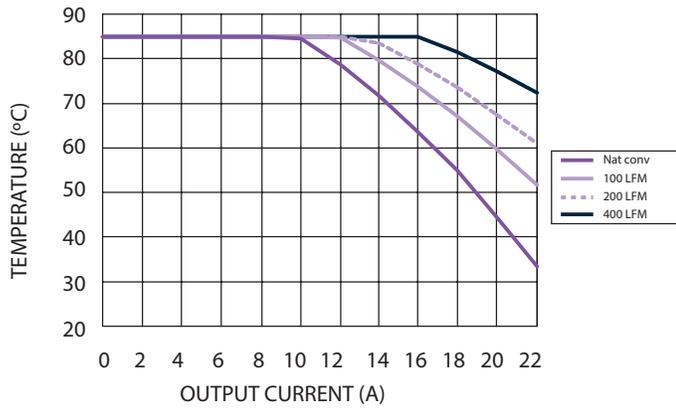


Figure 1 - Safe Operating Area  
 $V_{in} = 5\text{ V}$ , Output Voltage = 3.3 V (See Note A)

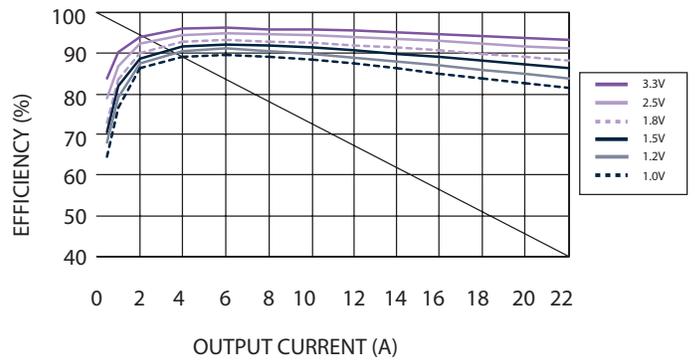


Figure 2 - Efficiency vs Load Current  
 $V_{in} = 5\text{ V}$  (See Note B)

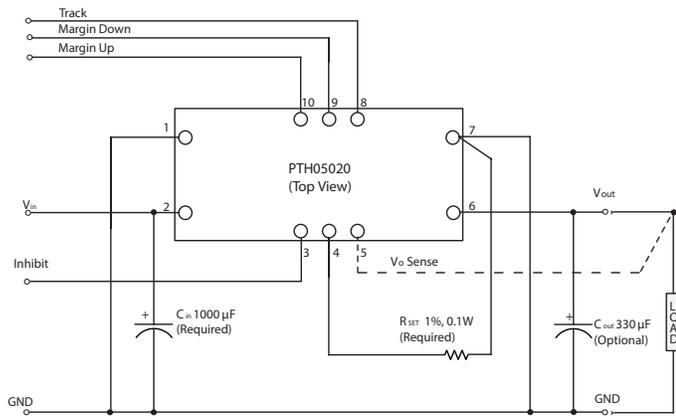


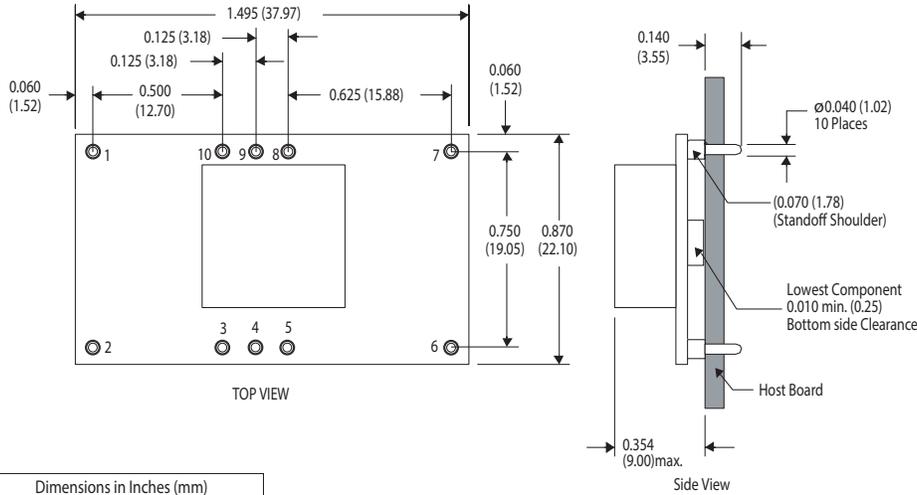
Figure 3 - Standard Application

**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.

## Mechanical Drawings

### Plated through-hole

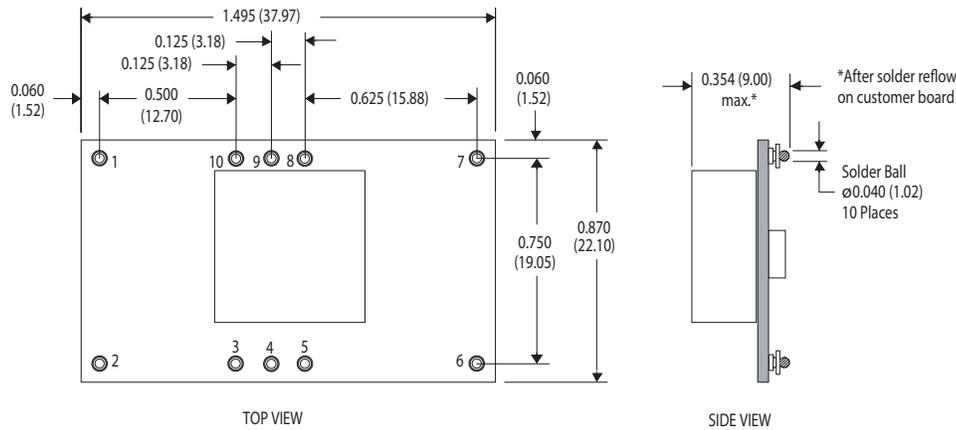


Pin Assignments	
Pin	Function
1	Ground
2	Vin
3	Inhibit*
4	Vo adjust
5	Vo sense
6	Vout
7	Ground
8	Track
9	Margin down*
10	Margin up*

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

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

### Surface-mount



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

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