

## ELECTRICAL SPECIFICATIONS

Input		
Input voltage range	(See Note 3)	2.95 - 3.65 V
Input current	No load	10 mA typical
Remote ON/OFF	(See Note 1)	Positive logic
Start-up time		1 V/ms
Undervoltage lockout		2.7 - 2.8 V typical
Track input voltage	Pin 8 (See Note 6, 7)	$\pm 0.3 V_{in}$
Output		
Voltage adjustability	(See Note 4)	0.8 - 2.5 Vdc
Setpoint accuracy		$\pm 2.0\% V_o$
Line regulation		$\pm 5$ mV typical
Load regulation		$\pm 5$ mV typical
Total regulation		$\pm 3.0\% V_o$
Minimum load		0 A
Ripple and noise	20 MHz bandwidth	20 mV pk-pk
Temperature co-efficient	-40 °C to +85 °C	$\pm 0.5\% V_o$
Transient response	(See Note 5)	50 $\mu$ s recovery time Overshoot/undershoot 100 mV
Margin adjustment		$\pm 5.0\% V_o$

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated.  $C_{in} = 1000 \mu F$ ,  $C_{out} = 0 \mu F$ .

## GENERAL SPECIFICATIONS

Efficiency	(See Efficiency Table)	95% max.
Insulation voltage		Non-isolated
Switching frequency	Fixed	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		5 g (0.18 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>(®)</sup>	Output Power (Max.)	Input Voltage	Output Voltage	Output Current (Min.)	Output Current (Max.)	Efficiency (Typical)	Regulation	
							Line	Load
PTH03020	55 W	2.95 - 3.65 V	0.8 - 2.5 V	0 A	22 A	95%	±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>	<b>03</b>	<b>02</b>	<b>0</b>	<b>W</b>	<b>A</b>	<b>S</b>	<b>T</b>
Point-of-Load Alliance compatible	03 = 3.3 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 <sup>(®)</sup>

## OUTPUT VOLTAGE ADJUSTMENT

The ultra-wide output voltage trim range offers major advantages to users who select the PTH03020. 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 PTH03020 converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

**Efficiency Table ( $I_o = 10A$ )**

Output Voltage	Efficiency
$V_o = 1.0\text{ V}$	88%
$V_o = 1.2\text{ V}$	90%
$V_o = 1.5\text{ V}$	91%
$V_o = 1.8\text{ V}$	93%
$V_o = 2.0\text{ V}$	95%
$V_o = 2.5\text{ V}$	95%

**Notes:**

1. Remote ON/OFF, Positive Logic

ON: Pin 3 open; or  $V > V_{in} - 0.5\text{ V}$

OFF: Pin 3 GND; or  $V < 0.8\text{ V}$  (min - 0.2 V).

2. See Figures 1 for safe operating curves.

3. A 1000  $\mu\text{F}$  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  $\mu\text{F}$  of distributed capacitance at the load will improve the transient response.

5. 1 A/ $\mu\text{s}$  load step, 50 to 100%  $I_{omax}$ ,  $C_{out} = 330\text{ }\mu\text{F}$ .

6. If utilized  $V_{out}$  will track applied voltage by  $\pm 0.3\text{ V}$  (up to  $V_o$  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 151 for more details.

8. 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)

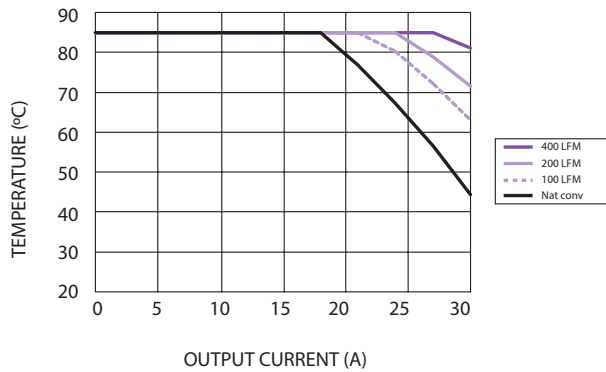


Figure 1 - Safe Operating Area  
 $V_{in} = 3.3\text{ V}$ , Output Voltage = 2.5 V (See Note A)

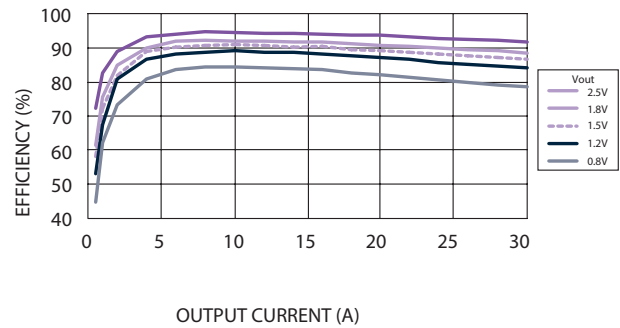


Figure 2 - Efficiency vs Load Current  
 $V_{in} = 3.3\text{ V}$  (See Note B)

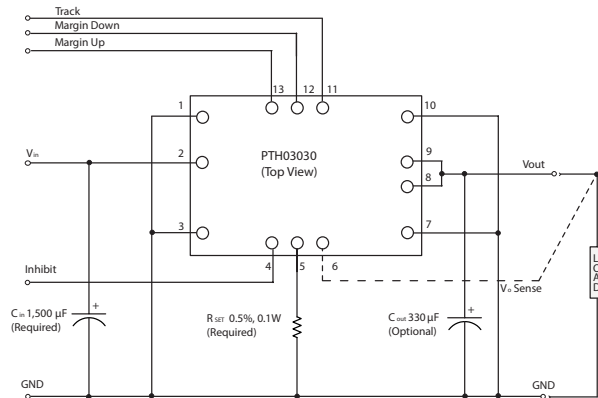


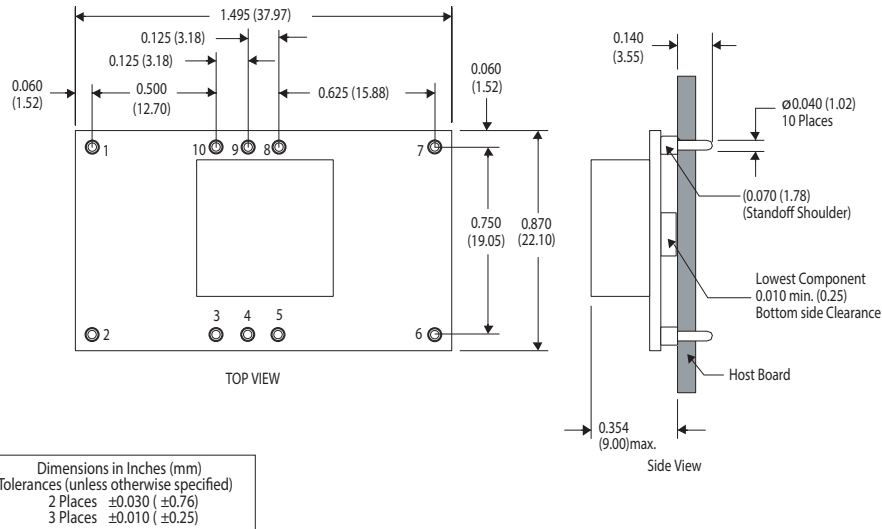
Figure 3 - Standard Application

### Notes:

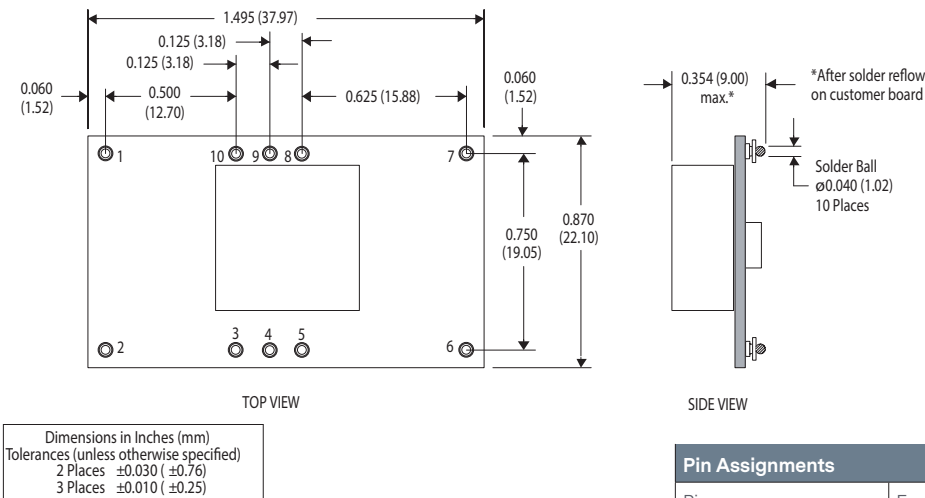
- A. SOA curves represent the conditions at which internal components are within the Artesyn derating guidelines.
- B. Characteristic data has been developed from actual products tested at 25 °C. This data is considered typical data for the converter.

# MECHANICAL DRAWINGS

## Plated through-hole



## Surface-mount



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	



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## ABOUT ADVANCED ENERGY

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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

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