

POWER

PTH03020

3.3 Vin Single Output

Data Sheet

Total Power: 55 Watts
Input Voltage: 2.95 - 3.65 Vdc
of Outputs: Single

SPECIAL FEATURES

- 22 A output current
- 3.3 V input voltage
- Wide-output voltage adjust (0.8 V - 2.5 V)
- Auto-track™ sequencing*
- Margin up/down controls
- Pre-bias start-up capability
- Efficiencies up to 95%
- 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)	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		± 5 mV typical
Load regulation		± 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 μ 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. $C_{in} = 1000 \mu F$, $C_{out} = 0 \mu F$.

*Auto-track is a trademark of Texas Instruments.

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 ⁽⁹⁾	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
PTH	03	02	0	W	A	S	T
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 ⁽⁹⁾

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 V	88%
V _o = 1.2 V	90%
V _o = 1.5 V	91%
V _o = 1.8 V	93%
V _o = 2.0 V	95%
V _o = 2.5 V	95%

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 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_{omax}, C_{out} = 330 µF.
- If utilized V_{out} will track applied voltage by ±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 151 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> to find a suitable alternative.

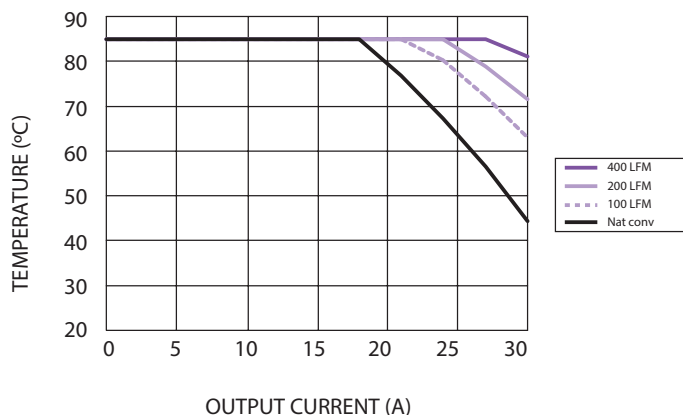


Figure 1 - Safe Operating Area
 $V_{in} = 3.3\text{ V}$, Output Voltage = 2.5 V (See Note A)

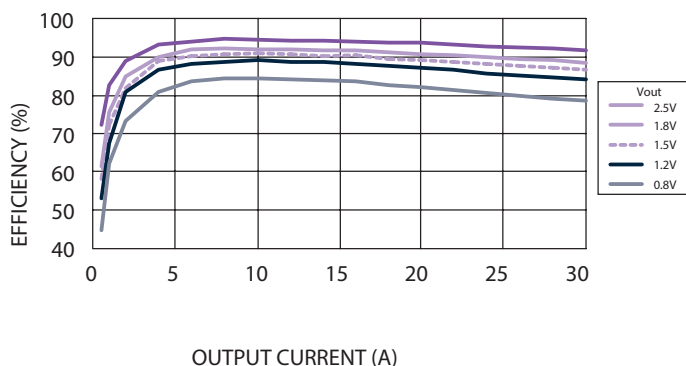


Figure 2 - Efficiency vs Load Current
 $V_{in} = 3.3\text{ V}$ (See Note B)

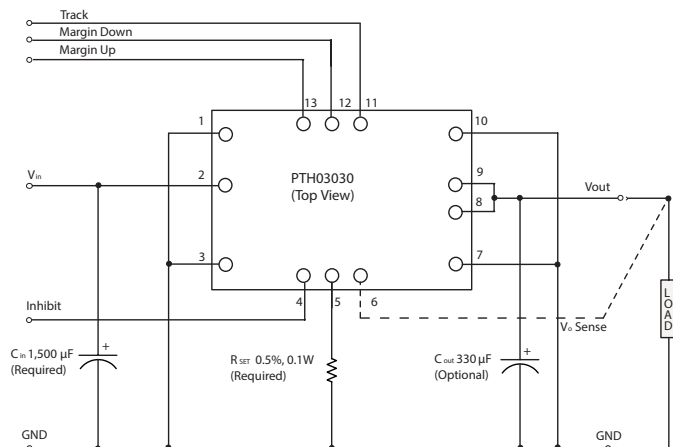


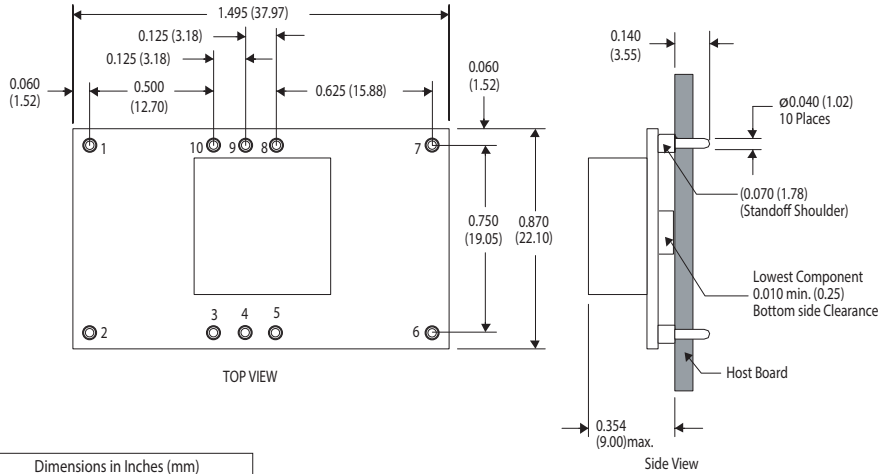
Figure 3 - Standard Application

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

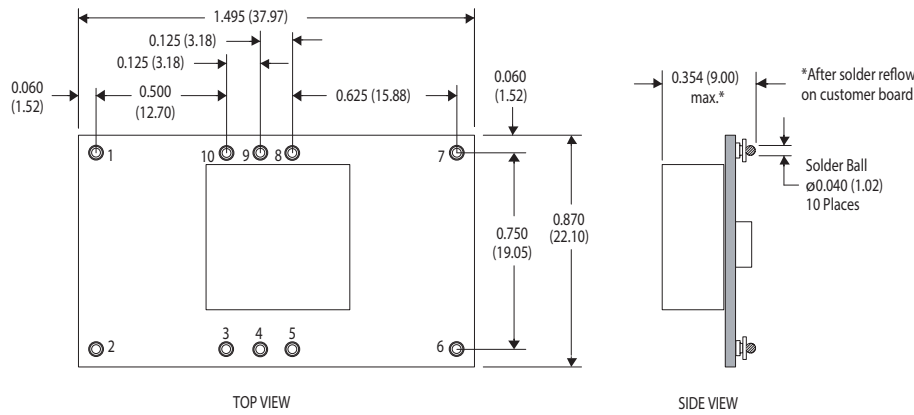


Dimensions in Inches (mm)
Tolerances (unless otherwise specified)
2 Places ± 0.030 (± 0.76)
3 Places ± 0.010 (± 0.25)

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

Surface-mount



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

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