

## PTH04040

### 3.3 / 5.0 Vin Single Output

#### Data Sheet

**Total Power:** 150 Watts  
**Input Voltage:** 2.95 - 5.5 Vdc  
**# of Outputs:** Single

#### SPECIAL FEATURES

- 60 A output current<sup>(7)</sup>
- 3.3/5 V input voltage (2.95 - 5.5 Vdc)
- Wide-output voltage adjust (0.8 V - 2.5 V)
- Auto-track™ sequencing\*
- Margin up/down controls
- Efficiencies up to 93%
- Output ON/OFF inhibit
- Differential remote sense
- Programmable input Under-Voltage Lockout (UVLO)
- Point-of-Load-Alliance (POLA) compatible
- RoHS compliant
- Two year warranty

#### SAFETY

- UL/cUL CAN/CSA-C22.2 No. 60950
- 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, 5)	2.95 - 5.5 V
Input standby current		60 mA typical
Remote ON/OFF	(See Note 5)	Negative logic
Undervoltage lockout (Pin 8 open)	(See Note 6) On threshold Hysteresis	6.6 - 7.5 Vdc typical 2.60 V 0.6 V
Track input voltage	Pin 18 (See Note 2)	-0.11 mA
Output		
Voltage adjustability	$2.95 \leq V_i \leq 4.5 \text{ V}$ $4.50 \leq V_i \leq 5.5 \text{ V}$	0.8 - 1.65 Vdc 0.8 - 2.5 Vdc
Setpoint accuracy	(See Note 1)	±2.0% Vo
Line regulation		±5 mV typical
Load regulation		±5 mV typical
Total regulation	(See Note 1)	±3.0% Vo
Minimum load		0 A
Ripple and noise	20 MHz bandwidth	15 mV typical
Transient response	(See Note 4)	100 μs recovery time Overshoot/undershoot 200 mV
Margin adjustment	(See Note 8)	±5.0% Vo

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated.  
 Cin = 1000 μF, Cout = 660 μF.

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

### General Specifications

Efficiency	(See Efficiency Table)	93% max.
Insulation voltage		Non-isolated
Switching frequency		825 MHz
Approvals and standards		EN60950, UL/cUL60950
Material flammability		UL94V-0
Dimensions	L x W x H	51.94 x 26.54 x 9.07 mm 2.045 x 1.045 x 0.357 in
Weight		22.5 g (79 oz)
MTBF	Telcordia SR-332	2,100,000 hours

### EMC Characteristics

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

### Environmental Specifications

Thermal performance	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
<b>Protection</b>		
Short-circuit	Auto reset	90 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
PTH04040W	150 W	2.95 - 5.5 V	0.8 - 2.5 V	0 A	60 A	93%	±5 mV	±5 mV

### Part Number System with Options

Product Family	Input Voltage	Output Current	Mechanical Package	Output Voltage Code	Pin Option	Mounting Options
<b>PTH</b>	<b>04</b>	<b>04</b>	<b>0</b>	<b>W</b>	<b>A</b>	<b>S</b>
Point-of-Load Alliance compatible	04 = 2.95 - 5.5 Vdc	04 = 60 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)

### Output Voltage Adjustment

The ultra-wide output voltage trim range offers major advantages to users who select the PTH04040W. 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 PTH04040W converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

#### Notes:

- The set-point voltage tolerance is affected by the tolerance and stability of RSET. The stated limit is unconditionally met if RSET has a tolerance of 1% with 100 ppm/°C or better temperature stability.
- This control pin has an internal pull-up to Vin nominal. If it is left open-circuit the module will operate when input power is applied. A small low-leakage (<100 nA) MOSFET is recommended for control. For further information, consult Application Note 192.
- A 1000 µF input capacitor is required for proper operation. The capacitor must be rated for a minimum of 400 mA rms of ripple current.
- This is with a 1 A/µs loadstep, 50 to 100% Iomax. Co = 660 µF.
- The minimum input voltage is 2.95 V or 1.34 x Vo, whichever is greater.
- These are default voltages. They may be adjusted using the 'UVLO Prog.' control input. Consult Application Note 192 for further details.
- See Figures 1 and 2 for safe operating curves. All power pins must be used.
- A small low-leakage (<100 nA) MOSFET is recommended to control this pin. The open-circuit voltage is less than 1 Vdc.
- 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.

### Efficiency Table (Io = 45 A; Vin = 5 V)

Output Voltage	Efficiency
Vo = 1.2 V	86%
Vo = 1.5 V	88%
Vo = 1.8 V	90%
Vo = 2.5 V	93%

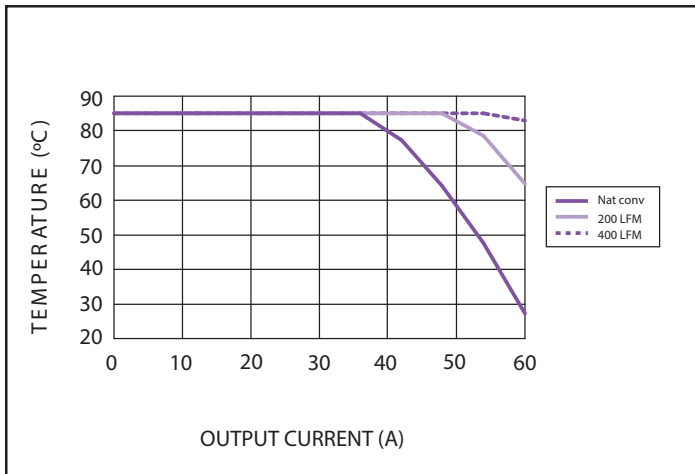


Figure 1 - Safe Operating Area  
Vin = 3.3 V (See Note A)

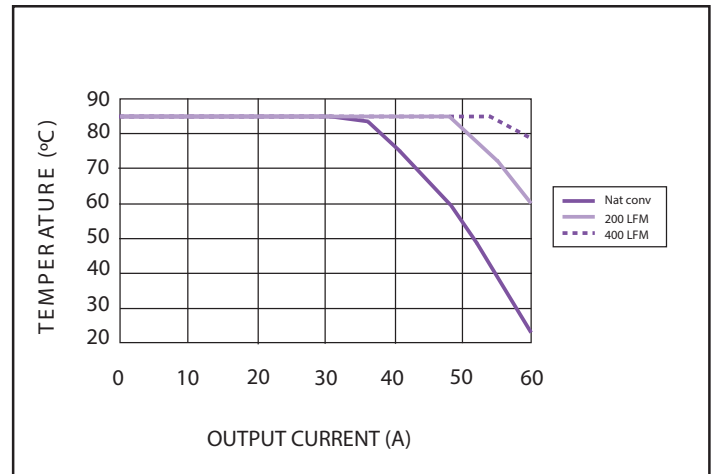


Figure 2 - Safe Operating Area  
Vin = 5 V (See Note A)

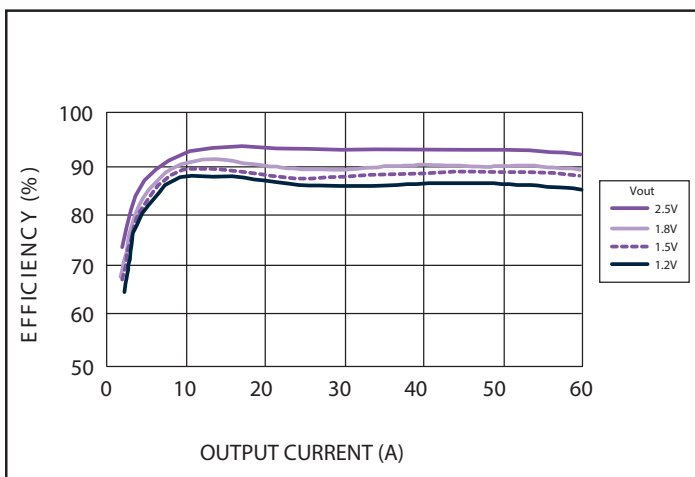


Figure 3 - Efficiency vs Load Current  
Vin = 5 V (See Note B)

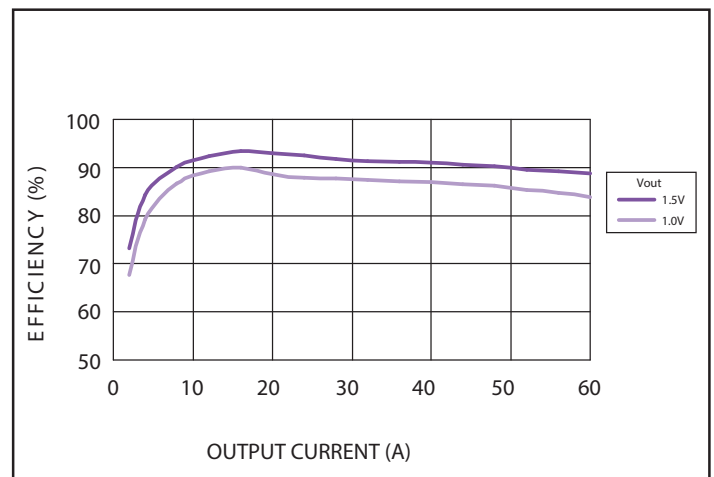


Figure 4 - Efficiency vs Load Current  
Vin = 3.3 V (See Note B)

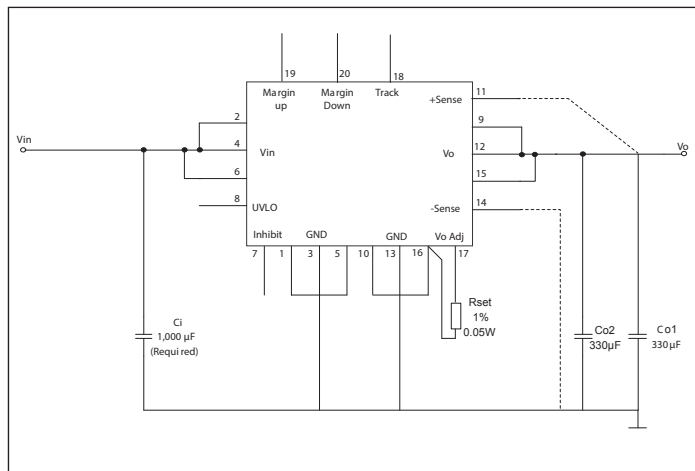


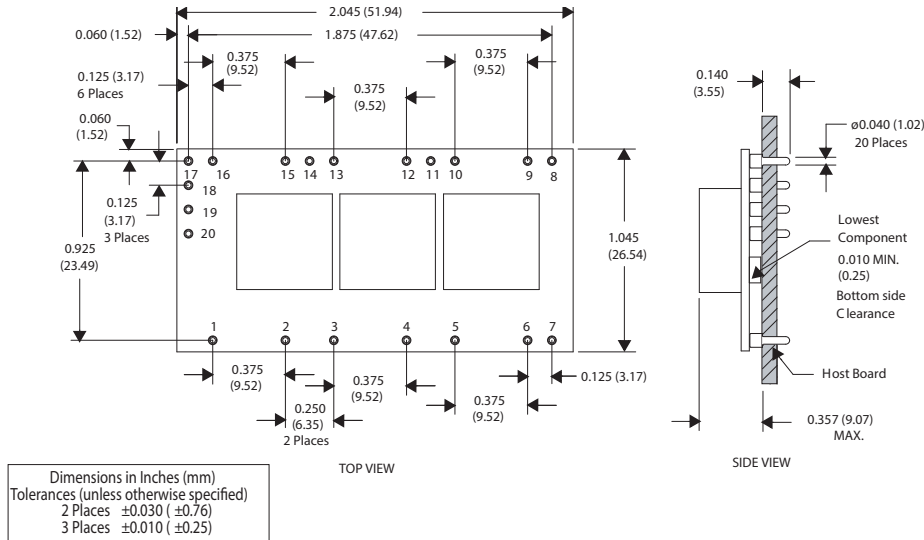
Figure 5 - Standard Application

**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

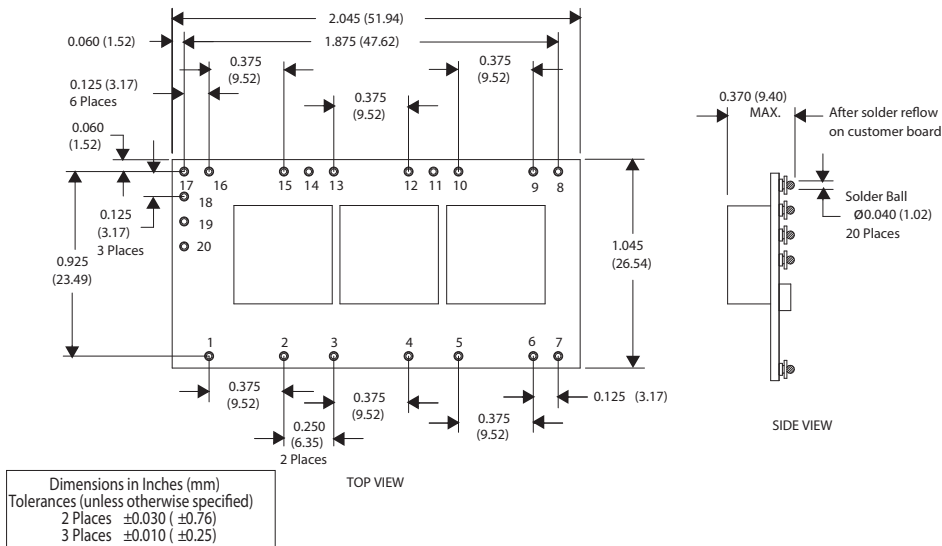
### Plated through-hole



Pin Assignments	
Pin	Function
1	Ground
2	Vin
3	Ground
4	Vin
5	Ground
6	Vin
7	Inhibit*
8	UVLO Programming
9	Vout
10	Ground
11	Vs+
12	Vout
13	Ground
14	Vs-
15	Vout
16	Ground
17	Adjust
18	Track
19	Margin up*
20	Margin down*

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

### Surface-mount



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