POWER

PTH04040

3.3 / 5.0 Vin Single Output

Data Sheet

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

RoHS 6/6 COMPLIANT

SPECIAL FEATURES

- 60 A output current(7)
- 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 ≤ Vi ≤ 4.5 V 4.50 ≤ Vi ≤ 5.5 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.

ARTESYN™
EMBEDDED TECHNOLOGIES

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
Protection		
Short-circuit	Auto reset	90 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
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
PTH	**04**	**04**	**0**	**W**	**A**	**S**
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.

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%

Notes:

1. 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/ºC or better temperature stability.
2. 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 recommend for control. For further information, consult Application Note 192.
3. 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.
4. This is with a 1 A/µs loadstep, 50 to 100% Iomax. Co = 660 µF.
5. The minimum input voltage is 2.95 V or 1.34 x Vo, whichever is greater.
6. These are default voltages. They may be adjusted using the 'UVLO Prog.' control input. Consult Application Note 192 for further details.
7. See Figures 1 and 2 for safe operating curves. All power pins must be used.
8. A small low-leakage (<100 nA) MOSFET is recommended to control this pin. The open-circuit voltage is less than 1 Vdc.
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/power to find a suitable alternative.

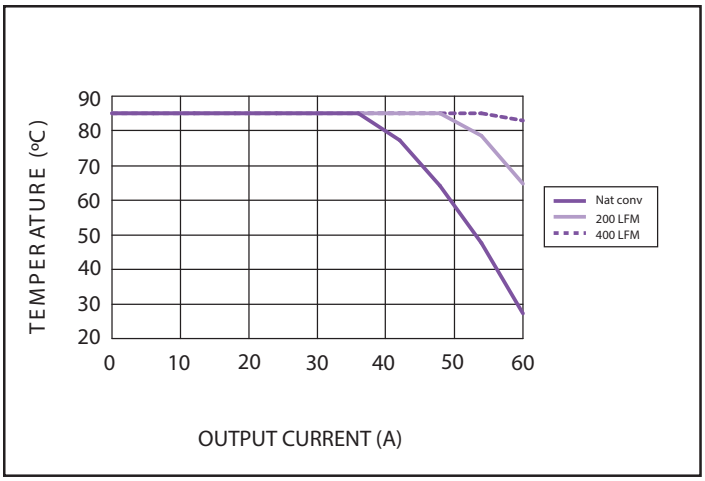


Figure 1 - Safe Operating Area
Vin = 3.3 V (See Note A)

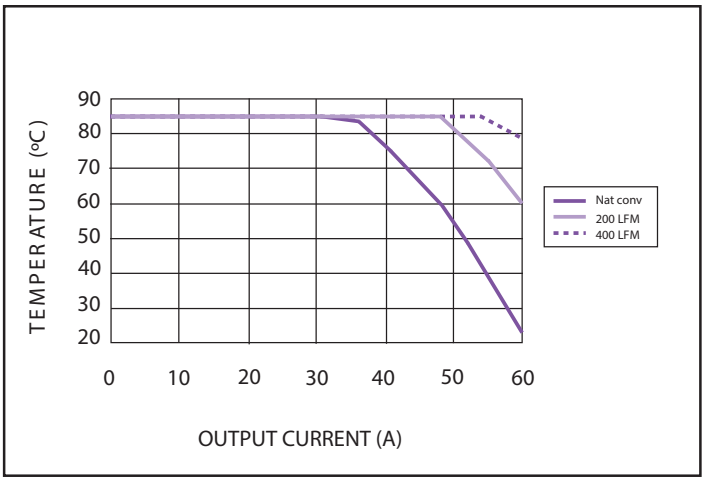


Figure 2 - Safe Operating Area
Vin = 5 V (See Note A)

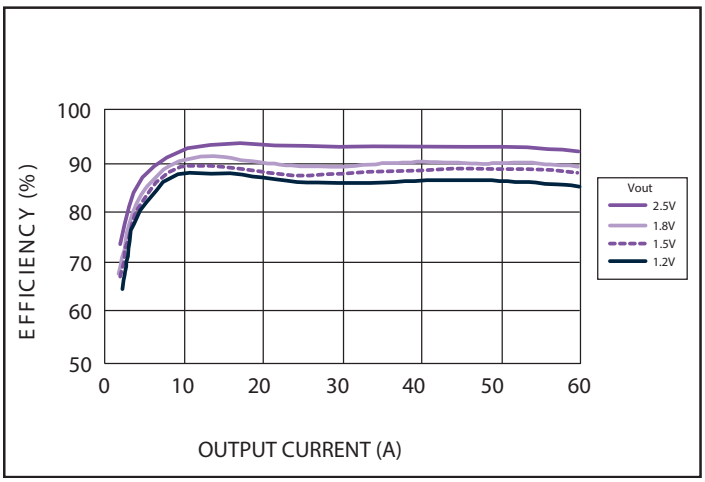


Figure 3 - Efficiency vs Load Current
Vin = 5 V (See Note B)

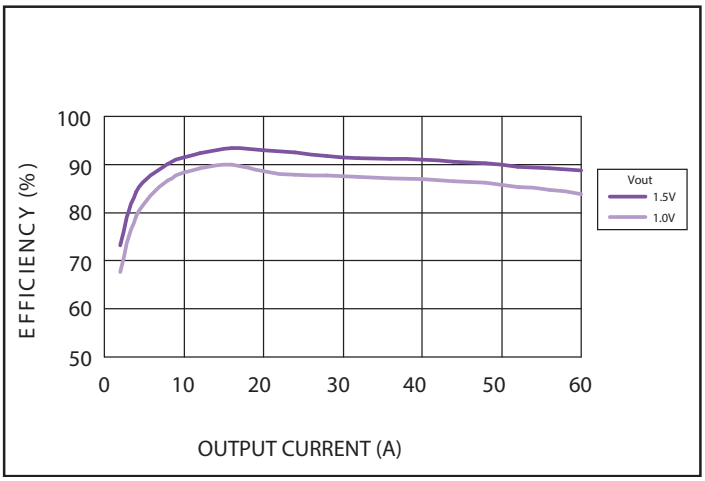


Figure 4 - Efficiency vs Load Current
Vin = 3.3 V (See Note B)

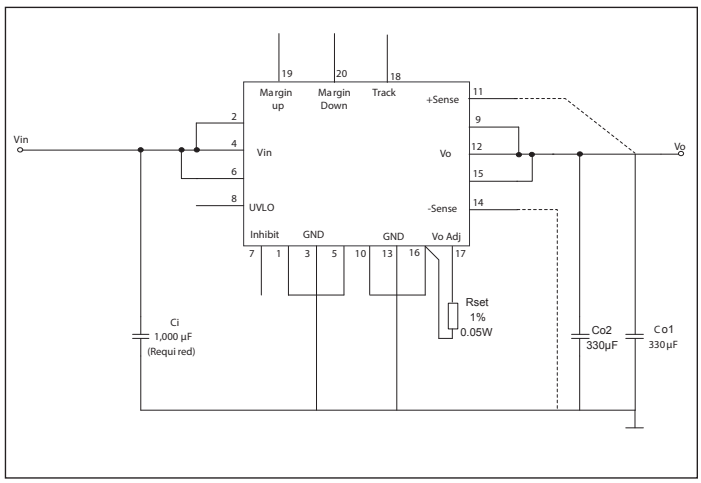


Figure 5 - Standard Application

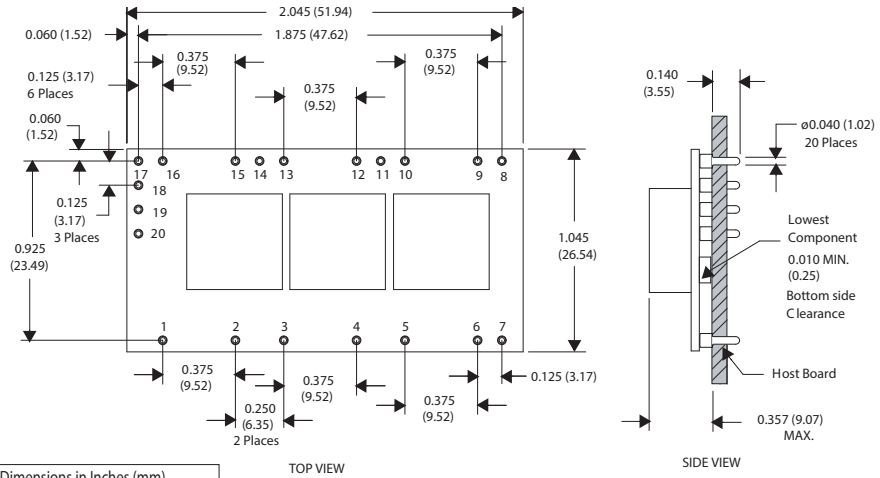
Notes:

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

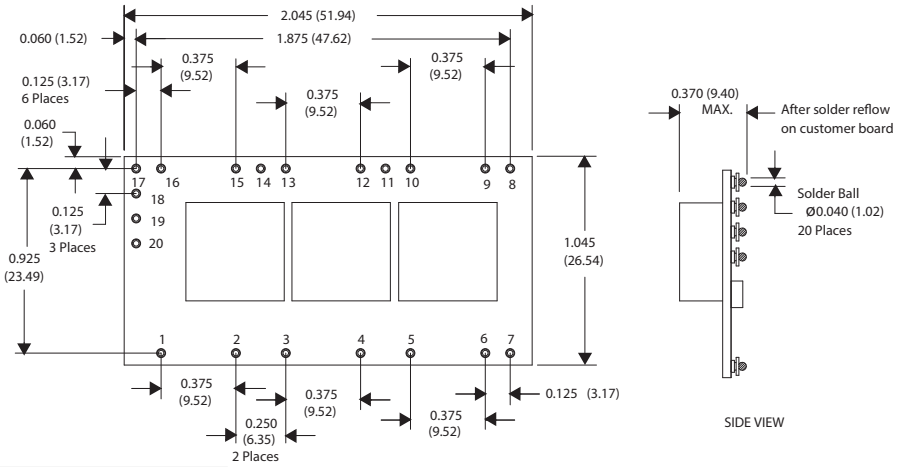


Dimensions in Inches (mm)
Tolerances (unless otherwise specified)
2 Places ±0.030 (±0.76)
3 Places ±0.010 (±0.25)

Pin Assignments	
Pin	*Function*
1	Ground
2	Vin
3	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



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

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