

PTH12040

12 Vin Single Output

Data Sheet

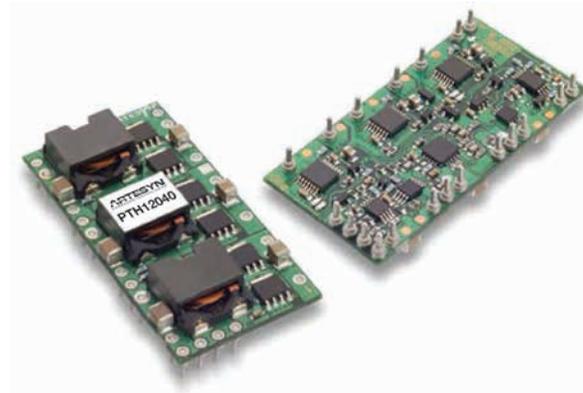
Total Power: 275 Watts
of Outputs: Single

SPECIAL FEATURES

- 50 A output current
- 12 V input voltage (8 - 14 Vdc)
- Wide-output voltage adjust:
0.8 - 5.5 Vdc
- Auto-track™ sequencing*
- Margin up/down controls
- Efficiencies up to 96%
- Output ON/OFF inhibit
- Differential remote sense
- Programmable UnderVoltage Lockout (UVLO)
- 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 B 04 06 38572 044
- CB Report and Certificate to IEC60950, Certificate No. US/8292/UL



Electrical Specifications

Input		
Input voltage range	(See Note 3)	8 - 14Vdc
Input current	(See Note 2)	35 mA typical
Remote ON/OFF	(See Note 1)	Positive logic
Start-up time		1 V/ms
Undervoltage lockout	(See Note 8)	6.6 - 7.5 V typical
Track input voltage	Pin 18 (See Note 7)	-0.13 mA
Output		
Voltage adjustability		0.8 - 5.5 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)	70 μs recovery time Overshoot/undershoot 150 mV
Margin adjustment	(See Note 7)	±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
Insulation voltage		Non-isolated
Switching frequency		1.05 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		17 g (0.60 oz)
MTBF	Telcordia SR-332	2,500,000 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 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	95 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
PTH12030W	275 W	8 - 14 Vdc	0.8 - 5.5 Vdc	0 A	50 A	96%	±5 mV	±5 mV

Part Number System with Options

Product Family	Input Voltage	Output Current	Mechanical Package	Output Voltage Code	Pin Option ⁽⁸⁾	Mounting Options
PTH	12	04	0	W	A	S
Point-of-Load Alliance compatible	12 = 12 V	04 = 50 A	Always 0	W = Wide		D = Horizontal through-hole (RoHS 6/6) Z = Surface-mount solder ball (RoHS 6/6)

Output Voltage Adjustment

The ultra-wide output voltage trim range offers major advantages to users who select the PTH12040W. 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 1.8 Vdc. When the PTH12040W 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 5V 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 the related application note. For further information, consult Application Note 193.
- A 1000 µF input capacitor is required for proper operation. The capacitor must be rated for a minimum of 300 mA rms of ripple current.
- This is with a 1 A/µs loadstep, 50 to 100% I_{o max}, I_o = 680 µF.
- See Figures 1 and 2 for safe operating curves.
- When the set-point voltage is adjusted higher than 3.6 V, a 10V minimum input voltage is recommended.
- A small low-leakage (<100 nA) MOSFET is recommended to control this pin. The open circuit voltage is less than 1 Vdc.
- These are the default voltages. They may be adjusted using the 'UVLO Prog' control input. Consult Application Note No. 193 for further information.
- 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: PTH12040W (I_o = 35 A)

Output Voltage	Efficiency
V _o = 5.0 V	96%
V _o = 3.3 V	95%
V _o = 2.5 V	93%
V _o = 2.0V	92%
V _o = 1.8 V	91%
V _o = 1.5 V	90%
V _o = 1.2 V	88%
V _o = 1.0 V	86%
V _o = 0.8 V	82%

Characteristic Data

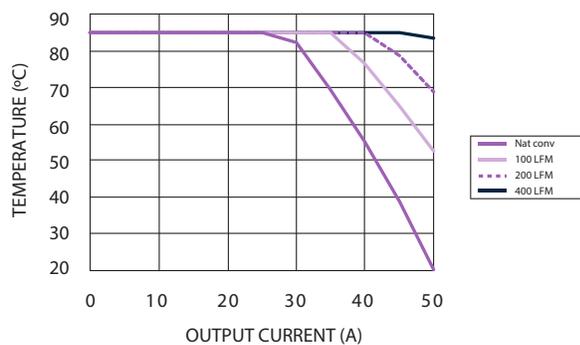


Figure 1 - Safe Operating Area
 $V_{in} = 12\text{ V}$, Output Voltage = 3.3 V (See Note A)

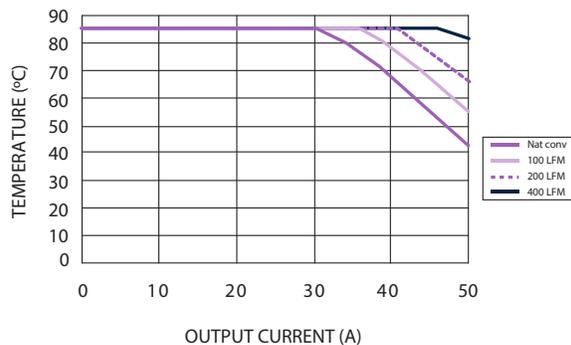


Figure 2 - Safe Operating Area
 $V_{in} = 12\text{ V}$, Output Voltage = 1.2 V (See Note A)

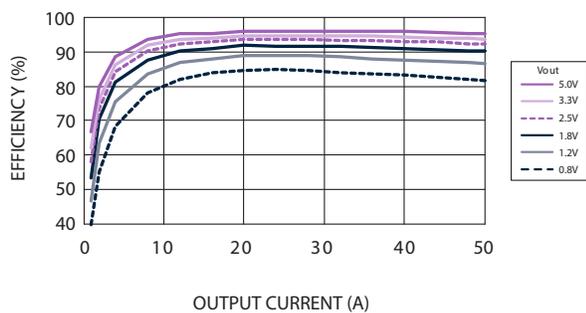


Figure 3 - Efficiency vs Load Current
 $V_{in} = 12\text{ V}$ (See Note B)

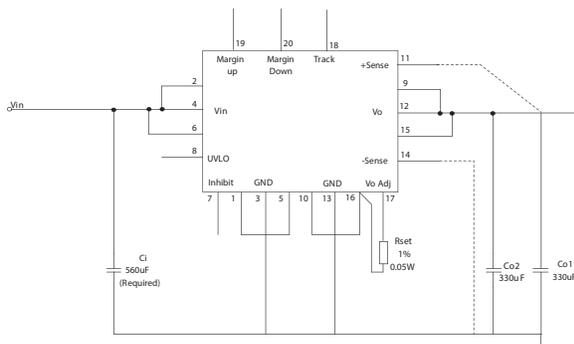


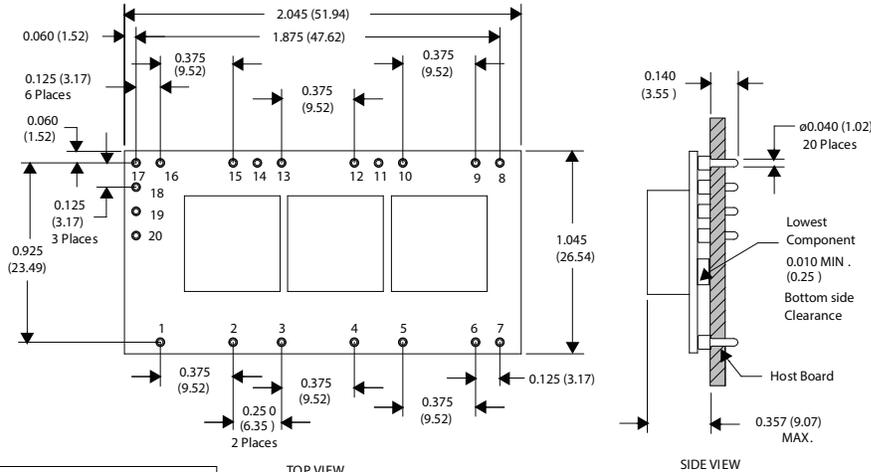
Figure 4 - Standard Application

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

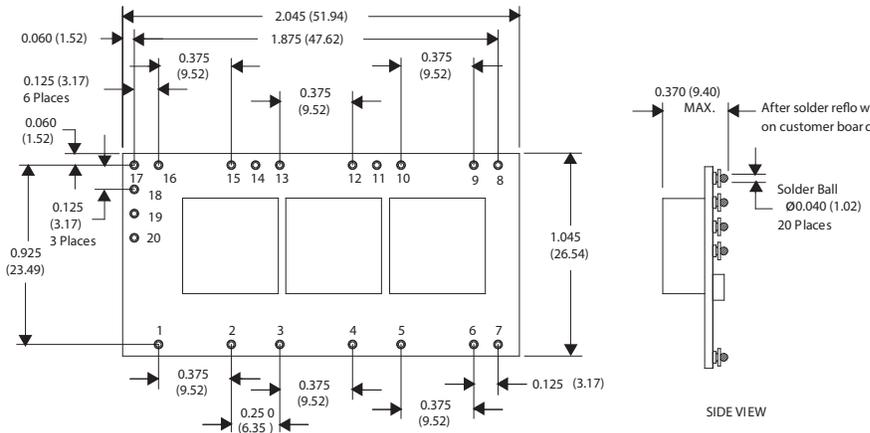


Dimensions in Inches (mm)
Tolerances (unless otherwise specified)
2 Places 0.030 (0.76)
3 Places 0.010 (0.25)

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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