PTH12040
12 Vin

Total Power: 275 Watts
# of Outputs: Single

RoHS
2002/95/EC
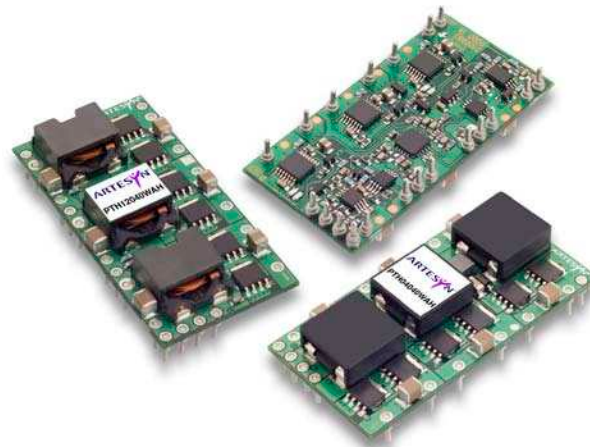
Special Features

- 50 A output current [5]
- 12 V input voltage (8 Vdc to 14 Vdc)
- Wide-output voltage adjust
  - 0.8 Vdc to 5.5 Vdc
- Auto-track™ sequencing*
- Margin up/down controls
- Efficiencies up to 96%
- Output ON/OFF inhibit
- Differential remote sense
- Programmable Under-Voltage Lockout (UVLO)
- Point-of-Load-Alliance (POLA) compatible
- Available RoHS compliant
- 2 Year Warranty

Safety

- UL/cUL CAN/CSA-C22.2 No. 60950, 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

Specifications

Input		
Input voltage range:	(See Note 3)	8 - 14 Vdc
Input standby current:	(See Note 2)	35 mA typ.
Remote ON/OFF:	(See Note 1)	Positive logic
Start-up time:		1 V/ms
Undervoltage lockout: + Pin 8 open	(See Note 8)	6.6 - 7.5 V typ.
Track input current:	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 typ.
Load regulation:		± 5 mV typ.
Total regulation:	(See Note 1)	± 3.0% Vo
Minimum load:		0 A
Ripple and noise:	20 MHz bandwidth	15 mV typ.
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 trade mark of Texas Instruments

ARTESYN®

EMERSON™
Network Power

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

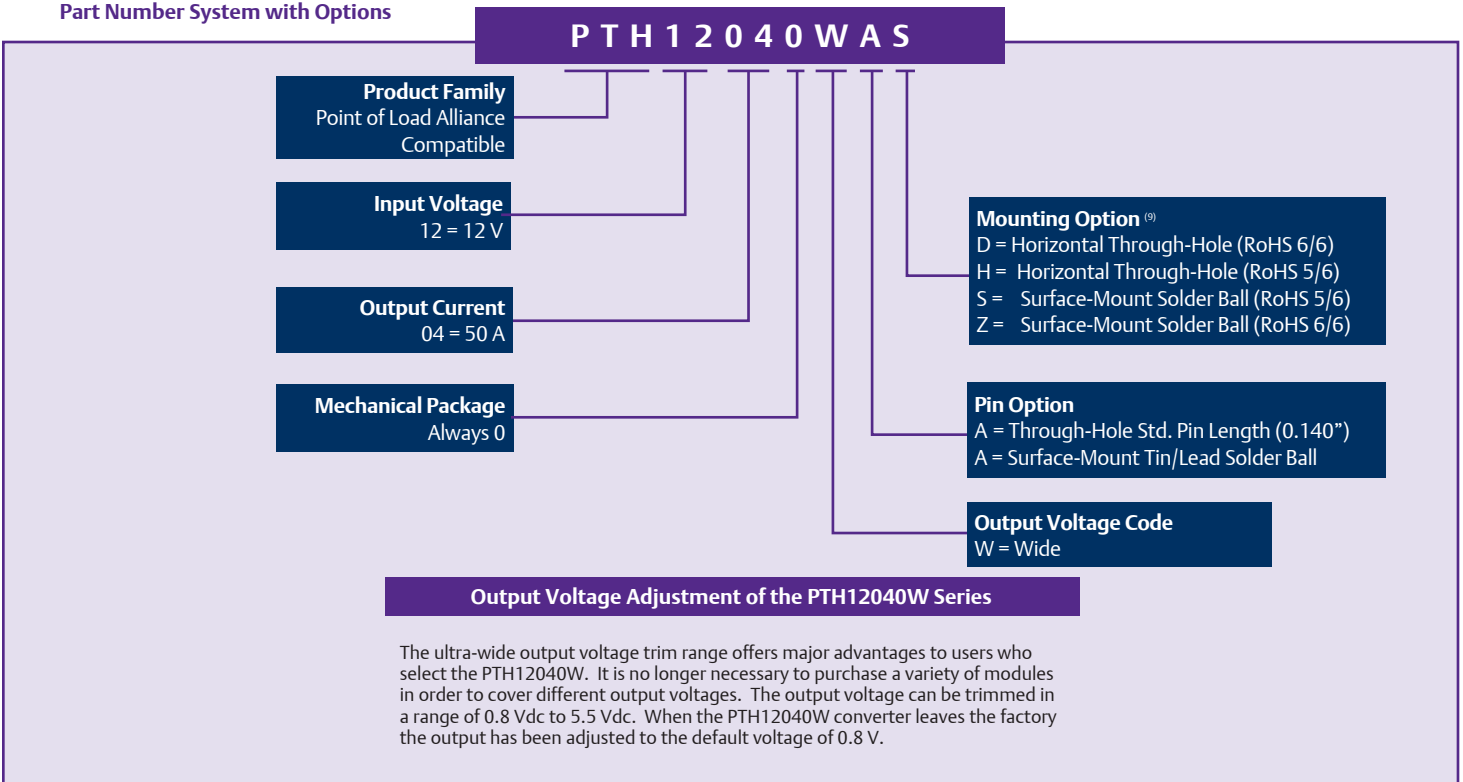| General Specifications		
Efficiency:		See efficiency table on page 3
Insulation voltage:		Non-Isolated
Switching frequency:		1.05 Mhz.
Approvals and standards:		EN60950, UL/cUL60950
Material flammability:		UL94V-0
Dimensions:	(L x W x H)	51.94 x 26.54 x 9.07 mm 2.045 x 1.045 x 0.357 in
Weight:		17g (60 oz)
MTBF:	Telcordia SR-332	2,500,000 hours

Environmental Specifications

Thermal performance:	Operating ambient, temperature Non-operating	-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
Thermal:		Auto recovery

Ordering Information

Output Power (max)	Input Voltage	Output Voltage	Output Currents		Efficiency (max)	Regulation		Model Numbers [9, 10]
			Min	Max		Line	Load	
275 W	8 - 14 Vdc	0.8 - 5.5 Vdc	0 A	50 A	96%	± 5 mV	± 5 mV	PTH12040W

Part Number System with Options

PTH12040WAS

Product Family
Point of Load Alliance Compatible

Input Voltage
12 = 12 V

Output Current
04 = 50 A

Mechanical Package
Always 0

Mounting Option [9]
D = Horizontal Through-Hole (RoHS 6/6)
H = Horizontal Through-Hole (RoHS 5/6)
S = Surface-Mount Solder Ball (RoHS 5/6)
Z = Surface-Mount Solder Ball (RoHS 6/6)

Pin Option
A = Through-Hole Std. Pin Length (0.140")
A = Surface-Mount Tin/Lead Solder Ball

Output Voltage Code
W = Wide

Output Voltage Adjustment of the PTH12040W Series

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 5.5 Vdc. When the PTH12040W converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

Efficiency Table - PTH12040W (I_O = 35 A)

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

Notes

1. The set-point voltage tolerance is affected by the tolerance and stability of R_{SET}. The stated limit is unconditionally met if R_{SET} has a tolerance of 1% with 100 ppm/°C or better temperature stability.
2. This control pin has an internal pull-up to 5 V 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.
3. 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.
4. This is with a 1 A/µs loadstep, 50 to 100% I_{omax}, I_o = 680 µF.
5. See Figures 1 and 2 for safe operating curves.
6. When the set-point voltage is adjusted higher than 3.6 V, a 10 V minimum input voltage is recommended.
7. A small low-leakage (<100 nA) MOSFET is recommended to control this pin. The open circuit voltage is less than 1 Vdc.
8. These are the default voltages. They may be adjusted using the 'UVLO Prog' control input. Consult Application Note No. 193 for further information.
9. To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH12040WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH12040WAD.
10. NOTICE: Some models do not support all options. Please contact your local Emerson Network Power representative or use the on-line model number search tool at http://www.Emerson.com/EmbeddedPower to find a suitable alternative.

Embedded Power for Business-Critical Continuity

Embedded Power for
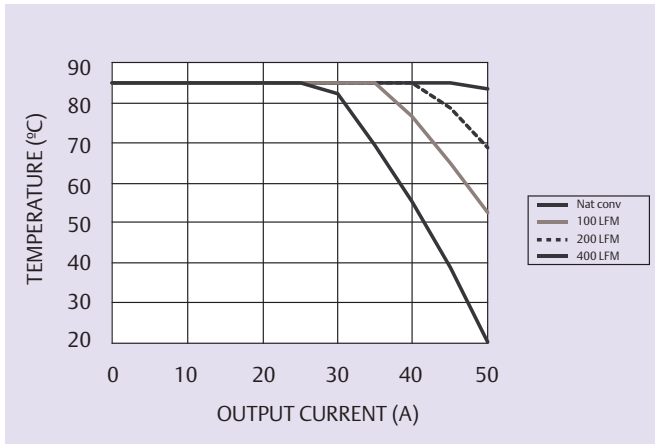Business-Critical Continuity

Characteristic Data

Figure 1 - Safe Operating Area
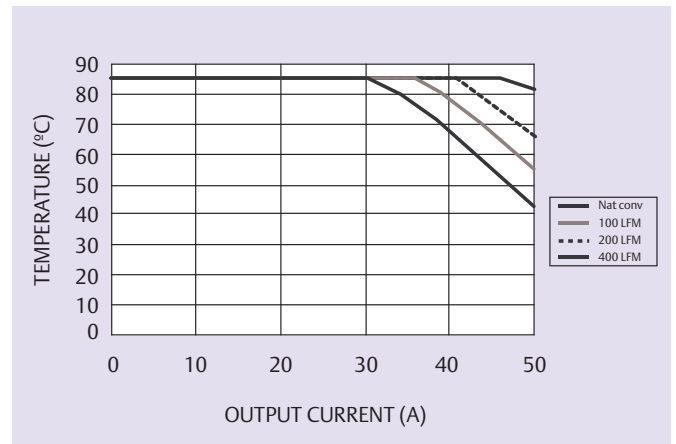**Vin = 12 V, Output Voltage = 3.3 V (See Note A)**

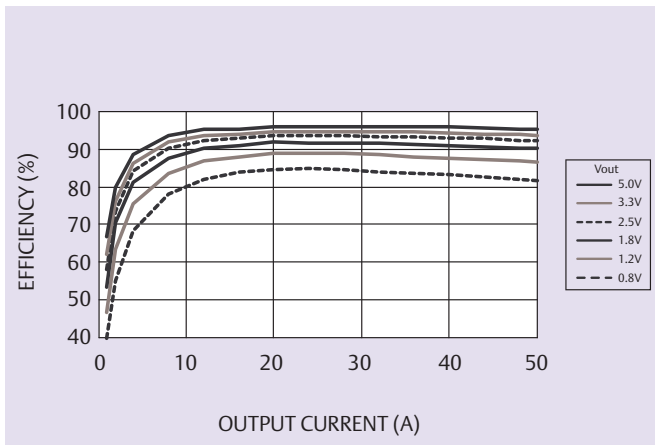**Figure 2 - Safe Operating Area**
Vin = 12 V, Output Voltage = 1.2 V (See Note A)

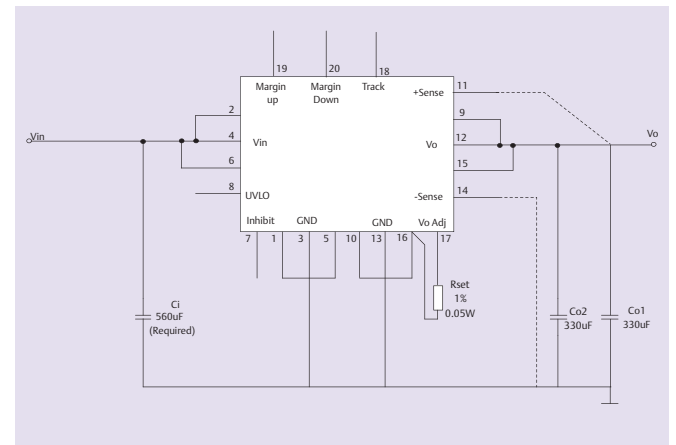**Figure 3 - Efficiency vs Load Current**
Vin = 12 V (See Note B)

Figure 4 - Standard Application

Notes

A   SOA curves represent the conditions at which internal components are within
the Emerson Network Power 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
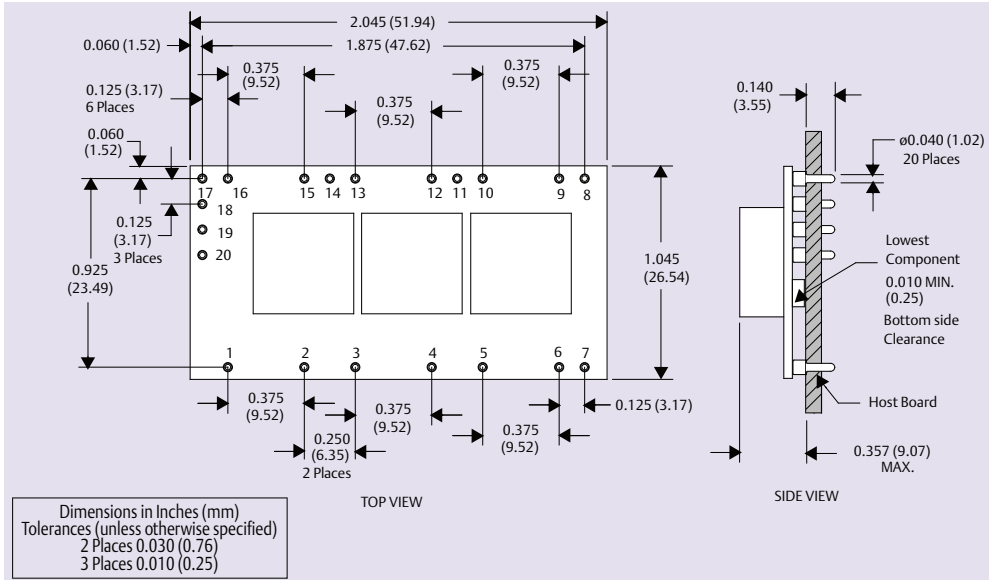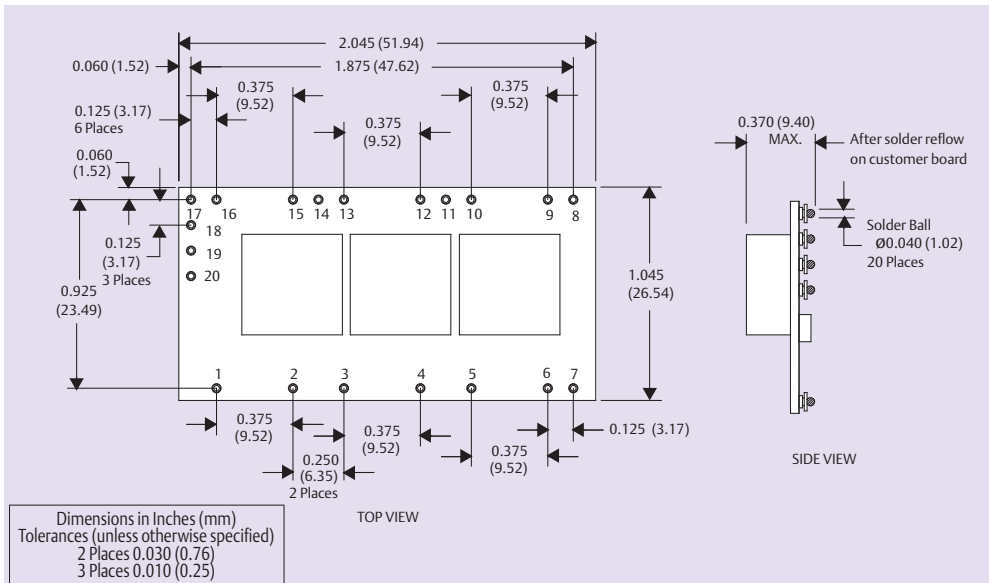
Figure 5 - Plated Through-Hole

Figure 6 - Surface-Mount

Pin Connections	
Pin No.	Function
Pin 1	Ground
Pin 2	Vin
Pin 3	Ground
Pin 4	Vin
Pin 5	Ground
Pin 6	Vin
Pin 7	Inhibit*

Pin Connections cont.	
Pin No.	Function
Pin 8	UVLO Programming
Pin 9	Vout
Pin 10	Ground
Pin 11	Vs+
Pin 12	Vout
Pin 13	Ground
Pin 14	Vs-

Pin Connections cont.	
Pin No.	Function
Pin 15	Vout
Pin 16	Ground
Pin 17	Adjust
Pin 18	Track
Pin 19	Margin Up*
Pin 20	Margin Down*

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

While every precaution has been taken to ensure accuracy and completeness in this literature, Emerson Network Power assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

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