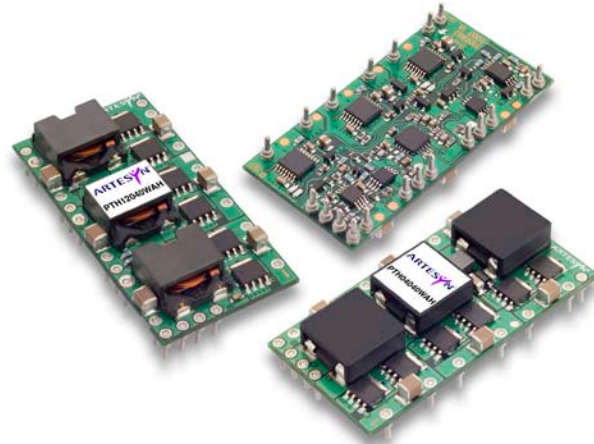


# PTH12040 12 Vin

**Total Power:** 275 Watts  
**# of Outputs:** Single



## Special Features

- 50 A output current <sup>(5)</sup>
- 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  
C<sub>in</sub> = 1000 μF, C<sub>out</sub> = 660 μF

\*Auto-track™ is a trade mark of Texas Instruments



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

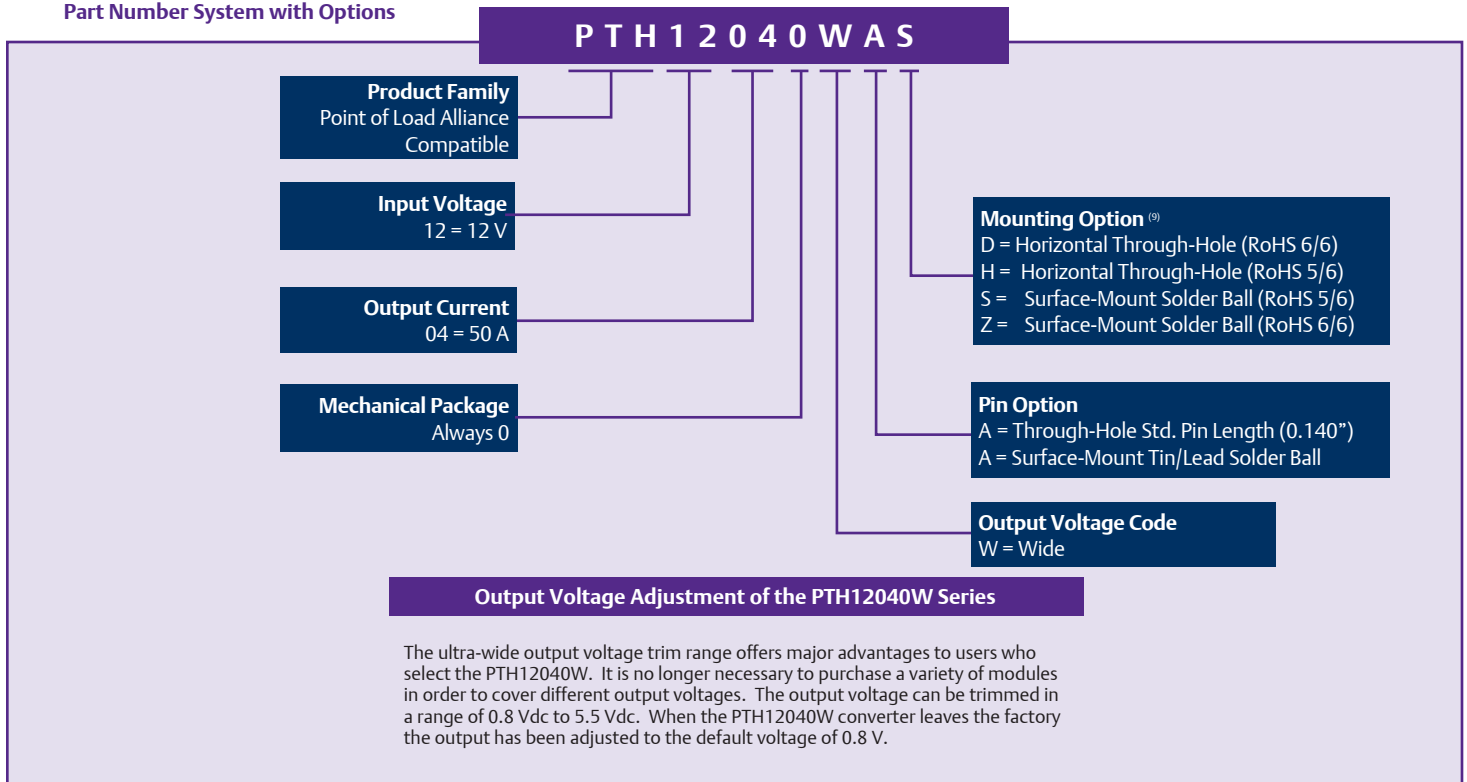
Thermal performance:	Operating ambient, temperature Non-operating	-40 °C to +85 °C -40 °C to +125 °C
MSL ('Z' suffix only):	JEDEC J-STD-020C	Level 3

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 <sup>(9, 10)</sup>
			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



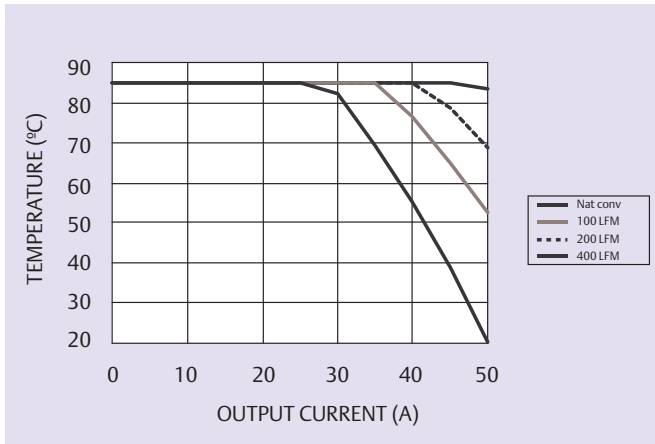
Efficiency Table - PTH12040W ( $I_O = 35$  A)

Output Voltage	Efficiency
$V_o = 5.0$ V	96%
$V_o = 3.3$ V	95%
$V_o = 2.5$ V	93%
$V_o = 2.0$ V	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%

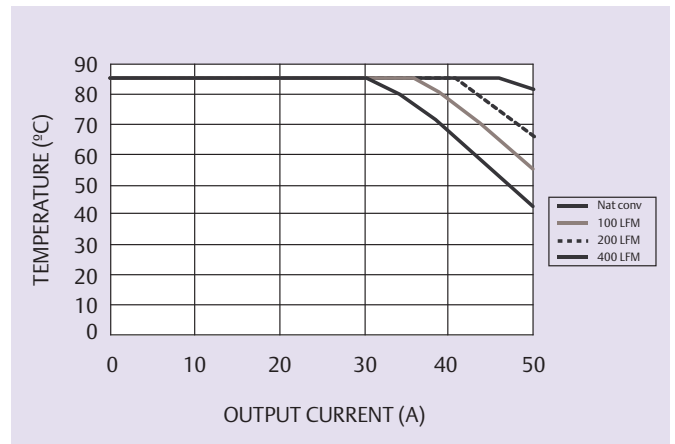
## Notes

- 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.
- 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.
- A 1000  $\mu$ F 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/ $\mu$ s loadstep, 50 to 100%  $I_{Omax}$ ,  $I_O = 680$   $\mu$ F.
- See Figures 1 and 2 for safe operating curves.
- When the set-point voltage is adjusted higher than 3.6 V, a 10 V 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.
- 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.
- 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.

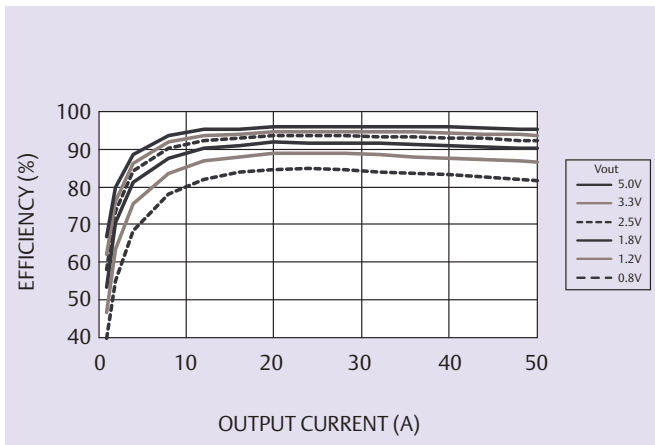
## Characteristic Data



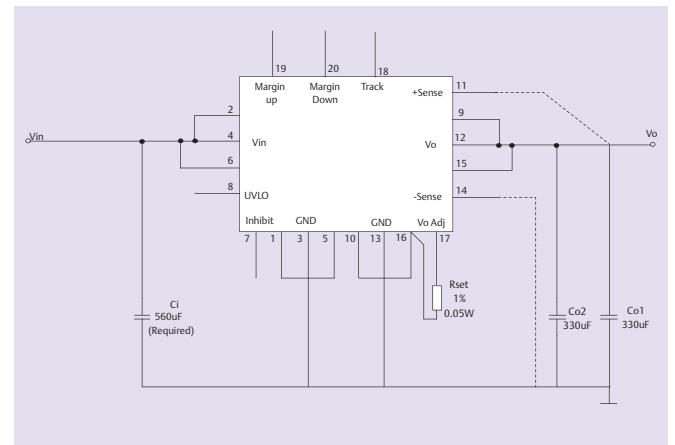
**Figure 1 - Safe Operating Area**  
Vin = 12 V, Output Voltage = 3.3 V (See Note A)



**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

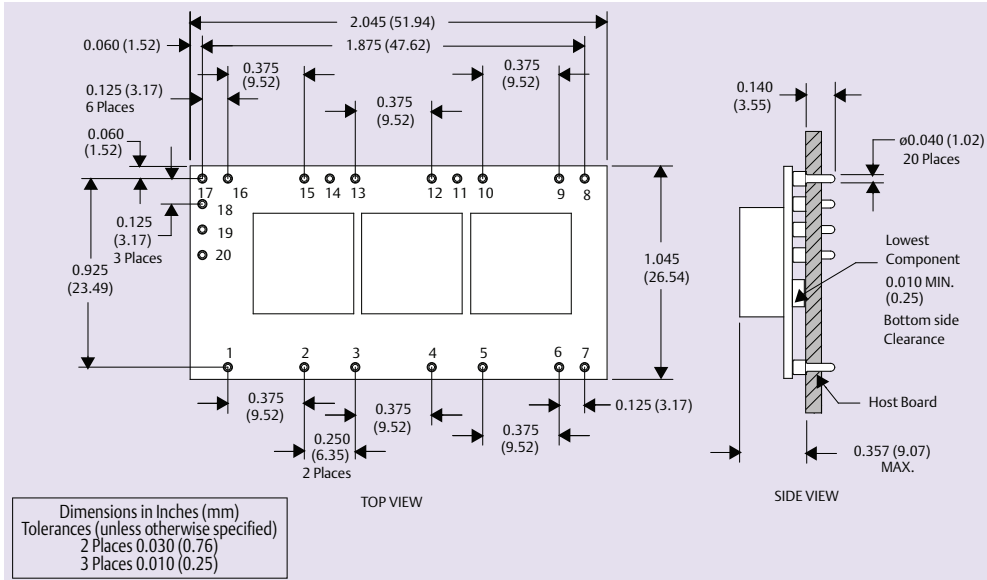


Figure 5 - Plated Through-Hole

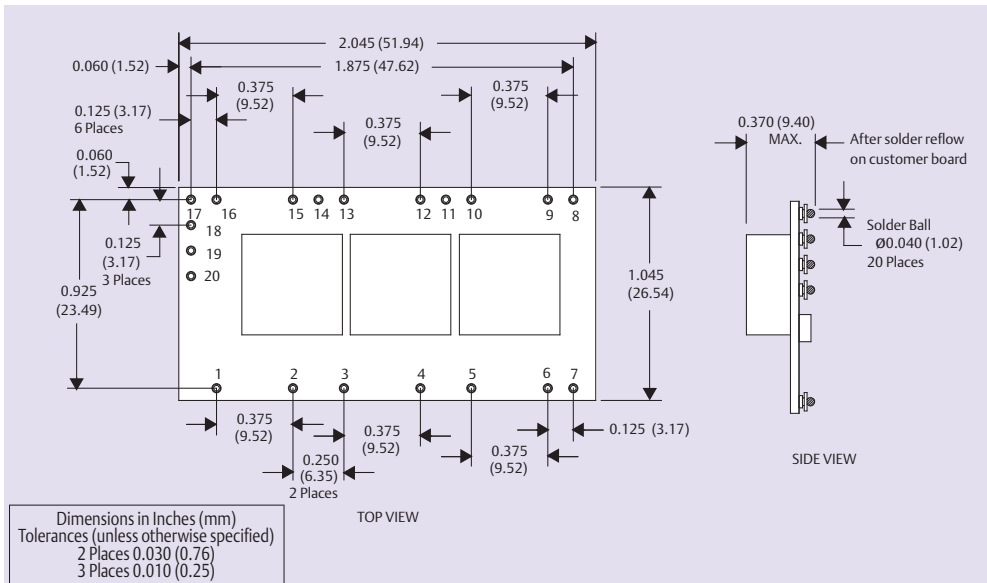


Figure 6 - Surface-Mount

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

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