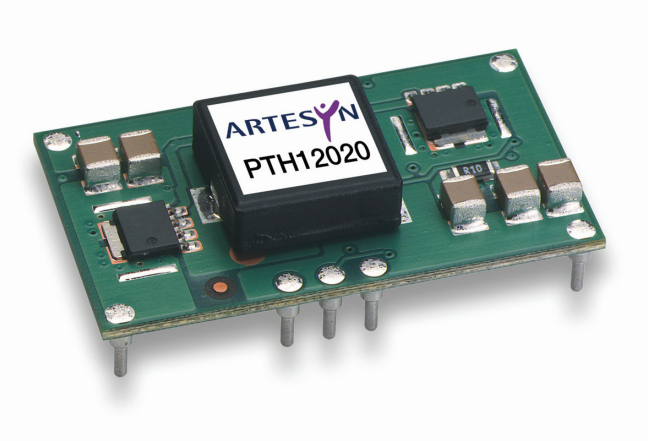
PTH12020
12 Vin

Total Power: 99 Watts
# of Outputs: Single



RoHS 2002/95/EC

Special Features

- 18 A output current
- 12 V input voltage
- Wide-output voltage adjust
  - 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L'
- Auto-track™ sequencing*
- Margin up/down controls
- Efficiencies up to 95%
- Output ON/OFF inhibit
- Output voltage sense
- Point-of-Load-Alliance (POLA) compatible
- Available RoHS compliant
- 2 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

Specifications

Input		
Input voltage range:	(See Note 3, page 3)	10.8 - 13.2 Vdc
Input current:	No load	10 mA typ.
Remote ON/OFF:	(See Note 1, page 3)	Positive logic
Start-up time:		1 V/ms
Undervoltage lockout:		9.2 - 9.7 V typ.
Track input voltage:	Pin 8 (See Note 6, page 3)	± 0.3 Vin
Output		
Voltage adjustability: (See Note 4, page 3)	Suffix '-W' Suffix '-L'	1.2 - 5.5 Vdc 0.8 - 1.8 Vdc
Setpoint accuracy:		± 2.0% Vo
Line regulation:		± 5 mV typ.
Load regulation:		± 5 mV typ.
Total regulation:		± 3.0% Vo
Minimum load:		0 A
Ripple and noise: 20 MHz bandwidth	Suffix '-W' Suffix '-L'	32 mV pk-pk 1% Vo
Temperature co-efficient:	-40 °C to +85 °C	± 0.5% Vo
Transient response: (See Note 5, page 3)		70 µs recovery time Overshoot/undershoot 130 mV
Margin adjustment:		± 5.0% Vo

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated
Cin = 560 µF, Cout = 0 µF

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

ARTESYN®

EMERSON™
Network Power

Specifications Continued

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:	Suffix '-W' Suffix '-L'	260 kHz to 380 kHz 200 kHz to 300 kHz
Approvals and standards:		EN60950, UL/cUL60950
Material flammability:		UL94V-0
Dimensions:	(L x W x H)	37.97 x 22.10 x 9.00 mm 1.495 x 0.870 x 0.354 in
Weight:		7g (0.25 oz)
MTBF:	Telcordia SR-332	5,236,000 hours

Environmental Specifications

Thermal performance: (See Note 2, page 3)	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	30 A typ.
Thermal:		Auto recovery

Ordering Information

Output Power (max)	Input Voltage	Output Voltage	Output Currents		Efficiency (max)	Regulation		Model Numbers [8, 9]
			Min	Max		Line	Load	
99 W	10.8 - 13.2 Vdc	0.8 - 1.8 Vdc	0 A	18 A	89%	±5 mV	±5 mV	PTH12020L
99 W	10.8 - 13.2 Vdc	1.2 - 5.5 Vdc	0 A	18 A	95%	±5 mV	±5 mV	PTH12020W

Part Number System with Options

P T H 1 2 0 2 0 W A S T

Product Family
Point of Load Alliance Compatible

Input Voltage
12 = 12 V

Output Current
02 = 18 A

Mechanical Package
Always 0

Packaging Options
No Suffix = Trays
T = Tape and Reel [7]

Mounting Option [8]
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, L = Low Voltage

Output Voltage Adjustment of the PTH12020 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH12020. 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 1.2 Vdc to 5.5 Vdc. When the PTH12020 converter leaves the factory the output has been adjusted to the default voltage of 1.2 V.

Efficiency Table - PTH12020W (I_O = 18 A)	
Output Voltage	Efficiency
Vo = 5.0 V	95%
Vo = 3.3 V	93%
Vo = 2.5 V	92%
Vo = 1.8 V	90%
Vo = 1.5 V	88%
Vo = 1.2 V	86%

Efficiency Table - PTH12020L (I_O = 18 A)	
Output Voltage	Efficiency
Vo = 1.8 V	89%
Vo = 1.5 V	87%
Vo = 1.2 V	85%
Vo = 1.0 V	83%
Vo = 0.8 V	80%

Notes

1 Remote ON/OFF. Positive Logic
ON: Pin 3 open; or V > Vin - 0.5 V
OFF: Pin 3 GND; or V < 0.8 V (min - 0.2 V).
2 See Figures 1, 2 and 3 for safe operating curves.
3 A 560 µF electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 800 mA rms of ripple current.
4 An external output capacitor is not required for basic operation. Adding 330 µF of distributed capacitance at the load will improve the transient response.
5 1 A/µs load step, 50 to 100% I_{omax}, C_{out} = 330 µF.
6 If utilized Vout will track applied voltage by ±0.3 V (up to Vo set point).
7 Tape and reel packaging only available on the surface-mount versions.
8 To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH12020WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH12020WAD.
9 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.PowerConversion.com to find a suitable alternative.

PTH12020W Characteristic Data

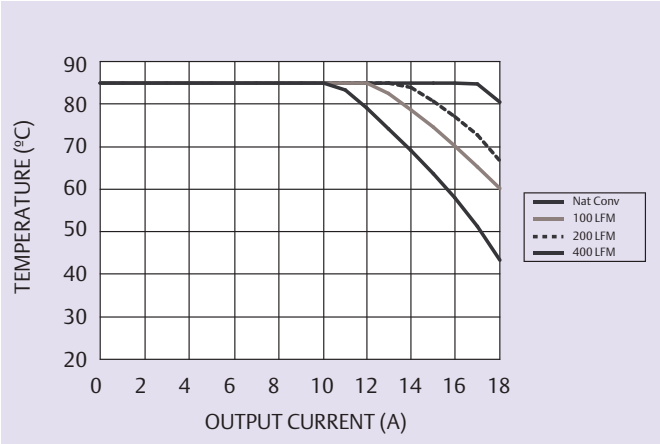


Figure 1 - Safe Operating Area
Vin = 12 V, Output Voltage = 5 V (See Note A)

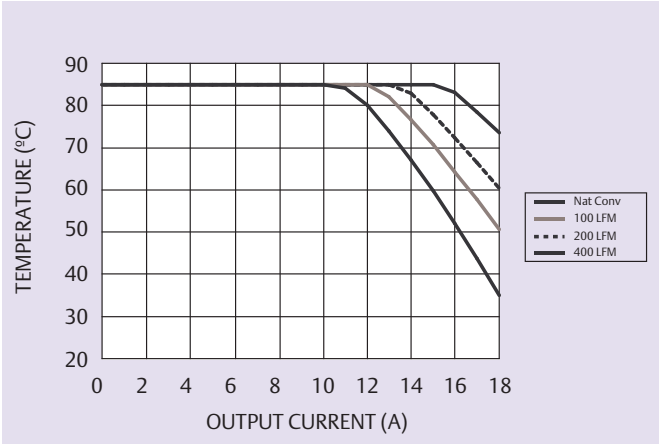


Figure 2 - Safe Operating Area
Vin = 12 V, Output Voltage = 3.3 V (See Note A)

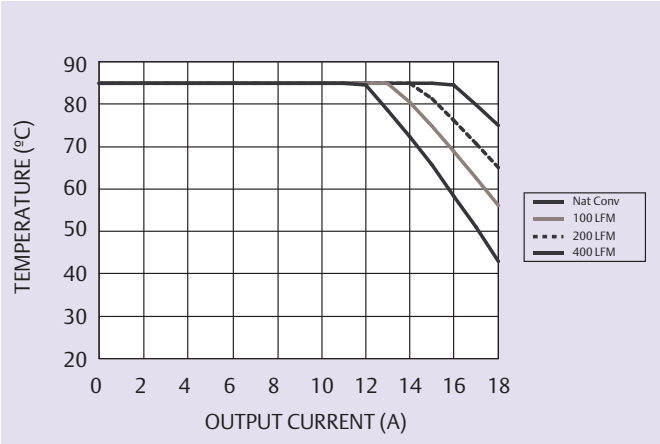


Figure 3 - Safe Operating Area
Vin = 12 V, Output Voltage ≤ 1.8 V (See Note A)

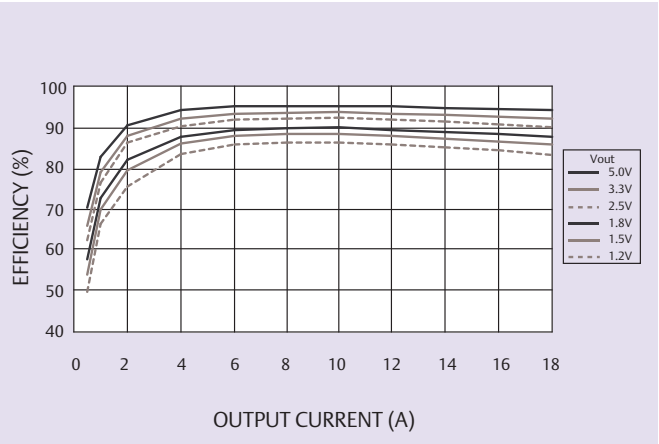


Figure 4 - Efficiency vs Load Current
Vin = 12 V (See Note B)

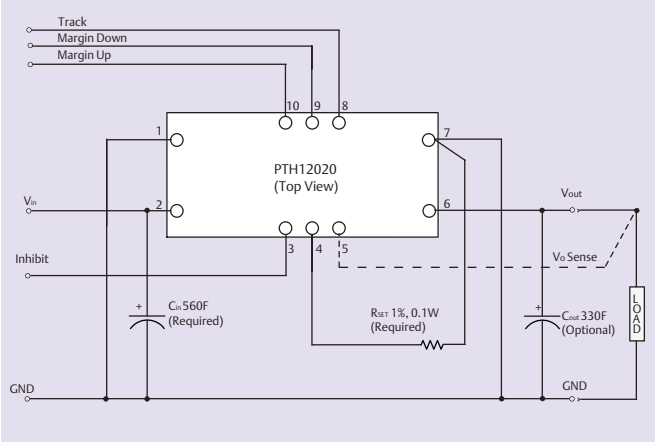


Figure 5 - Standard Application

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.

PTH12020L Characteristic Data

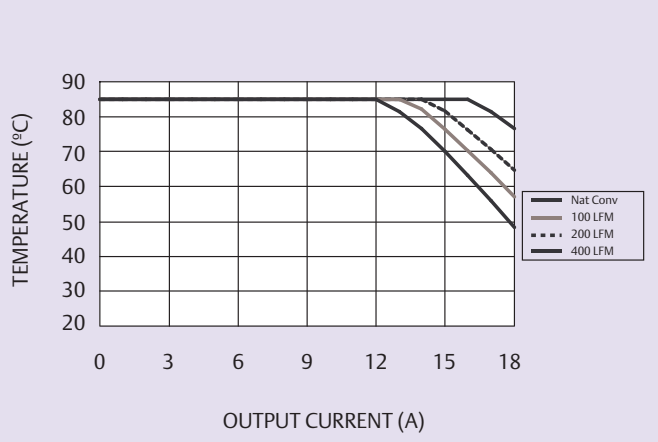


Figure 6 - Safe Operating Area for PTH12020L
Vin = 12 V, Output Voltage = 1.8 V (See Note A)

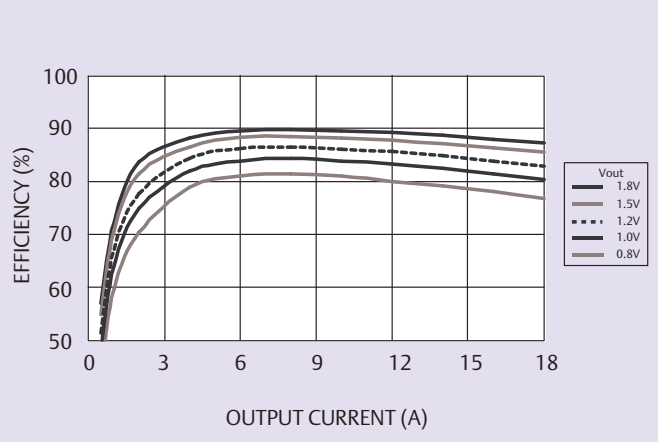


Figure 7 - Efficiency vs Load Current for PTH12020L
Vin = 12 V (See Note B)

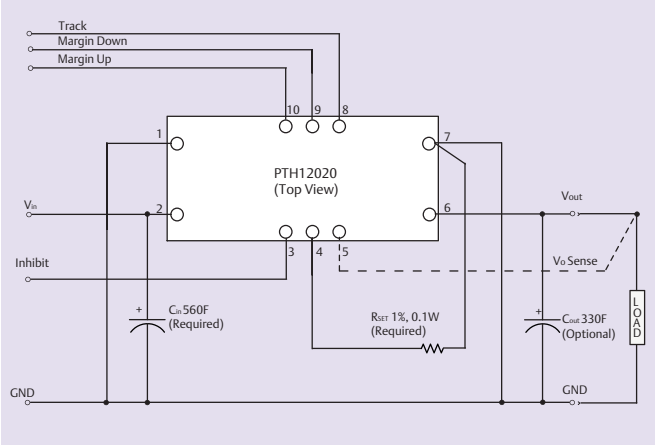


Figure 8 - Standard Application

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

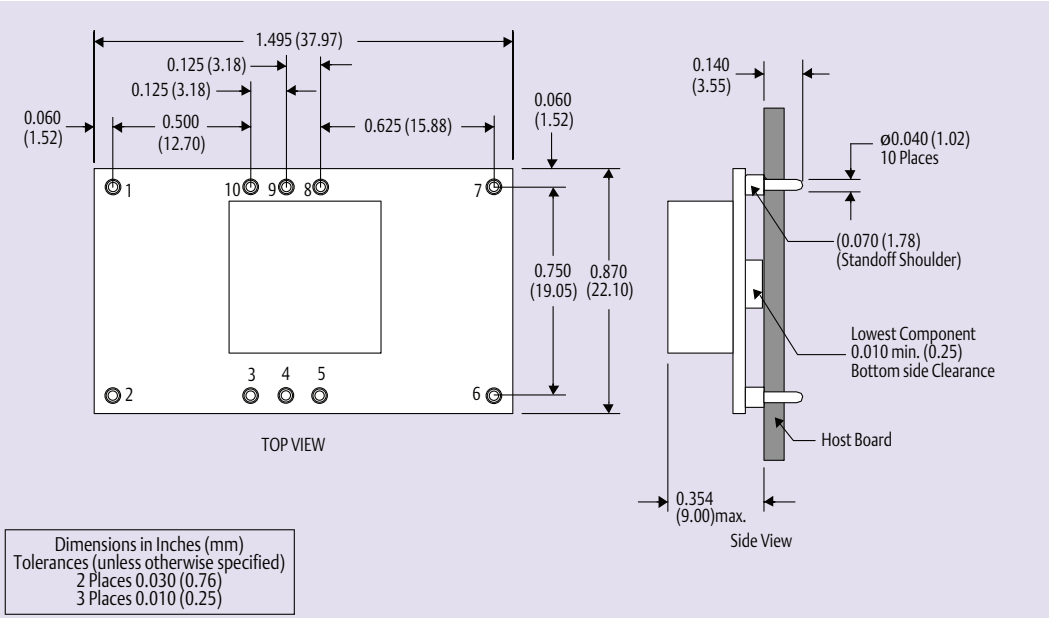


Figure 9 - Plated Through-Hole

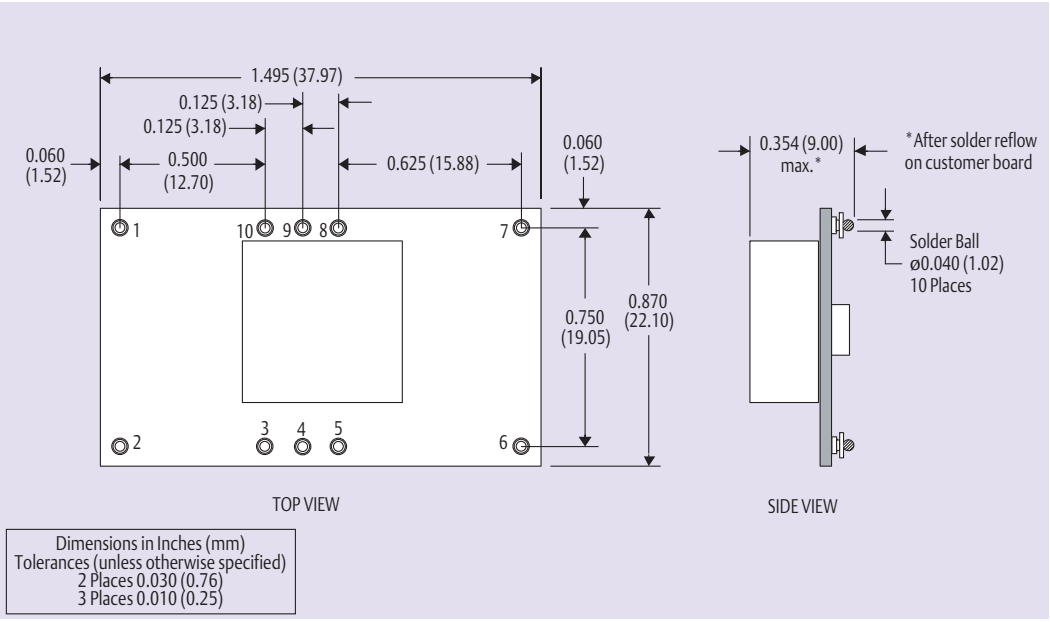


Figure 10 - Surface-Mount

Pin Connections	
Pin No.	Function
Pin 1	Ground
Pin 2	Vin
Pin 3	Inhibit*
Pin 4	Vo adjust
Pin 5	Vo sense

Pin Connections cont.	
Pin No.	Function
Pin 6	Vout
Pin 7	Ground
Pin 8	Track
Pin 9	Margin down*
Pin 10	Margin up*

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

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