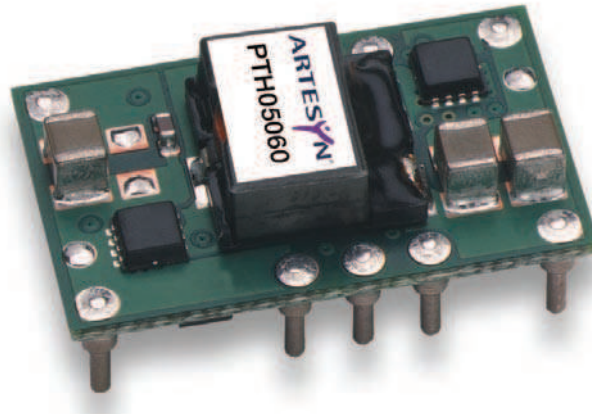


## PTH05060 5 Vin

**Total Power:** 36 Watts  
**# of Outputs:** Single



### Special Features

- 10 A output current
- 5 V input voltage
- Wide-output voltage adjust 0.8 Vdc to 3.6 Vdc
- Auto-track™ sequencing\*
- Margin up/down controls
- Pre-bias start-up capability
- Efficiencies up to 94%
- 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)	4.5 - 5.5 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:		3.7 - 4.3 V typ.
Track input voltage:	Pin 8 (See Note 6 & 7, page 3)	± 0.3 Vin
Output		
Voltage adjustability:	(See Note 4, page 3)	0.8 - 3.6 Vdc
Setpoint accuracy:		± 2.0% Vo
Line regulation:		± 10 mV typ.
Load regulation:		± 12 mV typ.
Total regulation:		± 3.0% Vo
Minimum load:		0 A
Ripple and noise:	20 MHz bandwidth	25 mV pk-pk
Temperature co-efficient:	-40 °C to +85 °C	± 0.5% Vo
Transient response: (See Note 5, page 3)		70 μs recovery time Overshoot/undershoot 100 mV
Margin adjustment:		± 5.0% Vo

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated  
C<sub>in</sub> = 330 μF, C<sub>out</sub> = 0 μF

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



## 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	94% max
Insulation voltage:		Non-Isolated
Switching frequency:		300 kHz typ. ±25 kHz
Approvals and standards:		EN60950, UL/cUL60950
Material flammability:		UL94V-0
Dimensions:	(L x W x H)	25.27 x 15.75 x 9.00 mm 0.995 x 0.620 x 0.354 in
Weight:		3.7g (0.13 oz)
MTBF:	Telcordia SR-332	7,092,000 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

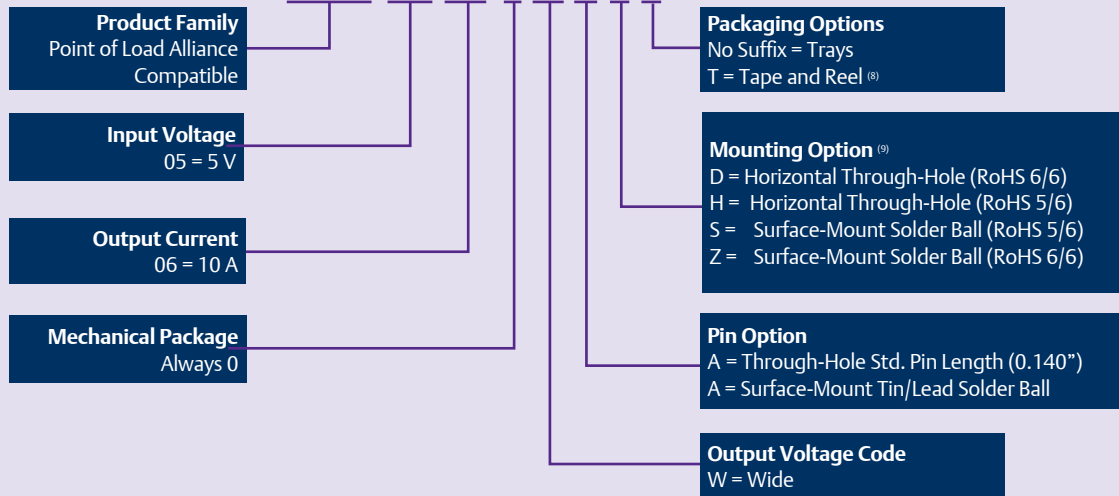
Protection		
Short circuit:	Auto reset	20 A typ.

## Ordering Information

Output Power (max)	Input Voltage	Output Voltage	Output Currents		Efficiency (max)	Regulation		Model Numbers <sup>(9, 10)</sup>
			Min	Max		Line	Load	
36 W	4.5 - 5.5 Vdc	0.8 - 3.6 Vdc	0 A	10 A	94%	± 10 mV	± 12 mV	PTH05060

## Part Number System with Options

**PTH05060WAST**



## Output Voltage Adjustment of the PTH05060 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH05060. 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 3.6 Vdc. When the PTH05060 converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

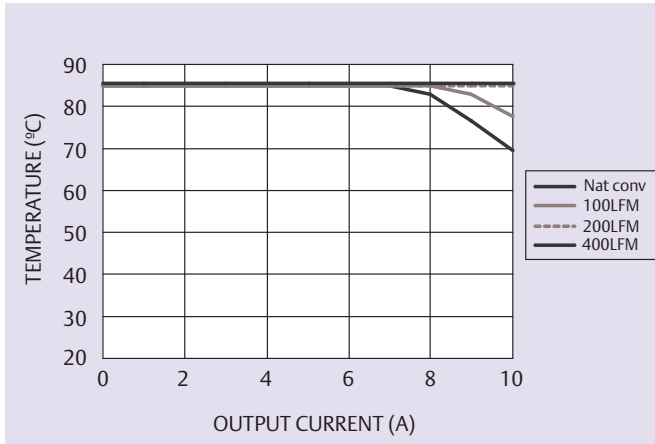
Efficiency Table ( $I_O = 7\text{ A}$ )

Output Voltage	Efficiency
$V_O = 1.0\text{ V}$	85%
$V_O = 1.2\text{ V}$	86%
$V_O = 1.5\text{ V}$	89%
$V_O = 1.8\text{ V}$	90%
$V_O = 2.0\text{ V}$	91%
$V_O = 2.5\text{ V}$	92%
$V_O = 3.3\text{ V}$	94%

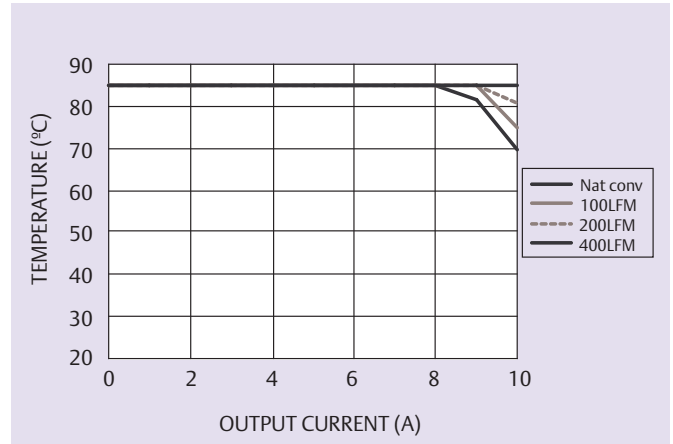
## Notes

- Remote ON/OFF. Positive Logic  
ON: Pin 3 open; or  $V > V_{in} - 0.5\text{ V}$   
OFF: Pin 3 GND; or  $V < 0.8\text{ V}$  (min - 0.2 V).
- See Figures 1 and 2 for safe operating curves.
- A 330  $\mu\text{F}$  electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 500 mA rms of ripple current.
- An external output capacitor is not required for basic operation. Adding 330  $\mu\text{F}$  of distributed capacitance at the load will improve the transient response.
- 1 A/ $\mu\text{s}$  load step, 50 to 100%  $I_{Omax}$ ,  $C_{out} = 330\ \mu\text{F}$ .
- If utilized  $V_{out}$  will track applied voltage by  $\pm 0.3\text{ V}$  (up to  $V_O$  set point).
- The pre-bias start-up feature is not compatible with Auto-Track™. This is because when the module is under Auto-Track™ control, it is fully active and will sink current if the output voltage is below that of a back-feeding source. Therefore to ensure a pre-bias hold-off, one of the following two techniques must be followed when input power is first applied to the module. The Auto-Track™ function must either be disabled, or the module's output held off using the inhibit pin. Refer to Application Note 159 for more details.
- Tape and reel packaging only available on the surface-mount versions.
- To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH05060WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH05060WAD.
- 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.

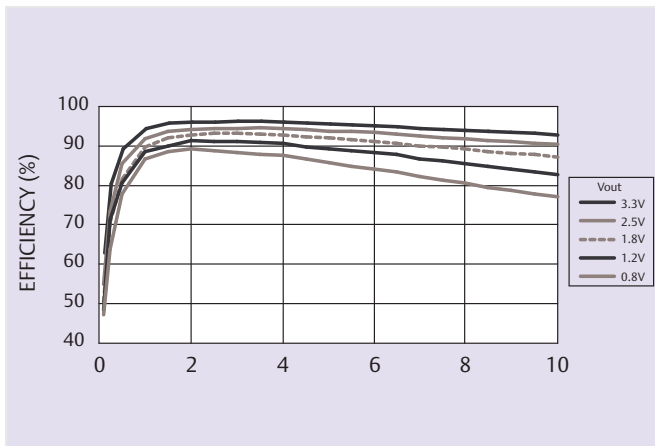
## Characteristic Data



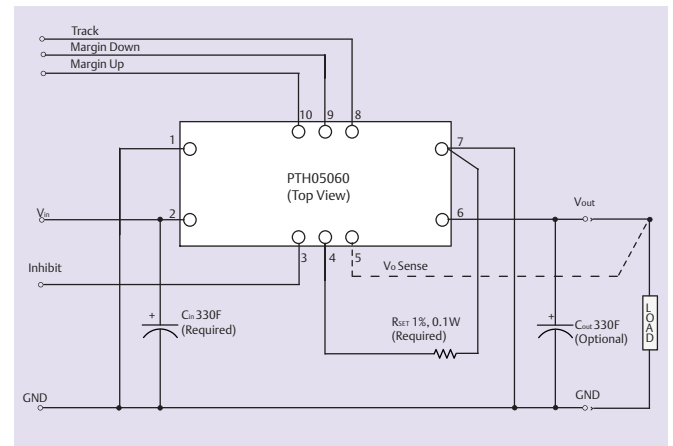
**Figure 1 - Safe Operating Area**  
Vin = 5 V, Output Voltage = 3.3 V (See Note A)



**Figure 2 - Safe Operating Area**  
Vin = 5 V, Output Voltage = 1.0 V (See Note A)



**Figure 3 - Efficiency vs Load Current**  
Vin = 5 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

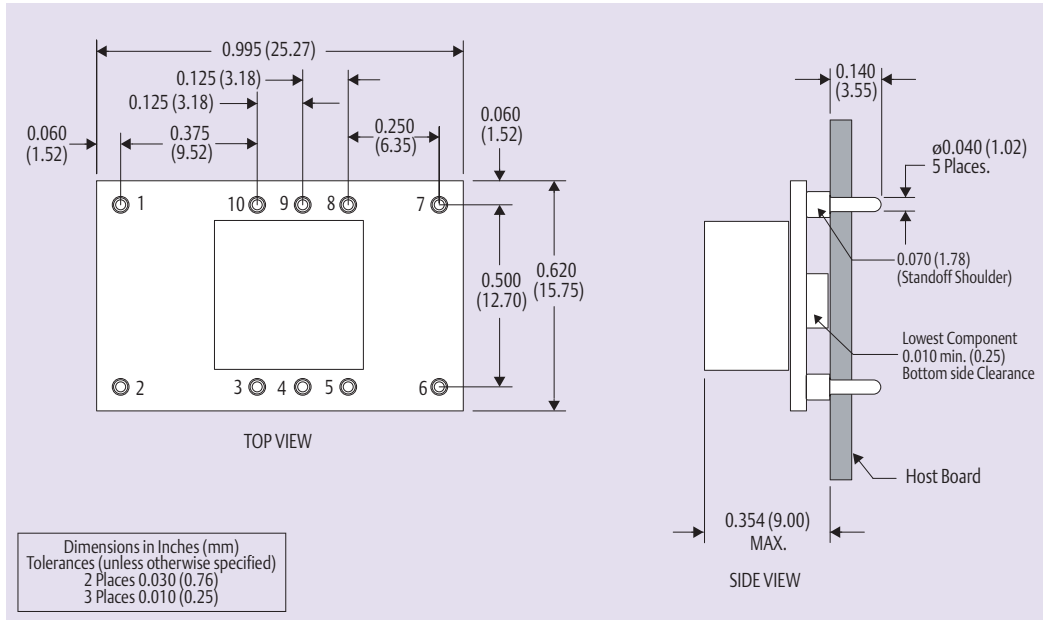


Figure 5 - Plated Through-Hole

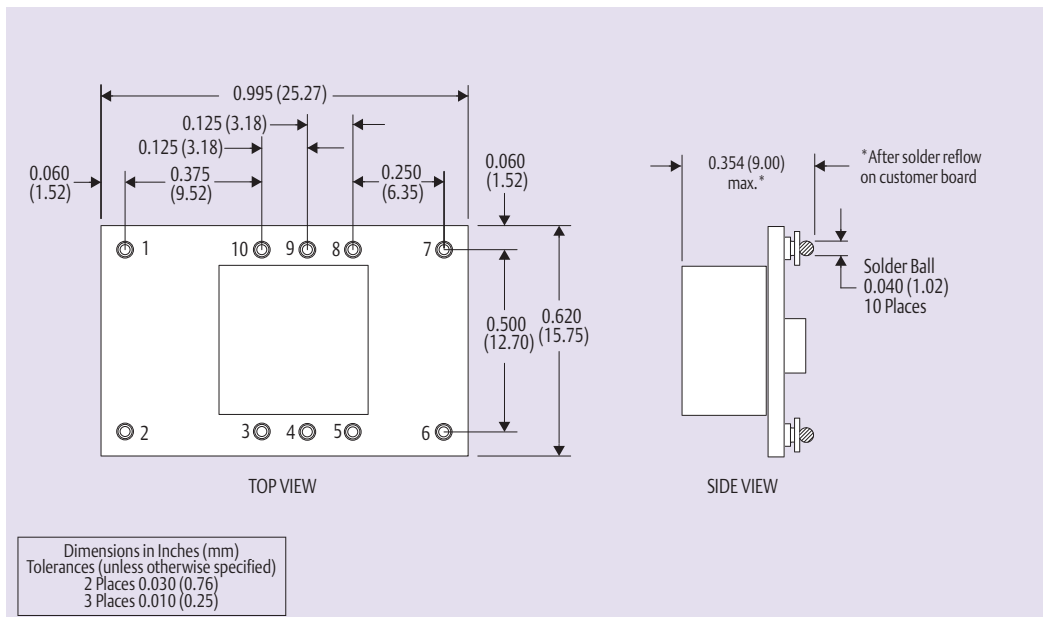


Figure 6 - Surface-Mount

Pin Connections	
Pin No.	Function
Pin 1	Ground
Pin 2	Vin
Pin 3	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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