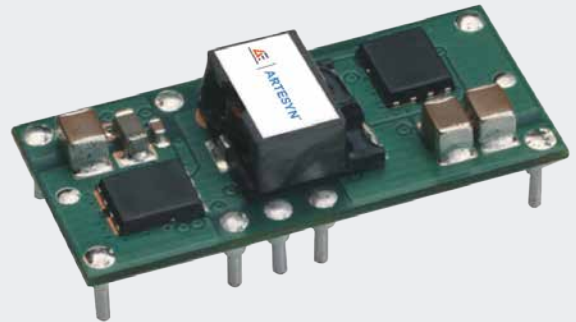


ARTESYN PTH05010

5 Vin Single Output



Advanced Energy's Artesyn PTH05010 series non-isolated DC-DC converter complies with the Point-of-Load Alliance (POLA) standard. It offers some of the most advanced POL functions in the industry, including Auto-Track™ sequencing for controlled power-up/power-down of complex semiconductor devices such as DSPs, FPGAs and ASICs, and voltage margining. Standard features include pre-bias startup, input undervoltage lockout, remote sense, remote On/Off and auto resetting short-circuit protection.

PTH05010 series converters have an input voltage range of 4.5 to 5.5 Vdc and an output voltage that can be trimmed from 0.8 to 3.6 Vdc to meet a wide variety of semiconductor power needs. Rated at 54 watts, the converters offer up to 95% efficiency and can deliver up to 15 amps. Available in through-hole horizontal mount and surface-mount versions, they have a small 0.62 x 1.37 inch (15.7 x 34.8 mm) footprint and an installed height of just 0.35 inch (9 mm).

SPECIAL FEATURES

- 15 A output current
- 5 V input voltage
- Wide-output voltage adjust (0.8 V - 3.6 V)
- Auto-track™ sequencing*
- Margin up/down controls
- Pre-bias start-up capability
- Efficiencies up to 95%
- Output ON/OFF inhibit
- Output voltage sense

- 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. B04 06 38572 044
- CB report and certificate to IEC60950, Certificate No. US/8292/UL

DATA SHEET

Total Power:

54 Watts

of Outputs:

Single



*Auto-track is a trademark of Texas Instruments.

ELECTRICAL SPECIFICATIONS

Input		
Input voltage range	(See Note 3)	4.5 - 5.5 Vdc
Input current	No load	10 mA typical
Remote ON/OFF	(See Note 1)	Positive logic
Undervoltage lockout		3.7 - 4.3 V typical
Track input voltage	Pin 8 (See Note 6 & 7)	±0.3 Vin
Output		
Voltage adjustability	(See Note 4)	0.8 - 3.6 Vdc
Setpoint accuracy		±2.0% Vo
Line regulation		±10 mV typical
Load regulation		±12 mV typical
Total regulation		±3.0% Vo
Minimum load		0 A
Ripple and noise	20 MHz bandwidth	30 mV typical
Temperature co-efficient	-40 °C to +85 °C	±0.5% Vo
Transient response	(See Note 5)	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.
Cin = 470 µF, Cout = 0 µF.

GENERAL SPECIFICATIONS

Efficiency	(See Efficiency Table)	95% max.
Insulation voltage		Non-isolated
Switching frequency		275 - 325 kHz
Approvals and standards		EN60950, UL/cUL60950
Material flammability		UL94V-0
Dimensions	L x W x H	34.80 x 15.75 x 9.00 mm 1.370 x 0.620 x 0.354 in
Weight		5 g (.18 oz)
MTBF	Telcordia SR-332	7,092,000 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	27.5 A typical
Thermal		Auto recovery

ORDERING INFORMATION

Model Number ^(®)	Output Power (Max.)	Input Voltage	Output Voltage	Output Current (Min.)	Output Current (Max.)	Efficiency (Typical)	Regulation	
							Line	Load
PTH05010	54 W	4.5 - 5.5 Vdc	0.8 - 3.6 V	0 A	15 A	95%	±10 mV	±12 mV

PART NUMBER SYSTEM WITH OPTIONS

Product Family	Input Voltage	Output Current	Mechanical Package	Output Voltage Code	Pin Option	Mounting Options	Pin Option
PTH	05	01	0	W	A	S	T
Point-of-Load Alliance compatible	05 = 5 V	01 = 15 A	Always 0	W = Wide		D = Horizontal throughhole (RoHS 6/6) Z = Surface-mount solder ball (RoHS 6/6)	No Suffix = Trays T = Tape and Reel ^(®)

OUTPUT VOLTAGE ADJUSTMENT

The ultra-wide output voltage trim range offers major advantages to users who select the PTH05010. 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 2.5 Vdc. When the PTH05010 converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

Efficiency Table (Io = 45 A; Vin = 5 V)	
Output Voltage	Efficiency
Vo = 1.0 V	86%
Vo = 1.2 V	88%
Vo = 1.5 V	90%
Vo = 1.8 V	91%
Vo = 2.0 V	92%
Vo = 2.5 V	93%
Vo = 3.3 V	95%

Notes:

- Remote ON/OFF, Positive Logic
 ON: Pin 3 open; or $V > V_{in} - 0.5 V$
 OFF: Pin 3 GND; or $V < 0.8 V$ (min - 0.2 V).
- See Figures 1 & 2 for safe operating curves.
- A 470 μF electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 700 mA rms of ripple current.
- An external output capacitor is not required for basic operation. Adding 330 μF of distributed capacitance at the load will improve the transient response.
- 1 A/ μs load step, 50 to 100% I_{o max}, C_{out} = 330 μF .
- If utilized V_{out} will track applied voltage by $\pm 0.3 V$ (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 155 for more details.
- Tape and reel packaging only available on the surface-mount versions.
- 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.

OUTPUT VOLTAGE ADJUSTMENT (CONTINUED)

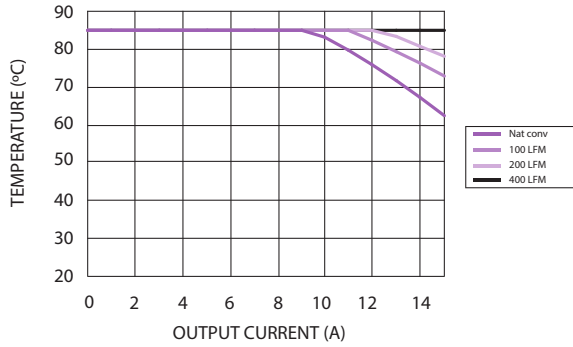


Figure 1 - Safe Operating Area
 Vin = 5 V, Output Voltage = 3.3 V (See Note A)

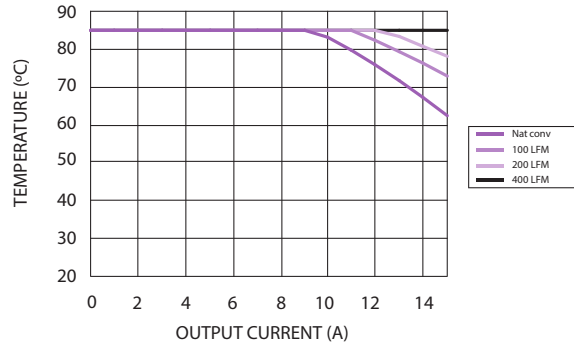


Figure 2 - Safe Operating Area
 Vin = 5 V, Output Voltage = 1.0 V (See Note A)

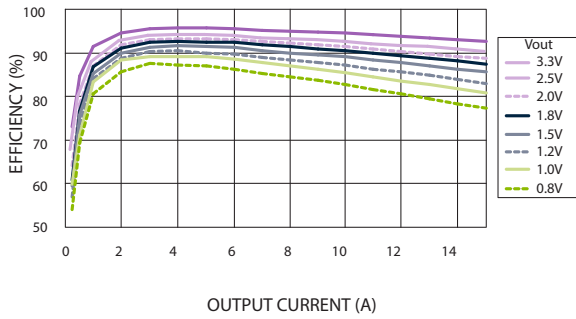


Figure 3 - Efficiency vs Load Current
 Vin = 5 V (See Note B)

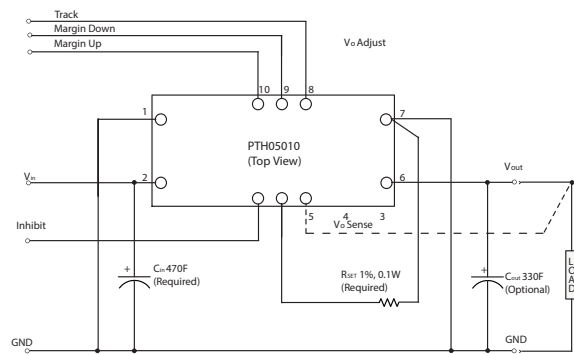


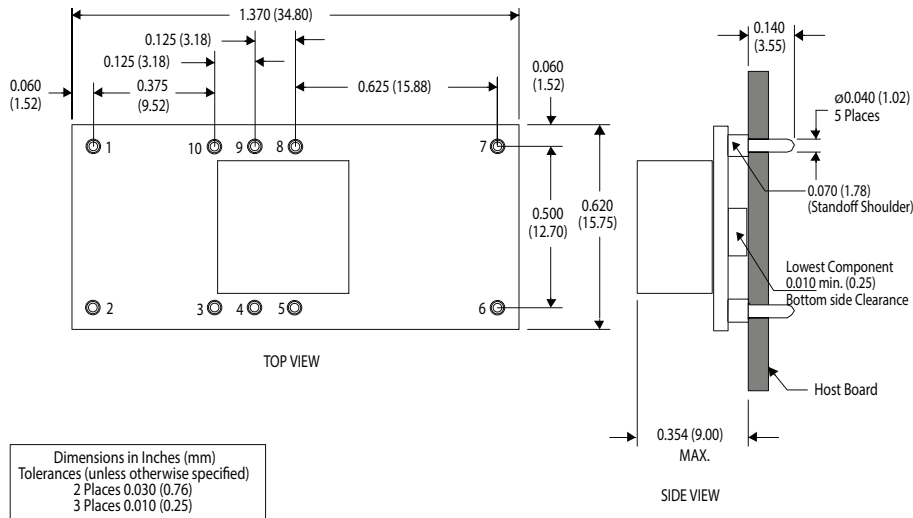
Figure 4 - Standard Application

Notes:

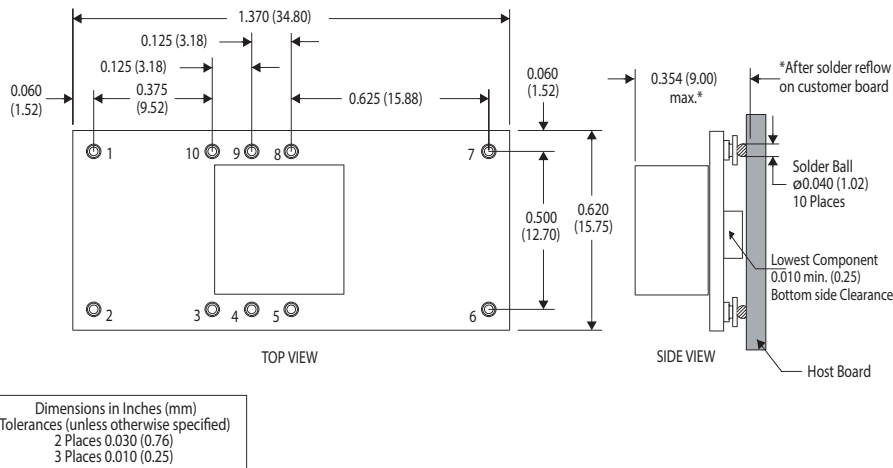
- A. SOA curves represent the conditions at which internal components are within the Artesyn derating guidelines.
- B. Characteristic data has been developed from actual products tested at 25 °C. This data is considered typical data for the converter.

MECHANICAL DRAWINGS

Plated through-hole



Surface-mount



Pin Assignments	
Pin	Function
1	Ground
2	Vin
3	Inhibit*
4	Vo adjust
5	Vo sense
6	Vout
7	Ground
8	Track
9	Margin down*
10	Margin up*
*Denotes negative logic: Open = Normal operation Ground = Function active	



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Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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