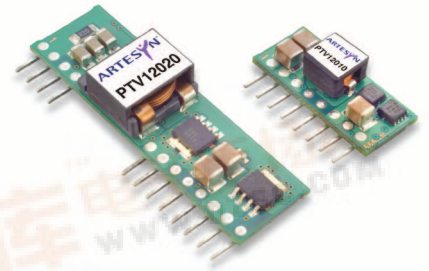


- 18 A output current
- 5 V input voltage
- Wide-output voltage adjust (0.8 Vdc to 3.6 Vdc)
- Auto-track™ sequencing\*
- Pre-bias start-up
- Efficiencies up to 96%
- Output ON/OFF inhibit
- Output voltage sense
- Vertical through-hole mounting
- Point-of-Load-Alliance (POLA) compatible
- Undervoltage lockout
- Available RoHS compliant



2 YEAR WARRANTY

The PTV05020 is a non-isolated dc-dc converter from Artesyn under the Point of Load Alliance (POLA) standard. The vertical mounting option of the PTV05020 module provides performance in less than 20% of the space that is required by alternative solutions. The Auto-Track™ feature provides for sequencing between multiple modules, a function, which is becoming a necessity for powering advanced silicon including DSP's, FPGA's and ASIC's requiring controlled power-up and power-down. The PTV05020 has an input voltage of 4.5 Vdc to 5.5 Vdc and offers a wide 0.8 Vdc to 3.6 Vdc output voltage range with up to 18 A output current, which allows for maximum design flexibility and a pathway for future upgrades.

All specifications are typical at nominal input, full load at 25 °C  $V_o = 3.3$  V unless otherwise stated  
 $C_{in} = 680 \mu F$  and  $22 \mu F$  (Ceramic),  $C_{out} = 0 \mu F$

## SPECIFICATIONS

## OUTPUT SPECIFICATIONS

Voltage adjustability	(See Note 4)	0.8-3.6 Vdc
Setpoint accuracy	(See Note 4)	$\pm 2.0\%$ $V_o$
Line regulation		$\pm 5$ mV typ.
Load regulation		$\pm 5$ mV typ.
Total regulation	(See Note 4)	$\pm 3.0\%$ $V_o$
Minimum load		0 A
Ripple and noise	20 MHz bandwidth	20 mV pk-pk
Temperature co-efficient	-40 °C to +85 °C	$\pm 0.5\%$ $V_o$
Transient response (See Note 5)	70 $\mu s$ recovery time Overshoot/undershoot 120 mV	

## INPUT SPECIFICATIONS

Input voltage range	(See Note 3)	4.5-5.5 Vdc
Input standby current		10 mA typ.
Remote ON/OFF	(See Note 1)	Positive logic
Undervoltage lockout	Increasing	4.3 V typ
Track input current	Pin 9 (See Note 6, 7)	-0.13 mA

## GENERAL SPECIFICATIONS

Efficiency	(See Efficiency Table)	96% max.
Insulation voltage		Non-isolated
Switching frequency	250-340 kHz	300 kHz typ.
Approvals and standards		EN60950 UL/cUL60950
Material flammability		UL94V-0
Dimensions	(L x W x H)	44.45 x 9.39 x 12.70 mm 1.75 x 0.37 x 0.50 in
Weight		5.5 g (0.19 oz)
MTBF	Telcordia SR-332	5,000,000 hours

## ENVIRONMENTAL SPECIFICATIONS

Thermal performance (See Note 2)	Operating ambient, temperature Non-operating	-40 °C to +85 °C -40 °C to +125 °C
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## PROTECTION

Overcurrent	Auto reset	35 A typ.
Overtemperature		Auto recovery

OUTPUT POWER (MAX.)	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (MIN.) (2)	OUTPUT CURRENT (MAX.)	EFFICIENCY (MAX.)	REGULATION		MODEL NUMBER (9,10)
						LINE	LOAD	
64.8 W	4.5-5.5 Vdc	0.8-3.6 Vdc	0 A	18 A	96%	±5 mV	±5 mV	PTV05020W

## Part Number System with Options

**PTV05020WAH**

**Product Family**  
Point of Load Alliance  
Compatible

**Mounting Version**  
V = Vertical

**Input Voltage**  
05 = 5 V

**Output Current**  
02 = 18 A

**Mechanical Package**  
Always 0

**Mounting Style (9)**  
D = Horizontal Through-Hole (Matte Sn)  
H = Horizontal Through-Hole (Sn/Pb)

**Pin Style**  
A = Through-Hole Std. Pin Length (0.140")

**Output Voltage Code**  
W = Wide

### Output Voltage Adjustment of the PTV05020 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTV05020. 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 PTV05020 converter leaves the factory the output has been adjusted to the default voltage of 0.8 V

## Notes

- Remote ON/OFF. Positive logic  
ON: Pin 3 open; or  $V > V_{in} - 0.5 V$   
OFF: Pin 3 GND; or  $V < 0.6 V$
- See Figure 1 for safe operating curve.
- A 680  $\mu F$  electrolytic input capacitor is required for proper operation as well as a 22  $\mu F$  high-frequency ceramic capacitor. The electrolytic capacitor must be rated for a minimum of 750 mA rms of ripple current.
- An external output capacitor is not required for basic operation. Adding 330  $\mu F$  of distributed capacitance at the load will improve the transient response.
- 1 A/ $\mu s$  load step, 50 to 100%  $I_{Omax}$ ,  $C3 = 330 \mu F$ .
- 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 198 for more details.
- 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°C or better temperature stability.
- To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTV05020WAD.
- 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/powergroup/products.htm> to find a suitable

EFFICIENCY TABLE ( $I_O = I_{Omax}$ )	
OUTPUT VOLTAGE	EFFICIENCY
$V_o = 3.3 V$	94%
$V_o = 2.5 V$	93%
$V_o = 1.8 V$	90%
$V_o = 1.5 V$	89%
$V_o = 1.2 V$	87%
$V_o = 1.0 V$	85%

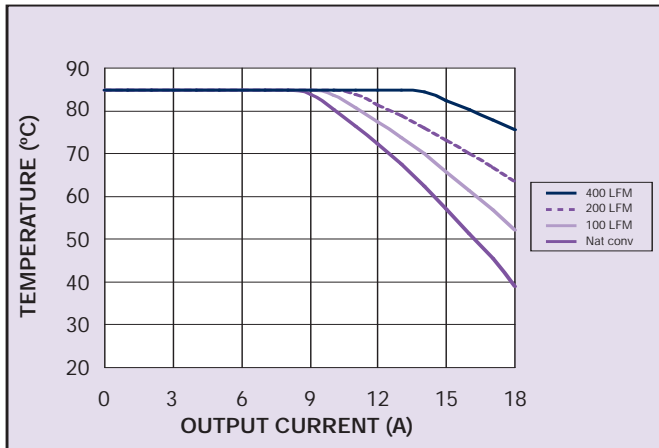


Figure 1 - Safe Operating Area  
Vin = 5 V, Output Voltage = 3.3 V (See Note A)

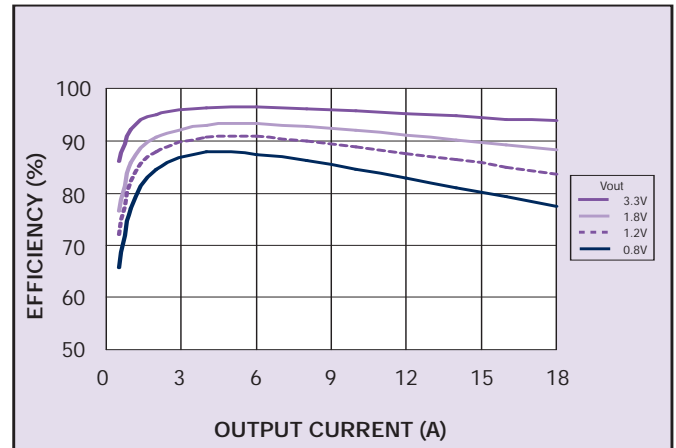


Figure 2 - Efficiency vs Load Current  
Vin = 5 V (See Note B)

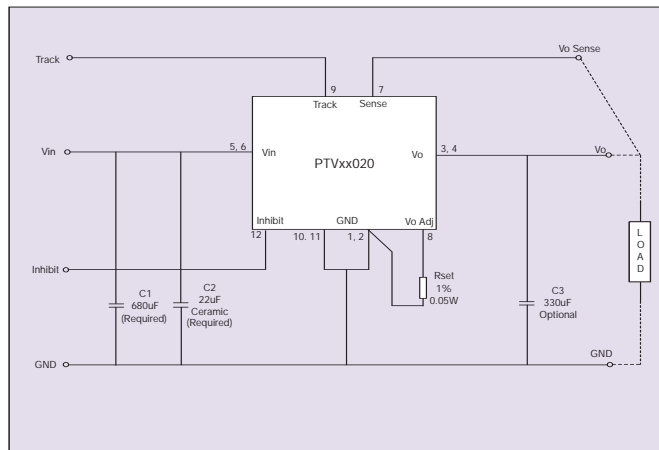
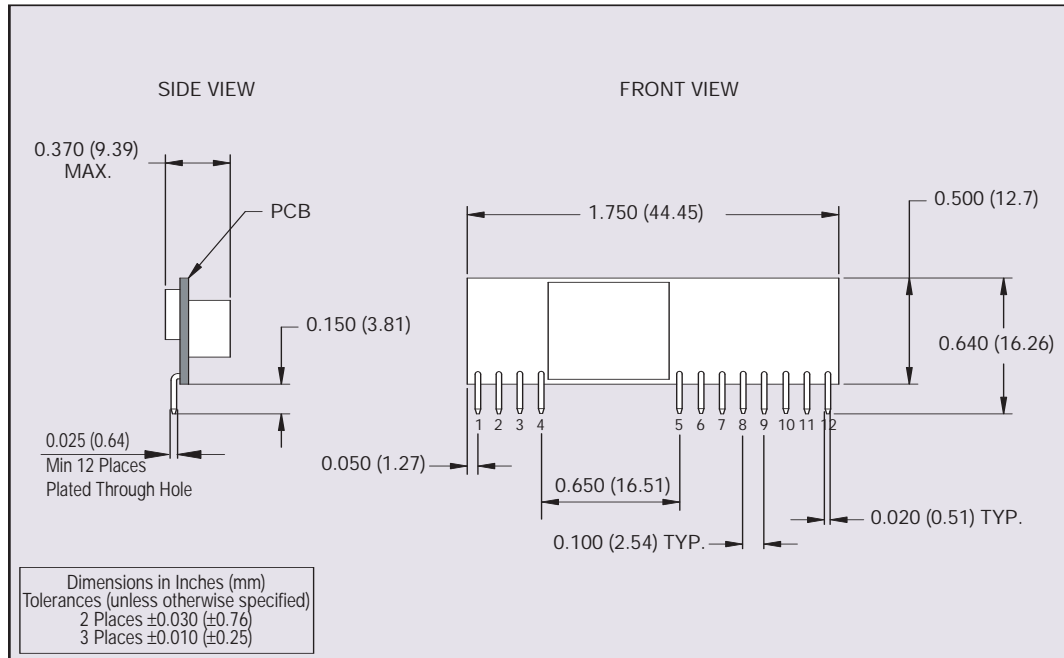


Figure 3 - Standard Application

## 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.



PIN CONNECTIONS	
PIN NO.	FUNCTION
1	Ground
2	Ground
3	Vout
4	Vout
5	Vin
6	Vin
7	Vo Sense
8	Vo Adjust
9	Track
10	Ground
11	Ground
12	Inhibit

Figure 4 - Mechanical Drawing and Pinout Table