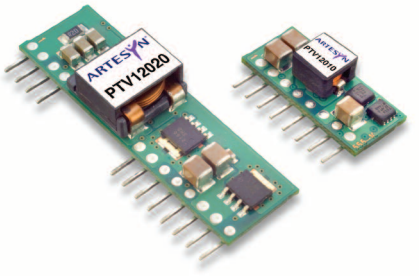
# PTV05020

## 5 Vin single output

DC-DC CONVERTERS | POLA Non-isolated | 1

NEW Product

- **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**




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.

2 YEAR WARRANTY

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

## SPECIFICATIONS

### OUTPUT SPECIFICATIONS

| | | |
|---|---|---|
| Voltage adjustability | (See Note 4) | 0.8-3.6 Vdc |
| Setpoint accuracy | (See Note 4) | ±2.0% Vo |
| Line regulation | | ±5 mV typ. |
| Load regulation | | ±5 mV typ. |
| Total regulation | (See Note 4) | ±3.0% Vo |
| Minimum load | | 0 A |
| Ripple and noise | 20 MHz bandwidth | 20 mV pk-pk |
| Temperature co-efficient | -40 ºC to +85 ºC | ±0.5% Vo |
| Transient response (See Note 5) | | 70 µs 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 | -40 ºC to +85 ºC |
| | Non-operating | -40 ºC to +125 ºC |

### PROTECTION

| | | |
|---|---|---|
| Overcurrent | Auto reset | 35 A typ. |
| Overtemperature | | Auto recovery |

**International Safety Standard Approvals**

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

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

# PTV05020

## 5 Vin single output

Point-of-Load Alliance

ARTESYN TECHNOLOGIES



For the most current data and application support visit www.artesyn.com/powergroup/products.htm

NEW Product

| 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

**P T V 0 5 0 2 0 W A H**

**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

1. Remote ON/OFF. Positive logic
   ON: Pin 3 open; or V > Vin - 0.5 V
   OFF: Pin 3 GND; or V < 0.6 V
2. See Figure 1 for safe operating curve.
3. A 680 µF electrolytic input capacitor is required for proper operation as well as a 22 µF high-frequency ceramic capacitor. The electrolytic capacitor must be rated for a minimum of 750 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% $I_{omax}$, C3 = 330 µF.
6. If utilized Vout will track applied voltage by ±0.3 V (up to Vo set point).
7. 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.
8. 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/ºC or better temperature stability.
9. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTV05020WAD.
10. 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 alternative.

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

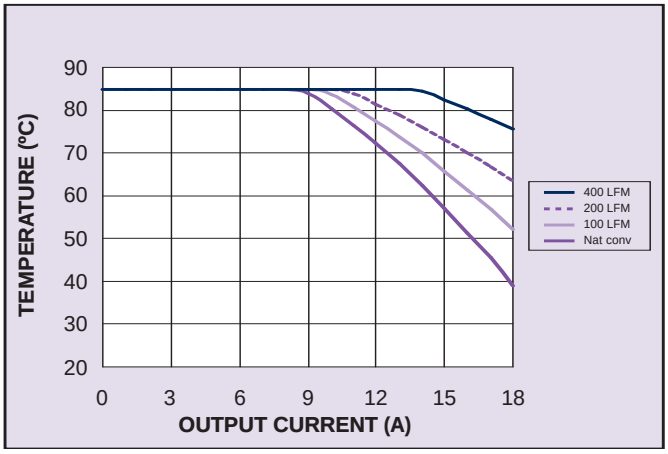



**Figure 1 - Safe Operating Area**
**Vin = 5 V, Output Voltage = 3.3 V (See Note A)**

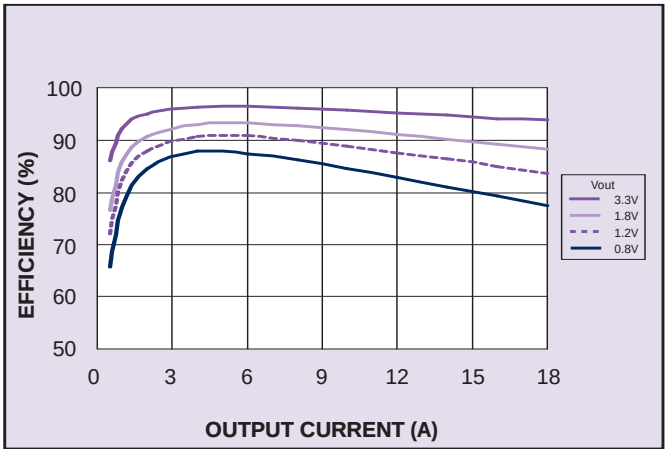



**Figure 2 - Efficiency vs Load Current**
**Vin = 5 V (See Note B)**

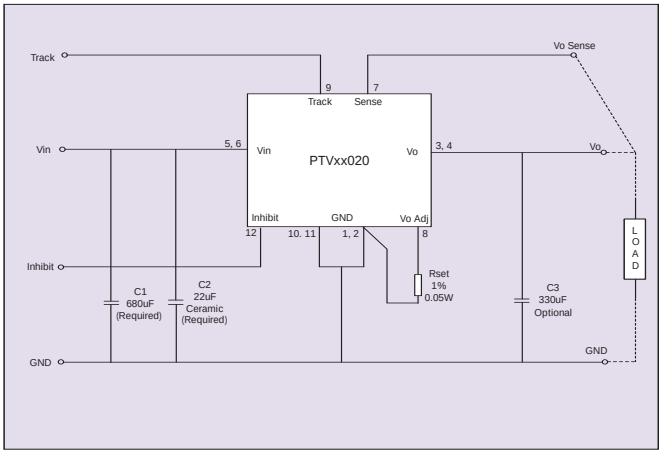
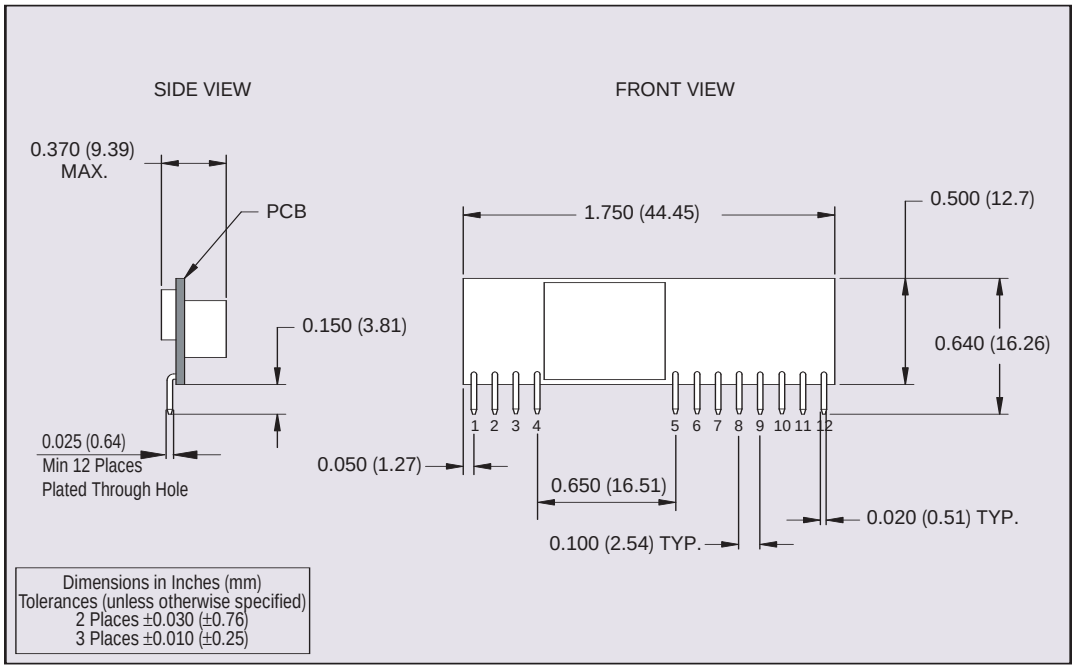



**Figure 3 - Standard Application**

## 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**

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