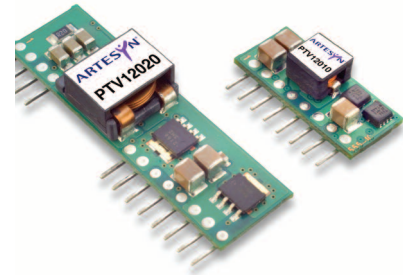




- 16 A output current
- 12 V input voltage
- Wide-output voltage adjust
  - 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L'
- Auto-track™ sequencing\*
- Pre-bias start-up
- Efficiencies up to 93%
- Output ON/OFF inhibit
- Vertical through-hole mounting
- Point-of-Load-Alliance (POLA) compatible
- Undervoltage lockout
- Available RoHS compliant



The PTV12020 is a non-isolated dc-dc converter from Artesyn under the Point of Load Alliance (POLA) standard. The vertical mounting option of the PTV12020 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 PTV12020 has an input voltage of 10.8 Vdc to 13.2 Vdc and offers a wide 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L' output voltage range with up to 16 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 unless otherwise stated  
 $C_{in} = 560 \mu F$  (non-ceramic) and  $22 \mu F$  (ceramic),  $C_{out} = 0 \mu F$

## SPECIFICATIONS

### OUTPUT SPECIFICATIONS

Voltage adjustability (See Note 4)	Suffix 'W' Suffix 'L'	1.2-5.5 Vdc 0.8-1.8 Vdc
Setpoint accuracy	(See Note 8)	±2.0% Vo
Line regulation	Suffix 'W' Suffix 'L'	±5 mV typ. ±10 mV typ.
Load regulation	Suffix 'W' Suffix 'L'	±10 mV typ. ±12 mV typ.
Total regulation	(See Note 8)	±3.0% Vo
Minimum load		0 A
Ripple and noise 20 MHz bandwidth	Suffix 'W' $V_o < 2.5 V$ Suffix 'W' $V_o > 2.5 V$ Suffix 'L'	1.0% $V_o$ 1.5% $V_o$ 2.0% $V_o$
Temperature co-efficient	-40 °C to +85 °C	±0.5% Vo
Transient response (See Note 5)		70 $\mu s$ recovery time Overshoot/undershoot 100 mV

### INPUT SPECIFICATIONS

Input voltage range	(See Note 3)	10.8-13.2 Vdc
Input standby current		10 mA typ.
Remote ON/OFF	(See Note 1)	Positive logic
Undervoltage lockout	(Increasing)	9.5 V typ.
Track input current	Pin 9 (See Notes 6, 7)	0.13 mA

### EMC CHARACTERISTICS

Electrostatic discharge	EN61000-4-2, IEC801-2
Conducted immunity	EN61000-4-6
Radiated immunity	EN61000-4-3

### GENERAL SPECIFICATIONS

Efficiency	See Tables on page 2	
Insulation voltage	Non-isolated	
Switching frequency		
Suffix 'W'	250-400 kHz	325 kHz typ.
Suffix 'L'	200-300 kHz	250 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	4,900,000 hours

### ENVIRONMENTAL SPECIFICATIONS

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

### PROTECTION

Overcurrent	Auto reset	30 A typ.
Overtemperature	Auto recovery	

### International Safety Standard Approvals



UL/cUL CAN/CSA-C22.2 No. 60950  
File No. E174104



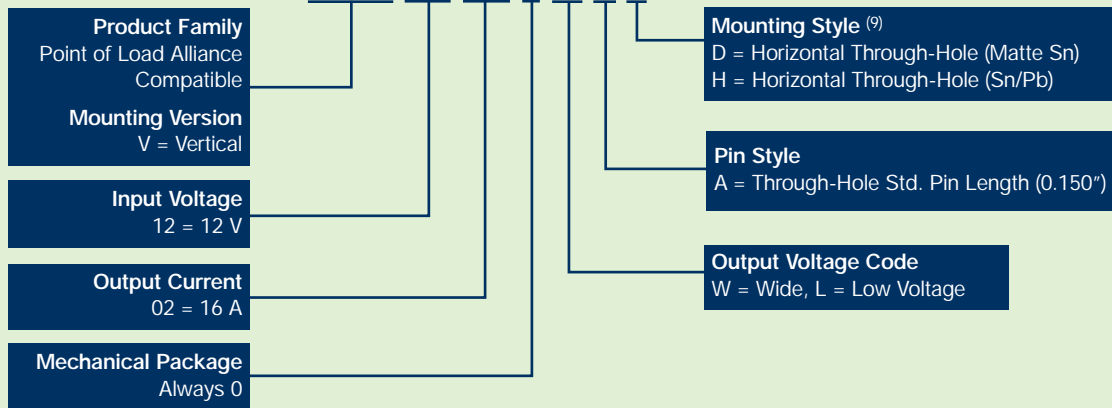
TÜV Product Service (EN60950) Certificate No. B 04 06 38572 044  
CB Report and Certificate to IEC60950, Certificate No. US/8292/UL

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

OUTPUT POWER (MAX.)	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (MIN.)	OUTPUT CURRENT (MAX.) <sup>(2)</sup>	EFFICIENCY (MAX.)	REGULATION		MODEL NUMBER <sup>(9,10)</sup>
						LINE	LOAD	
28.8 W	10.8-13.2 Vdc	0.8-1.8 Vdc	0 A	16 A	89%	±10 mV	±12 mV	PTV12020L
88 W	10.8-13.2 Vdc	1.2-5.5 Vdc	0 A	16 A	94%	±5 mV	±10 mV	PTV12020W

Part Number System with Options

**PTV12020WAH**



**Output Voltage Adjustment of the PTV12020 Series**

The ultra-wide output voltage trim range offers major advantages to users who select the PTV12020. 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 for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L'. When the PTV12020 converter leaves the factory the output has been adjusted to the default voltage of 1.2 V for the PTV12020W and 0.8 V for PTV12020L.

EFFICIENCY TABLE - PTH12020L ( $I_O = I_{OMAX}$ )

OUTPUT VOLTAGE	EFFICIENCY
$V_o = 1.8 V$	87%
$V_o = 1.5 V$	85%
$V_o = 1.2 V$	83%
$V_o = 1.0 V$	80%
$V_o = 0.8 V$	77%

EFFICIENCY TABLE - PTV12020W ( $I_O = I_{OMAX}$ )

OUTPUT VOLTAGE	EFFICIENCY
$V_o = 5.0 V$	93%
$V_o = 3.3 V$	91%
$V_o = 2.5 V$	89%
$V_o = 1.8 V$	86%
$V_o = 1.5 V$	84%
$V_o = 1.2 V$	81%

**Notes**

- Remote ON/OFF. Positive logic  
ON: Pin 3 open; or  $V > 2 V$   
OFF: Pin 3 GND; or  $V < 0.6 V$ .
- See Figures 1, 2, 3 and 6 for safe operating area curves.
- A 560  $\mu F$  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 the minimum 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 199 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. PTV12020WAD.
- 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.

PTV12020W Characteristic Data

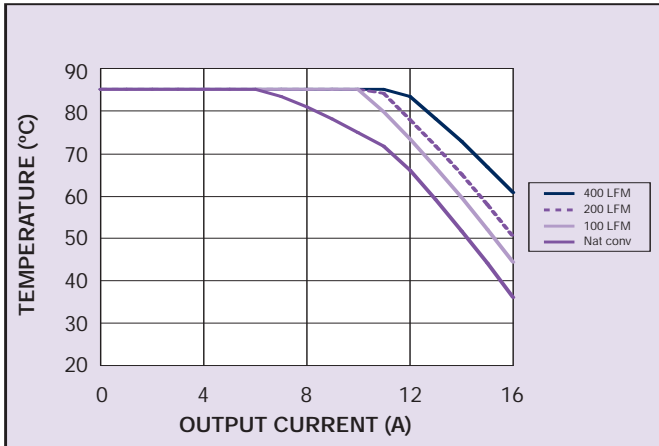


Figure 1 - Safe Operating Area  
Vin = 12 V, Output Voltage = 5 V (See Note A)

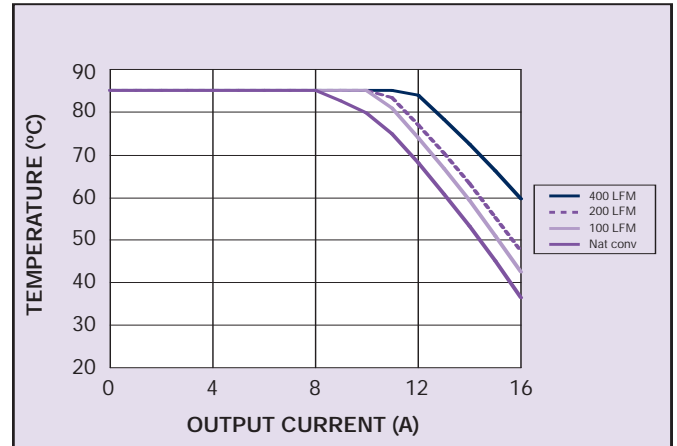


Figure 2 - Safe Operating Area  
Vin = 12 V, Output Voltage = 3.3 V (See Note A)

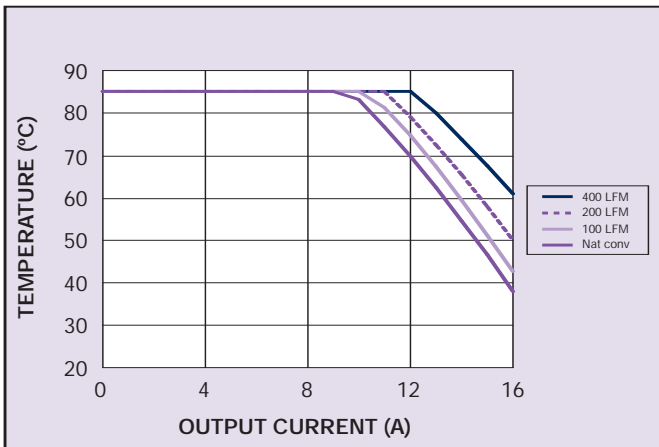


Figure 3 - Safe Operating Area  
Vin = 12 V, Output Voltage = 1.8 V (See Note A)

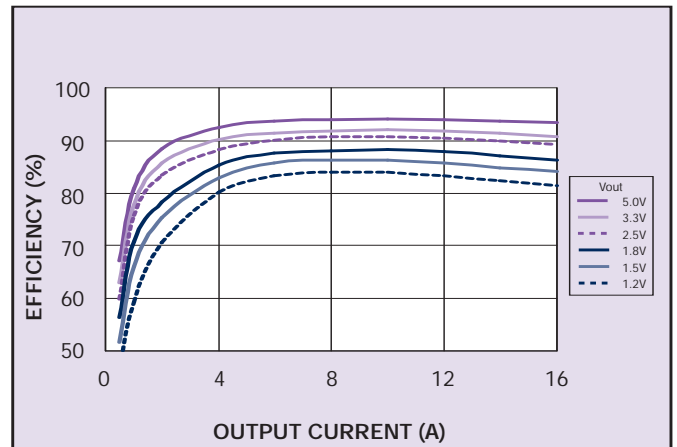


Figure 4 - Efficiency vs Load Current  
Vin = 12 V (See Note B)

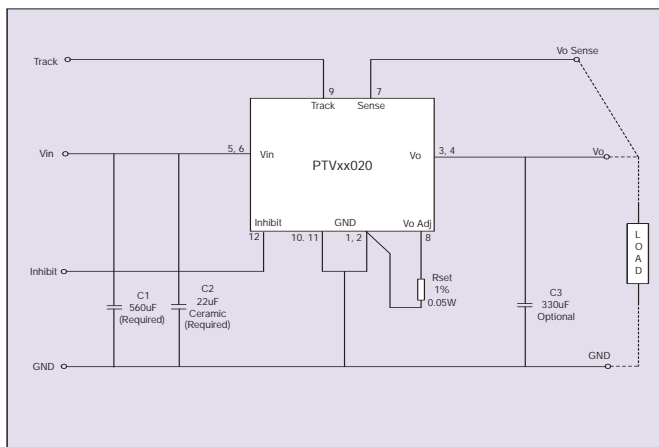


Figure 5 - Standard Application

**Notes**

- A SOA curves represent the conditions at which internal components are within the 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.

PTV12020L Characteristic Data

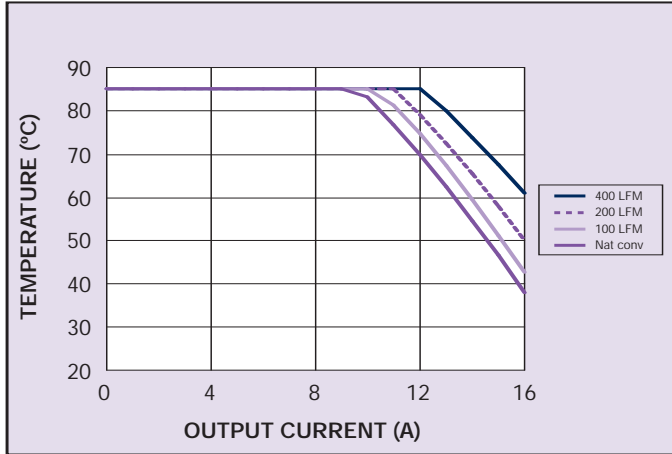


Figure 6 - Safe Operating Area  
Vin = 12 V, Output Voltage = 1.8 V (See Note A)

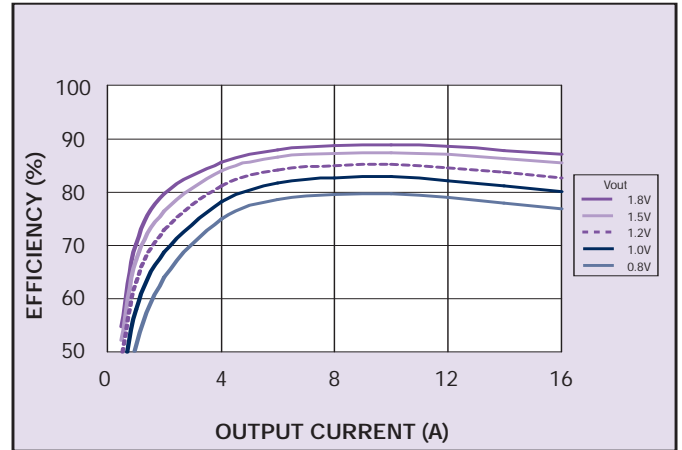


Figure 7 - Efficiency vs Load Current  
Vin = 12 V (See Note B)

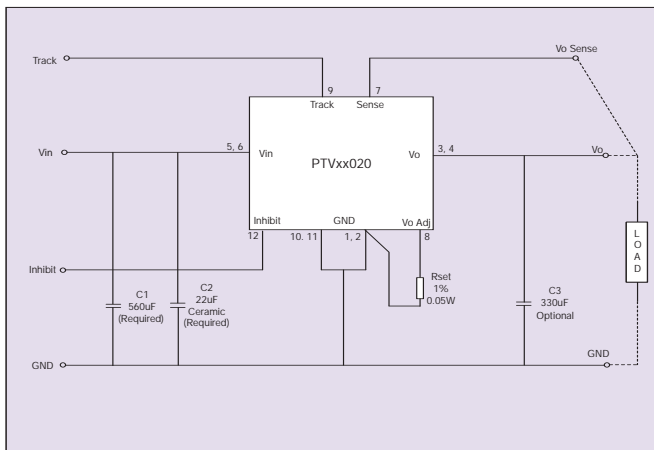
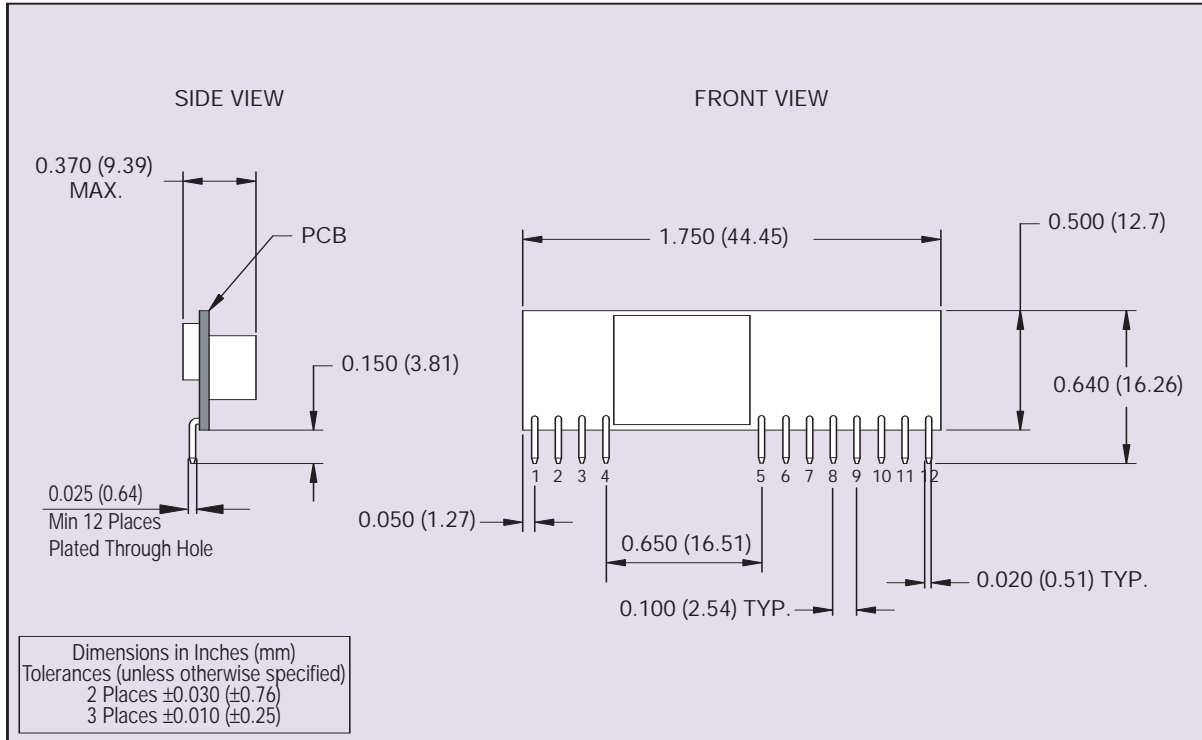


Figure 8 - Standard Application

**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 9 - Mechanical Drawing and Pinout Table

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