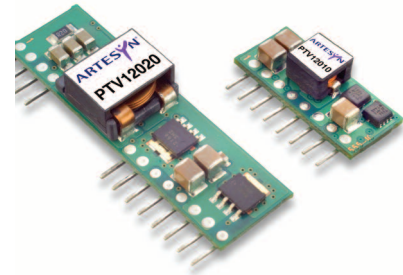




- 16 A output current
- 12 V input voltage
- Wide-output voltage adjust
  - 1.2 Vdc to 5.5 Vdc for suffix 'W' and 0.8 Vdc to 1.8 Vdc for suffix 'L'
- Auto-track™ sequencing\*
- Pre-bias start-up
- Efficiencies up to 93%
- Output ON/OFF inhibit
- Vertical through-hole mounting
- Point-of-Load-Alliance (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 Non-operating	-40 °C to +85 °C -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

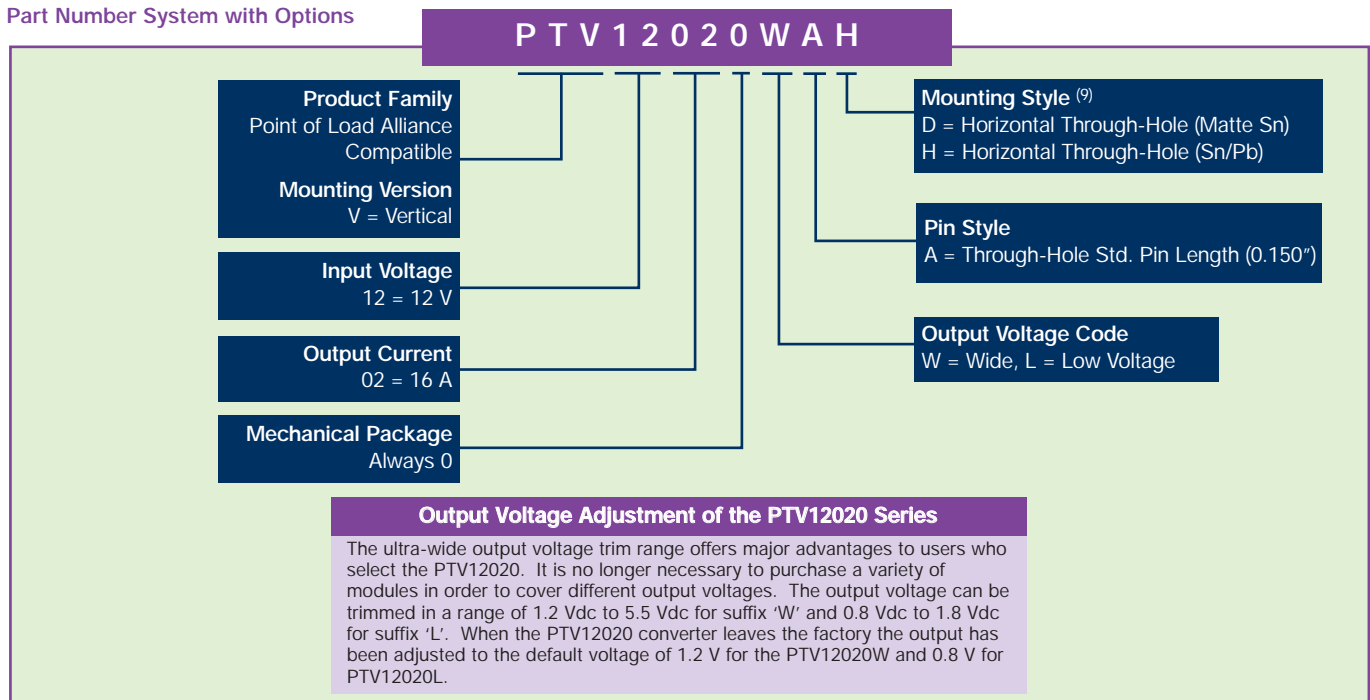


TÜV Product Service (EN60950) Certificate No. B 04 06 38572 044  
CB Report and Certificate to IEC60950, Certificate No. US/8292/UL

\*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



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

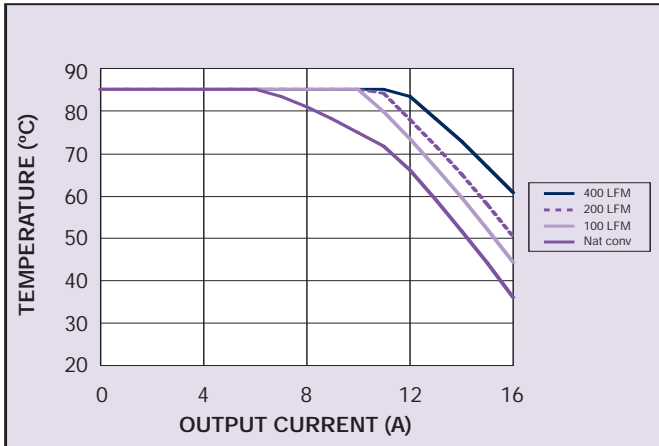


Figure 1 - Safe Operating Area  
Vin = 12 V, Output Voltage = 5 V (See Note A)

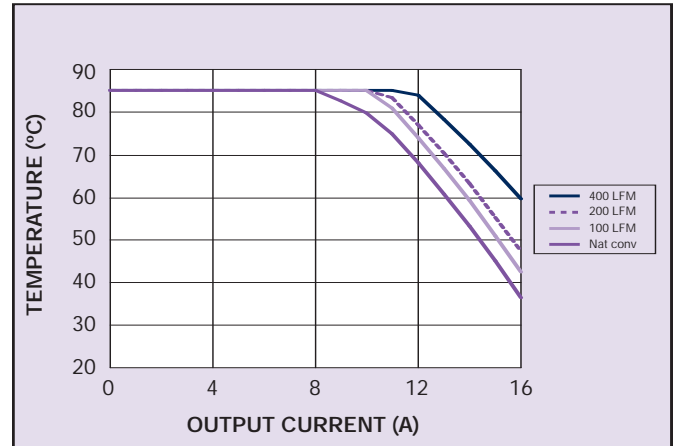


Figure 2 - Safe Operating Area  
Vin = 12 V, Output Voltage = 3.3 V (See Note A)

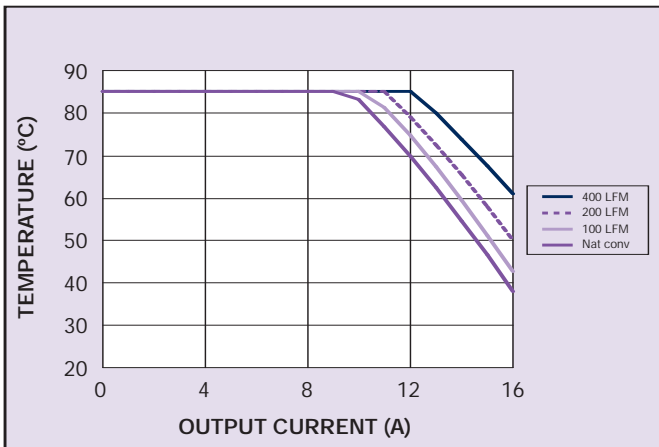


Figure 3 - Safe Operating Area  
Vin = 12 V, Output Voltage = 1.8 V (See Note A)

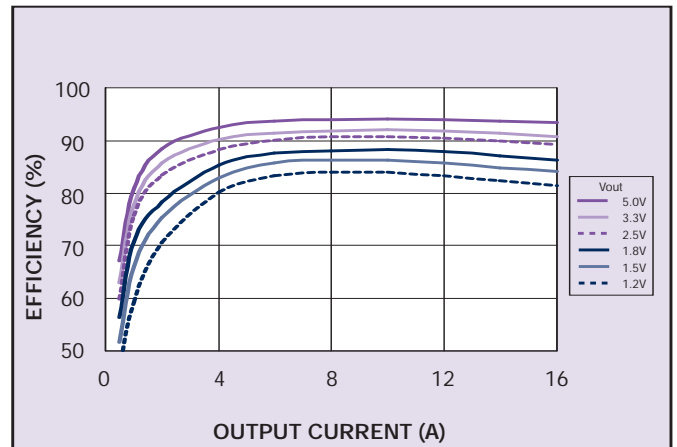


Figure 4 - Efficiency vs Load Current  
Vin = 12 V (See Note B)

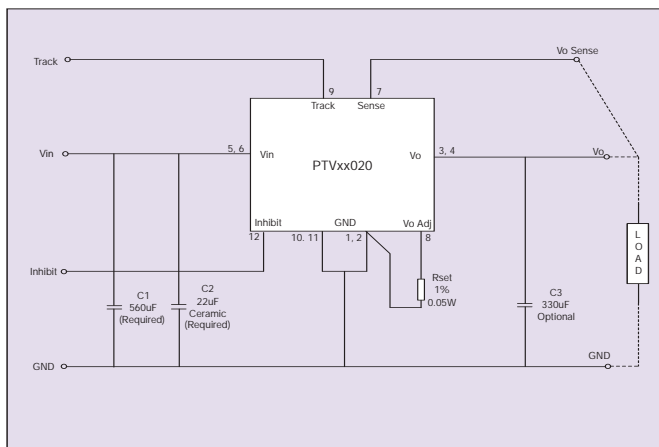


Figure 5 - Standard Application

**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

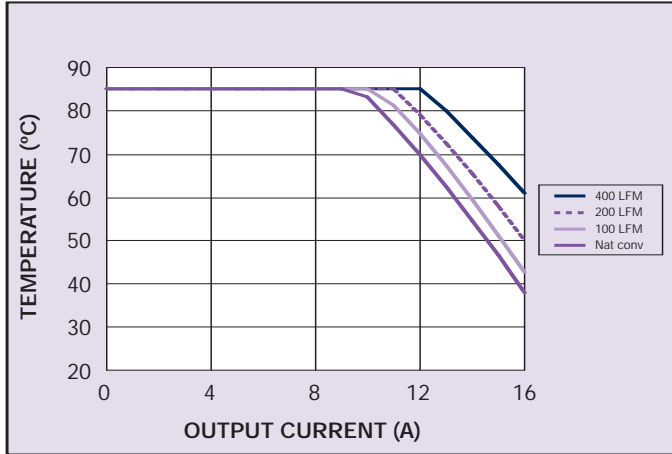


Figure 6 - Safe Operating Area  
Vin = 12 V, Output Voltage 1.8 V (See Note A)

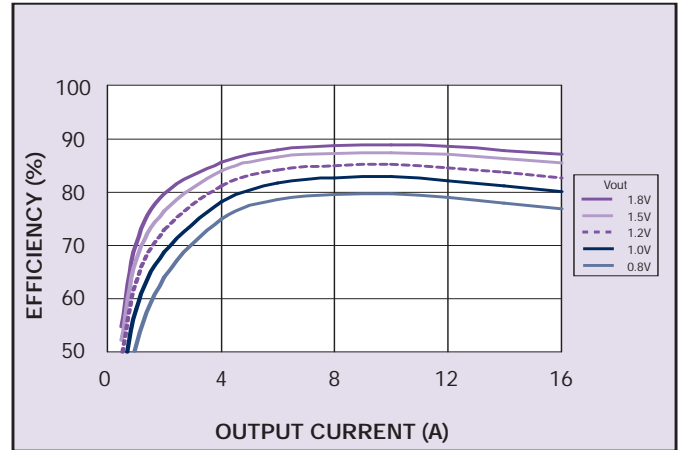


Figure 7 - Efficiency vs Load Current  
Vin = 12 V (See Note B)

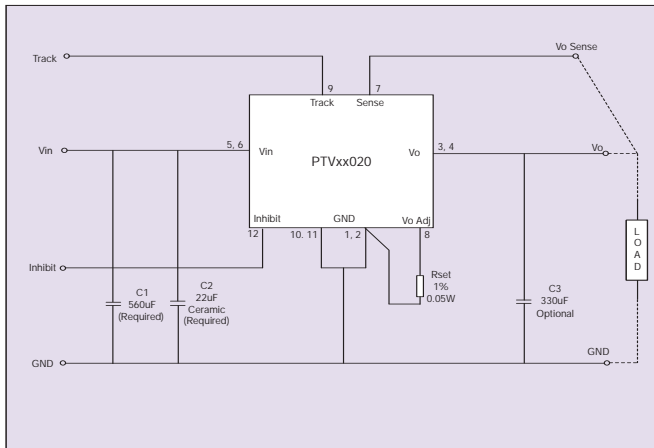
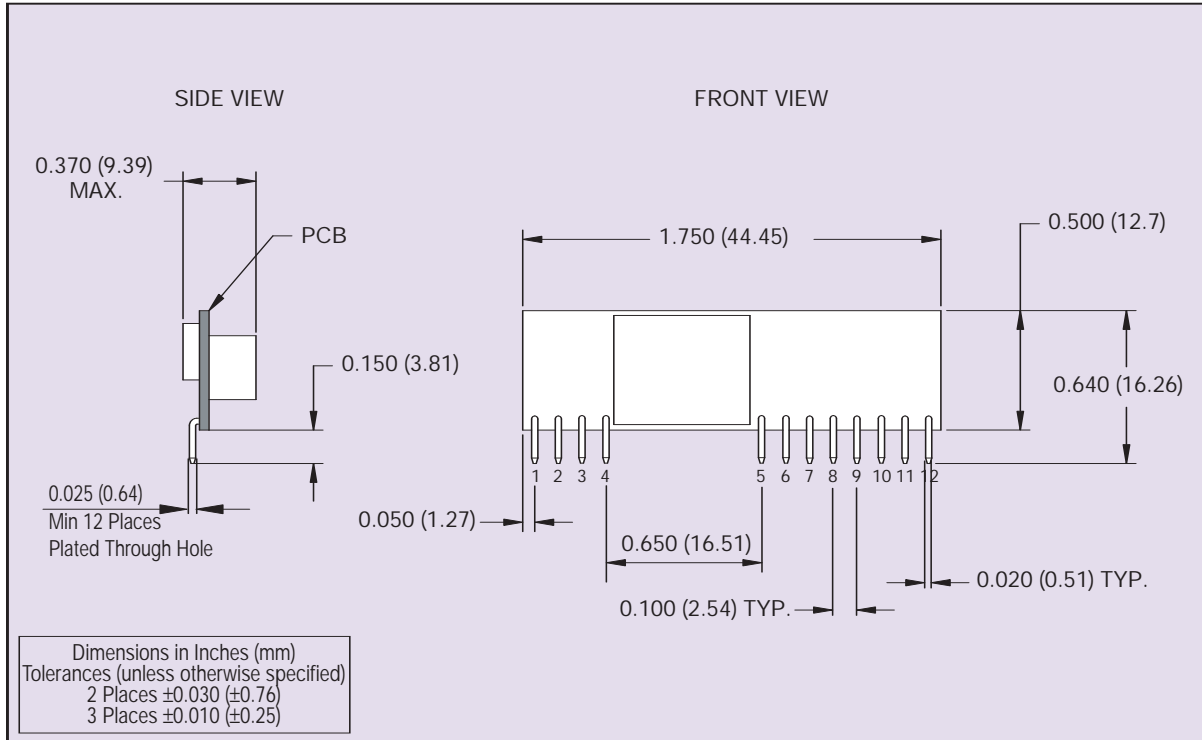


Figure 8 - Standard Application

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