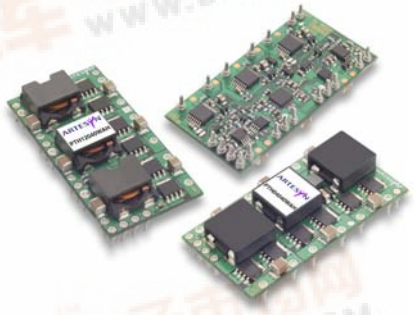
PTH12040

12 Vin single output

NEW Product

- **50 A output current (5)**
- **12 V input voltage (8 Vdc to 14 Vdc)**
- **Wide-output voltage adjust (0.8 Vdc to 5.5 Vdc)**
- **Auto-track™ sequencing***
- **Margin up/down controls**
- **Efficiencies up 96%**
- **Output ON/OFF inhibit**
- **Differential remote sense**
- **Programmable Under-Voltage Lockout (UVLO)**
- **Point-of-Load-Alliance (POLA) compatible**
- **Available RoHS compliant**



The PTH12040 is a next generation series of non-isolated dc-dc converters offering some of the most advanced POL features available in the industry. The primary new 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 Other industry leading features include margin up/down controls and efficiencies up to 96%. The PTH12040 has an input voltage of 8 Vdc to 14 Vdc and offers a wide 0.8 Vdc to 5.5 Vdc output voltage range with up to 50 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} = 1000 µF, C_{out} = 660 µF

SPECIFICATIONS

OUTPUT SPECIFICATIONS

Voltage adjustability	(See Note	0.8-5.5 Vdc
Setpoint accuracy	(See Note 1)	±2.0% Vo
Line regulation		±5 mV typ.
Load regulation		±5 mV typ.
Total regulation	(See Note 1)	±3.0% Vo
Minimum load		0 A
Ripple and noise	20 MHz bandwidth	15 mV typ.
Transient response (See Note 4)		70 µs recovery time Overshoot/undershoot 150 mV
Margin adjustment	(See Note 7)	±5.0% Vo

INPUT SPECIFICATIONS

Input voltage range	(See Note 3)	8-14 Vdc
Input standby current	(See Note 2)	35 mA typ.
Remote ON/OFF	(See Note 1)	Positive logic
Undervoltage lockout + Pin 8 open	(See Note 8)	6.6-7.5 V typ.
Track input current	Pin 18 (See Note 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 Table on page 2	96% max.
Insulation voltage		Non-isolated
Switching frequency		1.05 kHz
Approvals and standards		EN60950 UL/cUL60950
Material flammability		UL94V-0
Dimensions	(L x W x H)	51.94 x 26.54 x 9.07 mm 2.045 x 1.045 x 0.357 in
Weight		17 g (60 oz)
MTBF	Telcordia SR-332	2,500,00 hours

ENVIRONMENTAL SPECIFICATIONS

Thermal performance	Operating ambient, temperature	-40 °C to +85 °C
	Non-operating	-40 °C to +125 °C
MSL ('Z' suffix only)	JEDEC J-STD-020C	Level 3

PROTECTION

Overcurrent	Auto reset	95 A
Thermal		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

PTH12040

12 Vin single output

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.)	OUTPUT CURRENT (MAX.)	EFFICIENCY (MAX.)	REGULATION		MODEL NUMBER (9.10)
						LINE	LOAD	
275 W	8-14 Vdc	0.8-5.5 Vdc	0 A	50 A	96%	±5 mV	±5 mV	PTH12040W

Part Number System with Options

P T H 1 2 0 4 0 W A S

Product Family
Point of Load Alliance Compatible

Input Voltage
12 = 12 V

Output Current
04 = 50 A

Mechanical Package
Always 0

Mounting Option (9)
D = Horizontal Through-Hole (Matte Sn)
H = Horizontal Through-Hole (Sn/Pb)
S = Surface-Mount (63/37 Sn/Pb pin solder material)
Z = Surface-Mount (96.5/3.0/0.5 Sn/Ag/Cu pin solder material)

Pin Option
A = Through-Hole Std. Pin Length (0.140")
A = Surface-Mount Tin/Lead Solder Ball

Output Voltage Code
W = Wide

Output Voltage Adjustment of the PTH12040W Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH12040W. 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 5.5 Vdc. When the PTH12040W converter leaves the factory the output has been adjusted to the default voltage of 0.8 V.

EFFICIENCY TABLE (I_O = 35 A)	
OUTPUT VOLTAGE	EFFICIENCY
Vo = 5.0 V	96%
Vo = 3.3 V	95%
Vo = 2.5 V	93%
Vo = 2.0 V	92%
Vo = 1.8 V	91%
Vo = 1.5 V	90%
Vo = 1.2 V	88%
Vo = 1.0 V	86%
Vo = 0.8 V	82%

Notes

1 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 ppm/°C or better temperature stability.
2 This control pin has an internal pull-up to 5 V nominal. If it is left open-circuit the module will operate when input power is applied. A small lowleakage (<100 nA) MOSFET is recommended for control. For further information, consult the related application note. For further information, consult Application Note 193.
3 A 1000 µF input capacitor is required for proper operation. The capacitor must be rated for a minimum of 300 mA rms of ripple current.
4 This is with a 1 A/µs loadstep, 50 to 100% I_{omax}. I_o = 680 µF
5 See Figures 1 and 2 for safe operating curves.
6 When the set-point voltage is adjusted higher than 3.6 V, a 10 V minimum input voltage is recommended.
7 A small low-leakage (<100 nA) MOSFET is recommended to control this pin. The opencircuit voltage is less than 1 Vdc.
8 These are the default voltages. The y may be adjusted using the 'UVLO Prog' control input. Consult Application Note No. 193 for further information.
9 To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH12040WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH12040WAD.
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.

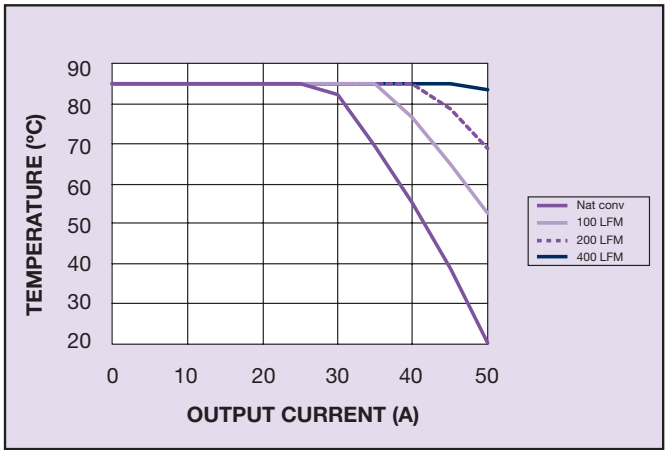


Figure 1 - Safe Operating Area
Vin = 12 V, Output Voltage = 3.3 V (See Note A)

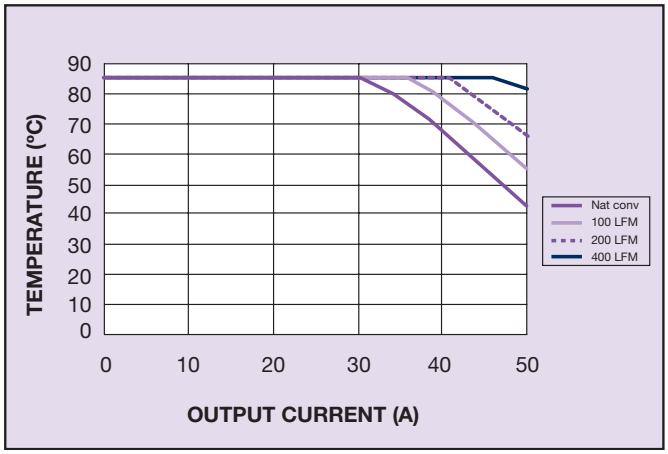


Figure 2 - Safe Operating Area
Vin = 12 V, Output Voltage = 1.2 V (See Note A)

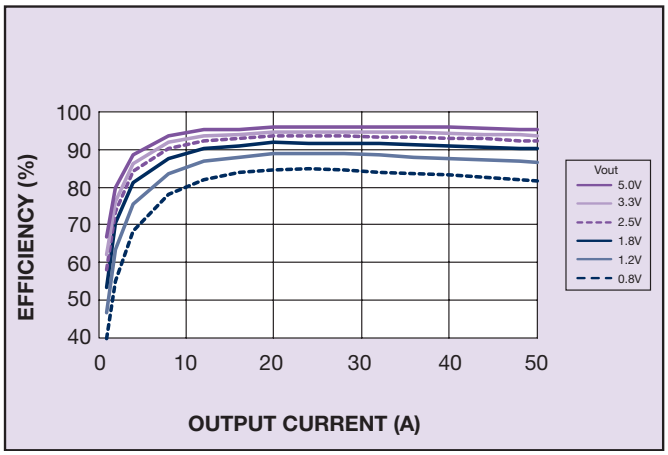


Figure 3 - Efficiency vs Load Current
Vin = 12 V (See Note B)

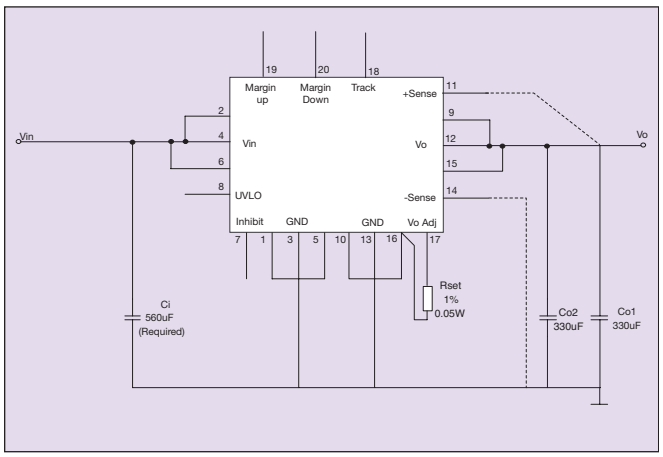


Figure 4 - Standard Application

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.

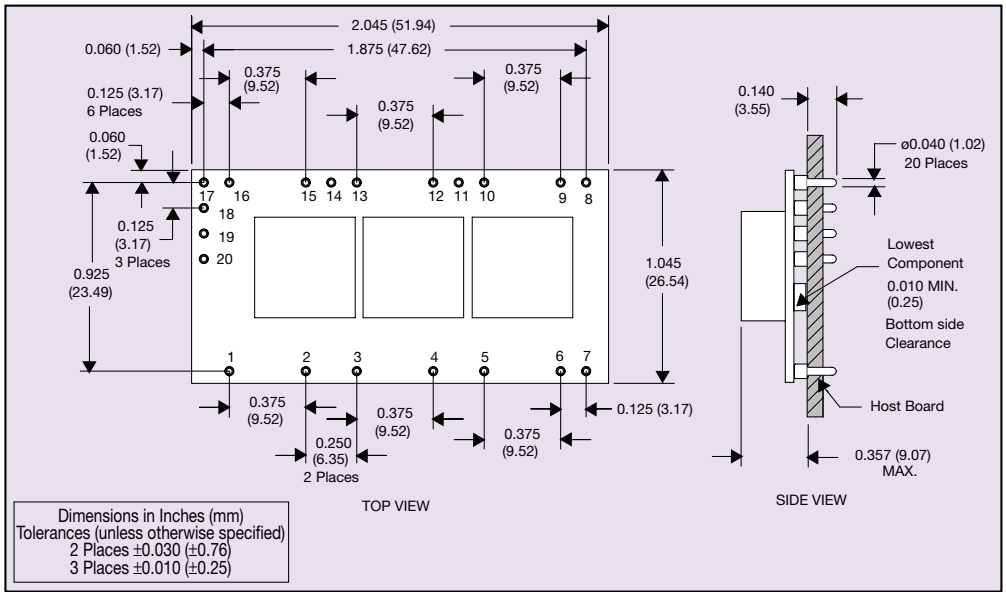


Figure 5 - Plated Through-Hole Mechanical Drawing

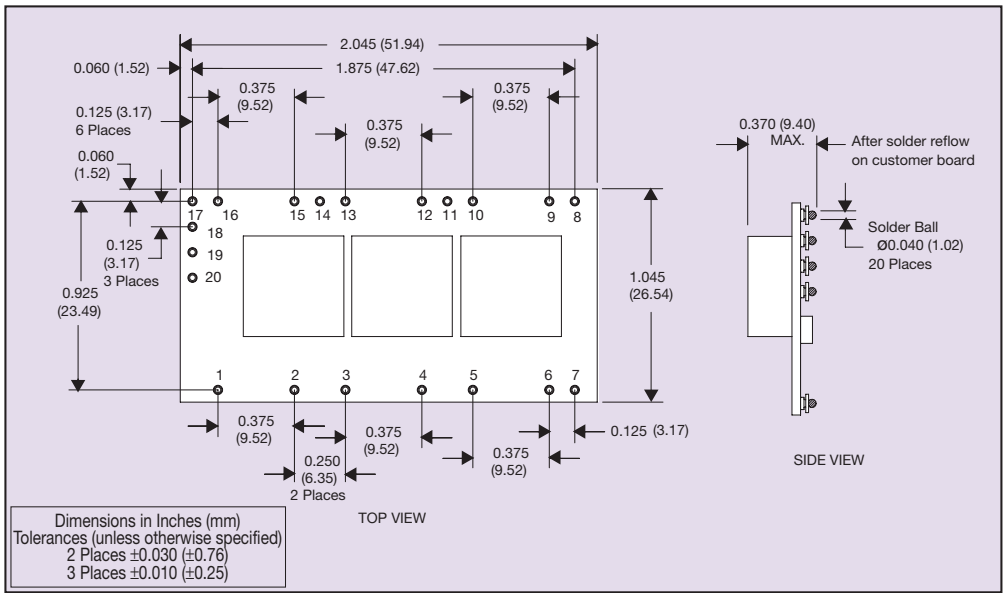


Figure 6 - Surface-Mount Mechanical Drawing

PIN CONNECTIONS	
PIN NO.	**FUNCTION**
1	Ground
2	Vin
3	Ground
4	Vin
5	Ground
6	Vin
7	Inhibit*
8	UVLO Programming
9	Vout
10	Ground
11	Vs+
12	Vout
13	Ground
14	Vs-
15	Vout
16	Ground
17	Adjust
18	Track
19	Margin Up*
20	Margin Down*

*Denotes negative logic:
Open = Normal operation
Ground = Function active