

- 22 A output current
- 5 V input voltage
- Wide-output voltage adjust (0.8 Vdc to 3.6 Vdc)
- Auto-track™ sequencing*
- Margin up/down controls
- Pre-bias start-up capability
- Efficiencies up to 96%
- Output ON/OFF inhibit
- Output voltage sense
- Point-of-Load-Alliance (POLA) compatible
- Available RoHS compliant

NEW Product



The PTH05020 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, pre-bias start-up capability and efficiencies up to 96%. The PTH05020 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 22 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
 $C_{in} = 1000 \mu F$, $C_{out} = 0 \mu F$

SPECIFICATIONS

OUTPUT SPECIFICATIONS

Voltage adjustability	(See Note 4)	0.8-3.6 Vdc
Setpoint accuracy		$\pm 2.0\% V_o$
Line regulation		± 5 mV typ.
Load regulation		± 5 mV typ.
Total regulation		$\pm 3.0\% V_o$
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 μs recovery time Overshoot/undershoot 120 mV	
Margin adjustment		$\pm 5.0\% V_o$

INPUT SPECIFICATIONS

Input voltage range	(See Note 3)	4.5-5.5 Vdc
Input current	No load	10 mA typ.
Remote ON/OFF	(See Note 1)	Positive logic
Start-up time		1 V/ms
Undervoltage lockout		3.7-4.3 Vdc typ.
Track input voltage	Pin 8 (See Note 6, 7)	$\pm 0.3 V_{in}$

EMC CHARACTERISTICS

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

GENERAL SPECIFICATIONS

Efficiency	(See Efficiency Table)	96% max.
Insulation voltage		Non-isolated
Switching frequency		250 kHz to 340 kHz
Approvals and standards		EN60950 UL/cUL60950
Material flammability		UL94V-0
Dimensions	(L x W x H)	37.97 x 22.10 x 9.00 mm 1.495 x 0.870 x 0.354 in
Weight		7 g (0.25 oz)
MTBF	Telcordia SR-332	5,236,000 hours

ENVIRONMENTAL SPECIFICATIONS

Thermal performance (See Note 2)	Operating ambient, temperature Non-operating	-40 °C to +85 °C -40 °C to +125 °C
MSL ('Z' suffix only)	JEDEC J-STD-020C	Level 3

PROTECTION

Short-circuit	Auto reset	41 A typ.
Thermal		Auto recovery

International Safety Standard Approvals



UL/cUL CAN/CSA-C22.2 No. 60950-1-03/UL 60950-1,
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
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OUTPUT POWER (MAX.)	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (MIN.)	OUTPUT CURRENT (MAX.)	EFFICIENCY (MAX.)	REGULATION		MODEL NUMBER ^(9,10)
						LINE	LOAD	
79.2 W	4.5-5.5 Vdc	0.8-3.6 Vdc	0 A	22 A	96%	±5 mV	±5 mV	PTH05020

Part Number System with Options

PTH05020WAST

Product Family
Point of Load Alliance
Compatible

Input Voltage
05 = 5 V

Output Current
02 = 22 A

Mechanical Package
Always 0

Packaging Options
No Suffix = Trays
T = Tape and Reel ⁽⁸⁾

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 PTH05020 Series

The ultra-wide output voltage trim range offers major advantages to users who select the PTH05020. 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 PTH05020 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 $V < 0.8 V$ (min - 0.2 V).
- See Figure 1 for safe operating curve.
- A 1,000 μF electrolytic input capacitor is required for proper operation. The capacitor must be rated for a minimum of 700 mA rms of ripple current.
- An external output capacitor is not required for basic operation. Adding 330 μF of distributed capacitance at the load will improve the transient response.
- 1 A/ μs load step, 50 to 100% I_{Omax} ; $C_{out} = 330 \mu F$.
- 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 156 for more details.
- Tape and reel packaging only available on the surface-mount versions.
- To order Pb-free (RoHS compatible) surface-mount parts replace the mounting option 'S' with 'Z', e.g. PTH05020WAZ. To order Pb-free (RoHS compatible) through-hole parts replace the mounting option 'H' with 'D', e.g. PTH05020WAD.
- 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 ($I_O = 10 A$)

OUTPUT VOLTAGE	EFFICIENCY
$V_o = 1.0 V$	88%
$V_o = 1.2 V$	90%
$V_o = 1.5 V$	91%
$V_o = 1.8 V$	92%
$V_o = 2.0 V$	93%
$V_o = 2.5 V$	94%
$V_o = 3.3 V$	96%

Output Current (A)	Nat conv (°C)	100 LFM (°C)	200 LFM (°C)	400 LFM (°C)
0	85	85	85	85
10	85	85	85	85
12	80	85	85	85
14	70	80	82	85
16	60	70	80	85
18	50	60	75	80
20	40	50	65	75
22	33	50	60	72

The graph shows the efficiency of the converter as a function of output current for different input voltages. The y-axis represents Efficiency (%) from 40 to 100, and the x-axis represents Output Current (A) from 0 to 22. The legend indicates six input voltages: 3.3V (solid purple), 2.5V (solid light purple), 1.8V (dashed grey), 1.5V (solid dark blue), 1.2V (solid medium blue), and 1.0V (dashed dark blue). Efficiency generally increases with input voltage and peaks around 4-6A before slightly declining at higher currents.

Output Current (A)	3.3V (%)	2.5V (%)	1.8V (%)	1.5V (%)	1.2V (%)	1.0V (%)
0	85	80	75	70	65	60
2	95	92	88	85	82	78
4	97	95	92	90	88	85
6	97	95	92	90	88	85
8	97	95	92	90	88	85
10	97	95	92	90	88	85
12	96	94	91	89	87	84
14	95	93	90	88	86	83
16	94	92	89	87	85	82
18	93	91	88	86	84	81
20	92	90	87	85	83	80
22	91	89	86	84	82	79

- 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.

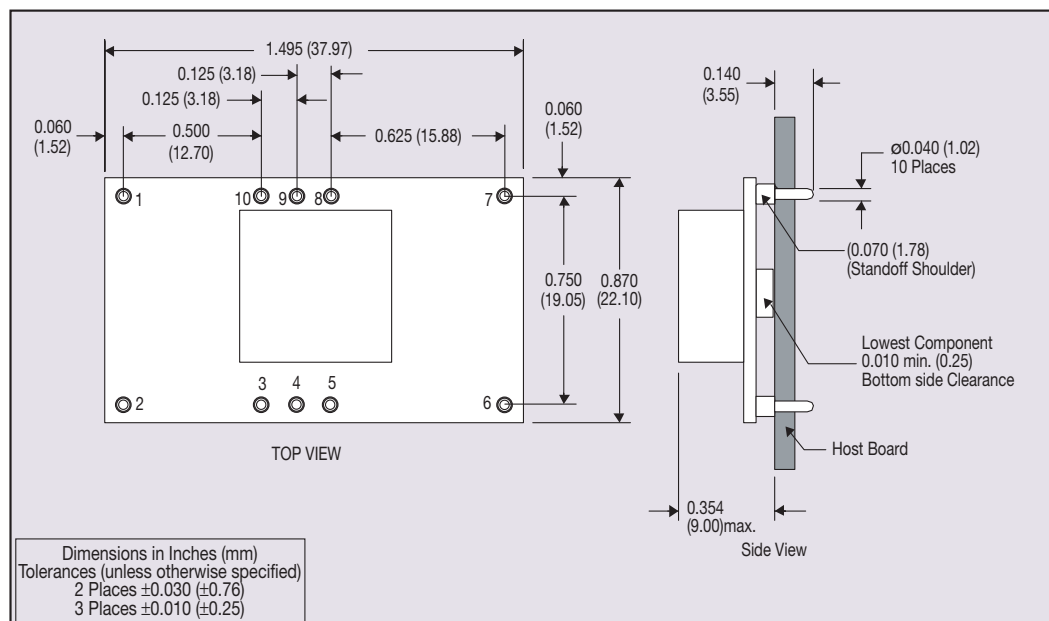


Figure 4 - Plated Through-Hole Mechanical Drawing

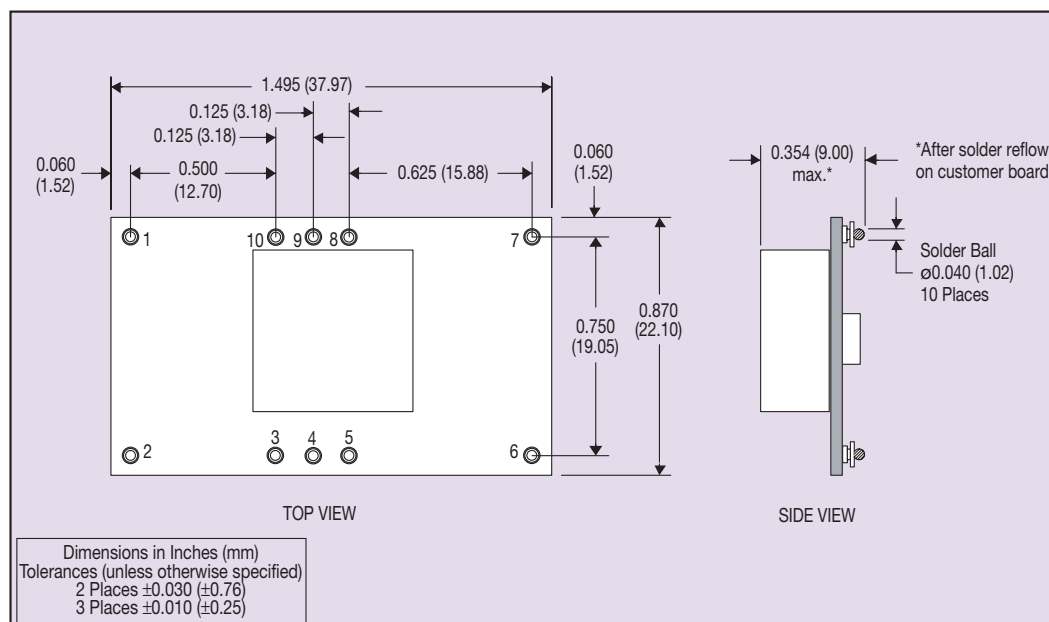


Figure 5 - Surface-Mount Mechanical Drawing

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