



VPTVME-28 Series

HIGH RELIABILITY VME POWER SUPPLY

DESCRIPTION

The VPTVME series of isolated VME power supplies is an effective COTS solution for many demanding high reliability applications. A wide input voltage range accommodates nominal 28V inputs including avionics, mobile, ground systems, and other applications. High efficiency, low input and output ripple, fixed operating frequency, and built-in EMI compliance simplify system design. Incorporating VPT's proven design and rugged packaging heritage ensures long term reliability.

The VPTVME series is intended for harsh environments including severe vibration, shock and temperature cycling. Testing is to MIL-STD-810, and MIL-STD-883 as detailed.

This assembly is designed and manufactured in the USA in a facility certified to ISO9001, J-STD-001 and IPC-A-610.

This product may incorporate one or more of the following U.S. patents:

5,784,266
5,790,389
5,963,438
5,999,433
6,005,780
6,084,792
6,118,673

FEATURES

- Single Slot 6U VME Form Factor
- IEEE Std 1101.2-1992 compatible
- Conduction Cooled
- 28VDC Input per MIL-STD-704
- MIL-STD-1275 Compatibility Available
- Up to 500 Watts Maximum Output Power
- Up to 5 Individual Outputs
- Input Under Voltage Lockout
- Over Voltage Protection
- Over Current Protection
- Short Circuit Protection
- Over Temperature Protection
- Fixed Frequency
- Remote Sensing
- Fast Startup time with Soft Start
- Isolated Magnetic Feedback
- Meets MIL-STD-461D/E/F Conducted Emissions Requirements
- Rugged Metal Enclosure
- Wide Temperature Range, -55°C to 85°C
- **Custom Configurations are Available**

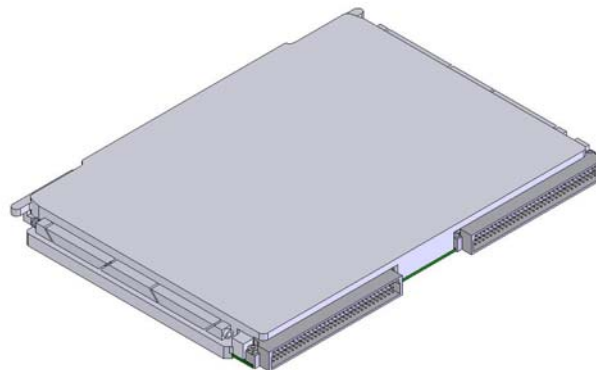


Figure 1 – VPTVME-28 Power Supply
(Not To Scale)



VPTVME-28 Series

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	40 V_{DC}	Operating Temperature	-55°C to $+85^{\circ}\text{C}$
Input Voltage (Transient, 1 second)	50 Volts	Storage Temperature	-55°C to $+125^{\circ}\text{C}$
Output Power	500 Watts	Weight (Maximum)	1250 Grams
Power Dissipation (Full Load, $T_{CASE} = +85^{\circ}\text{C}$)	89 Watts		

Parameter	Conditions	Min	Typ	Max	Units
INPUT Voltage ¹	Continuous	18	28	40	V
	Transient, 1 sec ²	-	-	50	V
UVLO Turn On		17	-	17.8	V
UVLO Turn Off ²		16	-	17	V
POWER		0		500	W
EFFICIENCY		85		-	%
Turn On Delay	$V_{IN} = 0\text{V}$ to 28V	-	-	100	mSec
Over Temperature Shutdown ²	Rail Temperature	-	95	-	$^{\circ}\text{C}$
Over Temperature Shutdown Hysteresis ²	Rail Temperature	-	10	-	$^{\circ}\text{C}$
ISOLATION	500 V_{DC}	100	-	-	$M\Omega$
OUTPUT: +5V					
OUTPUT Voltage	$T_{CASE} = 25^{\circ}\text{C}$	4.925	5.00	5.075	V
	$T_{CASE} = -55^{\circ}\text{C}$ to 85°C	4.875	5.00	5.125	V
Power		0	-	200	W
Current		0	-	40	A
Ripple Voltage	Full Load, 20Hz to 10MHz	-	-	50	mV_{p-p}
Line Regulation	$V_{IN} = 18\text{V}$ to 40V	-	-	20	mV
Load Regulation	No Load to Full Load	-	-	50	mV
Load Step Output Transient	Half Load to Full Load	-	-	± 300	mV_{pk}
Load Step Recovery ³		-	-	300	μSec
OUTPUT: +3.3V					
OUTPUT Voltage	$T_{CASE} = 25^{\circ}\text{C}$	3.25	3.3	3.35	V
	$T_{CASE} = -55^{\circ}\text{C}$ to 85°C	3.217	3.30	3.383	V
Power		0	-	132	W
Current		0	-	40	A
Ripple Voltage	Full Load, 20Hz to 10MHz	-	-	50	mV_{p-p}
Line Regulation	$V_{IN} = 18\text{V}$ to 40V	-	-	20	mV
Load Regulation	No Load to Full Load	-	-	50	mV
Load Step Output Transient	Half Load to Full Load	-	-	± 300	mV_{pk}
Load Step Recovery ³		-	-	300	μSec

- Notes: 1. MIL-STD-704A and MIL-STD-1275 input ranges available. Contact VPT.
 2. Verified by qualification testing.
 3. Time for output voltage to settle within 1% of its nominal value.



VPTVME-28 Series

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	40 V_{DC}	Operating Temperature	-55°C to $+85^{\circ}\text{C}$
Input Voltage (Transient, 1 second)	50 Volts	Storage Temperature	-55°C to $+125^{\circ}\text{C}$
Output Power	500 Watts	Weight (Maximum)	1250 Grams
Power Dissipation (Full Load, $T_{CASE} = +85^{\circ}\text{C}$)	89 Watts		

Parameter	Conditions	Min	Typ	Max	Units
OUTPUT: +12V, -12V					
OUTPUT Voltage	$T_{CASE} = 25^{\circ}\text{C}$	11.82	12.0	12.18	V
	$T_{CASE} = -55^{\circ}\text{C}$ to 85°C	11.70	12.0	12.30	V
Power		0	-	100	W
Current		0	-	8.33	A
Ripple Voltage	Full Load, 20Hz to 10MHz	-	-	100	mV_{p-p}
Line Regulation	$V_{IN} = 18\text{V}$ to 40V	-	-	20	mV
Load Regulation	No Load to Full Load	-	-	100	mV
Load Step Output Transient	Half Load to Full Load	-	-	± 400	mV_{pk}
Load Step Recovery ³		-	-	300	μSec
OUTPUT: +5V Standby					
OUTPUT Voltage	$T_{CASE} = 25^{\circ}\text{C}$	4.875	5.0	5.125	V
	$T_{CASE} = -55^{\circ}\text{C}$ to 85°C	4.825	5.0	5.175	V
Power		0	-	5	W
Current		0	-	1	A
Ripple Voltage	Full Load, 20Hz to 10MHz	-	-	50	mV_{p-p}
Line Regulation	$V_{IN} = 18\text{V}$ to 40V	-	-	20	mV
Load Regulation	No Load to Full Load	-	-	80	mV
Load Step Output Transient	Half Load to Full Load	-	-	± 300	mV_{pk}
Load Step Recovery ³		-	-	500	μSec
TELEMETRY:					
PRIMARY INHIBIT	PRI INH Pin Open Circuit Voltage	2.65	2.94	3.23	V
	PRI INH Pin Input	0	-	1.5	V
SECONDARY INHIBIT	SEC INH Pin Open Circuit Voltage	2.65	2.94	3.23	V
	SEC INH Pin Input	0	-	1.5	V
INPUT GOOD SIGNAL	Low State Voltage, $I_{SINK} = 50\text{ mA}$	0	-	0.6	V
OUTPUT GOOD SIGNAL	Low State Voltage, $I_{SINK} = 50\text{ mA}$	0	-	0.6	V
OVERTEMP SIGNAL	Low State Voltage, $I_{SINK} = 50\text{ mA}$	0	-	0.6	V

- Notes:
1. MIL-STD-704A and MIL-STD-1275 input ranges available. Contact VPT.
 2. Verified by qualification testing.
 3. Time for output voltage to settle within 1% of its nominal value.

BLOCK DIAGRAM

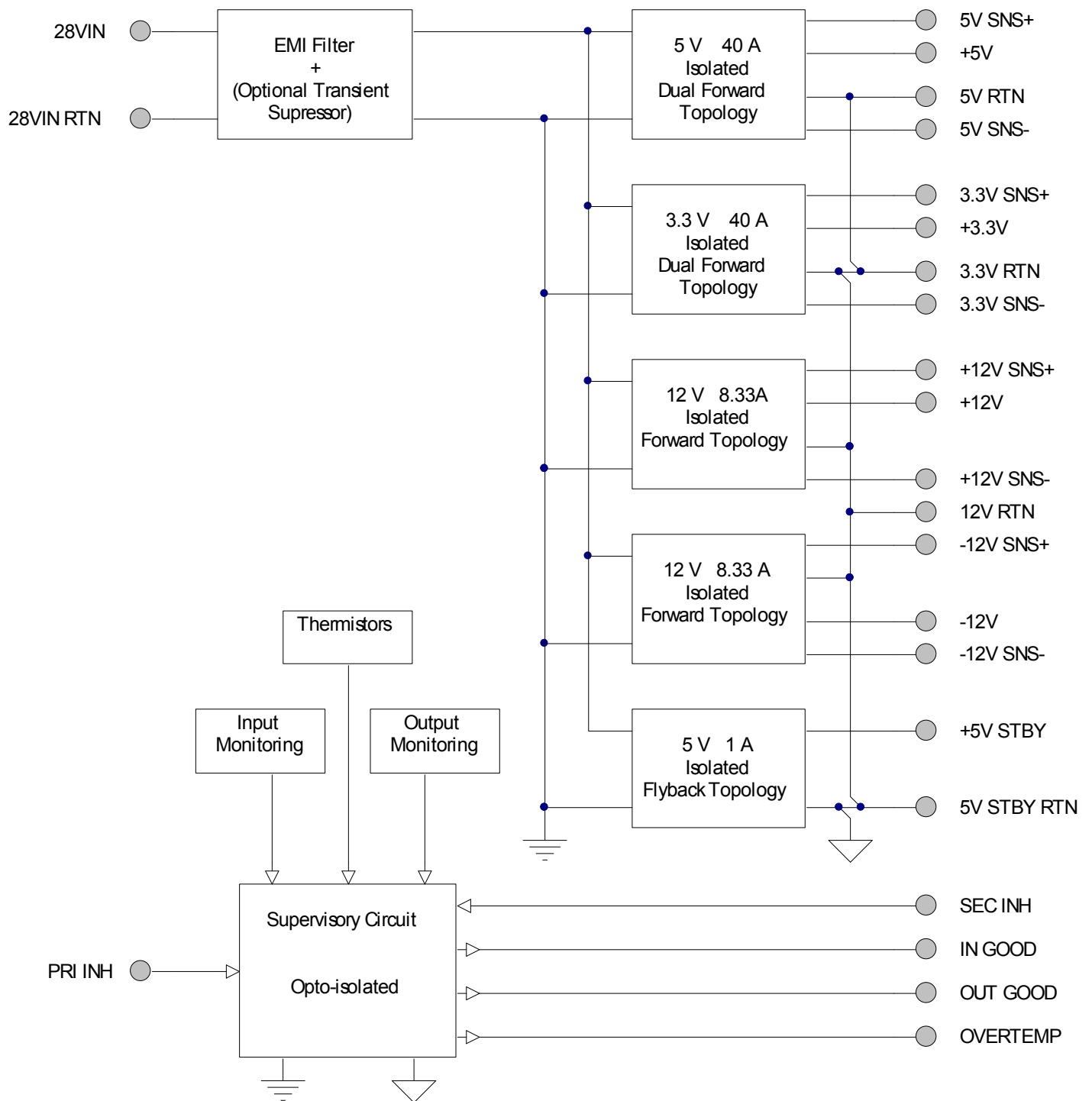


Figure 2

FUNCTIONAL DESCRIPTION

PRIMARY INHIBIT: The PRIMARY INHIBIT pin is used to enable / disable all outputs except for the 5V Standby output. The PRIMARY INHIBIT input is internally pulled up to $2.94V \pm 10\%$ and is referenced to 28VIN RTN. If PRIMARY INHIBIT is driven high or left open, the outputs will be enabled; if pulled low, the outputs will be disabled. Cycling the PRIMARY INHIBIT pin will also clear any fault condition.

SECONDARY INHIBIT: The SECONDARY INHIBIT pin is used to enable / disable all outputs except for the 5V Standby output. The SECONDARY INHIBIT input is internally pulled up to $2.94V \pm 10\%$ and is referenced to 5V STBY RTN. If SECONDARY INHIBIT is driven high or left open, the outputs will be enabled; if pulled low, the outputs will be disabled.

INPUT GOOD: The INPUT GOOD pin / LED indicates the condition of the input line. The INPUT GOOD pin is an open collector output and is referenced to 5V STBY RTN. Under normal operating conditions the INPUT GOOD pin is pulled low and the LED is lit green. If the input line drops below the UVLO Turn Off threshold, the INPUT GOOD pin will be open / high impedance and the LED will change to red.

OUTPUT GOOD: The OUTPUT GOOD pin / LED indicates the condition of the outputs. The OUTPUT GOOD pin is an open collector output and is referenced to 5V STBY RTN. Under normal operating conditions the OUTPUT GOOD pin is pulled low and the LED is lit green. If an UVLO, Over Current, Over Voltage, or Over Temperature condition occurs or if the unit is disabled, the OUTPUT GOOD pin will be open / high impedance and the LED will change to red. The OUTPUT GOOD pin will also be open collector and the LED will be red during start-up for approximately 250ms.

OVERTEMP: The OVERTEMP pin / LED indicates the unit's mounting rail temperature. The OVERTEMP pin is open collector and is referenced to 5V STBY RTN. Under normal operating conditions the OVERTEMP pin is open / high impedance and the LED is lit green. If the unit's temperature exceeds the over temperature threshold, all outputs except the 5V Standby will latch off, the OVERTEMP pin will be active low and the LED will change to red. The LED indication will self clear when the temperature returns to normal however the latch condition will need to be cleared by either cycling the PRIMARY INHIBIT pin or by cycling the input line below the UVLO Turn Off threshold.

OVER CURRENT: Each output is protected against an over current condition. The output current is limited to approximately 125% of rated output current. A sustained over current condition will trip the over current latch, latching all outputs except the 5V Standby off. The latch condition can be cleared by either cycling the PRIMARY INHIBIT pin or by cycling the input line below the UVLO Turn Off threshold.

OVER VOLTAGE: Each output is protected against an over voltage condition. The over voltage protection is activated if an output exceeds approximately 120% of its output voltage setpoint. An overvoltage condition will trip the over voltage latch, latching all outputs except the 5V Standby off. The latch condition can be cleared by either cycling the PRIMARY INHIBIT pin or by cycling the input line below the UVLO Turn Off threshold.

REMOTE SENSE: The main outputs each have remote sensing capability. The remote sense pins should be connected to their respective outputs. They can be connected on the backplane to compensate for drop across the connector, or at the load. The sense lines can compensate for up to 0.5V total drop (output and return). The sense lines should be routed with their outputs to minimize noise pickup.

PACKAGE SPECIFICATIONS

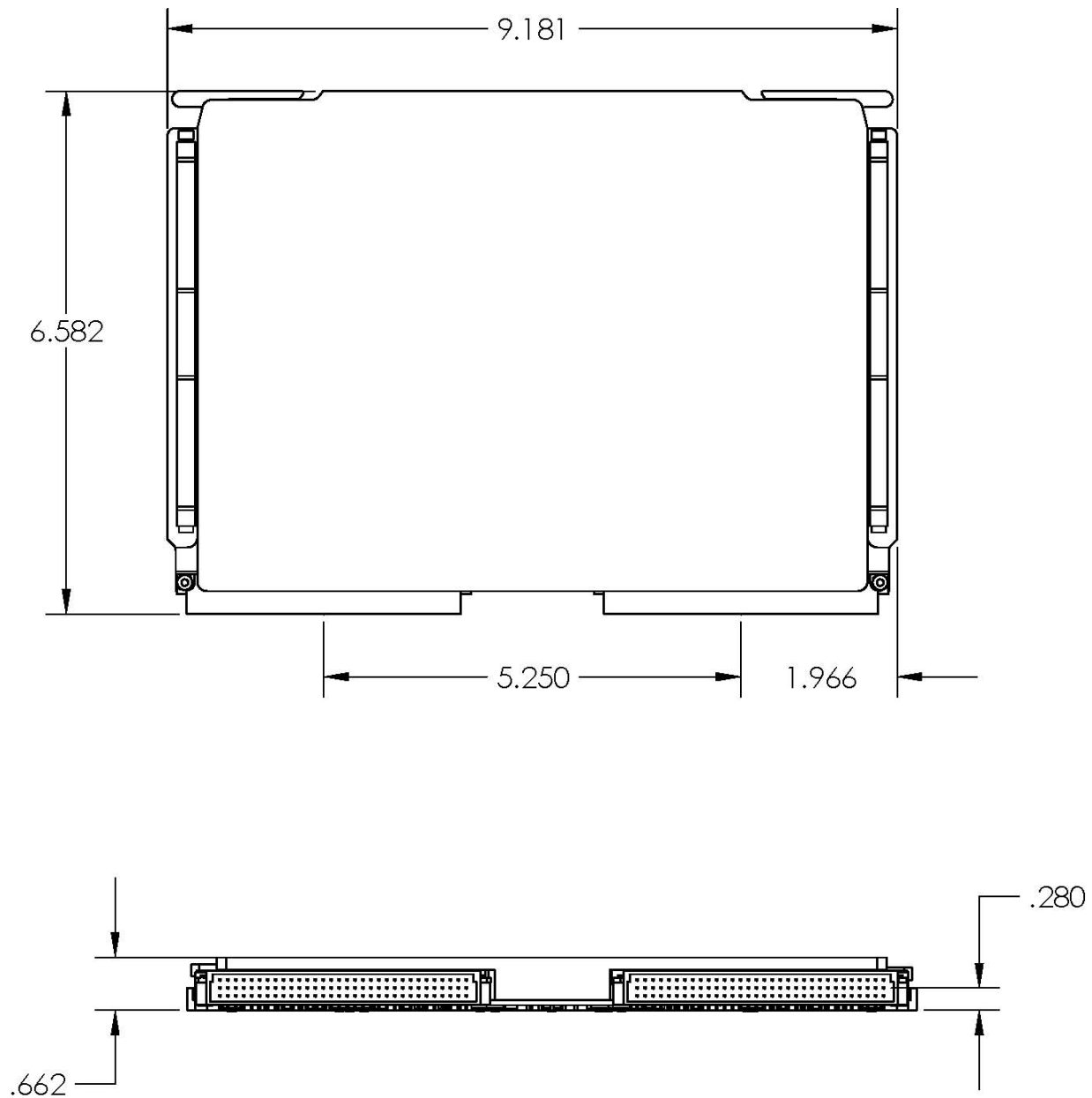


Figure 3 – Package Drawing
 (Dimensional Limits are ± 0.005 " Unless Otherwise Stated)

Package Notes:

1. IEEE Std 1101.2-1992 compatible
2. Materials: Baseplate – aluminum, conductive conversion coating.
3. Case temperature is measured on the rail.



ELECTRICAL PINOUT

Pin No.	P1			P2		
	Row A	Row B	Row C	Row A	Row B	Row C
1	NC	NC	PRI INH	SEC INH	5V STBY RTN	+5V STBY
2	28VIN RTN	28VIN RTN	28VIN RTN	OUT GOOD	OVERTEMP	IN GOOD
3	28VIN	28VIN	28VIN	NC	NC	NC
4	28VIN RTN	28VIN RTN	28VIN RTN	NC	5V SENSE -	5V SENSE +
5	28VIN	28VIN	28VIN	5V RTN	5V RTN	5V RTN
6	28VIN RTN	28VIN RTN	28VIN RTN	+5V	+5V	+5V
7	28VIN	28VIN	28VIN	5V RTN	5V RTN	5V RTN
8	28VIN RTN	28VIN RTN	28VIN RTN	+5V	+5V	+5V
9	28VIN	28VIN	28VIN	5V RTN	5V RTN	5V RTN
10	28VIN RTN	28VIN RTN	28VIN RTN	+5V	+5V	+5V
11	28VIN	28VIN	28VIN	5V RTN	5V RTN	5V RTN
12	28VIN RTN	28VIN RTN	28VIN RTN	+5V	+5V	+5V
13	28VIN	28VIN	28VIN	NC	NC	NC
14	28VIN RTN	28VIN RTN	28VIN RTN	CASE	CASE	CASE
15	28VIN	28VIN	28VIN	CASE	CASE	CASE
16	NC	NC	NC	NC	NC	NC
17	NC	NC	NC	+5V	+5V	+5V
18	3.3V RTN	3.3V RTN	3.3V RTN	5V RTN	5V RTN	5V RTN
19	+3.3V	+3.3V	+3.3V	+5V	+5V	+5V
20	3.3V RTN	3.3V RTN	3.3V RTN	5V RTN	5V RTN	5V RTN
21	+3.3V	+3.3V	+3.3V	+5V	+5V	+5V
22	3.3V RTN	3.3V RTN	3.3V RTN	5V RTN	5V RTN	5V RTN
23	+3.3V	+3.3V	+3.3V	NC	-12V SENSE -	-12V SENSE +
24	3.3V RTN	3.3V RTN	3.3V RTN	12V RTN	12V RTN	12V RTN
25	+3.3V	+3.3V	+3.3V	-12V	-12V	-12V
26	3.3V RTN	3.3V RTN	3.3V RTN	12V RTN	12V RTN	12V RTN
27	+3.3V	+3.3V	+3.3V	-12V	-12V	-12V
28	3.3V RTN	3.3V RTN	3.3V RTN	12V RTN	12V RTN	12V RTN
29	+3.3V	+3.3V	+3.3V	+12V	+12V	+12V
30	3.3V RTN	3.3V RTN	3.3V RTN	12V RTN	12V RTN	12V RTN
31	+3.3V	+3.3V	+3.3V	+12V	+12V	+12V
32	NC	3.3V SENSE -	3.3V SENSE +	NC	+12V SENSE -	+12V SENSE +



100% ENVIRONMENTAL SCREENING

Screening	Condition
Internal Visual	IPC-A-610
Stabilization Bake	MIL-STD-883, Method 1008, Condition A, 100°C, 24 hours
Temperature Cycling	MIL-STD-883, Method 1010, Condition A, -55°C to +100°C, 10 Cycles
Burn-In	MIL-STD-883, Method 1015, 96 hours at +85°C
Final Electrical	100% at 25°C
External Visual	MIL-STD-883, Method 2009

ORDERING INFORMATION

VPTVME

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CUSTOM PRODUCTS ARE AVAILABLE AND ENCOURAGED. PLEASE CONTACT VPT WITH YOUR POWER CONVERSION REQUIREMENTS TO DISCUSS IN DETAIL. Please contact your sales representative or the VPT Inc. Sales Department for more information concerning environmental screening and testing, different input voltage, output voltage, power requirement, source inspection, and/or other special requirements.

CONTACT INFORMATION

To request a quotation or place orders please contact your sales representative or the VPT Inc. Sales Department at:

Phone: (425) 353-3010
Fax: (425) 353-4030
E-mail: vptsales@vpt-inc.com

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