



DVSA2800D Series

VPT Inc.
2801 Commerce Street
Blacksburg, VA 24060
Sales Info: (425) 337-2482 FAX: (603) 297-1160
WEB: <http://www.vpt-inc.com>
E-mail: mbosmann@worldnet.att.net

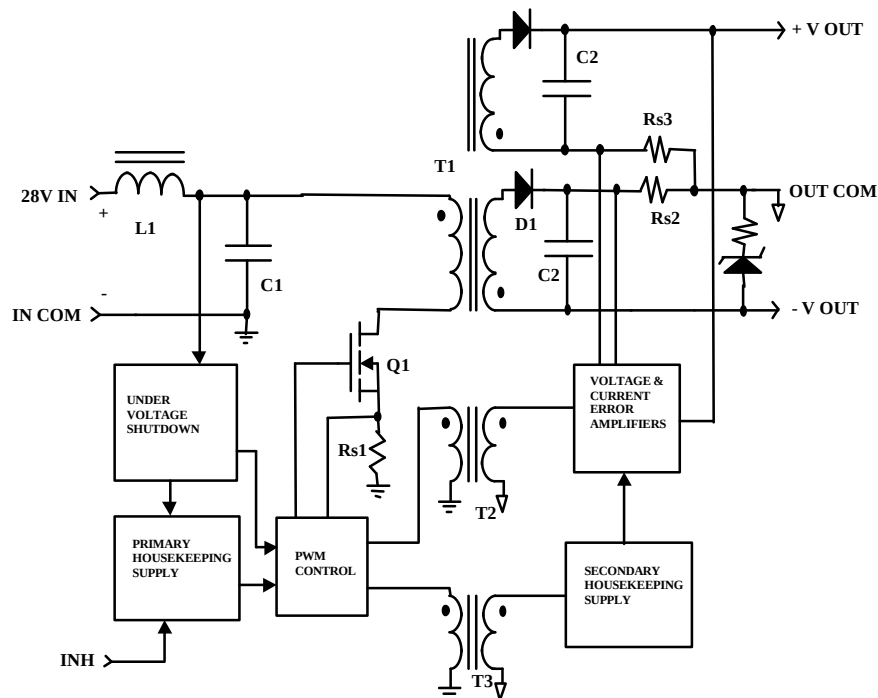
Description

The DVSA series of hybrid DC to DC converters is able to operate at the full military (-55 °C to +125 °C) temperature range with no power derating. Unique to the DVSA series is a patented magnetic feedback circuit that is fault tolerant and radiation immune. Operating at a nominal fixed frequency of 450kHz the regulated, isolated units utilize well controlled undervoltage lock out circuitry to eliminate slow start-up problems.

Features

- Very low output noise
- High Reliability
- Wide input voltage range : 15 to 50 Volts / MIL-STD-704
- Up to 6 Watts output power
- Patented, fault tolerant feedback circuit
- NO optoisolator
- Undervoltage Lockout
- Standard Pinout
- High input transient voltage : 80 Volts for 1 Sec MIL-STD-704A
- Radiation hardened version available
- Precision projection welded hermetic package
- High power density, >19 W/in³
- Custom Versions Available
- Environmental Screening Available
- Meets MIL-STD-461C and MIL-STD-461D EMC requirements when used with a DVMA28 EMI filter

Block Diagram



Specifications

Absolute Maximum Ratings

Input Voltage (Continuous)	50 Vdc
Input Voltage (Transient)	80 V (1sec)
Output Power ¹	6 Watts
Power Dissipation, PO=6 Watts, T _{CASE} = +125°C	2.5 Watts
Junction Temperature rise to case	+10°C
Storage Temperature	-65°C to +150°C
Lead Solder Temperature for 10 seconds	270°C
Weight	15 grams

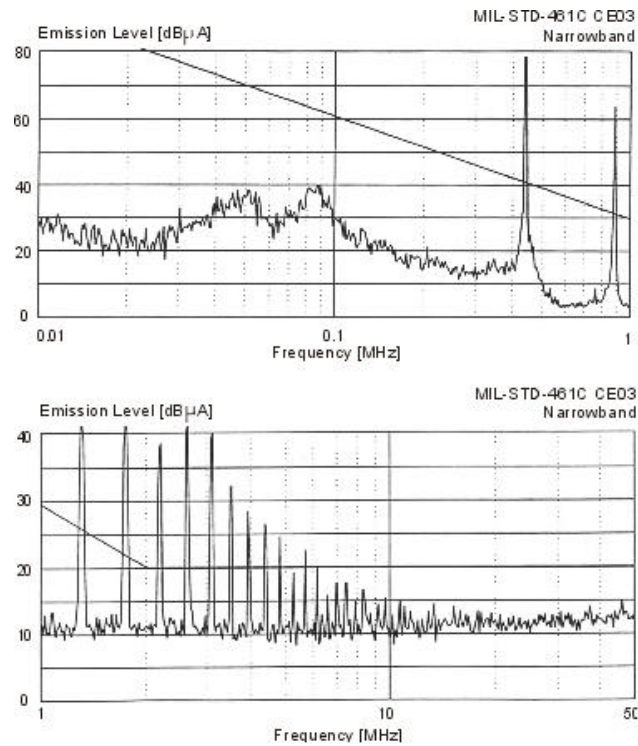
T_{case} = -55°C to +125°C, Vin = +28V ±5%, Full Load² unless otherwise specified

Parameter		Conditions -55 °C ≤Tc ≤125 °C, VIN = 28 VDC ±5%, Full Load ² Unless otherwise specified	DVSA2805D			DVSA2812D			DVSA2815D			Units
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Static												
INPUT												
Voltage			15	28	50	15	28	50	15	28	50	V
Current ⁵		Inhibited No Load		3.5 40	5 60		3.5 40	5 60		3.5 40	5 60	mA mA
Ripple Current		Full Load ² , 20Hz to 10MHz		15	30		15	30		15	30	mA _{p-p}
Inhibit Pin Input			0		1.5	0		1.5	0		1.5	V
Inhibit Pin Open Circuit Voltage			9.0	11.0	13.0	9.0	11.0	13.0	9.0	11.0	13.0	V
UVLO Turn On			11.5		15.0	11.5		15.0	11.5		15.0	V
UVLO Turn Off			11.0		14.5	11.0		14.5	11.0		14.5	V
OUTPUT												
Voltage	+V _O T _{case} = 25°C		4.95	5.00	5.05	11.88	12.00	12.12	14.85	15.00	15.15	V
	- V _{OUT}		4.90	5.00	5.10	11.76	12.00	12.24	14.70	15.00	15.30	V
	+V _O -55°C≤T _{case} ≤+125°C		4.85	5.00	5.15	11.64	12.00	12.36	14.55	15.00	15.45	V
	- V _{OUT}		4.80		5.20	11.52	12.00	12.48	14.40	15.00	15.60	V
	Total		0		5	0		6	0		6	W
Power ³	±V _O T _{case} = 25°C		0		3.5	0		4.2	0		4.2	W
Current ³	±V _O T _{case} = 25°C		0		0.7	0		0.35	0		0.28	A
Ripple Voltage	±V _O Full Load ² , 20Hz to 10MHz			10	30		15	40		15	40	mV _{p-p}
Line Regulation	±V _O Vin = 15 V to 50 V			10	30		15	40		15	40	mV _{p-p}
Load Regulation	+V _O No Load to Full Load ²			20	40		20	40		20	40	mV
	- V _{OUT}			20	100		20	100		20	100	mV
Cross Regulation	+V _O +V _{OUT} =30% Load, -V _{OUT} =70% Load			20	40		20	40		20	40	mV
	- V _{OUT}			200	350		300	400		300	400	mV
EFFICIENCY	Full Load ²		70	74		75	79		76	80		%
LOAD FAULT POWER DISSIPATION	Overload Short Circuit				3.0 2.5			3.0 2.5			3.0 2.5	W W
CAPACITIVE LOAD					500			500			500	μF
SWITCHING FREQUENCY			400	450	525	400	450	525	400	450	525	kHz
ISOLATION	Input to Output at 500Vdc T _{case} = 25°C		100			100			100			MΩ
THERMAL RESISTANCE	Case to Ambient (θ _{CA})			28			28			28		°C/W
MTBF	MIL-HDBK-217F, AIF @T _c =55°C			457			457			457		kHrs

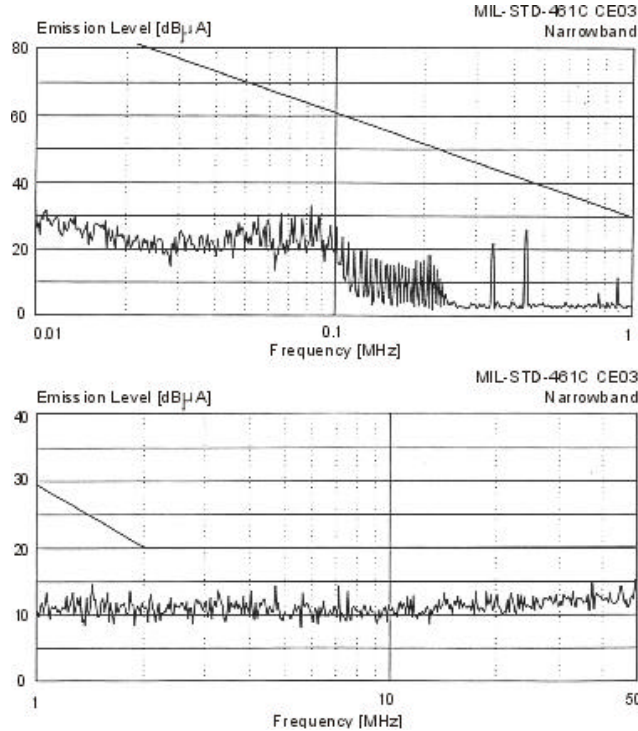
Dynamic												
LOAD STEP		Half load to Full Load		200	400		300	500		300	500	mV _{PK}
Output Transient	$\pm V_O$		200	400		300	500		300	500		μ Sec
Recovery ⁴	U_T		200	400		200	400		200	400		
LINE STEP		$V_{IN} = 15\text{ V to }50\text{ V}$		200	400		300	500		300	500	mV _{PK}
Output Transient	$\pm V_O$		200	400		300	500		300	500		μ Sec
Recovery ⁴	U_T		200	400		300	500		200	400		
TURN ON		$V_{IN} = 0\text{ V to }28\text{ V}$		10	15		10	15		10	15	mSec
Delay Overshoot ⁴	$\pm V_O$		0	50		0	120		0	150		mV _{PK}
	U_T											

NOTES:

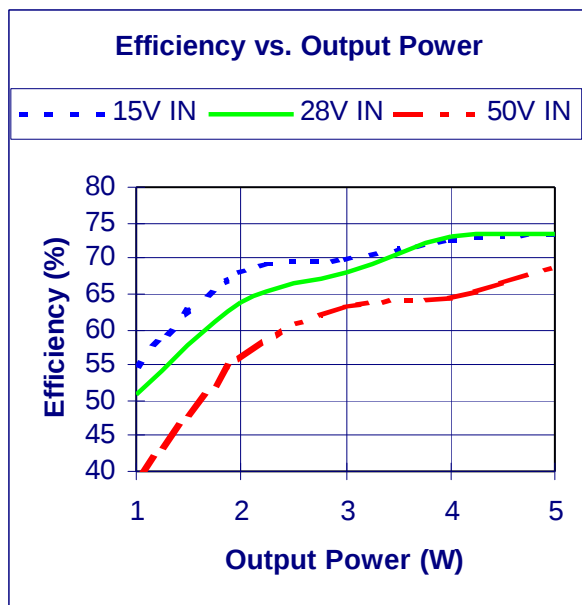
1. Dependent on output voltage.
2. Half Load at +V_{out} and Half Load at -V_{out}.
3. Up to 70% of the total power or current can be drawn from any one of the two outputs.
4. Time for output voltage to settle within 1% of its nominal value.
5. Derate linearly to 0 at 135°C.



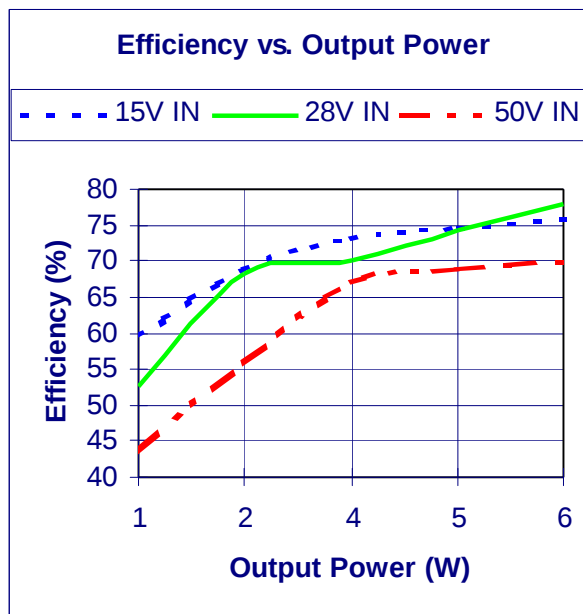
DVSA2800D Without EMI filter
Figure 1



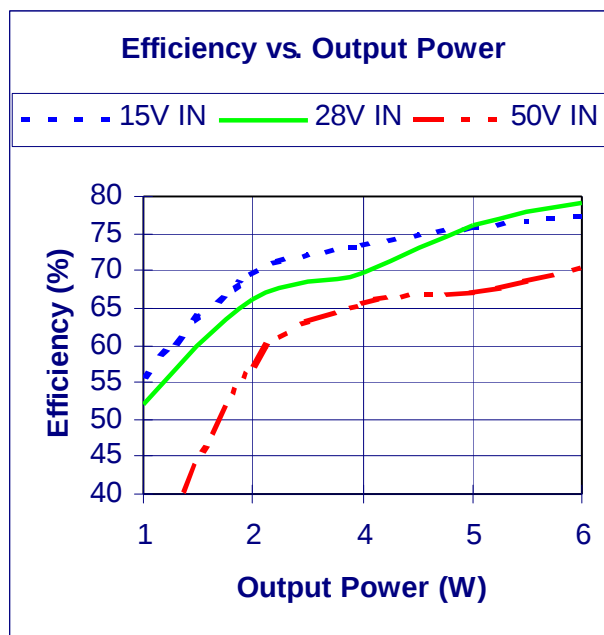
DVSA2800D With EMI filter
Figure 2



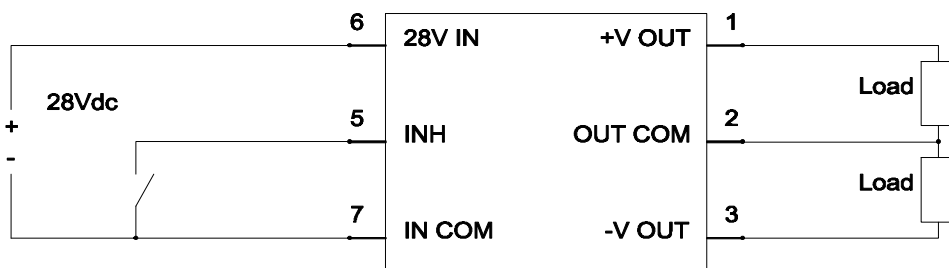
Efficiency vs. Load, **DVSA2805D**
Figure 3



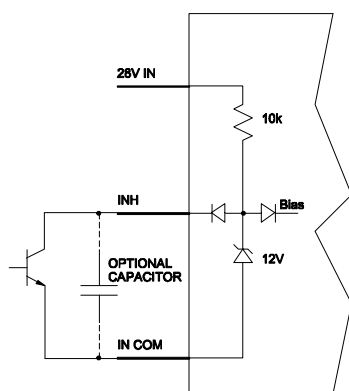
Efficiency vs. Load, **DVSA2812D**
Figure 4



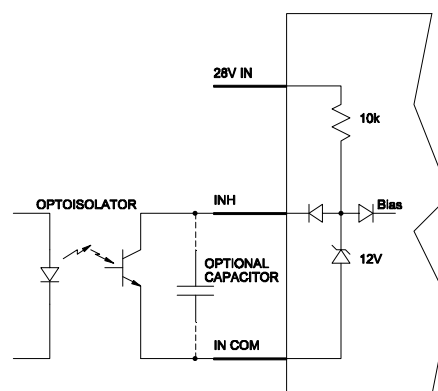
Efficiency vs. Load, **DVSA2815D**
Figure 5



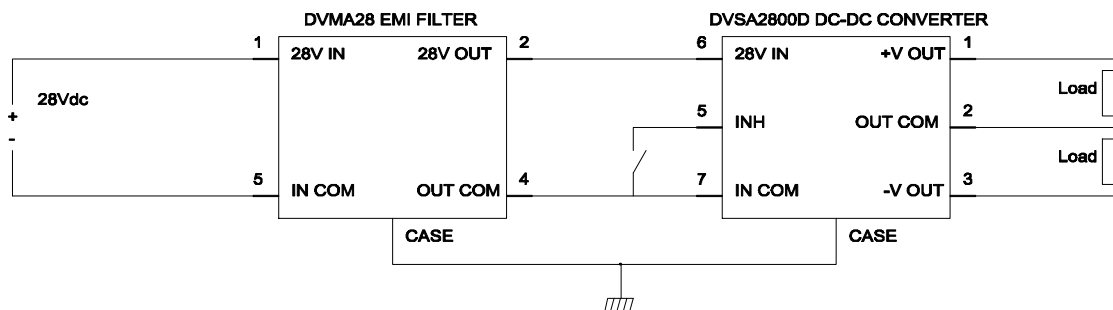
Connection Diagram
Figure 6



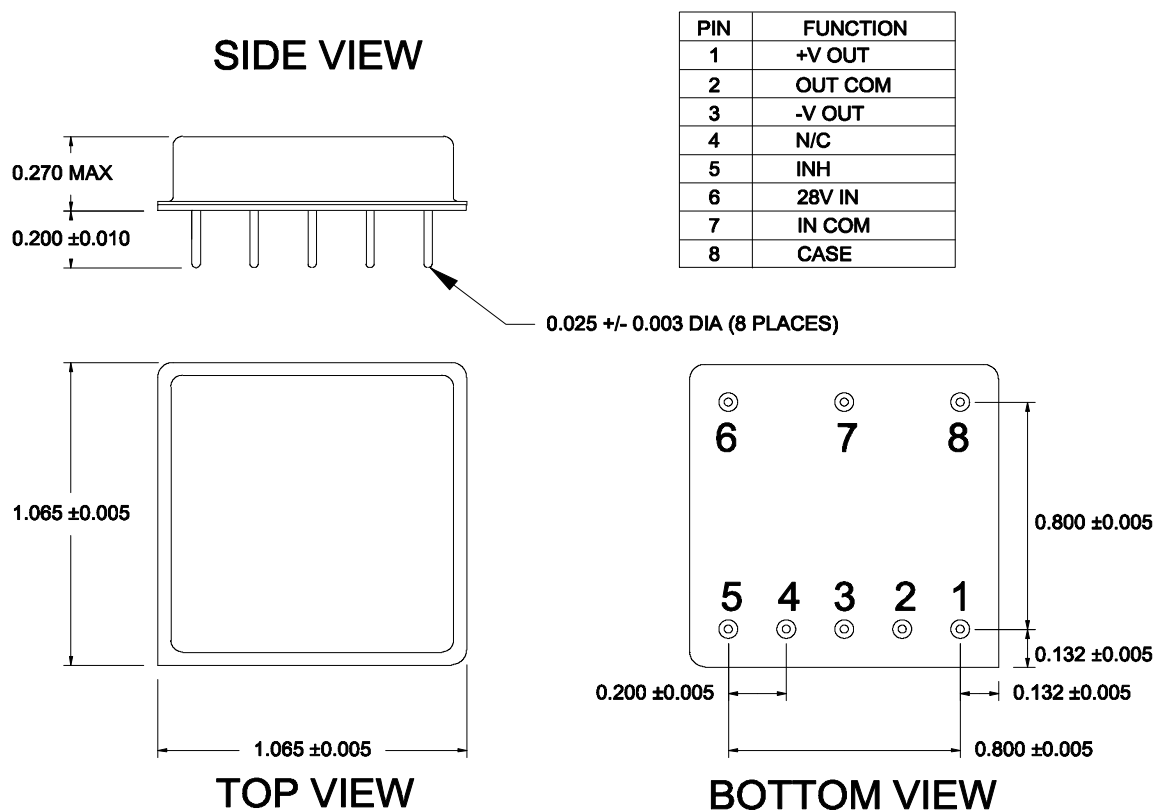
Internal Inhibit Circuit and Recommended Drive
(Shown with optional capacitor for turn on delay)
Figure 7



Isolated Inhibit Drive
(Shown with optional capacitor for turn on delay)
Figure 8



Converter with EMI Filter Hookup Diagram
Figure 9



Package Drawing and Pinout
Figure 13

Screening Action	MIL-STD-883	Standard (No Suffix)	Extended /ES Suffix	(H) /HB Suffix
Pre-cap Inspection	Method 2017, 203	•	•	•
Temperature Cycling	Method 1010, Condition C Method 1010, -55°C to +125°C		•	•
Constant Acceleration	Method 2001, 3000g Method 2001, 500g		•	•
Burn-In	Method 1015, 160 hours at 125°C 96 hours at 125°C 24 hours at 125°C	•	•	•
Hermeticity	Fine Leak, Method 1014, Condition A Gross Leak, Method 1014, Condition C	•	•	•
Final Electrical	MIL-PRF-38534, Group A 100% at 25°C	•	•	•
Final Inspection	Method 2009	•	•	•

Screening Information
Table 1

Ordering Information

Example Part Number: DVSA2805DR/ES					
DVSA	28	05	D	R	/ES
Product Series	Nominal Input Voltage	Output Voltage	No. Outputs	Rad Hard Opt.	Screening
DVSA	28 28 Volts	05 5 Volts	D Dual	None Std.	None Standard
		12 12 Volts		R 100kRad	/ES Extended
		15 15 Volts			/HB HB Screening