

HIGH RELIABILITY HYBRID EMI FILTERS

DESCRIPTION

The DVMH series of hybrid EMI filters is operable over the full military (-55 °C to +125 °C) temperature range with no power derating. The DVMH EMI filter is designed to filter conducted emissions of two DVHF or one DVTR series DC-DC converters.

These filters are designed and manufactured in a facility qualified to ISO9001 and certified to MIL-PRF-38534 and MIL-STD-883.

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

- High Reliability
- Wide Input Voltage Range: 0 to 50 Volts per MIL-STD-704
- Up to 2.0 Amp Maximum Current
- 40 dB Minimum Attenuation at 500 kHz
- Industry Standard Pinout
- High Input Transient Voltage: 80 Volts for 1 sec per MIL-STD-704A
- Precision Projection Welded Hermetic Package
- Custom Versions Available
- Additional Environmental Screening Available
- Meets MIL-STD-461C and MIL-STD-461D EMC Requirements
- Protects Against Conducted Susceptibility Specified in MIL-STD-461C, CS01 and CS02
- Flanged and Non-flanged Versions Available
- MIL-PRF-38534 Element Evaluated Components

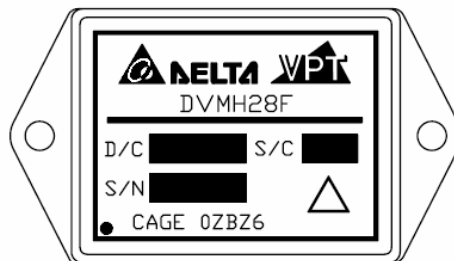


Figure 1 – DVMH28 / DVMH28F EMI Filter
(Not To Scale)

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V_{DC}	Storage Temperature	-65°C to $+150^{\circ}\text{C}$
Input Voltage (Transient, 1 second)	80 Volts	Lead Solder Temperature (10 seconds)	300°C
Output Current	2.0 Amps	Weight (Maximum) (Un-Flanged / Flanged)	(24 / 29) Grams
Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}\text{C}$)	1.0 Watt		

Parameter	Conditions	DVMH28			Units
		Min	Typ	Max	
STATIC					
INPUT Voltage ²	Continuous	0	28	50	V
	Transient, 1 sec	-	-	80	V
Current ^{1,2,3}	Continuous	0	-	2.0	A
OUTPUT Voltage ²	Continuous	$V_{OUT} = V_{IN} - (I_{IN} \times R_{DC})$			V
Current ^{2,3}	Continuous	0	-	2.0	A
DC RESISTANCE	Continuous	-	-	250	$m\Omega$
POWER DISSIPATION ²	Continuous	-	-	1.0	W
NOISE REJECTION	$f = 500 \text{ kHz}$	55	-	-	dB
CAPACITANCE	Pin to Case	10	-	30	nF
ISOLATION	Any Pin to Case, 500 V_{DC}	100	-	-	$M\Omega$
MTBF (MIL-HDBK-217F)	AIF @ $T_c = 55^{\circ}\text{C}$	-	2.49	-	MHrs

- Notes:
1. Derate linearly to 0 at 135°C .
 2. Verified by qualification testing.
 3. Rated current applies at any voltage.

BLOCK DIAGRAM

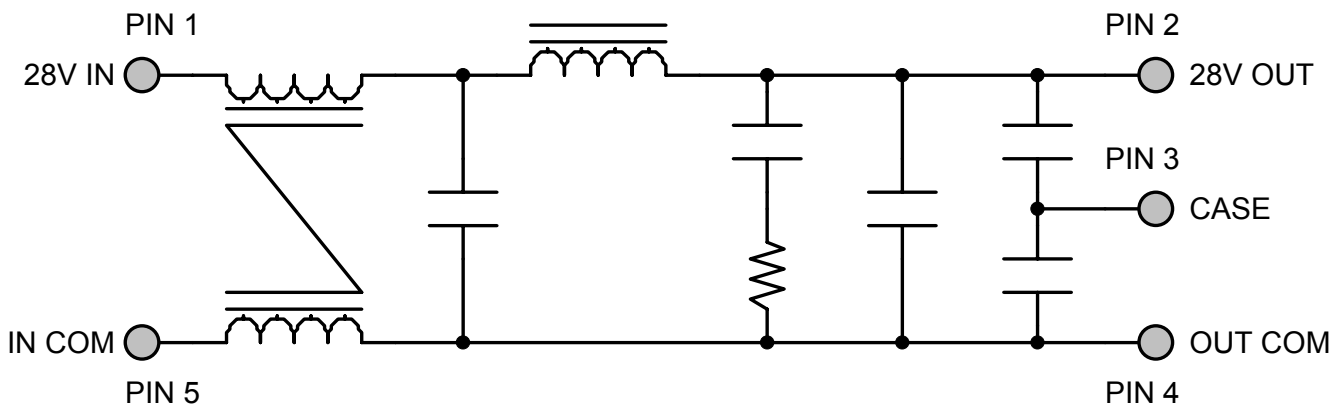


Figure 2

CONNECTION DIAGRAMS

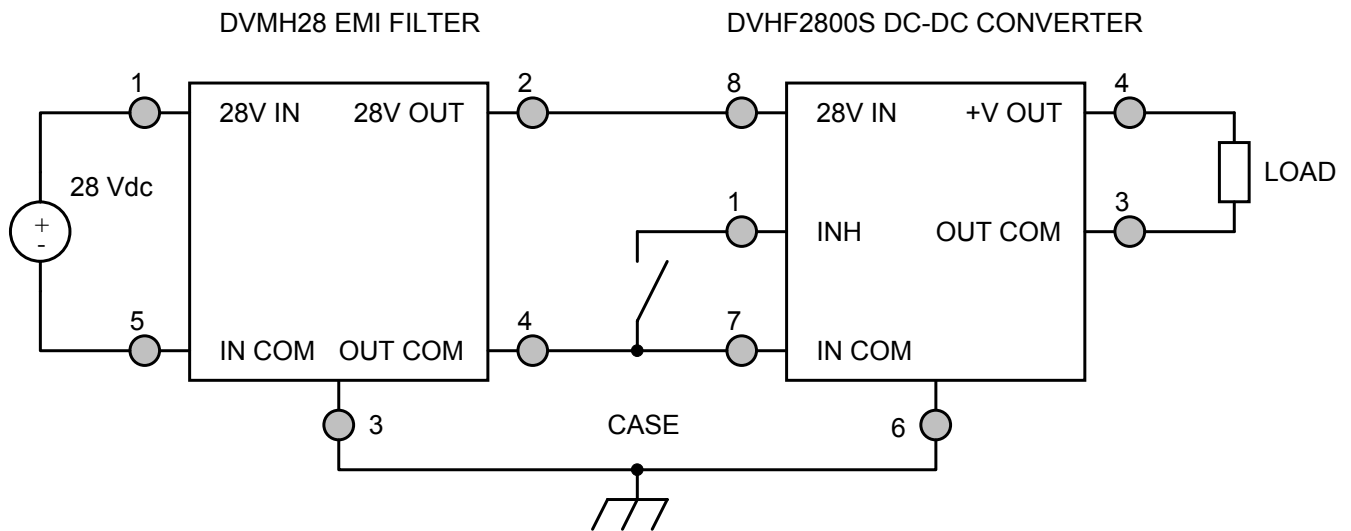


Figure 3 – DVMH28 EMI Filter Hookup with Single Converter

CONNECTION DIAGRAMS

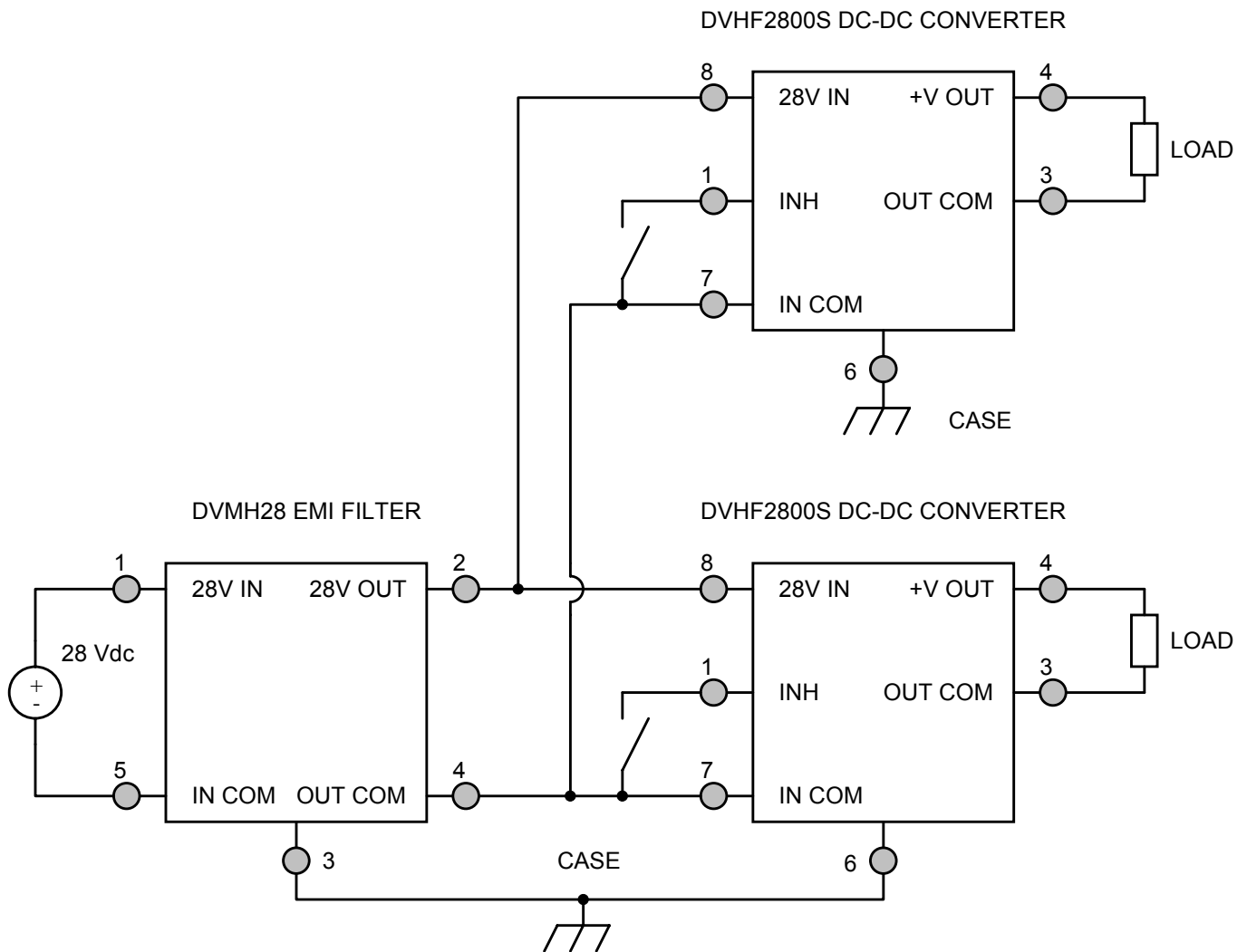


Figure 4 – DVMH28 EMI Filter Hookup with Two Converters

EMI MEASUREMENT METHODS CONNECTION DIAGRAMS

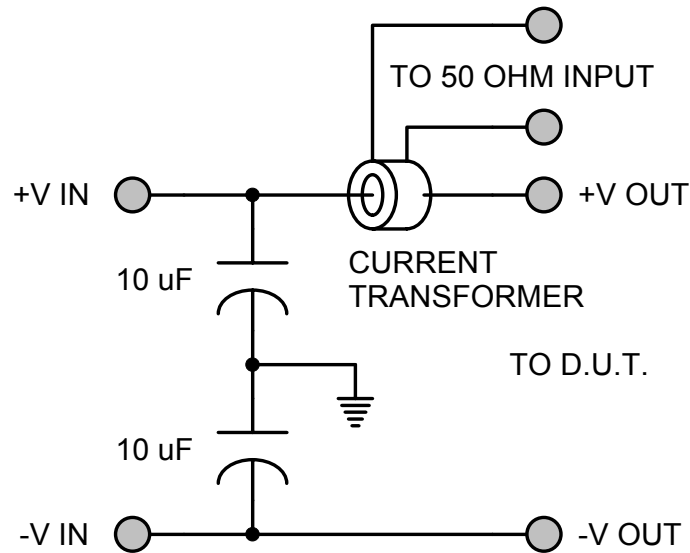


Figure 5 – MIL-STD-461C Measurement Method (Feedthrough Capacitor)

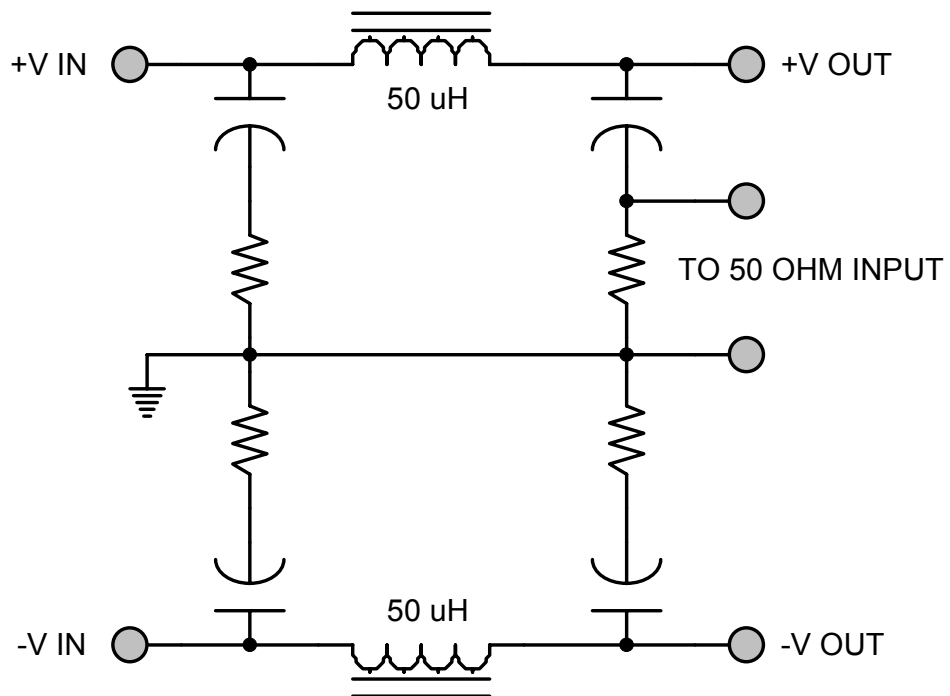
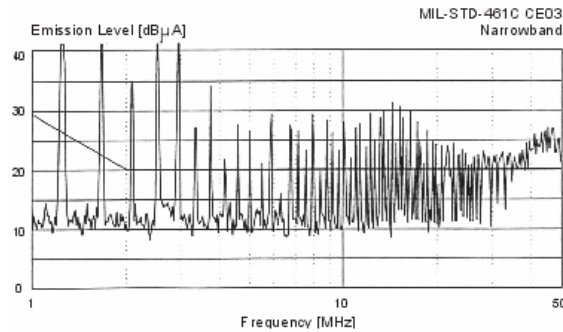
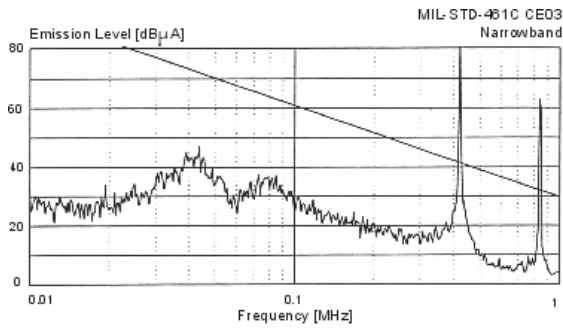


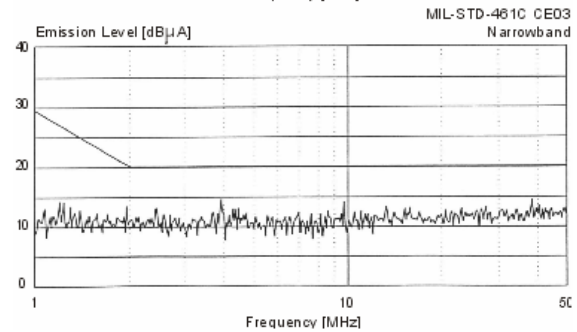
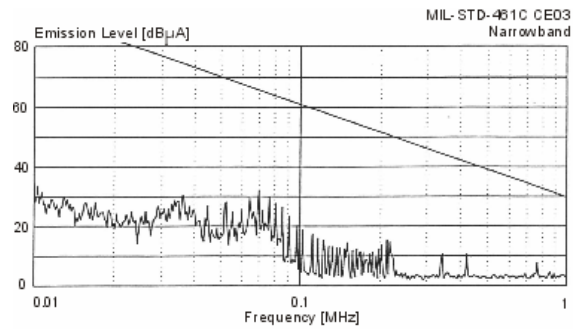
Figure 6 – MIL-STD-461D Measurement Method (LISN)

EMI PERFORMANCE CURVES

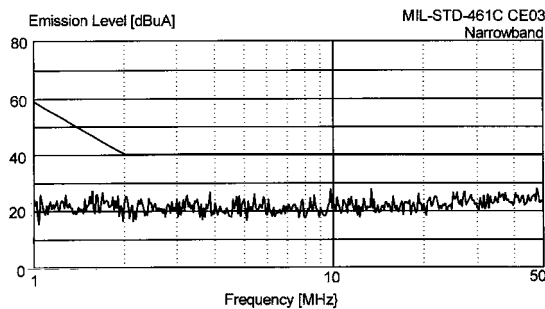
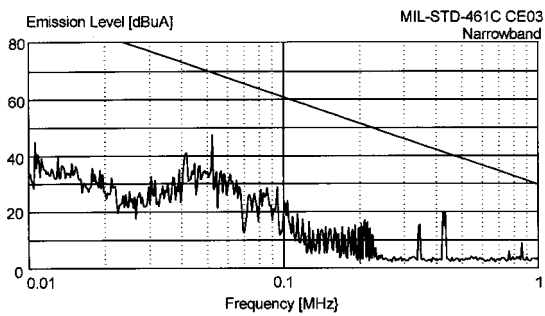
($T_{CASE} = 25^{\circ}C$, $V_{IN} = +28V \pm 5\%$, Full Load, Unless Otherwise Specified)



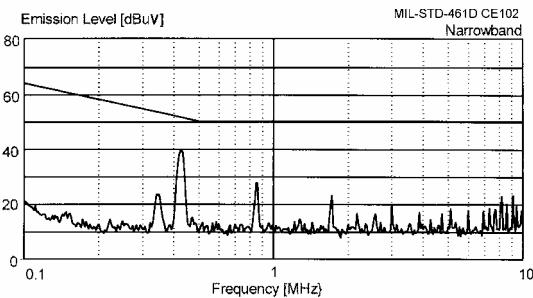
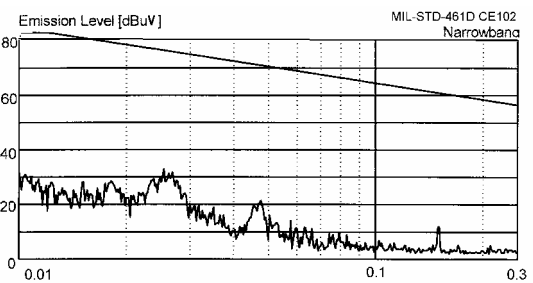
**Figure 7 – MIL-STD-461C
DVHF2800D Without EMI Filter**



**Figure 8 – MIL-STD-461C
DVHF2800D With DVMH28 EMI Filter**

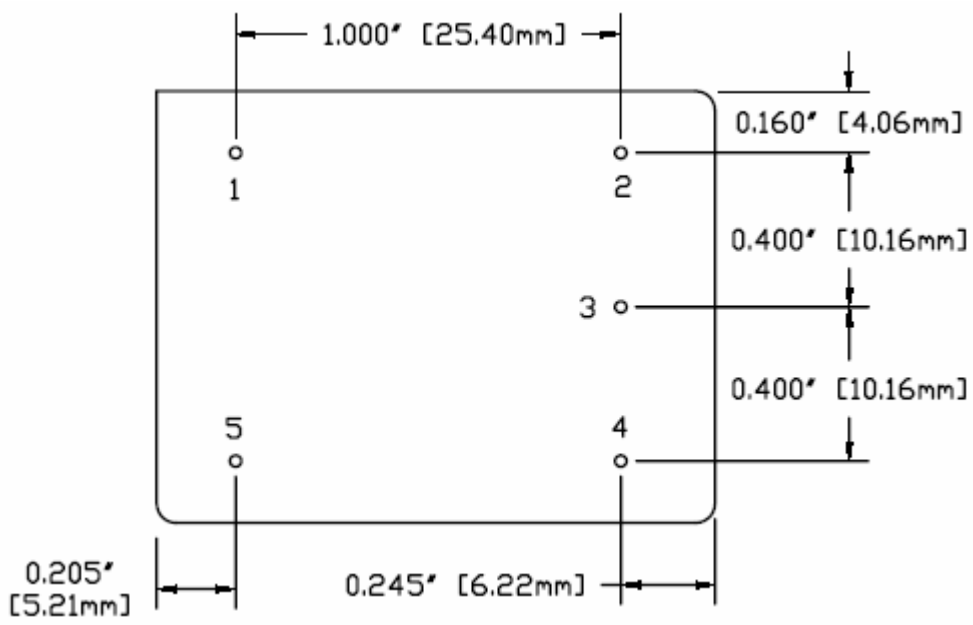
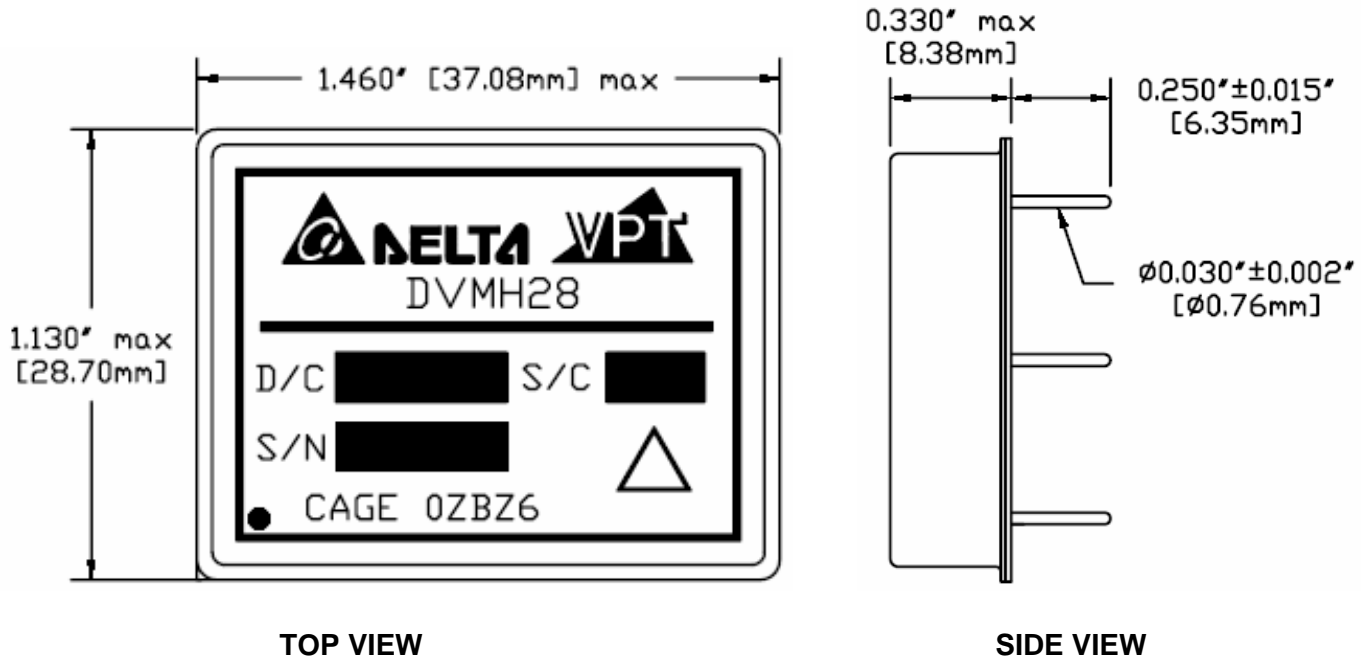


**Figure 9 – MIL-STD-461C
Two DVHF2800S's With DVMH28 EMI Filter**



**Figure 10 – MIL-STD-461D
DVHF2800S With DVMH28 EMI Filter**

PACKAGE SPECIFICATIONS (NON-FLANGED)

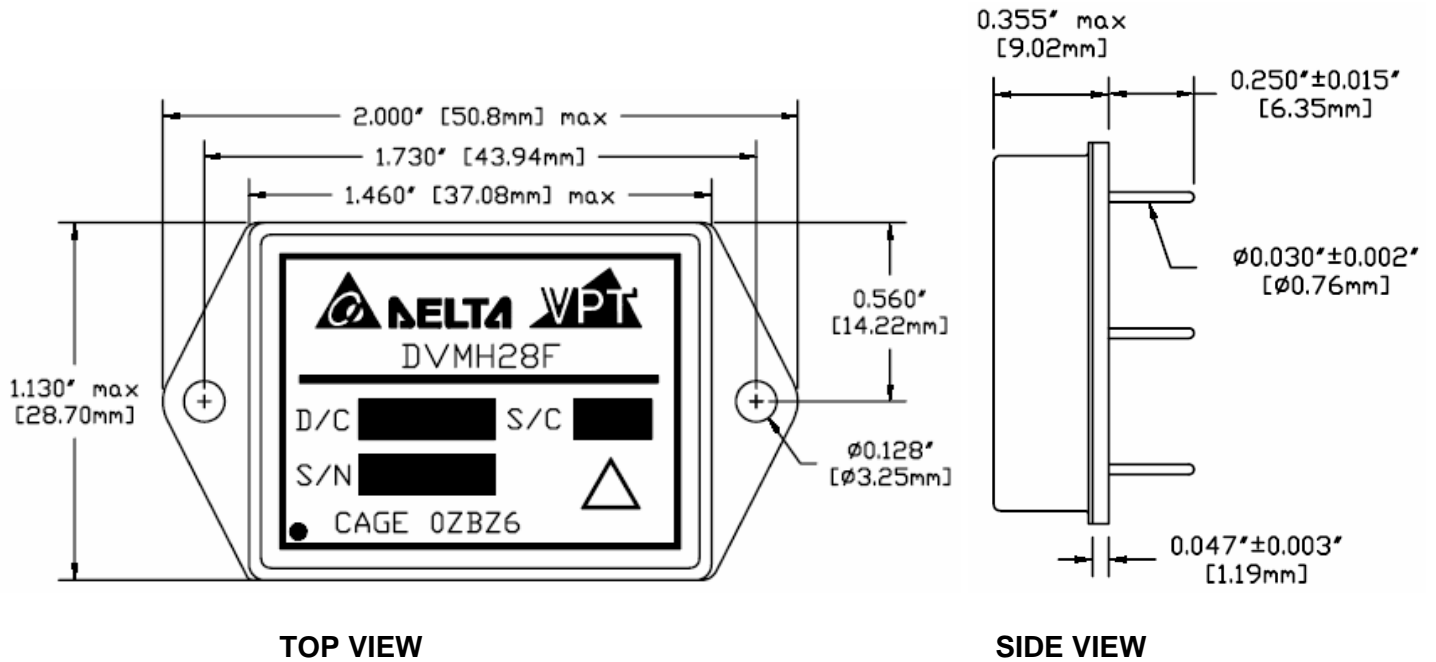


PIN	FUNCTION
1	28V IN
2	28V OUT
3	CASE
4	OUT COM
5	IN COM

BOTTOM VIEW

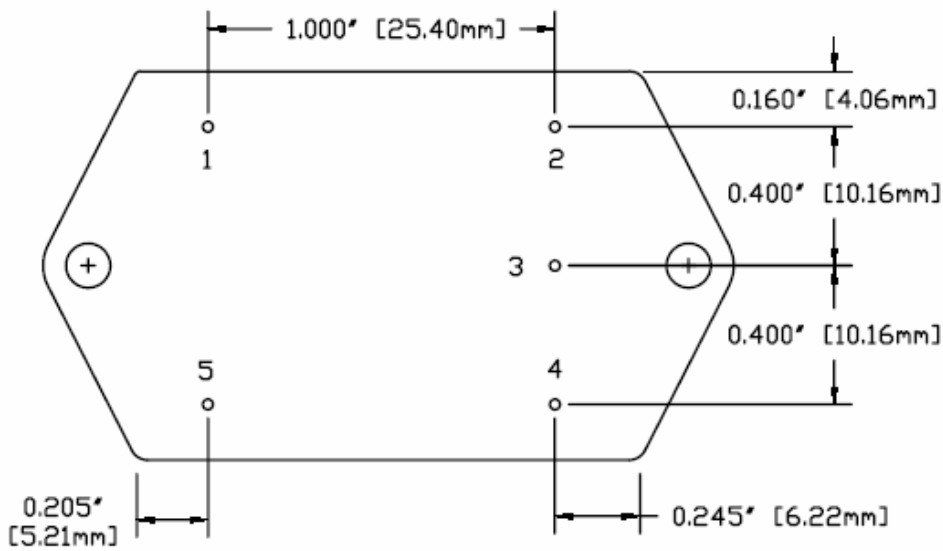
Figure 11 – Non-Flanged Package and Pinout
(Dimensional Limits are ±0.005" Unless Otherwise Stated)

PACKAGE SPECIFICATIONS (FLANGED)



TOP VIEW

SIDE VIEW



BOTTOM VIEW

PIN	FUNCTION
1	28V IN
2	28V OUT
3	CASE
4	OUT COM
5	IN COM

Figure 12 – Flanged Package and Pinout
(Dimensional Limits are ±0.005" Unless Otherwise Stated)

PACKAGE PIN DESCRIPTION

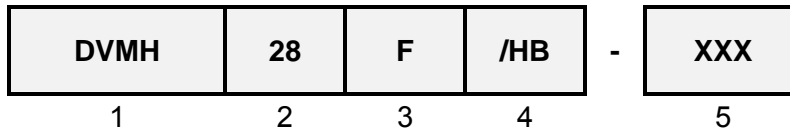
Pin	Function	Description
1	28V IN	Positive Input Voltage Connection
2	28V OUT	Positive Output Voltage Connection
3	CASE	Case Connection
4	OUT COM	Output Common Connection
5	IN COM	Input Common Connection

ENVIRONMENTAL SCREENING (100% Tested Per MIL-STD-883 as referenced to MIL-PRF-38534)

Screening	MIL-STD-883	Standard (No Suffix)	Extended /ES	HB /HB	Class H /H	Class K /K
Non-Destructive Bond Pull	N/A – Products do not contain Wirebonds	N/A	N/A	N/A	N/A	N/A
Internal Visual	Method 2017, 2032 Internal Procedure	•	•	•	•	•
Temperature Cycling	Method 1010, Condition C Method 1010, -55°C to 125°C		•	•	•	•
Constant Acceleration	Method 2001, 3000g, Y1 Direction Method 2001, 500g, Y1 Direction		•	•	•	•
PIND	Method 2020, Condition A ²					•
Pre Burn-In Electrical	100% at 25°C					•
Burn-In	Method 1015, 320 hours at +125°C Method 1015, 160 hours at +125°C 96 hours at +125°C 24 hours at +125°C	•	•	•	•	•
Final Electrical	MIL-PRF-38534, Group A ¹ 100% at 25°C	•	•	•	•	•
Hermeticity	Method 1014, Fine Leak, Condition A Method 1014, Gross Leak, Condition C Dip (1 x 10 ⁻³)	•	•	•	•	•
Radiography	Method 2012 ³					•
External Visual	Method 2009	•	•	•	•	•

- Notes:
1. 100% R&R testing at -55°C, +25°C, and +125°C with all test data included in product shipment.
 2. PIND test Certificate of Compliance included in product shipment.
 3. Radiographic test Certificate of Compliance and film(s) included in product shipment.

ORDERING INFORMATION



(1)

(2)

(3)

(4)

(5)

Product Series	Nominal Input Voltage		Package Option		Screening Code ^{1,2}		Additional Screening Code
DVMH	28	28 Volts	None F	Non-Flanged Flanged	None /ES /HB /H /K	Standard Extended HB Class H Class K	Contact Sales

- Notes:
1. Contact the VPT Inc. Sales Department for availability of Class H (/H) or Class K (/K) qualified products.
 2. VPT Inc. reserves the right to ship higher screened or DSCC Drawing products to meet lower screened orders at our sole discretion unless specifically forbidden by customer contract.

Please contact your sales representative or the VPT Inc. Sales Department for more information concerning additional environmental screening and testing, different input voltage, output voltage, power requirement, source inspection, and/or special element evaluation for space or other higher quality applications.

DSCC DRAWING NUMBERS

DSCC Drawing	DVMH28 Series Similar Part Number
06005-01HXC	DVMH28/H
06005-01HYC	DVMH28F/H

Do not use the DVMH28 Series similar part number for DSCC Drawing product acquisition. It is listed for reference only. For exact specifications for the DSCC Drawing product, refer to the DSCC Drawing. DSCC Drawings can be downloaded from the DSCC website at <http://www.dsccl.dla.mil/programs/smcr/>. The DSCC Drawing number listed above is for MIL-PRF-38534 Class H screening, standard gold plated lead finish, and no RHA (Radiation Hardness Assurance) level. Please reference the DSCC Drawing for other screening levels, lead finishes, and radiation levels.

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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