



# DVMA28 Series

## HIGH RELIABILITY HYBRID EMI FILTERS

### DESCRIPTION

The DVMA series of hybrid EMI filters is operable over the full military (-55 °C to +125 °C) temperature range with no power derating. The DVMA EMI filter is designed to filter conducted emissions of two DVSA or one DVHF 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 1.0 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
- Meets MIL-STD-461 Revisions C, D, E and F Requirements for Conducted Emissions
- Meets MIL-STD-461 Revisions C, D, E and F Requirements for Conducted Susceptibility as detailed in the Application Note, "MIL-STD-461 Compliance for VPT DC-DC Converters and EMI Filters"
- MIL-PRF-38534 Element Evaluated Components



**Figure 1** – DVMA28 EMI Filter  
(Exact marking may differ from that shown)

## SPECIFICATIONS (T<sub>CASE</sub> = -55°C to +125°C, V<sub>IN</sub> = +28V ± 5%, Full Load, Unless Otherwise Specified)

### ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V <sub>DC</sub>	Storage Temperature	-65°C to +150°C
Input Voltage (Transient, 1 second)	80 Volts	Lead Solder Temperature (10 seconds)	300°C
Output Current	1.0 Amp	Weight (Maximum)	15 Grams
Power Dissipation (Full Load, T <sub>CASE</sub> = +125°C)	0.20 Watts		

Parameter	Conditions	DVMA28			Units
		Min	Typ	Max	
<b>STATIC</b>					
INPUT Voltage <sup>2</sup>	Continuous	0	28	50	V
	Transient, 1 sec	-	-	80	V
Current <sup>1,2,3</sup>	Continuous	0	-	1.0	A
OUTPUT Voltage <sup>2</sup>	Continuous	$V_{OUT} = V_{IN} - (I_{IN} \times R_{DC})$			V
Current <sup>2,3</sup>	Continuous	0	-	1.0	A
DC RESISTANCE	Continuous	-	-	200	mΩ
POWER DISSIPATION <sup>2</sup>	Continuous	-	-	0.20	W
NOISE REJECTION	f = 500 kHz	40	-	-	dB
CAPACITANCE	Pin to Case	13	-	27	nF
ISOLATION	Any Pin to Case, 500 V <sub>DC</sub>	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ T <sub>C</sub> = 55°C	-	3.15	-	MHrs

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

### BLOCK DIAGRAM

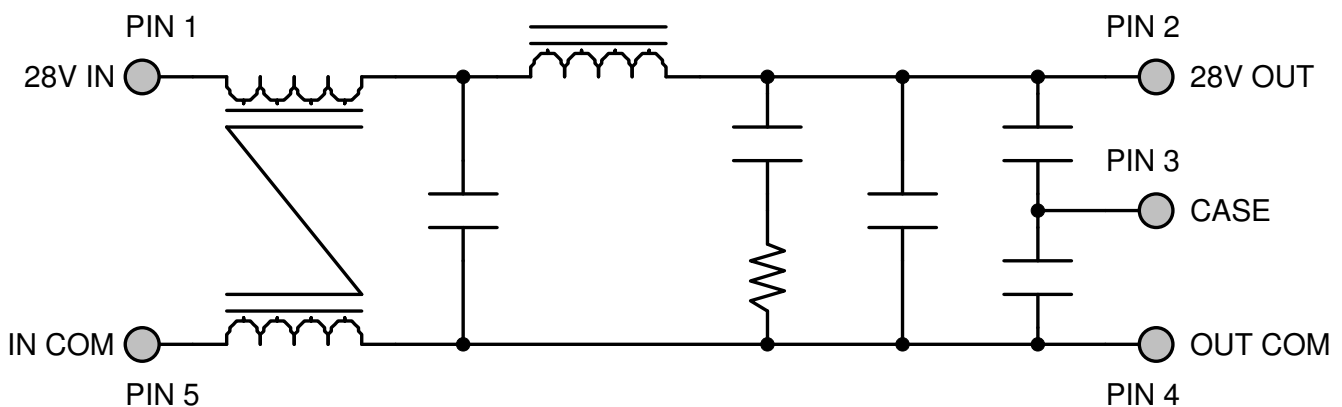


Figure 2

CONNECTION DIAGRAMS

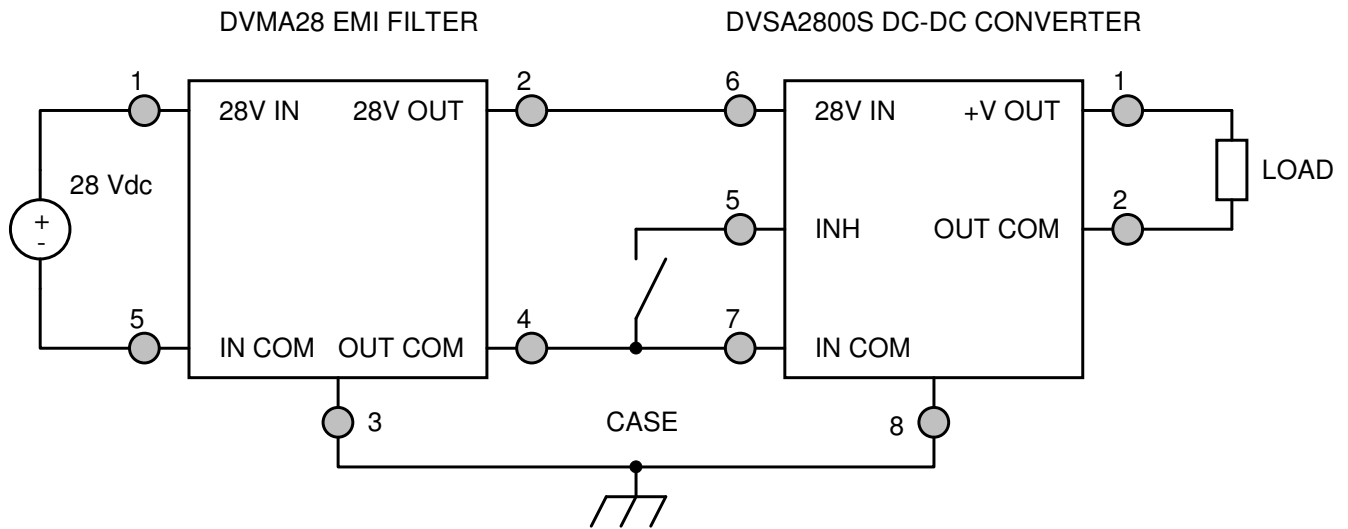


Figure 3 – DVMA28 EMI Filter Hookup with Single Converter

CONNECTION DIAGRAMS

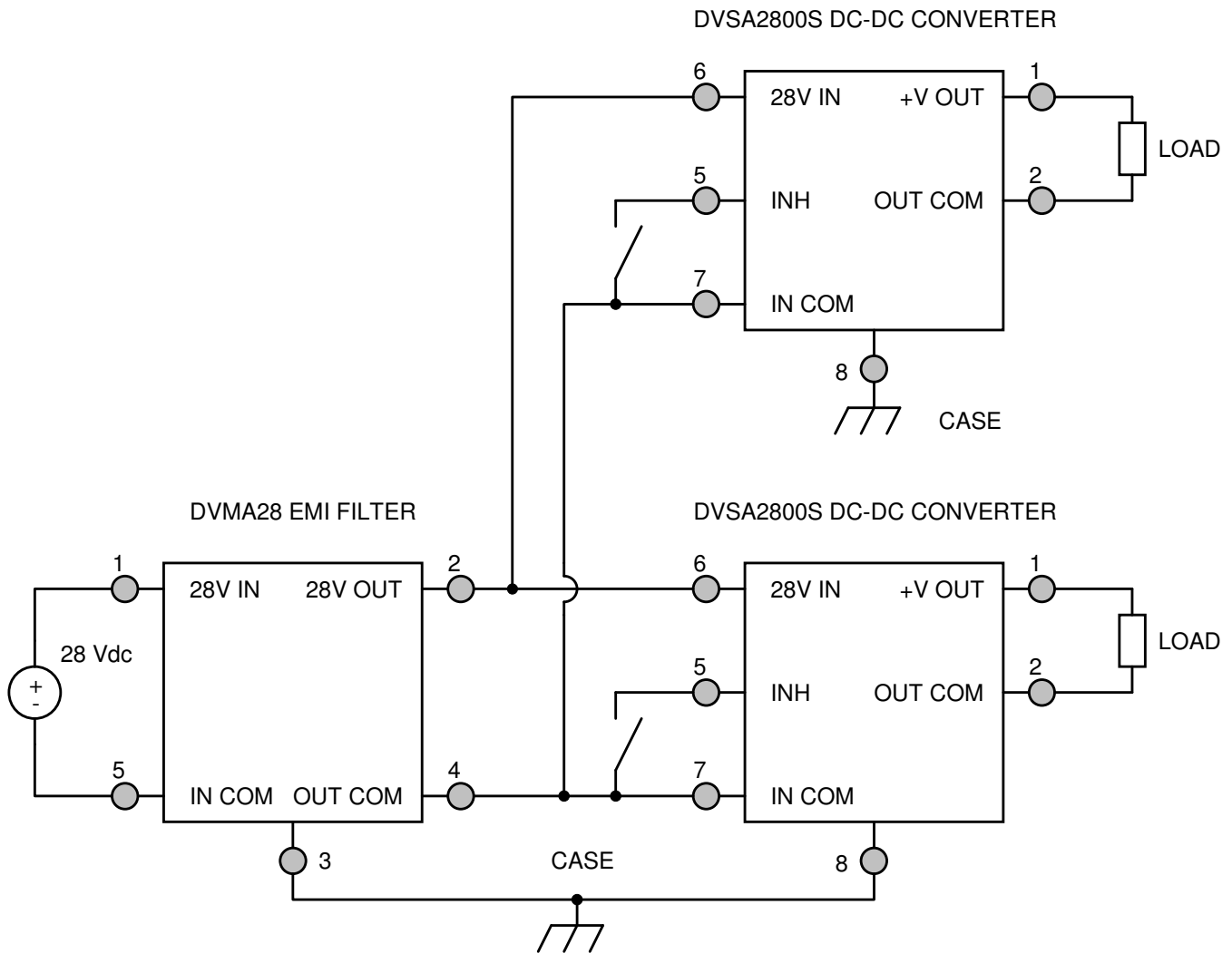


Figure 4 – DVMA28 EMI Filter Hookup with Two Converters

EMI MEASUREMENT METHODS CONNECTION DIAGRAMS

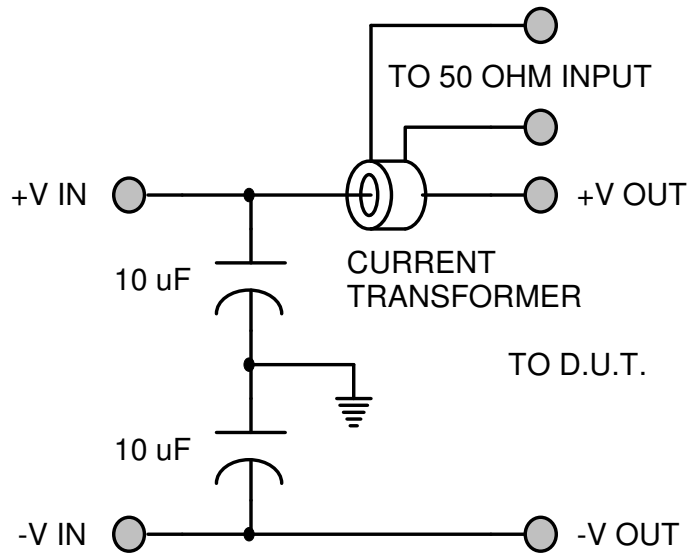


Figure 5 – MIL-STD-461C Measurement Method (Feedthrough Capacitor)

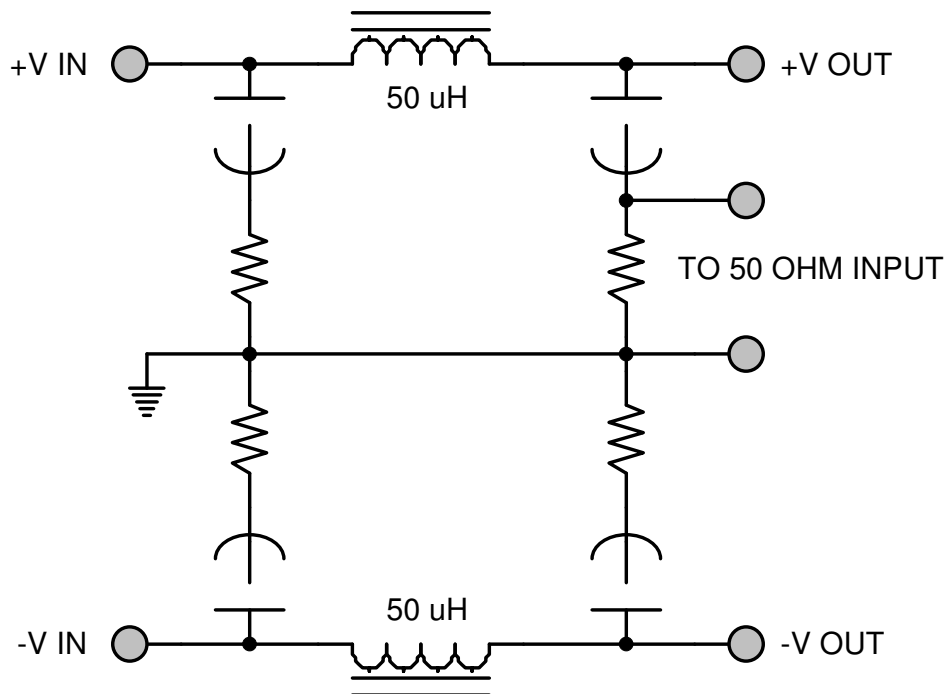
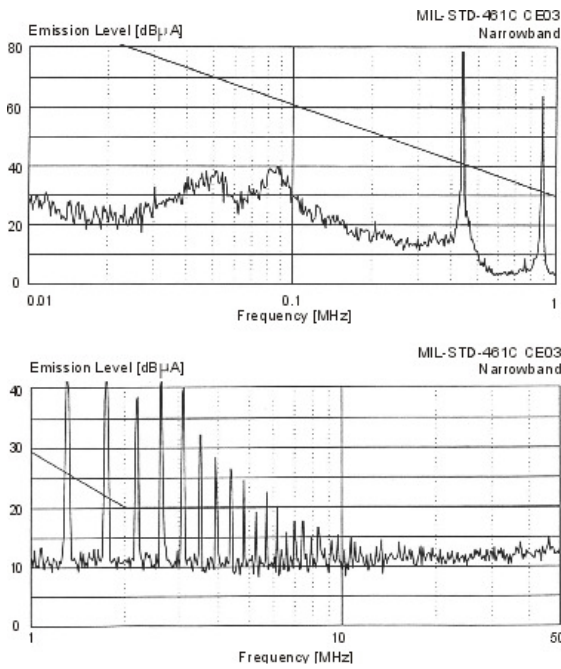


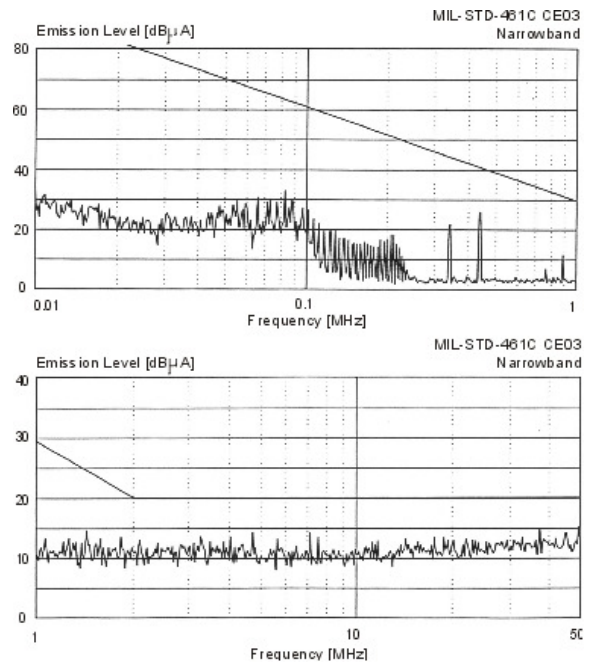
Figure 6 – MIL-STD-461D Measurement Method (LISN)

**EMI PERFORMANCE CURVES**

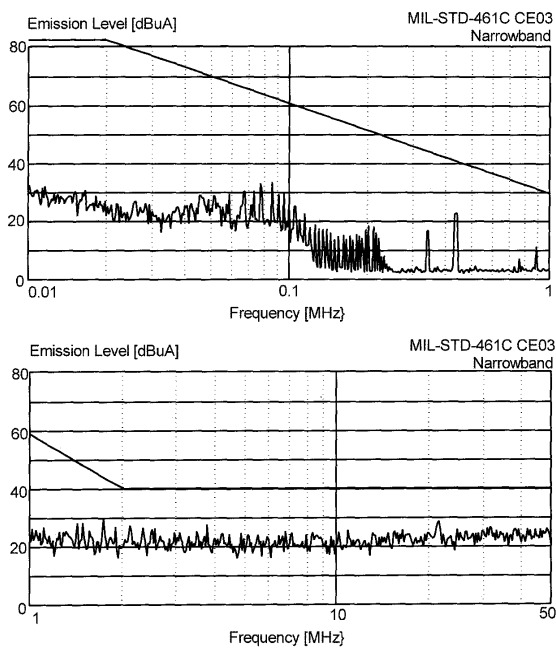
( $T_{CASE} = 25^{\circ}C$ ,  $V_{IN} = +28V \pm 5\%$ , Full Load, Unless Otherwise Specified)



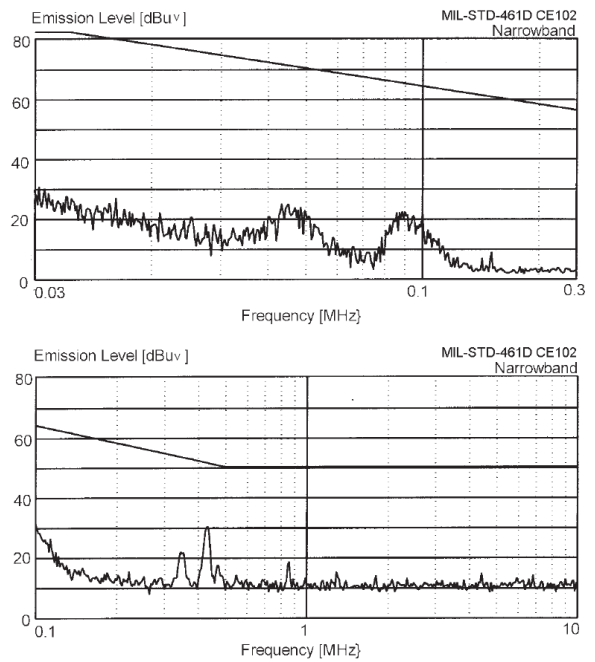
**Figure 7 – MIL-STD-461C DVSA2800D Without EMI Filter**



**Figure 8 – MIL-STD-461C DVSA2800D With DVMA28 EMI Filter**

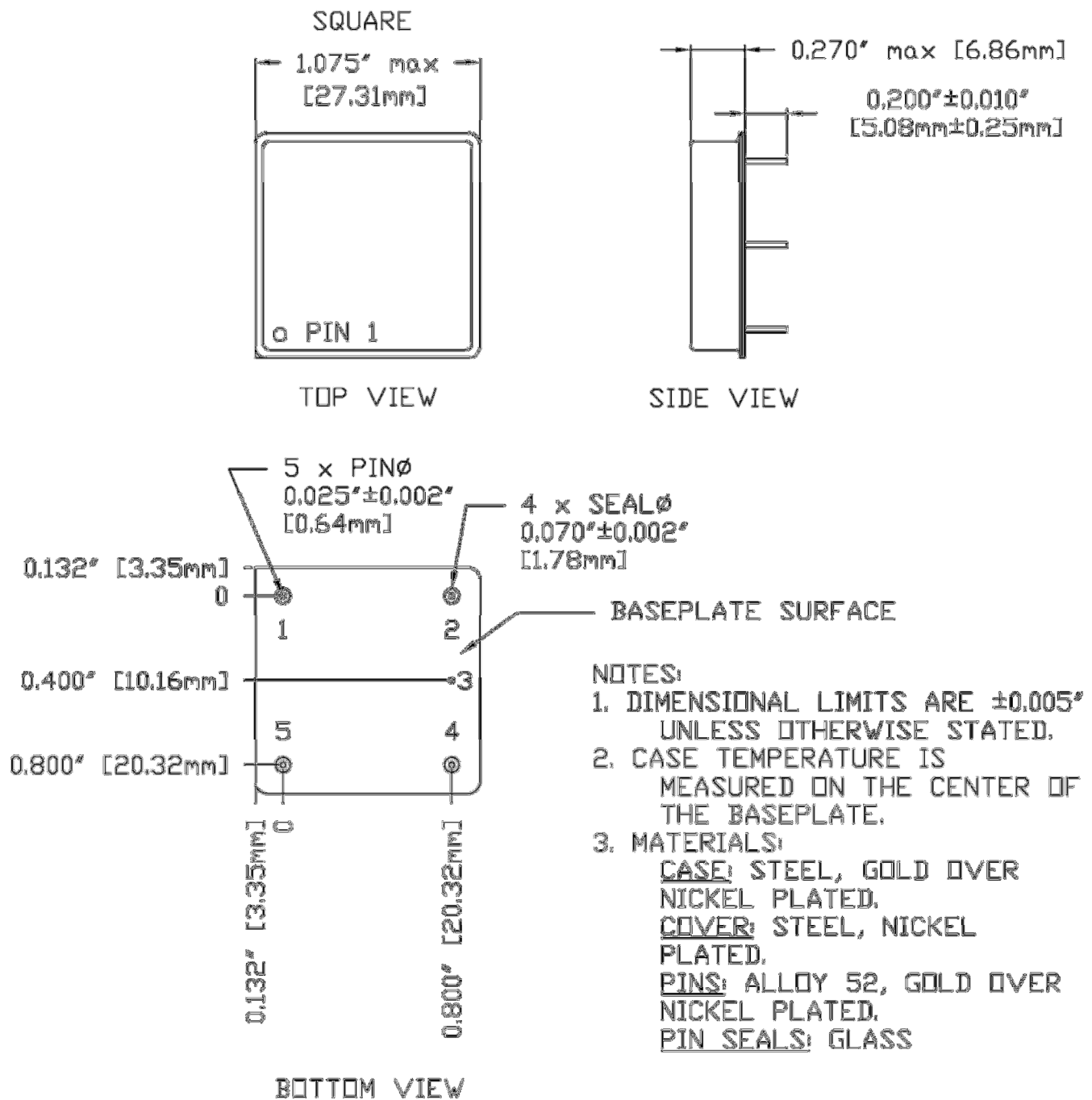


**Figure 9 – MIL-STD-461C Two DVSA2800S's With DVMA28 EMI Filter**



**Figure 10 – MIL-STD-461D DVSA2800S With DVMA28 EMI Filter**

**PACKAGE SPECIFICATIONS**



Pin	Function	Pin	Function	Pin	Function
1	28V IN	3	CASE	5	IN COM
2	28V OUT	4	OUT COM		

Figure 11 – Package and Pinout

**PACKAGE PIN DESCRIPTION**

<b>Pin</b>	<b>Function</b>	<b>Description</b>
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



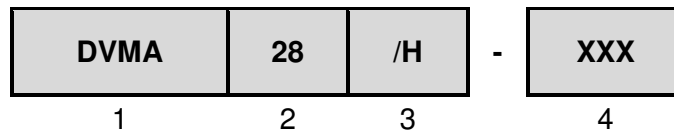
## ENVIRONMENTAL SCREENING (100% Tested Per MIL-STD-883 as referenced to MIL-PRF-38534)

Test	MIL-STD-883 Test Method, Condition	No Suffix (Standard) Non-QML ⑤	/ES (Extended) Non-QML ⑤	/H (Class H)	/K (Class K)
Internal Visual	TM2010, TM2017, TM2032 (MIL-STD-750, TM2072, TM2073)	•	•	•	•
Temperature Cycling	TM1010, Condition C -65 °C to 150 °C, Ambient			•	•
	TM1010, Condition B -55 °C to 125 °C, Ambient		•		
Constant Acceleration	TM2001, 3000g, Y1 Direction			•	•
	TM2001, 500g, Y1 Direction		•		
PIND ⑦	TM2020, Condition A				•
Pre Burn-In Electrical	25 °C				•
Burn-In	TM1015, 320 hrs, 125 °C, Case Typ				•
	TM1015, 160 hrs, 125 °C, Case Typ			•	
	96 hrs, 125 °C, Case Typ		•		
	24 hrs, 125 °C, Case Typ	•			
Final Electrical	MIL-PRF-38534, Group A Subgroups 1-6 -55 °C, 25 °C, 125 °C ③			•	•
	MIL-PRF-38534, Group A Subgroups 1 and 4 25 °C	•	•		
Hermeticity (Seal)	TM1014, Fine Leak, Condition A2		•	•	•
	TM1014, Gross Leak, Condition C		•	•	•
	Gross Leak, Dip (1 x 10 <sup>-3</sup> )	•			
Radiography ⑧	TM2012				•
External Visual	TM2009	•	•	•	•

Notes:

- ① Contact Sales for more information concerning additional environmental screening and testing options desired.
- ② VPT Inc. reserves the right to ship higher screened or SMD products to meet lower screened orders at our sole discretion unless specifically forbidden by customer contract.
- ③ 100% R&R testing with all test data included in product shipment.
- ④ Note intentionally not used.
- ⑤ Non-QML products may not meet all requirements of MIL-PRF-38534.
- ⑥ Note intentionally not used.
- ⑦ PIND test Certificate of Compliance included in product shipment.
- ⑧ Radiographic test Certificate of Compliance and film(s) or data CD included in product shipment.

## ORDERING INFORMATION



(1) Product Series	(2) Nominal Input Voltage		(3) Screening Code <sup>1</sup>		(4) Additional Screening Code
DVMA	28	28 Volts	None /ES /H /K	Standard Extended Class H Class K	Contact Sales

Notes: 1. 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

DLA Drawing	DVMA28 Series Similar Part Number
06004-01HXC	DVMA28/H
06004-01HXA	DVMA28/H-E
06004-01KXC	DVMA28/K
06004-01KXA	DVMA28/K-E

Do not use the DVMA28 Series similar part number for DLA Land and Maritime (Previously known as DSCC) Drawing product acquisition. It is listed for reference only. For exact specifications for the DLA Drawing product, refer to the DLA Drawing. DLA Drawings can be downloaded from the DLA website at <https://landandmaritimeapps.dla.mil/programs/defaultapps.asp>. The DLA Drawing number listed above is for standard gold plated lead finish, and no RHA (Radiation Hardness Assurance) level. Please reference the DLA Drawing for other screening levels, lead finishes, and radiation levels. All DLA Drawing products are marked with a "Q" on the cover as specified by the QML certification mark requirement of MIL-PRF-38534.

## 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](mailto:vptsales@vpt-inc.com)

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