



# DVMC28 Series

## HIGH RELIABILITY HYBRID EMI FILTERS

### DESCRIPTION

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

### FEATURES

- High Reliability
- Wide Input Voltage Range: 0 to 50 Volts per MIL-STD-704
- Up to 4.0 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 Seam Welded or Solder Seal 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

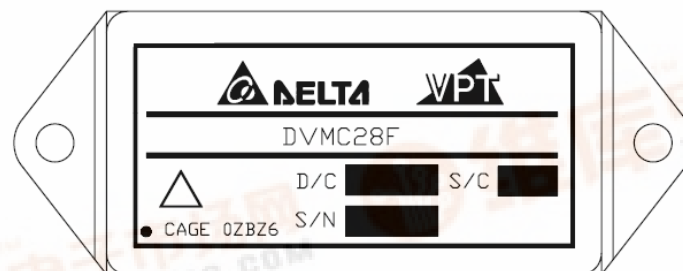


Figure 1 – DVMC28 / DVMC28F EMI Filter  
(Not To Scale)

## 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 <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	4.0 Amps	Weight (Maximum) (Un-Flanged / Flanged)	(47 / 51) Grams
Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}\text{C}$ )	2.4 Watts		

Parameter	Conditions	DVMC28			Units
		Min	Typ	Max	
<b>STATIC</b>					
INPUT Voltage <sup>2</sup>	Continuous	0	28	50	V
	Transient, 1 sec	-	-	80	V
Current <sup>1,3</sup>	Continuous	0	-	4.0	A
OUTPUT Voltage	Continuous	$V_{OUT} = V_{IN} - (I_{IN} \times R_{DC})$			V
Current <sup>3</sup>	Continuous	0	-	4.0	A
DC RESISTANCE	Continuous	-	-	150	mΩ
POWER DISSIPATION <sup>2</sup>	Continuous	-	-	2.4	W
NOISE REJECTION	f = 500 kHz	40	-	-	dB
CAPACITANCE	Pin to Case	30	-	50	nF
ISOLATION	Any Pin to Case, 500 V <sub>DC</sub>	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ $T_c = 55^{\circ}\text{C}$	-	2.20	-	MHrs

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

### BLOCK DIAGRAM

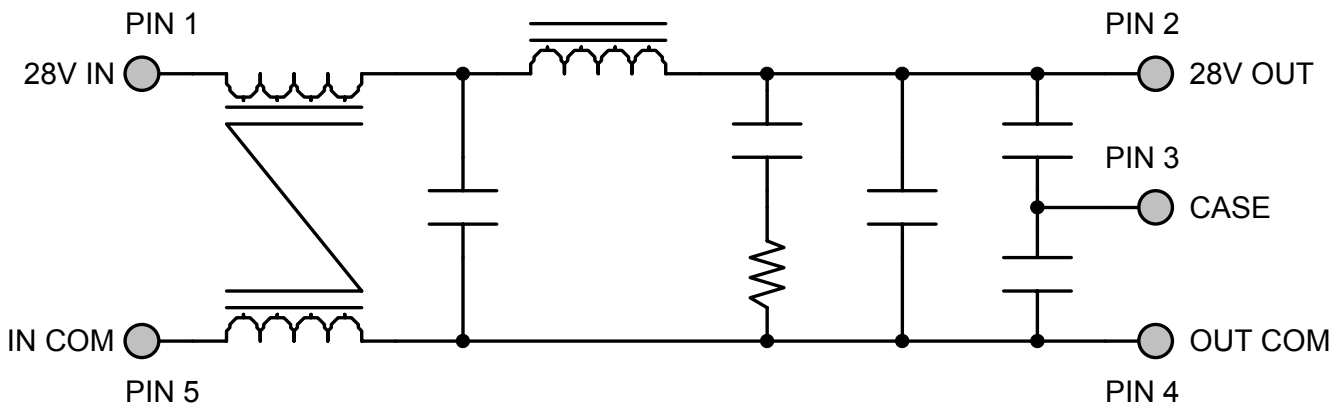
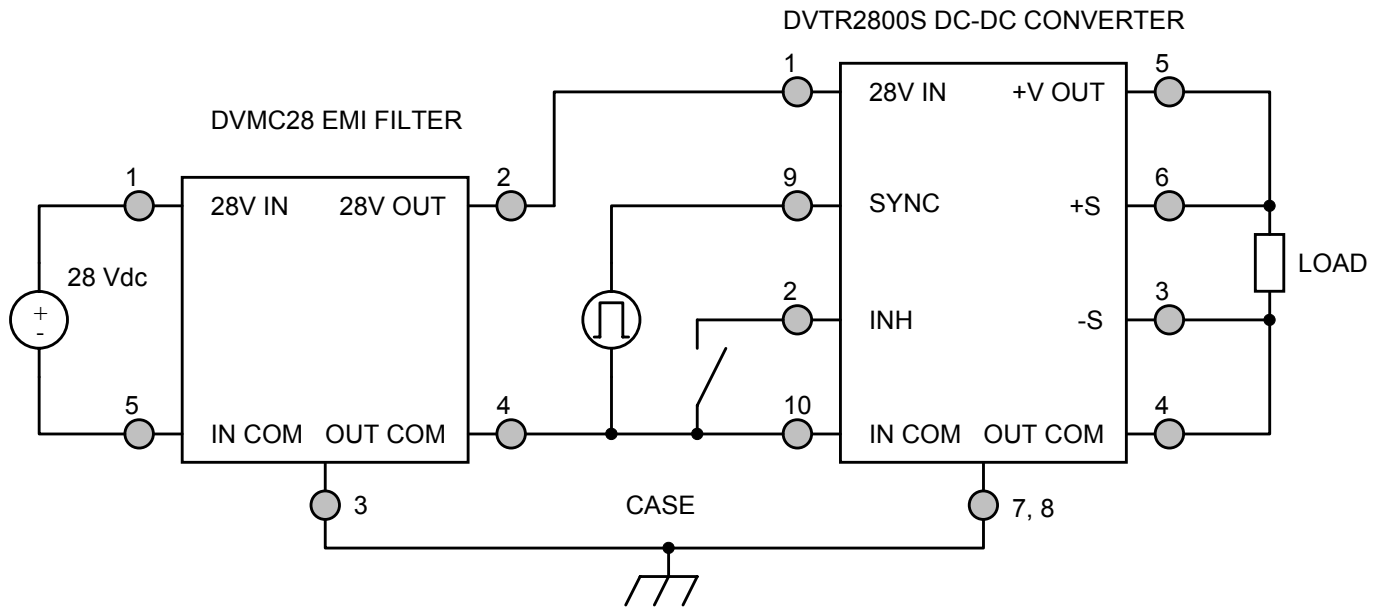


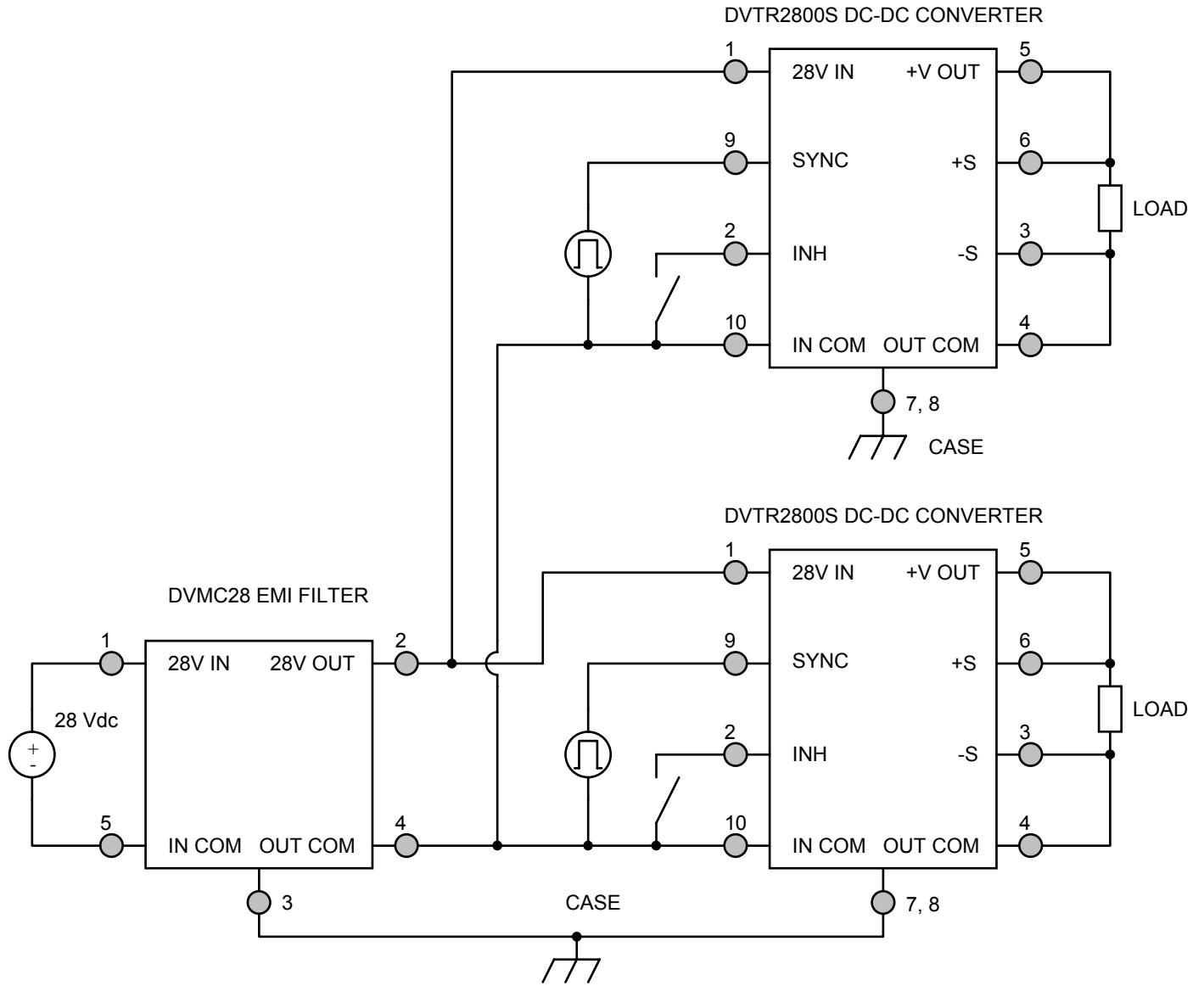
Figure 2

## CONNECTION DIAGRAMS



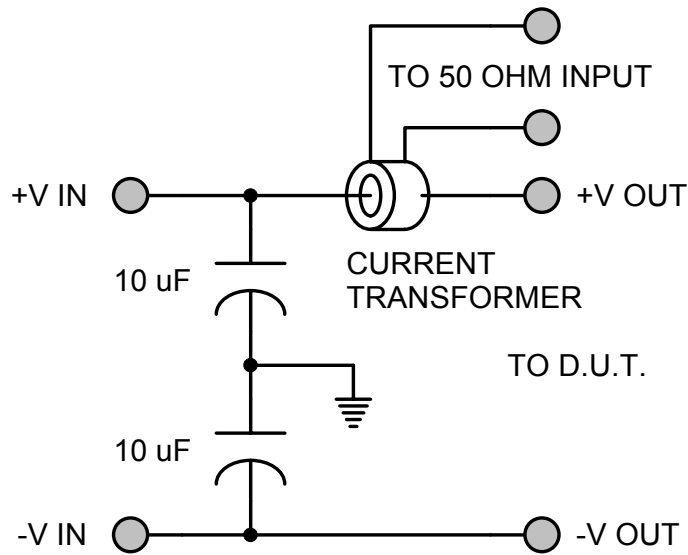
**Figure 3** – DVMC28 EMI Filter Hookup with Single Converter

## CONNECTION DIAGRAMS

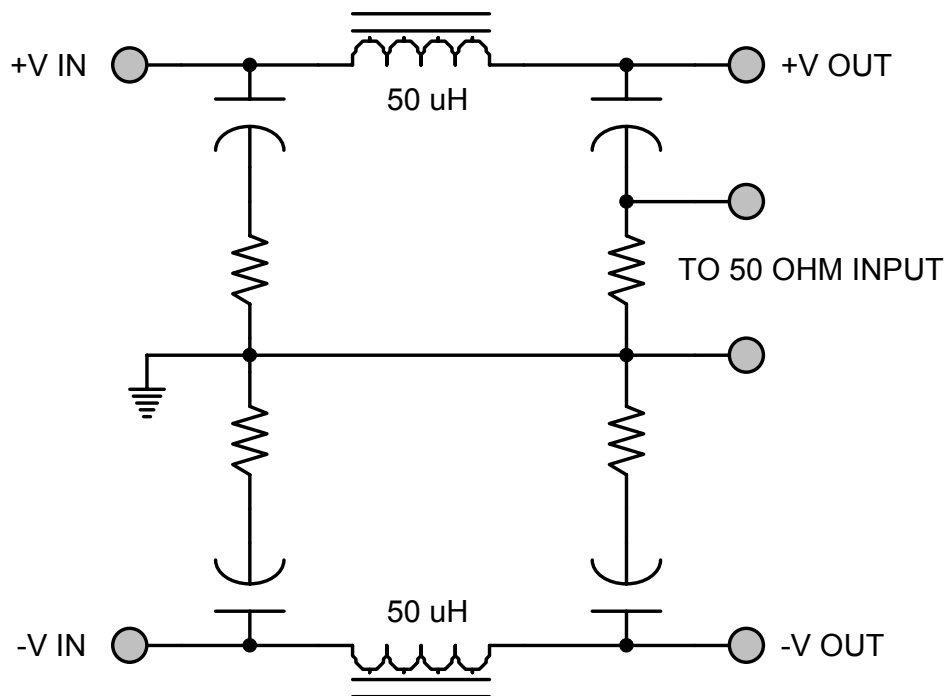


**Figure 4** – DVMC28 EMI Filter Hookup with Two Converters

EMI MEASUREMENT METHODS CONNECTION DIAGRAMS



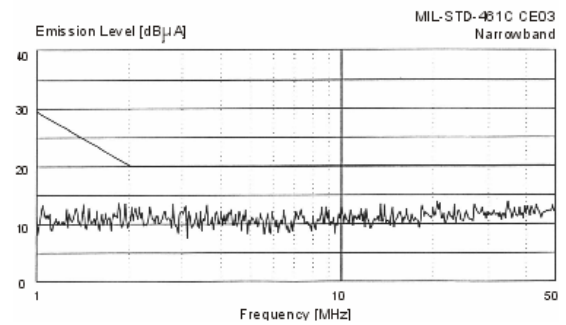
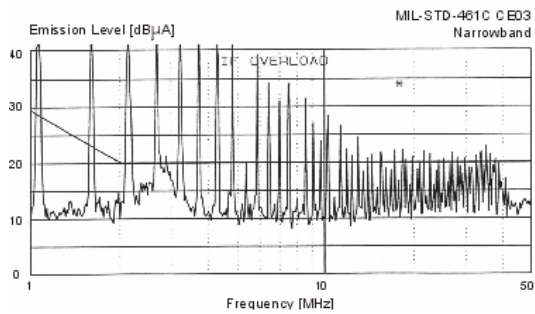
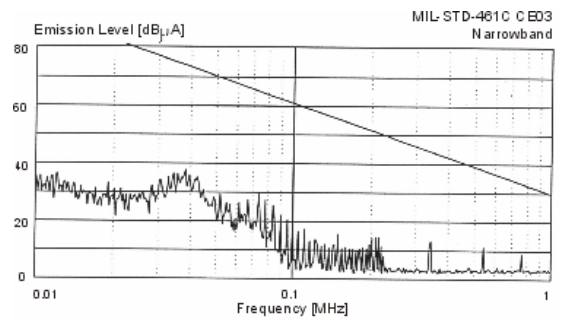
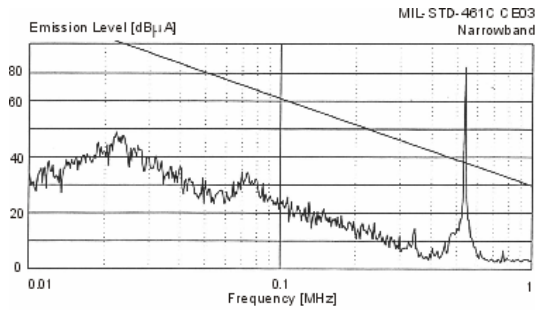
**Figure 5** – MIL-STD-461C Measurement Method (Feedthrough Capacitor)



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

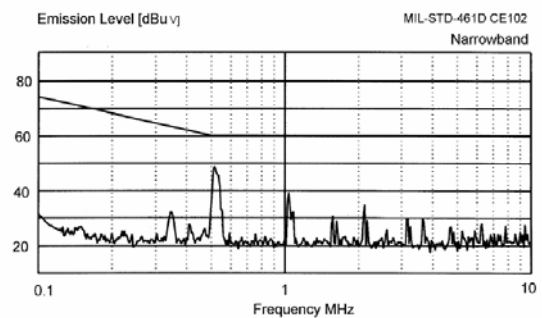
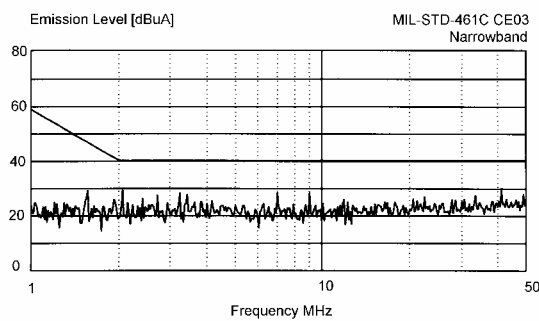
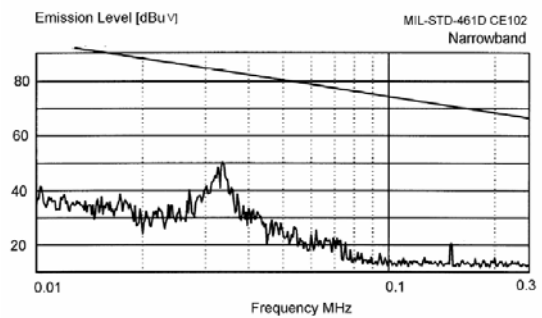
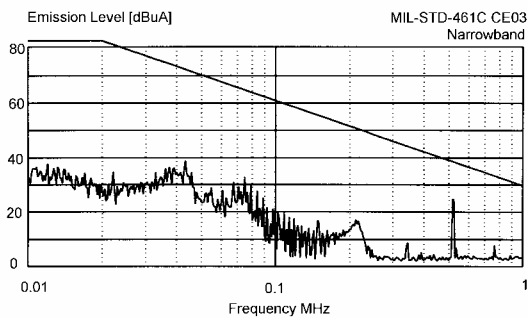
## EMI PERFORMANCE CURVES

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



**Figure 7 – MIL-STD-461C DVTR2800D Without EMI Filter**

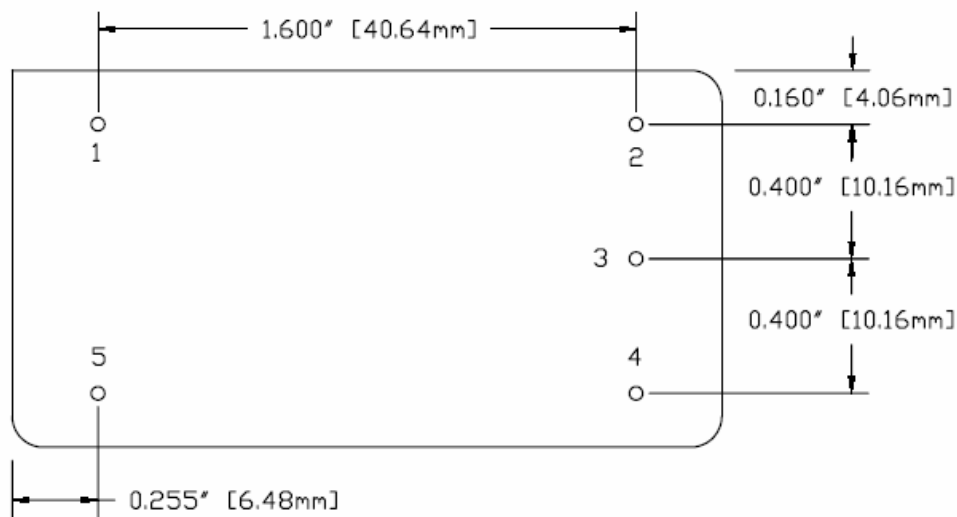
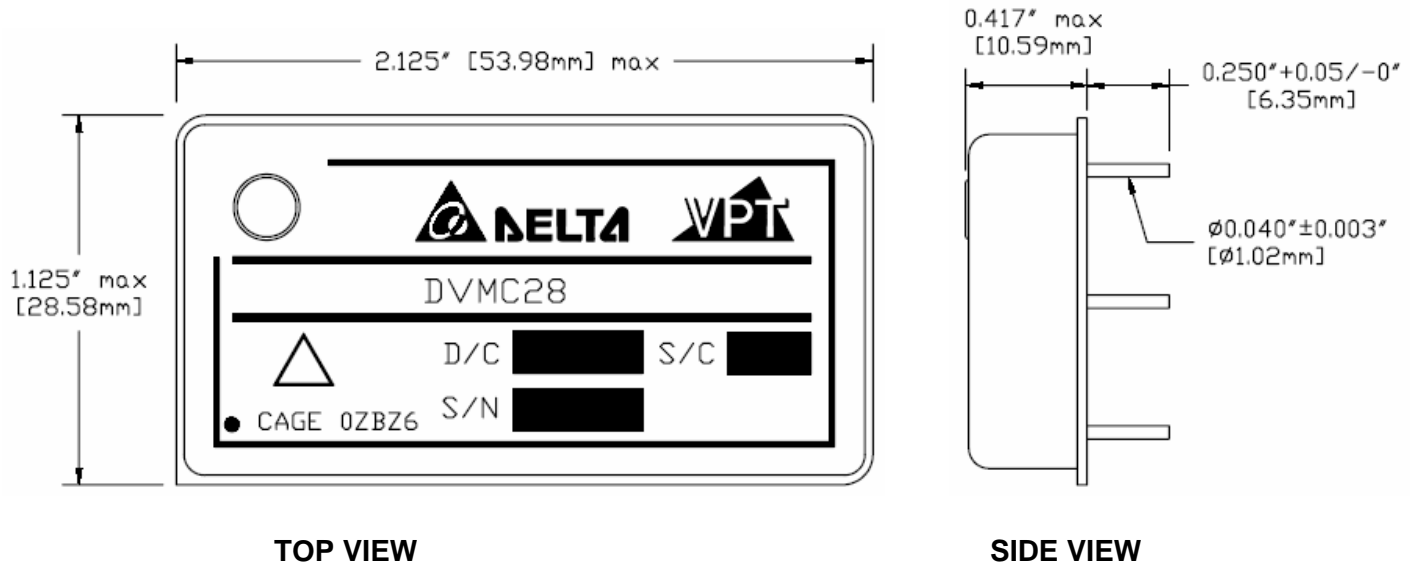
**Figure 8 – MIL-STD-461C DVTR2800D With DVMC28 EMI Filter**



**Figure 9 – MIL-STD-461C Two DVTR2800S's With DVMC28 EMI Filter**

**Figure 10 – MIL-STD-461D DVTR2800S With DVMC28 EMI Filter**

## PACKAGE SPECIFICATIONS (NON-FLANGED, SOLDER SEAL)

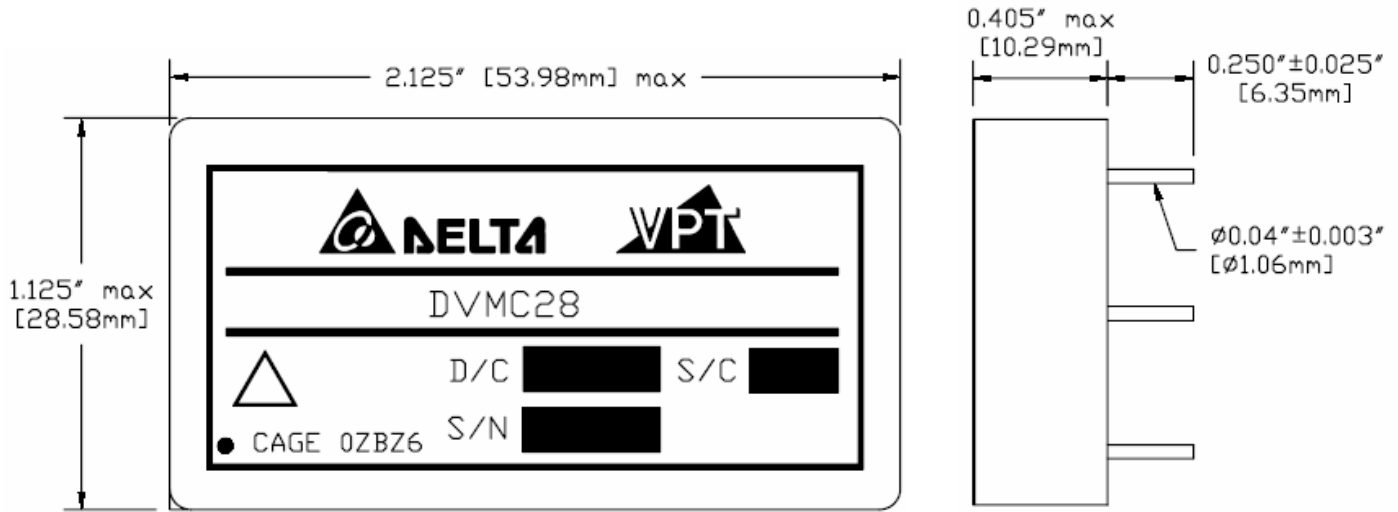


PIN	FUNCTION
1	28V IN
2	28V OUT
3	CASE
4	OUT COM
5	IN COM

**BOTTOM VIEW**

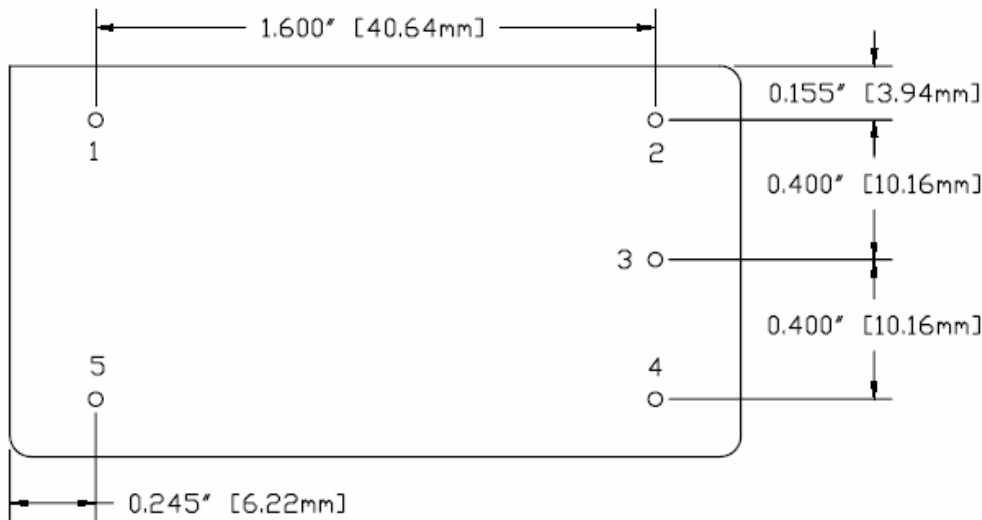
**Figure 11** – Non-Flanged, Solder Seal Package and Pinout (Not Used for /HB Screened Products)  
(Dimensional Limits are ±0.005" Unless Otherwise Stated)

## PACKAGE SPECIFICATIONS (NON-FLANGED, SEAM SEAL)



**TOP VIEW**

**SIDE VIEW**



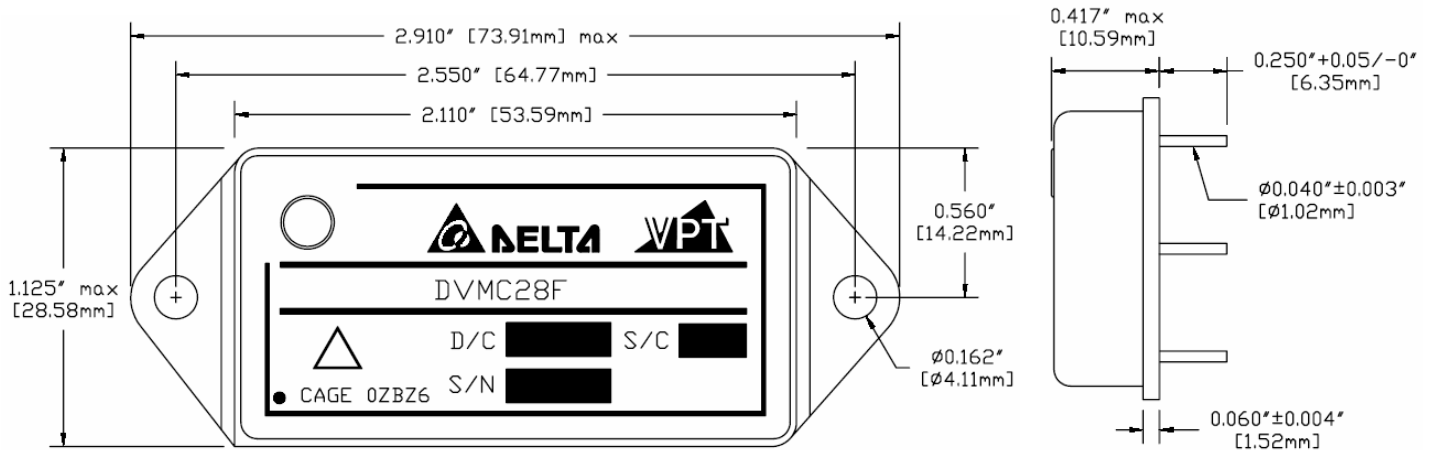
PIN	FUNCTION
1	28V IN
2	28V OUT
3	CASE
4	OUT COM
5	IN COM

**BOTTOM VIEW**

**Figure 12 – Non-Flanged, Seam Seal Package and Pinout**  
(Dimensional Limits are  $\pm 0.005$ " Unless Otherwise Stated)

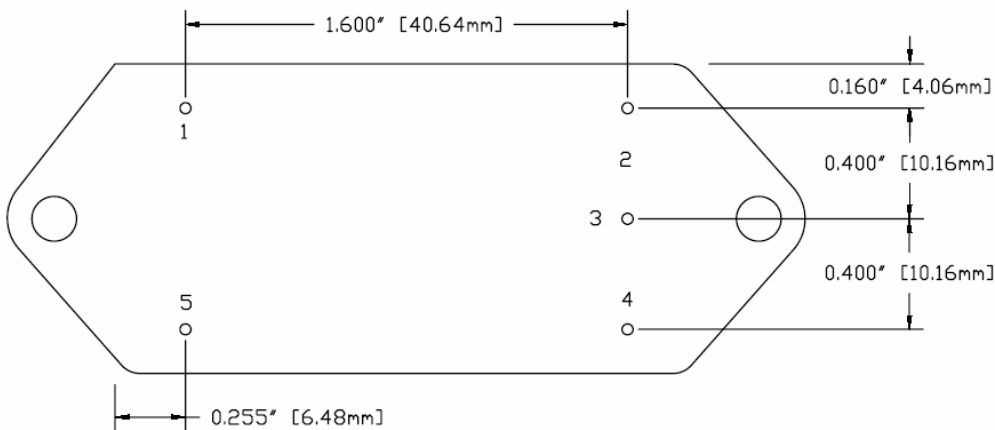


## PACKAGE SPECIFICATIONS (FLANGED, SOLDER SEAL)



**TOP VIEW**

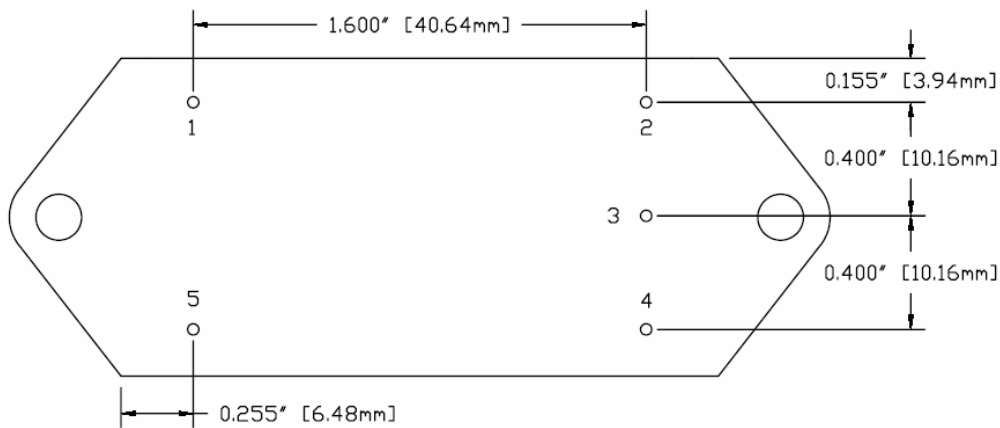
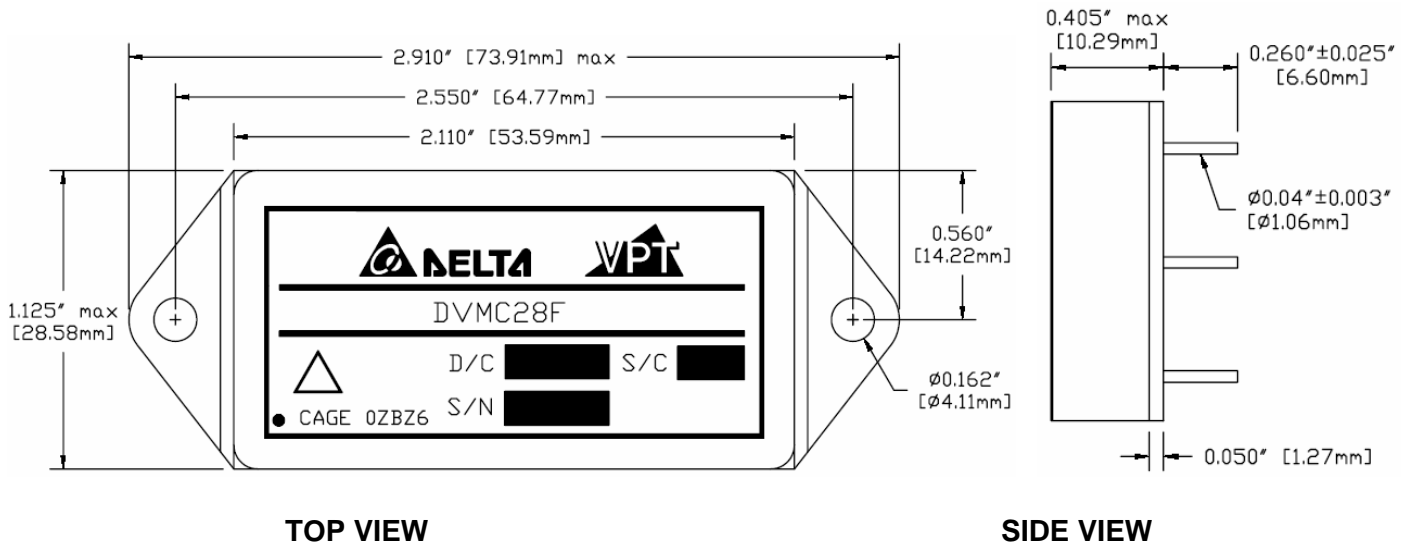
**SIDE VIEW**



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

**Figure 13** – Flanged, Solder Seal Package and Pinout (Not Used for /HB Screened Products)  
 (Dimensional Limits are  $\pm 0.005"$  Unless Otherwise Stated)

## PACKAGE SPECIFICATIONS (FLANGED, SEAM SEAL)



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

**Figure 14** – Flanged, Seam Seal Package and Pinout  
(Dimensional Limits are  $\pm 0.005"$  Unless Otherwise Stated)

**PACKAGE PIN DESCRIPTION**

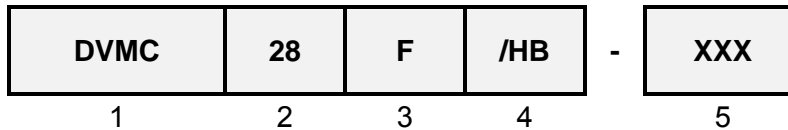
Pin	Function	Description
1	28V IN	Positive Input Voltage Connection
2	28V OUT	Positive Output Voltage Connection
3	CASE	Case Connection
4	OUT COM	Output Common Connection
5	IN COM	Input Common Connection

**ENVIRONMENTAL SCREENING (Per MIL-STD-883 as referenced to MIL-PRF-38534, Class H)**

Screening	MIL-STD-883	Standard (No Suffix)	Extended /ES	HB /HB
Pre-Cap Inspection	Method 2017, 2032 Internal Procedure	•	•	•
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	Method 1014, Fine Leak, Condition A Method 1014, Gross Leak, Condition C Dip ( $1 \times 10^{-3}$ )	•	• •	• •
Final Electrical	MIL-PRF-38534, Group A <sup>1</sup> 100% at 25°C	•	•	•
Final Inspection	Method 2009	•	•	•

Note: 1. 100% R&R testing at -55°C, +25°C, and +125°C with all test data included in product shipment.

## ORDERING INFORMATION



(1)

(2)

(3)

(4)

(5)

Product Series	Nominal Input Voltage		Package Option		Screening Code		Additional Screening Code
<b>DVMC</b>	<b>28</b>	28 Volts	<b>None F</b>	Non-Flanged Flanged	<b>None /ES /HB</b>	Standard Extended HB	Contact Sales

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.

## CONTACT INFORMATION

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

**Phone:** (425) 487-4850  
**Fax:** (425) 487-4802  
**E-mail:** [sales@vpt-inc.com](mailto:sales@vpt-inc.com)