



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.

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 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 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

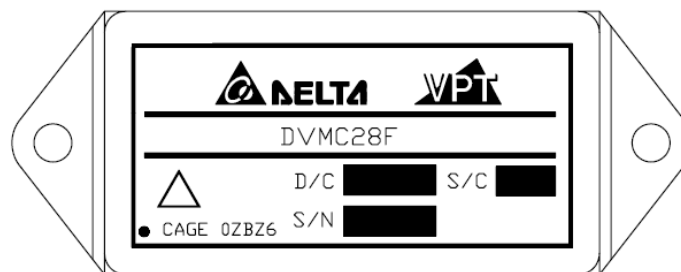


Figure 1 – DVMC28 / DVMC28F EMI Filter
(Exact marking may differ from that shown)

SPECIFICATIONS (T_{CASE} = -55°C to +125°C, V_{IN} = +28V ± 5%, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V _{DC}	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)	(49 / 52) Grams
Power Dissipation (Full Load, T _{CASE} = +125°C)	2.4 Watts		

Parameter	Conditions	DVMC28			Units
		Min	Typ	Max	
STATIC					
INPUT Voltage ²	Continuous	0	28	50	V
	Transient, 1 sec	-	-	80	V
Current ^{1,2,3}	Continuous	0	-	4.0	A
OUTPUT Voltage ²	Continuous	$V_{OUT} = V_{IN} - (I_{IN} \times R_{DC})$			V
	Current ^{2,3}	Continuous	0	-	4.0
DC RESISTANCE	Continuous	-	-	150	mΩ
POWER DISSIPATION ²	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 _{DC}	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ T _C = 55°C	-	2.20	-	MHrs

- Notes:
1. Derate linearly to 0 at 135°C.
 2. Verified by initial electrical design verification. Post design verification, parameter shall be guaranteed to the limits specified.
 3. Rated current applies at any voltage.

BLOCK DIAGRAM

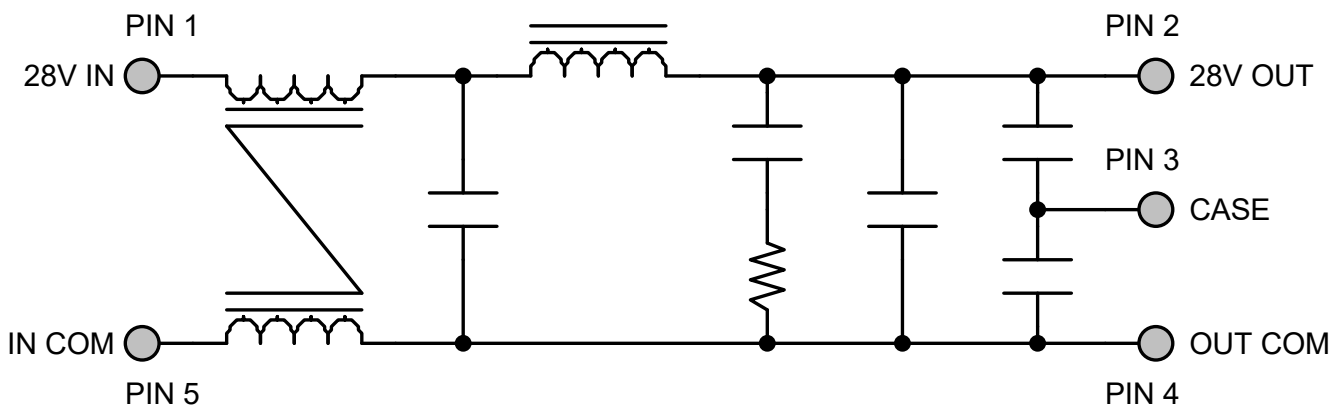


Figure 2

CONNECTION DIAGRAMS

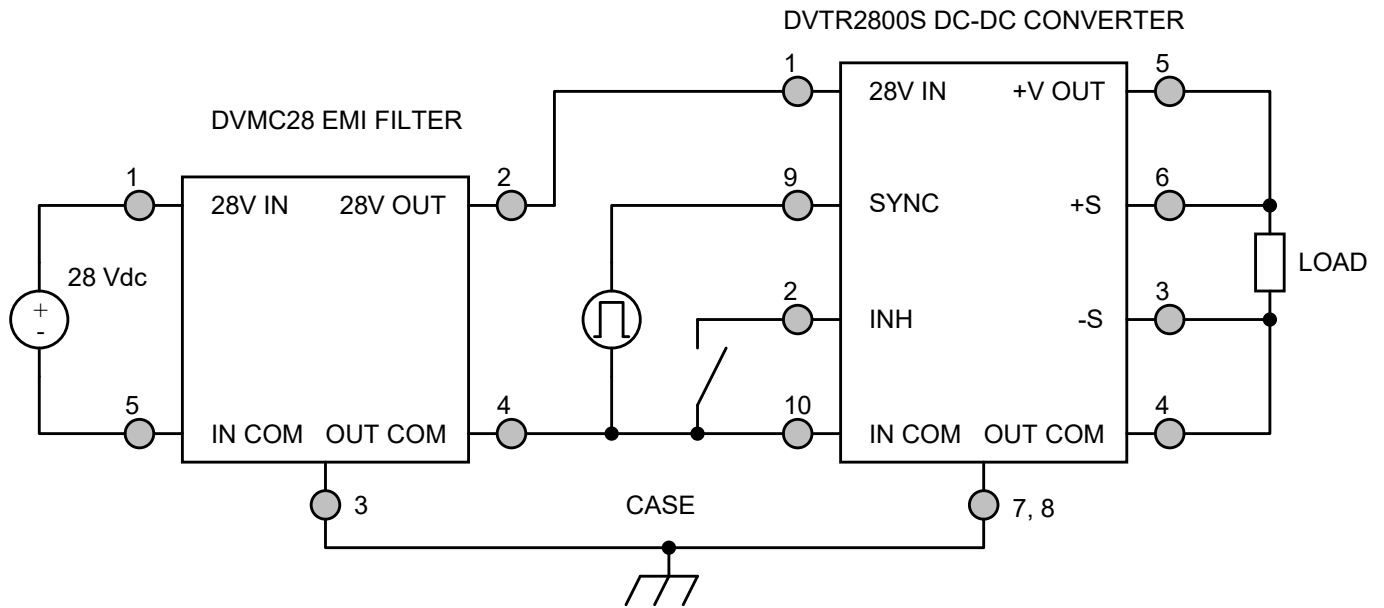


Figure 3 – DVMC28 EMI Filter Hookup with Single Converter

CONNECTION DIAGRAMS

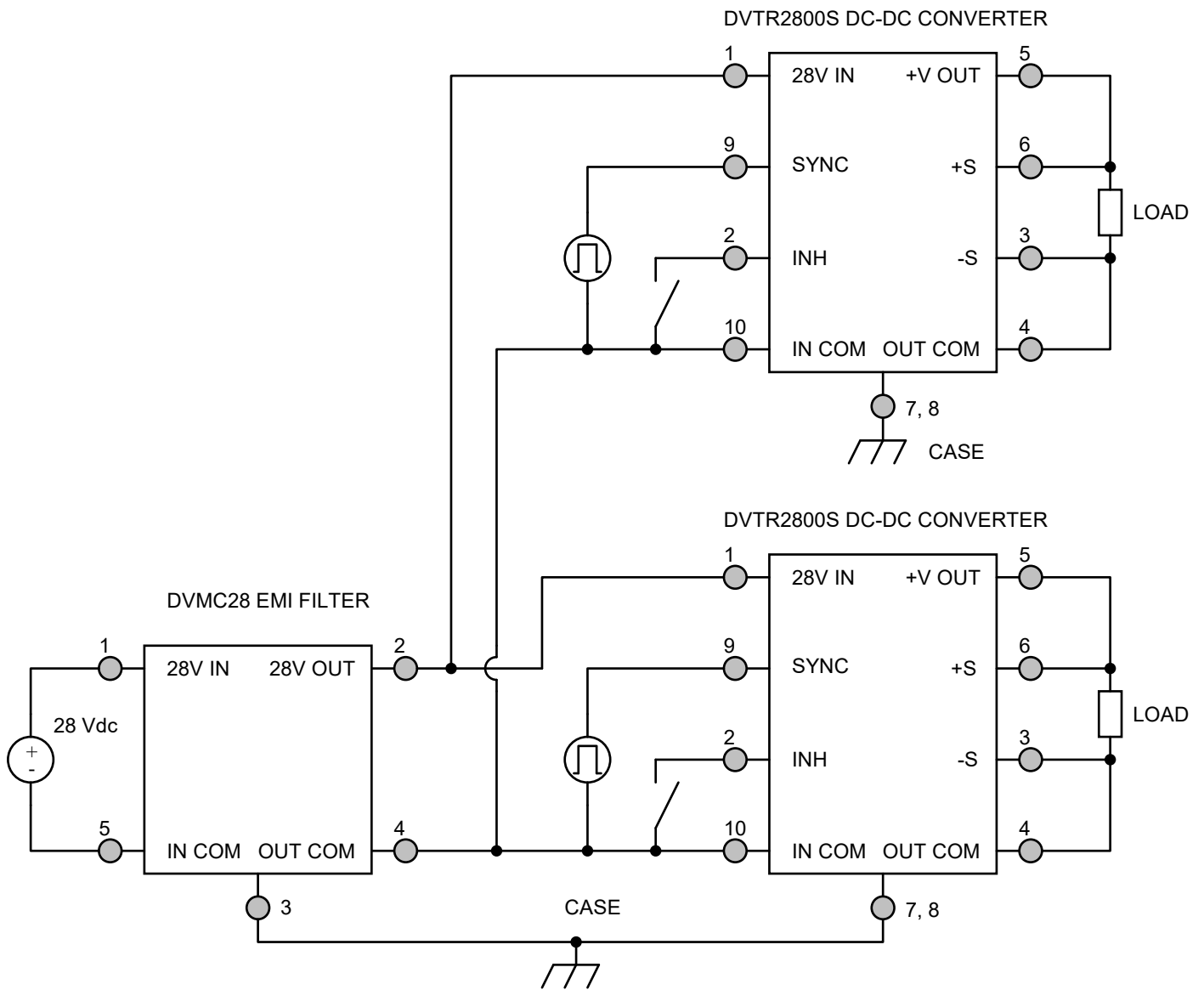


Figure 4 – DVMC28 EMI Filter Hookup with Two Converters

EMI MEASUREMENT METHODS CONNECTION DIAGRAMS

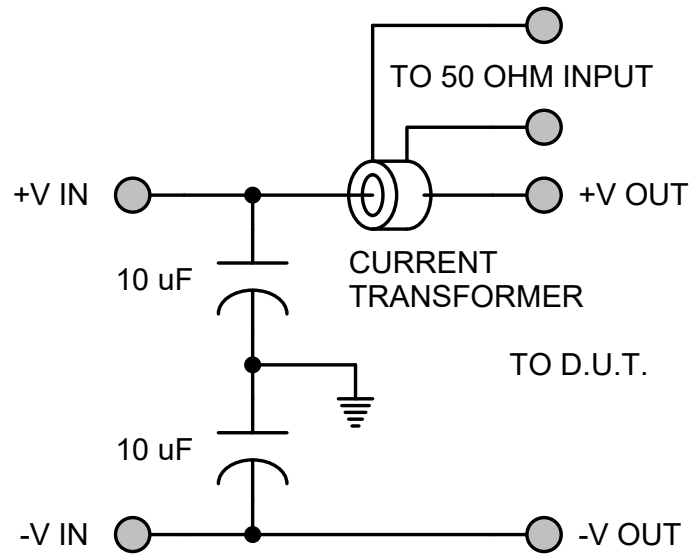


Figure 5 – MIL-STD-461C Measurement Method (Feedthrough Capacitor)

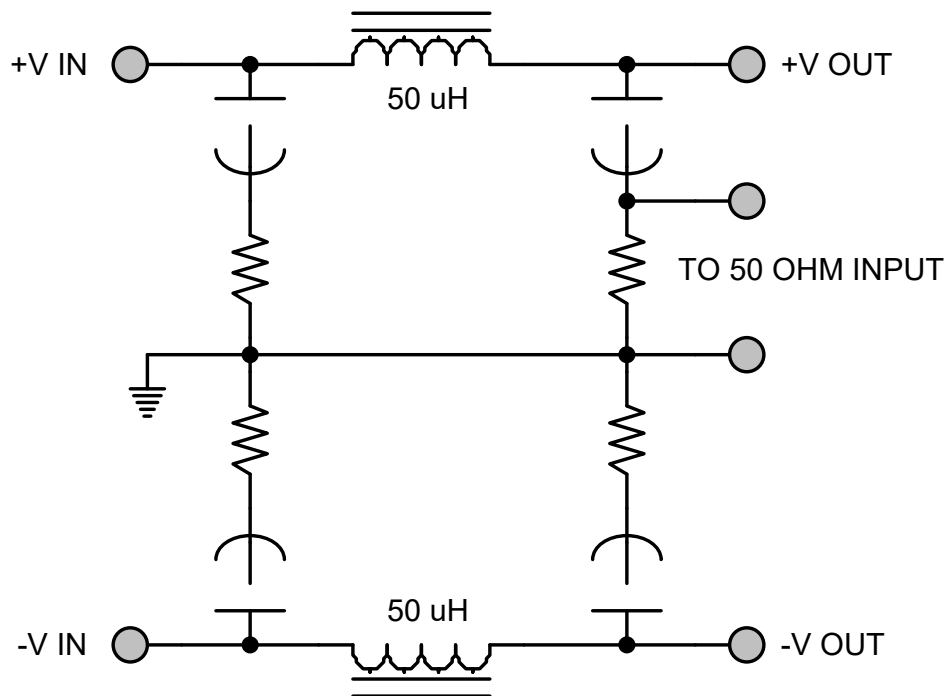


Figure 6 – MIL-STD-461D Measurement Method (LISN)

EMI PERFORMANCE CURVES

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

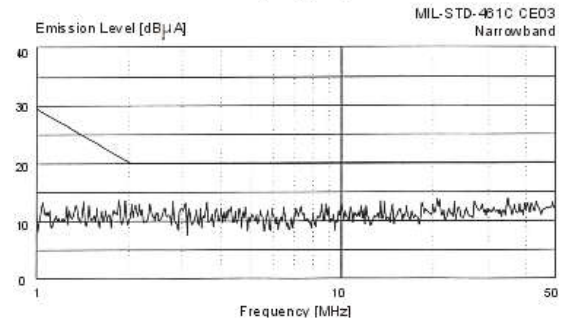
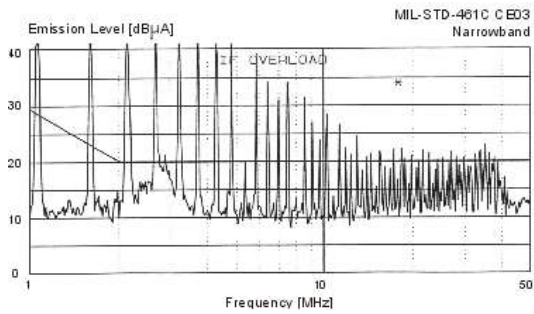
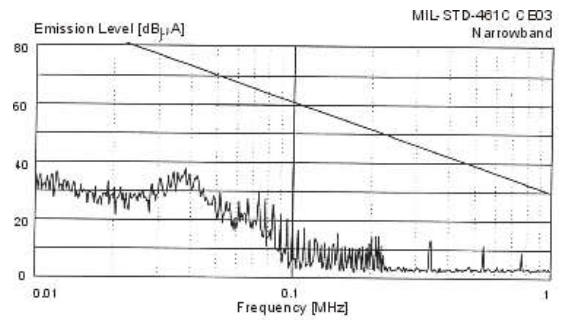
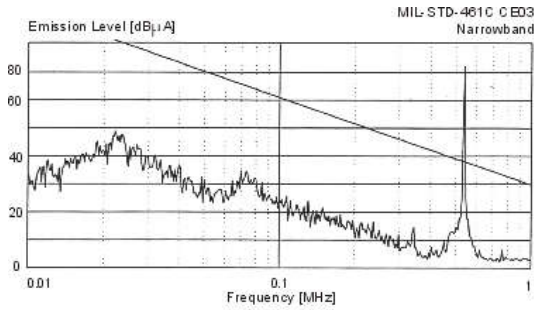


Figure 7 – MIL-STD-461C DVTR2800D Without EMI Filter

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

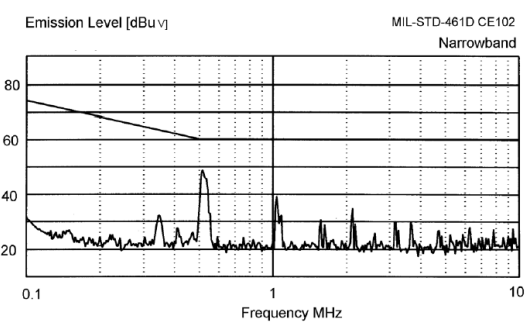
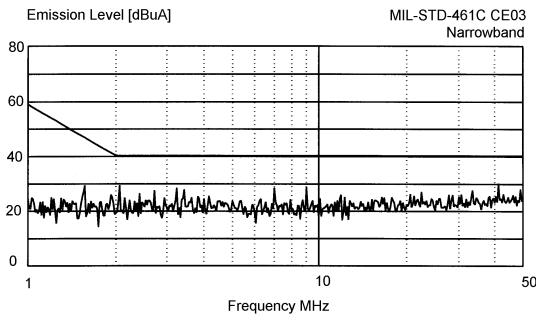
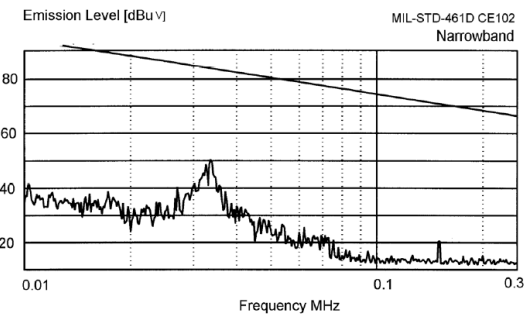
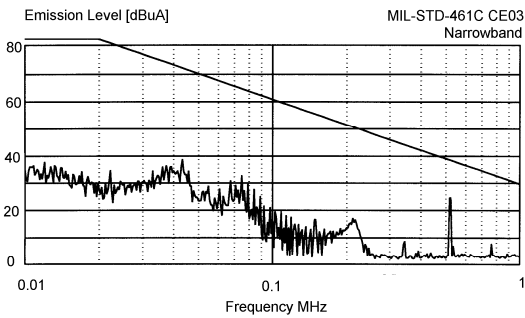
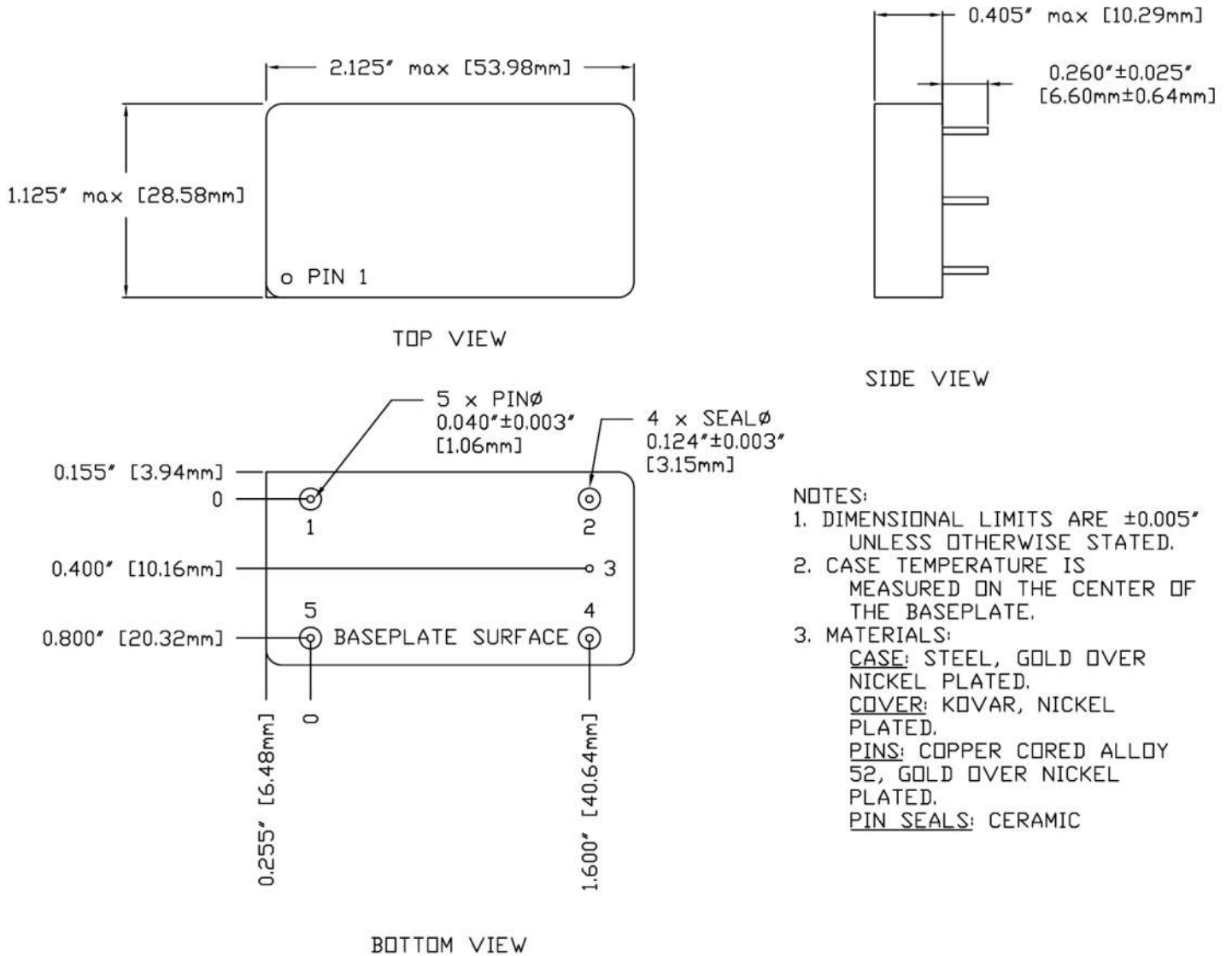


Figure 9 – MIL-STD-461C Two DVTR2800S's With DVMC28 EMI Filter

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

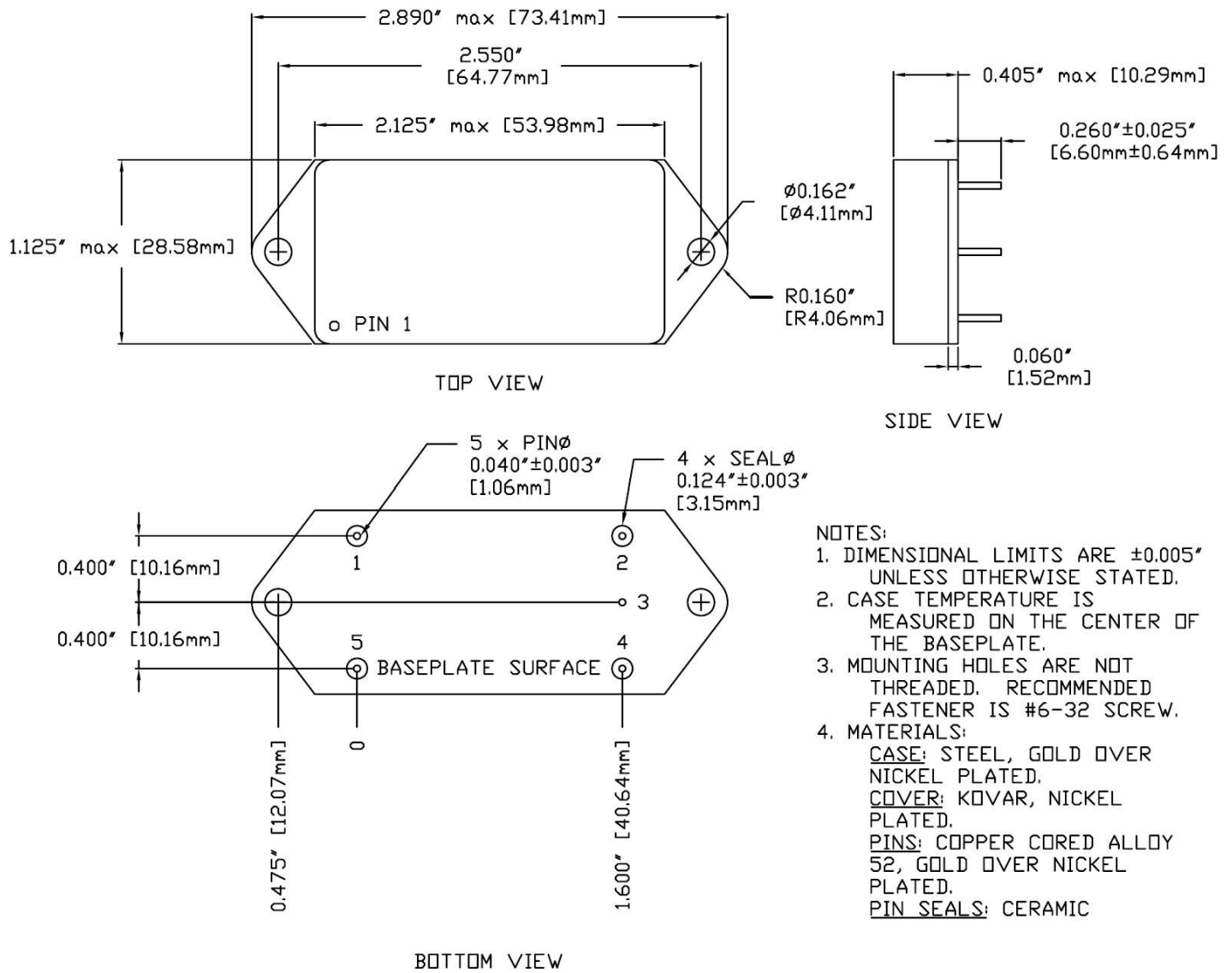
PACKAGE SPECIFICATIONS (NON-FLANGED)



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

Figure 11 – Non-Flanged, Seam Seal Package and Pinout

PACKAGE SPECIFICATIONS (FLANGED)



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

Figure 12 – Flanged, Seam Seal Package and Pinout

PACKAGE PIN DESCRIPTION

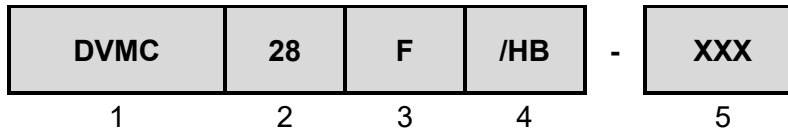
Pin	Function	Description
1	28V IN	Positive Input Voltage Connection
2	28V OUT	Positive Output Voltage Connection
3	CASE	Case Connection
4	OUT COM	Output Common Connection
5	IN COM	Input Common Connection

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

Test	MIL-STD-883 Test Method, Condition	No Suffix ⁴ (Standard) Non-QML	/ES ⁴ (Extended) Non-QML	/HB ⁴ (HB) Non-QML	/H ⁷ (Class H)	/K and /KL1 ^{4,8} (Class 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 ⁵					•
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 ³ 100% at 25°C	•	•	•	•	•
Hermeticity	Method 1014, Fine Leak, Condition A Method 1014, Gross Leak, Condition C Dip (1 x 10 ⁻³)	•	•	•	•	•
Radiography	Method 2012 ⁶					•
External Visual	Method 2009	•	•	•	•	•

- Contact Sales for more information concerning additional environmental screening and testing options desired.
- 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.
- 100% R&R testing with all test data included in product shipment.
- Non-QML products may not meet all requirements of MIL-PRF-38534.
- PIND test Certificate of Compliance included in product shipment.
- Radiographic test Certificate of Compliance and film(s) or data CD included in product shipment.
- QML screening levels are not available for products with Up-Leaded or Down-Leaded pin extensions added.
- KL1 products are identical in every way with Class K products in compliance with MIL-PRF-38534 revision L and later revisions except they contain elements evaluated to the requirements of MIL-PRF-38534 revision K and previous revisions. These devices are not marked with an SMD number or MIL-PRF-38534 certification mark and are marked with -KL1 screening code in place of -K.

ORDERING INFORMATION



	(1)	(2)	(3)		(4)		(5)
Product Series	Nominal Input Voltage		Package Option		Screening Code ^{1,2,3}		Additional Screening Code
DVMC	28	28 Volts	None F	Non-Flanged Flanged	None /ES /HB /H /K /KL1	Standard Extended HB Class H Class K Class K (KL1)	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 SMD products to meet lower screened orders at our sole discretion unless specifically forbidden by customer contract.
 3. -KL1 products are identical in every way with Class K products in compliance with MIL-PRF-38534 revision L and later revisions except they contain elements evaluated to the requirements of MIL-PRF-38534 revision K and previous revisions. These devices are not marked with an SMD number or MIL-PRF-38534 certification mark and are marked with -KL1 screening code in place of -K.

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	DVMC28 Series Similar Part Number
06023-01HXC 06023-01HXA 06023-01KXC 06023-01KXA	DVMC28/H DVMC28/H-E DVMC28/K DVMC28/K-E
06023-01HYC 06023-01HYA 06023-01KYC 06023-01KYA	DVMC28F/H DVMC28F/H-E DVMC28F/K DVMC28F/K-E

Do not use the DVMC28 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 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@vptpower.com

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