



DVMD28 Series

HIGH RELIABILITY HYBRID EMI FILTERS

DESCRIPTION

The DVMD series of hybrid EMI filters is operable over the full military (-55 °C to +125 °C) temperature range with no power derating. The DVMD 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 7.0 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
- MIL-PRF-38534 Element Evaluated Components

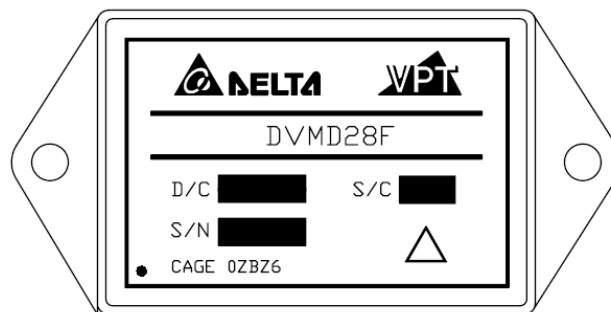


Figure 1 – DVMD28F EMI Filter
(Exact marking may differ from that shown)

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 | 7 Amps | Weight (Maximum) | 57 Grams |
| Power Dissipation (Full Load, T _{CASE} = +125°C) | 6 Watts | | |

| Parameter | Conditions | DVMD28 | | | Units |
|--------------------------------|--------------------------------------|---|-------|-----|-------|
| | | Min | Typ | Max | |
| STATIC | | | | | |
| INPUT Voltage ² | Continuous | 0 | 28 | 50 | V |
| | Transient, 1 sec | - | - | 80 | V |
| Current ^{1,2,3} | Continuous | 0 | - | 7 | A |
| OUTPUT Voltage ² | Continuous | $V_{OUT} = V_{IN} - (I_{IN} \times R_{DC})$ | | | V |
| Current ^{2,3} | Continuous | 0 | - | 7 | A |
| DC RESISTANCE | Continuous | - | - | 120 | mΩ |
| POWER DISSIPATION ² | Continuous | - | - | 6 | W |
| NOISE REJECTION | f = 500 kHz | 40 | - | - | dB |
| CAPACITANCE | Pin to Case | 25 | - | 55 | nF |
| ISOLATION | Any Pin to Case, 500 V _{DC} | 100 | - | - | MΩ |
| MTBF (MIL-HDBK-217F) | AIF @ T _C = 55°C | - | 1.225 | - | MHrs |

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

BLOCK DIAGRAM

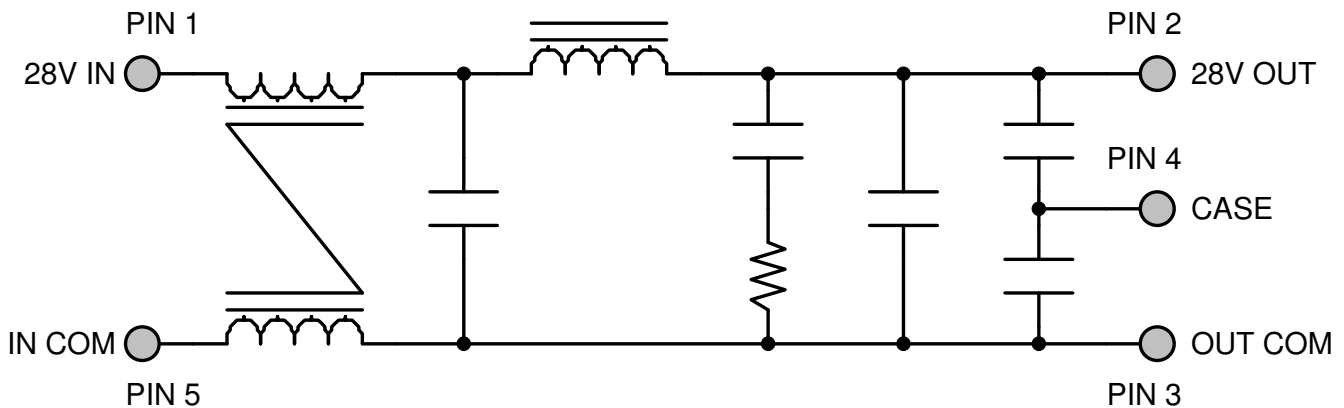


Figure 2

CONNECTION DIAGRAMS

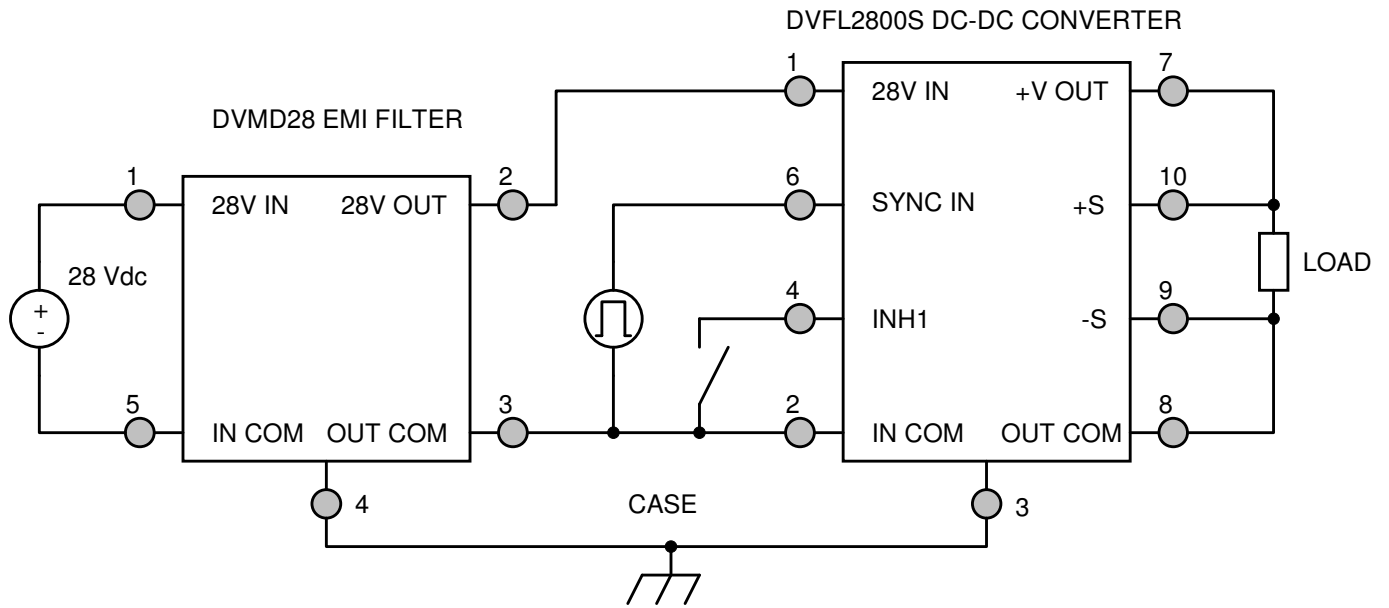


Figure 3 – DVMD28 EMI Filter Hookup with Single Converter

CONNECTION DIAGRAMS

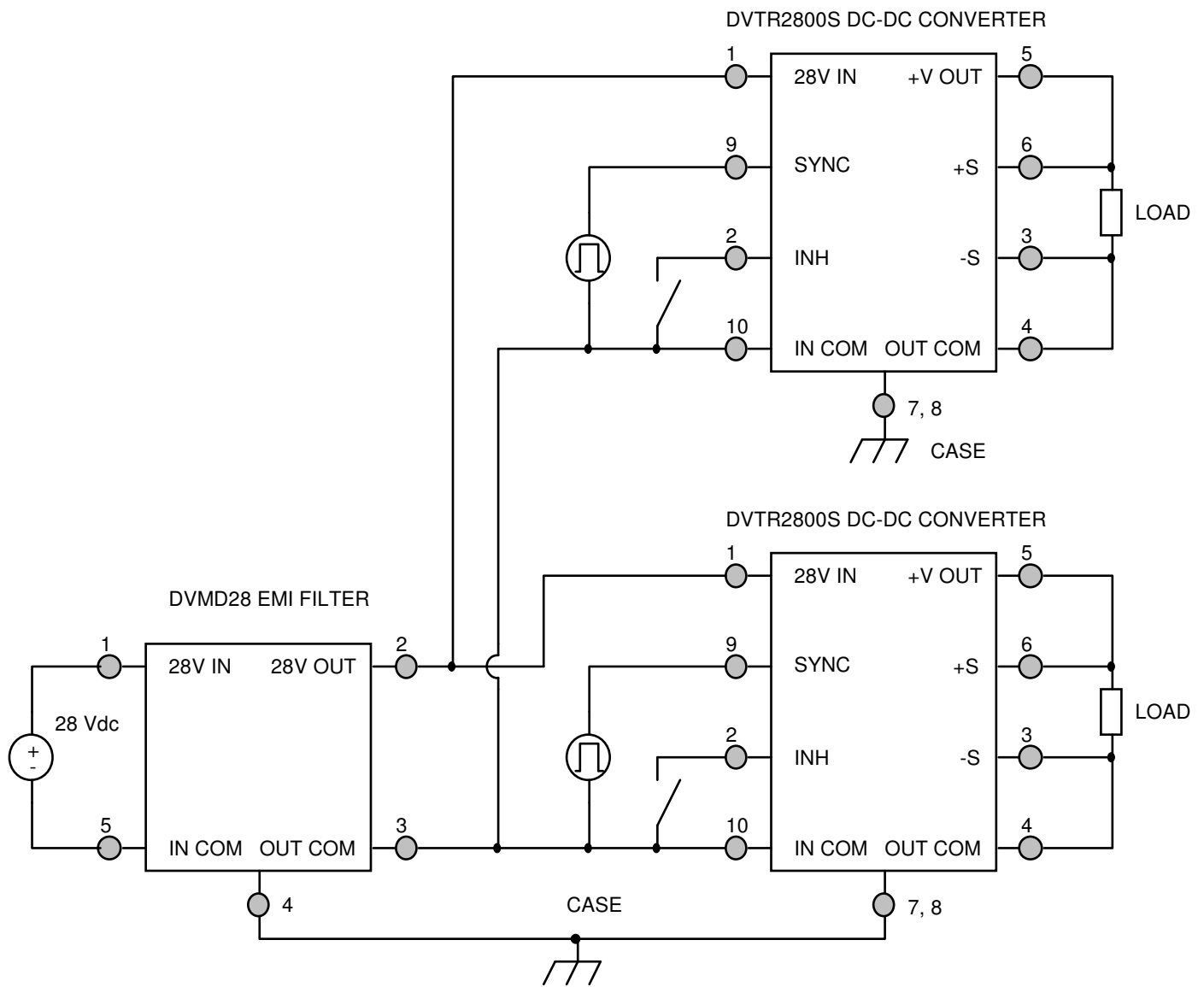


Figure 4 – DVMD28 EMI Filter Hookup with Two Converters

EMI MEASUREMENT METHODS CONNECTION DIAGRAMS

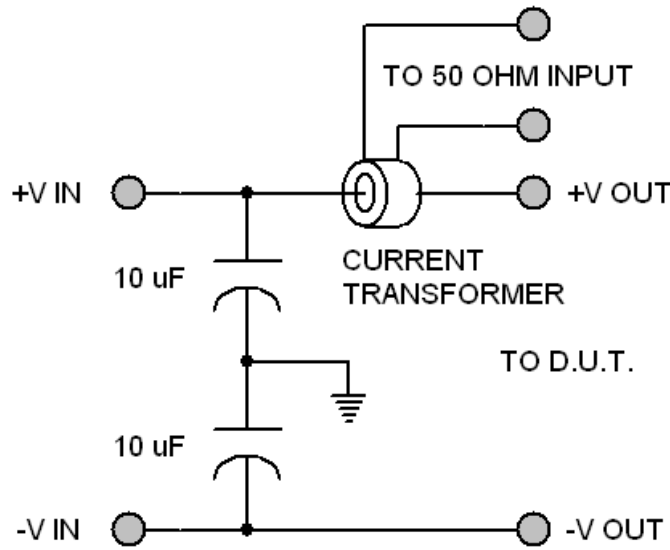


Figure 5 – MIL-STD-461C Measurement Method (Feedthrough Capacitor)

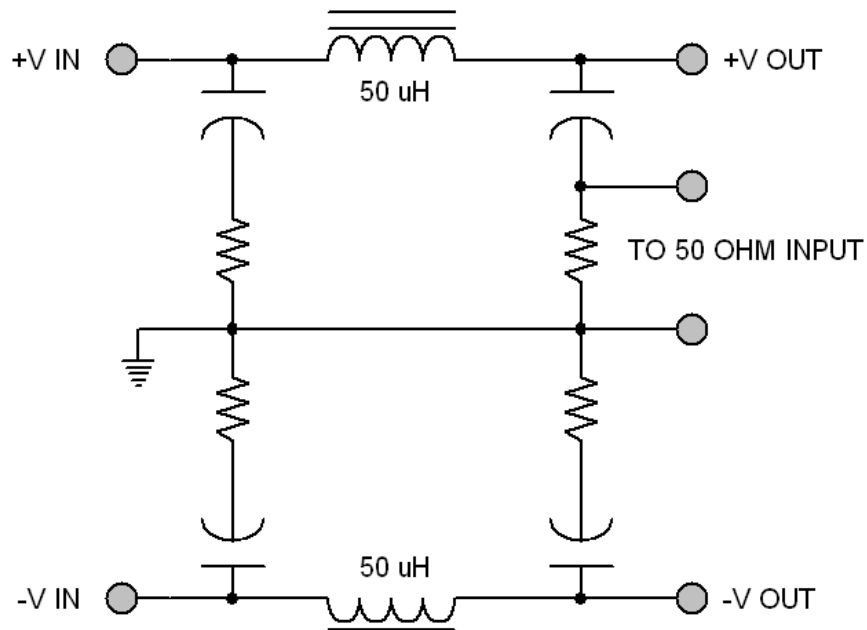


Figure 6 – MIL-STD-461D Measurement Method (LISN)

EMI PERFORMANCE CURVES

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

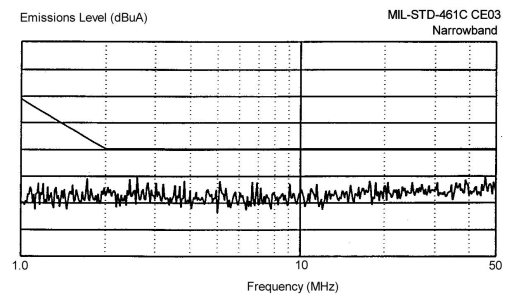
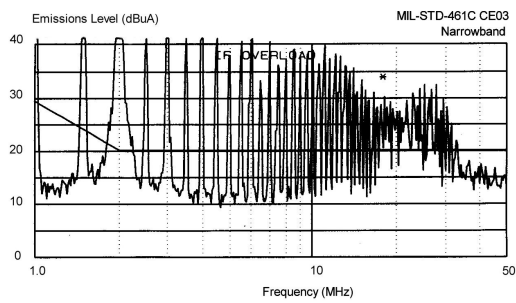
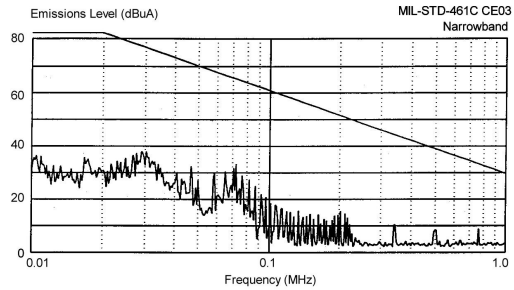
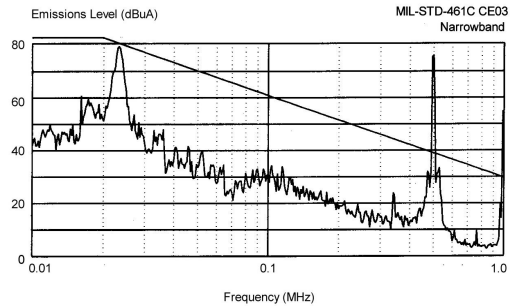


Figure 7 – MIL-STD-461C
(2) DVTR2800S Without EMI Filter

Figure 8 – MIL-STD-461C
(2) DVTR2800S With DVMD28 EMI Filter

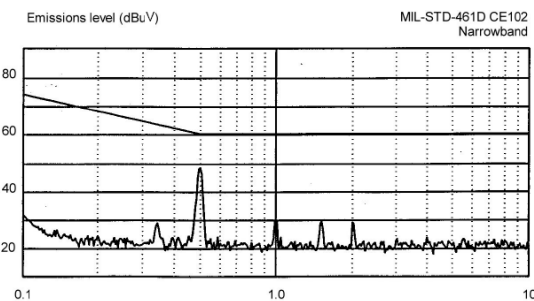
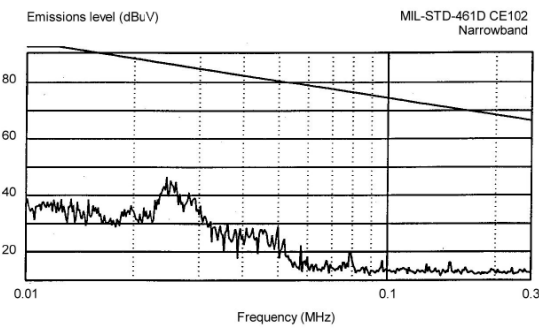
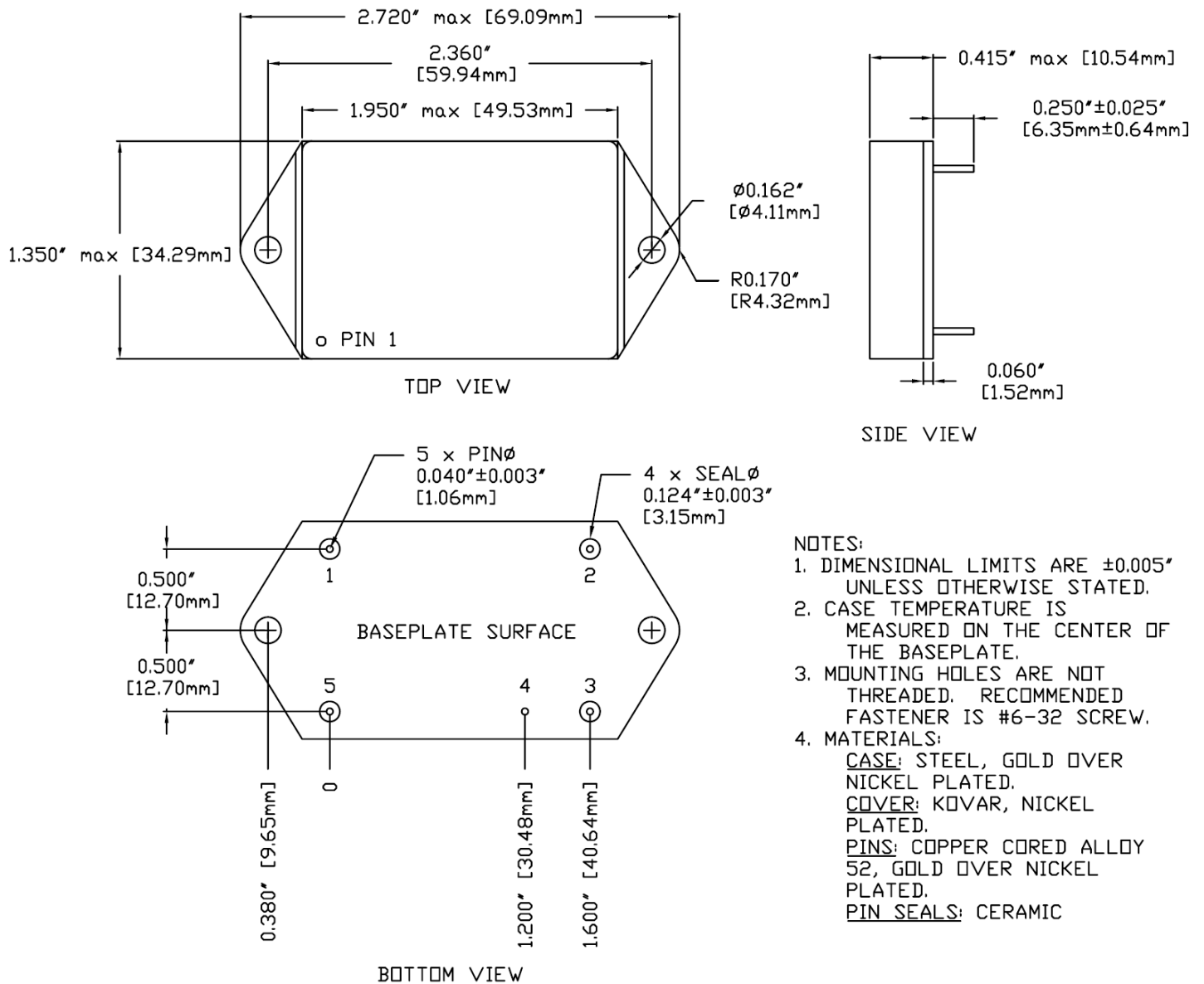


Figure 9 – MIL-STD-461D
(2) DVTR2800S With DVMD28 EMI Filter

PACKAGE SPECIFICATIONS



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

Figure 10 – Package and Pinout

PACKAGE PIN DESCRIPTION

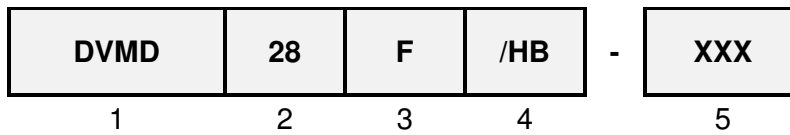
| Pin | Function | Description |
|-----|----------|------------------------------------|
| 1 | 28V IN | Positive Input Voltage Connection |
| 2 | 28V OUT | Positive Output Voltage Connection |
| 3 | OUT COM | Output Common Connection |
| 4 | CASE | Case Connection |
| 5 | IN COM | Input Common Connection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

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 |
|----------------|-----------------------|----------|----------------|---------|---------------------------------------|--|---------------------------|
| DVMD | 28 | 28 Volts | F | 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 SMD 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 | DVMD28 Series Similar Part Number |
|--------------|-----------------------------------|
| 06024-01HXC | DVMD28F/H |

Do not use the DVMA28 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 <https://landandmaritimeapps.dla.mil/programs/defaultapps.asp>. 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. All DSCC 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

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