



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 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

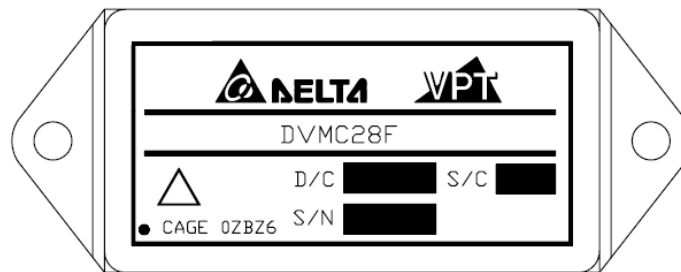


Figure 1 – DVMC28 / DVMC28F EMI Filter
(Exact marking may differ from that shown)

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°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	A
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 qualification testing.
 3. Rated current applies at any voltage.

BLOCK DIAGRAM

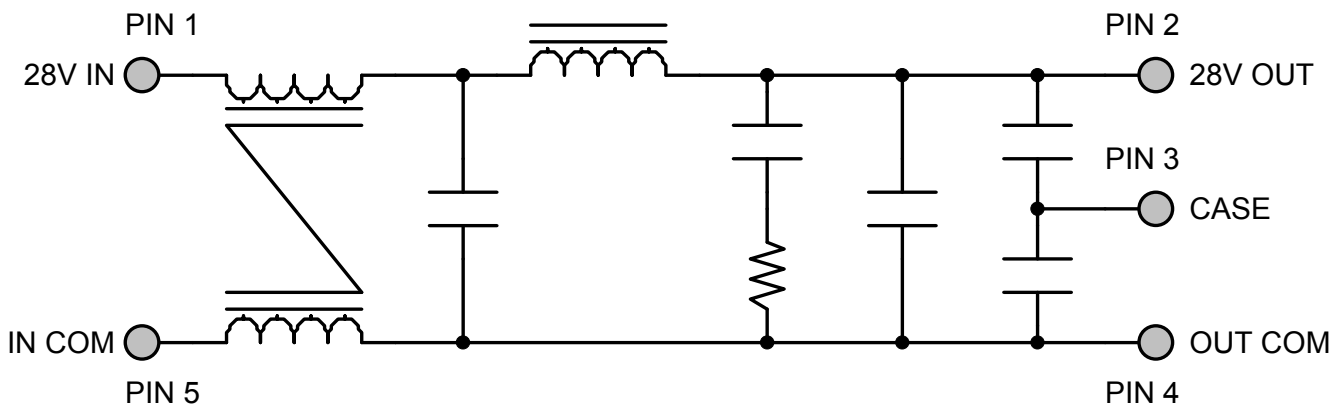


Figure 2

CONNECTION DIAGRAMS

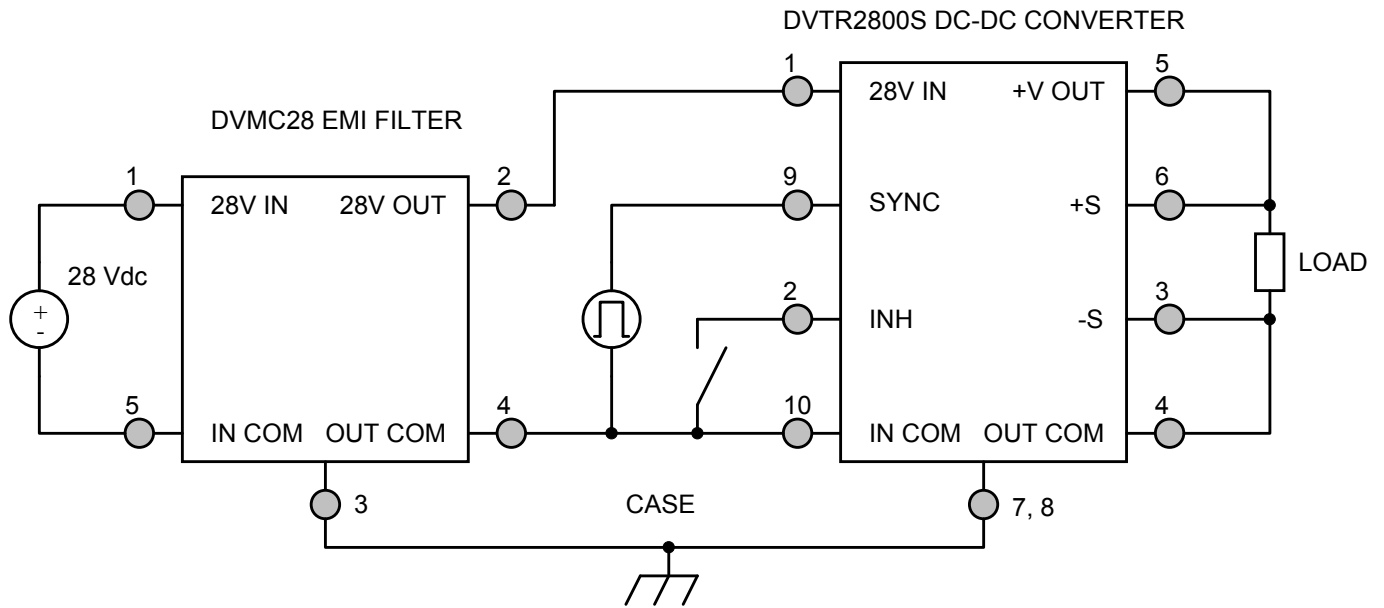


Figure 3 – DVMC28 EMI Filter Hookup with Single Converter

CONNECTION DIAGRAMS

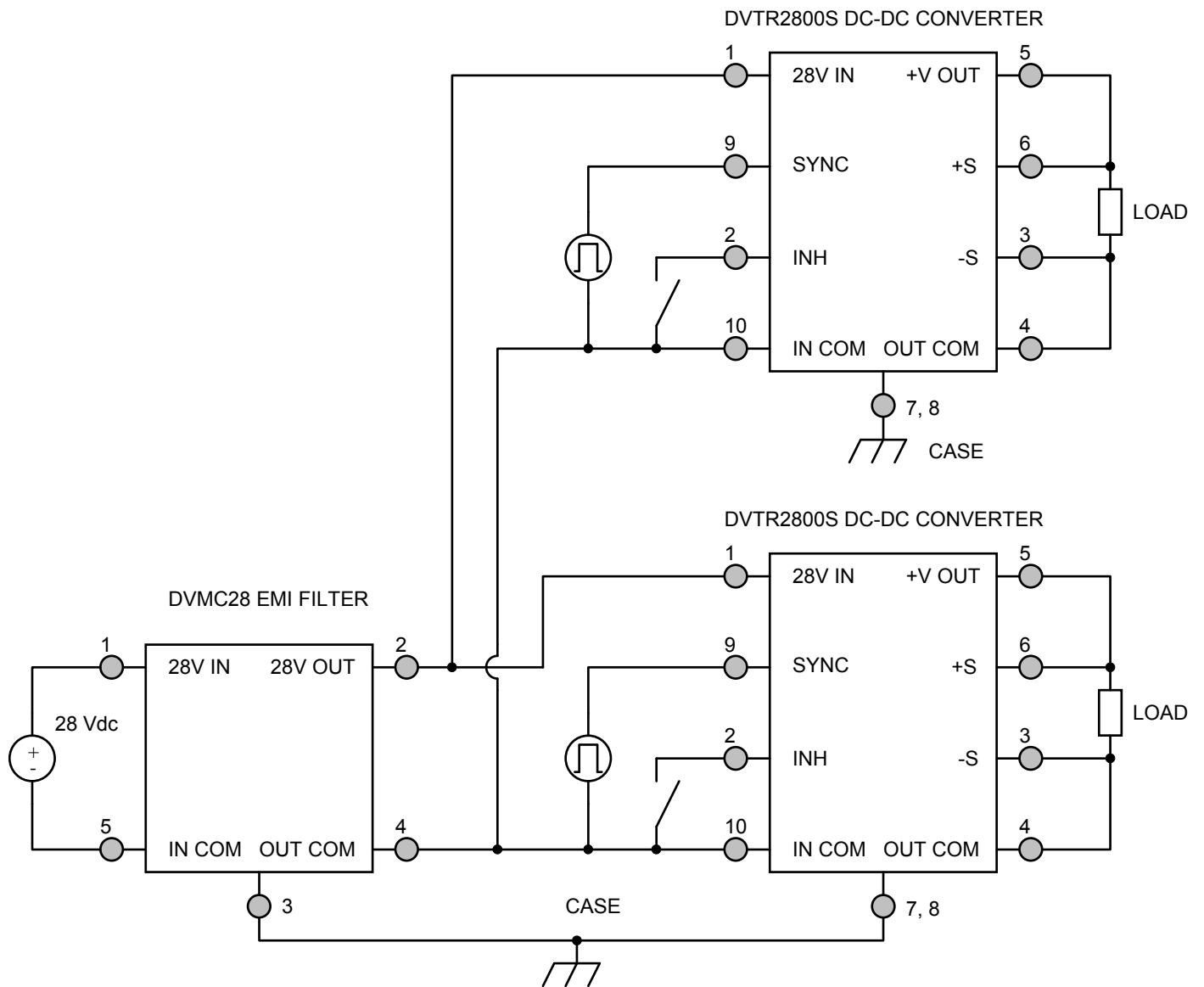


Figure 4 – DVMC28 EMI Filter Hookup with Two Converters

EMI MEASUREMENT METHODS CONNECTION DIAGRAMS

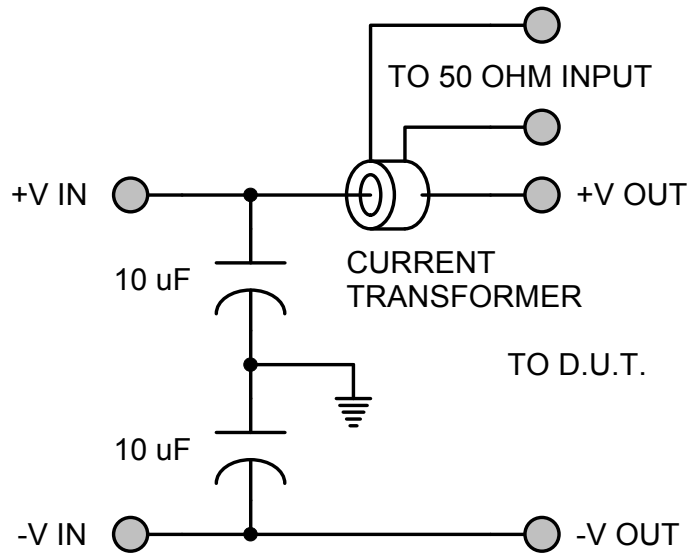


Figure 5 – MIL-STD-461C Measurement Method (Feedthrough Capacitor)

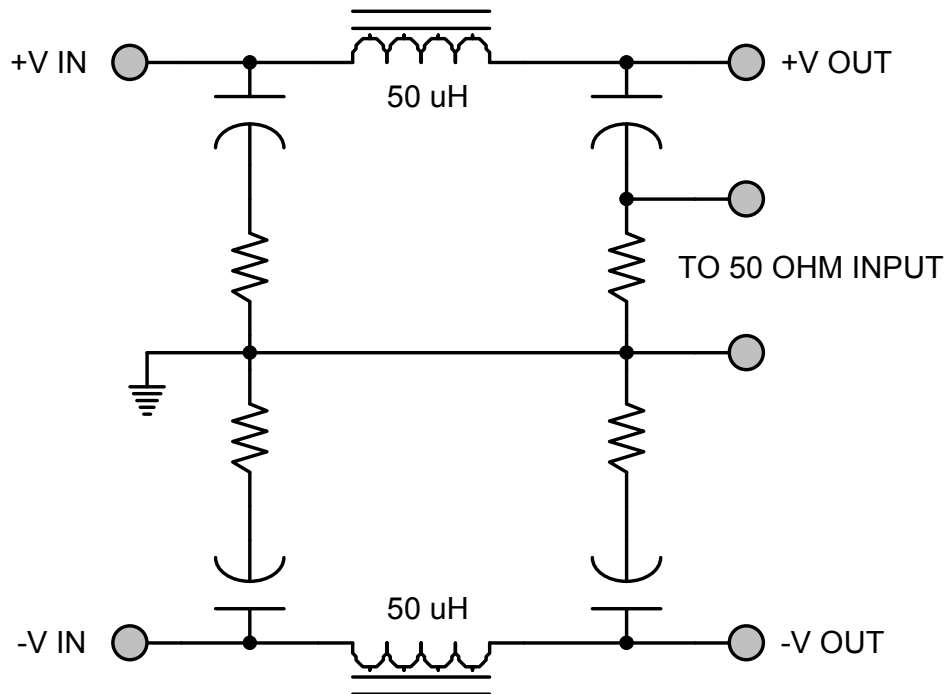


Figure 6 – MIL-STD-461D Measurement Method (LISN)

EMI PERFORMANCE CURVES

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

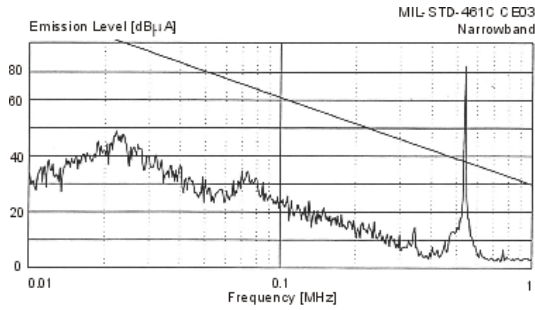


Figure 7 – MIL-STD-461C DVTR2800D Without EMI Filter

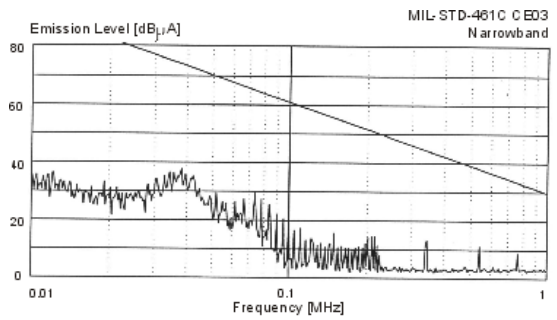


Figure 8 – MIL-STD-461C DVTR2800D With DVMC28 EMI Filter

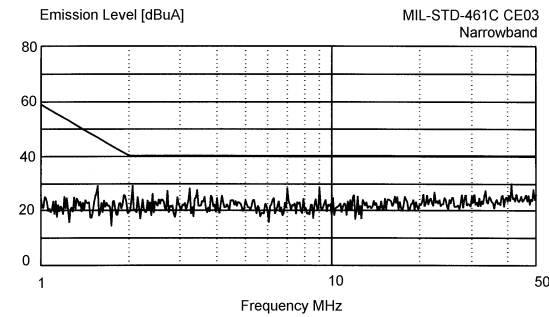
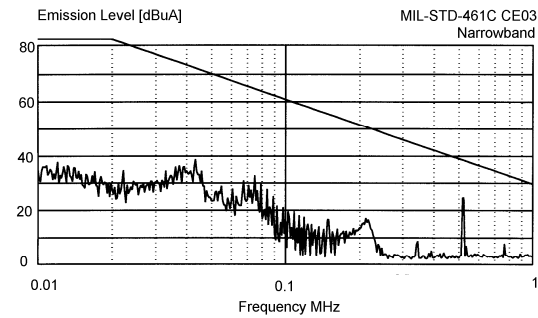
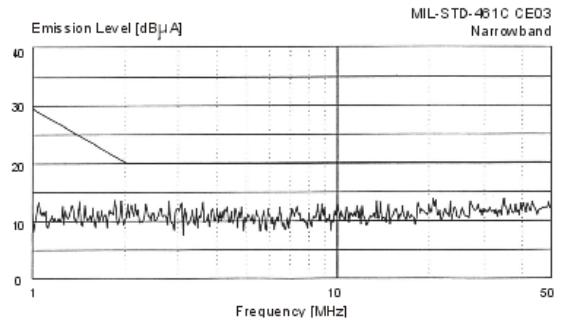
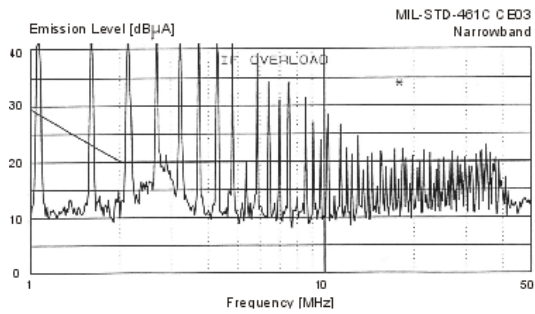


Figure 9 – MIL-STD-461C Two DVTR2800S's With DVMC28 EMI Filter

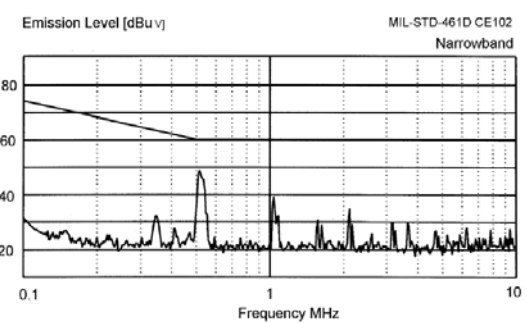
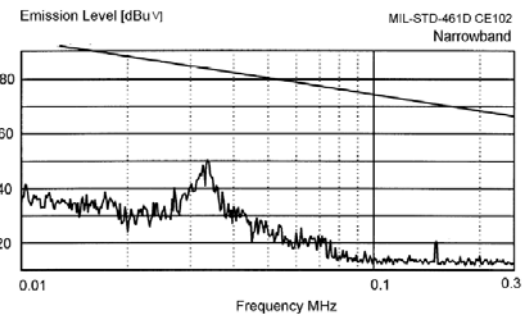
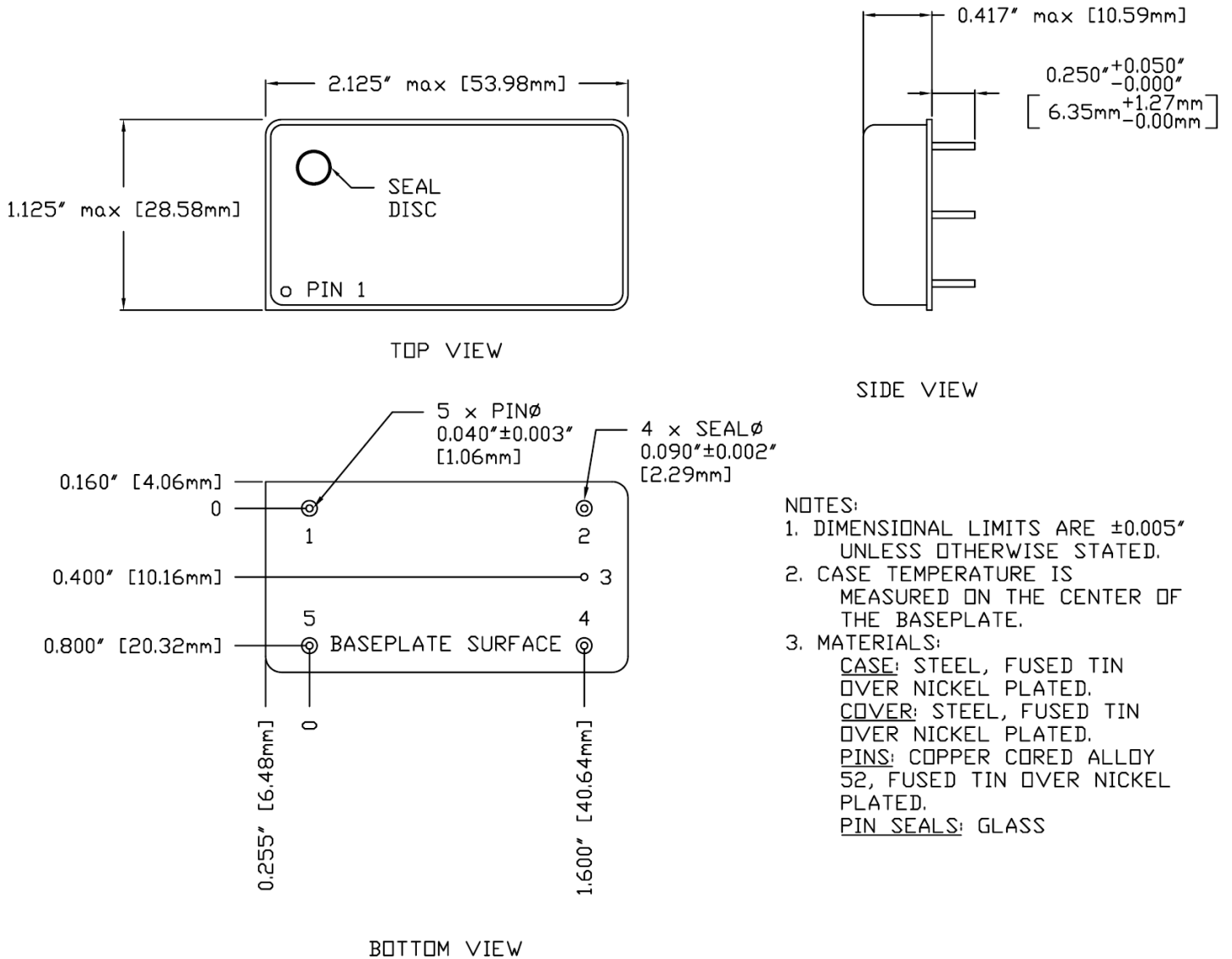


Figure 10 – MIL-STD-461D DVTR2800S With DVMC28 EMI Filter

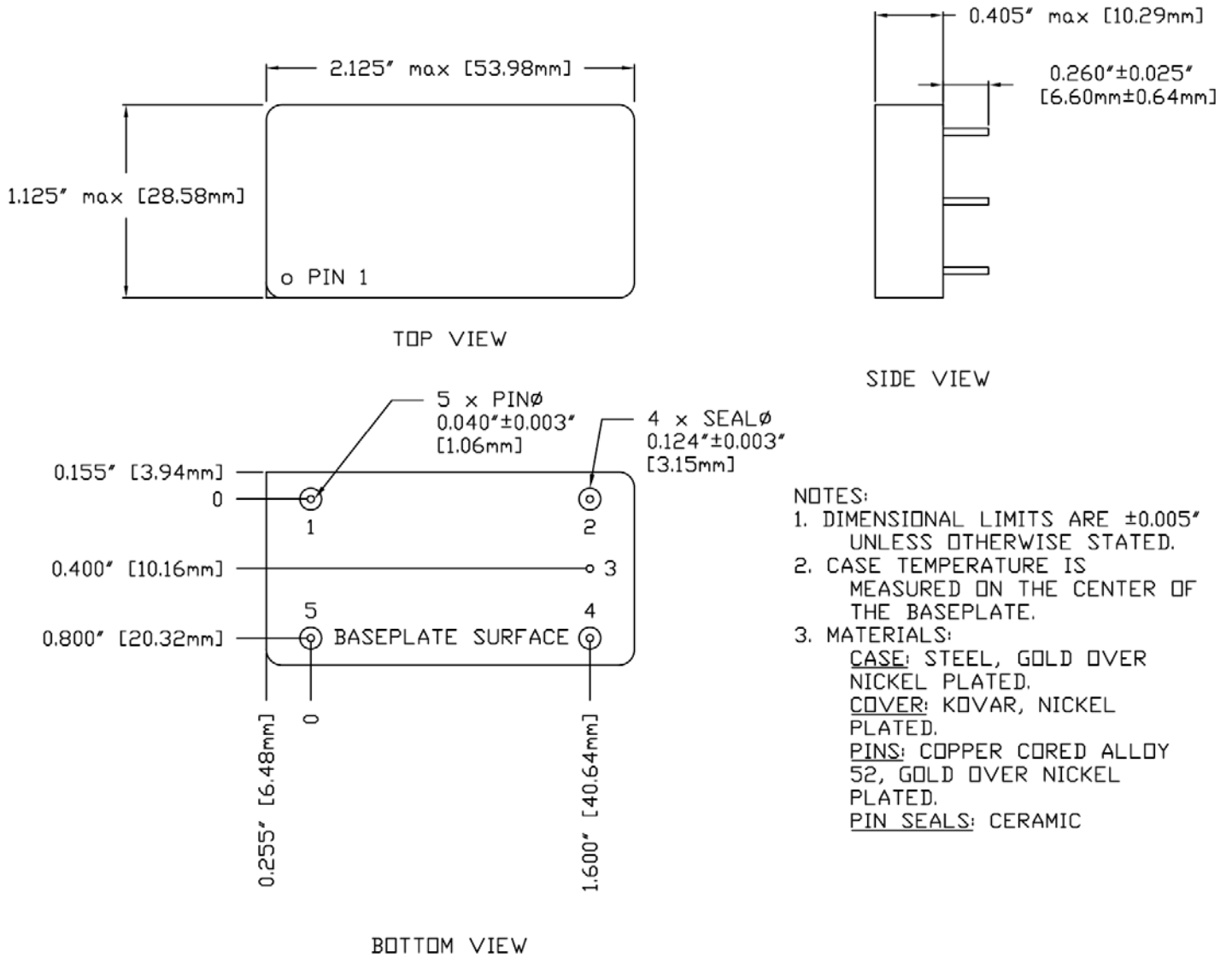
PACKAGE SPECIFICATIONS (NON-FLANGED, SOLDER SEAL)



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

Figure 11 – Non-Flanged, Solder Seal Package and Pinout (Not Used for /HB or Higher Screened Products)

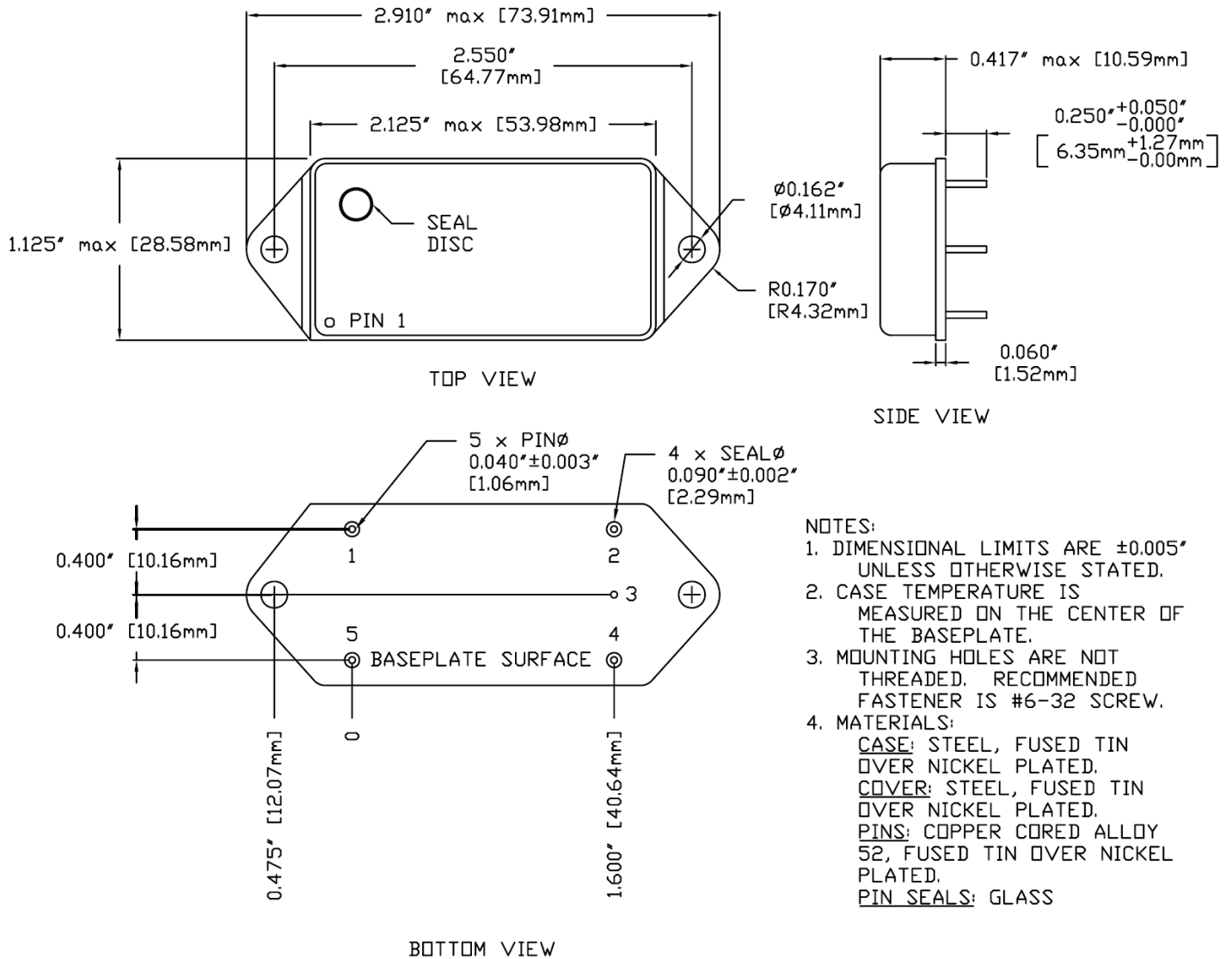
PACKAGE SPECIFICATIONS (NON-FLANGED, SEAM SEAL)



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

Figure 12 – Non-Flanged, Seam Seal Package and Pinout

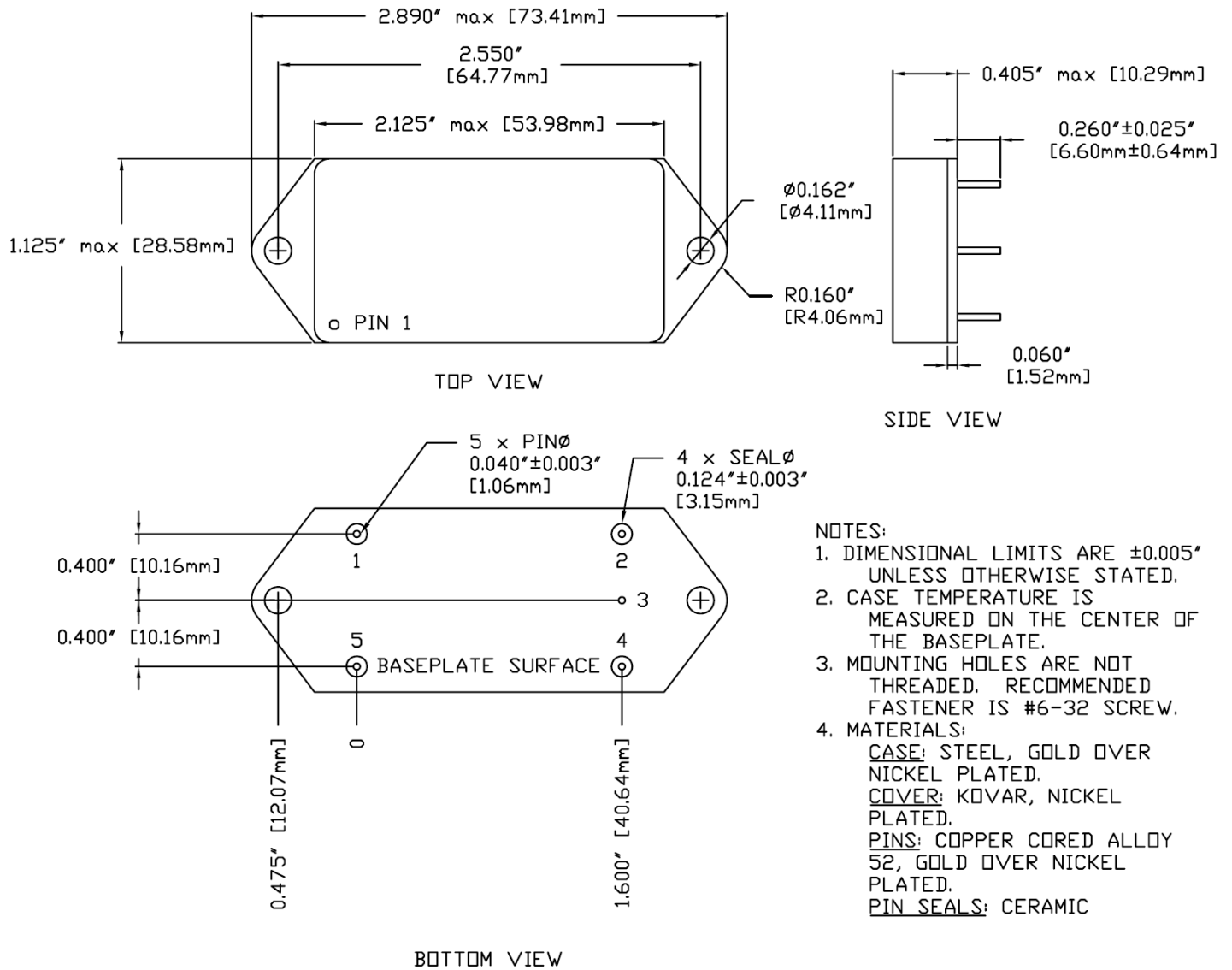
PACKAGE SPECIFICATIONS (FLANGED, SOLDER SEAL)



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

Figure 13 – Flanged, Solder Seal Package and Pinout (Not Used for /HB or Higher Screened Products)

PACKAGE SPECIFICATIONS (FLANGED, SEAM SEAL)



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

Figure 14 – 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)

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.

DSCC DRAWING NUMBERS

DSCC Drawing	DVMC28 Series Similar Part Number
06023-01HXC	DVMC28/H
06023-01HYC	DVMC28F/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 <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. 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:

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Fax: (425) 353-4030
E-mail: vptsales@vpt-inc.com

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