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DATA SHEET

Power Your Critical Mission Today

SVRMC28 Series

SPACE QUALIFIED HYBRID EMI FILTERS



SVRMC28 - Exact marking may differ from that shown

Models Available
Input: 28 V nominal
Output: 4 A
Qualified to MIL-PRF-38534 Class H and Class K
Designed for TOR Compliance

1.0 DESCRIPTION

The SVRMC is specifically designed for use with the SVR Series of DC-DC converters in the harsh radiation environment of space applications. The SCRMC design is fully passive, giving a strong resistance to radiation degradation, and is designed in accordance with Aerospace TOR requirements. Product performance is guaranteed through extensive circuit worst-case analysis.

The SVRMC Series of EMI filters is suited for use in low Earth orbit (LEO), medium Earth orbit (MEO), geostationary orbit (GEO), deep space, and launch vehicle programs.

1.1 FEATURES

- Up to 4 A maximum current
- High reliability
- Wide input voltage range: 0 to 40 V
- High input transient voltage: 50 V for 1 second
- 40 dB minimum attenuation at 500 kHz
- Continuous operation over full military temperature range of -55 °C to +125 °C with no power derating
- One module filters the emissions of multiple SVR Series DC-DC converters

1.2 SPACE LEVEL CHARACTERIZATIONS

- Fully passive design is immune to degradation from radiation
- Worst-case analysis, stress, radiation, reliability reports available

1.3 MANUFACTURING AND COMPLIANCE

- Qualified to MIL-PRF-38534 Class H and Class K, DLA Drawing # 13010
- Available compliant to MIL-HDBK-1547 and Aerospace TOR component level element evaluation
- MIL-PRF-38534 element evaluated components
- MIL-STD-461C/D/E/F requirements for conducted emissions
- Manufactured in a MIL-PRF-38534 Class H and Class K facility
- MIL-STD-883
- ISO-9001

1.4 PACKAGING

- Low-profile: 2.890” x 1.125” x 0.405”
- Max weight: 55 g
- Industry standard pinout
- Precision seam-welded hermetic metal case
- Flanged and Non-flanged versions available

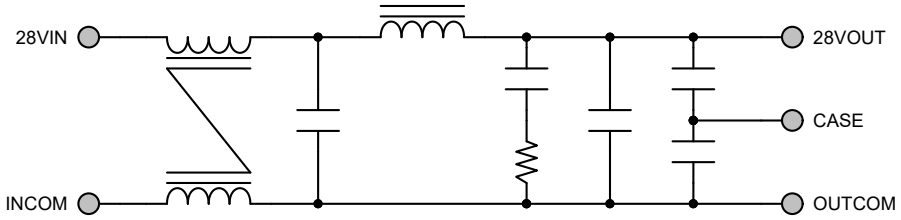
1.5 SIMILAR PRODUCTS AND ACCESSORIES

- DVMC 4 A EMI filter for military/avionics applications
- Custom versions available
- SVR Series DC-DC converters

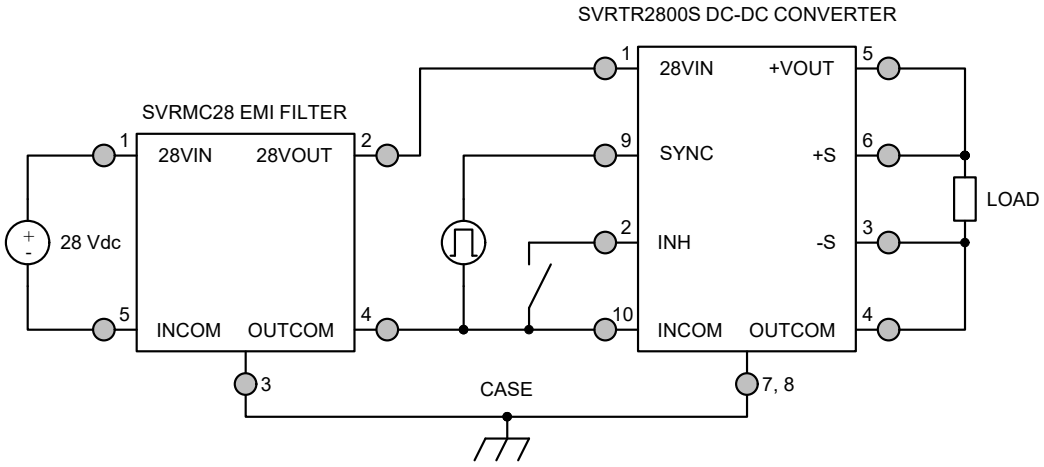
Products and reports described in this datasheet are subject to all export license restrictions and regulations which may include but are not limited to ITAR (International Traffic in Arms Regulations) and the Export Administration and Foreign Assets Control Regulations. Further restrictions may apply. Contact VPT sales for details.

2.0 DIAGRAMS

2.1 BLOCK DIAGRAM



2.2 CONNECTION DIAGRAM



3.0 SPECIFICATIONS

3.1 ABSOLUTE MAXIMUM RATING

Absolute Maximum Ratings			
Input Voltage (Continuous):	-0.5 V to 40 V	Operating Temperature (Full Load):	-55 °C to +125 °C
Input Voltage (Transient, 1 second):	-0.5 V to 50 V	Storage Temperature:	-65 °C to +150 °C
		Lead Solder Temperature (10 seconds):	300 °C

3.2 PERFORMANCE SPECIFICATIONS

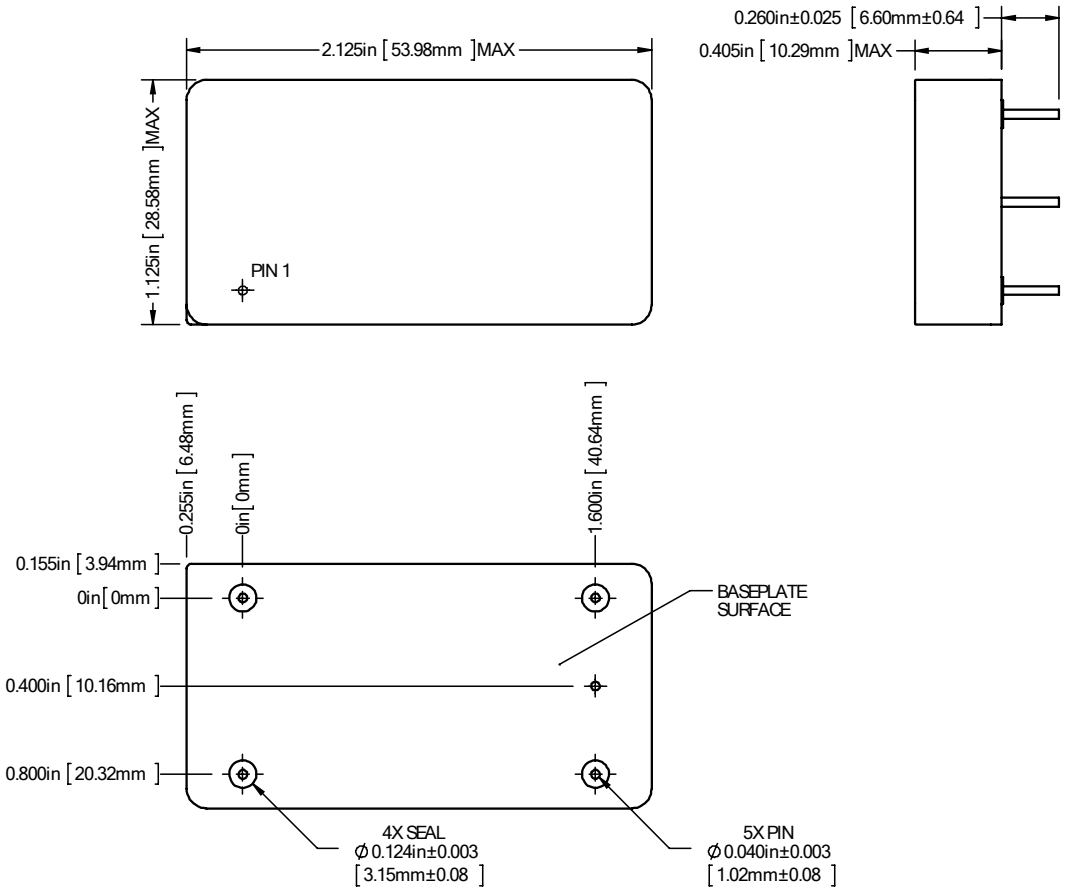
Tcase = -55 °C to +125 °C, Vin = +28 V ± 5%, Full Load, Unless Otherwise Specified

		SVRMC28			
Parameter	**Conditions**[2]	**Min**	**Typ**	**Max**	**Units**
INPUT					
Voltage	Continuous	0	28	40[4]	V
	Transient[1], 1 sec	-	-	50	V
OUTPUT STATIC					
Voltage[1]		Vout = Vin – (Iin x RDC)			V
Current		0	-	4.0	A
GENERAL					
DC Resistance		-	-	150	mΩ
Power Dissipation[1]		-	-	2.4	W
Noise Rejection	f = 500 kHz	40	-	-	dB
Capacitance	Any pin to case	30	-	50	nF
Isolation	Any pin to case, 500 V DC	100	-	-	MΩ
Weight	Non-flanged package option	-	-	52	g
	Flanged package option			55	g
MTBF (MIL-HDBK-217F) [3]	SF, Class K @ Tcase= 55 °C	-	107	-	MHr

1. Verified by initial electrical design verification. Post design verification, parameter shall be guaranteed to the limits specified.
2. End-of-Life performance includes aging and radiation degradation and is within standard limits except where noted
3. Correction factor of 0.12 added to ceramic capacitors
4. 37.5 V Max continuous to be compliant to MIL-HDBK-1547 and Aerospace TOR

4.0 MECHANICAL OUTLINES AND PINOUT

Non-Flanged Package Option:

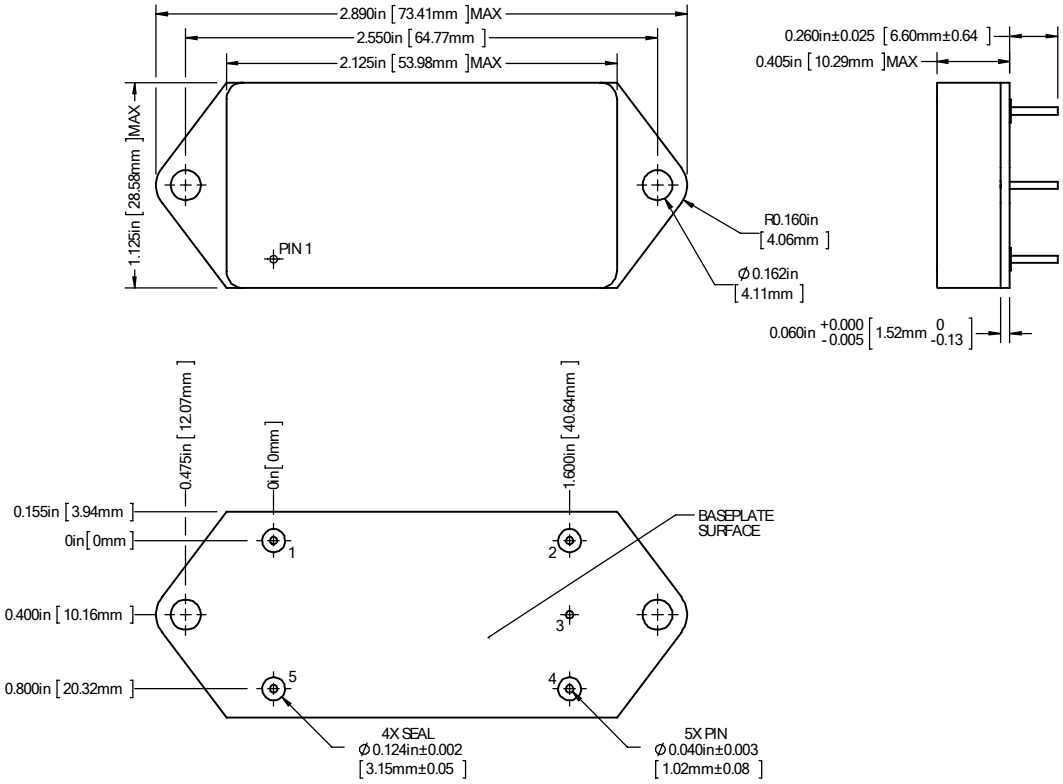


1. Tolerances are ±0.005" unless otherwise stated
2. Case temperature is measured on the center of the baseplate surface
3. Materials: Case (Steel, gold over nickel plated); Cover (Kovar, nickel plated); Pin (Copper-cored alloy 52, gold over nickel plated); Pin Seals (Ceramic)

Pin	Function	Pin	Function
1	28VIN	4	OUTCOM
2	28VOUT	5	INCOM
3	CASE		

4.0 MECHANICAL OUTLINES AND PINOUT (CONTINUED)

Flanged Package Option:



1. Tolerances are ±0.005" unless otherwise stated
2. Case temperature is measured on the center of the baseplate surface
3. Mounting holes are not threaded. Recommended fastener is 6-32
4. Materials: Case (Steel, gold over nickel plated); Cover (Kovar, nickel plated); Pin (Copper-cored alloy 52, gold over nickel plated); Pin Seals (Ceramic)

Pin	Function	Pin	Function
1	28VIN	4	OUTCOM
2	28VOUT	5	INCOM
3	CASE		

5.0 ENVIRONMENTAL SCREENING

100% tested per MIL-STD-883 as referenced to MIL-PRF-38534.

Contact sales for more information concerning additional environmental screening and testing options. VPT Inc. reserves the right to ship higher screened or SMD products to meet orders for lower screening levels at our sole discretion unless specifically forbidden by customer contract.

Test	MIL-STD-883 Test Method, Condition	/H+ (Class H Screening + PIND)	/K and /KL1[1,7] (Class K Screening)	/EM (Engineering Model, Non-QML[1,6])
Non-Destructive Bond Pull	TM2023	•[2]	•	•[2]
Internal Visual	TM2010, TM2017, TM2032 (MIL-STD-750, TM2072, TM2073)	•	•	•
Temperature Cycling	TM1010, Condition C -65 °C to 150 °C, Ambient	•	•	
Constant Acceleration	TM2001, 3000g, Y1 Direction	•	•	
PIND[3]	TM2020, Condition A	•[2]	•	
Pre Burn-In Electrical	25 °C		•	
Burn-In	TM1015, 320 hrs., 125 °C, Case Typ		•	
	TM1015, 160 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[4]	•	•	
	MIL-PRF-38534, Group A Subgroups 1 and 4 25 °C			•
Hermeticity (Seal)	TM1014, Fine Leak, Condition A2 or B1	•	•	
	TM1014, Gross Leak, Condition C1 or B2	•	•	
	Gross Leak, Dip ($1x10^{-3}$)			•
Radiography[5]	TM2012		•	
External Visual	TM2009	•	•	•

1. Non-QML products may not meet all requirements of MIL-PRF-38534
2. Not required per MIL-PRF-38534. Test performed for additional product quality assurance
3. PIND test Certificate of Compliance included in product shipment
4. 100% R&R testing with all test data included in product shipment
5. Radiographic test Certificate of Compliance and film(s) or data CD included in product shipment
6. Engineering models utilize only the screening specified and are not considered compliant for flight use
7. -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.

6.0 STANDARD MICROCIRCUIT DRAWING (SMD) NUMBERS

DLA Drawing Number	SVRMC Series Similar Part Number
13010-01HXC	SVRMC28/H+
13010-01HXA	SVRMC28/H+-E
13010-01HYC	SVRMC28F/H+
13010-01HYA	SVRMC28F/H+-E
13010-01KXC	SVRMC28/K
13010-01KXA	SVRMC28/K-E
13010-01KYC	SVRMC28F/K
13010-01KYA	SVRMC28F/K-E

Do not use the SVRMC28 Series similar part number for DLA 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 Land and Maritime (Previously known as DSCC) website at https://landandmaritimeapps.dla.mil/programs/defaultapps.asp. The DLA Drawing number listed above is for MIL-PRF-38534 Class K screening and standard gold plated lead finish. Please reference the DLA Drawing for other screening levels and lead finishes. All DLA Drawing products are marked with a “Q” on the cover as specified by the QML certification mark requirement of MIL-PRF-38534.

7.0 ORDERING INFORMATION

SVRMC	28	F	/K	-	XXX
1	2	3	4		5

(1) Product Series	(2) Nominal Input Voltage	(3) Package Option	(4) Screening Code[1,2,3]	(5) Additional Screening Code
SVRMC	**28** 28 Volts	(None) Non-Flanged **F** Flanged	**/EM** Engineering Model **/H+** Class H + PIND **/K** Class K **/KL1** Class K (KL1)	Contact Sales

1. Contact the VPT Sales Department for availability of Class H (/H), Class K (/K), or KL1 (/KL1) 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. Engineering models utilize only the standard screening specified and are not considered compliant for flight use. These models are intended for low volume engineering characterization only and have no guarantee regarding operation in a radiation environment. The customer must place the following statement on each line item of their purchase order(s) for /EM units when ordering engineering models:

   "(Customer Name) acknowledges that the /EM unit listed in this line item is not permitted for flight use and will be used for Engineering characterization only."
4. -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 requirements, source inspection, and/or special element evaluation for space or other higher quality applications.

8.0 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

All information contained in this datasheet is believed to be accurate, however, no responsibility is assumed for possible errors or omissions. The products or specifications contained herein are subject to change without notice.

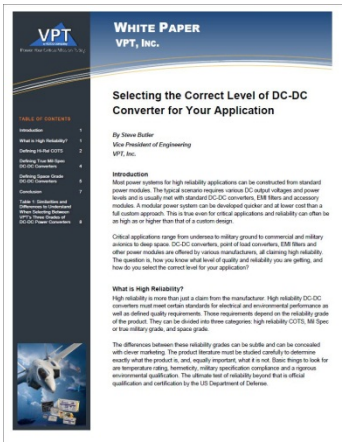
9.0 ADDITIONAL INFORMATION

Visit the VPT website for additional technical resources, including:

Product Catalogs



Application Notes and White Papers



Technical Video Labs



Additional Products For Avionics/Military, Hi-Rel COTS, and Space Applications



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