

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with [ASME Y14.100](#)

<b>REV STATUS OF PAGES</b>	<b>REV</b>																		
	<b>PAGES</b>	1	2	3	4	5	6	7	8										
<b>PMIC N/A</b>	<b>PREPARED BY</b> John Bonitatibus								<b>DESIGN ACTIVITY</b> DLA LAND AND MARITIME COLUMBUS, OH 43218-3990										
Original date of drawing  20 June 2013	<b>CHECKED BY</b> Andrew R. Ernst								<b>TITLE</b>  FILTER, EMI, HYBRID, 28 V dc										
	<b>APPROVED BY</b> Michael A. Radecki																		
	<b>SIZE</b> A	<b>CODE IDENT. NO.</b> 037Z3							<b>DWG NO.</b>  13011										
	<b>SCALE</b> N/A			<b>REV</b>					<b>PAGE</b> 1 OF 8										

1. SCOPE

1.1 Scope. This drawing describes the requirements for hybrid microcircuit electromagnetic interference (EMI) suppression filters to be processed in accordance with [MIL-PRF-38534](#). Two product assurance classes consisting of class H (military high reliability) and class K (space application) and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of radiation hardness assurance (RHA) levels is reflected in the PIN.

1.2 PIN. The PIN shall be as shown in the following example:



1.2.1 Radiation hardness assurance (RHA) designator. Device classes H and K RHA marked devices shall meet the [MIL-PRF-38534](#) specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device types. The device type identifies the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	SVRMH28, SVRMH28F	EMI filter, 28V dc, 2.0 A

1.2.3 Device class designator. This device class designator shall be a single letter identifying the product assurance level as follows:

<u>Device class</u>	<u>Device requirements documentation</u>
K	Highest reliability class available. This level is intended for use in space applications. Certification and qualification to <a href="#">MIL-PRF-38534</a> is required.
H	Standard military reliability level. This level is intended for use in applications where non-space high reliability devices are required. Certification and qualification to <a href="#">MIL-PRF-38534</a> is required.

1.2.4 Case outline. The case outline shall be as designated in [MIL-STD-1835](#), and as follows:

<u>Outline letter</u>	<u>Case outline</u>
X	1.460" x 1.130" x .330" (see <a href="#">figure 1</a> )
Y	2.000" x 1.130" x .355" (see <a href="#">figure 2</a> )

1.2.5 Lead finish. The lead finish shall be as specified in [MIL-PRF-38534](#) for classes H and K. Finish letter "X" will not be marked on the filter or its packaging. The "X" designation is for use when lead finishes A, B, or C are considered acceptable and interchangeable without preference.

1.3 Absolute maximum ratings. 1/

Input voltage (continuous) -----	+37.5V dc
Input voltage (transient, 1 second) -----	+50V dc
Input current -----	2.0 A
Power dissipation (Tc = +125°C) -----	1.0 W
Lead temperature (soldering, 10 seconds) -----	+300° C
Storage temperature -----	-65° C to +150° C

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

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1.4 Recommended operating conditions.

Input voltage ----- 0V dc to +37.5V dc  
Case operating temperature range ----- -55° C to +125° C

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this drawing. This section does not include documents cited in other sections of this drawing or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents in sections 3 and 4 of this drawing, whether or not they are listed here.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

DEPARTMENT OF DEFENSE SPECIFICATIONS

**MIL-PRF-38534** - Hybrid Microcircuits, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

**MIL-STD-883** - Test Methods and Procedures for Microelectronics.

(Copies of these documents are available online at <http://quicksearch.dla.mil/> or from the Standardization Document Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with **MIL-PRF-38534** and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in **MIL-PRF-38534** and as specified herein.

3.2.1 Case outline. The case outline shall be in accordance with 1.2.4 herein and **figure 1** and **figure 2**.

3.2.2 Terminal connections. The terminal connections shall be as specified on **figure 1** and **figure 2**.

3.3 Pure tin prohibition. The use of pure tin as an underplate or final finish in the internal or external construction of the filter and the terminations is prohibited. This includes the discrete devices and solders used internal to the case. Tin shall be alloyed with a minimum of 3 percent lead, by mass. The use of tin alloys other than lead is permissible as specified in appendix E of **MIL-PRF-38534**.

3.4 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in **table I** and shall apply over the full specified operating temperature range.

3.5 Electrical test requirements. The electrical test requirements shall be the subgroups specified in **table II**. The electrical tests for each subgroup are defined in **table I**.

3.6 Marking. Marking shall be in accordance with **MIL-PRF-38534**. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed on QML-38534.

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3.7 Manufacturer eligibility. To be eligible for listing as an approved source of supply, the manufacturer shall be certified and qualified to MIL-PRF-38534. In addition to the general requirements of MIL-PRF-38534, the manufacturer of the part described herein shall maintain the electrical test data (variables format) from the initial quality conformance inspection group A lot sample, produced on the certified line, for each device type listed herein. The data should also include a summary of all parameters manually tested, and for those which, if any, are guaranteed. This data shall be maintained under document revision level control by the manufacturer and be made available to the preparing activity (DLA Land and Maritime-VA) upon request.

3.8 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to supply to this drawing. The certificate of compliance submitted to DLA Land and Maritime-VA shall affirm that the manufacturer's product meets the requirements of MIL-PRF-38534 and the requirements herein.

3.9 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38534 shall be provided with each lot of filters delivered to this drawing.

3.10 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

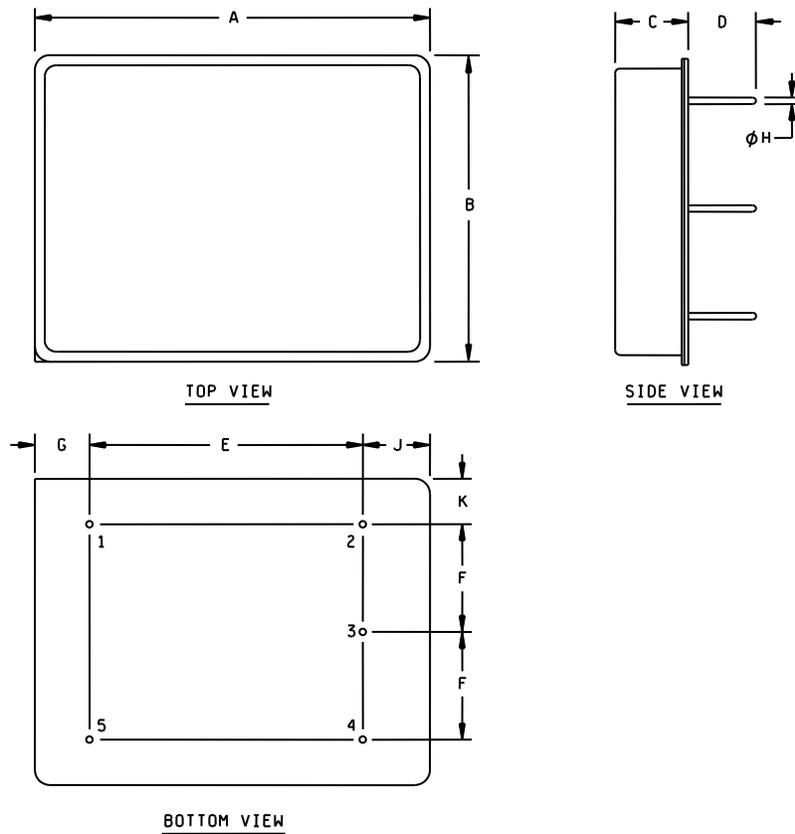
3.11 Workmanship. Filters shall be processed in such a manner as to be uniform in quality and shall be free from cold soldering, corrosion, pits, dents, cracks, rough or sharp edges, misalignments and other defects that will affect life, serviceability, or appearance.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C < Tc < ±125°C unless otherwise specified	Group A subgroup	Device types	Limits		Units
					Min	Max	
Noise reduction	NO	f = 500 kHz	1, 2, 3	01	55	----	dB
DC resistance	R <sub>dc</sub>		1, 2, 3	01	----	250	mΩ
Isolation	ISO	Any pin to case, 500 V dc	1	01	100	----	MΩ
Capacitance	CAP	Any pin to case	1, 2, 3	01	10	30	nF

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Case outline X



Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	----	1.460	----	37.08
B	----	1.130	----	28.70
C	----	.330	----	8.38
D	.235	.265	5.97	6.73
E	.995	1.005	25.27	25.53
F	.395	.405	10.03	10.29
G	.200	.210	5.08	5.33
J	.240	.250	6.10	6.35
K	.155	.165	3.94	4.19
ØH	.028	.032	0.71	0.81

Terminal number	Function
1	+ 28V IN
2	+ 28V OUT
3	CASE GROUND
4	OUTPUT COMMON
5	INPUT COMMON

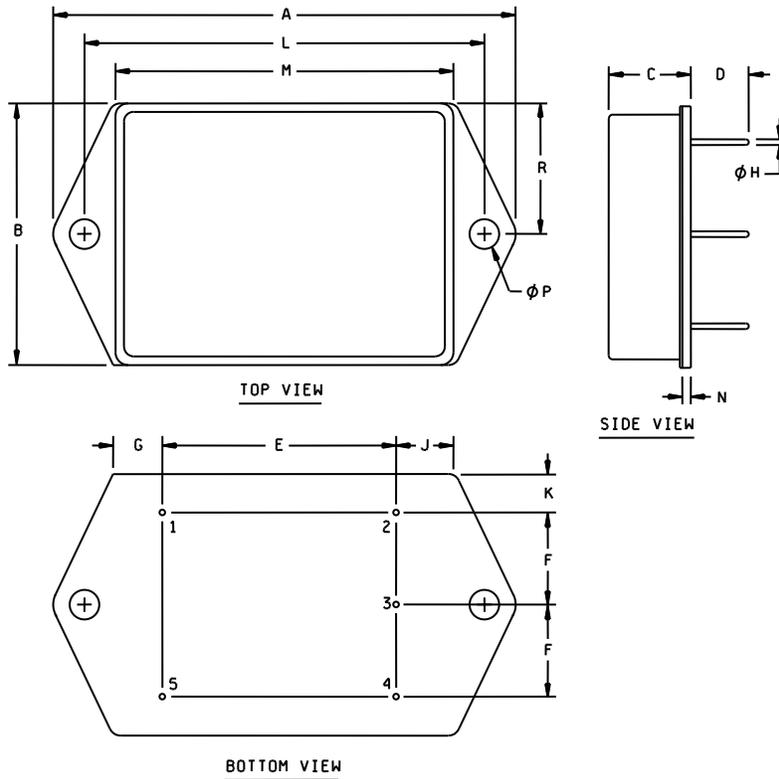
NOTES:

1. The case was originally designed using inch-pound units of measurement; in the event of conflict between the metric and inch-pound units, the inch-pound shall take precedence.
2. Device weight: 24 grams maximum.

FIGURE 1. Case outline X configuration, dimensions, and terminal connections.

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Case outline Y



Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	----	2.000		50.8
B	----	1.130	----	28.70
C	----	.355	----	9.02
D	.235	.265	5.97	6.73
E	.995	1.005	25.27	25.53
F	.395	.405	10.03	10.29
G	.200	.210	5.08	5.33
J	.240	.250	6.10	6.35
K	.155	.165	3.94	4.19
L	1.725	1.735	43.82	44.07
M	----	1.460	----	37.08
N	.042	.050	1.07	1.27
R	.555	.565	14.10	14.35
ØH	.028	.032	0.71	0.81
ØP	.123	.133	3.12	3.38

Terminal number	Function
1	+ 28V IN
2	+ 28V OUT
3	CASE GROUND
4	OUTPUT COMMON
5	INPUT COMMON

NOTES:

1. The case was originally designed using inch-pound units of measurement; in the event of conflict between the metric and inch-pound units, the inch-pound shall take precedence.
2. Device weight: 29 grams maximum.

FIGURE 2. Case outline Y configuration, dimensions, and terminal connections.

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4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38534.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38534. The following additional criteria shall apply:

- a. Burn-in test, method 1015 of MIL-STD-883.
  - (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to DLA Land and Maritime-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.
  - (2)  $T_A$  as specified in accordance with table I of method 1015 of MIL-STD-883.
- b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.
- c. PIND testing, method 2020, condition A, of MIL-STD-883.

TABLE II. Electrical test requirements

MIL-PRF-38534 test requirements	Subgroups (in accordance with MIL-PRF-38534, group A test table)
Interim electrical parameters	
Final electrical parameters	1, 2, 3 <u>1/</u>
Group A test requirements	1, 2, 3
Group C end-point electrical parameters	1, 2, 3
End-point electrical parameters for RHA devices	Not Applicable

1/ PDA applies to subgroup 1.

4.3 Conformance inspection. Conformance inspection (CI) and periodic inspection (PI) shall be in accordance with MIL-PRF-38534 and as specified herein.

4.3.1 Group A inspection (CI). Group A inspection shall be in accordance with MIL-PRF-38534 and as follows:

- a. Tests shall be as specified in table II herein.
- b. Subgroups 4, 5, 6, 7, 8, 9, 10, and 11 of MIL-PRF-38534, group A shall be omitted.

4.3.2 Group B inspection (PI). Group B inspection shall be in accordance with MIL-PRF-38534.

4.3.3 Group C inspection (PI). Group C inspection shall be in accordance with MIL-PRF-38534 and as follows:

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
  - (1) Test conditions A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to DLA Land and Maritime-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
  - (2)  $T_A$  as specified in accordance with table I of method 1005 of MIL-STD-883.
  - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

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4.3.4 Group D inspection (PI). Group D inspection shall be in accordance with [MIL-PRF-38534](#).

4.3.5 Radiation Hardness Assurance (RHA). RHA inspection is not currently applicable to this drawing.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with [MIL-PRF-38534](#).

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. Filters conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.2 Ordering data. The contract or purchase order should specify the following:

- a. Complete PIN (see [1.2](#))
- b. Requirements for delivery and one copy of the conformance inspection data or certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.

6.3 Replaceability. Filters covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.4 Changes from previous issue. Not applicable.

6.5 Configuration control. All proposed changes to this drawing will be coordinated with the sources of supply and users of record.

6.6 Users of record. Coordination of this document for future revisions is coordinated only with the approved source(s) of supply and the users of record of this document. Requests to be added as a recorded user of this drawing may be achieved online at [capacitorfilter@dla.mil](mailto:capacitorfilter@dla.mil) or if in writing to: DLA Land and Maritime, ATTN: VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4709 or DSN 850-4709.

6.7 Approved sources of supply. Approved source(s) of supply are listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained online at [capacitorfilter@dla.mil](mailto:capacitorfilter@dla.mil), or by contacting DLA Land and Maritime, ATTN: VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-4709 or DSN 850-4709.

DLA Land and Maritime drawing PIN 13011	Vendor CAGE number	Vendor similar PIN <u>1/</u>
-01HXC	0ZBZ6	SVRMH28/H+
-01HXA	0ZBZ6	SVRMH28/H+-E
-01KXC	0ZBZ6	SVRMH28/K
-01KXA	0ZBZ6	SVRMH28/K-E
-01HYC	0ZBZ6	SVRMH28F/H+
-01HYA	0ZBZ6	SVRMH28F/H+-E
-01KYC	0ZBZ6	SVRMH28F/K
-01KYA	0ZBZ6	SVRMH28F/K-E

1/ Parts must be purchased to the DLA Land and Maritime PIN to assure that all performance requirements and tests are met.

Vendor CAGE

0ZBZ6

Vendor name and address

VPT, Inc  
1971 Kraft Drive  
Suite 1000  
Blacksburg, VA 24060

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