DEFENSE LOGISTICS AGENCY
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June 30, 2016

MEMORANDUM FOR MILITARY/INDUSTRY DISTRIBUTION

SUBJECT: Initial Draft of DLA drawing 00003 Revision F
Project number 5915-2016-E11.

The draft of the above subject document is being sent to you for review and comments. This draft consists of the following changes:

Remove 1 Amp from Table I, DC Resistance, Condition.

If this document is interest to you, please provide your comments electronically. This can be in the form of a return e-mail, with or without an attached text file. A 30 day coordination cycle from the date of this letter has been allotted. Please provide your comments within that time period. If no comments are received in the allotted 30 day coordination cycle, concurrence is assumed and all comments received after will be held to the first amendment. If an electronic response is not possible we will still accept comments via letter, facsimile or phone call but only after you have contacted the project officer listed below. The draft document can be found at the following DLA Land and Maritime web page:

https://landandmaritimeapps.dla.mil/programs/milspec/default.aspx
This process still requires military departments to identify their comments as "Essential" or "Suggested". Essential comments must be justified with supporting data. Military review activities should forward comments to their custodians or this office, as applicable, in sufficient time to allow for consolidating the department reply.

If there are any questions, please contact Yeasvina Afroz by the preferred method of E-Mail at Yeasvina.Afroz@dla.mil or by telephone at commercial 614-692-0551, DSN 850-0551; or by facsimile at 614-693-1644. Our mailing address as a last resort is DLA Land and Maritime, VAT, P.O. Box 3990, Columbus, OH 43218-3990. If you have further questions or concerns you may contact me at Michael.Radecki@dla.mil by telephone at 614-692-0561 or by facsimile at 614-692-6939.

/SIGNED/
MICHAEL A. RADECKI
Chief
Electronic Components Branch

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	Editorial changes.	22 June 2005	Kendall A. Cottongim
B	Added paragraph 3.3; Pure tin prohibition. Editorial changes throughout.	6 Jan 2011	M. Radecki
C	Cancellation Notice	25 Jan 2016	M. Radecki
D	Reinstate the drawing from cancel to active. Editorial changes throughout, update vendor's address and add QR code. Add subgroups 2,3,4,5,6 to Table II.	24 Mar 2016	M. Radecki
E	Table I, remove 1 kHz row from Noise Reduction.	3 June 2016	M. Radecki
F	Remove 1 Amp from Table I, DC Resistance, Condition.	DRAFT	

CURRENT DESIGN ACTIVITY CAGE CODE 037Z3
HAS CHANGED NAMES TO:
DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990

Prepared in accordance with ASME Y14.100

REV STATUS OF PAGES																		
	REV	F	F	F	F	F	F	F	F									
	PAGES	1	2	3	4	5	6	7	8									

PMIC N/A	**PREPARED BY** Patrick Kyne	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OH**
Original date of drawing 8 June 2000	**CHECKED BY** Michael A. Radecki **APPROVED BY** Kendall A. Cottongim	**TITLE** FILTER, EMI, HYBRID
	SIZE A / **CODE IDENT. NO.** 037Z3	**DWG NO.** **00003**
	REV F	**PAGE** 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:

00003	-	01	H	X	X
Drawing number	RHA designator (See 1.2.1)	Device type (See 1.2.2)	Device class designator (See 1.2.3)	Case outline (See 1.2.4)	Lead finish (See 1.2.5)

1.2.1 Radiation hardness assurance (RHA) designator. Device classes H and K RHA marked devices meet the MIL-PRF-38534 specified RHA levels and should 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:

Device type	Generic number	Circuit function
01	SFCS 28-461	EMI filter, 5 A

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

Device class	Device requirements documentation
K	Highest reliability class available. This level is intended for use in space applications. Certification and qualification to MIL-PRF-38534 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 MIL-PRF-38534 required.

1.2.4 Case outline. The case outline is designated in MIL-STD-1835, and as follows:

Outline letter	Case outline	Package style
X	see figure 1	Flange mount, short lead

1.2.5 Lead finish. The lead finish is 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 ---------- +50 V dc
Input current ---------- 5 A
Power dissipation (Tc = 25°C)---------- 5 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.

1.4 Recommended operating conditions.

Input voltage ---------- +16 V dc to +40 V 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/.)

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.

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

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. 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.

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-VAT 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.

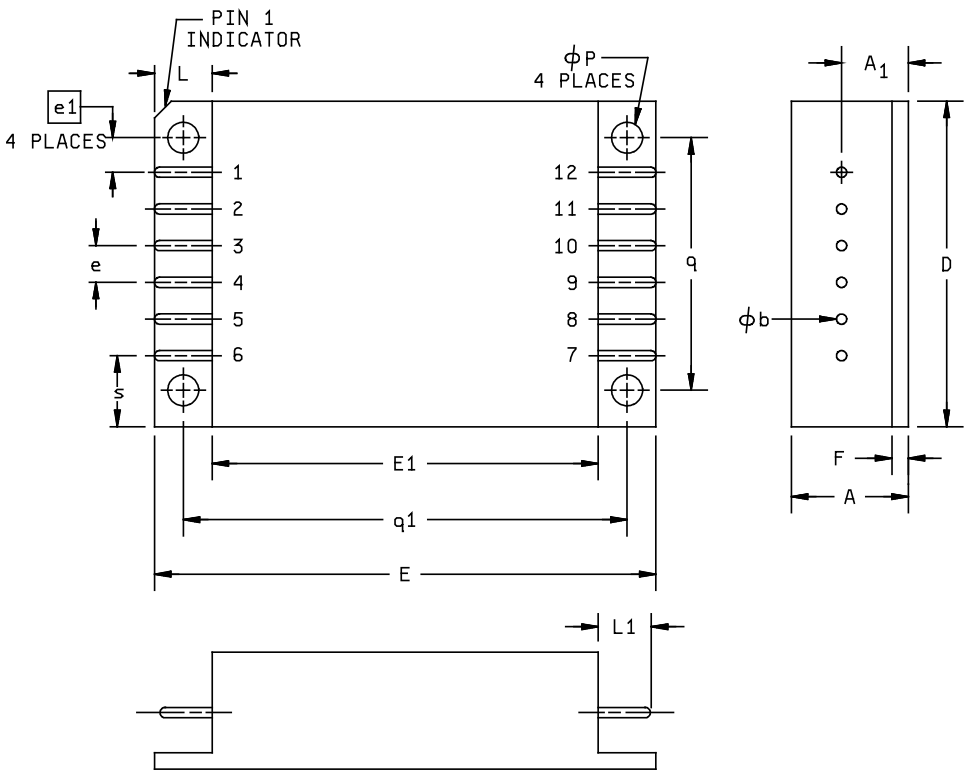
3.10 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically 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	
Input voltage	V_{in}	I_{in} ≤ 500 µA	1,2,3	01	0	40	V dc
Noise reduction	NO	f = 500 kHz	4,5,6	01	60	----	dB
		f = 1 MHz	4,5,6	01	60	----	
		f = 5 MHz	4,5,6	01	60	----	
DC resistance	R_{dc}		1	01	----	0.2	Ω
Isolation	ISO	Any pin to case, 500 V dc	1	01	100	----	MΩ
Capacitance	CAP	Any pin to case @ 1 kHz	1	01	50	70	nF

Case outline X.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		10.16		0.400
A1	5.46	5.72	0.215	0.225
ϕb	0.89	1.14	0.035	0.045
D	37.97	38.23	1.495	1.505
e	5.08 BSC		.200 BSC	
e1	3.30 BSC		.130 BSC	
E	75.95	76.46	2.990	3.010
E1	63.37	63.63	2.495	2.505
F	1.14	1.40	0.045	0.055
L	6.10	6.60	0.240	0.260
L1	5.58	6.10	0.220	0.240
ϕP	3.12	3.38	0.123	0.133
q	31.88	32.13	1.255	1.265
q1	69.97	70.23	2.755	2.765
s	6.22	6.48	0.245	0.255

Device type	01
Case outline	X(Figure 1)
Terminal number	Terminal symbol
1, 2, 3	$+V_{in}$
10, 11, 12	$+V_{out}$
*	case ground
7, 8, 9	output return
4, 5, 6	input return

* NOTE: Case ground connection is made by contact of the base plate to the chassis.

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: 86 grams maximum.

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

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-VAT 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.

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, 4, 5, 6
Group A test requirements	1, 2, 3, 4, 5, 6
Group C end-point electrical parameters	1, 2, 3, 4, 5, 6
Post irradiation end-point electrical parameters for RHA devices	1, 2, 3, 4, 5, 6

* 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 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-VAT 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.

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 qualification is required only for those devices with the RHA designator as specified herein:

	RHA level H	Units
Total ionizing dose tolerance level	1,000	kRad (Si)
Single event upset survival level at linear energy transfer (LET)	100	MeV/(mg/cm^2)

a. Radiation dose rate in accordance with condition C of method 1019 of MIL-STD-883.

b. The manufacturer shall perform a worst-case and radiation susceptibility analysis on the device. This analysis shall show that the minimum performance requirements of each component has adequate design margin under worst-case operating conditions (extremes of line voltage, temperature, load, frequency, radiation environment, etc.). The analysis guarantees the limits specified in table I reflect post-irradiation exposure. Device analysis shall be repeated for design changes that may effect the RHA performance of the device. Reports shall be filed and controlled in accordance with the manufacturer's configuration management system.

c. The device manufacturer shall designate a RHA program manager to monitor design changes for continued compliance to RHA requirements.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38534.

6. NOTES

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

6.5 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 or if in writing to: DLA Land and Maritime, ATTN: VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-0551 or DSN 850-0551.

6.6 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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 , or by contacting DLA Land and Maritime, ATTN: VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-0551 or DSN 850-0551.

DLA Land and Maritime drawing 00003	Vendor CAGE number	Vendor similar PIN 1/
H01HXX	50821	SFCS28-461/HH
H01KXX	50821	SFCS28-461/KH

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

Vendor CAGE	Vendor name and address
50821	Crane Electronics, Inc. 10301 Willows Road NE Redmond, WA 98052