REVISIONS

LT	DESCRIPTION	DATE	APPROVED
A	Page 2; paragraph 3.1.3, deleted reference to MIL-T-10727. Removed one suggested source of supply. Added a new suggested source of supply. Editorial changes.	27 April 2001	Kendall A. Cottongim
B	Changed to source control. Removed packaging inspection. Revised pure tin prohibition.	30 July 2009	Michael A. Radecki

Prepared in accordance with ASME Y14.100

Source control drawing

REV STATUS OF PAGES																		
	REV	B	B	B	B	B	B	B										
	PAGES	1	2	3	4	5	6	7										

PMIC N/A	**PREPARED BY** Patrick Kyne	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OH**
Original date of drawing 18 May 1999	**CHECKED BY** Michael A. Radecki	**TITLE** **CAPACITORS, FIXED, CERAMIC DIELECTRIC, NON-HERMETICALLY SEALED, FEED-THROUGH**
	APPROVED BY James A. Crum	
	SIZE A / **CODE IDENT. NO.** 037Z3	**DWG NO.** **97007**
	REV B	**PAGE** 1 **OF** 7

AMSC N/A

5910-E432

1. SCOPE

1.1 Scope. This drawing and MIL-PRF-28861 describe the requirements for feedthrough capacitors.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as follows:

97007-	XXX	X
Drawing number	Dash number (see table I)	Finish (see 3.1.3)

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification 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 specification, whether or not they are listed.

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-28861 - Filters and Capacitors, Radio Frequency/Electromagnetic Interference Suppression, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-1285 - Marking of Electrical and Electronic Parts.

(Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch/ or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, 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 document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-28861 and herein.

3.1.1 Terminals. Terminals shall be solderable and in accordance with figure 1.

3.1.2 Case dimensions. The case dimensions shall be in accordance with figure 1.

3.1.3 Finish. The finish shall be T (tin plated or tin-lead plated), S (silver plated), or G (gold plated) in accordance with MIL-PRF-28861

3.1.4 Pure tin. The use of pure tin is prohibited in accordance with MIL-PRF-28861 (see 6.4).

3.2 Operating temperature range. The operating temperature range shall be -55°C to +125°C.

3.3 Electrical characteristics.

3.3.1 Rated voltage. The rated voltage shall be in accordance with table I.

3.3.2 Rated current. The rated current shall be 10 amperes maximum.

3.3.3 Dissipation factor (DF). The DF shall be 3.0 percent maximum.

3.3.4 Capacitance. Capacitance shall be in accordance with table I.

3.3.5 Capacitance tolerance. Capacitance tolerance shall be +100 percent, -0 percent.

3.3.6 Insulation resistance. When measured between one terminal and the case, insulation resistance shall be as follows:
At +25°C: 1,000 megohm-microfarads or 100,000 megohms minimum, whichever is less.
At +125°C: 100 megohm-microfarads or 10,000 megohms minimum, whichever is less.

3.3.7 Insertion loss. Not applicable.

3.3.8 Voltage-temperature limits. In accordance with MIL-PRF-28861 and the following:

Capacitance change with reference to 25°C		Capacitance values
Paragraph 4.6.10 of MIL-PRF-28861 Bias = 0 volts	Paragraph 4.6.10 of MIL-PRF-28861 Bias = rated voltage	
±15 percent ±15 percent	+15, -25 percent +15, -40 percent	less than 1,000 pF 1,000 pF and greater

3.3.9 Dc resistance. Dc resistance shall be 0.01 ohm, maximum.

3.3.10 Dc voltage drop. Dc voltage drop shall be 0.1 volt, maximum.

3.4 Thermal shock: Not applicable.

3.5 Seal. Not applicable.

3.6 Immersion. Not applicable.

3.7 Moisture Resistance. Not applicable.

3.8 Temperature rise. Temperature rise shall be +25°C, maximum.

3.9 Life. Life test shall be in accordance with MIL-PRF-28861. The following details and exceptions shall apply:

a. Operating conditions: 200 percent of rated dc voltage shall be applied at +125°C.

b. Measurements after test:

Capacitance: Shall change no more than ±20 percent from initial measured value.

Dissipation factor: Not greater than 3.5 percent.

IR: at +25°C, 100,000 megohms or 1,000 megohm-microfarads minimum, whichever is less.

at +125°C, 10,000 megohms or 100 megohm-microfarads minimum, whichever is less.

3.10 Resistance to soldering heat. Resistance to soldering heat test shall be in accordance with MIL-PRF-28861. The following details and exceptions shall apply:

Measurements after test:

Capacitance: Shall change no more than ±20 percent from initial measured value.

DF: Shall not exceed initial limit.

IR at +25°C: Shall not be less than the initial +25°C requirement.

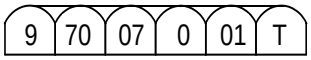
3.11 Vibration (high frequency). Vibration (high frequency) test shall be in accordance with MIL-PRF-28861. The following details and exceptions shall apply:

Measurements after test:

Capacitance shall meet initial requirements.

3.12 Product assurance level. Product assurance level requirements shall be class B only.

3.13 Marking. Capacitors shall be marked with the PIN as specified in 1.2 and as shown on the following example. The unit package shall be marked in accordance with MIL-STD-1285, except the PIN shall be as specified in 1.2, with the manufacturer's name or code, date code, voltage rating, and current rating.



Example of marking for the PIN
on the hex flats (expanded view).

3.14 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the MIL-PRF-28861 Qualified Products List (QPL) for at least one part or, perform first article inspection in accordance with the MIL-PRF-28861 qualification inspection requirements for class B.

3.15 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.

3.16 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be an approved source of supply.

3.17 Workmanship. Capacitors 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 sharp edges, misalignments, and other defects that will affect life, serviceability, or appearance. Cracks in glass seals are not allowed; however, minor meniscus crazing is acceptable.

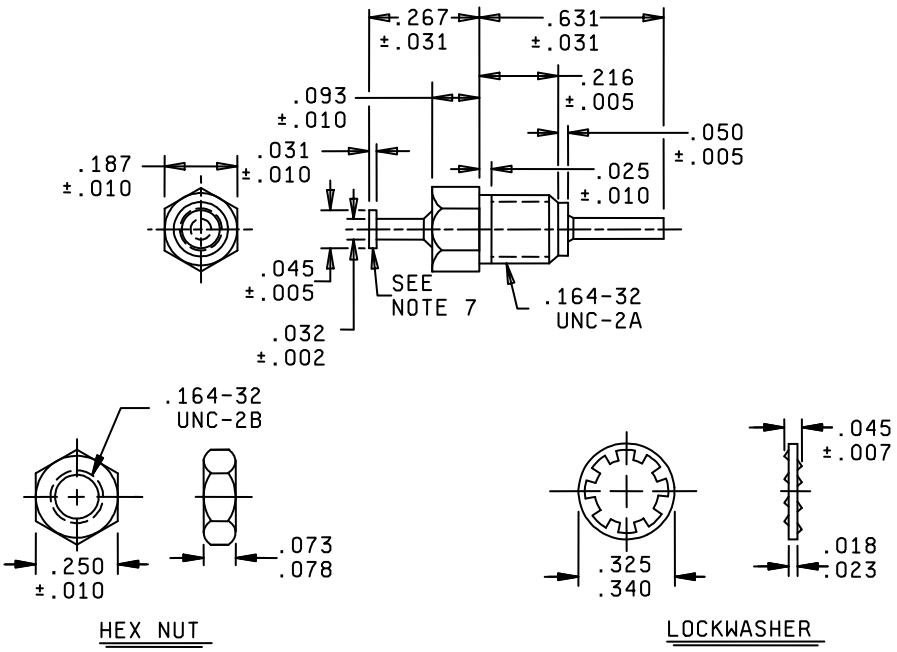
4. VERIFICATION

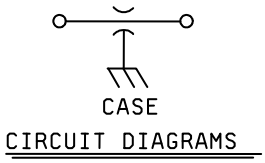
4.1 Qualification inspection. Qualification inspection is not required.

4.2 Conformance inspection.

4.2.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A and group B inspections of MIL-PRF-28861 for class B.

4.2.2 Certification. The acquiring activity, at its discretion, may accept a certification of compliance with group B requirements in lieu of performing group B tests (see 6.2d).





Inches	mm	Inches	mm
.001	0.03	.078	1.98
.002	0.05	.093	2.36
.005	0.13	.100	2.54
.007	0.18	.164	4.17
.010	0.25	.187	4.75
.018	0.46	.216	5.49
.023	0.58	.250	6.35
.025	0.64	.267	6.78
.031	0.79	.325	8.26
.045	1.14	.340	8.64
.050	1.27	.631	16.03
.073	1.85		

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Circuit diagram is for information only.
4. All capacitors shall be supplied with mounting hardware (hex nut and lockwasher).
5. Recommended mounting torque: 32 oz-inch ± 4 oz-inch.
6. Potting shall not extend beyond .030 inch (0.76 mm) from the body.
7. Turret head terminal is optional.

FIGURE 1. Case and hardware dimensions and circuit diagram.

Table I. Electrical characteristics.

DSCC Drawing PIN 97007-	Capacitance (pF)	Voltage V dc @ +125°C
001	10	200
002	22	200
003	47	200
004	100	200
005	220	200
006	470	200
007	1000	200
008	1500	200
009	2700	200
010	5000	200
011	10,000	200
012	15,000	100
013	27,000	100

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Departments or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

5.1.1 Mounting hardware. Mounting hardware (hex nut and lockwasher) shall be packaged with each capacitor but need not be assembled.

6. NOTES

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

6.1 Intended use. Capacitors conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. This drawing is intended exclusively to prevent the proliferation of unnecessary duplicate specifications, drawings, and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-28861, this drawing becomes obsolete and will not be used for new design. The QPL-28861 product shall be the preferred item for all applications.

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.

c. Requirements for packaging and packing.

d. Whether the manufacturer performs the group B tests or provides certification of compliance with group B requirements.

e. Requirements for notification of change of product to acquiring activity, if applicable.

6.3 Application note. These nonhermetically sealed capacitors may be susceptible to moisture intrusion when subjected to repeated thermal cycling. If these items are to be used in applications enduring harsh environments, the user should consider placing them within hermetic enclosures.

6.4 Tin whisker growth. The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to ASTM B545 (Standard Specification for Electrodeposited Coating of Tin).

6.5 Users of record. Coordination of this document for future revisions is coordinated only with the approved sources of supply and the users of record of this document. Requests to be added as a recorded user of this drawing should be in writing to Defense Supply Center Columbus, DSCC-VAT, Post Office Box 3990, Columbus, OH 43218-3990, by email to capacitorfilter@dla.mil, or by telephone (614) 692-4709 or DSN 850-4709.

6.6 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. For assistance in the use of this drawing, contact Defense Supply Center Columbus, DSCC-VAT, Post Office Box 3990, Columbus, OH 43218-3990, by email to capacitorfilter@dla.mil, or telephone (614) 692-4709.

DSCC drawing PIN 97007-	Vendor A similar designation or type number 1/	Vendor B similar designation or type number 1/
001-	SB1B3-100MX	2136-3246-100-V_F
002-	SB1B3-220MX	2136-3246-220-V_F
003-	SB1B3-470MX	2136-3246-470-V_F
004-	SB1B3-101MX	2136-3246-101-V_F
005-	SB1B3-221MX	2136-3246-221-V_F
006-	SB1B3-471MX	2136-3246-471-V_F
007-	SB1B3-102MX	2136-3246-102-V_F
008-	SB1B3-152MX	2136-3246-152-V_F
009-	SB1B3-272MX	2136-3246-272-V_F
010-	SB1B3-502MX	2136-3246-502-V_F
011-	SB1B3-103MX	2136-3246-103-V_F
012-	SB1B3-153MX	2126-3246-153-V_F
013-	SB1B3-273MX	2126-3246-273-V_F

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

Vendor	Vendor CAGE	Vendor name and address
A	59942	AVX Filters Corporation 11144 Penrose Street Sun Valley, CA 91352-3921
B	66230	Pacific Aerospace & Electronics, Inc. Filter Division 434 Olds Station Road Wenatchee, WA 98801