REVISIONS			
LT	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.100

Source control drawing

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PMIC N/A	**PREPARED BY** John Bonitatibus	**DESIGN ACTIVITY** **DLA LAND AND MARITIME** **COLUMBUS, OH 43218-3990**
Original date of drawing 11 December 2012	**CHECKED BY** Mark Rush	**TITLE** CAPACITORS, FIXED, GLASS DIELECTRIC, (RADIAL OR AXIAL WIRE-LEAD TERMINALS)
	APPROVED BY Michael A. Radecki	
	SIZE **A** / **CODE IDENT. NO.** **037Z3**	**DWG NO.** **13006**
	SCALE N/A / **REV**	**PAGE** 1 **OF** 10

1. SCOPE

1.1 Scope. This drawing describes the requirements for glass dielectric capacitors screened to MIL-PRF-23269. The capacitors described herein are possible replacements for MIL-PRF-23269/10 capacitors (see 6.4 and table II).

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

13006	-001
Drawing number	Dash number (see table I)

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 cited 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.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-23269 - Capacitors, Fixed, Glass Dielectric, Established Reliability, General Specification for.

(Copies of these documents are available online at https://assist.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 (except for related specification sheets), 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

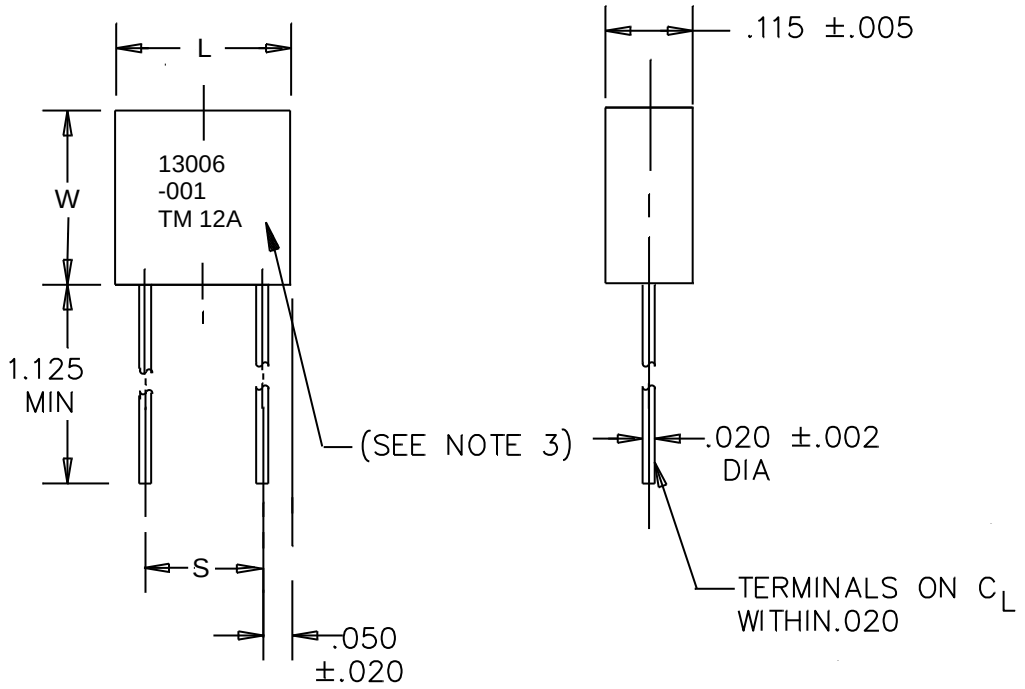
3.1 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-23269 and herein (see figure 1).

3.1.1 Case material. Epoxy.

3.1.2 Terminals. Solderable.

3.1.3 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin content of capacitor components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass (see 6.3).

3.2 Rated temperature. -55°C to +125°C.



Case Size	L ±.005	W ±.010	S ±.020
51	.300	.200	.200
52	.300	.300	.200
53	.500	.300	.400

Inches	mm	Inches	mm
.002	0.05	.200	5.08
.005	0.13	.300	7.62
.010	0.25	.400	10.16
.020	0.51	.500	12.75
.050	1.27	1.25	31.75
.115	2.92		

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. See marking requirement (see 3.8).

FIGURE 1. Dimensions and configuration.

3.3 Electrical characteristics.

3.3.1 Capacitance tolerance. See table I.

3.3.2 Rated voltage. 300 V dc.

3.3.3 Capacitance. When measured as specified in MIL-PRF-23269, the capacitance shall be within the applicable tolerance of the nominal value specified in table I.

3.3.4 Dissipation factor. When measured as specified in MIL-PRF-23269, the dissipation factor shall not exceed 0.2 percent (1.0 pF through 100 pF) or 0.1 percent (110 pF and up).

3.3.5 Temperature coefficient and capacitance drift (manufacturer eligibility only (see 3.9). When measured as specified in MIL-PRF-23269, the capacitors shall meet the following requirements:

a. Temperature coefficient: 140 parts per million (ppm)/°C ±25 ppm/°C.

b. Capacitance drift: 0.1 percent or 0.1 pF, whichever is greater.

3.3.6 Insulation resistance (IR). When measured as specified in MIL-PRF-23269, the insulation resistance shall be 100,000 megohms, minimum, at +25°C.

3.3.7 Quality factor (Q) (manufacturer eligibility only (see 3.9). 500 minimum (1.0 pF through 100 pF) or 1,000 minimum (110 pF and up).

3.4 Seal. In accordance with MIL-PRF-23269, test II.

3.5 Thermal shock and moisture resistance (manufacturer eligibility group C (see 3.9)). In accordance with MIL-PRF-23269. The following detail shall apply: Dissipation factor: 0.3 percent maximum (1 pF through 100 pF) or 0.1 percent maximum (110 pF and up).

3.6 Thermal shock (group A inpection): In accordance with MIL-PRF-23269. The following details shall apply:

a. Capacitance: Within the tolerance specified (see table I).

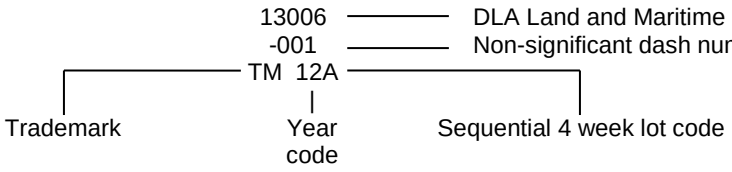
b. Dissipation factor: Within the initial limits.

3.7 Life (manufacturer eligibility only (see 3.9). In accordance with MIL-PRF-23269. The following details shall apply:

a. ΔCapacitance (240 hours and 2,000 hours): 0.5 percent or 0.5 pF, maximum.

b. Dissipation factor (240 hours and 2,000 hours): 0.45 percent maximum (1.0 pF through 100 pF) or 0.25 percent maximum (100 pF and up).

3.8 Marking. In accordance with MIL-PRF-23269, except the capacitor shall be marked with the PIN as specified herein (see 1.2.



3.9 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the MIL-PRF-23269 Qualified Products Database for at least one part, or perform the group A and group C inspections specified herein on a sample of parts agreed upon by the manufacturer and DLA Land and Maritime-VA.

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

3.12 Workmanship. The capacitor shall be uniform in quality and free from any defects that will affect life, serviceability, or appearance.

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 the group A inspection of MIL-PRF-23269.

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 commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

TABLE I. Electrical characteristics.

DLA Land and Maritime drawing (PIN) 13006-	Capacitance (pF)	Capacitance tolerance
Case size 51		
001	1.0	±0.25 pF
002	1.5	±0.25 pF
003	2.2	±0.25 pF
004	2.7	±0.25 pF
005	3.0	±0.25 pF
006	3.3	±0.25 pF
007	3.6	±0.25 pF
008	3.9	±0.25 pF
009	4.3	±0.25 pF
010	4.7	±0.25 pF
011	5.1	±0.25 pF
012	5.1	±5%
013	5.6	±0.25 pF
014	5.6	±5%
015	6.2	±0.25 pF
016	6.2	±5%
017	6.8	±0.25 pF
018	6.8	±5%
019	7.5	±0.25 pF
020	7.5	±5%
021	8.2	±0.25 pF
022	8.2	±5%
023	9.1	±0.25 pF

TABLE I. Electrical characteristics. - Continued.

DLA Land and Maritime drawing (PIN) 13006-	Capacitance (pF)	Capacitance tolerance
024	9.1	±5%
025	10	±0.25 pF
026	10	±5%
027	11	±0.25 pF
028	11	±5%
029	12	±0.25 pF
030	12	±5%
031	13	±0.25 pF
032	13	±2%
033	13	±5%
034	15	±0.25 pF
035	15	±2%
036	15	±5%
037	16	±0.25 pF
038	16	±2%
039	16	±5%
040	18	±0.25 pF
041	18	±2%
042	18	±5%
043	20	±0.25 pF
044	20	±2%
045	20	±5%
046	22	±0.25 pF
047	22	±2%
048	22	±5%
049	24	±0.25 pF
050	24	±2%
051	24	±5%
052	27	±1%
053	27	±2%
054	27	±5%
055	30	±1%
056	30	±2%
057	30	±5%
058	33	±1%
059	33	±2%
060	33	±5%
061	36	±1%
062	36	±2%
063	36	±5%
064	39	±1%
065	39	±2%
066	39	±5%
067	43	±1%
068	43	±2%
069	43	±5%

TABLE I. Electrical characteristics. - Continued.

DLA Land and Maritime drawing (PIN) 13006-	Capacitance (pF)	Capacitance tolerance
070	47	±1%
071	47	±2%
072	47	±5%
073	51	±1%
074	51	±2%
075	51	±5%
076	56	±1%
077	56	±2%
078	56	±5%
079	62	±1%
080	62	±2%
081	62	±5%
082	68	±1%
083	68	±2%
084	68	±5%
085	75	±1%
086	75	±2%
087	75	±5%
088	82	±1%
089	82	±2%
090	82	±5%
091	91	±1%
092	91	±2%
093	91	±5%
094	100	±1%
095	100	±2%
096	100	±5%
097	110	±1%
098	110	±2%
099	110	±5%
100	120	±1%
101	120	±2%
102	120	±5%
103	130	±1%
104	130	±2%
105	130	±5%
106	150	±1%
107	150	±2%
108	150	±5%
109	160	±1%
110	160	±2%
111	160	±5%
112	180	±1%
113	180	±2%
114	180	±5%
115	200	±1%

TABLE I. Electrical characteristics. - Continued.

DLA Land and Maritime drawing (PIN) 13006-	Capacitance (pF)	Capacitance tolerance
116	200	±2%
117	200	±5%
118	220	±1%
119	220	±2%
120	220	±5%
121	240	±1%
122	240	±2%
123	240	±5%
124	270	±1%
125	270	±2%
126	270	±5%
127	300	±1%
128	300	±2%
129	300	±5%
130	330	±1%
131	330	±2%
132	330	±5%
133	360	±1%
134	360	±2%
135	360	±5%
136	390	±1%
137	390	±2%
138	390	±5%
139	430	±1%
140	430	±2%
141	430	±5%
142	470	±1%
143	470	±2%
144	470	±5%
145	510	±1%
146	510	±2%
147	510	±5%
148	560	±1%
149	560	±2%
150	560	±5%
Case size 52		
201	620	±1%
202	620	±2%
203	620	±5%
204	680	±1%
205	680	±2%
206	680	±5%
207	750	±1%
208	750	±2%
209	750	±5%
210	820	±1%

TABLE I. Electrical characteristics. - Continued.

DLA Land and Maritime drawing (PIN) 13006-	Capacitance (pF)	Capacitance tolerance
211	820	±2%
212	820	±5%
213	910	±1%
214	910	±2%
215	910	±5%
216	1,000	±1%
217	1,000	±2%
218	1,000	±5%
Case size 53		
301	1,100	±1%
302	1,100	±2%
303	1,100	±5%
304	1,200	±1%
305	1,200	±2%
306	1,200	±5%
307	1,300	±1%
308	1,300	±2%
309	1,300	±5%
310	1,500	±1%
311	1,500	±2%
312	1,500	±5%
313	1,600	±1%
314	1,600	±2%
315	1,600	±5%
316	1,800	±1%
317	1,800	±2%
318	1,800	±5%
319	2,000	±1%
320	2,000	±2%
321	2,000	±5%
322	2,200	±1%
323	2,200	±2%
324	2,200	±5%
325	2,400	±1%
326	2,400	±2%
327	2,400	±5%

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, this drawing becomes obsolete and will not be used for new design.

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 notification of change of product to the acquiring activity, if applicable.

d. Requirements for packaging and packing.

6.3 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 Coatings of Tin).

6.4 MIL-PRF-23269/10 replacements. The capacitors described herein are possible replacements for MIL-PRF-23269/10 capacitors. Users are cautioned to evaluate this document for their particular application before citing it as a replacement document. MIL-PRF-23269/10 capacitors have failure rate levels (FRL) established in accordance with MIL-STD-690. DLA Land and Maritime drawing 13006 capacitors are non-established reliability.

TABLE II. Replacement data.

MIL-PRF-23269/10 PIN 1/	DLA Land and Maritime drawing PIN 13006-
-001 through -150	001 through 150
-201 through -218	201 through 218
-301 through -327	301 through 327

1/ The complete MIL-PRF-23269/10 PIN shall include an additional character to indicate the FRL (3, 4, 5, or 6).

6.5 Replaceability. Capacitors covered by this drawing will replace the same commercial device covered by contractor prepared specification or drawing.

6.6 Changes from previous issue. Not applicable.

6.7 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: DLA Land and Maritime, ATTN: 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.

6.8 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 DLA Land and Maritime, ATTN: 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.

Vendor	Vendor CAGE	Vendor name and address	Similar designation 1/
A	16299	AVX Corporation 3900 Electronics Drive Raleigh, NC 27604-1698	ER51, ER52, and ER53 Series

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