

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.100

Selected item drawing

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PMIC N/A	PREPARED BY Ken Bernier	DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OH
Original date of drawing 18 June 2004	CHECKED BY Ken Bernier	TITLE CAPACITORS, TANTALUM, HYBRID, POLYMER CASE, SEALED
	APPROVED BY Kendall Cottongim	
	SIZE A	CODE IDENT. NO. 037Z3
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1. SCOPE

1.1 Scope. This drawing describes the specific electrical, mechanical, and environmental requirements for polymer cased hybrid capacitors.

1.2 General. The capacitor shall utilize a sintered tantalum anodes and ruthenium oxide coated cathodes operating in aqueous electrolyte.

1.3 Part or Identifying Number (PIN). The complete PIN is as follows:



2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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).

STANDARDS

DEPARTMENT OF DEFENSE

- MIL-STD-202 - Test Methods for Electronic and Electrical Components Parts.
- MIL-STD-1285 - Marking of Electrical and Electronic Parts.

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

2.2 Order of precedence. 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.

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3. REQUIREMENTS

3.1 Interface and physical dimensions. The interface and physical dimensions shall be as specified herein (see figure 1).

3.1.1 Case. The case shall be polymer.

3.1.2 Mass. 0 – 50 volt parts: 25 ± 3 grams; 63 – 125 volt parts: 31 ± 3 grams.

3.1.3 Tin plated finishes. Tin plating is prohibited as a final finish or as an undercoat. Tin-lead (Sn-Pb) finishes are acceptable provided that the minimum lead content is 5 percent.

3.1.4 Storage temperature. The storage temperature shall be -40°C to $+80^{\circ}\text{C}$.

3.1.5 Operating temperature range. The operating temperature range shall be -40°C to $+70^{\circ}\text{C}$.

3.2 Electrical characteristics.

3.2.1 Rated voltage. The rated voltage shall be in accordance with Table I at -40°C to $+70^{\circ}\text{C}$.

3.2.2 Surge voltage. Surge voltage [see Table I] shall be 1000 cycles at 110% of rated voltage, charge and discharge through a 1000 ohm resistor. The capacitor shall not be visibly damaged and the electrical characteristics shall remain within specification:

- a. The ambient temperature during cycling shall be $+70^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
- b. Each cycle shall consist of 30 ± 2 seconds surge voltage application followed by 330 ± 2 seconds discharge period.

3.2.3 Dielectric. The dielectric shall be an aqueous electrolyte.

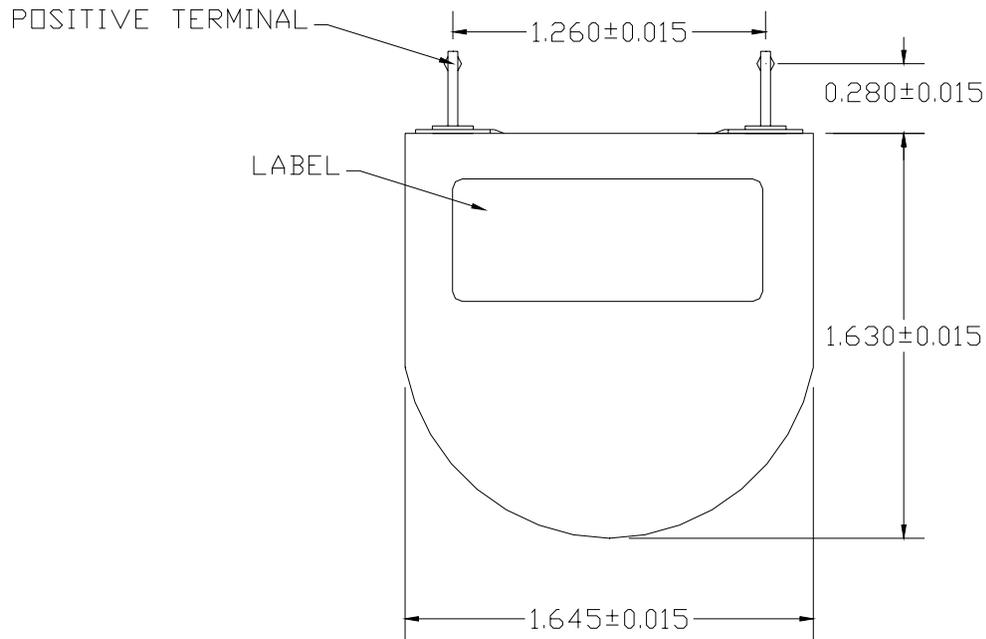
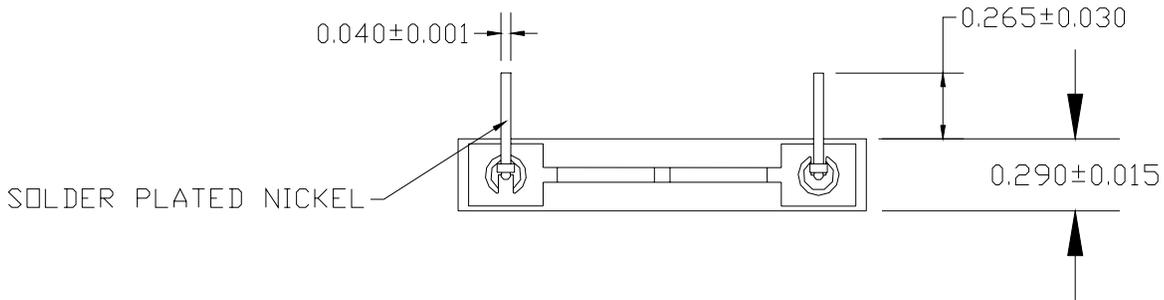
3.2.4 DC leakage current. The maximum DC leakage current shall be as specified in Table I following 5 minutes at the working voltage and 25°C (see Table II).

3.2.5 Capacitance. Capacitance shall be as specified in Table I at 120Hz and 25°C , $\pm 20\%$.

3.2.6 Capacitance tolerance. The capacitance tolerance shall be ± 20 percent at $+25^{\circ}\text{C}$.

3.2.7 Equivalent series resistance (ESR). The maximum equivalent series resistance shall be as specified in Table I at 1 kHz and 25°C .

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Inches	mm
.001	0.03
.015	0.38
.030	0.76
.040	1.02
.265	6.73
.280	7.11
.290	7.37
.815	20.70
1.260	32.00
1.630	41.40
1.645	41.78

FIGURE 1. Case dimensions and configuration

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

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TABLE I. Electrical characteristics.

DSCC Drawing 04002-	Voltage DC	Capacitance in (uF)	Surge Voltage	DCL max (μA)	ESR (max)
01	10	53,000	11	150	0.050
02	16	30,000	18	150	0.050
03	25	20,000	28	150	0.050
04	35	12,000	39	150	0.050
05	50	8,000	55	170	0.060
06	63	4,000	69	170	0.100
07	80	2,800	88	200	0.100
08	100	1,900	110	200	0.125
09	110	1,500	127	200	0.200
10	125	1,100	138	200	0.200

3.3 Environmental testing.

TABLE II. Environmental testing.

Test	Test Method	Condition	Details
Shock	MIL-STD-202 Method 213	G	11mS @ 50g
Vibration	MIL-STD-202 Method 204	D	12 Sweeps/Axis, 20g peak
Vibration	MIL-STD-202 Method 214	I, Letter D	1.5 Hours/Axis, 12g rms
Moisture Resistance	MIL-STD-202 Method 106		6 V Polarity
Thermal Shock	MIL-STD-202 Method 107	A	
Altitude	MIL-STD-202 Method 105	D	100,000 ft test

3.3.1 Thermal shock. Thermal shock test shall be as specified in Table II.

3.3.2 Moisture resistance. Moisture resistance test shall be as specified in Table II.

3.4 Physical testing.

3.4.1 Shock. Shock test shall be as specified in Table II.

3.4.3 Resistance to solder heat. The capacitor shall withstand solder dipping of the terminals at 260°C for 10 seconds per MIL-STD-202, method 210, test condition B. The capacitor shall not be visibly damaged and the electrical characteristics shall not be affected.

3.4.4 Terminal strength. The capacitor terminals shall withstand a 5-pound pull test for 30 seconds per MIL-STD-202, method 211, test condition A. The capacitor shall not be visibly damaged and the electrical characteristics shall not be affected.

3.4.5 Solderability. The terminations shall be solderable per ANSI J-STD-002.

3.4.6 Resistance to solvents. Resistance to solvents shall be in as specified in MIL-STD-202, method 215K.

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3.5 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.

3.6 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be a suggested source of supply.

3.7 Marking. Marking shall be in accordance with MIL-STD-1285, except the capacitor shall be marked with the PIN as specified herein (see 1.2), the manufacturer's name or Commercial and Government Entity (CAGE) code, date lot code and polarity.

3.8 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 inspections.

4.2.1 Inspection of product for delivery. Inspection of product for delivery shall consist of dc leakage, capacitance, and ESR before being shipped.

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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.

6. NOTES

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

6.1 Intended use. Hybrid capacitors covered by this drawing are intended mainly for use in defense electronic systems, avionics, and weapon systems.

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

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

6.4 Similar vendor PIN's. See table II.

6.5 Users of record. Coordination of this document for future revisions are coordinated only with the suggested 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, ATTN: DSCC/VAT, Post Office Box 3990, Columbus, OH 43218-3990 or e-mailed to capacitorfilter@dscclia.mil also by telephone (614) 692-0563 or DSN 850-0563.

6.6 Suggested sources of supply. Suggested 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, ATTN: DSCC-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or e-mailed to capacitorfilter@dscclia.mil also by telephone (614) 692-0563 or DSN 850-0563.

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Table II. Similar vendor PIN.

DSCC drawing PIN	Vendor similar designation or type number <u>1/</u>	Vendor CAGE	Vendor name and address
04002-01 04002-02 04002-03 04002-04 04002-05 04002-06 04002-07 04002-08 04002-09 04002-10	HQ1010533 HQ1016303 HQ1025203 HQ1035123 HQ1050802 HQ1063402 HQ1080282 HQ1100192 HQ1110152 HQ1125112	06MN5	Evans Capacitor Company 72 Boyd Avenue East Providence, RI 02914-1202

1/ CAUTION: Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

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