

1. SCOPE

1.1 Scope. This drawing describes the requirements for tantalum hybrid capacitors, hermetically sealed in welded tantalum case with glass to metal anode terminal seal.

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).

DEPARTMENT OF DEFENSE STANDARDS

- 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 tantalum.

3.1.2 Mass. 0 - 50 volt parts: 100 ± 3 grams; 63 - 125 volt parts; 125 ± 3 grams and 150 volt parts; 130 ± 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 -62°C to 130°C .

3.1.5 Operating temperature range. The operating temperature range shall be -55°C to $+125^{\circ}\text{C}$.

3.2 Electrical characteristics.

3.2.1 Rated voltage. The rated voltage shall be in accordance with table I at -55°C to $+85^{\circ}\text{C}$ or [$+125^{\circ}\text{C}$ with voltage derating (Table I)].

3.2.2 Surge voltage. Surge voltage shall be 1,000 cycles at 110 percent of $+85^{\circ}\text{C}$ rated voltage, charge and discharge through a 1,000 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 $+85^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
- 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.

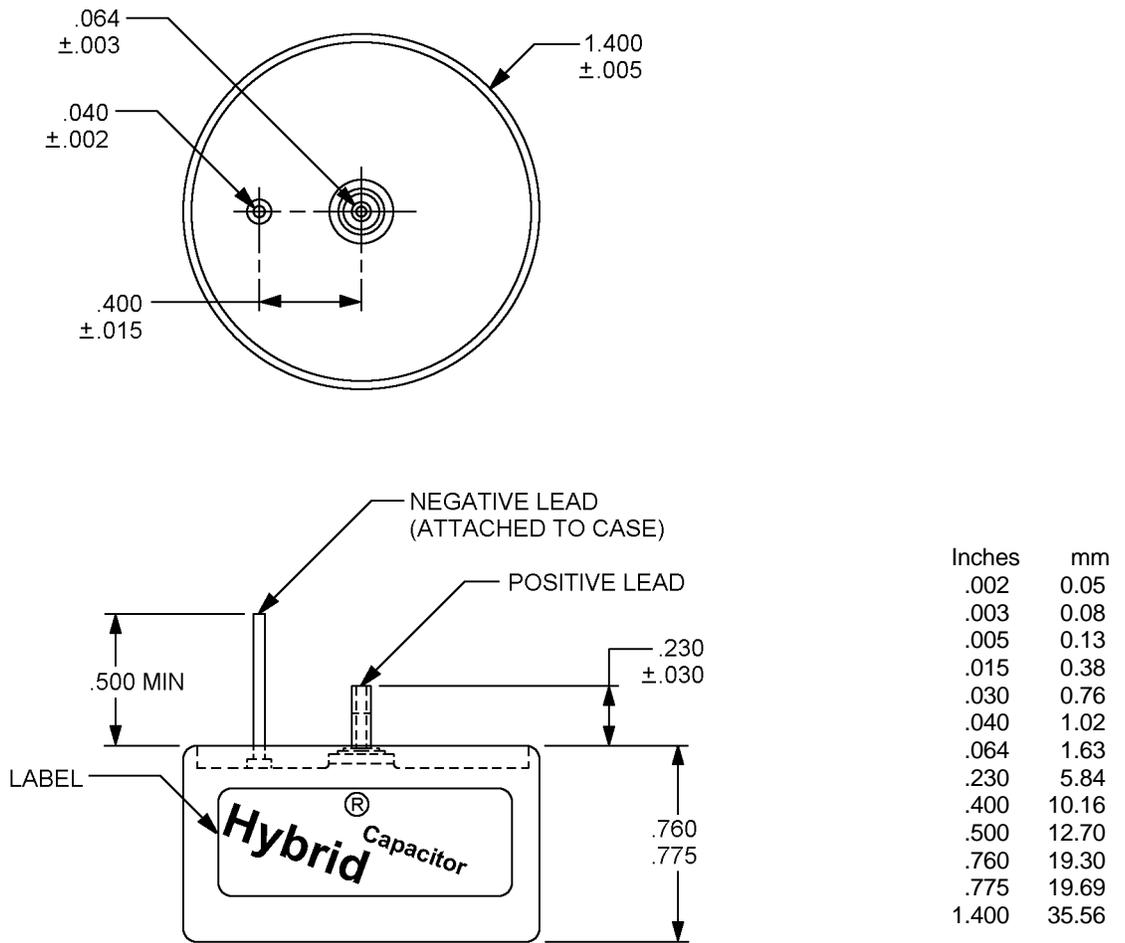
3.2.4 DC leakage current. The maximum dc leakage current shall be as specified in table I following 5 minutes at the working voltage and 25°C .

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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NOTES:

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

FIGURE 1. Case dimensions and configuration.

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TABLE I. Electrical characteristics.

DSCC drawing 04004-	Capacitance in (uF)	85°C rated voltage dc	125°C rated voltage dc	ESR max (ohms)	Leakage current max (µA)
01	200,000	10	6	0.025	300
02	120,000	16	9.5	0.025	300
03	70,000	25	15	0.025	300
04	48,000	35	21	0.025	300
05	30,000	50	30	0.025	400
06	16,000	63	37.5	0.035	400
07	11,000	80	48	0.035	500
08	7,500	100	60	0.035	500
09	4,500	125	75	0.050	500
10	1,750	150	90	0.100	500

3.3 Environmental testing.

TABLE II. Environmental testing.

Test	Test method	Condition	Details
Shock	MIL-STD-202, method 213	G	11 mS at 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.

3.3.3 Hermetic Seal. The capacitor shall be hermetically sealed such that the case does not leak electrolyte or vent any gas when exposed to a vacuum, in accordance with MIL-STD-202, method 112, test condition C, procedure IIIa.

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 in accordance with 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 in accordance with 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 in accordance with 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 III.

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@dsc.dla.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@dsc.dla.mil also by telephone (614) 692-0563 or DSN 850-0563.

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Table III. Similar vendor PIN.

DSCC PIN 04004-	Vendor similar PIN
<u>1/</u>	
01	THQ5010204
02	THQ5016124
03	THQ5025703
04	THQ5035483
05	THQ5050303
06	THQ5063163
07	THQ5080113
08	THQ5100752
09	THQ5125452
10	THQ5150172

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

Vendor CAGE
Number

06MN5

Vendor name
and address

Evans Capacitor Company
72 Boyd Avenue
East Providence, RI 02914-1202

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