

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Update and validation of drawing. Editorial changes throughout.	02-11-01	K. Cottongim
B	Change vendor plant address. Editor changes throughout.	04-22-04	K. Cottongim
C	Add pure tin, manufacturer eligibility, and high power pulse paragraphs. Editorial changes throughout.	10-26-03	M. Radecki
D	Update Hyperlinks. Editorial changes throughout.	18-05-10	M. Radecki

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



Prepared in accordance with [AMSE Y14.100](#)

Selected Item Drawing

REV STATUS OF PAGES	REV	D	D	D	D	D													
	PAGES	1	2	3	4	5													
PMIC N/A	PREPARED BY Andrew R. Ernst					DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OH													
Original date of drawing 97-28-05	CHECKED BY Andrew R. Ernst					TITLE RESISTOR, FIXED, FILM, INSULATED, LOW INDUCTANCE													
	APPROVED BY David E. Moore																		
	SIZE A	CAGE CODE 037Z3					DWG NO. 96002												
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1. SCOPE

1.1 Scope. This drawing describes the requirements for an insulated, fixed, film resistor which exhibits low inductance over a frequency range of 1 MHz to 30 MHz.

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

96002	***	*
Drawing number	Resistance value (see 3.3.1)	Tolerance (see 3.3.2)

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.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-39017 - Resistor, Fixed, Film (Insulated), Nonestablished Reliability, and Established Reliability, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-690 - Failure Rate Sampling Plans and Procedures.
 MIL-STD-790 - Established Reliability and High Reliability Qualified Products List (QPL) Systems for Electrical, Electronic, and Fiber Optic Parts Specifications.

(Copies of these documents are available online at <http://quicksearch.dla.mil>).

2.2 Order of precedence. Unless otherwise noted herein or 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 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-39017 and as specified herein.

3.2 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-39017 and herein (see figure 1).

3.3 Electrical characteristics.

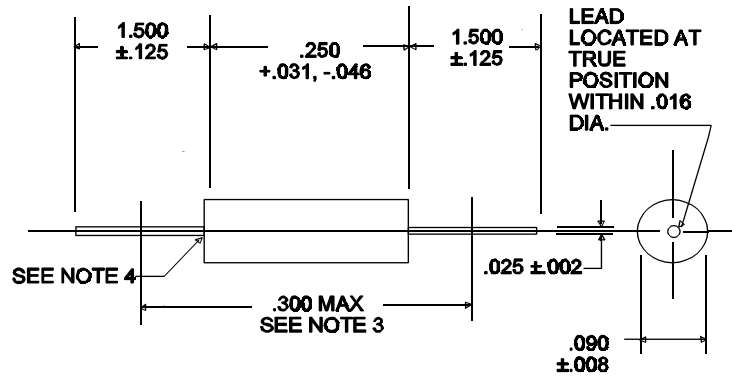
3.3.1 Resistance. The nominal resistance expressed in ohms is identified by four digits; the first three digits represent significant figures and the last digit specifies the number of zeros to follow. When the value of resistance is less than 100 ohms, or fractional values of an ohm are required, the letter "R" shall be substituted for one of the significant figures. The resistance value designations are shown in table I. Minimum and maximum resistance values shall be as specified in MIL-PRF-39017. Resistance values not listed in table VI of MIL-PRF-39017 for the appropriate resistance tolerance shall be considered nonconforming to the specification.

TABLE I. Resistance value designations.

Designation	Resistance ohms
1R00 to 9R76 inclusive	1.00 to 9.76 inclusive
10R0 to 49R9 inclusive	10.0 to 49.9 inclusive

3.3.2 Resistance tolerance. The resistance tolerances shall be (F) ±1 percent and (G) ±2 percent.

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Inches	mm	Inches	mm	Inches	mm	Inches	mm
.002	0.05	.025	0.64	.090	2.29	.300	7.62
.008	0.20	.031	0.79	.125	3.18	1.500	38.10
.016	0.41	.046	1.17	.250	6.35		

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Maximum length is "clean lead" to "clean lead".
4. The end of the body shall be that point at which the body diameter equals the nearest drill size larger than 250 percent of the nominal diameter.
5. Lead length for tape and reel packaging shall be 1 inch minimum.

FIGURE 1. Fixed film insulated resistor.

3.3.3 Power rating. The power rating shall be 0.25 watt and derated in accordance with figure 2.

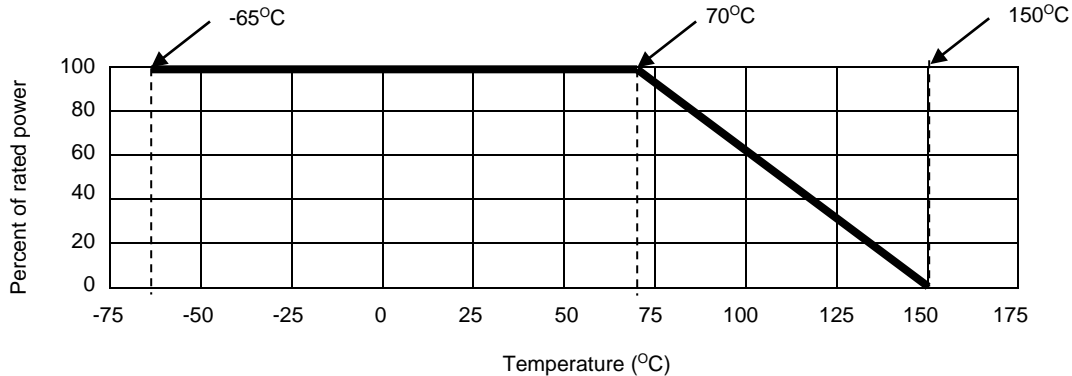


FIGURE 2. Derating curve.

3.4 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin content of resistor 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).

3.5 Voltage rating. The continuous voltage shall not exceed 250 volts.

3.6 Resistance. Minimum and maximum resistance values for temperature characteristic of ±100 parts per million (PPM) shall be as follows:

	10 nH	8 nH
Minimum resistance	1 Ω	11 Ω
Maximum resistance	10 Ω	49.9 Ω

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3.7 Maximum weight. The maximum weight shall not exceed 0.5 gram.

3.8 Maximum inductive resistance. When resistors are tested as specified in 4.5, they shall not exceed the inductance level as described in 3.6.

3.9 Marking. Resistors shall be marked with the PIN assigned herein (see 1.2) and manufacturer's identification code (CAGE or logo).

3.10 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the [MIL-PRF-39017 Qualified Products List](#) for at least one part, or perform the group A and group B inspections specified herein on a sample agreed upon by the manufacturer and DLA Land and Maritime-VAT.

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

3.11 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.

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

4. VERIFICATION

4.1 Qualification inspection. Qualification inspection is not applicable to this document.

4.2 Reliability assurance program. The reliability assurance provisions specified in [MIL-PRF-39017](#) and maintained in accordance with [MIL-STD-790](#) are not applicable to this document.

4.3 Failure rate qualification. Failure rate qualification specified in [MIL-PRF-39017](#) and [MIL-STD-690](#) is not applicable to this document.

4.4 Conformance inspection.

4.4.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A and group B inspections.

4.4.1.1 Group A inspection. Group A inspection shall be in accordance with [MIL-PRF-39017](#). PPM testing and verification as specified in [MIL-PRF-39017](#) are not applicable to this document.

4.4.1.2 Group B inspection. Group B inspection shall be in accordance with [MIL-PRF-39017](#).

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

4.4.1.3 Visual and mechanical inspection. Resistors shall be examined to verify that the materials, design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements 3.2, 3.3, 3.9, and 3.12.

4.5 Inductive reactance. When tested at 1 MHz and 30 MHz, the inductance reactance shall not exceed 10 nH for nominal resistance values less than 10 ohms, or 8 nH for resistance values greater than 10 ohms and less than or equal to 50 ohms. Measurements shall be made using a Hewlett-Packard model 4191A impedance analyzer and either Hewlett-Packard spring clip test fixture model 16092A or binding post test fixture model 16093A, or equivalent devices. Measurements with model 6092A fixture shall be taken with the resistor positioned between spring clips which are adjusted for 0.5 inch spacing. When using the model 16092A fixture, the resistor lead that is beyond the area of electrical contact on the signal (right side of the fixture) shall be bent 90 degrees vertically from the ground plane to reduce shunt capacitance. Measurements with the 16093A fixture shall be taken with the resistor positioned in a straight axial lead configuration between the (fixed position) binding posts so that the binding posts contact the resistor leads at the end of the body (nearly zero lead length).

4.6 Inspection of packaging. Inspection of packaging shall be in accordance with [MIL-PRF-39017](#).

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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 activity within the Military Department 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 that may be helpful, but is not mandatory.)

6.1 Intended use. The film resistors described herein are intended to be used in electronic circuits where semi-precision characteristic, low inductive reactance and small sizes are required.

6.2 Ordering data. The contract or purchase order should specify the following:

- a. Complete DLA Land and Maritime CAGE CODE and PIN (see 1.2).
- b. Requirements for delivery: One copy of the conformance inspection data or certification 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 (see 4.4.1.2.1).

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 Pulse applications. Designers are CAUTIONED on using the above resistors in high power pulse applications. Since they have not been qualified nor tested for such applications, damage and premature failure are possible. These resistors only see a one-time pulse (Short-time overload) as part of the group B inspection of [MIL-PRF-39017](#).

6.5 Users of record. User 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 may be achieved on-line at resistor@dla.mil or in writing to: DLA Land and Maritime - VAT, P.O. Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-8754 or DSN 850-8754.

6.6 Approved source of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained on on-line at resistor@dla.mil or contact DLA Land and Maritime - VAT, P.O. Box 3990, Columbus, OH 43218-3990, or by telephone (614) 692-8754 or DSN 850-8754.

DLA Land and Maritime drawing PIN (see 1.2)	Vendors similar designation or type number ^{1/}	Vendor CAGE	Vendor's name and address
96002****	ERL07-62	91637	Vishay Dale P.O. Box 609 1122 23rd Street Columbus, NE 68602-0609

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

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