

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Revise to present DoD policy requirements. Update Hyper-links.	21-11-30	M. Radecki

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

Selected item drawing

[illegible]

PMIC N/A	PREPARED BY Andrew R. Ernst		DLA LAND AND MARITIME COLUMBUS, OH	
Original date of drawing 2016-03-28	CHECKED BY Andrew R. Ernst		TITLE RESISTOR, FIXED, WIREWOUND, (ACCURATE), RADIAL LEADED, 0.1 WATT (RBR80)	
	APPROVED BY Michael A. Radecki			
	SIZE A	CAGE CODE 037Z3	DWG NO. 15007	
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1. SCOPE

1.1 Scope. This drawing describes the requirements for a fixed, wirewound (accurate), radial leaded, 0.1 watt resistor.

1.2 Part or Identifying Number (PIN). The complete PIN is as shown in the following example:

15007-	L	12601	F
Drawing number	Terminal (see 3.3.1)	Resistance (see 3.3.2)	Tolerance (see 3.3.3)

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-39005 - Resistor, Fixed, Wirewound (Accurate), Nonestablished Reliability, and Established Reliability, General Specification for
- MIL-PRF-39005/11 - Resistor, Fixed, Wirewound (Accurate), Nonestablished Reliability, and Established Reliability, Style RBR80 and RBR81

DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-690 - Failure Rate Sampling Plans and Procedures
- MIL-STD-790 - Standard Practice for 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 <https://quicksearch.dla.mil>.)

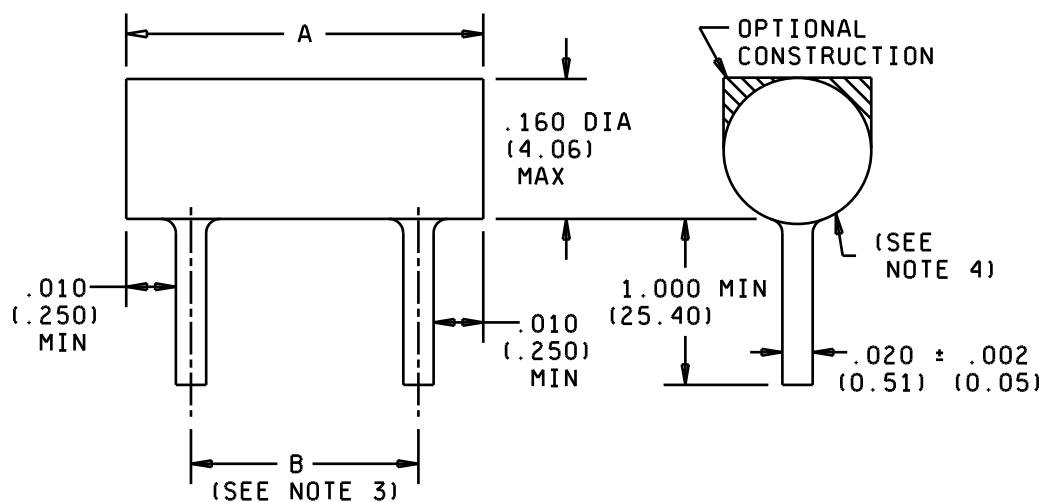
2.2 Order of precedence. Unless otherwise noted herein or in the contract or in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes 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-39005, and as specified herein.

3.2 Interface and physical dimensions. The resistor shall meet the interface and physical dimensions as specified in MIL-PRF-39005/11 and herein (see [figure 1](#)).

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A, Max	B, ±0.005 (0.13)
0.325 (8.26)	0.225 (5.72)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are in parenthesis.
3. The lead measurements shall be made at the point of emergence from the body.
4. Leads are to be clean and solderable to within 0.005 (0.13mm) from the resistor body.
5. Resistance measurement points for all values of resistance shall be 0.375 ±0.0625 (9.53 mm ±1.588 mm) from the end of the body.

FIGURE 1. Radial leaded resistor.

3.3 Electrical characteristics.

3.3.1 Terminal. The terminal is identified by a single letter in accordance with table I.

TABLE I. Terminal.

Symbol	Terminal
L	Solderable
U	Weldable

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3.3.2 Resistance. The nominal resistance is expressed in ohms and is identified by five digits; the first four digits represent significant figures and the last digit specifies the number of zeros to follow. When the values of resistance are less than 1,000 ohms, or when fractional values of an ohm are required, the letter "R" is substituted for one of the significant digits to represent the decimal point. When the letter "R" is used, succeeding digits of the group represent significant figures. The resistance value designations are in accordance with MIL-PRF-39005. Minimum and maximum resistance values are as specified in table II. The standard values for every decade are in accordance with the "10 to 100" decade table of MIL-PRF-39005. The resistance values for 0.01 percent (T), 0.02 percent (Q), 0.05 percent (A) and 0.1 percent (B) resistance tolerances may be of any value, but it is preferred that the values are chosen within the "10 to 100" decade table of MIL-PRF-39005.

3.3.3 Resistance tolerance. Resistors are available in resistance tolerances in accordance with table II.

TABLE II. Resistance and resistance tolerance.

Resistance tolerance	Minimum resistance	Maximum resistance
T (± 0.01 percent)	1 kilohms	120 kilohms
Q (± 0.02 percent)	100 ohms	
A (± 0.05 percent)	100 ohms	
B (± 0.10 percent)	10 ohms	
F (± 1.00 percent)	10 ohms	

3.3.4 Resistance temperature characteristic. The resistance temperature characteristic shall not exceed the value listed in table III.

TABLE III. Maximum resistance temperature characteristic.

Resistance (ohms)	Parts/million/ $^{\circ}$ C (ppm)
Less than 100 ohms	± 10
100 ohms and above	± 5

3.3.5 Power rating. The power rating for all characteristics shall be 0.1 watt. Resistors power rating is based on continuous full load operation at an ambient temperature of $+125^{\circ}\text{C}$. For temperature in excess of $+125^{\circ}\text{C}$, the load shall be derated in accordance with figure 1.

3.3.6 Voltage rating. The maximum continuous working voltage shall not exceed 100 volts.

3.3.7 Maximum weight. The maximum weight shall be 0.4 grams.

3.3.8 Maximum allowable reactance (see 4.5). The maximum allowable reactance shall be defined as follows:

- For resistance values less than 500 ohms, the phase angle shall not exceed $+5$ degrees.
- For resistance values 500 ohms or greater, but less than 20,000, the phase angle shall not exceed ± 10 degrees.
- For resistance values 20,000 ohms or greater, but less than 50,000 ohms, the effective parallel capacitance shall not exceed 4.0 pF.
- For resistance values of 50,000 ohms or greater, the maximum effective parallel capacitance shall not exceed 6.0 pF.

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3.3.9 High Temperature exposure (see 4.6). The maximum allowable change in resistance after exposure to an ambient of 145°C shall be as follows:

- a. For resistance values less of 10 ohms or greater, but less than 100 ohms, the change in resistance shall not exceed phase angle shall not exceed ± 0.1 percent.
- b. For resistance values of 100 ohms or greater, the change in resistance shall not exceed ± 0.05 percent.

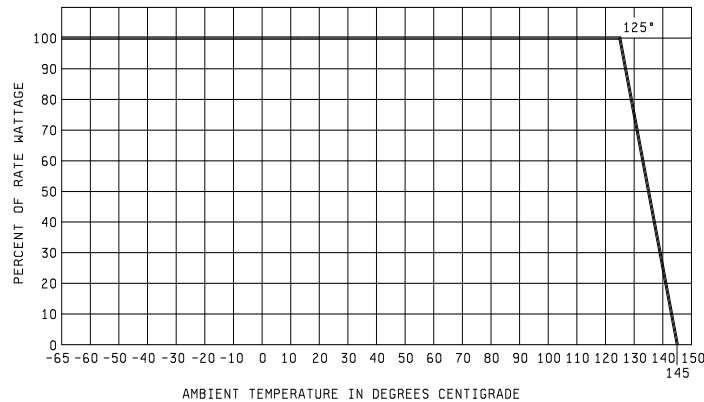


FIGURE 1. Derating curve for high ambient temperatures.

3.4 Marking. The resistor shall be marked with the following information:

- XXXXXX - Manufacturer's identification (CAGE or logo).
- 15007L - DLA Land and Maritime drawing number and terminal
- 12701F - Coded resistance value and tolerance.
- XXXXXX - Date code, and Lot code.

The complete marking is required on the unit package. Unit packages shall be marked with the PIN assigned herein (see 1.2) and manufacturer's identification code (CAGE or logo), date code, and lot code.

3.5 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).

3.6 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.

* 3.7 Manufacturer eligibility. To be eligible for being added as an approved source of supply, a manufacturer shall be listed on the [MIL-PRF-39005](#) 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.

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

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

4. VERIFICATIONS

4.1 Product assurance program. The product assurance program specified in MIL-PRF-39005 and maintained in accordance with MIL-STD-790 is not applicable to this document.

4.2 Product level qualification. The product level qualification specified in MIL-PRF-39005 and MIL-STD-690 is not applicable to this document.

4.3 Conformance provisions.

4.3.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection and group B inspection of MIL-PRF-39005.

4.3.2 Group A inspection. Group A inspection shall be in accordance with MIL-PRF-39005.

4.3.3 Group B inspection. Group B inspection shall be in accordance with MIL-PRF-39005 with an additional 30 samples to be performed on the maximum allowable reactance (see 3.3.8 and 4.5) and high temperature exposure tests (3.3.9 and 4.6) as described herein, with zero defectives allowed.

4.3.3.1 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 Visual and mechanical examination. Resistors shall be examined to verify that the materials, design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements of MIL-PRF-39005.

4.5 Maximum allowable reactance. The inherent reactance shall be measured as follows:

- a. Test instrument: Hewlett-Packard RX meter, model 250B; Tektronic LC meter, type 130, or any other equivalent meter.
- b. Frequency range: 100 kHz to 500 kHz.

4.6 High temperature exposure. The high temperature exposure test shall be in accordance with MIL-PRF-39005.

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. Resistors are intended for use in dc amplifiers, voltmeter multipliers, electronic computers, meters, and laboratory test equipment.

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6.2 Ordering data. The contract or purchase order will 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 that parts have passed conformance inspection, with each shipment of parts by the manufacturer.
- c. Packaging requirements (see 5.1).
- d. Whether the manufacturer performs the group B inspection or provides a certificate of compliance (see 4.3.3.1).

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 Supplementary insulation. Where potential to ground is over 250 volts, supplementary insulation should be provided.

- * 6.5 Low tolerance resistors. Low tolerance resistors (0.005 and 0.01), exhibiting resistance shifts due to high humidity are normal to precision, fixed resistors. Before being considered out of tolerance, resistors should be conditioned in a dry oven. Users of said resistors should contact suppliers for temperature and drying times. Resistors which continue to be out of tolerance after the above conditioning process should be considered rejects.

6.6 MIL-PRF-39005/11 replacements. The resistors described herein are possible replacements for MIL-PRF-39005/11 (RBR80) resistors. Users are cautioned to evaluate this document for their particular application before citing it as a replacement document. [MIL-PRF-39005/11](#) resistors have failure rate levels (FRL) established in accordance with MIL-STD-690. DLA Land and Maritime drawing 15007 resistors are non-established reliability.

- * 6.7 User of record. Coordination of this document for future revisions is coordinated only with the approved source of supply and the users of record of this document. Requests to be added as a recorded user of this drawing may be achieved online at resistor@dla.mil or in writing to: DLA Land and Maritime, Attn: VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 400-3997 or DSN 850-0552.

- * 6.8 Approved source of supply. Approved source of supply is listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained online at resistor@dla.mil or contact DLA Land and Maritime, Attn: VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 400-3997 or DSN 850-0552.

DLA Land and Maritime drawing PIN 15007-*****	Vendor similar designation or type number 1/	Vendor CAGE	Vendor name and address
Terminal: L and U Tolerance and Resistance: T - 1 kilohm to 120 kilohms Q and A - 100 ohms to 120 kilohms B and F - 10 ohms to 120 kilohms	104B	44655	Ohmite Manufacturing Company 27501 Bella Vista Parkway Warrenville, IL 60555 <u>Plant:</u> Victoreen de Mexico S.A. de C.V., Oriente 2, #46 Cd. Industrial Apdo. Postal 171 Matamoros. Tam. 87499, MX

- * 1/ Parts must be purchased to the DLA Land and Maritime CAGE CODE and PIN to assure that all performance requirements and test are met.

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