

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Add tolerances "K" (± 10 percent) and "M" (± 20 percent). Editorial changes throughout.	16 OCT 01	K. Cottongim
B	Changes in accordance with NOR 5905-R001-02.	30 OCT 01	K. Cottongim
C	Change derating temperature to 25°C.	30 JAN 02	K. Cottongim
D	Changes IAW NOR 5905-R009-02 – paragraph 3.3.1, delete "table II" and substitute "3.3.1.1".	16 JUL 02	K. Cottongim
E	Add requirements for termination finish (see 3.4); DoD policy corrections throughout.	12 DEC 02	K. Cottongim
F	Add pure tin, manufacturer eligibility, and high power pulse paragraphs. Editorial changes throughout.	14 JAN 10	M. Radecki
G	Add new plant address. Editorial changes throughout.	17 JAN 13	M. Radecki

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

Prepared in accordance with ASME Y14.100

Source control drawing

REV STATUS OF PAGES	REV	G	G	G	G	G	G	G										
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PMIC N/A	PREPARED BY Andrew R. Ernst		DESIGN ACTIVITY: DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OH															
Original date of drawing 12 January 2001	CHECKED BY Andrew R. Ernst		TITLE RESISTOR, FIXED, FILM, CHIP, 1.5 WATT (MELF), FLAT CERAMIC PACKAGE, STYLE 2512															
	APPROVED BY Kendall A. Cottongim																	
	SIZE A	CODE IDENT. NO. 037Z3	DWG NO. 01002															
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1. SCOPE

1.1 Scope. This drawing describes the requirements for a 1.5 watt, fixed, chip resistor (MELF), style 2512, in a flat ceramic package.

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

01002	-	****	*
Drawing Number		Resistance value (see 3.3.1)	Tolerance (see 3.3.2)

2. APPLICABLE DOCUMENTS

2.1 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-55342](#) - Resistors, Chip, Fixed, Film, Nonestablished Reliability, Established Reliability, Space Level, General Specification for.

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.

[MIL-STD-1285](#) - Marking of Electrical and Electronic Parts.

(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.)

2.2 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 unless otherwise noted. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

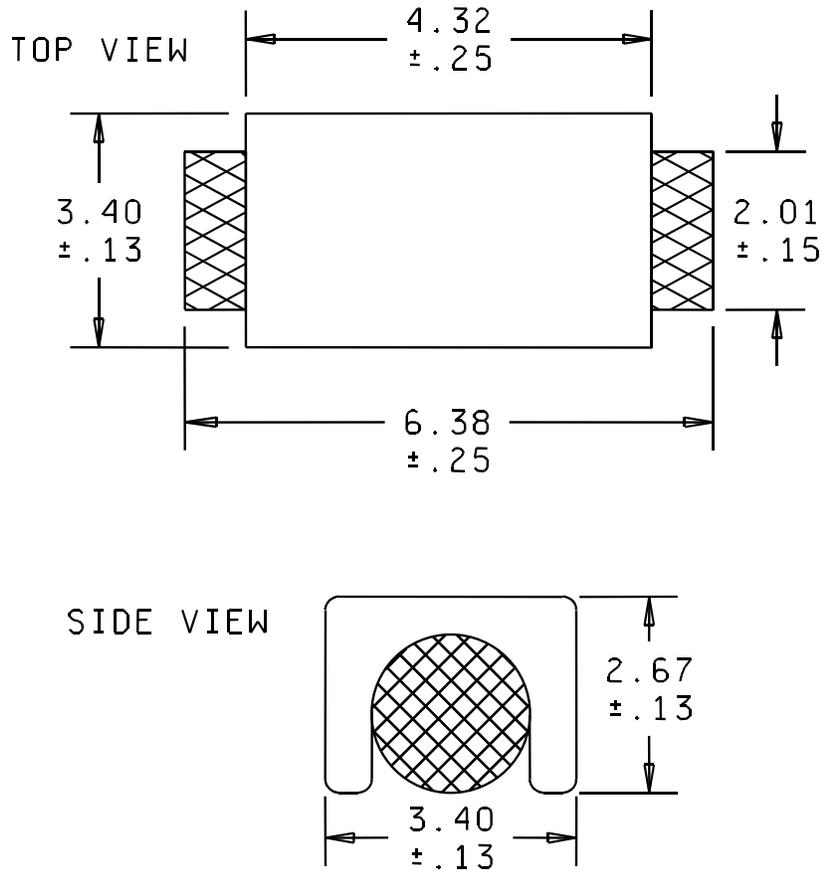
3.1 Item requirements. The individual item requirements shall be in accordance with [MIL-PRF-55342](#) and as specified herein.

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

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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 3.3.1.1. Resistance values not listed in the "10 to 100" decade table of MIL-PRF-55342 for the appropriate resistance tolerance shall be considered nonconforming to the specification.



Inches	mm	Inches	mm	Inches	mm	Inches	mm
.005	0.13	.010	0.25	.105	2.67	.170	4.32
.006	0.15	.079	2.01	.134	3.40	.251	6.38

NOTES:

1. Dimensions are in millimeters.
2. Inch equivalents are given for general information only.

FIGURE 1. Chip resistor.

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3.3.1.1 Resistance range. Minimum and maximum resistance shall be from 0.1 to 348 kilohms. See table I.

TABLE I. Resistance value designations.

Designation				Resistance ohms		
R100	to	R976	inclusive	0.10	to	0.976 inclusive
1R00	to	9R76	inclusive	1.00	to	9.76 inclusive
10R0	to	97R6	inclusive	10.0	to	97.6 inclusive
1000	to	9760	inclusive	100	to	976 inclusive
1001	to	9761	inclusive	1,000	to	9,760 inclusive
1002	to	9762	inclusive	10,000	to	97,600 inclusive
1003	to	3483	inclusive	100,000	to	384,000 inclusive

3.3.2 Resistance tolerance. The resistance tolerances shall be in accordance with table II. Tolerances “K” and “M” signify that the resistor shall be an untrimmed body for enhanced pulse handling characteristics (see 6.4).

TABLE II. Resistance tolerance.

Symbol	Resistance tolerance percent	Symbol	Resistance tolerance percent	Symbol	Resistance tolerance percent
F	±1	J	±5	M	±20
G	±2	K	±10		

3.3.3 Rated power. The rated power shall be 1.5 watt from -55°C to +25°C. For operation temperatures higher than +25°C, derated in accordance with figure 2 (see 6.5).

3.3.4 Temperature range. The temperature range shall be -55°C to +150°C.

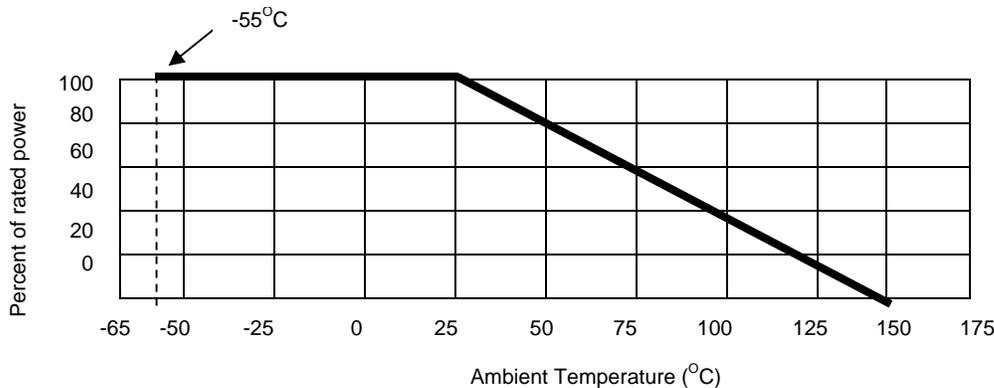


FIGURE 2. Derating curve for high ambient temperatures.

3.3.5 Resistance temperature characteristic. The resistance temperature characteristic shall be ±100 ppm/°C.

3.3.4 Voltage rating. The working voltage shall not exceed 350 volts.

3.4 Termination material. Termination material shall be in accordance with [MIL-PRF-55342](#), code letter B.

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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 6.6).

3.6 Marking. Marking of the individual chip resistors is not required; however, each unit package shall be marked in accordance with [MIL-STD-1285](#) and include the PIN as specified herein (see 1.2), the manufacturer's name or Commercial and Government Entity (CAGE) code, date, and lot codes.

3.7 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.

3.8 Manufacturer eligibility. To be eligible for listing as a approved source of supply, a manufacturer shall be listed on the [MIL-PRF-55342](#) 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.

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

3.9 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-55342](#) and maintained in accordance with [MIL-STD-790](#) are not applicable to this document.

4.3 Product level qualification. Product level qualification specified in [MIL-PRF-55342](#) 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 (ER level) and group B inspections.

4.4.1.1 Group A inspection. Group A inspection (ER level) shall be in accordance with [MIL-PRF-55342](#). PPM testing and verification as specified in [MIL-PRF-55342](#) are not applicable to this document.

4.4.1.2 Group B inspection. Group B inspection shall be in accordance with [MIL-PRF-55342](#).

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).

4.5 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, 3.6, and 3.9.

4.6 Inspection of packaging. Inspection of packaging shall be in accordance with [MIL-PRF-55342](#).

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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 requisite 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 Department's Services System Command. 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 chip resistors described herein are intended to be used in thick or thin film circuits where microcircuitry is intended; also for use in surface mounting applications.

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

- a. Complete 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 DLA Land and Maritime drawing 95006. Resistors of DLA Land and Maritime drawing [95006](#) are of the same footprint without the ceramic packaging, and a power rating of 1 watt.

6.4 Untrimmed resistors. Parts ordered to tolerances "K" and "M" signify that the manufacturer shall provide resistors which have not been trimmed for tighter tolerances. Untrimmed resistors of this style have approximately 4 times the surge capability as trimmed resistors. Manufacturers generally use a select group of resistor rods and trim them to provide a great number of resistor values. Orders for untrimmed values not in stock could result in long lead times and large minimum order quantity to compensate for a custom ceramic body.

6.4.1 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-55342](#).

6.5 Rated power. Rated power for conformation inspection is performed at 70°C using a derated wattage of 1 watt.

6.6 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).

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6.7 Electrostatic charge. Under several combinations of conditions, these resistors can be electrically damaged, by electrostatic charges, and drift from specified value. Users should consider this phenomena when ordering or shipping resistors. Direct shipment to the Government is controlled by [MIL-DTL-39032](#) that specifies a preventive packaging procedure.

6.8 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-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-8754 or DSN 850-8754.

6.9 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-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-8754 or DSN 850-8754.

DLA Land and Maritime drawing PIN	Vendors similar designation or type number ^{1/}	Vendor CAGE	Vendor's name and address
01002-****	PPS-2	11502 SQQ65	TT Electronics/International Resistive Company, Inc. 4222 S. Staples Street Corpus Christi, TX 78411 <u>Plant:</u> BI Technologies S.A. DE C.V. Circulo De La Amistad No. 102, Pimsa IV 413 Rood Rd STE 7 Mexicali, Mexico 21210

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

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