REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	Extend maximum resistance range to 10 kilohms. Editorial changes throughout.	26 JUL 04	K. Cottongim
B	Add pure tin, manufacturer edibility, and pulse application paragraphs. Editorial changes throughout.	25 MAR 10	M. Radecki
C	Add testing requirement to the PIN. Editorial changes throughout.	15 NOV 13	M. Radecki

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DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990

Prepared in accordance with ASME Y14.100

REV STATUS OF PAGES																		
	REV	C	C	C	C	C	C	C	C									
	PAGES	1	2	3	4	5	6	7	8									

PMIC N/A	**PREPARED BY** Jesus V. Garcia III	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OH**
Original date of drawing: 26 February 2001	**CHECKED BY** Andrew R. Ernst	**TITLE** RESISTOR, CHIP, FIXED, FILM, BERYLLIA SUBSTRATE, HIGH POWER, STYLE 1206
	APPROVED BY Kendall A. Cottongim	
	SIZE A / **CODE IDENT. NO.** 037Z3	**DWG NO.** **01032**
	REV C	**PAGE** 1 **OF** 8

1. SCOPE

1.1 Scope. This drawing describes the requirements for a beryllia substrate, high power, fixed film, chip resistor, style 1206.

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

01032	-	C	F	K	XXXX	A
Drawing number		Termination type (see 3.3.3)	Resistance tolerance (see 3.3.2)	Resistance temperature characteristic (see 3.3.5)	Resistance (see 3.3.1)	Testing requirement (see 3.3.9)

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. 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 listed in the 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.

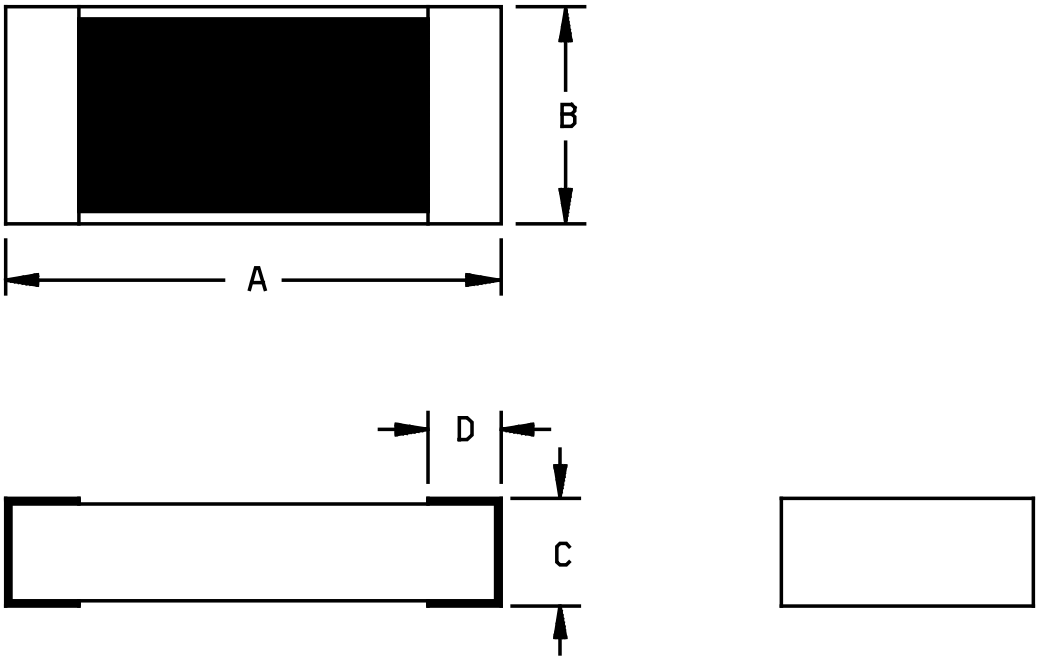
* (Copies of these documents are available online at http://quicksearch.dla.mil or from the DLA Document Services, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

* 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 as specified herein and MIL-PRF-55342.

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



Inches	mm	Inches	mm
0.005	0.127	0.030	0.762
0.010	0.254	0.065	1.651
0.025	0.635	0.125	3.175

Termination	A	B	C	E
C	0.125 ±0.010	0.065 ±0.005	0.030 ±0.010	0.025 ±0.010

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. The picturization of the resistor above is a given representation of the envelope of the item. Slight deviations from the outline shown, which are contained within the envelope, and do not alter the functional aspects of the device are acceptable.

FIGURE 1. RESISTOR, CHIP, FIXED, FILM.

3.3 Electrical characteristics.

3.3.1 Resistance. The nominal resistance expressed in ohms is identified by four digits; the first three digits represent the significant figures and the last digit specifies the number of zeros to follow. When the value of the resistance is less than 100 ohms, or when fractional values of an ohm are required, the “R” shall be substituted for one of the significant figures to represent the decimal point. When the letter “R” is used succeeding digits of the group represent significant figures.

3.3.1.1 Resistance range. The resistance range shall be 1 ohm to 10 kilohms.

3.3.2 Resistance tolerance. The resistance tolerance is identified by a single letter in accordance with table I.

TABLE I. Resistance tolerance.

Symbol	Resistance tolerance (±)
F	1.0
G	2.0
J	5.0
K	10.0
M	20.0

3.3.3 Termination type. The termination type is identified by a single letter in letter in accordance with table II.

TABLE II. Termination type.

Symbol	Termination type
C	Solderable wraparound

3.3.4 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 6.4).

3.3.5 Resistance temperature characteristic (RTC). The resistance temperature characteristic is identified by a single letter in accordance with table III.

TABLE III. Resistance temperature characteristic.

Symbol	Resistance temperature characteristic (RTC) in part per million (ppm)
K	100
L 1/	200
M	300

1/ All Group B requirements (except RTC) for characteristics "M" applies.

3.3.6 Voltage rating . The voltage rating shall be 100 volts.

3.3.7 Operating temperature. The operating temperature shall be -55°C to +150°C.

3.3.8 Power rating. When tested in accordance with MIL-PRF-55342 on a fiberglass board, the power rating in accordance with table IV.

TABLE IV. Power rating.

Termination	Power rating (in watts)
C	1.5

* 3.3.9 Testing requirements. The requirement for testing shall be identified by a single letter in accordance with table V.

TABLE V. Testing.

Symbol	Testing requirements
(blank)	Group A
A	Group A and Group B
B	Group A and Power moisture
C	Group A and Life
D	Group A, Power moisture and Life
E	Group A, Group B and Power moisture
F	Group A, Group B and Life
G	Group A, Group B, Power moisture and Life

NOTE: Any testing requirements that are not specified in the PIN shall have a certificate of compliance issued (see 4.4.1.2.1).

3.4 Power moisture resistance. When resistors are tested as specified in 4.4.1.3, there shall be no evidence of mechanical damage; the change in resistance between the initial and final measurements shall not exceed ±(0.50 percent +0.01 ohm) change in resistance value.

3.5 Life test (fiberglass board). When resistors are tested in accordance with 4.4.1.4, there shall be no evidence of mechanical damage. The change in resistance between the initial measurement and any of the succeeding measurements, up to and including 2,000 hours, shall not exceed ±(0.50 percent +0.01 ohm) change in resistance value.

3.6 Marking. Resistors shall be marked in accordance with MIL-PRF-55342.

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 an 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 listed as an approved source of supply.

3.9 Workmanship. Resistors shall be processed in such a manner as to be uniform in quality and parts shall be free from any 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 Failure rate qualification. Failure rate 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 per MIL-PRF-55342. Moisture resistance and life test shall be performed on 5 sample units each when specified in the PIN.

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, when specified in the PIN shall be in accordance with MIL-PRF-55342.

* 4.4.1.2.1 Certification. The manufacturer shall submit a certificate of compliance in lieu of Group B inspection, power moisture resistance and/or life test (see 6.2d), if not specified in the PIN.

* 4.4.1.3 Power moisture resistance. Power moisture resistance, when specified in the PIN shall be in accordance with MIL-PRF-55342 except the loading voltage shall be as follows:

Loading voltage: The loading voltage shall be equal to 10 percent rated power for resistance values less than or equal to the critical resistance value as shown in example below.

EXAMPLE

Characteristics:	"K"
Rated wattage:	1.5 watt (P)
Value:	100 ohms

$V = \sqrt{0.1PR}$ for "R" ≤ critical resistance

$= \sqrt{0.1 \times 1.5 \times 100}$

$= \sqrt{15}$

= 3.87 volts

* 4.4.1.4 Life test (fiberglass board). Life test, when specified in the PIN shall be in accordance with MIL-PRF-55342.

4.4.1.5 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.

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 which may be helpful, but is not mandatory.)

6.1 Intended use. Resistors conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for the OEM application. These items are suited for high current pulse applications and can be used as microwave terminations.

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 with each shipment of parts by the manufacturer.

c. Packaging requirements (see 5.1). (i.e. Electrostatic discharge (ESD) sensitive packaging).

d. Should life test be specified; the contract or purchase order must indicate whether the product can ship prior to or after completion of the life test.

6.3 Safety precautions.

6.3.1 Beryllia substrate. CAUTION: These devices use beryllium oxide ceramics in their construction. Any mechanical or chemical treatment of these ceramics which produces dust or fumes even in minute amounts can be hazardous. Care should be taken to ensure that all those who handle, use or dispose of these devices are aware of its nature and of the necessary safety precautions. In particular it should never be thrown out with general industrial or domestic waste.

6.3.2 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 which specifies a preventive packaging procedure.

6.4 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).

6.5 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 onetime pulse (Short-time overload) as part of the group B inspection of MIL-PRF-55342.

* 6.6 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) 692-0552 or DSN 850-0552.

* 6.7 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) 692-0552 or DSN 850-0552.

DLA Land and Maritime drawing PIN	Vendor similar designation or type number 1/	Vendor CAGE	Vendor name and address
01032-********	H1206CBX*******	56235	State of the Art, INC. 2470 Fox Hill Road State College, PA 16803-1797

1/ Parts must be purchased to the DLA Land and Maritime PIN to assure all performance requirements and tests are met.