

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.100

Selected item drawing

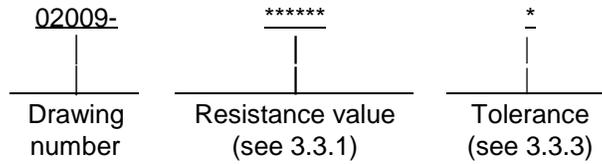
REV STATUS OF PAGES	REV																		
	PAGES	1	2	3	4	5	6	7	8										

PMIC N/A	<b>PREPARED BY</b> Dennis L. Cross		<b>DEFENSE SUPPLY CENTER, COLUMBUS          COLUMBUS, OH</b>																
Original date of drawing  24 October 2002	<b>CHECKED BY</b> Andrew R. Ernst		<b>TITLE</b> RESISTORS, FIXED, FILM, FLIP CHIP, ULTRA PRECISION, STYLE 1206																
	<b>APPROVED BY</b> Kendall A. Cottongim																		
	<b>SIZE</b> A	<b>CODE IDENT. NO.</b> 037Z3		<b>DWG NO.</b> <b>02009</b>															
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1. SCOPE

1.1 Scope. This drawing describes the requirements for a bulk metal foil, ultra precision, flip chip resistor.

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



2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-55342 - Resistors, Fixed, Film, Chip, Nonestablished Reliability, Established Reliability, Space Level, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.
- 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.

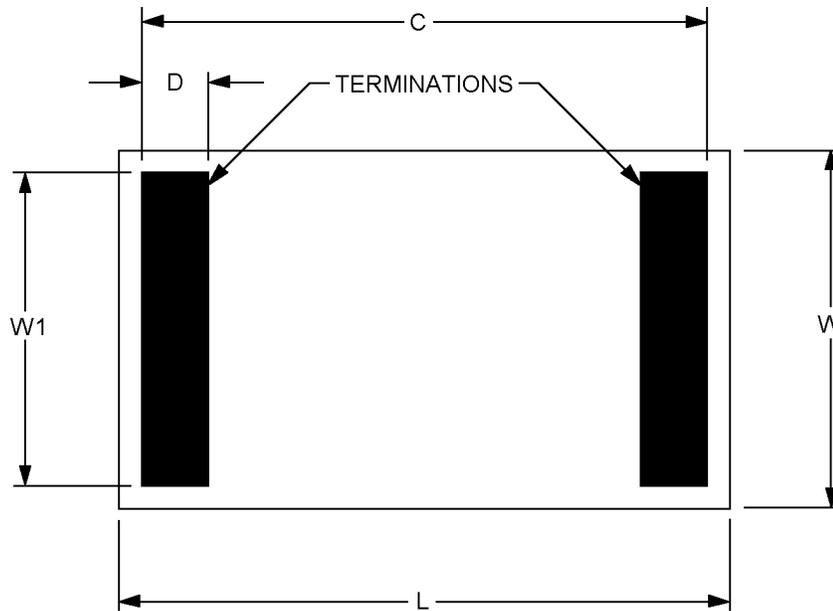
(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Document Automation and Production Service, Building 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence. Nothing in this document 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.

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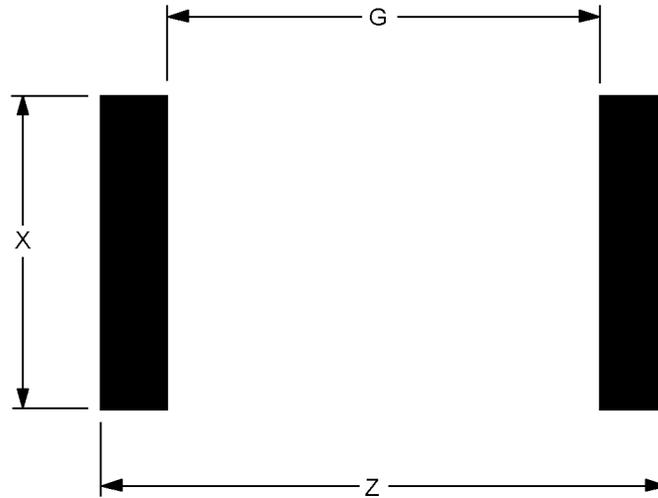


BOTTOM VIEW SHOWING TERMINALS FOR MOUNTING

L	W	Thickness (max)	D	W1	C
3.20 ±0.13 (0.126 ±0.005)	1.57 ±0.13 (0.062 ±0.005)	0.64 (0.025)	0.38 ±0.08 (0.015 ±0.003)	1.50 ±0.08 (0.059 ±0.003)	3.12 ±0.13 (0.123 ±0.005)

FIGURE 1. Flip chip resistor.

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LAND PATTERN

Recommended land pattern

Z	X	G
3.20 ±0.08 (0.126 ±0.003)	1.57 ±0.08 0.062 ±0.003	2.29 ±0.08 (0.090 ±0.003)

NOTES:

1. Dimensions are in millimeters.
2. Inch equivalents are given for general information only.
3. The pictorial view of the styles above is given as representative 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. Flip chip resistor - Continued.

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3.2 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-55342 and herein (see figure 1). Passivation is not applicable, however, a protective coating over the element shall be provided.

3.3 Electrical characteristics.

3.3.1 Resistance. The nominal resistance expressed in ohms is identified by six characters, consisting of five digits and a letter. The letter is used simultaneously as a decimal point and as a multiplier. For resistance values:

- a. Greater than or equal to 1 ohm but less than 1,000 ohms, the letter "R" is used to represent a decimal point.
- b. Greater than or equal to 1,000 ohms but less than 1 megohm, the letter "K" is used to represent a decimal point.

All digits preceding and following the letters (R or K) of the group represent significant figures. The resistance value designations are shown in table I. Minimum and maximum resistance values shall be as specified herein. The resistance values for tolerances T, Q, A, B, and C may be any value within the limits specified herein.

TABLE I. Designation of resistance values.

Designation	Resistance ohms
10R000 to 99R999 incl.	10.0 to 99.999 incl.
100R00 to 999R99 incl.	100.0 to 999.99 incl.
1K0000 to 9K9999 incl.	1000.0 to 9999.9 incl.
10K000 to 30K000 incl.	10000.0 to 30000.0 incl.

3.3.2 Resistance range. The resistance range shall be from 10 ohms to 30 kilohms (see 3.3.6).

3.3.3 Resistance tolerance. Resistors are available in resistance tolerances as specified in table II and 3.3.3.1.

TABLE II. Resistance tolerance.

Symbol	Resistance tolerance (Percent)
T	±0.01
Q	±0.02
A	±0.05
B	±0.1
C	±0.25

3.3.3.1 Resistance value versus resistance tolerance. The tightest resistance tolerance available is value specific as specified in table III. Resistors are also available in all higher tolerances than that which they are certified.

TABLE III. Resistance values versus resistance tolerance.

Resistance (ohms)	Tolerance (Symbol)
10 to <25 ohms	C
25 to <50 ohms	B (C)
50 to <100 ohms	A (B, C)
100 to 30 kohms	T (Q, A, B, C)

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3.3.4 Power rating. The power rating for chip resistors shall be .125 watt at +70°C derated to +150°C at zero power (see figure 2).

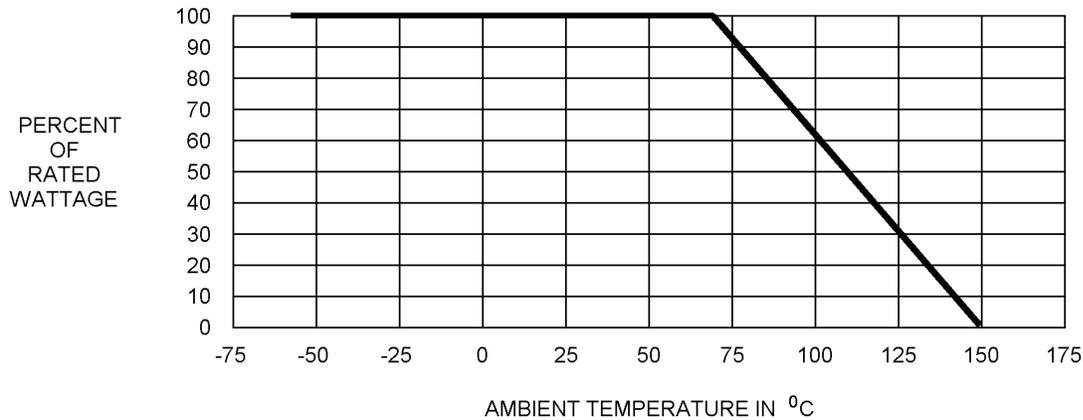


FIGURE 2. Derating curve.

3.3.5 Voltage rating. The maximum continuous working voltage shall not exceed 61 volts.

3.3.6 Resistance temperature coefficient. The resistance temperature coefficient shall not exceed the values specified below:

TABLE IV. Resistance temperature coefficient.

Characteristic	Resistance range
±2 ppm/°C	100 ohms to 30 kohms
±3 ppm/°C	50 ohms to <100 ohms
±4 ppm/°C	25 ohms to <50 ohms
±5 ppm/°C	10 ohms to <25 ohms

3.3.7 Termination. The termination material shall be tin-lead (Sn-Pb) provided that minimum lead content is 3 percent.

3.4 Thermal shock. When resistors are tested as specified in MIL-PRF-55342 for thermal shock the change in resistance shall not exceed ±(0.05 percent +0.01 ohm).

3.5 Low temperature operation. When resistors are tested as specified in MIL-PRF-55342 for low temperature operation the change in resistance shall not exceed ±(0.05 percent +0.01 ohm).

3.6 Short time overload. When resistors are tested as specified in MIL-PRF-55342 for short time overload the change in resistance shall not exceed ±(0.05 percent +0.01 ohm).

3.7 High temperature exposure. When resistors are tested as specified in MIL-PRF-55342 for high temperature exposure the change in resistance shall not exceed ±(0.5 percent +0.01 ohm).

3.8 Resistance to bonding exposure. When resistors are tested as specified in MIL-PRF-55342 for resistance to bonding exposure the change in resistance shall not exceed ±(0.02 percent +0.01 ohm).

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3.9 Soldering mounting integrity. When resistors are tested as specified in MIL-PRF-55342 there shall be no evidence of mechanical damage. The force applied shall be 2 kilograms.

3.10 Moisture resistance. When resistors are tested as specified in MIL-PRF-55342 for moisture resistance the change in resistance shall not exceed  $\pm(0.05 \text{ percent } +0.01 \text{ ohm})$ .

3.11 Life. When resistors are tested as specified in MIL-PRF-55342 for life the change in resistance shall not exceed  $\pm(0.5 \text{ percent } +0.01 \text{ ohm})$ .

3.12 Resistance temperature characteristic. When resistors are tested as specified in MIL-PRF-55342 except the RTC shall not exceed the values specified (see 3.3.6).

3.13 Marking. Marking is not required on this resistor; however, each waffle pack and each unit package shall be marked with the PIN assigned herein (see 1.2), the manufacturer's identification code, the date code, and the lot code. At the option of the manufacturer, the resistor may be marked by laser or color dot). The marking shall remain legible after all tests.

3.14 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be listed as suggested sources of supply.

3.15 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.

3.16 Workmanship. Resistors shall be processed in such a manner as to be uniform in quality and be free from defects that will affect life, serviceability, or appearance.

#### 4. VERIFICATION

4.1 Product assurance program. The product assurance program specified in MIL-PRF-55342 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-55342 and MIL-STD-690 is not applicable to this document.

#### 4.3 Conformance inspection.

4.3.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection (ER level only and ppm reporting, subgroup 1, subgroup 3, and 3.23 herein are not applicable) and group B inspection of MIL-PRF-55342.

4.3.1.1 Certification. The procuring activity may accept a certificate of compliance in lieu of Group B inspection.

#### 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD 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 System Command. Packaging data retrieval is available from the managing Military Departments or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

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6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Chip resistors are intended to be used in circuits where precision microcircuitry is intended, also, for use in surface mounting application.

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

- a. Complete PIN.
- b. Requirements for delivery of one copy of the conformance inspection data or a certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.
- c. Packaging requirements.
- d. Whether the manufacturer performs the group B tests or provides certification of compliance with group B requirements.

6.3 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 Tolerance caution. Soldering temperature used during installation may cause resistance to shift up to 0.02 percent.

6.5 Users 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 should be in writing to: DSCC-VAT, Post Office Box 3990, Columbus, OH 43216-5000 or by telephone (614) 692-0553 or DSN 850-0553.

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 DSCC-VAT, Post Office Box 3990, Columbus, OH 43216-5000, or by telephone (614) 692-0553 or DSN 850-0553.

DSCC drawing PIN	Vendor similar designation or type number <sup>1/</sup>	Vendor CAGE	Vendor name and address
02009-*****	VFC1206	S8016	Vishay Foil Resistors 63 Lincoln Highway Malvern, PA 19355-2120  <u>Plant:</u> Vishay, Israel, Ltd. 2 Ha'ofan Street Holon 58125, Israel

<sup>1/</sup> Caution: Parts must be purchased to the DSCC PIN to assure that all performance requirements and tests are met.

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