

REVISIONS			
LT	DESCRIPTION	DATE	APPROVED
A	Add new paragraph on resistance. Editorial changes throughout.	21 AUG 1989	D. Moore
B	Separate RTC into specific resistance ranges. Change voltage rating to 75 volts. Revise power conditioning test method. Change vendor's PIN. Editorial changes throughout.	15 JAN 1991	D. Moore
C	Partial inactivation of resistance range for characteristics K and M. Editorial changes throughout.	22 SEP 1994	D. Moore
D	Add new source of supply; add resistance tolerances 0.1 percent and 5.0 percent; add characteristic E; dimension changes in accordance with MIL-PRF-55342/10. Editorial changes throughout.	5 APR 1999	J. Crum
E	Lower resistance range value to 1 ohm for characteristics K and M. Editorial changes throughout.	5 MAY 2000	K. Cottongim
F	Table 1 correction. 5 year review cycle. Editorial and procedural changes throughout	6 APR 2005	K. Cottongim
G	Inactivation for new design. Vendor part number addition. Editorial and procedural changes throughout.	26 MAR 2010	M. Radecki
H	Change vendor's CAGE code. Add QR code. Editorial changes throughout.	12 FEB 2016	M. Radecki

Notice of Inactivation for New Design  
 DLA Land and Maritime Drawing 88033 is inactive for new design and is no longer used, except for replacement purposes. Use [MIL-PRF-55342/10](https://www.dla.mil/PRF/55342/10).

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](#)

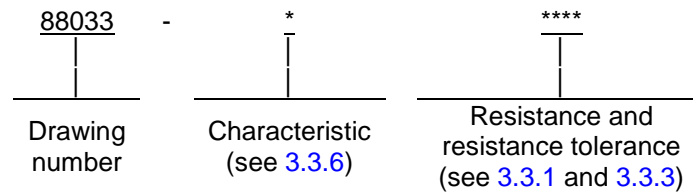
REV STATUS OF PAGES	REV	H	H	H	H	H	H	H	H								
	PAGES	1	2	3	4	5	6	7	8								

PMIC N/A	PREPARED BY ALLAN R. KNOX	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OH	
Original date of drawing  4 May 1988	CHECKED BY DAVID WITHROW	TITLE RESISTOR, CHIP, FIXED, FILM, STYLE 1010	
	APPROVED BY DAVID E. MOORE		
	SIZE A	CODE IDENT. NO. 14933	DWG NO.  88033
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## 1. SCOPE

1.1 Scope. This drawing describes the requirements for a fixed, film, chip resistor, style 1010.

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, 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 (see 6.2).

#### DEPARTMENT OF DEFENSE SPECIFICATIONS

[MIL-PRF-55342](#) - Resistor, Chip, Fixed, Film, Nonestablished Reliability, Established Reliability, Space Level, General Specification For

#### \* DEPARTMENT OF DEFENSE STANDARDS

[MIL-STD-202](#) - Test Method Standard Electronic and Electrical Component Parts.  
[MIL-STD-202-108](#) - Test Method Standard Method 108, Life (At Elevated Ambient Temperature).  
[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 <http://quicksearch.dla.mil>.)

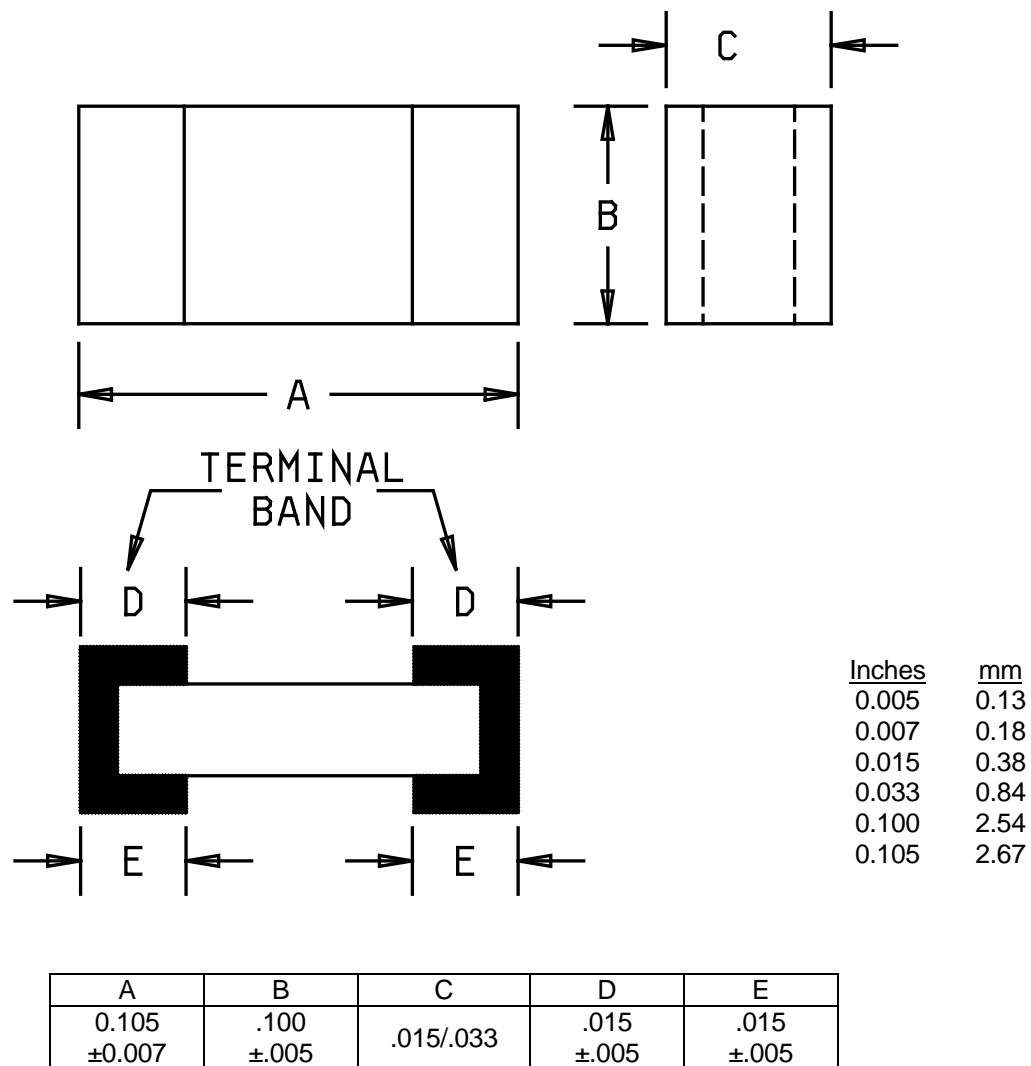
\* 2.2 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes 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 in [MIL-PRF-55342](#) and herein (see [figure 1](#)).

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**NOTES:**

1. Dimensions are in inches. Metric equivalents are given for general information only.
2. The pictorial view is 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 aspect of the device are acceptable.

FIGURE 1. Chip resistor.

3.3 Electrical characteristics.

3.3.1 Resistance and resistance tolerance. The nominal resistance expressed in ohms is identified by four characters consisting of three digits and a letter. The letter is used simultaneously as a decimal point, multiplier, and resistance tolerance designator in accordance with MIL-PRF-55342 and herein (see table I). Minimum and maximum resistance values available shall be as specified in 3.3.2, 3.3.6, and 6.8. Resistance values not listed in the "10 to 100" decade table of MIL-PRF-55342 for the appropriate resistance tolerance shall be considered as not conforming to this drawing. The standard values for every decade shall follow the sequence demonstrated for the "10 to 100" decade table specified in MIL-PRF-55342.

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TABLE I. Designator of resistance values for resistance tolerances.

Designator for 0.1 percent tolerance	Resistance (ohms)		
1A00 to 9A88 inclusive	1.00	to	9.88 inclusive
10A0 to 98A8 inclusive	10.0	to	98.8 inclusive
100A to 988A inclusive	100	to	988 inclusive
1B00 to 9B88 inclusive	1,000	to	9,880 inclusive
10B0 to 98B8 inclusive	10,000	to	98,800 inclusive
100B to 988B inclusive	100,000	to	988,000 inclusive
1C00 to 9C88 inclusive	1,000,000	to	9,880,000 inclusive
10C0 to 22C0 inclusive	10,000,000	to	22,000,000 inclusive
Designator for 1.0 percent tolerance	Resistance (ohms)		
1D00 to 9D76 inclusive	1.00	to	9.76 inclusive
10D0 to 97D6 inclusive	10.0	to	97.6 inclusive
100D to 976D inclusive	100	to	976 inclusive
1E00 to 9E76 inclusive	1,000	to	9,760 inclusive
10E0 to 97E6 inclusive	10,000	to	97,600 inclusive
100E to 976E inclusive	100,000	to	976,000 inclusive
1F00 to 9F76 inclusive	1,000,000	to	9,760,000 inclusive
10F0 to 22F0 inclusive	10,000,000	to	22,000,000 inclusive
Designator for 5.0 percent tolerance	Resistance (ohms)		
1J00 to 9J10 inclusive	1.00	to	9.10 inclusive
10J0 to 91J0 inclusive	10.0	to	91.0 inclusive
100J to 910J inclusive	100	to	910 inclusive
1K00 to 9K10 inclusive	1,000	to	9,100 inclusive
10K0 to 91K1 inclusive	10,000	to	91,000 inclusive
100K to 910K inclusive	100,000	to	910,000 inclusive
1L00 to 9L10 inclusive	1,000,000	to	9,100,000 inclusive
10L0 to 22L0 inclusive	10,000,000	to	22,000,000 inclusive

3.3.2 Resistance range. The resistance range shall be from 1 ohm to 22 megohms.

3.3.3 Resistance tolerance. The resistance tolerance for chip resistors shall be  $\pm 0.1$  percent,  $\pm 1$  percent, and  $\pm 5$  percent in accordance with MIL-PRF-55342 and table I herein.

3.3.4 Power rating. The power rating for chip resistors shall be 0.50 watt at  $+70^{\circ}\text{C}$  derated to zero power at  $+150^{\circ}\text{C}$  (see figure 2).

3.3.5 Voltage rating. The maximum continuous working voltage shall not exceed 75 volts.

3.3.6 Resistance temperature coefficient. The resistance temperature coefficient shall be in accordance with MIL-PRF-55342 and not exceed the values specified in table II.

3.3.7 Termination. Termination material shall be in accordance with MIL-PRF-55342, code letter B.

3.3.8 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).

3.3.9 DC resistance. When resistors are tested as specified in 4.6, the dc resistance shall be within the specified tolerance of the nominal resistance.

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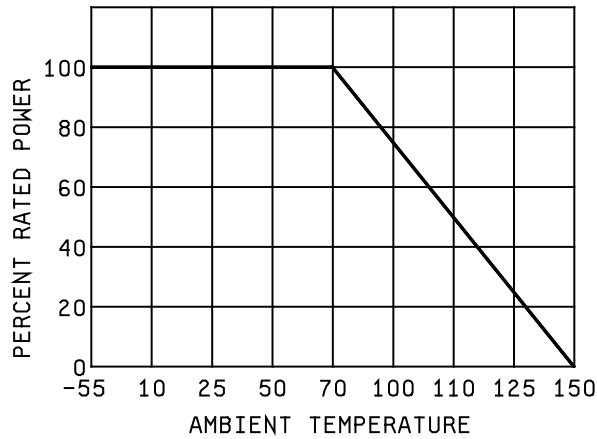


FIGURE 2. Derating curve.

TABLE II. Resistance temperature coefficient

Characteristic	Resistance range	Resistance tolerance
E and H	100Ω thru 1.5MΩ	0.1 percent
	1Ω thru 10MΩ	1.0 percent
K and M	1Ω thru 22MΩ	1.0 and 5.0 percent

3.3.10 Thermal shock. When resistors are tested as specified in 4.7, there shall be no evidence of mechanical damage.

3.3.11 Power conditioning. When resistors are tested as specified in 4.8, there shall be no evidence of mechanical damage. The change in resistance between initial and final measurements shall not exceed ± (0.5 percent ±0.01 ohm).

3.3.12 Solderability. When resistors are tested as specified in 4.9, they shall meet the criteria for surface mount leadless components in the test method.

3.4 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, and date lot codes.

3.5 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 materials meet or exceed the operational and maintenance requirements, and promote economically advantageous life cycle costs.

3.6 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.

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

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

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

4.3 Product level qualification. The product level qualification specified in MIL-PRF-55342 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 the groups A and B inspections.

4.4.1.1 Group A inspection. Group A inspection shall consist of the inspections specified in table III, and shall be made on the same set of sample units, in the order shown.

TABLE III. Group A inspection.

Inspection	Requirement	Method	Sampling procedure
<u>Subgroup 1</u>			
DC resistance	3.3.9	4.6	100 percent
Thermal shock	3.3.10	4.7	
Power conditioning	3.3.11	4.8	
DC resistance	3.3.9	4.6	
<u>Subgroup 2</u>			
Visual inspection	3.2, 3.4, 3.7	4.5	13 samples, 0 failures
<u>Subgroup 3</u>			
Solderability	3.3.12	4.9	See 4.4.1.1.3

4.4.1.1.1 Subgroup 1. Subgroup 1 tests shall be performed on a production lot basis on 100 percent of the product supplied under this document. Resistors that are out of resistance tolerance, or which experience a change in resistance greater than that permitted for the tests of this subgroup shall be removed from the lot. Lots having more than 5 percent total rejects, due to exceeding the specified resistance change limit shall not be furnished on contracts.

4.4.1.1.2 Subgroup 2. Subgroup 2 tests shall be performed on an inspection lot basis. A sample of 13 parts shall be randomly selected; if one or more defects are found, the lot shall be rescreened and defects removed. A new sample of 13 parts shall then be randomly selected. If one or more defects are found in this second sample, the lot shall be rejected and shall not be supplied against the document.

4.4.1.1.3 Subgroup 3. Subgroup 3 tests shall be performed as specified in MIL-PRF-55342.

4.4.2 Group B inspection. Group B inspection shall be in accordance with MIL-PRF-55342.

4.4.2.1 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 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-55342.

4.6 DC resistance. DC resistance shall be tested in accordance with MIL-PRF-55342.

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4.7 Thermal shock. Thermal shock shall be tested in accordance with [MIL-PRF-55342](#).

4.8 Power conditioning. Resistors shall be tested in accordance with [method 108 of MIL-STD-202](#). The following details and exceptions shall apply:

- a. Method of mounting: Chip resistor sample units shall be mounted on a test fixture.
- b. Test temperature:  $+70^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .
- c. Operating conditions: Rated dc continuous working voltage or filtered full wave rectified ac voltage shall be applied intermittently, 1.5 hours "on", and 0.5 hour "off", for the applicable number of hours and applicable test temperature. "On time" shall be three quarters of the total elapsed time. During the "on" cycle, the voltage shall be regulated and controlled to maintain  $\pm 5$  percent of the rated continuous working voltage.
- d. Duration: 100 hours  $\pm 4$  hours.
- e. Stabilization and final dc resistance measurement: Resistors shall be removed from chambers for a minimum of 45 minutes and stabilized prior to final resistance measurement.
- f. Examination after test: Resistors shall be examined for evidence of mechanical damage.

4.9 Solderability. Solderability shall be tested in accordance with [MIL-PRF-55342](#).

## 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. Chip resistors are intended for use in thick or thin film circuits where microcircuitry is intended. Resistors are also for use in surface mount 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 certificate 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 [4.4.2.1](#)).

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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 PIN supersession. PIN's of revision C of this document have been superseded by a new PIN in revision D that includes a combination resistance value and resistance tolerance in accordance with MIL-PRF-55342 and herein.

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

6.6 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](#).

\* 6.7 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](mailto: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.

\* 6.8 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](mailto: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 88033-*****			Vendor similar Designation or type Number <u>1/</u>	Vendor CAGE	Vendor name and address
Characteristic	Resistance Range	Tolerance (in percent)			
K and M	1Ω to 21.5MΩ	1.0 (see 3.3.6)	WA90PG-XXXXF-NS62P WA90PG-XXXXF-NS62X WA90SM-XXXXF-NS62	50316	MINI-SYSTEMS, INC. 20 David Road N. Attleboro, MA 02761-0069
K and M	1Ω to 22 MΩ	5.0 (see 3.3.6)			
E, H, K and M	1Ω to 10MΩ As specified (see 3.3.6)	0.1, 1.0 and 5.0	H1010CPX***** (DEC033) H1010CA*****B (DEC033)	56235	State of the Art, Inc. 2470 Foxhill Road State College, PA 16803-1797
K	5.62Ω to 22MΩ	1.0, 2.0, 5.0 and 10	RCWP-1100-98	2799A	Vishay Dale Electronics, Inc. 1122 23 <sup>rd</sup> Street Post Office Box 609 Columbus, NE 68602-0609
M	1Ω to 5.6Ω	2.0, 5.0 and 10			
	5.62Ω to 22 MΩ	1.0, 2.0, 5.0 and 10			

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

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