

| REVISIONS | | | |
|-----------|--|-------------|--------------|
| LTR | DESCRIPTION | DATE | APPROVED |
| A | Added new paragraph for resistance. Editorial changes throughout. | 13 JUL 1989 | D. Moore |
| B | Change voltage rating from 40 V. to 50 V. Add new characteristic and specify resistance ranges. Allow fixtures to be used for power condition. Add new vendor part number. Editorial changes throughout. | 27 FEB 1992 | D. Moore |
| C | Added new resistance tolerances, values, and characteristics. Revise to present DoD policy requirements. Editorial changes throughout. | 12 JUL 2000 | K. Cottongim |
| D | Extend resistance range of source of supply. Update to present DoD policy requirements. | 28 FEB 2005 | K. Cottongim |
| E | Add pure tin paragraph. Add new source of supply. Editorial changes throughout. | 22 JAN 2007 | M. Radecki |
| F | Add manufacturer eligibility, electrostatic charge, and pulse application paragraphs. Editorial changes throughout. | 24 JUN 2014 | M. Radecki |

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

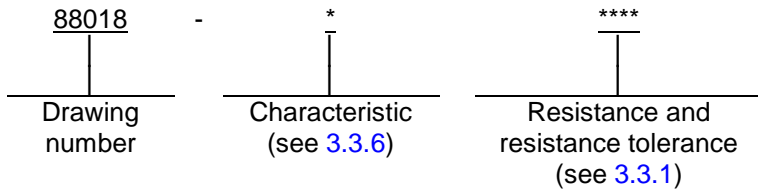
Prepared in accordance with [ASME Y14.100](#)

| REV STATUS OF PAGES | REV | F | F | F | F | F | F | F | F | F | F | | | | | | | |
|---|---------------------------------|--------------------------|---|---|---|---|-------------|---|---|---|---|--|--|--|--|--|--|--|
| | PAGES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | | | | | | |
| PMIC N/A | PREPARED BY Allan R. Knox | | | | | | | DESIGN ACTIVITY: DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO 45444-5000 | | | | | | | | | | |
| Original date of drawing 30 March 1988 | CHECKED BY David W. Withrow | | | | | | | TITLE RESISTOR, CHIP, FIXED, FILM, .200 WATT, STYLE 0705 | | | | | | | | | | |
| | APPROVED BY David W. Withrow | | | | | | | | | | | | | | | | | |
| | SIZE A | CODE IDENT. NO. 14933 | | | | | | DWG NO. 88018 | | | | | | | | | | |
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1. SCOPE

1.1 Scope. This drawing describes the requirements for a fixed, film, .200 watt, .075 X .050 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, 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, Fixed, Film, Chip, Nonestablished Reliability, Established Reliability, Space Level, General Specification For.

DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-202** - Test Methods for Electronic and Electrical Component Parts.
- MIL-STD-790** - Established Reliability and High Reliability Qualified Product 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>.)

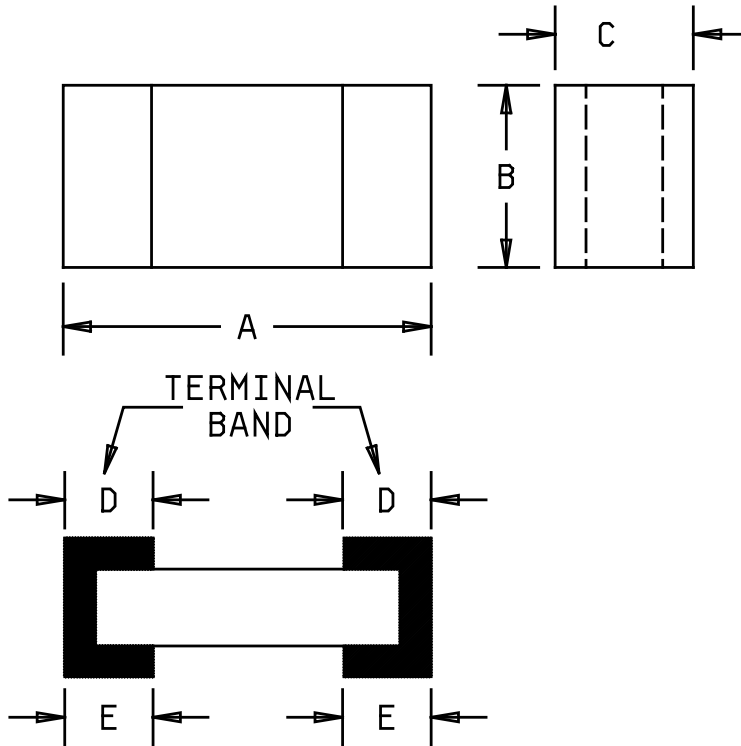
* 2.2 Order of precedence. Unless otherwise noted herein or in the contract, or in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes 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-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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| A | B | C | D | E |
|--------|-------|-----------|-------|-------|
| 0.080 | .050 | .015/.033 | .016 | .015 |
| ±0.006 | ±.005 | | ±.008 | ±.005 |

| Inches | mm |
|--------|------|
| .005 | 0.13 |
| .006 | 0.15 |
| .008 | 0.20 |
| .015 | 0.38 |
| .016 | 0.41 |
| .033 | 0.84 |
| .050 | 1.27 |
| .080 | 2.03 |

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. 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.

| | | | |
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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.

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 9880 inclusive |
| 10B0 to 98B8 inclusive | 10,000 to 98800 inclusive |
| 100B to 988B inclusive | 100,000 to 988,000 inclusive |
| 1C00 to 9C88 inclusive | 1,000,000 to 9,880,000 inclusive |
| 10C0 | 10,000,000 |
| Designator for 1.0 percent tolerance | Resistance (ohms) |
| 1D00 to 9D88 inclusive | 1.00 to 9.76 inclusive |
| 10D0 to 98D8 inclusive | 10.0 to 97.6 inclusive |
| 100D to 988D inclusive | 100 to 976 inclusive |
| 1E00 to 9E88 inclusive | 1,000 to 9760 inclusive |
| 10E0 to 98E8 inclusive | 10,000 to 97600 inclusive |
| 100E to 988E inclusive | 100,000 to 976,000 inclusive |
| 1F00 to 9F88 inclusive | 1,000,000 to 9,760,000 inclusive |
| 10F0 | 10,000,000 |
| Designator for 5.0 percent tolerance | Resistance (ohms) |
| 1J00 to 9J88 inclusive | 1.00 to 9.10 inclusive |
| 10J0 to 98J8 inclusive | 10.0 to 91.0 inclusive |
| 100J to 988J inclusive | 100 to 910 inclusive |
| 1K00 to 9K88 inclusive | 1,000 to 9100 inclusive |
| 10K0 to 98K8 inclusive | 10,000 to 91000 inclusive |
| 100K to 988K inclusive | 100,000 to 910,000 inclusive |
| 1L00 to 9L88 inclusive | 1,000,000 to 9,100,000 inclusive |
| 10L0 | 10,000,000 |

3.3.2 Resistance range. The resistance range shall be from 1 ohm to 10 megohms.

3.3.3 Resistance tolerances. The resistance tolerances for chip resistors shall be ±0.1 percent, ±1 percent, and ±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 0.200 watt at +70°C derated to zero power at +150°C (see figure 2).

3.3.5 Voltage rating. The maximum continuous working voltage shall not exceed 50 volts.

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

| <u>Characteristic</u> | <u>Resistance range</u> | <u>Resistance tolerance</u> |
|-----------------------|---------------------------|-----------------------------|
| E and H | 100 ohms thru 1.5 megohms | 0.1 percent |
| E and H | 10 ohms thru 1.5 megohms | 1.0 percent |
| K and M | 1 ohm thru 10 megohms | 1.0 percent |
| K and M | 1 ohm thru 10 megohms | 5.0 percent |

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

3.3.7.1 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).

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

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

3.3.10 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 $\pm(0.5 \text{ percent} \pm 0.01 \text{ ohm})$.

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

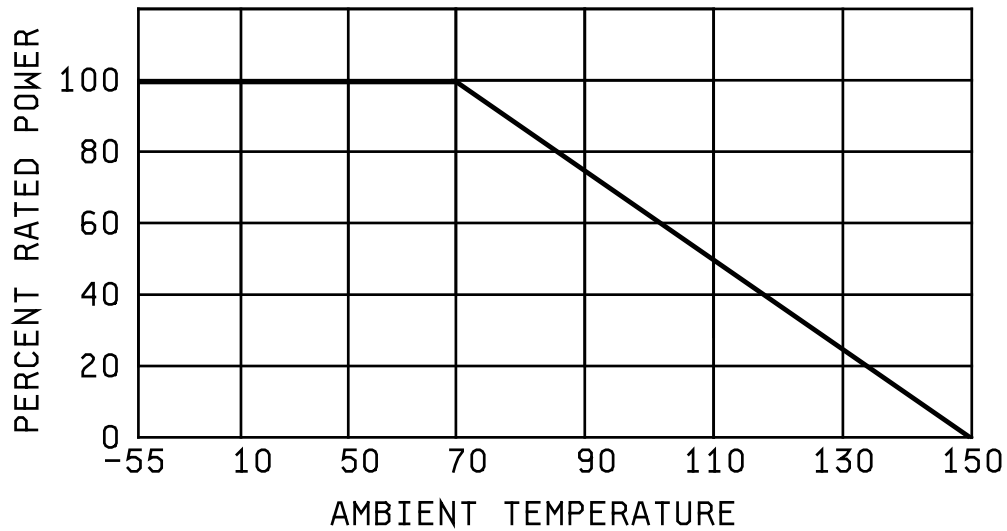


FIGURE 2. Derating curve.

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.

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- * 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 material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.
 - * 3.6 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.
 - * 3.6.1 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.

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 II](#), and shall be made on the same set of sample units, in the order shown.
- 4.4.1.1.1 Subgroup 1. Subgroup I 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 tolerance change limit shall not be furnished on contracts.
- 4.4.1.1.2 Subgroup 2. Subgroup II 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 manufacturer shall submit a certificate of compliance in lieu of group B inspection, when group B is not in the ordering data (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.

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TABLE II. Group A inspection.

| Inspection | Requirement | Method | Sampling procedure |
|--------------------|---------------|--------|------------------------|
| <u>Subgroup 1</u> | | | |
| DC resistance | 3.3.8 | 4.6 | 100 percent |
| Thermal shock | 3.3.9 | 4.7 | |
| Power conditioning | 3.3.10 | 4.8 | |
| DC resistance | 3.3.8 | 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 | 3.3.11 | 4.9 | See 4.4.1.1.3 |

4.6 DC resistance. DC resistance shall be tested in accordance with [MIL-PRF-55342](#).

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°C ±5°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 ±5 percent of the rated continuous working voltage.
- d. Duration: 100 hours ±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 activities within the Military Service 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.

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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.

6.3 PIN supersession. PIN's of revision B of this document have been superseded by a new PIN in revision C that includes a combination resistance value and resistance tolerance in accordance with [MIL-PRF-55342](#) and herein.

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 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.
- * 6.6 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 onetime 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 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.

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* 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) 692-0552 or DSN 850-0552.

| DLA Land and Maritime drawing PIN 88018-***** | Vendor similar designation or type number <u>1/</u> | Vendor CAGE | Vendor name and address |
|---|---|-------------|--|
| Char. K & M, res. values 1 ohm thru 10 megohms, res. tol. 1.0 & 5.0 pct. | WA86SM-*****-NS62C | 50316 | MINI-SYSTEMS, INC. 20 David Road N. Attleboro, MA 02761-0069 |
| Char. E & H, res. values 100 ohms thru 1.5 megohms, res. tol. 0.1, 10 ohms thru 1.5 megohms, 1.0 pct.; char. K & M, res. values 1 ohm thru 10 megohms, res. tol. 1.0 & 5.0 pct. | H0705CPX***** (DEC018) H0705CA***** (DEC018) | 56235 | State of the Art, Inc. 2470 Foxhill Road State College, PA 16803-1797 |
| Char. K & M, res. values 1 ohm thru 10 megohms, res. tol. 1.0 & 5.0 pct. | RCWP-575-ARO | SH903 | Vishay Israel, LTD. Emek-Sara "B" Industrial Park Beer Sheva, Israel 84874 |

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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