

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Changes in accordance with NOR 5905-R008-93.	93-28-05	D. Moore
B	Update vendor list. Editorial changes throughout.	99-05-01	A. Ernst
C	Revise revision letter. Editorial changes throughout	99-16-07	W. Sindelar
D	Add Group B inspection certification paragraph. Editorial changes throughout.	05-13-04	K. Cottongim
E	The molded epoxy case is obsolete and is superseded by conformal coated case. Add pure tin, manufacturer eligibility, and high power pulse paragraphs. Editorial changes throughout.	11-24-02	M. Radecki
F	Update Hyperlinks. Editorial changes throughout.	18-05-10	M. Radecki

The molded epoxy case is obsolete and is superseded by conformal coated case.

CURRENT DESIGN ACTIVITY CAGE CODE 14933  
HAS CHANGED TO: 037Z3

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](#)

Selected Item Drawing

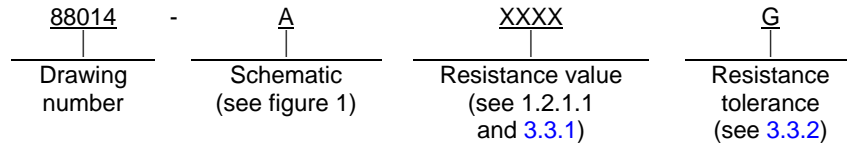
REV STATUS OF PAGES	REV	F	F	F	F	F	F										
	PAGES	1	2	3	4	5	6										

PMIC N/A	PREPARED BY Allan R. Knox	DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO 45444-5000
Original date of drawing  88-07-03	CHECKED BY David W. Withrow	TITLE  RESISTOR, NETWORK, 12-PIN, SINGLE-IN-LINE PACKAGE (SIP)
	APPROVED BY David E. Moore	
	SIZE A	CAGE CODE 14933
	REV F	DWG NO. 88014
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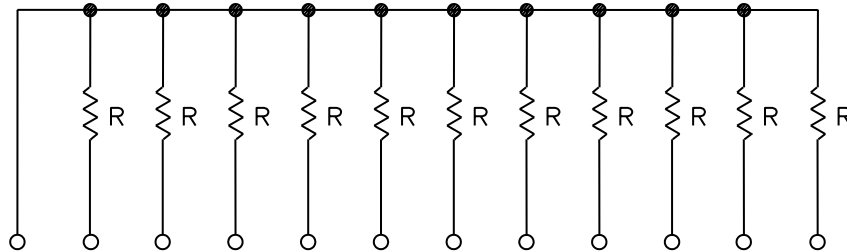
1. SCOPE

1.1 Scope. This drawing describes the requirements for a 12 pin, single-in-line package (SIP), resistor network.

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



1.2.1 Schematic. The schematic of the resistor is identified by a single letter in accordance with the drawings (see figure 1). The resistor element  $R_{ref}$  is the reference resistor element used in determining the ratio accuracy (when applicable).



SCHEMATIC A

FIGURE 1. Schematic.

1.2.1.1 Resistance value designations. The resistance value designation is in accordance with MIL-PRF-83401.

1.2.1.2 Characteristics. Characteristics is in accordance with MIL-PRF-83401 (characteristic K).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents in sections 3 and 4 of this specification, whether or not they are listed.

2.2 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-83401 - Resistor Networks, Fixed, Film, and Capacitor-Resistor Networks, Ceramic Capacitor and Fixed Film Resistors, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-1285 - Marking of Electrical and Electronic Parts.

(Copies of these documents are available online at <http://quicksearch.dla.mil>).

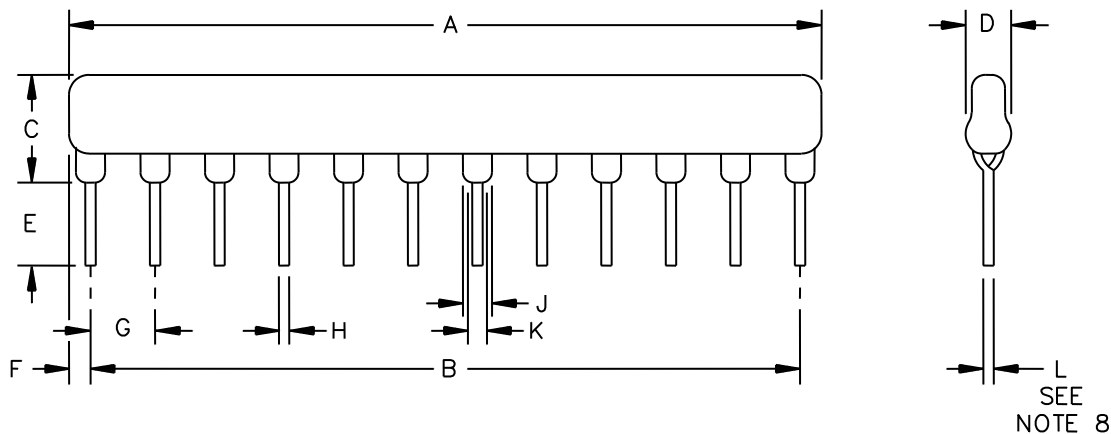
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2.2 Order of precedence. Unless otherwise noted herein or in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in 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.

3.2 Interface and physical dimensions. The resistor shall meet the interface and physical dimensions as specified in MIL-PRF-83401 and herein (see figure 2).



Ltr	Inches		mm	
	Min	Max	Min	Max
A	---	1.190	---	30.23
B	1.095	1.105	27.81	28.07
C	---	.200	---	5.08
D	.093	.103	2.36	2.62
E	.120	.140	3.05	3.56
F	---	.050	---	1.27

Ltr	Inches		mm	
	Min	Max	Min	Max
G	.090	.110	2.29	2.79
H	.015	.021	0.38	0.53
J	.040	.050	1.02	1.27
K	.027	.037	0.69	0.94
L	.009	.015	0.23	0.38

NOTES:

- Dimensions are in inches, unless otherwise specified, tolerances are  $\pm 0.005$  (0.13mm).
- Metric equivalents are given for general information only.
- The picturization of the styles above is given as representative of the envelope of the item. Slight deviation from the outline shown, which are contained within the envelope and do not alter the functional aspects of the device, are acceptable, (includes conformal coated resistors).
- Measurement made at the point of emergence of the lead from the body.
- Pin 1 locator shall be a bevel, stripe, notch or a dot above pin 1 in the shaded area.
- If standoffs are located on the body, a minimum of two standoffs are required as illustrated. As an option, additional standoffs may be located on the body of the resistor network. If leads with standoffs are used, standoffs on the body are not required.
- The molded epoxy case as shown in previous revision is obsolete and is superseded by conformal coated case as shown in figure 2.
- Leads are along centerline of body.

FIGURE 2. Resistor network.

3.3 Electrical characteristics.

3.3.1 Resistance. The resistance range shall be 10 ohms to 3.3 megohms.

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3.3.2 Resistance tolerance. Resistors tolerance shall be  $\pm 2$  percent.

3.3.3 Power ratings. The power rating for schematic A shall be 0.19 watt at 25°C derated to zero power at 150°C (see figure 3).

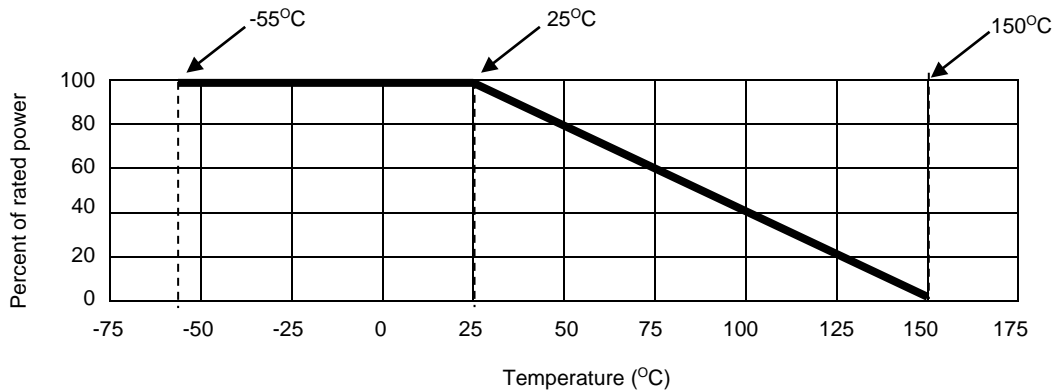


FIGURE 3. Derating curve.

3.3.4 Package power rating. The package power rating shall be 2.00 watts at 25°C.

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

3.3.6 Resistance temperature characteristic. The resistance temperature characteristic shall not exceed  $\pm 100$  ppm/°C for characteristic K.

3.3.7 TC tracking. The TC tracking shall be 50 ppm/°C.

3.3.8 Operating voltage. The maximum operating voltage shall be 50 V dc.

3.4 Environmental characteristics.

3.4.1 Moisture resistance. When resistors are tested as specified in 4.3 there shall be no evidence of mechanical damage. The change in resistance shall not exceed  $\pm 1.0$  percent.

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 6.5).

3.6 Marking. Marking shall be in accordance with MIL-STD-1285, except the resistors shall be marked with the PIN assigned herein (see 1.2), manufacturer's Commercial and Government Entity (CAGE) code, date code and lot code.

3.7 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the MIL-PRF-83401 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.

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

3.8 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.

3.9 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.

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#### 4. VERIFICATION

4.1 Qualification inspection. Qualification inspection in accordance with [MIL-PRF-83401](#) is not applicable to this document.

4.2 Conformance inspection.

4.2.1 Inspection of product for delivery. Inspection of product for delivery shall consist of the group A and B inspections of [MIL-PRF-83401](#).

4.2.1.1 Group A inspection. Group A inspection shall be in accordance with [MIL-PRF-83401](#). It should be noted that the power conditioning of [MIL-PRF-83401](#) is required to be performed at 25°C and the calculation derived from the derated wattage as shown in figure 3.

4.2.1.2 Group B inspection. Group B inspection shall be in accordance with [MIL-PRF-83401](#).

4.2.1.2.1 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 6.2c).

4.3 Moisture resistance. Resistors shall be tested in accordance with [MIL-PRF-83401](#), and the change in resistance shall not exceed ±1.0 percent.

#### 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.

#### 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.

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

- a. Complete DLA Land and Maritime CAGE CODE and PIN (see 1.2).
- b. Requirements for delivery: 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. Whether the manufacturer performs the group B tests or provides certification of compliance with group B requirements (see 4.2.1.2.1).
- d. Requirements for packaging and packing.

6.3 Precautionary note. Due to the low profile of these parts and the length dimension required for the 12 pins, the parts are more fragile than regular parts and must be inserted into the boards with caution.

6.4 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.

6.5 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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6.6 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.

6.7 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 may be achieved on-line at [resistor@dla.mil](mailto:resistor@dla.mil) or in writing to: DLA Land and Maritime - VAT, P.O. Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-8754 or DSN 850-8754.

6.8 Approved source of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained on on-line at [resistor@dla.mil](mailto:resistor@dla.mil) or contact DLA Land and Maritime - VAT, P.O. Box 3990, Columbus, OH 43218-3990, or by telephone (614) 692-8754 or DSN 850-8754.

DLA Land and Maritime drawing PIN (see 1.2)	Vendors similar designation or type number <u>1/</u>	Vendor CAGE	Vendor's name and address
88014-*****	CSC12A01XXXGPA	91637	Vishay Dale, Inc. P.O. Box 609 1122 23rd Street Columbus, NE 68602-0609

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

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