

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Update Hyperlinks. Editorial changes throughout.	18-07-13	M. Radecki
B	Remove vendor from drawing. Update to present DoD requirements.	24-03-29	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 Y14.24](#)

Selected Item Drawing

Revision Status of Sheets

REV																							
SHEET																							
REV	B	B	B	B	B	B	B																
SHEET	1	2	3	4	5	6	7																

PMIC N/A Original date of drawing 2006-12-18	PREPARED BY Andrew R. Ernst					DEFENSE SUPPLY CENTER, COLUMBUS COLUMBUS, OHIO 43218-3990						
	CHECKED BY Andrew R. Ernst					TITLE RESISTOR NETWORK, FIXED, FILM, SURFACE MOUNT, VOLTAGE DIVIDER, 3 PIN						
	APPROVED BY Michael A. Radecki											
	SIZE A		CAGE CODE 037Z3			DWG NO. 06018						
	REV B					PAGE 1 OF 7						

1. SCOPE

1.1 Scope. This drawing describes the requirements for a fixed, film, 3 pin surface mount, voltage divider, resistor network.

1.2 Part or Identifying Number (PIN). The complete PIN is as follows (see 3.7):

06018 ----- Drawing number	**** ----- R1 resistance (see 3.3.1 & 3.3.2.2)	**** ----- R2 resistance (see 3.3.1 & 3.3.2.2)	* ----- Absolute tolerance (see 3.3.4.1)	* ----- Ratio tolerance (see 3.3.4.2)
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Example of the PIN for a two 1 kilohms divider with 1 percent tolerances:

0601810011001FF

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-83401](#) - Resistor Networks, Fixed, Film and Capacitor-Resistor Networks, Ceramic Capacitor and Fixed, Film, Resistors, General Specification for

(Copies of these documents are available online at <https://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, 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

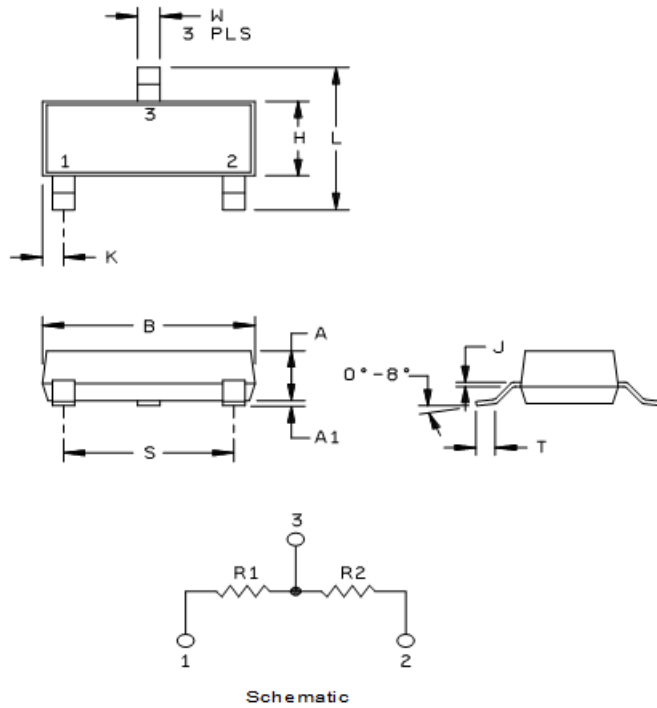
3.1 Item requirements. The individual item requirements shall be in accordance with [MIL-PRF-83401](#), and as specified herein.

3.2 Interface and physical dimensions. Resistors shall meet the interface and physical dimensions as specified herein (see [figure 1](#)).

3.3 Electrical characteristics.

3.3.1 Resistance. The nominal resistance is expressed in ohms and 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 1,000 ohms, or when fractional values of an ohm are required, the letter "R" is substituted for one of the significant digits to represent the decimal point. Resistance values from the standard resistance value table in [MIL-PRF-83401](#) shall be used.

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	<u>Inch</u>	<u>mm</u>		<u>Inch</u>	<u>mm</u>
A	0.033 ±0.007	(0.838 ±0.177)	W	0.018 ±0.003	(0.457 ±0.076)
A1	0.005 ±0.004	(0.127 ±0.101)	K	0.020 ±0.004	(0.508 ±0.101)
B	0.112 ±0.008	(2.844 ±0.203)	L	0.097 ±0.014	(2.463 ±0.355)
H	0.051 ±0.004	(1.295 ±0.101)	J	0.005 ±0.002	(0.127 ±0.050)
S	0.075 ±0.005	(1.905 ±0.127)	T	0.007 ±0.004	(0.117 ±0.101)

NOTES:

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

FIGURE 1. Resistor network, 3 pin voltage divider.

3.3.2 Resistance range.

3.3.2.1 Package resistance range. The package resistance range shall be 20 ohms to 200 kilohms (see 6.5).

3.3.2.2 Individual resistance range. The individual resistance range per resistor is 10 ohms to 100 kilohms.

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3.3.3 Resistance temperature coefficient. The resistance temperature coefficient shall be as follows in table I.

TABLE I. Resistance Temperature Coefficient (RTC).

Resistance range	Resistance Temperature Coefficient (RTC)	Tracking Resistance Temperature Coefficient
10 Ω to 4.99 kΩ	±100 ppm/°C	±50 ppm/°C
5 kΩ to 100 kΩ	±25 ppm/°C	±5 ppm/°C

3.3.4 Resistance tolerance.

3.3.4.1 Absolute resistance tolerances. The absolute resistance tolerances are available in table II (see 6.5)

TABLE II. Absolute Resistance Tolerance.

Symbol	Tolerance (in percent)
B	±0.1
C	±0.25
D	±0.5
F	±1.0
G	±2.0
J	±5.0
K	±10.0

3.3.4.2 Ratio resistance tolerances. The ratio resistance tolerances are available in table III (see 6.5).

TABLE III. Ratio Resistance Tolerance.

Symbol	Tolerance (in percent)
A	±0.05
B	±0.1
C	±0.25
D	±0.5
F	±1.0
G	±2.0

3.3.5 Characteristic. The characteristics shall be in accordance with [MIL-PRF-83401](#), characteristic K.

3.3.6 Power rating. The package power rating shall be 0.200 watt and the element power rating shall 0.100 watt, all at +70°C. For operation at temperatures greater than +70°C, derated in accordance with [figure 2](#).

3.3.7 Operating temperature. The operating temperature shall be -55°C to +125°C.

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 6.3).

3.5 Moisture resistance. When resistor networks are tested as specified in 4.3, there shall be no evidence of mechanical damage; the change in resistance between the initial and final measurements shall not exceed ±(0.05 percent + 0.01 ohm).

3.6 Manufacturers performance data. The manufacturer's technical specifications and performance data shall be made available to the customer for a period of two years.

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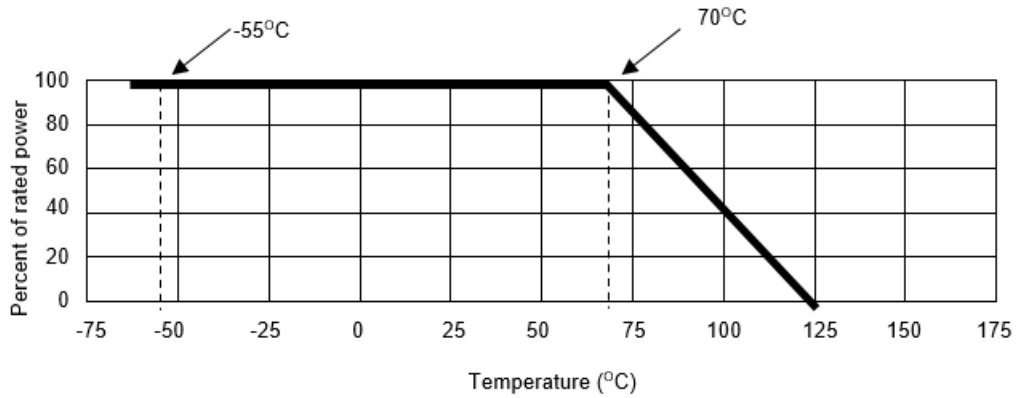


FIGURE 2. Derating curve for high ambient temperatures.

3.7 Marking. Marking is not required on the resistor; however, each unit package shall be marked with the PIN assigned herein (see 1.2), vendor CAGE code, and date and lot codes.

3.8 Manufacturer eligibility. To be eligible to be added 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 of parts 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 an approved source of supply.

3.9 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.

3.10 Workmanship. The resistor shall be uniform in quality and 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 Conformance inspection.

4.2.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection (M level part) and group B inspection of [MIL-PRF-83401](#). Additionally; a power moisture resistance test as specified in 4.3 shall be performed.

4.2.2 Certification. The acquiring activity may accept a certificate of compliance in lieu of performing group B inspection and the power moisture resistance test.

4.3 Moisture resistance. Resistor networks shall be tested in accordance with [MIL-PRF-83401](#). The following details and exceptions shall apply:

- a. The test is to be performed on an annual basis.
- b. A 30 piece sample shall be used with 0 defects allowed.

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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 material 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 that may be helpful, but is not mandatory.)

6.1 Intended use. Surface mount resistors are used in electronic circuits where space is a major concern.

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 and one copy of the conformance inspection data or certification 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 inspection and the moisture resistance test or provides a certificate of compliance (see 4.2.2).

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 User 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 or in writing to: DLA Land and Maritime - VAT, P.O. Box 3990, Columbus, OH 43218-3990 or by telephone (614) 400-3997 or DSN 850-0552.

6.5 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 or contact DLA Land and Maritime - VAT, P.O. Box 3990, Columbus, OH 43218-3990, or by telephone (614) 400-3997 or DSN 850-0552.

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DLA Land and Maritime drawing PIN (see 1.2) 06018	Vendors similar designation or type number <u>1/</u>	Vendor CAGE	Vendor's name and address
<u>Resistance Values:</u> 100Ω to 100 kΩ <u>Absolute Resistance</u> <u>2/</u> <u>Tolerance:</u> B, C, D, F, G, J, K <u>Ratio Resistance Tolerance:</u> <u>3/</u> A, B, C, D, F, G	MPM	57489	Vishay Thin Film, LLC. 2160 Liberty Drive Niagara Falls, NY 14304
<u>Resistance Values:</u> 500Ω to 100 kΩ <u>Absolute Resistance</u> <u>2/</u> <u>Tolerance:</u> B, C, D, F, G, J, K <u>Ratio Resistance Tolerance:</u> <u>3/</u> A, B, C, D, F, G	SOT23	57027	IRCTT Advanced Film Division 4222 South Staples Street Corpus Christi, TX 78411-2796

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.

2/ see 3.3.4.1

3/ see 3.3.4.2

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