REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Update hyperlinks and vendor's name.	25-04-08	Mark Rush

Prepared in accordance with ASME Y14.24

Selected Item Drawing

Revision Status of Sheets

REV																						
SHEET																						
REV	A	A	A	A	A	A	A	A														
SHEET	1	2	3	4	5	6	7	8														

PMIC N/A

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2024-12-25

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TITLE
Resistor, Fixed, Metal Foil, Current Sense, 2 Terminal, Style 0805

SIZE	CAGE CODE	DWG NO.
A	037Z3	25003

REV A

PAGE 1 OF 8

AMSC N/A

5905-2025-E19

1. SCOPE

1.1 Scope. This drawing describes the requirements for a fixed, metal foil, 2.03 mm X 1.27 mm, 2 terminal, current sense, resistor. Space level testing is available for these parts.

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

25003-*****FA

25003-	-	Drawing number
*****	-	Resistance (See 3.3.1)
F	-	Resistance tolerance (See 3.3.2)
A	-	Testing requirement (See 3.3.5)

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-32773	-	Resistor, Fixed, Metal Strip, Current Sensing, Ambient Temperature Rated, Industrial, High Reliability, Space Level, General Specification For

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-202-108	-	Method 108, Life (At Elevated Ambient Temperature)
MIL-STD-790	-	Established Reliability and High Reliability Qualified Products List (QPL) Systems for Electrical, Electronic, and Fiber Optic Parts Specification
MIL-STD-1285	-	Marking of Electrical and Electronic Parts

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

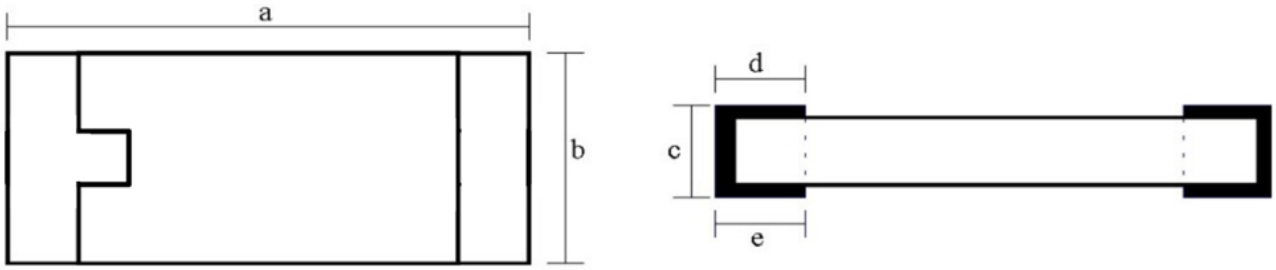
2.2 Order of precedence. Unless otherwise noted herein or in the contract, or in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes 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-32773 and as specified herein.

3.2 Interface and physical dimensions. The resistor shall meet the interface and physical dimensions as specified in MIL-PRF-32773 and herein (see figure 1).

3.2.1 Design documentation. The design documentation shall be in accordance with MIL-PRF-32773 and unless otherwise specified in the contract or purchase order, shall be retained by the manufacturer and available for review by the acquiring activity or contractor upon request.



a	b	c	d	e
2.03	1.27	0.40	0.18	0.38
±0.15	±0.15	±0.15	+0.15/-0.10	±0.10

mm	Inches	mm	Inches	mm	Inches	mm	Inches
0.10	0.004	0.18	0.007	0.40	0.016	2.03	0.08
0.15	0.006	0.38	0.015	1.27	0.05		

NOTES:

1. Dimensions are in millimeters.
2. Inch equivalents are given for general information only.
3. The pictorial view of the style above is given as representative 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. Resistor, Fixed, Metal Foil, Current Sense, Style 0805.

3.3 Electrical characteristics.

3.3.1 Resistance. The resistance values are expressed in ohms and is identified by five digits. The letter "R" is substituted for one of the significant digits to represent the decimal point. The succeeding digits of the group represent the significant figures. The discrete values specified in table I are the standard offerings. The resistance values may be of any value within the resistance range (see table II) and maybe ordered depending on the manufacturers capability, however, it is preferred that the values be chosen from those listed in table I.

TABLE I. Resistance value designations.

Resistance code	Resistance ohms
0R010	0.010
0R012	0.012
0R020	0.020
0R033	0.033

Resistance code	Resistance ohms
0R050	0.050
0R075	0.075
0R100	0.100

3.3.1.1 Resistance range. The resistance range shall be 0.010 ohms to 0.10 ohm.

TABLE II. Resistance range.

Designation	Resistance ohms
0R010 to 0R100 incl.	0.010 to 0.10 incl.

3.3.1.2 Resistance tolerance. The resistance tolerance shall be (F) ±1 percent.

3.3.2 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).

3.3.3 Resistance temperature characteristic. The resistance temperature characteristic shall be ±50 ppm/°C.

3.3.4 Testing requirements. The requirement for testing shall be identified by a single letter in accordance with table III.

TABLE III. Testing.

Symbol	Testing requirements
A (see 4.3.1)	Group A (M level) 1/
B (see 4.3.2)	Group A (T level), Group B (T level) 1/
T (see 4.3.3)	Group A (T level), Group B (T level), 1/ and Life test (4.4)

1/ Per MIL-PRF-32773.

3.3.5 Temperature range. The temperature range shall be -65°C to +170°C.

3.3.6 Power rating. The power rating shall be 0.5 watt at +70°C, derated to zero power at +170°C (see figure 2).

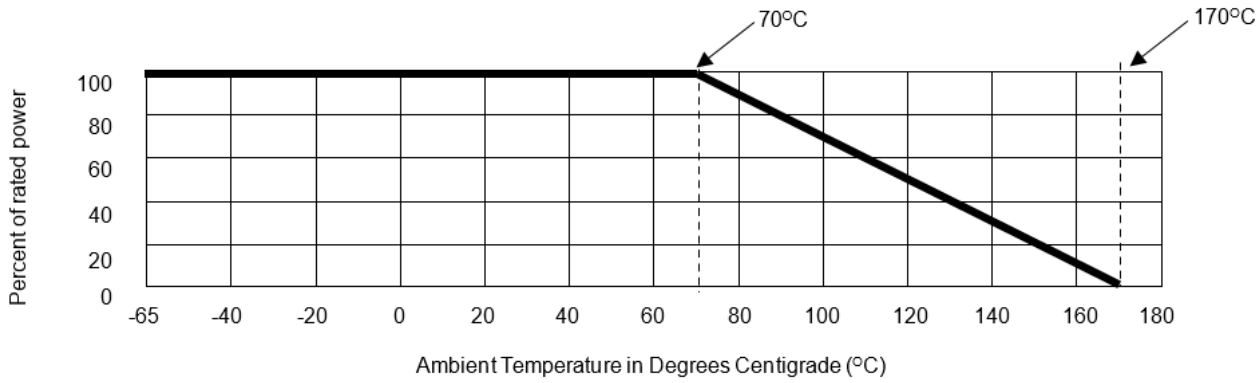


FIGURE 2. Derating curves for high ambient temperatures.

3.3.7 Voltage rating. The maximum continuous working voltage shall not exceed 200 volts.

3.4 Thermal shock. When resistors are tested as specified in MIL-PRF-32773. There shall be no evidence of mechanical damage; the change in resistance shall not exceed ±0.5 percent ±0.001 ohm.

3.5 High Temperature Exposure. When resistors are tested as specified in MIL-PRF-32773. There shall be no evidence of mechanical damage; the change in resistance shall not exceed ±0.5 percent ±0.001 ohm.

3.6 Solder mounting integrity. When resistors are tested as specified in MIL-PRF-32773, there shall be no evidence of mechanical damage. A force of 3.0 kilogram shall be used.

3.7 Short time overload. When resistors are tested as specified in MIL-PRF-32773, exception the resistors shall be submitted to 3.5 times the rated power for a duration of 5 second and there shall be no evidence of mechanical damage and the change in resistance shall not exceed ±0.25 percent ±0.001 ohm.

3.8 Life test (test code T). Resistors shall be tested in accordance with MIL-STD-202-108, there shall be no evidence of mechanical damage. The change in resistance between the initial measurement and any succeeding measurements up to and including 1,000 hours shall not exceed ±0.5 percent ±0.001 ohm. (see 4.4).

3.9 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, date, and lot codes.

3.10 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.

3.11 Manufacturer eligibility. To be eligible for being added as an approved source of supply, a manufacturer shall be listed on the MIL-PRF-32773 Qualified Products List for at least one part, or see table III on a sample of parts agreed upon by the manufacturer and DLA Land and Maritime-VAT.

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

3.12 Workmanship. Resistors shall be uniform in quality and 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-32773 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 Conformance inspection.

4.3.1 Inspection of product for delivery (test code A). Inspection of product for delivery for each PIN ordered shall consist of group A (M level) inspection per MIL-PRF-32773.

4.3.2 Inspection of product for delivery (test code B). Inspection of product for delivery for each PIN ordered (each production lot) shall consist of: Group A (T level) and Group B (T level) inspection per MIL-PRF-32773.

4.3.3 Inspection of product for delivery (test code T). Inspection of product for delivery for each PIN ordered (each inspection lot) shall consist of: Group A (T level), Group B (T level) inspection per MIL-PRF-32773, and Life test (see 3.8 and 4.5) specified herein.

4.4 Group A inspection (subgroups 1 and 2). Resistors shall be tested as specified in MIL-PRF-32773.

4.4.1 Subgroup 3 (visual inspection). The subgroup 3 test shall be performed on an inspection lot basis for product level M and production lot basis for space level product T. A sample of parts shall be randomly selected in accordance with table V. If one or more defects are found, the lot shall be reworked or screened and defectives removed. After reworking or screening and removal of defectives, a new sample of parts shall be randomly selected in accordance with table V. If one or more defects are found in this second sample for the same quality characteristic, the lot shall be rejected and shall not be supplied to this specification.

TABLE V Sampling plans for subgroup 3, subgroup 4, and subgroup 5.

Lot size			Sample size for subgroup 3	Sample size for subgroup 4	Sample size for subgroup 5
1	to	5	100%	100%	
6	to	13	100%	5	
14	to	150	37	5	
15	to	280	37	5	
281	to	500	37	5	12
501	to	1,200	37	5	
1,201	to	3,200	37	5	
3,201	to	10,000	74	20	
10,001	to	35,000	74	20	
35,001	to	150,000	74	20	

4.4.2 Subgroup 4 (solderability) test. The subgroup 4 test shall be performed on an inspection lot basis for product level M and production lot basis for space level product T. A sample shall be randomly selected from each lot in accordance with table V. As an option, the manufacturer may use electrical rejects from the subgroup 2 tests for all or part of the sample. If there are one or more defects, the lot shall be considered to have failed. The subgroup 4 test shall be performed on an inspection lot basis for product level M and production lot basis for space level product T. A sample shall be randomly selected from each lot in accordance with table V. As an option, the manufacturer may use electrical rejects from the subgroup 2 tests for all or part of the sample. If there are one or more defects, the lot shall be considered to have failed.

4.4.3 Subgroup 5. The manufacturer may use electrical rejects from the subgroup 1 screening tests for all or part of the samples to be used for the subgroup 5 testing. In case there are one or more defects, the lot shall be considered to have failed.

a. Laser marked resistors. Twelve samples of laser marked resistors shall be selected randomly from each inspection lot and subjected to the subgroup 4 tests (six to resistance to solvents and six to marking legibility).
b. Ink marked or color dot marked resistors. Six resistors marked with color dots or screen-printed characters shall be subjected to resistance to solvents test only.

4.4.4 Rejected lots. In the event of one or more defects, the inspection lot is rejected. If the lot fails this solderability test, the lot may be reworked and retested. Any inspection lot that fails the solderability retest shall be considered to have failed and that lot will not be supplied to the requirements of the specification.

4.4.5 Disposition of samples. The solderability test is considered a destructive test and samples submitted to the solderability test shall not be supplied on the contract.

4.5 Life test (test code T). Resistors shall be tested in accordance with MIL-STD-202-108. The following details and exceptions shall apply:

a. Method of mounting: Resistors shall be mounted on an appropriate test board(s).
b. Test temperature and tolerance: 70°C ±5°C.
c. Initial resistance measurement of mounted resistors: Measurements may be made inside or outside the chamber. The DC resistance shall be measured in accordance with 4.8.3 of MIL-PRF-32773.
   (1) Inside chamber: When measurements are to be made inside the chamber, the initial DC resistance shall be measured after mounting at the applicable test temperature, after a thirty minutes +90 minutes, -15 minutes stabilization period, and within 8 hours of exposure of the resistors to the test temperature. This initial measurement shall be used as the reference DC resistance for all subsequent measurements under the same condition.
   (2) Outside chamber: When measurements are to be made outside the chamber, the initial DC resistance shall be measured after mounting at room temperature. This initial measurement shall be used as the reference DC resistance for all subsequent measurements under the same condition.
d. Operating conditions: Rated DC continuous working voltage or filtered or non-filtered full wave rectified ac voltage, shall be applied intermittently, 90 minutes “on” and 30 minutes “off”, for the applicable number of hours and at the 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.
e. Test condition: 1,000 hours.
f. Measurements during test: DC resistance shall be measured at the end of the 30 minutes “off” periods after 250 hours +72 hours, -24 hours; 500 hours +72 hours, -24 hours; 1,000 hours +72 hours, -24 hours have elapsed.
g. Examination after test: Resistors shall be examined for evidence of mechanical damage.

4.6 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-32773.

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 requisite requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Services System Command. 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. Chip resistors are intended for use in thick or thin film circuits where microcircuitry is intended, also in most surface mount applications.

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

a. Complete DLA Land and Maritime CAGE CODE (037Z3) and PIN (see 1.2).
b. Requirements for delivery: 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.

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 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 phenomenon when ordering or shipping resistors. Direct shipment to the Government is controlled by MIL-DTL-39032, which specifies a preventive packaging procedure.

6.5 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-32773.

6.6 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) 692-4546 or DSN 850-4546.

6.7 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) 692-4546 or DSN 850-4546.

DLA Land and Maritime drawing PIN 25003-*******	Vendors similar designation or type number 1/	Vendor CAGE	Vendor's name and address
Resistance: All values (see 3.3.1) Resistance tolerance: F (see 3.3.2) Testing requirement: A, B, and T (see 3.3.5)	VMI-********	07XX3	Isabellenhuette USA, Inc. 1199 Gar Highway Swansea, MA 02777-4262 Plant: Isabellenhütte Heusler GmbH & Co. KG Eibacher Weg 3-5 Dillenburg, Germany 35683 https://www.isabellenhuette.de/

1/ Parts must be purchased to the DLA Land and Maritime CAGE CODE (037Z3) and PIN to assure that all performance requirements and test are met.