

INCH-POUND
MIL-PRF-23648/20C
28 September 2001
SUPERSEDING
MIL-R-23648/20B
4 April 1995

PERFORMANCE SPECIFICATION

RESISTOR, THERMAL (THERMISTOR), INSULATED NEGATIVE TEMPERATURE COEFFICIENT STYLE RTH44

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for style RTH44 thermistors. This style is available in resistance ratios A, B, and C. The only terminal lead available is S type. Resistance tolerance versus temperature characteristics F, G, J, and K are applicable through the maximum temperature of 125°C.

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 documents cited 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-23648 - Resistor, Thermal (Thermistor), Insulated, General Specification For.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Document Automation and Production Service, Building 4D, (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC-VAT, P.O. 3990, Columbus, Ohio, 43216-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 5905

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

2.3 Order of precedence. 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

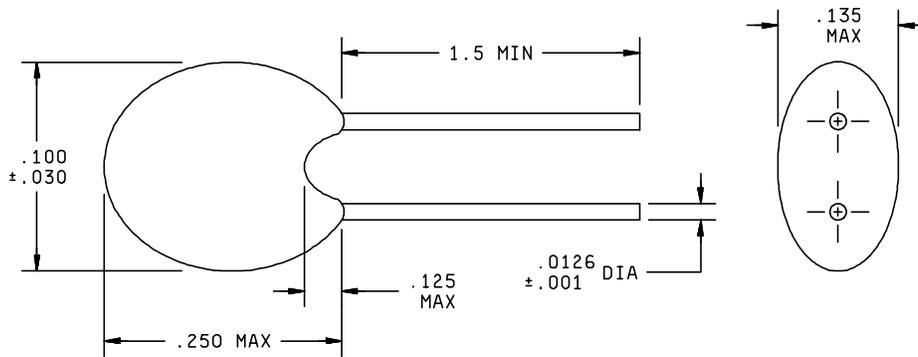
3.1 Requirements. Requirements shall be in accordance with MIL-PRF-23648, and as specified herein.

3.2 Interface and physical dimensions. The thermistors shall meet the interface and physical dimensions as specified on figure 1 and herein.

3.3 Thermal time constant. The thermal time constant shall be 25 seconds maximum.

3.4 Dissipation constant. The dissipation constant shall be 2 milliwatts per degrees Celsius minimum.

3.5 Power rating. The thermistor shall be capable of dissipating a maximum power of 0.2 watts at 25°C. Thermistors shall be derated in accordance with figure 2.



| Inch | mm |
|--------|-------|
| 0.001 | 0.025 |
| 0.0126 | 0.319 |
| 0.030 | 0.762 |
| 0.100 | 2.54 |
| 0.125 | 3.175 |
| 0.135 | 3.429 |
| 0.250 | 6.35 |
| 1.5 | 38.10 |

NOTES:

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

FIGURE 1. Style RTH44 thermistors.

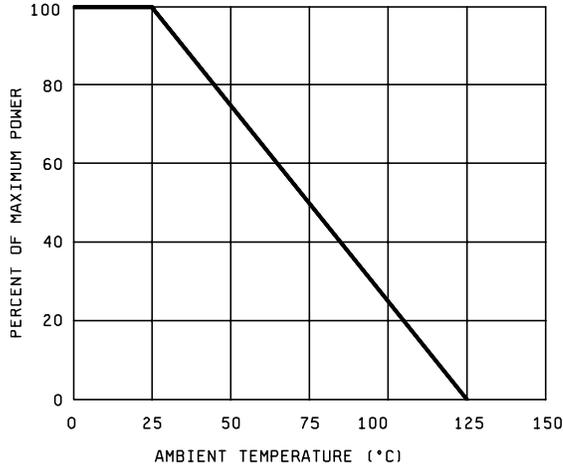


FIGURE 2. Derating curve for high ambient temperatures.

3.6 Resistance.

3.6.1 Resistance at 25°C. Standard values shall be as specified in MIL-PRF-23648 except that the 5 percent decade values shall also be used for resistance tolerance F and G. Minimum and maximum resistance values shall be in accordance with table I.

TABLE I. Minimum and maximum resistance values (at 25°C) for each available resistance ratio.

| Ratio 19.8 (A) | Ratio 29.4 (B) | Ratio 48.7 (C) |
|-------------------|--------------------|---------------------|
| <u>Ohms</u> | <u>Ohms</u> | <u>Ohms</u> |
| 300 min 3k max | 100 min 10k max | 15k min 500k max |

3.6.2 Resistance at temperatures other than 25°C. Factors for determining resistance at temperatures other than 25°C are determined by multiplying the zero-power resistance at 25°C by the factors shown in table II for the applicable resistance ratio.

TABLE II. Resistance temperature characteristic factors.

| Temperature (°C) | Ratio 19.8 (A) | Ratio 29.4 (B) | Ratio 48.7 (C) |
|---------------------|-------------------|-------------------|-------------------|
| -55 | 54.9 | 100 | ---- |
| -15 | 5.77 | 7.38 | 8.80 |
| 0 | 2.85 | 3.27 | 3.66 |
| 25 | 1.00 | 1.00 | 1.00 |
| 50 | 0.405 | 0.360 | 0.320 |
| 75 | 0.184 | 0.148 | 0.116 |
| 100 | 0.0923 | 0.0675 | 0.047 |
| 125 | 0.0503 | 0.0340 | 0.021 |

3.7 Short time overload. The maximum allowable change in zero-power resistance as the result of the short time load test shall be ± 2 percent.

3.8 Low temperature storage. The maximum allowable change in zero-power resistance as the result of the low temperature storage test shall be ± 2 percent.

3.9 High temperature storage. The maximum allowable change in zero-power resistance as the result of the high temperature storage test shall be ± 2 percent.

3.10 Terminal strength. When tested in accordance with 4.2, the maximum allowable change in zero-power resistance shall be ± 1 percent.

3.11 Thermal shock. The maximum allowable change in zero-power resistance as the result of the thermal shock test shall be ± 2 percent.

3.12 Resistance to soldering heat. The maximum allowable change in zero-power resistance as the result of the resistance to soldering heat test shall be ± 3 percent.

3.13 Moisture resistance. The maximum allowable change in zero-power resistance as the result of the moisture resistance test shall be ± 5 percent.

3.14 Life. The maximum allowable change in zero-power resistance as the result of the life test shall be ± 5 percent.

3.15 High temperature exposure. The maximum allowable change in zero-power resistance as the result of the high temperature exposure test shall be ± 2 percent after 100 hours, and ± 3 percent after 1,000 hours.

3.16 Vibration, high frequency. The maximum allowable change in zero-power resistance as the result of the vibration test shall be ± 2 percent.

3.17 Shock, specified pulse. The maximum allowable change in zero-power resistance as the result of the shock test shall be ± 2 percent.

3.18 Immersion. The maximum allowable change in zero-power resistance as the result of the immersion test shall be ± 3 percent.

4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-PRF-23648.

4.2 Terminal strength.

4.2.1 Direct load. Direct load shall be applied gradually until the load reaches 1.0 pound.

4.3 Solderability. The solderability test is applicable to this specification except the steam aging requirement shall be 60 minutes +5 minutes, -0 minutes.

4.4 Resistance to soldering heat. The resistance to soldering heat test is applicable to this specification.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite 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 Department's System Command. Packaging data retrieval is available from the managing Military Departments 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. The notes specified in MIL-PRF-23648 are applicable to this specification.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1).
- c. Packaging requirements (see 5.1).

6.3 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the change.

MIL-PRF-23648/20C

Custodians:

Army - CR
Navy - EC
Air Force - 11
NASA - NA
DLA - CC

Preparing activity:

DLA - CC

(Project 5905-1623-04)

Review activities:

Army - AR, AT, AV
Navy - AS, CG, MC, OS
Air Force - 19