

INCH-POUND
MIL-PRF-55182G
AMENDMENT 7
18 January 2002
SUPERSEDING
AMENDMENT 6
9 August 2001

PERFORMANCE SPECIFICATION

RESISTORS, FIXED, FILM,
NON-ESTABLISHED RELIABILITY, ESTABLISHED RELIABILITY, AND SPACE LEVEL,
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-PRF-55182G, dated 9 June 1997, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 5

2.2.1, STANDARDS, parenthetical source statement, delete "Defense Printing Service Detachment Office, Bldg 4D, Customer Service" and substitute "Document Automation and Production Service (DAPS), Bldg. 4D, (DPM-DODSSP)"

PAGE 6

3.4, delete and substitute:

"3.4 Materials. Materials shall be used which will enable the resistors to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product."

PAGE 7

3.5.3.3, delete in its entirety and substitute:

"3.5.3.3 Solder dip (retinning) of leads. The manufacturer (or their authorized category B or category C distributor) may solder dip/retin the leads of product supplied to this specification provided the solder dip process (see Appendix A) has been approved by the qualifying activity."

PAGE 8 & 9

TABLE VII, 3.5.3.3.1, and 3.5.3.3.2, delete in their entirety.

PAGE 13

3.34.4, delete paragraph title "Supplying to higher FR levels and product levels." and substitute "Product level substitution."

3.34.5, delete paragraph title "Supplying to lower resistance temperature characteristics and/or lower resistance tolerances." and substitute "Resistance temperature characteristic and/or resistance tolerance substitution."

PAGE 14

TABLE X, characteristic substitution column, delete "J, K" and substitute "J, H".

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PAGE 16 and PAGE 17

TABLE XI, delete and substitute:

"TABLE XI. Qualification inspection.

| Inspection | Requirements paragraph | Method paragraph | Number of samples | Number of defects permitted |
|---|---|------------------|--|-----------------------------|
| <u>Certification requirements</u> | | | | |
| Aqueous-extract-conductivity <u>1/</u> | 3.5.1 | 4.8.27 | | <u>2/</u> |
| Flux <u>1/</u> | 3.5.4 | | | |
| Outgassing (space level only) | 3.32 | 4.8.26 | | |
| <u>Group I</u> | | | | |
| Visual and mechanical examination <u>3/</u> | 3.1, 3.4, 3.5, 3.5.1.1 through 3.5.3.2 inclusive, 3.5.5, 3.31, and 3.32 | 4.8.1 | All sample units | N/A |
| Thermal shock <u>4/</u> | 3.8 | 4.8.2 | | |
| Overload <u>4/</u> | 3.9 | 4.8.3 | | |
| DC resistance <u>4/</u> | 3.11 | 4.8.5 | | |
| Hermetic seal (when applicable) <u>4/</u> | 3.12 | 4.8.6 | | |
| <u>Group IA</u> | | | | |
| Solderability | 3.13 | 4.8.7 | 12 sample units | 0 |
| Resistance to solvents | 3.14 | 4.8.8 | | |
| <u>Group II</u> | | | | |
| Resistance temperature characteristics | 3.15 | 4.8.9 | | <u>5/ 1</u> |
| Low temperature storage | 3.29 | 4.8.23 | 10 highest | |
| Low temperature operation | 3.16 | 4.8.10 | 30 10 critical | |
| Terminal strength | 3.17 | 4.8.11 | 10 lowest | |
| Hermetic seal (when applicable) | 3.12 | 4.8.6 | | |
| <u>Group III</u> | | | | |
| Dielectric withstanding voltage | 3.18 | 4.8.12 | 10 highest | <u>5/ 1</u> |
| Insulation resistance | 3.19 | 4.8.13 | 30 10 critical | |
| Resistance to soldering heat | 3.20 | 4.8.14 | 10 lowest | |
| Moisture resistance | 3.21 | 4.8.15 | | |
| <u>Group IV</u> | | | | |
| Shock (specified pulse) | 3.22 | 4.8.16 | 10 highest | <u>5/ 1</u> |
| Vibration, high frequency | 3.23 | 4.8.17 | 30 10 critical | |
| Hermetic seal (when applicable) | 3.12 | 4.8.6 | 10 lowest | |
| <u>Group V</u> | | | | |
| Life | 3.24 | 4.8.18 | 102 34 highest 34 critical 34 lowest | 1 |
| <u>Group VA</u> <u>6/</u> | | | | |
| +70°C power rating | 3.24.3 | 4.8.18 | 102 34 highest 34 critical 34 lowest | 1 |

See footnotes at end of table.

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| | | | | |
|--|------|--------|---|---|
| <u>Group VI</u> High temperature exposure | 3.25 | 4.8.19 | 34 highest 7/ 102 34 critical 34 lowest | 1 |
| <u>Group VII</u> Voltage coefficient (applicable to resistors of 1,000 ohms and over) | 3.26 | 4.8.20 | | |
| Fungus | 3.27 | 4.8.21 | 10 highest | 0 |
| Mechanical shear (when applicable) | 3.28 | 4.8.22 | | |
| <u>Group VIII (space level only)</u> Thermal shock (100 cycles) | 3.8 | 4.8.2 | 10 highest 30 10 critical 10 lowest | 0 |

- 1/ The manufacturer shall verify by certification that these requirements have been met in fabricating resistors furnished to this specification.
- 2/ Failure of a resistor in one or more tests of a group shall be charged as a single defect.
- 3/ Marking shall be considered defective if the marking is illegible or incorrect. The two additional unenclosed sample units shall be subjected to the visual and mechanical examination of group I only. Marking shall remain legible at the end of all tests.
- 4/ As an option, the manufacturer may perform group A, subgroup 1 tests with the required PDA in lieu of these tests.
- 5/ For characteristic C and characteristic E, zero failures are permitted in moisture resistance.
- 6/ The power rating shall be +70°C. Qualification inspection only.
- 7/ Ten sample units shall be subjected to dielectric withstanding voltage and insulation resistance following this test."

PAGE 23

TABLE XV, add the following to end of NOTE 1: "(NOTE: Not applicable to space level.)"

PAGE 27

TABLE XVII, delete and substitute:

"TABLE XVII. Overload.

| Resistor style 1/ | Overload and duration | Maximum voltage (ac or dc) |
|-------------------------------|-------------------------------|-------------------------------|
| | | <u>Volts</u> |
| RNR50, RNR55, RNR57, RNR60 | 5 X rated power for 1 hour | 500 |
| RNR65 | 4 X rated power for 1 hour | 600 |
| RNR70 | 2.25 X rated power for 1 hour | 700 |
| RNR75 | 2.25 X rated power for 1 hour | 1,000 |
| RNR77 | 1.25 X rated power for 1 hour | 1,000 |

- 1/ Third letter is variable, dependent upon lead material or capability."

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4.8.4, delete the next to last sentence and substitute:

“Following the test and a two hour stabilization period of $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ the dc resistance as specified in 4.8.5 shall be measured and compared with the reading taken prior to the test of 4.8.2.”

PAGE 28

4.8.6.b, delete and substitute:

“b. Group I qualification inspection and group A inspection: Method 112 of MIL-STD-202, test condition A or the manufacturer’s own procedure, provided the hermetic seal test has been approved by the qualifying activity.”

PAGE 29

4.8.9.c, first sentence, delete “ $+1^{\circ}\text{C}$ ” and substitute “ $\pm 3^{\circ}\text{C}$ ”.

PAGE 31

4.8.14.c, after test condition C, delete “($+260^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 10 seconds ± 2 seconds)”.

PAGE 42

6.2.c, delete and substitute:

“c. Packaging requirements (see 5.1). (i.e. Electrostatic discharge (ESD) sensitive packaging).”

PAGE 43

Add new paragraph:

“6.4.1 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.”

PAGE 45

Add the new paragraph:

“A.3.3 Outgassing (space level only). Manufacturers shall validate to the qualifying activity the outgassing requirements as specified in 3.32.”

PAGE 47

After TABLE XXIII, add new section A.5:

“A.5. SOLDER DIP (RETNING) LEADS

A.5.1 Solder dip (retinning) leads. The manufacturer (or their authorized category B or category C distributor) may solder dip/retin the leads of product supplied to this specification provided the solder dip process (see 5.2 of this appendix) or an equivalent process has been approved by the qualifying activity.

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* A.5.2 Delete parenthetical note:

A.5.2 Qualifying activity approval. Approval of the solder dip process will be based on one of the following options:

- a. When the original lead finish qualified was hot solder dip lead finish 52 of MIL-STD-1276. (NOTE: The 200 microinch maximum thickness is not applicable.) The manufacturer shall use the same solder dip process for reflowing as is used in the original manufacture of the product.
- b. When the lead originally qualified was not hot solder dip lead finish 52 of MIL-STD-1276 as prescribed in 5.2a, approval for the process to be used for solder dip shall be based on the following test procedure:
 - (1) Thirty samples of any resistance value for each style and lead finish are subjected to the manufacturer's solder dip process. Following the solder dip process, the resistors are subjected to the dc resistance test (and other group A electricals). No defects are allowed.
 - (2) Ten of the 30 samples are then subjected to the solderability test. No defects are allowed.
 - (3) The remaining 20 samples are subjected to the resistance to solder heat test followed by the moisture resistance test (or hermetic seal test if the device is hermetically sealed). No defects are allowed.

A.5.3 Solder dip/reflowing options. The manufacturer may solder dip/reflow as follows:

- a. After the 100 percent group A screening tests. Following the solder dip/reflowing process, the electrical measurements required in group A, subgroup 1, 100 percent screening tests shall be repeated on 100 percent of the lot. (NOTE: The manufacturer may solder dip/reflow prior to the 100 percent electrical measurements of the group A, subgroup 1 tests). The percentage defective allowable (PDA) for the electrical measurements shall be as for the subgroup 1 tests.
- b. As a corrective action, if the lot fails the group A solderability test: The lot may be reflowed no more than two times. The lot after reflowing shall be 100 percent screened for group A electrical requirements (dc resistance). Any parts failing (lot not exceeding PDA for group A, subgroup 1, see 4.6.3.2.1) these screens shall not be supplied to this specification. If electrical failures exceeding 1 percent of the lot are detected after the second reflowing operation, the lot shall not be supplied to this specification.
- c. After the group A inspection has been completed: Following the solder dip/reflowing process, the electrical measurements required in group A, subgroup 1, 100 percent screening test shall be repeated on 100 percent of the lot. The PDA for the electrical measurements shall be as for the subgroup 1 tests. Following these tests, the manufacturer shall submit the lot to the group A solderability test as specified in 4.6.3.2.4."

Custodians:

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

Preparing activity:

Army - CR

Agent:

DLA - CC

Review activities:

Army - AR
Navy - AS, CG, MC, OS
Air Force - 19, 99

(Project 5905-1648)