

EIA RS-251-A

EIA STANDARD

*Test to Determine the
Temperature Rise as a
Function of Current
in Printed Conductors*

RS-251-A
(Revision of RS-251)



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Engineering Department

ELECTRONIC INDUSTRIES ASSOCIATION

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TEST TO DETERMINE THE TEMPERATURE RISE AS A FUNCTION OF CURRENT IN PRINTED CONDUCTORS

(From EIA Standard RS-251 and Standards Proposal No. 1033, formulated under the cognizance of EIA Working Group P-7.6 on Printed Wiring Boards.)

1. SCOPE

1.1 This test method covers a procedure for comparatively determining the effects of printed conductor materials, conductor cross sections, substrate materials, and processes on the temperature-D.C. current characteristics of printed wiring boards. A standard test sample is recommended and defined.

2. GENERAL

2.1 The test sample shown in Figure 1 shall be vertically suspended by the upper corners and centrally located within an enclosure free of forced air movement. The sample shall be so oriented that the conductors are horizontal.

Only one test specimen shall be tested at any one time, with current passing through only one conductor.

2.2 The current leads for connection to the printed conductors shall be #12 AWG stranded wire and shall be secured by soldering to the terminal area. Pretinning of parts prior to soldering is advisable.

2.3 The potential leads shall be #26 AWG magnet wire and shall be secured to the test tabs by soldering. Pretinning of parts prior to soldering is advisable.

2.4 The ambient air temperature measured at approximately 4 inches perpendicularly from the center of the conductor side of the board shall be $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$. The temperature shall be recorded at each measurement.

2.5 Extraneous surface coatings shall be removed without affecting the dimensions of the conductor. The sample shall represent the materials and processes under investigation.

2.6 To achieve 3-figure significance in temperature rise measurements, all potentials should be measured accurately to four significant figures.

2.7 Caution should be exercised in the choice of the current adjust "Resistor". Resistors of low wattage rating will give erratic readings due to resistance fluctuations resulting from overheating.

2.8 In reporting results it is recommended that the temperature rise for each conductor material be given for a particular value of current for a specified conductor cross-sectional area, approximate