

METHOD 309

VOLTAGE COEFFICIENT OF RESISTANCE DETERMINATION PROCEDURE

1. PURPOSE. Certain types of resistors exhibit a variation of resistance with changes in voltage across the resistor. This is a measurable characteristic; a test to determine the magnitude of such a characteristic is the Voltage Coefficient of Resistance Determination Procedure.

2. PROCEDURE. The voltage coefficient is applicable only to resistors of 1,000 ohms and over. Unless otherwise specified in the individual specification, all measurements and tests shall be made at a temperature of 25°C ±5°C. Adjust the resistance measuring device to apply 0.1 X rated continuous working voltage to the resistor. Measure the resistance by applying this voltage intermittently for not more than the total of 0.5 second in any 5 second interval. Readjust the resistance measuring device to apply 1.0 X rated continuous working voltage to the resistor and repeat the above intermittent measuring procedure. Compute the Voltage Coefficient (VC) as follows:

$$VC = \frac{(R - r)100}{0.9Er}$$

Where:

- R = Resistance at rated continuous working voltage.
- r = Resistance at 0.1 rated continuous working voltage.
- E = Rated continuous working voltage.

3. PRECAUTIONS. Adherence to 2, applying voltage intermittently for not more than the total of 0.5 seconds in any 5 second interval is emphasized as an important consideration of this method. Failure to comply would result in a voltage coefficient of vast variations. A resistance measuring device capable of withstanding high voltage applications should be used. Certain types of resistors exhibit a variation of resistance with changes in potential difference, this effect being separate and distinct from the change in resistance due to heating effect whether from applied voltage or ambient conditions.

4. SUMMARY. The following detail is to be specified in the individual specification:

The continuous working voltage (see 2).