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# Measurements of Fixed Inductors

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## ▶ Measurements of Fixed Inductors

### Measurements of Fixed Inductors

#### Inductance

The inductance is measured with a Q-meter, LCR meter or an impedance analyzer.

- Fixed inductors for signals: Use of a Q-meter in which the frequency is for direct readout of the inductance or at the specified frequency.
- Inductors for high current power line circuits: 1kHz or 100kHz.

#### Q Factor

The unloaded Q is measured with a Q-meter, LCR meter or impedance analyzer. The frequency of measurement is that at which the inductance has been measured or at a different frequency as specified. However, for high current power line inductors, the resistance is measured and the Q may be neglected.

#### DCR (DC Resistance), SRF (Self-Resonant Frequency)

DCR: A digital multimeter is used for measurement;

SRF: Measured with a Q-meter, impedance analyzer or network analyzer.

#### Dielectric Strength

For specimen coil, apply 100V DC for 5 seconds between the shielding case and terminals. There should be no damage or abnormalities in the inductor.

#### Maximum Allowable Current

The maximum allowable current is a DC Current which causes initial inductance to decrease by 10% or 30%. Or coil temperature to rise by 20°C or 40°C, whichever is smaller. (Reference ambient temperature: 20°C)

#### Solderability

After immersion of terminals in flux for 5 to 10 seconds, dip the terminals in the solder bath at 245±5°C for 2±0.5 seconds. Make certain that more than 3/4 of the surface of the terminals is coated with new solder.

#### Dry Heat Test

The change in inductance, if any, is measured after exposure to 85±2°C in a test chamber for 500±12 hours and for 1 to 2 hours at room temperature.

#### Shock Tests

The change in inductance, if any, is measured after the following tests.

- Free Fall Drop Test: A specimen coil is mounted on a test board and dropped freely 3 times from a height of 1 meter.
- Impact Tester: A specimen inductor is mounted on a test board and dropped 3 times in three directions with shock applied for 0.01 seconds at 981 m/s<sup>2</sup>. The change in inductance, if any, is measured after the tests.

#### Vibration Test

The change in inductance, if any, is measured after the following condition:

- A specimen coil/inductor is mounted on a test board of vibration instrument.
- Overall amplitude: 1.5mm, frequency range: 10~55Hz, and swept in the (10~55~10)Hz order per minute for 2 hrs in each of the 3 directions for total of 6 hrs.

#### Humidity Test

The change in inductance, if any, is measured after exposure in a test chamber to humidity of 90% to 95% R.H. at 60±2°C for 500±12 hours and 1 hour exposure at room temperature.

