When measuring a capacitor via a Keysight LCR meter, what is the best circuit mode, Cs or Cp?

Technical Support Knowledge Center Open

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The following guideline (based upon the expected impedance of the capacitor) should be applied for selecting the circuit mode:

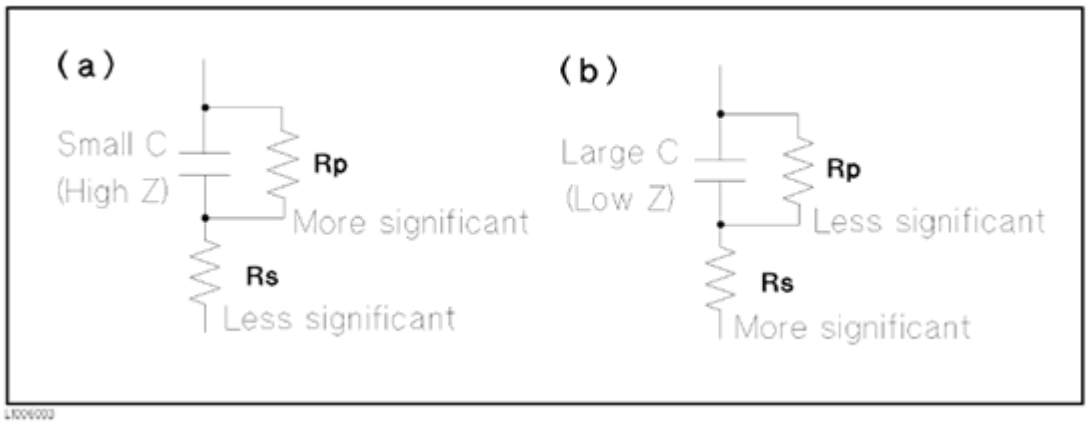
For |Z| ≥10k Ohms, use the parallel circuit mode (Cp);

For |Z| ≤ 10 Ohms, use series circuit mode (Cs);

For 10 Ohms < |Z| < 10K Ohms, follow the manufacturer's recommendations (if available).

Additional Details:

To measure L, C, or R, there are two equivalent circuit models.The LCR meter can select the mode by setting the FUNC (function) to Cp, Cs, Lp or Ls. To determine which mode is best, consider the relative impedance magnitude of the reactance, Rs and Rp.



Small Capacitance (modeled by (a) in above figure).

Small capacitance yields large reactance which implies that the effect of the parallel resistance (Rp) has relatively more significance than that of series resistance (Rs). The low value of resistance represented by Rs has negligible significance compared with the capacitive reactance so the parallel circuit mode (Cp-D or Cp-G) should be used.

Large Capacitance (modeled by (b) in above figure)

When the measurement involves a large capacitance (low impedance), Rs has relatively more significance than Rp. The series circuit mode (Cs-D or Cs-Q) should be utilized.

Note that the same concepts apply to inductor measurement as well.

Learn more about Keysight LCR Meter and Impedance Measurement products

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