

## Pass/Fail Judgment of Passive Components such as Capacitors using Equivalent Circuit Analysis

Passive component quality can be determined by analyzing the components of an equivalent circuit. The Equivalent Circuit Analysis Software IM9000 compares the values of the fundamental and equivalent-circuit components to enable pass/fail judgment of the fundamental component.

### ■ Highlights

The IM9000 software is optionally incorporated in the IMPEDANCE ANALYZER IM3570. A passive component can be approximated by one of five equivalent circuit model types by measuring an object and performing equivalent circuit analysis with the IM3570. Using reference values in the equivalent circuit, pass/fail judgment of the component is performed by comparing circuit constants.

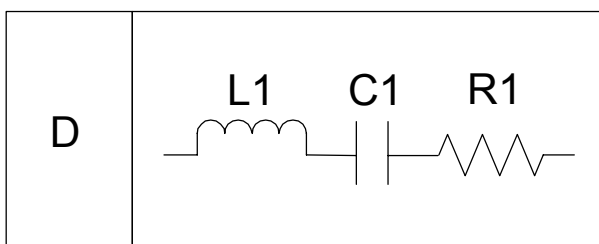


Figure 1 The equivalent circuit of a capacitor (Pattern:D)



IMPEDANCE ANALYZER  
IM3570

Consider a capacitor having the equivalent circuit of Figure 1.

First, a frequency sweep by the IM3570 measures impedance and phase difference.  
\*1

The IM9000 software then analyzes the equivalent circuit.\*2

The IM9000 includes five equivalent circuit model types so that the constants of a pre-specified equivalent circuit can be calculated from the measurements. The example screenshot at the right shows R1 to be above the reference value range, L1 and C1 are within the reference range, and Q is below the reference range.

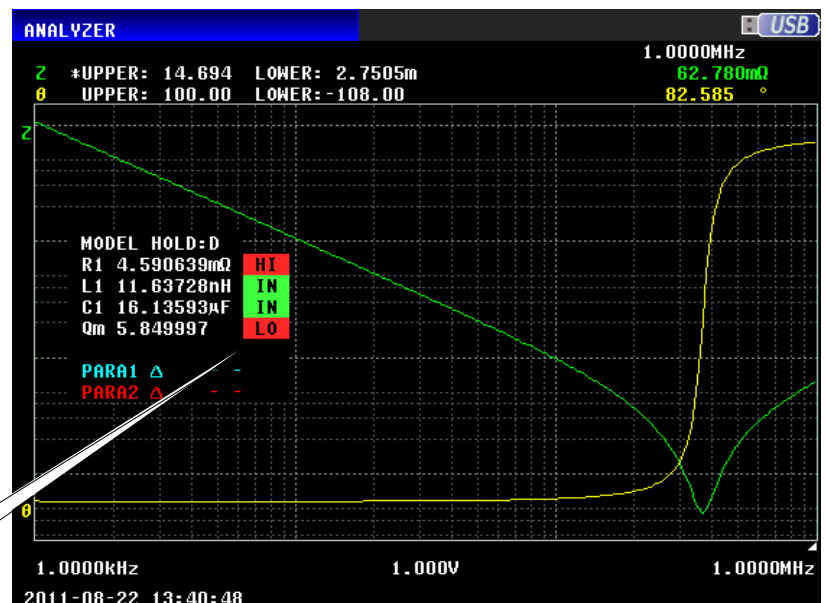


Figure 2 Frequency characteristic of a capacitor

Result of comparator (Pass/Fail comparison)

### Products used

IMPEDANCE ANALYZER IM3570

EQUIVALENT CIRCUIT ANALYSIS FIRMWARE IM9000

\*1 The IMPEDANCE ANALYZER IM3570 requires optional probes and fixtures for measurements.  
Select according to the shapes of the measurement objects.

\*2 The EQUIVALENT CIRCUIT ANALYSIS SOFTWARE IM9000 is optionally installed in the IM3570 prior to shipping.