

# Capacitance and Dissipation Factor Test

## Introduction

### Capacitance

Capacitance is defined as the electric quantity between the capacitor plates in which electromotive force increase 1 volt. It is a physical quantity to characterize the ability to hold electric charge. Physically speaking, capacitors are static charge storage dielectric, and the charge will be permanent without considering the self-discharge leakage. Capacitors are mainly used for power supply filtering, signal filtering, signal coupling, resonance, DC blocking etc.

### Dissipation factor

Dissipation factor (D) is defined as the energy generating heat in unit time of capacitors. D is caused by dielectric loss, conductance loss and resistance of metal part in the capacitors. The dissipation factor serves as a measure of a reactance's purity of capacitors, it is simply the reciprocal of Q.

## Test System

A variety of equipment meet the spectrum test from 20 Hz to 3 GHz.

Device Name	Impedance analyzer	RF impedance analyzer
Equipment Type	E4990A	E4991A
Frequency Range	20 Hz to 120 MHz	1 MHz to 3 GHz
Basic Accuracy	±0.08%	±0.8%

## Data Output

Spectrum graphics or spectral data can be saved. It is a typical impedance spectrum curve of capacitors on the right.

