

Impedance Analyzer

The impedance analyzer provides a complete measurement solution for surface packing inductors, capacitors, resistances and dielectric/magnetic materials. With the use of E4990A and E4991A, it achieves a seamless measurement of LCR and material parameters from 20 Hz to 3 GHz.



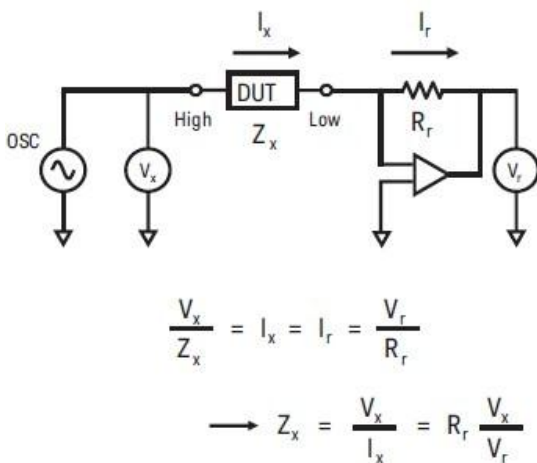
❖ Instrument parameters

Device Name	E4991A	E4990A
Fixture Type	7mm Coaxial	7mm Coaxial、4-terminal pair
Frequency Range	1 MHz to 3 GHz	20 Hz to 120 MHz
Measurement Methods	RF IV	Auto-balance bridge
Accuracy	$\pm 0.8\%$	$\pm 0.08\%$
Impedance Range	130 m Ω to 20 k Ω	20 m Ω to 40 M Ω
DC Bias	0~ ± 40 V, ± 100 μ A~ ± 50 mA	0~ ± 40 V/ ± 100 mA
Material Parameters	Permeability、Permittivity	-
Spectrum	Yes	Yes

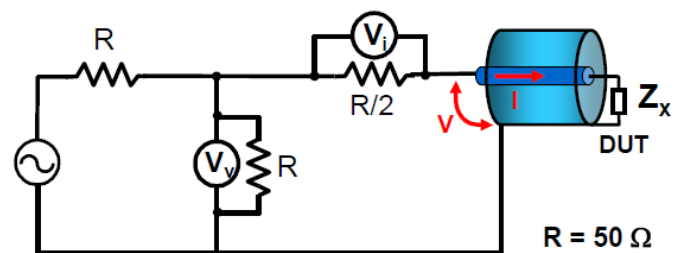
❖ Measurement method

Due to the different operating frequency, the measurement method is not the same. While E4990A (20 Hz to 120 MHz) use auto-balancing bridge method and E4991A (1 MHz to 3 GHz) use ratio-frequency IV method.

- Auto-balancing bridge method: The current I_x balances with the current I_r which flows through the range resistor (R_r), by operation of the I-V converter. The potential at the Low point is maintained at zero volts (thus called a virtual ground.) The impedance of the DUT is calculated using the voltage measured at the High terminal (V_x) and across R_r (V_r).
- RF-IV method: While the RF I-V measurement method is based on the same principle as the I-V method, it is configured in a different way by using an impedance-matched measurement circuit (50ohm) and a precision coaxial test port for operation at higher frequencies.



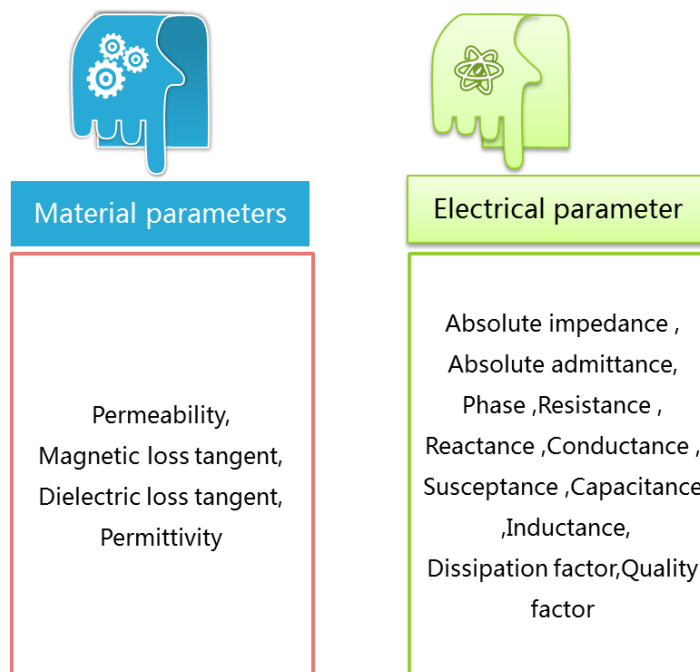
Auto-balancing bridge method



RF-IV method

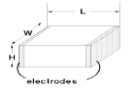
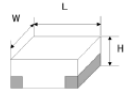

❖ Test item

Both can achieve all the electrical parameters measurement whining each test frequency. They can also achieve test at different temperatures by carrying temperature characteristics system. They can achieve greater bias conditions (up to 5A) with an external DC bias source. In addition, E4991A can test material parameters.



❖ Test object

E4991A can achieve electrical and material parameters measurement of different sizes of SMD and plug-in components by connecting different types of test fixtures (7mm coaxial).The size can be more flexible by connecting 4TP adapter with E4990A.

ProductsType	Size range[code in mm/(EIA code in inch)]	DUT Type	Photo
Parallel	1005(0402)~5705(2210)、 0402(01005)	Multilayer chip ferrite inductor	
Bottom	0603(0201)~3225(1210)	Wire wound SMD power inductor	
Magnetic Ring	$I_d > 3.1$, $O_d < 8$, $T < 3$	Magnetic ring	
Plug-in	1005~5705(0402~2210)	Power transformer	