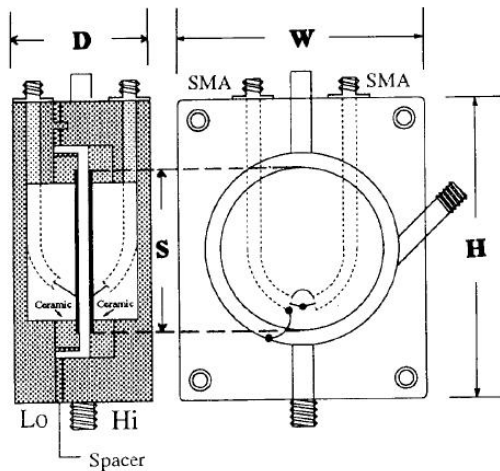


Specifications

This section lists the complete 16452A specifications. These specifications are the performance standards and limits against which the 16452A is tested. When shipped from the factory, the 16452A meets the following specifications:

Electrode Size (S)	$\phi 38 \pm 0.5$ (mm)
Dimension	85 (H) x 85 (W) x 37 (D)(mm)
Weight	1.4 kg
Maximum Operating Voltage	30 Vrms

Figure 1-1 Electrode Size of the 16452A (section view)



Operating Frequency	20 Hz to 30 MHz
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The operating frequency differs according to the instrument that the 16452A is used with.

Materials

Test fixture body (electrodes, spacers, liquid inlet and outlet)

Nickel-plated cobal (Fe 54%, Co 17%, Ni 29%)

Insulator

Ceramic (alumina Al_2O_3)

O-ring

Viton (Fluoro rubber)

Insulator soldering

Silver-copper and
gold-copper

General Information
Specifications

The typical corrosive characteristics of these materials are shown in Appendix A.

Operating Temperature -20 to +125°C

The measurement cable's operating temperature is:

16048A 0 to +55°C

16048G/H + 1250-2375 -20 to +150°C

Non-Operating Temperature -40 to 70°C

Supplemental Performance Characteristics

This section lists supplemental performance characteristics. Supplemental performance characteristics are not specifications, but are typical characteristics included as additional information for the operator. Supplemental performance characteristics are not guaranteed.

Electrode gap repeatability (Screw torque: 15 kgf·cm)	100 Hz to 15 MHz
Assembly repeatability	See Table 1-1
Temperature repeatability (@23°C to 125°C)	See Table 1-1
Necessary liquid volume	See Table 1-1
Air Capacitance Value (@23°C ± 5°C, 1MHz)	See Table 1-1

Table 1-1

Typical Data

Spacer thickness	1.3mm	1.5mm	2.0mm	3.0mm
Electrode gap assembly repeatability	0.3mm±12µm	0.5mm±12µm	1.0mm±12µm	2.0mm±12µm
Electrode gap temperature repeatability	0.3mm±2µm	0.5mm±2µm	1.0mm±2µm	2.0mm±2µm
Necessary liquid volume	3.4ml	3.8ml	4.8ml	6.8ml
Air capacitance value	34.9pF±25%	21.2pF±15%	10.9pF±10%	5.5pF±10%

Short residual (when using the furnished shorting plate with a 1.3mm spacer)

LS (equivalent series inductance) 20nH

RS (equivalent series resistance) 0.5Ω

Temperature expansion coefficient ≤ ±300ppm/°C

Additional impedance measurement

In the following measurement,

- The SHORT compensation is done.

General Information
Supplemental Performance Characteristics

- The calculation is done using the capacitive measurement method (see “Capacitive Measurement Method” on page 34).
- The measurement instrument is LCR Meter/Impedance Analyzer with 4 terminal pair.
- The relative dielectric constant is $1 < |\dot{\epsilon}_r| < 500$

The fixture error¹ is defined by:

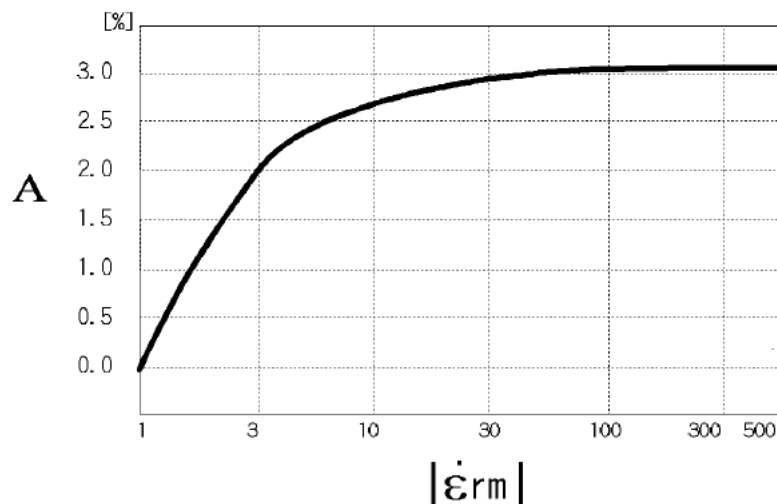
$$\text{Error} = A + B \text{ [%]} \text{ (See Figure 1-4)}$$

Where,

A :Obtained from Figure 1-2

B :Obtained from Figure 1-3

Figure 1-2 Fixture Error (A)



1. The measurement accuracy is a complex function of the measurement instrument accuracy and the fixture error.

Figure 1-3 Fixture Error (B)

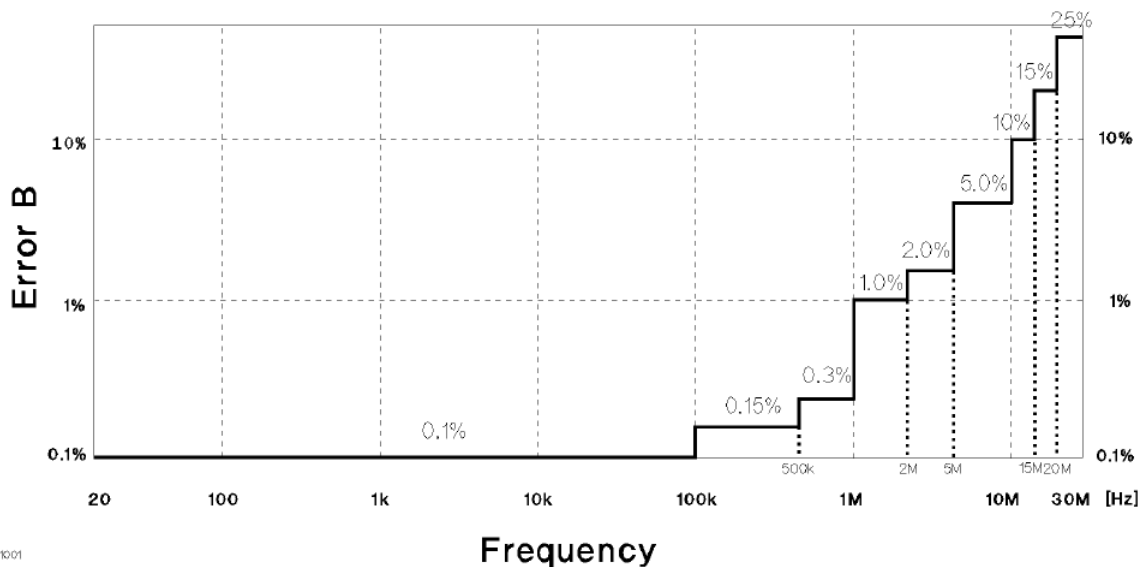
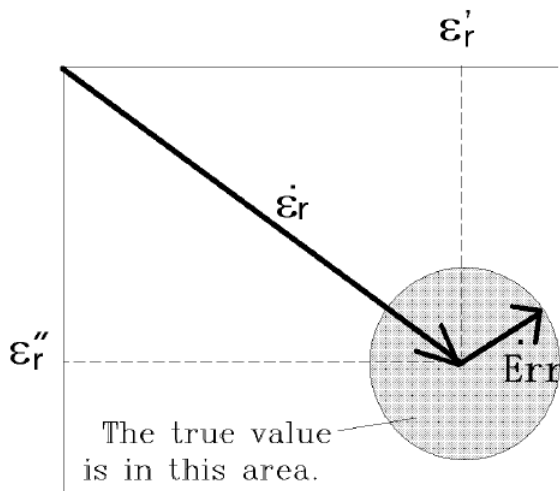


Figure 1-4 Fixture Error (A+B)



The true value is a vector sum of $\dot{\epsilon}_r$ and $\dot{\epsilon}_{rr}$.

Where,

$\dot{\epsilon}_r$: Measurement result

$\dot{\epsilon}_{rr}$: Fixture Error

$$\frac{|\dot{\epsilon}_{rr}|}{|\dot{\epsilon}_r|} \leq A+B [\%]$$