Options Available

The following option is supplied for the 16193A:

Option 001 Delete the magnifying lens and tweezers

Option 010 Add industry standard size short bar set

Accessories Supplied

The following accessories are supplied with the 16193A:

Table 1-1. Furnished Accessories

Description	Part Number	Quantity
Operation and Service Manual	P/N 16193-90040	1
Shorting device (4 types)	P/N 16191-29001	1
	P/N 16191-29002	1
	P/N 16191-29003	1
	P/N 16191-29004	1
Case for shorting devices	P/N 1540-0692	1
Option 010[*1]	P/N 16191-29005	1
	P/N 16191-29006	1
	P/N 16191-29007	1
	P/N 16191-29008	1
Magnifying lens	P/N 16193-60002	1
Tweezers	P/N 8710-2081	1
Wrench	P/N 8710-1181	1

[*1] Option 010 sizes are the same as industry standard (EIA/EIAJ) SMD sizes. This short bar set has the following SMD sizes included : 1005(mm)/0402(inch), 1608(mm)/0603(inch), 2012(mm)/0805(inch), 3216(mm)/1206(inch). Order option 010 if the SMD that is to be measured has the same size as the EIA/EIAJ sizes.

Specifications

This section lists the complete 16193A specifications. These specifications are the performance standards and limits against which the 16193A is tested. When shipped from the factory, the 16193A meets the following specifications:

Maximum DC Bias Voltage ..... ± 40V
Operating Temperature ..... –55 to +85°C
Operating Humidity (@wet bulb temperature <40°C)
..... 15 % to 95 % RH
Non-operating Temperature ..... –55 to +85°C
Non-operating Humidity (@wet bulb temperature <65°C)
..... Up to 90 % RH
Weight ..... 500 g
Dimension ..... 150(W) × 70 (H) × 80(D) [mm]

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.

Frequency Range ..... DC to 2 GHz
Applicable DUT size (see Figure 1-1) ..... 0.5 mm to 3.2 mm
Supplied shorting device size
P/N 16191-29001 ..... 1 × 1 × 2.4 [mm]
P/N 16191-29002 ..... 1.6 × 2.4 × 2 [mm]
P/N 16191-29003 ..... 2.4 × 2.4 × 3.2 [mm]
P/N 16191-29004 ..... 2.4 × 2.4 × 4.5 [mm]
Option 010 shorting device size
P/N 16191-29005 ..... 1.0(L) × 0.5(W) × 0.5(H) [mm]
P/N 16191-29006 ..... 1.6(L) × 0.8(W) × 0.8(H) [mm]
P/N 16191-29007 ..... 2.0(L) × 1.2(W) × 0.8(H) [mm]
P/N 16191-29008 ..... 3.2(L) × 1.6(W) × 0.8(H) [mm]
Electrical length (when the length between electrodes is 2 mm) ..... 14.0 mm
Additional Error* ..... $1.5 \times f^2$ [%]
Repeatability*
(for inductive component) ..... $30 + 250 \times f$ [mΩ]
(impedance of 30 mΩ, 40 pH)
..... $2 + 30 \times f$ [μS]
(admittance of 2 μS, 5 fF)

* f: frequency (GHz)

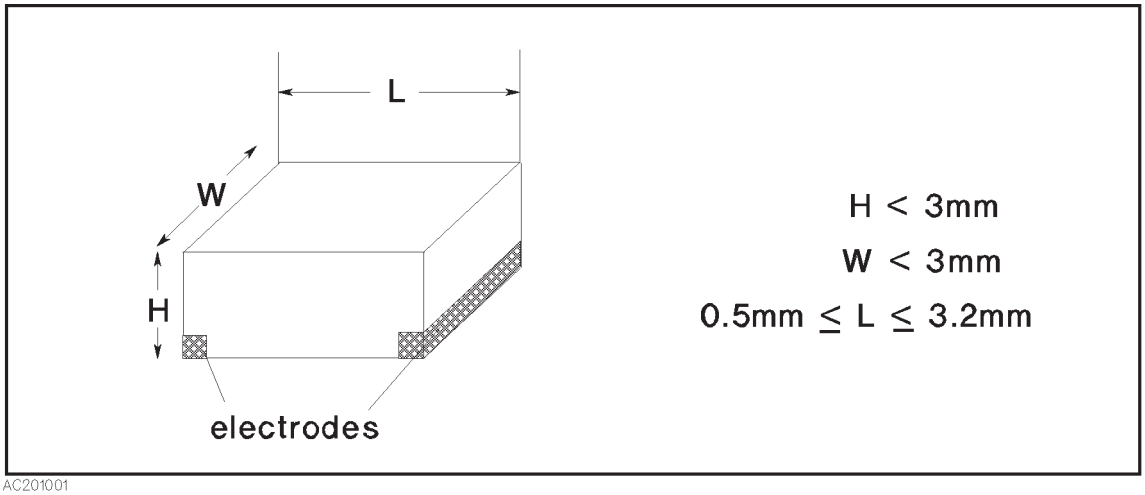

Figure 1-1. Applicable DUT Size

Residual Inductance of the Shorting Bar

The usual method to compensate the test fixture's residual inductance is to let SHORT = 0H. In this method, the measurement result is the relative value of the measured impedance to the shorting bar's impedance. The short bar's residual inductance as a result of its size and shape is not estimated.

On the other hand, there is a definition method to let SHORT = x H. In this method, the measurement result is the absolute value of the device's impedance. The short bar's residual inductance as a result of its size and shape is estimated under specific conditions and is used as a reference value. This method, is useful for devices with values which are close to the short conditions of the measurement system.

The reference inductance values presented Table 1-2 and Table 1-3 were simulated as the relative difference to a disk-type 0 Ω termination on either the 7 mm or the 3.5 mm connector. The measurement of these short bars under other conditions than shown below cannot reproduce the reference inductance values.

Table 1-2. Supplied Shorting Device Residual Inductance (Typical)

Shorting Bar	l [mm]	d [mm]	h [mm]	Offset [mm]	Connector	Inductance (Typical)
P/N 16191-29001	1	2.4	1	0.75	3.5 mm	0.2 nH
P/N 16191-29002	1.6	2.4	2	0.45	3.5 mm	0.2 nH
P/N 16191-29002	2	2.4	1.6	0.25	3.5 mm	0.2 nH
P/N 16191-29002	2.4	2	1.6	1.3	7 mm	0.7 nH
P/N 16191-29003	3.2	2.4	2.4	0.9	7 mm	0.6 nH
P/N 16191-29004	4.5	2.4	2.4	0	7 mm	0.6 nH

Table 1-3. Option 010 Shorting Device Residual Inductance (Typical)

Shorting Bar	l [mm]	d [mm]	h [mm]	Offset [mm]	Connector	Inductance (Typical)
P/N 16191-29005	1.0	0.5	0.5	0.75	3.5 mm	0.5 nH
P/N 16191-29006	1.6	0.8	0.8	0.45	3.5 mm	0.4 nH
P/N 16191-29007	2.0	1.2	0.8	1.5	7 mm	0.9 nH
P/N 16191-29008	3.2	1.6	0.8	0.9	7 mm	0.8 nH

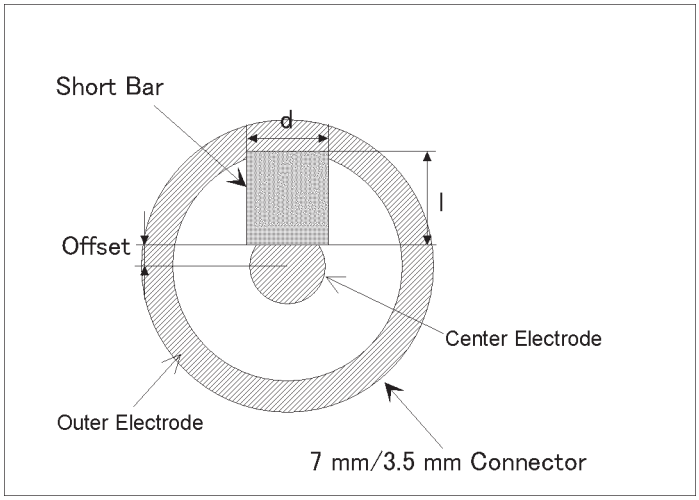

Figure 1-2. Simulation Setup