

# IM9110

## SMD TEST FIXTURE

### Instruction Manual

EN

Aug. 2018 Revised edition 1

IM9110A961-01 18-08H



# HIOKI

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Edited and published by HIOKI E.E. CORPORATION

Printed in Japan

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### Warranty Certificate

**HIOKI**

Model	Serial number	Warranty period
		Three (3) years from date of purchase ( ___ / ___ )

Customer name: \_\_\_\_\_  
Customer address: \_\_\_\_\_

**Important**

- Please retain this warranty certificate. Duplicates cannot be reissued.
- Complete the certificate with the model number, serial number, and date of purchase, along with your name and address. The personal information you provide on this form will only be used to provide repair service and information about Hioki products and services.

This document certifies that the product has been inspected and verified to conform to Hioki's standards. Please contact the place of purchase in the event of a malfunction and provide this document, in which case Hioki will repair or replace the product subject to the warranty terms described below.

**Warranty terms**

- The product is guaranteed to operate properly during the warranty period (three [3] years from the date of purchase). If the date of purchase is unknown, the warranty period is defined as three (3) years from the date (month and year) of manufacture (as indicated by the first four digits of the serial number in YYMM format).
- If the product came with an AC adapter, the adapter is warranted for one (1) year from the date of purchase.
- The accuracy of measured values and other data generated by the product is guaranteed as described in the product specifications.
- In the event that the product or AC adapter malfunctions during its respective warranty period due to a defect of workmanship or materials, Hioki will repair or replace the product or AC adapter free of charge.
- The following malfunctions and issues are not covered by the warranty and as such are not subject to free repair or replacement:
  - 1. Malfunctions or damage of consumables, parts with a defined service life, etc.
  - 2. Malfunctions or damage of connectors, cables, etc.
  - 3. Malfunctions or damage caused by shipment, dropping, relocation, etc., after purchase of the product
  - 4. Malfunctions or damage caused by inappropriate handling that violates information found in the instruction manual or on precautionary labeling on the product itself
  - 5. Malfunctions or damage caused by a failure to perform maintenance or inspections as required by law or recommended in the instruction manual
  - 6. Malfunctions or damage caused by fire, storms or flooding, earthquakes, lightning, power anomalies (involving voltage, frequency, etc.), war or unrest, contamination with radiation, or other acts of God
  - 7. Damage that is limited to the product's appearance (cosmetic blemishes, deformation of enclosure shape, fading of color, etc.)
  - 8. Other malfunctions or damage for which Hioki is not responsible
- The warranty will be considered invalidated in the following circumstances, in which case Hioki will be unable to perform service such as repair or calibration:
  - 1. If the product has been repaired or modified by a company, entity, or individual other than Hioki
  - 2. If the product has been embedded in another piece of equipment for use in a special application (aerospace, nuclear power, medical use, vehicle control, etc.) without Hioki's having received prior notice
- If you experience a loss caused by use of the product and Hioki determines that it is responsible for the underlying issue, Hioki will provide compensation in an amount not to exceed the purchase price, with the following exceptions:
  - 1. Secondary damage arising from damage to a measured device or component that was caused by use of the product
  - 2. Damage arising from measurement results provided by the product
  - 3. Damage to a device other than the product that was sustained when connecting the device to the product (including via network connections)
- Hioki reserves the right to decline to perform repair, calibration, or other service for products for which a certain amount of time has passed since their manufacture, products whose parts have been discontinued, and products that cannot be repaired due to unforeseen circumstances.

HIOKI E.E. CORPORATION  
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### Introduction

Thank you for purchasing the Hioki IM9110 SMD Test Fixture. To obtain maximum performance from the device, please read this manual first, and keep it handy for future reference.

### Verifying Package Contents

When you receive the device, inspect it carefully to ensure that no damage occurred during shipping. In particular, check the connectors. If damage is evident, or if it fails to operate according to the specifications, contact your authorized Hioki distributor or reseller.

Please remove the seal which holds the control lever before using the device for the first time.

### Precautions during shipment

- Store the packaging in which the device was delivered, as you will need it when transporting the device.
- To avoid damage to the device, use the original packing materials in which it was shipped, and be sure to pack in a double carton. Damage occurring during transportation is not covered by the warranty.
- When sending the device for repair, be sure to include a description of the problem.

### Repair

If you are unable to make measurement even after cleaning the measurement location with the supplied cleaning brush, contact your authorized Hioki distributor or reseller.

### Consumable parts

The short compensation jig is a consumable part and can be purchased. If it is lost or if it is unable to perform compensation due to deformation, please contact your authorized Hioki distributor or reseller.

### Disposal

Handle and dispose of the device in accordance with local regulations.

## Safety Notes

Before using the device, be certain to carefully read the following safety notes:

### CAUTION

- Mishandling during use could damage to the device. Be certain that you understand the instructions and precautions in the manual before use.
- If persons unfamiliar with electricity measuring device are to use the device, another person familiar with such devices must supervise operations.

### Notations

In this manual, the risk seriousness and the hazard levels are classified as follows.

	Indicates a potentially hazardous situation that may result in death or serious injury to the operator.
	Indicates a potentially hazardous situation that may result in minor or moderate injury to the operator or damage to the device or malfunction.
	Indicates prohibited actions.
	Indicates the action which must be performed.

### Symbols for standards

	Indicates that the product conforms to regulations set out by the EC Directive.
	Indicates the Waste Electrical and Electronic Equipment Directive (WEEE Directive) in EU member states.

## Operating Precautions

Follow these precautions to ensure safe operation and to obtain the full benefits of the various functions.

### WARNING

Installing the device in inappropriate locations may cause a malfunction of device or may give rise to an accident. Avoid the following locations:

- Exposed to direct sunlight or high temperature
  - Exposed to corrosive or combustible gases
  - Exposed to a strong electromagnetic field or electrostatic charge
  - Near induction heating systems (such as high-frequency induction heating systems and IH cooking equipment)
  - Susceptible to vibration
  - Exposed to water, oil, chemicals, or solvents
  - Exposed to high humidity or condensation
  - Exposed to high quantities of dust particles
- Do not use the device beyond its rated and specification ranges. Doing so may damage the device or cause it to become hot, resulting in electric shock.
- Customers are not allowed to modify, disassemble, or repair the device. Doing so may cause fire, electric shock, or injury.
- To avoid electric shock when using the IM9110 with the 9268 or 9268-10 DC Bias Voltage Unit, never touch the measurement terminals while a DC voltage (DC vias) is being input.

### CAUTION

- To avoid damage to the device, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.

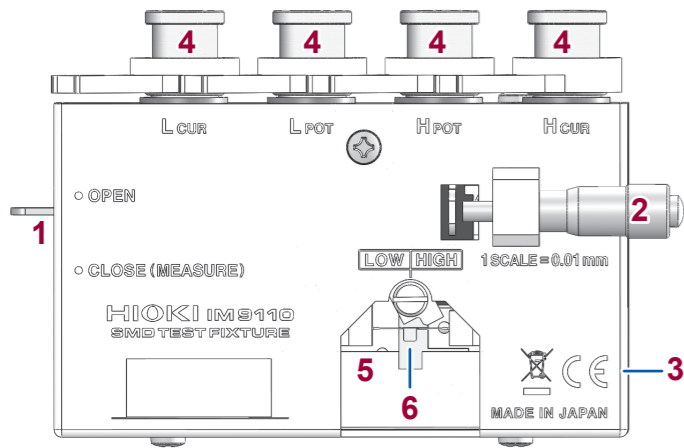
## Overview

The IM9110 SMD Test Fixture is a test fixture for SMD components that connects directly to the measurement terminal (UNKNOWN terminal) on a Hioki LCR meter or Hioki C meter. It allows you to perform measurement of 0201 chip size component (L/W/T = 0.25 mm × 0.125 mm × 0.125 mm) with side contact. Since this device comes equipped with a micrometer, the distance between two measurement probes can be easily set.

## Specifications

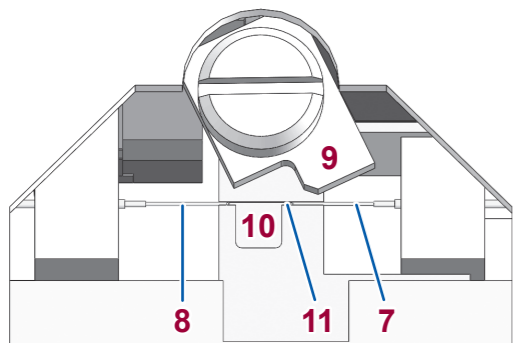
<b>Connectable instruments</b>	Auto balancing bridge type Hioki LCR meters or Hioki C meters
<b>Supported models</b>	3506-10, 3511-50, 3522-50, 3532-50, IM3523, IM3533, IM3533-01, IM3536, IM3570, IM3590 (as of August, 2018) For updated information, contact your authorized Hioki distributor or reseller.
<b>Operating environment</b>	Indoors, altitude up to 2000 m (6562 ft.)
<b>Operating temperature and humidity</b>	0°C to 40°C (32°F to 104°F), 80% RH or less (no condensation)
<b>Storage temperature and humidity</b>	-10°C to 55°C (14°F to 131°F), 80% RH or less (no condensation)
<b>Dimensions</b>	Approx. 99W × 42H × 73D mm /3.90"W × 1.65"H × 2.87"D (Excluding protruding parts such as the control lever, lock lever, and micrometer)
<b>Mass</b>	Approx. 270 g (9.5 oz.)
<b>Product warranty period</b>	3 years This warranty does not apply to measurement probes, holder (at the measurement location), and movable parts.
<b>Connection to measuring instrument</b>	4-terminal pair design
<b>Instrument connectors</b>	BNC (connector spacing: 22 mm)
<b>Contact with DUT (sample)</b>	Side contact, 2-terminal design
<b>Measurable DUT (sample) size</b>	0.25 ±20% × 0.125 ±10% × 0.125 ±10% mm (JIS: 0201)
<b>Maximum input voltage</b>	±42 V peak (AC+DC)
<b>Maximum input current</b>	0.15 A rms (±0.15 A DC)
<b>Usable frequency range</b>	DC to 1 MHz
<b>Residual parameter values (reference values at 1 MHz measurement frequency)</b>	Capacitance: C < 35 fF (when the distance between two measurement probes is set to 0.25 mm) Inductance: L < 120 nH (2-terminal design using a short compensation jig) Resistance: R < 800 mΩ (2-terminal design using a short compensation jig) The L and R values stated are when the contact pressure is 0.1 N (10.2 gf) (with 0.1 mm push)
<b>Contact pressure applied to DUT (sample)</b>	0.14 N (14.3 gf) or less 0.09 N (9.2 gf) + 0.01 N (1 gf) /0.1 mm (The value varies with the micrometer's setting.)
<b>Distance setting between two measurement probes</b>	With a 0.01 mm increment micrometer
<b>Accessories</b>	<ul style="list-style-type: none"> <li>• Instruction manual × 1</li> <li>• Short compensation jig × 5 (packed in a translucent container)</li> <li>• Cleaning brush × 1</li> </ul>

## Part Names



1	Control lever
2	Micrometer (The smallest increment of the scale = 0.01 mm, one full turn = 0.5 mm)
3	Enclosure
4	BNC connectors (with lock levers) for signal connections
5	Measurement location
6	Holder

### Enlarged view of the measurement location

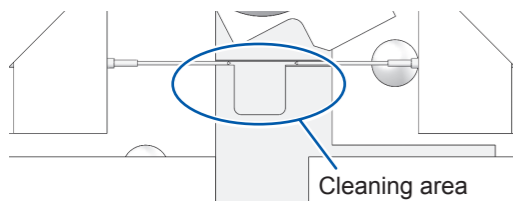


7	Measurement probe (fixed side)	10	Temporary placing table
8	Measurement probe (movable side)	11	Guide groove
9	Open and close cover (linked with the control lever)		

## Cleaning

### Measurement location

Clean the measurement location regularly with the cleaning brush provided with the instrument. Move the control lever to the **OPEN** position and gently move the brush back and forth several times.



### Other areas of the device

To clean the device, wipe it gently with a soft cloth moistened with water or mild detergent.

## Connecting to the Instrument

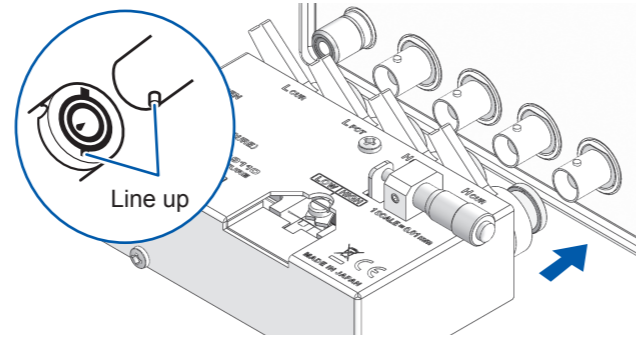
### Inspection Before Use

Before using the device, verify that it operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact your authorized Hioki distributor or reseller.

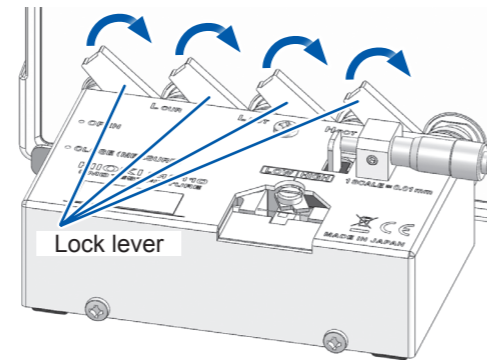
### CAUTION

To prevent damage to the BNC connector, be sure to release the locking mechanism, grip the head of the connector, and pull it out.

- 1 Align the device's BNC connectors with the instrument's BNC connectors and insert them.



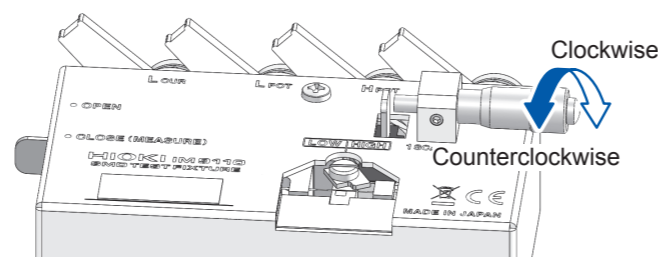
- 2 Lock the device in place with the lock lever.



## Operating Micrometer

When the control lever is in the **CLOSE (MEASURE)** position, the distance between the two measurement probes can be set using the micrometer. Connect the device to the instrument first and then, by turning the micrometer's knob, find the position where the circuit state between the two measurement probes is switched between an open-circuit state (non-conducting state) and a short-circuit state (conducting state).

Turning the knob in clockwise direction	The distance between the two probes will become larger
Turning the knob in counterclockwise direction	The distance between the two probes will become smaller



## Performing Short and Open Compensations

To reduce measurement error, perform compensations in the following order: short compensation and open compensation. The compensation method varies with the instrument to which the device is to be connected. See the manual that came with the instrument. It is necessary that the short compensation value is less than the resistance value specified in the "Residual parameter values" of the specifications. Have the device repaired if the short compensation value is particularly large even if the measurement location is cleaned regularly. (See "Cleaning" about how to clean the device.)

### Short Compensation

You will need: A short compensation jig

- 1 Move the control lever to the **OPEN** position.
- 2 Place the short compensation jig. (For the detailed procedure, see Steps 3 & 4 of "Performing Measurement".)
- 3 Move the control lever to the **CLOSE (MEASURE)** position.
- 4 Turn the micrometer's knob until you find the position where the circuit state between the two measurement probes is switched between an open and a short state.
- 5 Turn the micrometer's knob ten increments (0.1 mm) counterclockwise from that position and perform short compensation.
- 6 After short compensation is complete, move the control lever to the **OPEN** position and remove the short compensation jig by reversing the steps used to secure it in place.

### To perform short compensation without using a short compensation jig (when it is lost or broken)

(If the short compensation jig is not used, measured values may vary significantly due to the effects of contact resistance.)

- 1 Move the control lever to the **CLOSE (MEASURE)** position.
- 2 Turn the micrometer's knob until you find the position where the circuit state between the two measurement probes is switched between an open and a short state.
- 3 Turn the micrometer's knob ten increments (0.1 mm) counterclockwise from that position and perform short compensation.

### Open Compensation

To perform open compensation without using a DUT

- 1 Move the control lever to the **CLOSE (MEASURE)** position.
- 2 Turn the micrometer's knob until you find the position where the circuit state between the two measurement probes is switched between an open and a short state.
- 3 Turn the micrometer's knob one-half turn (0.25 mm) clockwise from that position and perform open compensation.

To perform open compensation using a DUT

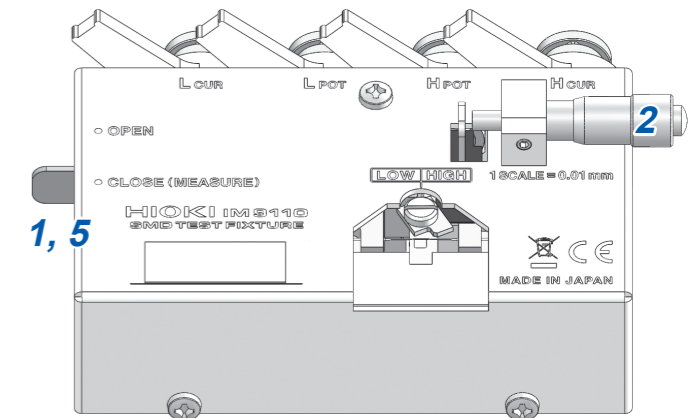
- 1 Move the control lever to the **OPEN** position.
- 2 Place the DUT. (For the detailed procedure, see Steps 3 & 4 of "Performing Measurement".)
- 3 Move the control lever to the **CLOSE (MEASURE)** position.
- 4 Turn the micrometer's knob until you find the position right before the measurement probes come into contact with the DUT.
- 5 Move the control lever to the **OPEN** position and remove the DUT.
- 6 Move the control lever to the **CLOSE (MEASURE)** position and perform open compensation.

## Performing Measurement

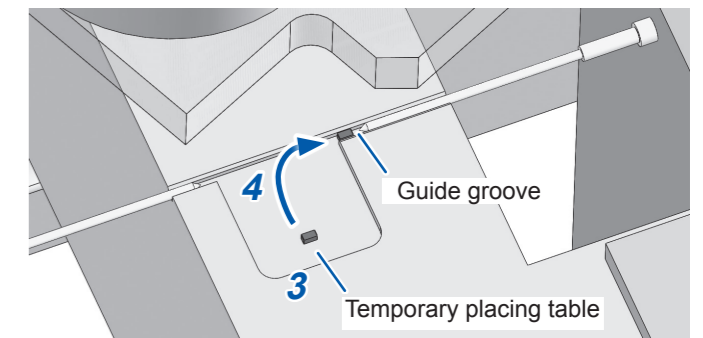
You will need: A pair of tweezers

- 1 Move the control lever to the **OPEN** position.
- 2 Turn the micrometer's knob ten increments (0.1 mm)\* counterclockwise from the position where the open compensation was performed.

\*The reference value. The optimal value varies with the test DUT.



- 3 Place the DUT on the temporary placing table using a pair of tweezers.
- 4 Move the DUT to the guide groove.



- 5 Move the control lever to the **CLOSE (MEASURE)** position.
- 6 Perform measurement with the instrument.
- 7 After measurement is complete, move the control lever to the **OPEN** position and remove the DUT by reversing the steps used to secure it in place.

To make a continuous measurement, repeat Steps 3 through 7.