



# HIOKI

## 1270/1271 X-Y BOARD HiTESTER

### Dual-Sided Bare Board Test Equipment

Automatic Testing  
Equipment



# Superior cost effectiveness



## Maximum Measurement Speed of 0.012 s/step

The 1270/1271 X-Y BOARD HiTESTERS are fixtureless, dual-sided, bare board testers that provide superior cost performance. Using a total of four arms, two in front and two in back, it is capable of simultaneously testing both sides of a board, and is available with a 4-terminal resistance measurement function (optional) that allows measurement of very small resistances in IVH or through holes.

1270 ( Board size : 50 × 50 to 400 × 330mm )

1271 ( Board size : 50 × 70 to 610 × 510mm )



ISO14001  
JQA-E-90091



<http://www.hioki.co.jp/>

HIOKI company overview, new products, environmental considerations and other information are available on our website.

# A Wide Range of Test Capabilities -- With High Speed and High Precision

The conductivity detection and capacitance measurement methods provide all the features required for dual-sided testing in a wide range of testing capabilities. The 1270/1271 can not only detect build-up board broken connections with IVH, but it can also measure resistance values, making it possible to detect defects such as cracks that are not visible to the eye.

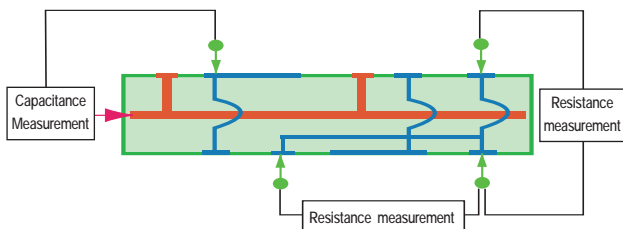


## A Wide Range of Test Capabilities

Continuity testing by the insulation conductivity test method	<ul style="list-style-type: none"> <li>● Pattern resistance test</li> <li>● Insulation test between nets</li> </ul>
Continuity testing by combination of capacitance and resistance tests (Patent No. 1736393)	<ul style="list-style-type: none"> <li>● Pattern resistance test</li> <li>● Detection of high-resistance short by capacitance measurement (high-speed insulation test)</li> <li>● Detection at single pads of ICs</li> </ul>
Continuity testing by capacitance measurement method	<ul style="list-style-type: none"> <li>● High-speed insulation conductivity test</li> </ul>
IVH and through hole resistance test	<ul style="list-style-type: none"> <li>● High-speed, high-precision four-terminal resistance measurement</li> </ul>
L, C, R and D measurement	<ul style="list-style-type: none"> <li>● Measures internal board characteristic constants</li> </ul>

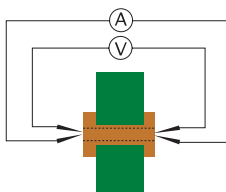
### Combined measurement method

Combination testing for detection of short circuits and broken connections. With combination testing, impedance measurement (capacitance measurement) and resistance measurement are used together to test the electrical circuit network. This facilitates high testing efficiency. (Patent No. 1736393)



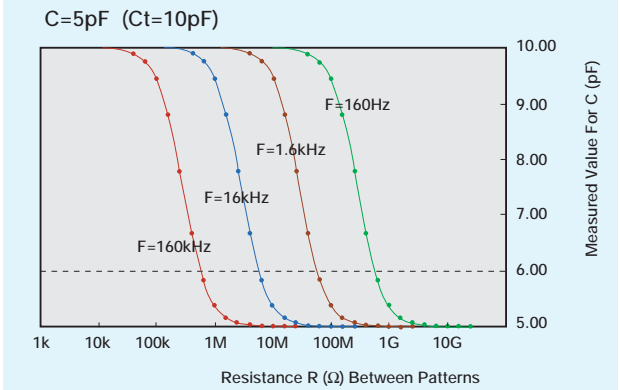
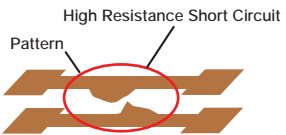
### Four-terminal resistance measurement (Optional)

Very small resistances of IVH and through holes are measured by the four-terminal resistance measurement method and four-terminal probe. This four-terminal method measures low resistance correctly without being affected by test leads or contact resistance.



### Detection of High Resistance Short Circuits with Capacitance Measurement

Capacitance variations can be accurately measured based on the resistance between neighboring patterns, to detect short circuits that have high resistance. The detection range depends on the frequency. A single measurement detects short circuits between one net and all the other nets.



■ **Maximum Measurement Speed of 0.012 Seconds per Step**

High speed testing: maximum speed of 0.012 seconds per step with high precision.

(0.1 mm movement, four arms simultaneously, during capacitance measurement)

■ **High Resolution of 5 aF for Capacitance Measurement (1 aF = 10<sup>-6</sup> pF)**

The variation in capacitance ( $\Delta C$ ) when there is a defect is extremely small, so capacitance measurement requires high resolution capabilities. The 1270/1271 offers extremely high resolution of 5 aF to accurately detect very small variations.

■ **High-precision probing**

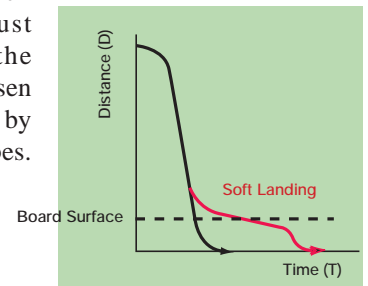
Minute, fine-pitch pads can be reliably probed with high-precision support for pad diameters as small as 20  $\mu\text{m}$ .

■ **Insulated measurement function (Optional)**

Add the insulation withstand voltage test to the capacitance measurement method. Test voltage is settable from 1 to 250V DC at 1V resolution for measurement ranges up to 500 M $\Omega$  (depending on test voltage), so highly efficient testing is possible by selecting a power-related or any other desired net. Also included are a high-voltage resistance measurement mode to judges pass-fail insulation resistance by upper and lower limits, and a conductivity test mode using high open-circuit voltage (~120V DC).

■ **Minimization of Gouges**

Gouges are kept to a minimum by the high speed soft landing feature, which reduces the speed just before reaching the pattern in order to lessen the striking force, and by impact absorbing probes.

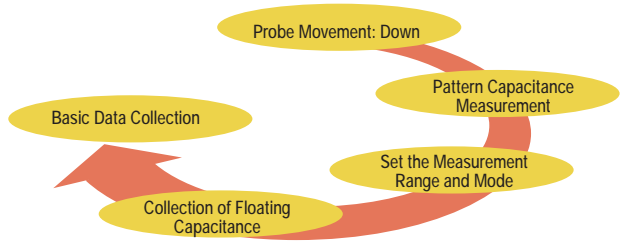


■ **Four-Edge Chuck Method**

All four edges of the board are chucked for stable measurements. The left and right sides can be chucked only at the central region.

■ **Simple Basic Data Collection**

An automatic sequence of operations collects the basic data.



**Probes to support various tests**

A wide selection of probes are available to support a variety of test objects. Choose the probes most suitable for your application.

- 1172-66 LINK PROBE
- 1172-67 DOUBLE LINK PROBE
- 1172-68 LINK PROBE WITH BLADE
- 1172-69 DOUBLE LINK PROBE WITH BLADE
- 1172-70 SHOCK-ABSORBING SINGLE NEEDLE PROBE(SK)\*
- 1172-71 SHOCK-ABSORBING SINGLE NEEDLE PROBE(WC)\*
- 1172-72 SHOCK-ABSORBING TRIANGULAR PYRAMID PROBE(SK)\*
- 1172-74 PROBE FOR CALIBRATION(For use with measurement section calibration unit)
- 1172-75 SHOCK-ABSORBING SINGLE NEEDLE PROBE (HP)\*

- 1172-76 SHOCK-ABSORBING SINGLE NEEDLE PROBE (HP SR10)\*
- 1172-77 SHOCK-ABSORBING SINGLE NEEDLE PROBE (WC SR10)\*
- 1172-80 PROBE
- 1172-81 LINK PROBE
- 1172-83 DOUBLE LINK PROBE(HP)

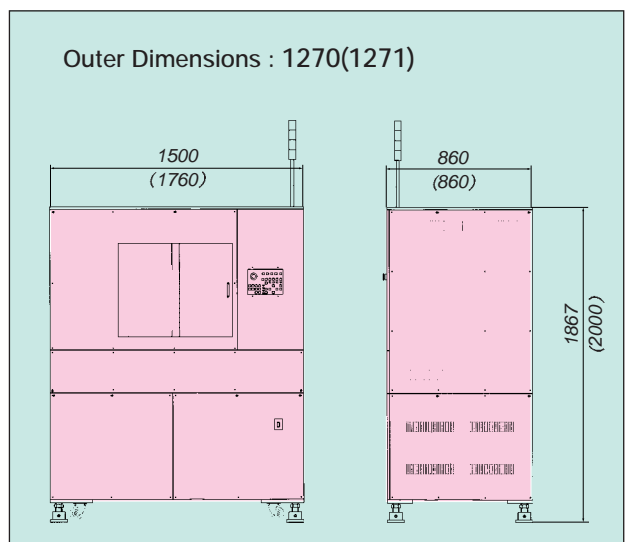
\*Requires the 1164-03 PROBE ATTACHMENT.

**Measurement Step Comparison**

The capacitance measurement method performs pattern testing with fewer measurement steps than the conductivity detection method. The 1270/1271 can use either method, but the capacitance measurement method greatly reduces the measurement time.

Example With 100 Nets and a Total of 500 Nodes

	Conductivity Detection Method	Capacitance Measurement Method
<b>Discontinuity Testing</b>	All nodes within the same net: 500 - 100 = 400	Measure the capacitance of all nodes to detect discontinuities and short circuits: 500
<b>Short Circuit Testing</b>	$nCr = 100C2$ $100 \times (100 - 1) / 2 = 4950$	
<b>Measurement Steps</b>	<b>5350</b>	<b>500</b>



## ■ 1270/1271 Specifications

<b>Number of Arms</b>	4 (two each, front and back)
<b>Number of Test Steps</b>	40,000 steps (300,000 for continuous testing)
<b>Test Ranges</b>	DC Measurement Function
	Resistance: 4Ω to 40 MΩ 400 μΩ to 4Ω * <sup>1</sup>
	Capacitance: 4 μF to 400 mF
	Diodes and Transistors (VF): 0 to 25 V
	Zener Diodes (VZ): 0 to 25 V
	Photocouplers: 0 to 25 V
	Short Circuit: 400 mΩ to 40 kΩ
	Open Circuit: 4 Ω to 4 MΩ
	Voltage: 0 to 25 V
	AC Measurement Function
Resistance: 100 Ω to 100 MΩ 1 m Ω to 100 Ω * <sup>2</sup>	
Capacitance: 10 fF to 10 μF	
Inductance: 10 μH to 100 H	
<b>Measurement Signal</b>	DC Constant Voltage: 100 mV / 400 mV (2 ranges)
	DC Constant Current: 200 nA to 200 mA (13 ranges)
	AC Constant Voltage: 1 V / 10 V rms (2 ranges) 160 Hz / 1.6 kHz / 16 kHz / 160 kHz
<b>Measurement Section</b>	DC Voltage Measurement: 800 μV to 25 V f.s. (8 ranges)
	DC Current Measurement: 100 nA to 25 mA f.s. (7 ranges)
	AC Current Measurement: 10 μA to 1 mA rms (3 ranges, for 1 V rms) 1 μA to 100 μA peak f.s. (3 ranges, for 10 V peak)
<b>Decision Range Setting</b>	-99.9% to +999.9%, or absolute value
<b>Measurement Time</b>	0.012 seconds / step at top speed (0.1 mm movement with 4-arm simultaneous probing with capacitance measurement method.)
<b>Minimum pad diameter</b>	20 μm
<b>Minimum Movement Resolution</b>	X and Y: 1 μm / pulse, Z: 6 μm / pulse
<b>Minimum Probing Pitch</b>	0.1 mm between the left and right arms when using link probes

<b>Maximum Testable Area</b>	1270: 394 (W) × 324 (H) mm 1271: 604 (W) × 504 (H) mm
<b>Board Fixation</b>	Height: 1170 ± 15 mm (when placed on an even floor) Position: Vertical
<b>Fixation Method</b>	Board four sides hold form (sides are chucked for the center of the board only)
<b>Fixable Boards</b>	Thickness: 0.6 to 3.2 mm Outer Dimensions: 1270: 50 (W) × 50 (H) to 400 (W) × 330 (H) mm 1271: 50 (W) × 70 (H) to 610 (W) × 510 (H) mm
<b>Alignment</b>	Automatic
<b>Safety Devices</b>	Emergency stop switch, safety cover (anti-static resin), arm anti-collision function
<b>Power Supply</b>	200 VAC (single phase), 50/60 Hz Power Consumption: 3 kVA
<b>Operating Environment</b>	Temperature: 23 ± 10 °C Humidity: 75 %rh maximum (no condensation) Environment: Avoid use in environments subject to dust, vibration, or corrosive gases
	Floor Strength: 1270: At least 500 kg/m <sup>2</sup> 1271: At least 700 kg/m <sup>2</sup>
<b>Accessories</b>	Trace sheets(1134-02), Offset board(1350-02), Grease, Grease gun, Hexagonal wrench(2.5), Level jacks×4, Skid seat×4, CRT monitor, Power cord (split-top, 3 m), Spare fuse, PC accessories, Setup disk, Keyboard, PS/2 mouse, Mouse pad
<b>Unit Dimensions</b>	1270: Approx. 1500 (W) × 1800 (H) × 860 (D) mm 1271: Approx. 1760 (W) × 2000 (H) × 860 (D) mm
<b>Mass</b>	1270: Approx. 1000 kg, 1271: Approx. 1200 kg

\*<sup>1</sup> Using the DCmΩ MEASUREMENT UNIT (optional)\*<sup>2</sup> Using the ACmΩ MEASUREMENT UNIT (optional)

1270 X-Y BOARD HITESTER (Board size : 50 × 50 to 400 × 330mm)

1271 X-Y BOARD HITESTER (Board size : 50 × 70 to 610 × 510mm)

### ● Factory options

	Model	
	1270	1271
INSULATION MEASUREMENT UNIT	1933-10	
DCmΩ MEASUREMENT UNIT	1935-21	
ACmΩ MEASUREMENT UNIT	1935-11	1935-12
MAINTENANCE TOOL SET	1356	
STAMP UNIT for FR ARM	1941-51	1941-53
STAMP UNIT for BR ARM	1941-52	1941-54
POSITION COMPENSATION CAMERA UNIT for FR ARM	1940-31	1940-33
POSITION COMPENSATION CAMERA UNIT for BR ARM	1940-32	1940-34
COAXIAL DOWNWARD ILLUMINATION UNIT for FR ARM	1945-41	1945-51
COAXIAL DOWNWARD ILLUMINATION UNIT for FL ARM	1945-42	1945-52
COAXIAL DOWNWARD ILLUMINATION UNIT for BR ARM	1945-43	1945-53
COAXIAL DOWNWARD ILLUMINATION UNIT for BL ARM	1945-44	1945-54
OBLIQUE ILLUMINATION UNIT FOR FR ARM	1945-45	1945-55
OBLIQUE ILLUMINATION UNIT FOR FL ARM	1945-46	1945-56

	Model	
	1270	1271
OBLIQUE ILLUMINATION UNIT FOR BR ARM	1945-47	1945-57
OBLIQUE ILLUMINATION UNIT FOR BL ARM	1945-48	1945-58
MONITOR CAMERA	1946-06	1946-07
1.2 POWER LENS UNIT for FR ARM	1947-16	
1.2 POWER LENS UNIT for FL ARM	1947-17	
1.2 POWER LENS UNIT for BR ARM	1947-18	
1.2 POWER LENS UNIT for BL ARM	1947-19	
UNINTERRUPTIBLE POWER SUPPLY UNIT	1949-10	
PRINTER UNIT	1949-11	
LAN CONNECT UNIT	1949-12	
1270 DATA COMPOSITION SOFTWARE	1139-05	
FL-Link6 SOFTWARE	1139-55	
MEASUREMENT SECTION CALIBRATION UNIT	1330-03	
TENSION FRAME for FLEXIBLE BOARD	1948-16	1948-17

### ● Options (please refer to page 2 for probes)

1134-02 TRACE SHEET (Standard accessories)

1164-02 ONE-WAY CLUTCH

1164-03 PROBE ATTACHMENT

1350-02 OFFSET BOARD (Standard accessories)

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