

## 1107 UNIT HiTESTER

Automatic Test  
Equipment



### High-speed pattern inspection of fine-pitch boards

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#### From IC packages to MCM

The 1107 UNIT HiTESTER is a bare board tester employing a test head (inspection jig) that is suitable for batch inspection and inspection of mass-produced fine-pitch boards. In addition to features for inspection of BGA, MCM, CSP and other high-density boards, the equipment is also provided with in-circuit test functions that allow inspection of mounted components.



**ISO14001**  
JQA-E-90091

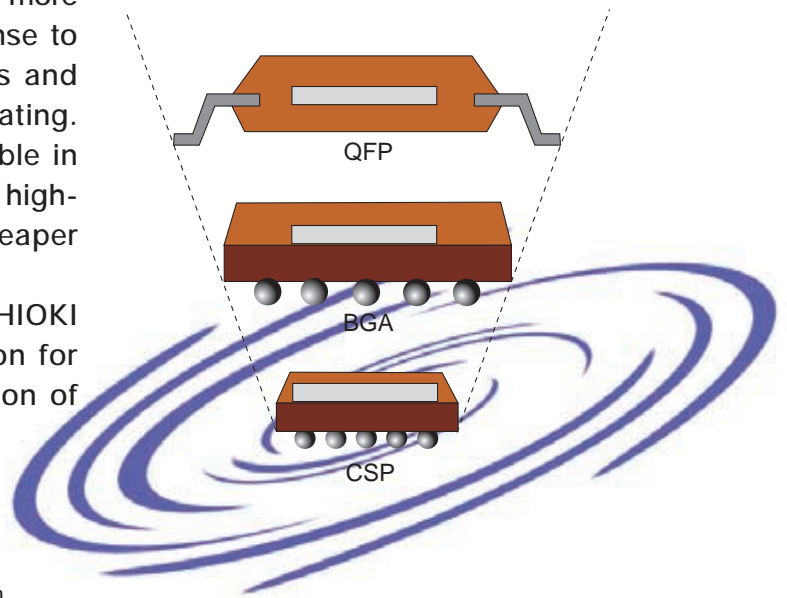


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# High speed and accuracy for inspection of mass-produced products

The demand for electronic components with more and more sophisticated functions in response to the shrinking sizes of electronic products and electrical equipment shows no sign of abating. Printed circuit boards that are indispensable in this context are steadily heading towards high-density and super fineness while both cheaper prices and high reliability are demanded. The 1107 UNIT HiTESTER developed by HIOKI boosts a high-precision alignment function for "high-speed and high-precision" inspection of "high-density and super fine" boards.



## ■ High accuracy

The superior position repeatability accuracy is within  $\pm 3 \mu\text{m}$  which guarantees reliable inspection of fine pitch boards.

## ■ User maintainable test head

The employment of probes using pipes means that user maintenance of the test head is possible notwithstanding the minute size of the probes. The probe's L component is minute, which enables the probe to perform AC measurement. (AC measurement is an optional function.)

## ■ L, C, R, D measurement

In-circuit test function is available for inspection of mounted components. This allows inspection of mounted boards and print resistance of patterns.

## ■ Compatible with multi-sample boards (Step & Repeat)

A test head for handling multi-sample boards with up to 128 blocks can be constructed inexpensively. Test data can be divided into blocks with up to 16 groups in each.

## ■ High-speed measurement

The inspection time is 0.3 sec/1024 points, and the tact time for one piece is as follows.

3 sec/1 piece: 1 sheet 4 pieces (1024 points)

5 sec/1 piece: 1 sheet 1 piece (1024 points)

These high-speed measuring properties support inspection of mass-produced items.

## ■ Inspection of up to 8192 points

The standard number of inspection points is 1024. This can be increased in 128-point units until the maximum 4096 points are reached. The special specification machine supports up to 8192 points.

## ■ Insulation test

Insulation tests can be conducted within the test voltage range of DC 1 V to 110 V. The test voltage can be set in 1 V steps.

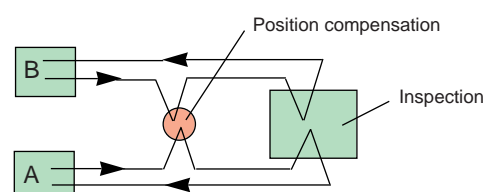
## Select between four models

The following four models are available. Select the model that best suits your needs.

- 1107-01 ONE-SIDED ALIGNMENT 1 ARM
- 1107-02 ONE-SIDED ALIGNMENT 2 ARMS
- 1107-51 DOUBLE-SIDED ALIGNMENT 1 ARM
- 1107-52 DOUBLE-SIDED ALIGNMENT 2 ARMS

## Efficient 2-arm model

While one arm is engaged in inspection, the other conducts position compensation. A uniform and efficient inspection is obtained by repeatedly alternating this routine.



## ■ Superior functions support high performance

### ● Self-diagnostics

A self test is performed automatically at startup and prevents erroneous judgement due to malfunctions. This function also facilitates maintenance.

### ● Password setting function

Setting a password can prevent unauthorized personnel from inadvertently altering inspection data.

### ● On-line help

Explanation of basic operations can be displayed on the monitor screen. Allows operation without looking up the instruction manual.

### ● Automatic backup function

To ensure that data are not lost due to power outages or other problems, data are periodically saved during inspection and editing.

### ● Automatic data creation function

Allows automatic pickup of conforming product data and automatic setting of optimum guard points, etc. It also enables automatic absorption of insulation data, absorption of stray capacitance and absorption of wiring resistance.

### ● Statistics function

Test results can be statistically processed, displayed and printed out. Data can be obtained in various ways, such as all data, for each inspection step, according to each block and group, and used for pre-process feedback and quality inspection.

### ● Re-inspection functions

Prevents erroneous judgement due to improper probe contact caused by corrosion of pattern surface or pattern displacement, etc. Various types such as a re-test function and a re-try function are available.

### ● NG map display

Allows map display of non-spec positions and printing via a printer for fast search of non-spec components when repairs are undertaken.

## Test head copes with 110 $\mu\text{m}$ pitch

**Test head**  
 Probing area:  
 10 × 10 mm to 80 × 80 mm  
 No. of pins:  
 Max. 4096 pins on each surface  
 Probe interval pitch:  
 Min. 110  $\mu\text{m}$

Test head up

**Applicable test boards**  
 Applicable board sizes:  
 1 arm: 10 × 10 mm to 160 × 160 mm  
 2 arms: 10 × 10 mm to 70 × 70 mm  
 No. of pieces:  
 Max. 128

Test head down



Combination with loader and unloader (handler)  
 [Image drawing]

### ● Double-safety functions

Safety functions are provided for both software and hardware so that damage to test head or machine parts will be kept at a minimum in the case of wrong data or erroneously created data.

## ■ Specifications

### [Mechanism Part]

#### ■ XY axis unit

No. of arms	: 1 arm (1107-01, 1107-51) 2 arms (1107-02, 1107-52)
Applicable (loadable) test board dimensions	: 1-arm specification 10 × 10 mm to 160 × 160 mm
	: 2-arm specification 10 × 10 mm to 70 × 70 mm
Measurement range	: 10 × 10 mm to 80 × 80 mm (test head)
Travel resolution	: 1 μm
Position repeatability	: Within ±3 μm
Loading height	: 1050 ±10 mm

#### ■ Upper Theta axis unit

Position repeatability	: Within ±3 μm
Rotation range	: ±3° (during measurement)

### [Measuring Unit]

No. of test points	: Standard 1024 pins (expandable up to 4096 pins) Maximum 8192 pins (special specifications)
No. of test steps	: Component test data maximum 5000 steps (only data equivalent to 1 piece is held as test data)
Test pieces	: Maximum 128 pieces
Test groups	: Maximum 16 groups/1 block
Insulation test	: Insulation test (FAIL when LEAK) Test voltage: DC 1 V to 200 V Resolution can be set in 1 V units DC 200 V: 40 kΩ to 200 MΩ : Continuity test (FAIL when OPEN) Test current: DC 1 mA to 200 mA Resolution can be set in 1 mA units Measurement range: 1 Ω to 400 kΩ : Measurement time 0.5 sec/1024 points (1 pattern/2 points, conforming article measurement, Insulation test; 100 V; 100 MΩ, Continuity test :50mA; 20 Ω)

#### ■ Lower Z axis unit

Travel stroke	: 10 mm (automatic inspection mode)
Position repeatability	: Within ±15 μm
Horizontal oscillation	: Within ±10 μm

#### ■ Tact time

(Insulation inspection 1024 points, 1 pattern/2 points, conforming article measurement)

1 sheet/4 pieces mode	: 3 sec/1 piece
1 sheet/1 piece mode	: 5 sec/1 piece

#### ■ Test head

Probing area	: 10 × 10 mm to 80 × 80 mm
Max. number of pins	: Max. 8192 pins (however, max. 4096 pins on each surface, differs with board thickness.)
Probe interval pitch	: Minimum 110 μm

Component test	: Insulation test Rated voltage measurement: 200 Ω to 200 MΩ / 1 to 200V : Continuity test Rated voltage measurement: 4 Ω to 40 MΩ / 0.1V Rated current measurement: 2 Ω to 1 MΩ / 1 to 100 mA : Resistance: 0.4 Ω to 40 MΩ : Capacitance: 10 pF to 400 mF : Coil: 1 μH to 400 H : Diodes, transistors: 0.1 mV to 25 V : Zener diodes: 0.1 mV to 25 V : Digital transistors: 0.1 mV to 25 V : Measurement time Component: from approximately 1.7 msec
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### [General Specifications]

Power supply	: AC 200 V ±10% (single phase) 50/60 Hz Power consumption: 4 kVA	Insulation resistance	: 100 MΩ or higher (DC 500 V between power supply and cabinet)
Pneumatic system	: Primary pressure: 0.6 to 0.99 MPa (dry air) Setting pressure (secondary side): 0.5 ±0.1 MPa	Withstand voltage	: AC 2.2 kVrms
Operating environment	: Operating temperature and humidity: 23°C±3°C, 70% rh maximum (no condensation) : Storage temperature and humidity: 10°C to 43°C, 80% rh maximum (no condensation) : Atmosphere: Avoid use in an atmosphere where dust, vibrations, corrosive gases, etc. may occur. : Floor strength: 500 kg/m <sup>2</sup> or higher	Accessories	: PC accessories (keyboard, etc.), 40-character width thermal printer, printer cable, printer buffer, leveling jacks, printer paper, maintenance toolset
		Main unit dimensions	: Approx. 1085 (W) × 1800 (H) × 1280 (D) mm (excluding protruding parts)
		Mass	: Approx. 1000 kg

## 1107 UNIT HiTESTER

## ● Options

### 1138 SCANNER BOARD (128-pin unit)

# HIOKI

DISTRIBUTED BY

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All information correct as of Mar. 8, 2000. All specifications are subject to change without notice.

■ Internet HIOKI website <http://www.hioki.co.jp/>

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