



PADAP

HIOKI

FLYING PROBE TESTER FA1282

Automatic Testing Equipment



Horizontal Double-sided Tester

2 probes on the top + 2 probes on the bottom



High-precision probing

Ideal for use with thin boards and device embedded substrates

Horizontal Double-sided Tester *2 probes on the top + 2 probes on the bottom*

Point 1 High-precision probing

Industry-leading precision

(See benchmarks to experience it for yourself!)

Point 2 Max.100 steps/s ultra-highspeed inspection

Industry-leading speed

1. Dramatically expanding the detection range with low-resistance and super-insulation testing

Four-terminal resistance measurement function

The FA1275 uses 4-terminal probes to deliver outstanding accuracy and stability when measuring the minute resistance values of inner via holes (IVHs) and through-holes.

Measurement using theoretical resistance values

Theoretical resistance values for patterns can be calculated from the board's design data using HIOKI's optional SIM-LINE software. Four-terminal testing can then be performed using those values as reference values.

Large-diameter via

Power supply net pattern

Micro-short

High-resistance short

Large-area pattern

Signal pattern

Print resistance

Standard testing range

1116 testing range

FA1282 testing range

10 $\mu\Omega$

100 m Ω

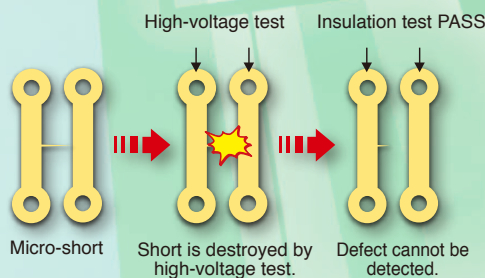
1 Ω

1 k Ω

Ability to detect latent defects

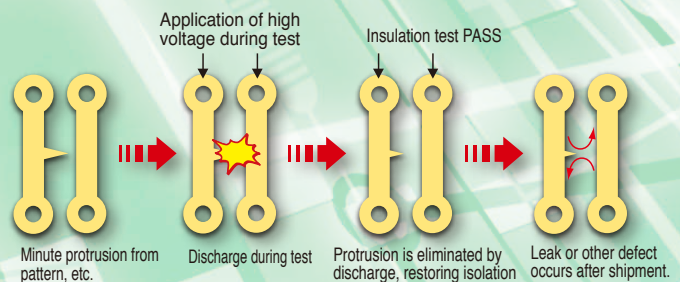
Micro-short testing

- Functionality for detecting minute shorts between patterns by applying a previously set low voltage before insulation testing



Arc detection

- Detection of arc discharge phenomena that occur during insulation testing



2. More extensive measurement of device embedded substrates (optional feature)

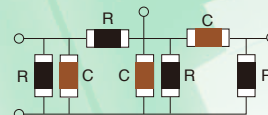
Measuring mounted electronic components

Low-power LCR measurement with 0.1 V applied

- Accurate measurement without operating LSIs and other semiconductors
- Measurement at voltage levels low enough that they don't damage components

JIS-compliant MLCC measurement function

- Multi-layer ceramic capacitors (MLCCs), whose capacitance values exhibit voltage dependence, can be measured using standard-specified frequencies and voltages



Guarding function

- Independent measurement while blocking measurement signals that sneak around circuit networks
- Ability to set guard potentials automatically based on component connection data

Phase-isolated measurement of individual components from complex LCR circuits

- Resistance and capacitance components can be measured separately and accurately based on AC signal phase differences. Values as low as 0.01 pF can be measured



Point 3

Reliable clamping of thin boards

Thin boards (0.2mm and less)

Point 4

Automatic transport capability (FA1282-11)

Reduced testing costs

200 mA continuity testing

Pattern reliability is assured by applying a high current of up to 200 mA, close to the rated current for a typical fine pattern.

100 GΩ/250 V testing

High-speed insulation testing with coverage of up to 100 GΩ/250 V detects latent defects and allows insulation resistance between wiring patterns to be judged with unsurpassed reliability.

Conductive impurities such as suboxides

Dust that has absorbed moisture

Non-defective organic product

Residual etching solution

Surface contamination

Impurities in insulators

Non-defective ceramic product

100 kΩ

100 MΩ

100 GΩ

1 TΩ



Importance of low-resistance testing (4-terminal measurement)

- Open vias result in increased resistance values and inductance, interfering with **signal transmission**. It is necessary to test boards with the **4-terminal method** using an instrument with a **high level of resolution and precision**



Normal via



Open via

Extensive selection of insulation testing modes

- Micro-short testing:
Detect micro-shorts without destroying them in the process using low-voltage insulation testing
- Impulse testing:
Manifest latent defects by applying a high voltage before testing
- Dual-polarity insulation testing:
Automatically switch positive and negative polarity to detect insulation defects that are polarity-dependent.

Insulation testing with automatic protection (for device embedded substrates)

- Automatic selection of settings to avoid insulation testing of nets that are connected to embedded passive and active devices

LSI reliability testing

How can boards with embedded LSIs be tested?

You need measurement technology that can avoid damaging boards with embedded LSIs due to static electricity and stress!

1. Stress on embedded components due to the test voltage **Low-power mode (0.1V measurement)**
2. Degradation of semiconductor insulation due to electrostatic discharge failures **I/O pin leak current test**
3. Initial failures of bare chips and stress failures **LSI current consumption test**
4. Diode characteristics test energization current
 The FA1282 decreases stress imposed by diode characteristics testing by using a minute current range of 1mA or less

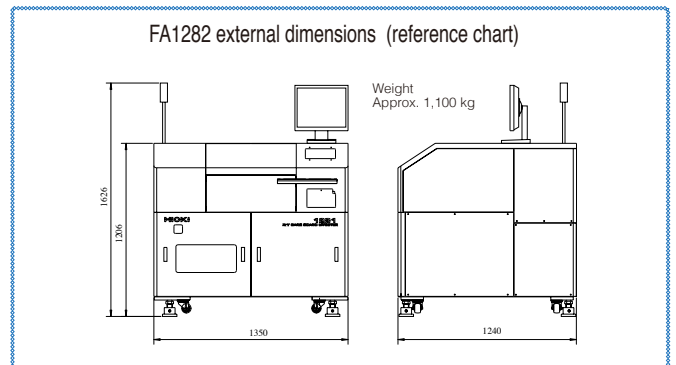
Model	
FLYING PROBE TESTER FA1282-01	Without transport capability
FLYING PROBE TESTER FA1282-11	With transport capability

Measurement Unit		
Test speed	100 steps/second (*0.15 mm movements, 4-arm simultaneous probing, capacitance measurement)	
No. of test steps	300,000 (max.)	
Tests • Measurement ranges	Resistance : 40.00 μΩ to 100.0 MΩ	
	Capacitance : 10.00 fF to 40.00 mF	
	Inductance : 10.00 μH to 100.0 mH	
	Diode VZ measurement : 0.000 V to 25.00 V	
	Insulation measurement : 200.0 Ω to 100 GΩ	
	Capacitor insulation measurement : 200.0 Ω to 10.00 MΩ	
	High-voltage resistance measurement : 200.0 Ω to 25.00 GΩ	
	High-voltage short measurement : 400.0 mΩ to 400.0 kΩ	
	Leak current measurement : 100.0 nA to 10.00 mA	
	Zener diode VZ measurement : 0.000 V to 25.00 V	
	Digital transistor measurement : 0.000 V to 25.00 V	
	Photocoupler measurement : 0.000 V to 25.00 V	
	Continuity measurement : 400mΩ to 1.000kΩ	
	Open measurement : 4.000Ω to 4.000MΩ	
	Short measurement : 400.0mΩ to 40.00kΩ	
	DC voltage measurement : 0.040 V to 25.00 V	
	Discharge function	
	Simple visual presence test	
Simple visual alignment measurement		
Test signals	DC constant voltage DC measurement mode : 100mV / 400mV / 12 V (3 ranges)	
	DC constant voltage Insulation measurement mode : 1 to 250 V (variable in 1 V steps)	
	DC constant current DC measurement mode : 200 nA to 200 mA (13 ranges)	
	DC constant current Insulation measurement mode : 0.1m to 25m A (variable in 0.1 mA steps)	
	AC constant voltage : 1 Vrms / 10 Vpeak (2 ranges)	
	DC voltmeter DC measurement mode : 80m / 125m / 400m / 4 / 25 V f.s. (5 ranges)	
	DC voltmeter Insulation measurement mode : 40m / 400m / 4 / 40 / 250 V (5 ranges)	
	DC ammeter DC measurement mode : 100 nA to 25 mA f.s. (7 ranges)	
	DC ammeter Insulation measurement mode : 10 nA to 100 mA (8 ranges)	
	AC ammeter : (at 1 Vrms) : 10μ / 100μ / 1mA / 10mA (4 ranges) (at 10 Vpeak) : 1μ / 10μ / 100μ A peak (3 ranges)	
Judgment range	-99.9% to +999.9% or absolute value	
Guarding	2 points/step	

General Specifications	
Power supply	200VAC ±10%(single-phase) 50/60Hz (Supply voltages of 220 V, 230 V, and 240 V AC can also be specified at the time of order.) Max. power consumption 5 kVA
Air supply	Air pressure (primary) 0.5 to 0.99 MPa (dry air) Set pressure (secondary) 0.5 ±0.1 MPa
Air consumption	Max. 0.3 NI/min (ANR)
Operating environment	Temperature: 23°C ±10°C Humidity: 75% RH or less (non-condensing) Atmosphere: Avoid use in environments characterized by excessive dust, vibration, or corrosive gasses. Floor strength: At least 500 kg/m ²
Dimensions and weight	Dimensions: 1,350 (W) × 1,206 (H) × 1,240 (D) mm (*Excluding signal tower and other protruding parts.) Weight: 1,100 kg
Standard accessories	Scratch Sheet1134-02, Offset BoardFA1350-05, Instruction Manual (with warranty card), Grease, Grease gun, Hexagonal wrench (2.5) (for replacing probes), Double Open-end Spanner (5.5x7) (for use with front cosmetic panel), Nut Driver (7) (for use with front cosmetic panel), Leveling jack 4, Anti-slip pad4, LCD display (17-inch), Thermal mini-printer (including 1 roll of paper), Printer cable, Power cord (terminating in bare wires; 3meters in length), Spare fuse (for internal 5 V and 24 V use), Computer accessories (computer manuals, etc.), Setup disk, Keyboard (included with computer), Mouse (included with computer), Mouse pad, Probes × 4 (as selected) (Please select from 1172-66, 1172-68, 1172-81 and 1172-82 at the time of order.)

Mechanism	
No. of arms	4 (upper: 2; lower: 2)
Compatible board size	50 (W) × 50 (D) to 400 (W) × 330 (D) mm
Compatible board thickness	0.1 to 2.5 (mm)
Probable area	400 × 324 (mm)
Repeatability	X, Y : ±3μm
Maximum resolution	X, Y : 1.00μm Z : 5.00μm
Board clamping	Chucks on 2 sides of board (*Chucks are not used at center of board.)
Probe clearance	Z upper : 12mm from board reference surface (max.), including board thickness Z lower : 12mm from board reference surface (max.)
Display	17" liquid crystal display (LCD)

Options		
Measurement		
FA1937-50	Embedded Device Board Test Unit	AC-LowPower(measurement voltage: 0.1 V) LSI testing MLCC measurement Impedance testing
FA1938-22	Micro ARC Detection Unit	Detects arcs of 1 μs or greater (Standard specifications, 1 ms or greater)
Probing precision		
FA1971-01	Precision Probing Function	
Camera, lens, and illumination		
FA1945-68	Coaxial EPI-Illumination Unit	Set of cameras for all arms
FA1945-69	Oblique Illumination Unit	Set of cameras for all arms
1947-61	1.2 Power Lens Unit	Set of cameras for all arms
Test data creation		
1139-09	1281 Data Composition Software	
1139-55	FL-LINK6 Software	
1139-60	EPA-Line Link Software	
1139-61	SIM-Line Link Software	
1391	EPA-Line Test Data Generation System	
1392	SIM-Line Test Data Generation System	
1741	Fly-Line Inspection Data Creation System	
Other		
1330-03	Measurement Section Calibration Unit	R:Up to 500 MΩ; C, L: All
1330-06	Measurement Section Calibration Unit	1 GΩ to 100 GΩ
FA1350-05	Offset Board	Double-sided, thickness = 1 mm
FA1395	Recovery disc	
FA1942-31	Board Loading Rails	
1944-03	Extension I/O Board	
1941-80	Stamp Marking With Oil Paint	



Note: Company names and Product names appearing in this catalog are trademarks or registered trademarks of various companies.

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