

### Complete Electrical Testing of High-Function Boards with a Single Unit



High-speed testing at up to 100 points/sec.

## Horizontal Double-Sided FLYING PROBE TESTER

2 Upper Probes + 2 Lower Probes

1/2 Impact Mark Depth, High-Accuracy Probing  
Low-Resistance Measurement, High-Speed 100 G $\Omega$ /250V Measurement  
Vacuum Unit for Capacitance Test, Embedded Device Measurement

# "Down to the 1 $\mu$ m"

Total Probing Accuracy  $\square$  15  $\mu$ m (when FA1971-01 is installed)

A High-Accuracy FLYING PROBE TESTER Aiming at  $\phi$ 10  $\mu$ m Contact



**Probe Lineup** Select from a wide variety according to the board under test.

1/2 impact mark depth

For fine patterns

For 4-terminal measurement

For VIA evaluation



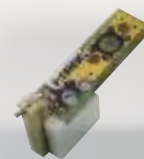
SINGLE PROBE  
CP series



SINGLE PROBE  
1172 series



KELVIN PROBE



LINK PROBE  
WITH BLADE



### Precision Probing Unit FA1971-01 (Optional)

The FA1283 features a special stage for reducing the gap between the optical axis of the alignment camera and the probe stroke to as close to 0 as possible.



Use software to correct backlash that is unavoidable with a ball-screw structure and XY deviation due to arm movement direction.



### High-Accuracy Link Probe CP1072-01 (Optional)

#### Illumination Unit for Position Correction (Optional)

The FA1283 supports high-accuracy CP link probes achieving 1/2 impact mark depth compared to conventional probes (1172 series).

Two types of illumination unit are available as optional settings for greater stability of position correction: coaxial downward illumination, best when there are changes to materials; and oblique illumination, superior for printed materials and transparent materials.



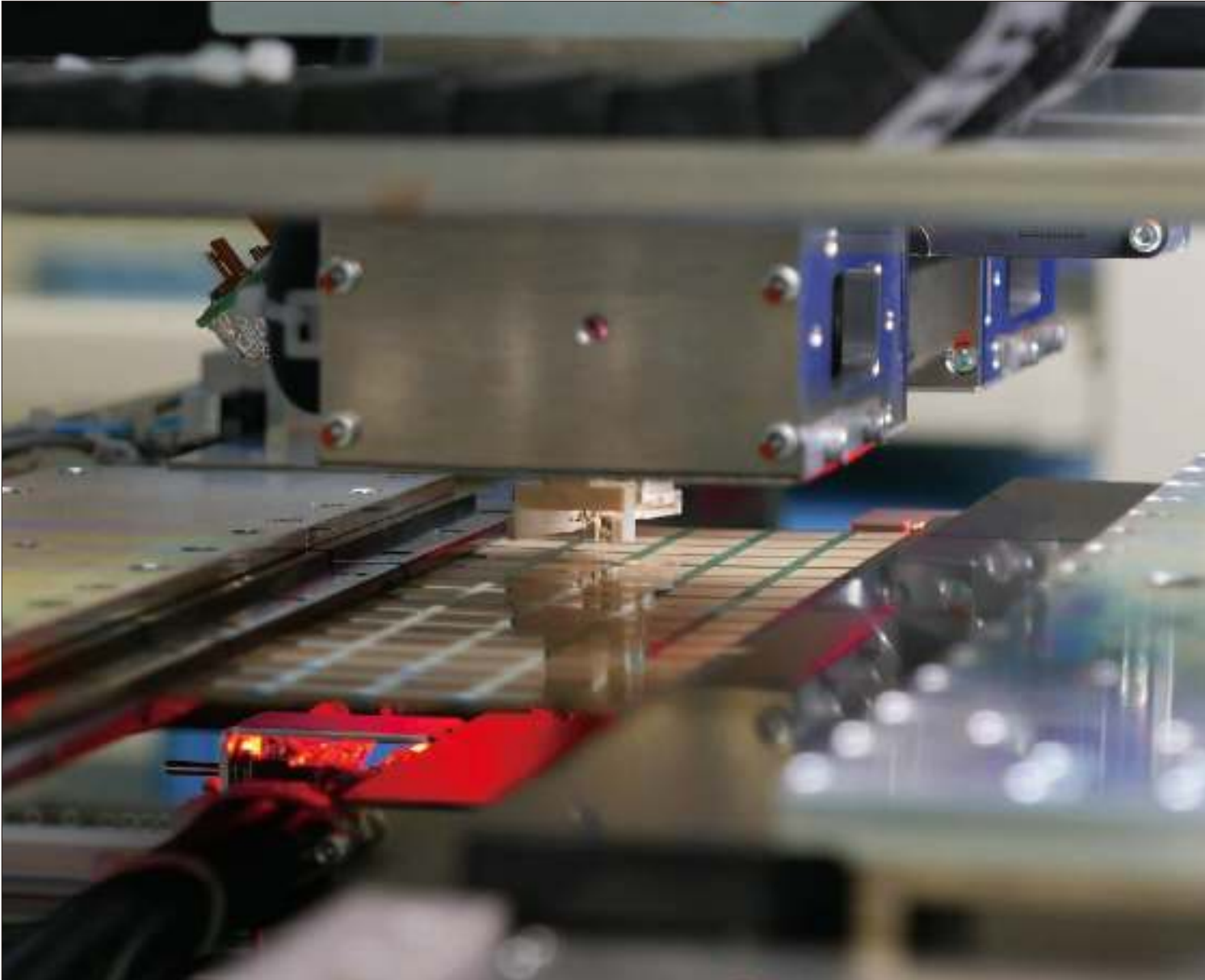
Coaxial Downward Illumination Unit FA1945-68  
Oblique Illumination Unit FA1945-69

# "Not One Second Wasted"

A smooth start to initial testing is vital.

Electrical testing schedules are short and strict.

This applies to high-density boards, flexible boards, and glass boards alike.



Automatic Transport Model FA1283-11

## **Tension Clamp Equipped as Standard**

Off-line Model

FA1283-01

Automatic Transport Model

FA1283-11

Use a tension clamp to immediately perform testing on even strip boards with a thickness of 0.16 mm (0.006 in). With horizontal transport, easily build an automated line at low cost by selecting commercially available peripheral devices.

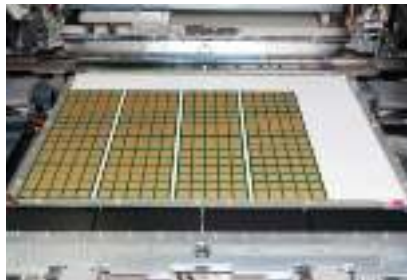


## Vacuum Unit for Capacitance Test E4001 (Optional)

"Nothing ships without electrical testing."

Vacuum absorption stage E4001 is used to perform capacitance method O/S testing, which is unaffected by board shape.

Perform stable testing independent of board dimensions or thickness.



Absorption Stage for Capacitance Measurement E4001

## Thickness Alignment Laser Unit (Standard)

The FA1283 provides functions that support maintaining a given probe weight, such as using a laser to measure length at positions on the tested surface and adjusting the contact stroke.

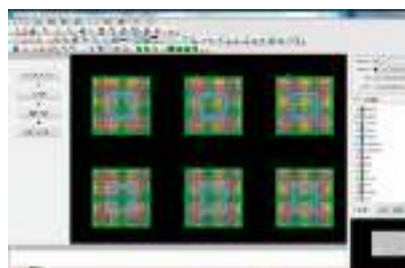
Make smaller impact marks without lowering the testing speed.



## FEB-LINE Inspection Data Creation System (Optional)

"Prepare accurate coordinate data before testing."

Gerber editing software UA1781 quickly generates testing points even for complex data structures such as high-density line data, cavity structures, and printed boards such as glass boards.



# "Total Measurement Mastery"

## Flexible to 900,000 Steps

A single unit for everything from simple continuity and insulation testing to advanced function measurements for component testing.

A testing unit and measurement unit for selection and analysis. This high-potential flying probe tester is designed to fit your needs.

## 1. Significant expansion of the guaranteed range for low

### Four-terminal resistance measurement function

Kelvin probes deliver outstanding accuracy and stability when measuring the minute resistance values of inner via holes (IVHs) and through-holes.

Large-diameter via

Power supply net pattern

Large-area pattern

Signal pattern

### 200 mA continuity testing

Apply high current up to 200 mA, near the normal rated current for fine patterns to maintain pattern reliability.

Micro-short

High-resistance short circuit

Print resistance

FA1283 testing range

FA1116 testing range

Standard testing range

10  $\mu\Omega$

100 m $\Omega$

1  $\Omega$

1 k $\Omega$

### Importance of low-resistance testing (large current continuity measurement)

- Open vias result in increased resistance and inductance, interfering in signal transmission. High-resolution and high-precision instruments using the 4-terminal method let you identify the connection conditions of low resistance inspections quickly.
- Low-resistance testing is the optimal way to confirm connection reliability for patterns and vias, because large current continuity testing at a maximum current of 200 mA measures resistance in an environment nearly identical to actual operation



Normal via



Open via

### Extensive selection of insulation testing modes

- Micro-short testing to detect minute shorts non-destructively using low-voltage insulation testing
- Impulse testing to expose latent defects before testing by applying a high-voltage signal
- Polarity insulation testing to detect polarity-dependent insulation defects by automatically switching between positive and negative voltages

### Flexible to 900,000 steps

- Set all testing modes in units of inspection steps. For continuity testing, change threshold values in units of testing points. For insulation testing, set a combination anywhere from 1:1 to M:N.

## 2. Embedded Device Measurement: A Sharp Departure

### Bringing together populated electronic component measuring technologies

#### Secure Insulation Testing with Automatic Protection

- Automatic separation of insulation testing for nets to which components are connected
- Safe design with no high voltage applied to components

#### Built-in MLCC Measurement Function According to JIS Standards

- Use specified frequencies and voltages to measure MLCC (multi-layer ceramic capacitors) with voltage-dependent capacitance

#### Low-power LCR measurement with the application of 0.1 V

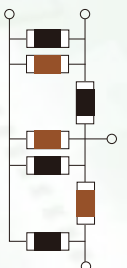
- Accurate measurement without operating semiconductors such as LSI
- Measurement at low voltage to prevent damage to components

#### Guarding Function

- ICT function for blocking measurement signals that bypass in-circuit components
- Automatically set guarding potential based on component connection information

#### Phase Separation Measurement of Discrete Components on LCR Composite Circuit

- Accurately isolate and measure resistance and capacitance components by means of the AC signal phase difference. Testing down to 0.01 pF is supported.



# resistance and ultra-insulation testing

## Visualization of latent defects

Use micro-short testing and the extensive insulation testing modes to detect latent defects that are overlooked with conventional testing.

## 100 GΩ/10 msec high-speed ultra-insulation testing

Perform 100 GΩ/250 V ultra-insulation testing (at a maximum speed of 10 msec) that rivals dedicated measurement units.

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

### Powerful insulation testing performance with FA1283

100 kΩ

100 MΩ

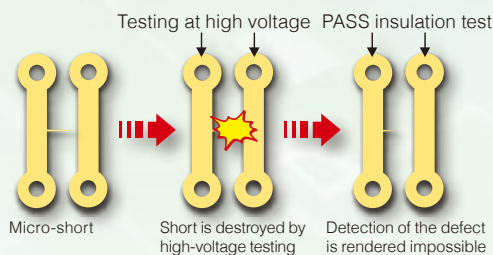
100 GΩ

1 TΩ

## Detect Latent Defects

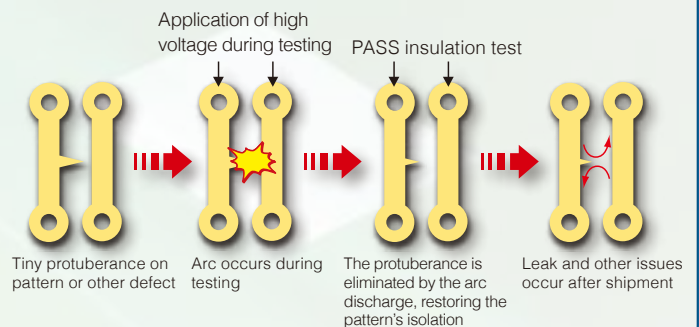
### Micro-short testing = improvement in testing reliability

- Detection of fine short circuits that occur between patterns before insulation testing, through the application of low voltage set in advance



### Arc detection = improvement in long-term reliability

- Detection of arc discharge during insulation testing



## from LCR Measurement

### LSI Reliability Testing Special Modes for Testing LSI-embedded Boards

#### Measurement Technology for Detecting Damage Caused by Static Electricity and Stress in Embedded Semiconductors

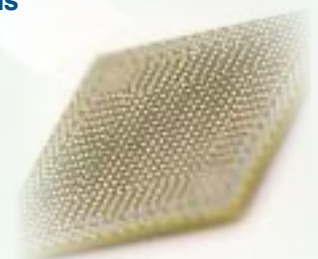
1. Stress on embedded devices due to test voltage
2. Degradation of semiconductor insulation due to electrostatic discharge failures
3. Initial failures of bare chips and stress failures
4. Diode characteristics test energization current

Low-power mode (0.1 V measurement)

I/O pin leak current test

LSI current consumption test

Decrease of stress imposed during diode characteristics testing by using a minute current range of 1 mA or less



## Model: FLYING PROBE TESTER FA1283

Model No. (Order Code)	(Note)
FA1283-01	Not transported
FA1283-11	Transported

### Measuring component

Testing speed	100 steps/sec (*Capacitance measurement with 4-arm simultaneous probing and 0.15 mm (0.006 in) movements)	
No. of test steps	900,000 (max.)	
Test types and measurement ranges	Resistance measurement	: 40.00 $\mu\Omega$ to 100.0 M $\Omega$
	Capacitance measurement	: 10.00 fF to 40.00 mF
	Inductance measurement	: 10.00 $\mu$ H to 100.0 mH
	Diode VZ measurement	: 0.000 V to 25.00 V
	Insulation measurement	: 200.0 $\Omega$ to 100.0 G $\Omega$
	Capacitor insulation measurement	: 200.0 $\Omega$ to 10.00 M $\Omega$
	High-voltage resistance measurement	: 200.0 $\Omega$ to 25.00 G $\Omega$
	High-voltage short measurement	: 400.0 m $\Omega$ to 400.0 k $\Omega$
	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	: 400 m $\Omega$ to 1.000 k $\Omega$
Open measurement	: 4.000 $\Omega$ to 4.000 M $\Omega$	
Short measurement	: 400.0 m $\Omega$ to 40.00 k $\Omega$	
DC voltage measurement	: 40.00 mV to 25.00 V	
Discharge function		
Simple visual test		
Simple visual alignment measurement		
Test signals	DC constant voltage	[DC measurement mode] : 100 mV/400 mV/12 V (3 ranges)
	DC constant voltage	[Isolation measurement mode] : 1 V to 250 V (in units of 1 V)
	DC constant current	[DC measurement mode] : 200 nA to 200 mA (13 ranges)
	DC constant current	[Isolation measurement mode] : 0.1 mA to 25 mA (in units of 0.1 mA)
	AC constant voltage	: 1 V rms. /10 V peak (2 ranges)
	DC voltmeter	[DC measurement mode] : 80 m/125 m/400 m/4/25 Vf.s. (5 ranges)
	DC voltmeter	[Isolation measurement mode] : 40 m/400 m/4/40/250 V (5 ranges)
	DC ammeter	[DC measurement mode] : 100 nA to 25 mA f.s. (7 ranges)
	DC ammeter	[Isolation measurement mode] : 10 nA to 100 mA (8 ranges)
	AC ammeter	: (for 1 V rms) : (for 10 V peak) : 10 $\mu$ A/100 $\mu$ A/1 mA/10 mA rms. (4 ranges) : 1 $\mu$ A/10 $\mu$ A/100 $\mu$ A peak f.s. (3 ranges)
Judgment range	-99.9% to +999.9% or absolute value	
Guarding	2 points/step	

### General specifications

Power supply	200 VAC $\pm$ 10% (single phase) 50/60 Hz (* Support provided for 220 VAC, 230 VAC, and 240 VAC upon request before shipment.) Maximum power consumption: 5 kVA
Pneumatic system	Pressure used (primary): 0.5 M to 0.99 MPa (dry air) Set pressure (secondary): 0.5 M $\pm$ 0.1 MPa
Air consumption	Max. 0.3 NI/min
Environmental conditions	Temperature: 23°C $\pm$ 10°C Humidity: 75% R.H. or less (no condensation) Environment: Avoid use in environments exposed to dust, vibration, and corrosive gases. Floor strength: 500 kg/m <sup>2</sup> (102.41 lb/ft <sup>2</sup> ) or greater
Dimensions and mass	Dimensions: 1360 mm (53.54 in) W x 1200 mm (47.24 in) H x 1280 mm (50.39 in) D (* Excluding the signal tower and other protrusions) Mass: 1100 kg (38,800.7 oz)
Supplied accessories	SCRATCHSHEET 1134-02, OFFSET BOARD (double-sided) FA1350-05, instruction manual (with warranty card), grease, grease gun, hex wrench (2.5) (for probe replacement), double-ended wrench (5.5 x 7) (for front exterior plate), nut screw driver (7), (for front exterior plate), level jack 4, anti-slip sheet 4, LCD display (17-inch), thermal mini-printer (includes 1 roll of paper), printer cable, power cable (uncrimped end, 3 m (9.84 ft)), spare fuse (interval 5 V, for 24 V), computer accessories (computer manual, etc.), setup disk, keyboard (for computer), mouse (for computer), mouse pad

### Features

No. of arms	4 (Upper: 2, Lower: 2)
Clampable board size	50 mm (1.97 in) W x 50 mm (1.97 in) D to 400 mm (15.75 in) W x 330 mm (12.99 in) D
Supported range of board thicknesses for clamping	0.1 mm (0.004 in) to 2.5 mm (0.10 in)
Probing area	400 mm (15.75 in) x 324 mm (12.76 in)
Repeatability	X, Y : within $\pm$ 3 $\mu$ m
Minimum movement step	X, Y : 1.00 $\mu$ m Z : 5.00 $\mu$ m
Total probing precision	$\pm$ 20 $\mu$ m / $\pm$ 15 $\mu$ m (when using FA1971-01)
Board clamping	Board 2-side chuck method (*with tension function)
Probe clearance	Z upper direction: 12 mm (0.47 in) (max.) from standard board surface, including board thickness Z lower direction: 12 mm (0.47 in) (max.) from standard board surface
Display section	17" LCD display

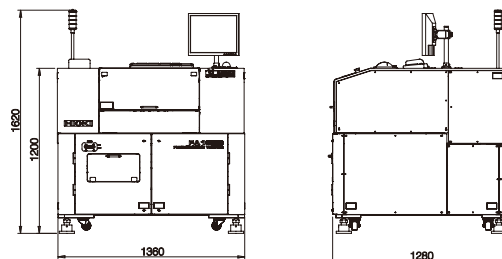
### Options

Model No. (Order Code)	Model name	Specifications
<b>Measurement</b>		
FA1937-50	EMBEDDED DEVICE BOARD TEST UNIT	AC-LowPower (0.1 V measurement voltage) LSI testing MLCC measurement Impedance testing
FA1938-22	MICRO ARC DETECTION UNIT	Detection of 1 $\mu$ s and longer arcs (1 ms or longer in standard specifications)
E4001	VACUUM UNIT FOR CAPACITANCE TEST	
<b>Probing precision</b>		
FA1971-01	PRECISION PROBING UNIT	
CP1072-01	LINK PROBE (REDUCED-IMPACT TYPE)	For FA1283 and FA1116
<b>Camera, Lenses, Lighting</b>		
FA1945-68	COAXIAL EPI-ILLUMINATION UNIT	1 set of 4 arms
FA1945-69	OBLIQUE ILLUMINATION UNIT	1 set of 4 arms
1947-61	1.2 POWER LENS UNIT	1 set of 4 arms
<b>Testing data creation</b>		
1139-09	1281 DATA COMPOSITION SOFTWARE	
1392	SIM-LINE TEST DATA GENERATION SYSTEM	FLY-LINE EXPANSION FUNCTION
UA1781	FEB-LINE INSPECTION DATA CREATION SYSTEM	Support for built-in component boards
UA1782	FAIL VISUALIZER	

### Other

1330-03	MEASUREMENT SECTION CALIBRATION UNIT	R: Up to 500 M $\Omega$ , C: All, L: All
1330-06	MEASUREMENT SECTION CALIBRATION UNIT	1 G to 100 G $\Omega$
FA1350-05	OFFSET BOARD	Double-sided, t=1.0 mm (0.04 in)
FA1395	RECOVERY DISC	
FA1942-31	BOARD LOADING RAILS	
1944-03	EXTENSION I/O BOARD	
1941-80	STAMP MARKING WITH OIL PAINT	

FA1283 external dimensions (reference diagram)



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