

**DUAL \times SIDE
FLYING PROBE TESTER**

APT-1600FD



DUAL SIDE FLYING PROBE TESTER

The APT-1600FD Series is a dual-sided flying probe test system which deploys the flying probes to both sides of a PCBA. Owing to the dual-sided probing contact, the APT-1600FD Series can contribute to a marked increase in test coverage and also assures the shortest test time.

In addition, the APT-1600FD has world-level advantages in test speed and positioning accuracy and is equipped with wealth of extraordinary test functionalities, so that your SMT boards can be tested with ease and precision in the shortest time.



6-HEADS & 10-FLYING PROBES SYSTEM FOR ULTIMATE TEST COVERAGE

In addition to the six standard moving probes which are installed diagonally to the board under test, the APT-1600FD is designed to use other four Z axis units, which are equipped with a vertical probe and/or an IC Open Checker. The vertical probe units enable to get access to the test points, which are hard to access for the standard moving probes. Those vertical probes also enable to contact test points at a different height with a high accuracy. In addition, it's possible to directly contact the through-holes and the head of connector pins by using dagger and inverse cone head type of probe, which finally results in an increased test coverage.

ULTRAFAST TEST SPEED

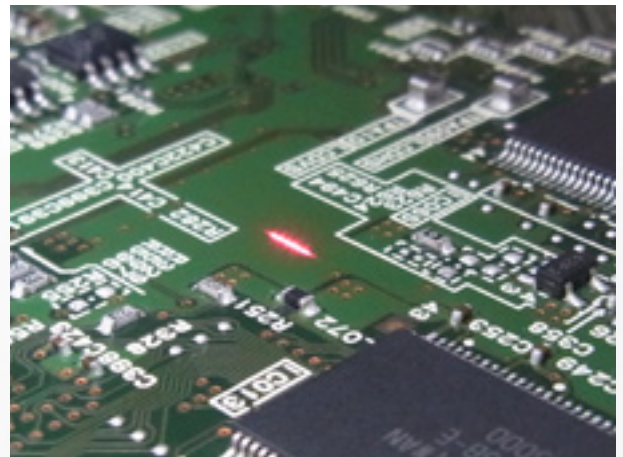
The state-of-the-art high power & fast-moving driving motor system and the new high-speed communication control contribute speed up test 30 – 50% faster than the conventional models. The system is equipped with 4 heads & 6 flying probes from the top and 2 heads & 4 flying probes from the Bottom. Utilizing those probe units makes combination test more efficient and cut the test time down.

STRONG AND RIGID XY STAGE

The tester's XY stage, crucial to stable and accurate probe contact, is made of highly polished native granite. The structure of the XY stage has been completely reviewed according to faster moving speed of the probes and the precision components adopted in the tester have the quality to last long. Also, the positioning accuracy is finely tuned tester by tester. Therefore, the APT-1600FD ensures the superfast movement of the probes and also increases the positioning accuracy by 25% comparing to the conventional models.

LASER DISPLACEMENT MEASUREMENT SYSTEM

The APT-1600FD is equipped with a laser displacement measuring system. Board warpage will be detected and the XY coordinates of the designated contact points will corrected immediately to ensure a precise contact of the probes. In addition to that also the Z-stroke of the probe will be adjusted, so that the contact pressure of the probes remains always the same, regardless of the height of the PCB. Furthermore, the test coverage will be increased by measuring the height of components.



COLORED TOS SYSTEM AND REAL MAP

The APT-1600FD is equipped with new vision test system TOS-7F corresponding to color images as standard. Owing to the megapixel color digital camera and the ring illuminations with high-intensity white LED, the TOS-7F can import sharp color image to detect missing, wrong orientation and positioning error on the spot. In addition, the TOS-7F can not only import the barcodes (include 2D codes) but also offer color identification test, OCR function which are supported by the optional software. Also, the APT-1600FD is equipped with the colored Real map function which is of remarkable help to check and modify the contact points during debugging the programs.

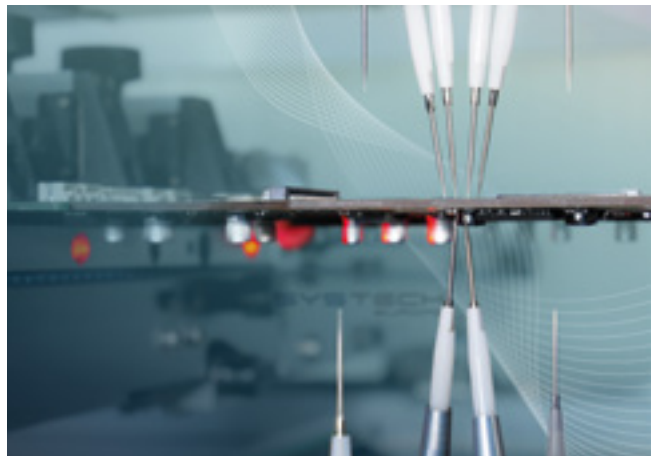
TEST ABILITY IN A CONSTANT STATE OF EVOLUTION

The APT-1600FD serves its customers with versatile option boards and software that achieves their particular needs, such as the LED color test system that tests color and brightness of LED devices on the board under test, the boundary scan testing and the functional testing. In addition, the tester has even more advantages to enhance its test coverage and test speed by using the newly developed NSW (Net Signal Wave) function.



EASY & USER-FRIENDLY SOFTWARE AND SECURITY FUNCTION

The software builds up with easy-to-follow operation menu and is provided with versatile functions which reflect the opinions of our users from more than 40 countries, such as menu customized function, multi language display function (option) and storage function that can maintain a history of automatic settings, operation and so on. All those features give aid to cut down your time to programming test and manage the test programs in safety.



ATTENUATING CONTACT PRESSURE OF PROBES

The APT-1600FD has enough ability to freely control the probing speed just before it contacts. This enables to minimize the probing marks on small and sensitive test lands without the need to slow down the movement all the way to the bottom.

IN-LINE APPLICATION

An in-line model can be built-to-order to establish full automated operation in your production line or rack-to-rack system. To meet various user's needs, it is possible to provide the conveyor installed with buffer stations to cut down the transport time as much as possible and an auto-conveyor width adjustment unit.

GENERAL SPECIFICATIONS APT-1600FD / APT-1600FDA

Flying probes and sensors	Top side	Standard type: 4 tilted contact probes Standard with single Z type: 4 tilted contact probes and 2 vertical contact probes or 2 IC-open check probes (changeable) Standard with dual Z type: 4 tilted contact probes and 2 vertical contact probes and 2 IC-open check probes LED ON-color test sensors: 2 sensors (option)
	Bottom side	Standard type: 2 tilted contact probes Standard with vertical Z type: 2 tilted contact probes and 2 vertical contact probes or 2 IC-open check probes/supprt-pins (changeable) LED ON-color test sensors: 2 sensors (option)
Positioning resolution of flying probes		X and Y axes : 1.25µm (0.05mil), Z axis : 5µm (0.2mil)
Positioning repeatability of flying probe (XY)		±25 to ±40µm (±1.5mil to ±1.6mil) in the high precision mode, approx.
Minimum pad size of probing		60 to 80µm (2.4 to 3.2mil) in the high precision mode
Minimum pad pitch of probing		150 to 190µm (6 to 7mil) in use of needle probes
Test time (at 2.5mm pitch movement)		Combination test : max. 0.02 - 0.03sec. /step, Single test : max. 0.05 - 0.06sec. /step
Signal sources for board test		DC Voltage/current generator -1: Four-quadrant source & measure system, max. ±20V/±1A DC Voltage/current generator -2: Four-quadrant source & measure system, max. ±20V/±1A DC Voltage/current generator -3: Four-quadrant source & measure system, max. ±80V/±1A, option AC Constant voltage generator: max. 20Vpk/100mApk, f=1Hz to 0.5MHz (sine, square or triangle wave)
Measuring ranges		DC Voltage, Current: ±125V, ±2A(max.±40V) or ±1A(max. ±80V, option) AC Voltage, Current: 150mV to 75Vrms, 0.7µA to 70mA Arms(max. 20Vpk), f = 10Hz to 0.5MHz Frequency: 1Hz to 20MHz Resistors: 5mΩ to 50MΩ Capacitors: 0.5pF to 200mF Inductors: 0.5µH to 500H Impedance/phse angle: 2.5Ω to 3.3MΩ / ±90° Transformers: Inductance, detection of winding, transmission ratio Forward voltage of PN junction: 0.1V to 40V Zener voltage: 0.1V to 40V (Max.80V, optional) Isolation test: Threshold is programmable from 5Ω to 50MΩ Continuity test: Threshold is programmable from 1Ω to 500KΩ Diodes/transistors/FETs: Forward voltage of PN junction, ON test, Gain, Static characteristics Relays/opto couplers/SW devices: ON test Open fault detection of IC leads: Forward voltage measure of PN junction, or IC-open check probes
Displacement measurement system TLS-1		Light source: Red semiconductor laser (Top side) Measuring method: Light/reflective type (laser displacement) Laser beam diameter: 0.25×2.65mm to 0.40×2.75mm (changes by the height of the measurement point) Measuring range: -5.0mm to +50.0mm Repeatability: ±100 µm or less Measuring time: 1ms/point (not included XY movement time) Application: Coordinates alignment by automatic generation of 3D-mapping Non-mounted components, floating components, missing components, etc.
Vision test system TOS-7F		Camera: 1/3"CCD mega-pixel color digital type (dual side) Light source for cameras: Ring-sharped white LED with brightness controllable to 256 steps Application: Coordinates alignment, simple vision test, reading of barcode & 2D code, real-map, etc. Vision test item: Non-mounted components, components shifting, missing components, polarity, color inspection of parts Image registration: Max. 2000 scenes (sum total on the dual side)
LED ON-color test system DOT-1 (option)		Sensor: 12-bit digital type, Sensitive to red, green and blue regions of the spectrum Detectable: Hue, saturation and luminance by R.G.B color ratio Sensing area: 1mm square (in the reference plane), approx. Detection time: 1ms/point (not included exposure time and XY movement time)
Test steps		Max. 350000 steps
Testable boards specifications		Test area (max.): L540 × D483mm (21.3"×19"), Dual side Board size: L50 × D50mm (2"×2") to L540 × D483mm (21"×19") Component height (max.): Top side 60mm (2.4"), Bottom side 60mm (2.4") includes board thickness Board thickness: 0.6 to 5.0mm (0.024" to 0.2") Component free-area: 3mm (0.12") or more from front and rear edges (for board clamp)
Conveyor specifications (APT-1600FD-A)		Transferable board size: L50×D50mm (2"×2") to L540×D483mm (21"×19"), Thickness 0.6 to 5.0mm Transfer direction and height: Left to right (standard), Right to left (option) FL 900mm (-15/+65mm) Transfer belts and speed: Timing belt (anti-static type), 200 to 667mm/sec. (programmable, 6 ranges) Conveyor width adjustment: Front side - fixed, Rear side - auto adjustment (with correction mechanism of parallelism) Interface for loader/unloader: SMEMA standards Entrance shutters (option): Automatic opening and closing Operation panel, Tower light: 5.6" colors TFT touch LCD, Colors lamp (red/green/yellow) with buzzer
Embedded PC and OS		Windows® PC (with DVD drive, HD drive, keyboard, mouse), Windows 7
Display & Printer		LCD : 1920×1080 resolution or higher resolution Printer: Small thermal type (USB connection)
Power and Air supply		AC200 to 240V (automatic change system, single phase) 50/60Hz (max. 4KVA), 0.6 to 0.8Mpa (dry clean air) (USB connection)
Operating environments		Temperature : 16 to 30 °C (60 to 86 °F) Humidity: 30 to 75% (no condensation)
Main body dimensions (W×D×H), Weight		1400×1500×1400mm (55"×59"×55"), 1450Kgs (3200 lb)
Options		NSW test software, LED ON-color test sensors, DC ±80V/±1A programmable source & measurement unit, Function scanner board, Power relay board, etc.

The technology and the options under development are included in specifications as of Nov., 2017. Specifications are subject to change without any obligation on the part of the manufacturer.