

i3070 Series 7i E9988GL, Inline High-Density In-Circuit Test System

Introduction

The Keysight i3070 Series 7i inline test system equipped with Quad-Density Pin Cards can provide up to 5760 test nodes in a slim footprint, allowing manufacturers to economically meet increasing test demands for large pin count digital devices while protecting their existing investments by maintaining backward compatibility with E9988E, E9988EL test programs, and fixtures.



New capabilities

- Test Super Capacitors up to 100 Farads (F) using a readily available integrated solution.
- Perform quick low-current measurements down to 100 nano-Amperes (nA) with reduced development time.
- Seamlessly integrate your preferred LED test analyzer and Flash programming solution into the functional ports.
- Improve cluster test reliability with new and enhanced test algorithms.
- Achieve up to 50% faster short tests for high-impedance nodes with Enhanced Shorts Test.

Faster Shorts Testing for High-Impedance Nodes with Enhanced Shorts Test

As technology evolves, the use of high-impedance nodes has been increasing. The increased need for high-impedance nodes is due to the increased demand for signal quality, lower power consumption, and improved functionality. However, with the increasing number of high-impedance nodes, the duration of short tests has also surged, posing challenges to testing efficiency.

Meet the i3070 Series 7i Enhanced Shorts Test – Keysight's innovative solution designed to address the growing need for efficient testing of high-impedance nodes. Enhanced Shorts Test revolutionizes the testing process by introducing a new test algorithm. This algorithm consists of two phases: a detection phase and an isolation phase, which collectively streamline the testing procedure.

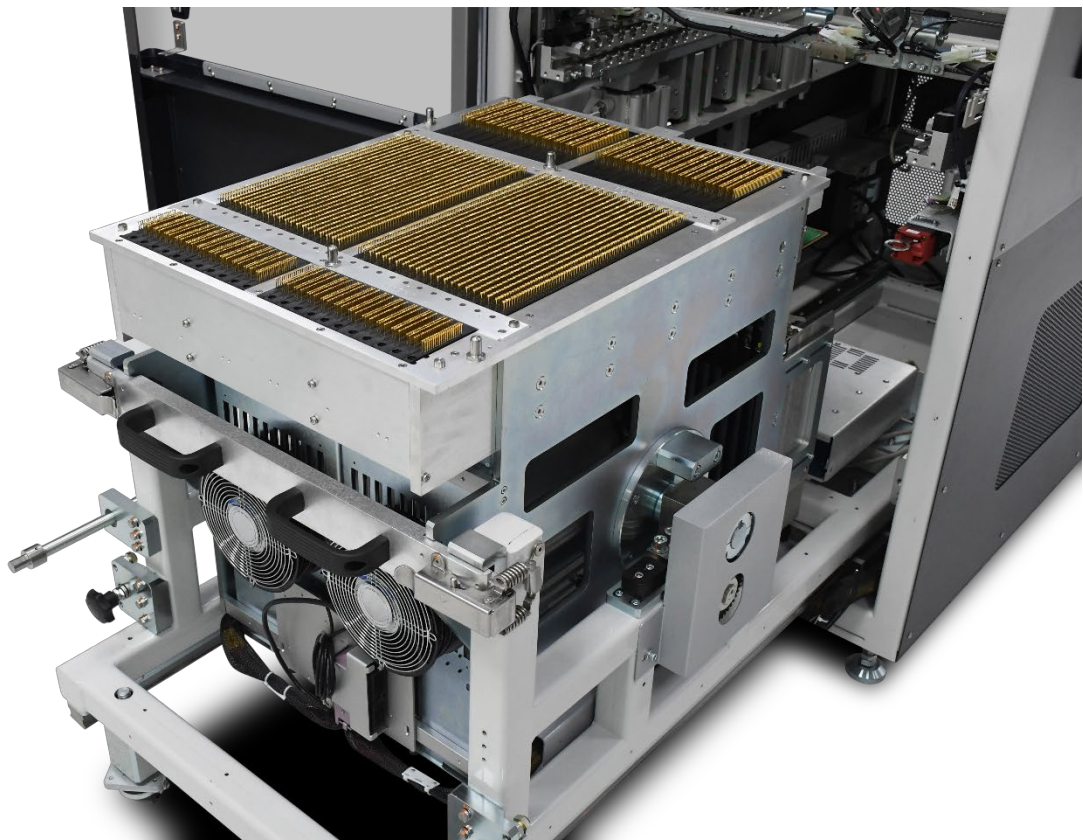
The key advantage lies in its efficient short-detection phase for high-impedance nodes. Leveraging the halving method, this phase significantly reduces the number of iterations required, substantially reducing overall test time.

Elevating High-Speed PCBAs Testing Efficiency with the Quad Density (QD) Pin Card

Testing high-speed PCBAs with a multitude of test pins can be a daunting and time-consuming task, often requiring multiple cycles for comprehensive testing. The i3070 Series 7i now introduces a groundbreaking solution, the Quad Density (QD) pin card, designed to tackle these challenges head-on.

With an impressive 320 test pins on a single board, the QD pin card enables a maximum of 2880 test pins per module, effectively doubling the capacity compared to the double-density pin card. This innovation means that even the most complex and large PCBAs can now undergo comprehensive testing in a single cycle, significantly reducing testing time.

The QD pin card goes beyond pin count, incorporating advanced features like a temperature sensor for environmental monitoring and a fixed discharging circuit for rapid capacitor discharge at a fixed current. Moreover, its seamless backward compatibility ensures easy integration into older tester bodies. With the QD pin card, you can achieve remarkable throughput improvements in the i3070 Series 7i while maintaining the utmost reliability and backward compatibility.



Improved Cluster Test Reliability

The i3070 Series 7i new cluster test algorithm represents a significant leap forward in improving the reliability of PCB testing for complex multilayer PCBAs. By automating the process of forming reliable passive device clusters, the i3070 Series 7i cluster test feature eliminates the manual and error-prone task of grouping components, reducing human intervention and potential errors. The new algorithm considers the presence of active components, ensuring that only purely passive devices are included in the clusters. This strategic approach maintains test measurement accuracy and reliability, as active components are known to introduce unpredictable shifts in impedance values, which can lead to unreliable readings.

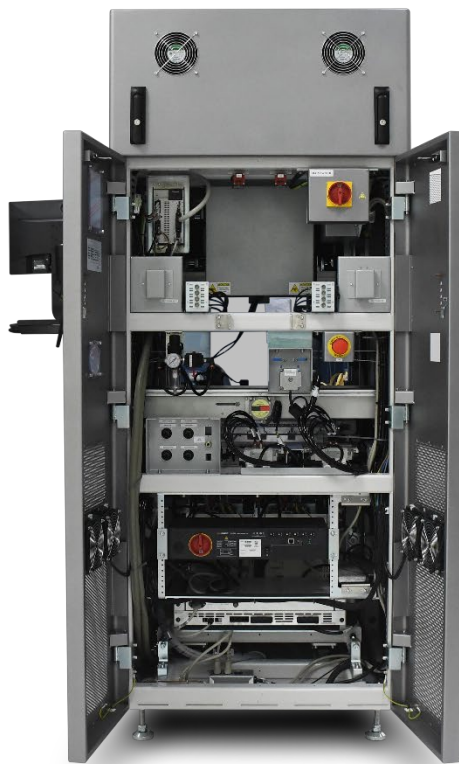
Its systematic verification of hardware requirements ensures that only compatible clusters are tested, mitigating the risk of invalid measurements caused by mixed device types or improper connections. Furthermore, by considering the specific hardware capabilities of the testing system, the algorithm dynamically defines the type of measurement to be executed for each cluster, encompassing resistors, capacitors, or inductors. As a result, the new cluster test significantly reduces the possibility of false passes and false failures, enhancing the overall test reliability.



Seamless Integration of 3rd-Party Test Equipment for LED Testing

PCBAs can often contain hundreds of LEDs, and testing the functionality of these LEDs on the PCBA is as important as testing the board's functionality since these LEDs serve as crucial indicators. While testing these LEDs is easily accomplished with an LED analyzer, integrating this test process or equipment into the ICT process is a different challenge.

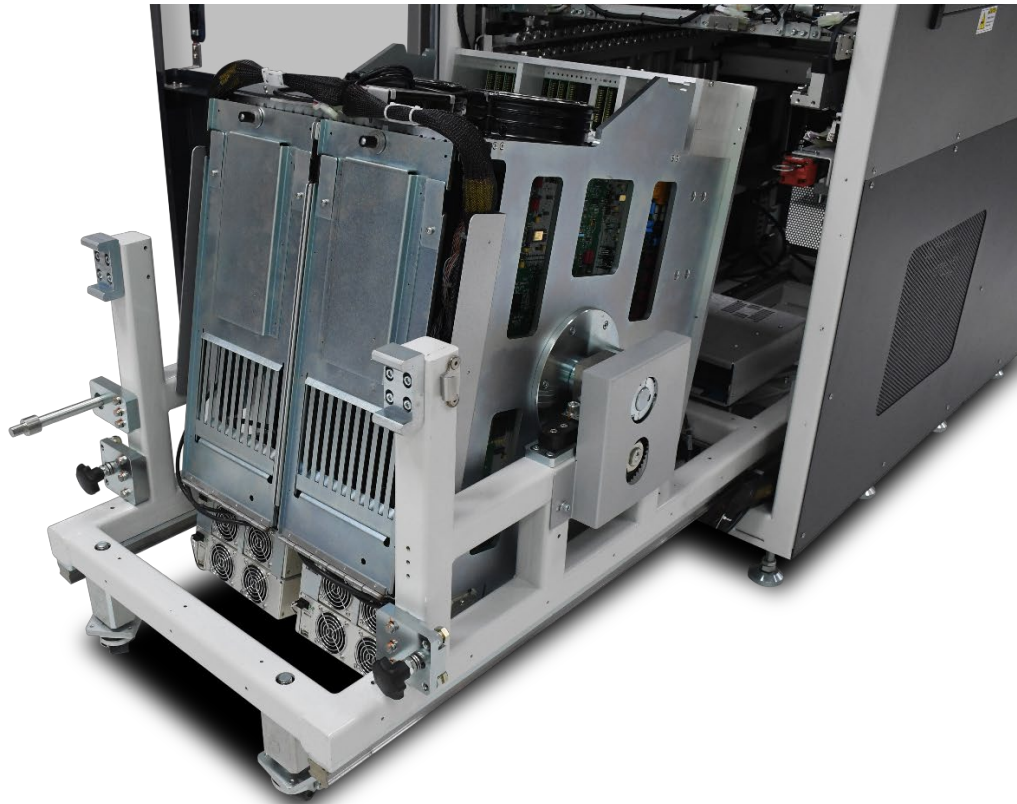
Fortunately, the i3070 Series 7i offers a streamlined and adaptable solution, enabling straightforward LED testing using a 3rd-party LED analyzer. It comes with a license to access the LED test plugin and a dedicated hardware structure that facilitates the mounting of 3rd-party test equipment. Additionally, the i3070 supports the OpenTAP test sequencer, empowering engineers to generate test sequences (TapPlan) for efficient LED testing with the i3070 Series 7i.



Streamlined Super Capacitor Testing

To ensure the correct installation of the supercapacitor component during assembly, the Equivalent Series Resistance (ESR) test must be performed during the ICT stage right after assembling the components. However, conducting the ESR measurement during the ICT stage presents certain risks and challenges. Firstly, the residue in the Supercap could potentially damage the tester, necessitating the use of custom-designed active load circuits to fully discharge the supercapacitor. Secondly, a fast and accurate charging, testing, and discharging method must be implemented to efficiently handle supercapacitors.

With the seamless integration of the Keysight N6792A DC electronic load or the N6786A two-quadrant SMU via the ASRU card of the i3070 Series 7i, you can now quickly and easily charge, test, and discharge supercapacitors ranging from 10mF to 100F using the built-in Supercap feature. Consequently, testing Supercaps becomes more streamlined and automated, eliminating the need for individual fixture electronics.



Driving Production Efficiency with Actionable Insights

Pathwave Manufacturing Analytics

By leveraging the test data produced by i3070 Series 7i, the PathWave Manufacturing Analytics platform provides actionable insights for every level in your organization in the smart factory of the future. Improve yield, lower retest, and handling, and lower the cost of poor quality with big data advanced analytics that really works. You can easily monitor and analyze the performance of your production line and make data-driven decisions to optimize the process. With this data-driven approach, manufacturers can reduce production costs, increase product quality, and improve overall production efficiency. To learn more about Pathwave Manufacturing Analytics, go to <https://www.keysight.com/us/en/product/PM2288A/pathwave-manufacturing-analytics.html>



General Specification

Parameter	Specification
Dimensions (excluding beacon and LCD panel) (L x W x H)	800 mm x 1,500 mm x 1,970 mm (31.5" x 59.0" x 77.6")
Number of test nodes	5,760 Maximum
PCB size (L X D)	- Minimum: 50 mm x 60 mm (2" x 2.4") - Maximum: 470 mm x 500 mm (18.5" x 19.7")
PCB size (With bypass option) (L x D)	- Minimum: 50 mm x 60 mm (2" x 2.4") - Maximum: 470 mm x 350 mm (18.5" x 13.8")
PCB thickness	- Minimum: 0.6 mm (0.02") - Maximum: 5 mm (0.20")
Maximum supportable PCB weight	5 kg (11 lbs)
PCB edge support (Factory configured)	3 mm (0.12")¹ 5 mm (0.2")^{2 3}
Component clearance	- Top: 90 mm (3.5") - Bottom: 30 mm (1.2")
Transport method	Belt transfer
Transport Direction (User configurable)	- Left to right - Right to left
Transport speed	- Minimum: 50 mm per second (2.0" per second) - Maximum: 650 mm per second (25.6" per second)
Transport height	- Minimum: 900 mm (35.4") - Maximum: 980 mm (38.5")
Bottom fixture height	- Minimum: 75 mm (2.9") - Maximum: 105 mm (4.1")
PCB exchange time	4 to 7 seconds
Press force	20 kN
Air Pressure	500 to 700 kPa (75.5 to 101.5 psi)
Power	3-phase, DELTA; Support 200 – 400 VAC 3-phase, WYE; Support 208 – 240 VAC 3-phase; WYE with neutral; Support 220/380 – 240/415 VAC (Line-to-neutral)/Line-to-line
Supercap measurement	Up to 100F (via N6700C with N6792A and N6752A)
Low current measurement	Down to 100 nA (via B2912B)

Note:

1: 3mm edge support is required to maintain backward compatibility with existing E9988E & E9988EL fixtures

2: Bypass option not available with 5mm edge support

3: 5mm edge support recommended for PCB weight more than 3Kg

Please refer to the [i3070 Series 6 Data Sheet](#) for detailed test and measurement specifications.

For more information

- To learn more about Keysight i3070 Series 7i Inline High-Density In-Circuit Test System, go to www.keysight.com/find/high-density-ict
- For more Keysight's ICT products, visit: <https://www.keysight.com/us/en/products/in-circuit-test-systems.html>