U9405B

FlexiCore i1000 automated inline parallel ICT system

Introduction

Maximizing cost-efficiency and throughput on today's manufacturing floors remains a growing challenge. Electronic Manufacturing Service (EMS) providers, traditionally focused on producing computing boards, have expanded into manufacturing communication boards and are now actively producing for the automotive market. This shift often involves handling medium- to high-mix board variants, which can increase the frequency of changeovers during testing, ultimately impacting throughput.

To address these challenges, manufacturers are increasingly adopting multi-panel boards. These panels may consist of identical designs (homogeneous) or multiple unique designs (heterogeneous) to reduce costs and minimize cycle times. However, testing heterogeneous boards introduces significant complexity.

Adding another layer of challenge, incorporating functional testing alongside these design variations creates a highly complex system that demands a flexible, adaptable solution to meet production line requirements effectively.



KEYSIGHT

i1000 Keysight FlexiCore In-Circuit Test

The i1000 Keysight FlexiCore In-Circuit Test (ICT) system is another step forward for Keysight's i1000 ICT family of products, which provides best-in-class price performance for today’s Printed Circuit Board Assembly (PCBA) manufacturing needs. Understanding the new challenges ahead, Keysight has made improvements to give users the option of changing the way i1000 systems are being used to suit production line needs.

Parallel testing of multi-panel boards

Addressing the increasing trend of using panelized boards in manufacturing is just one of the new features in the new i1000 Keysight FlexiCore In-Circuit Test system. Using panelized boards helps customers address a higher product mix, minimizing changeovers in manufacturing and increasing throughput. With the new enhanced software, the new Keysight FlexiCore feature allows easy configuration to test 2, 3, or 4 multi-panel boards, giving flexibility in managing manufacturing capacity. With an increase in board space, the maximum number of nodes tested increases from 1,664 nodes previously to 2,560 nodes, complementing larger panelized boards.

Functional test, flashing, LED checks – combine it all

Physically, the system depth has been increased by 200 mm from the previous generation's in-line system, giving additional space in 3 areas to expand testing capabilities.

- From the top, standard 19” EIA equipment can be easily mounted vertically, with up to 4RU of space.
- In the middle, behind the fixture workspace, measuring 320 mm (D) x 700 mm (W) x 500 mm (H), there is space to mount flash programmers or LED verification modules, making them close to the fixture.
- At the bottom, already present, behind the ICT hardware, a space of 10 RU, to mount PXI based hardware, like the Keysight M9018B PXIe chassis and all the available modules, or the 34980A multifunction switch/measure unit.

If the ICT capabilities are not required, the ICT hardware can be removed, and the space repurposed with additional functional test hardware, converting the system into an automated in-line functional test platform.



Figure 1. System bottom, 10 RU space for additional hardware

Device Under Test Specification

Key specifications	Options
Maximum PCB size	480 mm (L) x 320 mm (W)
Minimum PCB size	50 mm x 50 mm
Bottom side clearance height	40 mm
Top size clearance height	150 mm
PCB shape	A square or rectangle is recommended.
Deviation	1 mm (maximum)
PCB weight	3 Kg (maximum)
PCB margin for conveyor	3 mm
PCB alignment	Fixed by 2-4 guide pins
Maximum test points	2,560
Maximum cores	4 (640 nodes per core)
Core merge	Yes (1 / 2 / 3)

Mechanical and Environmental Specifications

Key specifications	Options
Dimension	850 mm (W) x 1100 mm (D) x 1,900 mm (H) With signal tower lights: 2,200 mm (H)
Conveying direction	Left to left / Left to right / Right to left / Right to right
Conveyor belt width	3.0 mm
Conveyor height	895 mm ~ 995 mm
Conveyor speed	300 mm/sec ~ 500 mm/sec
PCB exchange time	6 seconds
Board markers	Up to 7
Fixture lock mechanism	Automatic engagement
Power	200 V - 240 V AC
Power frequency	50 Hz / 60 Hz
Air pressure	6kN ~ 8kN, (6 kg/cm2 ~ 8 kg/cm2)
Working temperature	5 to 45 °C
Working humidity	20 to 80%

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