Shanghai Autotec Company Introduction

www.autotec.com.cn

Company Overview＞Main Products

Autotec

Solution for Automotive

Vehicle Navigation

Inverter

Amplifier

BCM

Wireless Charging

Sensor

Charging GUN

Headlight Controller

Vehicle USB

Body Control Unit

SCU

Transmission Control Unit

Solution for 3C/ PCBA Testing
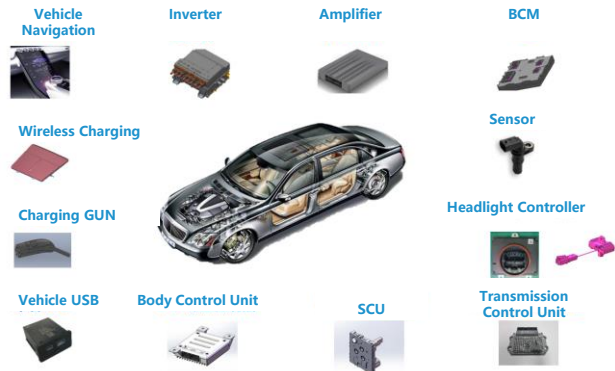
➢ 产品发展历程

2009

2013

2016

202X

Fixture & Fanual Standalone Devices

Automated Standalone Devices

Automated Passembly & Testing Production Line

Autotec
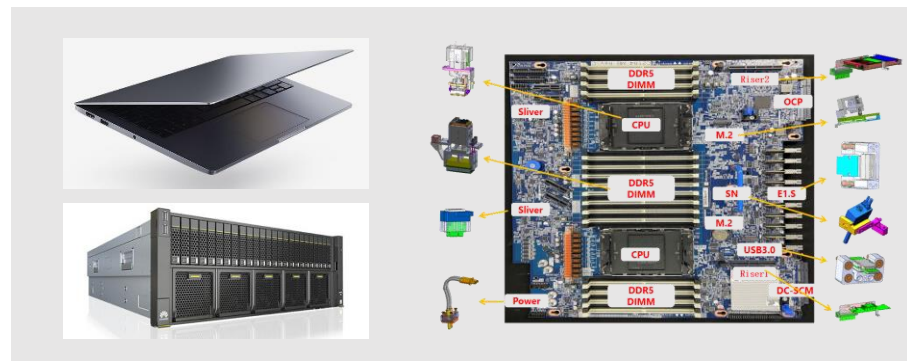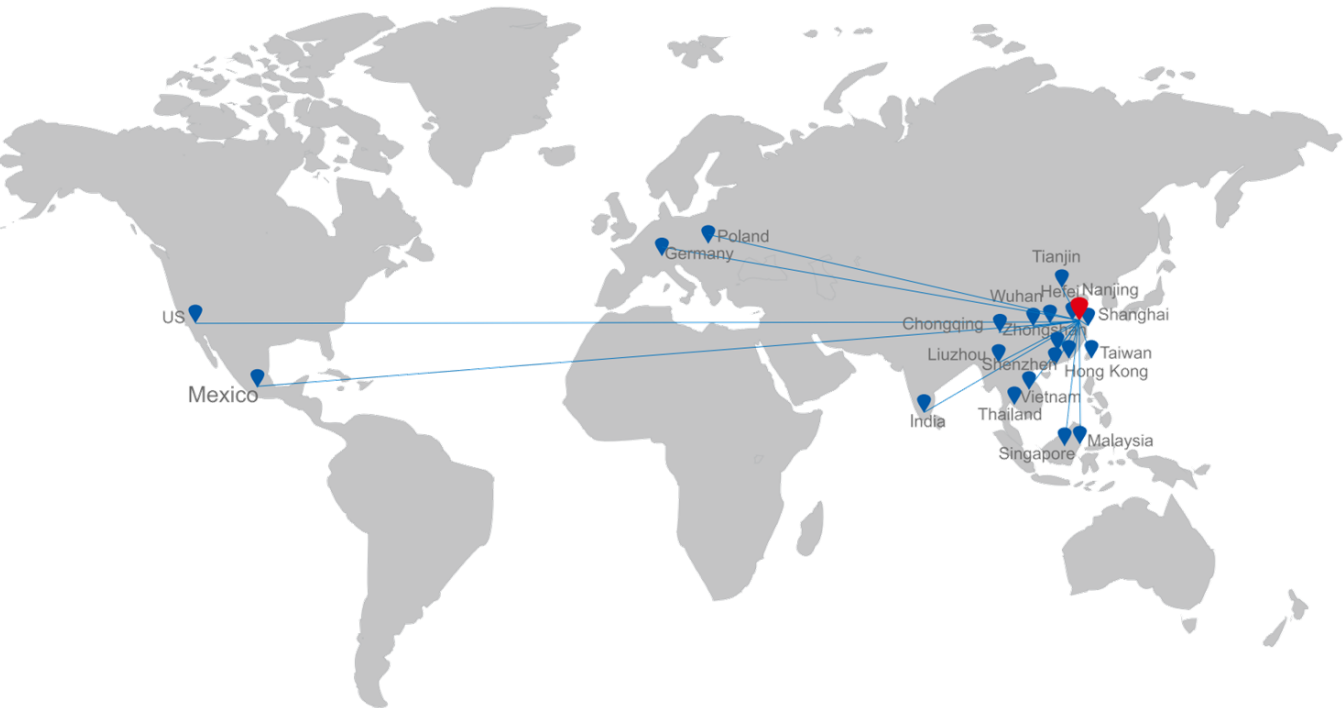
Overseas Layout	
Country /Region	**Nature of Business**
Singapore	Overseas Headquarters
Taiwan	Overseas Service Center
Vietnam	Factory, Service
Thailand	Factory, Service
The U.S.	R&D, Sales
Mexico	Factory, Service
Poland	Service

Map labels: Poland, Germany, US, Mexico, Tianjin, Wuhan, Hefei, Nanjing, Shanghai, Chongqing, Zhongshan, Liuzhou, Shenzhen, Taiwan, Hong Kong, India, Vietnam, Thailand, Singapore, Malaysia

Taiwan Factory:

Taoyuan City, Taiwan

Development Plan:

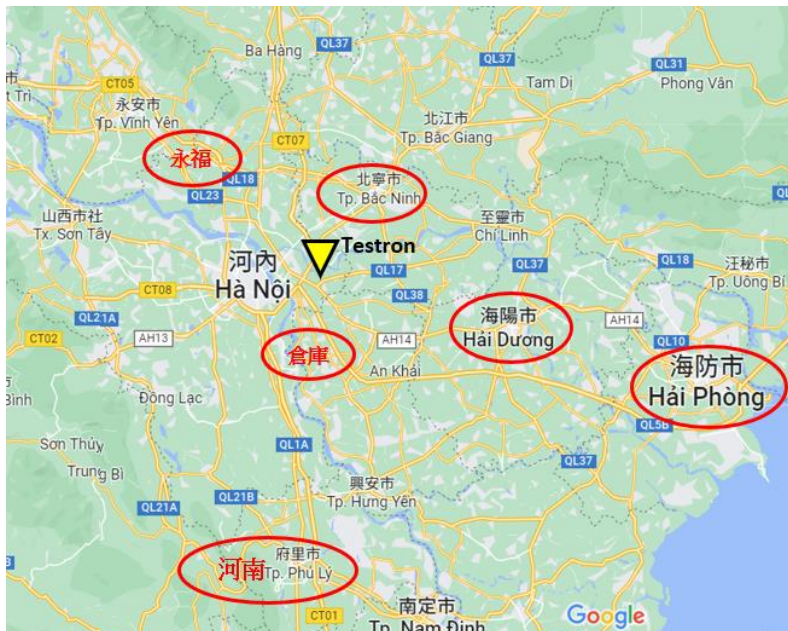| Phase	Positioning
Now	Sales, Design, Assembly & Debugging, After-Sales
Mid to Long-Term	Sales, Design, Production, Assembly & Debugging, After-Sales

Vietnam Factory:

Located in the Bac Ninh VSIP Industrial Zone,

approximately 1 hour's drive from various ODMs,

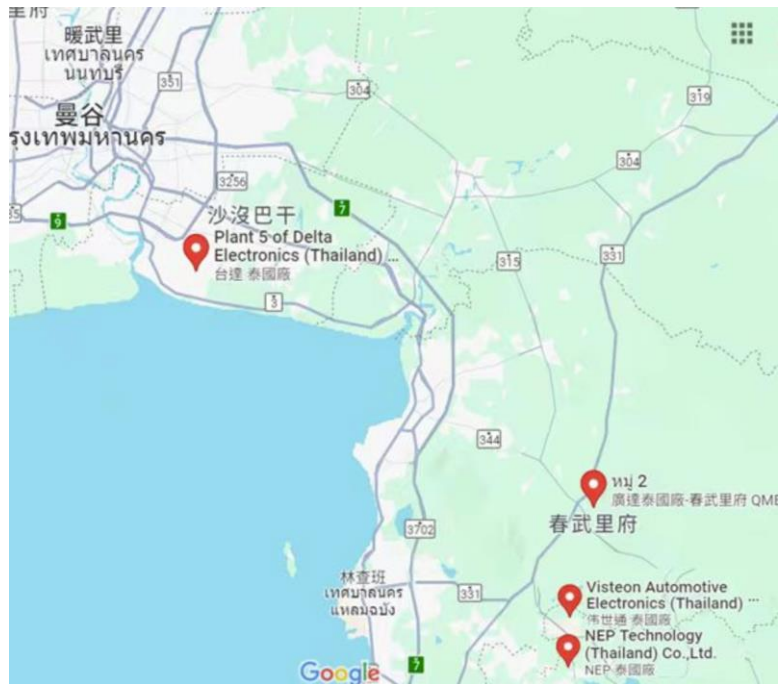providing radial service to customers.

Development Plan:

Phase	Positioning
Now	Sales, Assembly & Debugging, After-Sales
Mid to Long-Term	Sales, Production, Assembly & Debugging, After-Sales

Thailand Factory:

Chonburi, Bangkok

Development Plan:

Phase	Positioning
Now	Sales, Assembly & Debugging, After-Sales
Mid to Long-Term	Sales, Production, Assembly & Debugging, After-Sales

Mexico Factory:

Location: San Luis Potosí

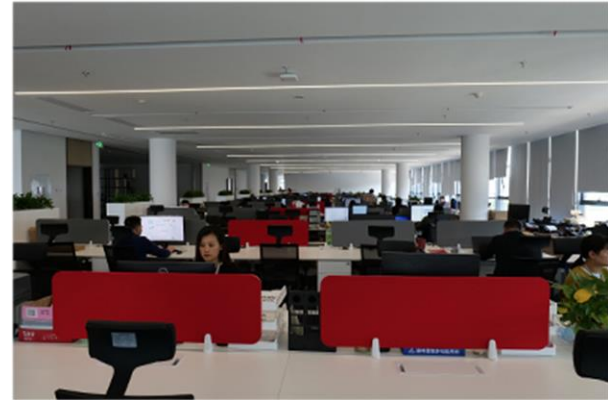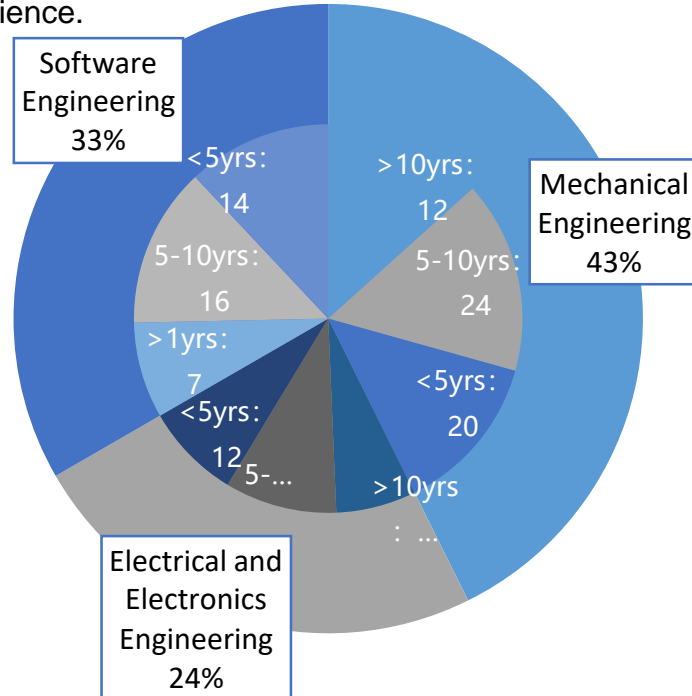**Development Plan:**

Phase	Positioning
Now	Sales, Debugging, Warehousing, After-Sales
2024.Q4	Sales, Production, Assembly & Debugging, After-Sales
Mid to Long-Term	Sales, Design, Production, Assembly & Debugging, After-Sales

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Technical Capabilities > Technical Team

- The company currently has over 270 employees, with about half being engineering personnels. Many of them are senior engineers with 5-10 years, or even more than 10 years of experience.

Software Engineering 33%

<5yrs: 14

>10yrs: 12

5-10yrs: 16

5-10yrs: 24

>1yrs: 7

Mechanical Engineering 43%

<5yrs: 12

<5yrs: 20

5-...

>10yrs: ...

Electrical and Electronics Engineering 24%

CNC*7 sets

CNC engraving & milling machine*20 sets

Drilling Machine*5 sets

Machining

Sheet-metal

3D Measuring Machine

Production Capabilities>Assembly Shop

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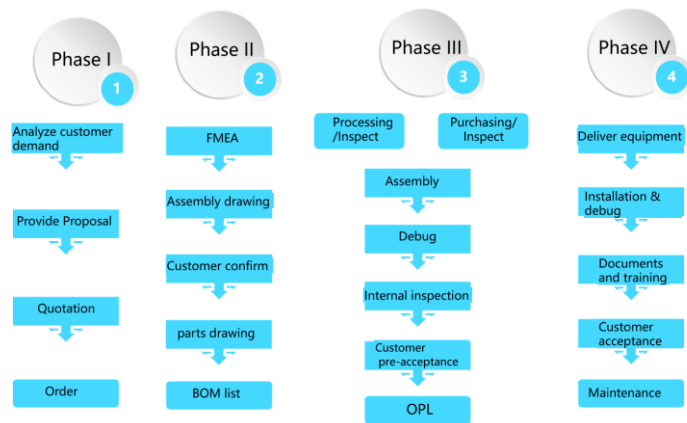ICT Assembly Shop

FCT Assembly Shop

Module Assembly Shop

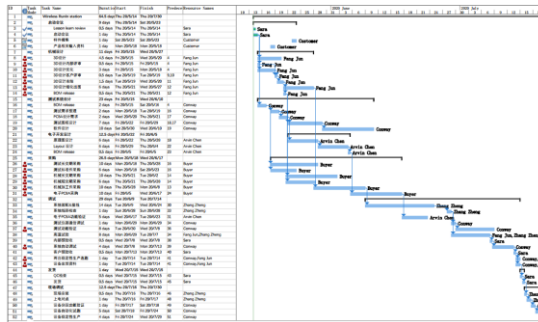Automation Assembly Shop

Automation Assembly Shop

Autotec

1. Project Management

2. Project Process Management Documentation

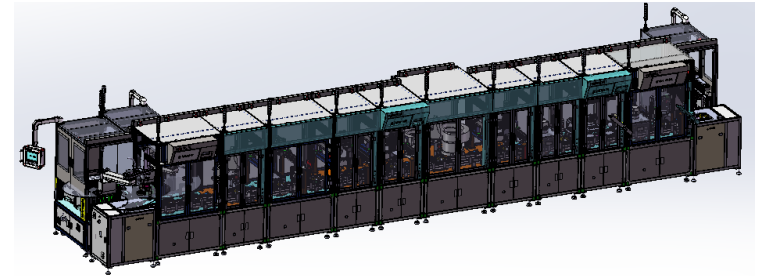| Process	Output Documents	Purpoes
Project Initiation	Device Development Customer Input Confirmation Checklist	Used to record the technical information/sample/device basic information confirmation provided by the client
	Project Initiation Form	Used to record the basic project information and related personnel information
	Project Lesson Learn	Similar to project lesson learn
	Project Schedule	Overall implementation plan for the project
Project Implementation	Project Issue Log	Used to record issues encountered during the project development process
	Risk Management Log	Used to record and follow up on risk identification and mitigation during the project development process
	Meeting Minutes	Used to record the contents of each meeting during project development
	Change Request	Used to record requirements changes during project development
Project Delivery	Project Handover Documentation	Includes project report, archive file, operation manual, maintenance manual, backup information, transaction clearing sheet, instrument calibration report, etc.

3. Quality Management

4. Project Manager

Each have over 10 years of management experience in the non-standard automation industry and hold PMP certification to enhance their professional skills.

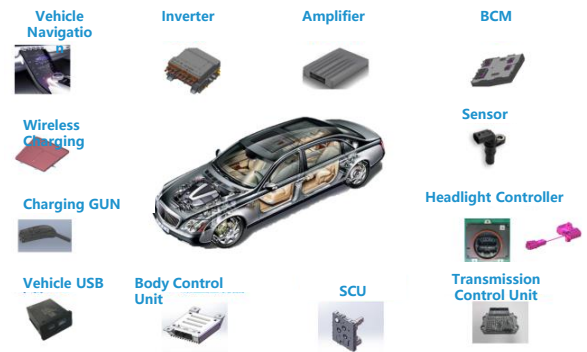# Automotive Electronic Assembly Testing Solution

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Automation Solution

Automation

Automotive Electronic Assembly Testing Solution

Testing Solution

Testing Solution

Vehicle Navigation

Inverter

Amplifier

BCM

Sensor

Wireless Charging

Charging GUN

Headlight Controller

Vehicle USB

Body Control Unit

SCU

Transmission Control Unit

The applications used on

Autotec

Automotive electronic parts automation solution-Domain controller

Domain controller

- Vehicle central domain controller
- Intelligent cockpit domain controller
- Intelligent driving domain controller
- Chassis domain controller
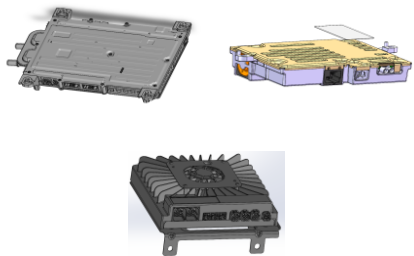
Solutions

- Product Testing DFT Report, covering testability analysis and solutions for improving test coverage, as well as test specifications;
- Product Process DFM Report, covering process analysis and production line DFM solutions;
- Intelligent MES System, enabling centralized control of the production line;
- Development of a fully automated production line, covering ICT, FCT, assembly, high-temperature aging, and test lines; Core processes mastered include automatic assembly, automatic gluing, automatic tightening, laser engraving, RF testing, vibration testing, and functional testing.
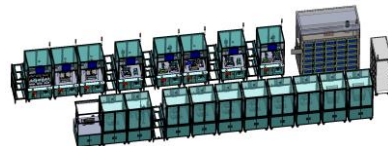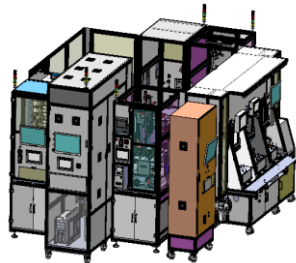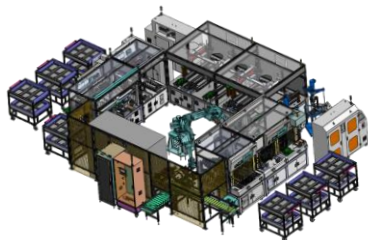
Headlight controller

- Headlight Controller
- Front Light Controller
- Ambient Light Controller
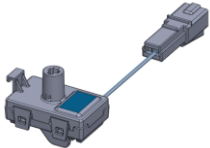
Solutions

- DFT Report for Product Testing, covering testability analysis and test specifications;
- DFM Report for Product Manufacturing, covering process analysis and production line DFM solutions;
- Intelligent MES system for centralized production line control;
- Development of fully automated production lines, covering FCT, assembly, high-temperature aging, and testing lines. Key processes include PCBA and housing assembly, thermal and sealant application, automatic tightening, automatic labeling, ceramic clamp welding, visual inspection, and EOL testing.
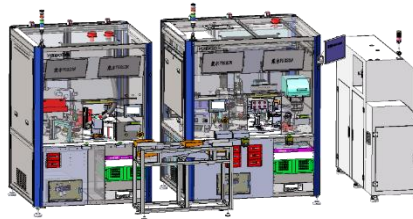
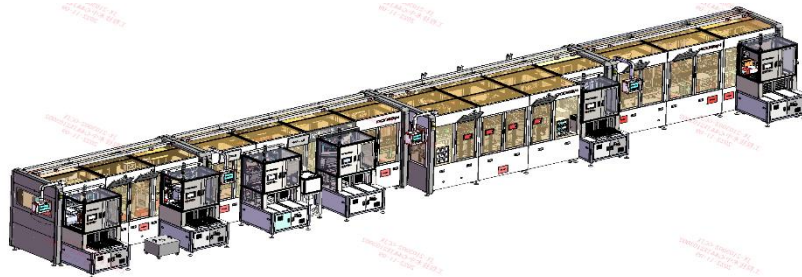# Automotive Electronic Parts Automation Solutions – Intelligent Actuator

Intelligent Actuators

- AVS Actuator (Active Valve System)
- Primarily controls the engine intake and exhaust systems.
- AGS Actuator (Active Grille Shutter)
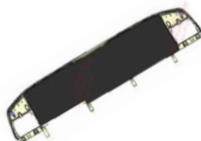- Primarily controls the active shutters in the vehicle's front grille.
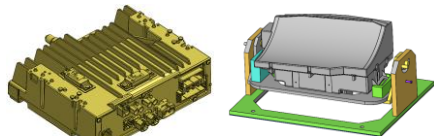

• Solutions

- Product Testing DFT Report, covering testability analysis and testing specifications;
- Product Manufacturing DFM Report, covering process analysis and production line DFM solutions;
- Intelligent MES system for centralized production line management;
- Development of fully automated production lines for the entire process, including assembly and testing lines. Core processes include laser engraving, motor assembly & pressing, bottom case oil injection, rotor assembly, PCBA assembly, gear assembly, laser welding, running-in testing, leak testing, noise testing, and EOL (End-of-Line) testing.

Automotive Electronic Parts Automation Solutions – In-Vehicle Information and Entertainment Systems

In-Vehicle Information and Entertainment Systems

- Navigation Head Unit
- Display Screen (Single Screen, Dual Screen, Triple Screen)
- AR-HUD (Augmented Reality Head-Up Display)
- Audio Amplifier

Solutions

- Product Testing DFT Report, covering testability analysis, solutions for improving test coverage, and testing specifications;
- Product Manufacturing DFM Report, covering process analysis and production line DFM solutions;
- Intelligent MES system for centralized production line control;
- Development of fully automated production lines for the entire process, including ICT, FCT, assembly, high-temperature aging, and testing lines. Key processes include automatic assembly, automated adhesive application, automatic tightening, laser engraving, frame assembly, double-sided adhesive application, RF testing, vibration testing, functional testing, screen testing, and more.
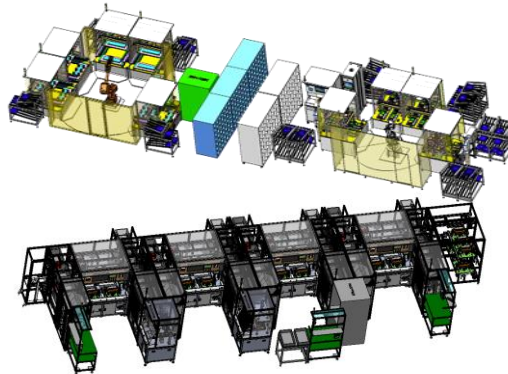
Automotive Electronics Components Automation Solutions — Other Body Electronics

Other Body Electronics

- - In-Vehicle USB HUB
- - In-Vehicle Wireless Charging (WPC)
- - Body Sensors: PM2.5 Sensor, Light and Rain Sensor, Temperature and Humidity Sensor
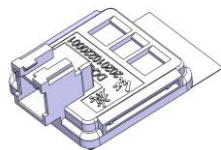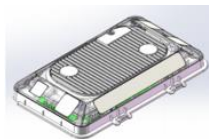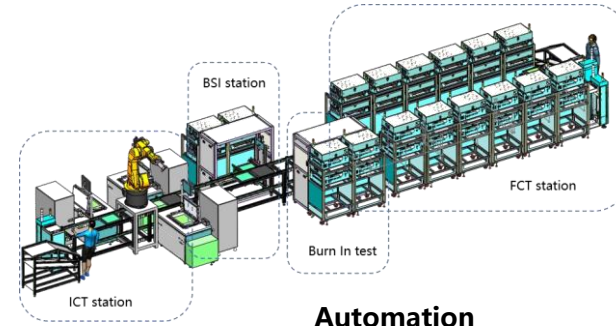

Solutions

- Development of fully automated production lines, covering PCBA testing, assembly, and test lines. Core processes include automatic assembly, automatic fastening, automatic dispensing, RF testing, and functional testing.
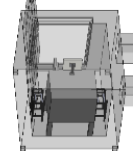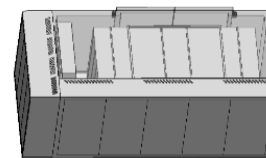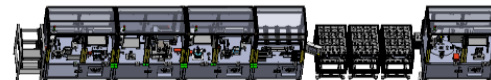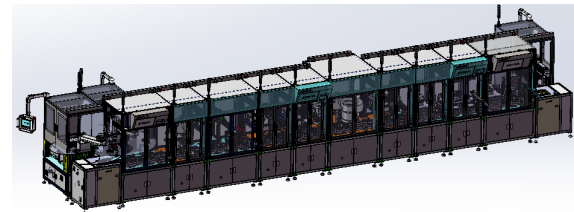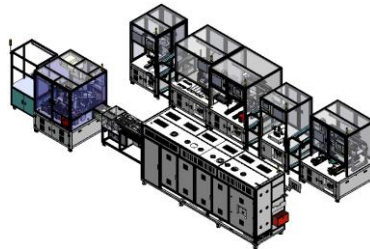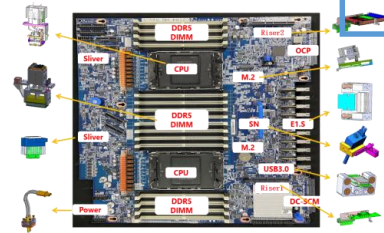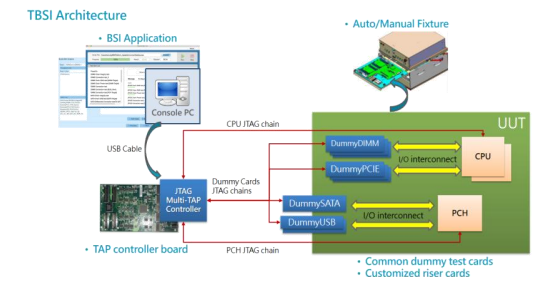
Solutions for PCBA testing

Autotec

Solution for PCBA testing

Automation Solution

Automation

Testing Solution

Testing Solution

Application---PCBA

>>Product Introduction：

This auto test line uses maglev loader with double-layer test chamber to automatically deliver in-line BSI and FCT test.

>>Project Introduction：

It contains Lift, AOI, BSI chamber, FCT chamber, Buffer chamber, etc., to achieve in-line auto PCBA test. After testing, the PCBA is automatically stored.

AOI

Buffer Chamber

Test line flow

Maglev loader rail

Lift

Carrier reflow

Lift

AOI

BSI test chamber*3 sets (6pcs tester)

FCT test chamber*29sets (58pcs tester)

Autotec

>>Product Introduction：

This auto test line uses in-line structure with double-layer test chamber to automatically deliver BSI and FCT test.

>>Project Introduction：

In-line auto BSI/FCT test line contains lift, BSI chamber, FCT chamber, Storing chamber, etc., to achieve in-line auto PCBA test. After testing, the PCBA is automatically stored.
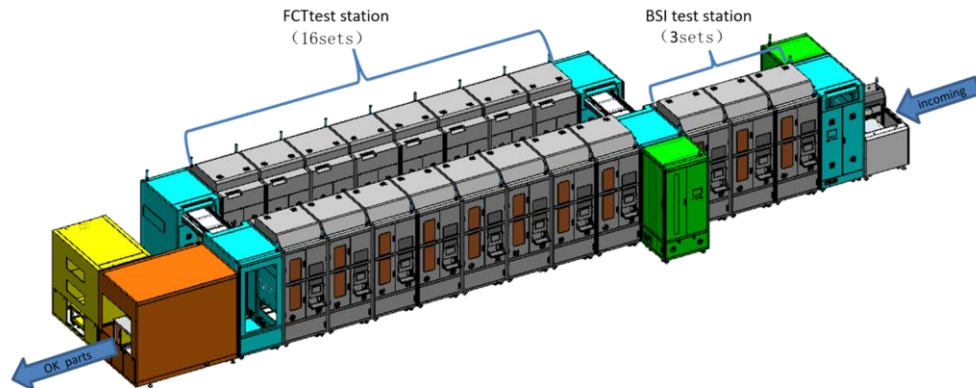
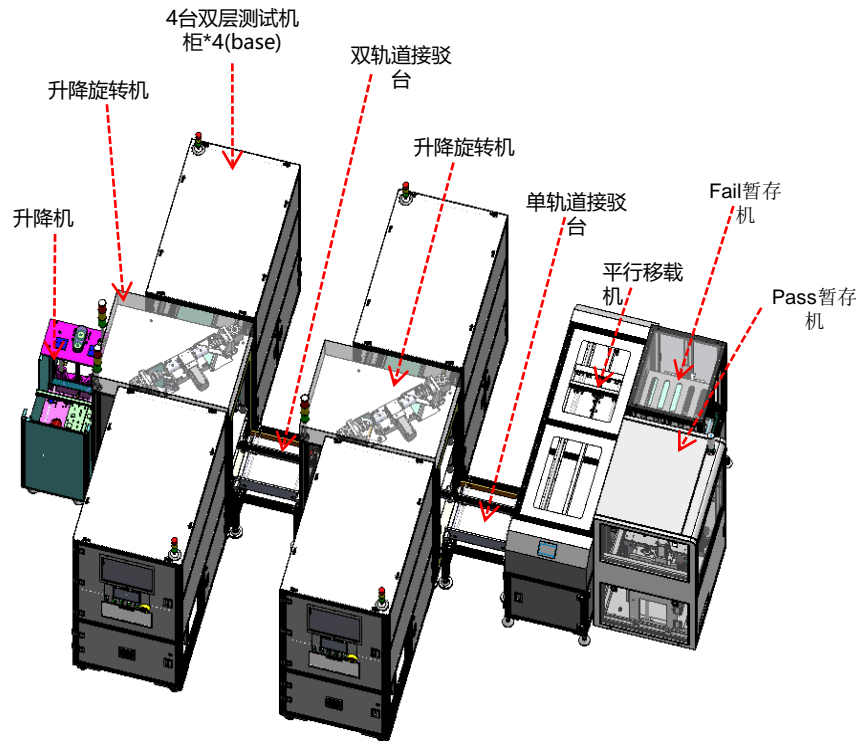**Autotec**

>>Product Introduction:

This auto test line uses in-line structure with double-layer test chamber to automatically deliver FCT test for NB products.

>> Features:

- ✓ CT ≤ 10.5sec
- ✓ Fixture could be quickly changed (T≤3min);
- ✓ Fixture is easy to maintain on the line with a drawer-style, which does not affect other test(s).
- ✓ The bottom board in a ramp-up design ensures the balance of test forces, and the arrangement of the needle points is not affected by the forces;
- ✓ It is possible to retest in different fixtures;
- ✓ Manual and Automatic modes (the manual mode allowing for manual loading for testing)

升降旋转机
4台双层测试机柜*4(base)
双轨道接驳台
升降旋转机
单轨道接驳台
Fail暂存机
升降机
平行移载机
Pass暂存机

Autotec

Autotec

>> product presentation:

The automatic wire body uses a manipulator or a shifter to put the main board into the test equipment for ICT, BSI, burning and functional testing. To realize the automatic testing of large size PCBA motherboards with large size such as server Sver motherboard.
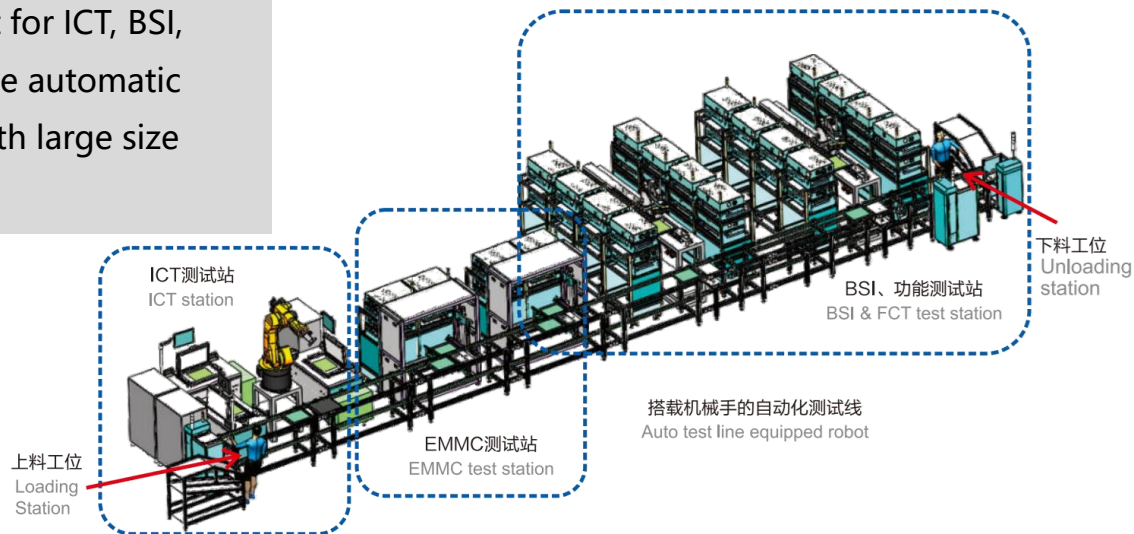
ICT测试站
ICT station

EMMC测试站
EMMC test station

BSI、功能测试站
BSI & FCT test station

下料工位
Unloading station

搭载机械手的自动化测试线
Auto test line equipped robot

上料工位
Loading Station

Autotec

>> product presentation:

The cable body realizes the automatic assembly and testing of the related components of the server motherboard.

>> Project Introduction:

Achieve a whole line UPH (Units Per Hour) ≥ 30 pcs

In addition to meeting the current generation product requirements, the system must be compatible with future upgraded models of the same type of motherboard
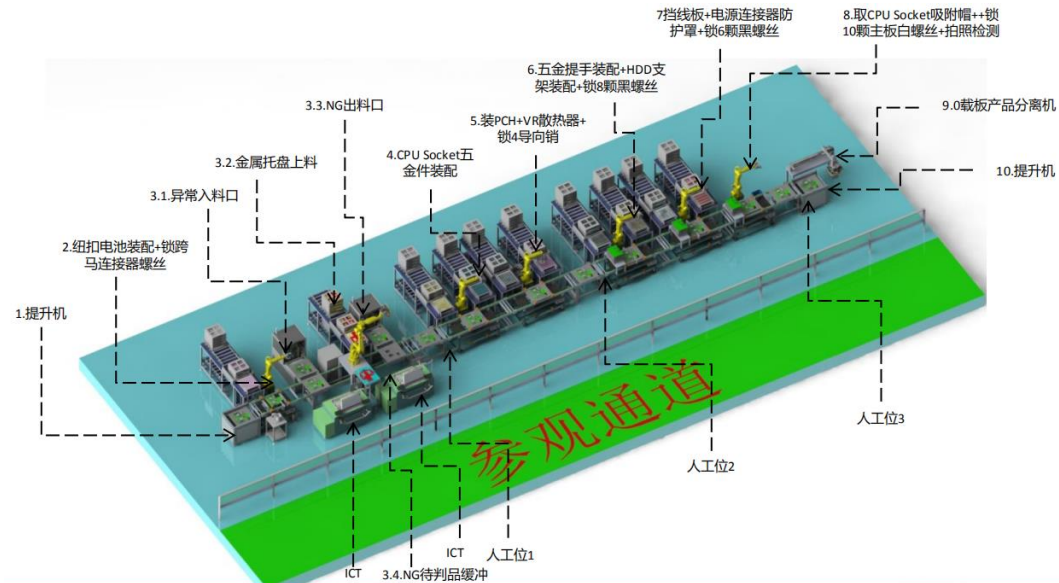
G5 主板			G6 及未来主板		
长	宽	厚	长	宽	厚
483.1	421.4	1.93	650	510	3.0

Autotec

>> product presentation:

The line body realizes the automatic ICT-test of the server mainboard, adopts the six-axis manipulator for PCBA picking and release, and completes the automatic test with the Keysight 3070 test platform.
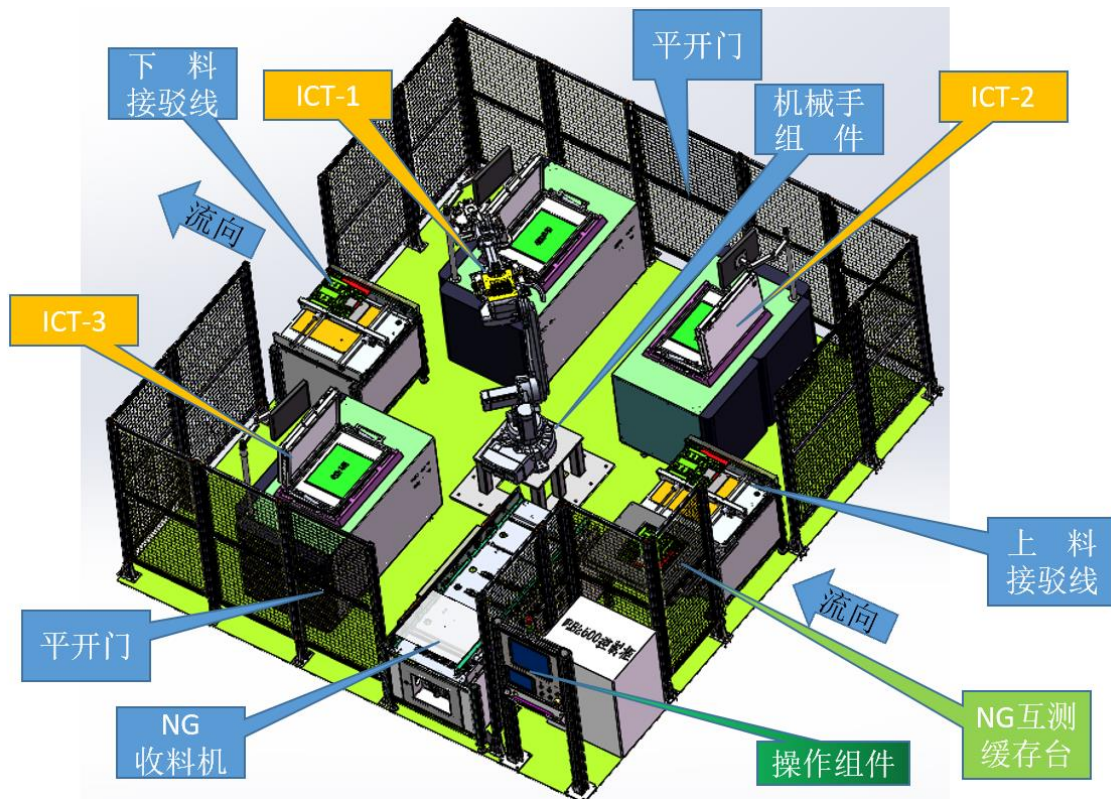
The PCBA plate to be tested runs into the belt line

The six-axis manipulator grabs the PCBA into the ICT test

Test OK on the belt line outflow, NG, then put into the NG feeding machine

下料接驳线 | ICT-1 | 平开门 | 机械手组件 | ICT-2 | 流向 | ICT-3 | 上料接驳线 | 平开门 | NG收料机 | 操作组件 | NG互测缓存台 | 流向

Autotec

>> product presentation:

The line body realizes the automatic ICT-test of the server board, and two quad manipulator are used to take and drop PCBA, and complete the automatic test in cooperation with the Keysight 3070 test platform.
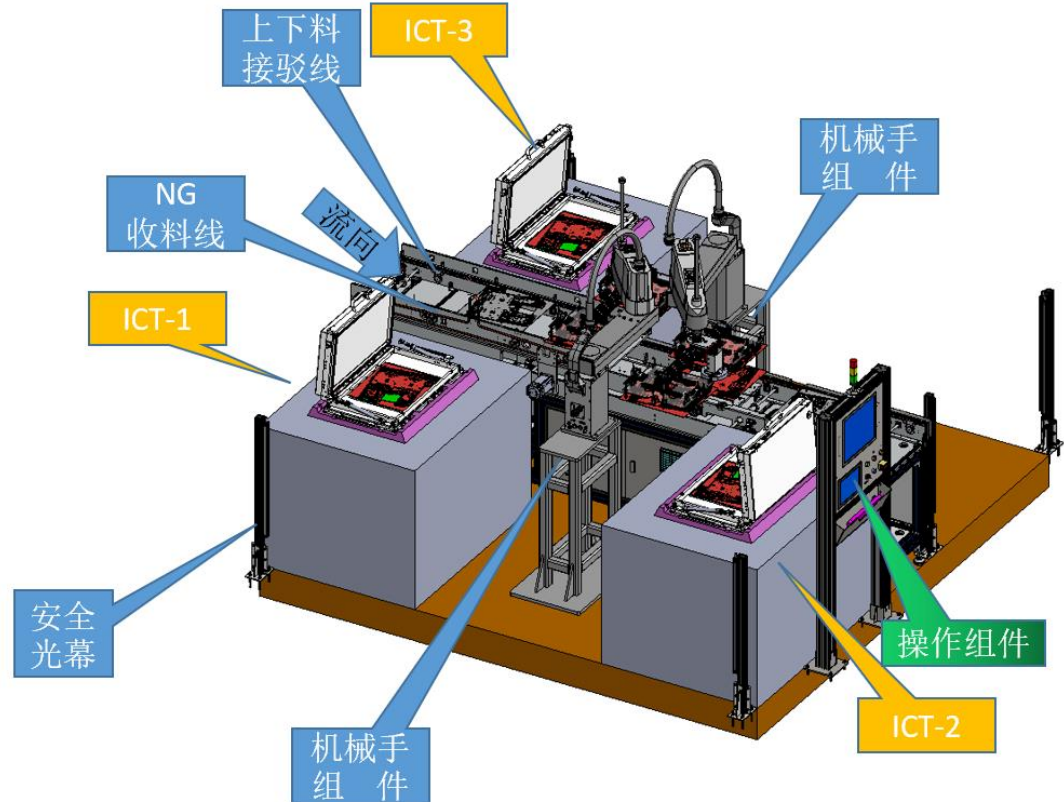
The PCBA plate to be tested runs into the belt line

The test shaft manipulator grabs the PCBA into the ICT test

If the test result is OK, the belt line continues; if NG (not good), it undergoes retesting. If it fails retesting again, it proceeds to the NG receiving line

上下料
接驳线　ICT-3

NG
收料线　流向　机械手
组　件

ICT-1

安全
光幕

机械手
组　件

操作组件

ICT-2

Hardware: ICT Fixture (Agilent, Teradyne and TRI)

- ✓ Wired ICT fixture;
- ✓ Wireless ICT fixture;
- ✓ ICT fixture with connector automatic insertion;
- ✓ Dual well ICT fixture;
- ✓ ICT fixture for multiple boards;
- ✓ ICT fixture with cable test;
- ✓ Inline ICT fixture;
- ✓ ICT fixture for robot in automatic production line.

Software: ICT Program (Agilent, Teradyne and TRI)

- ✓ Wired ICT program;
- ✓ Wireless ICT program;
- ✓ Multiple ICT program;
- ✓ IC online verification and programing;
- ✓ WIB board;
- ✓ JTAG test.
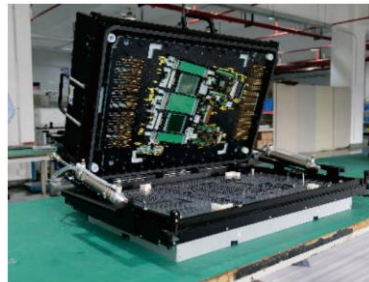
1、Auto Tester on worktable

>> Product Introduction：

Auto Tester, automatically plug in/out all connect ports (including DIMM, CPU, PCIe, M.2, USB, SATA, Type-C, Fans, VGA, etc.), deliver auto test.

>> Features：

- Put on worktable；
- have flip-type, drawer type, etc.；
- plug in/out all test ports automatically；
- fit to robot load/unload UUT, also OK for manual.

Flip-type FCT Auto Tester
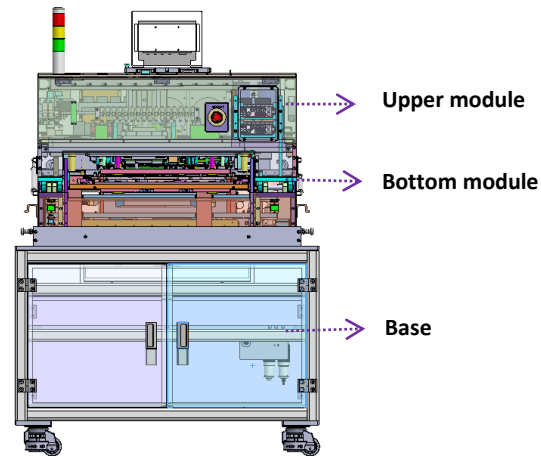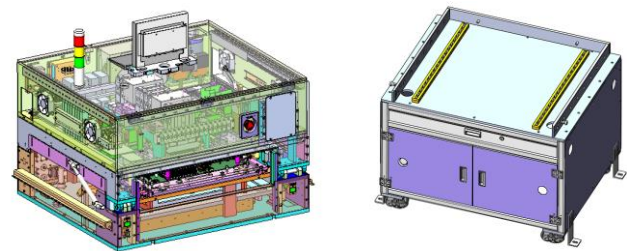

Drawer-type Auto Tester

Autotec

2、Auto tester with base

>> **Product Introduction：**

Auto tester with base, could quick move and locate, automatcially plug in/out all test ports, deliver auto test.

>> **Features :**

➢ including tester and base；
➢ covenient to quick move and locate；
➢ plug in/out all test ports automatically；
➢ Adapt to manual loading and unloading boards, transfer line, and robotic line

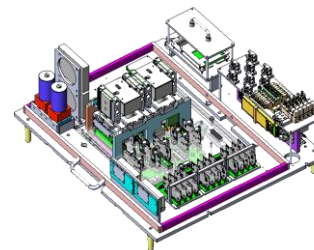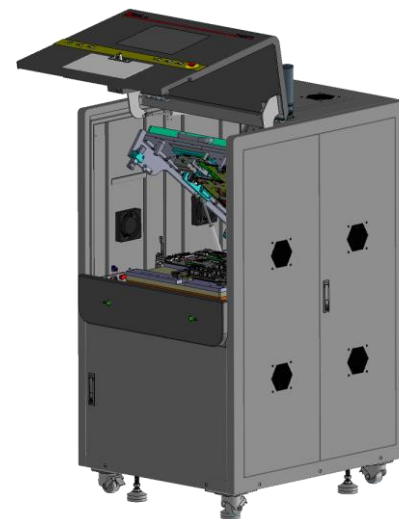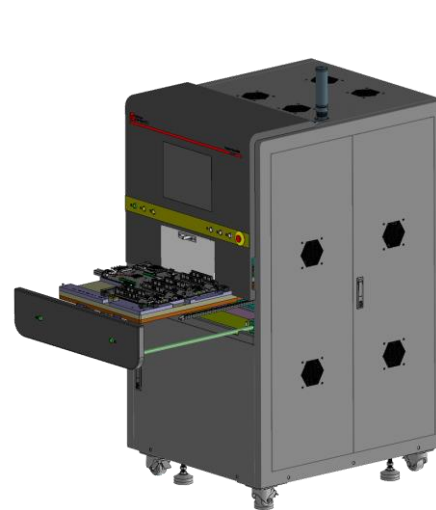Upper module

Bottom module

Base

Autotec

3、Auto Test Rack

>> Introduction：

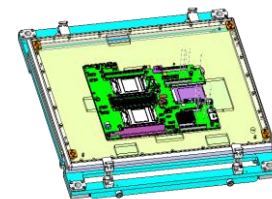Auo test rack put the drawer-type tester into the cabinet, is compatible for multiple fixtures, automatcially plug in/out all test ports, deliver auto test.

>> Features :

➢ Base+Mobile structure，Mobile is quick-change;

➢ compatible for multiple fixtures；

➢ plug in/out all test ports automatically；

➢ Adapt to manual loading and unloading boards, transfer line, and robotic line

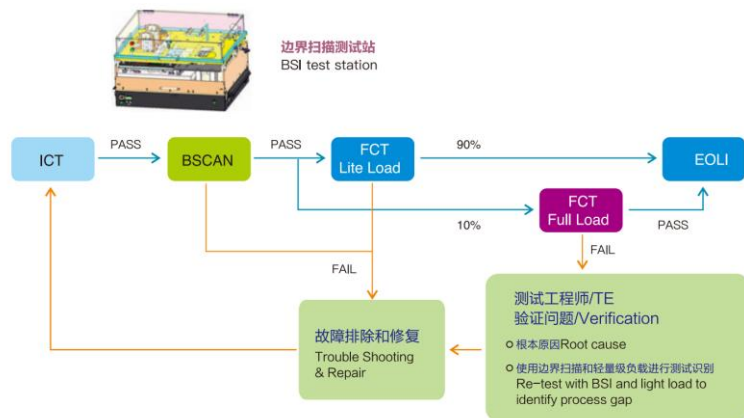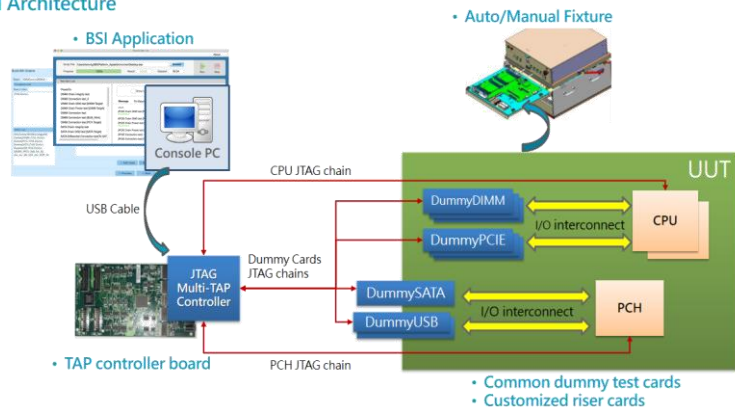**Upper Module**   **Bottom Module**

>> Introduction：

It possess multi-platform development and integration capabilities, such as Keysight, TRI, JTAG, and Asset. Additionally, we have independently developed the TBSI platform, which utilizes boundary scan technology to conduct various tests on motherboards, including testing multiple I/O slots (DIMM/PCIE/SAS/SATA/USB/RJ45, etc.).

>> Features:

➢ Based on boundary scan technology, compatible with IEEE1149.1/1149.6 for I/O testing functionality;

➢ In the manufacturing process, typically positioned between ICT and FCT tests;

➢ Supplements ICT with necessary enhancements to reduce fixture costs through higher coverage, enhancing test stability and reliability;

➢ Significantly reduces FCT testing time, thereby lowering overall testing costs.

TBSI Architecture

- BSI Application
- Auto/Manual Fixture
- Console PC
- USB Cable
- CPU JTAG chain
- DummyDIMM
- DummyPCIE
- I/O interconnect
- CPU
- JTAG Multi-TAP Controller
- Dummy Cards JTAG chains
- DummySATA
- DummyUSB
- I/O interconnect
- PCH
- TAP controller board
- PCH JTAG chain
- UUT
- Common dummy test cards
- Customized riser cards

边界扫描测试站
BSI test station

ICT → PASS → BSCAN → PASS → FCT Lite Load → 90% → EOLI
FCT Full Load → 10% → PASS
FAIL → FAIL

测试工程师/TE
验证问题/Verification
○ 根本原因Root cause
○ 使用边界扫描和轻量级负载进行测试识别
Re−test with BSI and light load to identify process gap

故障排除和修复
Trouble Shooting & Repair

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>> Application：

A universal testing platform for testing various types of small cards on laptop motherboards, desktop computer motherboards, or servers."


背板
Backplane

扩展卡
Expander/Riser

功能卡
Function cards

>> Introduction：

➢ Using the BSCAN functionality of the core processing chip as the foundation, conduct basic signal line testing coverage.

➢ Supplement with IO box and other devices to control chip for partial function simulation testing.

➢ Design or customize test cards for external interfaces to achieve signal testing coverage for connectors.
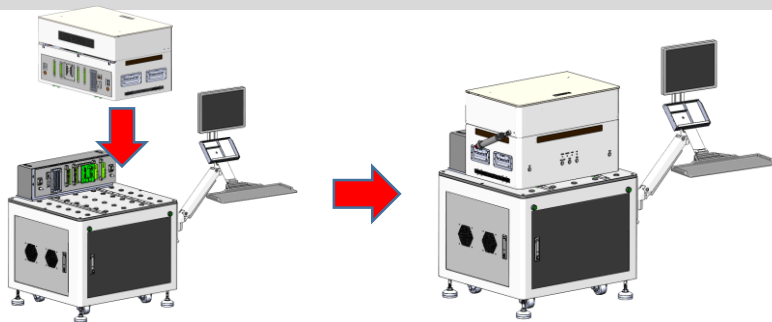
>> Features about tester :

➢ Base+Mobile structure, just need to change fixture for different UUT;

➢ common base, contains electric/air/commo parts;

➢ quick mating module for fixture quick-change.

Autotec

>> product presentation:

A single equipment to complete the ICT, burning, function and other tests of customer products.

>> Project Introduction:

➢ Integrated ICT (online test) / Flash (burning) / FCT (board level function test) at one station, saving customer investment and production line space;

➢ Up to 2,800 points of ICT test support;

➢ Support in-Line / Off line modes;

➢ Support up to 6000 kinds of chip burning;

➢ Voltage measurement / current measurement / communication diagnosis / LED test.
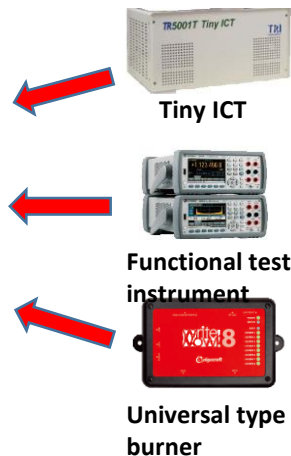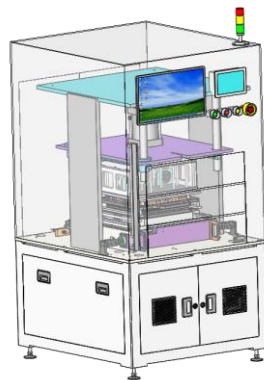
Tiny ICT

Functional test instrument

Universal type burner
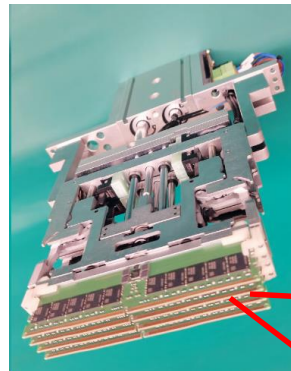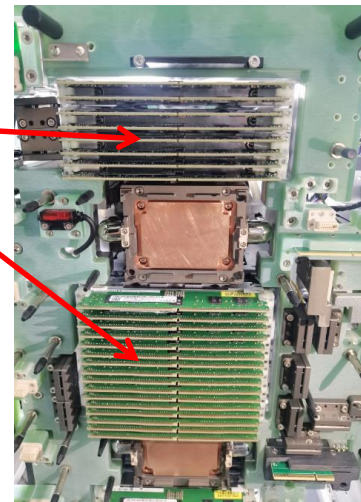
>> product presentation:

Special created patented products, for the industry first. Realized the motherboard test of the memory of the automatic plug. It has been widely used in testing equipment on desktop / workstation / server motherboards, enabling fully automated testing.

>> Product features:

➤ Plug in/out all test ports automatically, to achieve test automation;

➤ Delicate design, compact structure, stable performance, high efficiency, long life;

➤ Easy to install and maintain, convenient and safe operation;

➤ Free floating mechanism to avoid the risk of memory bar and card damage;

➤ Compatible with various brands of DIMM card slot;

➤ Continuously update the design, adapted to DDR 4, DDR 5, and DDR6.

**III, the generation module (DDR5/DDR6)**

Practical application scenarios

Autotec

>> **product presentation:**

Special created patented products, for the industry first. To automatically take up and release the CPU during the motherboard test. It has been widely used in testing equipment on desktop / workstation / server motherboards, enabling fully automated testing.

>> **Product features:**

➢ Automatically handle the testing CPU to achieve automation;

➢ Designed with precision, featuring excellent module guidance and floatability, and ensuring structural stability;

➢ Real-time monitoring of travel, pressure, and temperature;

➢ Incorporates a free-floating mechanism to mitigate risks of CPU and socket damage;

➢ Equipped with a water cooling system to ensure testing stability;

➢ Continuously updated design to accommodate new CPUs such as Amphere and Haiguang.
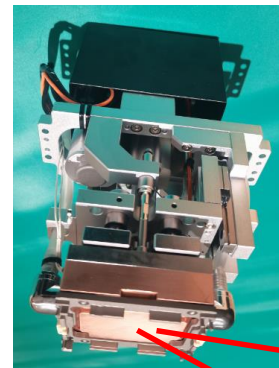
II generation module
Intel：4677pin
AMD：6096pin
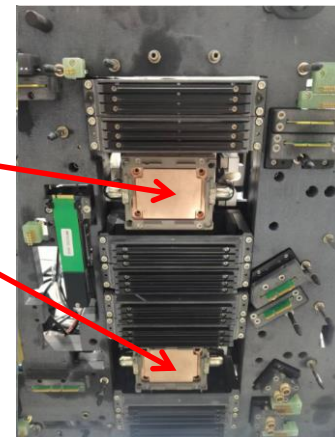
Practical application scenarios

THANKS