



德律科技股份有限公司

www.tri.com.tw

May 2024

報告人：陳冠元/財務長兼代理發言人

德律科技股份有限公司



- 成立時間：1989年4月10日
- 創立人：陳玠源董事長
- 資本額：新台幣23.62億



製造廠區擴展



地點: 德律林口二期廠區 (地上10層樓, 地下4層樓)

二期廠區面積: 35,000 平方米 / 10,600 坪

完工啟用日程: 2024 Q1



提升產能及產品開發/驗證使用空間

各產品線及智慧工廠應用展示

研討會/代理商大會舉辦



ESG應用方案進展

發行永續報告書

TRI
innovation



🏠 / 投資人關係 / 永續報告書 / 永續報告書

投資人關係

致股東信

財務資訊

永續報告書

永續報告書

公司治理

股東專欄

活動訊息

利害關係人

QA

永續報告書

日期	標題
2023/08/28	2022年永續報告書

Click to download the ESG Report



主力產品: 電路板組裝檢測設備

innovation

☆ 自動光學檢測設備(IT/Image Tester)

- ☆ 錫膏自動光學影像檢測機(SPI)
- ☆ 自動光學影像檢測機(AOI)
- ☆ X-ray自動檢測機(AXI)

☆ 電路板測試機(BT/In-Circuit Board Tester)

- ☆ 組裝電路板測試機(MDA)
- ☆ 全功能電路板自動測試機(ICT)

全球唯一“一條龍”電路板組裝檢測設備廠



德律產品在客戶的電路板組裝產線的應用

SPI
3D Solder Paste
Inspection

PRE-
REFLOW AOI
Automated Optical
Inspection

POST-
REFLOW AOI
Automated Optical
Inspection

DESKTOP
AOI
Desktop
Automated
Optical Inspection

Screen
Print

Pick &
Place

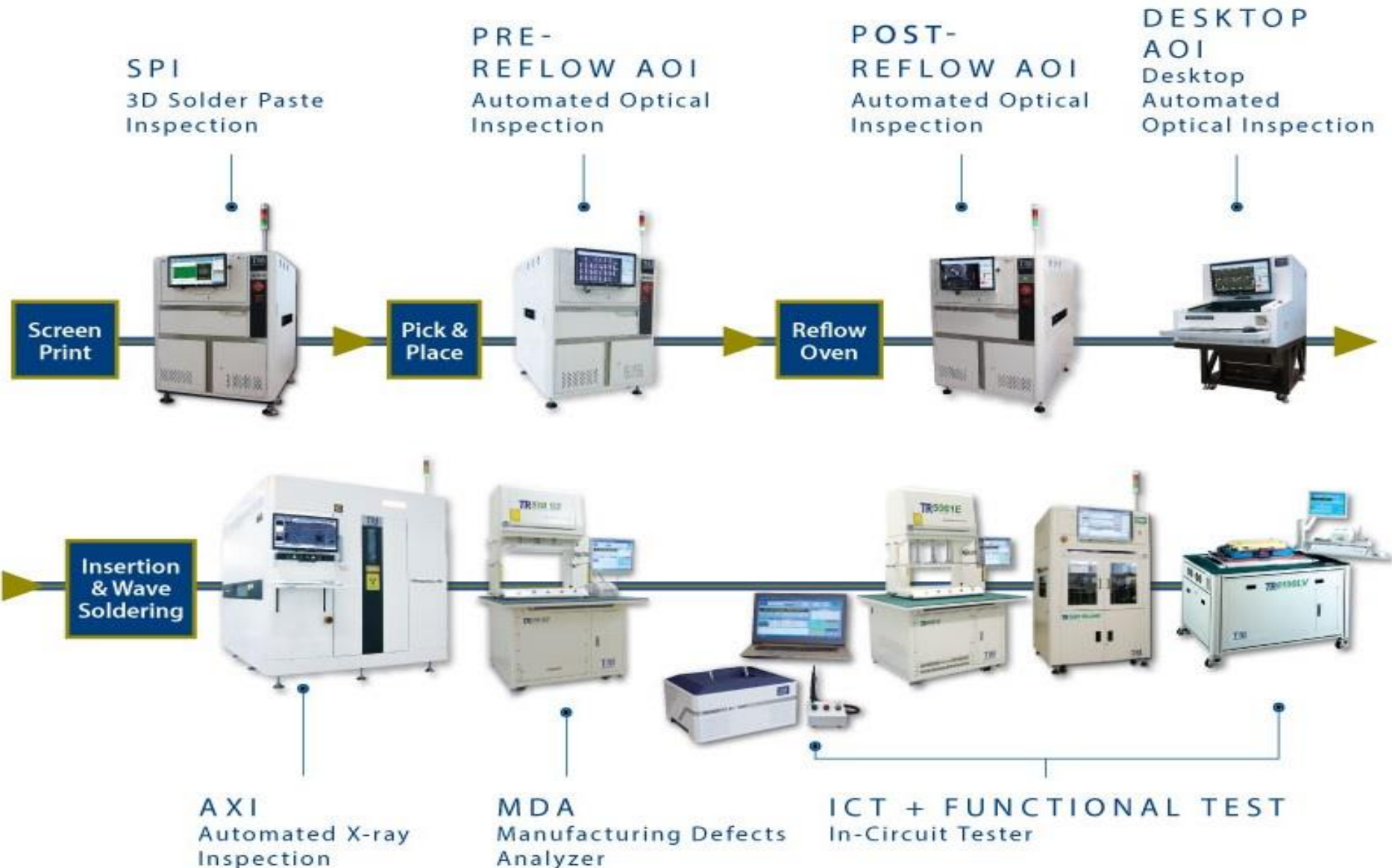
Reflow
Oven

Insertion
& Wave
Soldering

AXI
Automated X-ray
Inspection

MDA
Manufacturing Defects
Analyzer

ICT + FUNCTIONAL TEST
In-Circuit Tester



主要競爭對手

- 韓國: Koh Young, Pemtron, Parmi, Mirtec
- 日本: Omron, Saki
- 中國大陸: Jutze/Sinic-Tek/Holly
- 馬來西亞: Vitrox
- 美國: Keysight/Teradyne
- 德國: Viscom/SPEA

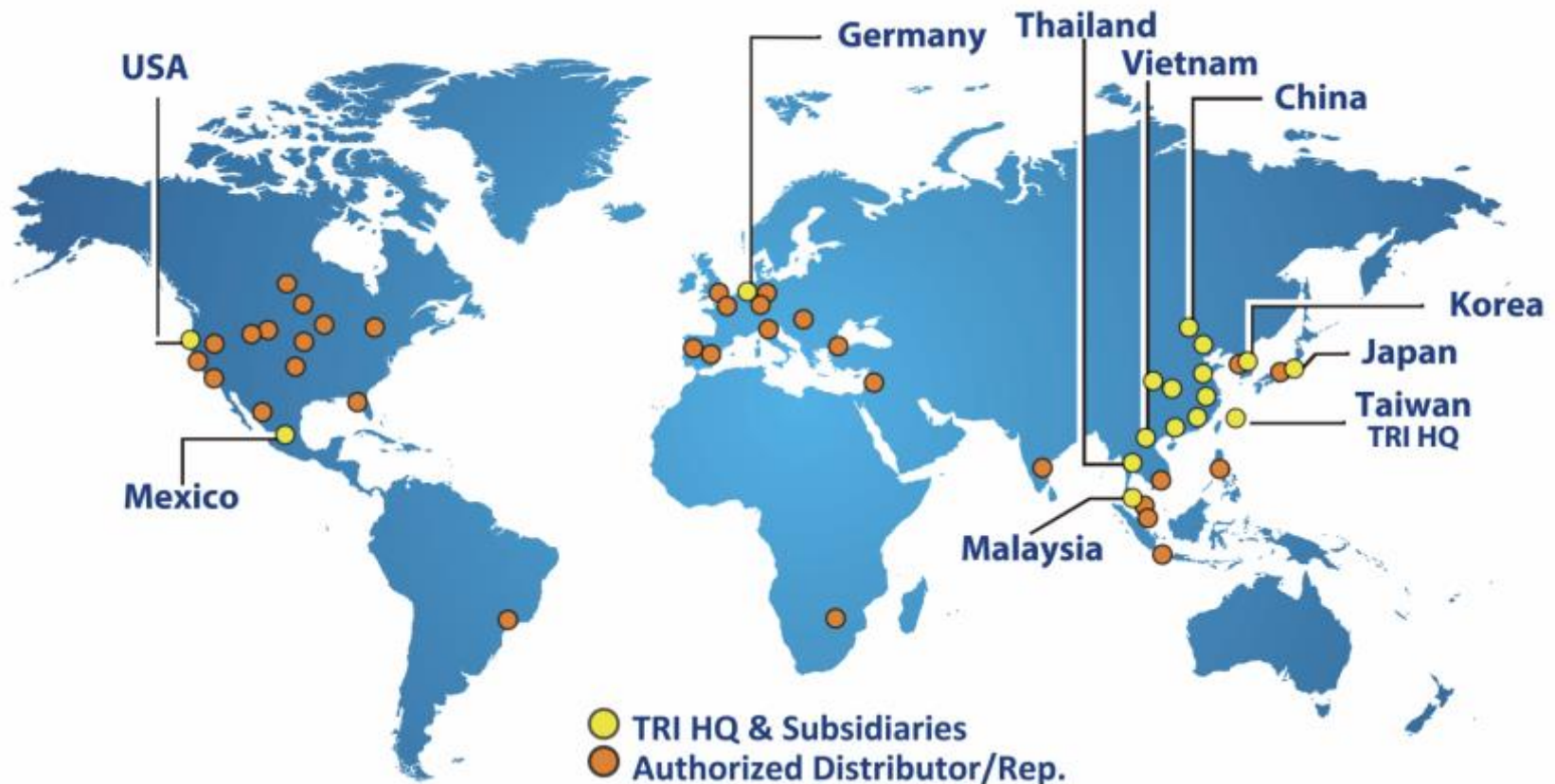
全球銷售服務網



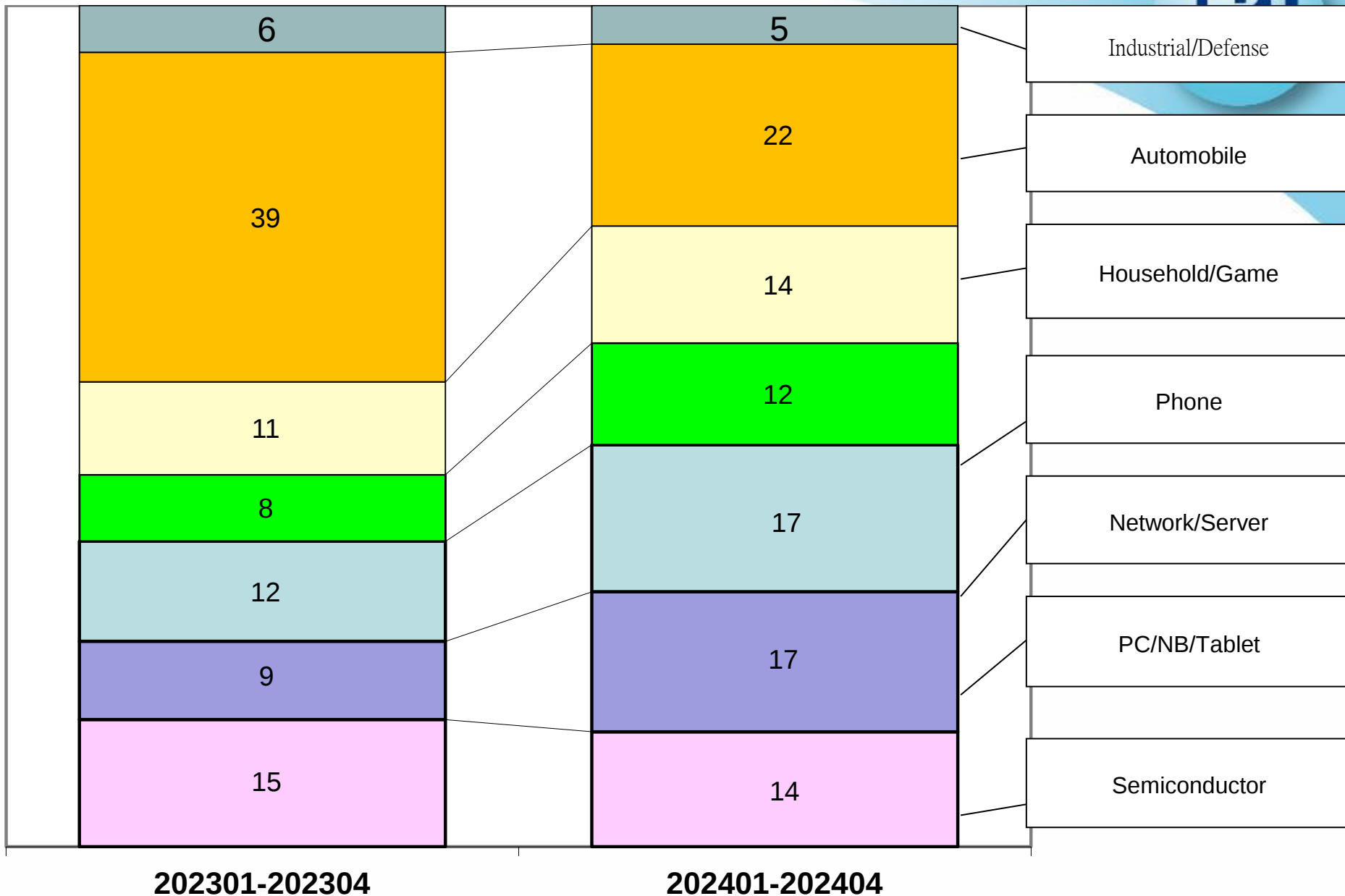
More than 3000 customers have been serviced through worldwide partners.

More than 50 distributors and Rep. worldwide.

主要客戶為全球電子產品以及半導體大廠

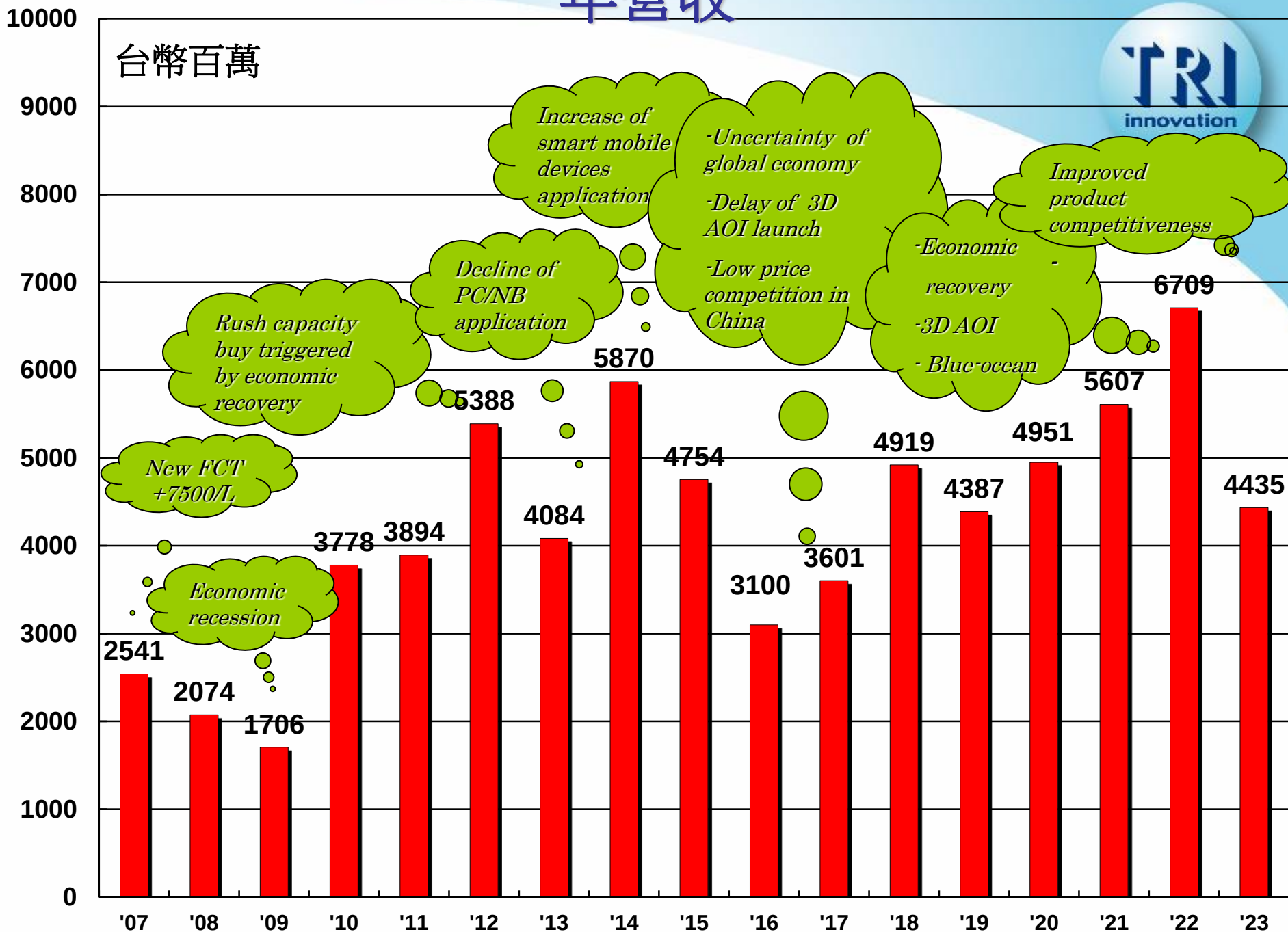


Electronic Industry/Revenue Movement

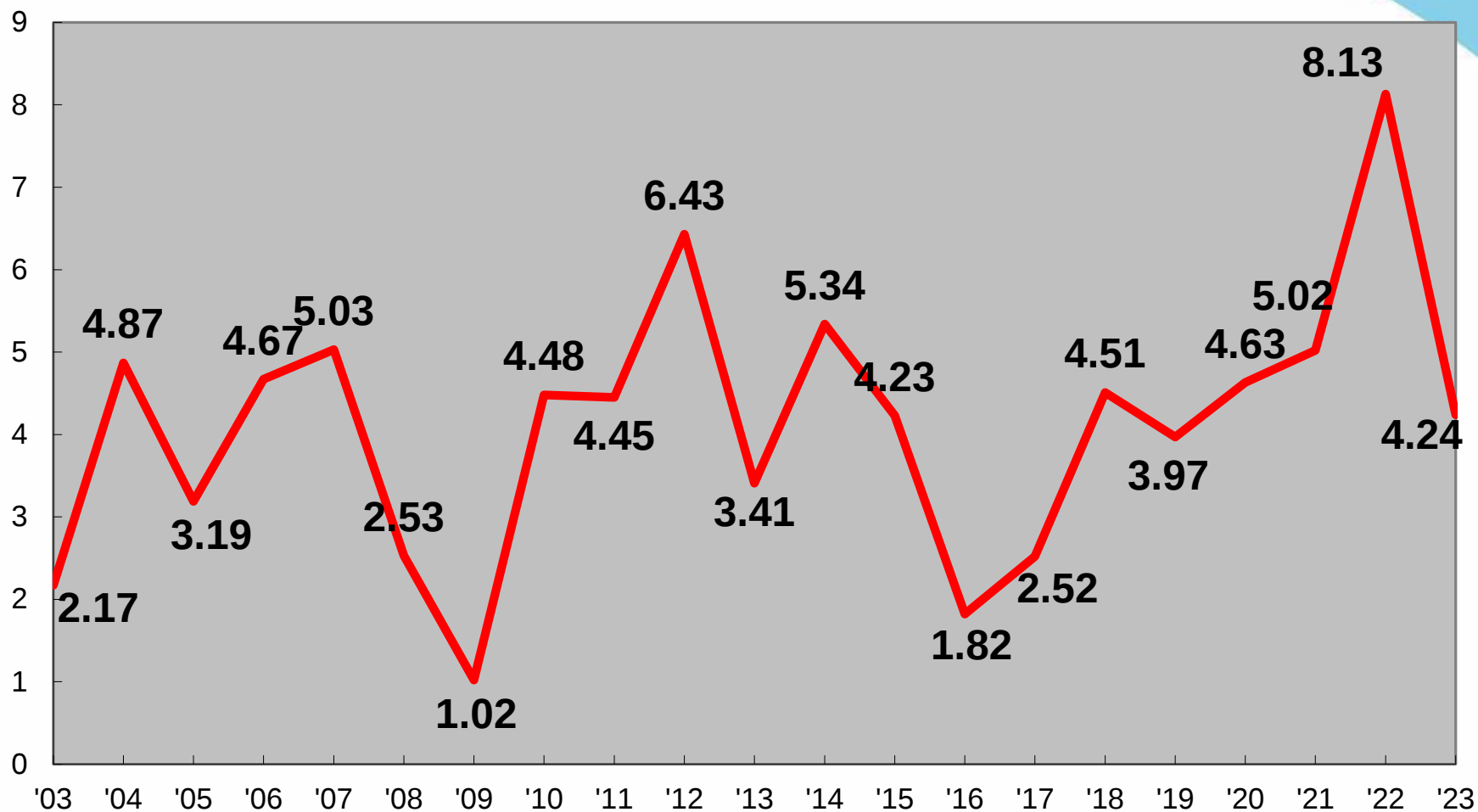


年營收

台幣百萬



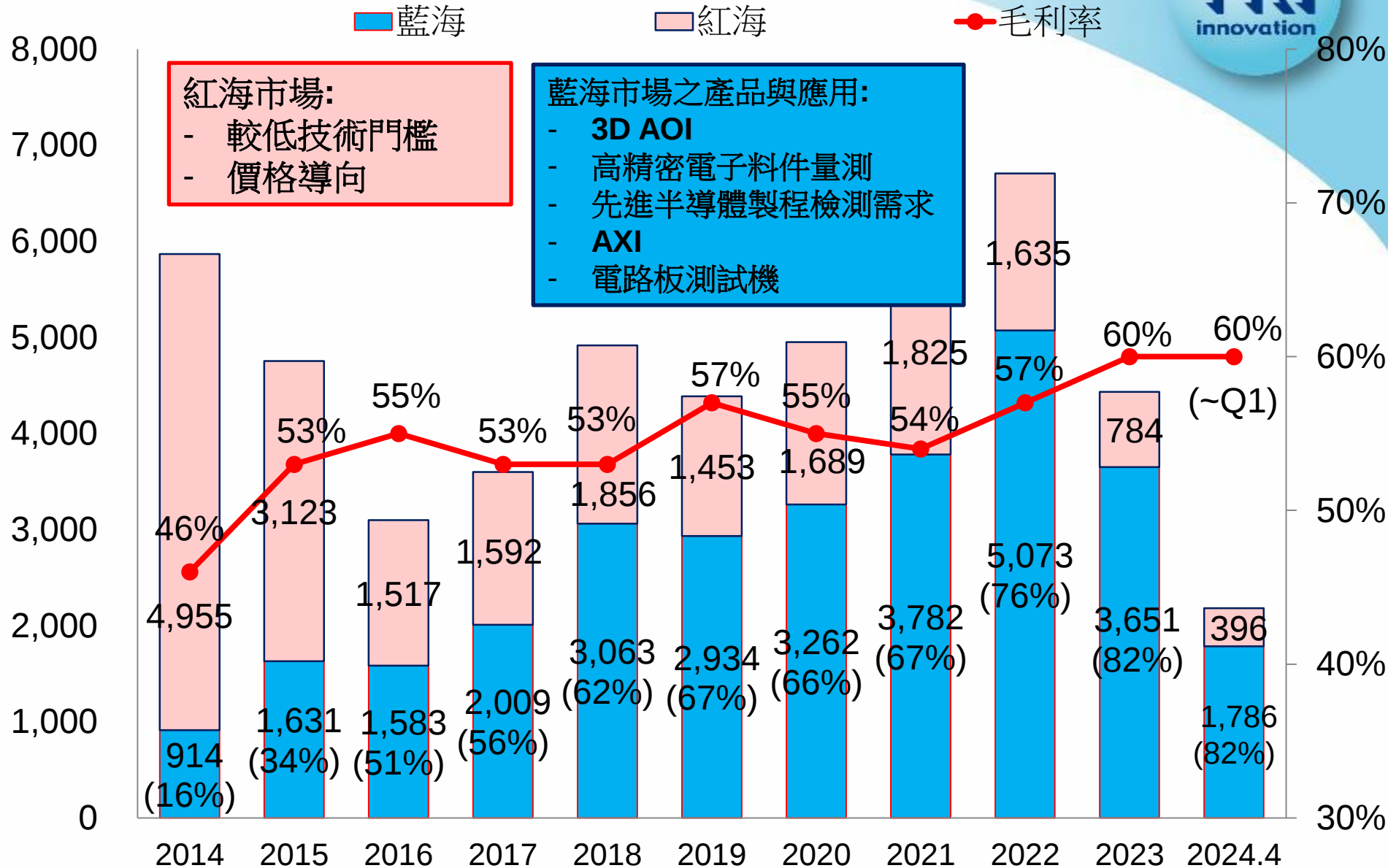
每股盈餘



紅海與藍海市場營收變化



台幣百萬



TRI 3D AOI 優勢



High Speed Line



AI-Powered
Algorithms



Metrology
Measurements



Smart
Programming



Top or Bottom
View Camera



Side-View
Cameras



Smart Factory
Solution



Ultra High Speed 3D Inspection!

TR7700QH SII

80 cm²/s

TR7700Q

23 cm²/s

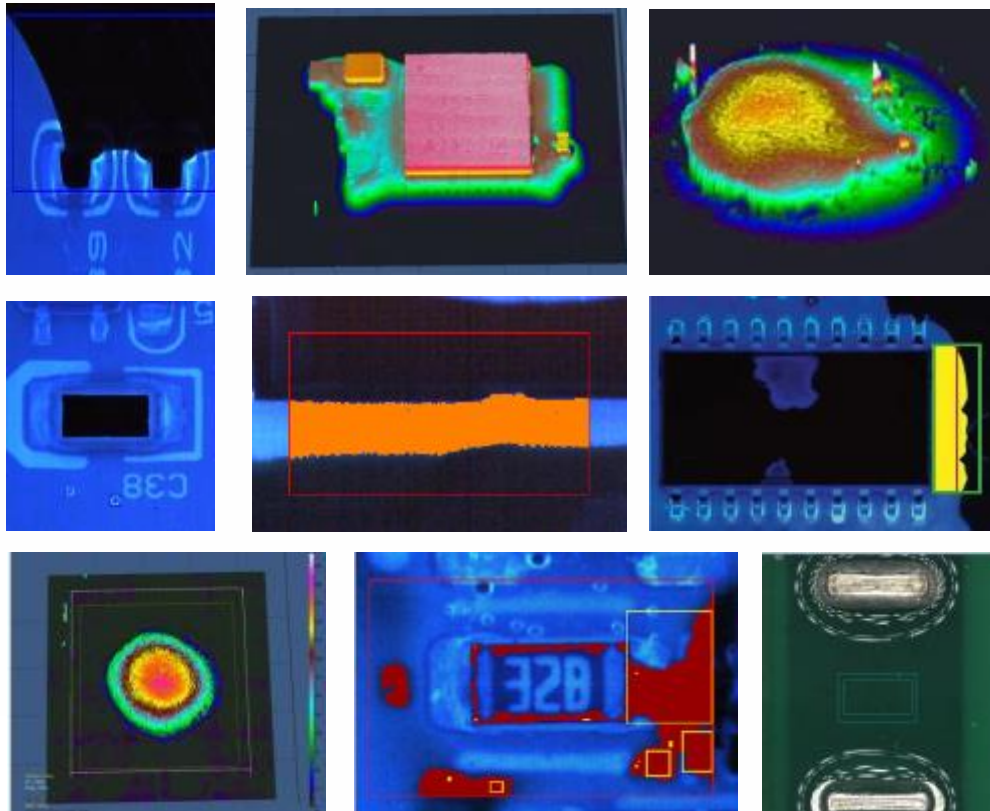


防護塗層檢測AOI



Conformal Coating, Flux, and Glue Inspection

Detects: Missing Coating, Insufficient Coating, Crack, Bubble, Splash, Contamination, Spill Coating, Thickness



NEW

半導體先進封裝檢測應用 -SEMI AOI



TR7720S
2D SEMI
AOI



TR7900Q SII
Magazine & Strip
3D SEMI AOI

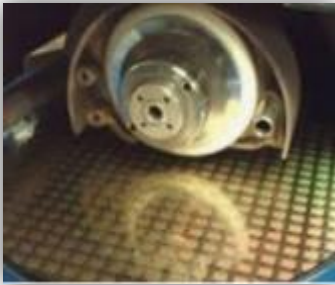


TR7900Q SII-R
3D SEMI AOI &
Reject Station

Back-End半導體製程封裝檢測應用



Wafer Saw / Dicing



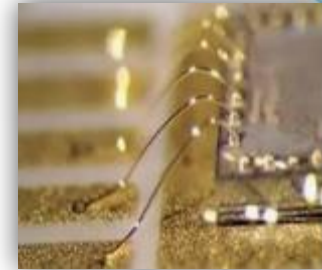
Fillet Inspection
Epoxy / Underfill



Die Bonding



Wire Bonding



TR7950Q SII
8"/12" Wafer
3D Saw Measuring
2D Surface AVI
Back Side & Top
Side Chipping
SWIR Support

TR7700Q SII-S
TR7720S
Bond Pad
Epoxy
Underfill
Surface
Inspection

TR7700Q SII-S
TR7700QE-S IR
Die Inner & Outer
Crack / Chipping
Surface Particle
Scratch / Residue
Foreign Material
Inspection

Magazine AOI
TR7900Q SII
TR7900Q SII-R
Die Bonding
2D / 3D
Inspection

Magazine AOI
TR7900Q SII
TR7900Q SII-R
Wire Bonding
2D / 3D
Inspection

TR7950Q SII



TR7700QE-S IR



TR7700Q SII-S



TR7720S



18
750 mm

TR7900Q SII



TR7900Q SII-R



Back-End半導體製程封裝檢測應用



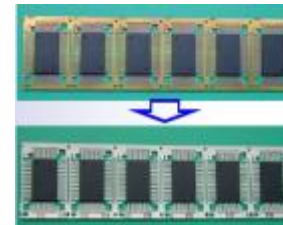
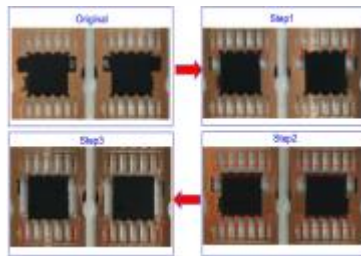
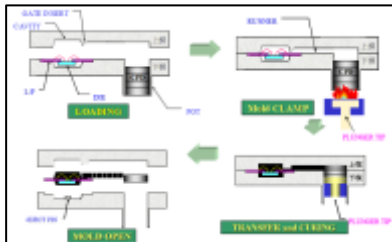
Molding

Ink / Laser
Marking

Trim

Electroplating

Form



TR7700Q SII-S
TR7720S(2D)
Molding
Quality
Inspection

TR7700Q SII-S
TR7720S(2D)
TR7960C (Inside)
IC OCV/COR
Inspection

SiP Package
TR7700QM SII-S
TR7720S(2D)
SiP 2D/3D
Inspection

Powerful / AI + AOI + AOM

AI Deep
Learning
In AOI

AOM Tool
(Automated
Optical
Measurement)

TR7700Q SII-S



TR7720S



TR7700MQ SII-S

TR7720S



TRI AOI可支援多種3D技術



Quad Digital
Fringe Pattern
Technology

General Application



Laser
Module

**Reflective &
Transparent
Part Inspection**



Depth from Focus (DFF)
Module

**Optimal Focus
0.5/1 μ m
High Resolution**

TR7600LL SV 3D AXI



NEW



High-Speed Robust Platform,
20% Performance Improvement*



AI-Powered Inspection Algorithms,
AI-Void Detection, AI Repair Station, and more



Smart Factory Ready for
Easy MES Connectivity

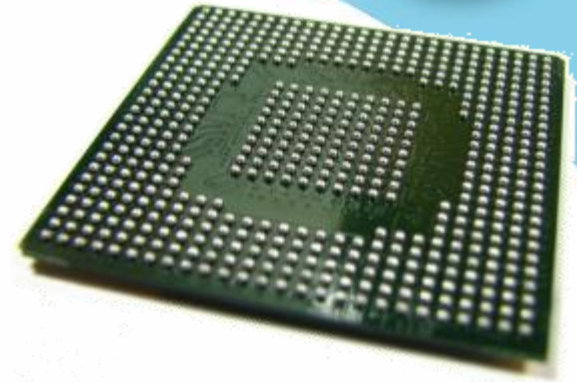


*Compared to Previous Mode, TR7600 SIII

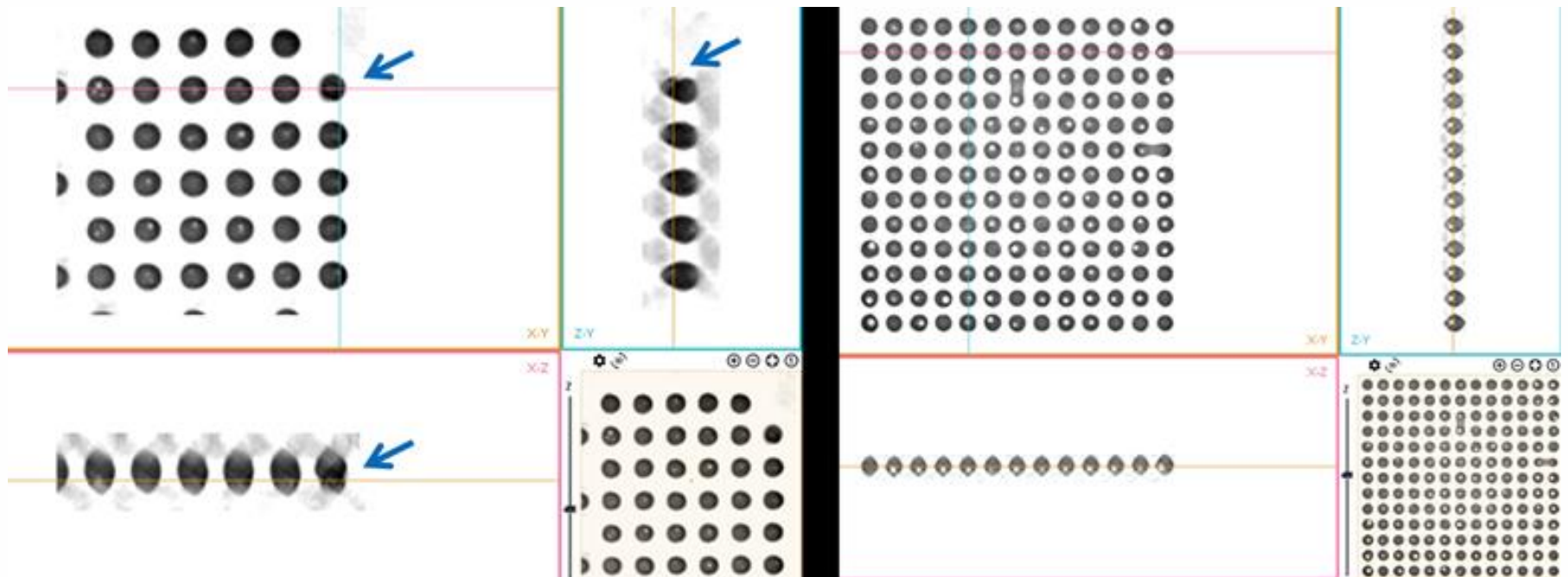
TRI AXI - BGA 檢測應用



Product Type Examples	ADAS, Radar Module, Communication Module
Inspection Criteria	<u>BGA Void, Open</u>
TRI AXI Application	3D CT Inspection



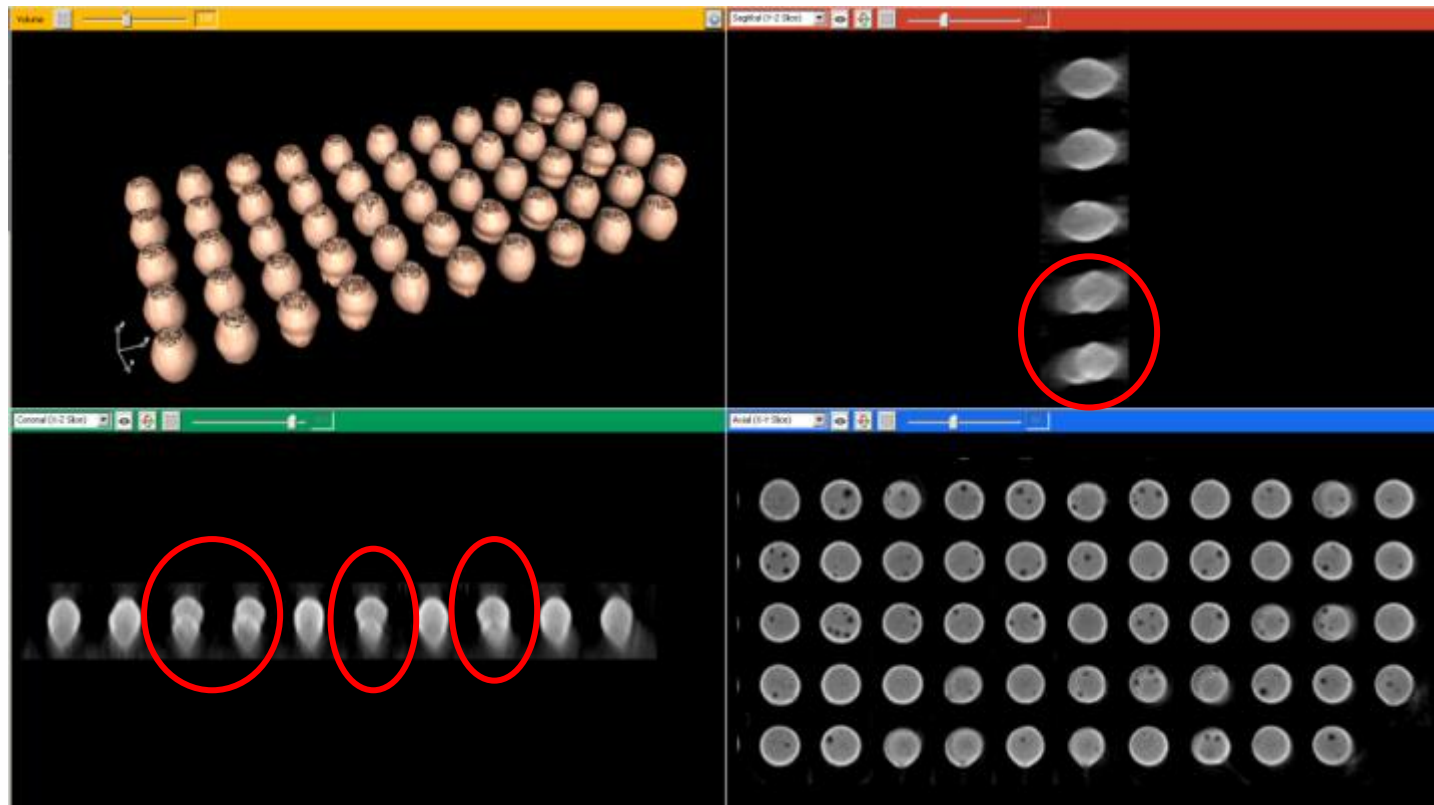
3D CT (電腦斷層掃描)



BGA CT Review at Repair Station



Users can confirm with XY / XZ / YZ interface



CT viewer is sent to repair station



TRI AXI 優勢



High Speed Line



AI Algorithms:

AI Voids Detection,
AI Programming,
AI Repair Station



Big Data Applications

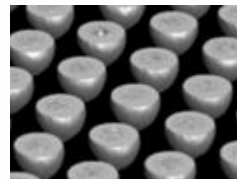
2- 30 μm

Multi-Resolution Multi-Applications

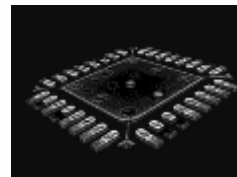


Up to 2100 x 510 mm

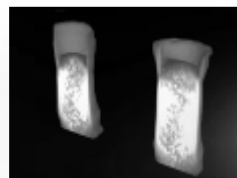
Large Board Inspection



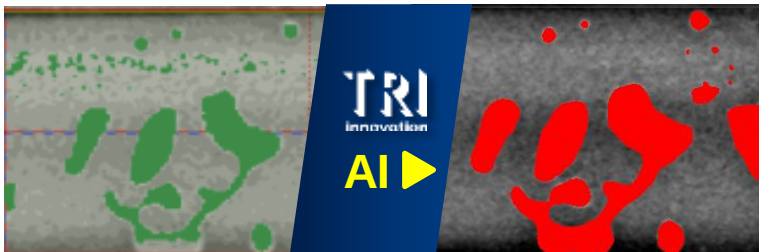
BGA Inspection



QFN 3D AXI



PTH/THT Filling level



TRI ICT/BT 產品組合



	MDA / ICT	Multi-Core ICT	High Pin Count ICT
In-Line	Tiny InLine ICT InLine 	New TR5001 SII InLine (2024 Q2) 	TR8100H SII InLine (2024 Q3) 
Pin Count	1024 2496	4096/4480	7056
Off-Line	TR5001T SII TR518 SII TR5001E SII 	New TR5001V SII New TR5001 SII QDI (2024 Q2) 	TR8100S SII (2024 Q2) TR8100H SII TR8100HL SII 
Pin Count	640 2560 3456	4096/4480	3584 7056 11088

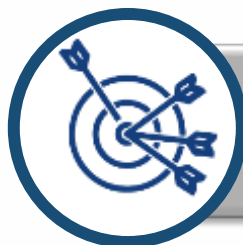
TR8100H SII 系列 ICT應用特點



NEW



High Pin-Count ICT
Up to 11,088 Testing Points



Full Coverage Test Solution
with Vacuum Fixture



High Speed Testing

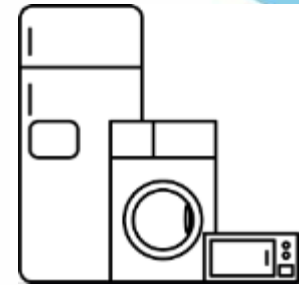
TRI ICT/BT 應用



Automation



Laptops



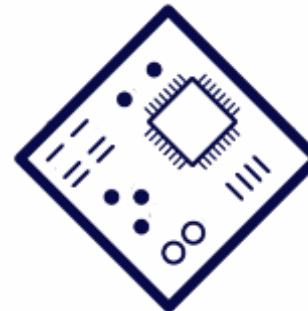
White Goods



Flex Boards



Smart Factory



Customized FCT



Automobile



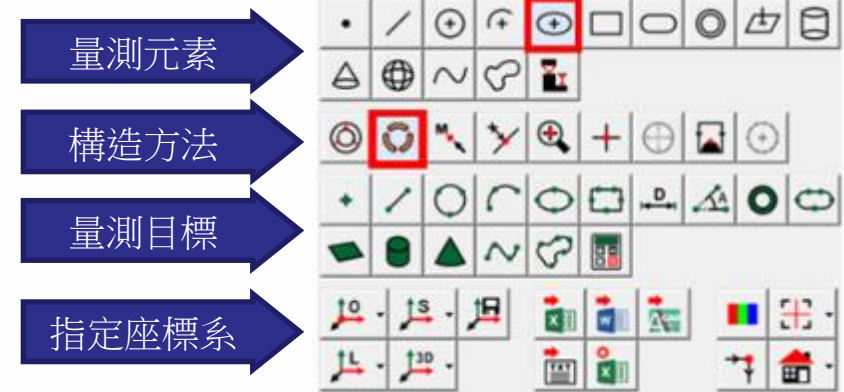
TRI量測功能(AOM)



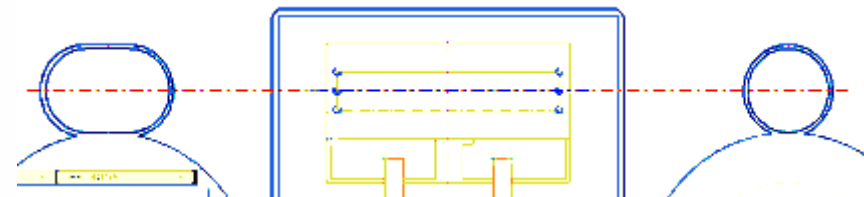
- ❖ UI: New designed and friendly user interface



- ❖ Features: More complete measurement functions will be available



- ❖ High Flexibility: Multi-Layer measurements



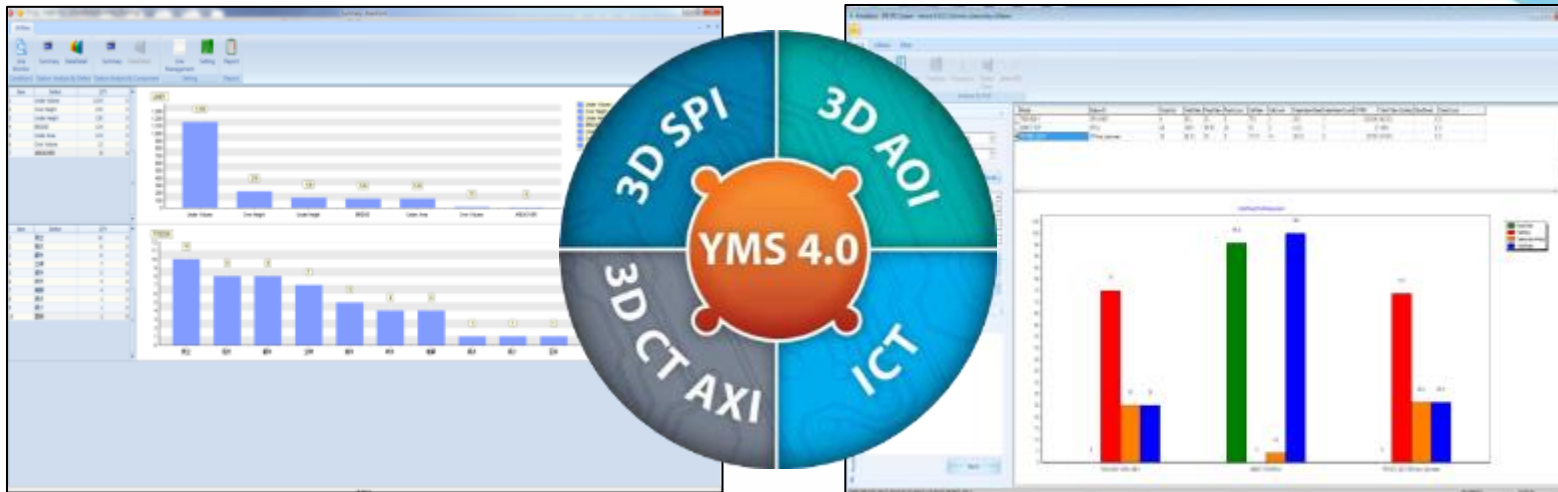
TRI的AI應用



1. AI 智慧編程 (Smart Programing)
2. AI 工作站:伺服器-終端架構的 AI 檢測及調試
3. AI 智慧複判主機 (Verify Host):
AI 維修/複判站(Repair Station) 管理 (開發中)
4. AI 檢測:
 - 字元辨識 (OCV/OCR)
 - 瑕疵檢測
 - 待測物外觀檢測
 - 異物檢測

TRI YMS 4.0 良率管理系統

協助客戶提升生產力及品質管理



- 實時狀態檢查
- SPC和生產力監控
- 列出排名前10的不良項目和對應圖像
- 依各站別, 線別, 流程找出問題點
- 監控生產問題改善狀況
- PDCA改善循環
- 支持品質優化
- 輸出報告到MES / SFCS

工業4.0解決方案

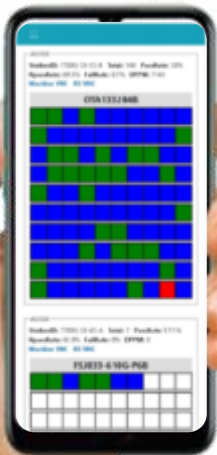


YMS 4.0 WEB 網頁版本



Portable Monitoring experience for your production line

User-friendly interface to access real-time statistical data such as the Yield Rate, Top defects and Top Defective Components from the comfort of your mobile device.



**Yield
Rate Monitor**



**Real-time
SPC Trends**



**Responsive Design:
Smart Phone, Tablets, PC**

工業4.0應用方案



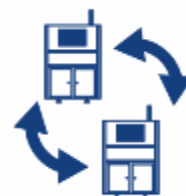
**SMART
FACTORY**



**MES
Connectivity**



**Real Time
SPC Trends**



**Closed Loop
Solution**

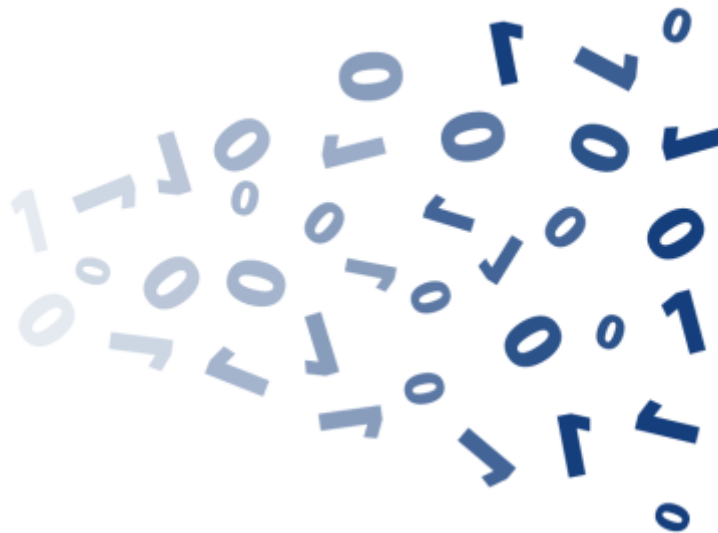


Repair Station

MES 客製化 – 大數據收集



TRI solutions generate  for your MES Applications
To Improve your Production Yield Rate



Data

- PCB ID
- Component ID
- Inspection Image
- Area / Height / Volume
- Position (X,Y,Z)
- Shift (X,Y,Z)
- Void %
- *and more...*

支援 IPC-HERMES-9852 規範



M2M Communication Standard

- Based on TCP/IP and XML
- Automatically Change the Program.
- Automatically adjusts the conveyor belt width.
- Continuous tracing of boards throughout a SMT line.
- Requirement: At least one Bar Code Scanner



支援 IPC-CFX (IPC-2591) 規範



Qualified Products



SPI

TR7007 SII Series
TR7007 SII Ultra
TR7007D Series
TR7007Q Series
TR7007Q Plus Series



AOI

TR7500QE Series
TR7700 SIII Series
TR7700Q SII Series
TR7700QE Series



AXI

TR7600 Series
TR7600F3D Series

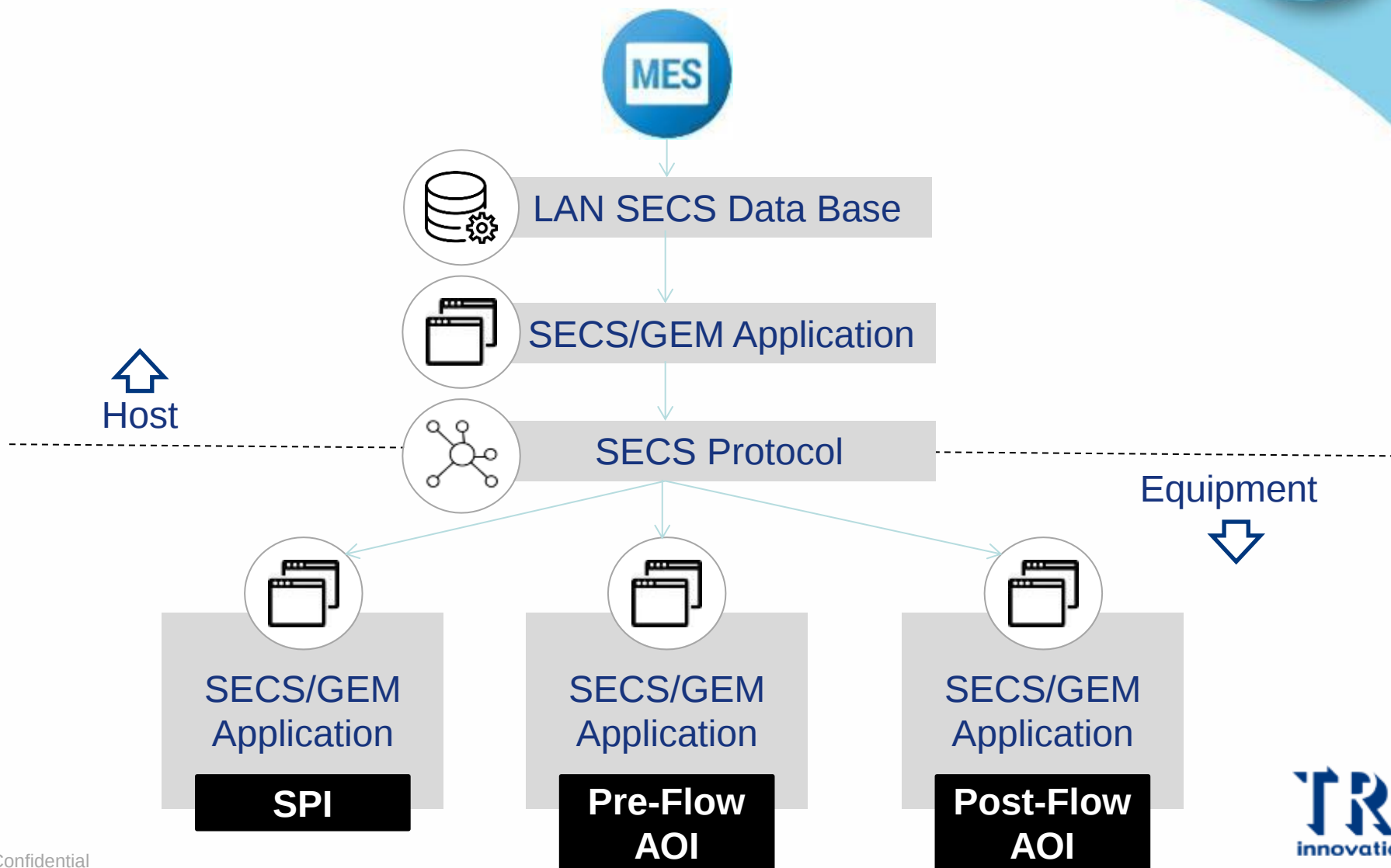


ICT

TR5001 Series

支援SECS/GEM 架構

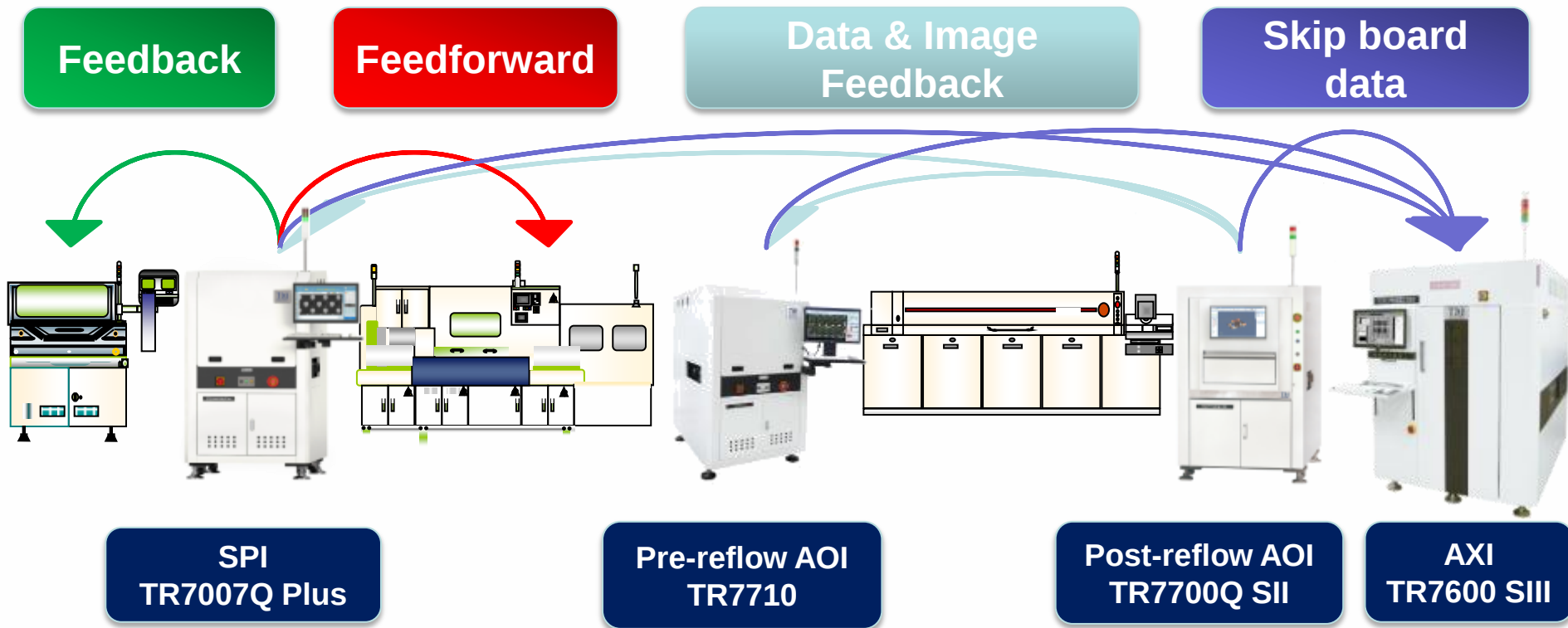
半導體設備通訊標準



TRI支援封閉迴路控制系統



TRI SPI, AOI, AXI 檢測資訊的串流 IPC CFX(data)/HERMES(M2M)



連接

數據共享
工業4.0通訊標準
MES 定制

優化

AI 智能複判主機
AI 智能工作站
共享檢測數據庫
遠端微調功能

監控

遠端通報
遠端控制

視覺化

圖表操作介面
即時SPC趨勢
檢測實況狀態



內部研發團隊



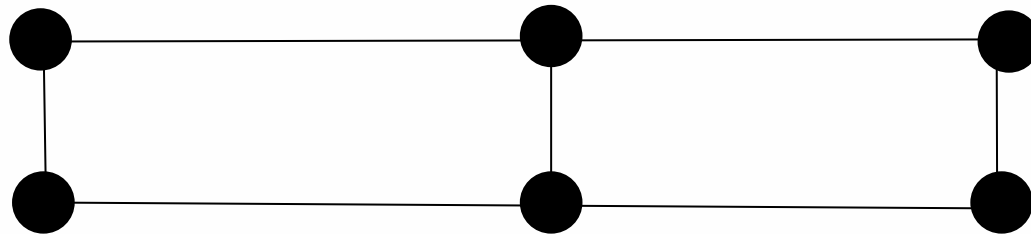
- Optical Dept.
- Mechanical Dept.

- system S/W
YMS, R/S

- PLC control
- Lighting control

光學檢測

電路板測試



220⁺ RD

外部機構技術支援

Department of Computer science, 台灣大學

- 影像處理 / Understanding

Department of Power Mechanical, 清華大學

- X-ray 3D Reconstruction/Digital Tomosynthesis Algorithm/電腦切層演算法

Center of Measurement Standards, 工研院

- Length/ Camera / 色彩校正

近年獲獎



- 2018 Circuits Assembly NPI Award
- 2018 EM Asia 最佳供應商獎
- 2019 Global Technology Award
- 2019 EM Asia 傑出產品獎
- 2020 Global Technology Award
- 2021 EM Asia 創新獎
- 2021 Global Technology Award
- 2022 EM Asia 傑出產品獎
- 2023 EM Asia 創新獎及傑出產品獎
- 2024 EM Asia 傑出產品獎及最佳供應商獎

* TRI's Company Milestones:

<https://www.tri.com.tw/tw/about/about-21-1-2.html>

免責聲明



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Better Testing Better Quality



THANK YOU!

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Test Research, Inc.***



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