



# 德律科技股份有限公司

## [www.tri.com.tw](http://www.tri.com.tw)

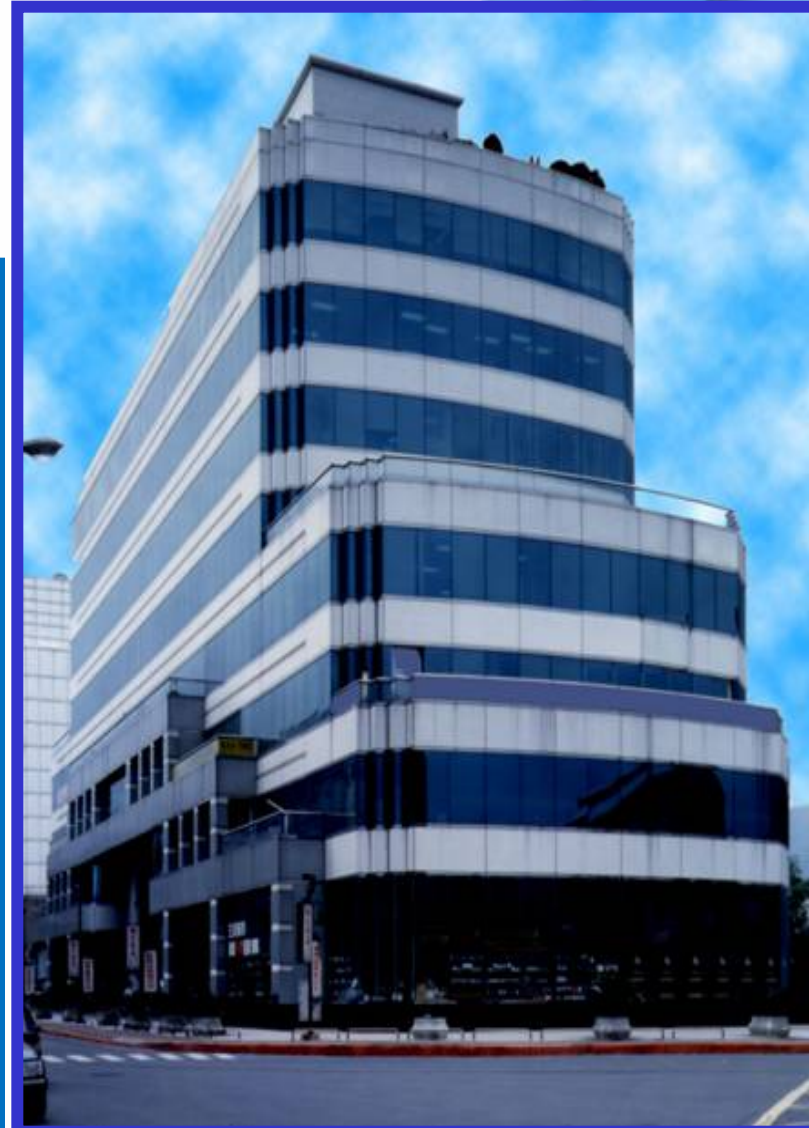
**November 2024**

**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

股東專權

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



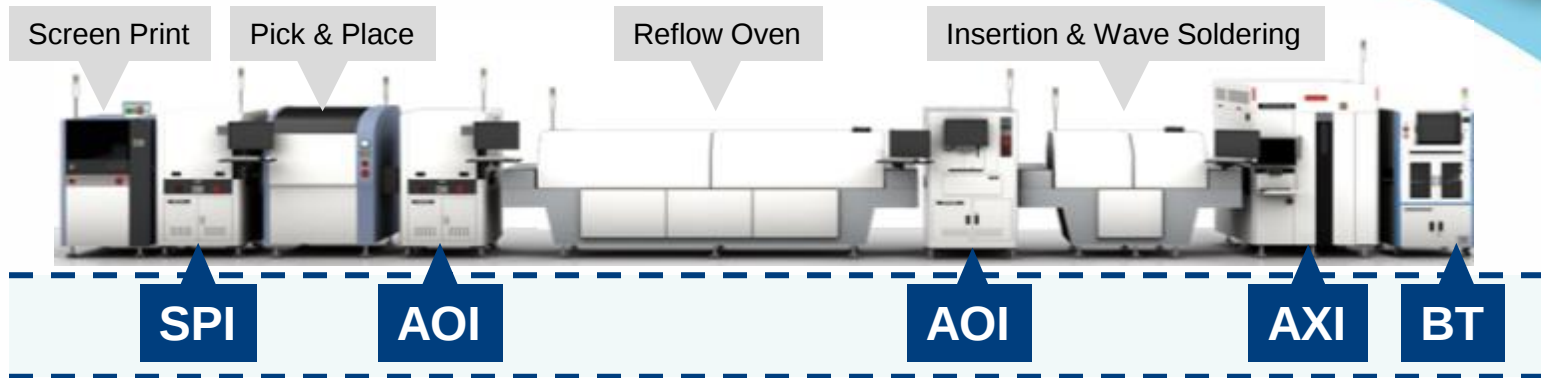
## ☆ 自動光學檢測設備(IT/Image Tester)

- ☆ 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)

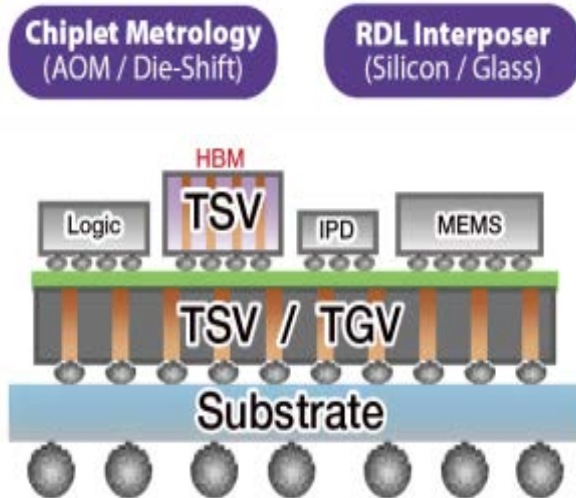
# 完整SMT檢測解決方案



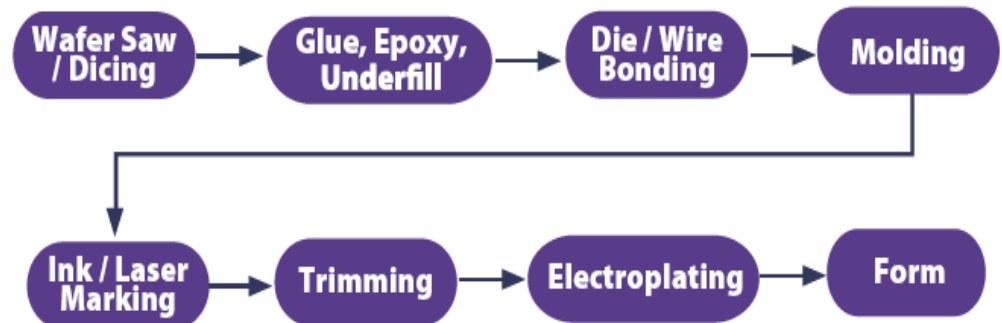
|                    |            |                                                                       |
|--------------------|------------|-----------------------------------------------------------------------|
| Optical Inspection | <b>SPI</b> | <i>Solder Paste Inspection</i>                                        |
|                    | <b>AOI</b> | <i>Automated Optical Inspection</i>                                   |
|                    | <b>AXI</b> | <i>Automated X-ray Inspection</i>                                     |
| Board Test         | <b>BT</b>  | <i>In-Circuit Tester (ICT)<br/>Manufacturer Defect Analyzer (MDA)</i> |

# 半導體中/後段製程 – 檢測與量測

## ► ADVANCED WLP/PLP

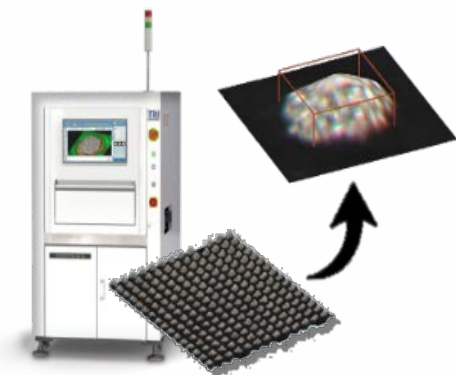


## ► BACK-END PROCESSING



# 半導體製程/先進封裝檢測應用產品

**TRI**  
innovation



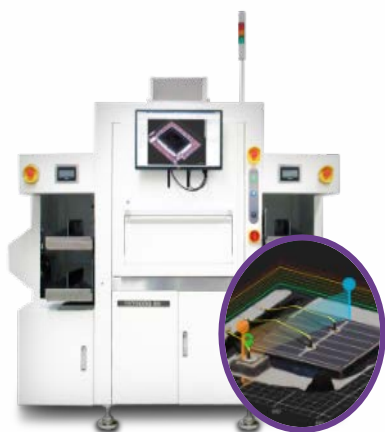
**TR7007Q SII-S**  
3D SEMI  
Bump Inspection



**TR7720S**  
2D SEMI  
AOI



**TR7700Q SII-S**  
3D SEMI  
AOI



**TR7900Q SII**  
Magazine & Strip  
3D Semi AOI



**TR7900Q SII-R**  
Magazine & Strip + Reject Station  
3D Semi AOI



**TR7600 SIII Plus**  
3D Semi X-Ray  
Cu-Pillar, C4 Bumps



**TR7950Q SII**  
Wafer Inspection and Metrology  
Frame, Bumping, Surface TSV

# 半導體中段封裝/後段封裝檢測項目



## INSPECTION & METROLOGY SOLUTIONS FOR:

Advanced WLP

Wafer Frame

Patterned Wafer

Wafer Bumping

WLCSP

TSV

Cu Pad/Pillar

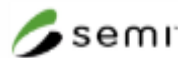
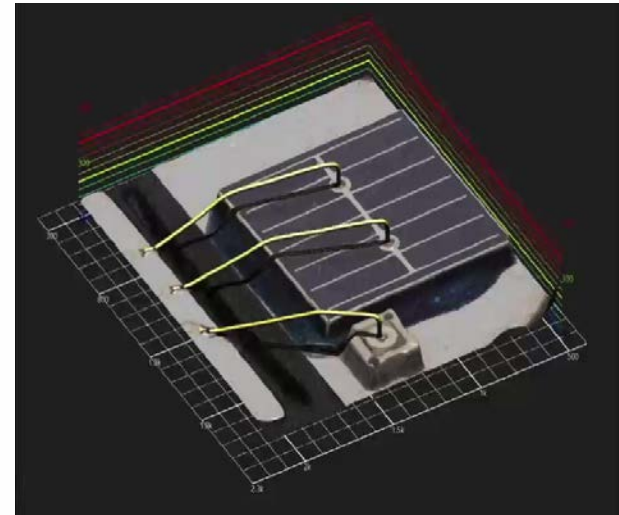
Die / Wire Bonding

IGBT / SiC / GaN

SiP

Underfill

Epoxy / Flux / Glue



# 半導體後段檢測應用



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**  
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



TR7700Q SII-S



TR7720S



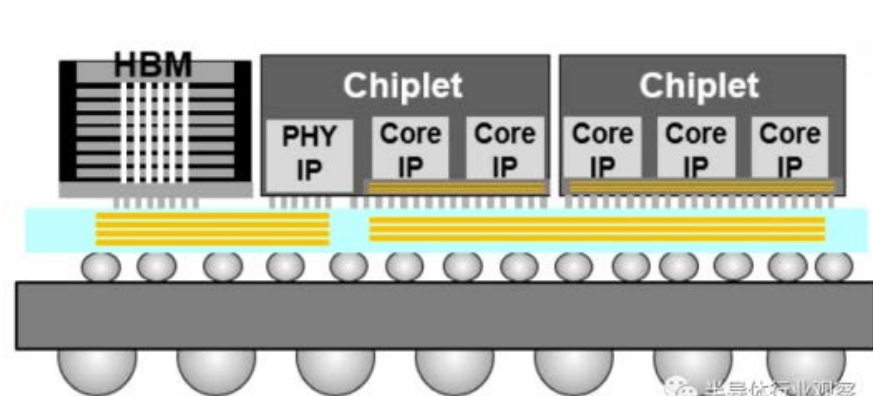
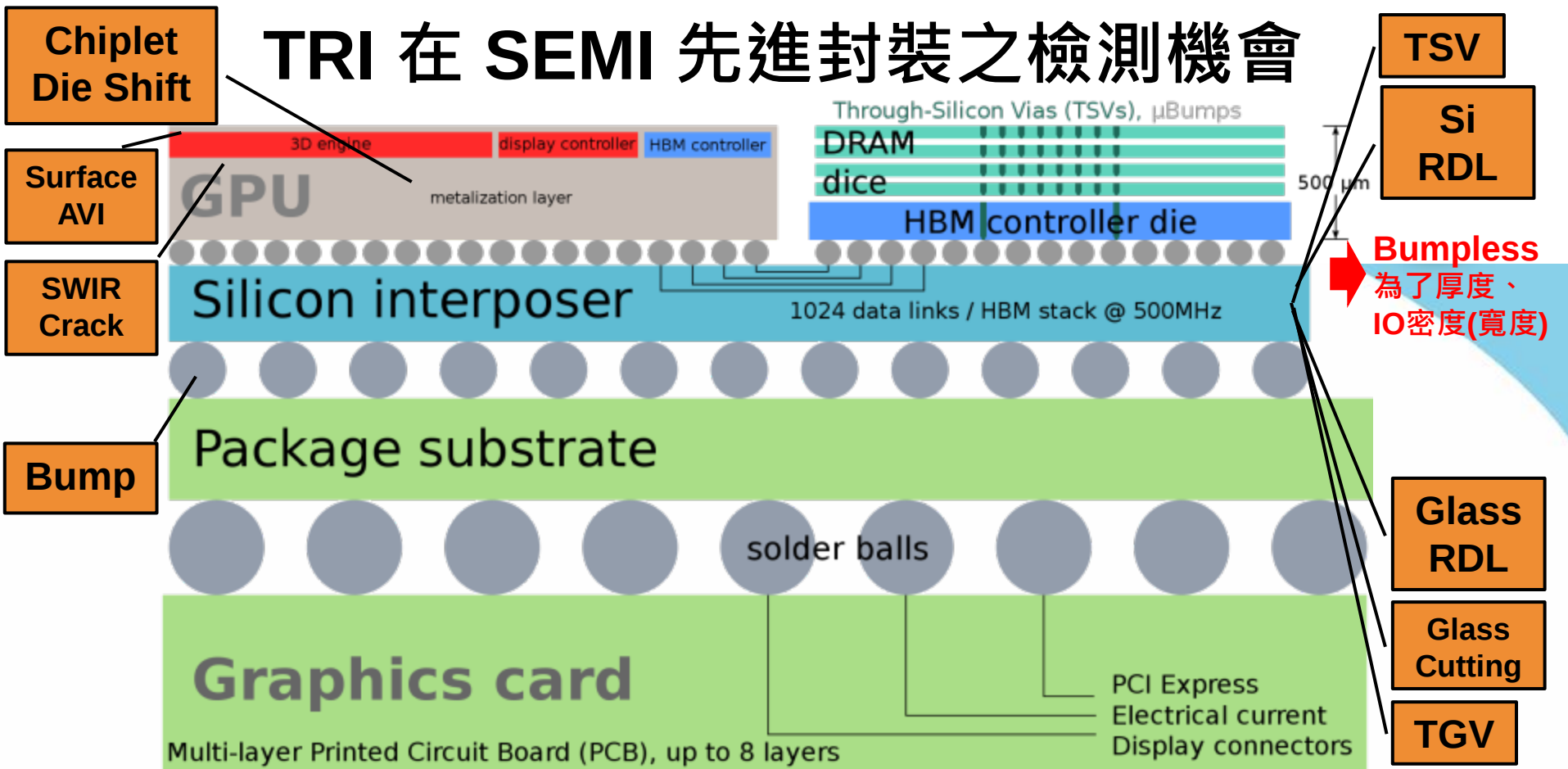
TR7900Q SII



TR7900Q SII-R



# TRI 在 SEMI 先進封裝之檢測機會



**TR7700Q SII   TR7950Q SII   TR7600 S3 Plus**

Confidential

# 主要競爭對手



- 韓國: Koh Young/Pemtron/Parmi/Mirtec
- 日本: Omron/YAMAHA/Saki
- 中國大陸: Jutze/Sinic-Tek/Holly/Unicomp
- 馬來西亞: Vitrox
- 美國: Keysight/Teradyne/Camtek(SEMI)/MVP(SEMI)
- 德國: Viscom/SPEA

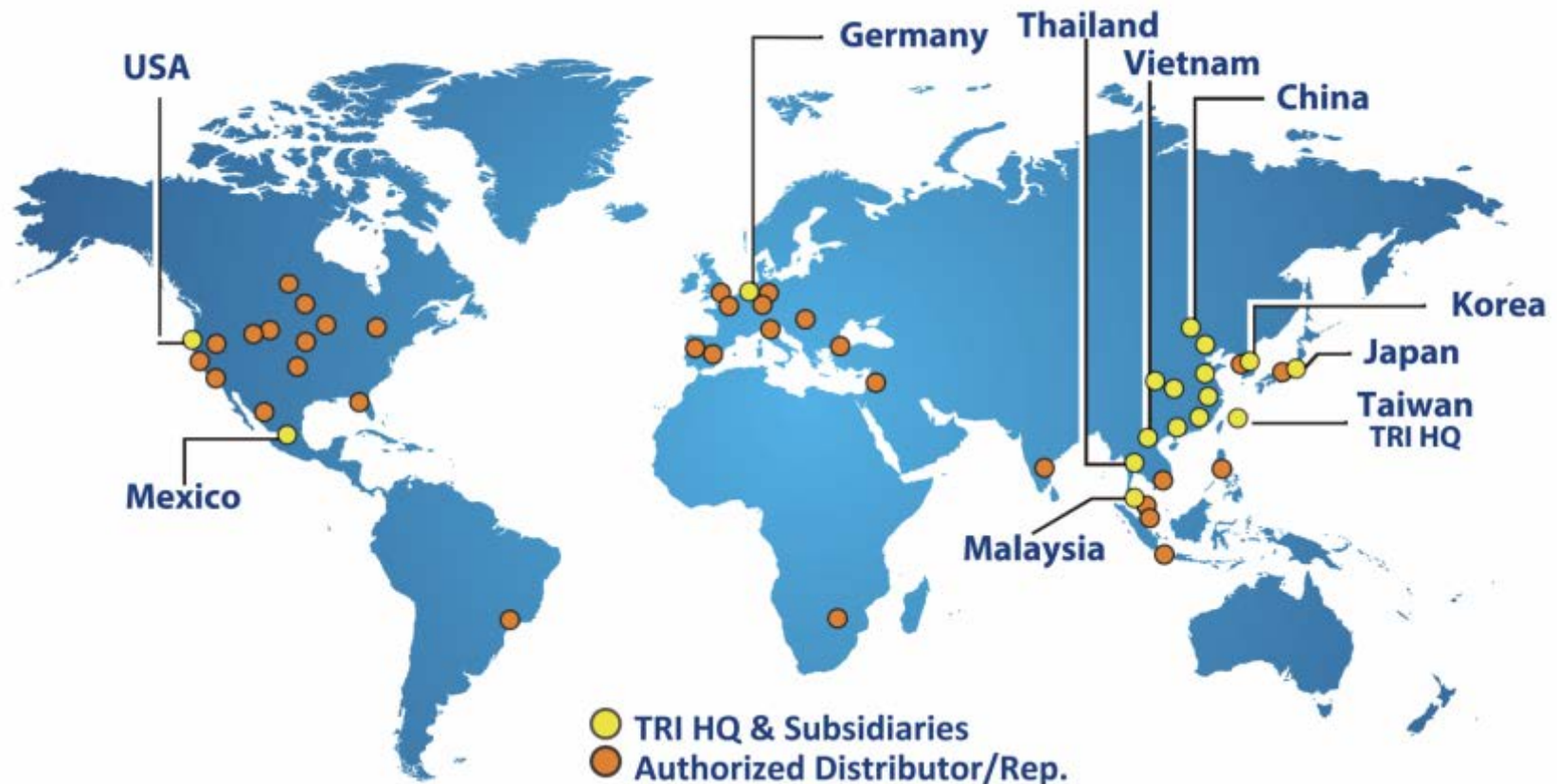
# 全球銷售服務網



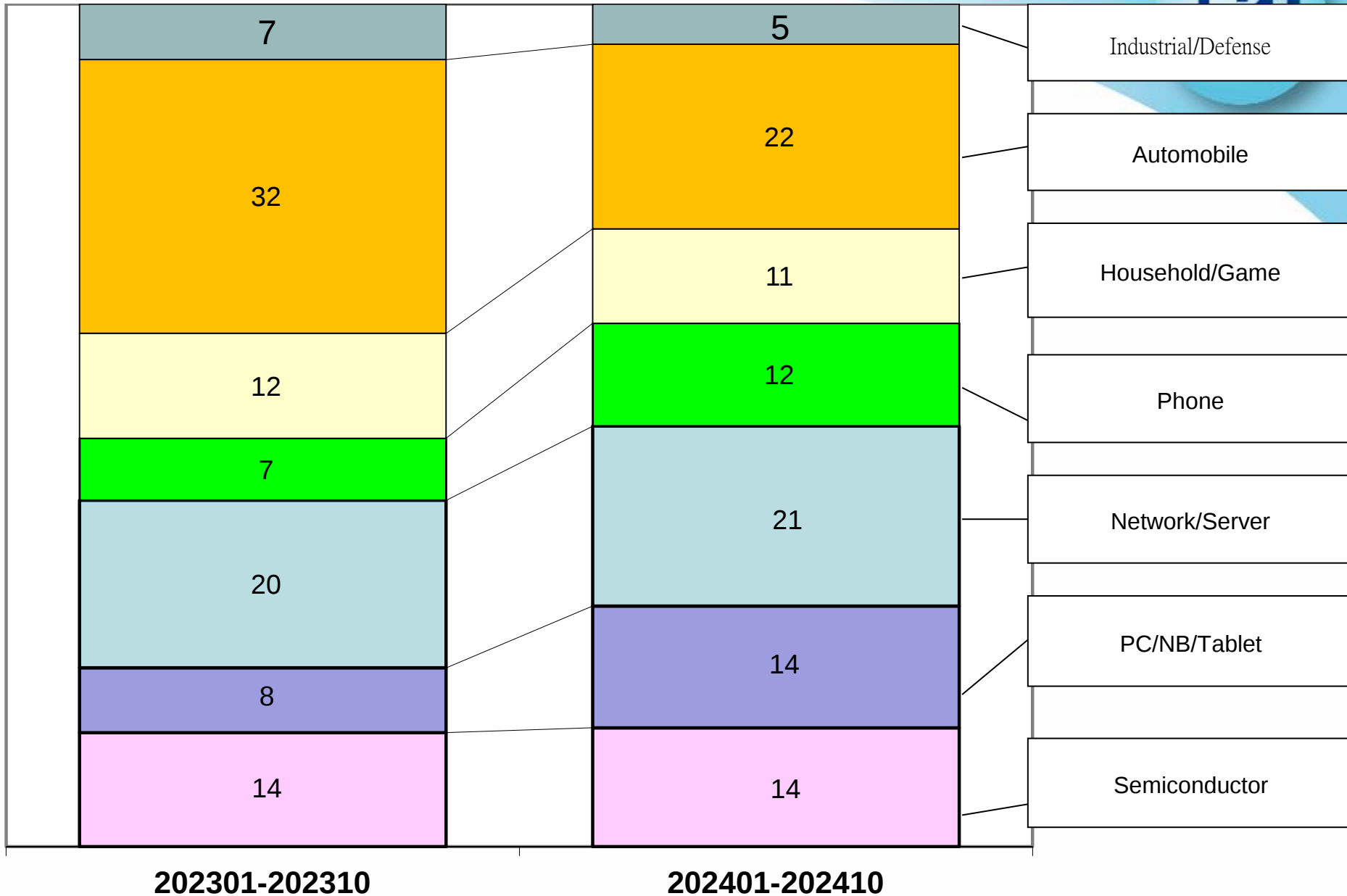
More than 3000 customers have been serviced through worldwide partners.

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

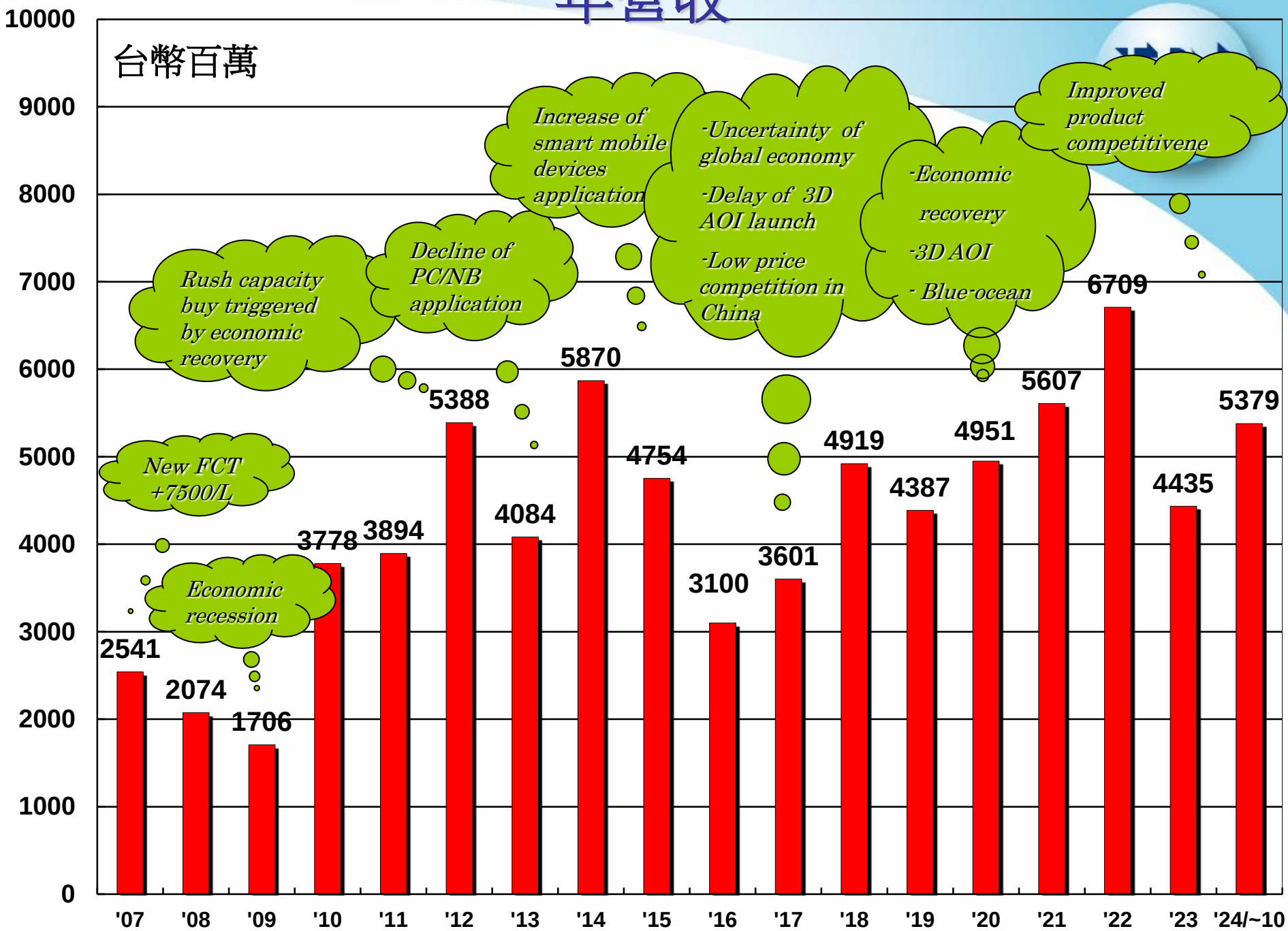


# Electronic Industry/Revenue Movement

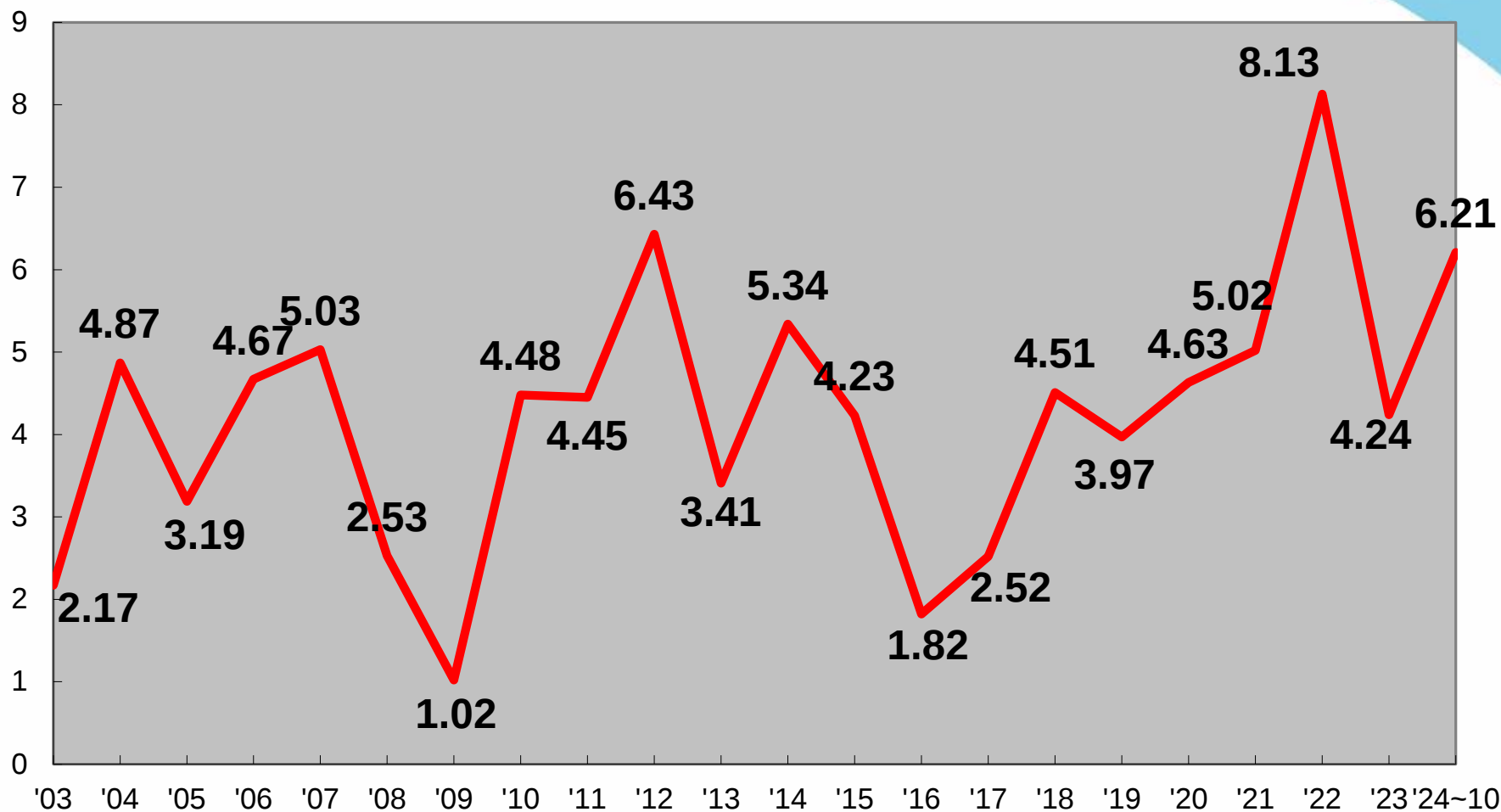


# 年營收

台幣百萬



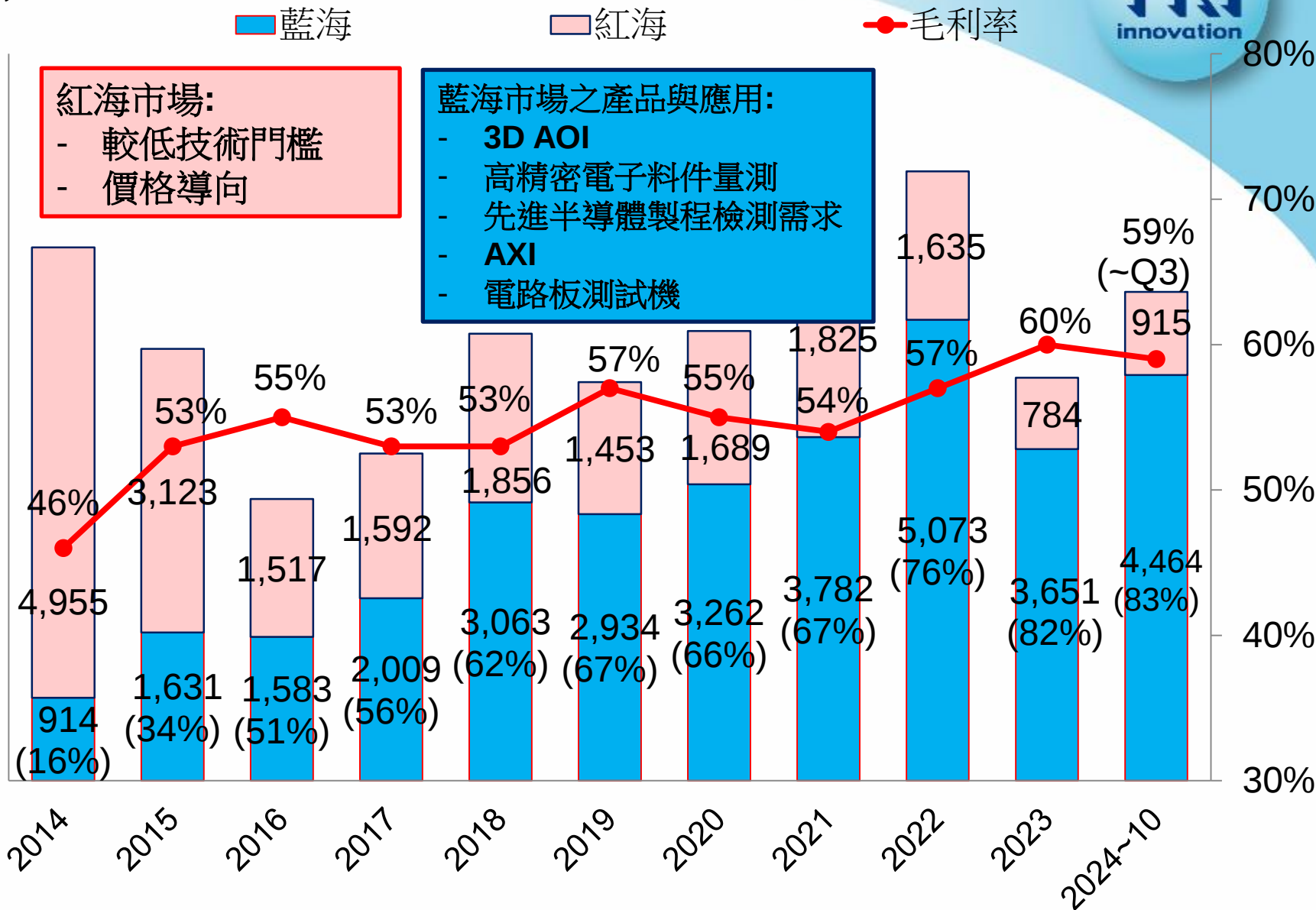
# 每股盈餘



# 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 cm<sup>2</sup>/s

TR7700Q

23 cm<sup>2</sup>/s



# 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 $\mu$ m  
High Resolution**

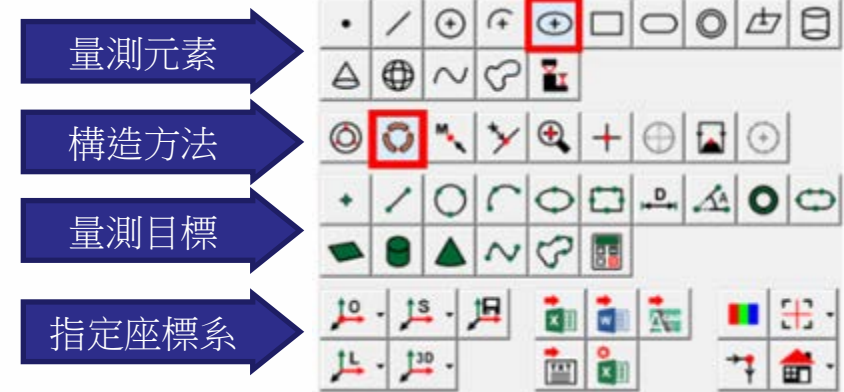
# TRI 量測功能 (AOM)



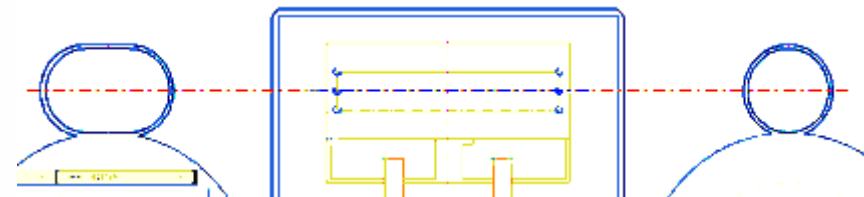
- ❖ UI: New designed and friendly user interface



- ❖ Features: More complete measurement functions will be available



- ❖ High Flexibility: Multi-Layer measurements



# TRI SPI 優勢



*Fast Inspection  
Speed*

3.5  $\mu\text{m}$

*Precision  
Inspection*

High Resolution

Enhanced Lighting

Metrology Measurements

High Inspection Range



Solder Paste, Mini-Bumps, Glue, Flux, Mini LED Solder, Bare Board / Pad, Foreign Material

# TRI AXI 優勢



## *High Speed Line*



### AI Algorithms:

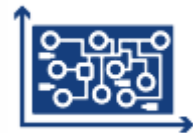
AI Voids Detection,  
AI Programming,  
AI Repair Station



### Big Data Applications

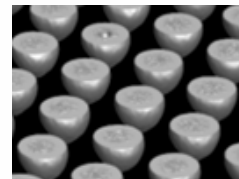
2- 30  $\mu\text{m}$

### Multi-Resolution Multi-Applications

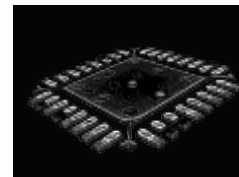


Up to 2100 x 510 mm

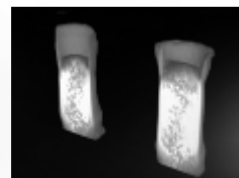
### Large Board Inspection



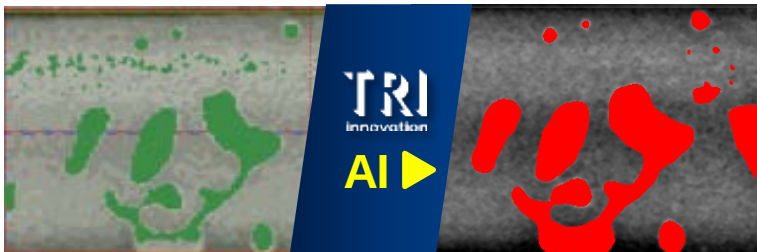
### BGA Inspection



### QFN 3D AXI



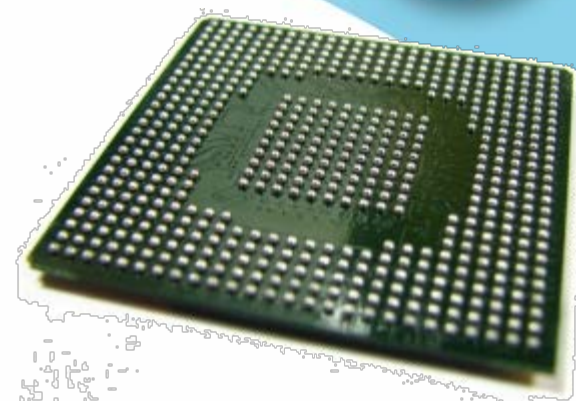
### PTH/THT Filling level



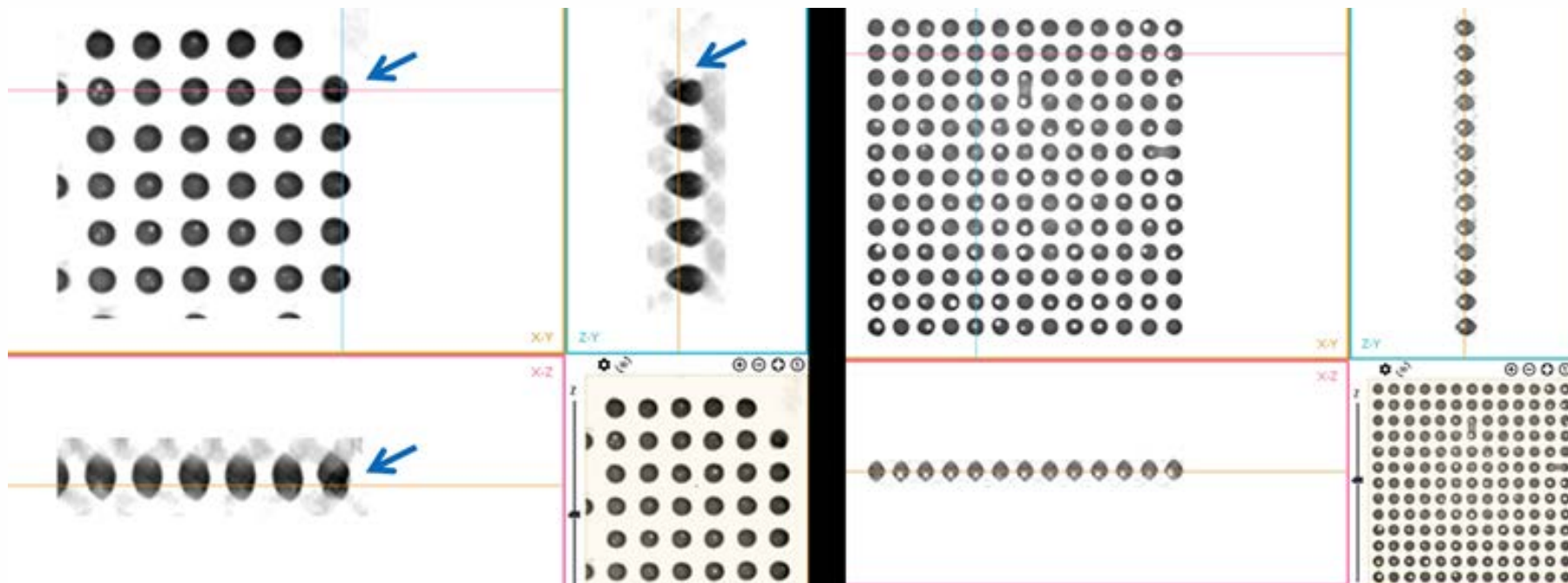
# TRI AXI - BGA 檢測應用



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



## 3D CT (電腦斷層掃描)



# TRI AXI – 平台特點



*TR7600F3D SII*

Joints-oriented Inspections



In-depth  
High-Resolution

Flat Panel Detector

*TR7600LL SV*

High Yield-rate Full-Inspection



High-Speed  
Inspection

Line Scan Detectors

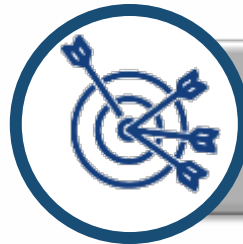
# TR8100H SII 系列 ICT應用特點



NEW



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



**Full Coverage Test Solution**  
**with Vacuum Fixture**



**High Speed Testing**

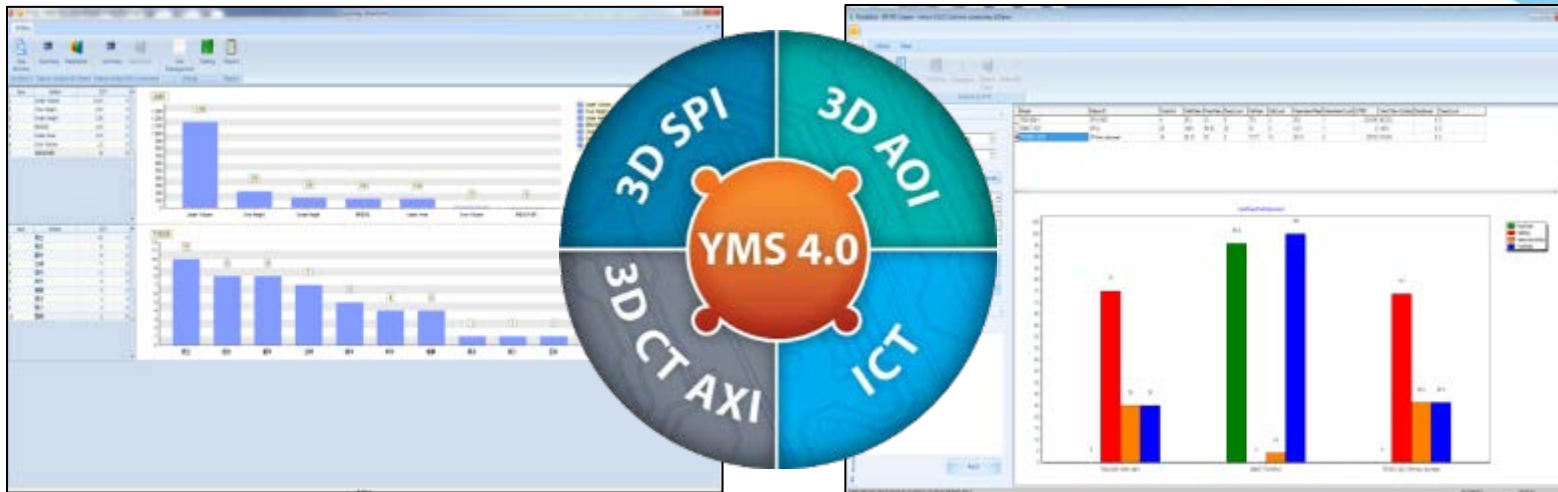
# TRI 的 AI 應用



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



# 工業 4.0 應用方案



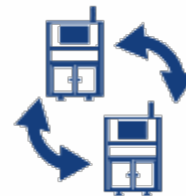
**SMART  
FACTORY**



**MES  
Connectivity**



**Real Time  
SPC Trends**



**Closed Loop  
Solution**

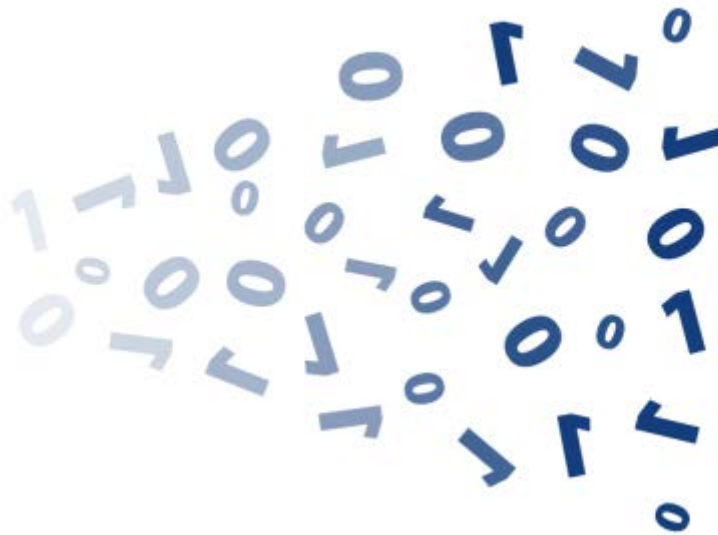


**Repair Station**

# MES 客製化 - 大數據收集



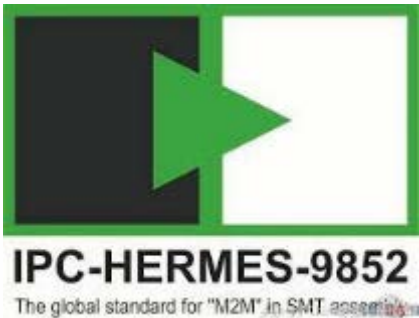
TRI solutions generate  for your MES Applications  
To Improve your Production Yield Rate



## 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

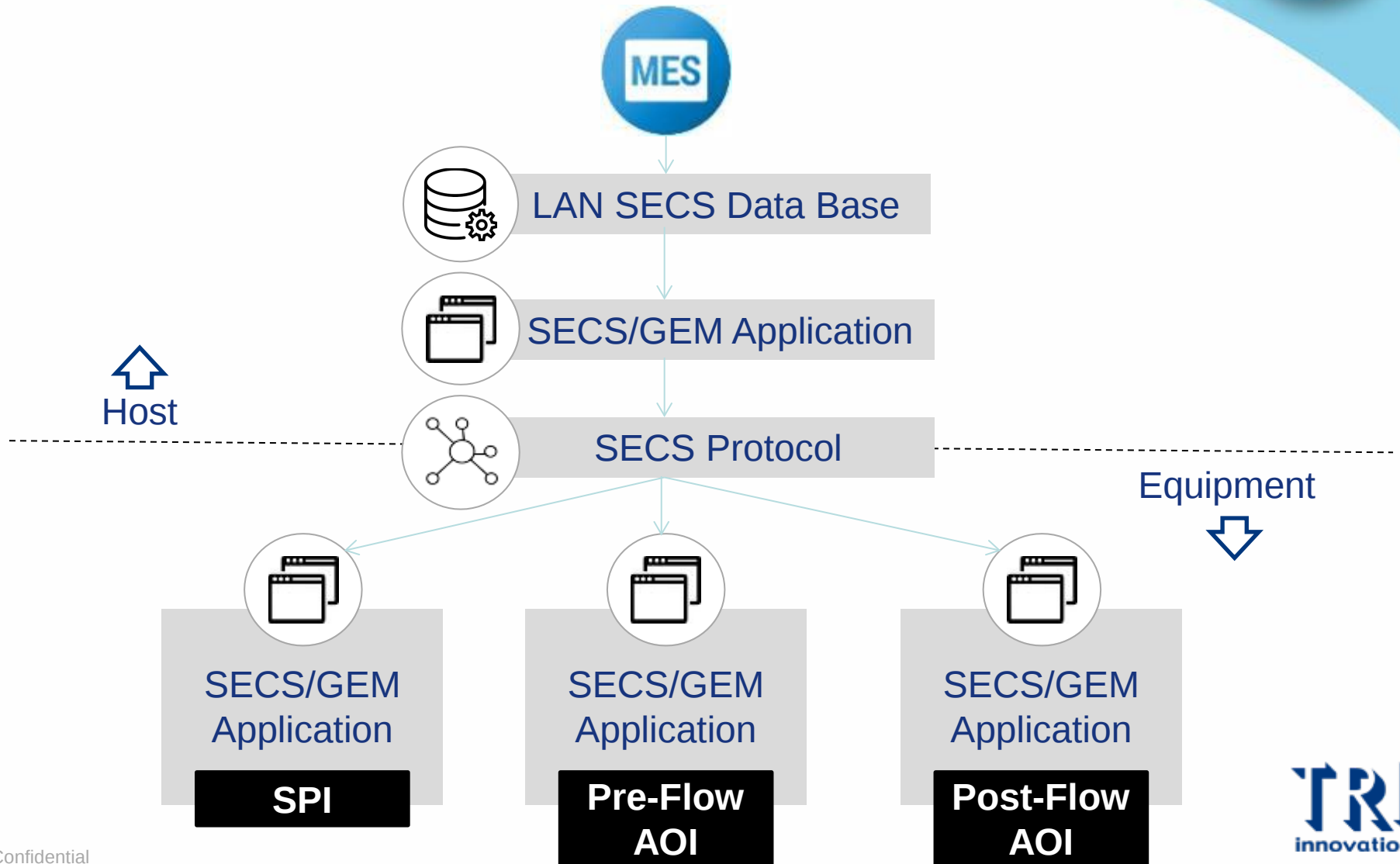


### ICT

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



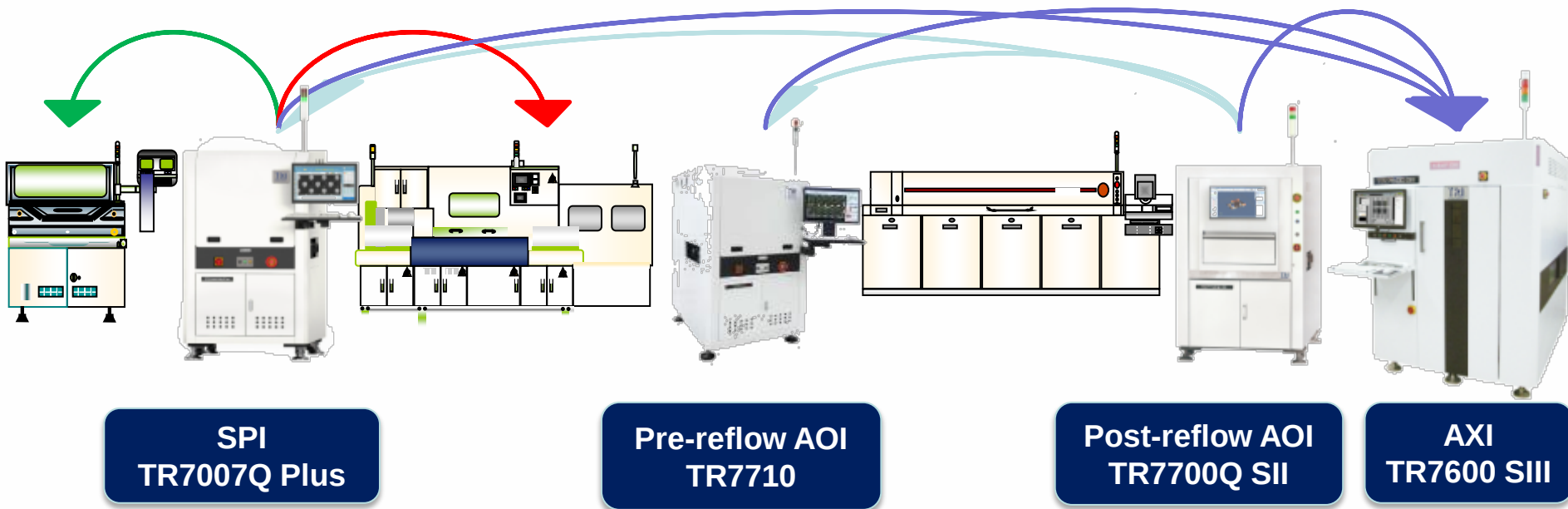
**TRI SPI, AOI, AXI 檢測資訊的串流**  
**IPC CFX(data)/HERMES(M2M)**

**Feedback**

**Feedforward**

**Data & Image Feedback**

**Skip board data**



## 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



# 合作案例: TRI & NVIDIA



TRI, Taiwan's leading AOI equipment maker, has announced it's integrating **NVIDIA Metropolis** for Factories workflow and capabilities into its latest AOI systems and is also planning to use NVIDIA NIM to further optimize system performance.

- NVIDIA

[Article Link](#)



**NVIDIA Metropolis** is an application framework, set of developer tools, and ecosystem of companies that brings visual data and AI together to improve operational efficiency and safety across a variety of industries. It helps make sense of data created by trillions of sensors for some of the world's most valuable physical transactions.

## Industrial and Manufacturing

Improve industrial inspection, increase productivity, and reduce waste on manufacturing lines.

Automated  
Optical  
Inspection

Preventive  
Maintenance

Remote  
Asset  
Monitoring

Safety and  
Compliance



# 內部研發團隊



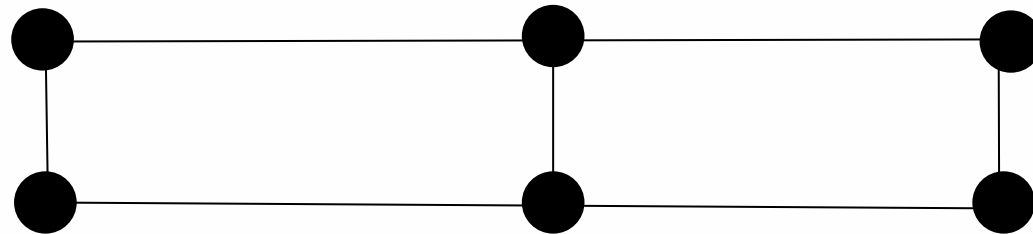
- Optical Dept.
- Mechanical Dept.

- system S/W  
YMS, R/S

- PLC control
- Lighting control

光學檢測

電路板測試



230<sup>+</sup> 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!***

***For more information about  
Test Research, Inc.***



**Please visit:**

**[www.tri.com.tw](http://www.tri.com.tw)**

