



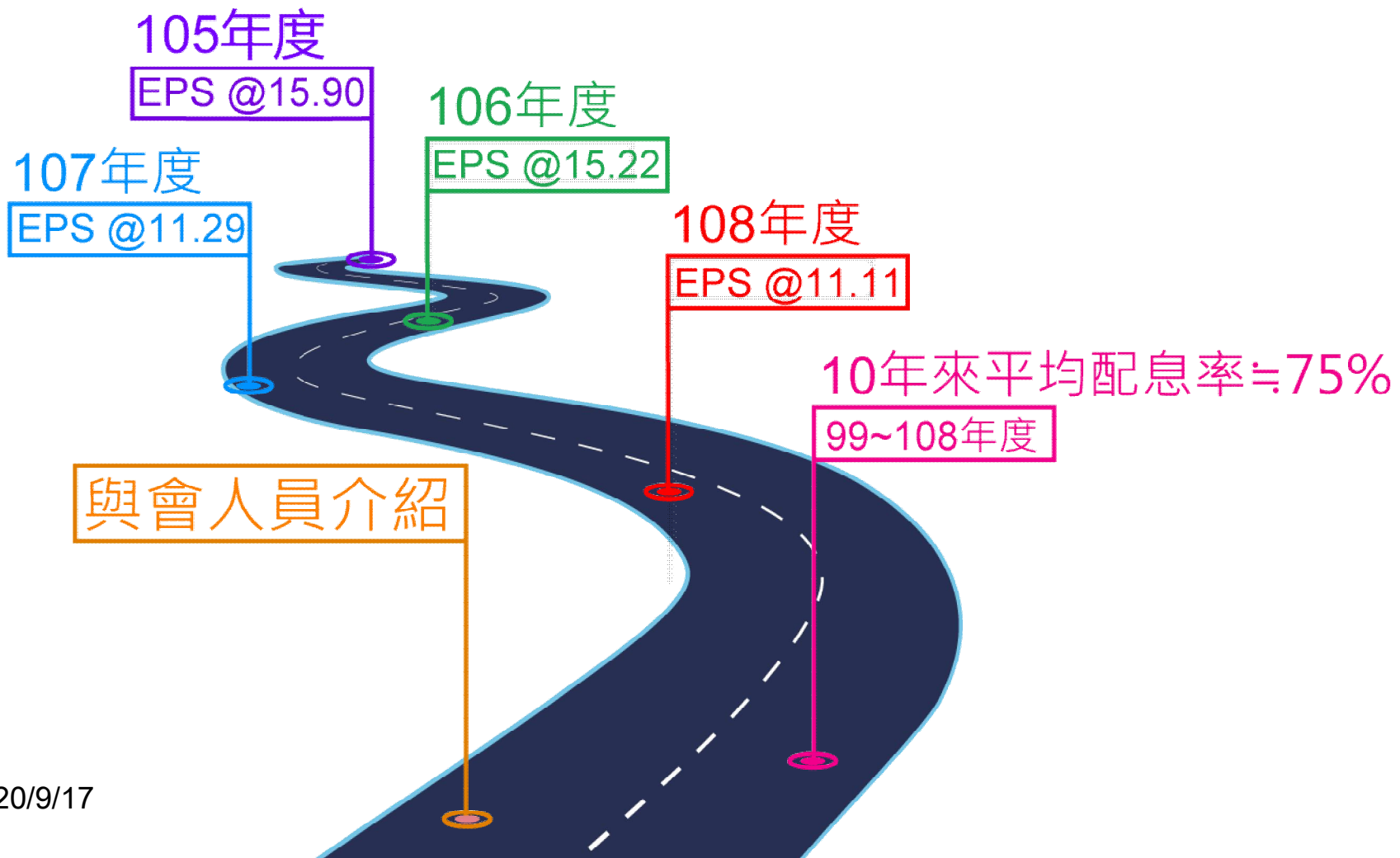
弘塑集團法說會簡報資料

109/9/17

董事長:張鴻泰
總經理:石本立

上次法說會在105年4月29日舉行

這四年來公司在做對內、對外的資源整合



各公司與會人員介紹



 **GPTC 弘塑科技** 執行副總: 黃富源, 財務處長 曾繁斌

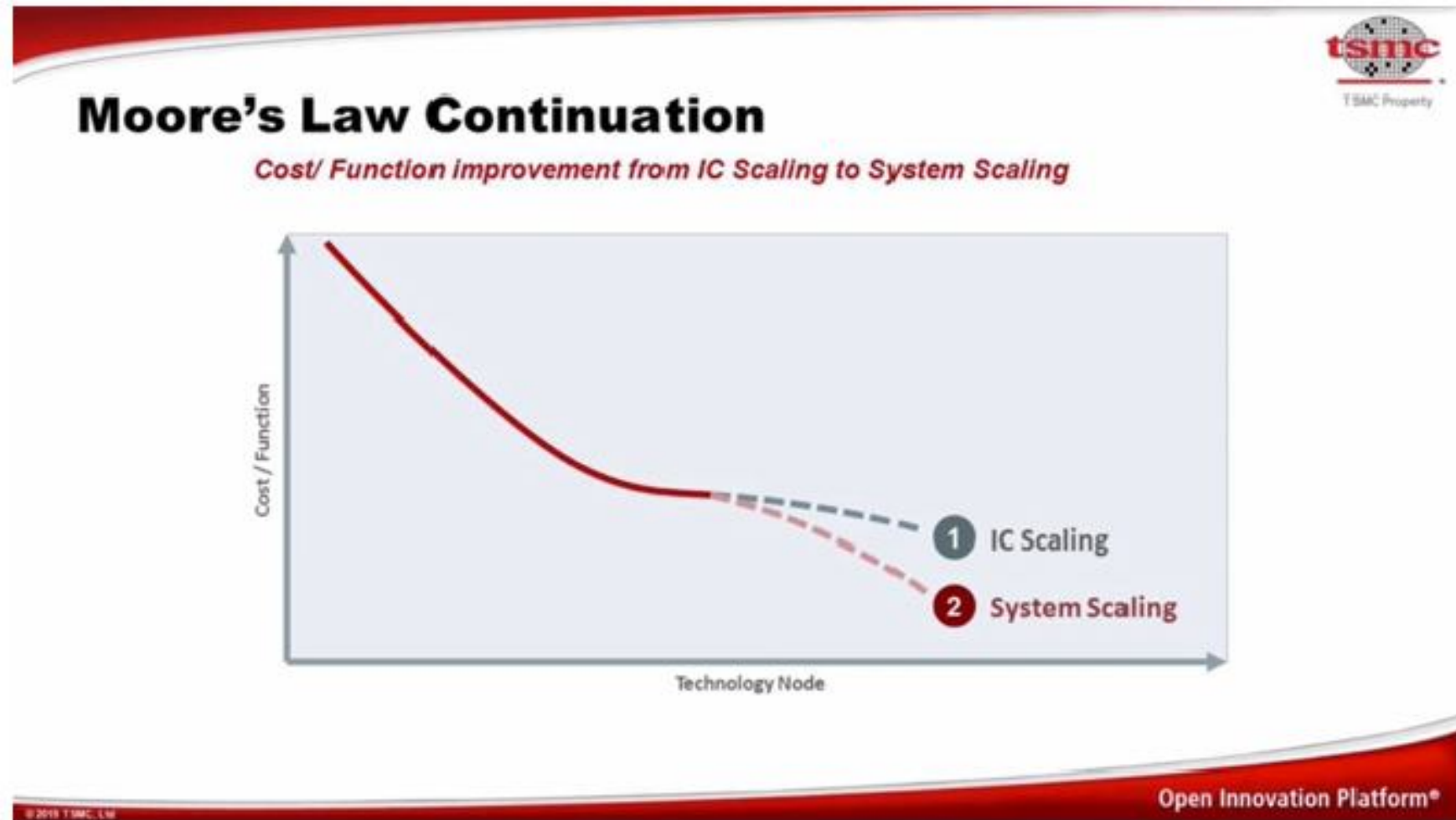
 **CLC 添鴻科技** 總經理: 鍾時俊 Ph.D

 **CIC 佳霖科技** 副總: 楊銘和

 **TYNE 太引資訊** 總經理: 周沁怡 Ph.D

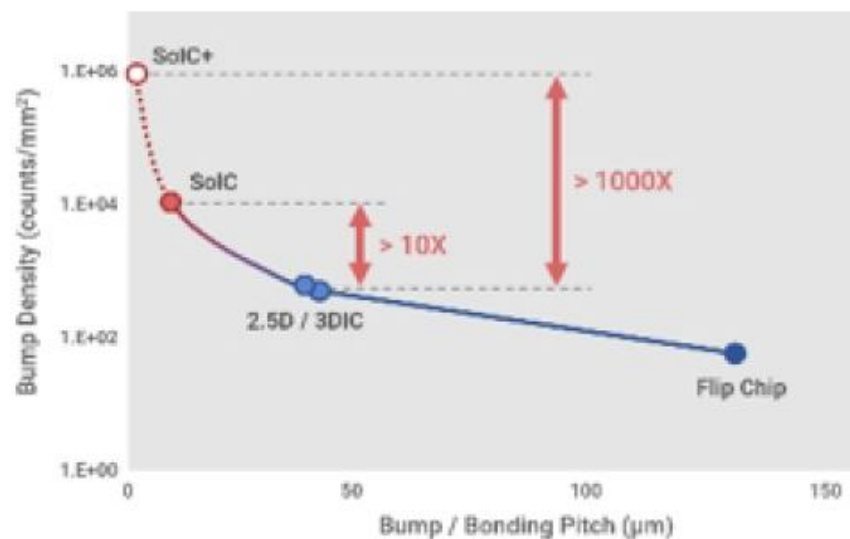
Figure 1 - TSMC's View on Moore's Law

Packaging adds the second driver for system scaling beyond traditional IC scaling



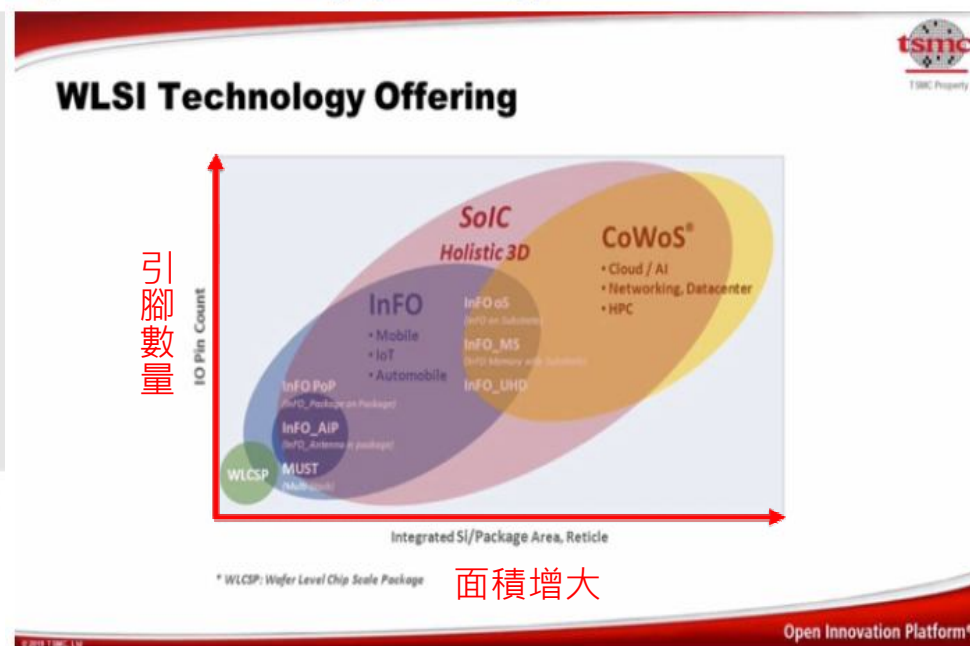
System Scaling: 推動封裝技術

Figure 15 - TSMC's Holistic Packaging Strategy



Source: TSMC

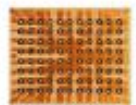
Figure 16 - TSMC's Packaging Technology Portfolio



Source: TSMC

封裝分類多樣化

Figure 7 - Packaging Taxanomy

Packaging Process Modules		Conventional Packaging					Advanced Packaging				
		Wire Bond		Flip Chip			Wafer/Panel Level Pkging		Heterogeneous Integration		
		DIP	PGA	QFP	QFN	BGA	Fan-In / WL-CSP	Fan-Out WLP/PLP	PoP	2.5D	3D-IC
											
Commercial Brands / Variants	Intel					LGA				EMIB	Foveros
	TSMC							InFO		CoWoS	SoIC
	Samsung (incl. SEMCO)									I-Cube	HBM
	ASE (incl. SPIIL)						aCSP	aWLP, M-Series		FOCoS	
	Amkor				MicroLeadFrame			SWIFT	TMV		
		JCET (incl. STATS ChipPAC)				AcCuBE	eWLCSP	eWLB			
Wafer/Chip I/Os	Pads	•	•	•	•	•			•	•	•
	Bumps/Pillars				•	•	•	•	•	•	•
Chip-to-Substrate Interconnect	Wire Bonding	•	•	•	•	•			•	•	
	Flip Chip Bonding				•	•			•	•	•
	RDL						•	•		•	•
	TSV/Si Interposer									•	•
Substrate	Wafer Bonding										•
	Lead Frame	•	•	•	•	•					
	Laminate/Ceramic				•	•			•	•	•
Package I/Os	Substrate-less						•	•		•	•
	Leads/Pins	•	•	•	•	•					
	Solder Balls/Pads				•	•	•	•	•	•	•

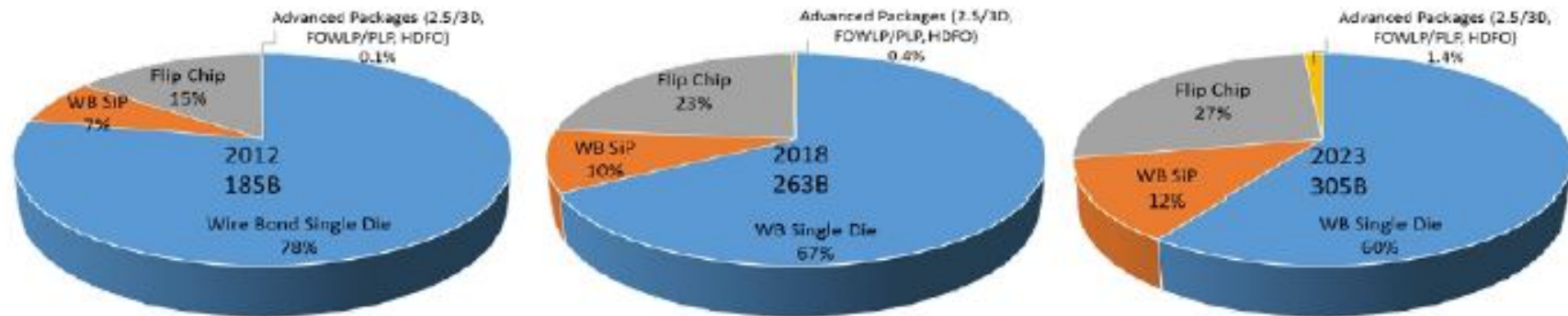
Source: various company reports, Needham & Company

2010~2019

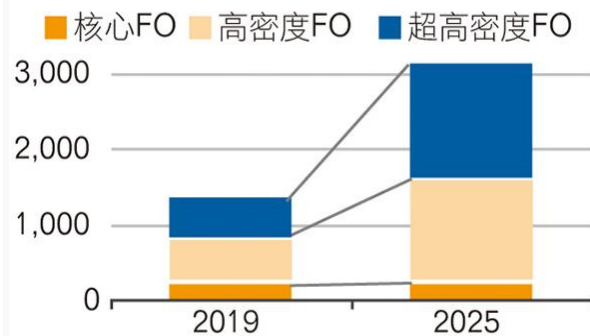
2019~~

封裝應用市場多樣化

Figure 8 - Package Volume By Units in 2013A, 2018A and 2023E

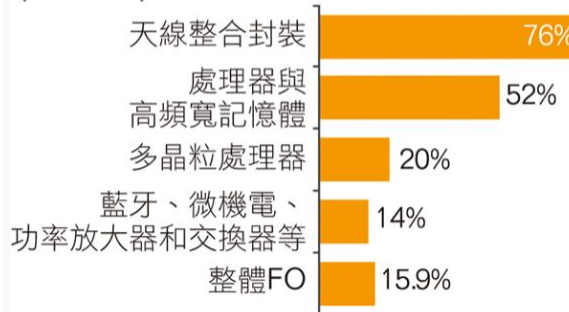


2019~2025年各類扇外型封裝技術市場規模預估 (百萬美元)



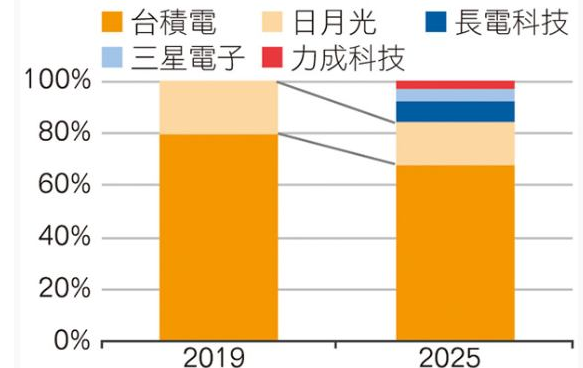
資料來源：Yole Developpement，DIGITIMES整理，2020/6

2019~2025年扇外型封裝各應用領域市場規模年複合成長率 (CAGR) 預估



資料來源：Yole Developpement，DIGITIMES整理，2020/6

2019~2025年超高密度扇外型封裝業者營收佔比預估



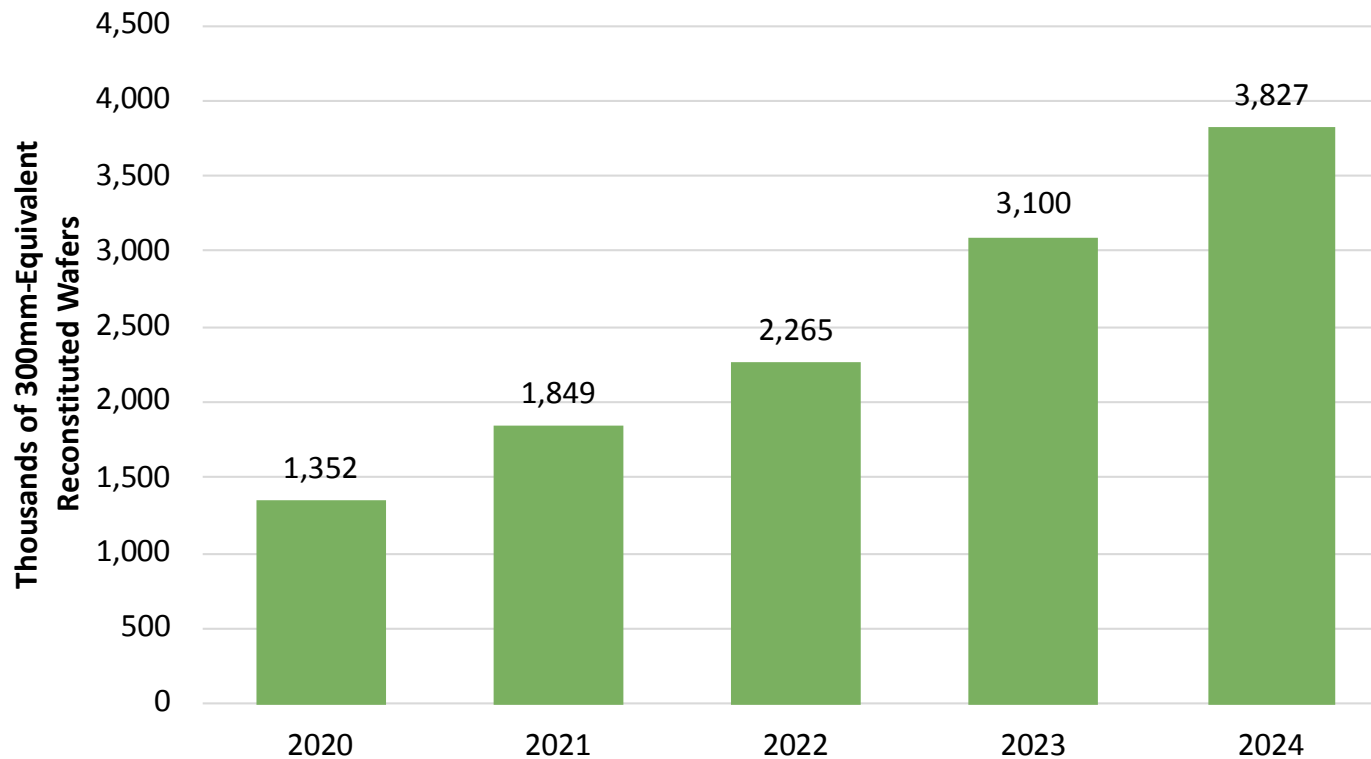
資料來源：Yole Developpement，DIGITIMES整理，2020/6

搭配前段微縮技術發展，必將蓬勃發展

FO-WLP Forecast (300mm-Equivalent Wafers)



P-8



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1. FO-WLP market calculated in reconstituted wafers shows ~30% CAGR
2. Wafer size growth driven by larger body sizes for FO on substrate

2020/9/17

- A. Founded : May, 1993
- B. Headquarter : HsinChu / Taiwan
- C. Employee : 160 in GPTC/74 in CLC/106 in CIC/33 in TYNE
- D. Capital : NT\$292M or 29,216,015 shares

✓ 2013 merged ChemLeader Corporation (CLC)

✓ 2015 invested JPN Tazmo/Apprecia

✓ 2018 merged CIC and TYNE

✓ 2018 invested USA SVXR

- E. Revenue : NT\$2.061B (2019)
- F. IPO : 2011/1/17
- G. ISO 9001: 2000 Certified
- H. SEMI-S2 0310 Certified
- I. Head Quarter
 - 1. Manufacturing Clean Room
 - 2. Research Lab





2015

TAZMO®

2018

SVXR
SILICON VALLEY X-RAY

集團發展策略：三條路線

	Advanced Packaging	QZ/Diode/BGB M/MOS/IGBT	GaAs/ GaN/m. LED	FEOL	Wafer	Mask	Glass應用相關
特殊化學品 特殊添加劑	V	V	V	謹慎為之			
Wet- SPIN	V→ CIP	V	V	Penetrating	Penetrating	Penetrating	Penetrating
Wet-bench	V→ CIP	V	V	Penetrating	Penetrating	Penetrating	Penetrating
ECP Tool	V Alliance						
Coater/ Developer	Alliance: Tazmo						
WSS/De- bonder/Recycler	V Alliance: Tazmo						
Plasma/ Vacuum 其他方案	Keep Searching.....						
良率、品質、效 率管理	3						
Spare Parts 支援性質服務	V		V	V			

A. 路線1: 深耕先進封裝主幹業務

B. 路線2: 利用核心能力向外延伸、擴充

C. 路線3: 新成長區塊: 協助客戶良率、品質、效率管理

順序：

定位 (1, 2, 3)

找資源

發展產品

切入客戶及市場

A. 路線1: 深耕先進封裝主幹業務

1. Laser De-bond、Carrier Recycle Cleaner開發完成
2. 電鍍機開發完成
3. 面板級封裝 PLP濕製程機種開發完成
4. 邏輯客戶、記憶體客戶開發

B. 路線2: 利用核心能力向外延伸、擴充

1. Glass領域: 蓋板玻璃、3D曲面玻璃、導光片、VSCEL lens module...
2. GaAs、MOSFET、IGBT、石英元件、二極體、Raw Wafer應用領域
3. BGBM 薄片濕製程製程應用

C. 路線3: 新成長區塊: 協助客戶良率、品質、效率管理

1. Metrology Solutions for Defect Inspection in FOWLP/FOPLP
2. 硬體方案: PVA TePla, SVXR, n&k.....
3. 軟體方案: 太引, 在數據分析領域耕耘

以下是主要公司產品、服務介紹

A.  **GPTC 弘塑科技**

B.  **CLC 添鴻科技**

C.  **CIC 佳霖科技**

D.  **TYNE 太引資訊**



弘塑科技股份有限公司
Grand Process Technology Corporation

2020/9/17

GPTC Single Spin System (UFO-300)



P-16

- POR for InFO & CoWoS & SoIC & Fanout & Bumping
 - UBM Etch
 - ✓ EPD(End Point Detector) equipped for fine pitch process control
 - Chemicals Clean & Etch
 - PR Strip
 - Oxide Etch, Silicon Etch

- On-going Development
 - Organic film formation
 - Surface pretreatment
 - Gap flux clean & Substrate Clean



GPTC Wet Bench System (VAN-300)



P-17

- POR for InFO & CoWoS & SoIC & Fanout & Bumping
 - PR Strip, H₂O₂ CuO formation
 - ✓ High WPH (>2.2x) design for productivity
 - ✓ Concentration monitor system equipped for process stability
 - PR Strip, Metal Etch for specialty project
 - ✓ Concentration monitor equipped for process stability
 - Silicon Etch for EUV Mask Pellicle
 - ✓ Concentration monitor system equipped for process stability

- On-going Development
 - EUV Mask Clean
 - EUV Cassette Cleaner



2020/9/17

GPTC Combo System (UFO-300-C)



P-18

- POR for InFO & CoWos & SoIC & Fanout & Bumping
 - Glass Carrier Clean
 - ✓ High WPH design
 - ✓ Concentration monitor system equipped for process stability
 - Laser Debond & Clean
 - Frame Wafer Combo Cleaner
 - ✓ Particle control spec. reached $>0.2\mu\text{m}$, $< 15\text{ea}$
 - PR Strip, UBM Etch
 - ✓ Soaking + spin for fine pitch process control
 - Frame wafer Metal Etch for MEMS process
 - ✓ Chemical reclaim function
- On-going Development
 - Double side carrier debond & cleaner development
 - ✓ High warpage handling (+- 6mm)
 - Gap flux clean & Substrate



Fan-out: Package technology

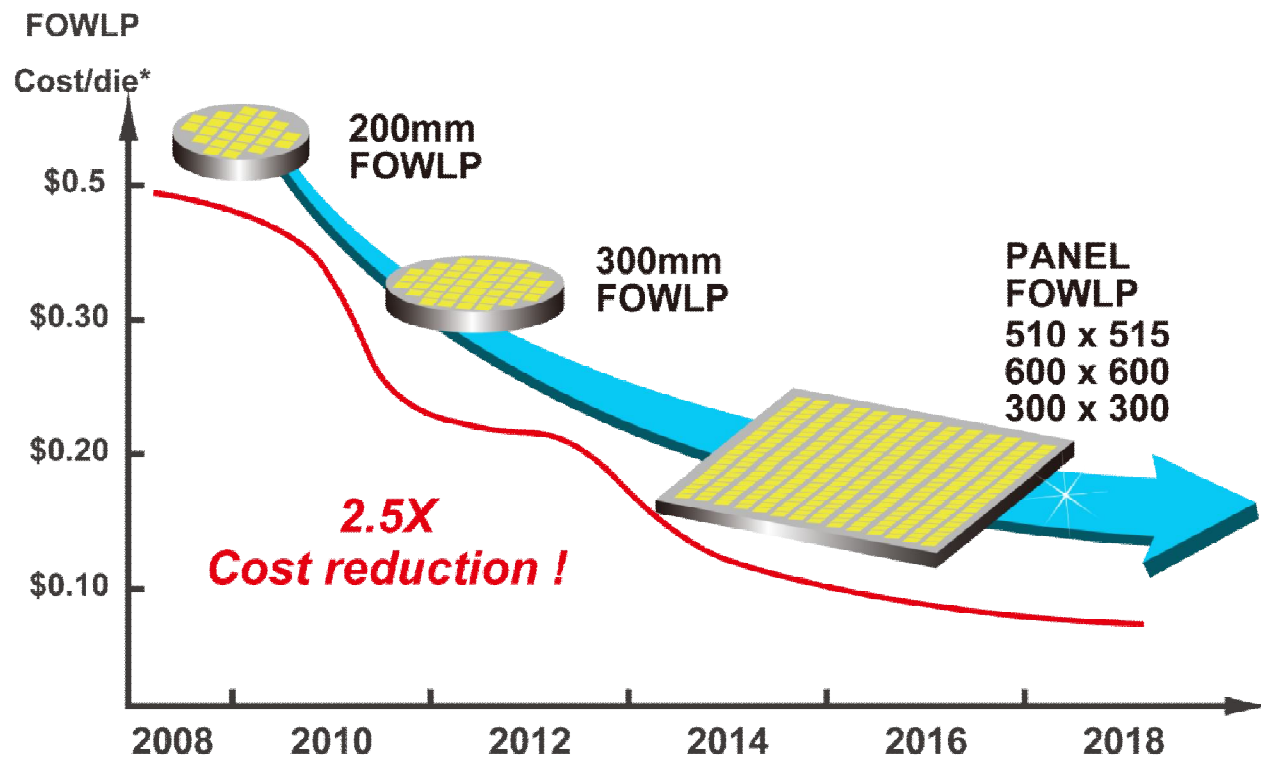
Cost driven is a trend



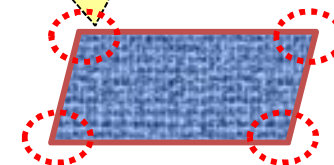
P-19



Customer Accept Customer Accept



Panel Fan-Out UBM Etcher : Edges U%



Dual Arms :
Arm-1: FOE(Focus on Edges).
Arm-2: MNS(Multi-Nozzles Swing).





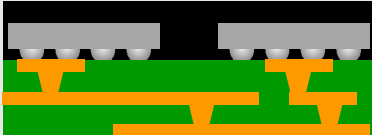
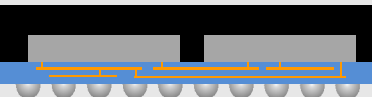
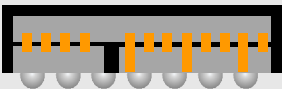
添鴻科技股份有限公司
Chemleader Corporation

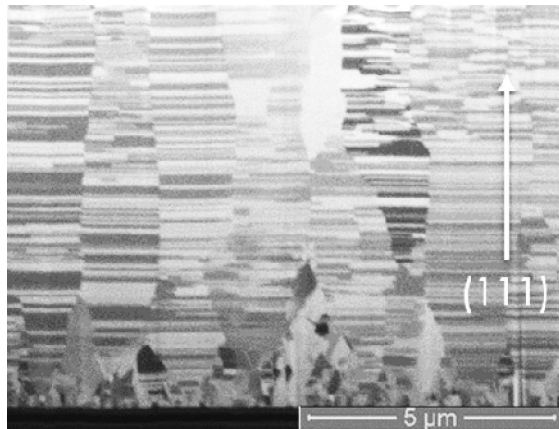
2020/9/17

CLC Solutions to Heterogeneous Integration



P-21

	2D	2D	3D
Example	 SiP	 InFO	 SoIC
Enabling technology	FC + Substrate	Fine line RDL Reconstituted wafer	Cu to Cu direct bond TSV
Chemical challenges	Low operation cost Environmental friendly	Fragile structure Low chemical resistance	Low bonding temp Cu
CLC Solutions	High loading UBM etchants Non-harzdous PR stripper	Precision UBM etchants PI compatible PR stripper nt-Cu ECD chemical	(111) nt-Cu ECD chemical

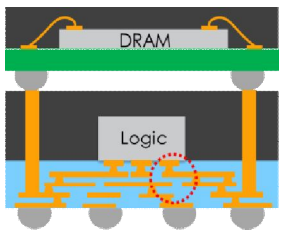
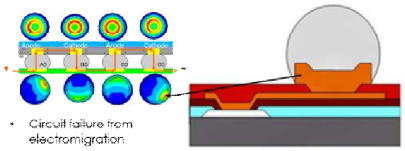
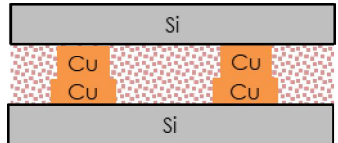
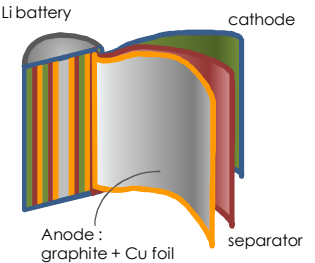


Nanotwinned copper

奈米雙晶銅

纳米孪晶铜

- Controlled microstructure by proprietary ECD chemical
- With **mechanical strength** and **thermal stability** of copper alloy,
but **electrical** and **thermal conductivity** of pure copper
- 1st commercial nt-Cu ECD chemicals in the world

	Fine line RDL in Fan Out WLCSP	Cu UBM/RDL in power device	Cu joint pad in 3D IC	Ultra thin Cu foil in Li ion battery
				
Why (111) nt- Cu	2x toughness High reliability	4x EM resistance High reliability	1000x surface diffusivity Low temperature bonding ($<200^{\circ}\text{C}$)	2x tensile strength Higher power density



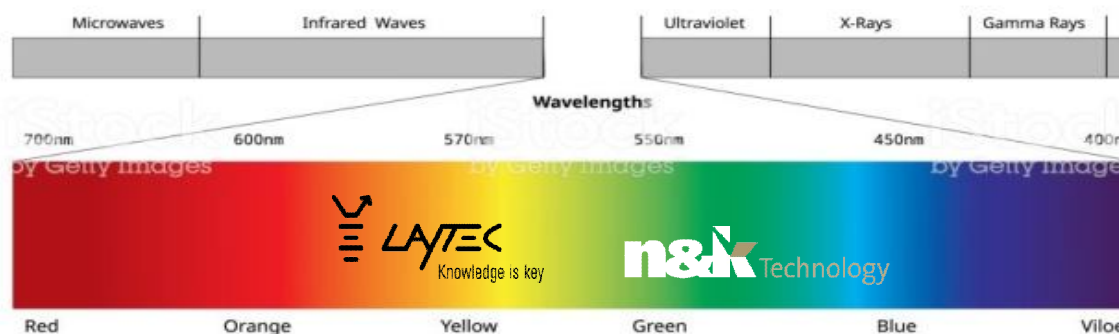
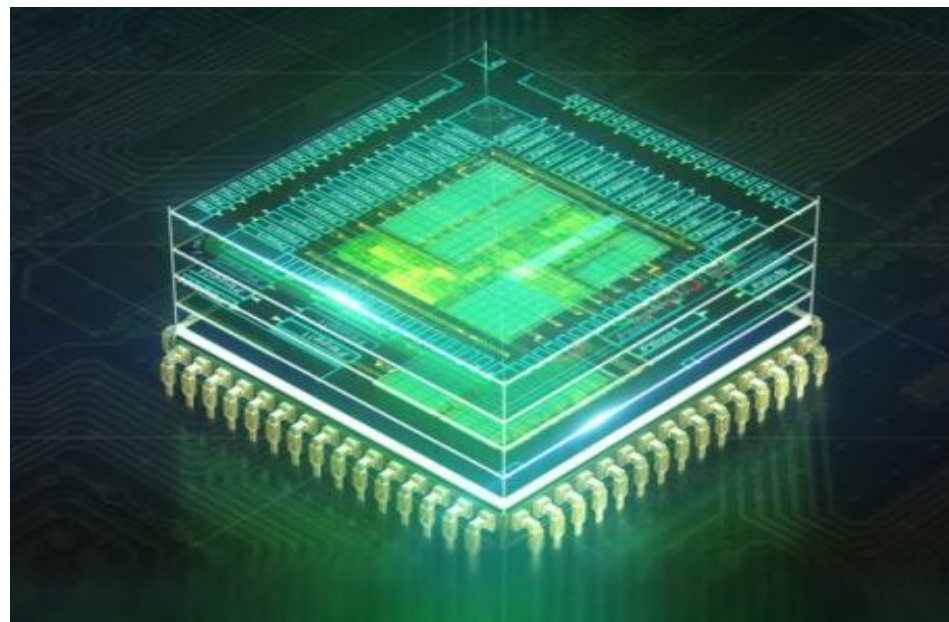
佳霖科技股份有限公司
Challentech International Corporation

2020/9/17

異質整合 量測/檢測設備



P-25



超高頻高解析
缺陷量測

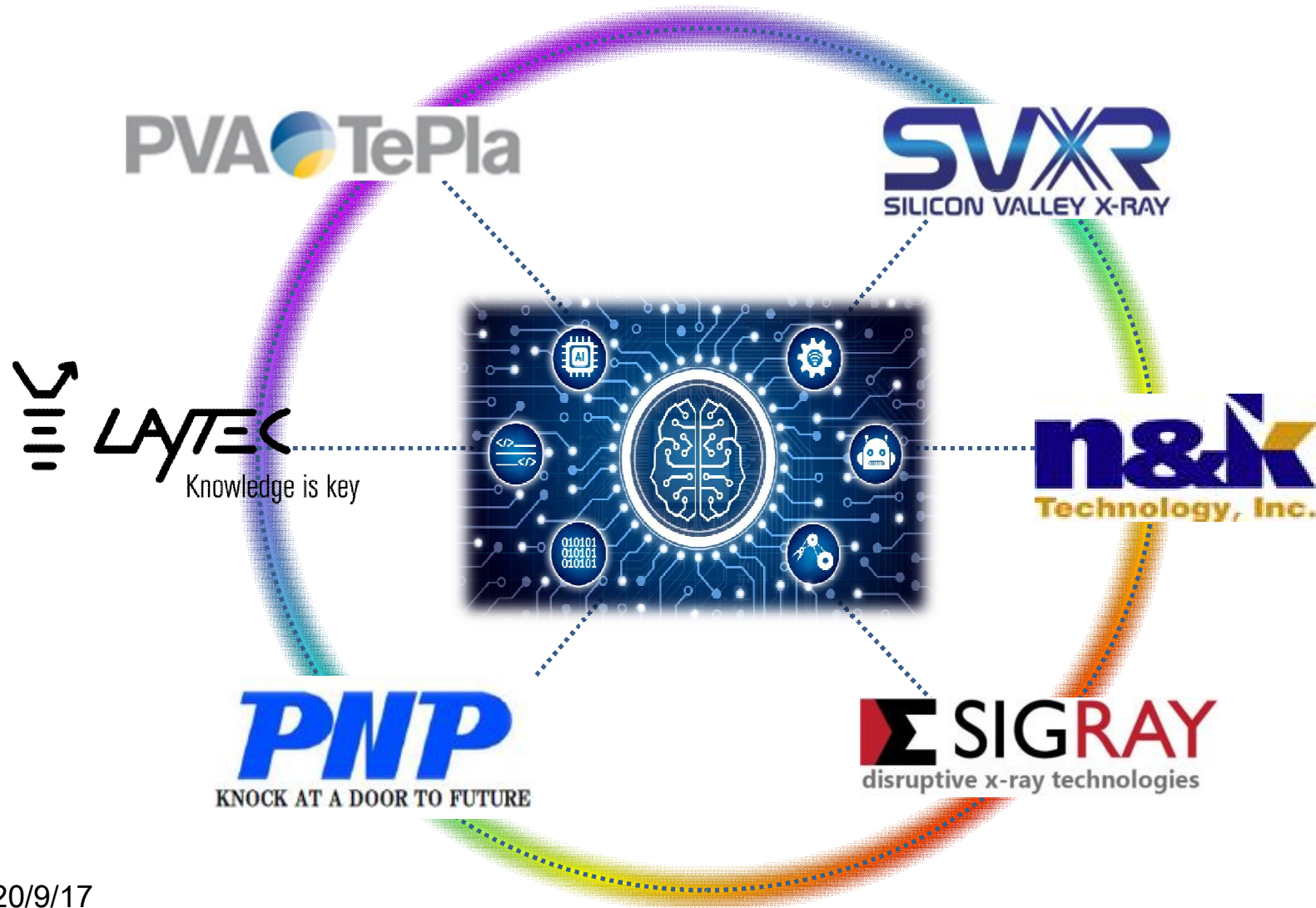
濕蝕刻終點

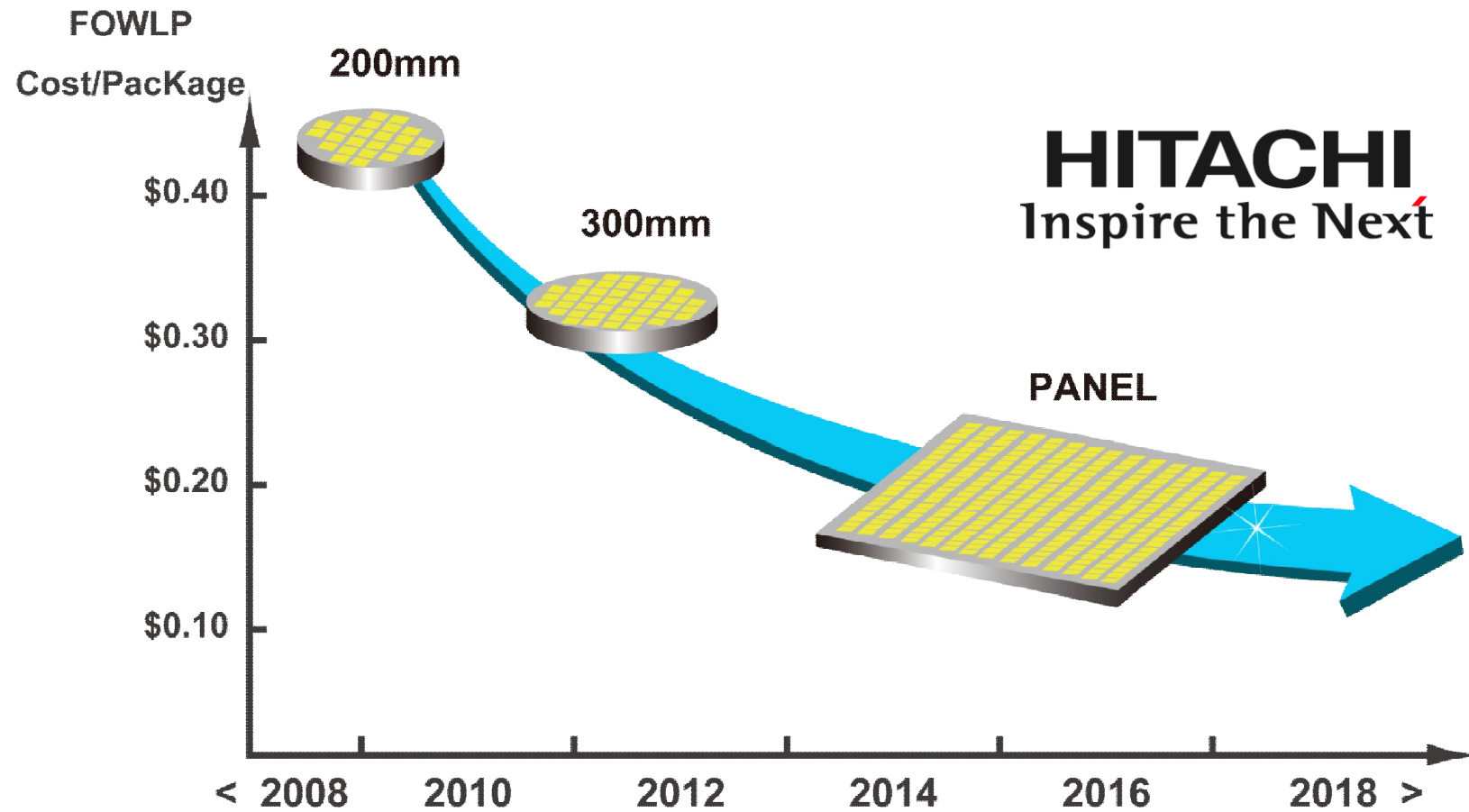
深溝槽電容輪廓

100%Bump
快速檢測

2020/9/17

人工智慧 良率提升







Fast Forward your Full Potential

太引資訊系統股份有限公司
TYNE Systems Corporation

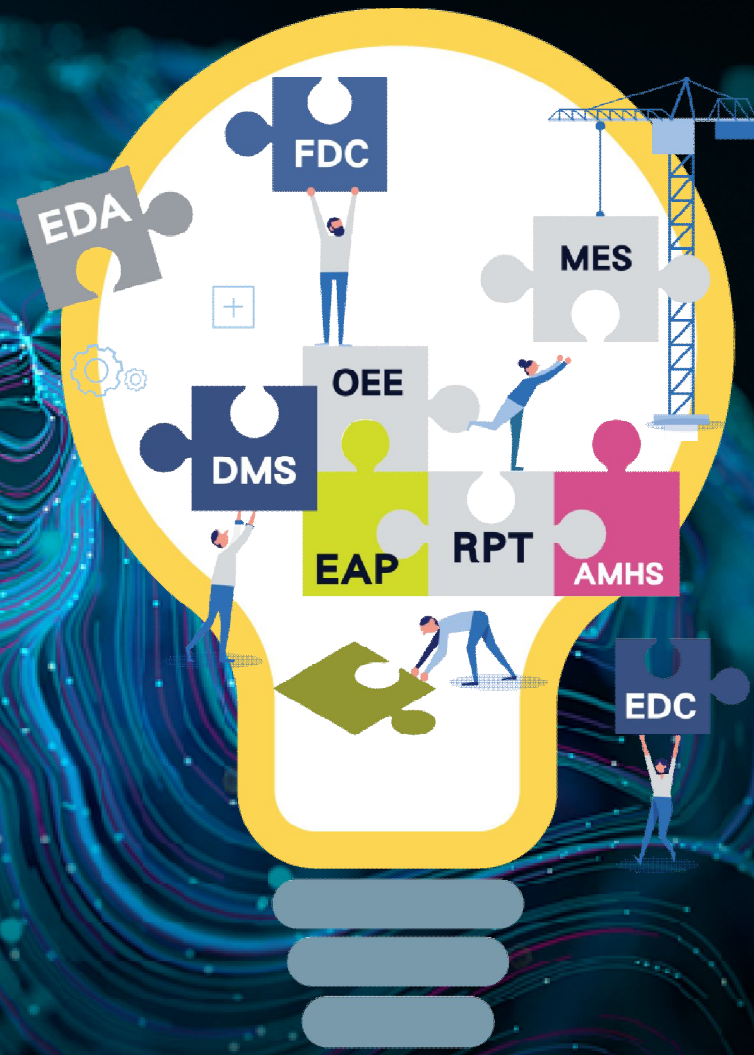
Total Yield and kNowledge Engineering Systems

引領企業利用數據 實現價值創新

The Power form Big Data

Data Lake Insight

高度整合各系統來源資料



大數據與人工智慧解決方案

EDA

工程資料分析

SPC

統計製程管制

ADC

瑕疵自動分類

WAT Judge

晶圓允收測試判定

CP Judge

晶圓針測良率判定

FDC

故障檢測分類

DMS

缺陷管理系統

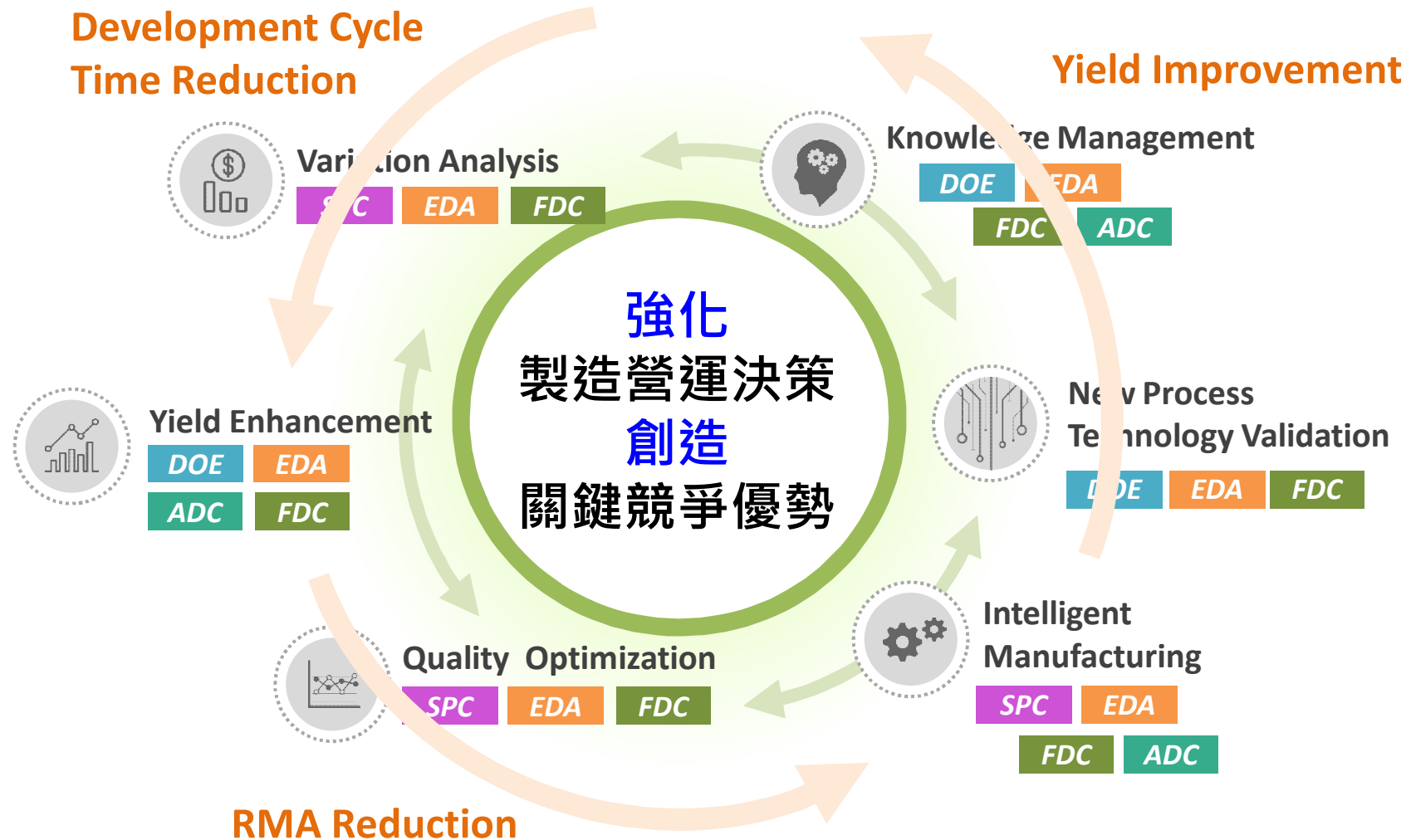
Lot Map Review

晶圓地圖檢視系統

Bit Map Review

晶圓位元地圖檢視系統

The Best Engineering Data Management Solution Provider



Technology Leading In-depth Professional



IT Technology

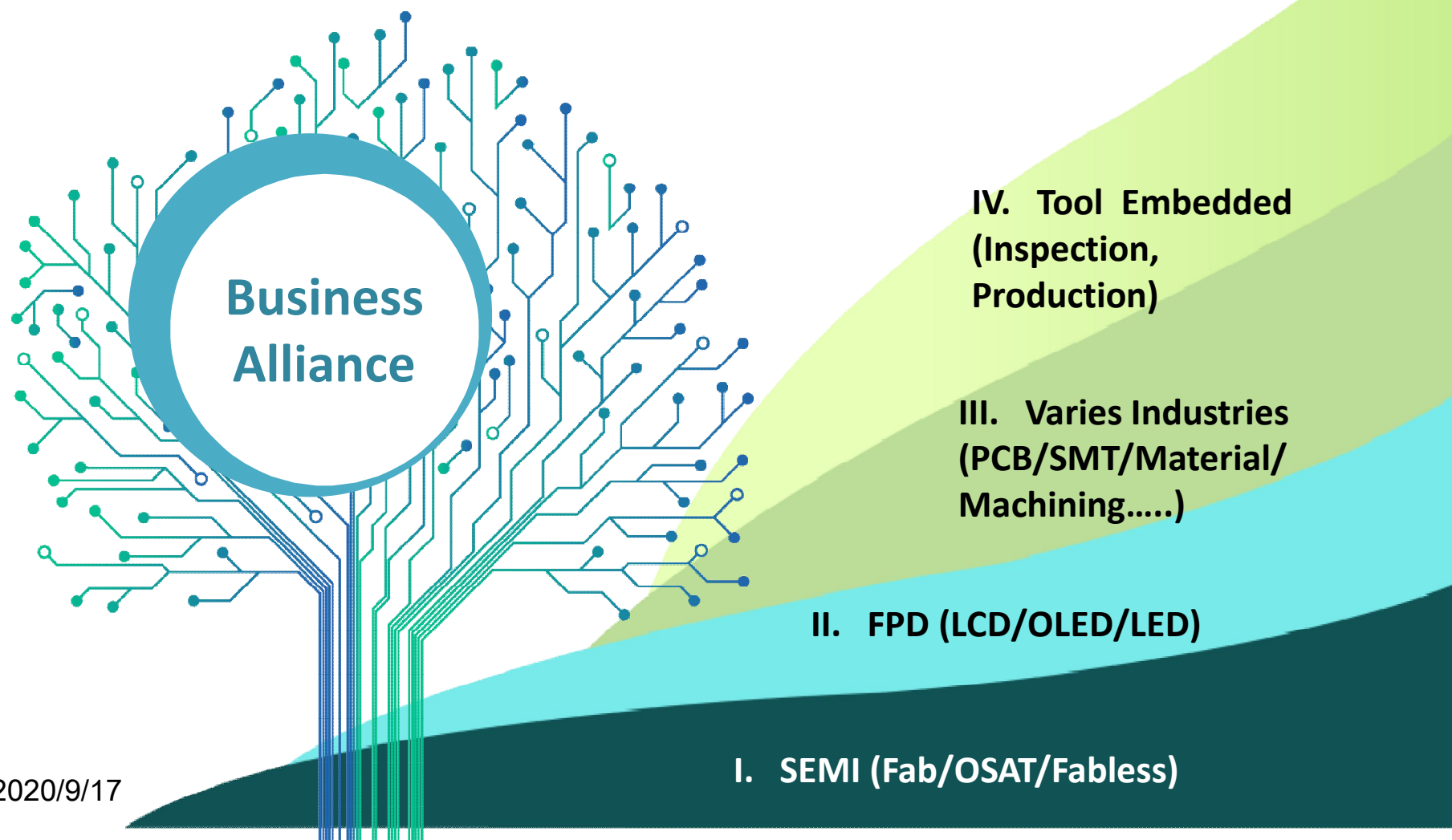


**Statistics
Application**



Industrial Domain Know-how

**Data Mining 、 Processing 、 Algorithm
Predictive & Prescriptive AI+ML**

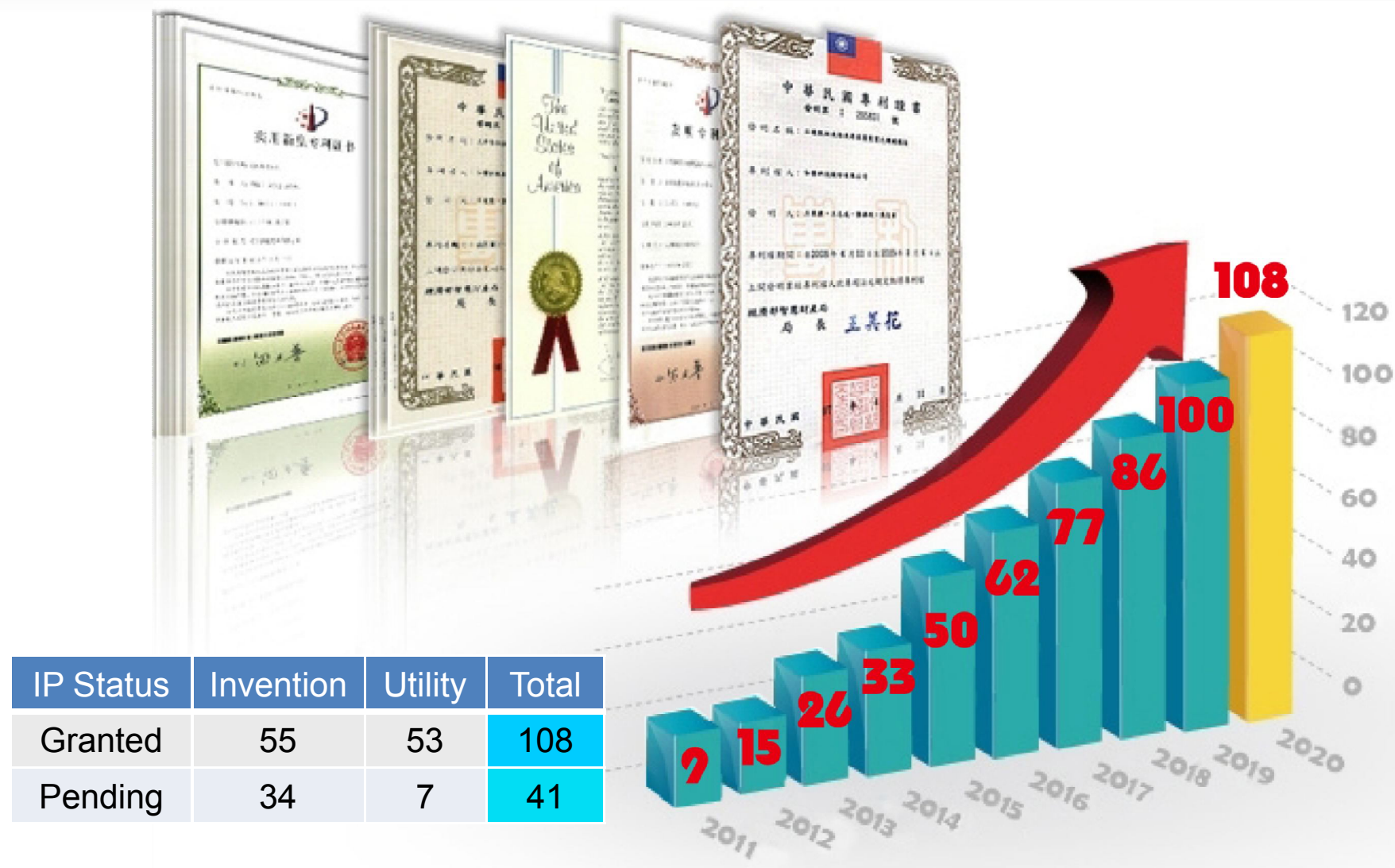


2020/9/17

A. 持續研發

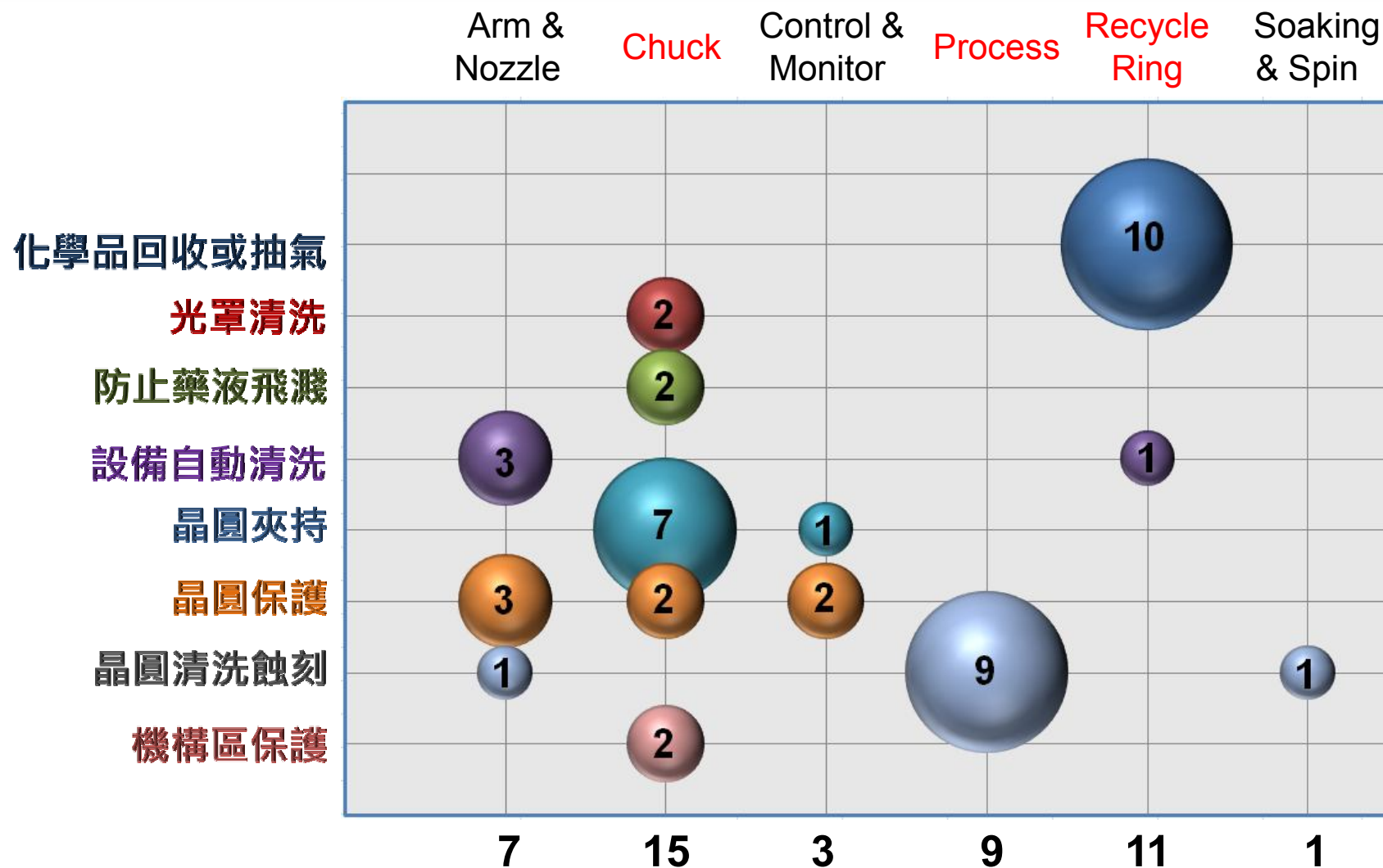
B. Open Resources for Customer RD supports

GPTC IP 累積趨勢



2020/9/17

單晶片相關IP 技術功效矩陣分析

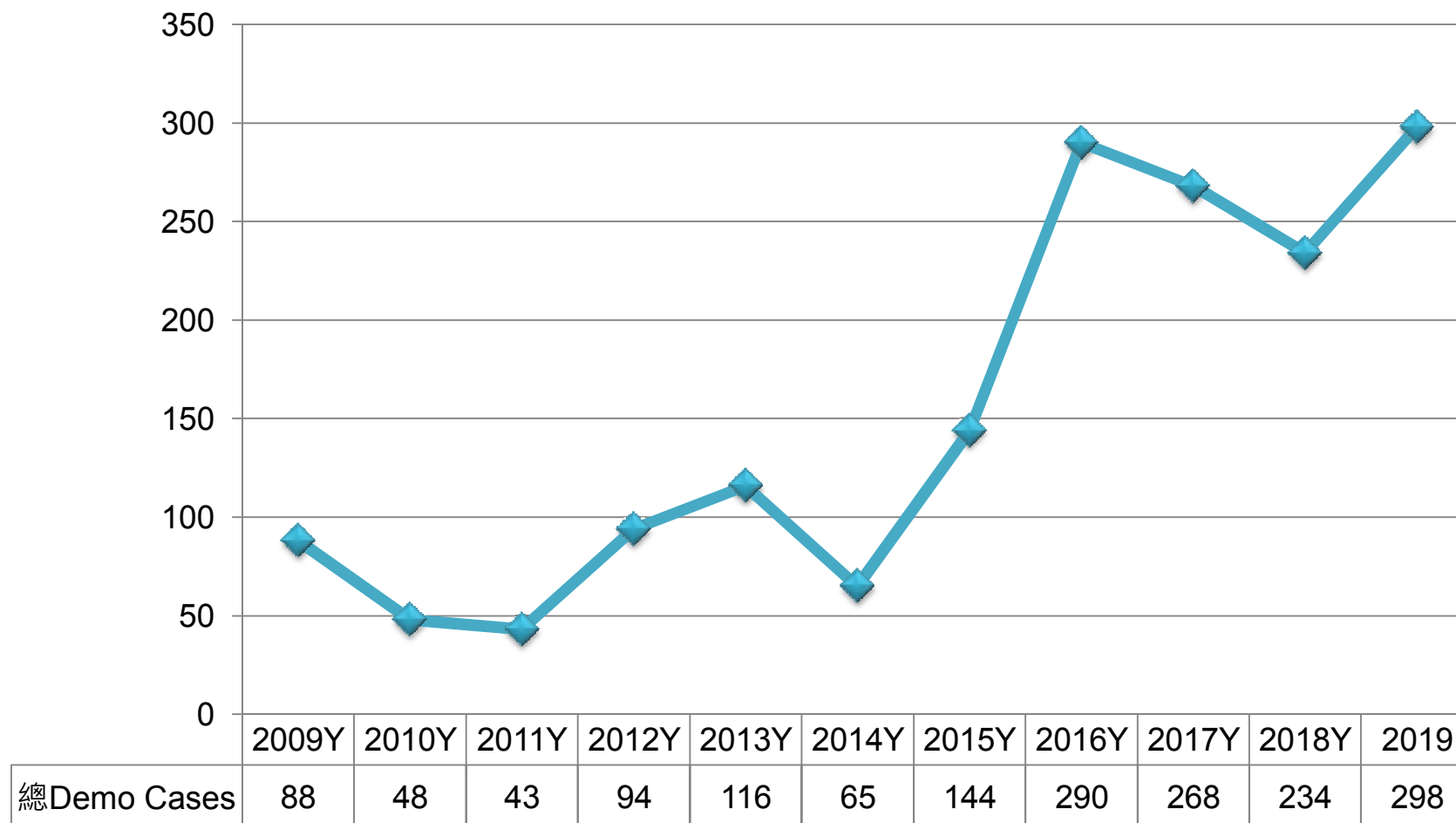


實驗室介紹



2020/9/17

每年累積案



Heterogeneous Integration Solutions Portfolios





期許

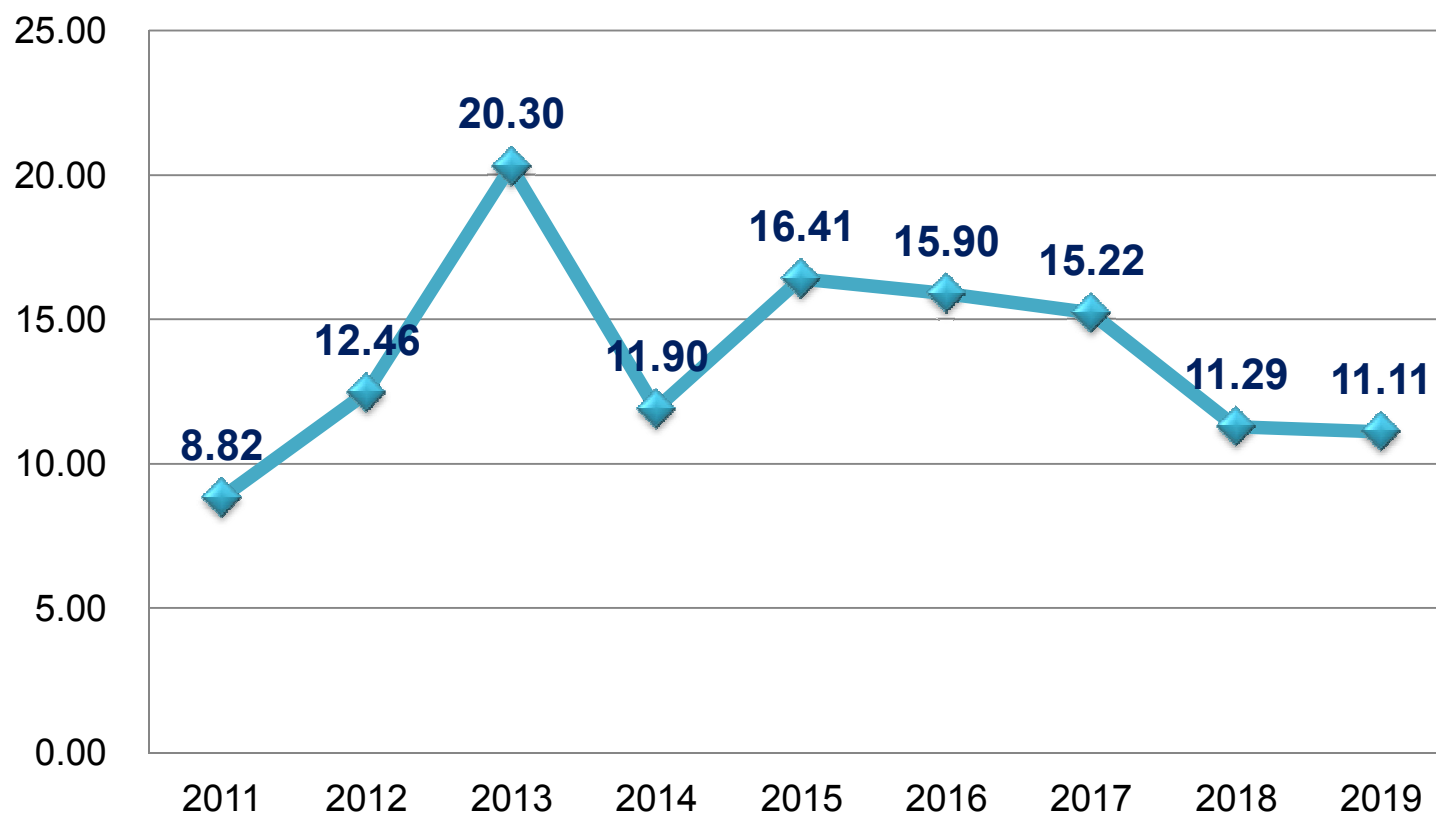
弘塑在先進封裝扮演更重要、積極角色.....

THANKS

感謝聆聽



歷年EPS趨勢



歷年股利配發率趨勢

