Chroma

Create Your Own Testing Innovation.

2014

Chroma 7935
晶粒外觀檢查機

Test and Automation turnkey Solution provider

2014年2月11日

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Wafer Chip Inspection Applications

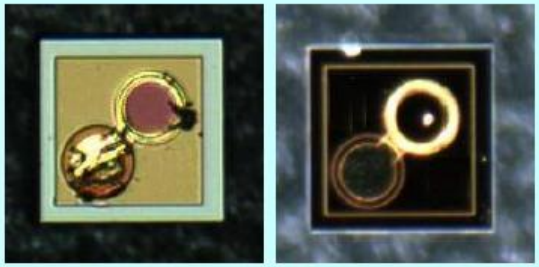
CMOS Image Sensor Inspection Items
影像感測器檢查項目

-Ball Missing 錫球缺少
-Ball Chipping 錫球崩缺
-Ball Shift 錫球位移
-Lead Short 引線短路
-Lead Open 引線斷路
-Lead Notch 引線缺角

LED Inspection Items
發光二極體檢查項目

-Pad Defect 電極缺陷
-Pad Residue 電極殘留
-ITO Peeling 發光區剝落
-Finger Broken 斷線
-Mesa Abnormality 切割道異常
-Epi Defect 磊晶缺陷
-Chipping 崩缺
-Chip Residue 晶粒殘留

Laser Diode Inspection Items
雷射二極體檢查項目



-Photosensitive Region Defect 光窗缺陷
-Bond Pad Defect 銲墊區缺陷
-Passivation Film Defect 外膜缺陷
-Scribe Line Defect 切割道缺陷
-Chipping 晶粒崩缺
-Double Chip 雙晶

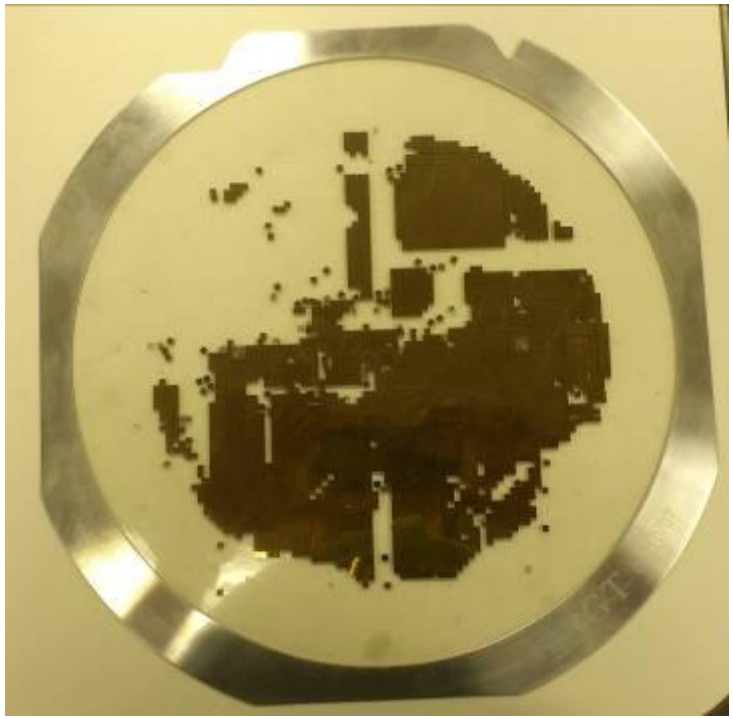
Chroma 7935產品規格

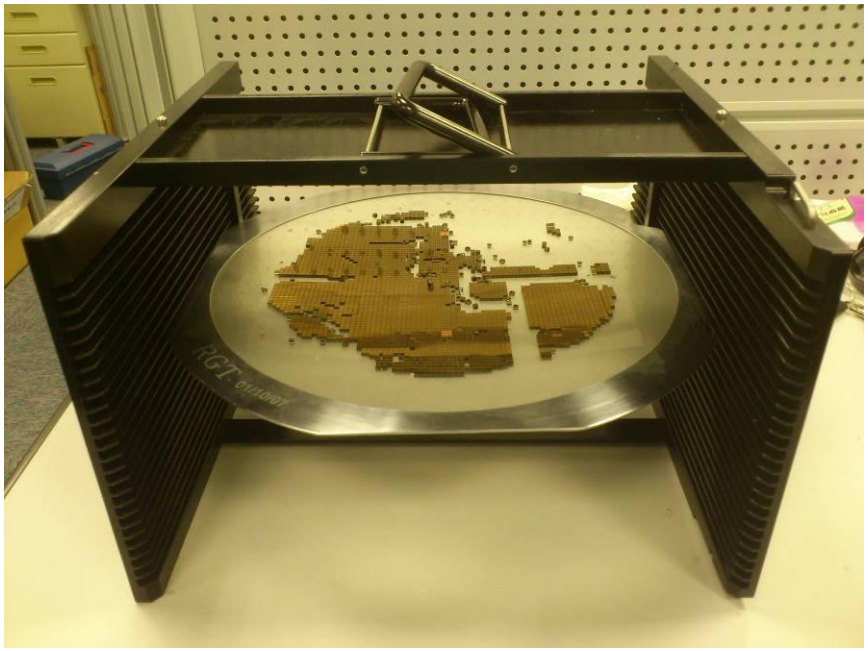
- 適用晶圓尺寸
  - 2”~6” (擴張後尺寸小於8吋)
- 適用晶粒尺寸
  - 6mil~100mil (2X lens)
- 7935可程式控制更換2X, 5X物鏡
  - 2X物鏡系統解析度為 1.72μm/pixel
  - 5X物鏡系統解析度為 0.7μm/pixel
- 具備多種光源可依不同缺陷調配
  - 同軸光、環型光、背光
- 自動化卡匣上下片
  - 視機型配置1~2個卡匣，每個卡匣可裝12片晶圓
- 檢測時間
  - 2”矽片使用2X物鏡可在2分鐘內檢測完成*

*測試條件為使用兩種光源以及晶粒尺寸為20mil

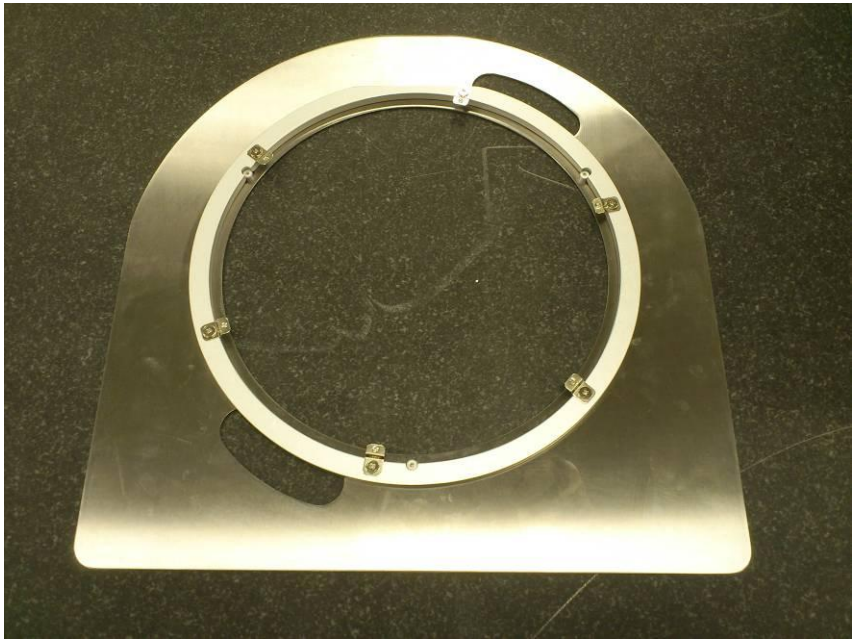
適用卡匣

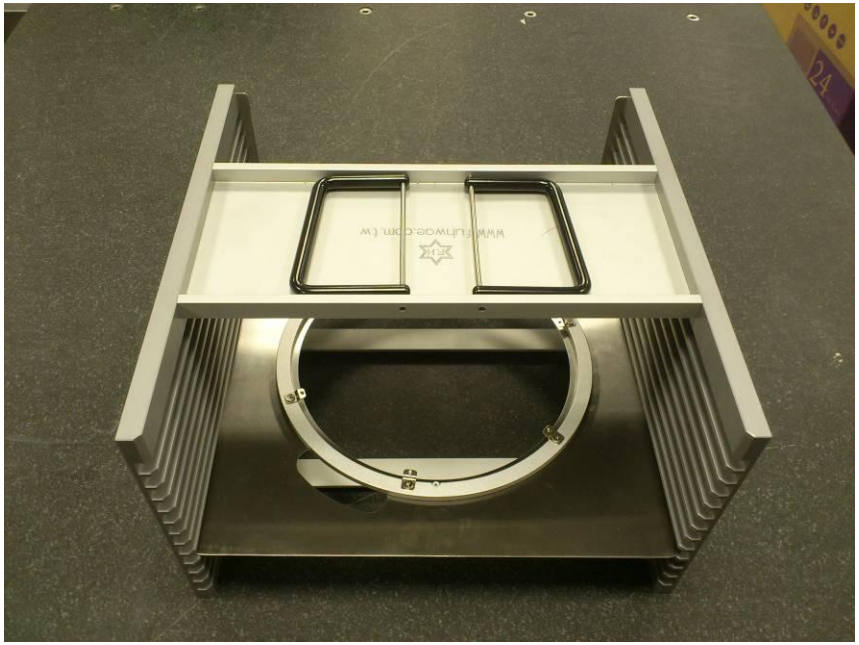
1.Wafer Frame (K&S DISCO type)





2. Expander Ring (Grip Ring) + Ring Holder

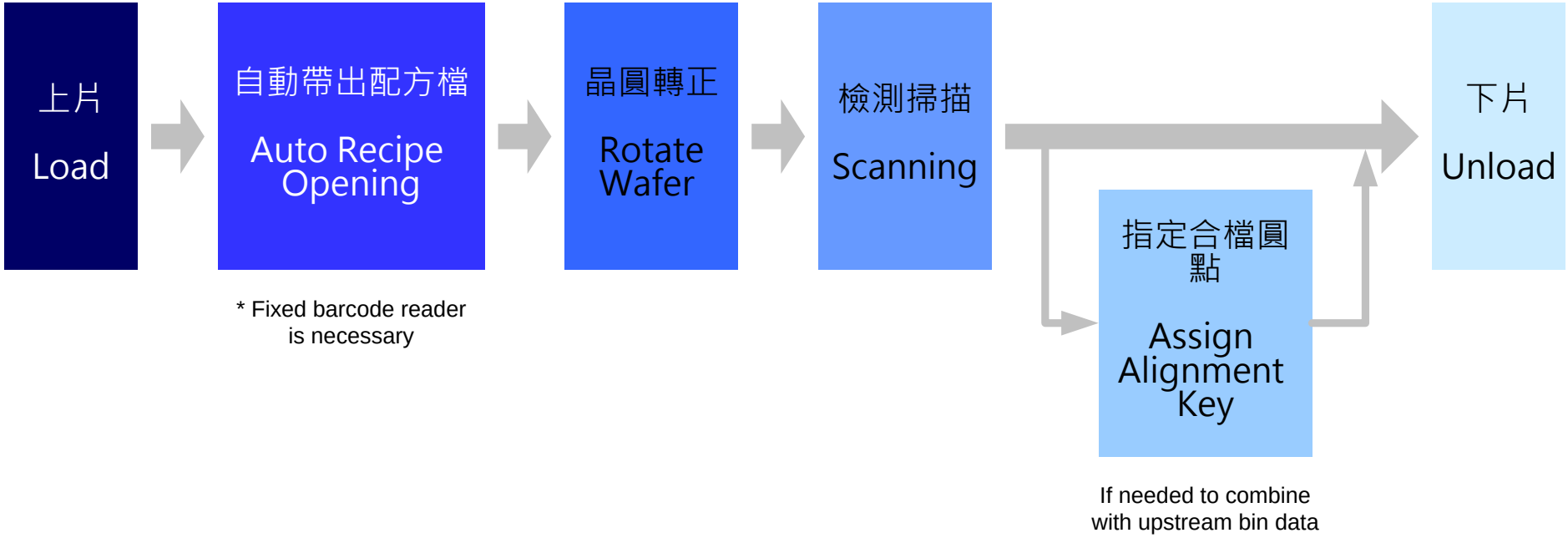




* 專利申請中

軟體功能介紹

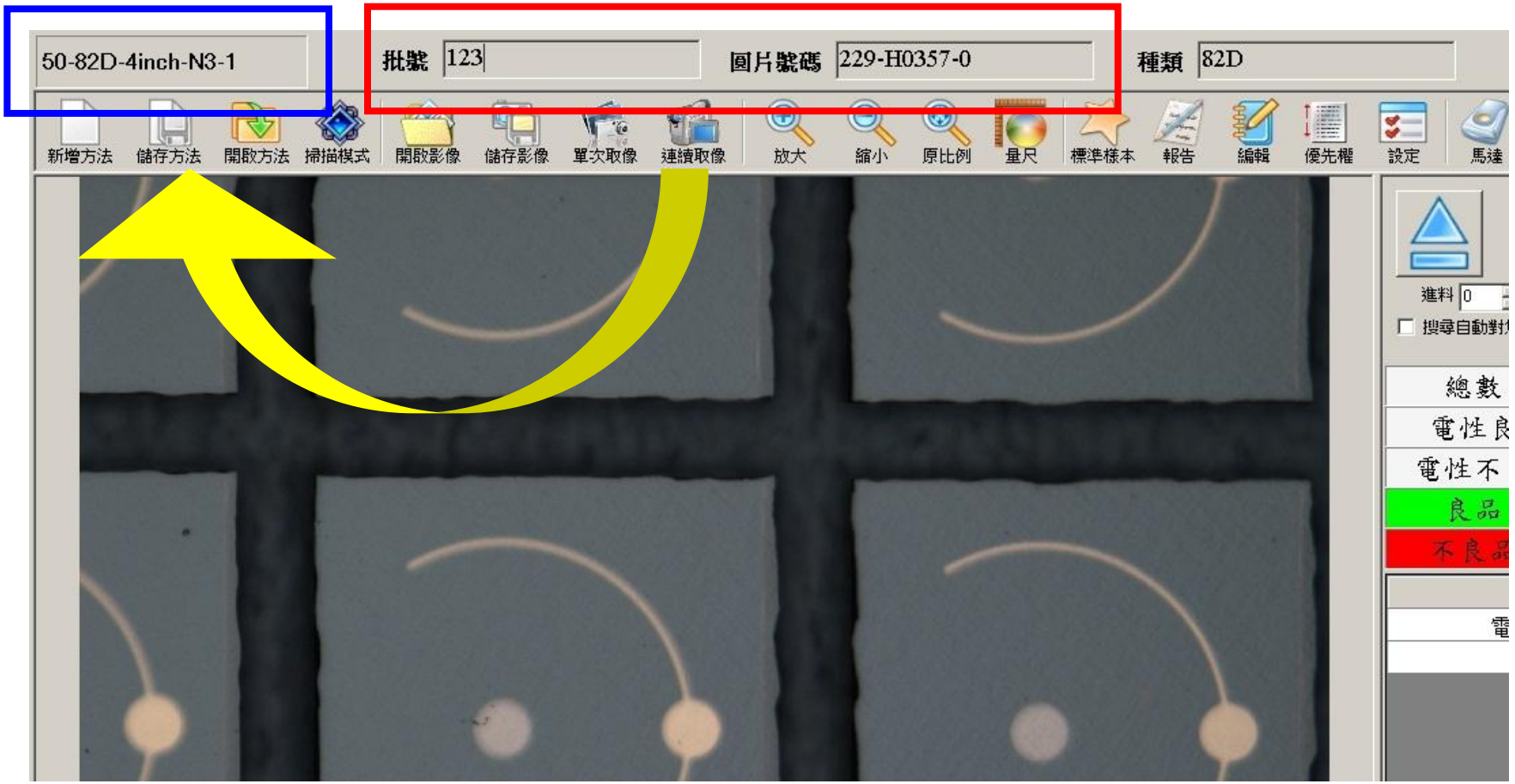
全自動化流程



設定完成後，不再需要人員逐片操作

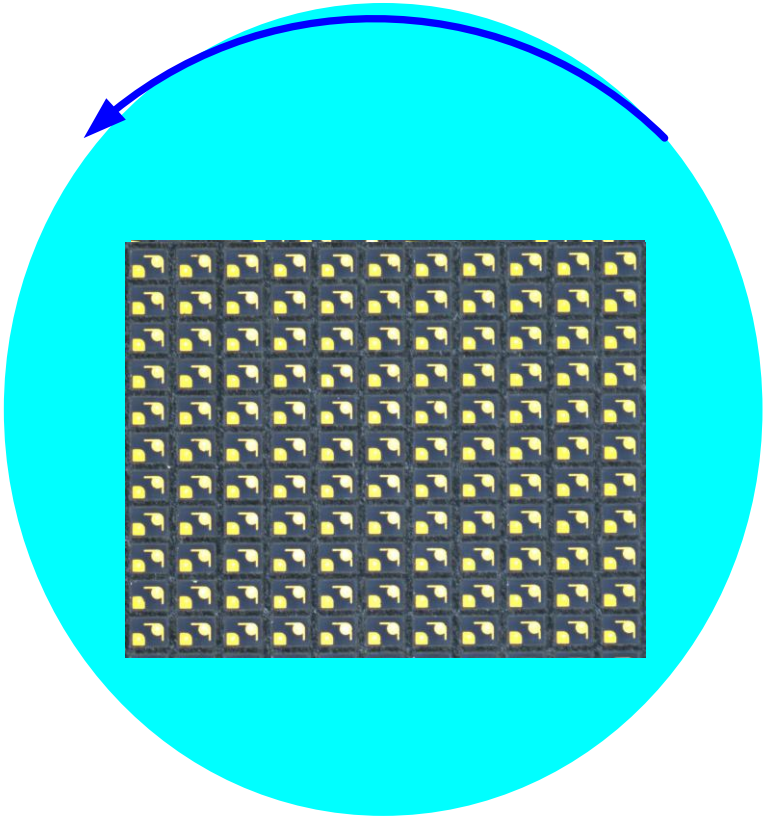
配方檔(Recipe)自動帶出

- 可依Wafer ID或Lot No之關鍵字帶出配方檔



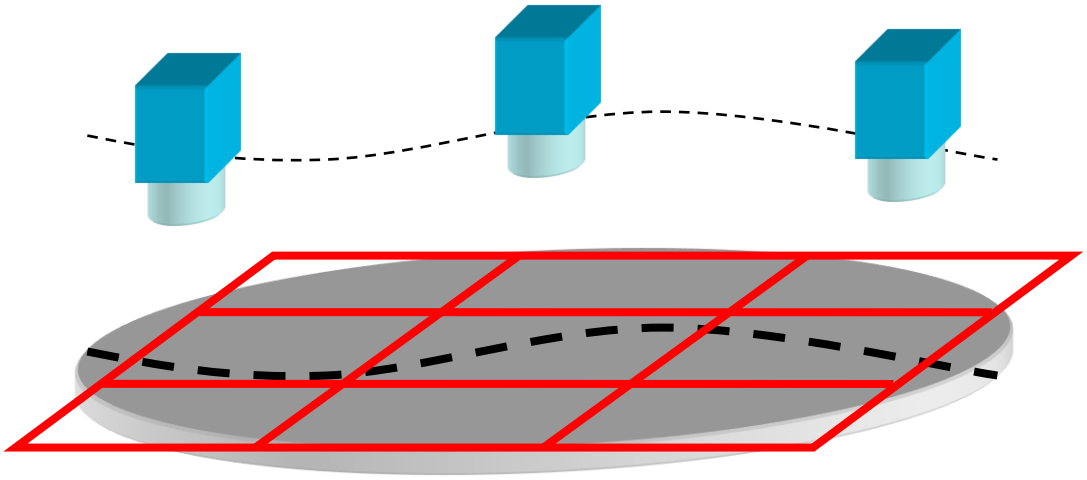
自動晶圓轉正

- 上片後自動依晶粒水平排列狀況進行轉正



軟體自動對焦

- 軟體自動對焦可以克服因藍膜或晶粒造成的表面不平現象
- 可設定自動對焦的頻率(次數)

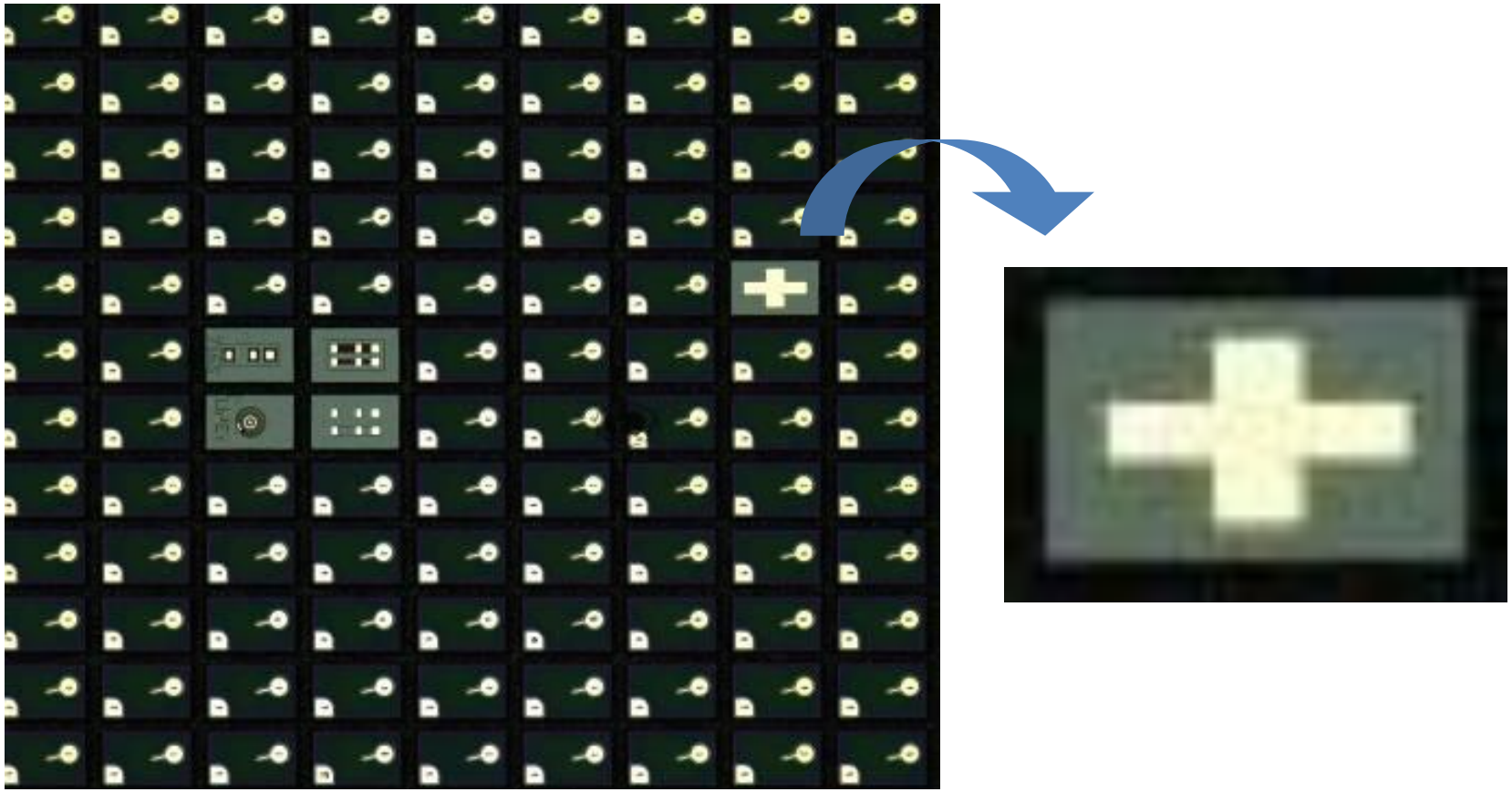


自動尋邊

- 掃描時可判斷晶粒邊緣，自動規劃掃描路徑

自動化指定合檔原點(1)

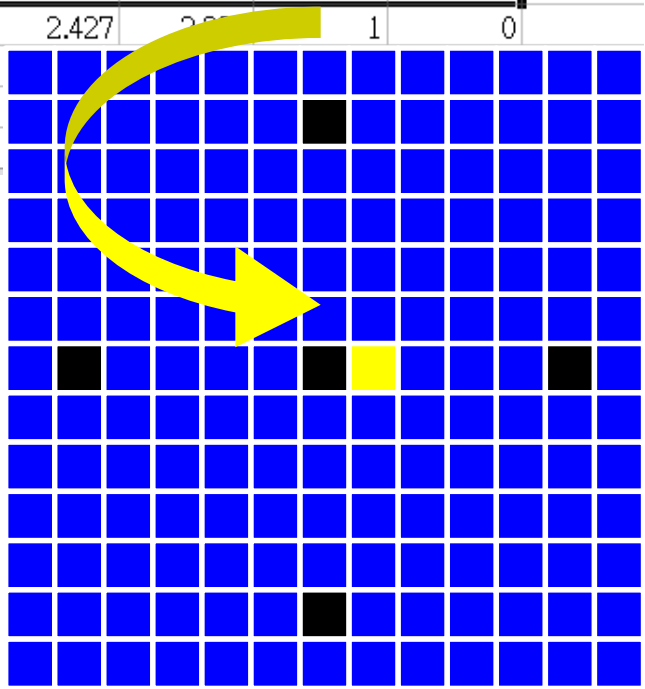
- 適用於圓片模式
- 設定定位圖案以作為合檔原點



自動化指定合檔原點(2)

- 適用於破片模式
- 可由上游分類檔尋找”非晶粒”座標，並與AOI檢測座標比較，自動找出合檔原點

60	TEST	BIN	POLAR	VF1	VF2	VF3	VF4	PosX	PosY
11149	11089	999	1	3.224		2.439	2.226	-3	0
11150	11090	999	1	3.225		2.439	2.234	-2	0
11151	11091	999	1	3.228		2.441	2.223	0	0
11152	11092	999	1	3.229		2.427		1	0
11153	11093	999	1	3.233					
11154	11094	999	1	3.233					
11155	11095	999	1	3.235					



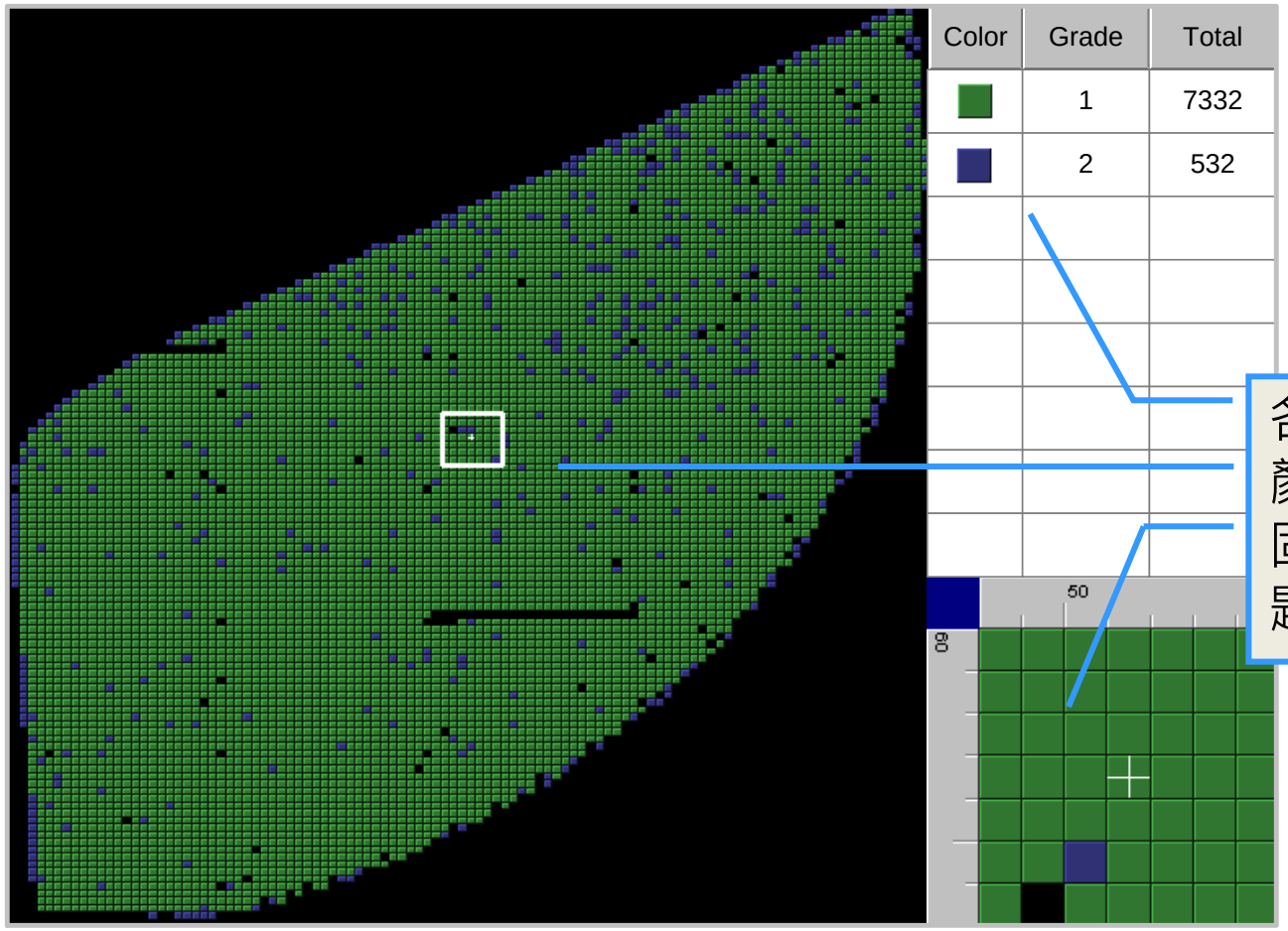
Normal Chip

Removed Chip

As Original Point

晶粒分佈圖

- 提供各等級晶粒分佈狀態以便於分析制程問題



各等級可自由設定顏色，判斷是否有固定位置之制程問題

離線掃描

- 可用於分析配方檔、調整配方檔及良率變化預估，並且不影響機台產能

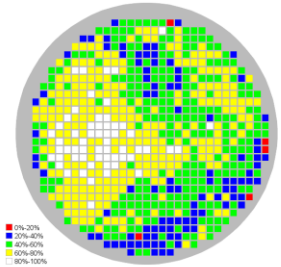
Edit Parameters and Criteria

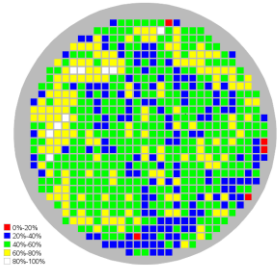
☐	電極線個數	1.00	大於	3.00
☑	電極線交集電極...	6.00	小於	100.00
☑	電極線斷個數	1.00	大於	0.00
☐	電極線長度比例	1.00	小於	100.00
☑	垂直與水平電極...	7.00	小於	100.00

Inline Scan

Image Data

Offline Scan



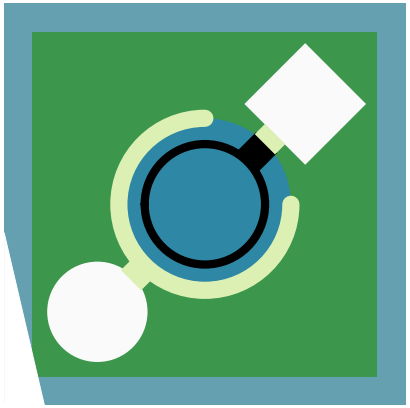
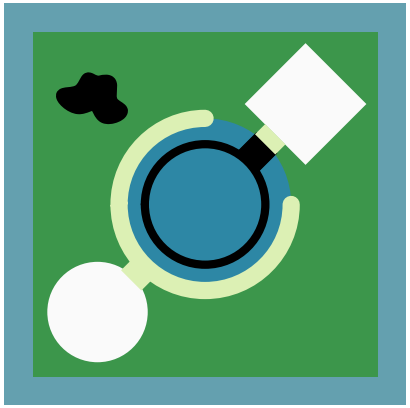
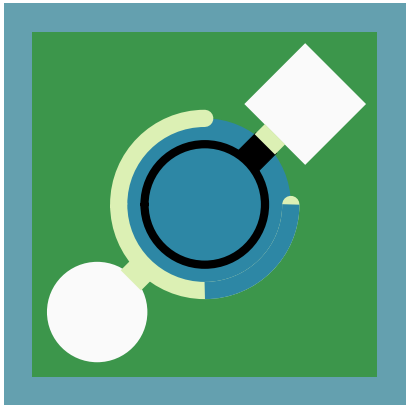
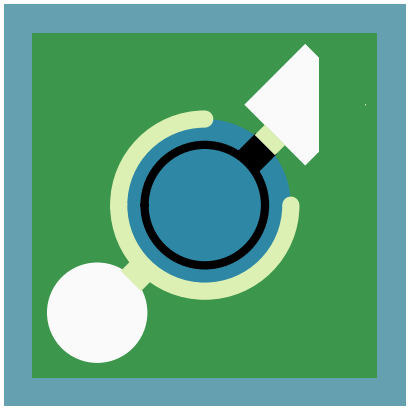
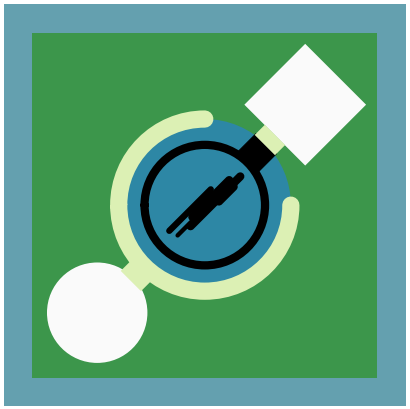
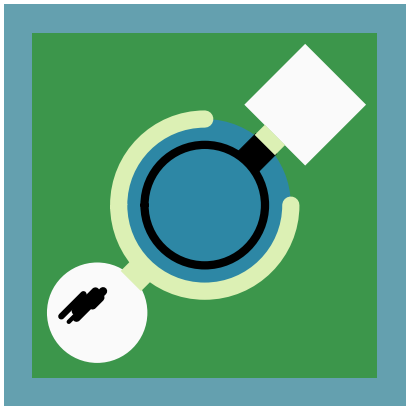


檢查項目

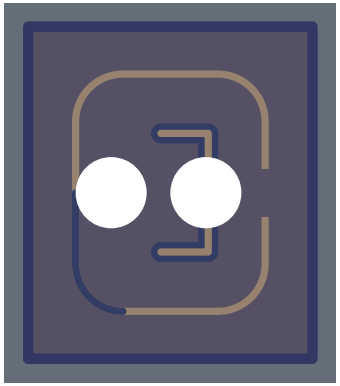
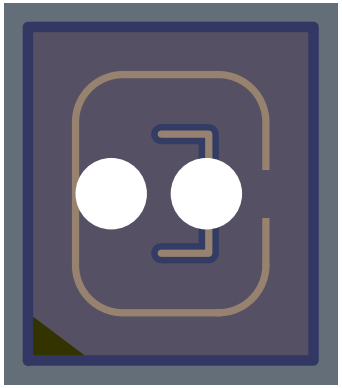
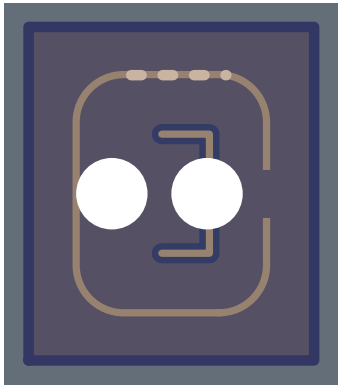
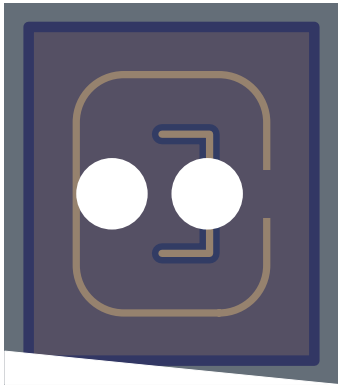
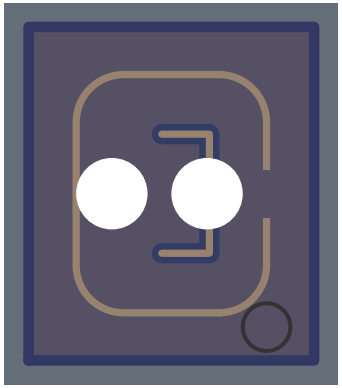
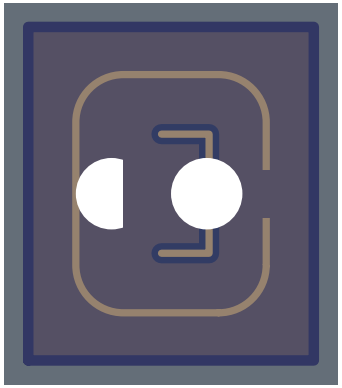
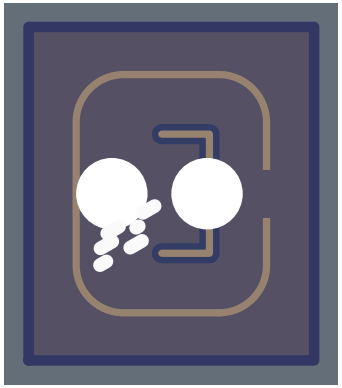
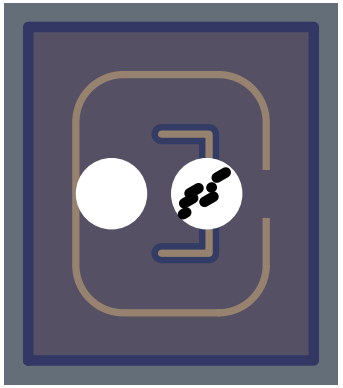
檢測方法編輯

- 提供Layout繪製工具，可針對不同產業的晶片繪製檢測範圍
- 標準樣本編輯時間一般可在20分鐘內完成

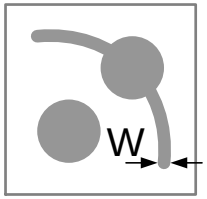
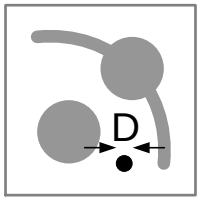
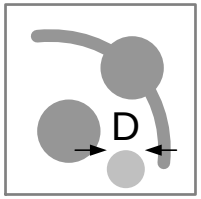
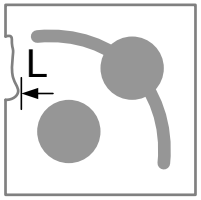
Application to Photo Diode

Chipping 晶粒崩缺	Blemish 汙染	Branch Broken 電極線斷
		
Pad Damage 電極缺少	**Scratch 光窗刮傷**	**Pad Scratch 電極刮傷**
		

Application to LED

Finger Broken 電極線斷	Peeling 發光區剝落	Finger Scratch 電極刮傷	Chipping 晶粒崩缺
			
Epitaxy Defect 磊晶缺陷	**Pad Lack** 電極缺少	**Pad Residue** 電極殘留	**Pad Scratch** 電極刮傷
			

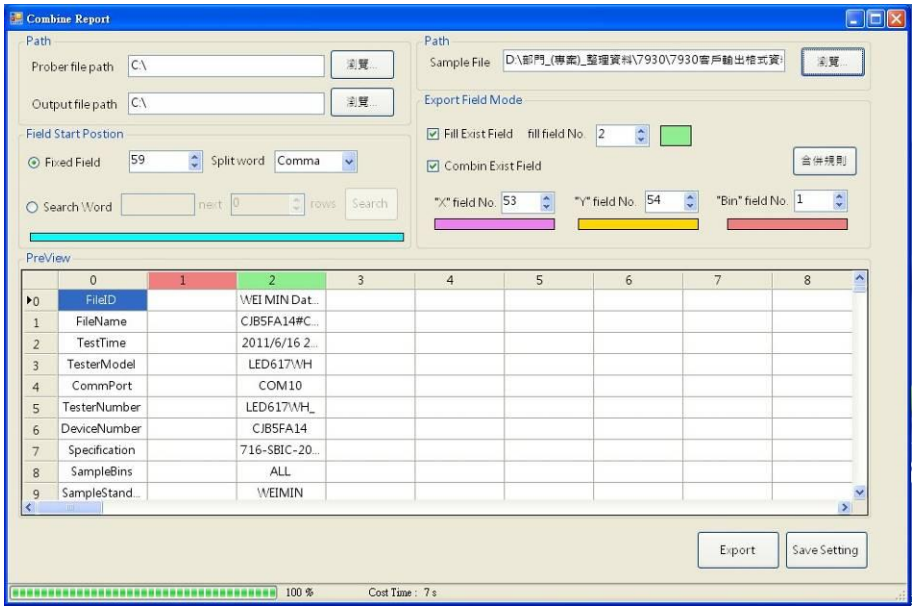
Minimum Detectable Defect Size

Defect ITEM		SPEC	
		2X Objective (1.7um/pixel)	5X Objective (0.7um/pixel)
Finger/ Branch Width		W > 5um	W > 2um
High Contrast Defect (Grey value > 80)		D > 5um	D > 2um
Low Contrast Defect (80 > Grey value > 40)		D > 20um	D > 10um
Chipping/ Abnormal Dicing		L > 10um	L > 4um

詳盡的報表及分析工具

合檔編輯器

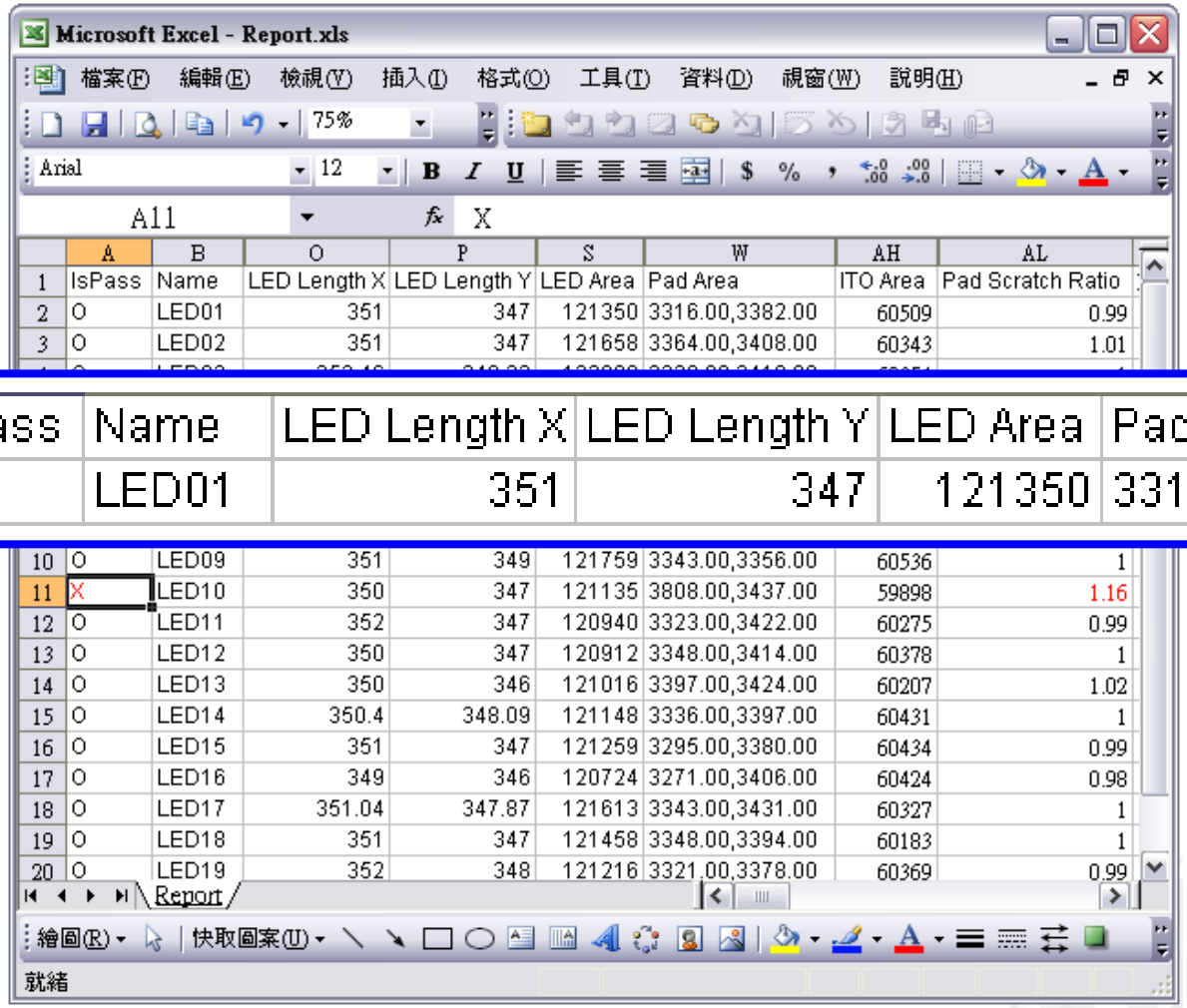
- 可合併上一站檢測設備之分類檔案，並輸出至服務器或挑揀機



可自由編輯合檔規則，
指定合檔欄位

檢測結果原始資料

- 可儲存檢測後每一顆晶粒瑕疵量化資料供後續統計製程分析

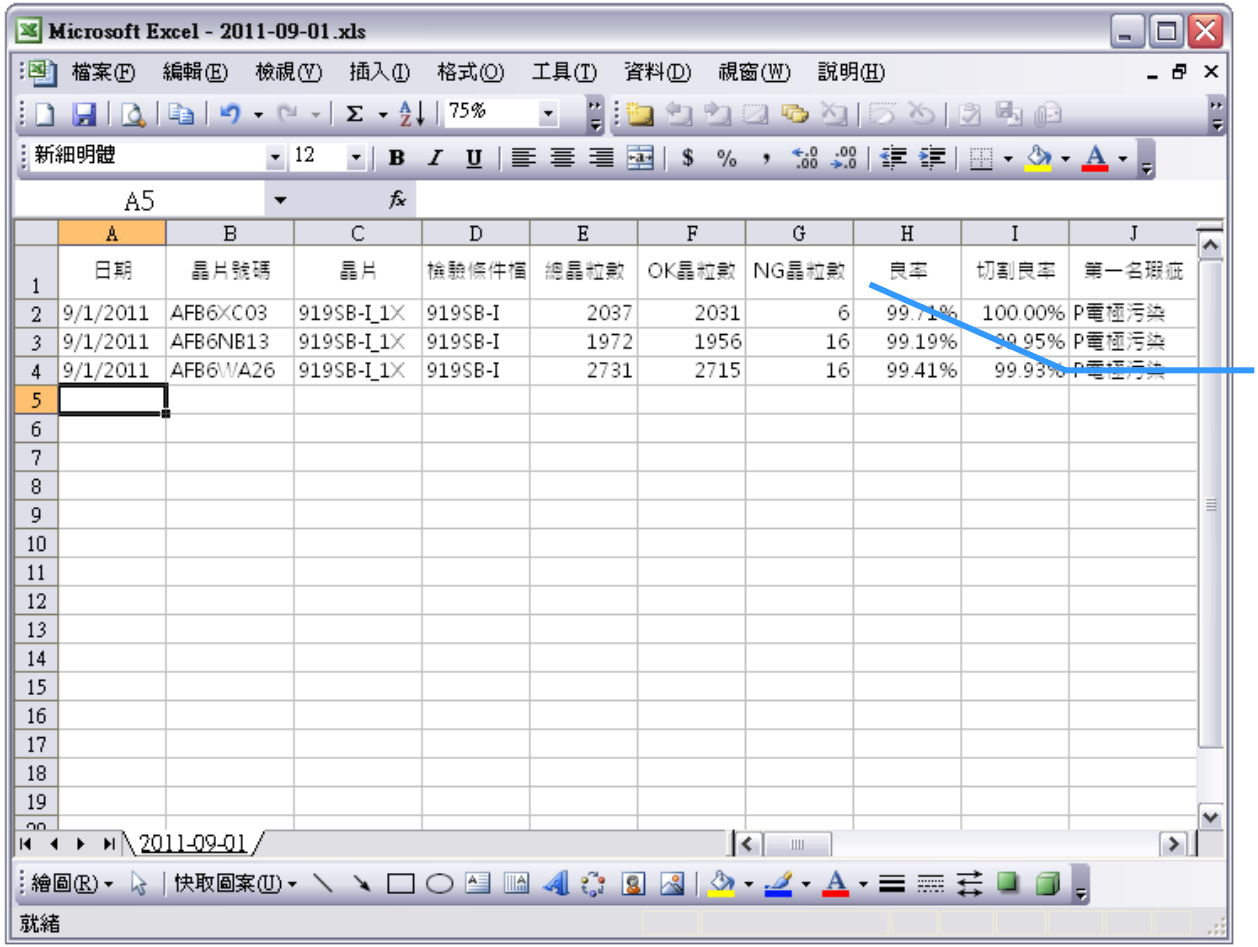


	A	B	O	P	S	W	AH	AL
1	IsPass	Name	LED Length X	LED Length Y	LED Area	Pad Area	ITO Area	Pad Scratch Ratio
2	O	LED01	351	347	121350	3316.00,3382.00	60509	0.99
3	O	LED02	351	347	121658	3364.00,3408.00	60343	1.01
10	O	LED09	351	349	121759	3343.00,3356.00	60536	1
11	X	LED10	350	347	121135	3808.00,3437.00	59898	1.16
12	O	LED11	352	347	120940	3323.00,3422.00	60275	0.99
13	O	LED12	350	347	120912	3348.00,3414.00	60378	1
14	O	LED13	350	346	121016	3397.00,3424.00	60207	1.02
15	O	LED14	350.4	348.09	121148	3336.00,3397.00	60431	1
16	O	LED15	351	347	121259	3295.00,3380.00	60434	0.99
17	O	LED16	349	346	120724	3271.00,3406.00	60424	0.98
18	O	LED17	351.04	347.87	121613	3343.00,3431.00	60327	1
19	O	LED18	351	347	121458	3348.00,3394.00	60183	1
20	O	LED19	352	348	121216	3321.00,3378.00	60369	0.99

IsPass	Name	LED Length X	LED Length Y	LED Area	Pad Area	ITO Area
O	LED01	351	347	121350	3316.00,3382.00	60509

晶圓統計報表

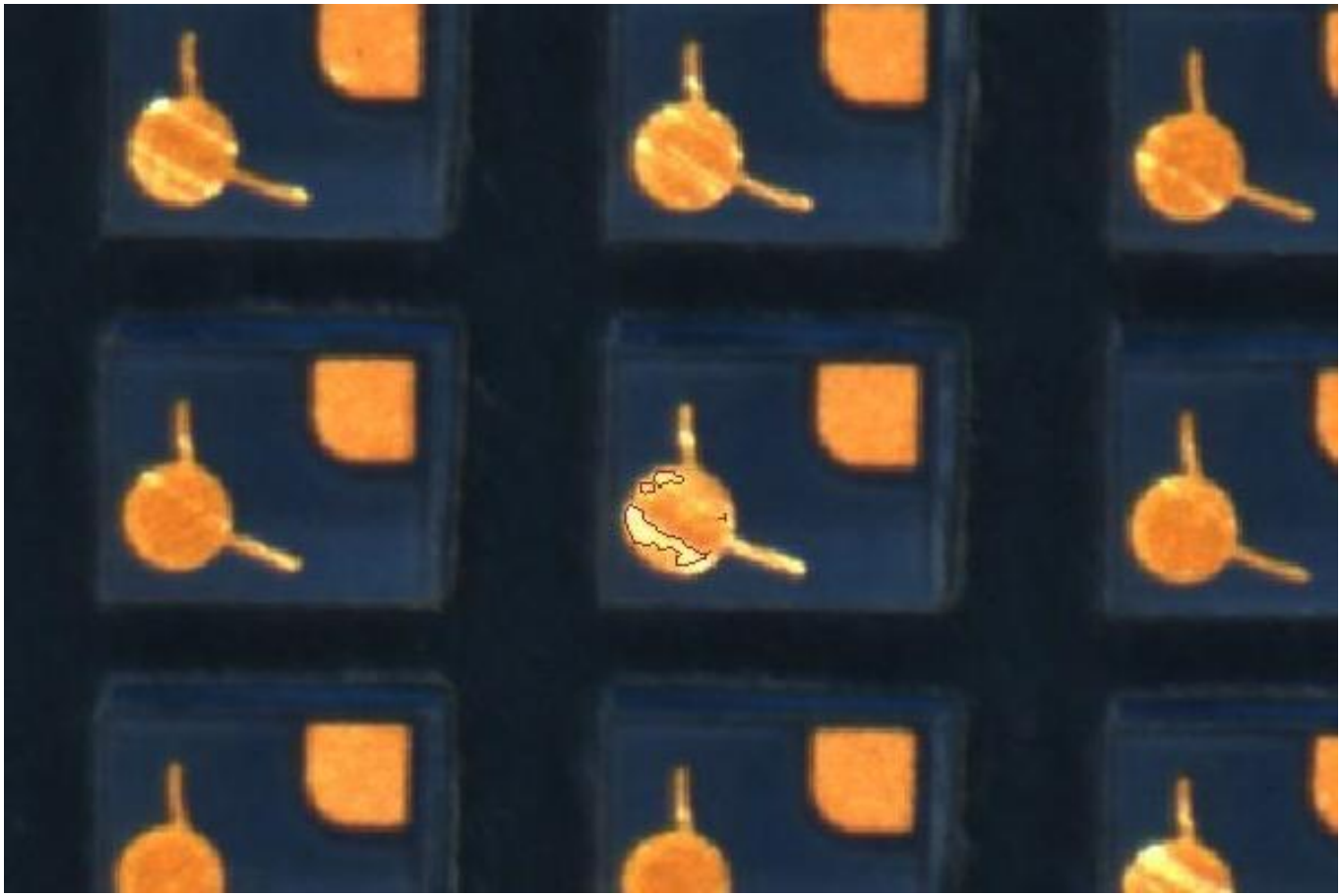
- 可產生每一片晶圓良率與各項統計資料



提供良率、OK、NG顆數及瑕疵排名及數量供使用者自行編輯報表格式

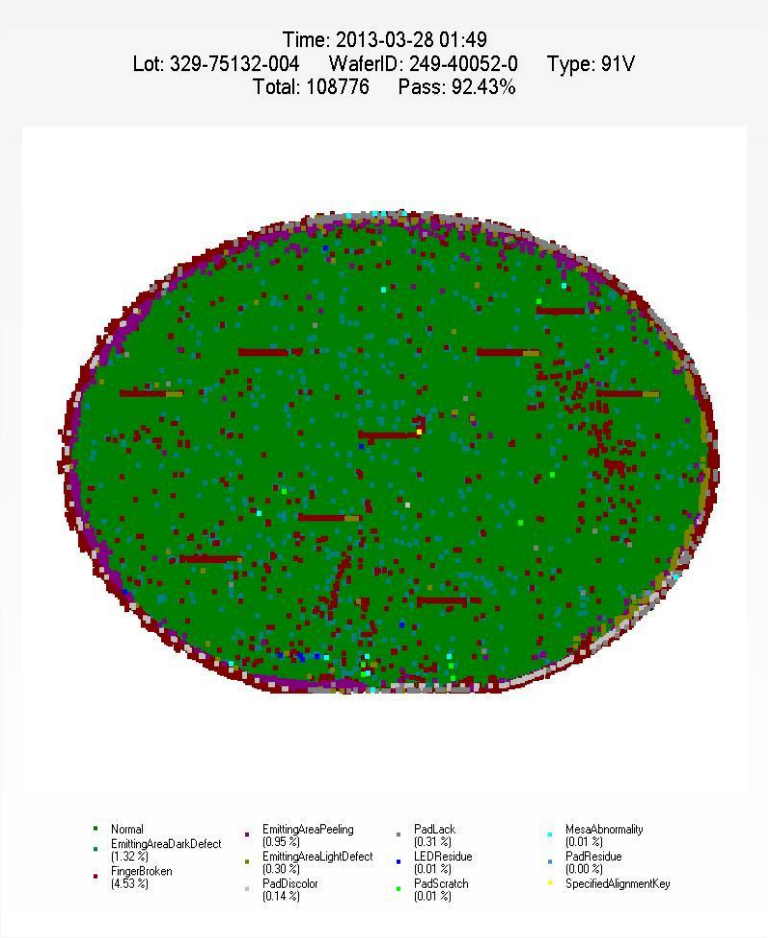
影像存圖

- 可選擇儲存原始影像，用於離線掃描
- 或是儲存瑕疵檢測結果影像，標示瑕疵區域

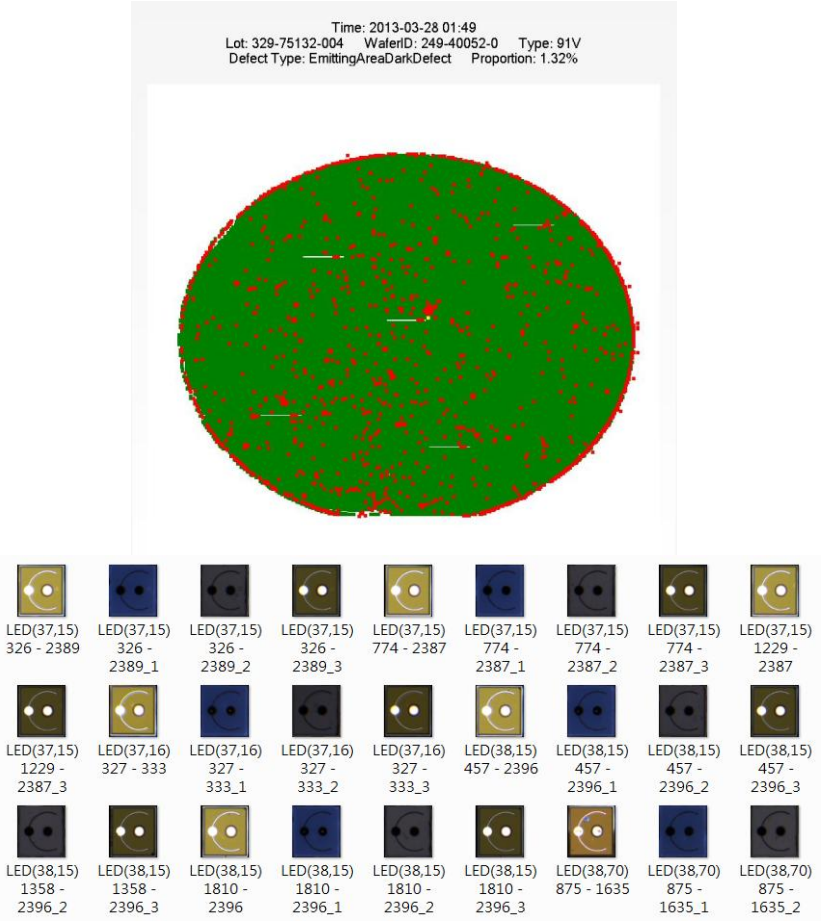


晶粒分佈圖

- 全部瑕疵分佈



- 單一瑕疵分佈及存圖



結論

- 具備全自動化功能，減少人員操作錯誤問題
- 使用者可依自身需求選擇卡匣模組
- 模組化的演算法設計，可因應不同產業的檢測需求
- 與市面上Wafer AOI產品相比，具備更好之產能/價格比

Thank you very much