# Lead Frame

## 影像處理

2021.02

# 影像處理流程

- 此次測試瑕疵共分三大類：OE有8個、UE有5個、FO有1個，共計14個缺陷樣本。
- 因部分缺陷是發生在背面，故需由背面取像才可檢出，如：OE-1。
- UE缺陷利用反面取像才能突顯瑕疵特徵，OE缺陷則大多是以正面取像呈現較佳效果。
- **正/反同軸落光兩個光學系統是互補的，若架設正/反兩套光學系統此次樣本之瑕疵成像率可達100%。**

| 蝕刻過度(OE) | | |
|---|---|---|
| 缺陷編號 | 正面取像 | 反面取像 |
| OE-1 | X | O |
| OE-2 | O | X |
| OE-3 | O | O |
| OE-4 | O | X |
| OE-5.1 | O | O |
| OE-5.2 | O | X |
| OE-6 | O | X |
| OE-7 | O | O |
| 檢出率 | 87.5% | 50% |

| 蝕刻不足(UE) | | |
|---|---|---|
| 缺陷編號 | 正面取像 | 反面取像 |
| UE-1 | X | O |
| UE-2 | X | O |
| UE-3 | X | O |
| UE-4 | X | O |
| UE-5 | X | O |
| 檢出率 | 0% | 100% |

| 異物(FO) | | |
|---|---|---|
| 缺陷編號 | 正面取像 | 反面取像 |
| FO-1 | O | X |
| 檢出率 | 100% | 0% |

O：可成像且可檢測
X：不可成像，無法檢出

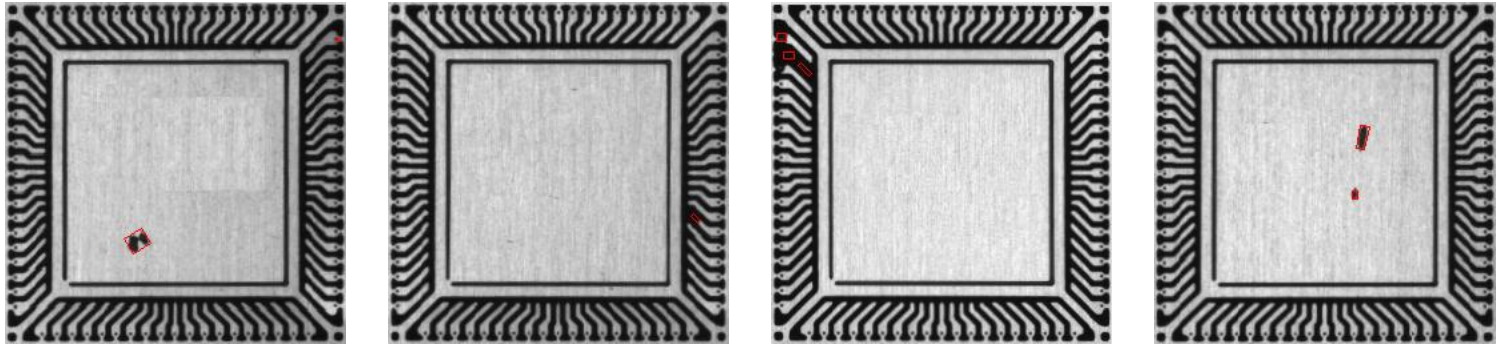
# Lead Frame(正面)檢測結果

| | 判NG | 判OK | Recall |
|---|---|---|---|
| 様本NG | 18(15) | 10(4) | 65% (79%) |
| 様本OK | 15 | 265 | 96% |

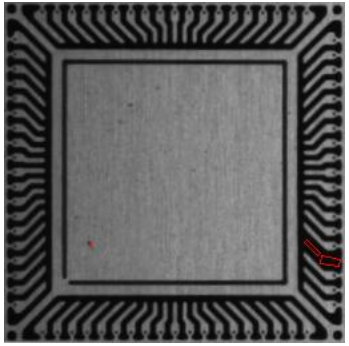
| 様本NG | | | | | |
|---|---|---|---|---|---|
| | 判OK | 判NG | Recall | | AI Recall |
| FO<br>異物 | 2 | 1 | 67% | < | 100% |
| OE<br>蝕刻過度 | 2 | 14 | 87.5% | = | 87.5% |
| UE<br>蝕刻不足 | 6 | 3 | 33% | | 0% |

# NG被判NG

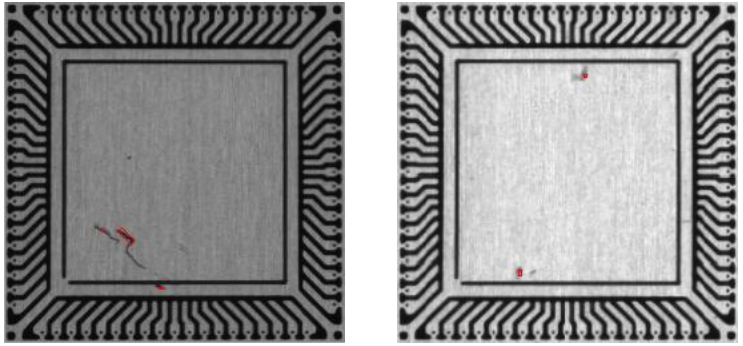
## OE



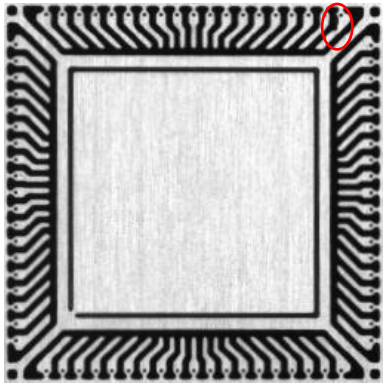
## FO



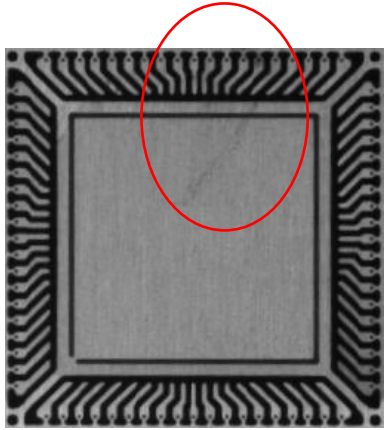
## UE



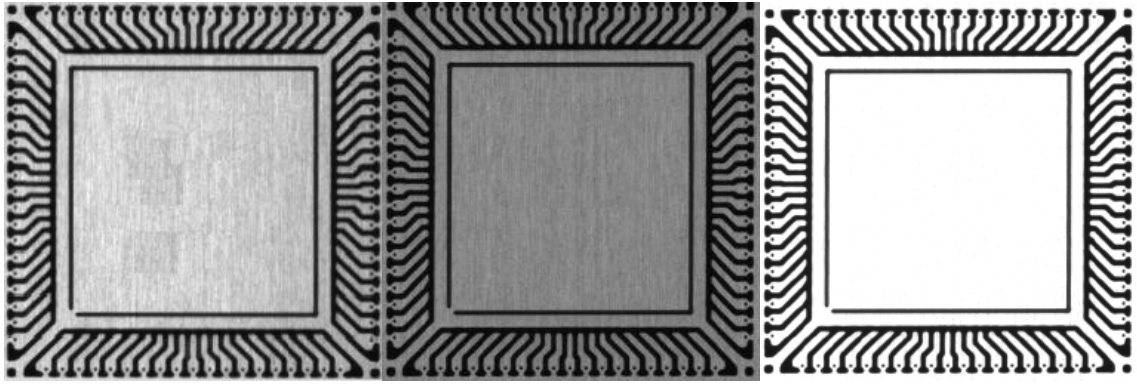
# NG被誤判成OK



OE
蝕刻過度



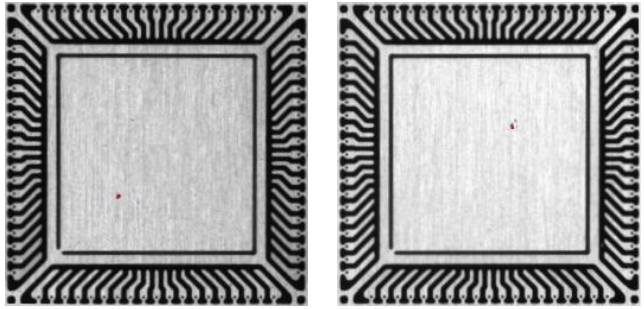
FO
異物



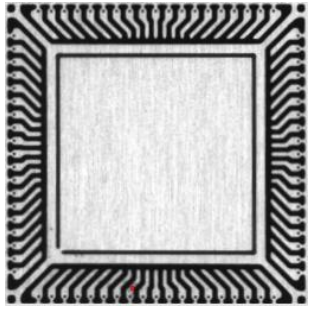
UE
蝕刻不足

# OK被誤判成NG

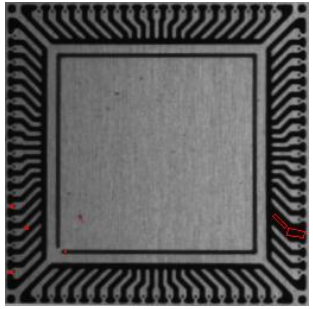
雜點



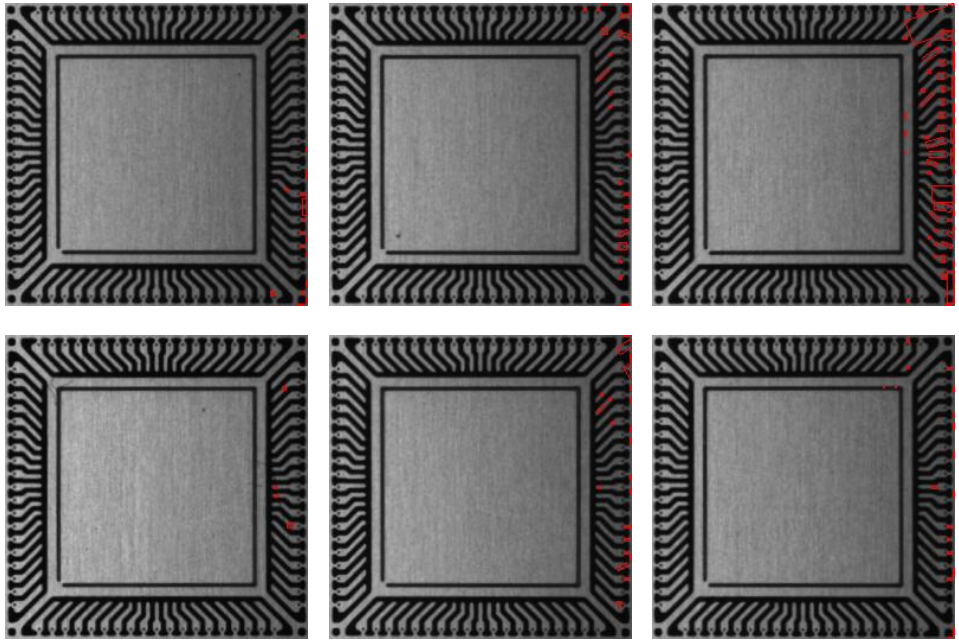
雜點



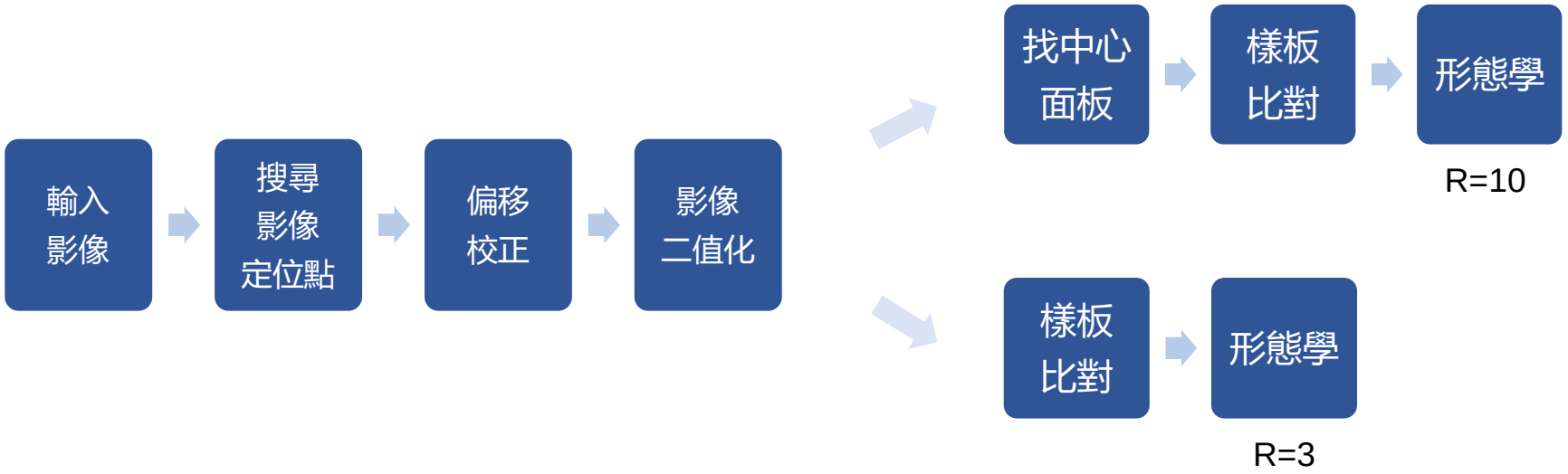
OE?



光線不均

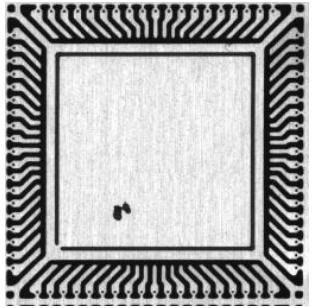


# 影像檢測流程

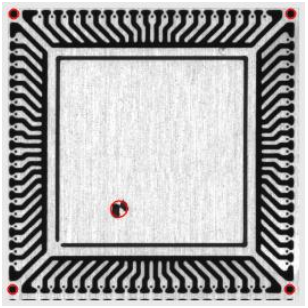


# 影像檢測流程

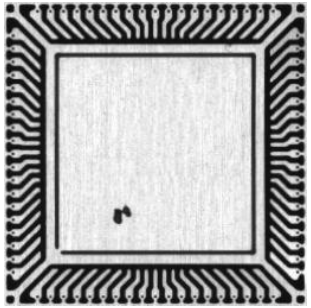
輸入影像



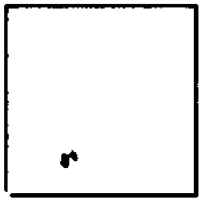
搜尋影像定位點



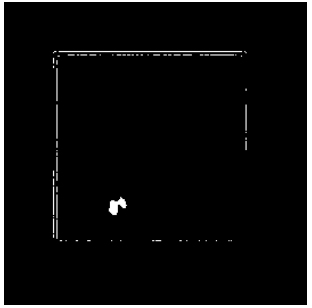
偏移校正



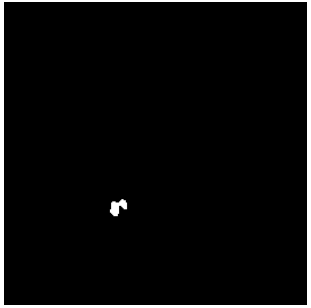
影像二值化



與OK樣板比對

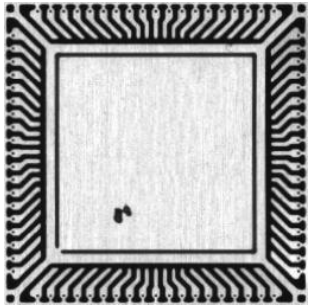


形態學

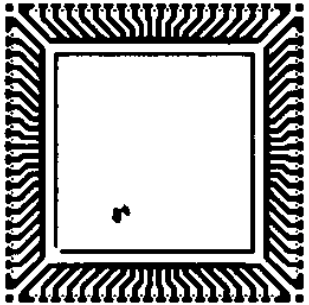


# 影像檢測流程(中心面板)

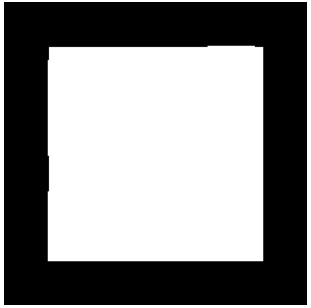
偏移校正



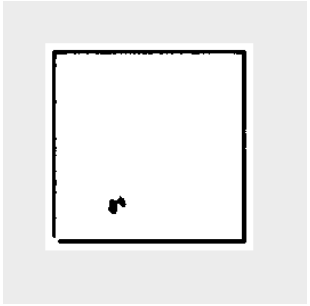
影像二值化



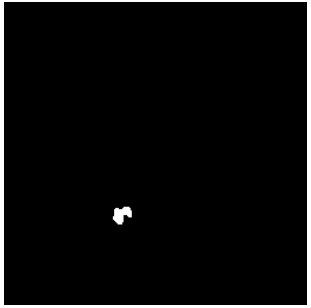
形態學



找中心面板



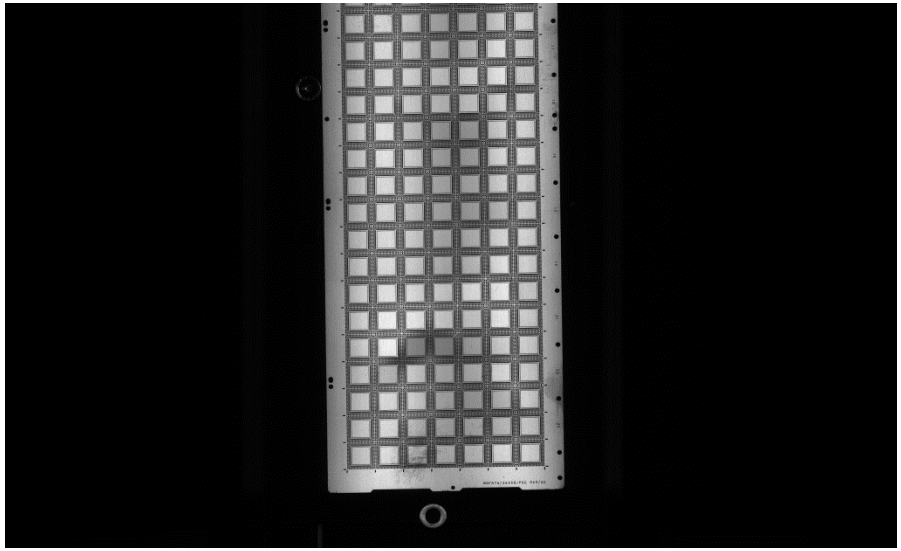
形態學



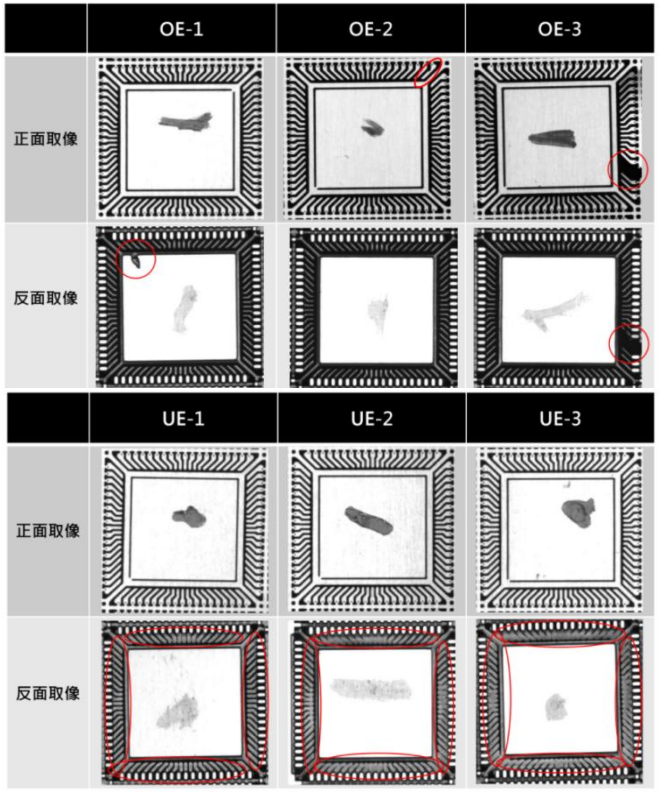
# 影像處理流程

拍攝影像 → 影像校正 → 影像切割 → AI分類

## 拍攝影像

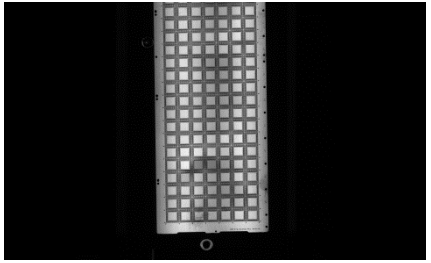


## AI分類

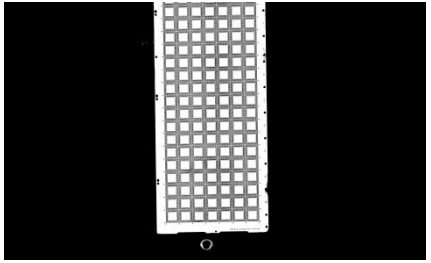


# 影像校正

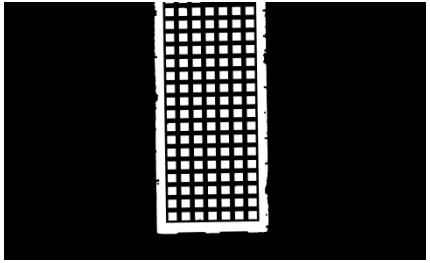
輸入影像



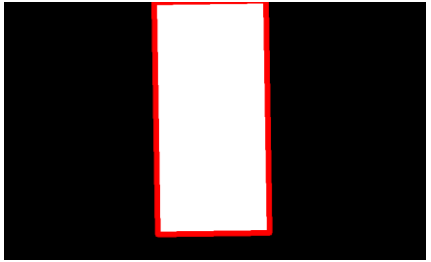
影像二質化



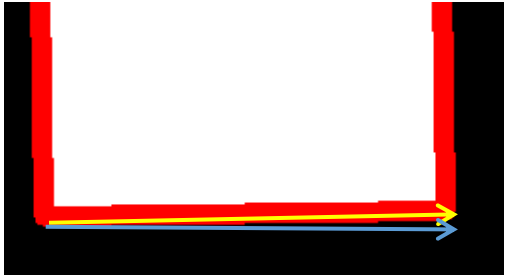
形態學



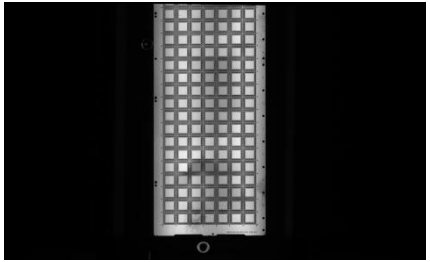
最小矩形



計算偏移角度

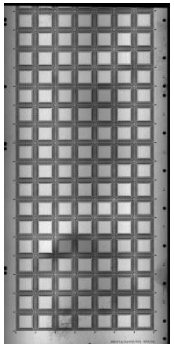


校正影像

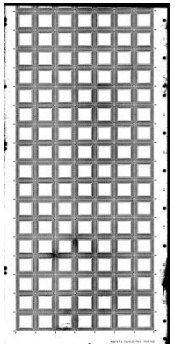


# 影像切割

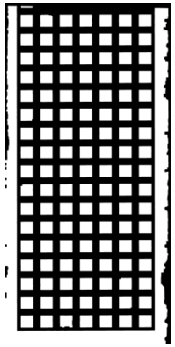
校正後影像



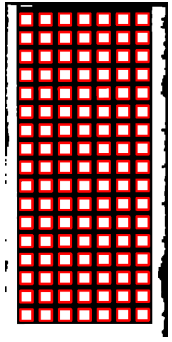
影像二質化



形態學



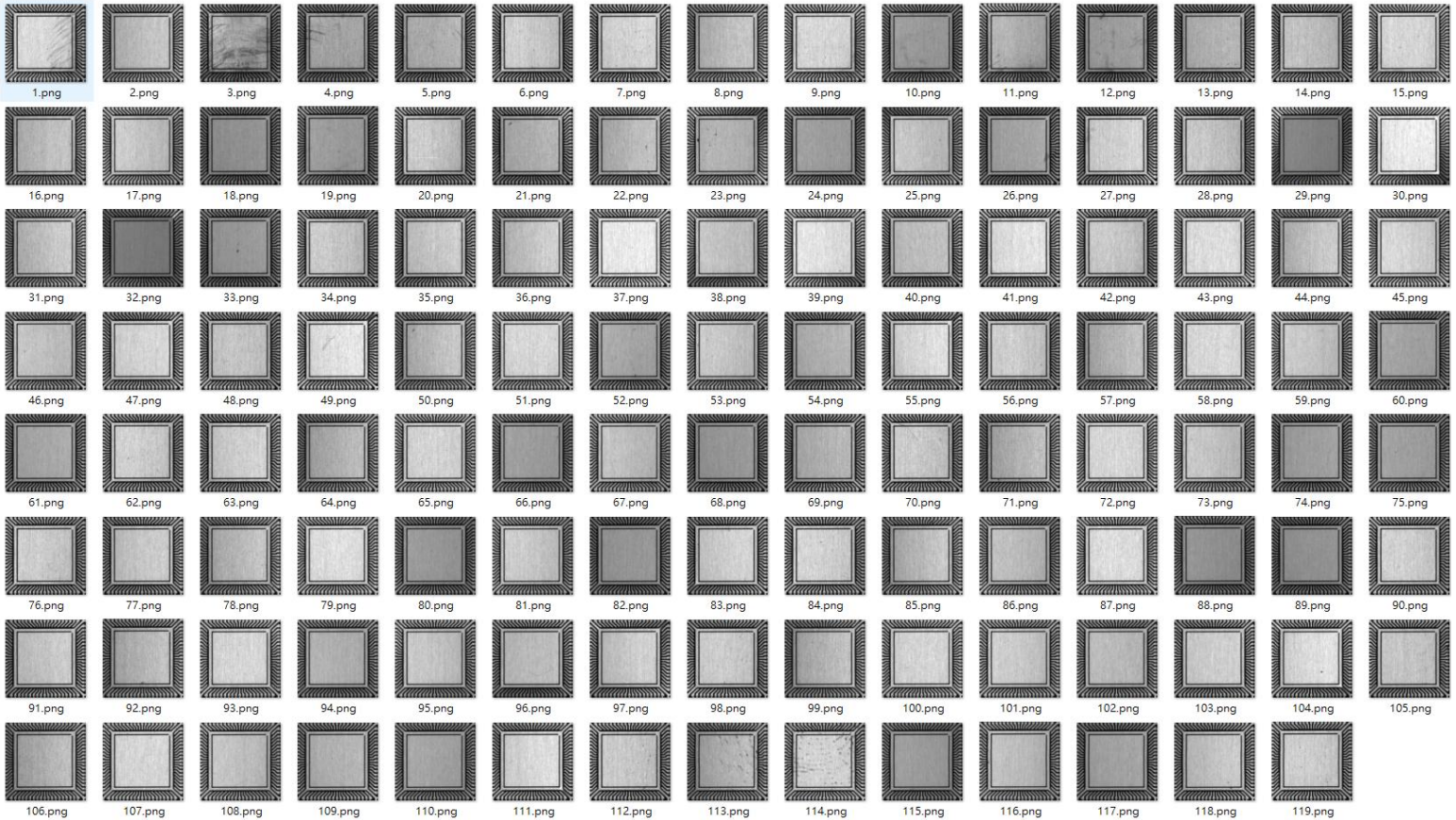
最小矩形



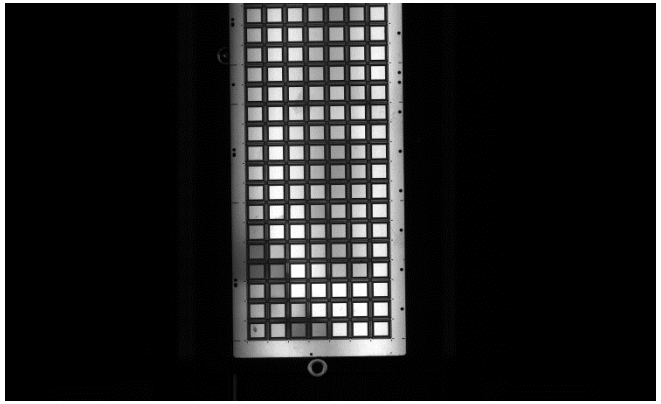
限制 w, h

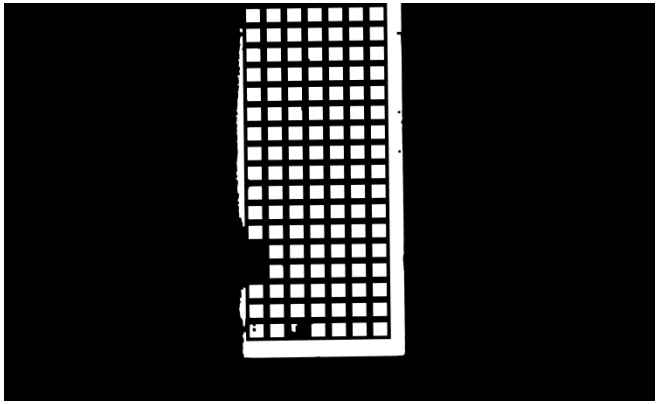
影像切割

# 裁切後的影像(Lead Frame正面)



# 光線不均造成的影響





# 開發規劃