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研發部	×1
工程部	×1
生產部	×1
維修部	×1

1. Purpose 目的：

To define the procedures and inspection of acceptance criteria for the incoming inspection of lead frame.
定義導線架進料檢驗程序和進料檢驗規格。

2. Scope 範圍：

All of Chant World lead frame suppliers should follow up this inspection criteria.
適用於清盛電子導線架檢驗程序和進料導線架品質要求，檢驗規格。

3. Responsibility 權責：

3.1 VQA in charge the inspection procedure.
VQA 負責導線架進料檢驗作業。

3.2 VQA has the responsibility to maintain and update this document.
VQA 負責此份文件維護及更新。

4. Definition 定義：

4.1 Lead frame 導線架：

There are stamping and etching 2 kinds of products. Both of them are very important material for IC Assembly.
導線架分為沖切和蝕刻兩種是 IC 封裝重要材料。

4.2 Function area 功能區：

The area which will stay with IC finished product.
留在 IC 成品上 L/F 面積。

4.3 Defect in the lead tip area (coin area or 15 mil from tip).
腳尖指 COIN 區或 15 MIL 離腳尖之內，COIN 邊緣或 15 MIL 處發現缺點。

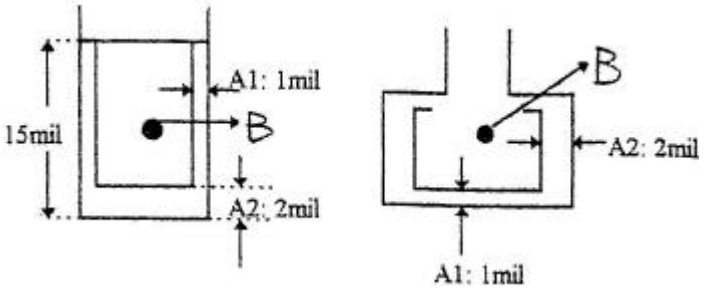
A type (near the edge). A 類 (靠近邊緣處)

A1：WIDTH < 1 mil (離邊緣 < 1)：Allowed 可

A2：WIDTH < 2 mil (離邊緣 < 2)：Allowed 可

B type：Central of lead tip area：Not allowed.

B 類：中間：不可



5. Contents 作業內容：

5.1 Does the supplier is qualified by Chant World Technology ?
是否為清盛電子合格供應商？

5.2 Does supplier enclose with outgoing inspection report ?
有無供應商出貨檢驗報告？

5.3 Does the bundle label on packing material is including supplier' s name , part no. , quantity , package and invoice no. ? Does this data fit with R/T description ?
包裝盒上供應商名稱、料號、數量、產品類型及發票號碼是否和 R/T 上之資料相符合？

5.4 Inspection notice 檢驗注意事項：

5.4.1 Have to wear mask and glove during inspection.
檢驗時，須帶口罩和手套。

5.4.2 Don' t touch the plating area and damage lead frame.
檢驗時，不可因檢驗而損壞產品且不可觸摸鍍區表面。

5.4.3 To avoid contamination , it' s not allowed to put packing material and interleaf paper on inspection table.
大盒及盒內的襯墊材料如保利龍等物品，嚴禁上檢驗桌以防造成污染。

5.4.4 After inspecting , return the sample back the original box or case.
檢驗完畢，將材料歸回原來小盒內以免數量發生錯誤。

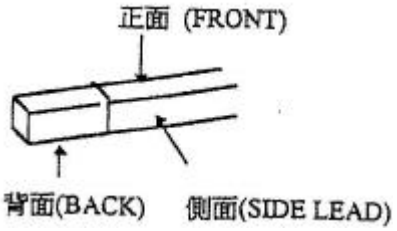
5.5 Contents 內容：

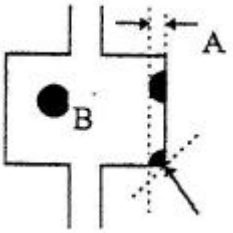
5.5.1 Visual inspection items and specification description (Seprate to each material spec. and position respectively).
目檢項目及規格說明 (依各項材料規格及位置說明)：

Inspection Item 目檢項目	Specification Description 規 格 說 明
Wrong direction 方向放反	Inspect thru light to check if there is any wrong direction. 透光檢驗是否方向放反
Mixed type 混錯	It' s not allowed to mix with different type in one packing. 不可同之型別相混在一起
Stamping / Etching defect 沖切／蝕刻缺點	(1) Not allowed for any kind of defect during stamping process. Such as not completed cut or material split. 任何由於沖切不良造成之缺點，如不該切被切除沖切不完全或材料分裂 (2) No depression , convex and lead connecting are allowed in the Function area for etching product. 在功能區任何因蝕刻所造成之缺點，如凹陷、突出或短路

Inspection Item 目檢項目	Specification Description 規 格 說 明
	(3) Convex is due to the material not complete removed during Etching process. It can be acceptance if it' s under drawing specification. 突出是蝕刻過程未被去除之多餘材料，突出只要不超過圖面規格，則可允收 (4) Depression on the lead tip is not acceptance. The concave or scratch or depression at the die pad top side should less than (deep and width) 0.2×0.2 mm , for other place and bottom of die pad , the concave or depression not allowed to have for greater than 50% of place area. 腳尖上的凹陷或蝕溝是不可接受的，銲墊正面上的刮傷、凹陷或蝕溝不得大於 0.2×0.2 mm (深及寬)，其它部位及銲墊背面之凹陷或蝕溝不得有於原尺寸的 50%
Burrs (For stamping L/F) 毛邊 (適用沖切導線架)	Any burrs along vertical and horizontal should follow the spec. on the drawing. 水平或垂直方向之毛邊不可超出規格 (規格依圖所示)
Photoresistor 光阻 (適用蝕刻導線架)	No photoresistor is allowed to remain on the lead frame. (The color for photoresistor is dark blue) 任何導線架上之光阻殘留物均不可接受 (光阻為黑藍色)
Damage / Deforming 損壞變形	Any clear damage / deforming is not accepted. Such as tilt , slug mark , twist and deform at the die pad or lead. Slug mark define as below： 任何明顯的損壞變形，如銲墊或銲墊或銲接腳的傾斜下陷，浮起及壓傷扭曲、變形，壓傷刮傷之判定如下所示： (1) Slug mark or scratch at the die pad not allowed to greater than 0.2×0.2×0.15 mm (length/width/depth). 銲墊上的壓傷、刮傷不得大於 0.2×0.2×0.15 mm(長/寬/深) (2) Any scratch which expose base material on plated area is not acceptable. 電鍍區中任何的刮傷導致露出底材時，則不能接受 (3) Slug mark or scratch not allowed to greater than 20 um at the outter leads. 膠體外的外腳，壓傷、刮傷深度不得大於 20um (4) No slug mark is allowed at the wire bond lead area. 銲線區內的銲接小腳不得有任何壓傷

Inspection Item 目檢項目	Specification Description 規 格 說 明
Surface defect 表面缺點	(1) Within package outline , the diameter of corrosion , rust , contamination and oxidation not allowed to greater than 0.5 mm. It' s acceptance for 3 points less than 0.25 mm. 封裝區內有腐蝕、生鏽 (藍色)、鏽斑、污染、氧化最大直徑不可大於 0.5 mm，同一顆直徑大於 0.25 mm 數量最多三個點 (2) Allowed in none function area. 非功能區可接受 (3) For those have tape L/F , No peeling or miss taping allowed. 已黏膠片的導線架，不得有膠片剝落，沒貼膠片等缺點 (4) Tool mark 壓痕 Dents or projections evenly spaced caused by damaged stamping die. 在材料表面有凹陷或凸起之痕跡，稱之 4.1 No tool mark of size bigger than 0.3mil (0.0076mm) depth/height and 2mil (0.05mm) the largest dimonsion is acceptable on the coining area. 在 Coin area 若 Tool mark 的大小未大於 0.3mil(0.0076mm) 深/高 和 2mils(0.05mm)長/寬 時可接受 4.2 No tool mark of size bigger than 0.3mil(0.0076mm) depth and 5mils(0.127mm) in the largest surface dimension is acceptable on die pad area. 在 Die pad area 若 Tool mark 的大小未大於 0.3mil (0.0076mm)深和在表面部份的最大尺寸未超過 5mils (0.127mm)時為可接受

Inspection Item 目檢項目	Specification Description 規 格 說 明
Plating defect 電鍍缺點	(1) It’ s not allowed for blistering , contamination , peeling , uncompleted plating , shift , decoloration and other particle in the plating area. 電鍍區內不得有任何起泡、沾污、剝落、鍍不完全、鍍偏、變色、有雜質等 (2) Lead tip not allowed for uncompleted plating. 腳尖 (銲線區) 上不得有任何未電鍍之點 (3) The uncompleted plating less than 0.2×0.2 mm at the die pad is acceptance. 銲墊上未電鍍之點不得大於 0.2×0.2 mm (4) Top：Not allowed to over plating coverage area. 正面：不可超過規定鍍銀面積 Bottom：It is acceptable if the bleeding width < 5mils (0.127mm) on die pad, other area is not allowed. 背面：在 Die pad 上背漏銀不得大於 5mils(0.127mm)，其它地區則不得有背漏銀 Side：Not allowed over to package outline area. 側面：不可超出封模區 (5) Plating void：電鍍氣洞 5.1 Accept criteria : max one void of maximum size of 2mils (0.025mm) length in coined area is acceptable, or maximum size of 3mils (0.076mm) length in die pad area is acceptable. 允收規格：在 Coin area 部位之氣洞最大尺寸不超過 2mils (0.05mm)，以不影響銲線為原則，在焊墊之氣洞不超過 3mils (0.076mm)
Plating defect supplement 電鍍缺點補充 Top – Same side of plating area 正面 – 漏銀位置與鍍面同一面 Bottom – The opposite side of top. 背面 – 漏銀位置與鍍面不同面 Side – Edge bleeding. 側面 – 漏銀位置非正面亦非背面	a. Bleeding – This situation is caused by plating mask cannot Completely keep out the none plating area. There are 3 types as below : Top , bottom , side bleeding. 漏銀 – 為一完整之鍍銀區外，因模具遮蔽不足而產生銀滲漏之現象，可分為鍍銀區正面漏銀，背面漏銀及側面漏銀三種  a.1 For open tool L/F, silver leakage can not excess dambar. For close tool L/F, silver leakage spec shall be followed CWT spec. 對於 Open tool L/F 銀側漏不可超過 dambar 。 對於 Close tool L/F 銀側漏依清盛規範。 a.2 For y-axis of so package L/F, silver leakage can not excess package outline area. 對於 y 方向 so 產品 L/F，銀側漏不可超過封模封裝線。

Inspection Item 目檢項目	Specification Description 規 格 說 明
	b. Burning – This situation is due to plating electrical not control suitable. It will cause silver plating color change to white or dark and rough surface. 燒焦 – 完整鍍銀區上，有部份因電流強弱不適，導致局部位置銀表面顏色變白或灰黑，且鍍銀結晶粗糙
b-1 Lead tip：Not allowed. 不可有 b-2 Pad	 A type：It’ s acceptable if the width < 5 mil (0.127 mm). A 類：Width < 5 mil (0.127 mm) B type：It’ s not allowed. B 類：不可有
	c. Contamination – It’ s not allowed even though it can be seen by microscope. 污染 – 鍍銀區中，有因異物沾附、水洗不潔、藥水殘留等其他因素，造成銀面受污者。顯微鏡可見皆不可。
	d. Oxidation – It’ s not allowed no matter it be found by visual or microscope. 氧化 – 銅面或鐵面因電流、藥水、空氣作用等其他因素，造成表面局部或全面生鏽、顏色不均等。顯微鏡可見皆不可。
	e. Discoloration – It’ s not allowed no matter it be found by visual or microscope. 變色 – 銀面因藥水不良、剝銀不良或其他生產條件不適，產生之局部或全面性銀面變色，大部份呈黃色。顯微鏡可見皆不可。
	f. Silver exchange – It’ s fail for silver exchange during plating. It will cause black silver film on the copper. 置換銀 – 銅面因置換防止效果失效，導致產生黑褐色之置換銀層 (其顏色類似銅變色) f-1 Lead tip：Not allowed. 腳尖：顯微鏡可見皆不可。 f-2 Die pad：It’ s not allowed if the defect can be seen by eyes or greater than 100 mil. 銲墊正面：肉眼明顯可見，畏度大於 100 mil 者不可。

Inspection Item 目檢項目	Specification Description 規 格 說 明
	g. Color difference – It's can be recognized by eyes or cannot detected by Gam Reading Machine. 光澤不均 – 因電流、噴液、光澤劑造成鍍銀面的光澤有目視上 之顏色分佈不均 (光澤度計無法量測) g-1 Die pad – Visual inspect , no clear circle sharp. 以裸眼觀察，不可有明顯之圓圈形狀 g-2 Lead tip – Use microscope , the grey level area ratio in the same lead is less than 25%. 顯微鏡觀察，明暗對比面積之比率，同一支 lead 內小於 25% h. Deforming – It's not allowed for those twist , crossbow , lead shift , pad shift , tool mark , burrs….etc. 變形 – 因素材不良或電鍍過程中，運搬不當、機器運作不當等因素，產生之任何物理尺寸之外觀形變，包括折痕、twist、crossbow、lead shift、pad shift、tool mark、burr…等。不良之程度依各種量測準則行之。
Coplanarity 共平面	

5.5.2 Visual inspection 使用儀器 (裸視目檢)：

Use 4X-40X microscope to help if it's not clear or have any doubt when inspect by eyes.

若裸視檢驗看不清楚或有疑問，用低倍顯微鏡輔助 (4X – 40X)。

5.5.3 Inspection items / sampling / acceptance / reject / unit

檢驗項目／抽樣數量／允收／退貨／單位：

Inspection items 檢 驗 項 目	Sampling 抽樣數量	Acceptance / Reject 允 收／退 貨	Unit 單 位
Wring direction 方向放反	80 strips/lot	0/1	Strip 條
Mixed type 混錯	80 ea/lot	0/1	Strip 條
Stamping defect 沖切缺點	80 ea/lot	0/1	Piece 顆
Etching defect 蝕刻缺點	80 ea/lot	0/1	Piece 顆
Burrs 毛邊	80 ea/lot	0/1	Piece 顆
Photoresistor 光阻	80 ea/lot	0/1	Piece 顆
Damage / Deforming 損壞變形	80 ea/lot	0/1	Piece 顆
Surface defect 表面缺點	80 ea/lot	0/1	Piece 顆
Plating defect 電鍍缺點	80 ea/lot	0/1	Piece 顆
Coplanarity 共平面	80 ea/lot	0/1	Piece 顆

Note：Different package with different pieces in one strip. The one piece is the basic unit for IC assembly.

備註：依型別不同，每一條導線架包含多個導線架，每一個導線架是製造 IC 之基本單位。

5.5.4 Dimension inspection items / Specification

Inspection items 檢 驗 項 目	Specification 規 格 說 明
Total length 總長	Refer to related drawing 規格參閱相關圖面
Total width 總寬	Refer to related drawing 規格參閱相關圖面
Unit pitch 單顆長度	Refer to related drawing 規格參閱相關圖面
Down set deepth 壓心深度	Refer to related drawing 規格參閱相關圖面
Pilot hole (X & Y Axis) 定位孔距離 (X & Y 軸)	Refer to related drawing 規格參閱相關圖面
Lead pitch 腳尖距離	Refer to related drawing 規格參閱相關圖面
Lead width 腳尖寬度	Refer to related drawing 規格參閱相關圖面
Dambar to dambar (Inner & outter) Dambar 至 dambar 距離 (內部和外部)	Refer to related drawing 規格參閱相關圖面
IRR	Refer to related drawing 規格參閱相關圖面
Die pad (X & Y Axis) 銲墊大小 (X 和 Y 軸)	Refer to related drawing 規格參閱相關圖面
Plating coverage area (X & Y Axis) 鍍銀面積 (X 和 Y 軸)	Refer to related drawing 規格參閱相關圖面
Pilot hole diameter 定位孔徑	Refer to related drawing 規格參閱相關圖面
Plating thickness 鍍層厚度	The plating thickness should measure at die pad and lead. The measure data should meet the spec. in the related drawing. 鍍層厚度應在銲墊及銲腳上量測，規格應符合相關圖上所標示之規格。

5.5.5 Equipment 使用儀器：

(1) Profile Projector 投影機。

(2) Micro-hite 三次元測量機。

(3) Thickness Gam Reading Machine 鍍層測量儀。

(4) Tool Microscope 工具顯微鏡。

(5) Caliper 游標卡尺。

5.5.6 Inspection items / Sampling / Acceptance / Reject / Unit
檢驗項目／抽樣數量／允收／退貨／單位：

Inspection items **檢 驗 項 目**	Sampling **抽樣數量**	Acceptance/Reject **允收／退貨**	Unit **單位**
Plating thickness **鍍層厚度**	13 **點**/lot	0/1	Piece **顆**
Total length **總長**	1 strip **條**/lot	0/1	Strip **條**
Total width **總寬**	1 strip **條**/lot	0/1	Strip **條**
Unit pitch **單顆長度**	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Down set deepth **壓心深度**	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Pilot hole (X & Y Axis) **定位孔距離** (X & Y **軸**)	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Lead pitch **腳尖距離**	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Lead width **腳尖寬度**	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Dambar to dambar (Inner & outter) Dambar **至** dambar **距離** (**內部和外部**)	1 pc/1 strip **條**/lot	0/1	Piece **顆**
IRR	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Die pad (X & Y Axis) **銲墊大小** (X **和** Y **軸**)	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Plating coverage area (X & Y Axis) **鍍銀面積** (X **和** Y **軸**)	1 pc/1 strip **條**/lot	0/1	Piece **顆**
Pilot hole diameter **定位孔徑**	1 pc/1 strip **條**/lot	0/1	Piece **顆**

5.5.7 Physical property inspection / specification **物理特性檢驗／規格：**

5.5.7.1 Physical property inspection **物理特性檢驗：**

Take 1 strip for heat test. Using microscope to check if there is any unusual deforming after heating test.

取一條導線架樣本做烘烤實驗，烘烤前後須用顯微鏡觀察導線架是否產生異樣變化。

5.5.7.2 Equipment **使用儀器：**

5.5.7.2.1 Heating plate **烤盤**。

5.5.7.2.2 Microscope **顯微鏡**。

5.5.7.3 Inspection items / Specification 檢驗項目／規格說明：

Inspection items 檢 驗 項 目	Specification 規 格 說 明
Plating test 鍍層試驗	Put lead frame on the heating plate and heat it to 400±10 deg C for 10 minutes (Sliver plating area face down) 導線架使用烤盤烘烤 設於攝氏 400°C±10°C 烘烤十分鐘 (釘架鍍銀區朝下)

5.5.7.3.1 After heating , any evidence of blistering , decoloration , contamination and peeling appear in the plating area will be rejected.

經烘烤後，導線架鍍銀區不得任何起泡變色、沾污或剝落。

5.5.7.3.2 After heating , use 3M SCROTCH #600 tape to stick plating area , no peeling allowed.

烘烤後用膠帶 3M SCROTCH #600 測試鍍銀區，不得有剝落。

Inspection items 檢 驗 項 目	Specification 規 格 說 明
Copper peeling test 銅剝落測試	Put lead frame on the heating plate and heat it to 230±10 deg C for 10 minutes 導線架使用烤盤烘烤 設於攝氏 230°C±10°C 烘烤十分鐘

5.5.7.4 After heating , use 3M SCROTCH #600 tape to stick plating area , no peeling allowed.

烘烤後用膠帶 3M SCROTCH #600 測試鍍銅層，不得有剝落。

MISMATCH = (a – b) / 2 MISMATCH = (a + b) / 2

5.5.7.5 Epoxy bleed out test 銀膠擴散測試:

5.5.7.5.1 Sample size:1 strip/lot 抽樣數: 一條/批

5.5.7.5.2 Normal products use SUM 1033BF epoxy, Green Parts use SUM 1076N for test basis.

正常產品以 SUM 1033BF，綠色產品以 SUM 1076N 為量測基準。

5.5.7.5.3 Drop epoxy onto the test lead frame die attach paddle with 50% at least coverage.

銀膠點至測試的導電架覆蓋面積至少 50%（以 Pad Size 比較）

5.5.7.5.4 Rejection criteria 拒收標準:

5.5.5.4.1 Before oven baking doesn’t allow over than 10 mils bleed out within 1 hour exposure in the test environment.

烘烤前暴露在測試環境 1 小時內，其擴散不能延伸至 10mil

5.5.5.4.2 Comply with die bond baking condition, 175 c peak temp. for cure. The test sample doesn’t allow over than 10 mils bleed out after that.

依黏晶的烘烤條件 175°C 為最高溫，烘烤後其擴散不能延伸至 10mil.

5.5.7.6 Oxide test **氧化測試**

5.5.7.6.1 Sample size：1 strip / lot **抽樣數：一條/批。**

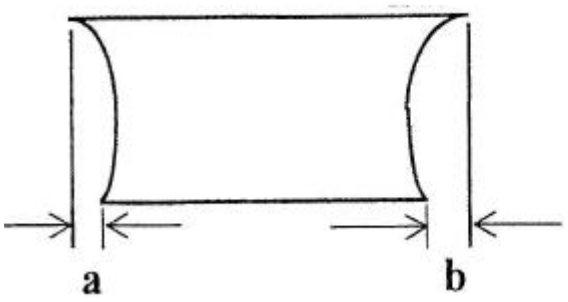
Oven test condition：175°C , 1 hour **烤箱測試條件：175 度，1 小時。**

After oven, the leadfram put clean room 16 hours. If the leadfram was oxid then reject the lot.

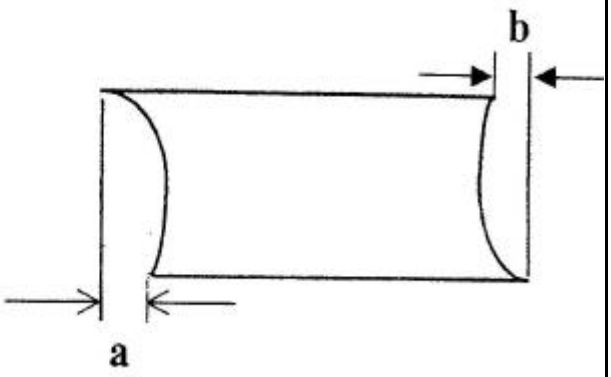
烘烤後放置在無塵室 16 小時後，若發現氧化則拒收此批。

5.5.7.7 Criteria for mismatch L/F **蝕刻錯位規格：**

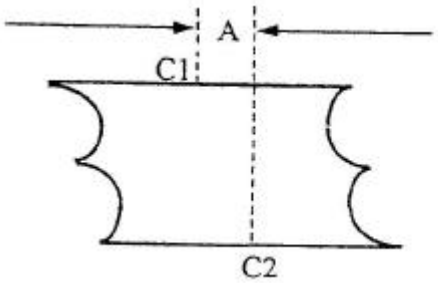
(1)



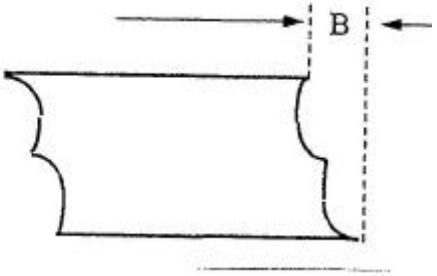
(2)



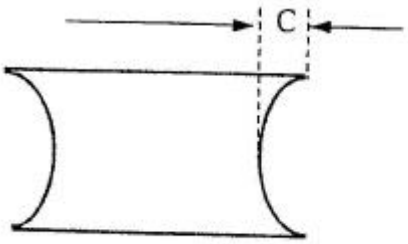
(3)



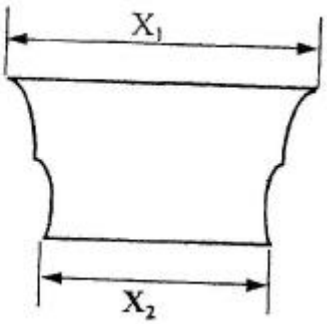
(4)



(5)



(6)



Criteria 規格：

(1) Mismatch 錯位 = (a-b) / 2 < 0.8 mil (0.02 mm)。

(2) Mismatch 錯位 = (a+b) / 2 < 0.8 mil (0.02 mm)。

(3) A < 0.8 mil (0.02 mm)。

(4) B < 0.8 mil (0.02 mm)。

(5) C < 0.8 mil (0.02 mm)。

(6) $X_2 \geqq 80\% X_1$。

5.5.8 Re-inspection 導線架覆檢：

5.5.8.1 L/F pass the IQC inspection , should re-inspection every 9 months. Just do the physical test& visual inspection follow the spec. on the 5.5.7.One time 9 months extend is allowable.

導線架於進料檢驗後，每九個月需覆檢一次，僅做物理特性檢驗及外觀檢驗，檢驗方式、規格、數量與第 5.5.7 項相同。只能允許一次 9 個月延用。

5.5.8.2 If the re-inspection is acceptable , then stamp " Acceptable reinspection "seal and VQA blue " ACC " seal on the packing box.

如果覆檢結果合格，則在各盒蓋「Acceptable reinspection」章並藍色 VQA「ACC」印章。

5.5.8.3 If the re-inspection is failed , then stamp " SCRAP "seal and VQA red " REJECT " seal on the packing box. And transfer the data to R-store , engineer should inform the related people to do disposition.

若覆檢結果不合格，則在各盒蓋上「SCRAP」(廢棄品) 章，並蓋紅色 VQA「REJECT」印章，並將該批資料轉入 R-store，由工程師通知相關人員處理。

6. Reference 相關文件：

None 無。

7. Form & Attachment 使用表單：

None 無。

Amendment Record (修 改 記 錄)

ECN Number ECN 編號	ECN Date ECN 日期	Effective 生效日	Rev. 版本	Amendment content 修 改 內 容	Check 校 對	Approve 批 准
00128	86/12/19	86/12/26	01	新版。	羅貴華	林慶義
00354	87/09/08	87/09/15	02	全面修改。	羅貴華	林慶義
00423	87/12/15	87/12/28	03	增加英文敘述及修改 5.5.7.5,	林慶義	林慶義
				5.5.7.6 項。	羅貴華	林慶義
00607	88/08/11	88/08/12	04	Plating Defect(4)Bottom	羅貴華	林慶義
00768	May/05/00	Jun/14/00	05	修改 5.5.8.1	羅貴華	戎卿泉
01069	Jul/23/02	Aug/09/02	06	增加(5)a.1 與 a.2。	黃雅靖	林慶義
				修改 5.5.8.2,5.5.8.3 以蓋章代替標籤。		
				刪除 5.5.8.4。		
01108	08/23/02	09/05/02	07	修改 5.5.1、5.5.3、5.5.8.1 增加共平面度檢驗	黃雅靖	林慶義
01121	09/12/02	09/13/02	08	修改 5.5.6,5.5.7.1 抽樣數量	林慶義	林慶義
01167	06/24/03	07/01/03	09	增加 5.5.8 只能允許一次 9 個月延用	李應典	李應典
01348	10/04/04	10/06/04	10	修改 5.5.7.3，5.5.7.3.2	郭弘智	李應典
01398	11/04/04	11/04/04	11	新增 5.5.7.5	陳品卉	李應典
01512	Oct/17/05	Oct/20/05	12	修改 5.5.6	蕭又瑄	羅貴華
01517	Oct/28/05	Nov/08/05	13	修改 5.5.3,5.5.6	羅貴華	羅貴華
01521	Dec/02/05	Dec/06/05	14	新增 5.5.7.6	羅貴華	羅貴華

DOCUMENT CIRCULATION RECORD

文 件 傳 閱 記 錄

PLEASE CIRCULATE TO PERSONNEL CONCERNED

請 傳 閱 至 相 關 人 員

PERSONNEL CONCERNED 相關人員	SIGNATURE 簽名	PERSONNEL CONCERNED 相關人員	SIGNATURE 簽名

REMARK 備 註：

CHECKED BY 核 對 者：