

## Product / Process Change Notice

PCN No.: Q000-PCN-PA201404-04

Date: 2014-04-10.

<p><b>Change Title:</b> <u>Nuvoton qualified assembly house Lingsen, transfer plating site from T.E.P.Z.factory to Wuqi Dist factory.</u></p> <p>Change Classification: <input checked="" type="checkbox"/> Major <input type="checkbox"/> Minor</p> <p>Change item: <input type="checkbox"/> Design <input type="checkbox"/> Raw Material <input type="checkbox"/> Wafer FAB <input checked="" type="checkbox"/> Package Assembly <input type="checkbox"/> Testing <input type="checkbox"/> Others: _____.</p>			
<p><b>Affected Product(s) :</b></p> <p>The affected part no. list, please refer to the Table I for more information.</p>			
<p><b>Description of Change(s) :</b></p> <p>Nuvoton qualified assembly house Lingsen transfers plating site from No. 5-1, Nan 2nd Rd., T.E.P.Z.(Taichung Export Processing Zone), Taichung City, Taiwan, 42760 to No. 37, Dagan Rd., Wuqi Dist., Taichung City, Taiwan, 43541.</p>			
<p><b>Reason for Change(s) :</b></p> <p>Due to Lingsen needs to increase capacity and arrange the capacity backup, plating site will be migrated to new site for capacity demand. The related material, equipment and operator s of plating process will not be changed.</p>			
<p><b>Impact of Change(s) : ( positive &amp; negative )</b></p> <p>Form: No change.</p> <p>Fit: No change.</p> <p>Function: No change.</p> <p>Reliability: No concern</p>			
<p><b>Qualification Plan/ Results :</b></p> <ol style="list-style-type: none"> <li>1. We followed Nuvoton standard procedure to proceed with the plating qualification.</li> <li>2. The package passed Nuvoton plating qualification criteria; please refer to appendix A for the qualification report.</li> </ol>			
<p><b>Implementation Plan :</b></p> <p><input type="checkbox"/> Date Code: _____ onward <input type="checkbox"/> Lot No.: _____ onward <input type="checkbox"/> Implemented date: <u>Jul. 09, 2014 (scheduled)</u></p>			
<b>Originator:</b>	HYLai / Q100	Approval:(QA Director)	C.C. Chen/ Q000
<b>Contact for Questions &amp; Concerns</b>	<p>Name: <u>HYLai</u> TEL: <u>886-3-5770066 (ext. 1226)</u> FAX: <u>886-3-5792673.</u></p> <p>Address: <u>No.4, Creation Rd. III Science-Based Industrial Park Hsinchu, Taiwan, R.O.C..</u></p> <p>E-mail: <u>hylai0@nuvoton.com.</u></p>		

**Customer Comments:**

Note: Please sign this notice, and return to **Nuvoton** contact within **30** days. If no response is received within **30** days, this Change Request will be assumed to meet your approval.

<input type="checkbox"/> Approval	<input type="checkbox"/> Disapproval	<input type="checkbox"/> Conditional Approval: _____.
Date: _____	Dept. name: _____	Person in charge: _____.

**Follow-up and Tracing:**

**A. copies to**

**FAB:**  Integration \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_.

**Test / Product:**  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_.

**Design/ Marketing:**  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_.

**Production control/ Others:**  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_.

**B. Changes:**

1. Document / Test program:

Document No/ test program	Document name/ test program name	version		responsibor	Completed date	Remark
		before	after			
NA	NA	NA	NA	NA	NA	NA

Verified by: \_\_\_\_\_.

**Table I: Affected parts list**

Part No.	Part No.
I1730EY	I4408EYI
I1730EYI	I5008EY
I1760EY	I5102EY
I1760EYI	I5116EY
I4212EY	I5116EYI
I4212EYI	I5216EY
I4224EY	
I4304EY	
I4304EYI	
I4306EYI	

## Appendix A: Packages qualification report

### PLATING PLANT MIGRATION QUALIFICATION REPORT

**CUSTOMER : All customer**

<b>ITEM</b>	<b>REPORT CONTENTS</b>
I	PURPOSE OF QUALIFICATION LOT
II	QUALIFICATION ITEMS
III	VISUAL INSPECTION
IV	IONIC CLEANLINESS TEST
V	PLATING THICKNESS
VI	SOLDERABILITY TEST
VII	LEAD FATIGUE TEST

**TOTAL : 8 PAGES**

**Prepare by : Art Chiang**

**Checked by : Amy Lin**

**Approve by : Jack Tu**

## I. PURPOSE OF QUALIFICATION LOT

LINGSEN setup the new plant in Chung-Kang export processing zone because LINGSEN need to increase capacity and arrange the capacity backup. Plating plant will migrate to new area for capacity demand. Material, equipment, operator of plating process will not change, only to change production area.

The qualification lot report will certify the process ability and quality for plating plant migration.

## II. QUALIFICATION ITEMS

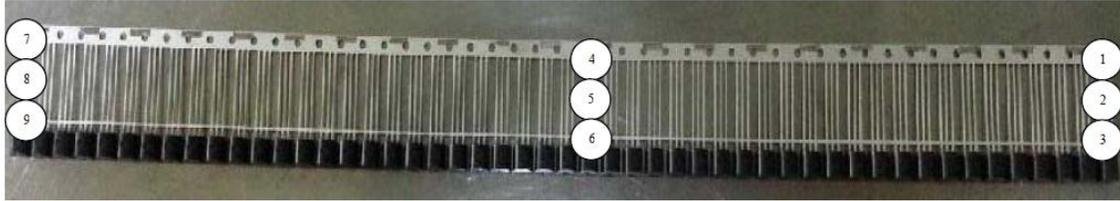
Plate the dummy by plating machine MECO#4(equipment number: 00410680078) in new plant. Qualification package type and test items as below list.

Package type	Lot no.	Qualification items
SOP008M	413685	1.VISUAL INSPECTION 2.IONIC CLEANLINESS TEST 3.PLATING THICKNESS 4.SOLDERABILITY TEST 5.LEAD FATIGUE TEST
TO-92STD	413686	
SOT-25M	413687	
TQ320707	413688	
TS481220	413689	
PLC032	413660	
WQFN280505L	416143	
WQFN240404L	416142	



## 2.package type: TO-92STD

Sample size: 125points; measure position as below drawing. (9 points per L/F; 14strips L/F)  
 Criteria: plating thickness: 7.62~15.27  $\mu$ m; CPK > 1.67(follow LINGSEN spec.50-6355)  
 Measured result: CPK=1.6843;PASS

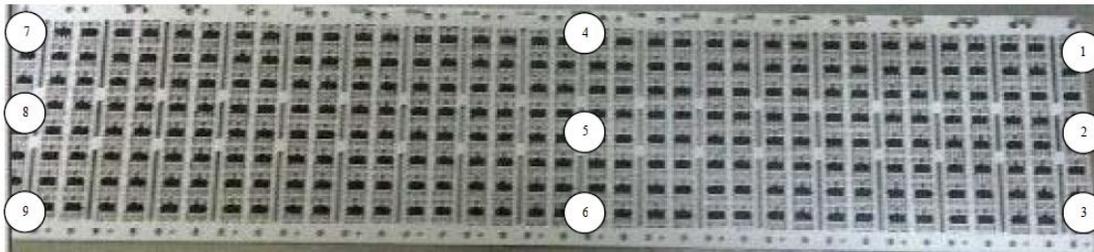


### Measured value & CPK

數值1	數值2	數值3	數值4	數值5	數值6	數值7	數值8	數值9	數值10	數值11	數值12	(note: 數值有效圖層名稱-測點)				
10.26	12.01	12.34	11.666	11.84	10.75	10.18	11.48	12.51	11	12.38	12.46					
10.587	11.09	11.01	11.55	12.13	12.93	12.2	10.96	11.81	12.12	10.444	10.65	USL	15.24			
11.09	10.51	11.92	12.74	12.55	11	12.44	12.99	11.409	10.84	11.45	10.6	LSL	7.62			
12	12.01	11.07	11.8	12.53	10.09	10.41	11.15	11.3	12.88	12.91	10.99	count	125			
12.31	12.26	11.796	11.2	11.85	10.44	12.36	12.37	10.82	12.89	12.95	11.479	max	12.95			
10.01	10.95	11.45	11.69	12.49	11.58	12.26	12.79	11.527	11.73	12.15	12.13	min	10.01			
10.29	12.01	12.34	11.666	11.84	10.75	11.18	11.48	12.51	11	12.38	12.26	stdev	0.7314			
10.587	11.09	11.01	11.55	12.13	12.93	12.2	11.96	11.81	12.12	11.444	11.65	avg	11.5446			
11.09	10.51	11.92	12.47	12.13	11	12.14	12.79	11.409	11.84	11.45	11.6	Cp	1.7264	Pp	1.7264	
12	12.01	11.07	11.8	12.75	11.04	11.41	11.15	11.3	12.81	12.19	10.91	CPU	1.6843	CPU	1.6843	
12.24	12.21	11.796	11.2	11.85								CPL	1.7886	CPL	1.7886	
												Ca	0.0300	Ca	0.03	
												Cpk	1.6843	Ppk	1.6843	

## 3.package type: SOT-25M

Sample size: 125points; measure position as below drawing. (9 points per L/F; 14strips L/F)  
 Criteria: plating thickness: 7.62~15.27  $\mu$ m; CPK > 1.67(follow LINGSEN spec.50-6355)  
 Measured result: CPK=2.6442;PASS

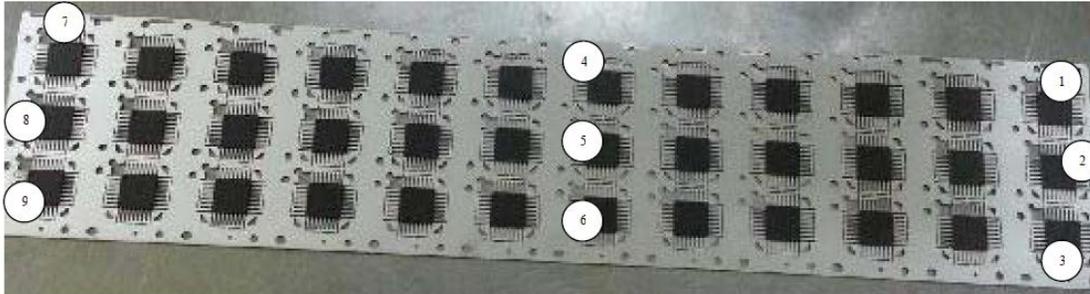


### Measured value & CPK

數值1	數值2	數值3	數值4	數值5	數值6	數值7	數值8	數值9	數值10	數值11	數值12	(note: 數值有效圖層名稱-測點)				
10.87	10.87	10.66	10.84	10.73	10.4	10.58	10.77	10.75	10.52	10.88	10.56					
10.91	10.36	10.52	11.02	10.52	10.18	10.55	10.74	10.7	11.06	10.84	10.44	USL	15.24			
10.42	10.45	10.05	10.62	10.7	10.81	10.69	11.34	10.46	10.36	10.47	10.23	LSL	7.62			
10.55	10.83	10.66	10.84	10.73	11.44	10.51	10.77	10.3	10.57	10.78	10.51	count	125			
10.91	10.36	10.36	11.02	10.52	11.16	10.57	10.64	10.7	11.06	10.64	11.44	max	11.98			
10.26	11.43	10.01	10.62	10.7	10.81	10.66	10.54	10.66	11.75	10.57	10.24	min	10.04			
11.87	10.87	11.66	10.84	10.73	11.45	10.51	11.47	10.3	10.54	10.48	10.56	stdev	0.3953			
11.91	10.36	10.35	11.02	10.52	11.16	11.45	11.34	10.7	11.03	10.74	11.46	avg	10.7655			
11.26	11.54	10.04	10.62	10.7	10.81	11.39	10.24	10.46	10.32	10.27	11.27	Cp	3.2130	Pp	3.213	
10.31	10.11	11.66	10.84	10.73	10.42	11.16	11.17	11.3	10.51	10.18	10.51	CPU	3.7818	CPU	3.7818	
10.24	10.67	11.32	11.02	10.52								CPL	2.6442	CPL	2.6442	
												Ca	0.1770	Ca	0.177	
												Cpk	2.6442	Ppk	2.6442	

## 4.package type: TQ320707

Sample size: 125points; measure position as below drawing. (9 points per L/F; 14strips L/F)  
 Criteria: plating thickness: 7.62~15.27  $\mu\text{m}$ ; CPK > 1.67(follow LINGSEN spec.50-6355)  
 Measured result: **CPK=2.5175;PASS**

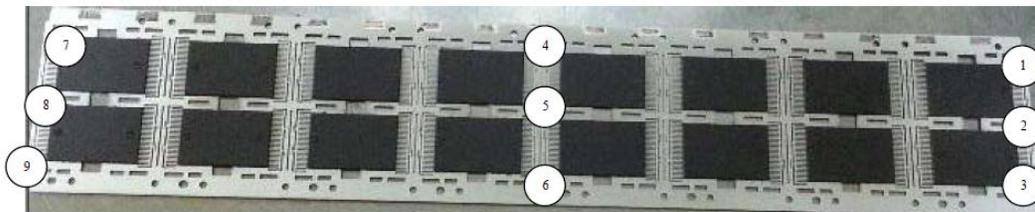


Measured value & CPK

數值1	數值2	數值3	數值4	數值5	數值6	數值7	數值8	數值9	數值10	數值11	數值12	(note: 數值有效數點位: 2個)			
11.03	11.33	11.87	12.13	11.08	11.61	11.97	11.06	11.25	11.71	11.6	12.35				
11.23	11.53	11.63	11.24	11.35	11.84	11.61	12.04	11.63	11.38	11.27	11.49	USL	15.24		
11.74	11.61	11.66	11.98	12.11	11.98	11.31	11.73	11.45	11.33	11.84	11.94	LSL	7.62		
11.97	12.11	11.92	11.78	11.76	11.88	11.26	11.79	11.82	11.65	12.19	11.61	count	125		
11.88	11.84	11.05	11.06	11.82	11.88	11.05	11.26	11.16	11.11	11.19	11.25	max	12.08		
12.09	12.33	12.87	11.24	12.18	12.61	11.87	12.26	11.15	11.51	11.24	11.35	min	11.02		
11.57	11.35	11.86	11.14	11.19	11.14	11.15	11.04	11.16	11.85	11.27	11.29	stdev	0.4798		
11.24	11.26	11.26	12.98	12.81	11.29	11.33	11.27	11.24	11.23	11.26	11.26	avg	11.6239		
11.47	12.41	11.29	11.38	11.27	11.88	11.82	12.23	11.25	11.26	12.15	11.18	Cp	2.6626	Pp	2.6626
12.39	12.43	12.78	12.24	12.18	12.81	12.87	12.06	11.51	11.41	11.42	11.52	CPU	2.5175	CPU	2.5175
12.29	11.33	12.87	11.24	12.18								CPL	2.7875	CPL	2.7875
												Ca	0.0609	Ca	0.0609
												Cpk	2.5175	Ppk	2.5175

## 5.package type: TS481220

Sample size: 125points; measure position as below drawing. (9 points per L/F; 14strips L/F)  
 Criteria: plating thickness: 7.62~15.27  $\mu\text{m}$ ; CPK > 1.67(follow LINGSEN spec.50-6355)  
 Measured result: **CPK=1.7476;PASS**

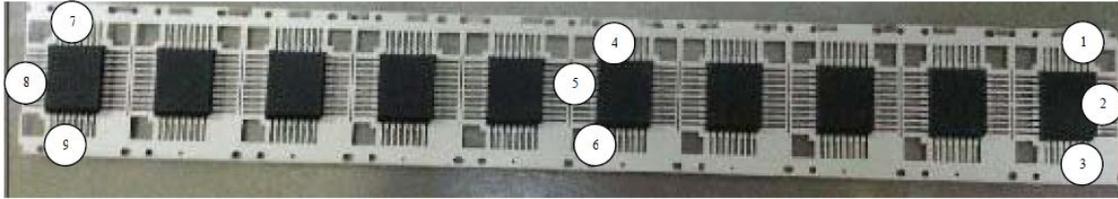


Measured value & CPK

數值1	數值2	數值3	數值4	數值5	數值6	數值7	數值8	數值9	數值10	數值11	數值12	(note: 數值有效數點位: 2個)			
12.79	12.01	11.97	12.88	10.81	12.58	12.17	10.69	11.98	12.23	11.68	11.87				
10.73	11.2	10.96	12.81	11.31	11.97	11.19	11.08	12.39	12.45	11.18	12.09	USL	15.24		
12.87	11.44	12.53	12.37	12.59	12.15	11.81	12.37	12.14	11.87	10.5	11.47	LSL	7.62		
10.622	12.57	12.58	11.88	12.1	11.33	12.26	12.23	11.35	12.88	12.45	11.37	count	125		
12.13	12.27	11.94	11.2	12.12	12.74	11.32	10.69	11.67	10.9	11.11	11.21	max	13.04		
10.38	10.74	11.863	12.43	12.03	12.92	12.02	12.2	12.87	11.86	10.53	10.93	min	10.08		
12.84	11.88	11.85	11.78	11.55	10.63	11.1	11.37	11.12	12.28	11.79	12.33	stdev	0.6772		
12.5	12.25	12.36	10.99	12.57	12.92	11.46	11.15	10.74	10.92	11.32	11.27	avg	11.6808		
10.99	11.22	10.88	12.16	11.26	11.41	12.49	12.38	11.63	13.04	10.5	11.07	Cp	1.8754	Pp	1.8754
10.8	11.43	11.861	10.89	11.09	11.32	11.72	11.99	11.885	11.81	11.28	11.31	CPU	1.7476	CPU	1.7476
11.97	12.41	10.52	11.83	11.18								CPL	2.0033	CPL	2.0033
												Ca	0.0682	Ca	0.0682
												Cpk	1.7476	Ppk	1.7476

## 6.package type: PLC032

Sample size: 125points; measure position as below drawing. (9 points per L/F; 14strips L/F)  
 Criteria: plating thickness: 7.62~15.27  $\mu$ m; CPK > 1.67(follow LINGSEN spec.50-6355)  
 Measured result: CPK=1.8117;PASS

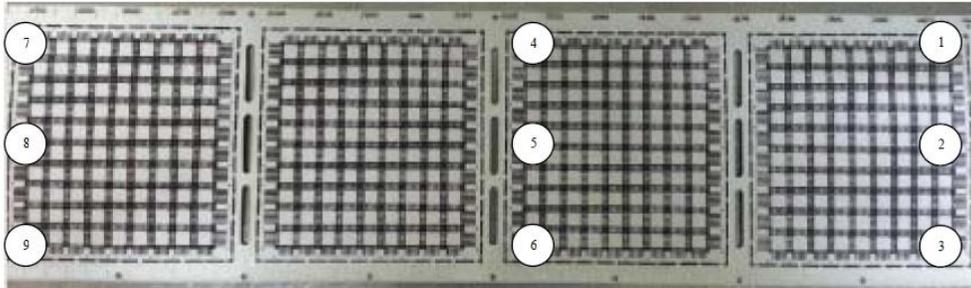


### Measured value & CPK

數值1	數值2	數值3	數值4	數值5	數值6	數值7	數值8	數值9	數值10	數值11	數值12	(note: 數值有效範圍為列2-列12)	
10.291	11.02	12.74	10.364	11.39	11.67	11.92	12.03	11.63	10.571	11.13	11.69	USL	15.24
10.211	10.1	11	10.665	11.19	11.72	10.25	11.36	11.72	10.1	10.62	10.34	LSL	7.62
10.52	11.23	11.1	10.2	11.21	11.96	10.83	10.51	10.71	10.4	11.19	11.71	count	125
10.33	11.21	11.87	10.25	10.65	10.77	10.3	11.21	11.57	10.29	11.34	11.84	max	12.74
10.21	10.62	10.43	10.27	11.43	11.67	10.41	11.24	11.79	10.08	10.51	10.8	min	10.05
10.36	11.25	11.6	10.38	11.12	11.71	10.87	10.45	10.72	10.63	11.21	11.58	stdev	0.5112
10.47	11.06	11.77	10.14	10.65	10.81	10.85	11.35	11.55	10.73	11.28	11.75	avg	10.9419
10.83	10.61	10.75	10.2	11.24	11.61	10.21	11.36	11.1	10.13	10.57	10.76	Cp	2.0779
10.21	11.34	11.11	10.55	11.52	11.83	10.87	10.57	10.75	10.55	11.55	11.77	CPU	2.3441
10.22	11.17	11.73	10.2	10.46	10.55	10.21	11.23	11.51	10.29	11.31	11.87	CPL	1.8117
10.31	10.41	10.97	10.96	11.27								Ca	0.1281
												Cpk	1.8117
												Ppk	1.8117

## 7.package type: WQFN280505L

Sample size: 125points; measure position as below drawing. (9 points per L/F; 14strips L/F)  
 Criteria: plating thickness: 7.62~15.27  $\mu$ m; CPK > 1.67(follow LINGSEN spec.50-6355)  
 Measured result: CPK=2.2733;PASS



### Measured value & CPK

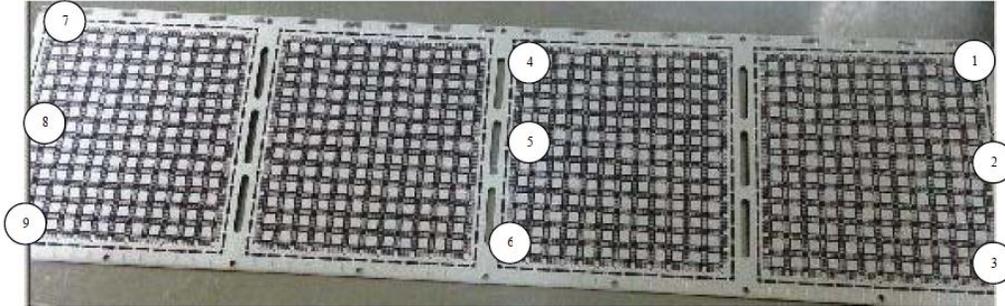
數值1	數值2	數值3	數值4	數值5	數值6	數值7	數值8	數值9	數值10	數值11	數值12	(note: 數值有效範圍為列2-列12)	
12.11	12.36	11.6	11.89	12.06	11.73	12.52	11.93	12.78	11.52	12.12	11.37	USL	15.24
11.53	12.09	11.71	12.36	12.85	12.46	11.39	12.73	11.13	11.46	12.32	11.12	LSL	7.62
12.41	12.42	11.81	11.41	12.83	11.87	11.42	11.66	11.01	11.59	12.11	11.43	count	125
12.06	12.38	11.65	11.85	12.46	11.77	12.23	11.39	12.87	12.52	12.21	11.43	max	12.87
12.51	12.19	12.82	12.43	12.55	12.82	12.29	12.42	12.31	12.43	12.54	12.41	min	11.08
12.41	12.41	11.51	11.41	12.62	11.39	11.23	11.89	11.43	11.79	12.51	12.39	stdev	0.4703
12.11	12.46	11.84	11.76	12.16	11.71	12.42	11.95	12.44	11.25	12.12	11.37	avg	12.0323
11.73	12.09	12.21	12.31	12.89	12.46	12.39	12.37	11.83	11.48	12.72	11.21	Cp	2.7002
12.87	12.46	11.81	11.49	12.83	11.66	11.24	12.66	11.8	11.52	12.19	12.37	CPU	2.2733
12.15	12.32	11.67	11.98	12.36	11.43	12.51	11.91	12.74	12.25	12.42	11.81	CPL	3.1271
11.43	12.29	11.31	12.46	12.19								Ca	0.1581
												Cpk	2.2733
												Ppk	2.2733

## 8.package type: WQFN240404L

Sample size: 125points; measure position as below drawing. (9 points per L/F; 14strips L/F)

Criteria: plating thickness: 7.62~15.27  $\mu$ m; CPK > 1.67(follow LINGSEN spec.50-6355)

Measured result: CPK=1.8302;PASS



### Measured value & CPK

數值1	數值2	數值3	數值4	數值5	數值6	數值7	數值8	數值9	數值10	數值11	數值12	(note: 數值有效位數為精確到0.001)			
12.71	12.71	12.46	12.55	12.59	12.79	12.79	13.44	13.57	13.85	12.4	12.74				
12.22	11.86	12.4	12.95	13.84	13.3	12.73	12.69	12.26	12.4	12.38	13.95	USL	15.24		
12.65	13.53	13.42	13.12	13.25	12.53	12.12	12.55	12.77	12.19	12.99	12.34	LSL	7.62		
13.17	12.72	12.79	12.23	12.58	12.72	12.79	12.44	12.57	13.15	12.64	12.84	count	125		
12.71	12.86	12.54	12.76	13.24	13.85	12.25	12.79	12.99	12.27	12.77	13.25	max	13.98		
13.81	12.75	12.66	13.55	12.79	12.77	12.19	13.24	13.57	12.95	12.99	12.72	min	11.79		
12.82	12.86	12.41	12.15	13.44	13.35	12.71	12.69	12.21	12.74	12.76	12.95	stdev	0.4492		
13.13	12.75	12.58	13.58	12.79	12.71	12.29	13.54	13.76	12.98	12.51	12.32	avg	12.7739		
13.84	12.718	12.79	12.73	12.79	12.99	12.31	13.54	13.17	13.25	12.45	12.24				
12.23	11.76	12.46	12.65	13.24	13.35	12.74	12.68	12.76	12.14	12.21	13.85	Cp	2.8278	Pp	2.8278
12.88	12.87	12.49	12.57	12.83								CPU	1.8302	CPU	1.8302
												CPL	3.8240	CPL	3.8240
												Ca	0.3527	Ca	0.3527
												Cpk	1.8302	Ppk	1.8302

## **VI. SOLDERABILITY TEST**

All result is pass. Please refer the attachment (Doc#SD1030114).

## **VII. LEAD FATIGUE TEST**

All result is pass. Please refer the attachment (Doc#LF1030102).



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

Sample Information 產品資料			
Month	01/2014	Lead Frame	C194AG
Customer	LPI	Mold Compound	EME-G600
Package Type	SOP008M	Wire	N/A
Run No.	413685	Silver Epoxy	N/A
Device Type	DUMMY UNIT	Die coating	NN/A
Lot No.	ENG	Received Date	01/22/2014
REL Doc. No.	103058	Completed Date	01/28/2014
Lead Finish	Matte Tin	Remark	Visual photo as attach.

Test Conditions 試驗條件	
1. Sample Plan :	N=5 AC=0 RE=1
2. Conditions :	Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)
3. Test Frequency :	<input type="checkbox"/> PPCM, Freq. once/quarter <input checked="" type="checkbox"/> Qualification <input type="checkbox"/> Customer Requirement <input type="checkbox"/> Material / Operation parameter of material change <input type="checkbox"/> Others:

Criteria 判定標準
1. All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.
2. Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.
3. The critical area as below.

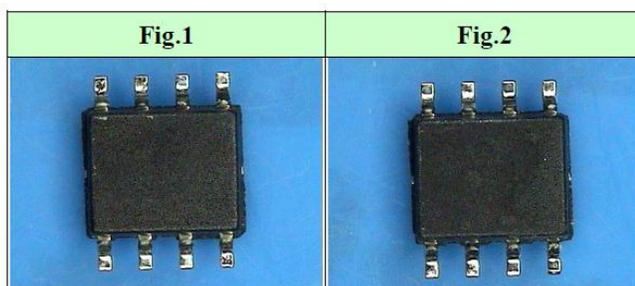
Test Result
試驗結果 : <u>0/5</u> (failure/total Q'ty) <input checked="" type="checkbox"/> Accept 合格 <input type="checkbox"/> Reject 不合格

Approved By: WP Huang      Checked By: Fu Yang      Prepared By: WenHuaWu  
Date: 01/28/2014      Date: 01/28/2014      Date: 01/28/2014



*Attachment: Test Result*

*After Test*



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

Sample Information 產品資料			
Month	<u>01/2014</u>	Lead Frame	<u>C194AG</u>
Customer	<u>LPI</u>	Mold Compound	<u>EME-G600</u>
Package Type	<u>TO-92 STD</u>	Wire	<u>N/A</u>
Run No.	<u>413686</u>	Silver Epoxy	<u>N/A</u>
Device Type	<u>DUMMY UNIT</u>	Die coating	<u>NN/A</u>
Lot No.	<u>ENG</u>	Received Date	<u>01/22/2014</u>
REL Doc. No.	<u>103058</u>	Completed Date	<u>01/28/2014</u>
Lead Finish	<u>Matte Tin</u>	Remark	<u>Visual photo as attach.</u>

Test Conditions 試驗條件	
1. Sample Plan :	<u>N=5 AC=0 RE=1</u>
2. Conditions :	<u>Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec</u> <u>Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)</u>
3. Test Frequency :	<input type="checkbox"/> PPCM, Freq. once/quarter <input checked="" type="checkbox"/> Qualification <input type="checkbox"/> Customer Requirement <input type="checkbox"/> Material / Operation parameter of material change <input type="checkbox"/> Others:

Criteria 判定標準	
1. All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.	
2. Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.	
3. The critical area as below.	
Fig. 4 圖四	

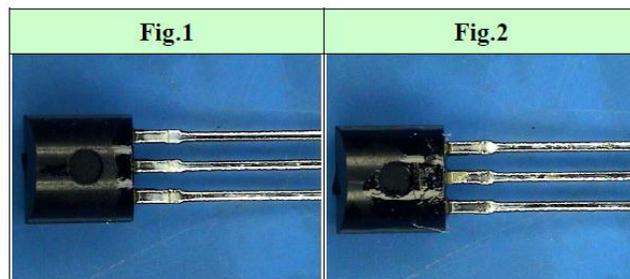
Test Result	
試驗結果 :	<u>0/5</u> (failure/total Q'ty) <input checked="" type="checkbox"/> Accept 合格 <input type="checkbox"/> Reject 不合格

Approved By: WP Huang    Checked By: Fu Yang    Prepared By: WenHuaWu  
Date: 01/28/2014                      Date: 01/28/2014                      Date: 01/28/2014

---

*Attachment: Test Result*

*After Test*



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

#### Sample Information

#### 產品資料

Month	<u>01/2014</u>	Lead Frame	<u>E64ATG</u>
Customer	<u>LPI</u>	Mold Compound	<u>EME-G600</u>
Package Type	<u>SOT-25M</u>	Wire	<u>N/A</u>
Run No.	<u>413687</u>	Silver Epoxy	<u>N/A</u>
Device Type	<u>DUMMY UNIT</u>	Die coating	<u>NN/A</u>
Lot No.	<u>ENG</u>	Received Date	<u>01/22/2014</u>
REL Doc. No.	<u>103058</u>	Completed Date	<u>01/28/2014</u>
Lead Finish	<u>Matte Tin</u>	Remark	<u>Visual photo as attach.</u>

#### Test Conditions 試驗條件

1. Sample Plan :	<u>N=5 AC=0 RE=1</u>
2. Conditions :	<u>Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec</u> <u>Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)</u>
3. Test Frequency :	<input type="checkbox"/> PPCM, Freq. once/quarter <input checked="" type="checkbox"/> Qualification <input type="checkbox"/> Customer Requirement <input type="checkbox"/> Material / Operation parameter of material change <input type="checkbox"/> Others:

#### Criteria 判定標準

- All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.
- Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.
- The critical area as below.

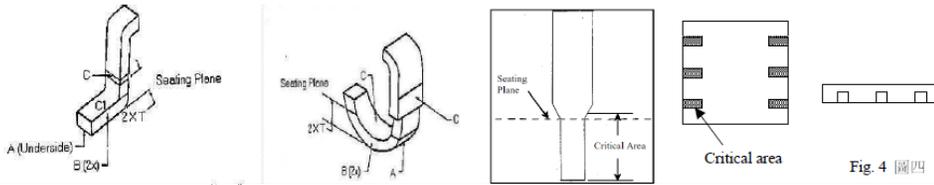


Fig. 4 圖四

#### Test Result

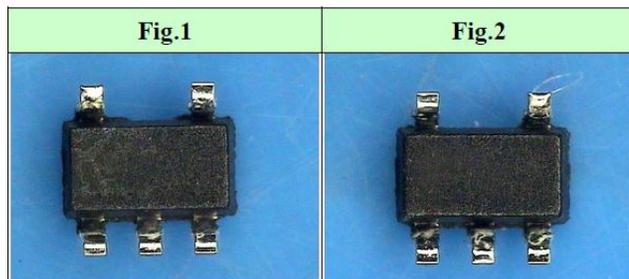
試驗結果 : 0/5 (failure/total Q'ty)  Accept 合格  Reject 不合格

Approved By: WP Huang      Checked By: Fu Yang      Prepared By: WenHuaWu  
Date: 01/28/2014      Date: 01/28/2014      Date: 01/28/2014



*Attachment: Test Result*

*After Test*



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

Sample Information 產品資料			
Month	01/2014	Lead Frame	C7025AG
Customer	LPI	Mold Compound	EME-G700
Package Type	TQ320707	Wire	N/A
Run No.	413688	Silver Epoxy	N/A
Device Type	DUMMY UNIT	Die coating	NN/A
Lot No.	ENG	Received Date	01/22/2014
REL Doc. No.	103058	Completed Date	01/28/2014
Lead Finish	Matte Tin	Remark	Visual photo as attach.

Test Conditions 試驗條件	
1. Sample Plan :	N=5 AC=0 RE=1
2. Conditions :	Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)
3. Test Frequency :	<input type="checkbox"/> PPCM, Freq. once/quarter <input checked="" type="checkbox"/> Qualification <input type="checkbox"/> Customer Requirement <input type="checkbox"/> Material / Operation parameter of material change <input type="checkbox"/> Others:

**Criteria 判定標準**

- All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.
- Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.
- The critical area as below.

Fig. 4 圖四

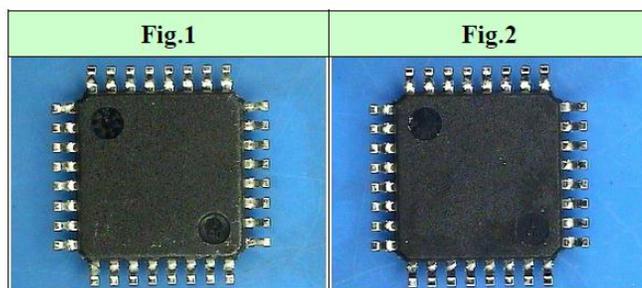
Test Result	
試驗結果 :	0/5 (failure/total Q'ty) <input checked="" type="checkbox"/> Accept 合格 <input type="checkbox"/> Reject 不合格

Approved By: WP Huang      Checked By: Fu Yang      Prepared By: WenHuaWu  
Date: 01/28/2014                      Date: 01/28/2014                      Date: 01/28/2014



*Attachment: Test Result*

*After Test*



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

#### Sample Information

#### 產品資料

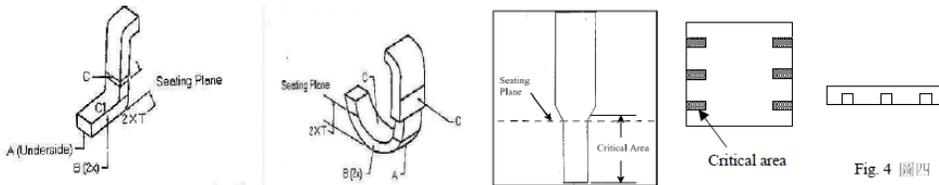
Month	<u>01/2014</u>	Lead Frame	<u>C7025AG</u>
Customer	<u>LPI</u>	Mold Compound	<u>EME-G700</u>
Package Type	<u>TS481220</u>	Wire	<u>N/A</u>
Run No.	<u>413689</u>	Silver Epoxy	<u>N/A</u>
Device Type	<u>DUMMY UNIT</u>	Die coating	<u>NN/A</u>
Lot No.	<u>ENG</u>	Received Date	<u>01/22/2014</u>
REL Doc. No.	<u>103058</u>	Completed Date	<u>01/28/2014</u>
Lead Finish	<u>Matte Tin</u>	Remark	<u>Visual photo as attach.</u>

#### Test Conditions 試驗條件

1. Sample Plan : N=5 AC=0 RE=1
2. Conditions : Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec  
Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)
3. Test Frequency :  PPCM, Freq. once/quarter  Qualification  Customer Requirement  
 Material /Operation parameter of material change  Others:

#### Criteria 判定標準

- All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.
- Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.
- The critical area as below.



#### Test Result

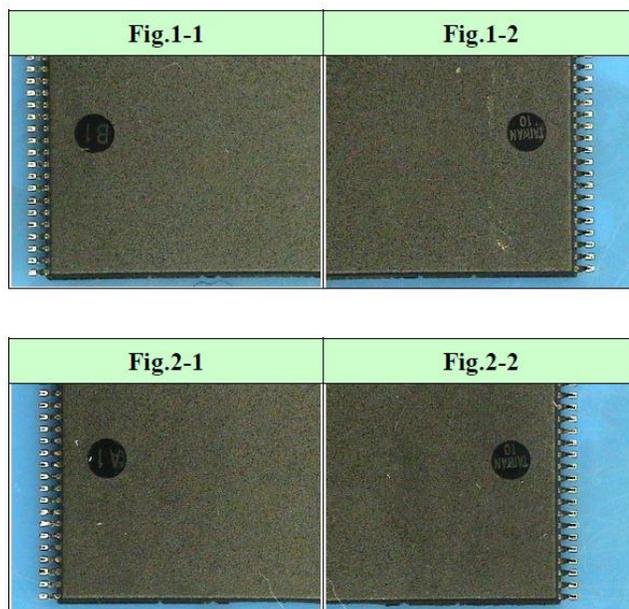
試驗結果 : 0/5 (failure/total Q'ty)  Accept 合格  Reject 不合格

Approved By: WP Huang Checked By: Fu Yang Prepared By: WenHuaWu  
 Date: 01/28/2014 Date: 01/28/2014 Date: 01/28/2014



*Attachment: Test Result*

*After Test*



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

Sample Information 產品資料			
Month	<u>01/2014</u>	Lead Frame	<u>C151AG</u>
Customer	<u>LPI</u>	Mold Compound	<u>EME-G600</u>
Package Type	<u>PLC032</u>	Wire	<u>N/A</u>
Run No.	<u>413690</u>	Silver Epoxy	<u>N/A</u>
Device Type	<u>DUMMY UNIT</u>	Die coating	<u>NN/A</u>
Lot No.	<u>ENG</u>	Received Date	<u>01/22/2014</u>
REL Doc. No.	<u>103058</u>	Completed Date	<u>01/28/2014</u>
Lead Finish	<u>Matte Tin</u>	Remark	<u>Visual photo as attach.</u>

Test Conditions 試驗條件	
1. Sample Plan :	<u>N=5 AC=0 RE=1</u>
2. Conditions :	<u>Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec</u> <u>Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)</u>
3. Test Frequency :	<input type="checkbox"/> PPCM, Freq. once/quarter <input checked="" type="checkbox"/> Qualification <input type="checkbox"/> Customer Requirement <input type="checkbox"/> Material /Operation parameter of material change <input type="checkbox"/> Others:

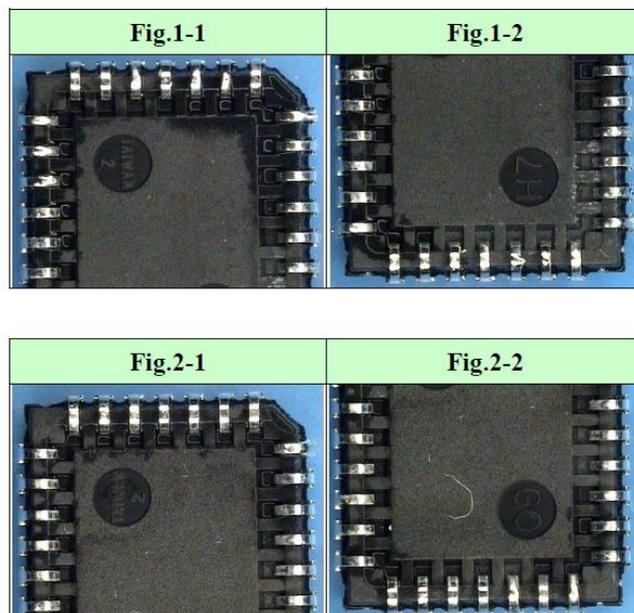
Criteria 判定標準
1. All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.
2. Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.
3. The critical area as below.

Test Result
試驗結果 : <u>0/5</u> (failure/total Q'ty) <input checked="" type="checkbox"/> Accept 合格 <input type="checkbox"/> Reject 不合格

Approved By: WP Huang      Checked By: Fu Yang      Prepared By: WenHuaWu  
Date: 01/28/2014                      Date: 01/28/2014                      Date: 01/28/2014

*Attachment: Test Result*

*After Test*



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

Sample Information 產品資料			
Month	<u>01/2014</u>	Lead Frame	<u>C194AG</u>
Customer	<u>LPI</u>	Mold Compound	<u>EME-G770H</u>
Package Type	<u>WQFN0240404L</u>	Wire	<u>N/A</u>
Run No.	<u>416142</u>	Silver Epoxy	<u>N/A</u>
Device Type	<u>DUMMY UNIT</u>	Die coating	<u>NN/A</u>
Lot No.	<u>ENG</u>	Received Date	<u>01/24/2014</u>
REL Doc. No.	<u>103067</u>	Completed Date	<u>01/28/2014</u>
Lead Finish	<u>Matte Tin</u>	Remark	<u>Visual photo as attach.</u>

Test Conditions 試驗條件	
1. Sample Plan :	<u>N=5 AC=0 RE=1</u>
2. Conditions :	<u>Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec</u> <u>Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)</u>
3. Test Frequency :	<input type="checkbox"/> PPCM, Freq. <u>once/quarter</u> <input checked="" type="checkbox"/> Qualification <input type="checkbox"/> Customer Requirement <input type="checkbox"/> Material /Operation parameter of material change <input type="checkbox"/> Others:

Criteria 判定標準
1. All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.
2. Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.
3. The critical area as below.

Test Result
試驗結果 : <u>0/5</u> (failure/total Q'ty) <input checked="" type="checkbox"/> Accept 合格 <input type="checkbox"/> Reject 不合格

Approved By: WP Huang    Checked By: Fu Yang    Prepared By: WenHuaWu

Date: 01/28/2014    Date: 01/28/2014    Date: 01/28/2014

LINGSEN RELIABILITY LAB

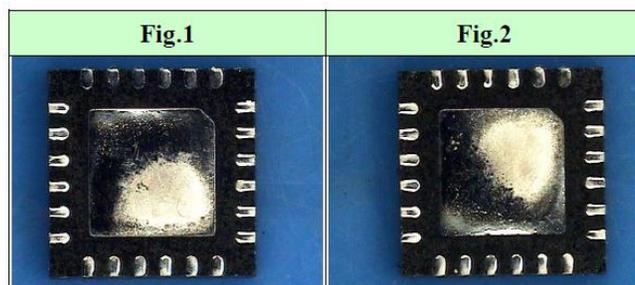
5-1 Nan 2nd Road, T.E.P.Z. Taichung, Taiwan 427 R.O.C

TEL : 04-25335120    FAX : 04-25327904

657306-01-06

*Attachment: Test Result*

*After Test*



## Dip & Look Solderability Test

### 沾錫信賴性試驗報告

#### Sample Information

##### 產品資料

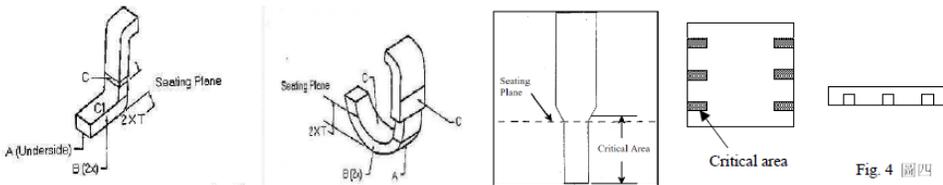
Month	01/2014	Lead Frame	C194AG
Customer	LPI	Mold Compound	EME-G770H
Package Type	WQFN0280505L	Wire	N/A
Run No.	416143	Silver Epoxy	N/A
Device Type	DUMMY UNIT	Die coating	NN/A
Lot No.	ENG	Received Date	01/24/2014
REL Doc. No.	103067	Completed Date	01/28/2014
Lead Finish	Matte Tin	Remark	Visual photo as attach.

#### Test Conditions 試驗條件

1. Sample Plan : N=5 AC=0 RE=1
2. Conditions : Steam Aging 8Hr, Solder Temp. : 245±5°C Dipping time : 5±0.5sec  
Solder pot : Sn96.5/Ag3/Cu0.5 Specific gravity of Flux : 0.847(ROL1)
3. Test Frequency :  PPCM, Freq. once/quarter  Qualification  Customer Requirement  
 Material /Operation parameter of material change  Others:

#### Criteria 判定標準

- All terminations shall exhibit continuous solder coating free from defects for a minimum of 95% of the critical surface area.
- Anomalies other than dewetting, nonwetting, and pinholes are not cause for rejection.
- The critical area as below.



#### Test Result

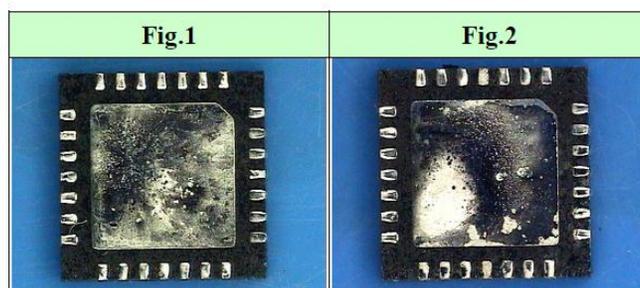
試驗結果 : 0/5 (failure/total Q'ty)  Accept 合格  Reject 不合格

Approved By: WP Huang    Checked By: Fu Yang    Prepared By: WenHuaWu  
Date: 01/28/2014                      Date: 01/28/2014                      Date: 01/28/2014



*Attachment: Test Result*

*After Test*





Lingsen Precision Industries.,  
菱生精密工業股份有限公司

Attachment 3

Doc#**LF1030102**

## Lead Fatigue Test 導腳疲勞強度試驗報告

Date : 01/23/2014

Page : 6 of 1

### Sample Information

#### 產品資料

Customer	<u>LPI</u>	Month	<u>01/2014</u>
Package Type	<u>SOP008M</u>	Leadframe	<u>C194AG</u>
Run No.	<u>413685</u>	Mold Compound	<u>EME-G600</u>
Device Type	<u>Dummy</u>	Au Wire	<u>N/A</u>
Lot No.	<u>N/A</u>	Epoxy	<u>N/A</u>
Request No.	<u>103058</u>	Die Coating	<u>N/A</u>
Lead Plating	<u>Matte Tin</u>	Received Date	<u>01/23/2014</u>

### Test Conditions

#### 試驗條件

1. Sample Plan : N=5 AC=0 RE=1

2. Conditions : Angle 90° ,Weight 3oz ,must ≥3.0cycles

3. Test Frequency :  PPCM, Freq. once/quarter  Qualification  Customer Requirement  
 Material /Operation parameter of material change  Others : PE request

### Measuring Data

試驗結果 0/5 (failed/total Q'ty)  Accept 合格  Reject 不合格

Sample No.	NO.1	NO.2	NO.3	NO.4	NO.5
LEAD 1	4.5	5	5.5	4.5	5
LEAD 2	5.5	5	3.5	4.5	4
LEAD 3	5.5	4.5	4.5	4.5	4
LEAD 4	5.5	7	4.5	4.5	5
LEAD 5	4	6.5	6	4.5	4
LEAD 6	5	4.5	5.5	3.5	4
Maximum	5.5	7	6	4.5	5
Minimum	4	4.5	3.5	3.5	4
Pass/Fail	PASS	PASS	PASS	PASS	PASS

Approved By: WP Huang    Checked By: Fu Yang    Prepared By: WenHuaWu  
 Date: 01/23/2014                      Date: 01/23/2014                      Date: 01/23/2014



## Lead Fatigue Test 導腳疲勞強度試驗報告

Date : 01/23/2014

Page : 6 of 2

### Sample Information

#### 產品資料

Customer	<u>LPI</u>	Month	<u>01/2014</u>
Package Type	<u>TO92STD</u>	Leadframe	<u>KFC</u>
Run No.	<u>413686</u>	Mold Compound	<u>EME-G600</u>
Device Type	<u>Dummy</u>	Au Wire	<u>N/A</u>
Lot No.	<u>N/A</u>	Epoxy	<u>N/A</u>
Request No.	<u>103058</u>	Die Coating	<u>N/A</u>
Lead Plating	<u>Matte Tin</u>	Received Date	<u>01/23/2014</u>

### Test Conditions

#### 試驗條件

1. Sample Plan : N=5 AC=0 RE=1
2. Conditions : Angle 90° ,Weight 3oz ,must ≥3.0cycles
3. Test Frequency : PPCM,Freq. once/quarter Qualification Customer Requirement  
Material /Operation parameter of material change Others : PE request

### Measuring Data

試驗結果 0/5 (failed/total Q'ty) Accept 合格 Reject 不合格

Sample No.	NO.1	NO.2	NO.3	NO.4	NO.5
LEAD 1	20	19.5	19	14.5	18
LEAD 2	16	16.5	12	15.5	17
LEAD 3	14	19.5	17	16	14.5
Maximum	20	19.5	19	14.5	18
Minimum	14	16.5	12	16	14.5
Pass/Fail	PASS	PASS	PASS	PASS	PASS

Approved By: WP Huang    Checked By: Fu Yang    Prepared By: WenHuaWu  
 Date: 01/23/2014                      Date: 01/23/2014                      Date: 01/23/2014



## Lead Fatigue Test 導腳疲勞強度試驗報告

Date : 01/23/2014

Page : 6 of 3

### Sample Information

#### 產品資料

Customer	<u>LPI</u>	Month	<u>01/2014</u>
Package Type	<u>SOT-25M</u>	Leadframe	<u>E64T</u>
Run No.	<u>413687</u>	Mold Compound	<u>EME-G600</u>
Device Type	<u>Dummy</u>	Au Wire	<u>N/A</u>
Lot No.	<u>N/A</u>	Epoxy	<u>N/A</u>
Request No.	<u>103058</u>	Die Coating	<u>N/A</u>
Lead Plating	<u>Matte Tin</u>	Received Date	<u>01/23/2014</u>

### Test Conditions

#### 試驗條件

- Sample Plan : N=5 AC=0 RE=1
- Conditions : Angle 90° ,Weight 2oz ,must ≥2.5cycles
- Test Frequency : PPCM,Freq.once/quarter Qualification Customer Requirement  
Material /Operation parameter of material change Others : PE request

### Measuring Data

試驗結果 0/5 (failed/total Q'ty) Accept 合格 Reject 不合格

Sample No.	NO.1	NO.2	NO.3	NO.4	NO.5
LEAD 1	3.5	3	3	3	3.5
LEAD 2	3	2.5	4	4	3.5
LEAD 3	3.5	2.5	3.5	3.5	4
LEAD 4	3	3	3	3	4
LEAD 5	3.5	3.5	3	4	3.5
LEAD 6	3	3	3.5	3.5	3
Maximum	3.5	3.5	4	4	4
Minimum	3	2.5	3	3	3
Pass/Fail	PASS	PASS	PASS	PASS	PASS

Approved By: WP Huang Checked By: Fu Yang Prepared By: WenHuaWu

Date: 01/23/2014 Date: 01/23/2014 Date: 01/23/2014



## Lead Fatigue Test 導腳疲勞強度試驗報告

Date : 01/23/2014  
Page : 6 of 4

### Sample Information 產品資料

Customer	<u>LPI</u>	Month	<u>01/2014</u>
Package Type	<u>TQ320707</u>	Leadframe	<u>C7025AG</u>
Run No.	<u>413688</u>	Mold Compound	<u>EME-G700</u>
Device Type	<u>Dummy</u>	Au Wire	<u>N/A</u>
Lot No.	<u>N/A</u>	Epoxy	<u>N/A</u>
Request No.	<u>103058</u>	Die Coating	<u>N/A</u>
Lead Plating	<u>Matte Tin</u>	Received Date	<u>01/23/2014</u>

### Test Conditions 試驗條件

1. Sample Plan : N=5 AC=0 RE=1

2. Conditions : Angle 90° ,Weight 2oz ,must ≥2.5cycles

3. Test Frequency : PPCM,Freq.once/quarter Qualification Customer Requirement  
Material /Operation parameter of material change Others : PE request

### Measuring Data

試驗結果 0/5 (failed/total Q'ty) Accept 合格 Reject 不合格

Sample No.	NO.1	NO.2	NO.3	NO.4	NO.5
LEAD 1	4.5	6.5	7.5	6	8
LEAD 2	8.5	6.5	4.5	4.5	4.5
LEAD 3	4.5	4.5	4	5.5	6
LEAD 4	6	4.5	7	4	7
LEAD 5	6.5	5	4.5	6	5.5
LEAD 6	9	4.5	5.5	5.5	6
Maximum	9	6.5	7.5	6	8
Minimum	4.5	4.5	4	4.5	4.5
Pass/Fail	PASS	PASS	PASS	PASS	PASS

Approved By: WP Huang    Checked By: Fu Yang    Prepared By: WenHuaWu  
Date: 01/23/2014                      Date: 01/23/2014                      Date: 01/23/2014



## Lead Fatigue Test 導腳疲勞強度試驗報告

Date : 01/23/2014

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### Sample Information

#### 產品資料

Customer	<u>LPI</u>	Month	<u>01/2014</u>
Package Type	<u>TS481220</u>	Leadframe	<u>C7025AG</u>
Run No.	<u>413689</u>	Mold Compound	<u>EME-G700</u>
Device Type	<u>Dummy</u>	Au Wire	<u>N/A</u>
Lot No.	<u>N/A</u>	Epoxy	<u>N/A</u>
Request No.	<u>103058</u>	Die Coating	<u>N/A</u>
Lead Plating	<u>Matte Tin</u>	Received Date	<u>01/23/2014</u>

### Test Conditions

#### 試驗條件

1. Sample Plan : N=5 AC=0 RE=1
2. Conditions : Angle 90° ,Weight 2oz ,must ≥2.5cycles
3. Test Frequency :  PPCM, Freq. once/quarter  Qualification  Customer Requirement  
 Material /Operation parameter of material change  Others : PE request

### Measuring Data

試驗結果 0/5 (failed/total Q'ty)  Accept 合格  Reject 不合格

Sample No.	NO.1	NO.2	NO.3	NO.4	NO.5
LEAD 1	2.5	3	2.5	3	2.5
LEAD 2	2.5	3.5	3.5	2.5	2.5
LEAD 3	2.5	3.5	3.5	3.5	3.5
LEAD 4	4	2.5	2.5	3.5	3.5
LEAD 5	3.5	2.5	2.5	3	2.5
LEAD 6	2.5	2.5	3	2.5	3
Maximum	4	3.5	3.5	3.5	3.5
Minimum	2.5	2.5	2.5	2.5	2.5
Pass/Fail	PASS	PASS	PASS	PASS	PASS

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## Lead Fatigue Test 導腳疲勞強度試驗報告

Date : 01/23/2014

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### Sample Information

#### 產品資料

Customer	<u>LPI</u>	Month	<u>01/2014</u>
Package Type	<u>PLC032</u>	Leadframe	<u>C151AG</u>
Run No.	<u>413690</u>	Mold Compound	<u>EME-G600</u>
Device Type	<u>Dummy</u>	Au Wire	<u>N/A</u>
Lot No.	<u>N/A</u>	Epoxy	<u>N/A</u>
Request No.	<u>103058</u>	Die Coating	<u>N/A</u>
Lead Plating	<u>Matte Tin</u>	Received Date	<u>01/23/2014</u>

### Test Conditions

#### 試驗條件

1. Sample Plan : N=5 AC=0 RE=1
2. Conditions : Angle 90° ,Weight 3oz ,must ≥3.0cycles
3. Test Frequency :  PPCM, Freq. once/quarter  Qualification  Customer Requirement  
 Material /Operation parameter of material change  Others : PE request

### Measuring Data

試驗結果 0/5 (failed/total Q'ty)  Accept 合格  Reject 不合格

Sample No.	NO.1	NO.2	NO.3	NO.4	NO.5
LEAD 1	4	5.5	4.5	4.5	3.5
LEAD 2	5	5	5.5	5.5	5.5
LEAD 3	5.5	4.5	7.5	6	4.5
LEAD 4	5	4.5	4	5.5	5
LEAD 5	3.5	6	4.5	4.5	5
LEAD 6	4.5	6.5	4.5	4	4.5
Maximum	5.5	6.5	7.5	6	5.5
Minimum	3.5	4.5	4	4	3.5
Pass/Fail	PASS	PASS	PASS	PASS	PASS

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 Date: 01/23/2014                      Date: 01/23/2014                      Date: 01/23/2014