

Product / Process Change Notice

PCN No.: Q000-PCN-PA201512-05

Date: 2015-12-03.

<p>Change Title: <u>Add ASE-CL as new assembly and testing site for NAU8822LYG product.</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>Affected Product(s) :</p> <p>The affected product is NAU8822LYG.</p>			
<p>Description of Change(s) :</p> <p>Add new assembly site for NAU8822LYG at ASECL (ASE Group ChungLi site, Taiwan) as the 2nd source for back up. ASECL is a qualified vendor for Nuvoton in assembly process.</p> <p><u>New Supplier</u></p> <p>ASE Group ChungLi site, Taiwan (hereinafter "ASECL"), (550, Chung-Hwa Road Section 1, Chung-Li, 320, Taiwan, R.O.C.)</p>			
<p>Reason for Change(s) :</p> <p>To increase manufacturing capacity and flexibility and to have multiple manufacturing routes for backup in case of disruption, Nuvoton is adding a new source of NAU8822LYG product at ASECL.</p>			
<p>Impact of Change(s) : (positive & negative)</p> <p>Form: No change on top effective marking except marking code. The marking code of ASECL shall be "A", please refer to Fig.1 for details.</p> <p>Fit: No change.</p> <p>Function: No change.</p> <p>Reliability: No concern (Passed Nuvoton package qualification.)</p>			
<p>Qualification Plan/ Results :</p> <p>QFN series packages were qualified as per Nuvoton's standard qualification procedures, please refer to appendix A for the qualification report."</p>			
<p>Implementation Plan :</p> <p><input type="checkbox"/> Date Code: _____ onward <input type="checkbox"/> Lot No.: _____ onward <input checked="" type="checkbox"/> Implemented date: <u>Mar. 01, 2016 (scheduled)</u></p>			
Originator:	H.Y. Lai / Q100	Approval:(QA Director)	K.L. Lin/ Q000
Contact for Questions & Concerns	<p>Name: <u>HYLai</u> TEL: <u>886-3-5770066</u> (ext. <u>31226</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: _____ _____ _____ _____.

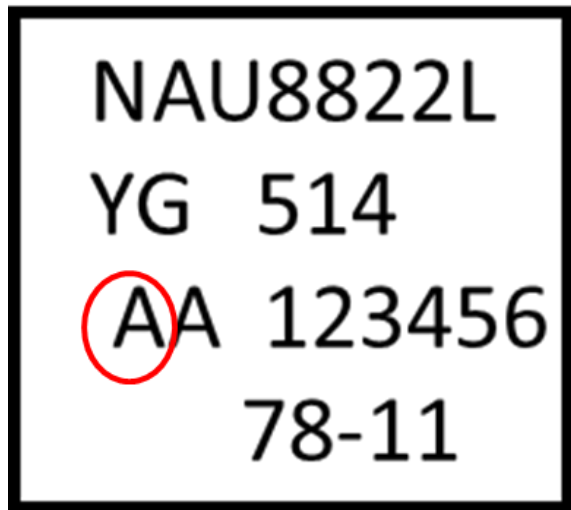
B. Changes:

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: _____.

Fig.1 The marking code of ASECL in the position marked in red shall be “A”



PACKAGE QUALIFICATION REPORT

Company: ASE(Chung-Li)

Package: QFN Series

Package Material: GREEN

Wire Bonding Material: Cu wire

ASSISTANT MANAGER : 許心怡

RA MANAGER : 蔡明耀

Publication Release Date: May.2011

SUMMARY

The **QFN series** product was passed the qualification tests.
A summary of the test result was as follows:

Pa. Wire Pull Test	: 5 units / 30 wires
Pa. Ball Shear Test	: 5 units /30 balls
Pa. Pre-condition Test	: 0/270 EA
Pa. Pressure Cooker Test	: 0/135 EA
Pa. Temperature Cycle Test	: 0/135 EA
Pa. Highly Temp. Storage Life Test	: 0/135 EA

Publication Release Date: Dec.2010

I . ENVIRONMENTAL TEST

A. Introduction

1. Wire Pull Test
2. Ball Shear Test
3. Pre-condition Test
4. Pressure Cooker Test (PCT)
5. Temperature Cycle Test (TCT)
6. High Temp. Storage Life Test(HTSL)

B. Test Results

1. Wire Pull Test
2. Ball Shear Test
3. Pre-condition Test
4. Pressure Cooker Test (PCT)
5. Temperature Cycle Test (TCT)
6. Highly Temp. Storage Life Test(HTSL)

I . ENVIRONMENTAL TESTS OF PROCEDURE

A. Introduction

1. Wire Pull Test

1.1 SCOPE

Wire Pull Test is to measure the First bond and Second bond quality at the Assembly wire bonding process.

1.2 TEST CONDITION

5 units 30 wires CPK \geq 1.66

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2. Ball Shear Test

2.1 SCOPE

Ball Shear Test is to measure the Copper ball quality on pad of chip.

2.2 Test condition:

5 units 30 balls CPK \geq 1.66

3. Pre-condition Test

3.1 SCOPE

Pre-condition Test is to measure the resistance of SMD (Surface Mount Devices) to the storage environment at the customer site and to thermal stress created by IR reflow or Vapor Phase Reflow.

3.2 TEST CONDITION

Step 1 : TCT(-65°C/150°C, 5 cycles)

Step 2 : Bake(125°C, 24 hours)

Step 3 : Soak(30°C/60%RH, 192 hours)

Step 4 : IR reflow (260 °C), 3 Passes.

3.3 SAT COFIRMATION: To confirm delamination, cracking, popcorn .

Criteria: IPC/JEDEC J-STD-020D

3.4 IR REFLOW PROFILE (FOR IPC/JEDEC J-STD-020D)

Temp.	Criteria
Preheat 150 °C to 200 °C	60~120 sec
Time maintained above: Above 217 °C	60~150 sec
Peak temp	260 °C +0 °C/-5 °C

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Time within 5 °C of actual Peak Temperature of peak	20~40 sec
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4. Pressure Cooker Test (PCT)

4.1 SCOPE

PCT is to evaluate the device resistance to moisture penetration.

4.2 TEST CONDITION

Ta = 121°C, RH = 100%, Td = 168 Hrs. 2 ATM ,(JESD22-A102-A)

5. Temperature Cycle Test (TCT)

5.1 SCOPE

TCT is to evaluate the resistance of device to environmental temperature change.

5.2 TEST CONDITION

-65°C / 15min, transfer time 1min, +150 °C/15min, 1000 cycles.

MIL-STD-883E, Method 1010, Condition "C".

6. Highly Temp. Storage Life Test (HTSL)

6.1 SCOPE

The purpose of this test is to determine the effect on solid state electronic devices of storage at elevated temperature without electrical stress applied.

6.2 Test condition:

Temperature: 150°C, Time: 1000hrs

B. Test Results

1. Wire Pull Test

- Sample size : 5units / 30wires
- Spec: ≥ 3 g
- Max: 11.697 g

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- Min: 9.603g
 - Avg. : 10.77 g
 - CPK: 4.988
- Criteria : CPK \geq 1.66

2. Ball Shear Test

- Sample size : 5units / 30 balls
 - Spec: \geq 15 g
 - Max: 17.787 g
 - Min: 15.238 g
 - Avg. : 16.651 g
 - CPK: 4.360
- Criteria : CPK \geq 1.66

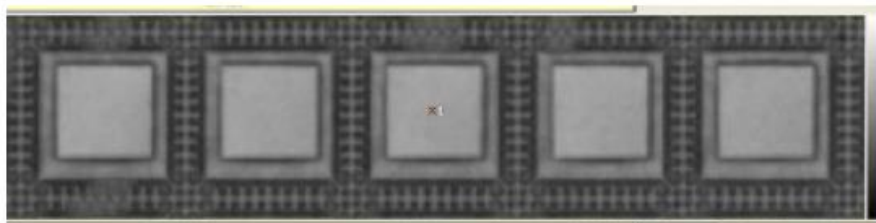
3.1 Pre-condition Test

Run	Lot No.	SAT before Precondition		SAT After Precondition		Electric result
		Topside	Backside	Topside	Backside	FT
#1	E037B006-ZX	0/135	0/135	0/135	0/135	0/135
#2	E037B006-ZY	0/135	0/135	0/135	0/135	0/135
#3	E037B006-ZZ	0/135	0/135	0/135	0/135	0/135

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*Criteria: Acc/Rej = 0/1.

3.2 SAT confirmation: PASS



4. Pressure Cooker Test (PCT)

Run	Package	168 Hrs	Result	Remark
#1	E037B006-ZX	0/45	Pass	
#2	E037B006-ZY	0/45	Pass	
#3	E037B006-ZZ	0/45	Pass	

*Criteria : Acc/Rej = 0/1.

5. Temperature Cycle Test (TCT)

Run	Package	1000 Cycles	Result	Remark
#1	E037B006-ZX	0/45	Pass	
#2	E037B006-ZY	0/45	Pass	
#3	E037B006-ZZ	0/45	Pass	

*Criteria : Acc/Rej = 0/1.

6. Highly Temp. Storage Life Test (HTSL)

Run	Package	1000 Hrs	Result	Remark
#1	E037B006-ZX	0/45	Pass	
#2	E037B006-ZY	0/45	Pass	

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#3	E037B006-ZZ	0/45	Pass	
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*Criteria : Acc/Rej = 0/1.

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