MACRONIX INTERNATIONAL CO., LTD.

Product/Process Change Notice

PCN # P-2109-0003
Date: 2021/9/23

Dear Customer:

Please be informed that Macronix is going to add 2nd source assembly subcontractor to backup customer original approved assembly subcontractors for 48 TSOP package products. The 2nd source assembly subcontractor is LINGSEN.

The detailed information about this change is described in the following pages. This process change has passed Macronix' qualification based on JEDEC standard, and the qualification report is attached below.

Please let us know within 30 days if your esteemed company has any questions, concerns, or requests about this change. Otherwise, it will be deemed as your esteemed company has accepted the change. Macronix follows JEDEC J-STD-046, which stipulates: ".....Lack of acknowledgement of the PCN within 30 days constitutes acceptance of the change".

Thank you.

Macronix International Co., Ltd.
旺宏電子股份有限公司

PCN No.: P-2109-0003 **Issue Date :** 2021/9/23

Subject: Adding a new assembly vendor–LINGSEN for 48 TSOP package products.

Affected Macronix Part No.:

MX29F200CBTI-70G, MX29F200CTTI-70G, MX29F400CBTC-70G, MX29F400CBTI-70G, MX29F400CBTI-90G, MX29F400CTTC-70G, MX29F400CTTI-70G, MX29F800CBTI-70G, MX29F800CBTJ-70Q, MX29F800CTTI-70G, MX29F800CTTJ-70Q, MX29GL320EBTI-70G, MX29GL320ETTI-70G, MX29GL640EBTI-70G, MX29GL640ELTI-70G, MX29GL640ETTI-70G, MX29GL640ETTI-90G, MX29LV400CBTC-70G, MX29LV400CBTI-55Q, MX29LV400CBTI-70G, MX29LV400CBTI-90G, MX29LV800CBTC-70G, MX29LV800CBTC-90G, MX29LV800CBTI-55Q, MX29LV800CBTI-70G, MX29LV800CBTL-70G, MX29LV800CTTC-70G, MX29LV800CTTC-90G, MX29LV800CTTI-70G, MX29SL402CBTI-90G, MX29SL402CTTI-90G

Package type: 48 TSOP package products

Change Category : New assembly vendor

Reason of Change:

To increase 48 TSOP package assembly capacity and flexibility.

Before Change :	**After Change :**
Assembly vendor:	Assembly vendors:
1. SPIL	1. SPIL
	2. LINGSEN

Product identification:

SPIL-assembled IC marking vendor code: S

LINGSEN-assembled IC marking vendor code: L

Assessment of Change:

1. No impact to Form, Fit, Function, Quality & Reliability.
2. LINGSEN assembled 48 TSOP package has passed Macronix' qualification based on JEDEC MSL level 3 standards, and it is also Halogen-Free, and meets the RoHS standards..
   * Attached is LINGSEN assembled 48 TSOP package qualification report.
3. LINGSEN has been one of Macronix' qualified assembly vendors with good quality for a long time.

Schedule:

Sample available date: 2021/9/23

1st shipping date: 2021/11/1 (For customers who approved the PCN)

LINGSEN 48L TSOP(I) Package Qualification Report

1. PURPOSE:

To qualify the new assembly subcontractor “LINGSEN” for 48L TSOP package.

2. PACKAGE PROFILE:

ASSEMBLY HOUSE	LINGSEN
PACKAGE	48L TSOP(I) (12x20 mm)
DIE SIZE	3502 x 5144 μm^2
DIE ATTACH	Sumitomo CRM-1076WA
LEAD FRAME	Copper
WIRE BOND MATERIAL	Au
MOLD COMPOUND	Sumitomo EME-G700
LEAD FINISH	Matte Sn

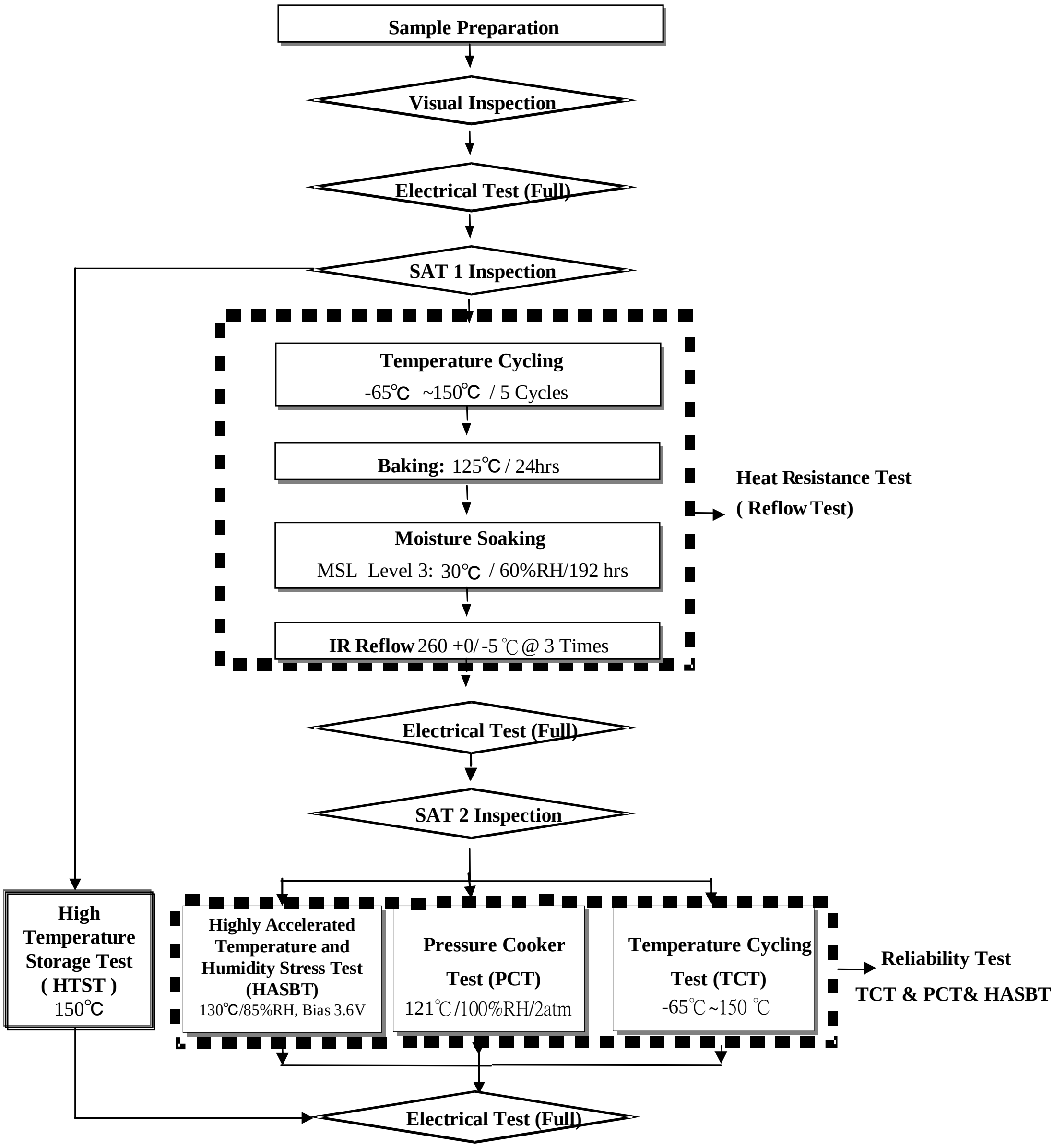
3. QUALIFICATION ITEMS, TEST CONDITION AND FLOW:

3-1. QUALIFICATION ITEMS:

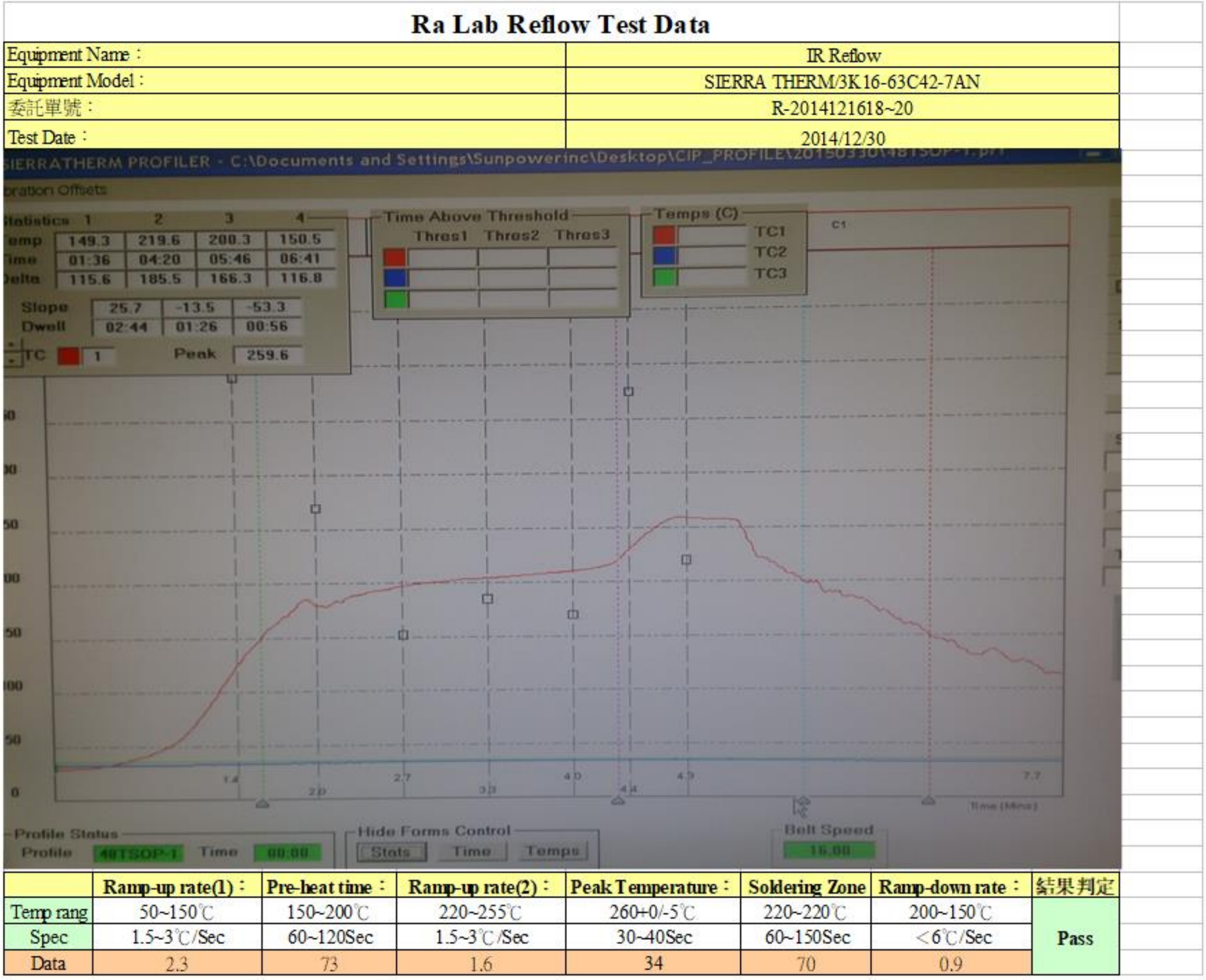
Test Item	Reference	Test Condition
1. Heat Resistance Test: Reflow Test	JEDEC J-STD-020	MSL: Follow JEDEC MSL Level 3 (30℃/ 60%RH, 192hrs)
2. Pressure Cooker Test	JESD22-A102	121℃/ 100%RH/2 atm
3. Temperature Cycling Test	JESD22-A104	-65℃ ~150℃
4. Highly Accelerated Temperature and Humidity Stress Test	JESD22-A110	130℃/ 85% RH, Bias: 3.6V
5. High Temperature Storage Test	JESD22-A103	@150℃
6. Solderability Test	JESD22-B102	■ Steam aging 8hrs & Dipping Time≦ 5sec ■ Sn-Ag-Cu solder paste: 245℃ ■ Sn-Pb solder paste: 235℃

*Perform SAT examination before and after Preconditioning per JESD22-A112.

3-2. HEAT RESISTANT TEST (REFLOW TEST) AND RELIABILITY TEST FLOW



3-2-1. REFLOW PROFILE:



Ra Lab Reflow Test Data

Equipment Name：	IR Reflow
Equipment Model：	SIERRA THERM/3K16-63C42-7AN
委託單號：	R-2014121618~20
Test Date：	2014/12/30

Statistics	1	2	3	4
Temp	149.3	219.6	200.3	150.5
Time	01:36	04:20	05:46	06:41
Delta	115.6	185.5	166.3	116.8

Slope	25.7	-13.5	-53.3
Dwell	02:44	01:26	00:56

TC 1 Peak 259.6

Profile Status: Profile 48TSOP-1 Time 00:00

Belt Speed 16.00

	Ramp-up rate(1)：	Pre-heat time：	Ramp-up rate(2)：	Peak Temperature：	Soldering Zone	Ramp-down rate：	結果判定
Temp rang	50~150℃	150~200℃	220~255℃	260+0/-5℃	220~220℃	200~150℃	**Pass**
Spec	1.5~3℃/Sec	60~120Sec	1.5~3℃/Sec	30~40Sec	60~150Sec	＜6℃/Sec	
Data	2.3	73	1.6	34	70	0.9	

Note 1: Subject the samples to 3 cycles of the above defined reflow conditions

Note 2: Time 25℃ to peak temperature: 8 minutes max.

Note 3: The time between reflows shall be 5 minutes minimum and 40 minutes maximum.

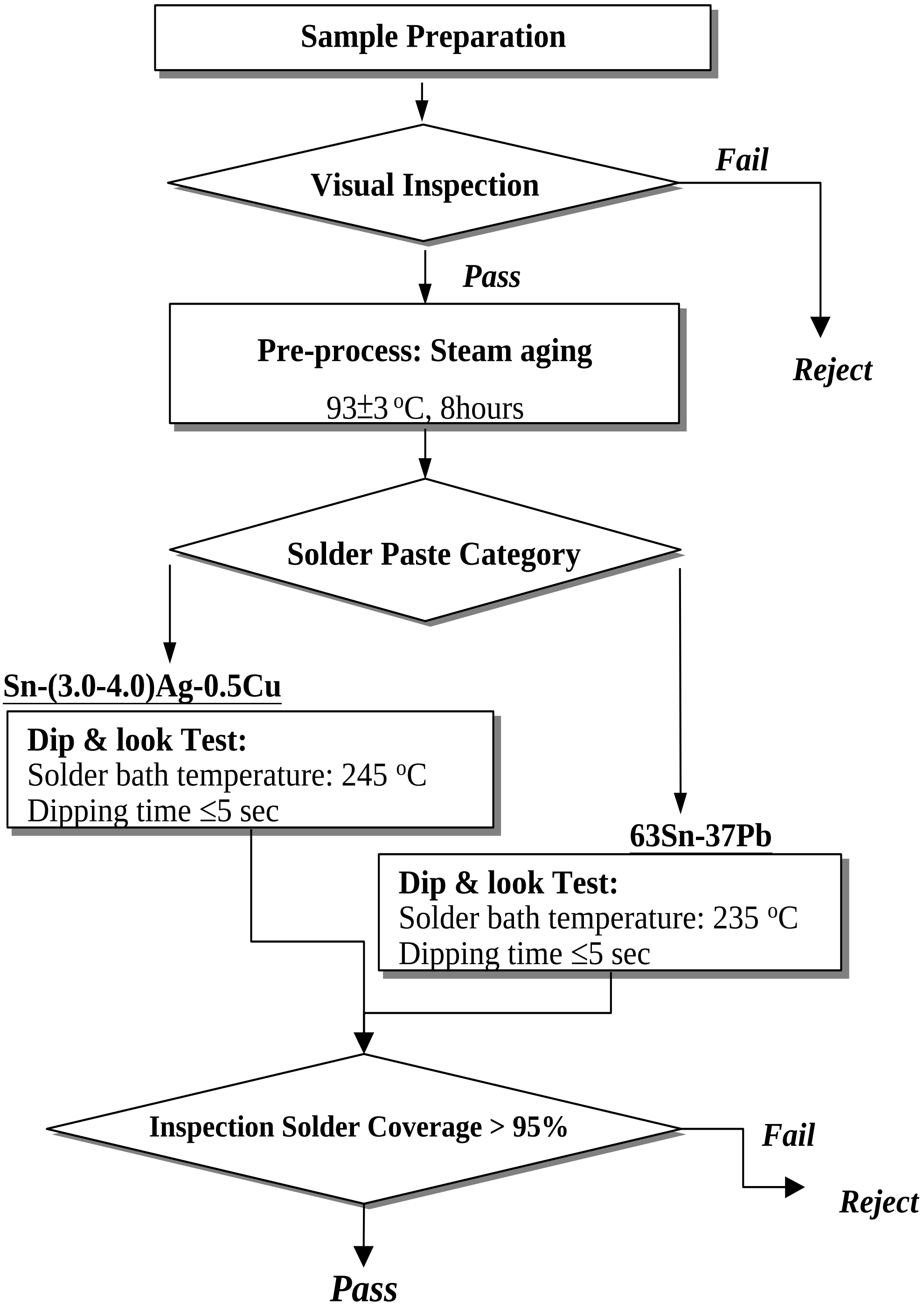
3-2-2. CRITERIA:

LTPD= 3%, PCT 96 hours and TCT 500 cycles & HASBT 96 hours & HTST 500 hours.

3-2-3. REFERENCE SPECIFICATION:

5650-0901: ASSEMBLY RELIABILITY QUALIFICATION SPEC

3-3. SOLDERABILITY TEST FLOW



4. RESULTS:

4-1. HEAT RESISTANCE TEST and RELIABILITY TEST RESULTS:

PRODUCT	6310		
LOT#	8B683000B8-1	8B683000B8-1	3E293700C3
DATE CODE	L1509	L1509	L1510
SAT 1	0/22	0/22	0/22
PRECON	0/250	0/250	0/250
SAT 2	0/22	0/22	0/22
PCT 96 HRS	0/77	0/77	0/77
TC 500 CYC	0/77	0/77	0/77
HAST 96 HRS	0/77	0/77	0/77
HTSL 500 HRS	0/45	0/45	0/45

FAIL / SAMPLE SIZE

4-2. SOLDERABILITY TEST RESULTS:

Matte Sn Plating

Plating Material	Matte Sn		
Solder Paste Material	Sn-(3.0-4.0)Ag-0.5Cu		
INSPECTION	0/5	0/5	0/5

FAIL / SAMPLE SIZE

Plating Material	Matte Sn		
Solder Paste Material	63Sn-37Pb		
INSPECTION	0/5	0/5	0/5

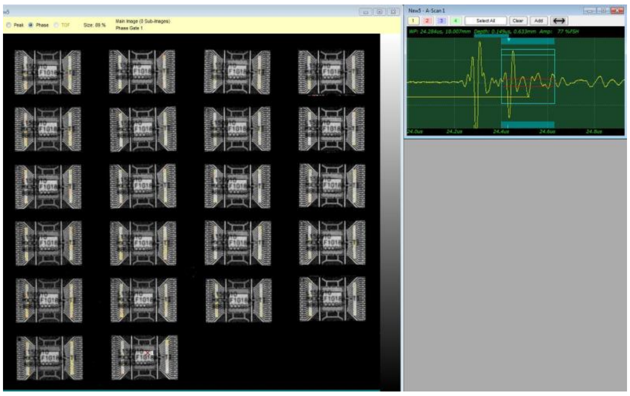
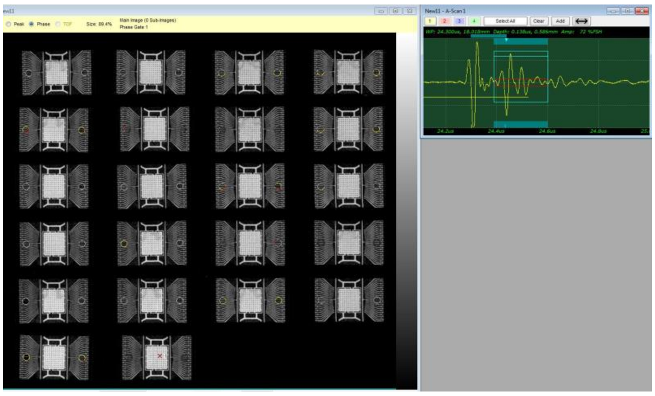
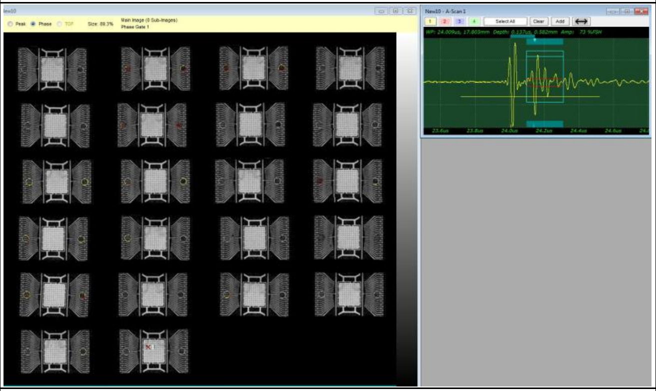
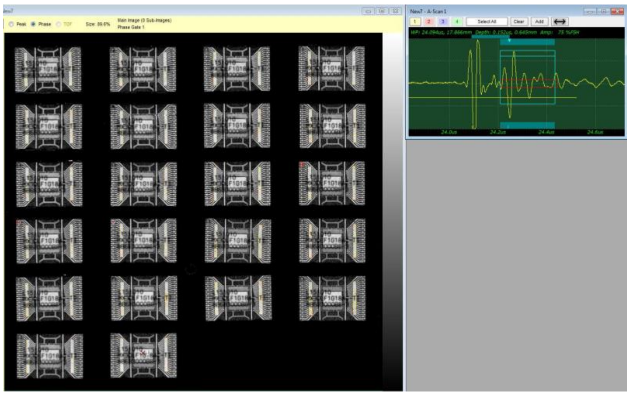
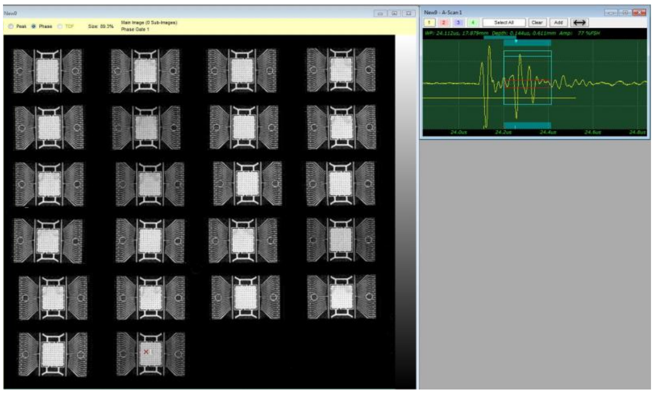
FAIL / SAMPLE SIZE

5. CONCLUSION: PASS

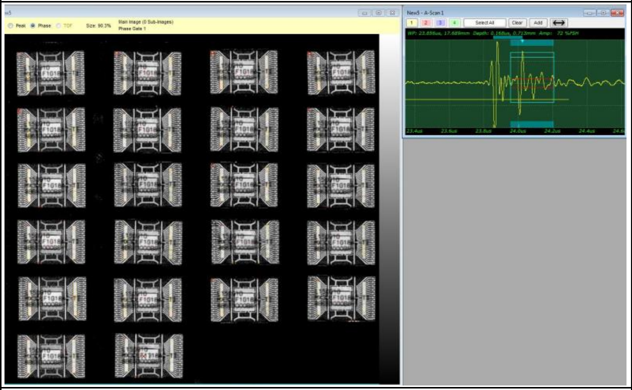
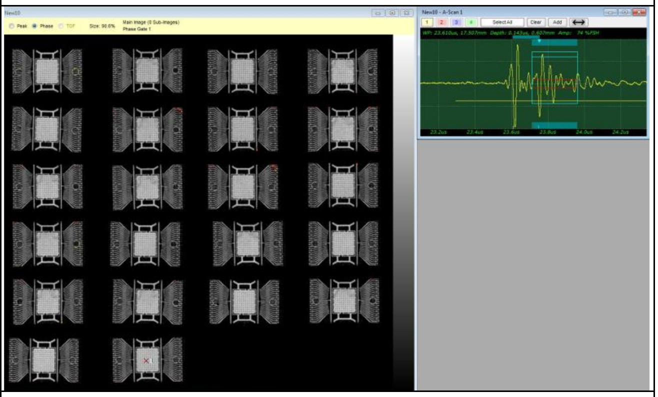
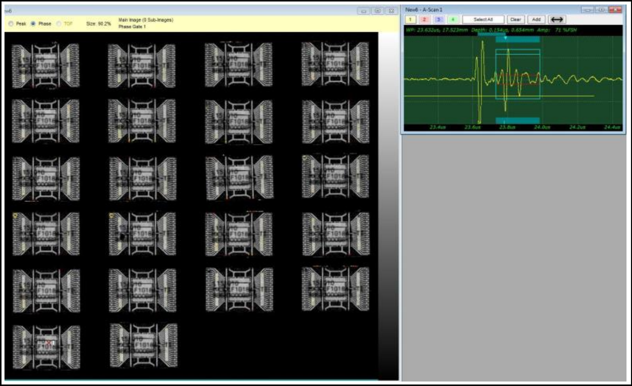
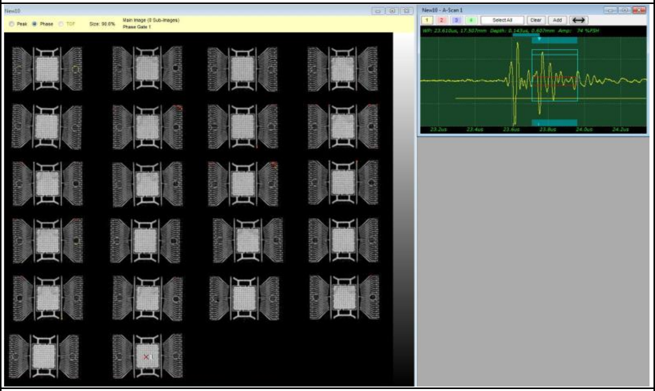
6. ATTACHED FILE:

6-1. SAT PHOTO

6-1-1. BEFORE PRE-CONDITION

a1.Lot no#8B683000B8-1:Topside of package	a2.Lot no#8B683000B8-1:Backside of package
	
b1.Lot no#8B683000B8-2:Topside of package	b2.Lot no#8B683000B8-2:Backside of package
	
c1.Lot no#8B683000B8-3:Topside of package	c2.Lot no#8B683000B8-3:Backside of package
	

6-1-2. AFTER PRE-CONDITION

a1.Lot no#8B683000B8-1:Topside of package	a2.Lot no#8B683000B8-1:Backside of package
	
b1.Lot no#8B683000B8-2:Topside of package	b2.Lot no#8B683000B8-2:Backside of package
	
c1.Lot no#8B683000B8-3:Topside of package	c2.Lot no#8B683000B8-3:Backside of package