



MACRONIX INTERNATIONAL CO., LTD.

Product/Process Change Notice

PCN # P-1509-0001

Date: 2015/11/13

Dear Customer:

Please be informed that Macronix is going to add 2nd source assembly subcontractor to backup customer original approved assembly subcontractors for NAND Flash 48TSOP package products. The 2nd source assembly subcontractor is ChipMOS located in Taiwan.

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.

If you have any questions, concerns, or requests about this change, please contact your local Macronix Sales Representatives within 30 days, otherwise Macronix will assume customer received the PCN with no comments and the change is acceptable to the customer. Macronix follows JEDEC standards, in JESD-46D, it stipulates: ".....Lack of acknowledgement of the PCN within 30 days constitutes acceptance of the change".

Thank you.

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(Note: For the customers who receive Macronix PCNs via distributors, Macronix will assist the distributors to convey the PCNs to the customers. It is each distributor's responsibility to communicate and track the responses of each customers and report back to Macronix, the distributor shall assume full responsibilities if failed to do so.)

PCN No.: P-1509-0001

Issue Date : 2015/11/13

Subject: Adding a new assembly vendor– ChipMOS for NAND Flash 48TSOP package products.

Affected Macronix Part No.:

MX30LF2G18AC-TI, MX30LF2G28AB-TI, MX30LF2GE8AB-TI, MX30LF4G18AC-TI,
MX30LF4G28AB-TI, MX30LF4G28SB-TI, MX30LF4GE8AB-TI, MX30UF2G18AB-TI,
MX30UF2G28AB-TI, MX30UF4G18AB-TI, MX30UF4G28AB-TI, MX60LF8G18AC-TI,
MX60LF8G28AB-TI

Package type: NAND Flash 48TSOP package products

Change Category : New assembly vendor

Reason of Change: To increase NAND Flash 48TSOP package assembly capacity and flexibility.

Before Change :

Assembly vendor:

SPIL

After Change :

Assembly vendors:

SPIL

ChipMOS

Product identification:

ChipMOS assembled IC marking vendor code: a

SPIL assembled IC marking vendor code: S

Assessment of Change:

1. No impact to Form, Fit, Function, Quality & Reliability.
2. ChipMOS assembled 48TSOP had passed internal Macronix's qualification based on JEDEC MSL level 3 standards and it is also Halogen-Free, and meets RoHS compliance.
* Attached is ChipMOS assembled 48TSOP package qualification report
3. ChipMOS has been one of Macronix's high performing assembly vendors for other package types for a long time.

Schedule:

CS Sample available: 2015/09/30

Mass production: 2015/12/01.



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ChipMOS 48L TSOP(I) Package Qualification Report

1. PURPOSE:

To qualify new assembly subcontractor “ChipMOS” for 48TSOP package.

2. PACKAGE PROFILE:

ASSEMBLY HOUSE	ChipMOS
PACKAGE	48L TSOP(I) (12 x 20 mm)
DIE SIZE	6898 x 7351 μm^2
DIE ATTACH	Nitto EM-710
LEAD FRAME	Copper
WIRE BOND MATERIAL	Au
MOLD COMPOUND	Hitachi 9740HF
LEAD FINISH	Matte Sn

3. QUALIFICATION ITEMS, TEST CONDITIONS, AND TEST FLOW:

3-1. QUALIFICATION ITEMS:

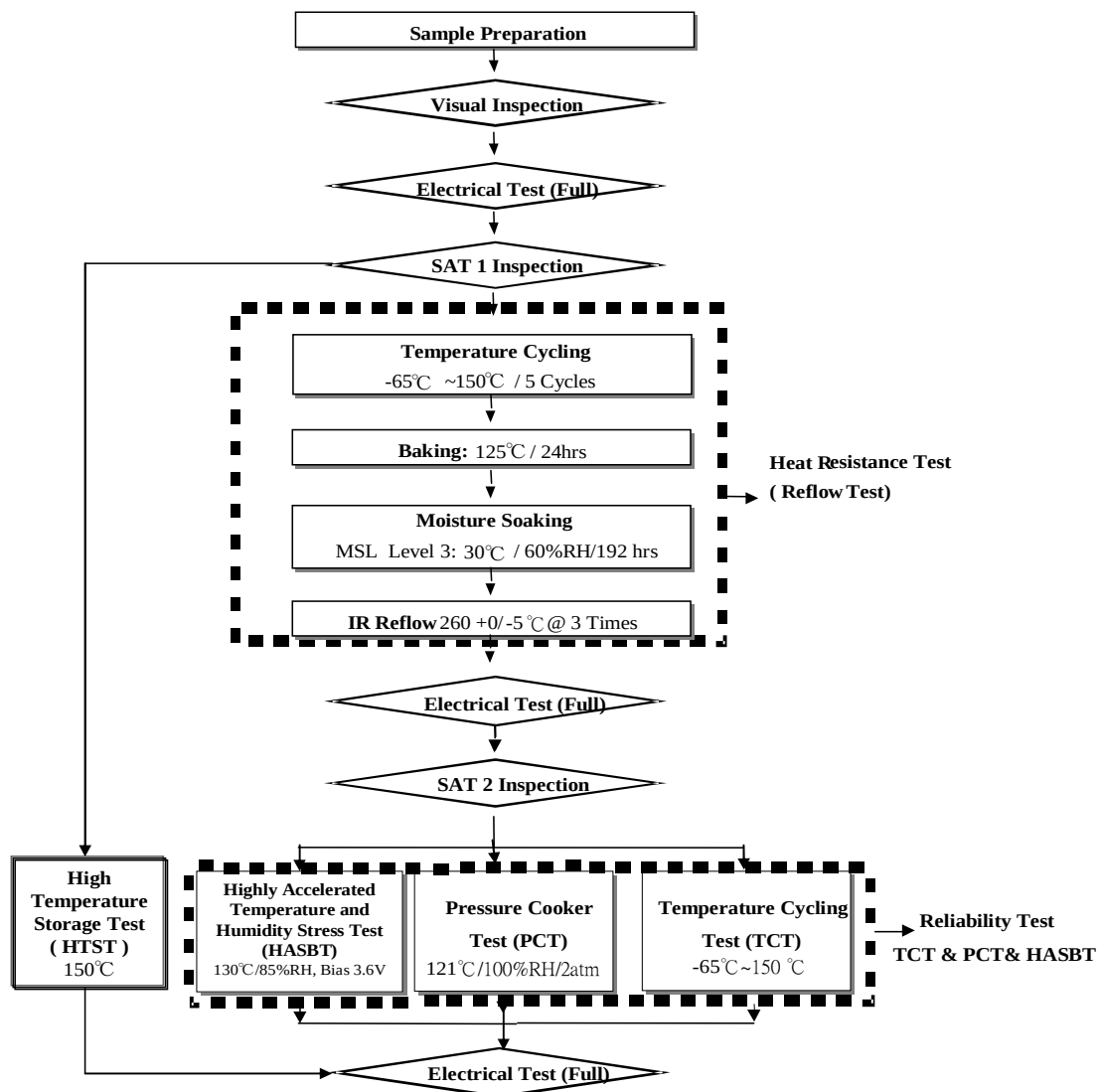
Test Item	Reference	Test Condition
1. Heat Resistance Test: Reflow Test	JEDEC J-STD-020	MSL: Follow JEDEC MSL Level 3 (30°C / 60%RH, 192hrs)
2. Pressure Cooker Test	JESD22-A102	121°C / 100%RH/2 atm
3. Temperature Cycling Test	JESD22-A104	-65°C ~150°C
4. Highly Accelerated Temperature and Humidity Stress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

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



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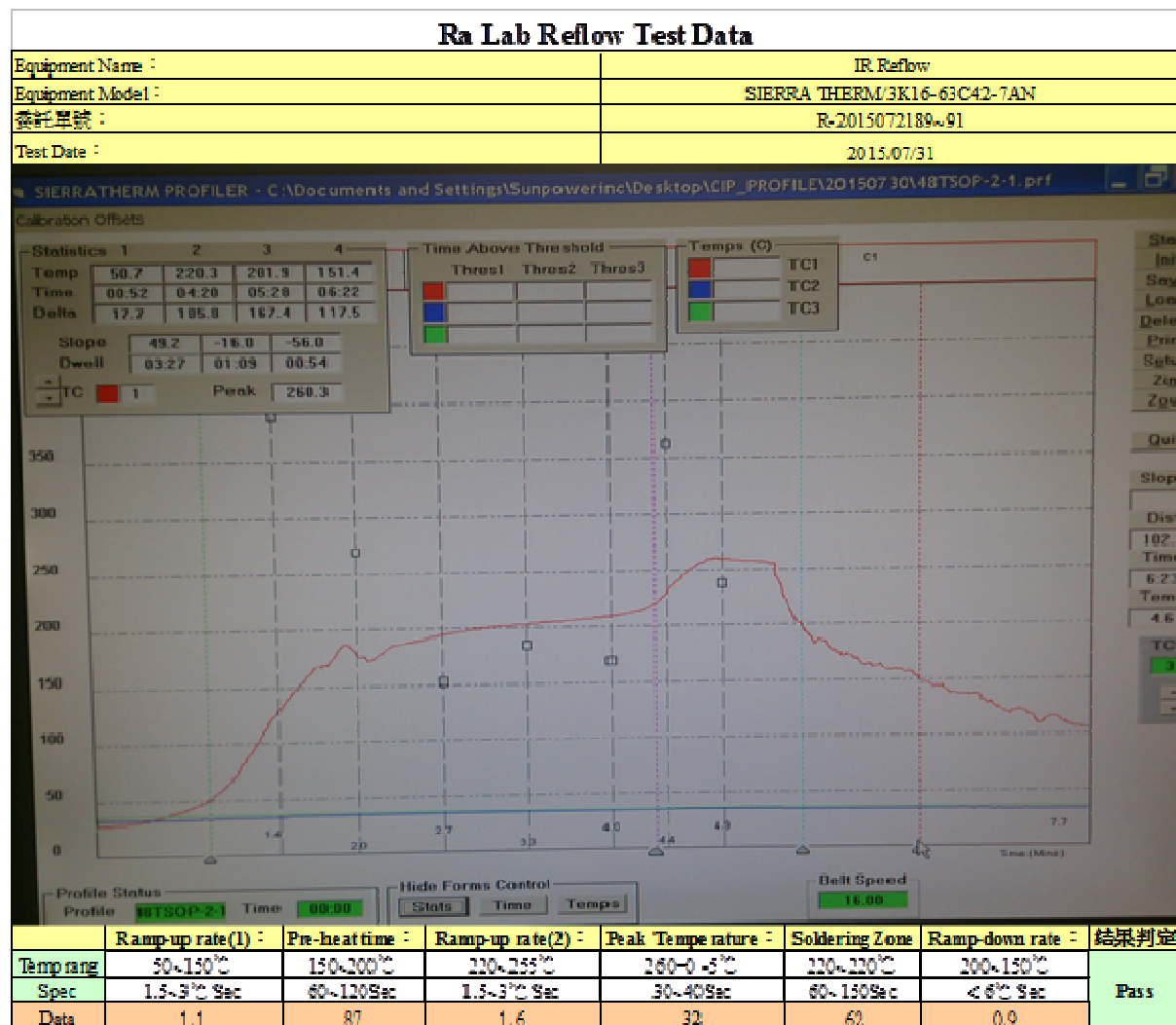
3-2. HEAT RESISTANT TEST (REFLOW TEST) AND RELIABILITY TEST FLOW





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3-2-1. REFLOW PROFILE



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

Note 2: Time 25°C 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.

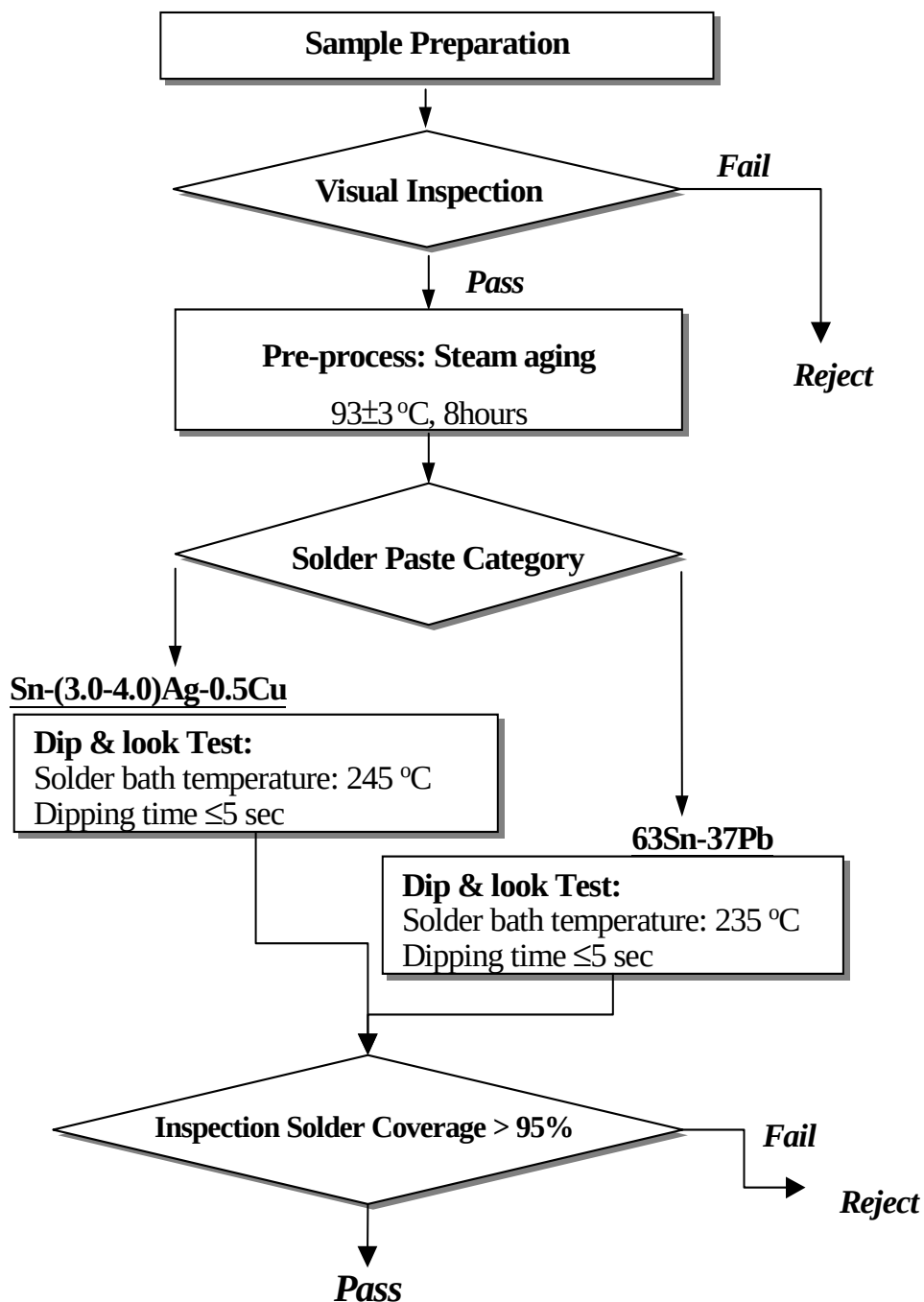
3-2-3. REFERENCE SPECIFICATION

5650-0901: ASSEMBLY RELIABILITY QUALIFICATION SPEC



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3-3. SOLDERABILITY TEST FLOW





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4. RESULTS

4-1. HEAT RESISTANCE TEST and RELIABILITY TEST RESULTS

PRODUCT	6311		
LOT#	8B630800A6-1	8B630800A6-2	8B630800A6-3
DATE CODE	a1524	a1524	a1525
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
TCT 500 CYC	0/77	0/77	0/77
HASBT 96 HRS	0/77	0/77	0/77
HTST 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

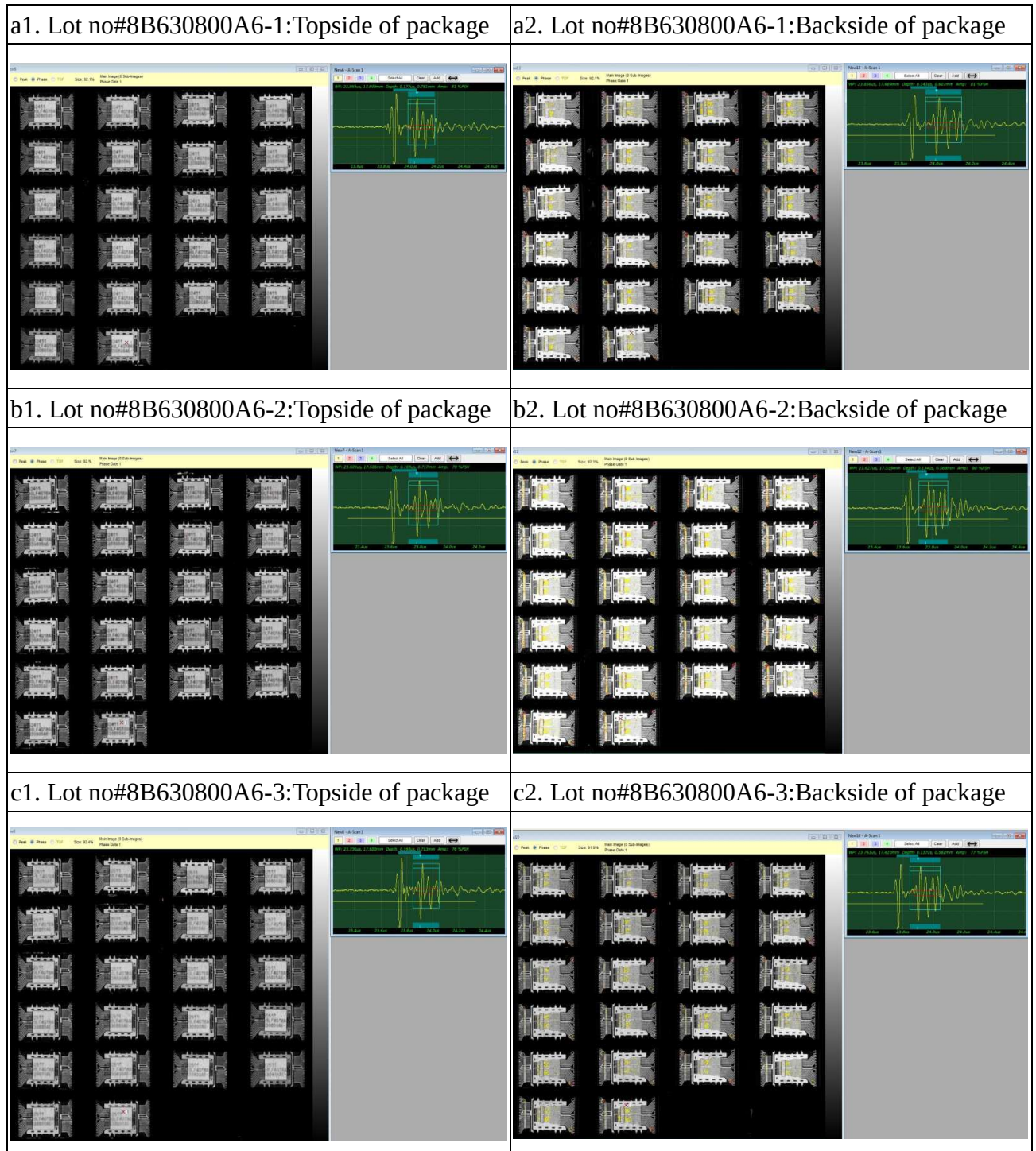


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6. ATTACHED FILE

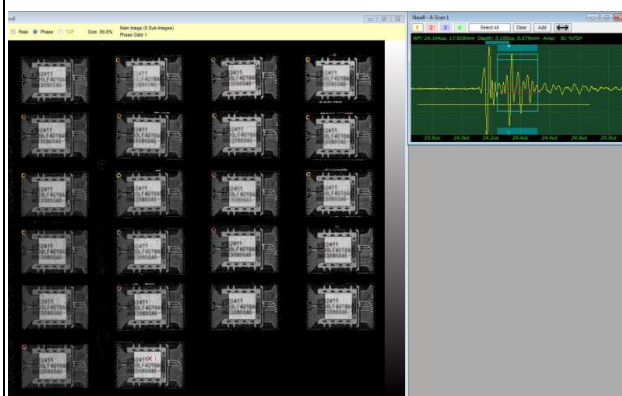
6-1. SAT PHOTO

6-1-1. BEFORE PRE-CONDITION

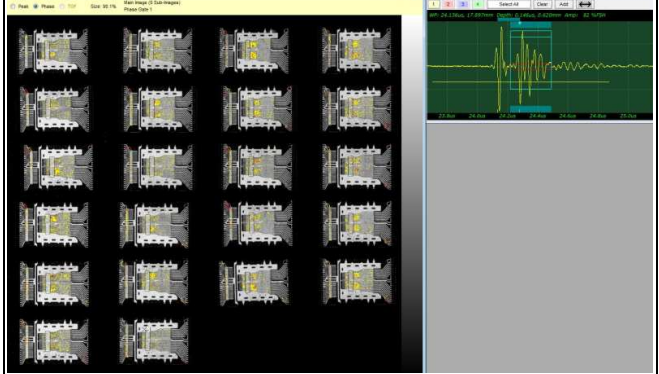


6-1-2. AFTER PRE-CONDITION

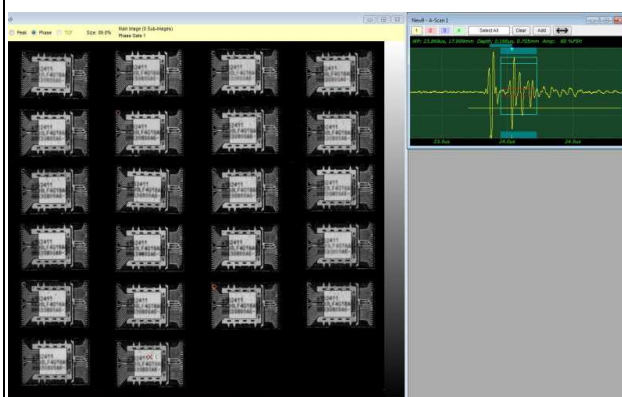
a1. Lot no#8B630800A6-1:Topside of package



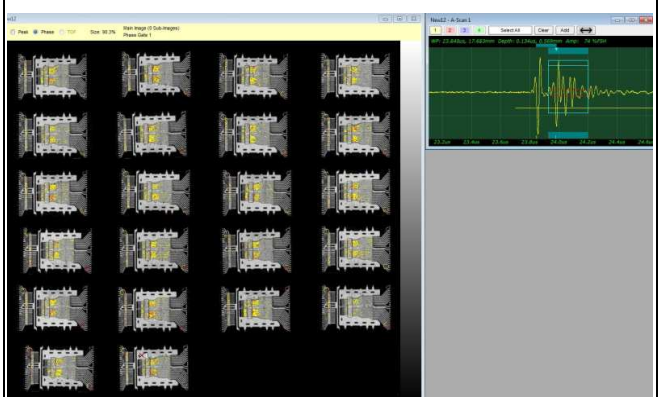
a2. Lot no#8B630800A6-1:Backside of package



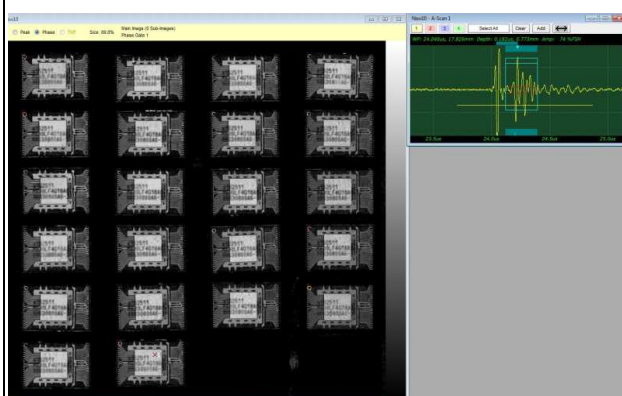
b1. Lot no#8B630800A6-2:Topside of package



b2. Lot no#8B630800A6-2:Backside of package



c1. Lot no#8B630800A6-3:Topside of package



c2. Lot no#8B630800A6-3:Backside of package

