



MACRONIX INTERNATIONAL CO., LTD.

Product/Process Change Notice

PCN # P-2204-0003

Date: 2022/05/13

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.

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 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-2204-0003

Issue Date : 2022/05/13

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

Affected Macronix Part No.:

MX29GL640EBTI-70G

MX29GL640EHTI-70G

MX29GL640ELTI-70G

MX29GL640ETTI-70G

MX29GL640ETTI-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 :

Assembly vendor:

1. SPIL

After Change :

Assembly vendors:

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: 2022/4/30

1st shipping date: 2022/8/1 (Or follow PCN agreement with the customer)



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:

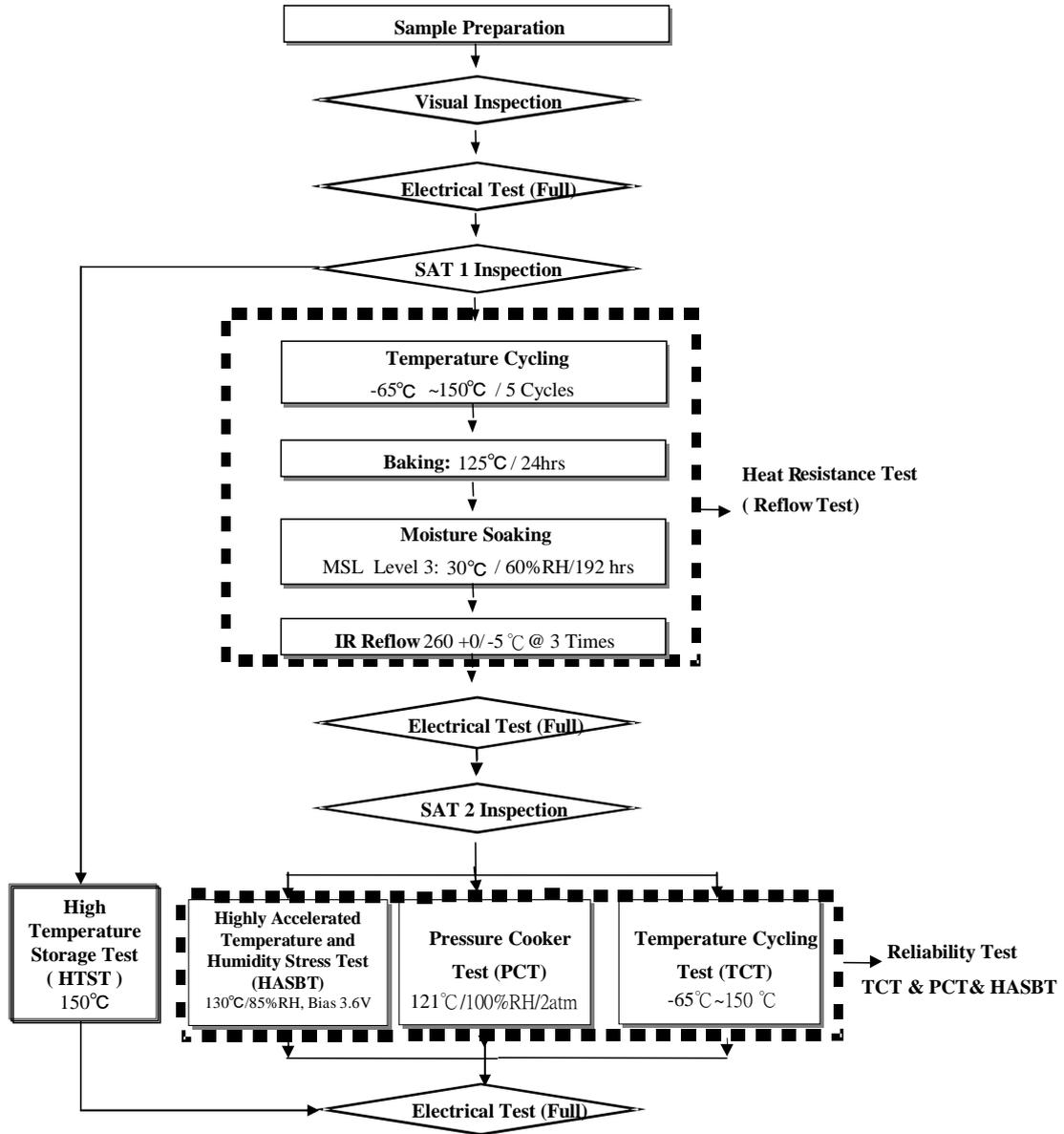
3-1. QUALIFICATION ITEMS:

| Test Item | Reference | Test Condition |
|------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Heat Resistance Test: Reflow Test | JEDEC J-STD-020 | MSL: Follow JEDEC MSL Level 3 (30°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 | <ul style="list-style-type: none"> ■ 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.



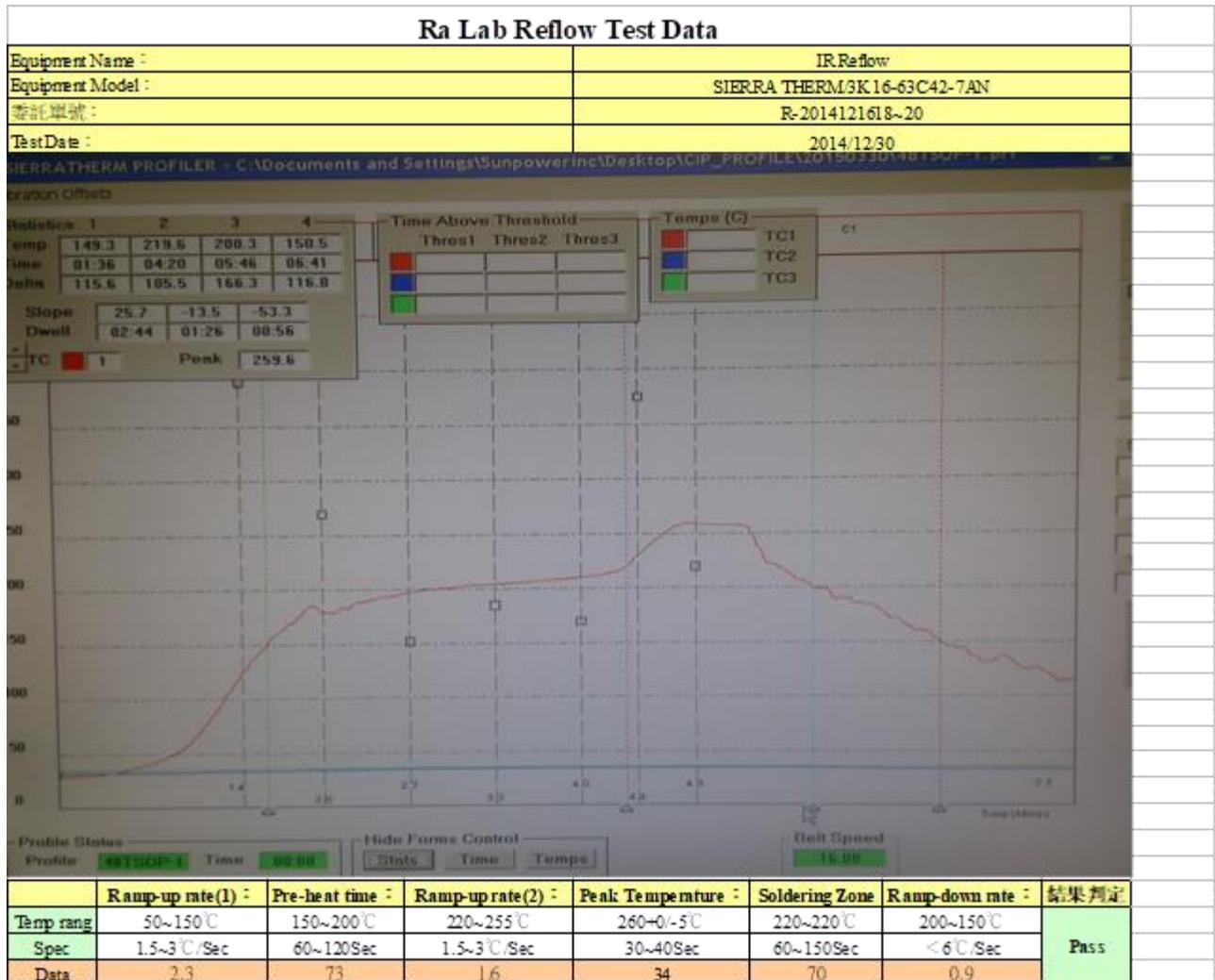
3-2. HEAT RESISTANT TEST (REFLOW TEST) AND RELIABILITY TEST FLOW





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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:

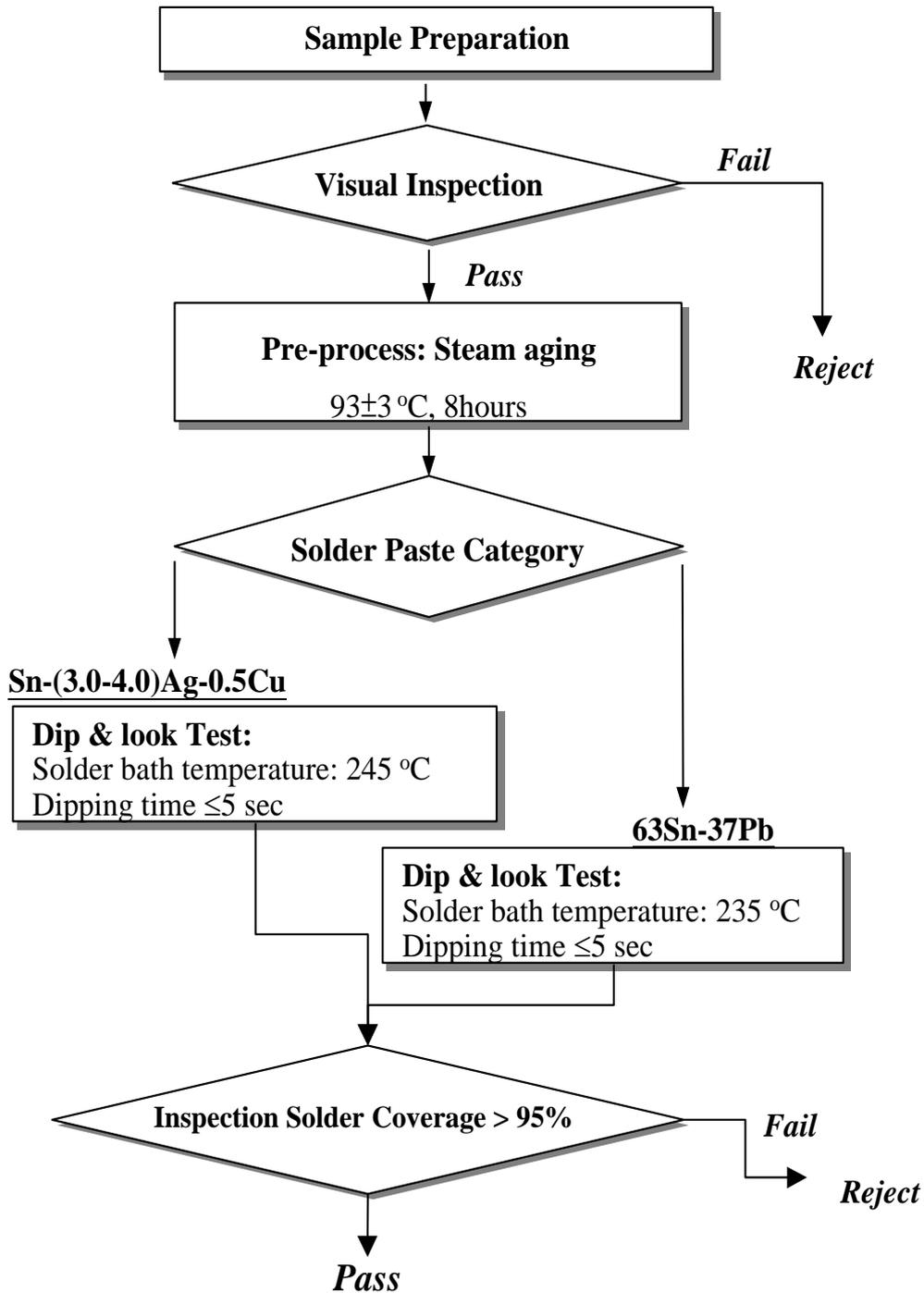
LTPD= 3%, PCT 96 hours and TCT 500 cycles & HASBT 96 hours & HTST 500 hours.

3-2-3. REFERENCE SPECIFICATION:

5650-0901: ASSEMBLY RELIABILITY QUALIFICATION SPEC



3-3. SOLDERABILITY TEST FLOW





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4. RESULTS:

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

| PRODUCT | 6310 | | |
|--------------|--------------|--------------|--------------|
| LOT# | 8B683000B8-1 | 8B683000B8-2 | 8B683000B8-3 |
| 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 |
| 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

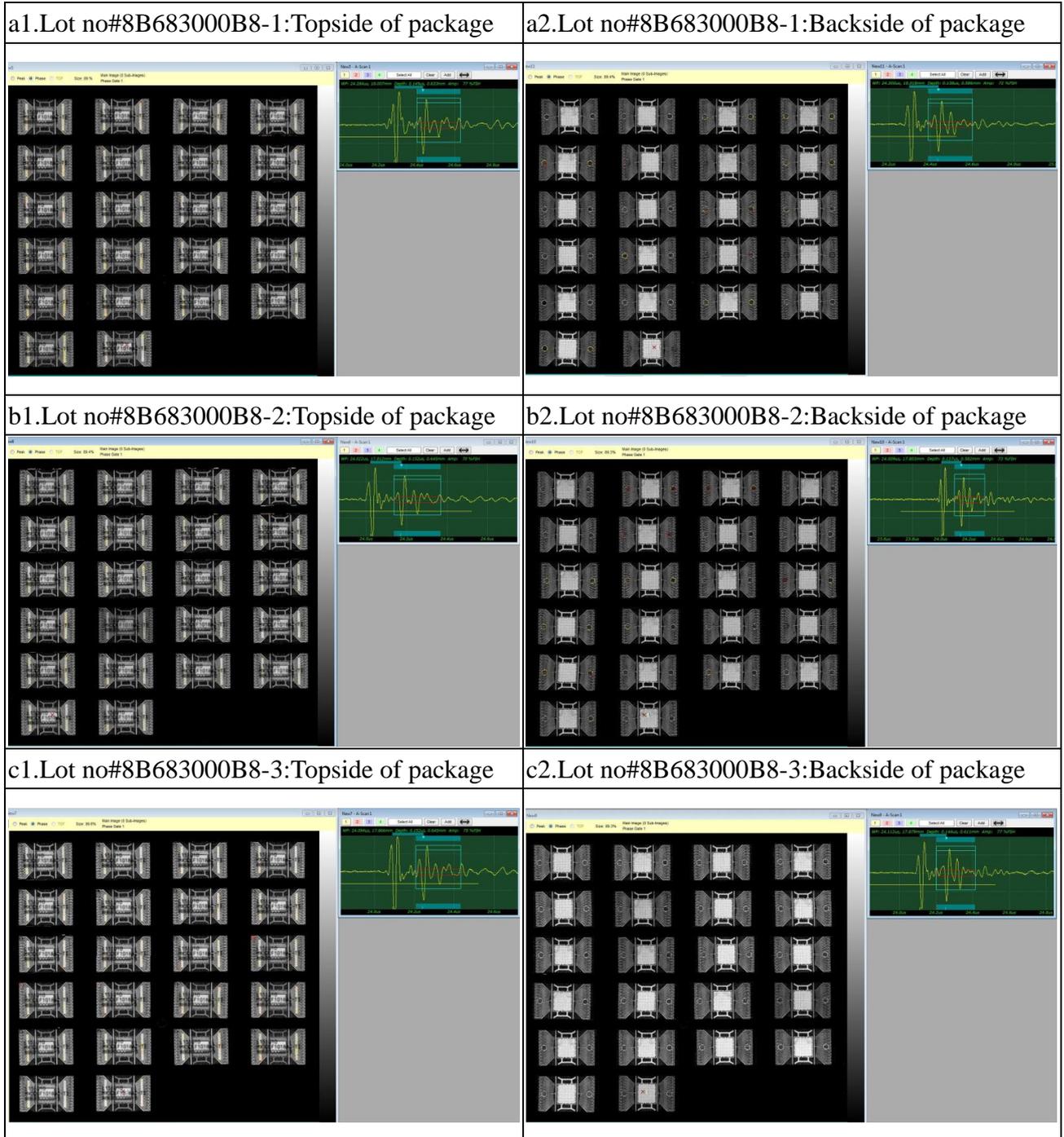


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6. ATTACHED FILE:

6-1. SAT PHOTO

6-1-1. BEFORE PRE-CONDITION



6-1-2. AFTER PRE-CONDITION

