PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	MDG/23/14224
1.3 Title of PCN	ASE KaoHsiung (Taiwan) LQFP 100 14x14 package copper palladium bonding wire introduction on STM32H74x, STM32H75x, STM32G47x and STM32G48x listed products
1.4 Product Category	STM32G47x, STM32G48x, STM32H74x, STM32H75x
1.5 Issue date	2023-09-07

2. PCN Team	
2.1 Contact supplier	
2.1.1 Name	NEMETH KRISZTINA
2.1.2 Phone	+49 89460062210
2.1.3 Email	krisztina.nemeth@st.com
2.2 Change responsibility	
2.2.1 Product Manager	Ricardo Antonio DE SA EARP
2.1.2 Marketing Manager	Veronique BARLATIER
2.1.3 Quality Manager	Pascal NARCHE

3. Change		
3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Transfer	Line transfer for a full process or process brick (process step, control plan, recipes) from one site to another site: Assembly site (SOP 2617)	ASE Kaohsiung (TAIWAN)

4. Description of change		
	Old	New
4.1 Description	Back-end source: - AMKOR ATP (Philippines) gold wire	Back-end source: - AMKOR ATP (Philippines) gold wire - ASE KaoHsiung (Taiwan) copper palladium wire - additional source
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	no impact on product Form, Fit, Function. Package darkness might change depending on molding compound. Ball1 identifier remain in the same corner but might slightly change in terms of form and positioning. Marking position and size could be different upon assembly site, without any loss of information.	

5. Reason / motivation for change	
5.1 Motivation	Due to the success on the market of STM32 devices, ST Microcontrollers Division decided to qualify an additional back-end site to maintain state of the art service level to our customers thanks to extra capacity.
5.2 Customer Benefit	SERVICE CONTINUITY

6. Marking of parts / traceability of change	
6.1 Description	Change is visible through assembly traceability plant, in the marking: - “7B” for AMKOR ATP Philippines - “AA” for ASE Kaohsiung Taiwan Please refer to PCN 14224 – Additional information attached document.

7. Timing / schedule	
7.1 Date of qualification results	2023-09-25
7.2 Intended start of delivery	2023-10-05
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description	14224 MDG-GPM-RER2304-PCN13841 PCN14224 V2-ASE LQFP7x7 to 20x20 Copper Palladium wire-Reliability evaluation report.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	**Issue Date**	2023-09-07

9. Attachments (additional documentations)
14224 Public product.pdf 14224 MDG-GPM-RER2304-PCN13841 PCN14224 V2-ASE LQFP7x7 to 20x20 Copper Palladium wire-Reliability evaluation report.pdf 14224 PCN14224_Additional information.pdf

10. Affected parts		
10. 1 Current		**10.2 New (if applicable)**
10.1.1 Customer Part No	**10.1.2 Supplier Part No**	**10.1.2 Supplier Part No**
	STM32H743VIT6	
	STM32H743VIT6TR	
	STM32H750VBT6	
	STM32H750VBT6TR	

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Public Products List

Publict Products are off the shelf products. They are not dedicated to specific customers, they are available through ST Sales team, or Distributors, and visible on ST.com

PCN Title : ASE KaoHsiung (Taiwan) LQFP 100 14x14 package copper palladium bonding wire introduction on STM32H74x, STM32H75x, STM32G47x and STM32G48x listed products

PCN Reference : MDG/23/14224

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

STM32H742VGT6	STM32H743VIT6	STM32H742VIT6TR
STM32H753VIT6	STM32G474VET6	STM32H750VBT6
STM32G474VBT3TR	STM32G473VCT3TR	STM32G474VCT6
STM32G474VET3TR	STM32H743VGT6	STM32G474VBT3
STM32H750VBT6TR	STM32G474VET6TR	STM32G484VET6
STM32G483VET3	STM32G473VCT6TR	STM32G474VBT6
STM32H743VIT6TR	STM32G474VET3	STM32G473VET6TR
STM32H742VGT6TR	STM32H742VIT6	STM32G483VET6
STM32G473VCT3	STM32G473VET6	STM32G473VBT6
STM32G473VET3	STM32G473VCT6	

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PRODUCT/PROCESS CHANGE NOTIFICATION
PCN14224 – Additional information

ASE KaoHsiung (Taiwan) LQFP 100 14x14 package copper palladium bonding wire introduction on STM32H74x, STM32H75x, STM32G47x and STM32G48x listed products

MDG – General Purpose Microcontrollers Division (GPM)

What are the changes?

Changes described in table below:

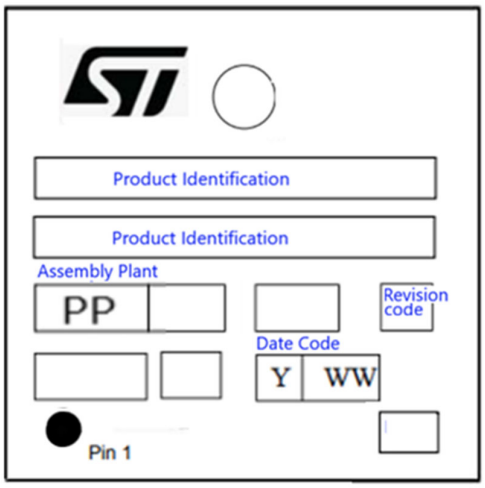
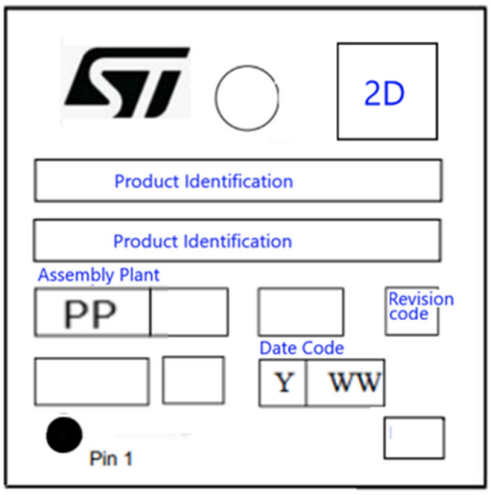
	Existing back-end line		Added back-end line
Assembly site	AMKOR ATP (Philippines)		ASE KaoHsiung (Taiwan)
Products family	STM32H74x, STM32H75x	STM32G47x, STM32G48x	STM32H74x, STM32G47x, STM32H75x, STM32G48x
Glue	Evertech AP4200	Sumitomo CRM 1076YB	Hitachi EN4900G
Resin (1)	Sumitomo EME-G631SHQ	Sumitomo EME-G631HQ	Sumitomo EME-G631SH
Wire	Gold 0.8mil		CuPd 0.8mil
Marking composition	Without 2D		With 2D Marking

(1) Package darkness changes depending on molding compound.

How can the change be seen?

Package top view Marking will display the 2D marking

Examples in below table

	Existing line	Added Line
LQFP100		

Y WW code indicates Year Week (manufacturing date)

PP code indicates assembly traceability plant code.

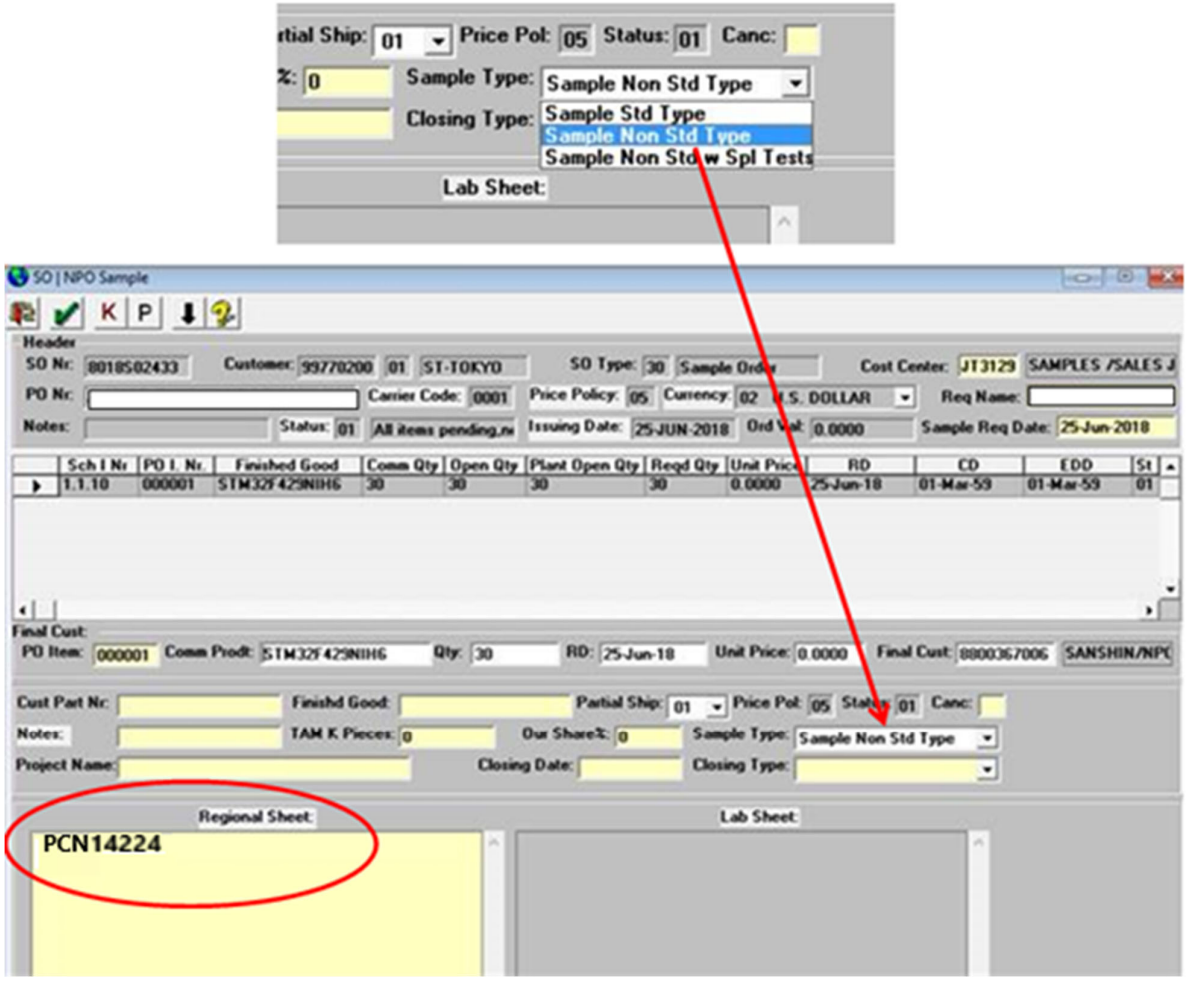
Existing		Additional	
PP code	Fab	PP code	Fab
7B	Amkor ATP Philippines	AA	ASE Kaohsiung Taiwan

Please refer to product **DataSheet** or Technical Note **TN1433** for package marking details.

How to order samples?

For all samples request linked to this PCN, please:

- place a **Non-standard** sample order (choose Sample Non Std Type from pull down menu).
- insert the PCN number "**PCN14224**" into the NPO Electronic Sheet/**Regional Sheet.**
- request sample(s) through Notice tool, indicating a single Commercial Product for each request.



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Reliability Evaluation Report

MDG-GPM-RER2304

ASEKH LQFP7x7 to LQFP20x20 Copper Palladium wire

General Information	
Commercial Product	STM32L433VCT6 STM32H723ZGT6 STM32F427VIT6 STM32F217ZGT6 STM32L552VET6 STM32F767ZIT6 STM32G030C8T6
Product Line	435X66 483X66 419X66 411X66 472X66 451X66 466X66
Die revision	435 cut1.1 483 cut 1.1 419 cut 2.2 411 cut 2.4 472 cut 2.1 451 cut 1.1 466 cut 1.2
Product Description	STM32L4 STM32H7 STM32F4 STM32F2 STM32L5 STM32F7 STM32G0
Package	LQFP 100 14x14x1.4 LQFP 144 20X20X1.4 LQFP 48 7x7x1.4
Silicon Technology	TN090 CMOSM40 CMOSM10
Division	MDG-GPM

Traceability	
Diffusion Plant	TSMC Fab14 / Crolles 300
Assembly Plant	ASEKH - TAIWAN

Reliability Assessment	
Pass	X
Fail	

Release	Date	Author	Function
1.0	12/06/2023	Gabin BOSCO	GPM BE Q&R
2.0	Sept. 5 2023	Gabin BOSCO	GPM BE Q&R

Approved by:

Approval list V1.0			
Name	**Function**	**Location**	**Date**
Berengere ROUTIER-SCAPPUCCI	GPM BE Q&R Manager	ROUSSET	16/06/2023
Pascal NARCHE	Subgroup Quality Manager	ROUSSET	19/06/2023
Approval list V2.0			
Berengere ROUTIER-SCAPPUCCI	GPM BE Q&R Manager	ROUSSET	Sept. 5 2023

This report is a summary of the reliability trials performed in good faith by STMicroelectronics. This report does not imply for STMicroelectronics expressly or implicitly any contractual obligations other than as set forth in STMicroelectronics General Terms and Conditions of Sale.

RELIABILITY EVALUATION OVERVIEW

- **OBJECTIVE**

The aim of this report is to present the reliability evaluation performed for the qualification of ASEKH (Taiwan) LQFP7x7/LQFP10x10/LQFP14x14/LQFP20X20 with copper-palladium wires on M10 TSMC/Crolles, M40/E40 Crolles and N90 TSMC.

PCN13841 changes are described here below:

	Existing back-end line	Added back-end line
Assembly site	ASE KaoHsiung (Taiwan)	
Wire	Gold 0.8mil	CuPd 0.8mil
GLUE	Sumitomo CRM 1076WA	HITACHI EN4900G(1)
Marking composition	Without 2D	With 2D marking

PCN14224 changes are described here below:

	Existing back-end line		Added back-end line
Assembly site	AMKOR ATP (Philippines)		ASE KaoHsiung (Taiwan)
Products family	STM32H74x, STM32H75x	STM32G47x, STM32G48x	STM32H74x, STM32G47x, STM32H75x, STM32G48x
GLUE	Evertech AP4200	Sumitomo CRM 1076YB	HITACHI EN4900G(1)
Resin	SUMITOMO EME-G631SHQ	Sumitomo EME-G631HQ	SUMITOMO EME-G631SH
Wire	Gold 0.8mil		CuPd 0.8mil
Marking composition	Without 2D		With 2D marking

(1)Sumitomo CRM 1076WA and HITACHI EN4900G glues were used during qualification phase however production will be on HITACHI EN4900G.

- **CONCLUSION**

All reliability tests have been completed with positive results. Neither functional nor parametric rejects were detected at final electrical testing.

Package oriented tests have not put in evidence any criticality. Physical analysis performed on samples submitted to tests has not put in evidence any issue. ESD CDM are in accordance with ST spec.

Based on the overall results obtained, products below have positively passed reliability evaluation:

Line code	Commercial product	Diff plant	Assy plant
435x66	STM32L433VCT6	TSMC FAB14	ASEKH (TAIWAN)
483x66	STM32H723ZGT6	Crolles 300	
419x66	STM32F427VIT6	TSMC FAB14	
411x66	STM32F217ZGT6	Crolles 300	
472x66	STM32L552VET6	TSMC FAB14	
451x66	STM32F767ZIT6	Crolles 300	
466x66	STM32G030C8T6	TSMC FAB14	

All reliability tests are completed with good results for Finished Goods diffused in M10 TSMC/Crolles, M40/E40 Crolles and N90 TSMC and assembled in LQFP7x7 to LQFP20x20 at ASEKH (Taiwan) in copper-palladium wire.

Refer to Section 3.0 for reliability test results.

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1. RELIABILITY STRATEGY

Reliability trials performed as part of this reliability evaluation are in agreement with ST 0061692 specification, in full compliancy with the JESD-47 international standard.

For details on test conditions, generic data used and specifications references, refer to test results summary in section 3.

2. PRODUCT OR TEST VEHICLE CHARACTERISTICS

2.1. Generalities

Package line	Partial rawline code	Number of lots
LQFP 100 14x14x1.4	1L*435	1
	1L*419	1
	1L*472	1
LQFP 144 20X20X1.4	1A*483	1
	1A*411	1
	1A*451	1
LQFP 48 7x7x1.4	5B*466	1

2.2. Traceability

2.2.1. Wafer Fab Information

Die 435

<table>
<tr><th colspan="2">Wafer Fab Information</th></tr>
<tr><th colspan="2">FAB1</th></tr>
<tr><td>Wafer fab name / location</td><td>TSMC Fab14 / Taiwan</td></tr>
<tr><td>Wafer diameter (inches)</td><td>12</td></tr>
<tr><td>Wafer thickness (µm)</td><td>775±25</td></tr>
<tr><td>Silicon process technology</td><td>TN090</td></tr>
<tr><td>Number of masks</td><td>45</td></tr>
<tr><td>Die finishing front side (passivation) materials / thickness</td><td>PSG+NITRIDE / 1,75µm</td></tr>
<tr><td>Die finishing back side Materials</td><td>RAW SILICON</td></tr>
<tr><td>Die area (Stepping die size)</td><td>10.045 mm² (3176.4µm, 3162.4µm)</td></tr>
<tr><td>Die pad size</td><td>
<table>
<tr><th>Geometry</th><th>Open(X,Y)</th></tr>
<tr><td>Rectangular</td><td>123,59 µm</td></tr>
</table>
</td></tr>
<tr><td>Sawing street width (X,Y) (µm)</td><td>80,80</td></tr>
<tr><td>Metal levels/Materials/Thicknesses</td><td>
<table>
<tr><th>Wire bond pad metal</th><th>Composition</th><th>Thickness</th></tr>
<tr><td>1</td><td>TaN/Ta/CuSeed/Cu</td><td>0.24 µm</td></tr>
<tr><td>2</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>3</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>4</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>5</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>6</td><td>TaN/Ta/CuSeed/Cu</td><td>0.85 µm</td></tr>
<tr><td>7</td><td>AlCu</td><td>1.45 µm</td></tr>
</table>
</td></tr>
</table>

Die 483

<table>
<tr><th colspan="2">Wafer Fab Information</th></tr>
<tr><th colspan="2">FAB1</th></tr>
<tr><td>Wafer fab name / location</td><td>Crolles 300 / France</td></tr>
<tr><td>Wafer diameter (inches)</td><td>12</td></tr>
<tr><td>Wafer thickness (µm)</td><td>775±25</td></tr>
<tr><td>Silicon process technology</td><td>CMOSM40</td></tr>
<tr><td>Number of masks</td><td>51</td></tr>
<tr><td>Die finishing front side (passivation) materials / thickness</td><td>PSG+NITRIDE / 1,75µm</td></tr>
<tr><td>Die finishing back side Materials</td><td>RAW SILICON</td></tr>
<tr><td>Die area (Stepping die size)</td><td>15.67 mm² (3753µm, 4175µm)</td></tr>
<tr><td>Die pad size</td><td>
<table>
<tr><th>Geometry</th><th>Open(X,Y)</th></tr>
<tr><td>Rectangular</td><td>54.9,54.4 µm</td></tr>
</table>
</td></tr>
<tr><td>Sawing street width (X,Y) (µm)</td><td>80,80</td></tr>
<tr><td>Metal levels/Materials/Thicknesses</td><td>
<table>
<tr><th>Wire bond pad metal</th><th>Composition</th><th>Thickness</th></tr>
<tr><td>1</td><td>TaN/Ta/CuSeed/Cu</td><td>0.13 µm</td></tr>
<tr><td>2</td><td>TaN/Ta/CuSeed/Cu</td><td>0.14 µm</td></tr>
<tr><td>3</td><td>TaN/Ta/CuSeed/Cu</td><td>0.14 µm</td></tr>
<tr><td>4</td><td>TaN/Ta/CuSeed/Cu</td><td>0.14 µm</td></tr>
<tr><td>5</td><td>TaN/Ta/CuSeed/Cu</td><td>0.14 µm</td></tr>
<tr><td>6</td><td>TaN/Ta/CuSeed/Cu</td><td>0.85 µm</td></tr>
<tr><td>7</td><td>TaN/Ta/CuSeed/Cu</td><td>0.85 µm</td></tr>
<tr><td>8</td><td>Ta/TaN/AlCu</td><td>1.525 µm</td></tr>
</table>
</td></tr>
</table>

Die 411

<table>
<tr><th colspan="2">Wafer Fab Information</th></tr>
<tr><th colspan="2">FAB1</th></tr>
<tr><td>Wafer fab name / location</td><td>Crolles 300 / France</td></tr>
<tr><td>Wafer diameter (inches)</td><td>12</td></tr>
<tr><td>Wafer thickness (µm)</td><td>775±25</td></tr>
<tr><td>Silicon process technology</td><td>CMOSM10</td></tr>
<tr><td>Number of masks</td><td>42</td></tr>
<tr><td>Die finishing front side (passivation) materials / thickness</td><td>PSG+NITRIDE / 1,75µm</td></tr>
<tr><td>Die finishing back side Materials</td><td>RAW SILICON</td></tr>
<tr><td>Die area (Stepping die size)</td><td>14.71mm² (4006µm, 3674µm)</td></tr>
<tr><td>Die pad size</td><td>
<table>
<tr><th>Geometry</th><th>Open(X,Y)</th></tr>
<tr><td>Rectangular</td><td>59,123 µm</td></tr>
<tr><td>Rectangular</td><td>63,73 µm</td></tr>
</table>
</td></tr>
<tr><td>Sawing street width (X,Y) (µm)</td><td>80,80</td></tr>
<tr><td>Metal levels/Materials/Thicknesses</td><td>
<table>
<tr><th>Wire bond pad metal</th><th>Composition</th><th>Thickness</th></tr>
<tr><td>1</td><td>TaN/CuSeed/Cu</td><td>0.24 µm</td></tr>
<tr><td>2</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>3</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>4</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>5</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>6</td><td>TaN/CuSeed/Cu</td><td>0.85 µm</td></tr>
<tr><td>7</td><td>AlCu/TinArc</td><td>1.45 µm</td></tr>
</table>
</td></tr>
</table>

Die 419

<table>
<tr><th colspan="2">Wafer Fab Information</th></tr>
<tr><th colspan="2">FAB1</th></tr>
<tr><td>Wafer fab name / location</td><td>TSMC Fab14 / Taiwan</td></tr>
<tr><td>Wafer diameter (inches)</td><td>12</td></tr>
<tr><td>Wafer thickness (µm)</td><td>775±25</td></tr>
<tr><td>Silicon process technology</td><td>CMOSM10</td></tr>
<tr><td>Number of masks</td><td>44</td></tr>
<tr><td>Die finishing front side (passivation) materials / thickness</td><td>USG + NITRIDE / 1.1µm</td></tr>
<tr><td>Die finishing back side Materials</td><td>RAW SILICON</td></tr>
<tr><td>Die area (Stepping die size)</td><td>25.43 mm² (5582µm, 4556µm)</td></tr>
<tr><td>Die pad size</td><td>
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<tr><th>Geometry</th><th>Open(X,Y)</th></tr>
<tr><td>Rectangular</td><td>59,123 µm</td></tr>
</table>
</td></tr>
<tr><td>Sawing street width (X,Y) (µm)</td><td>80,80</td></tr>
<tr><td>Metal levels/Materials/Thicknesses</td><td>
<table>
<tr><th>Wire bond pad metal</th><th>Composition</th><th>Thickness</th></tr>
<tr><td>1</td><td>TaN/Ta/CuSeed/Cu</td><td>0.22 µm</td></tr>
<tr><td>2</td><td>TaN/Ta/CuSeed/Cu</td><td>0.28 µm</td></tr>
<tr><td>3</td><td>TaN/Ta/CuSeed/Cu</td><td>0.28 µm</td></tr>
<tr><td>4</td><td>TaN/Ta/CuSeed/Cu</td><td>0.28 µm</td></tr>
<tr><td>5</td><td>TaN/Ta/CuSeed/Cu</td><td>0.28 µm</td></tr>
<tr><td>6</td><td>Ta/TaN/AlCu</td><td>0.73 µm</td></tr>
<tr><td>7</td><td>AlCu</td><td>1.2 µm</td></tr>
</table>
</td></tr>
</table>

Die 472

<table>
<tr><th colspan="2">Wafer Fab Information</th></tr>
<tr><th colspan="2">FAB1</th></tr>
<tr><td>Wafer fab name / location</td><td>TSMC Fab14 / Taiwan</td></tr>
<tr><td>Wafer diameter (inches)</td><td>12</td></tr>
<tr><td>Wafer thickness (µm)</td><td>775±25</td></tr>
<tr><td>Silicon process technology</td><td>TN090</td></tr>
<tr><td>Number of masks</td><td>45</td></tr>
<tr><td>Die finishing front side (passivation) materials / thickness</td><td>USG + NITRIDE / 1,75µm</td></tr>
<tr><td>Die finishing back side Materials</td><td>RAW SILICON</td></tr>
<tr><td>Die area (Stepping die size)</td><td>17.999 mm² (4099.2, 4391.0)</td></tr>
<tr><td>Die pad size</td><td>
<table>
<tr><th>Geometry</th><th>Open(X,Y)</th></tr>
<tr><td>Rectangular</td><td>123,59 µm</td></tr>
</table>
</td></tr>
<tr><td>Sawing street width (X,Y) (µm)</td><td>80,80</td></tr>
<tr><td>Metal levels/Materials/Thicknesses</td><td>
<table>
<tr><th>Wire bond pad metal</th><th>Composition</th><th>Thickness</th></tr>
<tr><td>1</td><td>TaN/Ta/CuSeed/Cu</td><td>0.24 µm</td></tr>
<tr><td>2</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>3</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>4</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>5</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>6</td><td>TaN/Ta/CuSeed/Cu</td><td>0.85 µm</td></tr>
<tr><td>7</td><td>AlCu</td><td>1.45 µm</td></tr>
</table>
</td></tr>
</table>

Die 451

<table>
<tr><th colspan="2">Wafer Fab Information</th></tr>
<tr><th colspan="2">FAB1</th></tr>
<tr><td>Wafer fab name / location</td><td>Crolles 300 / France</td></tr>
<tr><td>Wafer diameter (inches)</td><td>12</td></tr>
<tr><td>Wafer thickness (µm)</td><td>775±25</td></tr>
<tr><td>Silicon process technology</td><td>CMOSM10</td></tr>
<tr><td>Number of masks</td><td>43</td></tr>
<tr><td>Die finishing front side (passivation) materials / thickness</td><td>PSG + NITRIDE / 1.1µm</td></tr>
<tr><td>Die finishing back side Materials</td><td>RAW SILICON</td></tr>
<tr><td>Die area (Stepping die size)</td><td>34.15 mm² (6130, 5572)</td></tr>
<tr><td>Die pad size</td><td>
<table>
<tr><th>Geometry</th><th>Open(X,Y)</th></tr>
<tr><td>Rectangular</td><td>59,123 µm</td></tr>
</table>
</td></tr>
<tr><td>Sawing street width (X,Y) (µm)</td><td>80,80</td></tr>
<tr><td>Metal levels/Materials/Thicknesses</td><td>
<table>
<tr><th>Wire bond pad metal</th><th>Composition</th><th>Thickness</th></tr>
<tr><td>1</td><td>TaN/CuSeed/Cu</td><td>0.24 µm</td></tr>
<tr><td>2</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>3</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>4</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>5</td><td>TaN/CuSeed/Cu</td><td>0.33 µm</td></tr>
<tr><td>6</td><td>TaN/CuSeed/Cu</td><td>0.85 µm</td></tr>
<tr><td>7</td><td>AlCu/TinArc</td><td>1.45 µm</td></tr>
</table>
</td></tr>
</table>

Die 466

<table>
<tr><th colspan="2">Wafer Fab Information</th></tr>
<tr><th colspan="2">FAB1</th></tr>
<tr><td>Wafer fab name / location</td><td>TSMC Fab14 / Taiwan</td></tr>
<tr><td>Wafer diameter (inches)</td><td>12</td></tr>
<tr><td>Wafer thickness (µm)</td><td>775±25</td></tr>
<tr><td>Silicon process technology</td><td>TN090</td></tr>
<tr><td>Number of masks</td><td>45</td></tr>
<tr><td>Die finishing front side (passivation) materials / thickness</td><td>USG + NITRIDE / 1.1µm</td></tr>
<tr><td>Die finishing back side Materials</td><td>RAW SILICON</td></tr>
<tr><td>Die area (Stepping die size)</td><td>4.0921 mm² (1889.6, 2165.6)</td></tr>
<tr><td>Die pad size</td><td>
<table>
<tr><th>Geometry</th><th>Open(X,Y)</th></tr>
<tr><td>Rectangular</td><td>65,59 µm</td></tr>
<tr><td>Rectangular</td><td>123,59 µm</td></tr>
</table>
</td></tr>
<tr><td>Sawing street width (X,Y) (µm)</td><td>80,80</td></tr>
<tr><td>Metal levels/Materials/Thicknesses</td><td>
<table>
<tr><th>Wire bond pad metal</th><th>Composition</th><th>Thickness</th></tr>
<tr><td>1</td><td>TaN/Ta/CuSeed/Cu</td><td>0.24 µm</td></tr>
<tr><td>2</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>3</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>4</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>5</td><td>TaN/Ta/CuSeed/Cu</td><td>0.31 µm</td></tr>
<tr><td>6</td><td>TaN/Ta/CuSeed/Cu</td><td>0.85 µm</td></tr>
<tr><td>7</td><td>AlCu</td><td>1.45 µm</td></tr>
</table>
</td></tr>
</table>

2.2.2.Assembly Information

Assembly Information			
Package: LQFP 100 14x14x1.4 1	435	419	472
Assembly plant name / location	ASE Taiwan		
Pitch (mm)	0,5		
Die thickness after back-grinding (µm)	375±25		
Die sawing method	Laser groove + mechanical sawing		
Bill of Material elements			
Lead frame/ material/ reference	LF# A25516 LQ14 100L Pure Tin C7025 6.6sq Slot		
Lead frame finishing (material/thickness)	Pure Tin (e3): Tolerance 7 to 20µm		
Die attach material/ glue /supplier	GLUE SUMITOMO EPOXY CRM 1076WA		HITACHI EN4900G
Wire bonding material/diameter	Wire CuPd 0.8 mils		
Molding compound material/supplier/reference	MOLDING RESIN SUMITOMO EME-G631SH		
Package Moisture Sensitivity Level (JEDEC J-STD020D)	3		

Assembly Information			
Package 2: LQFP 144 20X20X1.4 2	483	411	451
Assembly plant name / location	ASE Taiwan		
Pitch (mm)	0.5		
Die thickness after back-grinding (µm)	375±25		
Die sawing method	Laser groove + mechanical sawing		
Bill of Material elements			
Lead frame/material/reference	LF# A25582 LQ20 144L Pure Tin C7025 6.6sq		
Lead frame finishing (material/thickness)	Pure Tin (e3): Tolerance 7 to 20µm		
Die attach material/glue/supplier	GLUE SUMITOMO EPOXY CRM 1076WA		HITACHI EN4900G
Wire bonding material/diameter	Wire CuPd 0.8 mils		
Molding compound material/supplier/reference	MOLDING RESIN SUMITOMO EME-G631SH		
Package Moisture Sensitivity Level (JEDEC J-STD020D)	3		

Assembly Information	
Package 3:LQFP 48 7x7x1.4 1	
Assembly plant name / location	ASE Taiwan
Pitch (mm)	0.5
Die thickness after back-grinding (µm)	375±25
Die sawing method	
Bill of Material elements	
Lead frame/material/reference	LF# A24950 LQ48L Pur tin C7025 4.092sq
Lead frame finishing (material/thickness)	Pure Tin (e3): Tolerance 7 to 20µm
Die attach material/glue/supplier	HITACHI EN4900G
Wire bonding material/diameter	Wire CuPd 0.8 mils
Molding compound material/supplier/reference	MOLDING RESIN SUMITOMO EME-G631SH
Package Moisture Sensitivity Level (JEDEC J-STD020D)	3

2.2.3.Reliability testing information

Reliability Testing Information	
Reliability laboratory name / location	Grenoble Rel Lab, Shenzhen BE Lab, Rousset MDG Rel Lab

Note: ST is ISO 9001 certified. This induces certification of all internal and subcontractor labs. ST certification document can be downloaded under the following link: http://www.st.com/content/st_com/en/support/quality-and-reliability/certifications.html

3. TEST RESULTS SUMMARY

3.1. Lot information

Lot #	Diffusion Lot / Wafer ID	Die Revision (Cut)	Assy Lot / Trace Code	Raw Line	Package
Lot 1	9R113962	Cut1.1	AA136031	211L*435CSXZ	LQFP 100 14x14x1.4 1
Lot 2	3R31C302	Cut 1.1	AA143030	221A*483CSXZ	LQFP 144 20X20X1.4 2
Lot 3	VQ112465	Cut 2.4	AA136033	201A*411CSX2	LQFP 144 20X20X1.4 2
Lot 4	9R121544	Cut 2.2	AA136032	201L*419CSX5	LQFP 100 14x14x1.4 1
Lot 5	9R23159	Cut 2.1	AA248173	211L*472QCXZ	LQFP 100 14x14x1.4 1
Lot 6	Q229850	Cut 1.1	AA306008	201A*451QCXZ	LQFP 144 20X20X1.4 2
Lot 7	9R230180	Cut 1.2	AA249007	235B*466QCXY	LQFP 48 7x7x1.4 1

3.2. Test results summary

ACCELERATED ENVIRONMENT STRESS TESTS

Test code	Stress method	Stress Conditions	Lots Qty	S.S.	Total	Results/Lot Fail/S.S.	Comments:(N/A =Not Applicable)
PC	JSTD 020 JESD 22-A113 7191395	24h bake@125°C, MSL3 (192h/30°C/60%RH) 3x Reflow simulation Peak Reflow Temp= 260°C	7	308	2156	Lot 1: 0/308 Lot 5: 0/308 Lot 2: 0/308 Lot 6: 0/308 Lot 3: 0/308 Lot 7: 0/308 Lot 4: 0/308	NA
HTSL	JESD22-A103	Ta= 150°C Duration= 1000hrs ☑ After PC	7	77	539	Lot 1: 0/77 Lot 5: 0/77 Lot 2: 0/77 Lot 6: 0/77 Lot 3: 0/77 Lot 7: 0/77 Lot 4: 0/77	NA
TC	JESD22-A104	Ta= -65/150°C Cyc= 500 ☑After PC	7	77	539	Lot 1: 0/77 Lot 5: 0/77 Lot 2: 0/77 Lot 6: 0/77 Lot 3: 0/77 Lot 7: 0/77 Lot 4: 0/77	NA
THB	JESD22-A101	Ta=85°C/85%RH VDD=3v6 Duration= 1000hrs ☑After PC	7	77	539	Lot 1: 0/77 Lot 5: 0/77 Lot 2: 0/77 Lot 6: 0/77 Lot 3: 0/77 Lot 7: 0/77 Lot 4: 0/77	NA
UHAST	JESD22-A118	Ta=130°C ,85% RH, 2 Atm Duration= 96hrs ☑ After PC	4	77	539	Lot 1: 0/77 Lot 5: 0/77 Lot 2: 0/77 Lot 6: 0/77 Lot 3: 0/77 Lot 7: 0/77 Lot 4: 0/77	NA

ELECTRICAL TEST VERIFICATION

Test code	Stress method	Stress Conditions	Lots Qty	S.S.	Total	Results/Lot Fail/S.S.	Comments:(N/A =Not Applicable)
CDM	JEDEC JS-002	Voltage=500V for 411/466 Voltage=250V for 435/483/419/472/451	7	3	21	Lot 1: 0/3 Lot 5: 0/3 Lot 2: 0/3 Lot 6: 0/3 Lot 3: 0/3 Lot 7: 0/3 Lot 4: 0/3	NA

PACKAGE ASSEMBLY INTEGRITY TESTS

Test code	Stress method	Stress Conditions	Lots Qty	S.S.	Total	Results/Lot Fail/S.S.	Comments:(N/A =Not Applicable)
CA	Construction analysis including -Wire bond shear -Wire bond pull	ST internal specifications	7	50	350	Lot 1: 0/50 Lot 2: 0/50 Lot 3: 0/50 Lot 4: 0/50 Lot 5: 0/50 Lot 6: 0/50 Lot 7: 0/50	SHZ-CA_21_00299 SHZ-CA_22_00003 SHZ-CA_21_00351 SHZ-CA_21_00298 SHZ-CA_23_00132 SHZ-CA_23_00275 SHZ-CA_23_00075

Note: Test method revision reference is the one active at the date of reliability trial execution.

4. APPLICABLE AND REFERENCE DOCUMENTS

Reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits
SOP2.4.4	Record Management Procedure
SOP2.6.2	Internal Change Management
SOP2.6.7	Finished Good Maturity Management
SOP2.6.9	Package & Process Maturity Management in BE
SOP2.6.11	Program Management for Product Development
SOP2.6.17	Management of Manufacturing Transfers
SOP2.6.19	Front-End Technology Platform Development and Qualification
DMS 0061692	Reliability Tests and Criteria for Product Qualification
JEDEC JS-002	Electrostatic discharge (ESD) sensitivity testing charge device model (CDM)
JESD 22-A103	High Temperature Storage Life
J-STD-020	Moisture/reflow sensitivity classification for non-hermetic solid state surface mount devices
JESD22-A113	Preconditioning of non-hermetic surface mount devices prior to reliability testing
JESD22-A118	Unbiased Highly Accelerated temperature & humidity Stress Test
JESD22-A104	Temperature cycling
JESD22-A101	Temperature Humidity Bias

5. GLOSSARY

ESD-CDM	Electrostatic Discharge - Charged device model
CA	Construction analysis
HTSL	High Temperature Storage Life
PC	Preconditioning
TC	Temperature Cycling
THB	Temperature Humidity Bias
UHAST	Unbiased HAST (Highly Accelerated Stress Test)
DMS	ST Advanced Documentation Controlled system/ Documentation Management system

6. REVISION HISTORY

Release	Author	Content description	Approval list			
			Function	Location	Name	Date
1.0	Gabin BOSCO	Initial release	Subgroup Quality Manager	ROUSSET	Pascal NARCHE	19/06/2023
			GPM BE Q&R Manager	ROUSSET	Berengere ROUTIER-SCAPPUCCI	16/06/2023
2.0	Gabin BOSCO	Added PCN14224	GPM BE Q&R Manager	ROUSSET	Berengere ROUTIER-SCAPPUCCI	Sept. 5 2023

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