PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	MDG/24/14291
1.3 Title of PCN	ST Calamba (Philippines) additional assembly plant for STM32MP15x product in BGA10x10, BGA18x18 packages
1.4 Product Category	STM32MP15x products in LFBGA18X18 and TFBGA10X10
1.5 Issue date	2024-02-09

2. PCN Team

2.1 Contact supplier	
2.1.1 Name	ROBERTSON HEATHER
2.1.2 Phone	+1 8475853058
2.1.3 Email	heather.robertson@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)	- AMKOR ATK (Korea) - ASE KAOHSIUNG (Taiwan) - ST CALAMBA (Philippines)

4. Description of change

	Old	**New**
4.1 Description	Existing Back-end source: - Amkor ATK Korea - ASE Kaohsiung Taiwan	Back-end sources: - Amkor ATK Korea - ASE Kaohsiung Taiwan - ST Calamba Philippines - Additional source For detailed information, please refer to PCN14291 – Additional information attached document.
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	Additional Assembly site Package darkness changes depending on molding compound. 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	CAPACITY INCREASE

6. Marking of parts / traceability of change

6.1 Description	Change is visible through assembly traceability plant, in the marking: - “HP” for Amkor ATK Korea - "AA" for ASE Kaohsiung Taiwan - “78” for ST Calamba Philippines Please refer to PCN 14291– Additional information attached document.

7. Timing / schedule

7.1 Date of qualification results	2023-12-20
7.2 Intended start of delivery	2023-12-20
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation

8.1 Description	14291 MDG-GPM-RER2301 PCN14291 ST Calamba additional assy STM32MP15x BGA10&18 reliability plan.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	**Issue Date**	2024-02-09

9. Attachments (additional documentations)

14291 Public product.pdf
14291 MDG-GPM-RER2301 PCN14291 ST Calamba additional assy STM32MP15x BGA10&18 reliability plan.pdf
14291 PCN14291_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**
	STM32MP151AAA3	
	STM32MP151AAD3	
	STM32MP151CAA3	
	STM32MP151CAD3	
	STM32MP151DAD1	
	STM32MP153AAA3	
	STM32MP153AAD3	
	STM32MP153CAA3	
	STM32MP153CAD3	
	STM32MP153DAD1	
	STM32MP157AAA3	
	STM32MP157AAD3	
	STM32MP157CAA3	
	STM32MP157CAD3	
	STM32MP157DAA1	
	STM32MP157DAD1	
	STM32MP157FAA1	
	STM32MP157FAD1	

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RERGPM2301 for PCN14291
ST Calamba (Philippines) additional assembly plant for STM32MP15x product in BGA10x10, BGA18x18 packages

Reliability Evaluation Plan

September 20th, 2023

MDG GPM Quality & Reliability

RERGPM2301 for PCN14291
ST Calamba additional assembly plant for STM32MP15x in BGA10x10, BGA18x18

Package Test Vehicles

Package line	Assembly Line	Package	Wire type	Device (RawLine Code)	Diffusion Process Plant	Number of Reliability Lots
TFBGA	TFBGA10*10	257L	Au 2N	STM32MP15x (GJ*500)	CMOS040 Cr300	1
LFBGA	LFBGA18*18	448L	Au 2N	STM32MP15x (GU*500)	CMOS040 Cr300	2

Reliability strategy:

- Reliability will be performed on 3 lots from representative test vehicles of STM32MP15x product. Refer to details in above and next tables.

RERGPM2301 for PCN14291
ST Calamba additional assembly plant for STM32MP15x in BGA10x10, BGA18x18

Package Reliability Trials

Reliability Trial & Standard		Test Conditions	Pass Criteria	Unit per Lot	Lot qty
PC	Pre Conditioning: Moisture Sensitivity Jedec Level 3 J-STD-020/ JESD22-A113	Bake (125°C / 24 hrs) Soak (30°C / 60% RH / 192 hrs) Convection reflow: 3 passes	3 passes MSL3	308	3
uHAST(*)	UnBiased Highly Accelerated Temperature and Humidity Stress JESD22 A118	130°C, 85%RH, 2.3 atm	96h	77	3
TC(*)	Thermal Cycling JESD22 A104	-65°C +150°C	500Cy and 1000Cy for monitoring	77	3
THB(*)	Biased temperature & humidity stress JESD22 A101	85°C, 85% RH bias	500h, 1000h	77	3
HTSL(*)	High Temperature Storage Life JESD22 A103	150°C- no bias	500h, 1000h	77	3
Construction analysis	ST internal specifications	Ball shear, pull test, IMC inspection , internal analysis	NA	50	2 (1 per package)
ESD	ESD Charge Device Model JEDEC JS-002	Aligned with device datasheet	Aligned with device datasheet	3	2 (1 per package)

(*) tests performed after preconditioning

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PRODUCT/PROCESS CHANGE NOTIFICATION
PCN14291– Additional information

ST Calamba (Philippines) additional assembly plant for STM32MP15x product in BGA10x10, BGA18x18 packages

MDG – General Purpose Microcontrollers Division (GPM)

What are the changes?

ST General Purpose Microcontrollers Division decided to qualify an additional back-end assembly site. The full process transfer to ST Calamba Assembly site is done maintaining state of the art service level to our customers thanks to extra capacity. This PCN is limited to STM32MP15x product in BGA 10x10 and BGA18 x18 packages.

Changes described in table below:

BGA10x10 package

(TFBGA 10X10 257L)

	Current condition	New condition
Assembly site	**AMKOR ATK (Korea)**	**ST Calamba (Philippines)**
Glue (no change)	2025D ABLESTIK	
Molding compound (1)	GE110-LL	GE 100LF1-2
Substrate core	HL832NXA (HS)	Showa Denko MCL-E-679FGB (SM)
Solder ball (no change)	SACN125-5 (0.30mm)	

BGA18X18 package

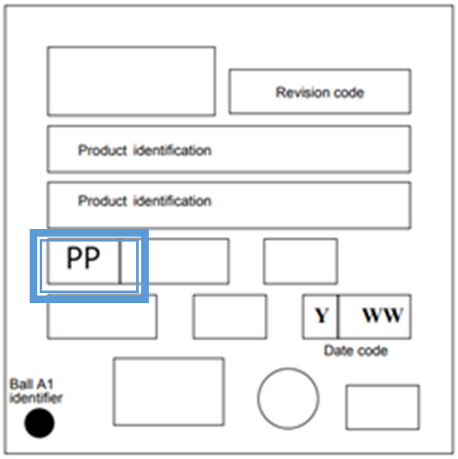
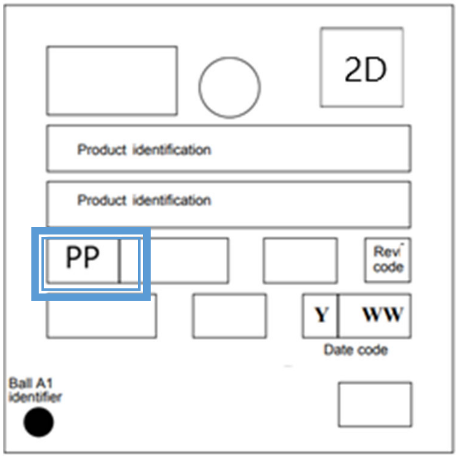
(LFBGA18X18 448L)

	Current condition		New condition
Assembly site	**AMKOR ATK (Korea)**	**ASE Kaohsiung (Taiwan)**	**ST Calamba (Philippines)**
Glue	Glue 2025D ABLESTIK	Die Attach Film ATB125 ABLESTIK	Glue 2025D ABLESTIK
Molding compound (1)	GE110LS	Kyocera G1250AAS	GE 100LF1-2
Substrate core	HL832NXAEX		Showa Denko MCL-E-679FGB (SM)
Solder ball	SACN305 (0.40mm)	SACN305 (0.40mm)	SACN306 (0.40mm)

(1) Package darkness changes depending on molding compound. Pin1 identifier can change in terms of form and positioning. Marking position and size could be different upon assembly site, without any loss of information.

How can the change be seen?

<u>The standard marking is</u>:

Marking	Before	After ST Calamba (Philippines)
BGA 18X18 BGA 10x10		
PP code	**HP:** Amkor ATK (Korea) **AA:** ASE KaoHsiung (Philippines)	**78:** ST Calamba (Philippines)

Y WW code indicates Year Week (manufacturing date)

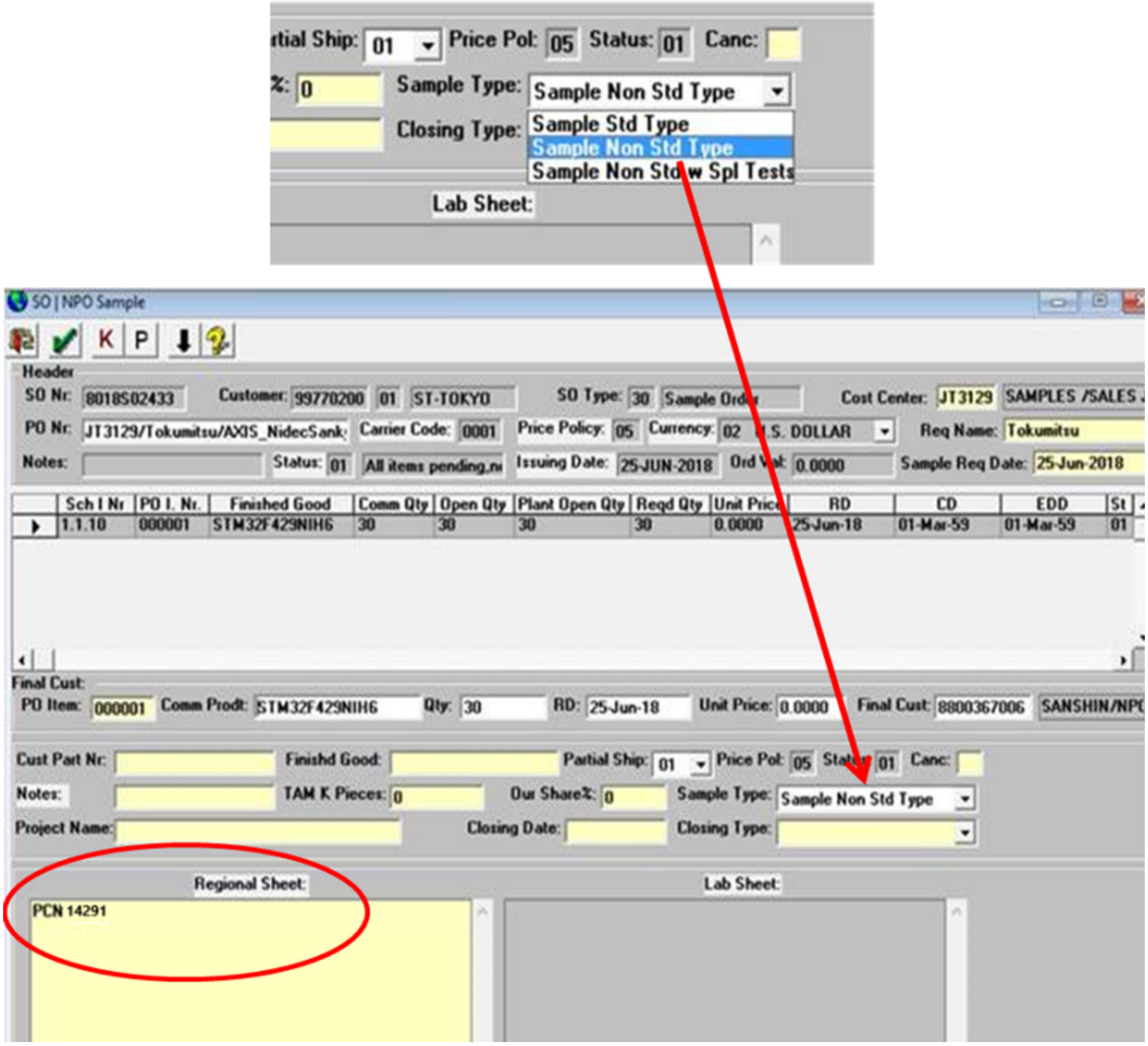
PP code indicates assembly traceability plant code.

Please refer to product **<u>DataSheet</u>** 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 "**PCN14291**" into the NPO Electronic Sheet/**Regional Sheet**
- request sample(s) through Notice tool, indicating a single Commercial Product for each request



rtial Ship: 01 Price Pol: 05 Status: 01 Canc:

%: 0 Sample Type: Sample Non Std Type

Closing Type:

SO Nr: 8018S02433 Customer: 99770200 01 ST-TOKYO SO Type: 30 Sample Order Cost Center: JT3129 SAMPLES /SALES

PO Nr: JT3129/Tokumitsu/AXIS_NidecSank Carrier Code: 0001 Price Policy: 05 Currency: 02 U.S. DOLLAR Req Name: Tokumitsu

Notes: Status: 01 All items pending,n Issuing Date: 25-JUN-2018 Ord Val: 0.0000 Sample Req Date: 25-Jun-2018

	Sch I Nr	PO I. Nr.	Finished Good	Comm Qty	Open Qty	Plant Open Qty	Reqd Qty	Unit Price	RD	CD	EDD	St
▶	1.1.10	000001	STM32F429NIH6	30	30	30	30	0.0000	25-Jun-18	01-Mar-59	01-Mar-59	01

PO Item: 000001 Comm Prodt: STM32F429NIH6 Qty: 30 RD: 25-Jun-18 Unit Price: 0.0000 Final Cust: 8800367006 SANSHIN/NPC

Cust Part Nr: Finishd Good: Partial Ship: 01 Price Pol: 05 Status: 01 Canc:

Notes: TAM K Pieces: 0 Our Share%: 0 Sample Type: Sample Non Std Type

Project Name: Closing Date: Closing Type:

Regional Sheet:

PCN 14291

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PCN Title : ST Calamba (Philippines) additional assembly plant for STM32MP15x product in BGA10x10, BGA18x18 packages
PCN Reference : MDG/24/14291

Subject : Public Products List

Dear Customer,

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

STM32MP151CAA3	STM32MP153AAA3	STM32MP153CAA3
STM32MP157AAA3	STM32MP157CAA3	STM32MP151AAD3
STM32MP151AAA3	STM32MP157AAD3	STM32MP153AAD3
STM32MP157AAA3T	STM32MP153DAA1	STM32MP151CAA3T
STM32MP157DAA1	STM32MP153CAD3	STM32MP151AAA3T
STM32MP153AAA3T	STM32MP157CAD3	STM32MP151FAA1
STM32MP157FAA1	STM32MP151DAA1	STM32MP151CAD3
STM32MP153CAA3T	STM32MP157CAA3T	STM32MP151AAD3T
STM32MP151CAD3T	STM32MP157FAA1T	STM32MP151DAD1
STM32MP157CAD3T	STM32MP157DAD1	STM32MP153CAD3T
STM32MP153FAD1	STM32MP151FAD1	STM32MP153FAA1
STM32MP157FAD1	STM32MP157AAD3T	STM32MP153DAD1
STM32MP153AAD3T		

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