PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	MDG/24/14312
1.3 Title of PCN	ASE Kaohsiung (Taiwan) UQFN5x5 32L & UQFN7x7 48L package copper palladium bonding wire introduction on STM32C0x, STM32G0x, STM32G4x, STM32L4x and STM32L5x listed products
1.4 Product Category	STM32C0x, STM32G0x, STM32G4x, STM32L4x, STM32L5x.
1.5 Issue date	2024-05-03

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
Materials	Direct Material: Bond Wire - Metallurgy (metallic composition/ raw material)	ASE Kaohsiung (Taiwan)

4. Description of change		
	Old	New
4.1 Description	Assembly lines / wire bonding: - JSCC (China) / Gold wire - JSCC (China) / Copper Palladium wire - ASE Kaohsiung (Taiwan) / Gold wire	Assembly lines / wire bonding: - JSCC (China) / Gold wire - JSCC (China) / Copper Palladium wire - ASE Kaohsiung (Taiwan) / 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 form, Fit, Function	

5. Reason / motivation for change	
5.1 Motivation	To improve service
5.2 Customer Benefit	SERVICE IMPROVEMENT

6. Marking of parts / traceability of change	
6.1 Description	traceability ensured by ST Internal tools

7. Timing / schedule	
7.1 Date of qualification results	2024-04-18
7.2 Intended start of delivery	2024-06-17
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation	
8.1 Description	14312 MDRF-GPM-RER2323 V1.0 - PCN14321 - ASE KH (Taiwan) UQFN 5x5 32L 7x7 48L cu wire - Rel Eval Report.pdf

8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2024-05-03

9. Attachments (additional documentations)
14312 Public product.pdf 14312 MDRF-GPM-RER2323 V1.0 - PCN14321 - ASE KH (Taiwan) UQFN 5x5 32L 7x7 48L cu wire - Rel Eval Report.pdf 14312 PCN14312_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
	STM32C031C4U6	
	STM32C031C6U6	
	STM32C031K4U6	
	STM32C031K6U6	
	STM32G031C6U6	
	STM32G031C8U6	
	STM32G031C8U7	
	STM32G031K6U6	
	STM32G031K8U6	
	STM32G031K8U7	
	STM32G031K8U7TR	
	STM32G051C6U6	
	STM32G051C8U6	
	STM32G051K6U6	
	STM32G051K8U6	
	STM32G051K8U7	
	STM32G061C6U6	
	STM32G061C8U6	
	STM32G071C8U3	
	STM32G071C8U6TR	
	STM32G071C8U7	
	STM32G071C8U7TR	
	STM32G071CBU3	
	STM32G071CBU6	
	STM32G071CBU6TR	
	STM32G071CBU7TR	
	STM32G071K8U6	
	STM32G071KBU3	
	STM32G071KBU6	
	STM32G071KBU6N	
	STM32G071KBU6TR	
	STM32G071KBU7	
	STM32G081CBU6	
	STM32G081KBU6	
	STM32G0B1CBU3	
	STM32G0B1CBU6	
	STM32G0B1CCU6	
	STM32G0B1CEU6	
	STM32G0B1CEU6N	
	STM32G0B1KBU3N	
	STM32G0B1KBU6	

	STM32G0B1KBU6N	
	STM32G0B1KCU6	
	STM32G0B1KCU7	
	STM32G0B1KEU6	
	STM32G0B1KEU6N	
	STM32G0C1CEU6	
	STM32G0C1KCU6	
	STM32G0C1KEU6	
	STM32G431CBU3	
	STM32G431CBU6	
	STM32G431KBU3	
	STM32G431KBU6	
	STM32G441KBU6	
	STM32G473CBU6	
	STM32G473CCU6	
	STM32G473CEU6	
	STM32G474CEU6	
	STM32G484CEU6	
	STM32G491CCU6	
	STM32G491CEU6	
	STM32L412C8U6	
	STM32L412CBU6	
	STM32L412CBU6P	
	STM32L412CBU6TR	
	STM32L412K8U6	
	STM32L412KBU3	
	STM32L412KBU6	
	STM32L422CBU6	
	STM32L422KBU6	
	STM32L431CBU6	
	STM32L431CCU6	
	STM32L431CCU6TR	
	STM32L431KBU3	
	STM32L431KBU6	
	STM32L431KBU6TR	
	STM32L431KCU6	
	STM32L431KCU6TR	
	STM32L432KBU6	
	STM32L432KCU3	
	STM32L432KCU6	
	STM32L433CBU6	
	STM32L433CCU3	
	STM32L433CCU6	
	STM32L442KCU6	
	STM32L443CCU6	
	STM32L451CCU3	
	STM32L451CCU6	
	STM32L451CCU6TR	
	STM32L451CEU6	
	STM32L451CEU6TR	
	STM32L452CCU6	

	STM32L452CEU3	
	STM32L452CEU6	
	STM32L462CEU6	
	STM32L462CEU6TR	
	STM32L4P5CEU6	
	STM32L4P5CGU6	
	STM32L4Q5CGU6	
	STM32L4Q5CGU6P	
	STM32L552CCU6	
	STM32L552CEU6	
	STM32L552CEU6P	
	STM32L562CEU6	
	STM32L562CEU6P	
	STM32L433CCU3TR	

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Reliability Report

MDRF-GPM-RER2323

ASE Kaohsiung (Taiwan) UQFN 5x5 32L & UQFN7x7 48L package copper palladium bonding wire introduction on STM32 listed products.

PCN14312

General Information	
Commercial Product	STM32G071CBU6 STM32L431KCU6 STM32G031K8U6
Product Line	460X66 435X66 466X66
Die revision	460: Cut2.1 435: Cut1.1 466: Cut 1.2
Package	UFQFPN 7X7X0.55 48L 0.5 MM PITCH UFQFPN 5X5X0.55 32L 0.5 MM PITCH
Silicon Technology	TN090CE
Division	MDRF-GPM

Traceability	
Diffusion Plant	TSMC (Taiwan) Fab14 DIFF
Assembly Plant	ASE (Taiwan)

Reliability Assessment	
Pass	☑
Fail	

Release	Date	Author	Function
1.0	4/18/2024	Gabin Bosco	GPM BE Q&R

DOCUMENT ACTORS:

Name	Function	Location	Date
Pascal NARCHE	Subgroup Quality Manager	Rousset	4/18/2024
Berengere ROUTIER-SCAPPUCCI	GPM BE Q&R Manager	Rousset	4/18/2024

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 qualification of copper wires on ASE (Taiwan) UFQFPN 5X5 32L, UFQFPN 7X7 48L packages in TSMC 90nm.

PCN14312 changes are described in table below:

	Existing back-end line			Added back-end line
Assembly site	StatsChipPAC JSCC Jiangyin (China)		ASE Kaohsiung (Taiwan)	
Molding Compound	Sumitomo EME-G770	Sumitomo EME-G700LA type LA	Sumitomo EME-G631H	
GLUE	Henkel Loctite Ablebond 8290	HITACHI EN4900G		
Wire	Gold 0.8mil	Copper Palladium 0.8mil	Gold 0.8mil	Copper Palladium 0.8mil
PP code marking	AA		GQ	

- **CONCLUSION**

All reliability tests have been completed with positive results for UFQFPN 5X5 32L, UFQFPN 7X7 48L packages. 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.

According to good reliability tests results in line with validated product mission profile and reliability strategy, the qualification is granted for all products with same silicon technology (TSMC 90nm) as Test vehicles in UFQFPN 5X5 32L, UFQFPN 7X7 48L packages with copper wires in ASE (Taiwan) assembly line.

TABLE OF CONTENT

1. RELIABILITY STRATEGY

1.1. 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, specifications references, refer to test results summary in section 3.

2. PRODUCT OR TEST VEHICLE CHARACTERISTICS

2.1. Generalities

Reliability test vehicles are defined below:

Package line	Device (partial Rawline Code)	Diffusion list	Number of lots
UFQFPN 7x7	MI*460	TSMC Fab14	1
UFQFPN 5x5	MG*435	TSMC Fab14	1
UFQFPN 5x5	MG*466	TSMC Fab14	1

2.2. Traceability

2.2.1. Wafer Fab Information

Die - 460

Wafer Fab Information	
FAB1	
Wafer fab name / location	TSMC Taiwan / Fab14 DIFF
Wafer diameter (inches)	12
Wafer thickness (µm)	775±25
Silicon process technology	TN090CE
Number of masks	45
Die finishing front side (passivation) materials	USG + NITRIDE
Die finishing back side Materials	RAW SILICON
Die area (Stepping die size)	5.8239 mm² (2326.6, 2503.2)
Die pad size	Geometry: Open(X,Y) Rectangular: 65,59 µm Rectangular: 123,59 µm
Sawing street width (X,Y) (µm)	79.92,79.84

Metal levels/Materials/Thicknesses	**Wire bond pad metal**	**Composition**	**Thickness**
	1	TaN/Ta/CuSeed/Cu	0.24 µm
	2	TaN/Ta/CuSeed/Cu	0.31 µm
	3	TaN/Ta/CuSeed/Cu	0.31 µm
	4	TaN/Ta/CuSeed/Cu	0.31 µm
	5	TaN/Ta/CuSeed/Cu	0.31 µm
	6	TaN/Ta/CuSeed/Cu	0.85 µm
	7	AlCu	1.45 µm

Die - 435

Wafer Fab Information			
FAB1			
Wafer fab name / location	TSMC Taiwan / Fab14 DIFF		
Wafer diameter (inches)	12		
Wafer thickness (µm)	775±25		
Silicon process technology	TN090CE		
Number of masks	45		
Die finishing front side (passivation) materials	PSG + NITRIDE		
Die finishing back side Materials	RAW SILICON		
Die area (Stepping die size)	10.045 mm² (3176.4, 3162.4)		
Die pad size	**Geometry**	**Open(X,Y)**	
	Rectangular	123,59 µm	
Sawing street width (X,Y) (µm)	80,80		
Metal levels/Materials/Thicknesses	**Wire bond pad metal**	**Composition**	**Thickness**
	1	TaN/Ta/CuSeed/Cu	0.24 µm
	2	TaN/Ta/CuSeed/Cu	0.31 µm
	3	TaN/Ta/CuSeed/Cu	0.31 µm
	4	TaN/Ta/CuSeed/Cu	0.31 µm
	5	TaN/Ta/CuSeed/Cu	0.31 µm
	6	TaN/Ta/CuSeed/Cu	0.85 µm
	7	AlCu	1.45 µm

Die - 466

Wafer Fab Information	
FAB1	
Wafer fab name / location	TSMC Taiwan / Fab14 DIFF
Wafer diameter (inches)	12
Wafer thickness (µm)	775±25
Silicon process technology	TN090CE
Number of masks	45
Die finishing front side (passivation) materials	USG + NITRIDE
Die finishing back side Materials	RAW SILICON
Die area (Stepping die size)	4.0921mm² (1889.6, 2165.6)
Die pad size	**Geometry** / **Open(X,Y)** Rectangular / 123,59 µm Rectangular / 65,59 µm
Sawing street width (X,Y) (µm)	80,80
Metal levels/Materials/Thicknesses	**Wire bond pad metal** / **Composition** / **Thickness** 1 / TaN/Ta/CuSeed/Cu / 0.24 µm 2 / TaN/Ta/CuSeed/Cu / 0.31 µm 3 / TaN/Ta/CuSeed/Cu / 0.31 µm 4 / TaN/Ta/CuSeed/Cu / 0.31 µm 5 / TaN/Ta/CuSeed/Cu / 0.31 µm 6 / TaN/Ta/CuSeed/Cu / 0.85 µm 7 / AlCu / 1.45 µm

2.2.2.Assembly Information

Assembly Information	
Package 1:UFQFPN 7X7X0.55 48L 0.5 MM PITCH	
Assembly plant name / location	ASE Taiwan
Pitch (mm)	0.5
Die thickness after back-grinding (µm)	150±25
Die sawing method	Laser grooving+ mechanical sawing
Bill of Material elements	
Lead frame/reference	LF for UQFN7x7 48L 5.2sq
Lead frame finishing (material/thickness)	Pure Tin (e3) - Tolerance 7 to 20 µm
Die attach material/glue/supplier	HITACHI EN4900G
Wire bonding material/diameter	CuPd 0.8 mils
Molding compound material/supplier/reference	RESIN SUMITOMO EME-G631H
Package Moisture Sensitivity Level (JEDEC J-STD020D)	3

Assembly Information		
Package 1:UFQFPN 5X5X0.55 32L 0.5 MM PITCH	466	435
Assembly plant name / location	ASE Taiwan	
Pitch (mm)	0.5mm	
Die thickness after back-grinding (µm)	150±25µm	
Die sawing method	Laser grooving+ mechanical sawing	
Bill of Material elements		
Lead frame/reference	LF for UQFN5x5 32L 3.1sq	LF for UQFN5X5 32L 3.96sq
Lead frame finishing (material/thickness)	Pure Tin (e3) - Tolerance 7 to 20 µm	
Die attach material/glue/supplier	HITACHI EN4900G	
Wire bonding material/diameter	CuPd 0.8 mils	
Molding compound material/supplier/reference	RESIN SUMITOMO EME-G631H	
Package Moisture Sensitivity Level (JEDEC J-STD020D)	3	

2.2.3.Reliability testing information

Reliability Testing Information	
Reliability laboratory name / location	Grenoble Rel Lab, ASE Rel LAB, MUAR BE 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	Note
Lot 1	9R334061	Cut2.1	AA347003	20MI*460QCXY	UFQFPN 7X7X0.55 48L 0.5 MM PITCH	
Lot 2	9R307074	Cut1.1	AA346004	26MG*435QCXZ	UFQFPN 5X5X0.55 32L 0.5 MM PITCH	
Lot 3	9R322210	Cut 1.2	AA345004	21MG*466QCXY	UFQFPN 5X5X0.55 32L 0.5 MM PITCH	

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	24h bake@125°C, MSL3 (192h/30°C/60%RH) 3x Reflow simulation Peak Reflow Temp= 260°C	3	308	924	Lot 1: 0/308 Lot 2: 0/308 Lot 3: 0/308	
HTSL	JESD22-A103	Ta= 150°C Duration= 1000hrs After PC	3	77	231	Lot 1: 0/77 Lot 2: 0/77 Lot 3: 0/77	
TC	JESD22-A104	Ta= -65 to 150°C Cyc= 500 cy After PC	3	77	231	Lot 1: 0/77 Lot 2: 0/77 Lot 3: 0/77	
THB	JESD22-A101	Ta= 85%HR/85°C/VDD max Duration= 1000hrs After PC	3	77	231	Lot 1: 0/77 Lot 2: 0/77 Lot 3: 0/77	
UHAST	JESD22-A118	Ta= 130°C/85%RH Duration= 96hrs After PC	3	77	231	Lot 1: 0/77 Lot 2: 0/77 Lot 3: 0/77	

Electrical Verification Tests

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 die 466 250V for die 435 500V for die 460	3	3	9	Lot 1: 0/3 Lot 2: 0/3 Lot 3: 0/3	

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	ST internal specifications JESD 22B102	Construction analysis including Solderability and BS/PT	3	50	150	Lot 1: 0/50 Lot 2: 0/50 Lot 3: 0/50	MDG Muar_24_00007 MDG Muar_24_00008 MDG Muar_24_00009

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
JESD 22B102	Solderability test

5. GLOSSARY

CDM	Electrostatic Discharge - Charged device model
THB	Temperature Humidity Bias
CA	Construction analysis System
HTSL	HTSL Storage Life 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
BS/PT	Ball Shear/Pull Test

6. REVISION HISTORY

Release	Date	Description
1.0	4/18/2024	Initial Release

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PRODUCT/PROCESS CHANGE NOTIFICATION
PCN14312 – Additional information

ASE Kaohsiung (Taiwan) UQFN5x5 32L & UQFN7x7 48L package copper palladium bonding wire introduction on STM32C0x, STM32G0x, STM32G4x, STM32L4x and STM32L5x listed products.

MDRF – General Purpose Microcontrollers Division (GPM)

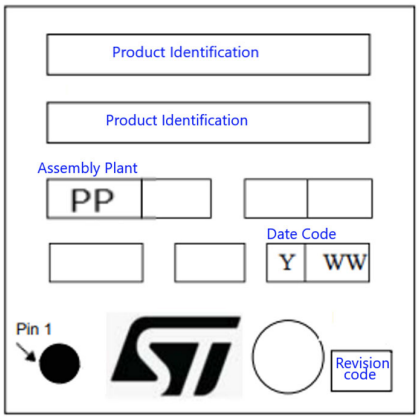
What are the changes?

Changes described in table below:

	Existing back-end line			Added back-end line
Assembly site	StatsChipPAC JSCC Jiangyin (China)		ASE Kaohsiung (Taiwan)	
Molding Compound	Sumitomo EME-G770	Sumitomo EME-G700LA type LA	Sumitomo EME-G631H	
GLUE	Henkel Loctite Ablebond 8290	HITACHI EN4900G		
Wire	Gold 0.8mil	Copper Palladium 0.8mil	Gold 0.8mil	Copper Palladium 0.8mil
PP code marking	AA		GQ	

How can the change be seen?

Package top view example marking for UQFN7x7 48L package



Y WW : Year Week (manufacturing date)

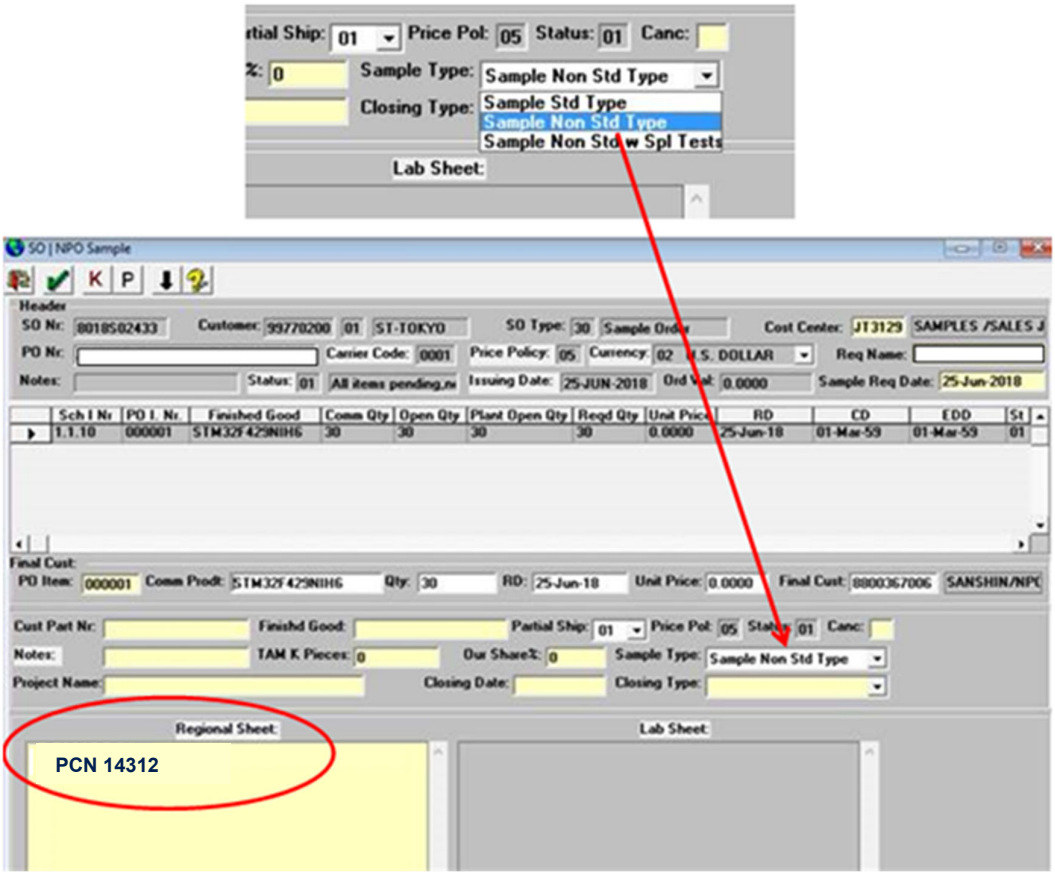
PP : Assembly Plant code

Please refer to 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 "**PCN14312**" 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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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) UQFN5x5 32L & UQFN7x7 48L package copper palladium bonding wire introduction on STM32C0x, STM32G0x, STM32G4x, STM32L4x and STM32L5x listed products

PCN Reference : MDG/24/14312

Subject : Public Products List

Dear Customer,

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

STM32G0B1CCU6NTR	STM32G0B1KBU3NTR	STM32G031K6U6
STM32L431CBU6	STM32G431CBU3	STM32G051K6U6
STM32G0B1CCU3TR	STM32G071CBU3	STM32G431C6U6
STM32L432KCU3TR	STM32G473CEU3TR	STM32L412KBU6TR
STM32L431CCU6	STM32G0B1CCU6TR	STM32L422CBU6
STM32C031K6U3TR	STM32G081KBU6	STM32G061C8U6
STM32G071KBU3	STM32G473CCU6TR	STM32L562CEU6P
STM32G071KBU6	STM32G0B1CBU3	STM32G0B1KCU6N
STM32G031K8U6TR	STM32G0B1CCU6	STM32L451CEU6TR
STM32G474CCU6	STM32L451CCU6	STM32G431K8U6
STM32G031C8U3	STM32L552CCU6	STM32L442KCU6
STM32G071C8U6TR	STM32L431KBU6	STM32G071KBU7TR
STM32C031K4U6TR	STM32G031K4U3TR	STM32L431CCU7TR
STM32G071C8U7	STM32G441CBU6	STM32G0B1CCU6N
STM32L4P5CGU6P	STM32G071C8U7TR	STM32G031K8U7
STM32L431CCU6TR	STM32G071KBU7	STM32G071CBU6TR
STM32L433CBU6	STM32G071KBU6TR	STM32G0B1CCU7TR
STM32L431CCU7	STM32G441KBU6	STM32L412K8U6TR
STM32G431K8U6TR	STM32L432KCU3	STM32G051K8U7
STM32L451CCU3TR	STM32L451CCU3	STM32G431KBU3TR
STM32G031C8U3TR	STM32G071CBU3TR	STM32G0B1KCU6
STM32G0C1CCU6	STM32G4A1CEU6	STM32C031K4U7TR
STM32G051C8U3TR	STM32G0C1KEU6	STM32G041K6U3TR
STM32G0B1CBU6N	STM32L4Q5CGU6P	STM32G0B1CBU6
STM32G484CEU6	STM32G0B1KEU6N	STM32L422KBU6
STM32G0B1KEU6	STM32L431KBU6TR	STM32G031K8U7TR
STM32G473CEU3	STM32G041K6U3	STM32L4P5CEU6
STM32G051C8U6TR	STM32G031C8U6	STM32L433CCU3TR
STM32G071C8U3	STM32G061K8U6	STM32L552CEU6P
STM32G0B1KEU7TR	STM32L452CEU6	STM32L412C8U6
STM32G071C8U3TR	STM32G051K6U7TR	STM32G031C4U6
STM32C031C6U6	STM32L462CEU6	STM32G473CCU3TR
STM32G0C1CEU6	STM32G0B1KCU7TR	STM32G473CEU6
STM32L431KBU3	STM32C031C4U6	STM32G474CCU3
STM32G0B1CEU6	STM32G0C1KCU6N	STM32G031C8U6TR

Public Products List

STM32C031K6U7TR	STM32G041K8U6	STM32G031K8U6
STM32C031K6U7	STM32G0B1CBU6TR	STM32G051K8U6
STM32G051K8U7TR	STM32G0B1KEU7	STM32L412KBU6
STM32G071KBU6N	STM32G061K6U6	STM32G0B1KCU7
STM32G061C6U6	STM32G0B1CBU7	STM32C031C6U7
STM32G031K4U6	STM32G474CEU6TR	STM32L412KBU3
STM32G051C8U3	STM32G431CBU6	STM32L432KBU6
STM32G491CEU3	STM32L412CBU6P	STM32G474CBU6
STM32G0C1KEU6N	STM32G031C8U7	STM32L431KCU6TR
STM32G431C8U3	STM32G071CBU6	STM32L462CEU6F
STM32L412K8U6	STM32G051K6U7	STM32L412C8U6TR
STM32L432KCU6TR	STM32L412CBU6	STM32G051C8U6
STM32L4Q5CGU6	STM32G031K4U6TR	STM32G0B1CEU7
STM32C031K6U6	STM32G051C8U7TR	STM32L432KBU6TR
STM32L431CBU6TR	STM32L442KCU6TR	STM32G431C8U6
STM32G0B1CCU3	STM32L433CCU6TR	STM32G473CCU3
STM32G431KBU6	STM32G071K8U6	STM32G0C1CEU6TR
STM32L412CBU6TR	STM32G491CEU6	STM32G0B1CEU7TR
STM32G031K4U3	STM32L431KBU3TR	STM32G051C6U6
STM32G081CBU6	STM32L452CEU3	STM32L562CEU6TR
STM32G051C8U7	STM32G473CBU6	STM32L432KCU6
STM32L431KCU6	STM32G0B1KBU6	STM32G0B1CEU6N
STM32G431K6U6	STM32L443CCU6	STM32L4P5CGU6
STM32G474CEU3	STM32L452CCU6	STM32G0B1CBU7TR
STM32G473CCU6	STM32G031C6U6	STM32L462CEU6TR
STM32G0B1KBU6N	STM32L451CEU6	STM32G031C8U7TR
STM32G431KBU3	STM32C031C6U7TR	STM32C031K4U6
STM32G0B1KBU3N	STM32L433CCU6	STM32L451CCU6TR
STM32L562CEU6	STM32C031K6U6TR	STM32G474CEU6
STM32L562CEU3	STM32G0B1CCU7	STM32G431K6U3
STM32G041C8U6	STM32L433CCU3	STM32G483CEU6
STM32G491CCU6	STM32G0C1KCU6	STM32L552CEU6
STM32C031K4U7	STM32G491CEU3TR	STM32G431CBU3TR
STM32G431CBU6TR	STM32G474CEU3TR	

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