Public Products List

PCN Title : Change leadframe supplier location and molding compound - STM8AFx VFQFPN 32 5x5 automotive selected products

PCN Reference : MDG/16/9518

PCN Created on : 10-Nov-2015

Subject : Public Products List

Dear Customer,

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

STM8AF6246UCX	STM8AF6246UAY	STM8AF6246UAX
STM8AF62A6UDX	STM8AF5286UAY	STM8AF5286UCX
STM8AF62A6UCY	STM8AF6246UDX	STM8AF5286UDY
STM8AF6266UCX	STM8AF52A6UCY	STM8AF6246UCY
STM8AF6246UDY	STM8AF5286UDX	STM8AF5286UCY

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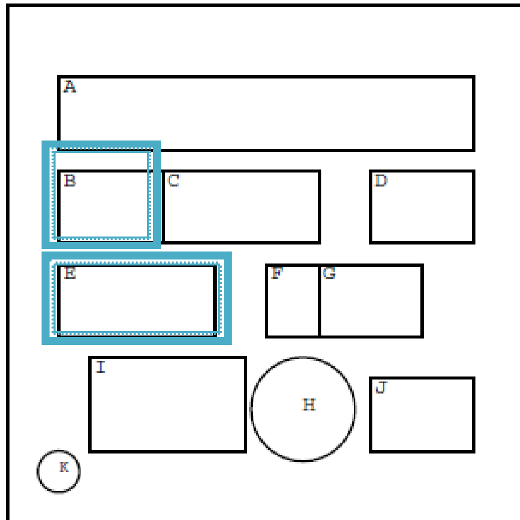
PRODUCT/PROCESS CHANGE NOTIFICATION
PCN 9518 - Additional information

Change leadframe supplier location and molding compound - STM8AFx VFQFPN 32 5x5 automotive selected products

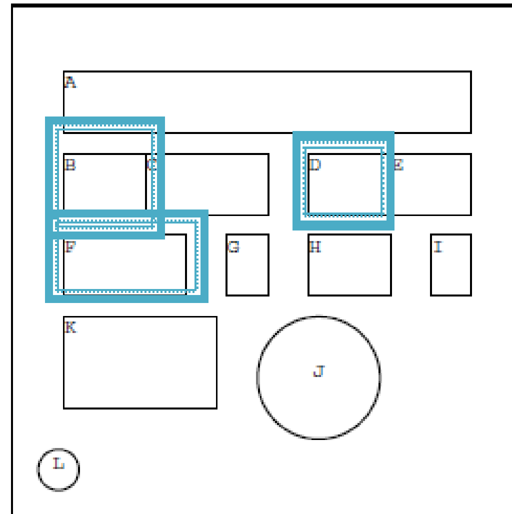
MMS - Microcontrollers Division (MCD)

How can the change be seen?

The marking instruction indicated on the products is changing:
- Assembly plant changes from GH (in B) to 78 (in B)
- Country Of Origin change from CHN (in E) to PHLS (in F)
- 2 digits are added for enhanced traceability (in D)



Previous marking



New marking

How to order samples?

For all sample request linked to this PCN, please:

- request sample(s) through Notice tool, indicating a single Commercial Product for each request.
- insert “PCN 9518” into the remarks of your order.
- place **non standard** sample order using the following field in your system.

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MMS- MCD RER1517
Reliability Report

Qualification Type : ASSEMBLY LINE QUALIFICATION, NEW BILL OF MATERIALS

VQFN5x5 32L – AMKOR ATP Qualification
Dice 79H/ 79J/ 79B/ 79A
PCN MDG/16/9518

Product / Process & Package Information for Test vehicles	Die 79H	Die 79J	Die 79B
Commercial Product:	STM8AL3166UAY	STM8AF6226UCY	STM8AF6246UCY
Product Line:	STM8AL die 79H	STM8AF die 79J	STM8AF die 79B
Product Description:	Micro 8Bits		
Finish Good Code:	ES8AL3166UAY$P7	ES8AF6226UCY$P7	ES8S207C8T6$9C
Mask Set Revision:	X79HX21Z	X79JX10A	X79BES4W
Silicon Process Technology:	2V8- CMOSF9 GO2 ULL	2V - CMOSF9	2V - CMOSF9
Wafer Fabrication Location:	ST Rousset 8" France		
Electrical Wafer Sort Test Plant Location:	ST MICROELECTRONICS Ang Mo Kio EWS SINGAPORE		
Package:	VFQFPN5*5 32L		
Assembly Plant location:	AMKOR ATP3 (Philippines)		
Final Test plant location:	ST Muar (Malaysia)		

Approval List			
Function	**Location**	**Name**	**Date**
Division Q&R Responsible	ST Rousset	Gisèle SEUBE	July 6th, 2016
Division Quality Manager	ST Rousset	Pascal NARCHE	July 6th, 2016

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1 RELIABILITY RESULTS OVERVIEW

1.1 Objectives

This report summarizes the reliability results for VFQFPN32L 5x5 package assembled at AMKOR ATP3 (Philippines) and final tested at ST Muar (Malaysia).
Test vehicles are described here below:

Product	Die	Package
STM8AL3166UAY	79H	VFQFPN 5X5x1.0 32L PITCH 0.5
STM8AF6226UCY	79J	VFQFPN 5X5x1.0 32L PITCH 0.5
STM8AF6246UCY	79B	VFQFPN 5X5x1.0 32L PITCH 0.5

Die 79A is qualified by similarity with dice 79B & 79J, same front end technology.

1.2 Context

1. For 79H & 79J devices- Qualification of VQFN5x5 32L package
2. For 79A & 79B devices- PCN MDG/16/9518- Qualification of a new bill of materials for VQFN5x5 32L package currently in production.

Bill of Materials changes are described here below:

Old	New
Change from: - previous leadframe supplier location : LGI (Fuzhou, China) - previous molding compound : Sumitomo EME-G700	Change to: - new leadframe supplier location : ALS (Ansan, Korea) - new molding compound : Sumitomo EMEG700Y

Changes are qualified using the standard STMicroelectronics Corporate Procedures for Quality and Reliability, in full compliancy with the JESD-47 international standard.

1.3 Conclusion

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

According to the positive reliability results, the qualification is granted for VQFN5x5 32L assembled at Amkor ATP (Philippines).

2 RELIABILITY TEST VEHICLES Characteristics

2.1 Reliability Test vehicles description

Package line	Assembly Line	Package	Device (Partial RawLine Code)	Diffusion Process	Number of Lots
QFN	VFQFPN5*5	32L	STM8AL (42*79H) STM8AF (42*79J) STM8AF (42*79B)	F9GO2 F9GO1 F9GO1	2 1 1

2.2 Reliability Information

Lot ID	Lot 1/ 2	Lot 3	Lot 4
Die Name /cut:	79H	79J	79B
Diffusion Lot Number:	G413760	G523783A	G540496
Trace Code:	7B603375/ 7B603289	7B603289	7B603289
Assy lot number	A561605CY0064/ A561605CY0065	A561605CY0063	A561605CY0127
Raw Line Code Package:	P142*79HES1Z	P142*79JES0A	4442*79BES4W
Reliability Lab location :	ST Muar (Malaysia)		

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2.3 Front-End information

Front-End	Lot 1 / 2 (79H)	Lot 3 (79J)	Lot 4 (79B)
Wafer Diameter:	8 inches		
Wafer Thickness:	375 +/-25 µm		
Die Size:	1738 X 2876 µm	1334 X 2210 µm	2118 X 2358 µm
Scribe Line size x/y:	80 x 80 µm		
Pad Die Size /Pad type:	65 x 108 µm	65 x 108 µm	65 x 108 µm
Metal Layers Number /Materials /Thickness:	Metal 1 TaN/Ta/Cu 0.280 µm Metal 2 TaN/Ta/Cu 0.350 µm Metal 3 TaN/Ta/Cu 0.350 µm Metal 3 TaN/Ta/Cu 0.350 µm Metal 5 Ti/AlCu/TxTN 0.900 µm	Metal 1 TaN/Ta/Cu 0.280 µm Metal 2 TaN/Ta/Cu 0.350 µm Metal 3 TaN/Ta/Cu 0.350 µm Metal 4 Ti/AlCu/TxTN 0.900 µm	Metal 1 TaN/Ta/Cu 0.280 µm Metal 2 TaN/Ta/Cu 0.350 µm Metal 3 TaN/Ta/Cu 0.350 µm Metal 4 Ti/AlCu/TxTN 0.900 µm
Passivation Layers Thickness:	USG + NitUV (HFP USG+UV Nitride)		
Back Metal Finishing	RAW SILICON - BACK GRINDING		

2.4 Back-End information

Back-End	Lot 1 / 2 (79H)	Lot 3 (79J)	Lot 4 (79B)
Assembly Plant Location/ Address:	AMKOR TECHNOLOGY PHILIPPINES, INC. (ATP) - P3/P4 119 North Science Avenue Special Economic Processing Zone Laguna Technopark, Binan Laguna PHILIPPINES 4024		
Final test Plant Location/ Address:	ST MICROELECTRONICS TANJONG AGAS IND ESTATE PO BOX 28 84007 MUAR / JOHOR MALAYSIA		
Die Thickness after Back grinding:	250µm +/- 25µm		
Die sawing method:	Step cut		
Die attach material: Type: Supplier:	Glue: Epoxy AMK-06 Ablestick		
Lead frame material: L/F Finishing Type: Die paddle size: Supplier:	Copper LF Pure Sn (e3) 3.9 x 3.9 ALS		
Wire bonding: Type /Diameter: Supplier:	GOLD WIRE 0.8mil HERAEUS		
Pitch:	80µm		
POA:	7376875		
Molding Compound Supplier:	EME-G700Y SUMITOMO		
Package Moisture Sensitivity Level (JEDEC J-STD020D):	3		

3 RELIABILITY RESULTS SUMMARY

3.1 Die oriented test

	Die Related Tests					Results VQFN 5x5		
Description	***Test/Method***	***Conditions***	***Sample Size***	***Criteria***	***Readout / Duration***	***79H***	***79J***	***79B***
Electrostatic discharge – Charge Device Model								
ESD CDM	ANSI/ESD STM5.3.1	1KV	3 units	1KV	NA	0/3	0/3	0/3

3.2 Package Oriented Test

	Package Related Tests					Results VQFN 5x5		
Description	***Test/Method***	***Conditions***	***Sample Size***	***Criteria***	***Readout / Duration***	***79H***	***79J***	***79B***
Preconditioning: moisture sensitivity level 3								
PC	J-STD-020 JESD22-A113	MSL3	308 units	Electrical test: A0/R1 (Accepted 0 reject/ Rejected 1 reject)	NA	0/616	0/308	0/308
				CSAM	NA	No delamination		
High Temperature Storage Life								
HTSL	JESD 22-A103	150°C	77 units	Elect test A0/R1	1000h	0/154	0/77	0/77
Thermal Cycling after Preconditioning								
TC	JESD 22-A104	-50c/+150°c	77 units	Elect test A0/R1	1000cy	0/154	0/77	0/77
Wire Bond Shear after Thermal Cycling								
Wire Bond Shear	AEC Q100-001	Min bond shear 15g after TC	30 x 3	A0/R1	After TC 1000cy	0/60	0/30	0/30
Wire Bond Pull after Thermal Cycling								
Wire Bond Pull	Mil Std 883 Method 2011	Minimum pull strength after TC=3 grams after TC	30 x 3	A0/R1	After TC 1000cy	0/60	0/30	0/30

Autoclave after Preconditioning								
AC	JESD 22A102	121°C ,100% 2Atm RH	77 units	Elect test A0/R1	96h	0/154	0/77	0/77
Temperature Humidity Bias after Preconditioning								
THB	JESD 22A110	85°C/85%RH Bias	77 units	Elect test A0/R1	1000h	0/154	0/77	0/77
Construction Analysis								
CA	Construction Analysis including : -Wire bond shear -Wire bond pull -Solderability -Physical Dimension	JESD 22B102 JESDB100/B108	50		No major concern	No major concern		

4 APPLICABLE AND REFERENCE DOCUMENTS

ADCS/DMS 0061692 :	Reliability Tests And Criteria For Qualifications
SOP 2.6.2:	Process qualification and transfer management
SOP 2.6.7:	Product Maturity Level
SOP 2.6.9:	Package and process maturity management in Back End
SOP 2.6.11:	Program management from product qualification
SOP 2.6.19:	Process maturity level
ANSI-ESD STM5.3.1:	Electrostatic discharge (ESD) sensitivity testing charge device model (CDM)
JESD 22-A103	High Temperature Storage Life
J-STD-020D:	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-A102:	Autoclave test (pressure pot)
JESD22-A104:	Temperature cycling
JESD22-A110:	Temperature Humidity Bake
JESD 22B102:	Solderability test
JESD22B100/B108:	Physical dimension

5 GLOSSARY AND TESTS DESCIPTION

PC	Preconditioning (solder simulation)
THB	Temperature Humidity Bias
TC	Temperature cycling
AC	Autoclave test (pressure pot)
HTSL	High temperature storage life
ADCS/DMS	ST Advanced Documentation Controlled system/ Documentation Management system
ESD CDM	Electrostatic discharge (charge device model)
CA	Construction Analysis

6 REVISION HISTORY

Version	Date	Author	Comment
1.0	July 6th, 2016	Gisele SEUBE	Initial release for qualification

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