PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data	
1.1 Company	STMicroelectronics International N.V
1.2 PCN No.	IPG/14/9014
1.3 Title of PCN	Qualification of a second assembly plant for Protection devices HSP051-4M10 and HSP061-4M10
1.4 Product Category	Protection devices HSP051-4M10 and HSP061-4M10
1.5 Issue date	2014-12-10

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	Christian NOPPER
2.1.2 Marketing Manager	Eric PARIS
2.1.3 Quality Manager	Jean-Paul REBRASSE

3. Change		
3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Machines	(Not Defined)	subcontractor in Philippines

4. Description of change		
	Old	New
4.1 Description	STMicroelectronics decided to expand the manufacturing capacity of its Protection devices HSP051-4M10 and HSP061-4M10 with one additional assembly and test subcontractor in Philippines.	N/A
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	The changed products do not present modified electrical, dimensional or thermal parameters, leaving unchanged the current information published in the product datasheet	

5. Reason / motivation for change	
5.1 Motivation	This additional multi-sourcing will increase our manufacturing capacity for a better service on the considered Protection devices.
5.2 Customer Benefit	SERVICE IMPROVEMENT

6. Marking of parts / traceability of change	
6.1 Description	marking of the components and QA number

7. Timing / schedule	
7.1 Date of qualification results	2014-11-28
7.2 Intended start of delivery	2015-02-28
7.3 Qualification sample available?	Upon Request

8. Qualification / Validation			
8.1 Description			
8.2 Qualification report and qualification results	In progress	Issue Date	

9. Attachments (additional documentations)
9014PpPrdtLst.pdf PCN-HSP_Amkor.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
	HSP051-4M10	
	HSP061-4M10	

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STMicroelectronics
IPD - ASD & IPAD™ Division[1]
BU IPAD™ & Protection

(1) IPD: Industrial & Power Group - ASD: Application Specific Device – IPAD™: Integrated Passive and Active Devices

PCN
Product/Process Change Notification

Qualification of a second assembly plant for Protection devices HSP051-4M10 and HSP061-4M10

Notification number:	IPG-DIS/9014	**Issue Date**	27/11/2014
Issued by	Aline AUGIS		
Product series affected by the change		HSP051-4M10 HSP061-4M10	
Type of change		Assembly additional location	

Description of the change

STMicroelectronics decided to **expand the manufacturing capacity of its Protection devices** HSP051-4M10 and HSP061-4M10 with one **additional assembly** and **test** subcontractor in **Philippines.**

Reason for change

This additional multi-sourcing will increase our **manufacturing capacity** for a better service on the considered **Protection** devices.

Former versus changed product:	The changed products do not present modified electrical, dimensional or thermal parameters, leaving unchanged the current information published in the product datasheet The Moisture Sensitivity Level of the part (according to the IPC/JEDEC JSTD-020D standard) remains unchanged. The footprint recommended by ST remains the same. There is no change in the packing modes and the standard delivery quantities either. The products remain in full compliance with the ST ECOPACK®2 grade (“halogen-free”).

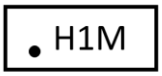
Disposition of former products

As the purpose is to expand the manufacturing capacity, shipments of the products processed in the initial test and assembly site will continue.

Marking and traceability

Traceability is ensured by the marking of the components (a rotation of the top side marking of 180°), an internal codification and the QA number. a rotation of the top side marking of 180°

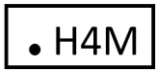
HSP051-4M10



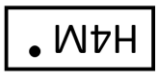
ST Site

Subcontractor Site

HSP061-4M10



ST Site



Subcontractor Site

Qualification complete date	14th November 2014

Forecasted sample availability

Product family	Sub-family	Commercial part Number	Availability date
Protection	ESD protection	HSP061-4M10	Week 42-2014
Protection	ESD protection	HSP051-4M10	Week 42-2014

Change implementation schedule

Sales types	Estimated production start	Estimated first shipments
HSP051-4M10 **HSP061-4M10**	**Week 46-2014**	**Week 09-2015**

Comments:	

Customer's feedback

Please contact your local ST sales representative or quality contact for requests concerning this change notification.
Absence of acknowledgement of this PCN within 30 days of receipt will constitute acceptance of the change
Absence of additional response within 90 days of receipt of this PCN will constitute acceptance of the change

Qualification program and results	14135QRP Attached

Reliability Report

Qualification of a second assembly plant for Protection devices HSP051-4M10 & HSP061-4M10

General Information	
Product Line	*Protection*
P/N	*HSP051-4M10* *HSP061-4M10*
Product Group	*IPG*
Product division	*ASD&IPAD*
Package	*DFN-10L*
Maturity level step	*Qualified*

Locations	
Wafer fab	*ST TOURS (FRANCE)*
Assembly plant	*SUBCON PHILIPPINES*
Reliability Lab	*ST TOURS (FRANCE)*

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	26/11/2014	7	J.MICHELON	J.P. REBRASSE	

Note: This report is a summary of the reliability trials performed in good faith by STMicroelectronics in order to evaluate the potential reliability risks during the product life using a set of defined test methods.
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TABLE OF CONTENTS

1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits
SOP 2614	Reliability requirements for product qualification
0061692	Reliability tests and criteria for qualifications
SOP 2610	general product qualification procedure
JESD 22	Reliability test methods for packaged devices

2 GLOSSARY

DUT	Device Under Test
PCB	Printed Circuit Board
SS	Sample Size
PC	Pre-conditionning
HTRB	High Temperature Reverse Bias
TC	Temperature Cycling
uHAST	Unbiased Highly Accelerated Stress Test
THB	Temperature Humidity Bias

3 OBJECTIVES

Description of the change:

STMicroelectronics decided to **expand the manufacturing capacity of its Protection devices** HSP051-4M10 and HSP061-4M10 with one **additional assembly** and **test** subcontractor in **Philippines.**

4 CONCLUSION

Qualification Plan requirements have been fulfilled without exception. Reliability tests have shown that the devices behave correctly against environmental tests (no failure). Moreover, the stability of electrical parameters during the accelerated tests demonstrates the robustness of the products and safe operation, which is consequently expected during their lifetime.

5 DEVICE CHARACTERISTICS

5.1 Description of the change

Multi-sourcing	Device	Current	New
Assembly & test location	HSP051-4M10 HSP061-4M10	STMicroelectronics Calamba (Philippines) – ECOPACK®2	STMicroelectronics Calamba (Philippines) – ECOPACK®2 Subcon Philippines – ECOPACK®2

6 TESTS RESULTS SUMMARY

6.1 Test vehicle

Lot #	Commercial part	Die manufacturing plant	Package	Assembly manufacturing plant	Comments
Lot 1	HSP061-4M10	ST Tours (France)	DFN-10L	Subcon Philippines	Qualification lots
Lot 2	HSP051-4M10				
Lot 3					

6.2 Test plan and results summary

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS		
						Lot 1	Lot 2	Lot 3
Die Oriented Tests								
HTRB	N	JESD22 A-108	Tj=150°C, VRM=3V Tension=3V (lot1) and 3.6V (lot 2 & 3)	229	168h	0/77	0/77	0/75
					504h	0/77	0/77	0/75
					1000h	0/77	0/77	0/75
Package Oriented Tests								
TC	Y	JESD22 A-104	-65°C/+150°C, 2 cycles/h	127	500c	0/77	0/25	0/25
THB	Y	JESD22 A-101	Humidity (HR)=85% Temperature=85°C Tension=3V (lot1) and 3.6V (lot 2 & 3)	126	168h	0/76	0/25	0/25
					504h	0/76	0/25	0/25
					1000h	0/76	0/25	0/25
Solderability	Y	JESD22 B-102	SnPb dry aging SnPb wet aging SnAg dry aging SnAg wet aging	40	Visual inspection	0/10	NA	NA
					Visual inspection	0/10	NA	NA
					Visual inspection	0/10	NA	NA
					Visual inspection	0/10	NA	NA
MSL1 Validation	N	JESD22 A-113	Humidity (HR)=85% Temperature=85°C +3 IR reflows	30	168h	0/30	NA	NA

6.3 Tests Description

Test name	Description	Purpose
Die Oriented		
HTRB High Temperature Reverse Bias	The device is stressed in static configuration, trying to satisfy as much as possible the following conditions: low power dissipation; max. supply voltage compatible with diffusion process and internal circuitry limitations;	To determine the effects of bias conditions and temperature on solid state devices over time. It simulates the devices operating condition in an accelerated way. To maximize the electrical field across either reverse-biased junctions or dielectric layers, in order to investigate the failure modes linked to mobile contamination, oxide ageing, layout sensitivity to surface effects.
Package Oriented		
PC Preconditioning	The device is submitted to a typical temperature profile used for surface mounting devices, after a controlled moisture absorption.	As stand-alone test: to investigate the moisture sensitivity level. As preconditioning before other reliability tests: to verify that the surface mounting stress does not impact on the subsequent reliability performance. The typical failure modes are "pop corn" effect and delamination.
THB Temperature Humidity Bias	The device is biased in static configuration minimizing its internal power dissipation, and stored at controlled conditions of ambient temperature and relative humidity.	To evaluate the package moisture resistance with electrical field applied, both electrolytic and galvanic corrosion are put in evidence.
TC Temperature Cycling	The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere.	To investigate failure modes related to the thermo-mechanical stress induced by the different thermal expansion of the materials interacting in the die-package system. Typical failure modes are linked to metal displacement, dielectric cracking, molding compound delamination, wire-bonds failure, die-attach layer degradation.

Test name	Description	Purpose
Solderability	The purpose of this test method is to provide a referee condition for the evaluation of the solderability of terminations (including leads up to 0.125 inch in diameter) that will be assembled using tin lead eutectic solder.	This evaluation is made on the basis of the ability of these terminations to be wetted and to produce a suitable fillet when coated by tin lead eutectic solder. These procedures will test whether the packaging materials and processes used during the manufacturing operations process produce a component that can be successfully soldered to the next level assembly using tin lead eutectic solder. A preconditioning test is included in this test method, which degrades the termination finish to provide a guard band against marginal finish.