


**PRODUCT / PROCESS CHANGE NOTIFICATION**

**1. PCN basic data**

1.1 Company		STMicroelectronics International N.V
1.2 PCN No.	ADG/19/11606	
1.3 Title of PCN	Additional Assembly and Test Location in China for the EMIF06-MSD02N16	
1.4 Product Category	EMIF06-MSD02N16	
1.5 Issue date	2019-08-01	

**2. PCN Team**

<b>2.1 Contact supplier</b>	
2.1.1 Name	ROBERTSON HEATHER
2.1.2 Phone	+1 8475853058
2.1.3 Email	heather.robertson@st.com
<b>2.2 Change responsibility</b>	
2.2.1 Product Manager	Richard RENARD
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)	Subco in China (Carsem)

**4. Description of change**

	Old	New
4.1 Description	Thailand (subco 1) (Carsem)	Thailand (subco 1) (Utac) CHINA (subco 2) (Carsem)
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	no	

**5. Reason / motivation for change**

5.1 Motivation	increase of the manufacturing capacity for a better service
5.2 Customer Benefit	CAPACITY INCREASE

**6. Marking of parts / traceability of change**

6.1 Description	internal codification, marking and QA number
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**7. Timing / schedule**

7.1 Date of qualification results	2019-05-24
7.2 Intended start of delivery	2019-09-02
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)**

11606 Public product.pdf
11606 PCN qualif EMIF06-MSD02N16 subco_China.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
	EMIF06-MSD02N16	

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## Public Products List

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**PCN Title :** Additional Assembly and Test Location in China for the EMIF06-MSD02N16

**PCN Reference :** ADG/19/11606

**Subject :** Public Products List

Dear Customer,

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

EMIF06-MSD02N16		
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## **PCN** **Product/Process Change Notification**

### **Additional Assembly and Test Location in China for the EMIF06-MSD02N16**

<b>Notification number:</b>	ADG-DIS/19/11606	<b>Issue Date</b>	23/07/2019
<b>Issued by</b>	Aline Augis		
<b>Product series affected by the change</b>		EMIF06-MSD02N16	
<b>Type of change</b>		Back end realization	

#### **Description of the change**

In order to better meet the market demand, we have decided to expand our manufacturing capacities for the EMIF06-MSD02N16 with one additional assembly and test line in a China subcontractor.

Multi-sourcing	Product	Current	New
<b>Assembly &amp; test location</b>	EMIF06-MSD02N16	Thailand (subco 1) – ECOPACK®2	Thailand (subco 1) – ECOPACK®2 <b>CHINA (subco 2) – ECOPACK®2</b>

#### **Reason for change**

This multi-sourcing will increase our manufacturing capacity for a better service on the considered device.

#### **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**

Deliveries will be done from both subcontractors in China and in Thailand.

#### **Marking and traceability**

Traceability for the implemented change will be ensured by a new internal codification (EMIF06-MSD2N16/S) with a new digit plant code marking "M" instead of EMIF06-MSD02N16/T with digit plant code marking "N".

(1) ADG: Automotive and Discretes Group

Marking subco Thailand		Marking New subco in China	
			
Qualification complete date		Week 21 - 2019	
Forecasted sample availability			
Samples will be available by the end of August 2019.			
Change implementation schedule			
Sales types		Estimated production start	
EMIF06-MSD02N16		Week 33 - 2018	
		Estimated first shipments	
		Week 43 – 2018	
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		19047QRP Attached	

# Reliability Evaluation Report

## Qualification of Additional Assembly and Test Location in China for the EMIF06-MSD02N16

### General Information

<b>Product Line</b>	<i>IPAD</i>
<b>Commercial Product</b>	<i>EMIF06-MSD02N16</i>
<b>Product Group</b>	<i>ADG</i>
<b>Product division</b>	<i>DFD</i>
<b>Package</b>	<i>μQFN 3.5x1.2 - 16L</i>
<b>Maturity level step</b>	<i>Qualified</i>

### Locations

<b>Wafer fab</b>	<i>STM TOURS (FRANCE)</i>
<b>Assembly plant</b>	<i>Subcontractor in China (996H)</i>
<b>Reliability Lab</b>	<i>STM TOURS (FRANCE)</i>
<b>Reliability Assessment</b>	<i>PASS</i>

### DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1	28/05/19	7	O. CHAVANON	J. MICHELON	PCN ADG-DIS/19/11606

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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## **1 APPLICABLE AND REFERENCE DOCUMENTS**

Document reference	Short description
JESD 47	Stress-Test-Driven Qualification of Integrated Circuits
JESD 94	Application specific qualification using knowledge based test methodology
JESD 22	Reliability test methods for packaged devices

## **2 GLOSSARY**

FE	Front End
BE	Back End
SS	Sample Size
PC	Pre-conditioning
LGA	Land Grid Array
CVS	Constant Voltage Stress
BCB	Benzocyclobutene
USG	Undoped Silicate Glass
SiN	Silicon Nitride
HRSi	High-Resistivity Silicon
ESD	Electrostatic Discharge

### **3 RELIABILITY EVALUATION OVERVIEW**

#### **3.1 Objectives**

The objective is to qualify an additional Assembly and Test location in China for the EMIF06-MSD02N16.

#### **3.2 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.

## 4 CHANGE DESCRIPTION

In order to better meet the market demand, we have decided to expand our manufacturing capacities for the EMIF06-MSD02N16 with one additional assembly and test line in a China subcontractor.

Multi-sourcing	Product	Current	New
Assembly & test location	EMIF06-MSD02N16	Thailand (subco 1) – ECOPACK®2	Thailand (subco 1) – ECOPACK®2 CHINA (subco 2) – ECOPACK®2

## 5 TESTS RESULTS SUMMARY

### 5.1 Test vehicles

Lot #	P/N	Die Manufacturing	Assembly Plant	Package	Comments
Lot 1	EMIF06-MSD02N16	ST Tours	Subcontractor China (996H)	µQFN 3.5x1.2	Qualification lots
Lot 2					
Lot 3					

Detailed results in below chapter will refer to P/N and Lot #.

### 5.2 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	Junction Temperature=150°C Tension=5V	231	168h	0/77	0/77	0/77
					504h	0/77	0/77	0/77
					1000h	0/76 *	0/77	0/77
Package Oriented Tests								
TC	Y	JESD22 A-104	Frequency (cy/h)=2cy/h Temperature (high)=150°C Temperature (low)=-65°C	75	500cy	0/24 *	0/25	0/23 *
THB	Y	JESD22 A-101	Humidity (HR)=85% Temperature=85°C Tension=5V	72	168h	0/22	0/25	0/24 *
					504h	0/22	0/25	0/24
					1000h	0/22	0/25	0/24
UFAST	Y	JESD22 A-118	Humidity (HR)=85% Pressure=2.3bar Temperature=130°C	75	96h	0/25	0/23 *	0/25
MSL research	N	J-STD- 020	Bake+168h 85°C 85%RH + 3IR reflows SAM before/after	30	168h	0/30 (No delamination)	-	-

\* Scrapped due to mishandling

## 6 ANNEXES

### 6.1 Tests Description

Test name	Standard Reference	Description	Purpose
<b>Die Oriented</b>			
<b>HTRB</b> High Temperature Reverse Bias	JESD22 A-108	HTRB : High Temperature Reverse Bias HTFB / HTGB : High Temperature Forward (Gate) 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.
<b>Package Oriented</b>			
<b>TC</b> Temperature Cycling	JESD22 A-104	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.
<b>THB</b> Temperature Humidity Bias	JESD22 A-101	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.
<b>UHASt</b>	JESD22 A-118	The device is stored under 130C 85% RH during 96 hours, or equivalent 110C 85% RH during 264 hours	To investigate corrosion phenomena affecting die or package materials, related to chemical contamination and package hermeticity. To point out critical water entry paths with consequent electrochemical and galvanic corrosion.