



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN MMS-MIC/13/7963
Dated 27 Jun 2013

**TFBGA5x5 Transfer assembly site from ST Shenzhen
(China) to ST Muar (Malaysia)**

Table 1. Change Implementation Schedule

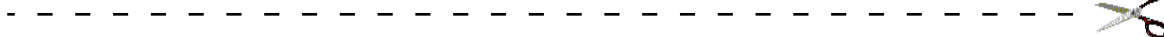
Forecasted implementation date for change	16-Oct-2013
Forecasted availability date of samples for customer	16-Sep-2013
Forecasted date for STMicroelectronics change Qualification Plan results availability	16-Sep-2013
Estimated date of changed product first shipment	16-Oct-2013

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	TFBGA 5x5 products
Type of change	Package assembly location change
Reason for change	Supply chain rationalization
Description of the change	TFBGA 5x5 products assembled at ST Shenzhen (China) will be assembled at ST Muar (Malaysia) with the same process and the same bill of materials. All package dimensions will remain unchanged.
Change Product Identification	Assy plant change from GK to 99, Country Of Origin change from CHN to MYS
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt		PCN MMS-MIC/13/7963
Please sign and return to STMicroelectronics Sales Office		Dated 27 Jun 2013
<input type="checkbox"/> Qualification Plan Denied <input type="checkbox"/> Qualification Plan Approved <input type="checkbox"/> Change Denied <input type="checkbox"/> Change Approved	Name:	
	Title:	
	Company:	
	Date:	
	Signature:	
Remark		

DOCUMENT APPROVAL

Name	Function
Colonna, Daniel	Marketing Manager
Buffa, Michel	Product Manager
Narche, Pascal	Q.A. Manager



PRODUCT/PROCESS CHANGE NOTIFICATION

TFBGA5x5 Transfer assembly site from ST Shenzhen (China) to ST Muar (Malaysia)

MMS - Microcontrollers Division (MCD)

Dear Customer,

In order to sustain the strong demand and in order to provide best-in-class service to our customers, ST MCD Division has decided to transfer TFBGA 5x5 products from ST Shenzhen (China) to ST Muar (Malaysia).

What are the changes?

TFBGA 5x5 products assembled at ST Shenzhen (China) will be assembled at ST Muar (Malaysia) with the same process and the same bill of materials. All package dimensions will remain unchanged.

Why?

In order to better rationalize the supply chain, ST MCD division moves TFBGA 5x5 package production from ST Shenzhen (China) to ST Muar (Malaysia) site.

Assembly, Test and Finishing will be done on the same site. Consequently it will enable to provide a better service to our customers.

When?

The production on the new assembly site will start **week 42 2013**.

How will the change be qualified?

This change will be qualified using the standard STMicroelectronics Corporate Procedures for Quality and Reliability, in full compliancy with the JESD-47 international standard.

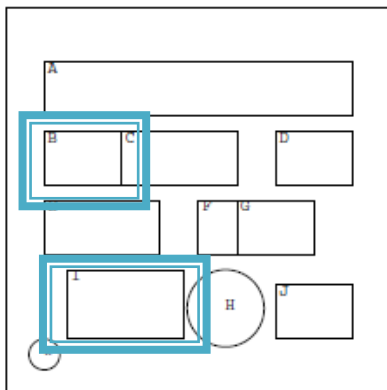
What is the impact of the change?

- **Form:** no change
- **Fit:** no change
- **Function:** no change

How can the change be seen?

Traceability of the change is ensured by ST internal tools.

The marking composition indicated on the products is changing from:



B : Assembly plant
change from GK to 99

I : Country Of Origin change
from CHN to MYS

We remain available to discuss any concern that you may have regarding this Product Change Notification.

With our sincere regards.

Michel Buffa

Microcontroller Division General Manager



RERMCD 1304 RELIABILITY PLAN

Qualification of :

TFBGA5x5 package at ST Muar

Qualification Reference:	RERMCD1304
Issued on:	June 18, 2013
Assembly and test Plant:	ST Muar
Assembly Line:	TFBGA
Devices:	STM32Fxx
Package / Process:	5x5 (64 Leads)

**Test Vehicles :****Device**

- STM32Fxx
- Die 410/ 416/420

Number of Lots

3 for monitoring (*)

(*) as device/ package already qualified, similarity rules are applied.

Package Reliability Trials :

Reliability Trial		Test Conditions	Pass Criteria	Unit per Lot
PC	Pre-Conditioning: Moisture sensitivity level 3 J-STD-020 JESD22-A113	Bake (125°C / 24 hrs) Soak (30°C / 60% RH / 192 hrs) for level 3 Convection reflow: 3 passes with Jedec level 3	3 passes MSL3 for qualification	308
AC	Autoclave JESD22 A102	121°C, 100% RH, 2 Atm	96h for monitoring	77
TC	Thermal Cycling JESD22 A104	-65°C, +150°C	500Cy for monitoring	77
THS/ THB	Temperature Humidity Storage or Biased JESD22 A110- A101	85°C, 85% RH, no bias/ No bias	1000h for monitoring	77
HTSL	High Temperature Storage Life JESD22 A103	150°C- no bias	1000h for monitoring	77
CA	Construction analysis	POA conformity	For qualification	30

Attachment : Reliability tests description**Package oriented tests/ Trials description****1. Preconditioning**

According to ST spec 0098044.

Preconditioning test sequence simulates storage and soldering of SMD (surface mount devices) before submitting them to the reliability tests. It aims to validate the moisture sensitivity level of the package, and prepare it to the stress of additional reliability tests, thus enabling a good modeling of the life of the packaged product.

Out-of-bag floor life storage and soldering are modeled by the following test sequence:

- Bake to completely remove moisture from the package;
- Moisture soak according to the package moisture level;
- IR reflow.

The aim is to check that the chip and plastic package withstand the stress due to report on card. Depending on their technology, packages may absorb moisture during their transportation and/or storage, moisture that is released during the soldering operation. At this step, the moisture absorbed is vaporized due to high temperature of solder reflow process. This phenomenon can create plastic swelling, "pop corn" effect, and cracks which eventually results in wire breakage, passivation cracks, and delamination.

2. Autoclave (AC)

The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature.

Purpose: 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.

3. Temperature Cycling (TC)

The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere (thermal gradient typical 10 C/min).

Purpose: 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, moulding compound delamination, wire-bonds failure, die-attach layer degradation.

4. Temperature Humidity Bias (THB)

The device is biased in static configuration minimizing its internal power dissipation, and stored at controlled conditions of ambient temperature and relative humidity.

The Temperature Humidity Bias follows the same method than HAST at lower temperature.

Purpose: to investigate failure mechanisms activated in the die-package environment by electrical field and wet conditions.

Typical failure mechanisms are electro-chemical corrosion and surface effects related to the molding compound.

The package moisture resistance with electrical field applied is verified, both electrolytic and galvanic corrosion are put in evidence.

Conditions:

- $T_a=85^{\circ}\text{C}$; R.H.=85%;
- Power supply voltage less or equal to max operative voltage to not exceed $T_j = 95^{\circ}\text{C}$.

5. Temperature Humidity Storage (THS)

The Temperature Humidity Storage is stored at controlled conditions of high temperature and relative humidity.

The Temperature Humidity Storage follows the same method than Unbiased HAST at lower temperature.

Purpose: to evaluate the reliability of non-hermetic packaged solid-state devices in humid environments. It is a highly accelerated test which employs temperature and humidity under non-condensing conditions to accelerate the penetration of moisture through the external protective material (encapsulant or seal) or along the interface between the external protective material and the metallic conductors which pass through it.

Bias is not applied in this test to ensure the failure mechanisms potentially overshadowed by bias can be uncovered (e.g. galvanic corrosion). This test is used to identify failure mechanisms internal to the package.

- Test conditions: 85°C / 85% RH.
- No power supply

6. High Temperature Storage Life (HTSL)

The device is stored in unbiased condition at the max. temperature allowed by the package materials, sometimes higher than the max. operative temperature.

Purpose: to investigate the failure mechanisms activated by high temperature, typically wire-bonds solder joint ageing, data retention faults, metal stress-voiding.

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