PRODUCT/PROCESS CHANGE NOTIFICATION

PCN MMS-MIC/09/4925
Notification Date 09/10/2009

Qualification of ST Muar (Malaysia) as an additional assembly site for lead free devices in TQFP 14x14 package

Table 1. Change Implementation Schedule

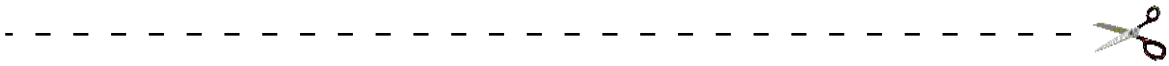
Forecasted implementation date for change	04-Sep-2009
Forecasted availabillity date of samples for customer	30-Sep-2009
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	04-Sep-2009
Estimated date of changed product first shipment	04-Dec-2009

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	See page 5
Type of change	Package assembly location change
Reason for change	Phase out of ST Malta assembly site
Description of the change	MCD is pleased to announce the qualification of ST Muar (Malaysia) assembly site for all the devices in TQFP 14x14 listes page 5. Muar was already running mass production for all ST7, ST9 and ST10 MCUs. Successful completion of the qualification plan as shown page 5 will allow for production of the affected devices. There are no changes to the devices design or part number as a result of this change.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	Country of Origin : Malaysia
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN MMS-MIC/09/4925**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 09/10/2009**

☐ Qualification Plan Denied	Name:
☐ Qualification Plan Approved	Title:
	Company:
☐ Change Denied	Date:
☐ Change Approved	Signature:

Remark

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DOCUMENT APPROVAL

Name	Function
Colonna, Daniel	Division Marketing Manager
Nicholas, Jimmy Edward	Division Product Manager
Narche, Pascal	Division Q.A. Manager

Details of the Qualification of PCN MMS-MIC/09/4925 are as follow:

Terms and conditions

Customers notification on: 4th-September-09

Estimated date of changed product first shipment: 4th-Dec-2009

List of Commercial Products for PCN MMS-MIC/09/4925:

Commercial Product	
STR750FV0T6	STM32F101V8T6TR
STR750FV1T6	STM32F101VBT6
STR750FV2T6	STM32F101VBT6TR
STR750FV2T7	STM32F103V8T6
STR755FV0T6	STM32F103VBT6
STR755FV1T6	STM32F103VBT7
STR755FV2T6	STM32F100VCT6
STM32F100V8T6	STM32F100VDT6
STM32F100VBT6	STM32F100VET6
STM32F101V8T6	STM32F101VCT6
STM32F101VDT6	STM32F103VDT6
STM32F101VDT6TR	STM32F103VET6
STM32F101VET6	STM32F103VET7
STM32F103VCT6	

For more information, please contact your local Sales & Marketing.

ST Microelectronics
MMS-MicroControllers Division Back End QA

MCD Pkg08 03 QC
QUALIFICATION CERTIFICATE

Date : 08/ 19/ 2008

Assembly Plant : ST MUAR

Package : LQFP 14*14

Product : STM32 devices

Process : Pre Plated Frame, leadfree plating (Ag, Au, NiPdAu)

Materials :

D/A Material	ABLEBOND 3280T
M/C Material	SUMITOMO G700L RESIN
Wire	GOLD WIRE: 1 MIL DIAMETER 25µ

Conclusion :

LQFP 14*14 package, assembled in ST MUAR, PPF leadfree plating is QUALIFIED.

CERTIFIED by:

Gisèle SEUBE
Microcontroller Division QA Dept
Rousset Aug 19th

MCD Pkg09 10 QUALIFICATION PLAN

Qualification of : LQFP14*14 for STR7at ST Muar

Qualification Reference :	**MCD Pkg09 10**
Issued on :	**Sept 1st, 2009**
Assembly Plant :	**ST Muar**
Assembly Line :	**QFP**
Package / Process :	**LQFP 14*14**

Test Vehicles :

RL Code	Number of Lots
*X31L*405XXXY*	*1*

Test Vehicle Features:

Die information

Test Vehicle	STR755FV2T6
Rawline	X31L*405XXXY
psfdescr	F405XXXY
Wafer Fab	ST Rousset 8”
FAB Process	CMOSM8T 34/37 Masks 6Met 2P
Die BackSide	Lapped Silicon
Passivation	SiN (nitride)
Die Step X	4228µm
Die Step Y	5344µm
Die Thickness	375+/-25µm
Pad Open X	65µm
Pad Open Y	70 µm
Min Pad Pitch	92.8µm

Assembly information

Test Vehicle	STR755FV2T6
Rawline	X31L*405XXXY
Assembly Plant	ST MUAR
Packaging	LQFP 100 14x14x1.4
POA	ADCS 0086901
BSA	eDOCS CD00234553
B/D	ADCS 7887574
Materials	FRAME TQFP 100L 14x14 7.2x7.2 FPd NiPdAu GLUE ABLEBOND 3280T RESIN SUMITOMO EME-G700L WIRE Au Diameter 1 mils
Ecopack	G (Ecopack2)
E Mark	e4
2nd Level Interco	Precious metal (Ag, Au, NiPdAu)
MSL	3
Peak Body Temp (C)	260°C

Package Reliability Trials :

Reliability Trial		Test Conditions	Pass Criteria	Unit per Lot
Preconditioning JL3+ AC	JL3+ Pressure Pot	121°C, 100% RH, 2 Atm	240h	80
Preconditioning JL3+ HTSL	JL3+ High Temperature Storage	150°C, Unbiased	500h,1000h	80
Preconditioning JL3+ TC	JL3+ Thermal Cycling MIL Std 883, Method 1010	-40°C, +150°C	500Cy,1000Cy	80
Preconditioning JL3+ THS	JL3+ Temperature Humidity Storage	85°C, 85% RH,Unbiased	500h,1000h	80

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 modelization 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 report 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 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

5. 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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