



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM/08/3892
Notification Date 07/31/2008

**HCMOS4 TECHNO FAMILY PROCESS DIFFUSION TRANSFER FROM
CARROLLTON 6" TO ANG MO KIO 6"**

Table 1. Change Implementation Schedule


Forecasted implementation date for change	20-Oct-2008
Forecasted availability date of samples for customer	24-Jul-2008
Forecasted date for STMicroelectronics change Qualification Plan results availability	24-Jul-2008
Estimated date of changed product first shipment	30-Oct-2008

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	See attached list
Type of change	Waferfab location change
Reason for change	FAB CLOSURE AS PER CORPORATE CIL CRP/07/2900
Description of the change	This document is related to HCMOS4X technology transfer from Carrollton to Ang Mo Kio and provide details applicable to the products listed in attachment.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	Plant marking identification "V6" for Ang Mo Kio plant
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	

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Customer Acknowledgement of Receipt		PCN APM/08/3892
Please sign and return to STMicroelectronics Sales Office		Notification Date 07/31/2008
<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
Sibille, Marie-Helene	Corporate Quality Manager
Buiguez, Francois	Process Owner

HCMOS4 BASELINE DIFFUSION TRANSFER FROM CARROLLTON 6" TO AMK 6"

WHAT:

Progressing along the Restructuring Plan already communicated by Corporate Information Letter (C.I.L.) CRP/07/2900 dated October 2, 2007 and APCN APM/07/3317 dated December 28, 2007, please be informed that the products currently manufactured in Carrollton 6" Plant (Texas, USA) by using HCMOS4 Baseline Technology, will be moved to our facilities located in Ang Mo Kio 6" Plant (Singapore). The relocation of the HCMOS4 Baseline Technology has been successfully qualified in the new plant and the full production ramp-up in the new site, will begin by the end of October 2008.

The affected products are listed in the table attached. All the products manufactured by ST using the HCMOS4 Baseline Technology, even if not expressly included in the above mentioned table, are affected by this change.

WHY:

In order to optimize ST asset utilization and enhance performance for shareholders and customers.

HOW:

By transferring and re-qualifying the mentioned front-end technology in the receiving plant; this technology has been qualified through a full set of evaluations on the selected test vehicle (TV for technology qualification): T84, EWS, electrical characterization, die and package oriented stress tests; other products diffused in the same Technology will be qualified mainly by similarity (generic data) if assembled in the same package family.

Techno family	Techno sub family	Product	Package	Product Group	Qualification Plan
HCMOS4 Baseline	HCMOS4 Baseline	M41T81	SO	APM	TV for technology and BE compatibility

This transfer will not modify the electrical, dimensional and thermal parameters for the product affected, maintaining unchanged current information published on the relevant datasheets. There are no changes in the packing modes or in the standard delivery quantities either. The table here in appendix 1, is providing you the detailed qualification plan that has been used in the new location to qualify the affected test vehicle.

ST will focus on customer satisfaction and ensure a seamless transition in the supply of products from different sites.

WHEN:

The transfer of all product lines and the ramp up in the new location will be finalized within **Q1 2009**.

Qualification program and results availability:

The qualification program mainly consists of comparative electrical characterizations and reliability tests. The relevant reliability report is provided in appendix 1 of this document.

Samples availability:

Samples of the test vehicle used to qualify the HCMOS4 Baseline Technology in our AMK6 facility are already available, while for all the concerned products, samples will be available upon request to the relevant product Business Unit.

Change implementation schedule:

The production start and first shipments will be implemented according to our work in progress and materials availability as indicated in the schedule below:

Product Family Code	Product Family Description	PCN date	1st Shipments
61	Advanced Analog	Week 30-2008	From Week 43-2008


Lack of acknowledgement of the PCN within 30 days will constitute acceptance of the change. After acknowledgement, lack of additional response within the 90 day period will constitute acceptance of the change (Jedec Standard No. 46-C). In any case, first shipments may start earlier with customer's written agreement.

Product's traceability:

Unless otherwise stated by customer specific requirement, new parts produced in AMK6 will be differentiated as indicated below:

Diffusion plant	ID	Country of origin
Carrollton (current)	VH	USA
AMK6 (new)	V6	Singapore

Shipments from new Wafer FAB location will be tracked on the ST Standard Label as showed below:

STMicroelectronics	Manufactured under patents or patents pending	
	Assembled in: 1234567890123456	
	Pb-free	2nd Level Interconnect
	MSL: 12	Bag seal date: dd mm yyyy
	PBT: 260 C	Category: xx ECOPACK/RoHS
	TYPE: 1234567890123456	
	1234567890123456	
	Total Qty: 12345	
	Trace codes	PPYWWLL1 WX TF
		PPYWWLL2 WX TF
Marking 12345678901234567890		
Bulk ID 1234567890123		
		
Please provide the bulk ID for any inquiry		

Wafer FAB area code will change from: **VH** to: **V6**

Generic ST Standard label

Please note that ST Team is doing all the best for providing you full visibility about the announced restructuring Plan and to minimize any negative impact it may occurs. While our Marketing and Sales teams are available for additional information when required, we are looking forward to your renewed confidence in STMicroelectronics as the strategic partner of your choice.

Sincerely Yours.

Reliability Report

*On HCMOS4 Technology
Test Vehicle: M41T81*

General Information		Locations	
Product Line	<i>A6AA61</i>	Wafer fabrication location	<i>AMK6</i>
Product Description	<i>RTC</i>	Assembly plant location (SO8)	<i>Bouskoura, Morocco</i>
Commercial Product	<i>M41T81</i>	Final test plant location (SO8)	<i>Bouskoura, Morocco</i>
Product Group	<i>APM GROUP</i>		
Product Division	<i>Advanced Analog and Logic</i>		
Package Description	<i>SO8</i>		
Silicon Process Technology	<i>Hcmos4 Baseline</i>		

DOCUMENT HISTORY

Version	Date	Pages	Author	Comment
0.1	Jul-18-2008		R. Winn / J. Peck	Original document

Reliability is the attitude of element to satisfy required function in fixed conditions during established time.

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.
This report does not imply for STMicroelectronics expressly or implicitly any contractual obligations other than as set forth in STMicroelectronics general terms and conditions of Sale. This report and its contents shall not be disclosed to a third party without previous written agreement from STMicroelectronics.

1 RELIABILITY EVALUATION OVERVIEW

1.1 Objectives

The purpose of this report is to present the results of the reliability evaluations performed on M41T81 device used as a test vehicle in order to qualify the transfer of HCMOS4 technology in AMK6.

This product is assembled in SO8 in Bouskoura, Morocco.

1.2 Conclusion

The final reliability results are positive for all stressed lots.

2 DEVICE CHARACTERISTICS

2.1 Device description

The test vehicle is a Serial Access Real-Time Clock with alarm.

2.2 Traceability

2.2.1 Wafer fabrication information

- Wafer fabrication manufacturing location: Ang Mo Kio 6" in Singapore
- Technology: HCMOS4 Baseline
- Die size: 80 mils x 111 mils
- Passivation type: Plasma Nitride

2.2.2 Assembly information

Assembly site	Bouskoura, Morocco
Package description	SO8
Frame	Copper
Wire	Au 1 mil

3 RELIABILITY TESTS RESULTS

3.1 Reliability test plan and results summary

Die oriented test

Test	Test short description				
	Method	Conditions	Sample size	Duration	Fail/ tested
T.H.B.	Temperature Humidity Bias				
		85°C / 85%RH Vcc = 5.5V	3 Lots / 76	959 H	0/76
HTB	High Temperature Bias				
		125°C Vcc = 6.5V	3 Lots / 231	1000 H	0/231

Package oriented test

Test	Test short description				
	Method	Conditions	Sample size	Duration	Fail/ tested
HAST	Hast				
		130°C / 85% RH Soak	3 Lots / 231	192 H	0/231
TC	Temperature Cycle				
		-65°C / 150°C	3 Lots / 77	1000 C	0/77
HTS	High Temperature Storage				
		150°C	3 Lots / 77	1000 H	0/77
P.C.	Pre Condition				
		85°C / 85%RH Level1; 260°C	3 Lots/ 480	168 H	0/480

ESD tests

ESD Model	Stress voltage (V)	Fail / tested
HBM	2000	0 / 16
MM	200	0 / 9
RCDM	1000	0 / 9

All tests above are compliant with below standards:

- MIL883C
 - JEDEC JESD22
-

Latch-Up tests

L/U	Stress Condition	Fail / tested
Current Injection	+/- 200ma; 11.0v	0 / 15
Over Voltage	500ma; 11.0v	0 / 15

All tests above are compliant with below standards:

- EIA/JESD 78A

3.2 Die oriented tests

These tests are performed in order to demonstrate the quality and reliability of devices subjected to an elevated temperature and reverse biased. The purpose of this test is to detect surface defects such as poor passivation, presence of contaminants, metal corrosion, etc

3.3 Package oriented tests

These tests are performed in order to check device life in various environmental conditions in an accelerated way. Detectable failure mechanisms are metal corrosion and molding defect, cracking of die, breaking of wire bonding, and mechanical damage to the device case.

4 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
AEC-Q100	Stress test qualification for integrated circuits
SOP 2610	General product qualification procedure
Internal ST specification	Reliability Tests and criteria for qualifications (Corporate Q&R rules)

5 GLOSSARY

ESD	Electro Static Discharge
LU	Latch Up
HTB	High Temperature Bias
HTS	High Temperature Storage
T.H.B.	Temperature Humidity Bias
T.C.	Thermal Cycle
P.C.	Preconditioning

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