



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-DIS/10/5788
Notification Date 08/06/2010

APM - ASD & IPAD Division
CLT3-4BT6(-TR) quad digital termination
6" wafer conversion in Singapore plant

Table 1. Change Implementation Schedule

Forecasted implementation date for change	30-Jul-2010
Forecasted availability date of samples for customer	30-Jul-2010
Forecasted date for STMicroelectronics change Qualification Plan results availability	30-Jul-2010
Estimated date of changed product first shipment	01-Nov-2010

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	CLT3-4BT6(-TR) quad digital termination
Type of change	Product design change
Reason for change	increase production capacity
Description of the change	As a result of the constant investments made by STMicroelectronics in its technology evolution, the company is now implementing the 6 inch wafer size for the diffusion process in its Singapore plant for the CLT3-4BT6(-TR) device. With this 6 inch wafer expansion, STMicroelectronics increases its production capacity to better serve its customers through service improvement and lead time reduction, especially as volumes grow.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	date code, internal codification and QA number
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt		PCN APM-DIS/10/5788
Please sign and return to STMicroelectronics Sales Office		Notification Date 08/06/2010
<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

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Cazaubon, Guy	Division Q.A. Manager



**PRODUCT/PROCESS
CHANGE NOTIFICATION**

PCN APM-DIS/10/5788

APM - ASD & IPAD Division¹

CLT3-4BT6(-TR) quad digital termination:

6 inch wafer conversion in Singapore plant



(1) APM: Analog, Power & MEMS Group - ASD: Application Specific Device - IPAD: Integrated Passive and Active Devices

WHY THIS CHANGE?

As a result of the constant investments made by STMicroelectronics in its technology evolution, the company is now implementing the **6 inch wafer size** for the diffusion process in its **Singapore plant** for the **CLT3-4BT6(-TR)** device.

With this 6 inch wafer expansion, STMicroelectronics increases its **production capacity** to better serve its customers through service improvement and lead time reduction, especially as volumes grow.

WHAT IS THE CHANGE?

This conversion to 6 inch wafers is achieved by migrating the current diffusion to the **6 inch process** line already in place for several years. The conversion is using **existing and qualified equipment** in this plant.

This conversion has **no impact on the electrical parameters** of the products. The verification by characterization is included in the qualification program. **No other change** is affecting the manufacturing process.

There is **no change** in the **packing mode** and in the standard **delivery quantities**.

HOW AND WHEN?Qualification program and results availability:

The **qualification program** mainly consists of **comparative electrical characterizations** and **reliability tests**.

The **qualification report** is annexed to this document.

Samples availability:

Samples are available on request from **now**.

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 table below.

Production Start	1st Shipments
From Week 30-2009	From Week 43-2010

Deliveries of **current product versions** will continue while the 6 inch conversion is brought to completion and as long as 5 inch stocks last.

Following Jedec Standard No. 46-C, 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 from PCN notification will constitute acceptance of the change. In any case, **first shipments** may start earlier with customer's **written agreement**.

Marking and traceability:

The marking of the products remains unchanged.

The **traceability** for the modified products will be ensured by the **date code**, by an **internal codification** and by the **Q.A. number**.

Annex: Related qualification reports

- **10132QRP**: Qualification of 6 inch Wafer Diameter in Singapore Plant



Reliability Evaluation Report

CLT3-4BT6(-TR)/M1: 6" wafer conversion in Singapore plant

General Information

Product Description	<i>Control part</i>
P/N	<i>CLT3-4BT6-TR/M1</i>
Product Group	<i>IMS</i>
Product division	<i>APM</i>
Package	<i>TSSOP20</i>
Silicon Process technology	<i>BI20IIS</i>
Maturity level step	<i>30</i>

Locations

Wafer fab	<i>ST AMK 6 inch</i>
Assembly plant	<i>Subcontractor</i>
Reliability Lab	<i>ST</i>
Reliability assessment	<i>Pass</i>

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1	07/27/10	7	S. Ducret	G. Cazaubon	First issue

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
JESD47	Stress-Test-Driven Qualification of Integrated Circuits

2 GLOSSARY

DUT	Device Under Test
PCB	Printed Circuit Board
SS	Sample Size
PC	Pre-conditionning
HTRB	High Temperature Reverse Bias
TC	Temperature Cycling
PCT	Pressure Pot 2 bars
THB	Temperature Humidity Bias
OLT	Operational Life Test or Functional Test



3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

The objective of this report is to evaluate the reliability impact of the conversion from 5 inch wafer size to 6 inch wafer size in Singapore plant for the CLT3-4BT6(-TR) device.

This conversion to 6 inch wafers is achieved by migrating the current CLT3-4BT6 diffusion to the 6 inch process line already in place and qualified for several years. The conversion is done using existing and qualified equipment in this plant. An electrical characterization has been done and shows that this conversion has no impact on the electrical parameters.

No other change is affecting the manufacturing process.

The current report leans on 6 inch BI20IIS similarities and uses generic data as evidence of reliability guarantee.

3.2 Conclusion

Qualification Plan requirements have been fulfilled without exception. It is stressed that 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 ruggedness of the products and safe operation, which is consequently expected during their lifetime.



4 DEVICE CHARACTERISTICS

4.1 Device description

See referenced Datasheet document.

4.2 Construction note

See referenced Product Baseline for detailed information.

		CLT3-4BT6-TR/M
Wafer/Die fab. information		
Wafer fab manufacturing location		STM AMK 6 inch
Technology		BI20IIS
Assembly information		
Assembly site		Subcontractor
Package description		TSSOP20
Molding compound		Epoxy resin
Final testing information		
Testing location		Subcontractor



5 TESTS RESULTS SUMMARY

5.1 Test vehicle

Lot #	Finished Good	Techno	Comments
1	PCLT-2AT4	BI20IIS	Similar F.E. technology and B.E.
2	STCC02-BD5	BI20IIS	Similar F.E. technology
3	STCC05-BD4	BI20IIS	Similar F.E. technology
4	STCC08	BI20IIS	Similar F.E. technology

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	Lot 4
package Oriented Tests									
THB	N	JESD22A-101	Ta = 85°C, RH = 85%, Bias	463	168 H	0/152	0/40	0/40	0/231
					500 H	0/152	0/40	0/40	0/231
					1000 H	0/152	0/40	0/40	0/231
PCT	Y	JESD22A-102	Temperature 121 °C Pressure 2 bar 100% relative humidity	198	96H	0/77	0/77	0/77	0/44
TC	Y	JESD22A-104	-65°C/+150°C; 2Cycles/hours	539	100 cycles	0/154	0/77	0/77	0/231
					500 cycles	0/154	0/77	0/77	0/231
					1000cycles	0/154	0/77	0/77	0/231
Die Oriented Tests									
OLT	N	JESD22A-108	Bias, Tj max	240	168 H	0/30	0/60	0/120	0/30
					500 H	0/30	0/60	0/120	0/30
					1000 H	0/30	0/60	0/120	0/30



5.3 Test description

Test name	Description	Purpose
Die Oriented		
OLT Operating Life Test	The device is stressed in dynamic configuration, trying to satisfy as much as possible the following conditions: <ul style="list-style-type: none">o Application stress condition.o Max. operative supply voltage and worst case operative voltage.o Max. current loado Max. operative junction temperature. The typical failure modes are related to electromigration, wire-bonds degradation, oxide faults.	The objective of this test is to simulate the life time of the device in the application and to verify the compatibility of the die with the application requirements
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.
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.
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. 85°C / RH=85% ; 1000 hours	To evaluate the package moisture resistance with electrical field applied, both electrolytic and galvanic corrosion are put in evidence.
PCT Pressure CookerTest	Conditions: - Ta=121°C Pressure=2 atm; 100% RH for 96 hrs	To point out critical water entry paths with consequent electrochemical and galvanic corrosion.

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