PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-SLI/09/4973
Notification Date 09/24/2009

SO8, SO8 exposed pad & SO16 packages transfer from ST Muar plant (Malaysia) to ST Bouskoura plant (Morocco)

Table 1. Change Implementation Schedule

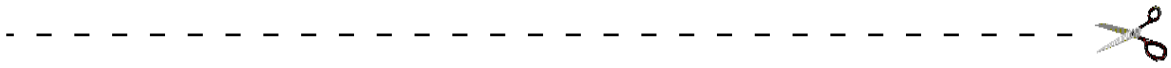
Forecasted implementation date for change	13-Nov-2009
Forecasted availabillity date of samples for customer	17-Sep-2009
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	17-Sep-2009
Estimated date of changed product first shipment	24-Dec-2009

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	See attached
Type of change	Multiple types of changes
Reason for change	Production rationalization
Description of the change	Assembly and Test&Finishing of SO8 and SO16 packages products is transfered from Muar to ST Bouskoura. Test&Finishing of SO8 exposed pad products transfered from Muar to ST Bouskoura.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	First digit of date code becomes Z instead of 9 on package
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN APM-SLI/09/4973**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 09/24/2009**

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

Remark

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DOCUMENT APPROVAL

Name	Function
Gilot, Yves	Division Marketing Manager
Kaire, Jean-Claude	Division Product Manager
Paccard, Francoise	Division Q.A. Manager

Reliability and Qualification Report

Products transfer from ST Muar to ST Bouskoura

General Information	
Product Line	*4871,0339, H094,*
Commercial product	*TS4871IDT, LM339DT, TSH94IDT*
Product Description	*Audio amp, Op amp, High speed op amp,*
Product Group	*APM*
Product division	*Standard Ic's*
Package	*SO8/SO14/SO16*
Silicon Process technology	*HF4CMOS (4871), Bipolar (0339) HF2CMOS (H094)*

Locations	
Wafer fab	*Ang Mo Kio (Singapore)*
Assembly plant	*ST Bouskoura (Morocco)*
Final Test plant	*ST Bouskoura (Morocco)*

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	28-July-2009	5	JM Bugnard	F Paccard	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 RELIABILITY AND QUALIFICATION EVALUATION OVERVIEW

1.1 Objectives

Aim of this report is to present the results of the reliability evaluations performed on 4871, 0339 and H094 test vehicles to qualify product transfer from ST Muar to ST Bouskoura.
Please note that ST Bouskoura already produce SO package for standard linear IC's since Year 2000.

Some products belong to audio or hi speed op amp families that were not tested in Bouskoura.
So aim of this report is also to show qualification results of the test transfer from ST Muar to ST Bouskoura.

1.2 Conclusion

All results are inside ST specification and product transfer is validated.

2 DEVICES TRACABILITY

2.1 Devices description

The TS4871 is an Audio Power Amplifier capable of delivering 1W of continuous RMS Ouput Power into 8Ω load @ 5V.
This Audio Amplifier is exhibiting 0.1% distortion level (THD) from a 5V supply for a Pout = 250mW RMS. An external standby mode control reduces the supply current to less than 10nA. An internal thermal shutdown protection is also provided.
The TS4871 has been designed for high quality audio applications such as mobile phones and to minimize the number of external components. The unity-gain stable amplifier can be configured by external gain setting resistors.

The LM339 consists of four independent precision-voltage comparators with an offset voltage specification. Each comparator has been designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible. These comparators also have a unique characteristic in that the input common mode voltage range includes ground even though operated from a single power supply voltage.

The TSH94 is a quad low-power high-frequency operation amplifier, designed for high-quality video signal processing. The device offers an excellent speed consumption ratio with 4.5 mA per amplifier for a 150 MHz bandwidth.
High slew rate and low noise also make it suitable for high-quality audio applications.
The TSH94 offers two separate complementary STANDBY functions: STANDBY 1 acting on the n°2 operator and STANDBY 2 acting on the n°3 oper ator.

2.2 Wafer fabrication information

TV	4871	0339	H094
Wafer fabrication location	AMK6	AMK6	AMK6
Technology	HF4CMOS	Bipolar	HF2CMOS
Die size (µm)	1470x2120	1100x1090	1990x2700
Passivation type	Oxide+Nitride	Nitride	Oxide+Nitride

2.3 Assembly information

TV	4871	0339	H094
Assembly site	ST Bouskoura	AMK6	AMK6
Package description	SO 8	SO 14	SO 16
Molding compound	Nitto MP8000CH4-2A	Nitto MP8000CH4-2A	Nitto MP8000CH4-2A
Frame material	Copper alloy C194	Copper alloy C194	Copper alloy C194
Die attach process	Epoxy glue	Epoxy glue	Epoxy glue
Die attach material	Hitachi 4900 ST10	Hitachi 4900 ST10	Hitachi 4900 ST10
Wires material & diameter	Gold, 20 microns	Gold, 20 microns	Gold, 20 microns
Lead finishing	NiPdAu preplated	NiPdAu preplated	NiPdAu preplated

3 RELIABILITY TESTS RESULTS

3.1 Reliability test plan and results summary

Die oriented test

Test	TV	Conditions	Sample size	Duration	Fail/ tested
HTB	4871	Electrical bias, Tj=125℃	78 x 1 lot	1000 H	0/78
HTB	0339	Electrical bias, Tj=125℃	78 x 1 lot	1000 H	0/78

Package oriented test

Test	TV	Conditions	Sample size	Duration	Fail/ tested
PC	4871	Drying 24 H @ 125℃ Store 168 H @ Ta=85℃ Rh=85% Oven Reflow @ Tpeak=260℃ 3 times	15 x 1 lot		0/15
PC	0339	Drying 24 H @ 125℃ Store 168 H @ Ta=85℃ Rh=85% Oven Reflow @ Tpeak=260℃ 3 times	15 x 1 lot		0/15
AC	4871	After PC above, Pa=2Atm / Ta=121℃	78 x 1 lot	168 H	0/78
AC	0339	After PC above, Pa=2Atm / Ta=121℃	78 x 1 lot	168 H	0/78
AC	H094	After PC above, Pa=2Atm / Ta=121℃	78 x 1 lot	168 H	0/78
THB	4871	After PC above, Ta = 85℃, RH = 85%, electrical bias	78 x 1 lot	1000 H	0/78
THB	0339	After PC above, Ta = 85℃, RH = 85%, electrical bias	78 x 1 lot	1000 H	0/78
THB	H094	After PC above, Ta = 85℃, RH = 85%, electrical bias	78 x 1 lot	1000 H	0/78
TC	4871	After PC above, Ta = -65℃ to 150℃	78 x 1 lot	1000 cy	0/78
TC	0339	After PC above, Ta = -65℃ to 150℃	78 x 1 lot	1000 cy	0/78
TC	H094	After PC above, Ta = -65℃ to 150℃	78 x 1 lot	1000 cy	0/78

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 FINAL TEST QUALIFICATION RESULTS

Audio Final test has been qualified by comparing Final test results on 1000 parts in ST Muar and ST Bouskoura plants. All results are aligned.
Hi Speed test has been qualified by comparing Final test results on golden units in ST Muar and ST Bouakoura, all results are aligned.

5 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)

6 GLOSSARY

ESD	Electro Static Discharge
ELFR	Early Life Failure Rate
GL	Gate Leakage
HTB	High Temperature Bias
HTRB	High Temperature Reverse Bias
HTS	High Temperature Storage
T.H.B.	Temperature Humidity Bias
T.C.	Thermal Cycle
P.P.	Pressure Pot
P.C.	Preconditioning
S.M.D.	Surface Mount Device moisture induced stress

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