PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-PWR/10/5251
Notification Date 01/11/2010

Capacity expansion for BIPOLAR DEVICES IN SOT-32

PACKAGE ON CHANGJIANG PLANT

Table 1. Change Implementation Schedule

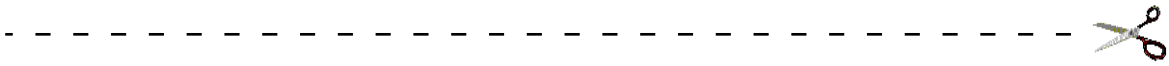
Forecasted implementation date for change	15-Apr-2010
Forecasted availabillity date of samples for customer	04-Jan-2010
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	04-Jan-2010
Estimated date of changed product first shipment	12-Apr-2010

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	see attached list
Type of change	Package assembly location change
Reason for change	To increase capacity
Description of the change	Following the continuous improvement of our service and to better support the strong market demand of Power Bipolar, the products listed in this document will be also manufactured in Subcontractor CHANGJIANG plant. The products are in agreement with ST standards and guarantee the same quality and the same electrical characteristics as the ones assembled in the ST plants. Changjiang plant is qualified for copper bonding and is already assembling products with Cu wire. Samples are available for devices used for Subcontractor qualification.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	Mark "GC" (Assy plant code) as first digits of the traceability code in the label.
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN APM-PWR/10/5251**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 01/11/2010**

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

Remark

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DOCUMENT APPROVAL

Name	Function
Saya, Francesco	Division Marketing Manager
Aleo, Mario-Antonio	Division Product Manager
Falcone, Giuseppe	Division Q.A. Manager

Reliability Report

Power Bipolar Devices in SOT-32 package On CHANGJIANG plant

General Information	
Product Lines	BA05
Product Description	Power BIPOLAR
Commercial Products	2SD882
Product Group	IMS – APM
Product division	Power BIPOLAR
Package	SOT-32
Silicon Process technology	PLANAR NPN

Locations	
Wafer fab	*Ang Mo Kio (SINGAPORE)*
Assembly plant	*SOT-32:* CHANGJIANG (CHINA)
Reliability Lab	*IMS-APM Catania Reliability Lab*

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	May-2009	6	G.Montalto	G.Falcone	First issue

TABLE OF CONTENTS

1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits

2 GLOSSARY

DUT	Device Under Test
SS	Sample Size

3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

Qualification of the Bipolar devices in SOT-32 package on CHANGJIANG plant.

3.2 Conclusion

The 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

PLANAR NPN Power BIPOLAR

4.2 Construction note

D.U.T.: 2SD882 LINE: BA05

Wafer/Die fab. information	
Wafer fab manufacturing location	*Ang Mo Kio (SINGAPORE)*
Technology	PLANAR NPN
Die finishing back side	AuAs/Cr/Ni/Au
Die size	1070 x 1070 um^2
Metal 1	Al/Si
Passivation type	P-Vapox

Wafer Testing (EWS) information	
Electrical testing manufacturing location	*Ang Mo Kio (SINGAPORE)*
Test program	WPIS

Assembly information	
Assembly site	CHANGJIANG - CHINA
Package description	SOT-32
Molding compound	Epoxy resin
Frame material	Raw Copper
Die attach process	Soft Solder
Die attach material	95.5%(Pb) / 2%(Sn) / 2.5%(Ag)
Wire bonding process	Thermosonic
Wires bonding materials/diameters	Cu Base / 1.7 mils Cu Emitter / 1.7 mils
Lead finishing/bump solder material	Pure Tin

Final testing information	
Testing location	CHANGJIANG - CHINA
Tester	JUNO test

5 TESTS RESULTS SUMMARY

5.1 Test vehicle

Lot #	Process/ Package	Product Line	Comments
1	2SD882,	BA05	Power BIPOLAR

5.2 Reliability test plan and results summary

D.U.T.: 2SD882 LINE: BA05 PACKAGE: SOT-32

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS
HTSL	N	JESD22 A-103	Ta = 150℃	77	1000H	0/77
HTRB	N	JESD22 A-108	T.A.=150℃ Vdd=48V	77	1000H	0/77
THB	N	JESD22 A-101	Ta=85℃ Rh=85%, Vdd=50V	77	1000H	0/77
TC	N	JESD22 A-104	TA=-65℃ TO 150℃ (30'+30')	77	500 cy	0/77
AC	N	JESD22 A-102	TA=121℃ – PA=2 ATM	77	96 H	0/77

ANNEXES 6.0

6.1Tests Description

Test name	Description	Purpose
HTRB High Temperature Reverse Bias	The device is stressed in static configuration, trying to satisfy as much as possible the following conditions: • low power dissipation; • max. supply voltage compatible with diffusion process and internal circuitry limitations;	To determine the effects of bias conditions and temperature on solid state devices over time. It simulates the devices' operating condition in an accelerated way. To maximize the electrical field across either reverse-biased junctions or dielectric layers, in order to investigate the failure modes linked to mobile contamination, oxide ageing, layout sensitivity to surface effects.
HTSL High Temperature Storage Life	The device is stored in unbiased condition at the max. temperature allowed by the package materials, sometimes higher than the max. operative temperature.	To investigate the failure mechanisms activated by high temperature, typically wire-bonds solder joint ageing, data retention faults, metal stress-voiding.
AC Auto Clave (Pressure Pot)	The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature.	To investigate corrosion phenomena affecting die or package materials, related to chemical contamination and package hermeticity.
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.	To evaluate the package moisture resistance with electrical field applied, both electrolytic and galvanic corrosion are put in evidence.

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