PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-PWR/07/2417
Notification Date 04/05/2007

Silicon Line Change for Bipolar devices-BB01 products line

PWR - PWR BIP/ IGBT/ RF

Table 1. Change Identification

Product Identification (Product Family/Commercial Product)	see attached list
Type of change	Waferfab process change
Reason for change	To improve performances
Description of the change	Planar Base Island technology ready to replace the mature Epibase technology in order to align our products to the actual Market. The line BB01 will replace the old ones B004 Feature: Improved hFE linearity and Higher fT frequency benefit: Better performances in switching and linear application.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	See "N" in additional info on P/N.
Manufacturing Location(s)	

Table 2. Change Implementation Schedule

Forecasted implementation date for change	30-Jun-2007
Forecasted availabillity date of samples for customer	29-Mar-2007
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	29-Mar-2007
Estimated date of changed product first shipment	05-Jul-2007

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	

Customer Acknowledgement of Receipt **PCN APM-PWR/07/2417**

Please sign and return to STMicroelectronics Sales Office **Notification Date 04/05/2007**

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

Remark

DOCUMENT APPROVAL

Name	Function
Lanzafame, Alfio Salvator	Division Marketing Manager
Porto, Michele Claudio	Division Product Manager
Falcone, Giuseppe	Division Q.A. Manager

	APM CATANIA RELIABILITY REPORT	Date:	Mar ’07
		No	01/07

Reliability evaluation

on

BB01 for silicon line change on TIP122

ISSUED BY	RELIABILITY DEPARTMENT	Page 1 of 8

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Introduction

This report is aimed to qualify the new line BB01 for line change on device TIP122

The Qualification Reliability test trials have been performed in ST Catania Site.

The evaluation results meet ST products qualification targets, therefore the new line BB01 for silicon line change on TIP122 is qualified.

Test Vehicles :

Product Line	Sales Type	Package
BB01	TIP122	TO-220

Failure Criteria :

A failed component is a device which becomes inoperative during the test or it fails on meeting the end limits foreseen in the device specification, for one or more than the parameters here below reported

Parameter Power BIPOLAR Main Parameter

Collector Leakage Current (Icbo or Iceo or Ices, etc...)
Emitter Leakage (Iebo)
$H_{FE,}$ Vcesat, Vbesat, Vf
Breakdown Voltage (BVcbo, BVceo,Vbces, Bvebo)

Reliability Evaluation Plan and results

D.U.T.: TIP122 LINE: BB01 PACKAGE: TO-220

Test	Conditions	S.S.	Requirement	Results
H.T.S.	TA=150℃	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
T.H.B.	TA=85℃ - RH=85% Vbias= 100V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
H.T.R.B.	T.A.=150℃ Vdd=80V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
PRESSURE POT	TA=121℃ - PA=2Atm	77 x 1 Lot	Parameter deviation within spec. limits at 96 hours.	No parameter deviation out of spec. limits at 96 hours.
THERMAL CYCLES AIR TO AIR	TA=-65℃ TO 150℃ 1 HOUR / CYCLE	77 x 1 Lot	Parameter deviation within spec. limits at 500 cycles.	No parameter deviation out of spec. limits at 500 cy
THERMAL FATIGUE	ΔTC=105℃ - Pd=4.8W	77 x 1 Lot	Parameter deviation within spec. limits at 10k cycles.	No parameter deviation out of spec. limits at 10Kcy.

Technological Characteristics

D.U.T.: TIP122 LINE: BB01 PACKAGE: TO-220

DIE	*Technology:*	Planar		
	Material:	Silicon	*Passivation :*	P-Vapox
	Metallization – Front :	Al/Si	*Dimensions :*	1830 x 1970 um^2
	- Back :	Au-As/Cr/Ni/Au		
DIE ATTACH	Soft Solder	**FRAME**	*Frame and lead material:*	Cu
			Frame coating :	Ni/NiP Plated
			Lead coating :	Sn 100%
WIRE BOND	Ultrasonic	**WIRE**	*Material :*	Al/Mg Base Al/Mg Emitter
			Diameter :	5 mils Base 7 mils Emitter
SEALING	Molding	**PACKAGING**	*Material :*	Epoxy Resin

PRODUCTION PLACES: WAFER PROCESSING : SINGAPORE
ASSEMBLY LOCATION : CASABLANCA/SHENZHEN/PSI LAGUNA
QA LOCATION : CASABLANCA/SHENZHEN/PSI LAGUNA

Reliability Test Description

High Temperature Reverse Bias (HTRB)

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

High Temperature Storage (HTS)

This stress test is performed to check the device life in a high temperature ambient. Specimens are put for a period of time inside a stove in free air. Detectable failure mechanisms are presence of contaminants and metal corrosion.

Temperature Humidity Bias (THB)

This test is performed to check the device life in a high humidity ambient. Specimens are subjected to a permanent bias in a climatic chamber in the presence of steam. Detectable failure mechanisms are metal corrosion and molding defects.

Pressure Pot

This test is performed in order to check device life in a high humidity ambient in an accelerated way. Specimens are subjected for a period of time inside an autoclave in the presence of steam and pressure. Detectable failure mechanism is metal corrosion.

Thermal Fatigue

This test is performed to demonstrate the quality and reliability of devices exposed to cyclic variation in electrical stress between "on" and "off" conditions and resultant cyclic variation in device and case temperatures (thermo-mechanical stress). The purpose of this test is to detect assembly defects: improper die-attach, bonding weakness and thermal mismatch among various components of the package.

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