



# PRODUCT/PROCESS CHANGE NOTIFICATION

---

PCN APM-PWR/07/2482  
Notification Date 05/16/2007

---

**SILICON LINE CHANGE FOR BIPOLAR DEVICES - BB02 PRODUCT 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 is ready to replace the mature Epibase technology in order to align our products to the actual Market. The line BB02 will replace the old ones BG01 . Feature: Improved hFE linearity and Higher fT frequency benefit: Better performances in switching and linear application. We kindly remind that, within 30 days, if no feedback will be provided by Customers we will consider PCN as accepted.
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-Jul-2007
Forecasted availability date of samples for customer	09-May-2007
Forecasted date for <b>STMicroelectronics</b> change Qualification Plan results availability	09-May-2007
Estimated date of changed product first shipment	15-Aug-2007



## DOCUMENT APPROVAL

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

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

## **Reliability evaluation**

**on**

**BB02 for silicon line change on**

**BD681 and TIP112 sales type**

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 1 of 10</b>
------------------	-----------------------------------	---------------------

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

### Table of Contents

1.	Introduction	pg. 3
2.	Test vehicles	pg. 4
3.	Failure Criteria	pg. 5
4.	Evaluation plan and results	pg. 6
5.	Appendixes	
	- Technological Characteristics	pg. 8
	- Reliability Test Description	pg. 10

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

### Introduction

This report is aimed to qualify the new line BB02 for line change on device BD681 and TIP112

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

The evaluation results meet ST products qualification targets, therefore the new line BB02 for silicon line change on BD681 and TIP112 is qualified.

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 3 of 10</b>
------------------	-----------------------------------	---------------------

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

**Test Vehicles :**

<b>Product Line</b>	<b>Sales Type</b>	<b>Package</b>
BB02	BD681	SOT-32
BB02	TIP112	TO-220

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 4 of 10</b>
------------------	-----------------------------------	---------------------



	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

**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 )

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 5 of 10</b>
------------------	-----------------------------------	---------------------

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

## Reliability Evaluation Plan and results

**D.U.T.: BD681    LINE: BB02    PACKAGE: SOT-32**

<b>Test</b>	<b>Conditions</b>	<b>S.S.</b>	<b>Requirement</b>	<b>Results</b>
<b>H.T.S.</b>	TA=150°C	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
<b>T.H.B.</b>	TA=85°C - 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.
<b>H.T.R.B.</b>	T.A.=150°C Vdd=80V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
<b>PRESSURE POT</b>	TA=121°C - PA=2Atm	77 x 1 Lot	Parameter deviation within spec. limits at 96 hours.	No parameter deviation out of spec. limits at 96 hours.
<b>THERMAL CYCLES AIR TO AIR</b>	TA=-65°C TO 150°C 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
<b>THERMAL FATIGUE</b>	ΔTC=105 °C - Pd= 3W	77 x 1 Lot	Parameter deviation within spec. limits at 10k cycles.	No parameter deviation out of spec. limits at 10Kcy.

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 6 of 10</b>
------------------	-----------------------------------	---------------------

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

## Reliability Evaluation Plan and results

**D.U.T.: TIP112    LINE: BB02    PACKAGE: TO-220**

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

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 7 of 10</b>
------------------	-----------------------------------	---------------------

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

### Technological Characteristics

**D.U.T.: BD681**

**LINE: BB02**

**PACKAGE: SOT-32**

<b>DIE</b>	<i>Technology:</i> PLANAR NPN		<i>Passivation :</i> P-Vapox	
	<i>Material:</i> Silicon		<i>Dimensions :</i> 1690 x 1550 um <sup>2</sup>	
<i>Metallization – Front :</i> Al/Si		<i>- Back :</i> AuAs/Cr/Ni/Au		
<b>DIE ATTACH</b>	Soft Solder	<b>FRAME</b>	<i>Frame and lead material:</i>	Cu
			<i>Frame coating :</i>	Nickel Plated
			<i>Lead coating :</i>	Sn 100%
<b>WIRE BOND</b>	Ultrasonic	<b>WIRE</b>	<i>Material :</i>	Al/Mg Base Al/Mg Emitter
			<i>Diameter :</i>	5 mils Base 5 mils Emitter
<b>SEALING</b>	Molding	<b>PACKAGING</b>	<i>Material :</i>	Epoxy Resin

**PRODUCTION PLACES:** WAFER PROCESSING : SINGAPORE  
ASSEMBLY LOCATION: PSI LAGUNA/CDIL MOHALI  
QA LOCATION : PSI LAGUNA/CDIL MOHALI

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 8 of 10</b>
------------------	-----------------------------------	---------------------

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

**Technological Characteristics**

**D.U.T.: TIP112**

**LINE: BB02**

**PACKAGE: TO-220**

<b>DIE</b>	<i>Technology:</i> PLANAR NPN		
	<i>Material:</i> Silicon	<i>Passivation :</i> P-Vapox	
	<i>Metallization – Front :</i> Al/Si	<i>Dimensions :</i> 1690 x 1550 x $\mu\text{m}^2$	
	<i>- Back :</i> AuAs/Cr/Ni/Au		
<b>DIE ATTACH</b>	Soft Solder	<b>FRAME</b>	<i>Frame and lead material:</i> Cu
			<i>Frame coating :</i> Ni/NiP Plated
			<i>Lead coating :</i> Sn 100%
<b>WIRE BOND</b>	Ultrasonic	<b>WIRE</b>	<i>Material :</i> Al/Mg Base Al/Mg Emitter
			<i>Diameter :</i> 5 mils Base 5 mils Emitter
<b>SEALING</b>	Molding	<b>PACKAGING</b>	<i>Material :</i> Epoxy Resin

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

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 9 of 10</b>
------------------	-------------------------------	---------------------

	<b>APM CATANIA RELIABILITY REPORT</b>	<b>Date:</b>	<b>Mar '07</b>
		<b>No</b>	<b>03/07</b>

### 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.

<b>ISSUED BY</b>	<b>RELIABILITY DEPARTMENT</b>	<b>Page 10 of 10</b>
------------------	-----------------------------------	----------------------

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE ( AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION ), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners

© 2007 STMicroelectronics - All rights reserved.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)

