



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-PMT/08/3262
Notification Date 01/23/2008

D2PAK PACKAGE: "COPPER-ON-COPPER" WIRE BONDING PROCESS CAPACITY EXTENSION

PMT - POWER MOSFET

Table 1. Change Implementation Schedule

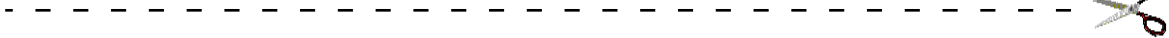
Forecasted implementation date for change	15-Apr-2008
Forecasted availability date of samples for customer	16-Jan-2008
Forecasted date for STMicroelectronics change Qualification Plan results availability	16-Jan-2008
Estimated date of changed product first shipment	23-Apr-2008

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	See attached list
Type of change	Package assembly material change
Reason for change	Capacity Extension
Description of the change	Devices in D2PAK Package will be manufactured also in ST Assembly Plant of Shenzhen (China)
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	See letter "N" as additional info field
Manufacturing Location(s)	1]St Shenzhen -China

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt		PCN APM-PMT/08/3262
Please sign and return to STMicroelectronics Sales Office		Notification Date 01/23/2008
<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

Name	Function
Giudice, Maurizio	Division Marketing Manager
Wilson, Ian	Division Product Manager
Falcone, Giuseppe	Division Q.A. Manager

	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

**RELIABILITY EVALUATION ON
D²PAK
COPPER ON COPPER**

ISSUED BY	RELIABILITY DEPARTMENT	Page 1 of 9
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	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

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. 7
	- Reliability Test Description	pg. 8

	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

Introduction

This report aims at the qualification of the D²PAK package COPPER ON COPPER

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

The evaluation results meet ST products qualification targets, therefore the D²PAK package COPPER ON COPPER is qualified.

ISSUED BY	RELIABILITY DEPARTMENT	Page 3 of 9
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	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

Test Vehicles :

Product Line	Sales Type	Package
EZ62	STB4NK60ZT4	D ² PAK

ISSUED BY	RELIABILITY DEPARTMENT	Page 4 of 9
------------------	-----------------------------------	--------------------

	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

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 MOSFET

- Drain Leakage Current (Idss)
- Gate Leakage Current (Igss)
- Threshold Voltage (Vgs(th))
- Forward On Voltage (Vsd)
- Drain Source On Voltage (Vds(on))
- Drain Source Breakdown Voltage (Bvdss)

ISSUED BY	RELIABILITY DEPARTMENT	Page 5 of 9
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	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

Reliability Evaluation Plan and results

D.U.T.: STB4NK60ZT4 LINE: EZ62 PACKAGE: D²PAK

Test	Conditions	S.S.	Requirement	Results
PRECONDITIONING OF SMD DEVICES BEFORE TC/THB/ENV. SEQ.	DRYNG 1H @ 125°C STORE 168H @ TA=85°C RH=85% Oven Reflow @ Tp=245°C 3 times	204 x 1 Lot	Parameter deviation within spec. limits at end of preconditionings.	No parameter deviation out of spec. limits at end of preconditionings.
H.T.S.	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.
T.H.B.	D.U.T. SMD PRECONDITIONED 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.
H.T.R.B.	T.A.=150°C; Vdd=480V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation out of spec. limits at 1000 hours.
H.T.F.B.	TA = 150°C ; Vgss= 30V	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°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.
THERMAL CYCLES AIR TO AIR	D.U.T. SMD PRECONDITIONED 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
THERMAL FATIGUE	TC=105°C - Pd=3.8W	77 x 1 Lot	Parameter deviation within spec. limits at 10k cycles.	No parameter deviation out of spec. limits at 10Kcy.
ENVIRONMENTAL SEQUENCE	D.U.T. SMD PRECONDITIONED 100 THERMAL CYCLES + 96H PP	50 x 1 Lot	Parameter deviation within spec. limits at end of test.	No parameter deviation out of spec. limits at end of test.

ISSUED BY	RELIABILITY DEPARTMENT	Page 6 of 9
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	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

Technological Characteristics

D.U.T.: STB4NK60ZT4 LINE: EZ62 PACKAGE: D²PAK

DIE	<i>Technology:</i> Zener-Protected SuperMESH™ MOSFET			
	<i>Material:</i>	Silicon	<i>Passivation :</i>	NITRIDE
	<i>Metallization – Front :</i>	Al/Si (1%)	<i>Dimensions :</i>	3190 x 2660 um ²
	<i>- Back :</i>	Ti/Ni/Au		
DIE ATTACH	Soft Solder	FRAME	<i>Frame and lead material:</i>	Copper
			<i>Frame coating :</i>	Selective Ni-Ni/P on Main Runner
			<i>Lead coating :</i>	Sn 100%
WIRE BOND	Thermosonic	WIRE	<i>Material :</i>	Copper Gate Copper Source
			<i>Diameter :</i>	2 mils Gate 2 mils Source
SEALING	Molding	PACKAGING	<i>Material :</i>	Epoxy Resin

PRODUCTION PLACES: WAFER PROCESSING: Ang Mokuo (Singapore)
ASSEMBLY LOCATION: SHENZHEN (China)
QA LOCATION: SHENZHEN (China)

ISSUED BY	RELIABILITY DEPARTMENT	Page 7 of 9
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	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

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 Forward Bias (HTFB)

This test is performed in order to demonstrate the quality and reliability of devices subjected to an elevated temperature and simultaneously forward gate biased. The purpose of this test is to detect surface and gate oxide defects.

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 moulding defects.

ISSUED BY	RELIABILITY DEPARTMENT	Page 8 of 9
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	APM CATANIA RELIABILITY REPORT	Date:	Oct '07
		No	24/07

Reliability Test Description (continued)

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.

ISSUED BY	RELIABILITY DEPARTMENT	Page 9 of 9
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