



PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-PMT/07/2998
Notification Date 11/14/2007

**New Additional Assy-Testing to Subcontract Fujitsu
(China) for Package: SO-8**

PMT - POWER MOSFET

Table 1. Change Identification

Product Identification (Product Family/Commercial Product)	Power MOSFETs in SO-8
Type of change	Package assembly location change
Reason for change	Capacity Extension
Description of the change	Devices in SO-8 will be manufactured also in Subcontractor Fujitsu (China)
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	1st two digits of the traceability code are GF
Manufacturing Location(s)	

Table 2. Change Implementation Schedule

Forecasted implementation date for change	06-Feb-2008
Forecasted availability date of samples for customer	07-Nov-2007
Forecasted date for STMicroelectronics change Qualification Plan results availability	07-Nov-2007
Estimated date of changed product first shipment	13-Feb-2008

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt		PCN APM-PMT/07/2998
Please sign and return to STMicroelectronics Sales Office		Notification Date 11/14/2007
<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

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RELIABILITY EVALUATION ON **SO-8** **MADE IN FUJITSU**

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Introduction

This report aims at the qualification of the SO-8 package made in FUJITSU.

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

The evaluation results meet ST products qualification targets, therefore the SO-8 package made in FUJITSU is qualified.

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Test Vehicles :

Product Lines PowerMos
E33E
T33P
EC6M

Main Sales Types
STS11NF3LL
STS8DNF3LL
STS1HNC60

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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

Parameters

Drain Leakage Current (I_{dss})
 Gate Leakage Current (I_{gss})
 Threshold Voltage ($V_{gs(th)}$)
 Forward On Voltage (V_{sd})
 Drain Source On Voltage ($V_{ds(on)}$)
 Drain Source Breakdown Voltage (B_{vds})

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Reliability Evaluation Plan and results


D.U.T.: STS11NF3LL

Line: E33E

Package: SO-8

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% Reflow @ 260°C 3 times	204 x 1 Lot	Parameter deviation within spec. limits at end of preconditionings.	No parameter deviation 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 at 1000 hours.
T.H.B.	<i>D.U.T. SMD PRECONDITIONED</i> TA=85°C - RH=85% Vbias= 24V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation at 1000 hours
H.T.R.B.	T.A.= 150°C Vdd = 24V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation at 1000 hours
H.T.F.B.	TA=150°C Vgss=16V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation 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 at 96 hours. .
THERMAL CYCLES AIR TO AIR	<i>D.U.T. SMD PRECONDITIONED</i> TA=-65°C TO 150°C 1 HOUR / CYCLE	77 x 1 Lot	Parameter deviation within spec. limits at 500 cycles.	No parameter deviation at 500 cy
ENVIRONMENTAL SEQUENCE	<i>D.U.T. SMD PRECONDITIONED</i> 100 THERMAL CYCLES + 168H PP	50 x 1 Lot	Parameter deviation within spec. limits at end of test.	No parameter deviation at end of test.

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Reliability Evaluation Plan and results

D.U.T.: STS8DNF3LL

Line: T33P

Package: SO-8

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% Reflow @ 260°C 3 times	204 x 1 Lot	Parameter deviation within spec. limits at end of preconditionings.	<i>No parameter deviation out of spec. Limits at end of preconditionings.</i>
H.T.S.	TA=150°C	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
T.H.B.	<i>D.U.T. SMD PRECONDITIONED</i> TA=85°C - RH=85% Vbias= 24V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
H.T.R.B.	T.A.= 150°C Vdd = 24V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
H.T.F.B.	TA=150°C Vgss=16V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
PRESSURE POT	TA=121°C - PA=2Atm	77 x 1 Lot	Parameter deviation within spec. limits at 96 hours.	<i>No parameter deviation out of spec. limits at 96 hours.</i>
THERMAL CYCLES AIR TO AIR	<i>D.U.T. SMD PRECONDITIONED</i> TA=-65°C TO 150°C 1 HOUR / CYCLE	77 x 1 Lot	Parameter deviation within spec. limits at 500 cycles.	<i>No parameter deviation out of spec. limits at 500 cy.</i>
ENVIRONMENTAL SEQUENCE	<i>D.U.T. SMD PRECONDITIONED</i> 100 THERMAL CYCLES + 168H PP	50 x 1 Lot	Parameter deviation within spec. limits at end of test.	<i>No parameter deviation out of spec. limits at end of test.</i>

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Reliability Evaluation Plan and results

D.U.T.: STS1HNK60

Line: EC6M

Package: SO-8

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% Reflow @ 260°C 3 times	204 x 1 Lot	Parameter deviation within spec. limits at end of preconditionings.	<i>No parameter deviation out of spec. Limits at end of preconditionings.</i>
H.T.S.	TA=150°C	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
T.H.B.	<i>D.U.T. SMD PRECONDITIONED</i> TA=85°C - RH=85% Vbias= 100V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
H.T.R.B.	T.A.= 150°C Vdd = 480V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
H.T.F.B.	TA=150°C Vgss=30V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	<i>No parameter deviation out of spec. limits at 1000 hours.</i>
PRESSURE POT	TA=121°C - PA=2Atm	77 x 1 Lot	Parameter deviation within spec. limits at 96 hours.	<i>No parameter deviation out of spec. limits at 96 hours.</i>
THERMAL CYCLES AIR TO AIR	<i>D.U.T. SMD PRECONDITIONED</i> TA=-65°C TO 150°C 1 HOUR / CYCLE	77 x 1 Lot	Parameter deviation within spec. limits at 500 cycles.	<i>No parameter deviation out of spec. limits at 500 cy.</i>
ENVIRONMENTAL SEQUENCE	<i>D.U.T. SMD PRECONDITIONED</i> 100 THERMAL CYCLES + 168H PP	50 x 1 Lot	Parameter deviation within spec. limits at end of test.	<i>No parameter deviation out of spec. limits at end of test.</i>

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Technological Characteristics

D.U.T.: STS11NF3LL Line: E33E Package: SO-8

DIE	<i>Technology:</i> STripFET™ II Power MOSFET <i>Material:</i> Silicon <i>Passivation :</i> None <i>Metallization – Front :</i> Al/Si/Cu <i>Dimensions :</i> 2540X3550 µm <i>- Back :</i> Ti-Ni-Au			
DIE ATTACH	Glue	FRAME	<i>Frame and lead material:</i> <i>Frame coating :</i> <i>Lead coating :</i>	Row copper No coating Sn 100%
WIRE BOND	Thermosonic	WIRE	<i>Material :</i> <i>Diameter :</i>	Au Gate Au Source 2 mils Gate 2 mils Source
SEALING	Molding	PACKAGING	<i>Material :</i>	Epoxy Resin

PRODUCTION PLACES: WAFER PROCESSING : SINGAPORE
 ASSEMBLY LOCATION : FUJITSU (CHINA)
 Q.A. LOCATION : FUJITSU (CHINA)

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Technological Characteristics

D.U.T.: STS8DNF3LL Line: T33P Package: SO-8

DIE	<i>Technology:</i> STripFET™ II Power MOSFET <i>Material:</i> Silicon <i>Passivation</i> : None <i>Metallization – Front :</i> Al/Si/Cu <i>Dimensions</i> : 2530 x 1710 μm <i>- Back :</i> Ti-Ni-Au			
DIE ATTACH	Glue	FRAME	<i>Frame and lead material:</i> <i>Frame coating :</i> <i>Lead coating :</i>	Row copper No coating Sn 100%
WIRE BOND	Thermosonic	WIRE	<i>Material :</i> <i>Diameter :</i>	Au Gate Au Source 2 mils Gate 2 mils Source
SEALING	Molding	PACKAGING	<i>Material :</i>	Epoxy Resin

PRODUCTION PLACES: WAFER PROCESSING : SINGAPORE
 ASSEMBLY LOCATION : FUJITSU (CHINA)
 Q.A. LOCATION : FUJITSU (CHINA)

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Technological Characteristics

D.U.T.: STS1HNK60


Line: EC6M

Package: SO-8

DIE	<i>Technology:</i> SuperMESH™Power MOSFET <i>Material:</i> Silicon <i>Passivation :</i> Nitride <i>Metallization – Front :</i> Al/Si (1%) <i>Dimensions :</i> 2300 x 1730 μm <i>- Back :</i> Ti-Ni-Au			
DIE ATTACH	Glue	FRAME	<i>Frame and lead material:</i> <i>Frame coating :</i> <i>Lead coating :</i>	Row copper No coating Sn 100%
WIRE BOND	Thermosonic	WIRE	<i>Material :</i> <i>Diameter :</i>	Au Gate Au Source 2 mils Gate 2 mils Source
SEALING	Molding	PACKAGING	<i>Material :</i>	Epoxy Resin

PRODUCTION PLACES: WAFER PROCESSING : SINGAPORE
 ASSEMBLY LOCATION : FUJITSU (CHINA)
 Q.A. LOCATION : FUJITSU (CHINA)

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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.

Thermal Cycles/Shocks

The purpose of this test is to determine the resistance of devices to exposure to extreme changes in temperature. Specimens are first placed in a suitable environment at a low temperature and then transferred to one at high temperature. Effects of thermal cycles/shocks include cracking of die, breaking of wire bonding, mechanical damage to the device case.

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Reliability Test Description (continued)

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.

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.

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