PRODUCT/PROCESS CHANGE NOTIFICATION

PCN CRP/07/3203
Notification Date 12/11/2007

PowerSO-10 production line transfer from Ain Sebaa to Bouskoura

CRP - Corporate Quality Assurance

Table 1. Change Implementation Schedule

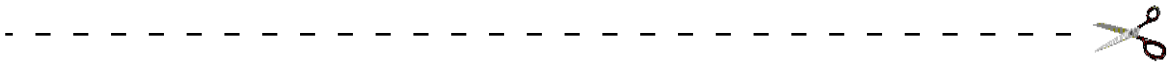
Forecasted implementation date for change	15-Mar-2008
Forecasted availabillity date of samples for customer	15-Dec-2007
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	12-Dec-2007
Estimated date of changed product first shipment (according to JEDEC standard JESD46C 'customer Notification of product/process change by semiconductor suppliers')	01-Apr-2008

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	PRODUCT POWER SO10
Type of change	Package assembly location change
Reason for change	Corporate package roadmap & Ain Sebaa plant closure
Description of the change	PowerSO-10 production line transfer from Ain Sebaa to Bouskoura
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	"CZ" as production area identification
Manufacturing Location(s)	1]St Ain Sebaa - Morocco

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN CRP/07/3203**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 12/11/2007**

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

Remark

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DOCUMENT APPROVAL

Name	Function
Sibille, Marie-Helene	Corporate Quality Manager
Caizzone, Francesco	Process Owner
Terzoli, Marzio	Process Owner

PowerSO-10 production line transfer from Ain Sebaa to Bouskoura (Morocco)

WHAT*:*

Following Corporate **CIL CRP/07/2927** dated September 25, 2007 on Ain Sebaa assembly plant closure, we are going to transfer the PowerSO-10 assy line from Ain Sebaa to Bouskoura plant. Final test & finishing operations will be transferred as well as assembly.

Both plants are located in Casablanca area. Equipment & personnel will be transferred from one plant to the other limiting the impact on production activity.

WHY: ST decided to enhance, in order to improve cost structure, the utilization of its leading-edge Bouskoura testing and packaging facility in Morocco.

WHO: All Customers using products housed in PowerSO-10 package.

WHEN: Change will be implemented in according to the below schedule:

Qualification reports:

The qualification of Bouskoura line has been shared between APG (Automotive Products Group) & APM (*Analog Power & MEMS*) both involved in this transfer to fully qualify the markets they serve.

APG test vehicles: **VN920SP** and **VB325SP** (VIPower products) - See attached qualification report **RR001107CT6029**

APM test vehicle: **STV160NF02LT4** - See attached APM CATANIA RELIABILITY REPORT 22/07

Samples availability:
-Samples of test vehicles are available.
-Samples of other products available on demand.

Start production / 1st shipment:
-April 2008. Shipment of products belonging to Bouskoura plant may occur prior this date upon Customer agreement (according to Jedec JESD46C standard).

APG

Automotive Product Group
Car Body Division

AEC_Q100 Rev.F Qualification Plan Results

Object: PowerSO-10 assy line transfer from Ain Sebaa to Bouskoura, test vehicles VN920SP-E (VN92) and VB325SP-E (V325)

General Information	
Product Line	VN92
Commercial Product	VN920SP-E
Silicon process technology	VIPower M0_A3
Package (*)	PowerSO10

Locations	
Diffusion fab location	CT6 Catania (Italy)
Assembly plant location	Bouskoura (Morocco)
Test plant location	Bouskoura (Morocco)
Reliability location	Catania (Italy)

General Information	
Product Line	V325
Commercial Product	VB325SP-E
Silicon process technology	VIPower M0_A3
Package (*)	PowerSO10

Locations	
Diffusion fab location	CT6 Catania (Italy)
Assembly plant location	Bouskoura (Morocco)
Test plant location	Bouskoura (Morocco)
Reliability location	Catania (Italy)

(*) The qualification was executed using as molding compound the resin Sumitomo 6650RL with new Low Stress Additive

Author:
A.Marmoni
APG Q&R Catania

ST approved:
E.Parrino
APG Q&R Catania Mng

Reliability and electrical test executed by:
S. Di Stefano
MPA Rel Dept. – APG Support

AEC #	Test Name	STM Test Conditions	Sample Size/ Lots	Results Fails/SS/Lots	Comments
4	**PC** Pre Cond	Preconditioning at Jedec Level 3, store 192 hours at Ta=30ºC, RH=60%, IR reflow (3 times) at 260ºC	Before all trials. Reliability executed on units soldered on card edge		
2	**HTOL** High Temp. Op. Life	Ta=125C, Vcc=28V for 1000 hours	77/3 (*)	0/77/3	
3	**HTSL** High Temp. Storage Life	Ta=150ºC for 1000 hours. TST before and after at room and hot temperatures.	45/2 (**)	0/45/1	
5	**THB** Temp Humidity Bias	Ta=85ºC, RH=85%, Vcc=24V for 1000 hours	77/3 (*)	0/77/3	
6	**AC** Autoclave	Ta=121ºC, Pa=2atm for 96 hours	77/3 (*)	0/77/3	
7	**TC** Temp. Cycling	Ta=-65ºC +150ºC for 500 cycles	77/3 (*)	0/77/3	
	ENV. SEQ. Enviromental Sequence	**TC** (Ta=-65ºC +150ºC for 100 cycles) + **AC** (Ta=121ºC, Pa=2atm for 96 hours)	50/2 (**)	0/50/1	STM additional test

(*) Test executed using 2 lots from VN920SP-E and 1 lot from VB325SP-E
(**) Test executed using 1 lot from VN920SP-E and 1 lot from VB325SP-E

Reliability evaluation

on

STV160NF02LT4 in PowerSO-10 package

made in BOUSKOURA

Table of Contents

Introduction

This report is aimed to qualify the STV160NF02LT4 in PowerSO-10 package made in BOUSKOURA.

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

The evaluation results meet ST products qualification targets, therefore the STV160NF02LT4 in PowerSO-10 package made in BOUSKOURA is qualified.

Test Vehicles :

Product Line	Sales Type	Package
TD2S	STV160NF02LT4	PowerSO-10

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 PowerMOS

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)

Reliability Evaluation Plan and results

D.U.T.: STV160NF02LT4 LINE:TD2S PACKAGE: PowerSO-10

Test	Conditions	S.S.	Requirement	Results
PRECONDITIONING OF SMD DEVICES BEFORE TC/THB/ENV. SEQ.	DRYNG 1H @ 125℃ STORE 168H @ TA=85℃ RH=85% IR @ Tp=260℃ 3 times	204 x 1 Lot	Parameter deviation within spec. limits at end of preconditionings.	No parameter deviation at end of preconditionings.
T.H.B.	D.U.T. SMD PRECONDITIONED TA=85℃ - RH=85% Vbias= 20V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation at 1000 hours.
H.T.R.B.	T.A.= 175℃ Vdd = 16V	77 x 1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation at 1000 hours.
H.T.F.B.	TA=150℃ Vgss=15V	77x1 Lot	Parameter deviation within spec. limits at 1000 hours.	No parameter deviation at 1000 hours.
PRESSURE POT	TA=121℃ – 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	D.U.T. SMD PRECONDITIONED TA=-65℃ TO 150℃ 1 HOUR / CYCLE	77 x 1 Lot	Parameter deviation within spec. limits at 500 cycles.	No parameter deviation at 500 cy
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 at end of test.

Technological Characteristics

D.U.T.: STV160NF02LT4 LINE:TD2S PACKAGE: PowerSO-10

DIE	*Technology:* STripFET™ II POWER MOSFET *Material:* Silicon *Metallization – Front :* Al/Si *- Back :* Ti/Ni/Au		*Passivation :* *Dimensions :*	NONE 5650 x 4620um^2
DIE ATTACH	Soft Solder	**FRAME**	*Frame and lead material:* *Frame coating :* *Lead coating :*	Cu PINi/NiP Sn 100%
WIRE BOND	Ultrasonic	**WIRE**	*Material :* *Diameter :*	Al/Mg Gate Al Source 1X5 mils Gate 7X10 mils Source
SEALING	Molding	**PACKAGING**	*Material :*	Epoxy Resin

PRODUCTION PLACES: WAFER PROCESSING: CATANIA
ASSEMBLY LOCATION: BOUSKOURA
QA LOCATION: BOUSKOURA

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.

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.

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