PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-IPC/10/5382
Notification Date 02/16/2010

Additional Assy & Testing line in Fujitsu for SO8 exposed pad package

Table 1. Change Implementation Schedule

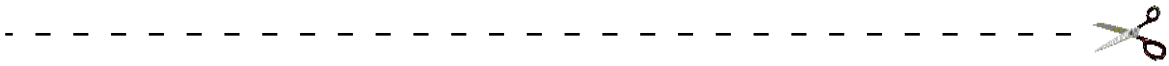
Forecasted implementation date for change	10-May-2010
Forecasted availabillity date of samples for customer	09-Feb-2010
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	09-Feb-2010
Estimated date of changed product first shipment	18-May-2010

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	see attached list
Type of change	Package assembly location change
Reason for change	Service improvement and capacity increase
Description of the change	A new Assembly and Testing line for SO8 exposed pad package has been installed in Subcontractor Fujitsu for Voltage Regulators. This new additional line will increase production capacity in order to satisfy our Customers demand. Here attached you can find the POA (Package outline Assembly) comparison. Despite of small differences on package dimension, both packages are JEDEC compliant and can be used with the same footprint (here attached)
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	See "GF" in the Traceability Code as identification of Assy&Testing Plant
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN APM-IPC/10/5382**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 02/16/2010**

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

Remark

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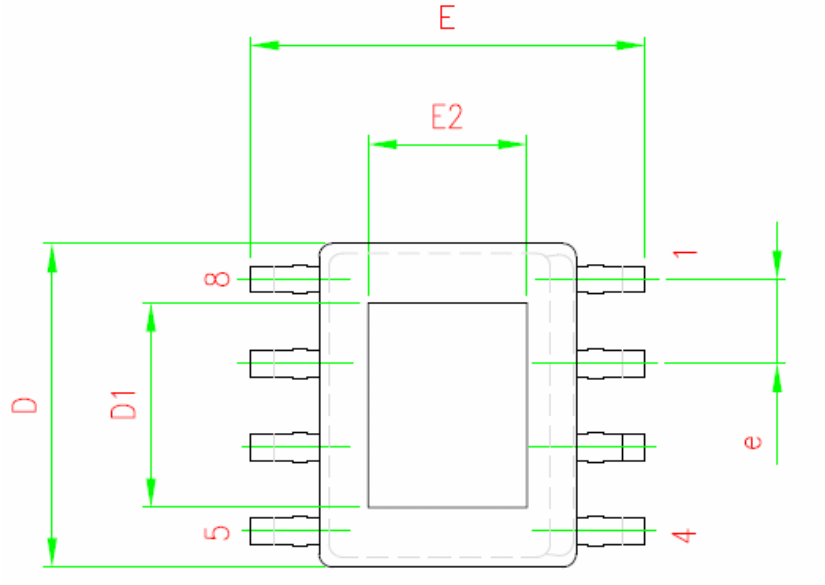
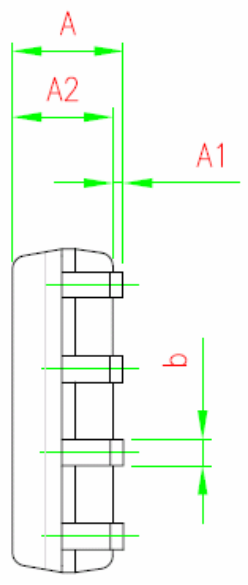
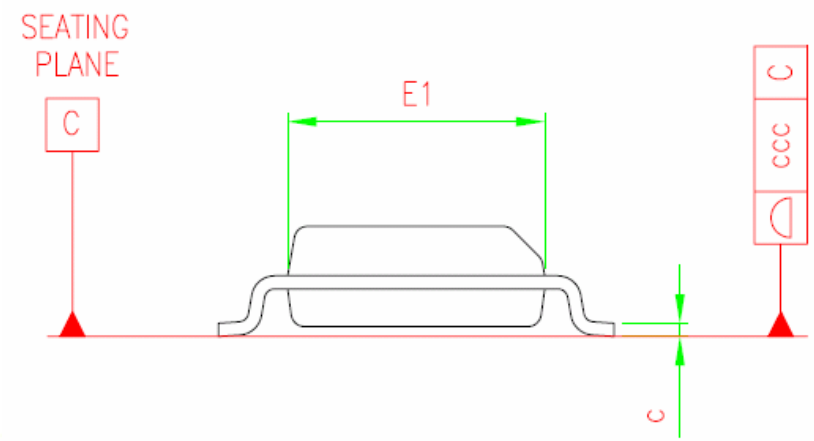
DOCUMENT APPROVAL

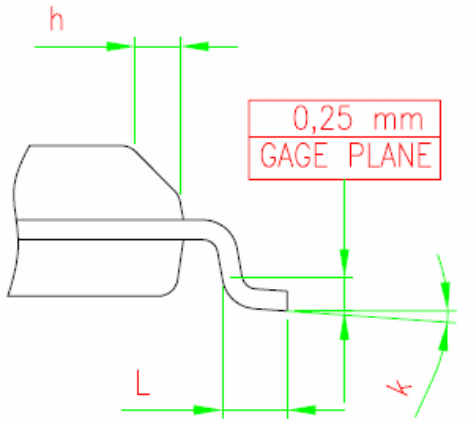
Name	Function
Riviera, Antonio	Division Marketing Manager
Naso, Lorenzo	Division Product Manager
Calderoni, Michele	Division Q.A. Manager

SO8 EP POA DRAWING





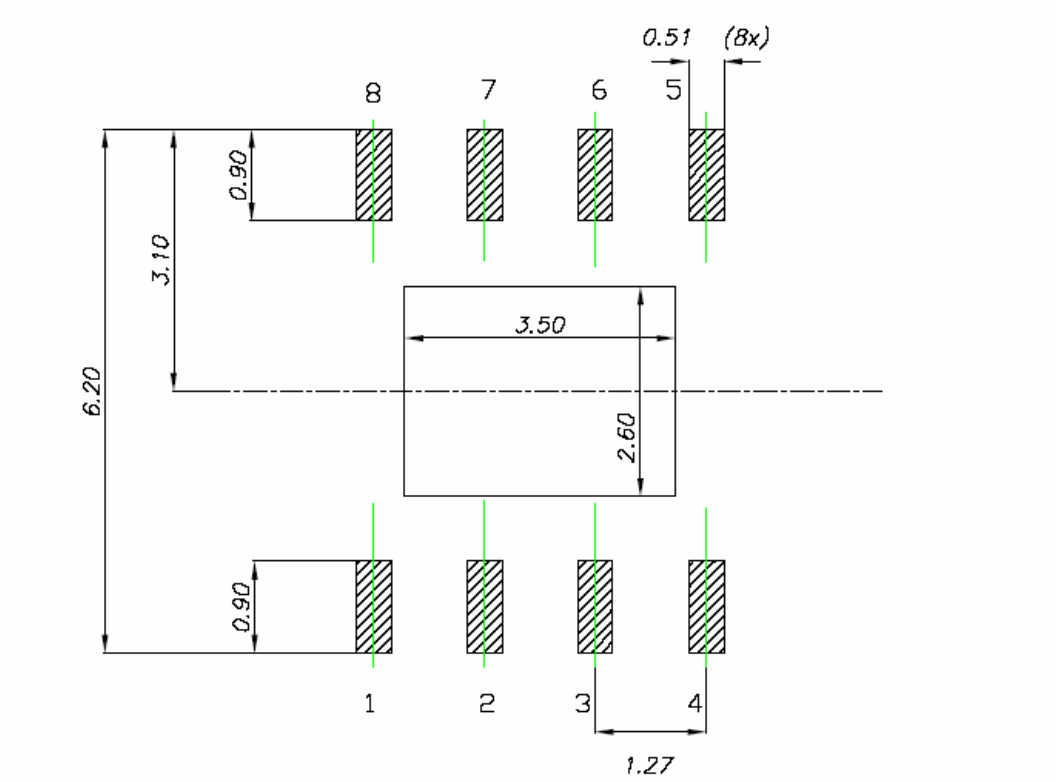




POA comparison

Package	SO8 EP					
Subcon	ST (Actual)			NFME (new)		
Unit	Millimeter			Millimeter		
Symbol	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.70			1.75
A1	0.00		0.15	0.00		0.15
A2	1.25			1.25		
b	0.31		0.51	0.31		0.51
c	0.17		0.25	0.17		0.25
D	4.80	4.90	5.00	4.80	4.90	5.00
D1	2.24	3.10	3.20	3.10	3.30	3.50
E	5.80	6.00	6.20	5.80	6.00	6.20
E1	3.80	3.90	4.00	3.80	3.90	4.00
E2	1.55	2.41	2.51	2.20	2.40	2.60
e		1.27			1.27	
h	0.25		0.50	0.25		0.50
L	0.40		1.27	0.40		1.27
k	0		8	0		8
ccc			0.10			0.10

RECOMMENDED FOOTPRINT



Comment: In spite of small difference on some dimensions, the new package is compatible with the in production one.
Both package types are JEDEC compliant and can be indiscriminately used with above recommended footprint.

Reliability Report on

SO8 EP
Nantong Fujitsu

TV: ST1S10PHR (UL53)

General Information	
Product Line	*UL53*
Product Description	*Step-down current mode PWM regulator*
P/N	*ST1S10PHR*
Product Group	*IMS-APM*
Product division	*Voltage Regulator&Interface*
Package	*SO8 EP*
Silicon Process technology	*BCD6*

Locations	
Wafer fab	*CTM8*
Assembly plant	*NANTONG FUJITSU*
Reliability Lab	*Catania Reliability*

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	Dec-2008	6	Angelo Donzuso	Giovanni Presti	First issue

TABLE OF CONTENTS

1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
AEC-Q100	Stress test qualification for automotive grade integrated circuits
JESD47	Stress-Test-Driven Qualification of Integrated Circuits

2 GLOSSARY

DUT	Device Under Test
SS	Sample Size

3 RELIABILITY EVALUATION OVERVIEW

3.1 Objectives

New subcontractor reliability Evaluation: SO8 Exposed Pad in Nantong Fujitsu

3.2 Conclusion

Qualification Plan requirements have been fulfilled. It is stressed that reliability tests have shown that the devices behave correctly against environmental tests (no failure). Moreover, the stability of electrical parameters during the accelerated tests demonstrates the ruggedness of the products and safe operation, which is consequently expected during their lifetime.

4 DEVICE CHARACTERISTICS

4.1 Device description

The ST1S10 is a high efficiency step-down PWM current mode switching regulator capable of providing up to 3 A of output current.

4.2 Construction note

	Assembly Lots		
	Lot1:	**Lot2:**	**Lot3:**
Wafer/Die fab. information	**CTM8**		
Wafer fab manufacturing location	Catania		
Technology	BCD6		
Die size	1978,1998 um		
Assembly information			
Assembly site	NANTONG FUJITSU		
Package description	SO8 EP		
Molding compound	SUMITOMO G700A		
Wires bonding materials/diameters	Au 1,3 mils		

5 TESTS RESULTS SUMMARY

5.1 Test vehicle

Lot #		Assy Lot		Process/ Package	Product Line	Comments
1		Lot1: 8OW01170101		SO8 EP	UL53	
2		Lot2: 8OW01570101		SO8 EP	UL53	
3		Lot3: 8OW01740101		SO8 EP	UL53	

5.2 Test plan and results summary

ST1S10PHR

Test	PC	Std ref.	Conditions		Steps	Failure/SS			Note
						Lot 1	Lot 2	Lot 3	
Die Oriented Tests									
HTSL	N	JESD22 A-103	Ta = 150°C		168 H	0/45	0/45	0/45	
					500 H	0/45	0/45	0/45	
					1000 H	0/45	0/45	0/45	
Package Oriented Tests									
PC		JESD22 A-113	Drying 24 H @ 125°C Store 168 H @ Ta=85°C Rh=85% Oven Reflow @ Tpeak=260°C 3 times		Final	Pass	Pass	Pass	No Delamination on front die after IR reflow on selected parts
AC	Y	JESD22 A-102	Pa=2Atm / Ta=121°C		168 H	0/77	0/77	0/77	
TC	Y	JESD22 A-104	Ta = -40°C to 125°C		100 cy	0/77	0/77	0/77	
					200 cy	0/77	0/77	0/77	
					500 cy	0/77	0/77	0/77	
THB	Y	JESD22 A-101	Ta = 85°C, RH = 85%, BIAS		168 H	0/77	0/77	0/77	
					500 H	0/77	0/77	0/77	
					1000 H	0/77	0/77	0/77	

6 ANNEXES

6.1 Tests Description

Test name	Description	Purpose
Die Oriented		
HTSL High Temperature Storage Life	The device is stored in unbiased condition at the max. temperature allowed by the package materials, sometimes higher than the max. operative temperature.	To investigate the failure mechanisms activated by high temperature, typically wire-bonds solder joint ageing, data retention faults, metal stress-voiding.
Package Oriented		
PC Preconditioning	The device is submitted to a typical temperature profile used for surface mounting devices, after a controlled moisture absorption.	As stand-alone test: to investigate the moisture sensitivity level. As preconditioning before other reliability tests: to verify that the surface mounting stress does not impact on the subsequent reliability performance. The typical failure modes are "pop corn" effect and delamination.
AC Auto Clave (Pressure Pot)	The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature.	To investigate corrosion phenomena affecting die or package materials, related to chemical contamination and package hermeticity.
TC Temperature Cycling	The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere.	To investigate failure modes related to the thermo-mechanical stress induced by the different thermal expansion of the materials interacting in the die-package system. Typical failure modes are linked to metal displacement, dielectric cracking, molding compound delamination, wire-bonds failure, die-attach layer degradation.
THB Temperature Humidity Bias	The device is biased in static configuration minimizing its internal power dissipation, and stored at controlled conditions of ambient temperature and relative humidity.	To evaluate the package moisture resistance with electrical field applied, both electrolytic and galvanic corrosion are put in evidence.

6.2 Drift Analysis

Drift analysis on key electrical parameter didn’t show remarkable drift.

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