# PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-SLI/09/4709
Notification Date 06/25/2009

**BCD6 45V diffusion transfer from Phoenix 8" to Catania M5 FAB 8"**

**Table 1. Change Implementation Schedule**

| | |
|---|---|
| Forecasted implementation date for change | 18-Sep-2009 |
| Forecasted availabillity date of samples for customer | 18-Jun-2009 |
| Forecasted date for **STMicroelectronics** change Qualification Plan results availability | 18-Jun-2009 |
| Estimated date of changed product first shipment | 24-Sep-2009 |

**Table 2. Change Identification**

| | |
|---|---|
| Product Identification (Product Family/Commercial Product) | see attached list |
| Type of change | Waferfab location change |
| Reason for change | FAB CLOSURE AS PER CORPORATE CIL: CRP/07/2900 |
| Description of the change | Following Corporate CIL: CRP/07/2900 we are transferring the product manufactured by using BCD6 45V Technology, from Phoenix 8" to Catania M5 FAB 8". This PCN is an addendum of PCN APM/08/4160. Samples of STPM01 and STPM1x already available, LNBH24PPR available on week 31 '09, LNBH24TPPR already available. |
| Product Line(s) and/or Part Number(s) | See attached |
| Description of the Qualification Plan | See attached |
| Change Product Identification | "V5" as wafer Fab area code. |
| Manufacturing Location(s) | |

**Table 3. List of Attachments**

| | |
|---|---|
| Customer Part numbers list | |
| Qualification Plan results | |

| Customer Acknowledgement of Receipt | **PCN APM-SLI/09/4709** |
|---|---|
| Please sign and return to STMicroelectronics Sales Office | **Notification Date 06/25/2009** |
| ☐ 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 |

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# 1 RELIABILITY EVALUATION OVERVIEW

## 1.1 Objectives

Aim of this report is to present the results of the reliability evaluations performed on STCS1 device used as test vehicle in order to qualify BCD6S-45V technology diffused in Catania M5.

This product is assembled in DFN8 (3 x 3 mm) and Power SO-8 package.

## 1.2 Conclusion

The final reliability results are positive for all stressed lots.

# 2 DEVICE CHARACTERISTICS

## 2.1 Device description

The STCS1 is a BiCMOS constant current source designed to provide a precise constant current starting from a varying input voltage source. The main target is to replace discrete components solution for driving LEDs in low voltage applications such as 5 V, 12 V or 24 V giving benefits in terms of precision, integration and reliability.

### 2.1.1 benefits in terms of precision, integration and Wafer fabrication information

- Wafer fabrication manufacturing location: CATANIA M5
- Technology: BCD6S-45V
- Die size: 1.012x1.7020 mm2
- Passivation type: TEOS / SiN / Polyimide

### 2.1.2 Assembly information

**DFN8 (3 x 3 mm)**

- Assembly site: CARSEM S MALAYSIA
- Package description: DFN8 (3 x 3 mm)
- Frame: Cu 1.88x2.66 mm
- Wire: Au 1 mils

**Power SO-8**

- Assembly site: Amkor - Philippines
- Package description: Power SO-8
- Frame: Cu 2.28x2.28 mm
- Wire: Au 1 mils

# 3 RELIABILITY TESTS RESULTS

## 3.1 Reliability test plan and results summary

Include here the tests plan and the results summary.

**Die oriented test**

| Test | Test short description | | | | |
|---|---|---|---|---|---|
| | **Method** | **Conditions** | **Sample Size** | **Duration** | **Results Fail/ Sample Size** |
| | **STCS1A – Power SO-8** | | | | |
| **HTB** | High Temperature Bias | | | | |
| | | Ta = 125°C, Vdd = 45V | 77x2 Lots | **1000 h** | 0/144 |
| **HTS** | High Temperature Storage | | | | |
| | | Ta = 150°C | 77x2 Lots | **1000 h** | 0/144 |
| | **STCS1A - DFN8 (3 x 3 mm)** | | | | |
| **HTB** | High Temperature Bias | | | | |
| | | Ta = 125°C, Vdd = 45V | 77x1 Lots | **1000 h** | 0/77 |
| **HTS** | High Temperature Storage | | | | |
| | | Ta = 150°C | 77x1 Lots | **1000 h** | 0/77 |

**Package oriented test**

| Test | Test short description | | | | |
|---|---|---|---|---|---|
| | **Method** | **Conditions** | **Sample Size** | **Duration** | **Results Fail/ Sample Size** |
| | **STCS1A – Power SO-8** | | | | |
| **P.C.** | Preconditioning on all devices to be subjected to THB, TC, PP | | | | |
| | | Drying 24H @ 125°C,<br>Store 168H @ TA=85°C RH=85%<br>Oven Reflow @ Tpeak=260°C 3 times | 256x1 Lot | Parameter deviation within spec. limits after go no go test | 0/256 |
| **T.H.B.** | Temperature Humidity Bias | | | | |
| | | Ta=85°C Rh=85%, Vdd=4.5V | 77x1 Lot | **1000 h** | 0/77 |
| **T.C.** | Thermal Cycle | | | | |
| | | TA=-65°C TO 150°C (1 HOUR/CYCLE) | 77x1 Lot | **500 cy** | 0/77 |
| **P.P.** | Pressure Pot | | | | |
| | | TA=121°C – PA=2ATM | 77x1 Lot | **168 h** | 0/77 |
| **S.M.D.** | SMD MOISTURE INDUCED STRESS | | | | |
| | | DRYNG 24H @ 125°C<br>STORE 168.H @ TA=85°C RH=85%<br>IR 3 times @ Tpeack=260°C | 25x1 Lot | Parameter deviation within spec. limits at end of test | No parameter deviation out of spec. limits at end of test |

| Test | Test short description | | | | |
|---|---|---|---|---|---|
| | **Method** | **Conditions** | **Sample Size** | **Duration** | **Results Fail/ Sample Size** |
| | **STCS1A – DFN8 (3 x 3 mm)** | | | | |
| **P.C.** | Preconditioning on all devices to be subjected to THB, TC, PP | | | | |
| | | Drying 24H @ 125°C,<br>Store 168H @ TA=85°C RH=85%<br>Oven Reflow @ Tpeak=260°C 3 times | 256x1 Lot | Parameter deviation within spec. limits after go no go test | 0/256 |
| **T.H.B.** | Temperature Humidity Bias | | | | |
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| **T.C.** | Thermal Cycle | | | | |
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| **P.P.** | Pressure Pot | | | | |
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| **S.M.D.** | SMD MOISTURE INDUCED STRESS | | | | |
| | | DRYNG 24H @ 125°C<br>STORE 168.H @ TA=85°C RH=85%<br>IR 3 times @ Tpeack=260°C | 25x1 Lot | Parameter deviation within spec. limits at end of test | No parameter deviation out of spec. limits at end of test |

**ESD tests**

**Zap Circuit: HBM-DH11C All pins zapped vs Gnd and Vcc**

| Date | Batch # | Zap Voltage | Quantity Zapped | Quantity Failed |
|---|---|---|---|---|
| 13-05-08 | 1 | 2KV | 3 | 0 |

ESD test is SATISFACTORY.

## 3.2 Die oriented tests

These tests are performed in order to demonstrate the quality and reliability of devices subjected to an elevated temperature and reverse biased.
The purpose of this test is to detect surface defects such as poor passivation, presence of contaminants, metal corrosion, etc

## 3.3 Package oriented tests

These tests are performed in order to check device life in various environmental conditions in an accelerated way.
Detectable failure mechanisms are metal corrosion and molding defect, cracking of die, breaking of wire bonding, and mechanical damage to the device case.

# 4 APPLICABLE AND REFERENCE DOCUMENTS

| Document reference | Short description |
|---|---|
| **AEC-Q100** | : Stress test qualification for integrated circuits |
| **SOP 2610** | : General product qualification procedure |
| **Internal ST specification** | : Reliability Tests and criteria for qualifications (CORPORATE Q&R RULES) |
| … | |

# 5 GLOSSARY

| | |
|---|---|
| **ESD** | Electro Static Discharge |
| **HTB** | High Temperature Bias |
| **HTS** | High Temperature Storage |
| **T.H.B.** | Temperature Humidity Bias |
| **T.C.** | Thermal Cycle |
| **P.P.** | Pressure Pot |
| **P.C.** | Preconditioning |
| **S.M.D.** | SMD MOISTURE INDUCED STRESS |

# 6 ANNEXES

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