PRODUCT/PROCESS CHANGE NOTIFICATION

PCN HED-AUD/07/2343
Notification Date 03/06/2007

Copper wire bonding introduction for PowerSO20-36 matrix line

AUD - AUDIO

Table 1. Change Identification

Product Identification (Product Family/Commercial Product)	PowerSO20-36 matrix line Audio Division products
Type of change	Package assembly material change
Reason for change	Bonding wire material change
Description of the change	Following a Company Roadmap, we are on going to change the bonding wire material from gold to copper on PowerSO20-36 matrix line assembled in our STM Malaysia plant. Package qualification certificate (QC-09-07) and samples will be available upon request.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	All products assembled on PowerSO20-36 matrix line
Manufacturing Location(s)	

Table 2. Change Implementation Schedule

Forecasted implementation date for change	27-May-2007
Forecasted availabillity date of samples for customer	30-Mar-2007
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	27-Feb-2007
Estimated date of changed product first shipment	05-Jun-2007

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	

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Customer Acknowledgement of Receipt	**PCN HED-AUD/07/2343**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 03/06/2007**
☐ Qualification Plan Denied	Name:
☐ Qualification Plan Approved	Title:
	Company:
☐ Change Denied	Date:
☐ Change Approved	Signature:

Remark

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DOCUMENT APPROVAL

Name	Function
Onetti, Andrea Mario	Division Marketing Manager
Angelici, Marco	Division Product Manager
Piccoli, Massimo	Division Q.A. Manager

HED BE Q&R RELIABILITY REPORT*

Assembly line: Muar
Package family: Power SO 20 & 36 Leads, Matrix line

Abstract

The object of this reliability report is to validate the introduction of Copper wire into the Muar Power SO 20 & 36.

This qualification plan comes as a complement of previous qualification plan done by APG (Lucia RIGHI & Alberto MANCALEONI): T.R. 29.04/1150 & RELIABILITY EVALUATION REPORT S-ER003104AG6050 (October 4th, 2004).

Change identification

Reliability report reference / date	HED-Rel 01_07	February 16, 2007
Qualification request reference /date	HPC 0044/05	August 5, 2005
Qualification plan reference / date	HPC QP05021-B	May 29, 2006
Affected products	Audio: L09503/ UD6303/ L18003/ UT4203/ UT3703/ UT3103	

Conclusion

Based on the results of reliability tests, all Power SO 20 & 36 leads with copper wires and plasma cleaning before molding can be considered as qualified with JEDEC level 3 @ 245°C (peak reflow temperature).

* HED BE Q&R – GRENOBLE
Issued by Corinne TRIOMPHE

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Package construction note

PACKAGE FEATURES	
Package name	Power So 20& 36 Matrix
Body size (mm^3)	15.9 x 11 x 3.3
Assembly site	Muar
Lead frame material	Copper alloy with Ag ring
Lead finish	Pure Sn
Die attach	PREFORM Pb/Ag/Sn 97.5/1.5/1
Molding compound	RESIN SUMITOMO 7307A typS
Wire material / diameter	Copper wire / 2 mil
Wire bonding	Ultrasonic

Test vehicles definition

DIE & PRODUCT FEATURES	
Technical code/ Line	L095
RL Code	A977*L095BA6
Package type	PowerSO 20 .43 SLUG DOWN
Wire on the die-pad	No
Pad size (µm²)	8060 x 6170
Diffusion process	CD BI20II
Wafer thickness (µm)	280
Die size (µm²)	3250 x 2870
Die front finishing	NITRIDE/POLYIMIDE (S
Die back finishing	CHROMIUM/NICKEL/GOLD

Construction analysis

See Construction analysis report N°CA 061201 - CTLib n° 26260, by Nathalie SABATTINI (March 28, 2006)

Lot traceability

Lot numbers:

- Lot 1: 99625IARZU
- Lot 2: 99625IARZT
- Lot 3: 99623IARZV

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Reliability test conditions and results

Line	Electrical test	Reliability plant	Particular points
L095	Agrate	Castelletto & Agrate (for TCT)	

TEST	CONDITIONS	REJECTED PARTS Lot 1	Lot 2	Lot 3
JL3	Preconditioning - T-SCAN + C-SAM @ time 0 - 24h bake @ 125°C - 192h @ 30°C / 60% RH - Reflow simulation (3 times) with standard JEDEC profile @ 245°C - T-SAM + C-SAM after reflow	*0/150*	*0/150*	*0/150*
JL3 + TCT	Thermal cycling Ta=-40/+150°C Steps: 0, 100, 500, 1000 cycles T-SCAN + C-SAM after 1000 cycles	*0/50*	*0/50*	*0/50*
JL3 + PPT	Pressure pot P=2atm, Ta=121°C, 100%RH Steps: 0, 168, 240h T-SCAN + C-SAM after 240h	*0/50*	*0/50*	*0/50*
JL3 + HdTS	Humidity storage Ta=85°C/85%Rh Steps: 0, 168, 500, 1000 hours T-SCAN + C-SAM after 1000 hours	*0/50*	*0/50*	*0/50*
HTS	High temperature storage Ta=150°C Steps: 0, 168, 500, 1000 hours T-SCAN + C-SAM after 1000 hours	*0/50*	*0/50*	*0/50*

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Annex: Reliability tests description

TEST NAME	DESCRIPTION	PURPOSE
JLn: JEDEC Level n surface mounting simulation	The device is submitted to a typical temperature profile used for surface mounting, after controlled moisture absorption.	*As stand-alone test:* to investigate the level of moisture sensitivity. *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.
TCT: Temperature Cycles Test	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, and die attach layer degradation.
PPT: Pressure Pot Test	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.
HTS: High Temperature Storage	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.
HdST: Humid Storage Test	The device is stored at controlled conditions of temperature and relative humidity.	To investigate failure mechanisms activated in the die-package environment by wet conditions. Typical failure mechanisms are corrosion and surface effects related to the molding compound.

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