PRODUCT/PROCESS CHANGE NOTIFICATION

PCN AMS-APD/13/7690
Dated 29 Jan 2013

TS4871ID-TS4871IDT ASSEMBLY and TEST PLANT AND BOM CHANGE

Table 1. Change Implementation Schedule

Forecasted implementation date for change	04-Feb-2013
Forecasted availability date of samples for customer	04-Feb-2013
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	04-Feb-2013
Estimated date of changed product first shipment	30-Apr-2013

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	TS4871ID-TS4871IDT
Type of change	Package assembly location change, Package assembly material change, Testing location change
Reason for change	Production optimization and ambiental impact minimization
Description of the change	Assembly and test plant transfer from ST Muar (Malaysia) to ST Shenzhen (China, Popular Republic). In ST Shenzhen will be also implemented -A Super High Density frame (SHD) -The ECOPACK 2 (so called halogen-free) molding compound (Sumitomo EME G700K in place of Nitto MP8000 H4-2A) -A different Die attach glue (Ablebond 8601S-25 in place of Hitachi EN4900 - The Copper wire bonding (in place of Gold).
Change Product Identification	Eco level "G" in Marking (before traceability code)
Manufacturing Location(s)	

DOCUMENT APPROVAL

Name	Function
Ferri, Simone	Marketing Manager
Onetti, Andrea Mario	Product Manager
Speroni, Ernesto Fabrizio	Q.A. Manager

TS4871ID-TS4871IDT ASSEMBLY PLANT AND BOM CHANGE

WHAT

Following the Company guidelines on the assets optimization, we are going to move our products housed in SO 08 package, from the plant ST Muar (Malaysia) to the ST Shenzhen (China, Popular Republic) for the Assembly, Final test and Finishing operations.

In ST Shenzhen will be also implemented
-A Super High Density frame (SHD)
-The ECOPACK 2 (so called halogen-free) molding compound
(Sumitomo EME G700K in place of Nitto MP8000 H4-2A)
-A different Die attach glue
(Ablebond 8601S-25 in place of Hitachi EN4900
- The Copper wire bonding (in place of Gold).

WHY

To optimize ST's assets utilization in compliance with the Company Roadmap and to have a lower impact on the ambient.

HOW

The SO 08 package in Shenzhen plant and the changed BOM are already qualified trough test vehicles.
The qualification program consists mainly of comparative electrical yield and reliability tests.
In particular here following the reliability report of the device TS4871 in subject.

Reliability Report
TS4871IDT

General Information	
Product Line	*4871*
Product Description	*OUTPUT RAIL TO RAIL 1W AUDIO POWER AMPLIFIER WITH STANDBY MODE*
Finished Good Code	*TS4871IDT*
Product division	*AMS Analog*
Package	*SO8*
Silicon process technology	*HF4CMOS*

Locations	
Wafer fab location	*AMK6*
Assembly plant location	*ST SHENZHEN - CHINA*
Reliability assessment	*Passed*

Document History			
Rev.	**Date**	**Author**	**Object**
A	21/01/2012	Fabio Fiabane	First release

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1 RELIABILITY EVALUATION OVERVIEW

1.1 Objectives

Aim of this report is to present the results of the reliability evaluation performed on TS4871IDT (4871 product line) in order to move the assembly fab to ST Shenzen (China).

TS4871IDT is processed in HF4CMOS, diffused in AMK6, and assembled in SO8 package down in ST SHENZEN – CHINA.

1.2 Conclusion

The product qualification is achieved with the qualification report Q4871C1.
The reliability evaluation of the parts coming from ST Shenzen (China) assembly fab have been completed with positive results.
Neither functional nor parametric rejects were detected at final electrical testing.
Package oriented tests have not put in evidence any criticality.

On the ground of the overall positive results, we conclude that TS4871IDT device can be released to production in ST Shenzen (China) assembly fab, from a reliability point of view.

2 DEVICE CHARACTERISTICS

2.1 Device description

TS4871

OUTPUT RAIL TO RAIL **1W** AUDIO POWER AMPLIFIER WITH STANDBY MODE

- OPERATING FROM V_{CC} **= 2.5V to 5.5V**
- **1W** RAIL TO RAIL OUTPUT POWER @ Vcc=5V, THD=1%, f=1kHz, with **8Ω** Load
- ULTRA LOW CONSUMPTION IN STANDBY MODE **(10nA)**
- **75dB** PSRR @ 217Hz from 5V to 2.6V
- ULTRA LOW POP & CLICK
- ULTRA LOW DISTORTION **(0.1%)**
- UNITY GAIN STABLE
- AVAILABLE IN **SO8, MiniSO8 & DFN8 3x3mm**

DESCRIPTION

The TS4871 is an Audio Power Amplifier capable of delivering 1W of continuous RMS Ouput Power into 8Ω load @ 5V.

This Audio Amplifier is exhibiting 0.1% distortion level (THD) from a 5V supply for a Pout = 250mW RMS. An external standby mode control reduces the supply current to less than 10nA. An internal thermal shutdown protection is also provided.

The TS4871 has been designed for high quality audio applications such as mobile phones and to minimize the number of external components.

The unity-gain stable amplifier can be configured by external gain setting resistors.

APPLICATIONS

- Mobile Phones (Cellular / Cordless)
- Laptop / Notebook Computers
- PDAs
- Portable Audio Devices

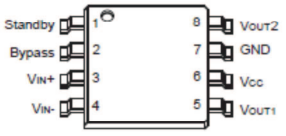
ORDER CODE

Part Number	Temperature Range: I	Package			Marking
		D	S	Q	
TS4871	-40, +85°C	•			4871I
			•	•	4871

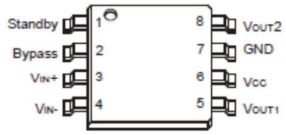
MiniSO & DFN only available in Tape & Reel with T suffix(IST & IQT)
D = Small Outline Package (SO) - also available in Tape & Reel (DT)

PIN CONNECTIONS (Top View)

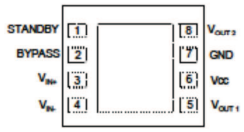
TS4871IST - MiniSO8



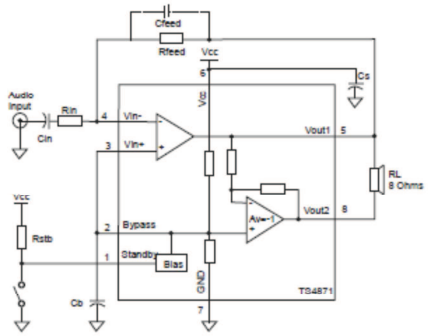
TS4871ID-TS4871IDT - SO8



TS4871IQT - DFN8



TYPICAL APPLICATION SCHEMATIC



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2.2 Traceability

Wafer fab information	
Wafer fab manufacturing location	*AMK6*
Wafer diameter	*6*
Silicon process technology	*HF4CMOS*
Die finishing back side	*RAW SILICON*
Die size	*2120 x 1470*
Passivation	*P-VAPOX(SiO2) / NITRIDE (SiN)*
Metal levels	*3*

Assembly Information	
Assembly plant location	*SHENZEN - CHINA*
Package description	*SO8*
Frame	*SO 8L 98x150 (Super High Density)*
Molding compound	*SUMITOMO EME-G700K*
Die attach material	*GLUE ABLEBOND 8601S-25*
Wires bonding materials/diameters	*Copper / 1.0 mil*

3 RELIABILITY TESTS RESULTS

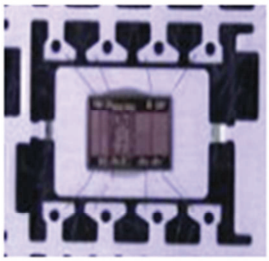
3.1 Test description

TEST NAME	DESCRIPTION	PURPOSE
HTS: High Temperature Storage	The device is stored in unbiased condition at the maximum temperature allowed by the package materials, sometimes higher than the maximum operative temperature.	To investigate the failure mechanisms activated by high temperature, typically wire-bonds solder joint ageing, data retention faults, metal stress-voiding.
PC (JL1): Preconditioning (solder simulation)	The device is submitted to a typical temperature profile used for surface mounting, after controlled moisture absorption.	To investigate in general the effect of customer manufacturing soldering enhanced by package water 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.
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, moulding wire-bonds failure.
AC: Autoclave	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. To point out critical water entry paths with consequent electrochemical and galvanic corrosion.

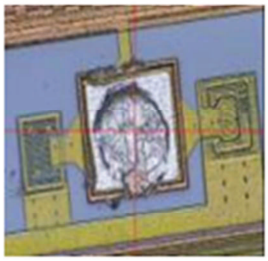
3.2 Test plan and results summary

N	TEST NAME	CONDITION/METHOD	STEPS	FAILS/SS
1	**Preconditioning (Jedec Level 1)**	Moisture Sensitivity 1 (1 Week at 85℃/85%RH) (Peak body Temperature=260℃) REFLOW PROFILE = J-STD-020C	FINAL	0/200
2	**HTS**	Ta = 150℃ JESD22a103	500 H	0/77
			1000 H	0/77
3	**TC**	Ta Cycling: -50℃/+150℃ JESD22a104	1000 Cy	0/77
4	**AC**	Ta=121℃ RH=100% P=2atm JESD22a102	168 H	0/77

3.3 Wire pull test results

LOT : DATA (20 Groups)	15,16	14,99	14,86	16,15	15,05
	16,78	16,41	16,53	18,08	17,33
	17,07	17,83	17,42	17,58	17,46
	15,32	14,84	15,21	14,77	15,95
Mean	16,23905				
Max	18,083				
Min	14,769				
Range	3,314				
Std Dev	1,15				
Cpk	3,55				
W/P FAILURE MODE					
Comment:	All datas within Spec				

3.4 Ball shear test results

LOT NO : DATA (20Groups)	42,70	39,79	42,48	43,42	45,22
	43,59	47,85	38,05	39,88	51,03
	42,70	43,05	44,48	39,54	41,78
	40,27	41,81	40,31	43,41	40,32
Mean	42,5827				
Max	51,028				
Min	38,048				
Range	12,98				
Std Dev	3,03				
Cpk	2,16				
B/S FAILURE MODE					
Comment:	All datas within Spec				

Public Products List

PCN Title : TS4871ID-TS4871IDT ASSEMBLY and TEST PLANT AND BOM CHANGE
PCN Reference : AMS-APD/13/7690
PCN Created on : 04-FEB-2013

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change:

ST COMMERCIAL PRODUCT

TS4871ID TS4871IDT

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