PRODUCT/PROCESS CHANGE NOTIFICATION

PCN APM-DIS/08/4060
Notification Date 10/10/2008

APM - ASD & IPAD Division

IPAD and Protection devices in Flip-Chip

Generalization of low Ag concentration in bump alloy

Table 1. Change Implementation Schedule

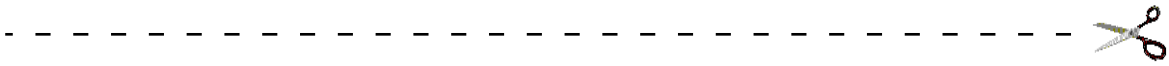
Forecasted implementation date for change	03-Oct-2008
Forecasted availabillity date of samples for customer	03-Oct-2008
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	03-Oct-2008
Estimated date of changed product first shipment	09-Jan-2009

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	IPAD and Protection devices in Flip-Chip
Type of change	Package assembly material change
Reason for change	production standardization
Description of the change	STMicroelectronics is going to change the alloy composition of the bumps used in the flip-chip assembly, moving from SAC 405 (Sn Ag 4% Cu 0.5%) to SAC 105 (Sn Ag 1% Cu 0.5%) while studies to date indicate superior drop performance for low Ag alloys.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	Traceability is ensured by the date code and by the Q.A. number
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt	**PCN APM-DIS/08/4060**
Please sign and return to STMicroelectronics Sales Office	**Notification Date 10/10/2008**

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

Remark

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DOCUMENT APPROVAL

Name	Function
Paris, Eric	Division Marketing Manager
Duclos, Franck	Division Product Manager
Cazaubon, Guy	Division Q.A. Manager

APM - ASD & IPAD[1] Division

IPAD™ and Protection devices in Flip-Chip:

Generalization of low Ag concentration in bump alloy

(1) APM: Analog, Power & MEMS Group - ASD: Application Specific Device - IPAD: Integrated Passive and Active Devices

WHY THIS CHANGE?

STMicroelectronics is going to change the alloy composition of the bumps used in the flip-chip assembly, moving from SAC 405 (Sn Ag 4% Cu 0.5%) to SAC 105 (Sn Ag 1% Cu 0.5%) while studies to date indicate superior drop performance for low Ag alloys.

This change will also result in a production standardization aiming at reducing the silver content of bumps for all ASD & IPAD products in flip-chip.

Product family	Sales Type	Package type
IPAD	EMIF01-SMIC01F2 EMIF02-MIC01F2 EMIF02-MIC02F2 EMIF02-MIC04F2 EMIF02-USB02F2 EMIF02-USB03F2 EMIF03-SIM02F2 EMIF04-EAR01F2 EMIF04-MMC02F2 EMIF10-1K010F2 EMIF10-COM01F2 EMIF02-USB01F2 EMIF03-SIM01F2 EMIF06-HMC01F2 EMIF06-MSD01F2 EMIF02-MIC03F2 EMIF02-MIC03C2 EMIF02-USB05F2 EMIF06-10006F2 EMIF06-VID01F2 EMIF08-VID01F2 EMIF10-LCD01F2 EMIF02-SPK01F2 EMIF02-SPK01C2 EMIF02-SPK02F2 EMIF04-VID01F2 EMIF06-1002F2 EMIF06-AUD01F2 EMIF03-SIM02C2 EMIF04-VID01C2 EMIF06-10006C2 EMIF06-MSD01C2 EMIF06-VID01C2 EMIF08-VID01C2 EMIF02-USB01C2 EMIF02-USB05C2 EMIF10-COM01C2 EMIF10-LCD01C2	Flip-Chip 500µm

	EMIF01-TV01F3 EMIF01-TV02F3 EMIF02-AV01F3 EMIF02-MIC02F3 EMIF02-MIC06F3 EMIF02-MIC07F3 EMIF03-SIM02F3 EMIF07-LCD02F3 EMIF07-LCD03F3 EMIF09-SD01F3 EMIF10-LCD02F3 EMIF10-LCD03F3 HDMI05-CL01F3 HDMI05-CL02F3	Flip-Chip 400µm
PROTECTION	ESDA14V2-4BF2 ESDA18-1F2 DSILC6-4F2 ESDALC6V1F2 ESDAULC6-3BF2 ESDA6V1-4F2 ESDALC6V1C2	Flip-Chip 500µm
	ESDA14V2-2BF3 ESDA14V2-4BF3 LFTVS7-1F3 LFTVS10-1F3 LFTVS18-1F3 USBULC6-2F3 ESDA6V1-1BF3 HDMIULC6-4F3	Flip-Chip 400µm

Customer specific Flip-Chip products not expressly included in the above table are included in this change.

WHAT IS THE CHANGE?

The only change is the bump composition from SAC 405 to SAC 105. There are consequently **no impacts** on the **electrical and dimensional characteristics of the products** with reference to the product datasheet. The verification is included in the **qualification program**.

The products involved in the change will remain in full compliance with the ST **ECOPACK** specification and the **RoHS*** directive. There will be no change in the **packing modes** and the standard **delivery quantities**.

Note: ST's recommendations for soldering stated in application notes AN1235 (500 µm Flip-Chip: Package description and recommendations for use) and AN2348 (400 µm Flip-Chip: Package description and recommendations for use) remain applicable. Especially for alloy with Ag content around 1%, solder joints must reach a minimum of 235°C with a TAL (time above liquidus) of at least 60 s.

(*) Restriction of the use of certain Hazardous Substances

HOW AND WHEN?

Qualification program and results availability:

The **qualification program** consists of mechanical tests and comparative electrical **characterizations**. The **qualification program** is attached in appendix to the present document. The **final qualification** report will be available in **week 43**.

Sampling:

Samples of **EMIF10-1K010F2** are available on request **from now**. Other samples will be available on request for delivery within notice period if ordered within 30 days from notification.

Change implementation schedule:

The **production change** and **first shipments** will start according to our work in progress and materials availability as indicated in the schedule below.

Production Start	1st Shipments
From wk 39-2008	From wk 01-2009

Deliveries of products with SAC 405 bumps will continue as long as stocks last.

Lack of acknowledgement of the PCN within **30 days** will constitute acceptance of the change. After acknowledgement, lack of additional response within the **90 days** period following the notification will constitute acceptance of the change (Jedec Standard No. 46-C). In any case, **first shipments** may start earlier with customer's **written agreement**.

Product marking and Traceability:

Product marking is unchanged. The **traceability** of the devices produced with SAC 105 bumps will be ensured by the **date code** and by the **QA number**.

Appendix 1: Qualification program.

IPAD™ and Protection devices in Flip-Chip: Generalization of low Ag concentration in bump alloy

Reliability tests plan for QUALIFICATION PROGRAM
Package oriented qualification

Product Family	Test Vehicles (Salestypes)
IPAD & Protection	DCS01-5X5F2
	DCS01-5X5F3

QUALITY RELIABILITY TESTS						
	TEST	CONDITIONS	DURATION	NBR OF LOTS (*)	SAMPLE SIZE	ACCEPTANCE CRITERIA
Flip-Chip 500µm	Temperature Cycling JESD22 A104	-40°C/+125°C; Soak time: 5 min; Air / Air ; Event detector	1000 cycles	1	36 units / lot	0/36
	Mechanical Shock	Drop test conditions : -Z direction, acceleration = 1500G, pulse length = 1 m	NA	1	36 units/lot	Passed if the risk of failure is lower than 5% at 100 drops with 95% probability in locations 5-8 of the board.
Flip-Chip 400µm	Temperature Cycling JESD22 A104	-40°C/+125°C; Soak time: 5 min; Air / Air ; Event detector	1000 cycles	1	36 units / lot	0/36
	Mechanical Shock	Drop test conditions : -Z direction, acceleration = 1500G, pulse length = 1 m	NA	1	36 units/lot	Passed if the risk of failure is lower than 5% at 100 drops with 95% probability in locations 5-8 of the board.

(1) APM: Analog, Power & MEMS Group - Application Specific Device - IPAD: Integrated Passive and Active Devices

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