PRODUCT INFORMATION LETTER

PIL MMS-MIC/12/7428
Dated 14 Aug 2012

Amkor ATT3 (Taiwan) additional EWS site for STM8 and STM32 devices - Standard products

Sales Type/product family label	Electrical Wafer Sort (probing)
Type of change	Testing additional location
Reason for change	Capacity increase and Test flexibility improvement
Description	Microcontrollers Division intends to qualify Amkor ATT3 (Taiwan) as an additional testing (Electrical Wafer Sort) site for STM8 and STM32 families on standard products. These products are already tested in other internal ST sites, with same testers and test programs. There is no change to the devices.
Forecasted date of implementation	07-Aug-2012
Forecasted date of samples for customer	07-Aug-2012
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	07-Aug-2012
Involved ST facilities	Amkor ATT3 (Taiwan) subcontractor

DOCUMENT APPROVAL

Name	Function
Colonna, Daniel	Marketing Manager
De mingo, Francisco	Process Owner
Narche, Pascal	Q.A. Manager

PRODUCT INFORMATION LETTER

Amkor ATT3 (Taiwan) additional EWS site for STM8 and STM32 devices – Standard products

MMS - Microcontrollers Division (MCD)

Dear Customer,

In order to sustain the strong demand on STM8 and STM32 product families and to maintain a high level of service to our customers, ST MCD division is announcing the addition of AMKOR ATT3 (Taiwan) site as a new Electrical Wafer Sort source (probing). This concerns non-automotive products.

What is the change?

The Electrical Wafer Sort for the STM8 and STM32 product families will be performed in an additional site. This new site will use same tester types and test programs than the current test sites. This change will be deployed to all future STM8 and STM32 standard family products.

Why ?

MCD faces important business grow for STM8 and STM32 device families. Consequently, our strategy is to provide best in class service level to our customers, by improving test flexibility, thanks to additional capacity.

When ?

The production on the new platform will start on STM8 products Week 32 2012.

How will the change be qualified?

This change is qualified using the standard STMicroelectronics Corporate Procedures for Quality and Reliability. You can find below Qualification Plan and results.

What is the impact of the change?

- Form: no change

- Fit: no change

- Function: no change

Samples availability

Due to logistic reasons, we will not be able to provide samples. We will start double source production Week 32 2012.

How can the change be seen?

Traceability of the change is ensured by ST internal tools.

We remain available to discuss any concern that you may have regarding this change.

With our sincere regards.

Michel Buffa

Microcontroller Division General Manager

QPMCD1210
Qualification Plan

Amkor ATT3 (Taiwan) additional EWS site for STM8 and STM32 devices – Standard products

Table 1. Products concerned by qualification

General information	
Commercial products list	All STM8 and STM32 Standard products: refer to PIL Annex
Product Vehicle description	S766XXXX
Product group	MMS
Product division	Microcontrollers (MCD)
Electrical wafer sort plant location	Subcontractor Amkor ATT3, Taiwan

Qualification assessment: PASS

1 Qualification overview

1.1 Objective

In order to sustain the strong demand on STM8 and STM32 devices and provide a better service to our customers, AMKOR ATT3 (Taiwan), certified ISO 9001, is qualified as a new Electrical Wafer Sort (probing) source for STM8 and STM32 families, on standard products, in addition to its internal plant ST APEE Toa Payoh EWS.

With respect to current STMicroelectronics production:

- The same test flow is used.
- The same Advantest T2000 tester type is used.
- The same electrical test programs are used. They are transferred from ST to AMKOR.

Note: *The EWS is followed by the Assembly and the Final Test steps. It must be reminded that, after assembly, each STMicroelectronics microcontroller goes through an electrical final test before shipment to the customer (no change at this level).*

This qualification plan report summarizes the results of the test trials that were performed to qualify subcontracotr AMKOR ATT3 (Taiwan) as an additional EWS site for STM8 and STM32 microcontroller products.

1.2 Conclusion

The new and additional subcontractor AMKOR ATT3 (Taiwan) EWS site for STM8 and STM32 families standard products is qualified.

Refer to Section2: Qualification test results for details on the test results.

2 Qualification test results

This section contains a general description of the qualification strategy.

The additional subcontractor AMKOR (Taiwan) EWS site for Microcontroller products is qualified using STMicroelectronics standard corporate quality and reliability procedures.

The product vehicle used for qualification is given in Table2.

Table 2. Product vehicle used for qualification

Product vehicle	Silicon process technology	Wafer fabrication location
S766XXXX	CMOS-F9GO1	RS8F – STM Rousset

2.1 Qualification test plan and result summary

Correlation tests have been performed in order to validate that Advantest T2000 tester running at subcontractor AMKOR ATT3 EWS are giving the same results as ST APEE Toa Payoh EWS:

- Test of wafers using Advantest T2000 tester at ST APEE Toa Payoh EWS
- Test of the same wafers using subcontractor AMKOR EWS Advantest T2000 tester to check that a full correlation is obtained

Testing environment conditions are presented in Table 3.

Table 3. Testing environment conditions

Parameter	ST Toa Payoh EWS	Subcontractor AMKOR	Difference
Temperature	20.5 °C – 23.5°C	18 °C – 22 °C	No impact - refer to difference analysis document -
Humidity	35% - 55%	45% - 55%	No impact - refer to difference analysis document -
Class	1000	1000	No
ESD prevention	Document reference ADCS 7057513	Compliant ESD20.20	No impact - refer to difference analysis document -

The qualification of subcontractor AMKOR in Taiwan has been performed through:

- The correlation exercise for each product to be tested by subcontractor AMKOR
- The preproduction exercise

The qualification test plan and the result summary are presented in Table 4.

The list of documents updated before the transfer is given in Table 5.

Table 4. Qualification plan and result summary

#	Test short description							Status
	Test	**Sample size**	**Acceptance criteria**	**ST APEE Ang Mo Kio test results (reference)**	**Subcontractor AMKOR test results**			
1	**Test correlation**							
	Die to die correlation matrix	1 production wafers per product	100% aligned	Total dice teste 5704	Total matched 100%			PASS
	Datalog distribution (parametric tests)	1 production wafers per product	100% aligned	Done on all parameters tests	100% aligned on all parameter tests			PASS
	Test time	1 production wafers per product	100% aligned		100% aligned			PASS
2	**Probing map validation**							
	Prober setup, probe card check, control validation	1 wafer per product	100% matched	Done	100% matched			PASS
3	**Preproduction lots results**							
	Yield analysis	3 full lots per product	100% aligned		Lot1 100% aligned	Lot2 100% aligned	Lot3 100% aligned	PASS
	Bin analysis	3 full lots per product	100% aligned		Lot1 100% aligned	Lot2 100% aligned	Lot3 100% aligned	PASS
	Datalog distribution	3 full lots per product	100% aligned		Lot1 100% aligned	Lot2 100% aligned	Lot3 100% aligned	PASS

	Test time	3 full lots per product	100% aligned		Lot1 100% aligned	Lot2 100% aligned	Lot3 100% aligned	PASS
4	**Data transfer and integrity**							
	AMKOR to ST data transfer	3 full lot per product	100% capable		Lot1 100% capable	Lot2 100% capable	Lot2 100% capable	PASS
	ST to AMKOR data transfer	3 full lot per product	100% capable		Lot1 100% capable	Lot2 100% capable	Lot2 100% capable	PASS
5	**Gage R&R**							
	Gage R&R on current	On all testers to be qualified	Capable (R&R < 10%)		Tester1 : <10% Tester2 : <10%			PASS
	Gage R&R on timing	On all testers to be qualified	Capable (R&R < 10%)		Tester1 : <10% Tester2 : <10%			PASS
6	**Flow chart and process flow management/correlation**							
	same Process flow		100%		100%			PASS
	same SBL rules	1 full lot per product	100%		100%			PASS
	same Zero Yield rules	1 full lot per product	100%		100%			PASS
	Hold Limits rules	1 full lot per product	100%		100%			PASS
	NCL instructions		100% capable		100% capable			PASS

Table 5. List of updated documents

#	List of differences between sending and receiving plant	Title	Reference	Status
1	STM procedures approved by ATT3	STM Quality documentation package	“ST_speclist_ATT3.xls”	Done and OK
2	Flow chart specification	AMKOR flow chart	852-TSFC-0001	Done and OK
3	Control plan specification	AMKOR control plan	60-TSOI-0014	Done and OK
4	OCAP specification	OCAP for Chip Test Abnormal Handling Procedure	60-TSOI-0213	Done and OK
5	NCL/NSL management specification	AMKOR Non Conformity Management	852-TSFC-0001	Done and OK
6	Process Change management specification	System – Process Change Notification (PCN)	852-GSMA-6001	Done and OK
7	Gage R&R specification	Measurement System Analysis (MSA) Operation Instruction	60-GSMA-6001	Done and OK
9	Equipment list	See FMEA tools	“STM Equipment List.xls”	Done and OK
9	Materials purchasing specification	- online cleaning material - Packing material (canister, interleaves)	001-2279 Rev. J 001-2266 Rev. H	Done and OK
10	Manufacturing Product Instructions (codification, manufacturing instructions EWSI, BSA, TFI,...)	All documents available in EDOCS	EDOCS reference: CD00334426	Done and OK
11	Maintenance specifications	Tester and Prober maintenance procedures	60-TSMI-0230 : Prober 60-TSMI-0227: Tester	Done and OK

3 Applicable and reference documents

- SOP2.6.2: Internal change management
- SOP2.6.7: Product maturity level
- SOP2.7.1: Informing customer about products and processes changes
- SOP2.6.10: General product qualification procedure
- SOP2.6.11: Program management for product qualification
- SOP2.6.19: Front end technology platform development & qualification
- SOP2.6.20: New process / new product qualification
- SOP2.6.22: Non conforming lot management
- Specifications 7412470: Technology process transfer methodology and documentation
- Spec 7886202: Risk management procedure
- Spec 0060531: Failure mode and effects analysis procedure (FMEA)
- Spec 0063181: Product testing and finishing transfer

4 Revision history

Table 6. Document revision history

Date	Revision	Changes
31-Jul-2012	1	Initial release

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries(‘‘ST’’) reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST’s terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST’S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND / OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS ‘‘AUTOMOTIVE GRADE’’ MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER’S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morroco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com