PRODUCT/PROCESS CHANGE NOTIFICATION

PCN MMS-MIC/13/8160
Dated 18 Oct 2013

PDIP16 Transfer assembly site from ST Longgang (China) to Amkor ATP1 (Philippines)

Table 1. Change Implementation Schedule

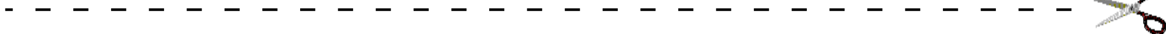
Forecasted implementation date for change	23-Jan-2014
Forecasted availability date of samples for customer	13-Dec-2013
Forecasted date for **STMicroelectronics** change Qualification Plan results availability	23-Dec-2013
Estimated date of changed product first shipment	23-Jan-2014

Table 2. Change Identification

Product Identification (Product Family/Commercial Product)	PDIP 16 package products
Type of change	Package assembly location change
Reason for change	ST PDIP production rationalization
Description of the change	PDIP 16 package assembly will be transferred from ST Longgang (China) to Amkor ATP1 (Philippines). Bill of Materials is modified as described below.
Change Product Identification	see indicated below
Manufacturing Location(s)	

Table 3. List of Attachments

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt Please sign and return to STMicroelectronics Sales Office	**PCN MMS-MIC/13/8160** **Dated 18 Oct 2013**
☐ Qualification Plan Denied	Name:
☐ Qualification Plan Approved	Title:
	Company:
☐ Change Denied	Date:
☐ Change Approved	Signature:

Remark

....

....

....

....

....

....

....

....

DOCUMENT APPROVAL

Name	Function
Colonna, Daniel	Marketing Manager
Buffa, Michel	Product Manager
Narche, Pascal	Q.A. Manager

PRODUCT/PROCESS CHANGE NOTIFICATION

PDIP16 Transfer assembly site from ST Longgang (China) to Amkor ATP1 (Philippines)

MMS - Microcontrollers Division (MCD)

Dear Customer,

In order to sustain the demand on products assembled in PDIP 16 package, ST General Purpose microcontroller Division (MCD) is announcing the transfer of PDIP 16 package assembly site from ST Longgang (China) to Amkor ATP1 (Philippines).

What is the change?

PDIP 16 package assembly will be transferred from ST Longgang (China) to Amkor ATP1 (Philippines). New Bill of Materials is described in the below table:

Assembly site	ST Longgang (China)	Amkor ATP1 (Philippines)
Glue	ABLESTIK QMI168	ABLESTIK 8390
Wire	Gold 1.0 Mil	Gold 1.0 Mil
Molding compound	KCC KTMC1000 1030SL	Panasonic CK5000A
Lead Finishing	NiPdAu (e4)	Mat Tin (e3)

PDIP 16 package assembled in Amkor ATP1 (Philippines) remains compliant with the JEDEC standard.

Why ?

ST PDIP production is rationalized. Consequently, PDIP 16 package will be permanently transferred to new assembly site (Amkor ATP1), in order to guaranty the product continuation.

When ?

The production on the new assembly site will start Week 04 2014.

How will the change be qualified?

This change will be qualified using the standard STMicroelectronics Corporate Procedures for Quality and Reliability, in full compliancy with the JESD-47 international standard. You can find below Qualification Plan.

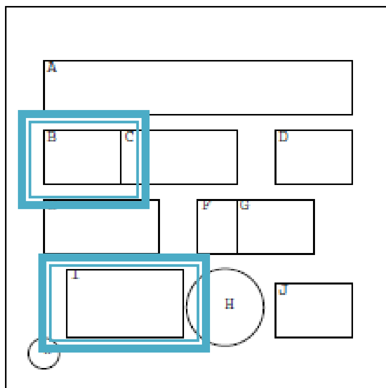
What is the impact of the change?

- **Form:** no change
- **Fit:** no change
- **Function:** no change

How can the change be seen?

Traceability of the change is ensured by ST internal tools.

The marking instruction indicated on the products is changing from:



B : Assembly plant
change from G4 to 7B

I : Country Of Origin change
from CHN to PHL

We remain available to discuss any concern that you may have regarding this Product Change Notification.

With our sincere regards.

Michel Buffa
Microcontroller Division General Manager

RERMCD 1314 RELIABILITY PLAN

Qualification of :

PDIP16 transfer for ST6/ ST7 legacy devices

Qualification Reference:	**RERMCD1314**
Issued on:	**Sept 24, 2013**
Assembly Plant:	**AMKOR Philippines**
Test Plant:	**ST LGG**
Assembly Line:	**PDIP**
Devices:	**ST6/ ST7**
Package / Process:	**PDIP16**

Purpose

Qualification of new Assembly site for PDIP 16 package.

Test & Finishing plant for PDIP16 is unchanged.

Test Vehicles :

Device/ Die	Number of Lots
•ST62T01/ die 221	1
•ST6201/ die 201	1
•ST7FLITE/ die 819	1

Package Reliability Trials:

Reliability Trial		Test Conditions	Pass Criteria	Unit per Lot	Lot nb
AC	Autoclave JESD22 A102	121°C, 100% RH, 2 Atm	96h	**77**	**3**
TC	Thermal Cycling JESD22 A104	-65°C, +150°C	500cy	**77**	**3**
THS/ THB	Temperature Humidity Storage or Biased JESD22 A110- A101	85°C, 85% RH, no bias/ No bias	1000h	**77**	**3**
HTSL	High Temperature Storage Life JESD22 A103	150°C- no bias	1000h,	**77**	**3**

Reliability tests description

Package oriented tests/ Trials description

1. Autoclave (AC)

The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature.
Purpose: 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.

2. Temperature Cycling (TC)

The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere (thermal gradient typical 10 C/min).

Purpose: 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 compound delamination, wire-bonds failure, die-attach layer degradation.

3. Temperature Humidity Bias (THB)

The device is biased in static configuration minimizing its internal power dissipation, and stored at controlled conditions of ambient temperature and relative humidity.

The Temperature Humidity Bias follows the same method than HAST at lower temperature.

Purpose: to investigate failure mechanisms activated in the die-package environment by electrical field and wet conditions.
Typical failure mechanisms are electro-chemical corrosion and surface effects related to the molding compound.
The package moisture resistance with electrical field applied is verified, both electrolytic and galvanic corrosion are put in evidence.

Conditions:

- Ta=85°C; R.H.=85%;
- Power supply voltage less or equal to max operative voltage to not exceed Tj = 95 °C.

4. Temperature Humidity Storage (THS)

The Temperature Humidity Storage is stored at controlled conditions of high temperature and relative humidity.
The Temperature Humidity Storage follows the same method than Unbiased HAST at lower temperature.
Purpose: to evaluate the reliability of non-hermetic packaged solid-state devices in humid environments. It is a highly accelerated test which employs temperature and humidity under non-condensing conditions to accelerate the penetration of moisture through the external protective material (encapsulant or seal) or along the interface between the external protective material and the metallic conductors which pass through it.
Bias is not applied in this test to ensure the failure mechanisms potentially overshadowed by bias can be uncovered (e.g. galvanic corrosion). This test is used to identify failure mechanisms internal to the package.

- Test conditions: 85°C / 85% RH.
- No power supply

5. High Temperature Storage Life (HTSL)

The device is stored in unbiased condition at the max. temperature allowed by the package materials, sometimes higher than the max. operative temperature.
Purpose: to investigate the failure mechanisms activated by high temperature, typically wire-bonds solder joint ageing, data retention faults, metal stress-voiding.

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.

ST PRODUCTS ARE NOT DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER’S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR “AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL” INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.

RESTRICTIONS OF USE AND CONFIDENTIALITY OBLIGATIONS:

THIS DOCUMENT AND ITS ANNEXES CONTAIN ST PROPRIETARY AND CONFIDENTIAL INFORMATION. THE DISCLOSURE, DISTRIBUTION, PUBLICATION OF WHATSOEVER NATURE OR USE FOR ANY OTHER PURPOSE THAN PROVIDED IN THIS DOCUMENT OF ANY INFORMATION CONTAINED IN THIS DOCUMENT AND ITS ANNEXES IS SUBMITTED TO ST PRIOR EXPRESS AUTHORIZATION. ANY UNAUTHORIZED REVIEW, USE, DISCLOSURE OR DISTRIBUTION OF SUCH INFORMATION IS EXPRESSLY PROHIBITED.

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

© 2013 STMicroelectronics - All rights reserved.

STMicroelectronics group of companies

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

www.st.com