PCN Notification

PCN Number: HC143702C (Revised 03/04/15) Notification Date: September 17, 2014
See Updates in Blue Text

Title: Change of Assembly Location Automotive Products

Product Identification:

Ordering code	Qualification Family	Ordering code	Qualification Family	Ordering code	Qualification Family	Ordering code	Qualification Family
ATA5021-TAPY 44	1	ATA6286C-PNPW	5	ATA6663-TAQY	1	ATA8741C-PXQW	5
ATA5021-TAQY 44	1	ATA6286C-PNQW	5	ATA6663-TAQY 18	1	ATA8742C-PXQW	5
ATA5428C-PLQW	5	ATA6612C-PLQW	2	ATA6664-TAQY 19	1	ATA8743C-PXQW	5
ATA5721C-PLQW	5	ATA6613C-PLQW	2	ATA6670-FFQW	2	ATAM893T-TKQYD 19	3
ATA5722C-PLQW	5	ATA6614Q-PLQW	2	ATA6670-FFQW 18	2	ATAM893T-TKSYD 19	3
ATA5723P3C-TKQY	3	ATA6616C-P3QW	2	ATA6823C-PHQW	2	ATAR090D-035-TKQYC	3
ATA5724P3C-TKQY	3	ATA6617C-P3QW	2	ATA6831C-PIQW	2	ATAR090G050-TKQYC1	3
ATA5728P6C-TKQY	3	ATA6622C-PGQW	2	ATA6832C-PIQW	6	ATAR092O111-TKQYC1	3
ATA5745C-PXPW	5	ATA6623C-TAQY-19	1	ATA6833C-PLQW	2	ATAR890L-029-TKQY1	3
ATA5745C-PXQW	5	ATA6624C-PGQW	2	ATA6834C-PLQW	6	ATAR892U-073-TKQY1	3
ATA5746C-PXPW	5	ATA6625C-TAQY	1	ATA6836C-PXQW 19	2	ATR2406-PNQG 86	5
ATA5746C-PXQW	5	ATA6626C-PGPW	2	ATA6836C-TIQY-19	7	ATR4251C-PFPY	5
ATA5771C-PXQW	5	ATA6626C-PGQW	2	ATA6838C-PXQW	2	ATR4251C-PFQY	5
ATA5773C-PXQW	5	ATA6628-PGPW	4	ATA6843-PLQW	2	ATR4251C-TKQY	3
ATA5774C-PXQW	5	ATA6628-PGQW	4	ATA6844-PLQW	6	ATR4252C-RAPW-19	2
ATA5795C-PNQW 18	5	ATA6629-TAPY	1	ATA6870N-PLPW	5	ATR4253C-PVPW	5
ATA5811C-PLQW	5	ATA6629-TAQY	1	ATA6870N-PLQW	5	ATR4253C-PVQW	5
ATA5812C-PLQW	5	ATA6630-PGQW-19	4	ATA8201C-PXQW	5	CE2303C-TKQH	3
ATA5823C-PLQW	5	ATA6631-TAPY	1	ATA8202C-PXQW	5	T44C080C-012-TKQY1	3
ATA5824C-PLQW	5	ATA6631-TAQY	1	ATA8203P3C-TKQY	3	T6020M013-TKQY	3
ATA6020N-017-TKQY1	3	ATA6662C-TAQY	1	ATA8204P3C-TKQY	3	T6020M014-TKQY	3
ATA6020N-018-TKQY1	3	ATA6663-FAQW	2	ATA8205P6C-TKQY	3	T6020M015-TKQY	3
ATA6020N-020-TKQY1	3						

Reason for Change:

- ☒ Material / Composition
- ☐ Processing / Manufacturing
- ☐ Design / Firmware
- ☐ Datasheet
- ☒ Manufacturing Location
- ☐ Quality / Reliability
- ☐ Logistics
- ☐ Other:

1) Change Description:

Atmel's assembly subcontractor STATS/Chippac is closing its current Malaysia facility (SCM). To ensure uninterrupted supply of parts, the assembly of ICs in QFN packages assembled at SCM will be moved to ASE Chung Li Taiwan.

In addition, in order to align its overall backend production strategy, ATMEL will introduce ASE Chung Li Taiwan and Amkor Philppines as IC assembly subcontractors for automotive products.

Both, ASE Chungli Taiwan and Amkor Philippines, have a long term experience as automotive assemblers, and both are TS16949 certified and ATMEL qualified suppliers with existing business.

Along with the assembly location changes, state-of-the-art package **B**ill **o**f **M**aterial (BoM) will be introduced, including the move from gold to copper bonds for 3 out of 7 qualification groups.

Besides small changes in package thickness for some devices, there is no change in form, fit and function, quality or reliability. The device marking will remain unchanged.

2) Qualification Method:

The package qualification follows the AEC-Q100 standard, complemented by Risk Assessment, Design of Experiment, Third Party Qualification Data and Knowledge Based Approach.

The qualification activities for the transferred products are devided into 7 qualification families according to the AEC-Q100 Standard, Appendix 1, chapter A1.3.2 "Multiple Families". The products within a particular family share commonalities in major process and material elements such as package type, wire bond material and assembly location.

Within a qualification family a minimum of three wafer lots is subject to a full qualification according to AEC-Q100. Devices within a family are either qualified as family heads or as family members. Some groups have several family heads; each family head is fully AEC-Q100 qualified with at least one lot. **E**lectrical **D**istribution (ED) data with statistical comparison vs. previous production distribution along with the qualification data of the family heads is used to qualify family member devices by similarity.

The qualification families are listed in the table below:

Qualification Family	Package	Wafer Technology [Wafer Fab]	New Assembly location	Bond Wire	PPAP availability date	Sample date
1	SO 150mil	CMOS HV [ATMEL]	Amkor Philippines	Cu	**see Appendix 1**	available
2	QFN incl. 2-chip package	CMOS HV [ATMEL]	ASE Chungli	Au	**See Appendix 2**	available
3	SSO 173mil	BiCMOS, BiPolar [ATMEL, TSG, TSMC] (2 or 3 chip packages)	Amkor Philippines	Au	**03/13/2015**	available
4	QFN	CMOS HV [ATMEL]	ASE Chungli	Cu	**see Appendix 4**	available
5	QFN	BiCMOS, BiPolar [ATMEL]	ASE Chungli	Au	**see Appendix 5**	available
6	QFN + NiAu bumps	CMOS HV [ATMEL]	ASE Chungli	Au	02/28/2015	available
7	SO 300mil	CMOS HV [ATMEL]	Amkor Philippines	Au	03/31/2015	available

Standard criteria of Delta-Sigma-Analyses of Electrical Distribution (ED) Tests

- Ratio of $\sigma_{new}/\sigma_{orig}$
- Pass if Ratio < 1.5
- Assessment if > 1.5
- $\sigma_{new} < 1.5\ \sigma_{orig}$

Standard criteria of Delta-Average-Analysis of Electrical Distribution (ED) Tests

- Delta of Abs($\mu_{new} - \mu_{old}$)
- Pass if <10% of Tolerance
- Assessment if >10%
- Abs($\mu_{new} - \mu_{old}$) <10%(Tol/Spec)

3) Qualification ongoing:

Details of the changes and the qualification schedule is described for each of the 7 qualification families in Appendix 1-7.

4) Qualification passed:

Upon completion of qualification PAPP and data sheets will be updated. The qualification data will be published in the PPAP itself.

5) Marking of parts:

The marking of the devices will not change.

6) Regular Updates:

ATMEL will publish a monthly qualification status report.

6a) Update December, 4th 2014:

- Appendix 1: Correction for ATA5021-GAQW: “No mold compound change” to “Mold compound change” in the overview table.
- Appendix 1: PPAP availability date changed to “available since MM/DD/YYYY”.
- Appendix 3 and Appendix 5: Highlighting that PPAP report is only valid for automotive grade parts.
- Appendix 4: Ordering codes ATA6836C-PXQW 19, ATA6838C-PXQW and ATA6831C-PIQW are not within qualification family 4 (QFN + Cu) anymore, but part of family 2 (QFN + Au). The qualification will be done with Au wire material instead of Cu as originally planned. The wire thickness will stay unchanged. The ordering code has been updated accordingly.
- Appendix 2-7: Availability date of samples changed to “Available”.

- Appendix 7: Qualification family 7 will be qualified with Au wire materal instead of Cu as originally planned. This will have an impact on the new ordering code as well.

6b) Update January, 29th 2015:

- Typo in table of qualification method: qualification family 7 is with Au as bond wire material and not Cu as originally mentioned
- Apendix 1-7: PPAP availability dates update for qualification families.

6c) Update March, 2nd 2015:

- **Typo in Appendix 3, qualification heads part numbers: ATAM862M-TNQW4D and ATAR862R-084-TNWQ4 to ATAM862C-TNQW4D and ATAR862C-084-TNWQ4**
- **Appendix 2-3: PPAP availability dates update for qualification families 2 and 3.**
- **In Appendix 2 and 7 "Pad redesign" exchanged by "Pad-via process adaption"**

7.) Samples:

To obtain samples please contact your local sales representative to submit your request.

Identification Method to Distinguish Change:

Devices can be tracked by lot number and date code which is part of the package marking.

New ordering code has been created by adding a suffix or by changing to the new package code to manage backlog conversion. Datasheets will be updated with the new ordering code.

Ordering code old	Ordering code new	Ordering code old	Ordering code new	Ordering code old	Ordering code new
ATA5021-TAPY 44	ATA5021-GAQW	ATA6622C-PGQW	ATA6622C-PGQW-1	ATA6870N-PLPW	ATA6870N-PLQW-1
ATA5021-TAQY 44	ATA5021-GAQW	ATA6623C-TAQY-19	ATA6623C-GAQW	ATA6870N-PLQW	ATA6870N-PLQW-1
ATA5428C-PLQW	ATA5428C-PLQW-1	ATA6624C-PGQW	ATA6624C-PGQW-1	ATA8201C-PXQW	ATA8201C-PXQW-1
ATA5721C-PLQW	ATA5721C-PLQW-1	ATA6625C-TAQY	ATA6625C-GAQW	ATA8202C-PXQW	ATA8202C-PXQW-1
ATA5722C-PLQW	ATA5722C-PLQW-1	ATA6626C-PGPW	ATA6626C-PGQW-1	ATA8203P3C-TKQY	ATA8203P3C-TKQW
ATA5723P3C-TKQY	ATA5723P3C-TKQW	ATA6626C-PGQW	ATA6626C-PGQW-1	ATA8204P3C-TKQY	ATA8204P3C-TKQW
ATA5724P3C-TKQY	ATA5724P3C-TKQW	ATA6628-PGPW	ATA6628-GLQW	ATA8205P6C-TKQY	ATA8205P6C-TKQW
ATA5728P6C-TKQY	ATA5728P6C-TKQW	ATA6628-PGQW	ATA6628-GLQW	ATA8741C-PXQW	ATA8741C-PXQW-1
ATA5745C-PXPW	ATA5745C-PXQW-1	ATA6629-TAPY	ATA6629-GAQW	ATA8742C-PXQW	ATA8742C-PXQW-1
ATA5745C-PXQW	ATA5745C-PXQW-1	ATA6629-TAQY	ATA6629-GAQW	ATA8743C-PXQW	ATA8743C-PXQW-1
ATA5746C-PXPW	ATA5746C-PXQW-1	ATA6630-PGQW-19	ATA6630-GLQW	ATAM893T-TKQYD 19	ATAM893T-TKQWD
ATA5746C-PXQW	ATA5746C-PXQW-1	ATA6631-TAPY	ATA6631-GAQW	ATAM893T-TKSYD 19	ATAM893T-TKQWD
ATA5771C-PXQW	ATA5771C-PXQW-1	ATA6631-TAQY	ATA6631-GAQW	ATAR090D-035-TKQYC	ATAR090D-035-TKQWC
ATA5773C-PXQW	ATA5773C-PXQW-1	ATA6662C-TAQY	ATA6662C-GAQW	ATAR090G050-TKQYC1	ATAR090G050-TKQWC1
ATA5774C-PXQW	ATA5774C-PXQW-1	ATA6663-FAQW	ATA6663-FAQW-1	ATAR092O111-TKQYC1	ATAR092O111-TKQWC1
ATA5795C-PNQW 18	ATA5795C-PNQW	ATA6663-TAQY	ATA6663-GAQW	ATAR890L-029-TKQY1	ATAR890L-029-TKQW1
ATA5811C-PLQW	ATA5811C-PLQW-1	ATA6663-TAQY 18	ATA6663-GAQW	ATAR892U-073-TKQY1	ATAR892U-073-TKQW1
ATA5812C-PLQW	ATA5812C-PLQW-1	ATA6664-TAQY 19	ATA6664-GAQW	ATR2406-PNQG 86	ATR2406-PNQW
ATA5823C-PLQW	ATA5823C-PLQW-1	ATA6670-FFQW	ATA6670-FFQW-1	ATR4251C-PFPY	ATR4251C-PFQW
ATA5824C-PLQW	ATA5824C-PLQW-1	ATA6670-FFQW 18	ATA6670-FFQW-1	ATR4251C-PFQY	ATR4251C-PFQW
ATA6020N-017-TKQY1	ATA6020N-017-TKQW	ATA6823C-PHQW	ATA6823C-PHQW-1	ATR4251C-TKQY	ATR4251C-TKQW
ATA6020N-018-TKQY1	ATA6020N-018-TKQW	ATA6831C-PIQW	ATA6831C-PIQW-1	ATR4252C-RAPW-19	ATR4252C-RAQW-1
ATA6020N-020-TKQY1	ATA6020N-020-TKQW	ATA6832C-PIQW	ATA6832C-PIQW-1	ATR4253C-PVPW	ATR4253C-PVQW-1
ATA6286C-PNPW	ATA6286C-PNQW-1	ATA6833C-PLQW	ATA6833C-PLQW-1	ATR4253C-PVQW	ATR4253C-PVQW-1
ATA6286C-PNQW	ATA6286C-PNQW-1	ATA6834C-PLQW	ATA6834C-PLQW-1	CE2303C-TKQH	CE2303C-TKQW
ATA6612C-PLQW	ATA6612C-PLQW-1	ATA6836C-PXQW 19	ATA6836C-PXQW-1	T44C080C-012-TKQY1	T44C080C-012-TKQW1
ATA6613C-PLQW	ATA6613C-PLQW-1	ATA6836C-TIQY-19	ATA6836C-TIQW	T6020M013-TKQY	T6020M013-TKQW
ATA6614Q-PLQW	ATA6614Q-PLQW-1	ATA6838C-PXQW	ATA6838C-PXQW-1	T6020M014-TKQY	T6020M014-TKQW
ATA6616C-P3QW	ATA6616C-P3QW-1	ATA6843-PLQW	ATA6843-PLQW-1	T6020M015-TKQY	T6020M015-TKQW
ATA6617C-P3QW	ATA6617C-P3QW-1	ATA6844-PLQW	ATA6844-PLQW-1		

Quantifiable Impact on Quality & Reliability: No impact on quality and reliability.			
Samples:	☒ Available see Appendix 1-7	☐ Will be available (mm/dd/yy):	☐ Not Applicable
Qualification Data:	☐ Available	☒ Will be available (mm/dd/yy): see Appendix 1-7	☐ Not Applicable
Forecasted Availability Date: 30 days after PPAP availability **Target Backlog Conversion Date:** 180 days after PPAP availability			
Atmel Contact: Please contact your Atmel Sales Representative or Distributor for additional information (when replying via e-mail please include the PCN number in subject line).			

CUSTOMER ACKNOWLEDGEMENT OF RECEIPT: Atmel requests you acknowledge receipt of this PCN / EOL. Please complete and email to pcnadm@atmel.com and the Atmel Contact listed above. In your acknowledgement, you can grant approval or request additional information. **Atmel will deem this change accepted unless specific conditions of acceptance are provided in writing within 30 days from the date of this notice.**

To be completed by customer:

☐ Approved

☐ Rejected (Please state reason for rejection): _____

Company:	
Name:	
Title:	
Date:	
Email Address:	
Location:	
Comments:	

Appendix 1

Qualification Family 1:

PPAP: available since see table below

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Package Type	Head/ Member	Ordering code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide	PPAP available
SO150	Head	ATA5021-TAQY 44	ATA5021-GAQW	Amkor Ph/ Amkor Ph	Cu	Yes	No	Yes	Yes	10-Oct-14
SO150	Member	ATA5021-TAPY 44	ATA5021-GAQW	Amkor Ph/ Amkor Ph	Cu	Yes	No	Yes	Yes	10-Oct-14
SO150	Member	ATA6623C-TAQY-19	ATA6623C-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	Yes	11-Nov-14
SO150	Head	ATA6625C-TAQY	ATA6625C-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	Yes	11-Nov-14
SO150	Member	ATA6629-TAPY	ATA6629-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	Yes	12-Nov-14
SO150	Member	ATA6631-TAPY	ATA6631-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	Yes	12-Nov-14
SO150	Head	ATA6662C-TAQY	ATA6662C-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	N/A	11-Oct-14
SO150	Member	ATA6663-TAQY	ATA6663-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	N/A	7-Nov-14
SO150	Member	ATA6663-TAQY 18	ATA6663-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	N/A	7-Nov-14
SO150	Member	ATA6664-TAQY 19	ATA6664-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	N/A	7-Nov-14
SO150	Member	ATA6629-TAQY	ATA6629-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	Yes	12-Nov-14
SO150	Member	ATA6631-TAQY	ATA6631-GAQW	TSPIC/ Amkor Ph	Cu	Yes	No	Yes	Yes	12-Nov-14

Bill of Material Changes of Qualification Family 1:

Item	TSPIC / AMKOR (old)	Amkor Philippines (new)	Risk assessment
Mold compound	EME6650 / G600	G700	Low, G700 is low stress state of the art compound
Die attach	AB84-1LMIS /AB8290	AB8290	Low, both are silver filled epoxies
Lead frame material	C194	C194	None
Lead frame plating	Ag	NiPdAu	Low, widely used lead frame finish
Lead frame treatment	None	Rough	Low, improved delamination robustness
Bond wire	Au	Cu	Low, copper bonding is mature process
Wire thickness	1.0 / 0.8	0.8mil	Low, copper bonding is mature process
Wafer thickness	0,250mm	0,250mm	No risk
Plating	Matte Sn	NiPdAu	Low, widely used lead frame finish
Package dimensions	within tolerance		Low, no impact on PCB design

Appendix 2

Qualification Family 2:

The following devices are already fully qualified.

PPAP: available

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Pack-age type	Head/ Member	Ordering Code Old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide
QFN 5X5	Head	ATA6624C-PGQW	ATA6624C-PGQW-1*	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes
DFN 3x3	Head	ATA6663-FAQW	ATA6663-FAQW-1*	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	N/A
DFN 3x4.5	Head	ATA6670-FFQW	ATA6670-FFQW-1*	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	N/A
QFN 4x5	Head	ATR4252C-RAPW-19	ATR4252C-RAQW-1*	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes
DFN 3x4.5	Head	ATA6670-FFQW 18	ATA6670-FFQW-1*	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	N/A

* Qualified with lead frame material C7025.

The qualification of the following devices are ongoing.

PPAP: available since see table below

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Pack-age type	Head/ Member	Ordering Code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide	PPAP available
QFN 7X7	Member	ATA6612C-PLQW	ATA6612C-PLQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 7X7	Member	ATA6613C-PLQW	ATA6613C-PLQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 7X7	Member	ATA6614Q-PLQW	ATA6614Q-PLQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 5x7	Member	ATA6616C-P3QW	ATA6616C-P3QW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 5x7	Head	ATA6617C-P3QW	ATA6617C-P3QW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 5X5	Member	ATA6622C-PGQW	ATA6622C-PGQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 7X7	Member	ATA6823C-PHQW	ATA6823C-PHQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	6-Mar-15
QFN 5X5	Member	ATA6626C-PGPW	ATA6626C-PGQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 5X5	Member	ATA6626C-PGQW	ATA6626C-PGQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 7X7	Member	ATA6843-PLQW	ATA6843-PLQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15
QFN 7X7	Member	ATA6833C-PLQW	ATA6833C-PLQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes	28-Feb-15

Pack-age Type	Head/ Member	Ordering Code Old	Orderin Code New	Assembly Location From / To	Wire Mat.	Lead Frame Change	Wafer Thickness Change	Mold Compound Change	Remove Polyimide	PPAP available
QFN 5X5	Head	ATA6836C-PXQW 19	ATA6836C-PXQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes*	13-Mar-15
QFN 5X5	Head	ATA6838C-PXQW	ATA6838C-PXQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes*	13-Mar-15
QFN 4x4	Head	ATA6831C-PIQW	ATA6831C-PIQW-1	TSPIC/ASE Chungli	Au	Yes	Yes	Yes	Yes*	13-Mar-15

* Pad-via process adaption

Bill of Material Changes of Qualification Family 2:

Item	**TSPIC (old)**	**ASE Chungli (new)**	**Risk assessment**
Mold compound	G770	G700	Low, same material family
Die attach	AB84-1LMIS	EN4900	Low, both are silver filled epoxies
Lead frame material	C7025	C194	Low, both are copper based alloys
Lead frame plating	Ag	Ag (photo mask)	None, increased robustness
Lead frame treatment	Rough	Rough	None
Bond wire	Au	Au	None, same material
Wire thickness	1.0 /1.2mil	0.8mil and 1.2mil	None, 0.8 mil is current standard
Wafer thickness	0,250/0,300 mm	0,178 mm	Low risk
Plating	Matte Sn	Matte Sn	No risk
Package thickness	0,9 +/-0,1	0,85 +/- 0,05	Low, within tolerance, no impact on PCB design or device handling
Other package dimensions	within tolerance		Low, no impact on PCB design

Appendix 3

Qualification Family 3:

PPAP: 03/13/2015

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Pack-age type	Head/ Member	Ordering code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide
SO175	Member	ATA8203P3C-TKQY	ATA8203P3C-TKQW*	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Member	ATA8204P3C-TKQY	ATA8204P3C-TKQW*	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Member	ATA8205P6C-TKQY	ATA8205P6C-TKQW*	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Member	ATA5723P3C-TKQY	ATA5723P3C-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Member	ATA5724P3C-TKQY	ATA5724P3C-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Member	ATA5728P6C-TKQY	ATA5728P6C-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Head*	CE2303C-TKQH	CE2303C-TKQW	TSPIC/ Amkor PH	Au	Yes	No	Yes	Yes
SO175	Member	T6020M013-TKQY	T6020M013-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	T6020M014-TKQY	T6020M014-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	T6020M015-TKQY	T6020M015-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATR4251C-TKQY	ATR4251C-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Member	ATA6020N-017-TKQY1	ATA6020N-017-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATA6020N-018-TKQY1	ATA6020N-018-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATA6020N-020-TKQY1	ATA6020N-020-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATAM893T-TKQYD 19	ATAM893T-TKQWD	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATAM893T-TKSYD 19	ATAM893T-TKQWD	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATAR090D-035-TKQYC	ATAR090D-035-TKQWC	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATAR090G050-TKQYC1	ATAR090G050-TKQWC1	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATAR092O111-TKQYC1	ATAR092O111-TKQWC1	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATAR890L-029-TKQY1	ATAR890L-029-TKQW1	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	ATAR892U-073-TKQY1	ATAR892U-073-TKQW1	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Member	T44C080C-012-TKQY1	T44C080C-012-TKQW1	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No

* Qualification results for industry and consumer devices will not be reported by PPAP but by a Qualification Report.

Bill of Material Changes of Qualification Family 3:

Item	TSPIC (old)	Amkor Philippines (new)	Risk assessment
Mold compound	EME6650	G700	Low, G700 is low stress state of the art compound
Die attach	AB84-1LMIS	AB8290	Low, both are silver filled epoxies
Lead frame material	C194	C194	None
Lead frame plating	Ag	NiPdAu	Low, widely used lead frame finish
Lead frame treatment	None	Rough	Low, increased delamination robustness
Bond wire	Au	Au	None
Wire thickness	1.0 mil	0.8mil	0.8 mil is current standard
Wafer thickness	0,200 / 0,300mm	0,200	Low risk
Plating	Matte Sn	NiPdAu	Low, widely used lead frame finish
Package thickness	Max. 1.3 mm	Max. 0.9mm	Low, no impact on PCB design
Other package dimensions	within tolerance		Low, no impact on PCB design

Qualification header devices

The following devices are qualification heads for family 3 using the same BOM. They are covered by separate PCN's #HE124001 and #HC132253 which are part of this PCN package.

Pack-age type	Head/ Member	Ordering code	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide
SO175	Head	ATA5743P3C-TKQW	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	Yes
SO175	Head	ATAM862C-TNQW4D	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No
SO175	Head	ATAR862C-084-TNQW4	TSPIC/ Amkor PH	Au	Yes	Yes	Yes	No

Appendix 4

Qualification Family 4:

PPAP: available since see table below

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Pack-age type	Head/ Member	Ordering code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide	**PPAP available**
QFN 5x5	Head	ATA6628-PGQW	ATA6628-GLQW	TSPIC/ASE Chungli	Cu	Yes	Yes	Yes	Yes	**12-Jan-15**
QFN 5X5	Member	ATA6628-PGPW	ATA6628-GLQW	TSPIC/ASE Chungli	Cu	Yes	Yes	Yes	Yes	**12-Jan-15**
QFN 5X5	Head	ATA6630-PGQW-19	ATA6630-GLQW	TSPIC/ASE Chungli	Cu	Yes	Yes	Yes	Yes	**12-Jan-15**

Bill of Material Changes of Qualification Family 4:

Item	**TSPIC (old)**	**ASE Chungli (new)**	**Risk assessment**
Mold compound	G770	G700	Low, same material family
Die attach	AB84-1LMIS	EN4900	Low, both are silver filled epoxies
Lead frame material	C7025	C194	Low, both are copper based alloys
Lead frame plating	Ag	Ag (photo mask)	Low, increased robustness
Lead frame treatment	Rough	Rough	None
Bond wire	Au	Cu	Low, meanwhile mature process accepted by most customers
Wire thickness	1.0 / 2.0 mil	0.8mil and 1.2mil	Low risk
Wafer thickness	0,250 mm	0,178mm	Low, copper bonding is mature process
Plating	Matte Sn	Matte Sn	None
Package thickness	0,9 +/-0,1	0,85 +/- 0,05	Low, within tolerance, no impact on PCB design or device handling
Other package dimensions	within the tolerance		Low, no impact on PCB design

Appendix 5

Qualification Family 5:

PPAP: available since see table below

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Pack-age type	Head/ Member	Ordering code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide	**PPAP available**
QFN 7X7	Member	ATA5428C-PLQW	ATA5428C-PLQW-1*	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 7X7	Member	ATA5721C-PLQW	ATA5721C-PLQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**5-Nov-14**
QFN 7X7	Member	ATA5722C-PLQW	ATA5722C-PLQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**5-Nov-14**
QFN 5X5	Member	ATA5745C-PXPW	ATA5745C-PXQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**12-Nov-14**
QFN 5X5	Member	ATA5746C-PXPW	ATA5746C-PXQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**12-Nov-14**
QFN 5X5	Member	ATA5771C-PXQW	ATA5771C-PXQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**30-Jan-15**
QFN 5X5	Head	ATA5773C-PXQW	ATA5773C-PXQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**30-Jan-15**
QFN 5X5	Member	ATA5774C-PXQW	ATA5774C-PXQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**30-Jan-15**
QFN 5X5	Member	ATA5795C-PNQW 18	ATA5795C-PNQW	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes	**30-Jan-15**
QFN 7X7	Member	ATA5811C-PLQW	ATA5811C-PLQW-1	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	Yes	**23-Jan-15**
QFN 7X7	Member	ATA5812C-PLQW	ATA5812C-PLQW-1	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	Yes	**23-Jan-15**
QFN 7X7	Head	ATA5823C-PLQW	ATA5823C-PLQW-1	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	Yes	**23-Jan-15**
QFN 7X7	Member	ATA5824C-PLQW	ATA5824C-PLQW-1	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	Yes	**23-Jan-15**
QFN 5X5	Member	ATR2406-PNQG 86	ATR2406-PNQW*	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	N/A	**NA***
QFN 5X5	Member	ATA8201C-PXQW	ATA8201C-PXQW-1*	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 5X5	Member	ATA8202C-PXQW	ATA8202C-PXQW-1*	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 5X5	Member	ATA8741C-PXQW	ATA8741C-PXQW-1*	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 5X5	Member	ATA8742C-PXQW	ATA8742C-PXQW-1*	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 5X5	Member	ATA8743C-PXQW	ATA8743C-PXQW-1*	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 7X7	Member	ATA6870N-PLPW	ATA6870N-PLQW-1	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 5X5	Member	ATA6286C-PNQW	ATA6286C-PNQW-1*	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***
QFN 4x4	Member	ATR4251C-PFPY	ATR4251C-PFQW	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**27-Feb-15**
QFN 3x3	Member	ATR4253C-PVPW	ATR4253C-PVQW-1	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	Yes	**4-Feb-15**

* Qualification results for industry and consumer devices will not be reported by PPAP but by a Qualification Report.

Continue Qualification Family 5:

Pack-age type	Head/ Member	Ordering code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide	**PPAP available**
QFN 7X7	Member	ATA6870N-PLQW	ATA6870N-PLQW-1	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**27-Feb-15**
QFN 4x4	Member	ATR4251C-PFQY	ATR4251C-PFQW	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**27-Feb-15**
QFN 3x3	Member	ATR4253C-PVQW	ATR4253C-PVQW-1	StatsChipPac/ASE CL	Au	Yes	Yes	Yes	Yes	**4-Feb-14**
QFN 5X5	Head	ATA5745C-PXQW	ATA5745C-PXQW-1	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**12-Nov-14**
QFN 5X5	Member	ATA5746C-PXQW	ATA5746C-PXQW-1	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**12-Nov-14**
QFN 5X5	Member	ATA6286C-PNPW	ATA6286C-PNQW-1*	TSPIC/ASE CL	Au	Yes	Yes	Yes	Yes	**NA***

Bill of Material Changes of Qualification Family 5:

Item	**TSPIC/ StatsChipPac (old)**	**ASE Chungli (new)**	**Risk assessment**
Mold compound	G770	G700	Low, same material family
Die attach	AB84-1LMIS / AB8290	EN4900	Low, both are silver filled epoxies
Lead frame material	C7025 /C194	C194	Low, both are copper based alloys
Lead frame plating	Ag	Ag (photo mask)	None, increased robustness
Lead frame treatment	Rough (TSPIC) None (StatsChipPac) /	Rough	None, increased delamination robustness
Bond wire	Au	Au	None
Wire thickness	0.8 / 1.0 mil	0.8mil	0.8 mil is current standard
Wafer thickness	0,200 / 0,300m	0,178mm	None
Plating	Matte Sn	Matte Sn	None
Package thickness	0,9 +/-0,1	0,85 +/- 0,05	Low, within tolerance, no impact on PCB design or device handling
Other package dimensions	within the tolerance		Low, no impact on PCB design

Appendix 6

Qualification Family 6:

PPAP: 02/28/2015

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Pack-age type	Head/ Member	Ordering code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide
QFN 7X7	Head	ATA6844-PLQW	ATA6844-PLQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes
QFN 7X7	Head	ATA6834C-PLQW	ATA6834C-PLQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes
QFN 4x4	Head	ATA6832C-PIQW	ATA6832C-PIQW-1	TSPIC/ ASE CL	Au	Yes	Yes	Yes	Yes

Bill of Material Changes of Qualification Family 6:

Item	**TSPIC (old)**	**ASE Chungli (new)**	**Risk assessment**
Mold compound	G770	G700	Low, same material family
Die attach	AB84-1LMIS	EN4900	Low, both are silver filled epoxies
Lead frame material	C7025	C194	Low, both are copper based alloys
Lead frame plating	Ag	Ag (photo mask)	None, increased robustness
Lead frame treatment	Rough	Rough	None
Bond wire	Au	Au	Low, meanwhile mature process accepted by most customers
Wire thickness	1.0 / 2.0 mil	0.8/ 2.0mil	0.8 mil is current standard
Wafer thickness	0,250 mm	0,178 mm	Low risk
Plating	Matte Sn	Matte Sn	None
Package thickness	0,9 +/-0,1	0,85 +/- 0,05	Low, within tolerance, no impact on PCB design or device handling
Other package dimensions	within the tolerance		Low, no impact on PCB design

Appendix 7

Qualification Family 7:

PPAP: 03/31/2015

Samples: Available - Please contact your local Atmel Sales Representative to complete the Sample Request Form

Pack-age type	Head/ Member	Ordering code old	Ordering code new	Assembly Location From/To	Wire mat.	Lead frame change	Wafer thickness change	Mold compound change	Remove Polyimide
SO300	Head	ATA6836C-TIQY-19	ATA6836C-TIQW	TSPIC/ Amkor PH	Au	Yes	No	Yes	Yes*

* Pad-via process adaption

Bill of Material Changes of Qualification Family 7:

Item	TSPIC (old)	Amkor Philippines (new)	Risk assessment
Mold compound	EME6650	G700	Low, G700 is low stress state of the art compound
Die attach	AB84-1LMIS	AB8290	Low, both are silver filled epoxies
Lead frame material	C194	C194	None
Lead frame plating	Ag	NiPdAu	Low, widely used lead frame finish
Lead frame treatment	None	Rough	None, increased delamination robustness
Bond wire	Au	Au	None
Wire Thickness	1.0 / 2.0 mil	1.0 / 2.0 mil	Low, now changes
Wafer Thickness	0,250 mm	0,250 mm	None
Plating	Matte Sn	NiPdAu	Low, widely used lead frame finish
Package dimensions	within tolerance		Low, no impact on PCB design