Product Change Notification - GBNG-10GPNP631

Date:

02 Apr 2019

Product Category:

32-bit Microcontrollers

Affected CPNs:

Notification subject:

CCB 3265 Final Notice: Qualification of UMC Fab 8N (U08N) as an additional fabrication site for selected Atmel products manufactured with the 66.11K process technology available in 64L TQFP package

Notification text:

PCN Status:

Final notification.

PCN Type:

Manufacturing Change

Microchip Parts Affected:

Please open one of the icons found in the Affected CPNs section above.
NOTE: For your convenience Microchip includes identical files in two formats (.pdf and .xls).

Description of Change:

Qualification of UMC Fab 8N (U08N) as an additional fabrication site for selected Atmel products manufactured with the 66.11K process technology available in 64L TQFP package

Pre Change:

Fabricated at United Microelectronics Corporation - UMC Fab 8D (U08D) or Fab 8S (U08S) site.

Post Change:

Fabricated at United Microelectronics Corporation - UMC Fab 8D (U08D), Fab 8S (U08S) or Fab 8N (U08N) site.

Pre and Post Change Summary:

	Pre Change		Post Change		
Fabrication Supplier and Location	United Microelectronics Corporation - Fab 8D Hsin-Chu Taiwan (U08D)	United Microelectronics Corporation - Fab 8S Hsin-Chu Taiwan (U08S)	United Microelectronics Corporation - Fab 8D Hsin-Chu Taiwan (U08D)	United Microelectronics Corporation - Fab 8S Hsin-Chu Taiwan (U08S)	United Microelectronics Corporation - Fab 8N China (U08N)
Technology	ISO/TS16949	ISO/TS16949	ISO/TS16949	ISO/TS16949	ISO/TS16949
Die Size	No change	No change	No change	No change	No change
Wafer Diameter	8 inches	8 inches	8 inches	8 inches	8 inches

Impacts to Data Sheet:

None

Change Impact:

None

Reason for Change:
To improve manufacturability and on-time delivery performance by qualifying UMC Fab 8N (U08N) as an additional fabrication site.
Change Implementation Status:
In Progress
Estimated First Ship Date:
May 2, 2019 (date code: 1918)
NOTE: Please be advised that after the estimated first ship date customers may receive pre and post change parts.
Time Table Summary:

	April 2018						April 2019				May 2019				
Workweek	14	15	16	17	18		14	15	16	17	18	19	20	21	22
Initial PCN Issue Date				X											
Qual Report Availability							X								
Final PCN Issue Date							X								
Estimated Implementation Date											X				

Method to Identify Change:
Traceability code
Qualification Report:
Please open the attachments included with this PCN labeled as PCN_#_Qual_Report.
Revision History:
April 16, 2018: Issued initial notification.
April 02, 2019: Issued final notification. Update the subject to specify that change is for 64L TQFP package. Attached the Qualification Report. Revised the affected parts list due to scope is specific only to mask 661A7. Provided estimated first ship date on May 02, 2019.

The change described in this PCN does not alter Microchip's current regulatory compliance regarding the material content of the applicable products.
Attachment(s):
PCN_GBNG-10GPNP631_Qual_Report.pdf

Please contact your local Microchip sales office with questions or concerns regarding this notification.

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Affected Catalog Part Numbers (CPN)

ATSAMD21J16B-AF
ATSAMD21J15B-AF
ATSAMD21J16B-AU
ATSAMD21J15B-AU
ATSAMDA1J16B-ABT
ATSAMDA1J15B-ABT
ATSAMDA1J14B-ABT
ATSAMD21J16B-AUT
ATSAMD21J15B-AUT
ATSAMD21J16B-AFT
ATSAMD21J15B-AFT

QUALIFICATION REPORT SUMMARY

PCN #: GBNG-10GPNP631

Date

February 01, 2019

Qualification of UMC Fab 8N (U08N) as an additional fabrication site for selected Atmel products manufactured with the 66.11K process technology available in 64L TQFP package

Purpose: Qualification of UMC Fab 8N (U08N) as an additional fabrication site for selected Atmel products manufactured with the 66.11K process technology available in 64L TQFP package

CCB NO.: 3265

I. Process Qualification

Test Items	Type	Lot No.	Qualification Results (Lifetime: Years)	Specification	Remarks
HCI	1.8V NMOS	NHH1S	1.23E+05	Lifetime > 0.2yrs (industrial) Lifetime > 0.3 yrs (automotive)	**Pass**
		NJKLA.21	4.71E+04		
		NJNNQ	2.81E+04		
	3.3V NMOS	NHH1S	1.32E+02		
		NJKLA.21	6.61E+01		
		NJNNQ	6.69E+01		
TDDB	1.2V PWELL	NHH1S	>1E+04	Lifetime > 10 yrs	
		NJKLA.21	>1E+04		
		NJNNQ	>1E+04		
	3.3V PWELL	NHH1S	7.99E+04		
		NJKLA.21	5.05E+04		
		NJNNQ	4.19E+04		
	HVPWELL	NHH1S	>1E+04		
		NJKLA.21	>1E+04		
		NJNNQ	>1E+04		
	Tunnel Oxide	NHH1S	1.50E+02		
		NJKLA.21	1.75E+02		
		NJNNQ	3.08E+01		
NBTI	1.8V PMOS (10/.12)	NHH1S	1.04E+04	Lifetime > 6 yrs (industrial) Lifetime > 10 yrs (automotive)	
		NJKLA.21	3.49E+03		
		NJNNQ	1.03E+04		
	1.8V PMOS (10/10)	NHH1S	1.91E+04		
		NJKLA.21	2.78E+04		
		NJNNQ	1.57E+04		
	3.3V PMOS (10/.35)	NHH1S	1.89E+02		
		NJKLA.21	4.88E+02		
		NJNNQ	4.09E+02		
	3.3V PMOS (10/10)	NHH1S	3.69E+02		
		NJKLA.21	1.15E+03		
		NJNNQ	4.96E+03		

Test Name / Test Conditions	Method	Lot No.	Sample Size/Lot	Result	Remarks
Early Failure Rate 24h 150°C	AEC-Q100-008	3	800	Lot 1 – 1/820 Lot 2 – 0/820 Lot 3 – 0/819	
Precycling 25k flash HTOL 150°C 168h 500h 1000h	JESD22 A108	3	80	Lot 1 – 0/167 Lot 2 – 0/167 Lot 3 – 0/240	
Precycling 25k flash HTOL 150°C - 168h		3	80	Lot 1 – 0/80 Lot 2 – 0/81 Lot 3 – 0/80	
Precycling 25k flash Data-Ret 175°C - 500h		3	80	Lot 1 – 0/80 Lot 2 – 0/80 Lot 3 – 0/80	
Precycling 25k Flash Data-Ret 25°C - 1000h		3	80	Lot 1 – 0/80 Lot 2 – 0/80 Lot 3 – 0/80	
UNL Endurance Flash 25°C - 25K		3	80	Lot 1 – 0/80 Lot 2 – 0/80 Lot 3 – 0/80	
UNL Endurance Flash 85°C - 25K		3	80	Lot 1 – 0/80 Lot 2 – 0/80 Lot 3 – 0/80	
UNL Endurance Flash 105°C - 25K *		3	80	Lot 1 – 0/80 Lot 2 – 0/80 Lot 3 – 0/80	
UNL Endurance Flash 125°C - 25K *		3	80	Lot 1 – 0/80 Lot 2 – 0/76 Lot 3 – 0/80	Not gating for Industrial release
UNL Endurance Flash -40°C - 25K		3	80	Lot 1 – 0/80 Lot 2 – 0/80 Lot 3 – 0/80	

** Not gating for Industrial release*

II. Package Qualification

Misc.	Assembly site	ASCL
	BD Number	BD_661A7_AIN_01_00.dxf
	Part Number (CPN)	ATSAMDA0J16BDKG-AZ
	Qual Report Number:	QTP 3171 Rev. B
	CCB No.	3741
Lead-Frame	Paddle size	200x200
	Material	C194
	Surface	Bare Cu with Ag on leads
	Treatment	Non-rough
	Process	stamping
	Lead-lock	no
	Part Number	0064QP001D04
	Lead Plating	Matte Tin
	Strip Size	78X250mm
	Strip Density	40
Bond Wire	Material	Au
Die Attach	Part Number	EN-4900GC
	Conductive	Yes
MC	Part Number	G700LA
PKG	PKG Type	TQFP
	Pin/Ball Count	64
	PKG width/size	10x10x1.0mm
Die	Die Thickness	7 mils
	Die Size	108.2 x 100.3 mils
	Fab	UMC 8N
	MSL	MSL3/260

Manufacturing Information

Assembly Lot No.	Wafer lot No.	Date Code
AG3QTGA6YT	NHR02JJ	1811
AG7KR0000	NJK79J	1830
ASCL192700143		1840

Result ☑ Pass ☐ Fail ☐ _____

ATSAMDA0J16BDKG-AZ 661A7 in TQFP64 Singulated Package using 0.8 Au wire from ASCL assembly pass reliability test per QCI-39000 which was conducted at MPHL rel lab. This package is qualified Moisture/Reflow Sensitivity Classification Level 3 at 260°C reflow temperature per IPC/JEDEC J-STD-020E standard.

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard/ Method	Qty. (Acc.)	Def/SS	Result	Remarks
Moisture/Reflow Sensitivity Classification Test (At MSL Level 3)	30°C/60%RH Moisture Soak 192 hrs. System: Climats Excal 5423-HE 3x Convection-Reflow 265°C max System: Mancorp CR.5000F (IPC/JEDEC J-STD-020E)	IPC/JEDE	45 units per lot	Lot 1 0/45 Lot 2 0/45 Lot 3 0/45	Pass Pass Pass	
Precondition Prior Perform Reliability Tests (At MSL Level 3)	**Electrical Test :**+25°C System: Magnum Bake 150°C, 24 hrs System: HERAEUS 30°C/60%RH Moisture Soak 192 hrs. System: Climats Excal 5423-HE 3x Convection-Reflow 265°C max System: Mancorp CR.5000F **Electrical Test :**+25°C System: Magnum	JESD22-A113	231 units per lot	Lot 1 0/231 Lot 2 0/231 Lot 3 0/231	Pass Pass Pass	Good Devices
HAST	**Stress Condition:** (Standard) + 110°C, 85%RH, 264 hrs. Bias Voltage: 3.6 Volts System: HIRAYAMA HASTEST PC-422R8 **Electrical Test:** +25°C, 125°C System: Magnum	JESD22-A110	77 units per lot	Lot 1 0/77 Lot 2 0/77 Lot 3 0/77	Pass	Parts had been pre-conditioned at 260°C
	Internal Package Analysis		5 units per lot	Lot 1 0/5 Lot 2 0/5 Lot 3 0/5	Pass	
UNBIASED HAST	**Stress Condition:** (Standard) + 110°C, 85%RH, 264 hrs. System: HIRAYAMA HASTEST PC-422R8 **Electrical Test:** +25°C System: Magnum	JESD22-A110	77 units per lot	Lot 1 0/77 Lot 2 0/77 Lot 3 0/77	Pass	Parts had been pre-conditioned at 260°C

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard/ Method	Qty. (Acc.)	Def/SS	Result	Remarks
Temp Cycle	**Stress Condition:** (Standard) -65°C to +150°C, 500 Cycles System : Votsch VTS²7012 **Electrical Test:** +25°C, 125°C System: Magnu	JESD22-A104	77 units per lot	Lot 1 0/77 Lot 2 0/77 Lot 3 0/77	Pass	Parts had been pre-conditioned at 260°C
	Internal Package Analysis		5 units per lot	Lot 1 0/5 Lot 2 0/5 Lot 3 0/5	Pass	
	Bond Strength: Wire Pull (> 1.75 grams) Bond *Shear (>12.6 grams)* System: Dage		5 units per lot	Lot 1 0/5 Lot 2 0/5 Lot 3 0/5	Pass	
High Temperature Storage Life	**Stress Condition:** Bake 175°C, 504 hrs System: HERAEUS **Electrical Test:** +25°C, 125°C System: Magnum	JESD22-A103	45 units per lot	Lot 1 0/45 Lot 2 0/45 Lot 3 0/45	Pass	
	Internal Package Analysis		5 units per lot	Lot 1 0/5 Lot 2 0/5 Lot 3 0/5	Pass	

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard/ Method	Qty. (Acc.)	Def/SS.	Result	Remarks
Bond Strength, 0 Hour **Internal Package Analysis, 0 Hour** **A.**	**System:** Dage Wire Pull (> 1.75 grams) Bond *Shear (>12.6 grams)*		5 units per lot	Lot 1 0/5 Lot 2 0/5 Lot 3 0/5	Pass	
			5 per lot	Lot 1 0/5 Lot 2 0/5 Lot 3 0/5	Pass	
PHYSICAL DIMENSIONS	Physical Dimension, 30 units from 3 lots	JESD22 -B100/B108	10 units per lot	Lot 1 0/10 Lot 2 0/10 Lot 3 0/10	Pass	
Solderability Temp 245°C	**Bake:** Temp 155°C,4Hrs System: Oven Solder Bath: Temp.245°C Solder material: SAC305 Visual Inspection: External Visual Inspection	JESD22B -102E	22 units (5 units min per lot)	Lot 1 0/5 Lot 2 0/5 Lot 3 0/12	Pass	