Final Product/Process Change Notification

Document #:FPCN24376ZA
Issue Date:05 Feb 2024

Title of Change:	Transfer AR0233 Front end manufacturing from TSMC FAB 12 to TSMC Fab 14 both located in Taiwan
Proposed Changed Material First Ship Date:	12 Aug 2024 or earlier if approved by customer
Current Material Last Order Date:	N/A *Orders received after the Current Material Last Order Date expiration are to be considered as orders for new changed material as described in this PCN. Orders for current (unchanged) material after this date will be per mutual agreement and current material inventory availability*.
Current Material Last Delivery Date:	11 Aug 2024 *The Current Material Last Delivery Date may be subject to change based on build and depletion of the current (unchanged) material inventory*
Product Category:	Active components – Integrated circuits
Contact information:	Contact your local onsemi Sales Office or Mike.Webster@onsemi.com
PCN Samples Contact:	Contact your local onsemi Sales Office to place sample order. Sample requests are to be submitted no later than 45 days after publication of this change notification. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements.
Sample Availability Date:	31 Jan 2024
PPAP Availability Date:	15 Mar 2024
Additional Reliability Data:	Contact your local onsemi Sales Office or Amy.Wu@onsemi.com
Type of Notification:	This is a Final Product/Process Change Notification (FPCN) sent to customers. The change will be implemented at 'Proposed Change Material First Ship Date' in compliance to J-STD-46 or ZVEI, or earlier upon customer approval, or per our signed agreements. onsemi will consider this proposed change and it's conditions acceptable, unless an inquiry is made in writing within 45 days of delivery of this notice. To do so, contact PCN.Support@onsemi.com.

Change Category

Category	Type of Change
Process - Wafer Production	Move of all or part of wafer fab to a different location/site/subcontractor

Description and Purpose:

The proposed change is to transfer all front side CMOS manufacturing of the AR0233 from TSMC Fab 12 to TSMC Fab 14. The current manufacturing wafer process flow is for front side processing to occur in FAB 12 and then backside processing to occur in Fab 14, with wafers shipping to Fab 14 after completing in Fab 12. In an effort to improve efficiency for Gen 2 product at TSMC, we have qualified material to run entirely at the Fab 14 facility. These two facilities use identical manufacturing equipment, processes and maintenance plans. The are located on separate TSMC sites in Taiwan. There will be no change to form, fit or function of the product.
The current inventory from Fab 12 will be depleted by the end of June 2024. We are requesting customers expedite the review, validation and approval of this PCN to maintain continuity of supply in July 2024.

	Before Change Description	After Change Description
Front-End MFG Site	TSMC Fab 12	TSMC Fab 14

There are no product material changes as a result of this change.

There is no product marking change as a result of this change

Reason / Motivation for Change:	Source/Supply/Capacity Changes
Anticipated impact on fit, form, function, reliability, product safety or manufacturability:	The device has been qualified and validated based on the same Product Specification. The device has successfully passed the qualification tests. Potential impacts can be identified, but due to testing performed by onsemi in relation to the PCN, associated risks are verified and excluded. No anticipated impacts.

Sites Affected:	
onsemi Sites	**External Foundry/Subcon Sites**
None	TSMC Semiconductor, Taiwan

Marking of Parts/ Traceability of Change:	Date code

Reliability Data Summary:

QV DEVICE NAME : AR0233ATSE17XUEA1-DRBR
PACKAGE : iBGA 10x10

Test	Specification	Condition	Result
HTOL	JESD22-A108	Ta = 105 °C, 100 % max rated Vcc, 1008hrs	0/231
ELFR	AEC Q100-008	Ta= 125 °C, 24hrs	0/2400
PC	J-STD-020 JESD-A113	MSL 3 @ 260 °C	0/231
HTSL	JESD22-A103	Ta= 150 °C, 504hr	0/45
TC	JESD22-A104	Ta= -55 °C to +125 °C, 1000cyc	0/231
HAST	JESD22-A110	110°C, 85% RH, with bias, 264hrs	0/231
uHAST	JESD22-A118	110°C, 85% RH, unbiased, 264hrs	0/231
WBS	AEC Q100-001 AEC Q003	CPK >1.67	PASS
WBP	MIL-STD883 Method 2011 AEC Q003	CPK >1.67 or 0 Fails after TC (test #A4)	PASS
HBM	AEC Q100-002	0 Fails; 2KV HBM	PASS
CDM	AEC Q100-011	0 Fails: 750V for corner pins, 500V all other pins	PASS
LU	AEC Q100-004	0 Fails	PASS
ED	AEC Q100-009 AEC Q003	Elect. Distribution: (Test @ C/ R/ H)	PASS
TDDB	JP001	-	PASS
NBTI	JP001	-	PASS
HCI	JP001	-	PASS
EM	JP001	-	PASS
SM	JP001	-	PASS

NOTE: AEC-1pager is attached.

To view attachments:
1. Download pdf copy of the PCN to your computer
2. Open the downloaded pdf copy of the PCN
3. Click on the paper clip icon available on the menu provided in the left/bottom portion of the screen to reveal the Attachment field
4. Then click on the attached file/s

Electrical Characteristics Summary:

				Fab12			Fab14			
Temperature (°C)	Supply	Mode of Operation	Unit	Mean	Sigma	Cpk	Mean	Sigma	Cpk	
75	IDD+IDD_PHY	Streaming, 1920x1080, 30 fps,HDR 3 exp, 16 bit	mA	201.34	2.36	4.84	206.41	1.97	6.77	
75	IDDIO	Streaming, 1920x1080, 30 fps,HDR 3 exp, 16 bit	mA	1.48	0.04	8.43	1.47	0.02	17.17	
75	IAA	Streaming, 1920x1080, 30 fps,HDR 3 exp, 16 bit	mA	90.91	0.74	7.54	90.61	0.82	7.88	
75	IAA_PIX	Streaming, 1920x1080, 30 fps,HDR 3 exp, 16 bit	mA	10.18	0.09	18.11	10.24	0.11	17.1	
75	IDD+IDD_PHY	Streaming, 2048x1280, 60 fps Linear, 12 Bit	mA	191.93	2.61	2.8	196.03	1.73	5	
75	IDDIO	Streaming, 2048x1280, 60 fps Linear, 12 Bit	mA	1.35	0.04	2.95	1.35	0.02	5.23	
75	IAA	Streaming, 2048x1280, 60 fps Linear, 12 Bit	mA	93.7	0.8	3.44	93.08	0.84	3.22	
75	IAA_PIX	Streaming, 2048x1280, 60 fps Linear, 12 Bit	mA	11.44	0.11	5.76	11.49	0.12	5.65	
75	IDD+IDD_PHY	Streaming, 2048x1280, 30 fps LFM, 12Bit	mA	138.97	1.51	2.66	141.26	1.13	2.88	
75	IDDIO	Streaming, 2048x1280, 30 fps LFM, 12Bit	mA	1.63	0.04	9.63	1.63	0.02	18.92	
75	IAA	Streaming, 2048x1280, 30 fps LFM, 12Bit	mA	31.54	0.23	2.7	31.67	0.21	2.71	
75	IAA_PIX	Streaming, 2048x1280, 30 fps LFM, 12Bit	mA	4.53	0.02	13.58	4.61	0.05	14.32	
75	Analog	Hard Standby (Clk off)	uA	479.87	11.7	2.41	494.28	10.72	2.74	
75	Digital	Hard Standby (Clk off)	uA	2446.11	582.32	2	3328.56	769.77	1.32	*
75	Analog	Hard Standby (Clk on)	uA	17494.08	364.56	2.58	17748.17	315.56	2.73	
75	Digital	Hard Standby (Clk on)	uA	2941.82	578.58	2.01	3835.77	768.71	1.45	*
75	Analog	Soft Standby (Clk off)	uA	763.02	20.43	1.93	782.62	13.71	2.9	
75	Digital	Soft Standby (Clk off)	uA	2479.28	594.25	1.94	3373.93	782.92	1.31	*
75	Analog	Soft Standby (Clk on)	uA	875.77	19.05	1.58	890.53	13.49	2.42	
75	Digital	Soft Standby (Clk on)	uA	13089.02	560.52	4.6	14307.5	791.26	3.75	

* F14 lots have lower Cpk in STBY current compared to F12 due to slightly higher WAT Idsat for core PMOS device; The corrective action is TSMC has tuned F14 core PMOS WAT process window within +/- 3 sigma to match F12 control WAT baseline (see the plot below).

List of Affected Parts:

Note: *Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the* ***PCN Customized Portal****.*

Current Part Number	New Part Number	Qualification Vehicle
AR0233ATSE17XUD20	#NONE	AR0233ATSE17XUEA1
AR0233ATSC17XUEA1-DPBR	#NONE	AR0233ATSE17XUEA1
AR0233ATSC17XUEA1-DRBR	#NONE	AR0233ATSE17XUEA1
AR0233ATSC17XUEA1-TPBR	#NONE	AR0233ATSE17XUEA1
AR0233ATSC17XUEA1-TRBR	#NONE	AR0233ATSE17XUEA1
AR0233ATSC17XUD20	#NONE	AR0233ATSE17XUEA1

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Appendix A: Changed Products

PCN#: FPCN24376ZA
Issue Date: Feb 05, 2024

DIKG: DIGI-KEY

Product	Customer Part Number	Qualification Vehicle	New Part Number	Replacement Supplier
AR0233ATSC17XUEA1-DPBR		AR0233ATSE17XUEA1	#NONE	
AR0233ATSC17XUEA1-TPBR		AR0233ATSE17XUEA1	#NONE	
AR0233ATSC17XUEA1-TRBR		AR0233ATSE17XUEA1	#NONE	
AR0233ATSC17XUEA1-DRBR		AR0233ATSE17XUEA1	#NONE	