PCN Number:	20191104001.1	**PCN Date:**	Nov 13, 2019
Title:	Conversion to TSMC 0.6/0.5um Hybrid Process		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Feb 13, 2020	**Estimated Sample Availability:**	Date provided at sample request.

Change Type:

☐	Assembly Site	☐	Assembly Process	☐	Assembly Materials
☐	Design	☐	Electrical Specification	☐	Mechanical Specification
☐	Test Site	☐	Packing/Shipping/Labeling	☐	Test Process
☐	Wafer Bump Site	☐	Wafer Bump Material	☐	Wafer Bump Process
☐	Wafer Fab Site	☐	Wafer Fab Materials	☒	Wafer Fab Process
		☐	Part number change		

Notification Details

Description of Change:

This change notification is to announce the conversion from the current TSMC 0.6um back end metallization/SOG Etch Back process to the TSMC 0.5um Tungsten plug back end process for the selected devices listed in the "Product Affected" section.

Change From	Change To
0.6um TSMC Backend Process IMD layer: PEOX + SOG DEP+ PEOX Metal: Ti / AlSiCu / TiN	0.5um TSMC Backend Process IMD layer: PEOX+SACVD-OX+PEOX+SOG dep. & Etch back+PEOX Metal: Via Plug TiN/WCVD/AlCu /TiN

Reason for Change:

Quality Improvement.

Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):

None.

Changes to product identification resulting from this notification:

None.

Product Affected:

REF3112AIDBZR	REF3130AIDBZR	REF3140TDD1	REF3225AIDBVTG4
REF3112AIDBZRG4	REF3130AIDBZRG4	REF3140TDD2	REF3230AIDBVR
REF3112AIDBZT	REF3130AIDBZT	REF3212AIDBVR	REF3230AIDBVT
REF3112AIDBZTG4	REF3130AIDBZTG4	REF3212AIDBVT	REF3230AIDBVTG4
REF3120AIDBZR	REF3133AIDBZR	REF3212AIDBVTG4	REF3233AIDBVR
REF3120AIDBZRG4	REF3133AIDBZT	REF3220AIDBVR	REF3233AIDBVT
REF3120AIDBZT	REF3133AIDBZTG4	REF3220AIDBVT	REF3233AIDBVTG4
REF3120AIDBZTG4	REF3140AIDBZR	REF3220AIDBVTG4	REF3240AIDBVR
REF3125AIDBZR	REF3140AIDBZRG4	REF3225AIDBVR	REF3240AIDBVRG4
REF3125AIDBZRG4	REF3140AIDBZT	REF3225AIDBVRG4	REF3240AIDBVT
REF3125AIDBZT	REF3140AIDBZTG4	REF3225AIDBVT	REF3240AIDBVTG4
REF3125AIDBZTG4			

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Q100H Grade-1 qual for REF31XXAQDBZRQ1 (TSMC-WF2 / 0.5/0.6-DPDM) in HNT using 3-pin SOT pkg

Approved 28-Mar-2017

Product Attributes

Attributes	Qual Device: REF3133AQDBZRQ1	Qual Device: REF3112AQDBZRQ1	Qual Device: REF3120AQDBZRQ1	Qual Device: REF3125AQDBZRQ1	Qual Device: REF3130AQDBZRQ1	Qual Device: REF3140AQDBZRQ1	QBS Process Reference: OPA356AQDBVRQ1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Product Function	Power Management	Power Management	Power Management	Power Management	Power Management	Power Management	Signal Chain
Wafer Fab Supplier	TSMC-WF2	TSMC-WF2	TSMC-WF2	TSMC-WF2	TSMC-WF2	TSMC-WF2	TSMC-WF2
Die Revision	E	E	E	E	E	E	-
Assembly Site	HNT	HNT	HNT	HNT	HNT	HNT	NFME
Package Type	SOT	SOT	SOT	SOT	SOT	SOT	SOT
Package Designator	DBZ	DBZ	DBZ	DBZ	DBZ	DBZ	DBV
Ball/Lead Count	3	3	3	3	3	3	5

- QBS: Qual By Similarity
- Qual Device REF3112AQDBZRQ1 is qualified at LEVEL2-260C
- Qual Devices qualified at LEVEL3-260C: REF3120AQDBZRQ1, REF3130AQDBZRQ1, REF3140AQDBZRQ1, REF3125AQDBZRQ1, REF3133AQDBZRQ1

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: REF3133AQDBZRQ1	Qual Device: REF3112AQDBZRQ1	Qual Device: REF3120AQDBZRQ1	Qual Device: REF3125AQDBZRQ1	Qual Device: REF3130AQDBZRQ1	Qual Device: REF3140AQDBZRQ1	QBS Process Reference: OPA356AQDBVRQ1
Test Group A – Accelerated Environment Stress Tests														
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning	Level 2-260C peak	3/all/0	-	-	-	-	-	3/all/0
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0	-	-	-	-	-	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0	-	-	-	-	-	3/230/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0	-	-	-	-	-	3/230/0
	TC-BP	A4	MIL-STD883 Method 2011	1	30	Post Temp. Cycle Bond Pull	500 Cycles	1/30/0	-	-	-	-	-	1/30/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A	N/A	N/A	N/A	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	1/45/0	-	-	-	-	-	1/45/0
Test Group B – Accelerated Lifetime Simulation Tests														
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0	-	-	-	-	-	3/231/0
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	-	-	3/2400/0
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	--	N/A	N/A	N/A	N/A	N/A	N/A	-
Test Group C – Package Assembly Integrity Tests														
	WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	Wires	1/30/0	-	-	-	-	-	-
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	1/30/0	-	-	-	-	-	-
	SD	C3	JEDEC JESD22-B102	1	15	Solderability (>95% Coverage)	Steam aging 8 hrs	-	-	-	-	-	-	1/15/0*
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	3/30/0	-	-	-	-	-	-
	SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Post HTSL/Bump	NA	-	-	-	-	-	-
	LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	Leads	NA	-	-	-	-	-	-
Test Group D – Die Fabrication Reliability Tests														
	EM	D1	JESD61	-	-	Electromigration	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	SM	D5	-	-	-	Stress Migration	--	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E – Electrical Verification Tests														
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	500 V (all pins) 750V (corner pins)	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
	LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC Q100-004)	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0	1/6/0
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold test	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0

Note; Solderability is performed on a separate device, SN74LVC2G66QDCURQ1, which has same lead frame plating material on same package type by same assembly site.

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST &TC samples, as applicable.
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40°C to +150°C
Grade 1 (or Q): -40°C to +125°C
Grade 2 (or T): -40°C to +105°C
Grade 3 (or I): -40°C to +85°C
E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold: HTOL, ED
Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room: AC/uHAST
Green/Pb-free Status:
Qualified Pb-Free (SMT) and Green

For questions regarding this notice, e-mails can be sent to the contacts shown below or your local Field Sales Representative.

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
WW PCN Team	PCN_ww_admin_team@list.ti.com