



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

**PCN# 20191104001.1**  
**Conversion to TSMC 0.6/0.5um Hybrid Process**  
**Change Notification / Sample Request**

**Date:** November 22, 2019  
**To:** PREMIER FARNELL PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments. The details of this change are on the following pages.

Texas Instruments requires acknowledgement of receipt of this notification within **30** days of the date of this notice. Lack of acknowledgement of this notice within 30 days constitutes acceptance of the change. If samples or additional data are required, requests must be received within **30 days** of this notification.

The changes discussed within this PCN will not take effect any earlier than the proposed first ship date on Page 3 of this notification, unless customer agreement has been reached on an earlier implementation of the change.

This notice does not change the end-of-life status of any product. Should product affected be on a previously issued product withdrawal/discontinuance notice, this notification does not extend the life of that product or change the life time buy offering/discontinuance plan.

For questions regarding this notice or to provide acknowledgement of this PCN, you may contact your local Field Sales Representative or the PCN Team ([PCN\\_ww\\_admin\\_team@list.ti.com](mailto:PCN_ww_admin_team@list.ti.com)). For sample requests or sample related questions, contact your local Field Sales Representative.

PCN Team  
SC Business Services

**20191104001.1**  
**Attachment: 1**

**Products Affected:**

The devices listed on this page are a subset of the complete list of affected devices. According to our records, these are the devices that you have purchased within the past twenty-four (24) months. The corresponding customer part number is also listed, if available.

<b>DEVICE</b>	<b>CUSTOMER PART NUMBER</b>
REF3130AIDBZTG4	null
REF3112AIDBZT	null
REF3120AIDBZT	null
REF3125AIDBZT	null
REF3130AIDBZR	null
REF3130AIDBZT	null
REF3133AIDBZT	null
REF3140AIDBZT	null
REF3212AIDBVT	null
REF3220AIDBVT	null
REF3225AIDBVR	null
REF3225AIDBVT	null
REF3230AIDBVT	null
REF3233AIDBVT	null
REF3240AIDBVT	null
REF3125AIDBZR	null

Technical details of this Product Change follow on the next page(s).

<b>PCN Number:</b>	20191104001.1	<b>PCN Date:</b>	Nov 13, 2019
<b>Title:</b>	Conversion to TSMC 0.6/0.5um Hybrid Process		
<b>Customer Contact:</b>	<a href="#">PCN Manager</a>	<b>Dept:</b>	Quality Services
<b>Proposed 1<sup>st</sup> Ship Date:</b>	Feb 13, 2020	<b>Estimated Sample Availability:</b>	Date provided at sample request.
<b>Change Type:</b>			
<input type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Assembly Process
<input type="checkbox"/>	Design	<input type="checkbox"/>	Electrical Specification
<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Packing/Shipping/Labeling
<input type="checkbox"/>	Wafer Bump Site	<input type="checkbox"/>	Wafer Bump Material
<input type="checkbox"/>	Wafer Fab Site	<input type="checkbox"/>	Wafer Fab Materials
		<input checked="" type="checkbox"/>	Wafer Fab Process
		<input type="checkbox"/>	Part number change
<b>Notification Details</b>			
<b>Description of Change:</b>			
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.			
<b>Change From</b>		<b>Change To</b>	
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	
<b>Reason for Change:</b>			
Quality Improvement.			
<b>Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):</b>			
None.			
<b>Changes to product identification resulting from this notification:</b>			
None.			
<b>Product Affected:</b>			
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 REF31XXAQBZQR1 (TSMC-WF2 / 0.5/0.6-DPDM) in HNT using 3-pin SOT pkg

Approved 28-Mar-2017

#### Product Attributes

Attributes	Qual Device: REF3133AQBZQR1	Qual Device: REF3112AQBZQR1	Qual Device: REF3120AQBZQR1	Qual Device: REF3125AQBZQR1	Qual Device: REF3130AQBZQR1	Qual Device: REF3140AQBZQR1	QBS Process Reference: OPA356AQBZVRQ1
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 REF3112AQBZQR1 is qualified at LEVEL2-260C

- Qual Devices qualified at LEVEL3-260C: REF3120AQBZQR1, REF3130AQBZQR1, REF3140AQBZQR1, REF3125AQBZQR1, REF3133AQBZQR1

#### 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: REF3133AQBZQR1	Qual Device: REF3112AQBZQR1	Qual Device: REF3120AQBZQR1	Qual Device: REF3125AQBZQR1	Qual Device: REF3130AQBZQR1	Qual Device: REF3140AQBZQR1	QBS Process Reference: OPA356AQBZVRQ1
<b>Test Group A – Accelerated Environment Stress Tests</b>													
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
<b>Test Group B – Accelerated Lifetime Simulation Tests</b>													
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	-
<b>Test Group C – Package Assembly Integrity Tests</b>													
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	-	-	-	-	-	-
<b>Test Group D – Die Fabrication Reliability Tests</b>													
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
<b>Test Group E – Electrical Verification Tests</b>													
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.

<b>Location</b>	<b>E-Mail</b>
USA	<a href="mailto:PCNAmericasContact@list.ti.com">PCNAmericasContact@list.ti.com</a>
Europe	<a href="mailto:PCNEuropeContact@list.ti.com">PCNEuropeContact@list.ti.com</a>
Asia Pacific	<a href="mailto:PCNAsiaContact@list.ti.com">PCNAsiaContact@list.ti.com</a>
WW PCN Team	<a href="mailto:PCN_ww_admin_team@list.ti.com">PCN_ww_admin_team@list.ti.com</a>

**IMPORTANT NOTICE AND DISCLAIMER**

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale ([www.ti.com/legal/termsofsale.html](http://www.ti.com/legal/termsofsale.html)) or other applicable terms available either on [ti.com](http://ti.com) or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.