12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20230328000.1
Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision and additional Assembly site/BOM options for select devices
Change Notification / Sample Request

Date: March 30, 2023
To: PREMIER FARNELL PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments (TI). The details of this change are on the following pages, and are in alignment with our standard product change notification (PCN) process.

TI 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, given that samples are not built ahead of the change.

The Proposed First Ship date in this PCN letter is the earliest possible date that customers could receive the changed material. It is our commitment that the changed device will not ship before that date. If samples are requested within the 30 day sample request window, customers will still have 30-days to complete their evaluation regardless of the proposed 1st ship date.

This particular PCN is related to TI's multiyear transition plan for our two remaining factories with 150-millimeter production (DFAB in Dallas, Texas, and SFAB in Sherman, Texas). DFAB will remain open, but will focus on 200-mm production, with a smaller set of technologies. SFAB will close no earlier than 2024 and no later than 2025. As referenced in the "reason for change" below, these changes are part of our multiyear plan to transition these products to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

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). For sample requests or sample related questions, contact your local Field Sales Representative. As always, we thank you for your continued business.

PCN Team
SC Business Services

20230328000.1
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.

DEVICE	CUSTOMER PART NUMBER
LM7301IM5/NOPB	null

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

PCN Number:	20230328000.1	PCN Date:	March 30, 2023
Title:	Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, and additional Assembly site options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Jun 28, 2023	Sample requests accepted until:	April 28, 2023*

***Sample requests received after April 28, 2023 will not be supported.**

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		

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of a new fab & process technology (RFAB, LBC9) and additional Assembly site (PHI, MLA) for selected devices listed below in the product affected section.

Current Fab Site			Additional Fab Site		
Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter
DL-LIN	VIP	150 mm	RFAB	LBC9	300 mm
SFAB	JI1	150 mm			
DL-LIN	LINCMOS	150 mm			

The die was also changed as a result of the process change.

Construction Differences are as follows:

Group 1 Devices (RFAB as an additional Fab site & TIEMA/LEN adding PHI as an additional Assembly site):

	TIEMA	LEN	TIPI
Mount Compound	8075531	SID#0003C10332	8095733
Mold Compound	8097131	SID#0011G60007	4222198
Bond wire composition, diameter	Cu, 0.96 mil	Au, 1.0 mil	Cu, 0.8 mil
Lead Finish	Matte Sn	NiPdAu	NiPdAu

Group 2 Devices (RFAB as an additional Fab site & FMX/TAI adding MLA as an additional Assembly site):

	FMX	MLA
Mount Compound	4147858	4147858
Mold Compound	4211880	4211880
Bond wire composition, diameter	Cu, 0.96 mil	Cu, 0.8 mil

Group 3 Devices (RFAB as an additional Fab site & TAI adding MLA as an additional Assembly site):

	TAI	MLA
Bond wire composition, diameter	Cu, 0.96 mil	Cu, 0.8 mil

Qual details are provided in the Qual Data Section.

Reason for Change:

These changes are part of our multiyear plan to transition products from our 150-millimeter factories to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

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

None

Impact on Environmental Ratings:

Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings.

RoHS	REACH	Green Status	IEC 62474
☒ No Change	☒ No Change	☒ No Change	☒ No Change

Changes to product identification resulting from this PCN:

Fab Site Information:

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
DL-LIN	DLN	USA	Dallas
SH-BIP-1	SHE	USA	Sherman
RFAB	**RFB**	**USA**	**Richardson**

Die Rev:

Current	New
Die Rev [2P]	**Die Rev [2P]**
B, C	**A**

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TIEM	CU6	MYS	Melaka
LEN	LIN	TWN	Taichung
FMX	MEX	MEX	Aguascalientes
TAI	TAI	TWN	Chung Ho, New Taipei City
TIPI	**PHI**	**PHL**	**Baguio City MLA**
MLA	**MLA**	**MYS**	**Kuala Lumpur**

Sample product shipping label (not actual product label)

Product Affected:

Group 1 Device List (RFAB as additional Fab site & PHI as an additional Assembly site):

LM7301IM5	LM7301IM5X/NOPB	LM7301IM5X/S7000823	TLV2231IDBVR
LM7301IM5/NOPB	LM7301IM5X/S5000655	LM7341MFX/NOPB	TLV2731IDBVR
LM7301IM5X			

Group 2 Device List (RFAB as additional Fab site & MLA as an additional Assembly site):

TLC277CDR	TLC277IDR

Group 3 Device List (RFAB as additional Fab site & MLA as an additional Assembly site):

TLC279CDR	TLC279IDR

For alternate parts with similar or improved performance, please visit the product page on TI.com

Qualification Report

Approve Date 28-Jul-2020

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

	Type	Test Name / Condition	Duration	Qual Device: OPA991IDBVR	QBS Process Reference: OPA4990IDR	QBS Package Reference: OPA990IDBVR
	PC	PreCon Level 1	Level 1-260C	-	-	6/933/0
	PC	PreCon Level 2	Level 2-260C	-	3/1477/1 (1)	3/246/0
	ED	Electrical Characterization	Per Datasheet Parameters	3/90/0	3/90/0	3/90/0
	HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	6/462/0
	AC	Autoclave 121C	96 Hours	-	3/231/5 (2)	1/77/0
	AC	Autoclave 121C	96 hours	-	-	2/154/0
	TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	3/231/0
	HTSL	High Temp Storage Bake 170C	420 Hours	-	-	3/231/0
	HTSL	High Temp Storage Bake 175C	500 Hours	-	3/231/0	-
	HTOL	Life Test, 150C	300 Hours	-	3/231/10 (3)	-
	ELFR	Early Life Failure Rate, 125C	48 Hours	-	1/800/0	-
	HBM	ESD - HBM	2500 V	1/3/0	-	-
	HBM	ESD - HBM	3000 V	-	3/9/0	-
	CDM	ESD - CDM	1500 V	3/9/0	2/6/0	3/9/0
	LI	Lead Pull to Destruction	Leads	-	1/24/0	-
	LU	Latch-up	Per JESD78	3/18/0	3/18/0	3/18/0
	MSL	Automotive Moist Sens. L2	Level 2-260C	-	3/36/0	-
	MSL	Moisture Sensitivity	Level 1-260C	-	-	3/36/0

	Type	Test Name / Condition	Duration	Qual Device: OPA991IDBVR	QBS Process Reference: OPA4990IDR	QBS Package Reference: OPA990IDBVR
	WBP	Bond Pull	Wires	1/76/0	3/228/0	3/228/0
	WBS	Ball Bond Shear	Wires	1/76/0	3/288/0	3/228/0

- QBS: Qual By Similarity
- Qual Device OPA991IDBVR is qualified at LEVEL1-260C
- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours
- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours
- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green
NOTE (1): T0 failing units got mixed back in with passing ones for the post-stress test resulting in false fails. See 8D attached to the eQDB
NOTE (2): Fails were due to mechanical damage from mishandling at test. Discounted.
NOTE (3): Fails due to faulty BI sockets. See 8D attached to the eQDB.

Qualification Report

Approve Date 21-May-2021

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

	Type	Test Name / Condition	Duration	Qual Device: OPA2991IDR	QBS Product Reference: OPA2991IDR	QBS Process Reference: OPA4990IDR	QBS Package Reference: OPA2990IDR
	PC	PreCon Level 1	Level 1-260C	1/160/0	-	-	-
	PC	PreCon Level 2	Level 2-260C	-	-	3/1477/0	3/990/0
	ED	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	3/90/0
	HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0	3/231/0
	AC	Autoclave 121C	96 Hours	1/77/0	-	3/231/0	-
	UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	-	-	3/231/0
	TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	3/231/0	3/231/0
	HTSL	High Temp Storage Bake 170C	420 Hours	-	-	-	3/231/0
	HTSL	High Temp Storage Bake 175C	500 Hours	-	-	3/231/0	-
	HTOL	Life Test, 150C	300 Hours	-	-	3/231/10 (1)	3/231/0
	ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	1/800/0	-
	HBM	ESD - HBM	2500 V	-	1/3/0	-	-
	HBM	ESD - HBM	3000 V	-	-	3/9/0	3/9/0
	CDM	ESD - CDM	1500 V	-	1/3/0	2/6/0	3/9/0
	LU	Latch-up	Per JESD78	-	1/6/0	3/18/0	6/36/0
	MSL	Moisture Sensitivity, L2	Level 2-260C	-	1/12/0	3/36/0	-

	Type	Test Name / Condition	Duration	Qual Device: OPA2991IDR	QBS Product Reference: OPA2991IDR	QBS Process Reference: OPA4990IDR	QBS Package Reference: OPA2990IDR
	WBP	Bond Pull	Wires	-	1/76/0	3/228/0	3/228/0
	WBS	Ball Bond Shear	Wires	-	1/76/0	3/228/0	3/228/0

- QBS: Qual By Similarity
- Qual Device OPA2991IDR is qualified at LEVEL1-260C
- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours
- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours
- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/
Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green
NOTE (1): Fails due to faulty BI sockets. See 8D attached to the eQDB.

Qualification Report
Approve Date 21-May-2021

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

	Type	Test Name / Condition	Duration	Qual Device: OPA4991IDR	QBS Product Reference: OPA4991IDR	QBS Process / Package Reference: OPA4990IDR
	PC	PreCon Level 1	Level 1-260C	1/80/0	-	-
	PC	PreCon Level 2	Level 2-260C	-	1/166/0	3/1477/0
	ED	Electrical Characterization	Per Datasheet Parameters	-	3/90/0	3/90/0
	HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	3/231/0
	AC	Autoclave 121C	96 Hours	1/77/0	1/77/0	3/231/0
	TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	1/77/0	3/231/0
	HTSL	High Temp Storage Bake 175C	500 Hours	-	-	3/231/0
	HTOL	Life Test, 150C	300 Hours	-	1/77/0	3/231/10 (1)
	ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	1/800/0
	HBM	ESD - HBM	4000 V	-	3/9/0	-
	HBM	ESD - HBM	3000 V	-	-	3/9/0
	CDM	ESD - CDM	1500 V	-	3/9/0	2/6/0
	LU	Latch-up	Per JESD78	-	3/18/0	3/18/0
	MSL	Moisture Sensitivity, L1	Level 1-260C	1/12/0	-	-
	MSL	Moisture Sensitivity, L2	Level 2-260C	-	1/12/0	3/36/0
	WBP	Bond Pull	Wires	-	1/76/0	3/228/0
	WBS	Ball Bond Shear	Wires	-	1/76/0	3/228/0

- QBS: Qual By Similarity
- Qual Device OPA4991IDR is qualified at LEVEL2-260C
- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours

- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours
- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/
Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green
NOTE (1): Fails due to faulty BI sockets. See 8D attached to the eQDB.

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

Location	E-Mail
WW Change Management Team	PCN_ww_admin_team@list.ti.com

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