12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20240723004.1
Qualification of FFAB using qualified Process Technology, Die Revision, and additional Assembly site/BOM options for select devices
Change Notification / Sample Request

Date: July 23, 2024
To: MOUSER 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 and approval of this 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 Change Management team. For sample requests or sample related questions, contact your local Field Sales Representative. As always, we thank you for your continued business.

Change Management Team
SC Business Services

20240723004.1
Attachment: 1

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, you have recently purchased these devices. The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
LM7321MAX/NOPB	NULL
LM7322MAX/NOPB	NULL
LM7322MM/NOPB	NULL
LM7332MAX/NOPB	NULL
LM7332MMX/NOPB	NULL
LM8272MMX/NOPB	NULL

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

PCN Number:	20240723004.1	**PCN Date:**	July 23, 2024
Title:	Qualification of FFAB using qualified Process Technology, Die Revision, and additional Assembly site/BOM options for select devices		
Customer Contact:	Change Management Team	**Dept:**	Quality Services
Proposed 1st Ship Date:	October 21, 2024	**Sample requests accepted until:**	August 22, 2024*

***Sample requests received after August 22, 2024 will not be supported.**

Change Type:

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

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of its FFAB fabrication facility as an additional Wafer Fab option in addition to Assembly site/BOM options for the devices listed below.

Current Fab Site			Additional Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
DL-LIN	VIP	200 mm	FFAB	BICOMHD	200 mm

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

Construction differences are as follows:

Group 1 device (TIEMA to MLA)

	TIEMA	MLA
Mount compound	8075531	4147858
Mold compound	8095179	4211880
Lead finish	Matte Sn	NiPdAu

Group 2 device (TIEMA to HFTF)

	TIEMA	HFTF
Mount compound	8075531	A-18
Mold compound	8096859	R-30

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
FR-BIP-1	**TID**	**DEU**	**Freising**

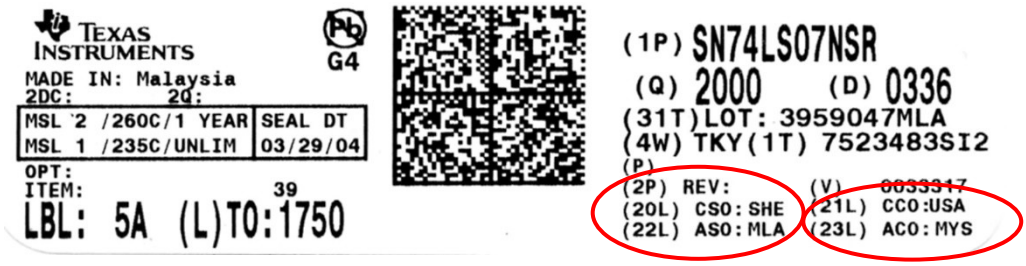
Die Rev:

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

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TIEMA	CU6	MYS	Melaka
MLA	**MLA**	**MYS**	**Kuala Lumpur**
HFTF	**HFT**	**CHN**	**Hefei**

Sample product shipping label (not actual product label)



Group 1 Product Affected:

LM7321MAX/NOPB	LM7322MAX/NOPB	LM7332MAX/NOPB

Group 2 Product Affected:

LM7322MM/NOPB	LM7332MMX/NOPB	LM8262MMX/NOPB	LM8272MMX/NOPB

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: OPA994IDR	QBS Process Reference: THS3491IDDAR	QBS Process Reference: OPA2810IDGKR	QBS Package Reference: XTHP210DR	QBS Package Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVDA195QDRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	-	3/231/0
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0	3/231/0	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	3/135/0	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	3/231/0	3/231/0	3/231/0	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	1/45/0
HTOL	B1	Life Test	125C	1000 Hours	-	-	3/231/0	-	-	3/231/0

Type	#	Test Name	Condition	Duration	Qual Device: OPA994IDR	QBS Process Reference: THS3491IDDAR	QBS Process Reference: OPA2810IDGKR	QBS Package Reference: XTHP210DR	QBS Package Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVDA195QDRQ1
HTOL	B1	Life Test	150C	300 Hours	-	3/231/0	-	-	3/231/0	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/3000/0	-	3/2400/0	3/2400/0
ELFR	B2	Early Life Failure Rate	70C (self heating brings Tj up to 150C)	24 Hours	-	3/3000/0	-	-	-	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	-	1/15/0	1/15/0
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	-	1/15/0	1/15/0
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	-	-	3/30/0	3/30/0
ESD	E2	ESD CDM	-	1500 Volts	-	-	-	-	-	1/3/0
ESD	E2	ESD CDM	-	250 Volts	1/3/0	3/9/0	3/9/0	-	-	-
ESD	E2	ESD CDM	-	500 Volts	-	-	-	-	1/3/0	-
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	3/9/0	3/9/0	-	-	-
ESD	E2	ESD HBM	-	11000 Volts	-	-	-	-	-	1/3/0
ESD	E2	ESD HBM	-	12000 Volts	-	-	-	-	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	-	1/3/0	-

Type	#	Test Name	Condition	Duration	Qual Device: OPA994IDR	QBS Process Reference: THS3491IDDAR	QBS Process Reference: OPA2810IDGKR	QBS Package Reference: XTHP210DR	QBS Package Reference: OPA2863QDRQ1	QBS Package Reference: SN65HVDA195QDRQ1
ESD	E2	ESD HBM	-	4000 Volts	-	-	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	1/3/0	3/18/0	3/9/0	-	1/6/0	1/6/0
CHAR	E5	Electrical Characterization	Min, Typ, Max Temp	-	1/30/0	3/90/0	3/90/0	-	-	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	3/90/0	-	-	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	-	-	3/90/0	3/90/0

- QBS: Qual By Similarity
- Qual Device OPA994IDR is qualified at MSL1 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/

TI Qualification ID: R-NPD-2302-064

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: OPA2994IDGKR	QBS Reference: OPA2810IDGKR	QBS Reference: XOPA1637DGKT	QBS Reference: OPA2991QDGKRQ1	QBS Reference: LM5008MM/NOPB	QBS Reference: OPA810IDBVR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0	3/231/2	3/231/0	3/231/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	3/231/0	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0	-	3/231/0	3/231/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	3/231/0	3/231/0	-	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	175C	630 Hours	-	-	-	3/135/0	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	-	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	3/231/0	-	-	-
HTOL	B1	Life Test	150C	408 Hours	-	-	-	3/231/1[1]	-	-

Type	#	Test Name	Condition	Duration	Qual Device: OPA2994IDGKR	QBS Reference: OPA2810IDGKR	QBS Reference: XOPA1637DGKT	QBS Reference: OPA2991QDGKRQ1	QBS Reference: LM5008MM/NOPB	QBS Reference: OPA810IDBVR
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	3/3000/0	-	3/2400/4[2]	-	-
ELFR	B2	Early Life Failure Rate	150C	24 Hours	-	-	3/2399/0	-	-	-
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	-	3/228/0	-
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	-	-
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	1/15/0	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	-	3/30/0	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	3/9/0	3/9/0	-	-	1/3/0
ESD	E2	ESD HBM	-	1000 Volts	-	3/9/0	3/9/0	-	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	1/3/0	-	-
LU	E4	Latch-Up	Per JESD78	-	-	3/9/0	3/18/0	1/6/0	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	-	3/90/0	3/90/0	3/90/0	-	1/30/0
FTY	E6	Final Test Yield	-	-	1/Pass	-	-	-	-	-

- QBS: Qual By Similarity
- Qual Device OPA2994IDGKR is qualified at MSL1 250C

- 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/

TI Qualification ID: R-NPD-2210-082

[1]-One unit failed Vio due to bad BI socket contact
[2]-Three units failed Vio due to bad BI socket contact
and one EOS failure due to reverse-insertion - discounted

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: OPA2994IDR	QBS Process Reference: THS3491IDDAR	QBS Package Reference: TCAN1044VDRQ1	QBS Process Reference: THS2630SDR	QBS Package Reference: SN65HVDA195QDRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	-	-	3/231/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	-	3/231/0
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	3/231/0	-	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	3/231/0	-	3/231/0
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	3/231/0	-	-	1/45/0
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	-	3/231/0
HTOL	B1	Life Test	140C	480 Hours	-	-	-	1/77/0	-
HTOL	B1	Life Test	70C Vcc Max (self heating brings Tj up to 150C)	300 Hours	-	3/231/0	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	-	3/2400/0
ELFR	B2	Early Life Failure Rate	70C (self heating brings Tj up to 150C)	24 Hours	-	3/3000/0	-	-	-

Type	#	Test Name	Condition	Duration	Qual Device: OPA2994IDR	QBS Process Reference: THS3491IDDAR	QBS Package Reference: TCAN1044VDRQ1	QBS Process Reference: THS2630SDR	QBS Package Reference: SN65HVDA195QDRQ1
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	-	1/15/0
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	3/66/0	-	1/15/0
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	3/30/0
ESD	E2	ESD CDM	-	1500 Volts	-	-	-	-	1/3/0
ESD	E2	ESD CDM	-	250 Volts	1/3/0	3/9/0	-	1/3/0	-
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	3/9/0	-	1/3/0	-
ESD	E2	ESD HBM	-	11000 Volts	-	-	-	-	1/3/0
ESD	E2	ESD HBM	-	12000 Volts	-	-	-	-	1/3/0
ESD	E2	ESD HBM	-	4000 Volts	-	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	1/3/0	3/18/0	-	1/3/0	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	-	1/30/0	3/90/0
FTY	E6	Final Test Yield	-	-	-	-	-	1/Pass	-

- QBS: Qual By Similarity
- Qual Device OPA2994IDR is qualified at MSL1 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/

TI Qualification ID: R-NPD-2201-109

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

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

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