12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20230228008.1
Qualification of new Fab site (FFAB) using qualified Process Technology, Die Revision and additional Assembly BOM options for select devices
Change Notification / Sample Request

Date: March 07, 2023
To: TOKYO ELECTRON DEVICE (DSTR) 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

20230228008.1
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
OPA2277UA	null
OPA2277UA/2K5	null
OPA2277UA/2K5E4	null

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

PCN Number:	20230228008.1	PCN Date:	March 07, 2023
Title:	Qualification of new Fab site (FFAB) using qualified Process Technology, Die Revision and additional Assembly BOM options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Jun 7, 2023	Sample requests accepted until:	Apr 7, 2023*

***Sample requests received after April 7, 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 (FFAB, BICOM3XHV) and assembly BOM options (MLA) for selected devices as 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**
SFAB	JIBB	150 mm	FFAB	BICOM3XHV	200 mm

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

Assembly BOM options are noted below:

	Current	Additional
Wire Type	1.2 mil Au	1.0 mil Cu
Mount compound	4205846	4147858
Mold compound	4209640	4226323
Die coat step	TI Malaysia	Bump Site

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
SH-BIP-1	SHE	USA	Sherman
FR-BIP-1	**TID**	**DEU**	**Freising**

Die Rev:

Current	**New**
Die Rev [2P]	**Die Rev [2P]**
D	**A**

Sample product shipping label (not actual product label)

Product Affected:

OPA2277UA	OPA2277UA/2K5E4	OPA2277UAE4	OPA2277UAG4
OPA2277UA/2K5			

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

Qualification Report

Approve Date 01-Jul-2022

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: OPA2277U	QBS Process Reference: OPA1637DGKR	QBS Package Reference: INA849D
HTOL	Life Test, 100C [B]	300 Hours	-	-	1/77/0
HTOL	Life Test, 150C	300 Hours	-	3/231/0	-
ELFR	Early Life Failure Rate, 150C	24 Hours	-	3/2400/1[A]	-
HBM	ESD - HBM	2000V	1/3/0	3/9/0	1/3/0
HBM	ESD - HBM	2500V	1/3/0	3/9/0	1/3/0
HBM	ESD - HBM	3000V	1/3/0	-	-
HBM	ESD - HBM	4000V	1/3/0	-	-
CDM	ESD - CDM	1000V	1/3/0	3/9/0	1/3/0
CDM	ESD - CDM	1500V	1/3/0	3/9/0	1/3/0
LU	Latch-up	Per JESD78, Class 2	1/6/0	3/18/0	1/6/0
LU	Latch-up	Per JESD78, Class 1	1/6/0	3/30/0	1/6/0
ED	Electrical Characterization	Per Datasheet Parameters	1/30/0	3/90/0	1/30/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	-
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	3/231/0	3/231/0
THB	Biased Temperature and Humidity, 85C/85%RH	1000 Hours	-	-	3/231/0
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	3/231/0	3/231/0

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
A - Crack at die corner under bond pad. Not stress related. See attached 8D in qualification plan.
B -Tj of device at 150C

- 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

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

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) or other applicable terms available either on 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.