12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN#20220802000.1
Qualification of new Fab site (FFAB) using qualified Process Technology, Die Revision, and additional Assembly, Datasheet & BOM option for select devices

Change Notification / Sample Request

Date: August 03, 2022
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

20220802000.1
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
INA128P	null
INA128U	null
INA128UA	null
INA128UA/2K5	null
INA128UAE4	null
INA128U/2K5	null
INA128UAG4	null
INA129UA/2K5	null
INA128PA	null
INA129U	null
INA129U/2K5	null
INA128UA/2K5E4	null
INA128U-2/2K5	null
INA128U/2K5G4	null
INA128UA/2K5G4	null
INA129UA	null

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

PCN Number:	20220802000.1	**PCN Date:**	August 03, 2022
Title:	Qualification of new Fab site (FFAB) using qualified Process Technology, Die Revision, and additional Assembly, Datasheet & BOM options for select devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Oct 31, 2022	**Sample Requests accepted until:**	Sept 3, 2022*

***Sample requests received after Sept 3, 2022 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) die revision, and Assembly & BOM option for selected devices as listed below in the product affected section. Construction differences are noted below:

Current Fab Site			Additional Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
SFAB	JI1	150 mm	FFAB	BICOM3XHV	200 mm

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

Additionally, there will be a BOM/Assembly options introduced for these devices in Group 1 below:

	MLA Current	**MLA Alternate**
Bond wire composition, diameter	Au, 1.2 mils	Cu, 1.0 mil
Mold Compound	4209640	4226323
Mount Compound	4205846	4147858

The datasheets will be changing as a result of the above mentioned changes. The datasheet change details can be reviewed in the datasheet revision history. The link to the revised datasheet is available in the table below.

Changes from Revision E (April 2019) to Revision F (May 2022) **Page**

- Updated the numbering format for tables, figures, and cross-references throughout the document....1
- Added bandwidth and noise specifications in *Features* 1
- Changed *Applications* to link to latest end-equipment solutions on ti.com....1
- Changed reference from INA819 to INA818 in *Device Comparison Table* 4
- Added single supply specification to *Absolute Maximum Ratings* 5
- Added note clarifying output short-circuit "to ground" in *Absolute Maximum Ratings* refers to short-circuit to V_S / 2....5
- Added single supply specification to *Recommended Operating Conditions* 5
- Changed input common-mode voltage range specification from V – 2 to (V–) + 2 in *Recommended Operating Conditions* 5
- Deleted INA128-HT and INA129-HT operating temperature specifications from *Recommended Operating Conditions* 5
- Added specified temperature range to *Recommended Operating Conditions* 5
- Added V_{REF} = 0 V, V_{CM} = V_S / 2, and G = 1 to "unless otherwise noted" conditions in *Electrical Characteristics* and *Typical Characteristics* for clarity....6
- Changed test condition for offset voltage drift specification in *Electrical Characteristics* from "T_A = T_{MIN} to T_{MAX}" to "T_A = –40°C to +85°C" for clarity....6
- Changed typical long-term stability specification from ±0.1±3/G µV/mo to ±0.2±3/G µV/mo in *Electrical Characteristics* 6
- Changed common-mode voltage specification from (V–) + 2 V minimum and (V+) – 2 V minimum across two rows to (V–) + 2 V minimum and (V+) – 2 V maximum across one row in *Electrical Characteristics* 6
- Deleted typical common-mode voltage specifications in *Electrical Characteristics* 6
- Added test condition of "R_S = 0 Ω" to safe input voltage specification in *Electrical Characteristics* for clarity....6
- Added test condition of "T_A = –40°C to +85°C" to input bias current drift specification in *Electrical Characteristics* for clarity....6
- Added test condition of "T_A = –40°C to +85°C" to input offset current drift specification in *Electrical Characteristics* for clarity....6
- Changed maximum gain error specification for INA128PA/UA and INA129PA/UA with G = 1 from ±0.01% to ±0.1% in *Electrical Characteristics* 6
- Added test condition of "T_A = –40°C to +85°C" for gain drift in *Electrical Characteristics* for clarity....6
- Changed parameter names from "Voltage - Positive" to "Positive output voltage swing" and from "Voltage - Negative" to "Negative output voltage swing" in *Electrical Characteristics* 6
- Deleted typical positive and negative output voltage swing specifications in *Electrical Characteristics* 6
- Added test condition of "Continuous to V_S / 2" to short-circuit current specification in *Electrical Characteristics* for clarity....6
- Changed typical bandwidth specification for G = 10 from 700 kHz to 640 kHz in *Electrical Characteristics* 6
- Changed typical slew rate specification from 4 V/µs to 1.2 V/µs in *Electrical Characteristics* 6
- Changed typical settling time specification for G = 1, G = 10, and G = 100 from 7 µs, 7 µs, and 9 µs respectively to 12 µs, 12 µs, and 12 µs, in *Electrical Characteristics* 6
- Deleted redundant voltage range, operating temperature range, and specification temperature range specifications from *Electrical Characteristics* 6
- Changed Figures 7-1, 7-3, 7-4, 7-9, 7-10, 7-11, 7-16, 7-17, 7-20, 7-21....8
- Changed values discussed in *Input Common-Mode Range* from typical input common-mode voltage range values to maximum and minimum values....14
- Changed Figure 9-1 to fix missing text and include reference voltage....15
- Added more detailed guidance concerning REF pin in *Design Requirements* 15
- Changed Figures 9-6, 9-7....18
- Changed Figures 9-10 and 9-11 to fix missing text....19
- Added *Related Documentation* links to *Device and Documentation Support* 22

Products	Current Datasheet Number	New Datasheet Number	Link to full datasheet
INA128/9	SBOS051E	SBOS051F	https://www.ti.com/lit/ds/symlink/ina129.pdf?ts=1659050265615&ref_url=https%253A%252F%252Fwww.ti.com%252Fproduct%252FINA129%253FkeyMatch%253DINA129%2526tisearch%253Dsearch-everything%2526usecase%253DGPN

Reason for Change:

These changes are part of our multiyear plan to transition products from our 150-milimeter 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
FFAB	**FRE**	**DEU**	**Freising**

Die Rev:

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

Sample product shipping label (not actual product label)

Product Affected:

Group 1 Device list (Wafer fab, die revision, BOM and Datasheet changes)

INA128U	INA128UAE4	INA129U/2K5	INA128U/2K5G4
INA129U	INA128UAG4	INA128UA/2K5	INA128UA/2K5E4
INA128UA	INA129UAE4	INA129UA/2K5	INA128UA/2K5G4
INA129UA	INA128U/2K5	INA128U-2/2K5	INA129UA/2K5G4
INA128UG4			

Group 2 Device list (Datasheet changes only)

INA128P	INA128PA	INA128PG4	INA129PG4
INA129P	INA129PA		

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

TI Information
Selective Disclosure

Qualification Report

Approve Date 01-Apr-2022

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

Type	Test Name / Condition	Duration	Qual Device: INA128U	QBS Process Reference: INA828ID	QBS Package Reference: INA849D
HTOL	Life Test, 100C[A]	300 Hours	-	-	1/77/0
HTOL	Life Test, 150C	300 Hours	-	3/231/0	-
HBM	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0
CDM	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0
LU	Latch-up	JEDEC78	1/6/0	1/6/0	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	-
HBM	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0
HTSL	High Temp Storage Bake 170C	420 Hours	-	3/231/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	-	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
- 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
[A] Tj of device at 150C

Change Number: C2011216
TI Qualification ID: 20201124-137263
- QBS: Qual By Similarity
- Qual Device INA128U 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

TEXAS INSTRUMENTS

TI Information
Selective Disclosure

Qualification Report

Approve Date 01-Apr-2022

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

Type	Test Name / Condition	Duration	Qual Device: INA129U	QBS Product Reference: INA128U	QBS Process Reference: INA828ID	QBS Package Reference: INA849D
HTOL	Life Test, 100C [A]	300 Hours	-	-	-	1/77/0
HTOL	Life Test, 150C	300 Hours	-	-	3/231/0	-
HBM	ESD - HBM	2000 V	-	1/3/0	1/3/0	1/3/0
CDM	ESD - CDM	1000 V	-	1/3/0	1/3/0	1/3/0
LU	Latch-up	JEDEC78	-	1/6/0	1/6/0	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	-	-	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
YLD	FTY and Bin Summary	-	1/Pass	-	-	-

- 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
[A] Tj of device at 150C

TI Qualification ID: 20210624-140661

For questions regarding this notice, e-mails can be sent to the contacts shown 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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