



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20230608002.1

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

Date: June 09, 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 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

20230608002.1
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
LF412CP	null
LF411CP	null
TL052ACP	null
TLC277CP	null
TLC272CP	null

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

PCN Number:	20230608002.1		PCN Date:	June 09, 2023	
Title:	Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, and additional Assembly BOM options for select devices				
Customer Contact:	Change Management team		Dept:	Quality Services	
Proposed 1st Ship Date:	Sep 9, 2023		Estimated Sample Availability:	Jul 9, 2023	
*Sample requests received after July 9, 2023 will not be supported.					
Change Type:					
<input type="checkbox"/> Assembly Site	<input checked="" type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Material	
<input type="checkbox"/> Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Process	
<input checked="" type="checkbox"/> Assembly Materials	<input type="checkbox"/>	Part number change	<input checked="" type="checkbox"/>	Wafer Fab Site	
<input type="checkbox"/> Mechanical Specification	<input type="checkbox"/>	Test Site	<input checked="" type="checkbox"/>	Wafer Fab Materials	
<input checked="" type="checkbox"/> Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input checked="" type="checkbox"/>	Wafer Fab Process	
PCN Details					
Description of Change:					
Texas Instruments is pleased to announce the qualification of a new fab & process technology (RFAB, LBC9) and additional Assembly BOM options 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
SFAB	J11	150 mm	RFAB	LBC9	300 mm
DL-LIN	LINCOS	150 mm			
The die was also changed as a result of the process change.					
Construction Differences are as follows:					
	Current		Proposed		
Wire type	0.96mil Au, 0.96mil Cu		0.8mil Cu		
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	
<input checked="" type="checkbox"/> No Change		<input checked="" type="checkbox"/> No Change		<input checked="" type="checkbox"/> No Change	
IEC 62474					
<input checked="" type="checkbox"/> No Change					

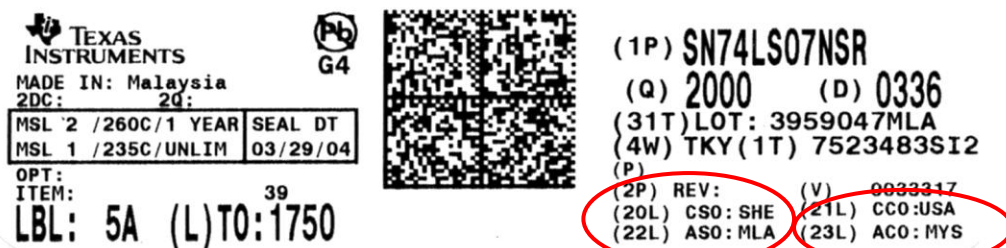
Changes to product identification resulting from this PCN:**Fab Site Information:**

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]
A, B, C, D, E	A, B

Sample product shipping label (not actual product label)

**Product Affected:**

LF411CP	TL052CP	TLC272ACP	TLC272CPE4
LF411CPE4	TL052IP	TLC272ACPE4	TLC272IP
LF412CP	TL072BCP	TLC272AIP	TLC272IPE4
TL051CP	TL082BCP	TLC272BCP	TLC277CP
TL051CPE4	TL082BCPE4	TLC272BCPE4	TLC277IP
TL052ACP	TL3472CP	TLC272BIP	
TL052AIP	TL3472IP	TLC272CP	

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

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: LF411CP	QBS Reference: OPA4990IDR	QBS Reference: LM2904BQDRQ1	QBS Reference: LT1013CP	QBS Reference: UCC37322P
HAST	A2	Biased HAST	130C	96 Hours	-	3/231/0	3/231/0	-	-
UHAST	A3	Autoclave	121C, 2 atm	96 Hours	-	3/231/5 ¹	-	-	3/231/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	-
UHAST	A3	Unbiased HAST	130C	192 Hours	-	-	3/231/0	-	-
TC	A4	Temperature Cycle	-65/150C	500 Cycles	-	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
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	3/135/0	-	-
HTOL	B1	Life Test	150C	300 Hours	-	3/231/10 ^{2,3}	-	-	-
HTOL	B1	Life Test	150C	408 Hours	-	-	3/231/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	1/800/0	3/2400/4 ^{4,5}	-	-
SD	C3	PB Solderability	Precondition w/155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-	-

Type	#	Test Name	Condition	Duration	Qual Device: LF411CP	QBS Reference: OPA4990IDR	QBS Reference: LM2904BQDRQ1	QBS Reference: LT1013CP	QBS Reference: UCC37322P
SD	C3	PB-Free Solderability	Precondition w/155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	1/15/0	-	-
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	-	-	-	3/66/0
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	-	3/9/0	-	-
LU	E4	Latch-Up	Per JESD78	-	-	3/18/0	3/18/0	-	-
CHAR	E5	Electrical Characterization	Min, Typ, Max Temp	-	-	3/90/0	-	-	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	3/90/0	-	-

- QBS: Qual By Similarity
- Qual Device LF411CP is qualified at NOT CLASSIFIED NOT CLASSIFIED

- 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/>

- [1]-Mechanical damage -Discounted
- [2]-Hardware - Discounted
- [3]-Hardware - Discounted
- [4]-Test Coverage Added
- [5]-Test Coverage Added

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLC272CP	QBS Reference: OPA4990DR	QBS Reference: LM2904BQORQ1	QBS Reference: NE5532P	QBS Reference: UCC37322P	QBS Reference: OPA2991DR
HAST	A2	Biased HAST	130C	96 Hours	-	3/231/0	-	-	-	-
HAST	A2	Biased HAST	130C	96 Hours	-	-	3/231/0	3/231/0	-	-
UHAST	A3	Autoclave	121C, 2 atm	96 Hours	-	-	-	-	3/231/0	-
UHAST	A3	Unbiased HAST	130C	192 Hours	-	-	3/231/0	-	-	-
TC	A4	Temperature Cycle	-65/150C	500 Cycles	-	3/231/0	3/231/0	-	3/231/0	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	3/231/0	-	-	3/231/0	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	3/135/0	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	3/231/10 ^{2,3}	-	3/231/0	-	-
HTOL	B1	Life Test	150C	408 Hours	-	-	3/231/0	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	1/800/0	-	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/4 ^{4,5}	-	-	-

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	-	-	-
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	-	-	3/66/0	3/66/0	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	-	3/9/0	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	3/18/0	-	-	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	Pass	3/90/0	-	-	-	1/30/0

- QBS: Qual By Similarity
-
- 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

[1]- Mechanical Damage and or handling

[2]-Mechanical Damage and or handling

[3]-Mechanical Damage and or handling

[4]-Precon and ELFR fails due to a defect screenable at production test.

[5]-Precon and ELFR fails due to a defect screenable at production test.

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

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 disdains 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.