



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN#20231219004.1

**Qualification of RFAB as an additional Fab site option, die revision, and new
Assembly site/BOM Options for select devices
Change Notification / Sample Request**

Date: December 21, 2023

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

20231219004.1
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
TPS5430DDAR	
TPS5430DDA	null
TPS5410DR	null
TPS5410D	null
TPS5420DR	null
TPS5420D	null
TPS5431DDA	null
TPS5431DDAR	null

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

PCN Number:	20231219004.1		PCN Date:	December 21, 2023	
Title:	Qualification of RFAB as an additional Fab site option, die revision, and new Assembly site/BOM Options for select devices				
Customer Contact:	Change Management Team		Dept:	Quality Services	
Proposed 1st Ship Date:	Mar 19, 2024		Sample requests accepted until:	Jan 20, 2024*	
*Sample requests received after Jan 20, 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 RFAB fabrication facility as an additional Wafer Fab option and die revision in addition to 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	LBC4	150mm	RFAB	LBC9	300mm
CFAB		200mm			
The die was also changed as a result of the process change.					
Construction differences are as follows (No constructions differences for Group 2 Devices :					
Group 1 BOM Table (RFAB/Process migration, Die Change & Qualify ASES as an additional Assembly site):					
		AP1	ASES		
	Mold Compound	SID#101379294	SID#EN2000784		
	Mount Compound	SID#101374994	SID#EY1000102		
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
CFAB	CU3	CHN	Chengu
RFAB	RFB	USA	Richardson

Die Rev:**Current****New**

Die Rev [2P]	Die Rev [2P]
A	A

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
AP1	AKR	PHL	Cupang, Muntinlupa City
ASESH	ASH	CHN	Shanghai

Sample product shipping label (not actual product label):

**Product Affected:****Group 1 Device list (RFAB/Process migration, Die Change & Qualify ASES as an additional Assembly site):**

TPS5430DDA	TPS5430DDAR	TPS5431DDA	TPS5431DDAR
------------	-------------	------------	-------------

Group 2 Device list (RFAB/Process migration, Die change only):

TPS5410D	TPS5410DR	TPS5420D	TPS5420DR
----------	-----------	----------	-----------

For alternate parts with similar or improved performance, please visit the product page on [TI.com](https://www.ti.com)

Qualification Report

Approve Date 30-August-2023

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: LMR54450DDARR	Wafer fab QBS Reference: LMR33620CQRNXTQ1	Package QBS Reference: LMR38010FDDAR
HAST	A2	Temperature Humidity Bias	85C/85%RH	1000 Hours	QBS		-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		-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	QBS		3/231/0
HTOL	B1	Life Test	125C	1000 Hours	1/77/0	3/231/0	
ESD	E2	ESD CDM	-	750 Volts	1/3/0		-
ESD	E2	ESD HBM	-	2500 Volts	1/3/0		-
LU	E4	Latch-Up	Per JESD78	-	1/6/0		-

- QBS: Qual By Similarity
- Qual Device LMR54450DDAR 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-2203-106

Change Qualification Summary (As per AEC-Q100 and JEDEC Guidelines)

Qualification for TPS542xQDRQ1 family in RFAB
Approve Date 10-August-2023

Product Attributes

Attributes	Qual Device: TPS5420QDRQ1	QBS Reference: LMR33620CQRNXTQ1	QBS Reference: SN65HVDA1040AQDRQ1	QBS Reference: TLV9064QDRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Product Function	Power Management	Power Management	Interface	-
Wafer Fab Supplier	RFAB	RFAB	DL-LIN	RFAB
Assembly Site	MLA	UTL1	MLA	MLA
Package Group	SOIC	-	-	SOIC
Package Designator	D	RNX	D	D
Pin Count	8	12	8	14

- QBS: Qual By Similarity
- Qual Device TPS5420QDRQ1 is qualified at MSL1 260C

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: TPS5420QDRQ1	QBS Reference: LMR33620CQRNXTQ1	QBS Reference: Package #1 SN65HVDA1040AQDRQ1	QBS Reference: package #2 TLV9064QDRQ1
Test Group A - Accelerated Environment Stress Tests											
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	1/154/0		3/693/0	
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-		-	3/693/0 plus 1/45/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C	96 Hours	-			-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	1/77/0		3/231/0	3/231/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	-		3/231/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65/150C	500 Cycles	1/77/0		3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0		-	-
PTC	A5	JEDEC JESD22-A105	1	45	PTC	-40/125C	1000 Cycles	-		-	1/45/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	-		-	3/231/0
Test Group B - Accelerated Lifetime Simulation Tests											
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	125C	1000 Hours	1/77/0	3/231/0		
ELFR	B2	AEC Q100-008	1	77	Early Life Failure Rate	125C	48 Hours	-	3/2400/0		

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: TPS5420QDRQ1	QBS Reference: LMR33620CQRNXTQ1	QBS Reference: Package #1 SN65HVDA1040AQDRQ1	QBS Reference: package #2 TLV9064QDRQ1
------	---	-----------	-------------	----------	-----------	-----------	----------	---	---	---	---

Test Group C - Package Assembly Integrity Tests

WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	-		
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	-		
SD	C3	JEDEC J-STD-002	1	15	PB Solderability	>95% Lead Coverage	-	-	-		
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	-	-		
PD	C4	JEDEC JESD22-B100 and B108	1	10	Physical Dimensions	Cpk>1.67	-	1/10/0		3/30/0	

Test Group D - Die Fabrication Reliability Tests

EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Tddb	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: TPS5420QDRQ1	QBS Reference: LMR33620CQRNXTQ1	QBS Reference: Package #1 SN65HVDA1040AQDRQ1	QBS Reference: package #2 TLV9064QDRQ1
------	---	-----------	-------------	----------	-----------	-----------	----------	---	---	---	---

Test Group E - Electrical Verification Tests

ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	1/3/0			
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0			
LU	E4	AEC Q100-004	1	6	Latch-Up	Per AEC Q100-004	-	1/6/0			
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	3/30/0			

Additional Tests

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable. 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

Ambient Operating Temperature by Automotive Grade Level:

- Grade 0 (or E): -40C to +150C
- Grade 1 (or Q): -40C to +125C
- Grade 2 (or T): -40C to +105C
- Grade 3 (or I): -40C to +85C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

- Room/Hot/Cold : HTOL, ED
- Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
- Room : AC/HAST

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

TI Qualification ID: R-NPD-2203-107

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 disdaims 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.