TEXAS INSTRUMENTS **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
**To:** Newark/Farnell 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

**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 |
| --- | --- |
| TPS5430DDA | 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 ASESH as an additional Assembly site):**

| | AP1 | ASESH |
|---|---|---|
| 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 ASESH 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](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 |
| **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 applicablePreconditioning 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/uHAST

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.


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