| PCN Number: | 20220909000.1 | PCN Date: | September 12, 2022 |
|---|---|---|---|
| Title: | Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, and additional Assembly sites & BOM options for select devices | | |
| Customer Contact: | PCN Manager | Dept: | Quality Services |
| Proposed 1st Ship Date: | Dec 8, 2022 | Sample Requests accepted until: | Oct 9, 2022* |

***Sample requests received after Oct 9, 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 (RFAB, TIB) 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 | JI2 | 150 mm | RFAB | TIB | 300 mm |

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

Additionally, there will be Assembly site & BOM options introduced for these devices as follows:

| | TFME | ASEWH | HNA | UTL2 | TIPI | CDAT |
|---|---|---|---|---|---|---|
| Lead finish | Matte Sn** | NiPdAu | NiPdAu | NiPdAu | NiPdAu | Matte Sn** |
| Mount Compound | SID# A-03 | SID#1120999A2 | SID#400180 | SID#PZ0001 | 8095733 | 4207123 |
| Mold Compound | SID#R-27 | SID#4020039A1 | SID#450179 | SID#CZ0096 | 4222198 | 4222198 |
| Bond wire composition, diameter | Cu, 1.0 or 0.8 mil | Au, 1.0 mil | Au, 1.0 mil | Au, 1.0 mil | Cu, 0.8 mil | Cu, 0.8 mil |

** G4 devices will not be built in TFME or CDAT

Devices in PDIP (P), SOP (PS), and TSSOP (PW) are included in EOL notice 20220909001.3.

**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 |
| **RFAB** | **RFB** | **USA** | **Richardson** |

**Die Rev:**

| **Current** | **New** |
|---|---|
| Die Rev [2P] | **Die Rev [2P]** |
| – | **A** |

| Assembly Site | Assembly Site Origin (22L) | Assembly Country Code (23L) | Assembly City |
|---|---|---|---|
| TFME | NFM | CHN | Economic Development Zone |
| ASEWH | AWH | CHN | Weihai |
| HNA | HNT | THA | Ayutthaya |
| UTL2 | NS2 | THA | Bangpakong, Chachoengsao |
| **TIPI** | **PHI** | **PHL** | **Baguio City** |
| **CDAT** | **CDA** | **CHN** | **Chengdu** |

Sample product shipping label (not actual product label)

**Product Affected:**

| | | | |
|---|---|---|---|
| TL431ACDBZR | TL431BIDBZRG4 | TL431QDBZRG4 | TL432BCDBZT |
| TL431ACDBZRG4 | TL431BIDBZT | TL431QDBZT | TL432BCDBZTG4 |
| TL431ACDBZT | TL431BIDBZTG4 | TL431QDBZTG4 | TL432BIDBZR |
| TL431ACDBZTG4 | TL431BQDBZR | TL432ACDBZR | TL432BIDBZR-P |
| TL431AIDBZR | TL431BQDBZRG4 | TL432ACDBZRG4 | TL432BIDBZRG4 |
| TL431AIDBZR-P | TL431BQDBZT | TL432ACDBZT | TL432BIDBZT |
| TL431AIDBZRG4 | TL431BQDBZTG4 | TL432ACDBZTG4 | TL432BIDBZTG4 |
| TL431AIDBZT | TL431CDBZR | TL432AIDBZR | TL432BQDBZR |
| TL431AIDBZTG4 | TL431CDBZRG4 | TL432AIDBZRG4 | TL432BQDBZRG4 |
| TL431AQDBZR | TL431CDBZT | TL432AIDBZT | TL432CDBZR |
| TL431AQDBZRG4 | TL431CDBZTG4 | TL432AIDBZTG4 | TL432CDBZRG4 |
| TL431AQDBZT | TL431IDBZR | TL432AQDBZR | TL432IDBZR |
| TL431AQDBZTG4 | TL431IDBZRG4 | TL432AQDBZRG4 | TL432IDBZRG4 |
| TL431BCDBZR | TL431IDBZT | TL432AQDBZT | TL432IDBZT |
| TL431BCDBZRG4 | TL431IDBZTG4 | TL432AQDBZTG4 | TL432IDBZTG4 |
| TL431BCDBZT | TL431LACDBZR-ND | TL432BCDBZR | TL432QDBZR |
| TL431BCDBZTG4 | TL431QDBZR | TL432BCDBZRG4 | TL432QDBZRG4 |
| TL431BIDBZR | | | |

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: TL431BQDBZR | QBS Process Reference: TIB 36V QEV |
|---|---|---|---|---|---|---|
| HAST | A2 | Biased HAST | 130C/85%RH | 96 Hours | 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 | 3/231/0 |
| HTSL | A6 | High Temperature Storage Life | 225C (Wafer Level) | 168 Hours | - | 1/45/0 |
| HTSL | A6 | High Temperature Storage Life | 150C | 1000 Hours | 3/231/0 | - |
| HTOL | B1 | Life Test | 150C | 300 Hours | 3/231/0 | - |
| HTOL | B1 | Life Test | 125C | 1000 Hours | - | 3/231/0 |
| ELFR | B2 | Early Life Failure Rate | 150C | 24 Hours | - | 3/2400/0 |
| ESD | E2 | ESD HBM | - | 1000 Volts | 3/9/0 | - |
| ESD | E2 | ESD HBM | - | 2000 Volts | 3/9/0 | - |
| ESD | E2 | ESD HBM | - | 4000 Volts | 3/9/0 | - |
| ESD | E3 | ESD CDM | - | 250 Volts | 3/9/0 | - |
| ESD | E3 | ESD CDM | - | 500 Volts | 3/9/0 | - |
| ESD | E3 | ESD CDM | - | 1500 Volts | 3/9/0 | - |
| LU | E4 | Latch-Up | Per JESD78 | - | 1/6/0 | - |
| CHAR | E5 | Electrical Characterization | Per Datasheet Parameters | - | 3/90/0 | 1/30/0 |
| MQ | - | MQ (Assembly) | Per Site Specification | - | 3/3/0 | - |
| MQ | - | MQ (Fab) | Per Site Specification | - | 3/3/0 | - |
| PCL | - | NVM Power Cycle | Room | 10K Cycles | - | 3/231/0 |

- QBS: Qual By Similarity
- Qual Device TL431BQDBZR is qualified at MSL1 260C. Concurrently qualifies TL43xyzDBZ Product Family, where x = 1/2 (Cat/Ref pin swap), y = {}/B/A (Accuracy grade), and z = C/I/Q (Temperature grade).

- 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

TI Qualification ID: R-NPD-2110-062

**Qualification Results**

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

| Type | Test Name / Condition | Duration | Qual Device: TLV809EA46DBZR | QBS Product Reference: TLV809EA46DBZR | QBS Product Reference: TPS3840DBVRQ1 | QBS Process Reference: TLV62568DBVR | QBS Package Reference: TL431LIBQDBZ |
|---|---|---|---|---|---|---|---|
| ACLV | Autoclave 121C | 96 Hours | - | - | - | 3/231/0 | 3/231/0 |
| DPA | Destructive Physical Analysis | Post TMCL | - | - | - | - | 3/90/0 |
| ED | Electrical Characterization | Per Datasheet Parameters | 1/30/0 | 3/90/0 | 3/90/0 | 3/90/0 | 3/90/0 |
| ELFR | Early Life Failure Rate, 125C | 48 Hours | - | - | - | 3/3000/0 | 3/2400/0 |
| HBM | ESD - HBM | 2500 V | - | 1/3/0 | 1/3/0 | - | 3/9/0 |
| HBM | ESD - HBM | 4000 V | - | 1/3/0 | 1/3/0 | - | - |
| CDM | ESD - CDM | 1500 V | - | 1/3/0 | 1/3/0 | - | 3/9/0 |
| HAST | Biased HAST, 130C/85%RH | 96 Hours | - | 3/231/0 | 3/231/0 | 3/231/0 | 3/231/0 |
| HTOL | Life Test, 150C | 300 Hours | - | - | - | 3/231/0 | 3/231/0 |
| HTOL | Life Test, 125C | 1000 Hours | - | 1/77/0 | 3/231/0 | - | - |
| HTSL | High Temp. Storage Bake, 170C | 420 Hours | - | - | - | 3/231/0 | - |
| HTSL | High Temp. Storage Bake, 150C | 1000 Hours | - | 3/231/0 | 3/231/0 | - | 3/231/0 |
| LU | Latch-up, 25C | (per JESD78) | - | 1/6/0 | 1/6/0 | 2/12/0 | 3/18/0 |
| LU | Latch-up, 125C | (per JESD78) | - | 1/6/0 | 1/6/0 | - | 3/18/0 |
| TC | Temperature Cycle, -65/150C | 500 Cycles | - | - | 3/231/0 | 3/231/0 | - |
| TC | Temperature Cycle, -65/150C | 1000 Cycles | - | 3/231/0 | - | - | 3/231/0 |
| SD | Solderability | Pb-Free | - | - | 1/15/0 | - | 3/66/0 |
| UHAST | UnBiased HAST, 130C/85%RH | 96 Hours | - | 3/231/0 | 2/231/0 | - | - |
| WBP | Bond Pull | Wires | - | - | 1/30/0 | - | 3/228/0 |
| WBS | Bond Shear | Wires | - | - | 1/30/0 | - | 3/228/0 |
| MQ | Manufacturing (Assembly) | Per Mfg Site Specification | - | 3/Pass | - | - | 3/3/0 |
| MSL | Moisture Sensitivity | MSL 1 @ 260C | - | - | - | - | 3/36/0 |

- QBS: Qual By Similarity
- Qual Device TLV809EA46DBZR is qualified at LEVEL1-260C
- Products to be concurrently qualified using stamped leadframe are voltage options from 1.7 to 4.63V with 3 output configurations namely: TLV803EXYYDBZR,TLV809EXYYDBZR, TLV810EXYYDBZR.

Where: X = delay options from A thru F; YY = Vth options from 17 thru 46. If an additional R character is in front of the package designator, this represents reversed pinout for the package. (Ex. RDBZR)

- 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 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 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

TI Qualification ID: 20200604-134548

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

| Type | Test Name / Condition | Duration | Qual Device: TLV803EA43VDBZR | QBS Package Reference: TLV9061IDBVR |
|---|---|---|---|---|
| AC | Autoclave 121C | 96 Hours | 3/231/0 | - |
| HAST | Biased HAST, 130C/85%RH | 96 Hours | - | 3/231/0 |
| HTOL | Life Test, 150C | 300 Hours | - | 3/231/0 |
| HTSL | High Temp Storage Bake 170C | 420 Hours | - | 3/231/0 |
| LI | Lead Fatigue | Leads | - | 3/54/0 |
| LI | Lead Pull | Leads | - | 3/66/0 |
| MISC | Salt Atmosphere | - | - | 3/66/0 |
| MQ | Manufacturability (Assembly) | (per mfg. Site specification) | Pass | Pass |
| PD | Physical Dimensions | (per mechanical drawing) | 3/15/0 | 3/15/0 |
| PKG | Lead Finish Adhesion | Leads | - | 3/54/0 |
| SD | Solderability | Pb Free | - | 3/66/0 |
| TC | Temperature Cycle, -65/150C | 500 Cycles | 3/231/0 | 3/231/0 |
| UHAST | Unbiased HAST 130C/85%RH | 96 Hours | - | 3/231/0 |
| VM | Visual / Mechanical | (per mfg. Site specification) | 3/984/0 | 3/984/0 |
| WBP | Bond Pull | Wires | 3/228/0 | 3/228/0 |
| WBS | Ball Bond Shear | Wires | 3/228/0 | 3/228/0 |

- QBS: Qual By Similarity
- Qual Device TLV803EA43VDBZR is qualified at LEVEL1-260CG
- 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

TI Qualification ID: 20210519-140142

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 |