

| PCN Number: | 20240327000.1 | | PCN Date: | March 28, 2024 | | | | | | | | | | | | | | | | | | | |
|---|--|-------------------------------------|---------------------------------------|-------------------------------------|---------------------|------------------|--|--|---------------------|--|--|------------------|---------|----------------|---------------------|---------|----------------|--------|-------|--------|------|------|--------|
| Title: | Qualification of RFAB using qualified Process Technology, Die Revision, and additional Assembly site options | | | | | | | | | | | | | | | | | | | | | | |
| Customer Contact: | Change Management team | | Dept: | Quality Services | | | | | | | | | | | | | | | | | | | |
| Proposed 1st Ship Date: | June 26, 2024 | | Estimated Sample Availability: | April 27, 2024* | | | | | | | | | | | | | | | | | | | |
| *Sample requests received after April 27, 2024 will not be supported. | | | | | | | | | | | | | | | | | | | | | | | |
| Change Type: | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | Assembly Site | <input checked="" type="checkbox"/> | Design | <input type="checkbox"/> | Wafer Bump Material | | | | | | | | | | | | | | | | | | |
| <input checked="" 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 addition of RFAB using the LBC9 qualified process technology and additional Assembly site (CDAT, TIPI) options for the device listed below. | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="3">Current Fab Site</th> <th colspan="3">Additional Fab Site</th> </tr> <tr> <th>Current Fab Site</th> <th>Process</th> <th>Wafer Diameter</th> <th>Additional Fab Site</th> <th>Process</th> <th>Wafer Diameter</th> </tr> </thead> <tbody> <tr> <td>DL-LIN</td> <td>LBC3S</td> <td>150 mm</td> <td>RFAB</td> <td>LBC9</td> <td>300 mm</td> </tr> </tbody> </table> | | | | | | Current Fab Site | | | Additional Fab Site | | | Current Fab Site | Process | Wafer Diameter | Additional Fab Site | Process | Wafer Diameter | DL-LIN | LBC3S | 150 mm | RFAB | LBC9 | 300 mm |
| Current Fab Site | | | Additional Fab Site | | | | | | | | | | | | | | | | | | | | |
| Current Fab Site | Process | Wafer Diameter | Additional Fab Site | Process | Wafer Diameter | | | | | | | | | | | | | | | | | | |
| DL-LIN | LBC3S | 150 mm | RFAB | LBC9 | 300 mm | | | | | | | | | | | | | | | | | | |
| The die was also changed as a result of the process change. | | | | | | | | | | | | | | | | | | | | | | | |
| Additionally, there will be a BOM options introduced for these devices: | | | | | | | | | | | | | | | | | | | | | | | |
| | TFME | UTL2 | TIPI | CDAT | | | | | | | | | | | | | | | | | | | |
| Bond wire | 1.0mil Au | Cu, 1.0 | 1.0 mil Cu | 0.8mil Cu | | | | | | | | | | | | | | | | | | | |
| Composition, diameter | SID# A-03 | SID#PZ0001 | 4207123 | 4207123 | | | | | | | | | | | | | | | | | | | |
| Mount Compound | SID#R-13 | SID#CZ0096 | 4222656 | 4222656 | | | | | | | | | | | | | | | | | | | |
| Mold Compound | Stripe | Stripe | Dot | Dot | | | | | | | | | | | | | | | | | | | |
| Pin 1 Marking | NiPdAu | NiPdAu | NiPdAu or Matte Sn | Matte Sn | | | | | | | | | | | | | | | | | | | |
| Lead finish | | | | | | | | | | | | | | | | | | | | | | | |
| NOTE: For TPS3813J25DBVR and TPS3813J25DBVT, TFME is the only current site. The remaining devices are at both TFME and UTL2 | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | IEC 62474 |
|---|---|---|---|
| <input checked="" type="checkbox"/> No Change | <input checked="" type="checkbox"/> No Change | <input checked="" type="checkbox"/> No Change | <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 |
| RFAB | RFB | USA | Richardson |

Die Rev:

| Current | New |
|--------------|---------------------|
| Die Rev [2P] | Die Rev [2P] |
| B | A |

Assembly/Test Site Information:

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

Sample product shipping label (not actual product label)


TEXAS INSTRUMENTS
 MADE IN: Malaysia
 2DC: 20:
 MSL '2 / 260C/1 YEAR SEAL DT
 MSL 1 / 235C/UNLIM 03/29/04
 OPT: 39
 ITEM:
LBL: 5A (L)T0:1750



(1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483SI2
 (P)
 (2P) REV: (V) 0033317
 (20L) CSO: SHE (21L) CCO: USA
 (22L) ASO: MLA (23L) ACO: MYS

Product Affected:

| | | | |
|----------------|----------------|----------------|----------------|
| TPS3813I50DBVR | TPS3813J25DBVR | TPS3813K33DBVR | TPS3813L30DBVR |
| TPS3813I50DBVT | TPS3813J25DBVT | TPS3813K33DBVT | TPS3813L30DBVT |

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

Qualification Report

TPS3813 Commercial Qualification LBC9-RFAB, DBV6-PHI Approve Date 04-March-2024

Qualification Results

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

| Type | # | Test Name | Condition | Duration | Qual Device: TPS3813K33DBVR | QBS Reference: TPS3813K33QDBVRQ1 |
|-------|----|-------------------------------|------------------------------|------------|--------------------------------|-------------------------------------|
| UHAST | A3 | Unbiased HAST | 130C/85%RH | 96 Hours | - | 1/77/0 |
| TC | A4 | Temperature Cycle | -65C/150C | 500 Cycles | - | 1/77/0 |
| HTSL | A6 | High Temperature Storage Life | 150C | 1000 Hours | - | 1/77/0 |
| PD | C4 | Physical Dimensions | Cpk>1.67 | - | - | 1/10/0 |
| ESD | E2 | ESD CDM | - | 500 Volts | - | 1/3/0 |
| ESD | E2 | ESD HBM | - | 2000 Volts | - | 1/3/0 |
| LU | E4 | Latch-Up | Per JESD78 | - | - | 1/6/0 |
| CHAR | E5 | Electrical Distributions | Cpk>1.67 Room, hot, and cold | - | - | 3/90/0 |
| FTY | E6 | Final Test Yield | - | - | 1/1/0 | 1/1/0 |

- QBS: Qual By Similarity
- Qual Device TPS3813K33DBVR 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-2301-021

Qualification Report

TPS3813 Commercial Qualification LBC9-RFAB, DBV6-CDAT
Approve Date 04-March-2024

Qualification Results

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

| Type | # | Test Name | Condition | Duration | Qual Device: TPS3813K33DBVR | QBS Reference: BQ79600PWRQ1 | QBS Reference: TPS3840PH30DBVRQ1 | QBS Reference: TPS3813K33QDBVRQ1 |
|------|----|-------------------------------|---|------------|--------------------------------|--------------------------------|-------------------------------------|-------------------------------------|
| HAST | A2 | Biased HAST | 130C/85%RH | 96 Hours | - | 3/231/0 | 3/231/0 | - |
| UHA | A3 | Autoclave | 121C/15psig | 96 Hours | - | 3/231/0 | 3/231/0 | - |
| UHA | A3 | Unbiased HAST | 130C/85%RH | 96 Hours | - | - | - | 1/77/0 |
| TC | A4 | Temperature Cycle | -65C/150C | 500 Cycles | - | 3/231/0 | 3/231/0 | 1/77/0 |
| HTSL | A6 | High Temperature Storage Life | 150C | 1000 Hours | - | 3/135/0 | 3/135/0 | 1/77/0 |
| HTOL | B1 | Life Test | 125C | 1000 Hours | - | 3/231/0 | 3/231/0 | - |
| ELFR | B2 | Early Life Failure Rate | 125C | 48 Hours | - | 3/2400/0 | - | - |
| SD | C3 | PB Solderability | Precondition w.155C Dry Bake (4 hrs +/- 15 minutes) | - | - | 1/15/0 | 1/15/0 | - |
| SD | C3 | PB-Free Solderability | Precondition w.155C Dry Bake (4 hrs +/- 15 minutes) | - | - | 1/15/0 | 1/15/0 | - |
| PD | C4 | Physical Dimensions | Cpk>1.67 | - | - | 3/30/0 | 3/30/0 | 1/10/0 |

| Type | # | Test Name | Condition | Duration | Qual Device: TPS3813K33DBVR | QBS Reference: BQ79600PWRQ1 | QBS Reference: TPS3840PH30DBVRQ1 | QBS Reference: TPS3813K33QDBVRQ1 |
|------|----|--------------------------|------------------------------|----------|--------------------------------|--------------------------------|-------------------------------------|-------------------------------------|
| CHAR | E5 | Electrical Distributions | Cpk>1.67 Room, hot, and cold | - | - | 2/60/0 | 3/90/0 | - |
| FTY | E6 | Final Test Yield | - | - | 1/1/0 | - | - | 1/1/0 |

- QBS: Qual By Similarity
- Qual Device TPS3813K33DBVR 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-2301-022

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