| | | | |
|---|---|---|---|
| **PCN Number:** | 20240116003.1 | **PCN Date:** | January 16, 2024 |
| **Title:** | Qualification of RFAB using qualified Process Technology and Die Revision for select devices | | |
| **Customer Contact:** | Change Management Team | **Dept:** | Quality Services |
| **Proposed 1st Ship Date:** | Apr 16, 2024 | **Sample requests accepted until:** | Feb 16, 2024* |

***Sample requests received after February 16, 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 addition of RFAB using the TIB qualified process technology for select 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 | JI1 | 150 mm | RFAB | TIB | 300 mm |

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

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

**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]** |
| F | **A** |

Sample product shipping label (not actual product label)


## Product Affected:

ULN2003ADR

**Qualification Results**

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

| Type | # | Test Name | Condition | Duration | Qual Device: ULN2003ADR | QBS Reference: MC33063ADR | QBS Reference: MC33063AQDRQ1 | QBS Reference: ULN2003ADR |
|---|---|---|---|---|---|---|---|---|
| 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 | 1/77/0 | 3/231/0 | - | - |
| HTSL | A6 | High Temperature Storage Life | 170C | 420 Hours | - | 3/231/0 | - | - |
| HTOL | B1 | Life Test | 125C | 1000 Hours | - | 2/154/0 | 3/231/0 | - |
| ELFR | B2 | Early Life Failure Rate | 125C | 48 Hours | - | 1/800/0 | 3/2400/0 | - |

| Type | # | Test Name | Condition | Duration | Qual Device: ULN2003ADR | QBS Reference: MC33063ADR | QBS Reference: MC33063AQDRQ1 | QBS Reference: ULN2003ADR |
|---|---|---|---|---|---|---|---|---|
| ESD | E2 | ESD CDM | - | 250 Volts | - | - | - | 1/3/0 |
| ESD | E2 | ESD HBM | - | 1000 Volts | - | - | - | 1/3/0 |
| LU | E4 | Latch-Up | Per JESD78 | - | - | - | - | 1/3/0 |
| CHAR | E5 | Electrical Characterization | Per Datasheet Parameters | - | 1/30/0 | - | - | 1/30/0 |

- QBS: Qual By Similarity
- Qual Device ULN2003ADR 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-CHG-2209-040

**Qualification Results**

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

| Type | # | Test Name | Condition | Duration | Qual Device: ULN2003ADR | QBS Reference: MC33063ADR | QBS Reference: MC33063ADR | QBS Reference: MC33063AQDRQ1 |
|---|---|---|---|---|---|---|---|---|
| HAST | A2 | Biased HAST | 130C/85%RH | 96 Hours | - | - | 3/231/0 | 3/231/0 |
| UHAST | A3 | Unbiased HAST | 130C/85%RH | 96 Hours | - | - | 3/231/0 | 3/231/0 |
| TC | A4 | Temperature Cycle | -65C/150C | 500 Cycles | 1/77/0 | - | 3/231/0 | 3/231/0 |
| HTSL | A6 | High Temperature Storage Life | 150C | 1000 Hours | - | - | - | 3/135/0 |
| HTSL | A6 | High Temperature Storage Life | 170C | 420 Hours | - | - | 3/231/0 | - |

| Type | # | Test Name | Condition | Duration | Qual Device: ULN2003ADR | QBS Reference: MC33063ADR | QBS Reference: MC33063ADR | QBS Reference: MC33063AQDRQ1 |
|---|---|---|---|---|---|---|---|---|
| HTOL | B1 | Life Test | 125C | 1000 Hours | - | 2/154/0 | 1/77/0 | 3/231/0 |
| ELFR | B2 | Early Life Failure Rate | 125C | 48 Hours | - | 1/800/0 | 2/1600/0 | 3/2400/0 |
| 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 |
| PD | C4 | Physical Dimensions | Cpk>1.67 | - | - | - | - | 3/30/0 |
| ESD | E2 | ESD CDM | - | 250 Volts | 1/3/0 | - | - | - |
| ESD | E2 | ESD HBM | - | 1000 Volts | 1/3/0 | - | - | - |
| LU | E4 | Latch-Up | Per JESD78 | - | 1/3/0 | - | - | - |
| CHAR | E5 | Electrical Characterization | Per Datasheet Parameters | - | 1/30/0 | - | - | - |

- QBS: Qual By Similarity
- Qual Device ULN2003ADR 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-CHG-2209-042

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

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