| PCN Number: | 20210326001.2 | PCN Date: | Mar 29, 2021 |
|---|---|---|---|
| Title: | Qualification of new Fab site (CFAB) using qualified Process Technology, Die Revision, Probe site, and additional Assembly site/BOM options for select devices | | |
| Customer Contact: | PCN Manager | Dept: | Quality Services |
| Proposed 1st Ship Date: | Sept 25, 2021 | Estimated Sample Availability: | Date provided at sample request. |

**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, (CFAB, JI3), die revisions, probe site, and AT (FMX) site/BOM (MLA) options 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 | JI1 | 150 mm | CFAB | JI3 | 200 mm |

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

Probe site change:

| | Current: | New: |
|---|---|---|
| Probe Site | TI Sherman-Probe (SH-BIP) | *None* |

Construction differences are noted below:

**Group 1 CFAB/Process migration & updated BOM in FMX for SOIC Devices:**

| | Current - FMX | New - FMX |
|---|---|---|
| Lead finish | NiPdAu, non RLF or RLF | NiPdAu, RLF |
| Mold Compound | 4211880 or 4205694 | 4211880 |
| Bond wire diameter | Cu, 1.0 mils or Au, 0.96 mils | Cu, 0.80 mils |

**Group 2 CFAB/Process migration & additional AT (FMX) for LBT-LM2903DR:**

| | MLA | FMX |
|---|---|---|
| Lead finish | NiPdAu, Non RLF | NiPdAu, RLF |
| Mount Compound | 4208458 | 4147858 |
| Mold Compound | 4209640 | 4211880 |
| Bond wire diameter | Au, 0.96 mils | Cu, 0.80 mils |

**Group 3 CFAB/Process migration & updated BOM in MLA for PW devices:**

| | Current - MLA | New - MLA |
|---|---|---|
| Lead finish | NiPdAu, RLF or Non RLF | NiPdAu, RLF |
| Bond wire diameter | Au, 0.96 mils or Cu, 1.0 mils | Cu, 0.80 mils |

**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

| Anticipated impact on Material Declaration | | | |
|---|---|---|---|
| ☐ | No Impact to the Material Declaration | ☒ | Material Declarations or Product Content reports are driven from production data and will be available following the production release. Upon production release the revised reports can be obtained from the TI ECO website. |

**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 |
| **CFAB** | **CU3** | **CHN** | **Chengdu** |

**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 |
|---|---|---|---|
| MLA | MLA | MYS | Kuala Lumpur |
| **FMX** | **MEX** | **MEX** | **Aguascalientes** |

Sample product shipping label (not actual product label)

**Product Affected:**

**Group 1 Device list: CFAB/Process migration & updated BOM in FMX for SOIC Devices:**

| | | | |
|---|---|---|---|
| LM2903DRCT | LM2903QDRQ1 | MLA00338DRG4 | LM2903VQDRG4Q1 |
| SN104611DR | LM2903VQDRQ1 | LM2903AVQDRQ1 | LM2903AVQDRG4Q1 |
| LM2903IDRDL | LM2903ZQDRQ1 | LM2903QDRG4Q1 | |

**Group 2 Device list: CFAB/Process migration & additional AT (FMX) for LBT-LM2903DR:**

| |
|---|
| LBT-LM2903DR |

**Group 3 Device list: CFAB/Process migration & updated BOM in MLA for PW devices:**

| | | | |
|---|---|---|---|
| MLA00414PWR | LM2903QPWRRB | LM2903AVQPWRQ1 | LM2903VQPWRG4Q1 |
| LM2903QPWRKN | LM2903VQPWRQ1 | LM2903QPWRG4Q1 | LM2903AVQPWRG4Q1 |
| LM2903QPWRQ1 | LM2903AVQPWRDL | LM2903QPWRRBG4 | |

**Group 1 & 2 (SOIC Devices) Qual report:**

Texas Instruments

TI Information
Selective Disclosure

# Approve Date 12-Mar-2021

## Product Attributes

| Attributes | Qual Device: LM2903AVQDRQ1 | QBS Package Reference: LM2904BQDRQ1 |
|---|---|---|
| **Operating Temp Range** | -40 to +125 C | -40 to +125 C |
| **Automotive Grade Level** | Grade 1 | Grade 1 |
| **Product Function** | Signal Chain | Signal Chain |
| **Wafer Fab Supplier** | CFAB | CFAB |
| **Die Revision** | A0 | B |
| **Assembly Site** | FMX | FMX |
| **Package Type** | SOIC | SOIC |
| **Package Designator** | D | D |
| **Ball/Lead Count** | 8 | 8 |

- QBS: Qual By Similarity
- Qual Device LM2903AVQDRQ1 is qualified at LEVEL1-260C

| | Type | # | Test Spec | Min Lot Qty | SS/Lot | Test Name / Condition | Duration | Qual Device: LM2903AVQDRQ1 | QBS Package Reference: LM2904BQDRQ1 |
|---|---|---|---|---|---|---|---|---|---|
| | Test Group A – Accelerated Environment Stress Tests | | | | | | | | |
| | | | AEC-Q006 | 3 | 11 | SAM Analysis, Pre Stress | - | 1/22/0 | 3/Pass |
| | PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Automotive Preconditioning | Level 2-260C | 1/308/0 | 3/1499/10 (1) |
| | | | AEC-Q006 | 3 | 11 | SAM Analysis, Post Stress | - | 1/22/0 | 3/Pass |
| | PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Automotive Preconditioning | Level 1-260C | 3/36/0 | - |
| | | | AEC-Q006 | 3 | 11 | SAM Analysis, Post Stress | - | 3/36/0 | - |
| | HAST | A2 | JEDEC JESD22-A110 | 3 | 77 | Biased HAST, 130C/85%RH | 96 Hours | 1/77/0 | 3/231/0 |
| | HAST | A2 | AEC-Q006 | 3 | 1 | Cross Section, Post bHAST 96 Hours | - | 1/1/0 | 3/3/0 |
| | HAST | A2 | AEC-Q006 | 3 | 3 | Wire Bond Shear, Post bHast, 96 Hours | - | 1/3/0 | 3/9/0 |
| | HAST | A2 | AEC-Q006 | 3 | 3 | Bond Pull over Stitch, post bHAST, 96 Hours | - | 1/3/0 | 3/9/0 |
| | HAST | A2 | AEC-Q006 | 3 | 3 | Bond Pull over Ball, Post bHAST, 96 Hours | - | 1/3/0 | 3/9/0 |
| | HAST | A2 | JEDEC JESD22-A110 | 3 | 70 | Biased HAST, 130C/85%RH | 192 Hours | 1/70/0 | 3/21/0 |
| | HAST | A2 | AEC-Q006 | 3 | 1 | Cross Section, Post bHAST 192 Hours | - | 1/1/0 | 3/3/0 |
| | HAST | A2 | AEC-Q006 | 3 | 22 | SAM Analysis, Post bHAST, 192 Hours | - | 1/22/0 | 3/66/0 |
| | HAST | A2 | AEC-Q006 | 3 | 2 | Wire Bond Shear, Post bHast, 192 Hours | - | 1/2/0 | 3/6/0 |
| | HAST | A2 | AEC-Q006 | 3 | 2 | Bond Pull over Stitch, post bHAST, 192 Hours | - | 1/2/0 | 3/6/0 |
| | HAST | A2 | - AEC-Q006 | 3 | 2 | Bond Pull over Ball, Post bHAST, 192 Hours | - | 1/2/0 | 3/6/0 |
| | UHAST | A3 | JEDEC JESD22-A118 | 3 | 77 | Unbiased HAST, 130C/85%RH | 96 Hours | 1/77/0 | 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 |
| | TC | A4 | - | 3 | 1 | Cross Section, Post T/C 500 Cycles | - | 1/1/0 | 3/3/0 |

| | Type | # | Test Spec | Min Lot Qty | SS/Lot | Test Name / Condition | Duration | Qual Device: LM2903AVQDRQ1 | QBS Package Reference: LM2904BQDRQ1 |
|---|---|---|---|---|---|---|---|---|---|
| | TC | A4 | - | 3 | 22 | SAM Analysis, Post T/C, 500 Cycles | - | 1/22/0 | 3/66/0 |
| | TC | A4 | - | 3 | 3 | Wire Bond Shear, Post T/C 500 Cycles | Wires | 1/3/0 | 3/9/0 |
| | TC | A4 | - | 3 | 3 | Bond Pull over Stitch Post T/C 500 Cycles | Wires | 1/3/0 | 3/9/0 |
| | TC | A4 | - | 3 | 3 | Bond Pull over Ball Post T/C 500 Cycles | Wires | 1/3/0 | 3/9/0 |
| | TC | A4 | JEDEC JESD22-A104 and Appendix 3 | 3 | 70 | Temperature Cycle, -65/150C | 1000 Cycles | 1/70/0 | 3/210/0 |
| | TC | A4 | - | 3 | 1 | Cross Section, Post T/C 1000 Cycles | - | 1/1/0 | 3/3/0 |
| | TC | A4 | - | 3 | 22 | SAM Analysis, Post T/C, 1000 Cycles | - | 1/22/0 | 3/66/0 |
| | TC | A4 | - | 3 | 2 | Wire Bond Shear, Post T/C 1000 Cycles | - | 1/2/0 | 3/6/0 |
| | TC | A4 | - | 3 | 2 | Bond Pull over Stitch, Post T/C, 1000 Cycles | - | 1/2/0 | 3/6/0 |
| | TC | A4 | - | 3 | 2 | Bond Pull over Ball, Post T/C, 1000 Cycles | - | 1/2/0 | 3/6/0 |
| | PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle -40/125C | 1000 Cycles | - | - |
| | PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle -40/125C | 2000 Cycles | - | - |
| | HTSL | A6 | JEDEC JESD22-A103 | 3 | 45 | High Temp Storage Bake 175C | 500 Hours | 1/45/0 | 3/135/0 |
| | HTSL | A6 | - | 3 | 1 | Cross Section, Post HTSL 500 Hours | - | 1/1/0 | 3/3/0 |
| | HTSL | A6 | JEDEC JESD22-A103 | 3 | 44 | High Temp Storage Bake 175C | 1000 Hours | 1/44/0 | 3/132/0 |
| | HTSL | A6 | - | 3 | 1 | Cross Section, Post HTSL 1000 Hours | - | 1/1/0 | 3/3/0 |
| | **Test Group B – Accelerated Lifetime Simulation Tests** | | | | | | | | |
| | HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 150C | 300 Hours | 3/231/0 | - |
| | ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 125C | 48 Hours | 1/800/0 | 3/2400/4 (1) |
| | **Test Group C – Package Assembly Integrity Tests** | | | | | | | | |
| | WBS | C1 | AEC Q100-001 | 3 | 30 | Wire Bond Shear, Cpk>1.67 | Wires | 3/90/0 | 3/90/0 |
| | WBP | C2 | MIL-STD883 Method 2011 | 3 | 30 | Bond Pull over Ball, Cpk >1.67 | Wires | 3/90/0 | 3/90/0 |

| | Type | # | Test Spec | Min Lot Qty | SS/Lot | Test Name / Condition | Duration | Qual Device: LM2903AVQDRQ1 | QBS Package Reference: LM2904BQDRQ1 |
|---|---|---|---|---|---|---|---|---|---|
| | SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb Free | 1/15/0 | 1/15/0 |
| | SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb | 1/15/0 | 1/15/0 |
| | PD | | JEDEC JESD22-B100 and B108 | 3 | 10 | Physical Dimensions | Cpk>1.67 | 3/30/0 | 3/30/0 |
| | **Test Group D – Die Fabrication Reliability Tests** | | | | | | | | |
| | EM | D1 | JESD61 | - | - | Electromigration | - | Completed Per Process Technology Requirements | - |
| | TDDB | D2 | JESD35 | - | - | Time Dependent Dielectric Breakdown | - | Completed Per Process Technology Requirements | - |
| | HCI | D3 | JESD60 & 28 | - | - | Hot Injection Carrier | - | Completed Per Process Technology Requirements | - |
| | NBTI | D4 | - | - | - | Negative Bias Temperature Instability | - | Completed Per Process Technology Requirements | - |
| | SM | D5 | - | - | - | Stress Migration | | Completed Per Process Technology Requirements | - |
| | **Test Group E – Electrical Verification Tests** | | | | | | | | |
| | HBM | E2 | AEC Q100-001 | 1 | 3 | ESD-HBM | 2000V | 3/9/0 | - |
| | CDM | E3 | AEC Q100-011 | 1 | 3 | ESD-CDM | 1500V | 3/9/0 | - |
| | LU | E4 | AEC Q100-004 | 1 | 6 | Latch-up, 125C | (Per AEC-Q100-004) | 3/18/0 | - |
| | ED | E5 | AEC Q100-009 | 3 | 30 | Electrical Distributions | Cpk>1.67 Room, hot, and cold test | 3/90/0 | - |

Note (1): Precon and ELFR fails due to a defect screenable at production test.
**A1 (PC): Preconditioning:**
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.

**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

**Green/Pb-free Status:**
Qualified Pb-Free(SMT) and Green

## Group 3 (PW Devices) Qual report:

TI Information
Selective Disclosure

# Automotive New Product Qualification Summary
# (As per AEC-Q100 / Q006 and JEDEC Guidelines)

## Approved 20-Mar-2021

### Product Attributes

| Attributes | Qual Device: LM2903AVQPWRQ1 | QBS Product Reference: LM2903BQDRQ1 | QBS Process Reference: LM2904BQDRQ1 |
|---|---|---|---|
| Operating Temp Range | -40 to +125 C | -40 to +125 C | -40 to +125 C |
| Automotive Grade Level | Grade 1 | Grade 1 | Grade 1 |
| Product Function | Signal Chain | Signal Chain | Signal Chain |
| Wafer Fab Supplier | CFAB | CFAB | CFAB |
| Die Revision | A0 | A0 | B |
| Assembly Site | MLA | FMX | FMX |
| Package Type | TSSOP | SOIC | SOIC |
| Package Designator | PW | D | D |
| Ball/Lead Count | 8 | 8 | 8 |

- QBS: Qual By Similarity
- Qual Device LM2903AVQPWRQ1 is qualified at LEVEL1-260C

**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: LM2903AVQPWRQ1 | QBS Product Reference: LM2903BQDRQ1 | QBS Process Reference: LM2904BQDRQ1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Group A – Accelerated Environment Stress Tests | | | | | | | | | | |
| | | | AEC-Q006 | 3 | 11 | SAM Analysis, Pre Stress | - | 3/66/0 | - | - |
| | PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Automotive Preconditioning | Level 1-260C | 3/924/0 | - | - |
| | | | AEC-Q006 | 3 | 11 | SAM Analysis, Post Stress | - | 3/66/0 | - | - |
| | HAST | A2 | JEDEC JESD22-A110 | 3 | 77 | Biased HAST, 130C/85%RH | 96 Hours | 3/231/0 | - | - |

| | Type | # | Test Spec | Min Lot Qty | SS/Lot | Test Name / Condition | Duration | Qual Device: LM2903AVQPWRQ1 | QBS Product Reference: LM2903BQDRQ1 | QBS Process Reference: LM2904BQDRQ1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | HAST | A2 | AEC-Q006 | 3 | 1 | Cross Section, Post bHAST 96 Hours | - | - | - | - |
| | HAST | A2 | AEC-Q006 | 3 | 3 | Wire Bond Shear, Post bHast, 96 Hours | - | - | - | - |
| | HAST | A2 | AEC-Q006 | 3 | 3 | Bond Pull over Stitch, post bHAST, 96 Hours | - | - | - | - |
| | HAST | A2 | AEC-Q006 | 3 | 3 | Bond Pull over Ball, Post bHAST, 96 Hours | - | - | - | - |
| | HAST | A2 | JEDEC JESD22-A110 | 3 | 70 | Biased HAST, 130C/85%RH | 192 Hours | 3/210/0 | - | - |
| | HAST | A2 | AEC-Q006 | 3 | 1 | Cross Section, Post bHAST 192 Hours | - | 3/3/0 | - | - |
| | HAST | A2 | AEC-Q006 | 3 | 22 | SAM Analysis, Post bHAST, 192 Hours | - | 3/66/0 | - | - |
| | HAST | A2 | AEC-Q006 | 3 | 2 | Wire Bond Shear, Post bHast, 192 Hours | - | 3/6/0 | - | - |
| | HAST | A2 | AEC-Q006 | 3 | 2 | Bond Pull over Stitch, post bHAST, 192 Hours | - | 3/6/0 | - | - |
| | HAST | A2 | - AEC-Q006 | 3 | 2 | Bond Pull over Ball, Post bHAST, 192 Hours | - | 3/6/0 | - | - |
| | UHAST | A3 | JEDEC JESD22-A118 | 3 | 77 | Unbiased HAST, 130C/85%RH | 96 Hours | 3/231/0 | - | - |
| | TC | A4 | JEDEC JESD22-A104 and Appendix 3 | 3 | 77 | Temperature Cycle, -65/150C | 500 Cycles | 3/231/0 | - | - |
| | TC | A4 | - | 3 | 1 | Cross Section, Post T/C 500 Cycles | - | - | - | - |
| | TC | A4 | - | 3 | 22 | SAM Analysis, Post T/C, 500 Cycles | - | 3/66/0 | - | - |
| | TC | A4 | - | 3 | 3 | Wire Bond Shear, Post T/C 500 Cycles | Wires | - | - | - |
| | TC | A4 | - | 3 | 3 | Bond Pull over Stitch Post T/C 500 Cycles | Wires | - | - | - |
| | TC | A4 | - | 3 | 3 | Bond Pull over Ball Post T/C 500 Cycles | Wires | - | - | - |
| | TC | A4 | JEDEC JESD22-A104 and Appendix 3 | 3 | 70 | Temperature Cycle, -65/150C | 1000 Cycles | 3/210/0 | - | - |
| | TC | A4 | - | 3 | 1 | Cross Section, Post T/C 1000 Cycles | - | 3/3/0 | - | - |
| | TC | A4 | - | 3 | 22 | SAM Analysis, Post T/C, 1000 Cycles | - | 3/66/0 | - | - |
| | TC | A4 | - | 3 | 2 | Wire Bond Shear, Post T/C 1000 Cycles | - | 3/6/0 | - | - |
| | Type | # | Test Spec | Min Lot Qty | SS/Lot | Test Name / Condition | Duration | Qual Device: LM2903AVQPWRQ1 | QBS Product Reference: LM2903BQDRQ1 | QBS Process Reference: LM2904BQDRQ1 |
| | TC | A4 | - | 3 | 2 | Bond Pull over Stitch, Post T/C, 1000 Cycles | - | 3/6/0 | - | - |
| | TC | A4 | - | 3 | 2 | Bond Pull over Ball, Post T/C, 1000 Cycles | - | 3/6/0 | - | - |
| | PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle -40/125C | 1000 Cycles | - | - | - |
| | PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle -40/125C | 2000 Cycles | - | - | - |
| | HTSL | A6 | JEDEC JESD22-A103 | 3 | 45 | High Temp Storage Bake 175C | 500 Hours | 3/231/0 | - | - |
| | HTSL | A6 | - | 3 | 1 | Cross Section, Post HTSL 500 Hours | - | - | - | - |
| | HTSL | A6 | JEDEC JESD22-A103 | 3 | 44 | High Temp Storage Bake 175C | 1000 Hours | 3/228/0 | - | - |
| | HTSL | A6 | - | 3 | 1 | Cross Section, Post HTSL 1000 Hours | - | 3/3/0 | - | - |
| **Test Group B – Accelerated Lifetime Simulation Tests** | | | | | | | | | | |
| | HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 150C | 300 Hours | 3/231/0 | - | - |
| | ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 125C | 48 Hours | - | 1/800/0 | 3/2400/4 (1) |
| **Test Group C – Package Assembly Integrity Tests** | | | | | | | | | | |
| | WBS | C1 | AEC Q100-001 | 3 | 30 | Wire Bond Shear, Cpk>1.67 | Wires | 3/90/0 | - | - |
| | WBP | C2 | MIL-STD883 Method 2011 | 3 | 30 | Bond Pull over Ball, Cpk >1.67 | Wires | 3/90/0 | - | - |
| | SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb Free | 1/15/0 | - | - |
| | SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb | 1/15/0 | - | - |
| | PD | | JEDEC JESD22-B100 and B108 | 3 | 10 | Physical Dimensions | Cpk>1.67 | 3/30/0 | - | - |
| **Test Group D – Die Fabrication Reliability Tests** | | | | | | | | | | |
| | EM | D1 | JESD61 | - | - | Electromigration | - | Completed Per Process Technology Requirements | - | - |
| | TDDB | D2 | JESD35 | - | - | Time Dependent Dielectric Breakdown | - | Completed Per Process Technology Requirements | - | - |
| | HCI | D3 | JESD60 & 28 | - | - | Hot Injection Carrier | - | Completed Per Process | - | - |

| | Type | # | Test Spec | Min Lot Qty | SS/Lot | Test Name / Condition | Duration | Qual Device: LM2903AVQPWRQ1 | QBS Product Reference: LM2903BQDRQ1 | QBS Process Reference: LM2904BQDRQ1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Technology Requirements | | |
| | NBTI | D4 | - | - | - | Negative Bias Temperature Instability | - | Completed Per Process Technology Requirements | - | - |
| | SM | D5 | - | - | - | Stress Migration | | Completed Per Process Technology Requirements | - | - |
| Test Group E – Electrical Verification Tests | | | | | | | | | | |
| | HBM | E2 | AEC Q100-001 | 1 | 3 | ESD-HBM | 2000V | 1/3/0 | 3/9/0 | - |
| | CDM | E3 | AEC Q100-011 | 1 | 3 | ESD-CDM | 1500V | 1/3/0 | - | - |
| | LU | E4 | AEC Q100-004 | 1 | 6 | Latch-up, 125C | (Per AEC-Q100-004) | - | 3/18/0 | - |
| | ED | E5 | AEC Q100-009 | 3 | 30 | Electrical Distributions | Cpk>1.67 Room, hot, and cold test | 3/90/0 | - | - |

Note (1): Precon and ELFR fails due to a defect screenable at production test.

**A1 (PC): Preconditioning:**
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.

**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

**Green/Pb-free Status:**
Qualified Pb-Free(SMT) and Green

For questions regarding this notice, e-mails can be sent to the contacts shown below or your local Field Sales Representative.

| Location | E-Mail |
|---|---|
| USA | PCNAmericasContact@list.ti.com |
| Europe | PCNEuropeContact@list.ti.com |
| Asia Pacific | PCNAsiaContact@list.ti.com |
| WW PCN Team | PCN_ww_admin_team@list.ti.com |

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