| | | | |
|---|---|---|---|
| **PCN Number:** | 20200515000.2 | **PCN Date:** | May 27, 2020 |
| **Title:** | Addition of Polyimide for DRV8801-Q1 | | |
| **Customer Contact:** | PCN Manager | **Dept:** | Quality Services |
| **Proposed 1st Ship Date:** | Nov 27, 2020 | **Estimated Sample Availability:** | Date provided at sample request |
| **Change Type:** | | | |

| | | | | | |
|---|---|---|---|---|---|
| ☐ | Assembly Site | ☐ | Design | ☐ | Wafer Bump Site |
| ☐ | Assembly Process | ☐ | Data Sheet | ☐ | Wafer Bump Material |
| ☐ | Assembly Materials | ☐ | Part number change | ☐ | Wafer Bump Process |
| ☐ | Mechanical Specification | ☐ | Test Site | ☐ | Wafer Fab Site |
| ☐ | Packing/Shipping/Labeling | ☐ | Test Process | ☒ | Wafer Fab Materials |
| | | | | ☐ | Wafer Fab Process |

## PCN Details

**Description of Change:**

Texas Instruments Incorporated is announcing the qualification of adding of Polyimide (PI) to part numbers under Product Affected section.

| Current Die Coat | New Die Coat |
|---|---|
| None | Polyimide |

**Reason for Change:**

Quality Improvement (Reduction of EOS failures).

**Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):**

None.

**Changes to product identification resulting from this PCN:**

None.

**Product Affected:**

DRV8801AQRMJRQ1
DRV8801QRTYRQ1

# Automotive New Product Qualification Summary

# (As per AEC-Q100 and JEDEC Guidelines)

# Approved 21-Feb-2020

## Product Attributes

| Attributes | Qual Device: DRV8801QRMJRQ1 | Qual Device: DRV8801QRTYRQ1 | QBS Product Reference: DRV8801QRMJRQ1 | QBS Process Reference: SN05071DPZPRG4 | QBS Package Reference: SN0508066RGC | QBS Package Reference: TPS57114QRTERDN |
|---|---|---|---|---|---|---|
| **Automotive Grade Level** | Grade 1 | Grade 1 | Grade 1 | Grade 1 | Grade 1 | Grade 1 |
| **Operating Temp Range** | -40 to +125 C | -40 to +125 C | -40 to +125 C | -40 to +125 C | -40 to +125 C | -40 to +125 C |
| **Product Function** | Power Management | Power Management | Power Management | ASIC | Power Management | Power Management |
| **Wafer Fab Supplier** | DM0S5 | DM0S5 | DM0S5 | DMOS5 | DMOS5 | MIHO 8 |
| **Die Revision** | A3 | A2 | A3 | D.1 | B2 | A3 |
| **Assembly Site** | MLA | MLA | MLA | TAI | MLA | MLA |
| **Package Type** | WQFN | WQFN | WQFN | Power Pad | QFN | WQFN |
| **Package Designator** | RMJ | RTY | RMJ | PZP | RGC | RTE |
| **Ball/Lead Count** | 16 | 16 | 16 | 100 | 64 | 16 |

- QBS: Qual By Similarity
- Qual Device DRV8801QRMJRQ1 is qualified at LEVEL3-260C
- Qual Device DRV8801QRTYRQ1 is qualified at LEVEL3-260CG

## 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: DRV8801QRMJRQ1 | Qual Device: DRV8801QRTYRQ1 | QBS Product Reference: DRV8801QRMJRQ1 | QBS Process Reference: SN05071DPZPRG4 | QBS Package Reference: SN0508066RGC | QBS Package Reference: TPS57114QRTERDN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test Group A – Accelerated Environment Stress Tests** | | | | | | | | | | | | | |
| | PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Auto Preconditioning Level 3 | Level 3-260C | Pass | Pass | Pass | Pass | Pass | Pass |
| | HAST | A2 | JEDEC JESD22-A110 | 3 | 77 | Biased HAST, 130C/85 %RH | 240 Hours | - | - | - | - | 3/231/0 | - |
| | HAST | A2 | JEDEC JESD22-A110 | 3 | 77 | Biased HAST, 130C/85 %RH | 96 Hours | - | - | 1/77/0 | 3/231/0 | - | 3/231/0 |
| | AC | A3 | JEDEC JESD22-A102 | 3 | 77 | Autoclave 121C | 240 Hours | - | - | - | 3/231/0 | 3/231/0 | - |
| | AC | A3 | JEDEC JESD22-A102 | 3 | 77 | Autoclave 121C | 96 Hours | - | - | 1/77/0 | - | - | 3/231/0 |
| | TC | A4 | JEDEC JESD22-A104 and Appe | 3 | 77 | Temperature Cycle, -65/150C | 1000 Cycles | 1/77/0 | - | - | 3/231/0 | - | - |

| | Type | # | Test Spec | Min Lot Qty | SS/ Lot | Test Name / Condition | Duration | Qual Device: DRV8801QRMJRQ1 | Qual Device: DRV8801QRTYRQ1 | QBS Product Reference: DRV8801QRMJRQ1 | QBS Process Reference: SN05071DPZPRG4 | QBS Package Reference: SN0508066RGC | QBS Package Reference: TPS57114QRTERDN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ndix 3 | | | | | | | | | | |
| | 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 | A4 | JEDEC JESD22-A104 and Appendix 3 | 3 | 77 | Temperature Cycle, -65/150C | 750 Cycles | - | - | - | - | 3/231/0 | - |
| | TC-BP | A4 | MIL-STD883 Method 2011 | 1 | 5 | Post Temp Cycle Bond Pull | Units | 1/5/0 | - | 1/5/0 | 1/5/0 | 1/5/0 | - |
| | PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle, -40/125C | 1000 Cycles | - | 1/45/0 | 1/450/0 | 1/45/0 | 1/45/0 | 1/50/0 |
| | HTSL | A6 | JEDEC JESD22-A103 | 1 | 45 | High Temp Storage Bake 150C | 1000 Hours | - | - | - | 3/231/0 | - | - |
| | HTSL | A6 | JEDEC JESD22-A103 | 1 | 45 | High Temp Storage Bake 175C | 500 Hours | - | - | 1/45/0 | - | - | 1/50/0 |
| **Test Group B – Accelerated Lifetime Simulation Tests** | | | | | | | | | | | | | |
| | HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 125C | 1000 Hours | - | - | 1/77/0 | 3/231/0 | - | 3/231/0 |
| | ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 125C | 48 Hours | - | - | - | 3/2400/0 | - | - |
| | EDR | B3 | AEC Q100-005 | 3 | 77 | NVM Endurance, Data | - | N/A | N/A | - | - | - | - |

| | Type | # | Test Spec | Min Lot Qty | SS/ Lot | Test Name / Condition | Duration | Qual Device: DRV8801QRMJRQ1 | Qual Device: DRV8801QRTYRQ1 | QBS Product Reference: DRV8801QRMJRQ1 | QBS Process Reference: SN05071DPZPRG4 | QBS Package Reference: SN0508066RGC | QBS Package Reference: TPS57114QRTERDN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Retention, and Operational Life | | | | | | | |
| **Test Group C – Package Assembly Integrity Tests** | | | | | | | | | | | | | |
| | WBS | C1 | AEC Q100-001 | 1 | 30 | Auto Wire Bond Shear | Minimum of 5 devices, 30 wires Cpk>1.33, Ppk>1.67 | 1/30/0 | - | 1/30/0 | - | - | - |
| | WBP | C2 | MIL-STD883 Method 2011 | 1 | 30 | Auto Wire Bond Pull | Minimum of 5 devices, 30 wires Cpk>1.33, Ppk>1.67 | 1/30/0 | - | 1/30/0 | - | - | - |
| | PD | C4 | JEDEC JESD22-B100 and B108 | 3 | 10 | Auto Physical Dimensions | Cpk>1.33 Ppk>1.67 | - | - | 3/30/0 | - | - | - |
| | SBS | C5 | AEC Q100-010 | 3 | 50 | Solder Ball Shear (Cpk>1.67) | Post HTSL/ Bump | - | - | - | - | - | - |
| | SBS | C5 | AEC Q100-010 | 3 | 50 | Solder Ball Shear (Cpk>1.67) | Solder Balls | - | - | - | - | - | - |
| | LI | C6 | JEDEC JESD22-B105 | 1 | 50 | Lead Integrity | - | - | - | - | - | - | - |
| **Test Group D – Die Fabrication Reliability Tests** | | | | | | | | | | | | | |
| | EM | D1 | JESD61 | - | - | Electromigration | - | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | - | - | - | - |

| | Type | # | Test Spec | Min Lot Qty | SS/ Lot | Test Name / Condition | Duration | Qual Device: DRV8801QRMJRQ1 | Qual Device: DRV8801QRTYRQ1 | QBS Product Reference: DRV8801QRMJRQ1 | QBS Process Reference: SN05071DPZPRG4 | QBS Package Reference: SN0508066RGC | QBS Package Reference: TPS57114QRTERDN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TDDB | D2 | JESD35 | - | - | Time Dependant Dielectric Breakdown | - | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | - | - | - | - |
| | HCI | D3 | JESD60 & 28 | - | - | Hot Injection Carrier | - | 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 | - | - | - | - |
| | SM | D5 | - | - | - | Stress Migration | - | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | - | - | - | - |
| **Test Group E – Electrical Verification Tests** | | | | | | | | | | | | | |
| | HBM | E2 | AEC Q100-002 | 1 | 3 | ESD - HBM | 3000 V | - | 1/3/0* | - | - | - | - |
| | CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM | 1000 V | - | - | 1/3/0 | - | - | - |
| | CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM | 2000 V | - | 1/3/0* | - | - | - | - |
| | LU | E4 | AEC Q100-004 | 1 | 6 | Latch-up | (per JESD78) | - | - | 1/6/0 | - | - | - |
| | ED | E5 | AEC Q100-009 | 3 | 30 | Auto Electrical Distributions | Cpk>1.67 Room, hot, and cold test | 1/30/0 | - | 3/90/0 | - | - | - |

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

**Ambient Operating Temperature by Automotive Grade Level:**
Grade 0 (or E): -40°C to +150°C

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Grade 1 (or Q): -40°C to +125°C
Grade 2 (or T): -40°C to +105°C
Grade 3 (or I) : -40°C to +85°C

**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

*HBM taking from non-PI device. Data in RelDB

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

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| Europe | PCNEuropeContact@list.ti.com |
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