| **PCN Number:** | 20210112004.2 | **PCN Date:** | Feb 5 2021 |
|---|---|---|---|

**Title:** Qualification of Cu as an alternate bond wire for select devices

**Customer Contact:** PCN Manager | **Dept:** Quality Services

**Proposed 1st Ship Date:** Aug 4 2021 | **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:**

This PCN is to inform of an alternative bond wire qualification for the devices in the product affected section as follows:

| Current Bond wire, Diameter | Additional Bond wire, diameter |
|---|---|
| **Au, 1.0 mils** | **Cu, 0.8 mils** |

**Reason for Change:**

Continuity of supply.

1) To align with world technology trends and use wiring with enhanced mechanical and electrical properties
2) Maximize flexibility within our Assembly/Test production sites.
3) Cu is easier to obtain and stock

**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 at the site link below http://www.ti.com/quality/docs/materialcontentsearch.tsp |

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

None

**Product Affected:**

| | | | |
|---|---|---|---|
| DS90UA101TRTVJQ1 | DS90UB914ATRHSJQ1 | DS90UH302QSQX/NOPB | DS90UR905QSQE/E7002382 |
| DS90UA101TRTVRQ1 | DS90UB914ATRHSRQ1 | DS90UH925QSQ/E7002397 | DS90UR905QSQE/NOPB |
| DS90UA101TRTVTQ1 | DS90UB914ATRHSTQ1 | DS90UH925QSQ/NOPB | DS90UR905QSQX/E7002382 |
| DS90UA102TRHSJQ1 | DS90UB914QSQ/NOPB | DS90UH925QSQE/E7002397 | DS90UR905QSQX/E7002600 |
| DS90UA102TRHSRQ1 | DS90UB914QSQE/NOPB | DS90UH925QSQE/NOPB | DS90UR905QSQX/NOPB |
| DS90UA102TRHSTQ1 | DS90UB914QSQX/NOPB | DS90UH925QSQX/E7002397 | DS90UR906QSQ/E7002383 |

| | | | |
|---|---|---|---|
| DS90UB301ATRHSRQ1 | DS90UB921TRHSRQ1 | DS90UH925QSQX/NOPB | DS90UR906QSQ/NOPB |
| DS90UB301ATRHSTQ1 | DS90UB921TRHSTQ1 | DS90UH926QSQ/E7002384 | DS90UR906QSQE/E7002383 |
| DS90UB301QSQ/NOPB | DS90UB925QSQ/E7002826 | DS90UH926QSQ/NOPB | DS90UR906QSQE/NOPB |
| DS90UB301QSQE/NOPB | DS90UB925QSQ/NOPB | DS90UH926QSQ/S7002920 | DS90UR906QSQX/E7002383 |
| DS90UB302QSQ/NOPB | DS90UB925QSQE/E7002826 | DS90UH926QSQE/E7002384 | DS90UR906QSQX/NOPB |
| DS90UB302QSQE/NOPB | DS90UB925QSQE/NOPB | DS90UH926QSQE/J7003048 | DS90UR907QSQ/E7003100 |
| DS90UB302QSQX/NOPB | DS90UB925QSQX/E7002826 | DS90UH926QSQE/NOPB | DS90UR907QSQ/NOPB |
| DS90UB303TRTARQ1 | DS90UB925QSQX/NOPB | DS90UH926QSQX/E7002384 | DS90UR907QSQE/E7003100 |
| DS90UB303TRTATQ1 | DS90UB926QSQ/E7002827 | DS90UH926QSQX/J7003049 | DS90UR907QSQE/NOPB |
| DS90UB633ARTVRQ1 | DS90UB926QSQ/NOPB | DS90UH926QSQX/NOPB | DS90UR907QSQX/E7003100 |
| DS90UB633ARTVTQ1 | DS90UB926QSQE/E7002827 | DS90UH927QSQ/E7002392 | DS90UR907QSQX/NOPB |
| DS90UB901QSQ/NOPB | DS90UB926QSQE/NOPB | DS90UH927QSQ/NOPB | DS90UR908QSQ/NOPB |
| DS90UB901QSQE/NOPB | DS90UB926QSQX/E7002827 | DS90UH927QSQE/E7002392 | DS90UR908QSQE/NOPB |
| DS90UB901QSQX/NOPB | DS90UB926QSQX/E7002956 | DS90UH927QSQE/NOPB | DS90UR908QSQX/NOPB |
| DS90UB902QSQ/NOPB | DS90UB926QSQX/NOPB | DS90UH927QSQX/E7002392 | DS90UR910QSQ/NOPB |
| DS90UB902QSQE/NOPB | DS90UB927QSQ/NOPB | DS90UH927QSQX/NOPB | DS90UR910QSQE/E7002687 |
| DS90UB902QSQX/NOPB | DS90UB927QSQE/E7003111 | DS90UH940NTNKDRQ1 | DS90UR910QSQE/NOPB |
| DS90UB903QSQ/NOPB | DS90UB927QSQE/NOPB | DS90UH940NTNKDTQ1 | DS90UR910QSQX/NOPB |
| DS90UB903QSQE/NOPB | DS90UB927QSQX/NOPB | DS90UH940TNKDRQ1 | DS90UR916QSQ/E7002619 |
| DS90UB903QSQX/NOPB | DS90UB933TRTVRQ1 | DS90UH940TNKDTQ1 | DS90UR916QSQ/NOPB |
| DS90UB903QSQX/S7002782 | DS90UB933TRTVTQ1 | DS90UH948TNKDRQ1 | DS90UR916QSQE/E7002619 |
| DS90UB904QSQ/NOPB | DS90UB940NTNKDRQ1 | DS90UH948TNKDTQ1 | DS90UR916QSQE/NOPB |
| DS90UB904QSQE/J7003047 | DS90UB940NTNKDTQ1 | DS90UR903QSQ/NOPB | DS90UR916QSQX/E7002619 |
| DS90UB904QSQE/NOPB | DS90UB940TNKDRQ1 | DS90UR903QSQE/NOPB | DS90UR916QSQX/NOPB |
| DS90UB904QSQX/NOPB | DS90UB940TNKDTQ1 | DS90UR903QSQX/NOPB | DS99R124AQSQ/NOPB |
| DS90UB904QSQX/S7002783 | DS90UB948TNKDRQ1 | DS90UR904QSQ/NOPB | DS99R124AQSQE/NOPB |
| DS90UB913ATRTVJQ1 | DS90UB948TNKDTQ1 | DS90UR904QSQE/J7003050 | DS99R124AQSQX/NOPB |
| DS90UB913ATRTVR/S2 | DS90UH301QSQ/NOPB | DS90UR904QSQE/NOPB | DS99R124QSQ/E7002678 |
| DS90UB913ATRTVRQ1 | DS90UH301QSQE/NOPB | DS90UR904QSQX/J7003069 | DS99R124QSQ/NOPB |
| DS90UB913ATRTVTQ1 | DS90UH301QSQX/NOPB | DS90UR904QSQX/NOPB | DS99R124QSQE/NOPB |
| DS90UB913QSQ/NOPB | DS90UH302QSQ/NOPB | DS90UR905QSQ/E7002382 | DS99R124QSQX/NOPB |
| DS90UB913QSQE/NOPB | DS90UH302QSQE/NOPB | DS90UR905QSQ/NOPB | PDS90UB923TRTATQ1 |
| DS90UB913QSQX/NOPB | | | |

TEXAS INSTRUMENTS

TI Information
Selective Disclosure

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

## Product Attributes

| Attributes | Qual Device: DS90UB925QB0RC | Qual Device: DS90UB940RQ | Qual Device: DS99R124AQNR83 |
|---|---|---|---|
| Automotive Grade Level | Grade 2 | Grade 2 | Grade 2 |
| Operating Temp Range | -40 to +105 C | -40 to +105 C | -40 to +105 C |
| Product Function | Interface | Interface | Interface |
| Wafer Fab Supplier | FRBW | MAINEFAB | MAINEFAB |
| Die Revision | A | B | C |
| Assembly Site | TIEMA | TIEMA | TIEMA |
| Package Type | WQFN | WQFN | WQFN |
| Package Designator | RHS | NKD | RHS |
| Ball/Lead Count | 48 | 64 | 48 |

- QBS: Qual By Similarity
- Qual Device DS99R124AQNR83 is qualified at LEVEL3-260CG
- Qual Device DS90UB925QB0RC is qualified at LEVEL3-260CG
- Qual Device DS90UB940RQ 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: DS90UB925QB0RC | Qual Device: DS90UB940RQ | Qual Device: DS99R124AQNR83 |
|---|---|---|---|---|---|---|---|---|---|
| Test Group A – Accelerated Environment Stress Tests | | | | | | | | | |
| PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Preconditioning | Level 3-260C | No Fails | No Fails | No Fails |
| HAST | A2 | JEDEC JESD22-A110 | 3 | 77 | Biased HAST, 110C/85%RH | 264 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 | 3/231/0 |
| TC-WBP | A4 | MIL-STD883 Method 2011 | 1 | 60 | Bond Pull over Ball Post T/C 500 Cycles | Wires | 1/30/0 | 3/90/0 | 3/90/0 |

| Type | # | Test Spec | Min Lot Qty | SS/Lot | Test Name / Condition | Duration | Qual Device: DS90UB925QB0RC | Qual Device: DS90UB940RQ | Qual Device: DS99R124AQNR83 |
|---|---|---|---|---|---|---|---|---|---|
| PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle | 1000 Cycles | N/A | N/A | N/A |
| HTSL | A6 | JEDEC JESD22-A103 | 1 | 45 | High Temp Storage Bake 150C | 500 Hours | 1/45/0 | 3/135/0 | - |
| Test Group B – Accelerated Lifetime Simulation Tests | | | | | | | | | |
| HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 125C | 1000 Hours | N/A | N/A | N/A |
| ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 150C | 24 Hours | N/A | N/A | N/A |
| Test Group C – Package Assembly Integrity Tests | | | | | | | | | |
| WBS | C1 | AEC Q100-001 | 1 | 30 | Wire Bond Shear (Cpk>1.67) | Wires | 1/30/0 | 3/90/0 | 3/90/0 |
| WBP | C2 | MIL-STD883 Method 2011 | 1 | 30 | Wire Bond Pull (Cpk>1.67) | Wires | 1/30/0 | 3/90/0 | 3/90/0 |
| SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability >95% Lead Coverage | - | - | - | - |
| PD | C4 | JEDEC JESD22-B100 and B108 | 3 | 10 | Physical Dimensions (Cpk>1.67) | - | - | - | - |
| 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 | Completed Per Process Technology Requirements |
| TDDB | D2 | JESD35 | - | - | Time Dependant Dielectric Breakdown | - | Completed Per Process Technology Requirements | 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 | Completed Per Process Technology Requirements |
| NBTI | D4 | - | - | - | Negative Bias Temperature Instability | - | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| SM | D5 | - | - | - | Stress Migration | - | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |

**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
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

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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