

| | | | | | |
|---|---|--|----------------------------|----------------|-----------------------|
| PCN Number: | 20221216013.2B | PCN Date: | May 01, 2023 | | |
| Title: | Qualification of RFAB as an additional Fab site and additional wafer Probe site (CLARK-PR & CDAT-PR) options for select devices | | | | |
| Customer Contact: | PCN Manager | Dept: | Quality Services | | |
| Proposed 1st Ship Date: | Jun 22, 2023 | Sample requests accepted until: | Jan 22, 2023* | | |
| *Sample requests received after January 22, 2023 will not be supported. | | | | | |
| Change Type: | | | | | |
| <input type="checkbox"/> | Assembly Site | <input type="checkbox"/> | Design | | |
| <input type="checkbox"/> | Assembly Process | <input type="checkbox"/> | Data Sheet | | |
| <input type="checkbox"/> | Assembly Materials | <input type="checkbox"/> | Part number change | | |
| <input type="checkbox"/> | Mechanical Specification | <input checked="" type="checkbox"/> | Test Site | | |
| <input type="checkbox"/> | Packing/Shipping/Labeling | <input type="checkbox"/> | Test Process | | |
| <input type="checkbox"/> | | <input type="checkbox"/> | Wafer Bump Site | | |
| <input type="checkbox"/> | | <input type="checkbox"/> | Wafer Bump Material | | |
| <input type="checkbox"/> | | <input type="checkbox"/> | Wafer Bump Process | | |
| <input type="checkbox"/> | | <input checked="" type="checkbox"/> | Wafer Fab Site | | |
| <input type="checkbox"/> | | <input checked="" type="checkbox"/> | Wafer Fab Materials | | |
| <input type="checkbox"/> | | <input type="checkbox"/> | Wafer Fab Process | | |
| PCN Details | | | | | |
| Description of Change: | | | | | |
| Revision B is to announce the <u>addition</u> of a probe site change for TLC59116ITPWRQ1 & TLC59116ITPWTQ1 under Group 1 device that was not included on the original PCN notification. The device affected is highlighted and bolded under Group 4 in the device list below. | | | | | |
| Texas Instruments is pleased to announce the qualification of its RFAB fabrication facility as an additional Wafer Fab source and CLARK-PR and CDAT-PR as an additional probe site options for the selected devices listed in the "Product Affected" section. | | | | | |
| Current Fab Site | | | Additional Fab Site | | |
| Current Fab Site | Process | Wafer Diameter | Additional Fab Site | Process | Wafer Diameter |
| MIHO | LBC7 | 200 mm | RFAB | LBC7 | 300 mm |
| Probe site changes are as follows: | | | | | |
| Group 2 Devices: | | | | | |
| Current Probe Site | | New Probe Site | | | |
| DL-MOS-4 | | CLARK-PR | | | |
| Group 3 Devices: | | | | | |
| Current Probe Site | | New Probe Site | | | |
| CLARK-PR | | CDAT-PR | | | |
| DL-LIN | | | | | |
| Group 4 Devices: | | | | | |
| Current Probe Site | | New Probe Site | | | |
| MH8 | | DL-MOS-4 | | | |
| Test coverage, insertions, conditions will remain consistent with current testing. | | | | | |
| Reason for Change: | | | | | |
| Continuity of Supply | | | | | |
| 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 |
|-------------|-----------------------------|------------------------------|-------------------|
| MIHO8 | MH8 | JPN | Ibaraki |
| RFAB | RFB | USA | Richardson |

Sample product shipping label (not actual product label)



MADE IN: Malaysia
2DC: 20:

| | |
|--------------------|----------|
| MSL 2 /260C/1 YEAR | SEAL DT |
| MSL 1 /235C/UNLIM | 03/29/04 |

OPT: 39
ITEM: 39
LBL: 5A (L)TO:1750





(1P) **SN74LS07NSR**
 (Q) **2000** (D) **0336**
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483S12
 (P)
 (2P) REV: (V) 0033817
 (20L) CSO: SHE (21L) CCO:USA
 (22L) ASO: MLA (23L) ACO: MYS

Product Affected:

Group 1 device list - MIHO adding RFAB as an additional Fab site:

| | | | |
|------------------|-----------------|-----------------|-----------------|
| SN2002036QRTERQ1 | TLC59116ITPWTQ1 | TPS62260QDRVRMU | TPS62290IDRVRQ1 |
| SN55340QRTERQ1 | TPD3S716QDBQRQ1 | TPS62260TDDCRQ1 | TPS62290TDRVRQ1 |
| SN55340QRTERQ1 | TPS55340QRTERQ1 | TPS62260TDRVRQ1 | TPS62293TDRVRQ1 |
| TAS6422QDKQQ1 | TPS55340QRTERWB | TPS62261TDRVRQ1 | TPS62590TDRVRQ1 |
| TAS6422QDKQRQ1 | TPS55340QRTERQ1 | TPS62262TDRVRQ1 | |
| TLC59116ITPWRQ1 | TPS62260IDRVRQ1 | TPS62263TDRVRQ1 | |

Group 2 device list - MIHO adding RFAB and CLARK-PR Probe site:

| | | | |
|-----------------|-----------------|-----------------|-----------------|
| TPA3110D2QPWRQ1 | TPA3111D1QPWRQ1 | TPA3112D1QPWRQ1 | TPD3S716QDBQRQ1 |
|-----------------|-----------------|-----------------|-----------------|

Group 3 device list - MIHO adding RFAB and CDAT-PR Probe site:

| | | |
|------------------|------------------|------------------|
| TPS54388CQRTERQ1 | TPS54618CQRTERQ1 | TPS57114CQRTERQ1 |
| TPS54388QRLBRQ1 | TPS57112CQRTERQ1 | TPS57114QRLBRQ1 |
| TPS54618AQLBRQ1 | TPS57112QRLBRQ1 | TPS57114QRTERDN |

Group 4 device list - MIHO adding RFAB and DMOS4 Probe site:

| | |
|------------------------|------------------------|
| TLC59116ITPWRQ1 | TLC59116ITPWTQ1 |
|------------------------|------------------------|

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

Approved 17-Jun-2020

**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: TAS5441QPWPRQ1 | QBS Process Reference: TPS2543QRTE |
|---|----|-------------------------------------|-------------|--------|---|--------------|--------------------------------|---------------------------------------|
| Test Group A – Accelerated Environment Stress Tests | | | | | | | | |
| PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Automotive Preconditioning, L2 | Level 2-260C | - | 3/765/0 |
| PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Automotive Preconditioning, L3 | Level 3-260C | 3/1258/0 | - |
| HAST | A2 | JEDEC JESD22-A110 | 3 | 77 | Biased HAST 130C/85%RH | 96 Hours | 3/231/0 | 3/240/0 |
| AC | A3 | JEDEC JESD22-A102 | 3 | 77 | Auto Autoclave 121C | 96 Hours | 3/231/0 | 3/231/0 |
| TC | A4 | JEDEC JESD22-A104 and Appendix 3 | 3 | 77 | Temperature Cycle, -65/150C, Grade-1 | 500 Cycles | 3/231/0 | 3/231/0 |
| TC-BP | A4 | MIL-STD883 Method 2011 | 1 | 30 | Post Temp. Cycle Bond Pull | 500 Cycles | 1/30/0 | 1/30/0 |
| PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle, -40/125C | 1000 Cycles | 1/45/0 | 1/45/0 |
| HTSL | A6 | JEDEC JESD22-A103 | 1 | 45 | High Temp Storage Bake 175C | 500 Hours | 3/135/0 | 3/135/0 |
| Test Group B – Accelerated Lifetime Simulation Tests | | | | | | | | |
| HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 125C | 1000 Hours | 3/231/0 | - |
| HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 150C | 408 Hours | - | 3/231/0 |
| ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 150C | 24 Hours | - | 3/2400/0 |
| EDR | B3 | AEC Q100-005 | 3 | 77 | NVM Endurance, Data Retention, and Operational Life | - | N/A | - |

| | | | | | | | | |
|--|----|-------------------------------|---|----|-----------------------------|----------|------------|--------|
| Test Group C – Package Assembly Integrity Tests | | | | | | | | |
| WBS | C1 | AEC Q100-001 | 1 | 30 | Wire Bond Shear (Cpk>1.67) | Wires | 3/90/0 | - |
| WBP | C2 | MIL-STD883 Method 2011 | 1 | 30 | Wire Bond Pull (Cpk>1.67) | Wires | 3/90/0 | - |
| SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb Free | 1/15/0 (1) | 2/30/0 |
| SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb | 1/15/0 (1) | - |
| PD | C4 | JEDEC JESD22-B100 and B108 | 3 | 10 | Auto Physical Dimensions | Cpk>1.67 | 3/30/0 | 3/30/0 |
| LI | C6 | JEDEC JESD22-B105 | 1 | 50 | Lead Pull to Destruction | Leads | 1/48/0 | - |

| | | | | | | | | |
|---|----|-------------|---|---|---------------------------------------|---|---|---|
| Test Group D – Die Fabrication Reliability Tests | | | | | | | | |
| EM | D1 | JESD61 | - | - | Electromigration | - | Completed Per Process Technology Requirements | - |
| TDDb | D2 | JESD35 | - | - | Time Dependant 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 Q100-002 | 1 | 3 | ESD - HBM - Q100 | 1500 V | 1/3/0 | - |
| HBM | E2 | AEC Q100-002 | 1 | 3 | ESD - HBM - Q100 | 4000 V | - | 1/3/0 |
| CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM - Q100 | 1000 V | 1/3/0 | - |
| CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM - Q100 | 1500 V | - | 1/3/0 |
| LU | E4 | AEC Q100-004 | 1 | 6 | Auto Latch-up | (Per AEC Q100-004) | 1/6/0 | 1/6/0 |
| ED | E5 | AEC Q100-009 | 3 | 30 | Auto Electrical Distributions | Cpk>1.67 | 3/90/0 | 3/90/0 |

| | | | | | | | | |
|-------------------------|--|--|---|---|---|--------------|--------|--------|
| Additional Tests | | | | | | | | |
| MSL | | | - | - | Automotive L3 Powerpad Moisture Sensitivity | Level 3-260C | 3/35/0 | - |
| MSL | | | - | - | Automotive L2 Powerpad Moisture Sensitivity | Level 2-260C | - | 3/35/0 |

- QBS: Qual By Similarity

- Qual Device TAS5441QPWPRQ1 is qualified at LEVEL3-260C

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

Note (1): Solderability results are from Qual ID# 20090826-9343.

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

Approved 03/17/2015

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: TPS62090QRGTRQ1 | Qual Device: TPS65263QRHBRQ1 | Qual Device: TPS62065QDSGRQ1 | QBS Process/Package: TPS2543QRTE |
|--|----|------------------------|-------------|---------|---|--------------------|---|---|---|---|
| Test Group A - Accelerated Environment Stress Test | | | | | | | | | | |
| HAST | A2 | JESD22-A110 | 3 | 77 | Biased HAST, 130C/85%RH | 96 Hours | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 |
| AC | A3 | JESD22-A102 | 3 | 77 | Autoclave 121C | 96 Hours | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 |
| TC-BP | A4 | MIL-STD883 Method 2011 | 1 | 30 | Post Temp. Cycle Bond Pull | Wires | 1/30/0 | 1/30/0 | 1/30/0 | 1/30/0 |
| TC | A4 | JESD22-A104 | 3 | 77 | Temperature Cycle, -65/150C | 500 Cycles | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 |
| PTC | A5 | JESD22-A105 | 1 | 45 | Power Temperature Cycle, -40/125C | 1000 Cycles | 1/45/0 | 1/45/0 | 1/45/0 | 1/45/0 |
| HTSL | A6 | JESD22-A103 | 1 | 45 | High Temp. Storage Bake, 150C | 1000 Hours | - | 1/45/0 | 1/45/0 | - |
| HTSL | A6 | JESD22-A103 | 1 | 45 | High Temp. Storage Bake, 175C | 500 Hours | 1/45/0 | - | - | 1/45/0 |
| Test Group B - Accelerated Lifetime Simulation Test | | | | | | | | | | |
| HTOL | B1 | JESD22-A108 | 3 | 77 | Life Test, 125C | 1000 Hours | 1/77/0 | 1/77/0 | 1/77/0 | - |
| HTOL | B1 | JESD22-A108 | 3 | 77 | Life Test, 150C | 408 Hours | - | - | - | 3/231/0 |
| ELFR | B2 | AEC-Q100-008 | 3 | 800 | Early Life Failure Rate, 125C | 48 Hours | 1/800/0 | - | - | - |
| ELFR | B2 | AEC-Q100-008 | 3 | 800 | Early Life Failure Rate, 150C | 24 Hours | - | - | - | 3/2400/0 |
| EDR | B3 | AEC-Q100-005 | 3 | 77 | NVM Endurance, Data Retention, and Operational Life | - | N/A | - | - | - |
| Test Group C - Package Assembly Integrity Tests | | | | | | | | | | |
| WBS | C1 | AEC-Q100-001 | 1 | 30 | Bond Shear (Cpk>1.67) | Wires | 1/30/0 | - | 1/30/0 | - |
| WBP | C2 | MIL-STD883 Method 2011 | 1 | 30 | Bond Pull (Cpk>1.67) | Wires | 1/30/0 | - | 1/30/0 | - |
| SD | C3 | JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb | 1/15/0 | - | - | - |
| SD | C3 | JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb Free | 1/15/0 | - | - | - |
| PD | C4 | 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 | 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 | 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 | 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 | Completed Per Process Technology Requirements |
| SM | D5 | - | - | - | Stress Migration | - | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| Test Group E - Electrical Verification | | | | | | | | | | |
| HBM | E2 | AEC-Q100-002 | 1 | 3 | ESD - HBM | 4000 V | - | 1/3/0 | 1/3/0 | 1/3/0 |
| CDM | E3 | AEC-Q100-011 | 1 | 3 | ESD - CDM | 1500 V | - | 1/3/0 | 1/3/0 | 1/3/0 |
| LU | E4 | AEC-Q100-004 | 1 | 6 | Auto Latch-up | (Per AEC Q100-004) | - | 1/6/0 | 1/6/0 | 1/6/0 |
| ED | E5 | AEC-Q100-009 | 3 | 30 | Electrical Distributions | Cpk>1.67 | - | 3/90/0 | 3/90/0 | 3/90/0 |

- QBS: Qual By Similarity
 - Qual Device TPS62090QRGTRQ1 is qualified at LEVEL2-260C
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 U): -40C to +85C

C1/C2 (WBS / WBP):
 Wire Bond Shear & Wire Bond Pull data from eQDB 20140626-106021

C4 (Physical dimensions):
 Physical Dimensions data from eQDB 20140626-106021

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

Automotive New Product Qualification Summary

(As per AEC-Q100 and JEDEC Guidelines)

Approved 24-Oct-2018

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: TPS61088QRHLQ1 | QBS Process Reference: TPS2543QRTE |
|---|----|-------------------------------------|-------------|---------|--|------------------|--------------------------------|---------------------------------------|
| Test Group A – Accelerated Environment Stress Tests | | | | | | | | |
| PC | A1 | JEDEC J-STD-020 JESD22-A113 | 3 | 77 | Automotive Preconditioning | Level 2- 260C | 3/All/0 | 3/All/0 |
| HAST | A2 | JEDEC JESD22-A110 | 3 | 77 | Biased HAST, 130C/85%RH | 96 Hours | 1/77/0 | 3/240/0 |
| AC | A3 | JEDEC JESD22-A102 | 3 | 77 | Autoclave 121C | 96 Hours | 1/77/0 | 3/237/0 |
| TC | A4 | JEDEC JESD22-A104 and Appendix 3 | 3 | 77 | Temperature Cycle, -85/150C | 500 Cycles | 3/231/0 | 3/238/0 |
| TC-BP | A4 | MIL-STD883 Method 2011 | 1 | 5 | Post Temp. Cycle Bond Pull | 500 Cycles | 1/5/0 | 1/5/0 |
| PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle, -40/125C | 1000 Cycles | 1/45/0 | 1/50/0 |
| HTSL | A6 | JEDEC JESD22-A103 | 1 | 45 | High Temp. Storage Bake, 150C | 1000 Hours | 1/45/0 | - |
| HTSL | A6 | JEDEC JESD22-A103 | 1 | 45 | High Temp. Storage Bake, 175C | 500 Hours | - | 3/149/0 |
| Test Group B – Accelerated Lifetime Simulation Tests | | | | | | | | |
| HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 125C | 1000 Hours | 1/77/0 | - |
| HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 150C | 408 Hours | - | 3/231/0 |
| ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 125C | 48 Hours | - | - |
| ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 150C | 24 Hours | - | 3/2640/0 |
| EDR | B3 | AEC Q100-005 | 3 | 77 | NVM Endurance, Data Retention, and Operational Life | -- | N/A | - |

| Test Group C – Package Assembly Integrity Tests | | | | | | | | |
|--|----|----------------------------|---|----|---------------------------------------|----------------------------|---|--------|
| WBS | C1 | AEC Q100-001 | 1 | 30 | Bond Shear (Cpk>1.67) | Wires | 1/30/0 | - |
| WBP | C2 | MIL-STD883 Method 2011 | 1 | 30 | Bond Pull (Cpk>1.67) | Wires | 1/30/0 | - |
| SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb Free | 1/15/0 | 2/30/0 |
| SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability | Pb Solder | 1/15/0 | - |
| PD | C4 | JEDEC JESD22-B100 and B108 | 3 | 10 | Physical Dimensions (Ppk>1.67) | -- | 3/90/0 | 3/90/0 |
| SBS | C5 | AEC Q100-010 | 3 | 50 | Solder Ball Shear (Cpk>1.67) | Post HTSL/Bump | N/A | - |
| LI | C6 | JEDEC JESD22-B105 | 1 | 50 | Lead Integrity | Leads | N/A | - |
| Test Group D – Die Fabrication Reliability Tests | | | | | | | | |
| EM | D1 | JESD61 | - | - | Electromigration | -- | Completed Per Process Technology Requirements | - |
| TDDB | D2 | JESD35 | - | - | Time Dependant 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 Q100-002 | 1 | 3 | ESD - HBM | 2500 V | 1/3/0 | 1/3/0 |
| CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM | 1000 V | 1/3/0 | 1/3/0 |
| LU | E4 | AEC Q100-004 | 1 | 6 | Latch-up | (Per AEC Q100-004) | 1/6/0 | 1/6/0 |
| ED | E5 | AEC Q100-009 | 3 | 30 | Electrical Distributions | Cpk>1.67 Room, Hot, & Cold | 3/90/0 | 3/90/0 |

- QBS: Qual By Similarity

- Qual Device TPS61088QRHLQ1 is qualified at LEVEL2-260C

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

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

Approve Date 10-July-2018

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: TLC6C5724QDAP RQ1 | Qual Device: TLC6C5712QP WPRQ1 | QBS Process Reference: TPS2543QRTE |
|---|----|----------------------------------|-------------|--------|--|-----------------------------------|---|---|---|
| Test Group A – Accelerated Environment Stress Tests | | | | | | | | | |
| PC | A1 | JEDEC J-STD-020 JESD22-A113 | - | - | Automotive Preconditioning | Level 2-260C | - | - | 3/765/0 |
| PC | A1 | JEDEC J-STD-020 JESD22-A113 | - | - | Automotive Preconditioning | Level 3-260C | 3/738/0 | 3/738/0 | - |
| HAST | A2 | JEDEC JESD22-A110 | 1 | 77 | Biased HAST, 130C/85%RH | 96 Hours | 3/231/0 | 3/231/0 | 3/231/0 |
| AC | A3 | JEDEC JESD22-A102 | 1 | 77 | Autoclave 121C | 96 Hours | 3/231/0 | 3/231/0 | 3/231/0 |
| TC | A4 | JEDEC JESD22-A104 and Appendix 3 | 1 | 77 | Temperature Cycle, -65/150C | 500 Cycles | 3/231/0 | 3/231/0 | 3/231/0 |
| TC-BP | A4 | MIL-STD883 Method 2011 | 1 | 5 | Post Temp. Cycle Bond Pull | per MIL-STD 883 Method 2011 | 1/5/0 | - | 1/5/0 |
| PTC | A5 | JEDEC JESD22-A105 | 1 | 45 | Power Temperature Cycle, -40/125C | 1000 Cycles | 1/45/0 | - | 1/45/0 |
| HTSL | A6 | JEDEC JESD22-A103 | 1 | 77 | High Temp. Storage Bake, 150C | 1000 Hours | 1/77/0 | - | - |
| HTSL | A6 | JEDEC JESD22-A103 | 1 | 45 | High Temp. Storage Bake, 175C | 500 Hours | - | 1/45/0 | 3/135/0 |
| Test Group B – Accelerated Lifetime Simulation Tests | | | | | | | | | |
| HTOL | B1 | JEDEC JESD22-A108 | 1 | 77 | Life Test, 150C | 408 Hours | 1/77/0 | 3/231/0 | - |
| HTOL | B1 | JEDEC JESD22-A108 | 3 | 77 | Life Test, 125C | 1000 Hours | - | - | 3/231/0 |
| ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 150C | 24 Hours | - | 3/2400/0 | 3/2240/0 |
| ELFR | B2 | AEC Q100-008 | 3 | 800 | Early Life Failure Rate, 125C | 48 Hours | - | - | - |
| Test Group C – Package Assembly Integrity Tests | | | | | | | | | |
| WBS | C1 | AEC Q100-001 | 1 | 30 | Bond Shear (Cpk>1.67) | Wires | 3/90/0 | - | - |
| WBP | C2 | MIL-STD883 Method 2011 | 1 | 30 | Bond Pull (Cpk>1.67) | Wires | 3/90/0 | - | - |
| SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability >95% Lead Coverage | 8 Hours Steam Age, Pb | - | - | 1/15/0 |
| SD | C3 | JEDEC JESD22-B102 | 1 | 15 | Surface Mount Solderability >95% Lead Coverage | 8 Hours Steam Age, Pb Free | 1/22/0 | - | 1/15/0 |
| PD | C4 | 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 | Completed Per Process Technology Requirements | Completed Per Process Technology Requirements |
| Tddb | D2 | JESD35 | - | - | Time Dependent 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 |
| Test Group E – Electrical Verification Tests | | | | | | | | | |
| HBM | E2 | AEC Q100-002 | 1 | 3 | ESD - HBM | 2000 V | 1/3/0 | 1/3/0 | 1/3/0 |
| HBM | E2 | AEC Q100-002 | 1 | 3 | ESD - HBM | 4000 V | - | 1/3/0 | - |
| CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM | 500 V | 1/3/0 | - | - |
| CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM | 750 V | 1/3/0 | 1/3/0 | - |
| CDM | E3 | AEC Q100-011 | 1 | 3 | ESD - CDM | 1000 V | - | 1/3/0 | 1/3/0 |
| LU | E4 | AEC Q100-004 | 1 | 6 | Latch-up | (Per AEC Q100-004) | 1/6/0 | 1/6/0 | 1/6/0 |
| ED | E5 | AEC Q100-009 | 3 | 30 | Electrical Distributions | Cpk>1.67 Room, hot, and cold test | 3/90/0 | 3/90/0 | 3/90/0 |

- Qual Device TLC6C5724QDAPRQ1 is qualified at LEVEL3-260C

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.

Junction 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 contact below or your local Field Sales Representative.

| | |
|---------------------------|--|
| Location | E-Mail |
| WW Change Management Team | PCN_ww_admin_team@list.ti.com |

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