12500 TI Boulevard, MS 8640, Dallas, Texas 75243

**PCN# 20230112001.1**
**Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, Datasheet and additional Assembly site/BOM options for select devices**
**Change Notification / Sample Request**

**Date:** January 12, 2023
**To:** TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments (TI). The details of this change are on the following pages, and are in alignment with our standard product change notification (PCN) process.

TI requires acknowledgement of receipt of this notification within 30 days of the date of this notice. Lack of acknowledgement of this notice within 30 days constitutes acceptance of the change. If samples or additional data are required, requests must be received within 30 days of this notification, given that samples are not built ahead of the change.

The Proposed First Ship date in this PCN letter is the earliest possible date that customers could receive the changed material. It is our commitment that the changed device will not ship before that date. If samples are requested within the 30 day sample request window, customers will still have 30-days to complete their evaluation regardless of the proposed 1st ship date.

This particular PCN is related to TI's multiyear transition plan for our two remaining factories with 150-millimeter production (DFAB in Dallas, Texas, and SFAB in Sherman, Texas). DFAB will remain open, but will focus on 200-mm production, with a smaller set of technologies. SFAB will close no earlier than 2024 and no later than 2025. As referenced in the "reason for change" below, these changes are part of our multiyear plan to transition these products to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

For questions regarding this notice or to provide acknowledgement of this PCN, you may contact your local Field Sales Representative or the PCN Team (PCN_ww_admin_team@list.ti.com). For sample requests or sample related questions, contact your local Field Sales Representative. As always, we thank you for your continued business.

PCN Team
SC Business Services

**20230112001.1**
**Attachment: 1**

## Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, these are the devices that you have purchased within the past twenty-four (24) months. The corresponding customer part number is also listed, if available.

| DEVICE | CUSTOMER PART NUMBER |
|---|---|
| SN65HVD1176DR | null |
| SN65ALS180DR | null |
| SN65LBC180ADR | null |
| SN75ALS176BDR | null |
| SN65LBC176ADR | null |
| SN65ALS176DR | null |
| SN65HVD1176DRG4 | null |

Technical details of this Product Change follow on the next page(s).

| PCN Number: | 20230112001.1 | PCN Date: | January 12, 2023 |
|---|---|---|---|
| Title: | Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, Datasheet and additional Assembly site/BOM options for select devices | | |
| Customer Contact: | PCN Manager | Dept: | Quality Services |
| Proposed 1st Ship Date: | Apr 12, 2023 | Sample requests accepted until: | Feb 12, 2023* |

***Sample requests received after February 12, 2023 will not be supported.**

| 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 (RFAB, LBC7) and assembly (MLA) site for selected 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 |
| DL-LIN | LBC3S | 150 mm | RFAB | LBC7 | 300 mm |
| DL-LIN | LBC3S | 200 mm | | | |
| SFAB | OI | 150 mm | | | |

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

Construction Differences: No material differences between sites.

The datasheet will be changing as a result of the above mentioned changes. The datasheet change details can be reviewed in the datasheet revision history. The links to the revised datasheets are available in the table below.

TEXAS INSTRUMENTS

**SN65LBC180A, SN75LBC180A**

SLLS378E – MAY 2000 – REVISED JANUARY 2023

**Changes from Revision D (April 2009) to Revision E (January 2023)** **Page**

- Changed the document to the latest TI format..... 1
- Added the *Pin Configuration and Functions* ..... 3
- Added the *Thermal Information* table..... 5
- Changed the Typical Characteristics graphs..... 7

TEXAS INSTRUMENTS

**SN65LBC179A, SN75LBC179A**

SLLS377E – MAY 2000 – REVISED JANUARY 2023

**Changes from Revision D (September 2011) to Revision E (January 2023)** **Page**

- Changed the document to the latest TI format..... 1
- Added the *Thermal Information* table..... 5
- Changed the *Typical Characteristics* graphs..... 7

**Changes from Revision H (June 2000) to Revision I (January 2023)** **Page**

- Changed the document to the latest TI format.... 1
- Deleted the Package thermal impedance from the *Absolute Maximum Ratings* .... 4
- Added the *Thermal Information* table.... 4
- Changed the *Typical Characteristics* graphs.... 9



**Changes from Revision G (April 2003) to Revision H (January 2023)** **Page**

- Changed the document to the latest TI format.... 1
- Deleted the Package thermal impedance from the *Absolute Maximum Ratings* .... 4
- Added the *Thermal Information* table.... 4
- Changed the *Typical Characteristics* graphs.... 8



**Changes from Revision A (December 1999) to Revision B (January 2023)** **Page**

- Changed the document to the latest TI format.... 1
- Deleted the P package option.... 3
- Deleted the Package thermal impedance from the *Absolute Maximum Ratings* .... 4
- Added the *Thermal Information* table.... 4



**Changes from Revision H (September 2015) to Revision I (January 2023)** **Page**

- Changed the *Thermal Information* table .... 5
- Changed the *Typical Characteristics* graphs.... 10



**Changes from Revision D (August 200/8) to Revision E (January 2023)** **Page**

- Changed the document to the latest TI format.... 1
- Added the *Thermal Information* table.... 5

| Product Folder | Current Datasheet Number | New Datasheet Number | Link to full datasheet |
|---|---|---|---|
| SNx5LBC180A | SLLS378D | SLLS378E | http://www.ti.com/product/SN65LBC180A |
| SNx5LBC179A | SLLS377D | SLLS377E | http://www.ti.com/product/SN65LBC179A |
| SNx5ALS176, SN75ALS176A, and SN75ALS176B | SLLS040H | SLLS040I | http://www.ti.com/product/SN65ALS176 |

| | | | |
|---|---|---|---|
| SNx5ALS180 | SLLS052G | SLLS052H | http://www.ti.com/product/SN65ALS180 |
| SN65ALS1176 | SLLS295A | SLLS295B | http://www.ti.com/product/SN65ALS1176 |
| SNx5HVD1176 | SLLS563H | SLLS563I | http://www.ti.com/product/SN65HVD1176 |
| SNx5LBC176A | SLLS376D | SLLS376E | http://www.ti.com/product/SN65LBC176A |

Temp and Tube variants of the devices are included in EOL notice PDN# 20230112004.3.

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-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

**Impact on Environmental Ratings**

Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings.

| RoHS | REACH | Green Status | IEC 62474 |
|---|---|---|---|
| ☒ No Change | ☒ No Change | ☒ No Change | ☒ No Change |

**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 |
|---|---|---|---|
| DL-LIN | DLN | USA | Dallas |
| SH-BIP-1 | SHE | USA | Sherman |
| **RFAB** | **RFB** | **USA** | **Richardson** |

**Die Rev:**

| **Current** | **New** |
|---|---|
| Die Rev [2P] | **Die Rev [2P]** |
| A, J, K | **-** |

**Assembly Site Information:**

| Assembly Site | Assembly Site Origin (22L) | Assembly Country Code (23L) | Assembly City |
|---|---|---|---|
| FMX | MEX | MEX | Aguascalientes |
| **MLA** | **MLA** | **MYS** | **KUALA LUMPUR** |

Sample product shipping label (not actual product label)

| Product Affected: | | | |
|---|---|---|---|
| SN65ALS1176DR | SN65ALS180DR | SN65HVD1176DRG4 | SN65LBC179ADRG4 |
| SN65ALS1176DRE4 | SN65ALS180DRG4 | SN65LBC176ADR | SN65LBC180ADR |
| SN65ALS176DR | SN65HVD1176DR | SN65LBC179ADR | SN75ALS176BDR |

For alternate parts with similar or improved performance, please visit the product page on TI.com

**Qualification Report**
**Approve Date 09-JANUARY -2023**

**Qualification Results**

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

| Type | # | Test Name | Condition | Duration | Qual Device: SN65ALS180DR | Qual Device: SN65ALS1176DR | Qual Device: SN65ALS176DR | Qual Device: SN75ALS176BDR | QBS Reference: TCAN1044VDRQ1 | QBS Reference: TCAN1044VDRQ1 | QBS Reference: TPS51217DSCR | QBS Reference: TCAN1043DQ1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HAST | A2 | Biased HAST | 130C/85%RH | 96 Hours | - | - | - | - | 2/154/0 | 2/154/0 | 3/231/0 | 3/231/0 |
| UHAST | A3 | Autoclave | 121C/15psig | 96 Hours | - | - | - | - | 1/77/0 | 2/154/0 | 3/231/0 | 3/231/0 |
| TC | A4 | Temperature Cycle | -65C/150C | 500 Cycles | - | - | - | - | 1/77/0 | 2/154/0 | 3/231/0 | 3/231/0 |
| HTSL | A6 | High Temperature Storage Life | 170C | 420 Hours | - | - | - | - | - | - | 3/231/0 | - |
| HTSL | A6 | High Temperature Storage Life | 175C | 500 Hours | - | - | - | - | 1/45/0 | 2/90/0 | - | 1/45/0 |
| HTOL | B1 | Life Test | 125C | 1000 Hours | - | - | - | - | 1/77/0 | 2/154/0 | - | 1/77/0 |
| HTOL | B1 | Life Test | 135C | 635 Hours | - | - | - | - | - | - | 3/231/0 | - |
| WBS | C1 | Ball Shear | 76 balls, 3 units min | Wires | 1/76/0 | - | 1/76/0 | - | - | - | - | - |
| WBP | C2 | Bond Pull | 76 Wires, 3 units min | Wires | 1/76/0 | - | 1/76/0 | - | - | - | - | - |
| SD | C3 | PB Solderability | Precondition w.155C Dry Bake (4 hrs +/- 15 minutes) | - | - | - | - | - | - | 1/15/0 | - | 1/15/0 |
| SD | C3 | PB-Free Solderability | Precondition w.155C Dry Bake (4 hrs +/- 15 minutes) | - | - | - | - | - | - | 1/15/0 | - | 1/15/0 |
| PD | C4 | Physical Dimensions | Cpk>1.67 | - | - | - | - | - | 1/10/0 | 2/20/0 | - | 3/30/0 |
| ESD | E2 | ESD CDM | - | 1500 Volts | - | - | - | - | - | - | 3/9/0 | - |
| ESD | E2 | ESD CDM | - | 250 Volts | 1/3/0 | - | 1/3/0 | - | - | - | - | - |
| ESD | E2 | ESD HBM | - | 1000 Volts | 1/3/0 | - | 1/3/0 | - | - | - | - | - |
| ESD | E2 | ESD HBM | - | 2000 Volts | - | - | - | - | - | - | 3/9/0 | - |
| LU | E4 | Latch-Up | Per JESD78 | - | 1/3/0 | - | 1/3/0 | - | - | - | 3/18/0 | - |
| CHAR | E5 | Electrical Characterization | Per Datasheet Parameters | - | 1/30/0 | 1/30/0 | 1/30/0 | - | - | - | 3/60/0 | - |
| CHAR | E5 | Electrical Distributions | Cpk>1.67 Room, hot, and cold | - | - | - | - | - | 2/60/0 | - | - | 1/30/0 |
| FTY | E6 | Final Test Yield | - | - | 1/1/0 | - | 1/1/0 | - | - | - | - | - |

- QBS: Qual By Similarity
- Qual Device SN65ALS180DR is qualified at MSL1 260C
- Qual Device SN65ALS1176DR is qualified at MSL1 260C
- Qual Device SN65ALS176DR is qualified at MSL1 260C
- Qual Device SN75ALS176BDR 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/

**Green/Pb-free Status:**

Qualified Pb-Free(SMT) and Green

**Qualification Report**
**Approve Date 09-JANUARY -2023**

**Qualification Results**

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

| Type | # | Test Name | Condition | Duration | Qual Device: SN65LBC180ADR | Qual Device: SN65LBC179ADR | QBS Reference: TCAN1044VDRQ1 | QBS Reference: TCAN1044VDRQ1 | QBS Reference: TPS51217DSCR | QBS Reference: TCAN1043DQ1 |
|---|---|---|---|---|---|---|---|---|---|---|
| HAST | A2 | Biased HAST | 130C/85%RH | 96 Hours | - | - | 1/77/0 | 2/154/0 | 3/231/0 | 3/231/0 |
| UHAST | A3 | Autoclave | 121C/15psig | 96 Hours | - | - | 1/77/0 | 2/154/0 | 3/231/0 | 3/231/0 |
| TC | A4 | Temperature Cycle | -65C/150C | 500 Cycles | - | - | 1/77/0 | 2/154/0 | 3/231/0 | 3/231/0 |
| HTSL | A6 | High Temperature Storage Life | 170C | 420 Hours | - | - | - | - | 3/231/0 | - |
| HTSL | A6 | High Temperature Storage Life | 175C | 500 Hours | - | - | 1/45/0 | 2/90/0 | - | 1/45/0 |
| HTOL | B1 | Life Test | 125C | 1000 Hours | - | - | 1/77/0 | 2/154/0 | - | 1/77/0 |
| HTOL | B1 | Life Test | 135C | 635 Hours | - | - | - | - | 3/231/0 | - |
| WBS | C1 | Ball Shear | 76 balls, 3 units min | Wires | 1/76/0 | 1/76/0 | - | - | - | - |
| WBP | C2 | Bond Pull | 76 Wires, 3 units min | Wires | 1/76/0 | 1/76/0 | - | - | - | - |
| SD | C3 | PB Solderability | Precondition w.155C Dry Bake (4 hrs +/- 15 minutes) | - | - | - | - | 1/15/0 | - | 1/15/0 |
| SD | C3 | PB-Free Solderability | Precondition w.155C Dry Bake (4 hrs +/- 15 minutes) | - | - | - | - | 1/15/0 | - | 1/15/0 |
| PD | C4 | Physical Dimensions | Cpk>1.67 | - | - | - | 1/10/0 | 2/20/0 | - | 3/30/0 |
| ESD | E2 | ESD CDM | - | 1500 Volts | - | - | - | - | 3/9/0 | - |
| ESD | E2 | ESD CDM | - | 250 Volts | 1/3/0 | 1/3/0 | - | - | - | - |
| ESD | E2 | ESD HBM | - | 1000 Volts | 1/3/0 | 1/3/0 | - | - | - | - |
| ESD | E2 | ESD HBM (Bus Pins) | - | 12000 Volts | 1/3/0 | - | - | - | - | - |
| ESD | E2 | ESD HBM (Bus Pins) | - | 15000 Volts | - | 1/3/0 | - | - | - | - |
| ESD | E2 | ESD HBM | - | 2000 Volts | - | - | - | - | 3/9/0 | - |
| LU | E4 | Latch-Up | Per JESD78 | - | 1/3/0 | 1/3/0 | - | - | 3/18/0 | - |
| CHAR | E5 | Electrical Characterization | Per Datasheet Parameters | - | 1/30/0 | 1/30/0 | - | - | 3/60/0 | - |
| CHAR | E5 | Electrical Distributions | Cpk>1.67 Room, hot, and cold | - | - | - | 2/60/0 | - | - | 1/30/0 |
| FTY | E6 | Final Test Yield | - | - | 1/1/0 | 1/1/0 | - | - | - | - |

- QBS: Qual By Similarity
- Qual Device SN65LBC180ADR is qualified at MSL1 260C
- Qual Device SN65LBC179ADR 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/

**Green/Pb-free Status:**

Qualified Pb-Free(SMT) and Green

**Qualification Report**
**Approve Date 09-JANUARY -2023**

**Qualification Results**

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

| Type | # | Test Name | Condition | Duration | Qual Device: SN65HVD1176DR | QBS Reference: TCAN1044VDRQ1 | QBS Reference: TCAN1044VDRQ1 | QBS Reference: TPS51217DSCR | QBS Reference: TPS51218DSCR |
|---|---|---|---|---|---|---|---|---|---|
| HAST | A2 | Biased HAST | 130C/85%RH | 96 Hours | - | 1/77/0 | 2/154/0 | 3/231/0 | - |
| UHAST | A3 | Autoclave | 121C/15psig | 96 Hours | - | 1/77/0 | 2/154/0 | 3/231/0 | - |
| TC | A4 | Temperature Cycle | -65C/150C | 500 Cycles | - | 1/77/0 | 2/154/0 | 3/231/0 | - |
| HTSL | A6 | High Temperature Storage Life | 170C | 420 Hours | - | - | - | 3/231/0 | - |
| HTSL | A6 | High Temperature Storage Life | 175C | 500 Hours | - | 1/45/0 | 2/90/0 | - | - |
| HTOL | B1 | Life Test | 125C | 1000 Hours | - | 1/77/0 | 2/154/0 | - | - |
| HTOL | B1 | Life Test | 135C | 635 Hours | - | - | - | 3/231/0 | - |
| WBS | C1 | Ball Shear | 76 balls, 3 units min | Wires | 1/76/0 | - | - | - | - |
| WBP | C2 | Bond Pull | 76 Wires, 3 units min | Wires | 1/76/0 | - | - | - | - |
| 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 | - | - | 1/10/0 | 2/20/0 | - | - |
| ESD | E2 | ESD CDM | - | 1500 Volts | - | - | - | 3/9/0 | - |
| ESD | E2 | ESD CDM | - | 250 Volts | 1/3/0 | - | - | - | - |
| ESD | E2 | ESD HBM | - | 1000 Volts | 1/3/0 | - | - | - | - |
| ESD | E2 | ESD HBM (Bus Pins) | - | 10000 Volts | 1/3/0 | - | - | - | - |
| ESD | E2 | ESD HBM | - | 2000 Volts | - | - | - | 3/9/0 | - |
| LU | E4 | Latch-Up | Per JESD78 | - | 1/3/0 | - | - | 3/18/0 | - |
| CHAR | E5 | Electrical Characterization | Per Datasheet Parameters | - | 1/30/0 | - | - | 3/60/0 | 1/30/0 |
| CHAR | E5 | Electrical Distributions | Cpk>1.67 Room, hot, and cold | - | - | 2/60/0 | - | - | - |
| FTY | E6 | Final Test Yield | - | - | 1/1/0 | - | - | - | - |

- QBS: Qual By Similarity
- Qual Device SN65HVD1176DR is qualified at NOT CLASSIFIED NOT CLASSIFIED

- 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/

**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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