



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20150430001
ULN2003A Die Revision Change
Final Change Notification / Sample Request

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments. The details of this change are on the following pages.

We request you acknowledge 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 you require samples or additional data to support your evaluation, please request within 30 days.

The changes discussed within this PCN will not take effect any earlier than **90** days from the date of this notification, unless customer agreement has been reached on an earlier implementation of the change. This notification period is per TI's standard process.

This notice does not change the end-of-life status of any product. Should product affected be on a previously issued product withdrawal/discontinuance notice, this notification does not extend the life of that product or change the life time buy offering/discontinuance plan.

For questions regarding this notice, contact your local Field Sales Representative or the PCN Manager (PCN_ww_admin_team@list.ti.com).


Sincerely,

PCN Team
SC Business Services

PCN# 20150430001
Attachment: 1

Products Affected:

According to our records, there are the affected device(s) that you have purchased within the past twenty-four (24) months. Technical details of this Product Change follow on the next page(s).

| | | | | |
|---|---|---------------------------------------|----------------------------------|--------------------------|
| PCN Number: | 20150430001 | | PCN Date: | 4/30/2015 |
| Title: | Die Revision Change for select ULN2003A devices | | | |
| Customer Contact: | PCN Manager | | Dept: | Quality Services |
| Proposed 1st Ship Date: | 7/30/2015 | Estimated Sample Availability: | Date provided at sample request. | |
| Change Type: | | | | |
| <input type="checkbox"/> | Assembly Site | <input type="checkbox"/> | Assembly Process | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | Design | <input type="checkbox"/> | Electrical Specification | <input type="checkbox"/> |
| <input type="checkbox"/> | Test Site | <input type="checkbox"/> | Packing/Shipping/Labeling | <input type="checkbox"/> |
| <input type="checkbox"/> | Wafer Bump Site | <input type="checkbox"/> | Wafer Bump Material | <input type="checkbox"/> |
| <input type="checkbox"/> | Wafer Fab Site | <input type="checkbox"/> | Wafer Fab Materials | <input type="checkbox"/> |
| | | <input type="checkbox"/> | Part number change | |
| PCN Details | | | | |
| Description of Change: | | | | |
| This notification is to inform of a die revision change to select devices. The design change does not affect the device's guaranteed datasheet specifications or electrical performance. Affected devices are listed in "Product Affected" section. | | | | |
| The Die Revision will change as follows: | | | | |
| Current | New | | | |
| Die Revision | Die Revision | | | |
| C/D | F | | | |
| Reason for Change: | | | | |
| Improved delivery and continuity of supply | | | | |
| Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative): | | | | |
| None | | | | |
| Changes to product identification resulting from this PCN: | | | | |
| Die Rev designator will change as shown in the table & sample label below: | | | | |
| Current | New | | | |
| Die Revision [2P] | Die Revision [2P] | | | |
| C/D | F | | | |
| Sample product shipping label to indicate die rev location (not actual product label) | | | | |
|  | | | | |
| Product Affected: | | | | |
| ULN2003AD | ULN2003AIDG4 | ULN2003AIPWE4 | ULN2003ANSR | |
| ULN2003ADE4 | ULN2003AIDR | ULN2003AIPWG4 | ULN2003ANSRE4 | |
| ULN2003ADG4 | ULN2003AIDRE4 | ULN2003AIPWR | ULN2003ANSRG4 | |
| ULN2003ADR | ULN2003AIDRG3 | ULN2003AIPWRG4 | ULN2003APW | |
| ULN2003ADRE4 | ULN2003AIDRG4 | ULN2003AN | ULN2003APW-P | |
| ULN2003ADRG3 | ULN2003AIN | ULN2003AN-P2 | ULN2003APWG3 | |
| ULN2003ADRG4 | ULN2003AINE4 | ULN2003AN-SQ | ULN2003APWG4 | |

| | | | |
|--------------|--------------|-------------|---------------|
| ULN2003AID | ULN2003AINSR | ULN2003ANE4 | ULN2003APWR |
| ULN2003AIDE4 | ULN2003AIPW | ULN2003ANS | ULN2003APWRG4 |

Qualification Report

ULN2003A Die Rev 'F' (SC2003FHS) in MLA and ASESHTSSOP (PW)
Approved 11/10/2014

Product Attributes

| Attributes | Qual Device: ULN2003AIPW | Qual Device: ULN2003AIPWR | Qual Device: ULN2003APW | Qual Device: ULN2003APWR | QBS Product: ULN2003BD | QBS Package: RC4558PWR | QBS Package: RC4558PWR | QBS Package: GD75232PWR |
|-------------------|--------------------------|---------------------------|-------------------------|--------------------------|------------------------|------------------------|------------------------|-------------------------|
| Assembly Site | MLA | ASESH | MLA | ASESH | ASESH | MLA (TIM) | ASE SHANGHAI | ASE SHANGHAI |
| Package Family | TSSOP | TSSOP | TSSOP | TSSOP | SOIC | TSSOP | TSSOP | TSSOP |
| Wafer Fab Site | SFAB | SFAB | SFAB | SFAB | SHE SFAB | SFAB | SFAB | SHE |
| Wafer Fab Process | J11 | J11 | J11 | J11 | J1-1 | J1-SLM | J1-SLM | - |

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL1-260CG: ULN2003AIPW, ULN2003AIPWR, ULN2003APW, ULN2003APWR

Qualification Results

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

| Type | Test Name / Condition | Duration | Qual Device: ULN2003AIPW | Qual Device: ULN2003AIPWR | Qual Device: ULN2003APW | Qual Device: ULN2003APWR | QBS Product: ULN2003BD | QBS Package: RC4558PWR | QBS Package: RC4558PWR | QBS Package: GD75232PWR |
|-------|-------------------------------|--------------------------|--------------------------|---------------------------|-------------------------|--------------------------|------------------------|------------------------|------------------------|-------------------------|
| HAST | Biased HAST, 130C/85%RH | 96 Hours | - | - | - | - | - | 1/77/0 | 1/77/0 | 3/231/0 |
| AC | Autoclave 121C | 96 Hours | - | - | - | - | - | 1/77/0 | - | - |
| UHAST | Unbiased HAST 130C/85%RH | 96 Hours | - | - | - | - | - | - | 1/77/0 | 3/231/0 |
| TC | Temperature Cycle -55/125C | 700 Cycles | - | - | - | - | - | 1/77/0 | - | - |
| TC | Temperature Cycle -55/150C | 500 Cycles | - | - | - | - | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 |
| HTSL | High Temp. Storage Bake, 150C | 1000 Hours | - | - | - | - | - | 1/77/0 | 1/77/0 | - |
| HTSL | High Temp. Storage Bake, 170C | 420 Hours | - | - | - | - | - | - | - | 3/231/0 |
| TS | Thermal Shock -65/150C | 500 Cycles | - | - | - | - | - | 1/77/0 | - | 3/231/0 |
| HTOL | Life Test, 150C | 300 Hours | - | - | - | - | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 |
| WBP | Bond Pull | Wires | - | - | - | - | 1/76/0 | - | - | - |
| SD | Solderability | Post 8 Hours Steam Age | - | - | - | - | - | - | - | 3/66/0 |
| PD | Physical Dimensions | -- | - | - | - | - | - | - | - | 3/15/0 |
| LI | Lead Fatigue | Leads | - | - | - | - | - | - | - | 3/66/0 |
| LI | Lead Pull | Leads | - | - | - | - | - | - | - | 3/66/0 |
| HBM | ESD - HBM | 4000 V | - | - | - | - | 1/3/0 | - | - | - |
| CDM | ESD - CDM | 1500 V | - | - | - | - | - | - | - | - |
| LU | Latch-up | (per JESD78) | - | - | - | - | 1/6/0 | - | - | - |
| ED | Electrical Characterization | Per Datasheet Parameters | - | - | - | - | Pass | Pass | Pass | - |
| WBS | Bond Strength | Wires | - | - | - | - | 1/76/0 | 1/76/0 | 1/76/0 | 3/231/0 |
| FLAM | Flammability (IEC 695-2-2) | -- | - | - | - | - | - | - | - | 3/15/0 |
| FLAM | Flammability (UL 94V-0) | -- | - | - | - | - | - | - | - | 3/15/0 |
| FLAM | Flammability (UL-1694) | -- | - | - | - | - | - | - | - | 3/15/0 |

- 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

ULN2003A Die Rev 'F' (SC2003FHS) in MLA SOP (NS) ULN2003AINSR / ULN2003ANS
Approved 02/11/2015

Product Attributes

| Attributes | Qual Device: ULN2003AINSR | Qual Device: ULN2003ANS | QBS Product: ULN2003BD | QBS Product: ULN2003BD.. | QBS Product: ULN2003BD.. | QBS Product: ULN2003BN | QBS Product: ULN2003BPW | QBS Product: ULN2003BPW. | QBS Package: CABT646ANSR | QBS Package: 2F1177NS | QBS Package: TL092CPS |
|-------------------|---------------------------|-------------------------|------------------------|--------------------------|--------------------------|------------------------|-------------------------|--------------------------|--------------------------|-----------------------|-----------------------|
| Assembly Site | MLA | MLA | ASESH | MLA | ASESH | JCET CHUZHOU | ASESH | MLA | MLA | MLA | MLA |
| Package Family | SOP | SOP | SOIC | SOIC | SOIC | PDIP | TSSOP | TSSOP | SOP | - | - |
| Wafer Fab Site | SFAB | SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | FFAB | SFAB | SFAB |
| Wafer Fab Process | J11 | J11 | J1-1 | J1-1 | J1-1 | J1-1 | J1-1 | J1-1 | ASL2B | O12 | J11 |

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL1-260CG: ULN2003AINSR, ULN2003ANS

Qualification Results

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

| Type | Test Name / Condition | Duration | Qual Device: ULN2003AINSR | Qual Device: ULN2003ANS | QBS Product: ULN2003BD | QBS Product: ULN2003BD.. | QBS Product: ULN2003BD.. | QBS Product: ULN2003BN | QBS Product: ULN2003BPW | QBS Product: ULN2003BPW. | QBS Package: CABT646ANSR | QBS Package: 2F1177NS | QBS Package: TL092CPS |
|------|-------------------------------|--------------------------|---------------------------|-------------------------|------------------------|--------------------------|--------------------------|------------------------|-------------------------|--------------------------|--------------------------|-----------------------|-----------------------|
| AC | Autoclave 121C | 96 Hours | - | - | - | - | - | - | - | - | 3/231/0 | 3/231/0 | 3/231/0 |
| TC | Temperature Cycle -65/150C | 500 Cycles | - | - | 1/77/0 | - | 1/77/0 | - | - | - | 3/231/0 | 3/231/0 | 3/231/0 |
| HTSL | High Temp. Storage Bake, 170C | 420 Hours | - | - | - | - | - | - | - | - | 3/231/0 | - | 3/231/0 |
| HTOL | Life Test, 150C | 300 Hours | - | - | 1/77/0 | - | - | - | - | - | - | - | - |
| WBP | Bond Pull | Wires | - | - | 1/76/0 | 1/76/0 | - | 1/76/0 | 1/76/0 | 1/76/0 | - | - | - |
| HBM | ESD - HBM | 4000 V | - | - | 1/3/0 | - | - | - | - | - | - | - | - |
| CDM | ESD - CDM | 1000 V | - | - | 1/3/0 | - | - | 1/3/0 | - | - | - | - | - |
| LU | Latch-up | (per JESD78) | - | - | 1/6/0 | - | - | - | - | - | - | - | - |
| ED | Electrical Characterization | Per Datasheet Parameters | - | Pass | Pass | - | Pass | - | - | - | - | - | - |
| WBS | Bond Strength | Wires | - | - | 1/76/0 | 1/76/0 | - | 1/76/0 | 1/76/0 | 1/76/0 | - | - | - |

- 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

ULN2003A Die Rev 'F' (SC2003FHS) in PDIP (N), ULN2003AIN / ULN2003AN
Approved 01/30/2015

Product Attributes

| Attributes | Qual Device: ULN2003AIN | Qual Device: ULN2003AIN | Qual Device: ULN2003AN | Qual Device: ULN2003AN | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BN | QBS Product: ULN2003BPW | QBS Product: ULN2003BPW | QBS Product: ULN2003BPW | QBS Package: SN74HC273N-P2 | QBS Package: ULN2003AN | QBS Package: NE5532P | QBS Package: ULN2003AN | QBS Package: SN74HC594N | QBS Package: CD4051BE | QBS Package: ULN2003AN |
|-------------------|-------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|----------------------------|------------------------|----------------------|------------------------|-------------------------|-----------------------|------------------------|
| Assembly Site | MLA | FMX | JCET CHUZHOU | NFME | ASESH | MLA | ASESH | JCET CHUZHOU | ASESH | MLA | MLA | MLA | MLA | FMX | FMX | NFME | JCET CHUZHOU | JCET CHUZHOU |
| Package Family | PDIP | PDIP | PDIP | N | SOIC | SOIC | SOIC | PDIP | TSSOP | TSSOP | PDIP | PDIP | PDIP | PDIP | PDIP | PDIP | PDIP | PDIP |
| Wafer Fab Site | SFAB | SFAB | SFAB | SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SFAB | SFAB | SFAB | SFAB | SHE SFAB | SFAB | SFAB |
| Wafer Fab Process | J11 | J11 | J11 | J11 | J1-1 | J1-1 | J1-1 | J1-1 | J1-1 | J1-1 | J1-1 | 74HC-NONEPI | J11 | J1 SLM | J1 SLM | HC-MOS | HC-C | J11 |

- QBS: Qual by Similarity
- Qual Devices qualified at LEVEL1-260CG: ULN2003AIN, ULN2003AN

Qualification Results

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

| Type | Test Name / Condition | Duration | Qual Device: ULN2003AIN | Qual Device: ULN2003AIN | Qual Device: ULN2003AN | Qual Device: ULN2003AN | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BN | QBS Product: ULN2003BPW | QBS Package: SN74HC273N-P2 | QBS Package: ULN2003AN | QBS Package: NE5532P | QBS Package: ULN2003AN | QBS Package: SN74HC594N | QBS Package: CD4051BE | QBS Package: ULN2003AN |
|-------|-------------------------------|----------------------|-------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|----------------------------|------------------------|----------------------|------------------------|-------------------------|-----------------------|------------------------|
| HAST | Biased HAST, 130C/85%RH | 96 Hours | - | - | - | - | - | - | - | - | - | - | 3/231/0 | 1/77/0 | 1/77/0 | 3/231/0 | 3/231/0 | 3/231/0 |
| AC | Autoclave 121C | 96 Hours | - | - | - | - | - | - | - | - | - | 1/77/0 | - | 1/77/0 | 1/77/0 | - | 3/231/0 | - |
| UHAST | Unbiased HAST 130C/85%RH | 96 Hours | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/231/0 | - |
| TC | Temperature Cycle, -65/150C | 500 Cycles | - | - | - | - | 1/77/0 | - | 1/77/0 | - | - | - | 1/77/0 | - | 1/77/0 | 1/77/0 | 3/231/0 | 3/231/0 |
| HTSL | High Temp. Storage Bake 150C | 1000 Hours | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/231/0 | - | - |
| HTSL | High Temp. Storage Bake, 170C | 420 Hours | - | - | - | - | - | - | - | - | - | 1/77/0 | - | 1/77/0 | 1/77/0 | - | 3/231/0 | - |
| TS | Thermal Shock - 65/150C | 500 cycles | - | - | - | - | - | - | - | - | - | - | - | 1/77/0 | 1/77/0 | 3/231/0 | - | - |
| HTOL | Life Test, 150C | 300 Hours | - | - | - | - | 1/77/0 | - | - | - | - | - | - | 1/77/0 | 1/77/0 | 3/231/0 | 3/231/0 | - |
| WBS | Ball Bond Shear | Wires | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/231/0 | 3/228/0 | 3/228/0 |
| WBP | Bond Pull | Wires | - | - | - | - | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | - | - | - | - | - | 3/228/0 | 3/228/0 |
| SD | Solderability | 8 Hours Steam Age | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/66/0 | - |
| PD | Physical Dimensions | -- | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/15/0 | - |
| LI | Lead Fatigue | Leads | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/66/0 | - | - |
| HBM | ESD - HBM | 4000 V | - | - | - | - | 1/3/0 | - | - | - | - | - | - | - | - | - | 3/66/0 | - |
| CDM | ESD - CDM | 1000 V | - | - | - | - | 1/3/0 | - | - | 1/3/0 | - | - | - | - | - | - | - | - |
| LU | Latch-up (per JEDEC78) | - | - | - | - | - | 1/6/0 | - | - | - | - | - | - | - | - | - | - | - |
| ED | Electrical Characterization | Datasheet Parameters | Pass | Pass | - | Pass | Pass | - | Pass | - | - | Pass | - | Pass | Pass | Pass | Pass | - |
| | Bond Strength | Wires | - | - | - | - | 1/76/0 | 1/76/0 | - | 1/76/0 | 1/76/0 | - | - | 1/76/0 | 1/76/0 | 3/234/0 | - | - |
| LI | Lead Pull to Destruction | Leads | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/66/0 | - |
| LI | Lead Pull | Leads | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/66/0 | - | - |
| FLAM | Flammability (IEC 605-2-2) | -- | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/15/0 | 3/15/0 | - |
| FLAM | Flammability (UL 94V-0) | -- | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/15/0 | 3/15/0 | - |
| FLAM | Flammability (UL-1694) | -- | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/15/0 | 3/15/0 | - |

- 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 JEDEC78: -65C/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

ULN2003A Die Rev 'F' (SC2003FHS) in SOIC(G)
Approved 01/21/2015

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Product Attributes

| Die Attributes | Qual Device: ULN2003AD | Qual Device: ULN2003AD | Qual Device: ULN2003ADR | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BN | QBS Product: ULN2003BPW | QBS Product: ULN2003BPW | QBS Package: CD4051BMS | QBS Package: LM339DR | QBS Package: RC4050DR | QBS Package: SN74LV14ADR | QBS Package: MAX232DR | QBS Package: RC4050DR | QBS Package: SN74LV14ADR | QBS Package: ULN2003ADR | QBS Package: CD4051BMS | QBS Package: LM339DR | QBS Package: TL4042DR | QBS Package: ULN2003ADR |
|-------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|------------------------|----------------------|-----------------------|--------------------------|-----------------------|-----------------------|--------------------------|-------------------------|------------------------|----------------------|-----------------------|-------------------------|
| Die Revision | F | F | F | F | F | F | F | F | F | A | E | B | H | B | B | H | C | A | E | H | C |
| Wafer Fab Site | SFAB | SFAB | SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SHE SFAB | SFAB | SFAB | SFAB | SFAB | SFAB | SFAB | SFAB | SFAB | SFAB | SFAB | SFAB | SFAB |
| Wafer Fab Process | J11 | J11 | J11 | J1-1 | J1-1 | J1-1 | J1-1 | J1-1 | J1-1 | CD4K | J1 SLM | J1 SLM | EPIC1-S_SLM | LBC3S | J1-LIN | EPIC1-S_SLM | J1 SLM | CD4K | J1 SLM 20K | J1-LIN 55K | J1 SLM 20K |

Qualification Results

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

| Type | Test Name / Condition | Duration | Qual Device: ULN2003AD | Qual Device: ULN2003AD | Qual Device: ULN2003ADR | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BD | QBS Product: ULN2003BN | QBS Product: ULN2003BPW | QBS Product: ULN2003BPW | QBS Package: CD4051BMS | QBS Package: LM339DR | QBS Package: RC4050DR | QBS Package: SN74LV14ADR | QBS Package: MAX232DR | QBS Package: RC4050DR | QBS Package: SN74LV14ADR | QBS Package: ULN2003ADR | QBS Package: CD4051BMS | QBS Package: LM339DR | QBS Package: TL4042DR | QBS Package: ULN2003ADR |
|-------|-------------------------------|-------------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|------------------------|----------------------|-----------------------|--------------------------|-----------------------|-----------------------|--------------------------|-------------------------|------------------------|----------------------|-----------------------|-------------------------|
| HAST | Biased HAST, 130C/85%RH | 96 hours | - | - | - | - | - | - | - | - | - | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 3/229/0 | 1/77/0 |
| AC | Autoclave 121C | 96 hours | - | - | - | - | - | - | - | - | - | - | - | - | 3/231/0 | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 | 3/231/0 |
| UHAST | Unbiased HAST, 130C/85%RH | 96 hours | - | - | - | - | - | - | - | - | - | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | - | - | - | - | - | - | - | - |
| TC | Temperature Cycle, -65/150C | 500 Cycles | - | - | - | 1/77/0 | - | 1/77/0 | - | - | - | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 | 3/231/0 | 3/231/0 | 3/231/0 | 1/77/0 | 3/231/0 | 3/231/0 | 3/231/0 |
| HTSL | High Temp. Storage Bake, 150C | 1000 Hours | - | - | - | - | - | - | - | - | - | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | - | 3/231/0 | 3/231/0 | - | - | - | - | - |
| HTSL | High Temp. Storage Bake, 170C | 420 Hours | - | - | - | - | - | - | - | - | - | - | - | - | 3/231/0 | - | - | 3/231/0 | 1/77/0 | 1/77/0 | - | - | - |
| TS | Thermal Shock - 65/150C | 500 Cycles | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1/77/0 | 3/231/0 | 3/231/0 | 3/231/0 | 3/231/0 |
| HTOL | Life Test, 150C | 300 hours | - | - | - | 1/77/0 | - | - | - | - | - | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 1/77/0 | 3/231/0 | 3/231/0 |
| WBS | Bond Pull | Wires | - | - | - | 1/76/0 | 1/76/0 | - | 1/76/0 | 1/76/0 | 1/76/0 | - | - | - | - | - | - | - | - | - | - | - | - |
| HBM | ESD - HBM | 4000 V | - | - | - | 1/3/0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CDM | ESD - CDM | 1000 V | - | - | - | 1/3/0 | - | - | 1/3/0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LU | Latch-up (per JEDEC78) | - | - | - | - | 1/6/0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ED | Electrical Characterization | Per Customer Parameters | - | - | - | Pass | - | Pass | - | - | - | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass |
| WBS | Bond Strength | Wires | - | - | - | 1/76/0 | 1/76/0 | - | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 1/76/0 | 3/225/0 | 1/76/0 |
| LI | Lead Pull to Destruction | Leads | - | - | - | - | - | - | - | - | - | - | - | - | - | 3/66/0 | 1/22/0 | 1/22/0 | 1/22/0 | - | - | - | - |
| LI | Lead Pull | Leads | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1/22/0 | 1/22/0 | 3/66/0 | 3/66/0 |
| FLAM | Flammability (IEC 605-2-2) | -- | - | - | - | - | - | - | - | - | - | - | - | - | 3/15/0 | 1/5/0 | 1/5/0 | - | - | - | - | 3/15/0 | - |
| FLAM | Flammability (UL 94V-0) | -- | - | - | - | - | - | - | - | - | - | - | - | - | 3/15/0 | 1/5/0 | 1/5/0 | - | - | - | - | 3/15/0 | - |
| FLAM | Flammability (UL-1694) | -- | - | - | - | - | - | - | - | - | - | - | - | - | 3/15/0 | 1/5/0 | 1/5/0 | - | - | - | - | 3/15/0 | - |

- 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 JEDEC78: -65C/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 regional 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 |
| Japan | PCNJapanContact@list.ti.com |