12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20240723008.2
Qualification of AIZU using qualified Process Technology, Die Revision, Datasheet and Assembly/Test site & BOM options for select devices
Change Notification / Sample Request

Date: July 23, 2024
To: MOUSER 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 and approval of this 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 Change Management team. For sample requests or sample related questions, contact your local Field Sales Representative. As always, we thank you for your continued business.

Change Management Team
SC Business Services

20240723008.2
Attachment: 1

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records**,** you have recently purchased these devices**.** The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
UCC27201AQDDARQ1	NULL
UCC27211AQDDARQ1	NULL
UCC27212AQDDARQ1	NULL

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

PCN Number:	20240723008.2	PCN Date:	July 23, 2024
Title:	Qualification of AIZU using qualified Process Technology, Die Revision, Datasheet and Assembly/Test site & BOM options for select devices		
Customer Contact:	Change Management team	Dept:	Quality Services
Proposed 1st Ship Date:	January 19, 2025	Sample requests accepted until:	August 22, 2024*

***Sample requests received after August 22, 2024 will not be supported.**

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

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of its AIZU fabrication facility as an additional Wafer Fab option in addition to Assembly site/BOM options for the devices listed below.

Current Fab Site			Additional Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
DFAB	LBCSOI	200 mm	AIZU	LBCSOI2	200 mm

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

Construction differences are as follows:

	ASESH	FMX
Wire diam/type	1.3mil Au	0.96mil Cu
Mount compound	EY1000063	4147858
Mold compound	EN2000509	4211880
Package marking	Pin1 stripe, with G4	Pin 1 dot, no G4

The datasheets 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.

Changes from Revision C (August 2016) to Revision D (July 2024) **Page**

- Changed document title to reflect the device's key features and device part number since this data sheet corresponds to only 1 part number (From: UCC2720x-Q1. To: UCC27200-Q1). Updated to several specifications to reflect the device characteristics. Deleted any reference to UCC27201-Q1 device from this data sheet. 1
- Updated the numbering format for tables, figures, and cross-references throughout the document..... 1
- Changed Features section: 1) Deleted HBM and CDM ESD classification level to follow latest TI data sheet standards. 2) Changed junction temperature range specification (From: -40°C to 140°C. To: -40°C to 150°C). 4) Changed typical propagation delay (From: 20ns. To: 22ns). 5) Deleted Greater than 1 MHz of Operation since the switching frequency is not a specified parameter. 6) Changed typical bootstrap diode resistance (From: 0.6Ω. To: 0.65Ω)..... 1
- Updated Applications section with list of top 5 typical applications..... 1
- Changed Description section to replaced UCC2720x-Q1 with UCC27200-Q1 and deleted any references to UCC27201-Q1..... 1
- Changed Pin Functions table with a change to the power pad description. 3
- Updated Absolute Maximum Ratings section to remove "Power dissipation at TA = 25°C" and "Lead temperature (soldering, 10s)". Power dissipation can be calculated with thermal metrics in "Thermal Information" table..... 4
- Updated Recommended Operating Conditions: Operating Junction Temperature maximum changed from 140°C to 150°C, and removed Operating Ambient Temperature. 4
- Updated Thermal Information section to reflect device characteristics. 4
- Updated Supply Currents specifications in the Electrical Characteristics table: 1) I_{DD} typical changed (From: 0.4mA. To: 0.11mA). 2) UC27200-Q1 I_{DDO} typical changed (From: 2.5mA. To: 1mA). 3) UCC27200-Q1 I_{DDO} maximum changed (From: 4mA. To: 3mA. 4) I_{HB} typical changed (From: 0.4mA. To: 0.065mA). 5) I_{HBO} typical changed (From: 2.5mA. To: 0.9mA). 6) I_{HBO} maximum changed (From: 4mA. To: 3mA). 7) I_{HBS} test condition changed to match V_{HS} maximum recommended operating conditions (From: 110V. To: 105V). 8) I_{HBSO} typical changed (From: 0.1mA. To: 0.03mA)..... 4
- Updated Input specifications in the Electrical Characteristics table: 1) UCC27200-Q1 V_{HIT} typical changed (From: 5.8V. To: 6V). 2) UCC27200-Q1 V_{LIT} typical changed (From: 5.4V. To: 5.6V). 4
- Updated Bootstrap diode specifications in the Electrical Characteristics table: 1) R_D test conditions changed (From: 100mA and 80mA. To: 120mA and 100mA). 2) R_D typical changed (From: 0.6Ω. To: 0.65Ω). 4
- Updated LO/HO Gate Driver specifications in the Electrical Characteristics table: 1) V_{LOL} typical changed (From 0.18V. To 0.1V). 2) V_{LOH} typical changed (From: 0.25V. To: 0.13V). 4
- Removed specifications with test conditions "-40°C to 125°C T_J", since all parameters are specified from -40°C to 150°C T_J (unless otherwise noted). Changed Propagation Delays typical specification (From: 20ns. To: 22ns)..... 4
- Updated Output Rise and Fall Time specifications: 1) t_R typical changed (From: 0.35us. To: 0.26us). 2) t_F typical changed (From: 0.3us. To: 0.22us). 4
- Updated all plots in Typical Characteristics section to reflect the device's typical specification. 8
- Updated Typical Application section to display a different application diagram and detailed design procedure since information in legacy data sheet had an outdated circuit with obsolete part numbers. 13
- Changed application curves to display propagation delay and rise/fall time plots. 16
- Updated Power Supply Recommendations section to fix 3 typos..... 17

Changes from Revision B (March 2016) to Revision C (July 2024) **Page**

- Changed document title to reflect the device's key features. Minor updates to several specifications to reflect the device characteristics. 1
- Updated Features section: 1) Deleted HBM and CDM ESD classification levels to follow latest TI datashee standards. 2) Changed junction temperature range from -40°C to 140°C to -40°C to 150°C. 3) Deleted DMK package since device is obsolete. 4) Changed typical propagation delay from 20ns to 22ns. 5) Deleted "Greater than 1 MHz of Operation" since the switching frequency is not a specified parameter. 6) Changed typical bootstrap diode resistance from 0.6Ω to 0.65Ω..... 1
- Updated Applications section with list of top 5 typical applications..... 1
- Updated Description section: 1) Deleted comparison to UCC27200 and UCC27201 products. 2) Clarified -18V HS tolerance is an absolute maximum specification. 3) Deleted references to DMK package..... 1
- Updated Pin Configuration and Functions Functions section - deleted 10-pin VSON DMK package information and updated PowerPAD description..... 3
- Updated Absolute Maximum Ratings section to remove "Power dissipation at TA = 25°C" and "Lead temperature (soldering, 10s)". Power dissipation can be calculated with thermal metrics in "Thermal Information" table..... 4
- Updated Recommended Operating Conditions: Operating Junction Temperature maximum changed from 140°C to 150°C..... 4
- Updated Thermal Information section to reflect device characteristics. 4
- Updated Supply Currents specifications in the Electrical Characteristics table: 1) I_{DD} typical changed (From: 0.4mA. To: 0.11mA). 2) I_{DDO} typical changed (From: 3.8mA. To: 1mA). 3) I_{DDO} maximum changed (From: 5.5mA. To: 3mA. 4) I_{HB} typical changed (From: 0.4mA. To: 0.065mA). 5) I_{HBO} typical changed (From: 2.5mA. To: 0.9mA). 6) I_{HBO} maximum changed (From: 4mA. To: 3mA). 7) I_{HBS} test condition changed to match V_{HS} maximum recommended operating conditions (From: 110V. To: 105V). 8) I_{HBSO} typical changed (From: 0.1mA. To: 0.03mA)..... 4
- Updated Input specifications in the Electrical Characteristics table: 1) V_{HIT} specifications changed (From: 1.7V typical, 2.5V maximum. To: 1.9V minimum, 2.3V typical, 2.7V maximum). 2) V_{LIT} specifications changed (From: 0.8V minimum, 1.6V typical. To: 1.3V minimum, 1.6V typical, 1.9V maximum). 3) V_{IHYS} typical changed (From: 100mV. To: 700mV). 4) R_{IN} specifications changed from (100kΩ minimum, 200kΩ typical, 350kΩ maximum. To: 68kΩ typical). 4
- Updated Bootstrap diode specifications in the Electrical Characteristics table: 1) R_D test conditions changed (From: 100mA and 80mA. To: 120mA and 100mA). 2) R_D typical changed (From: 0.6Ω. To: 0.65Ω). Updated LO/HO Gate Driver specifications in the Electrical Characteristics table: 1) V_{LOL} typical changed (From 0.18V. To 0.1V). 2) V_{LOH} typical changed (From: 0.25V. To: 0.13V). 4
- Removed specifications with test conditions "-40°C to 125°C T_J", since all parameters are specified from -40°C to 150°C T_J (unless otherwise noted). 4
- Changed Propagation Delays typical specification (From: 20ns. To: 22ns)..... 4
- Updated Output Rise and Fall Time specifications: 1) t_R typical changed (From: 0.35us. To: 0.26us). 2) t_F typical changed (From: 0.3us. To: 0.22us). 4
- Updated timing diagrams..... 7
- Updated all plots in Typical Characteristics section to reflect the device's typical specification. 8
- Updated Input Stages section to match the input typical specification in the electrical characteristics table - changed 200kΩ pull-down resistance, 1.7V input rising threshold to 8kΩ pull-down resistance, 2.3V input rising threshold. 11
- Updated Typical Application section to display a different application diagram, updated Design Requirements section, and updated Detailed Design procedure section since information in previous revision of data sheet had an outdated circuit with obsolete part numbers. 13
- Changed application curves to display propagation delay and rise/fall time plots. 17
- Changed Power Supply Recommendations section to correctly describe that LO is sourced from VDD and HO is souced from HB. 18

Changes from Revision A (January 2016) to Revision B (July 2024) **Page**

- Changed document title to reflect the device's key features. 1
- Changed several specifications to reflect the device characteristics..... 1
- Changes Features section: 1) Changed CDM classification level to follow latest JEDEC standard, no change in actual HBM rating (From: C6. To: C3). 2) Changed junction temperature range specification (From: -40°C to 140°C. To: -40°C to 150°C). 3) Changed peak currents to reflect specification, no change in actual drive strength (From: 4A/4A. To: 3.7A/4.5A). 4) Deleted 0.9-Ω Pullup and Pulldown Resistance since it is not specified in the Electrical Characteristics..... 1
- Updated Applications section with list of top 5 typical applications..... 1
- Changed in Description section: 1) Added new D (SOIC, 8) package variant. 2) Changed peak current to display typical pull-up/pull-down, no chang in actual specification (From: 4A4/A. To: 3.7A/4.5A). 3) Deleted pullup/pulldown resistance information since this is not an actual specification in the electrical charactersitics table. 4) Updated propagation delay plot with new data. 5) Changed HS transient tolerance to match the specification in the Absolute Maximum table (From: -18V. To: -(24-VDD)V. 1
- Updated Recommended Operating Conditions: Operating Junction Temperature maximum changed from 140°C to 150°C..... 4
- Updated Thermal Information section to reflect device characteristics. 4
- Updated Supply Currents specifications in the Electrical Characteristics table: 1) Minimum specification removed for I_{DD}, I_{DDO}, I_{HB} and I_{HBO}. 2) I_{DD} typical changed (From: 0.085mA. To: 0.11mA). 3) I_{DDO} typical changed (From: 2.5mA. To: 1.4mA). 4) I_{DDO} maximum changed (From: 6.5mA. To: 3mA. 5) I_{HBO} typical changed (From: 2.5mA. To: 1.3mA). 6) I_{HBO} maximum changed (From: 5.1mA. To: 3mA). 8) I_{HBS} test condition changed to match V_{HS} maximum recommended operating conditions (From: 115V. To: 105V). 9) I_{HBSO} typical changed (From: 0.07mA. To: 0.03mA). 10) I_{HBSO} maximum changed (From: 1.2mA. To: 1mA). . 4
- Updated Bootstrap diode specifications in the Electrical Characteristics table: 1) V_F maximum changed (From: 0.8V. To: 0.85V). 2) V_{FI} typical changed (From: 0.85V. To: 0.9V), and maximum changed (From: 0.95V. To: 1.05V). 3) R_D test conditions changed (From: 100mA and 80mA. To: 180mA and 160mA). 4) R_D typical changed (From: 0.5Ω. To: 0.55Ω). 4
- Updated LO/HO Gate Driver specifications in the Electrical Characteristics table: 1) Minimum specification removed for V_{LOL}, V_{LOH}, V_{HOL}, V_{HOH}. 2) V_{LOL} and V_{HOL} typical changed (From 0.1V. To 0.07V). 3) V_{LOH} and V_{HOH} typical changed (From: 0.16V. To: 0.11V)..... 4
- Updated Propagation Delays specifications in the Switching Characteristics table: 1) Changed T_{DLFF} and T_{DHFF} typicals (From: 16ns. To: 19ns). 4
- Updated Output Rise and Fall Time specifications in the Switching Characteristis table: 1) t_R typical changed (From: 0.36us. To: 0.27us). 2) t_F typical changed (From: 0.15us. To: 0.16us). 4
- Updated Switching Characteristics - Miscellaneous table: t_{IN_PW} maximum changed (From: 50ns. To: 40ns).. 4
- Updated all plots in Typical Characteristics section to reflect the typical specification of the device. 8
- Changed typical specifications listed in the Overview section to match the device specifications in the Electrical Characteristics table..... 11
- Changed Input Stages section to match the input pulldown resistance typical specification in the electrical characteristics table (From: 70kΩ. To: 68kΩ). 12
- Changed application curves to display propagation delay and rise/fall time plots. 18

Changes from Revision * (July 2017) to Revision A (July 2024) **Page**

- Changed document title to reflect the device's key features. 1
- Changed several specifications to reflect the device characteristics. Deleted specifications for 6.8V. Left only specifications for 12V as is typical for all half-bridge drivers..... 1
- Updated Features section: 1) Deleted HBM and CDM ESD classification level to follow latest TI data sheet standards. 2) Changed junction temperature range spec (From: -40°C to 140°C. To: -40°C to 150°C). 3) Changed sink/source current to use exact typical specification, no change in actual device specification (From: "4-A/4-A". To: "3.7-A/4.5-A"). 4) Updated typo on VDD operating range, no change in actual device specification (From 5-V to 17-V. To: 7-V to 17-V). 5) Deleted 0.9-Ω Pullup and Pulldown Resistance since it is not specified in the Electrical Characteristics table. 1
- Updated Applications section with list of top 5 typical applications..... 1
- Changed Description section: 1) Changed peak currents (From: 4-A source and 4-A sink. To: 3.7A source and 4.5A sink). 2) Deleted and pullup and pulldown resistance is 0.9Ω since this parameter is not specified. 3) Changed From: 100-V rated bootstrap diode To: 120-V rated bootstrap diode. 3) Changed device information table body size, no change in actual package (From: SOIC8 (powerpad) package, 5mm x 6mm body size. To: DDA (PowerPADtm SOIC, 8) package, 4.9mm x 3.9mm body size. 4) Updated propagation delay plot. 5) Changed HS abs max to reflect specification in Absolute Maximum table (From: -18V. To: -(24V-VDD))..... 1
- Updated Recommended Operating Conditions: Operating Junction Temperature maximum changed from 140°C to 150°C..... 4
- Updated Thermal Information section to reflect device characteristics. 4
- Updated Electrical Characteristics and Switching Characteristics tables to remove specifications for 6.8V VDD, leaving the specifications for 12V VDD test condtion, as typically done in gate driver datasheets. 4
- Updated Supply Currents specifications in the Electrical Characteristics table: 1) Minimum specification removed for I_{DD}, I_{DDO}, I_{HB} and I_{HBO}. 2) I_{DD} typical changed (From: 0.085mA. To: 0.11mA). 3) I_{DDO} typical changed (From: 2.5mA. To: 1.4mA). 4) I_{DDO} maximum changed (From: 6.5mA. To: 3mA. 5) I_{HBO} typical changed (From: 2.5mA. To: 1.3mA). 6) I_{HBO} maximum changed (From: 5.1mA. To: 3mA). 8) I_{HBS} test condition changed to match V_{HS} maximum recommended operating conditions (From: 115V. To: 100V). 9) I_{HBSO} typical changed (From: 0.07mA. To: 0.03mA). 10) I_{HBSO} maximum changed (From: 1.2mA. To: 1mA). . 4
- Updated Bootstrap diode specifications in the Electrical Characteristics table: 1) V_F maximum changed (From: 0.8V. To: 0.85V). 2) V_{FI} typical changed (From: 0.85V. To: 0.9V), and maximum changed (From: 0.95V. To: 1.05V). 3) R_D test conditions changed (From: 100mA and 80mA. To: 180mA and 160mA). 4) R_D typical changed (From: 0.5Ω. To: 0.55Ω). 4
- Updated LO/HO Gate Driver specifications in the Electrical Characteristics table: 1) Minimum specification removed for V_{LOL}, V_{LOH}, V_{HOL}, V_{HOH}. 2) V_{LOL} and V_{HOL} typical changed (From 0.1V. To 0.07V). 3) V_{LOH} and V_{HOH} typical changed (From: 0.16V. To: 0.11V)..... 4
- Updated Propagation Delays specifications in the Switching Characteristics table: 1) Changed T_{DLFF} and T_{DHFF} typicals (From: 16ns. To: 19ns). 4
- Updated Output Rise and Fall Time specifications in the Switching Characteristis table: 1) t_R with 1000pF C_{LOAD} changed (From: 7.8ns typical. To: 7.2ns typical). 2) t_F with 1000pF C_{LOAD} changed (From: 6ns typical. To: 5.5ns typical). 3) t_R with 1uF C_{LOAD} changed (From: 0.36us typical. To: 0.27us typical). 4) t_F with 0.1uF C_{LOAD} changed (From: 0.20us typical. To: 0.16us typical). 4
- Updated Miscellaneous specifications in the Switching Characteristics table: t_{IN_PW} maximum changed (From: 100ns. To: 40ns)..... 4
- Updated all plots in Typical Characteristics section to reflect the typical specification of the device. 8
- Changed typical specifications mentioned in the Overview section to match the device specifications in the Electrical Characteristics table..... 11
- Changed Input Stages section to match the input pulldown resistance typical specification in the electrical characteristics table (From: 70kΩ. To: 68kΩ). 12
- Changed Undervoltage Lockout (UVLO) section to VHB UVLO hysteresis to match electrical characteristics table (From: 0.4V. To: 0.3V)..... 12
- Changed application curves to display propagation delay and rise/fall time plots. 17

Product Folder	Current Datasheet Number	New Datasheet Number	Link to full datasheet
UCC27200-Q1	SLUS822C	**SLUS822D**	http://www.ti.com/product/UCC27200-Q1
UCC27201A-Q1	SLUSC72B	**SLUSC72C**	http://www.ti.com/product/UCC27201A-Q1
UCC27211A-Q1	SLUSCG0A	**SLUSCG0B**	http://www.ti.com/product/UCC27211A-Q1
UCC27212A-Q1	SLUSCZ8A	**SLUSCZ8B**	http://www.ti.com/product/UCC27212A-Q1

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-millimeter and 200-millimeter 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
AIZU	**CU2**	**JPN**	**Aizuwakamatsu-shi**

Die Rev:

Current	New
Die Rev [2P]	**Die Rev [2P]**
A, D	**A**

Assembly/Test Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
ASESH	ASH	CHN	Shanghai
TI Mexico	**MEX**	**MEX**	**Aguascalientes**

Sample product shipping label (not actual product label)

Product Affected:

UCC27200QDDARQ1	UCC27201AQDDARQ1	UCC27211AQDDARQ1	UCC27212AQDDARQ1

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

Automotive Qualification Summary
(As per AEC-Q100 Rev. J and JEDEC Guidelines)

Rialto UCC27301A_DDA
Approve Date 21-June-2024

Product Attributes

Attributes	Qual Device: UCC27301AQDDARQ1
Automotive Grade Level	Grade 1
Operating Temp Range (C)	-40 to 125
Product Function	Power Management
Wafer Fab Supplier	AIZU
Assembly Site	FMX
Package Group	SOIC
Package Designator	DDA
Pin Count	8

- QBS: Qual By Similarity
- Qual Device UCC27301AQDDARQ1 is qualified at MSL2 260C

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: UCC27301AQDDARQ1
Test Group A - Accelerated Environment Stress Tests								
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	No Fails
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	3/135/0
Test Group B - Accelerated Lifetime Simulation Tests								
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	150C	300 Hours	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate	150C	24 Hours	3/2400/0
Test Group C - Package Assembly Integrity Tests								
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	1/15/0
PD	C4	JEDEC 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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: UCC27301AQDDARQ1
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	Completed Per Process Technology Requirements
BTI	D4	-	-	-	Bias Temperature Instability	-	-	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	-	-	Completed Per Process Technology Requirements
Test Group E - Electrical Verification Tests								
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	1/3/0
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0
LU	E4	AEC Q100-004	1	6	Latch-Up	Per AEC Q100-004	-	1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	3/90/0
Additional Tests								

- 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

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 I) : -40C to +85C

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

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

TI Qualification ID: R-NPD-2205-127

Automotive Qualification Summary
(As per AEC and JEDEC Guidelines)

Q006 SOIC at FMX
Approve Date 21-June-2024

Attributes	Qual Device: UCC27301AQDDARQ1
Automotive Grade Level	Grade 1
Operating Temp Range (C)	-40 to 125
Product Function	Power Management
Wafer Fab Supplier	AIZU
Assembly Site	FMX
Package Group	SOIC
Package Designator	DDA
Pin Count	8

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: UCC27301AQDDARQ1
Test Group A - Accelerated Environment Stress Tests								
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	3/0/0
PC	A1.1	-	3	22	SAM Precon Pre	Review for delamination	-	3/66/0
PC	A1.2	-	3	22	SAM Precon Post	Review for delamination	-	3/66/0
HAST	A2.1	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0
HAST	A2.1.2	-	3	1	Cross Section, post bHAST, 1X	Post stress cross section	Completed	3/3/0
HAST	A2.1.3	-	3	3	Wire Bond Shear, post bHAST, 1X	Post stress	-	3/9/0
HAST	A2.1.4	-	3	3	Bond Pull over Stitch, post bHAST, 1X	Post stress	-	3/9/0
HAST	A2.1.5	-	3	3	Bond Pull over Ball, post bHAST, 1X	Post stress	-	3/9/0
HAST	A2.2	JEDEC JESD22-A110	3	70	Biased HAST	130C/85%RH	192 Hours	3/210/0
HAST	A2.2.1	-	3	22	SAM Analysis, post bHAST 2X	Review for delamination	Completed	3/66/0
HAST	A2.2.2	-	3	1	Cross Section, post bHAST, 2X	Post stress cross section	Completed	3/3/0
HAST	A2.2.3	-	3	3	Wire Bond Shear, post bHAST, 2X	Post stress	-	3/9/0
HAST	A2.2.4	-	3	3	Bond Pull over Stitch, post bHAST, 2X	Post stress	-	3/9/0
HAST	A2.2.5	-	3	3	Bond Pull over Ball, post bHAST, 2X	Post stress	-	3/9/0
TC	A4.1	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0
TC	A4.1.1	-	3	22	SAM Analysis, post TC 1X	Review for delamination	Completed	3/66/0
TC	A4.1.2	-	3	1	Cross Section, post TC, 1X	Post stress cross section	Completed	3/3/0

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: UCC27301AQDDARQ1
TC	A4.1.3	-	3	3	Wire Bond Shear, post TC, 1X	Post stress	-	3/9/0
TC	A4.1.4	-	3	3	Bond Pull over Stitch, post TC, 1X	Post stress	-	3/9/0
TC	A4.1.5	-	3	3	Bond Pull over Ball, post TC, 1X	Post stress	-	3/9/0
TC	A4.2	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle	-65C/150C	1000 Cycles	3/210/0
TC	A4.2.1	-	3	22	SAM Analysis, post TC, 2X	Review for delamination	Completed	3/66/0
TC	A4.2.2	-	3	1	Cross Section, post TC, 2X	Post stress cross section	Completed	3/3/0
TC	A4.2.3	-	3	3	Wire Bond Shear, post TC, 2X	Post stress	-	3/9/0
TC	A4.2.4	-	3	3	Bond Pull over Stitch, post TC, 2X	Post stress	-	3/9/0
TC	A4.2.5	-	3	3	Bond Pull over Ball, post TC, 2X	Post stress	-	3/9/0
HTSL	A6.1	JEDEC JESD22-A103	3	45	High Temperature Storage Life	150C	1000 Hours	3/135/0
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL, 1X	Post stress cross section	Completed	3/3/0
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	150C	2000 Hours	3/132/0
HTSL	A6.2.1	-	3	1	Cross Section, post HTSL, 2X	Post stress cross section	Completed	3/3/0
Test Group C - Package Assembly Integrity Tests								
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0

- QBS: Qual By Similarity
- Qual Device UCC27301AQDDARQ1 is qualified at MSL2 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

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 I) : -40C to +85C

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

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

TI Qualification ID: R-NPD-2205-127

Automotive Qualification Summary
(As per AEC-Q100 Rev. J and JEDEC Guidelines)

Rialto UCC273X1_SON_CDAT
Approve Date 28-June-2024

Product Attributes

Attributes	Qual Device: UCC27301AQDRCRQ1	Qual Device: UCC27311AQDRCRQ1	QBS Package Reference: TLC69601QRTWRQ1	QBS Process, Product Reference: UCC27301AQDDARQ1	QBS Package Reference: LP8868ZQDMTRQ1	QBS Package Reference: LM5149QRGYRQ1	QBS Package Reference: LM5149RGYR
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 150	-40 to 125
Product Function	Power Management	Power Management	Power Management	Power Management	Power Management	Power Management	Power Management
Wafer Fab Supplier	AIZU	AIZU	RFAB	AIZU	RFAB	RFAB, RFAB	RFAB, DMOS6
Assembly Site	CDAT	CDAT	CDAT	FMX	CDAT	CDAT	CDAT
Package Group	QFN	QFN	QFN	SOIC	QFN	QFN	QFN
Package Designator	DRC	DRC	RTW	DDA	DMT	RGY	RGY
Pin Count	10	10	24	8	14	24	24

- QBS: Qual By Similarity
- Qual Device UCC27301AQDRCRQ1 is qualified at MSL1 260C
- Qual Device UCC27311AQDRCRQ1 is qualified at MSL1 260C

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: UCC27301AQDRCRQ1	Qual Device: UCC27311AQDRCRQ1	QBS Package Reference: TLC69601QRTWRQ1	QBS Process, Product Reference: UCC27301AQDDARQ1	QBS Package Reference: LP8868ZQDMTRQ1	QBS Package Reference: LM5149QRGYRQ1	QBS Package Reference: LM5149RGYR
Test Group A - Accelerated Environment Stress Tests														
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	No Fails	-	No Fails	-	No Fails	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-	-	-	No Fails	-	No Fails	No Fails

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: UCC27301AQDRCRQ1	Qual Device: UCC27311AQDRCRQ1	QBS Package Reference: TLC69601QRTWRQ1	QBS Process, Product Reference: UCC27301AQDDARQ1	QBS Package Reference: LP8868ZQDMTRQ1	QBS Package Reference: LM5149QRGYRQ1	QBS Package Reference: LM5149RGYR
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0	1/77/0	1/77/0	3/231/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	1/77/0	-	-	3/231/0	-	-	-
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	1/77/0	-	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	1/77/0	-	3/231/0	3/231/0	1/77/0	1/77/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0	-	1/5/0	-	-	1/5/0	-
TC-SAM	A4	-	3	3	Post TC SAM	<50% delamination	-	1/12/0	-	-	-	-	-	-
PTC	A5	JEDEC JESD22-A105	1	45	PTC	-40/125C	1000 Cycles	-	-	-	-	1/45/0	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	-	-	3/135/0	3/135/0	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	-	-	1/77/0	-	1/77/0	-	-
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	150C	300 Hours	-	-	-	3/231/0	-	1/77/0	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	-	-	-	3/2400/0	-	-	-
Test Group C - Package Assembly Integrity Tests														
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	-	-	3/90/0	1/30/0	-	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	-	-	3/90/0	1/30/0	-	3/90/0
SD	C3	JEDEC J-STD-002	1	15	PB Solderability	>95% Lead Coverage	-	-	-	-	-	-	-	-
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	-	-	-	1/15/0	-	-	-

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: UCC27301AQDRCRQ1	Qual Device: UCC27311AQDRCRQ1	QBS Package Reference: TLC69601QRTWRQ1	QBS Process, Product Reference: UCC27301AQDDARQ1	QBS Package Reference: LP8868ZQDMTRQ1	QBS Package Reference: LM5149QRGYRQ1	QBS Package Reference: LM5149RGYR
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	-	1/10/0	-	3/30/0	3/30/0	1/10/0	-	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	Completed Per Process Technology Requirements	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	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 Carrier Injection	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
BTI	D4	-	-	-	Bias Temperature Instability	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	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	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E - Electrical Verification Tests														
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	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	1/6/0	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	-	1/30/0	-	3/90/0	3/90/0	1/30/0	3/90/0	3/90/0
Additional Tests														

- 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

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 I) : -40C to +85C

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

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

TI Qualification ID: R-NPD-2303-050

Automotive Qualification Summary
(As per AEC and JEDEC Guidelines)

Q006 QFN at CDAT
Approve Date 25-MAY -2023

Attributes	Qual Device: TLC69601QRTWRQ1	QBS Package Reference: LM2775QDSGRQ1	QBS Package Reference: BQ51013BQWRHLRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125
Product Function	Power Management	Power Management	Power Management
Wafer Fab Supplier	RFAB	RFAB	RFAB
Assembly Site	CDAT	CDAT	CDAT
Package Group	QFN	QFN	QFN
Package Designator	RTW	DSG	RHL
Pin Count	24	8	20

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: TLC69601QRTWRQ1	QBS Reference: LM2775QDSGRQ1	QBS Reference: BQ51013BQWRHLRQ1
Test Group A - Accelerated Environment Stress Tests										
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	3/All/0	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	-	3/All/0	3/All/0
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL3 260C	-	-	-	-
PC	A1.1	-	3	22	SAM Precon Pre	Review for delamination	-	3/66/0	3/66/0	-
PC	A1.2	-	3	22	SAM Precon Post	Review for delamination	-	3/66/0	3/66/0	-
HAST	A2.1	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0	-	-
HAST	A2.1.2	-	3	1	Cross Section, post bHAST, 1X	Post stress cross section	Completed	1/1/0	3/3/0	-
HAST	A2.1.3	-	3	3	Wire Bond Shear, post bHAST, 1X	Post stress	-	1/3/0	3/9/0	-
HAST	A2.1.4	-	3	3	Bond Pull over Stitch, post bHAST, 1X	Post stress	-	1/3/0	3/9/0	-
HAST	A2.1.5	-	3	3	Bond Pull over Ball, post bHAST, 1X	Post stress	-	1/3/0	3/9/0	-
HAST	A2.2	JEDEC JESD22-A110	3	70	Biased HAST	130C/85%RH	192 Hours	3/231/0	3/231/0	-

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: TLC69601QRTWRQ1	QBS Reference: LM2775QDSGRQ1	QBS Reference: BQ51013BQWRHLRQ1
HAST	A2.2.1	-	3	22	SAM Analysis, post bHAST 2X	Review for delamination	Completed	1/22/0	3/66/0	-
HAST	A2.2.2	-	3	1	Cross Section, post bHAST, 2X	Post stress cross section	Completed	1/1/0	3/3/0	-
HAST	A2.2.3	-	3	3	Wire Bond Shear, post bHAST, 2X	Post stress	-	1/3/0	3/9/0	-
HAST	A2.2.4	-	3	3	Bond Pull over Stitch, post bHAST, 2X	Post stress	-	1/3/0	3/9/0	-
HAST	A2.2.5	-	3	3	Bond Pull over Ball, post bHAST, 2X	Post stress	-	1/3/0	3/9/0	-
TC	A4.1.1	-	3	22	SAM Analysis, post TC 1X	Review for delamination	Completed	3/66/0	3/66/0	-
TC	A4.1.2	-	3	1	Cross Section, post TC, 1X	Post stress cross section	Completed	3/3/0	3/3/0	-
TC	A4.1.3	-	3	3	Wire Bond Shear, post TC, 1X	Post stress	-	3/9/0	3/9/0	-
TC	A4.1.4	-	3	3	Bond Pull over Stitch, post TC, 1X	Post stress	-	3/9/0	3/9/0	-
TC	A4.1.5	-	3	3	Bond Pull over Ball, post TC, 1X	Post stress	-	3/9/0	3/9/0	-
TC	A4.2	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle	-65C/150C	1000 Cycles	3/231/0	3/231/0	3/231/0
TC	A4.2.1	-	3	22	SAM Analysis, post TC, 2X	Review for delamination	Completed	3/66/0	3/66/0	3/66/0
TC	A4.2.2	-	3	1	Cross Section, post TC, 2X	Post stress cross section	Completed	3/3/0	3/3/0	3/3/0

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: TLC69601QRTWRQ1	QBS Reference: LM2775QDSGRQ1	QBS Reference: BQ51013BQWRHLRQ1
TC	A4.2.3	-	3	3	Wire Bond Shear, post TC, 2X	Post stress	-	3/9/0	3/9/0	3/9/0
TC	A4.2.4	-	3	3	Bond Pull over Stitch, post TC, 2X	Post stress	-	3/9/0	3/9/0	3/9/0
TC	A4.2.5	-	3	3	Bond Pull over Ball, post TC, 2X	Post stress	-	3/9/0	3/9/0	3/9/0
PTC	A5.2	JEDEC JESD22-A105	1	45	PTC	-40/125C	2000 Cycles	-	1/45/0	-
HTSL	A6.2	JEDEC JESD22-A103	3	45	High Temperature Storage Life	150C	1000 Hours	3/135/0		
HTSL	A6.1	JEDEC JESD22-A103	3	45	High Temperature Storage Life	175C	500 Hours	-	3/135/0	-
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL, 1X	Post stress cross section	Completed	1/1/0	3/3/0	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	150C	2000 Hours	3/135/0	-	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	175C	1000 Hours	-	3/135/0	-
HTSL	A6.2.1	-	3	1	Cross Section, post HTSL, 2X	Post stress cross section	Completed	1/1/0	3/3/0	-
Test Group C - Package Assembly Integrity Tests										
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	-	3/90/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	-	3/90/0	3/90/0

- QBS: Qual By Similarity
- Qual Device TLC69600QRTWRQ1 is qualified at MSL1 260C
- Qual Device TLC69601QRTWRQ1 is qualified at MSL1 260C
- Qual Device TLC69602QRTWRQ1 is qualified at MSL1 260C
- Qual Device TLC69604QRTWRQ1 is qualified at MSL1 260C
- Qual Device TLC69608QRTWRQ1 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

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- Grade 0 (or E): -40C to +150C
- Grade 1 (or Q): -40C to +125C
- Grade 2 (or T): -40C to +105C
- Grade 3 (or I) : -40C to +85C

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

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

TI Qualification ID: R-NPD-2204-001

ZVEI ID's: SEM-DE-03, SEM-DS-01, SEM-PW-09, SEM-PW-13, SEM-PA-08, SEM-PA-05, SEM-PA-11, SEM-PA-13, SEM-PA-18, SEM-TF-01

For questions regarding this notice, e-mails can be sent to the Change Management team or your local Field Sales Representative.