



**12500 TI Boulevard, MS 8640, Dallas, Texas 75243**

**PCN# 20240529003.2**

**Qualification of RFAB using qualified Process Technology, Die Revision and Assembly  
BOM options for select devices  
Change Notification / Sample Request**

**Date:** May 29, 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

**20240529003.2**  
**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.

<b>DEVICE</b>	<b>CUSTOMER PART NUMBER</b>
ULQ2003ATPWRQ1	NULL

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

<b>PCN Number:</b>	20240529003.2	<b>PCN Date:</b>	May 29, 2024
<b>Title:</b>	Qualification of RFAB using qualified Process Technology, Die Revision and Assembly BOM options for select devices		
<b>Customer Contact:</b>	Change Management team	<b>Dept:</b>	Quality Services
<b>Proposed 1<sup>st</sup> Ship Date:</b>	November 25, 2024	<b>Sample requests accepted until:</b>	June 28, 2024*
<b>*Sample requests received after June 28, 2024 will not be supported.</b>			
<b>Change Type:</b>			
<input type="checkbox"/> Assembly Site	<input checked="" type="checkbox"/> Design	<input type="checkbox"/>	Wafer Bump Material
<input checked="" type="checkbox"/> Assembly Process	<input type="checkbox"/> Data Sheet	<input type="checkbox"/>	Wafer Bump Process
<input checked="" type="checkbox"/> Assembly Materials	<input type="checkbox"/> Part number change	<input checked="" type="checkbox"/>	Wafer Fab Site
<input type="checkbox"/> Mechanical Specification	<input type="checkbox"/> Test Site	<input checked="" type="checkbox"/>	Wafer Fab Materials
<input checked="" type="checkbox"/> Packing/Shipping/Labeling	<input type="checkbox"/> Test Process	<input checked="" type="checkbox"/>	Wafer Fab Process

### PCN Details

#### Description of Change:

Texas Instruments is pleased to announce the addition of RFAB using the TIB qualified process technology and additional Assembly 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
SFAB	JI1	150 mm	RFAB	TIB	300 mm

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

Construction differences are as follows:

	Current	Proposed
Wire diam/type	1.15mil Au	1.0mil Cu
Mount compound	4042500	4147858
Mold compound	4206193	4211471
Marking differences	U2003AT \TI/ YMSG4 LLLL O VTI/ = TI LOGO G4 = ECAT O = PIN 1 DIMPLE	U2003AT TI YMS LLLL O (CAV) TI = TI LETTER CAV = CAVITY NUMBER O = PIN 1 DOT

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
<input checked="" type="checkbox"/> 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
SH-BIP-1	SHE	USA	Sherman
<b>RFAB</b>	<b>RFB</b>	<b>USA</b>	<b>Richardson</b>

### Die Rev:

**Current**

**New**

Die Rev [2P]	<b>Die Rev [2P]</b>
C	<b>A</b>

Sample product shipping label (not actual product label)



### Product Affected:

ULQ2003ATPWRQ1

For alternate parts with similar or improved performance, please visit the product page on [TI.com](https://www.ti.com)

TI Information  
Selective Disclosure

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

ULQ2003ATPWRQ1 MLA Qual  
Approve Date 03-May-2024

#### Product Attributes

Attributes	Qual Device: ULQ2003ATPWRQ1	QBS Package Reference: SN3257QFWRQ1	QBS Process Reference: MC33063AQDRQ1	QBS Process, Product Reference: ULQ2003AQDRQ1	QBS Package Reference: CD4051BQPWRQ1
Automotive Grade Level	Grade 2	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 105	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Product Function	Power Management	Logic	Power Management	Power Management	Interface
Wafer Fab Supplier	RFAB	RFAB	RFAB	RFAB	RFAB
Assembly Site	MLA	MLA	FMX	FMX	MLA
Package Group	TSSOP	-	SOIC	SOIC	TSSOP
Package Designator	PW	PW	D	D	PW
Pin Count	16	16	8	16	16

- QBS: Qual By Similarity
- Qual Device ULQ2003ATPWRQ1 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: <a href="#">ULQ2003ATPWRQ1</a>	QBS Package Reference: <a href="#">SN3257QPWRQ1</a>	QBS Process Reference: <a href="#">MC33063AQDRQ1</a>	QBS Process, Product Reference: <a href="#">ULQ2003AQDRQ1</a>	QBS Package Reference: <a href="#">CD4051BQPWRQ1</a>
<b>Test Group A - Accelerated Environment Stress Tests</b>												
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	1/0/0	3/0/0	3/0/0	1/0/0	1/0/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C	96 Hours	-	3/231/0	-	-	-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	1/77/0	-	3/231/0	1/77/0	1/77/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	-	3/231/0	-	1/77/0	-
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	1/77/0	-	3/231/0	-	1/77/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-55/150C	1000 Cycles	-	3/231/0	-	-	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-55C/125C	1000 Cycles	1/77/0	-	-	-	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	1/77/0	1/77/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0	-	-	1/5/0	1/5/0
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	1/45/0	1/45/0
<b>Test Group B - Accelerated Lifetime Simulation Tests</b>												
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	125C	1000 Hours	-	-	3/231/0	-	1/77/0
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	150C	300 Hours	-	3/231/0	-	3/231/0	-
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	-	-
<b>Test Group C - Package Assembly Integrity Tests</b>												
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpl>1.67	Wires	1/30/0	3/90/0	3/90/0	1/30/0	1/30/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpl>1.67	Wires	1/30/0	3/90/0	3/90/0	1/30/0	1/30/0
SD	C3	JEDEC J-STD-002	1	15	PB Solderability	>95% Lead Coverage	-	-	1/15/0	1/15/0	1/15/0	-
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	1/15/0	1/15/0	1/15/0	1/15/0	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpl>1.67	-	1/10/0	3/30/0	3/30/0	1/10/0	1/10/0
<b>Test Group D - Die Fabrication Reliability Tests</b>												
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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: <a href="#">ULQ2003ATPWRQ1</a>	QBS Package Reference: <a href="#">SN3257QPWRQ1</a>	QBS Process Reference: <a href="#">MC33063AQDRQ1</a>	QBS Process, Product Reference: <a href="#">ULQ2003AQDRQ1</a>	QBS Package Reference: <a href="#">CD4051BQPWRQ1</a>
TDBB	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
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
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
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

#### 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
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	5000 Volts	-	1/3/0	-	-	-
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	2000 Volts	-	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
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
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpl>1.67 Room, hot, and cold	-	1/30/0	3/90/0	3/90/0	3/90/0	1/30/0

#### 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-CHG-2305-088

**Automotive New Product Qualification Summary**  
(As per AEC-Q100, AEC-Q006, and JEDEC Guidelines)

**(REDBULL) CD4051BQPWRQ1 (16PW, TSSOP) die rev, LF and wire change @ MLA**  
Approve Date 20-March-2023

**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: CD4051BQPWRQ1	QBS Reference: TCA6408AQPWRQ1	QBS Reference: TMUX4051PWRQ1 (PG1.0)	QBS Reference: TMUX4052PWRQ1 (PG1.0)	QBS Reference: TMUX4051PWRQ1 (PG2.0)	QBS Reference: TMUX4052PWRQ1 (PG2.0)
<b>Test Group A - Accelerated Environment Stress Tests</b>													
<b>Test Group B - Accelerated Lifetime Simulation Tests</b>													
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	125C	1000 Hours	1/77/0	1/77/0	-	-	-	-
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	150C	300 Hours	-	-	-	-	1/77/0	-
<b>Test Group C - Package Assembly Integrity Tests</b>													
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	1/5/0	2/60/0	1/30/0	-	-
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	1/5/0	2/60/0	1/30/0	-	-
PD	C4	JEDEC JESD22-B100 and B108	1	10	Physical Dimensions	Cpk>1.67	-	1/10/0	3/30/0	2/20/0	1/10/0	-	-
<b>Test Group D - Die Fabrication Reliability Tests</b>													
EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requirements					
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	Completed Per Process Technology Requirements					
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	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					
<b>Test Group E - Electrical Verification Tests</b>													
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	1/3/0	-	-	-	1/3/0	1/3/0
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	4000 Volts	-	1/3/0	-	-	-	-
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	1500 Volts	-	1/3/0	-	-	-	-
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	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
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	1/30/0	3/90/0	1/30/0	-	1/30/0	1/30/0

- QBS: Qual By Similarity
- Qual Device CD4051BQPWRQ1 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
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- 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
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- 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-CHG-2303-034

ZVEI ID's: SEM-DE-03, SEM-PW-02, SEM-PW-09, SEM-PW-13, SEM-PA-08, SEM-PA-05, SEM-PA-11, SEM-PA-13

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

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