



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20240529002.1

**Qualification of RFAB using qualified Process Technology, Die Revision and
additional 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

20240529002.1
Attachment: 1

Products Affected:

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

DEVICE	CUSTOMER PART NUMBER
ULN2003AIPWR	NULL
ULN2003AN	NULL
ULN2003APWR	NULL

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

PCN Number:	20240529002.1	PCN Date:	May 29, 2024
Title:	Qualification of RFAB using qualified Process Technology, Die Revision, and additional Assembly BOM options for select devices		
Customer Contact:	Change Management Team	Dept:	Quality Services
Proposed 1st Ship Date:	August 27, 2024	Sample requests accepted until:	June 28, 2024*
*Sample requests received after June 28, 2024 will not be supported.			
Change Type:			
<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 Material
<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 qualification of its RFAB fabrication facility as an additional Wafer Fab option in addition to 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:

Group 1 device device marking:

	Current	Proposed
ULN2003AIPWR	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> UN2003AI TI/YMSG4 LLLL O </div> <p> TI/ = TI LOGO YM = YEAR/MONTH DATE CODE LLLL = LOT TRACE CODE G4 = ECAT O = PIN 1 DIMPLE </p>	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> U2003AI TI YMS LLLL O (CAV) </div> <p> TI = TI LETTER YM = YEAR/MONTH DATE CODE LLLL = LOT TRACE CODE CAV = CAVITY ID O = PIN 1 DOT </p>
ULN2003APWR	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> UN2003A TI/YMSG4 LLLL O </div> <p> TI/ = TI LOGO YM = YEAR/MONTH DATE CODE LLLL = LOT TRACE CODE G4 = ECAT O = PIN 1 DIMPLE </p>	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> UN2003A TI YMS LLLL O (CAV) </div> <p> TI = TI LETTER YM = YEAR/MONTH DATE CODE LLLL = LOT TRACE CODE CAV = CAVITY ID O = PIN 1 DOT </p>

Group 2 device:

	MLA	FMX	MLA, FMX
Wire diameter/type	1.15mil Au	0.96mil Cu	1.0mil Cu
Mold compound	4042503	4211880	4211880
Mount compound	4042500	4147858	4147858

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 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			
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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
RFAB	RFB	USA	Richardson

Die Rev:

Current

New

Die Rev [2P]	Die Rev [2P]
F	A

Sample product shipping label (not actual product label):



Group 1 Product Affected:

ULN2003AIPWR ULN2003APWR

Group 2 Product Affected:

ULN2003AN

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

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: ULN2003APWR	QBS Reference: SN3257QPWRQ1	QBS Reference: MC33063ADR	QBS Reference: MC33063ADR	QBS Reference: ULN2003ADR
HAST	A2	Biased HAST	130C	96 Hours	-	3/231/0	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	3/231/0	-	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0	-
TC	A4	Temperature Cycle	-55/150C	1000 Cycles	-	3/231/0	-	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	3/231/0	1/77/0
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	3/231/0	3/231/0	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	3/135/0	-	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	2/154/0	1/77/0	-
HTOL	B1	Life Test	150C	300 Hours	-	3/231/0	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	1/800/0	2/1600/0	-

Type	#	Test Name	Condition	Duration	Qual Device: ULN2003APWR	QBS Reference: SN3257QPWRQ1	QBS Reference: MC33063ADR	QBS Reference: MC33063ADR	QBS Reference: ULN2003ADR
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	-	-	3/30/0	-	-	-
ESD	E2	ESD CDM	-	2000 Volts	-	1/3/0	-	-	-
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	-	5000 Volts	-	1/3/0	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	1/6/0	1/3/0	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	-	-	1/30/0	1/30/0	1/30/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	3/90/0	-	-	-

- QBS: Qual By Similarity
- Qual Device ULN2003APWR 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/>

TI Qualification ID: R-CHG-2305-087

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: ULN2003AN	QBS Package Reference: SN74LS03N	QBS Process Reference: MC33063ADR	QBS Process Reference: MC33063ADR	QBS Product Reference: ULN2003ADR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	1/77/0	-	3/231/0	3/231/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	3/231/0	-	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	1/77/0	-	3/231/0	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	1/77/0	3/231/0	3/231/0	3/231/0	1/77/0
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	3/231/0	3/231/0	3/231/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	2/154/0	1/77/0	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	1/800/0	2/1600/0	-
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	3/66/0	-	-	-
ESD	E2	ESD CDM	-	250 Volts	-	-	1/3/0	-	1/3/0
ESD	E2	ESD HBM	-	1000 Volts	-	-	1/3/0	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	1/3/0	-	1/3/0	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	-	-	1/30/0	1/30/0	1/30/0

- QBS: Qual By Similarity
- Qual Device ULN2003AN 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/>

TI Qualification ID: R-CHG-2305-091

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: ULN2003AN	QBS Package Reference: NE5532P	QBS Process Reference: MC33063ADR	QBS Process Reference: MC33063ADR	QBS Product Reference: ULN2003ADR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0	3/231/0	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	1/77/0	-	3/231/0	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	1/77/0	-	3/231/0	3/231/0	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	1/77/0	-	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	3/231/0	3/231/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	2/154/0	1/77/0	-
HTOL	B1	Life Test	150C	300 Hours	-	3/231/0	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	1/800/0	2/1600/0	-
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	3/66/0	-	-	-
ESD	E2	ESD CDM	-	250 Volts	-	-	1/3/0	-	1/3/0
ESD	E2	ESD HBM	-	1000 Volts	-	-	1/3/0	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	-	1/3/0	-	1/3/0

Type	#	Test Name		Condition	Duration	Qual Device: ULN2003AN	QBS Package Reference: NE5532P	QBS Process Reference: MC33063ADR	QBS Process Reference: MC33063ADR	QBS Product Reference: ULN2003ADR
CHAR	E5	Electrical Characterization		Per Datasheet Parameters	-	1/30/0	-	1/30/0	1/30/0	1/30/0

- QBS: Qual By Similarity
- Qual Device ULN2003AN 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/>

TI Qualification ID: R-CHG-2305-092

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: ULQ2003ATPWRQ1	QBS Package Reference: SN3257QPWRQ1	QBS Process Reference: MC33063AQDRQ1	QBS Process, Product Reference: ULQ2003AQDRQ1	QBS Package Reference: CD4051BQPWRQ1
Test Group A - Accelerated Environment Stress Tests												
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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: ULQ2003ATPWRQ1	QBS Package Reference: SN3257QPWRQ1	QBS Process Reference: MC33063AQDRQ1	QBS Process, Product Reference: ULQ2003AQDRQ1	QBS Package Reference: CD4051BQPWRQ1
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	500 Hours	1/45/0	-	-	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	175C	500 Hours	-	3/135/0	-	-	-
Test Group B - Accelerated Lifetime Simulation Tests												
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	125C	1000 Hours	-	-	3/231/0	-	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	-	-
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	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 Cpk>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	Cpk>1.67	-	1/10/0	3/30/0	3/30/0	1/10/0	1/10/0
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
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: ULQ2003ATPWRQ1	QBS Package Reference: SN3257QPWRQ1	QBS Process Reference: MC33063AQDRQ1	QBS Process, Product Reference: ULQ2003AQDRQ1	QBS Package Reference: CD4051BQPWRQ1
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	Cpk>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

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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