



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

**PCN#20240910000.2**

**Qualification of RFAB using qualified Process Technology, Die Change & BOM update  
Change Notification / Sample Request**

**Date:** September 11, 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

**20240910000.2**  
**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>
LM2903AVQPWRG4Q1	NULL
LM2903AVQPWRQ1	NULL
LM2903BQPWRQ1	NULL
LM2903QPWRG4Q1	NULL
LM2903QPWRQ1	NULL
LM2903VQPWRG4Q1	NULL
LM2903VQPWRQ1	NULL

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

<b>PCN Number:</b>	20240910000.2		<b>PCN Date:</b>	September 11, 2024
<b>Title:</b>	Qualification of RFAB using qualified Process Technology, Die Change & BOM update			
<b>Customer Contact:</b>		Change Management team	<b>Dept:</b>	Quality Services
<b>Proposed 1<sup>st</sup> Ship Date:</b>		March 10, 2025	<b>Sample requests accepted until:</b>	October 11, 2024*
<b>*Sample requests received after October 11, 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 checked="" 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, die change and BOM update qualification:

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
CFAB	JI3	200 mm			

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

Construction differences are as follow:

#### BOM Table:(FAB/Process migration, die change plus BOM update):

What	Current	Additional
Bond Wire composition, diameter	Cu, 1.0 or 0.8 mil	Cu, 0.8 mil
Die thickness	10.5 mils	7.5 mils
Die Separation Method	Mechanical	Laser

As a result of this change, the LM2903BQPWRQ1 will be affected as follows: 1) For the condition of the inputs exceeding the maximum operating common mode range, the state of the output will be low. This will match the behavior of the classic LM2903-Q grade family. 2) while there will be no relaxations to any min/max specified electrical parameters for any of the devices affected by this PCN, there will be changes to graphs in the "Typical Characteristics" section of the datasheet" as well as thermal resistance values in the "Thermal Information" section. A PCN listing these changes is planned to be issued by the end of the year.

In conjunction with these changes, the probe step will be removed.

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

**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
CFAB	CU3	CHN	Chengdu
<b>RFAB</b>	<b>RFB</b>	<b>USA</b>	<b>Richardson</b>

**Die Rev:**

**Current**

**New**

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

Sample product shipping label (not actual product label)



**Product Affected:**

LM2903AVQPWRG4Q1	LM2903AVQPWRQ1	LM2903QPWRKN	LM2903QPWRRBG4
LM2903VQPWRG4Q1	LM2903BQPWRQ1	LM2903QPWRQ1	LM2903VQPWRQ1
LM2903AVQPWRDL	LM2903QPWRG4Q1	LM2903QPWRRB	MLA00414PWR

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

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

**ROLEX - LM2903QPWRQ1 Automotive Qualification for the New TIB(RFAB) 40V Process in PW package MLA**  
Approve Date 23-July-2024

**Product Attributes**

Attributes	Qual Device: <u>LM2903QPWRQ1</u>	QBS Package, Process Reference: <u>LM2902BQPWRQ1</u>
Automotive Grade Level	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125
Product Function	Signal Chain	Signal Chain
Wafer Fab Supplier	RFAB	RFAB
Assembly Site	MLA	MLA
Package Group	TSSOP	TSSOP
Package Designator	PW	PW
Pin Count	8	14

- QBS: Qual By Similarity
- Qual Device LM2903QPWRQ1 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: <u>LM2903QPWRQ1</u>	QBS Package, Process Reference: <u>LM2902BQPWRQ1</u>
<b>Test Group A - Accelerated Environment Stress Tests</b>									
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	1/308/0	3/924/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	1/77/0	3/231/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	110C/85%RH	264 Hours	-	3/231/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	1/77/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	1/77/0	-
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0	1/15/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	-	3/231/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	175C	500 Hours	1/77/0	-
<b>Test Group B - Accelerated Lifetime Simulation Tests</b>									
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	150C	300 Hours	1/77/0	-
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	150C	408 Hours	-	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>									

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: <a href="#">LM2903QPWRQ1</a>	QBS Package, Process Reference: <a href="#">LM2902BQPWRQ1</a>
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
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
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	-	1/10/0	3/30/0

#### Test Group D - Die Fabrication Reliability Tests

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	-
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	-	1500 Volts	1/3/0	-
LU	E4	AEC Q100-004	1	6	Latch-Up	Per AEC Q100-004	-	1/3/0	-

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: <a href="#">LM2903QPWRQ1</a>	QBS Package, Process Reference: <a href="#">LM2902BQPWRQ1</a>
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-CHG-2310-099

ZVEI IDs: SEM-DE-01, SEM-DE-02, SEM-DE-03, SEM-PW-02, SEM-PW-03, SEM-PW-09, SEM-PW-13, SEM-PA-08, SEM-PS-04, SEM-EQ-01, SEM-QG-01, SEM-PA-19

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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