



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.

DEVICE	CUSTOMER PART NUMBER
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).

PCN Number:		20240910000.2		PCN Date:		September 11, 2024																						
Title:		Qualification of RFAB using qualified Process Technology, Die Change & BOM update																										
Customer Contact:			Change Management team		Dept:		Quality Services																					
Proposed 1st Ship Date:			March 10, 2025		Sample requests accepted until:		October 11, 2024*																					
*Sample requests received after October 11, 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 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:																												
<table><thead><tr><th colspan="3">Current Fab Site</th><th colspan="3">Additional Fab Site</th></tr><tr><th>Current Fab Site</th><th>Process</th><th>Wafer Diameter</th><th>Additional Fab Site</th><th>Process</th><th>Wafer Diameter</th></tr></thead><tbody><tr><td>SFAB</td><td>J11</td><td>150 mm</td><td rowspan="2">RFAB</td><td rowspan="2">TIB</td><td rowspan="2">300 mm</td></tr><tr><td>CFAB</td><td>J13</td><td>200 mm</td></tr></tbody></table>						Current Fab Site			Additional Fab Site			Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter	SFAB	J11	150 mm	RFAB	TIB	300 mm	CFAB	J13	200 mm	The die was also changed as a result of the process change.	
Current Fab Site			Additional Fab Site																									
Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter																							
SFAB	J11	150 mm	RFAB	TIB	300 mm																							
CFAB	J13	200 mm																										
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
RFAB	RFB	USA	Richardson


Die Rev:


Current


New

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

Sample product shipping label (not actual product label)


TEXAS INSTRUMENTS
 MADE IN: Malaysia
 2DC: 2Q:


G4



(1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483SI2
 (P)
 (2P) REV: (V) 0033317
 (20L) CSO: SHE (21L) CCO: USA
 (22L) ASO: MLA (23L) ACO: MYS

MSL '2 / 260C / 1 YEAR SEAL DT
 MSL 1 / 235C / UNLIM 03/29/04
 OPT:
 ITEM: 39
 LBL: 5A (L)T0:1750

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](https://www.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>
Test Group A - Accelerated Environment Stress Tests									
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	-
Test Group B - Accelerated Lifetime Simulation Tests									
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
Test Group C - Package Assembly Integrity Tests									

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: <u>LM2903QPWRQ1</u>	QBS Package, Process Reference: <u>LM2902BQPWRQ1</u>
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: <u>LM2903QPWRQ1</u>	QBS Package, Process Reference: <u>LM2902BQPWRQ1</u>
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.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.