12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN#20240327005.1
Qualification of RFAB using qualified Process Technology, Die Revision, and additional Assembly site options
Change Notification / Sample Request

Date: March 28, 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

20240327005.1
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
LM193DR	NULL
LM193DRG4	NULL
LM2903AVQDR	NULL
LM2903AVQDRG4	NULL
LM2903DR	NULL
LM2903VQDR	NULL
LM293ADR	NULL
LM293DR	NULL
LM393ADR	NULL
LM393DR	NULL

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

PCN Number:	20240327005.1	PCN Date:	March 28, 2024
Title:	Qualification of RFAB using qualified Process Technology, Die Revision, and additional Assembly site options		
Customer Contact:	Change Management team	Dept:	Quality Services
Proposed 1st Ship Date:	June 26, 2024	Estimated Sample Availability:	April 27, 2024*

***Sample requests received after April 27, 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 addition of RFAB using the TIB qualified process technology and additional Assembly/Test site (MLA) 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 CFAB	JI1 JI3	150 mm 200 mm	RFAB	TIB	300 mm

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

Group 1 BOM Table (RFAB/Process migration, Die Change + BOM options qualification):

	Current	Additional
Mount Compound	4147858	**4147858 Or 4211470**
Mold Compound	4211880	**4211880 or 4228573**
Lead finish	NiPdAu	**NiPdAu or Matte Sn**

Group 2 BOM Table (RFAB/Process migration, Die Change + MLA (Currently FMX) as additional Assembly site/BOM options qualification):

	FMX	MLA
Mount Compound	4147858	**4147858 Or 4211470**
Mold Compound	4211880	**4211880 or 4228573**
Lead finish	NiPdAu	**NiPdAu or Matte Sn**

Group 3 BOM Table (RFAB/Process migration, Die Change + MLA (Currently TAI) as additional Assembly site/BOM options qualification):

	TAI	MLA
Mount Compound	4147858	**4147858 Or 4211470**
Mold Compound	4211880	**4211880 or 4228573**
Bond Wire composition/diameter	Au, 0.96 mil	**Cu, 0.8 mil**

Lead finish	NiPdAu	**NiPdAu or Matte Sn****

** Note: the LM193DRG4 will only be built with NiPdAu lead finish

Upon expiry of this PCN, there will be a transition period where TI will combine lead free solutions in a single ***standard part number*** For example; ***LM2903DR*** – can ship with both Matte Sn and NiPdAu.

Example:

- Customer order for 7500 units of LM2903DR with 2500 units SPQ (Standard Pack Quantity per Reel).

- TI can satisfy the above order in one of the following ways.
  - I. 3 Reels of NiPdAu finish.
  - II. 3 Reels of Matte Sn finish
  - III. 2 Reels of Matte Sn and 1 reel of NiPdAu finish.
  - IV. 2 Reels of NiPdAu and 1 reel of Matte Sn finish.

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-milimeter 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:

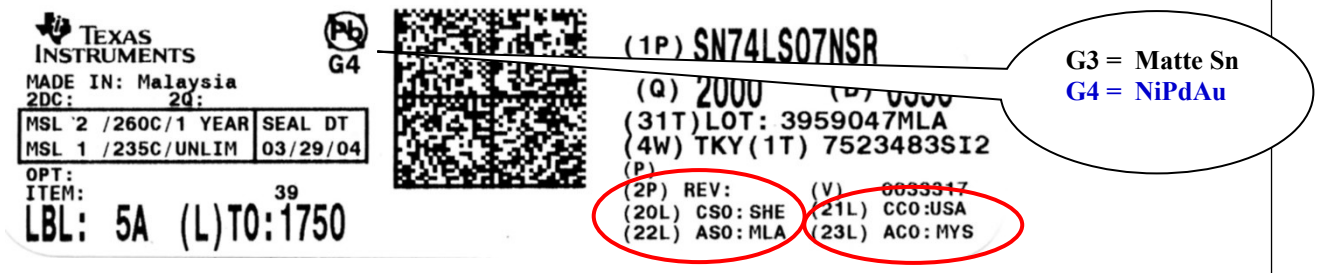
Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
SH-BIP1	SHE	USA	Sherman
CFAB	CU3	CHN	CHENGDU
RFAB	**RFB**	**USA**	**Richardson**

Die Rev:

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

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TI Mexico	MEX	MEX	Aguascalientes
TI Taiwan	TAI	TWN	Chung Ho, New Taipei City
TI Malaysia	**MLA**	**MYS**	**Kuala Lumpur**

Sample product shipping label (not actual product label)



Product Affected:

Group 1 Device List (RFAB/Process migration, Die Change + BOM options qualification):

LM2903DR	LM293ADR	LM393ADR	SN293DR
LM2903DR-S	LM293DR	LM393DR	SN393DR

Group 2 Device List (RFAB/Process migration, Die Change + MLA (Currently FMX) as additional Assembly site/BOM options qualification):

LM2903AVQDR	LM2903AVQDRG4	LM2903VQDR

Group 3 Device List (RFAB/Process migration, Die Change + MLA (Currently TAI) as additional Assembly site/BOM options qualification):

LM193DR	LM193DRG4

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

Qualification Report

LMX93 / LM2903 Commercial Device Using TIB Die and LCB in MLA.
Approve Date 23-FEBRUARY -2024

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: LM2903AVQDR	QBS Reference: LM324BIPWR	QBS Reference: LM2901BQDRQ1	QBS Reference: LM358BIDR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	1/77/0	3/231/0
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	1/77/0	3/231/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	1/77/0	3/231/0
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	1/77/0	3/231/0
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	1/77/0	-
WBS	C1	Ball Shear	76 balls, 3 units min	Wires	-	-	-	3/228/0
WBP	C2	Bond Pull	76 Wires, 3 units min	Wires	-	-	-	3/228/0
ESD	E2	ESD CDM	-	1000 Volts	1/3/0	-	-	-
ESD	E2	ESD HBM	-	2000 Volts	1/3/0	-	-	-
LU	E4	Latch-Up	Per JESD78	-	1/3/0	-	-	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	-	-	-

- QBS: Qual By Similarity
- Qual Device LM2903AVQDR 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-2402-033

Qualification Report

LM393 / LM2903 Legacy Die Redesign on TIB Process with Assembly in MLA.
Approve Date 23-FEBRUARY -2024

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: LM2903AVQDR (NIPDAU Finish)	QBS Reference: LM324BIPWR	QBS Reference: LM2901BQDRQ1	QBS Reference: OPA2991QDRQ1	QBS Reference: LM2903AVQDR (MATTE SN) Finish)
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	1/77/0	3/231/0	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	1/77/0	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	1/77/0	3/231/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	3/135/0	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	1/77/0	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	-	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	1/77/0	-	-
ESD	E2	ESD CDM	-	1000 Volts	1/3/0	-	-	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	-	-	-	1/30/0

- QBS: Qual By Similarity
- Qual Device LM2903AVQDR 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-2402-027

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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