12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20210318001.1
Qualification of new Fab site (CFAB) using qualified Process Technology, Die Revision, updated BOMs, and additional Assembly options for select devices
Change Notification / Sample Request

Date: March 29, 2021
To: Newark/Farnell 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 of the change. If samples or additional data are required, requests must be received within 30 days of acknowledgement, 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 previous announcement to close our two remaining factories with 150-millimeter production (DFAB in Dallas, Texas, and SFAB in Sherman, Texas). 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 PCN Team (PCN_ww_admin_team@list.ti.com). For sample requests or sample related questions, contact your local Field Sales Representative. As always, we thank you for your continued business.

PCN Team
SC Business Services

20210318001.1
Attachment: 1

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, these are the devices that you have purchased within the past twenty-four (24) months. The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
TL331IDBVR	null

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

PCN Number:	20210318001.1	PCN Date:	Mar 29, 2021
Title:	Qualification of new Fab site (CFAB) using qualified Process Technology, Die Revision, updated BOMs, and additional Assembly options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Jun 29, 2021	Estimated Sample Availability:	Date provided at sample request.

Change Type:					
☒	Assembly Site	☐	Assembly Process	☒	Assembly Materials
☒	Design	☐	Electrical Specification	☐	Mechanical Specification
☐	Test Site	☒	Packing/Shipping/Labeling	☐	Test Process
☐	Wafer Bump Site	☐	Wafer Bump Material	☐	Wafer Bump Process
☒	Wafer Fab Site	☒	Wafer Fab Materials	☒	Wafer Fab Process
		☐	Part number change		

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of a new fab using a qualified process technology (CFAB, JI3), updated BOMs, and assembly (FMX, MLA, TIPI) site options for selected devices as listed below in the product affected section.

Current Fab Site			New Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**New Fab Site**	**Process**	**Wafer Diameter**
SFAB	JI1	150 mm	CFAB	JI3	200 mm

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

Construction differences are noted below:

SOIC Package:

	FMX	MLA	TAI	ASESH	FMX, MLA New
Mount Compound	4147858	4147858	4042500	EY1000063	4147858
Mold Compound	4211880	4211880	4205694	EN2000509	4211880
Lead finish, Prep	NiPdAu	NiPdAu	NiPdAu	Matte Sn	NiPdAu
Bond wire, diameter	0.96 mil Cu	0.96 mil Cu	0.96mil Au	1.0mil Cu	0.8 mils Cu
MSL	G4	G4	G4	G3	G4

Upon expiry of this PCN TI will combine lead free solutions in a single ***standard part number***, for the devices in groups 1 & 2. For example; ***SN393DR*** – can ship with both Matte Sn and NiPdAu. Example:

- Customer order for 7500 units of SN358DR 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.

TSSOP Package:

	MLA	ASESH	MLA New
Mount Compound	4147858	EY1000063	4147858
Mold Compound	4211471	EN2000507	4211471
Lead finish, Prep	NiPdAu	Matte Sn	NiPdAu
Bond wire, diam	1mil, 0.96mil Cu	1.0mil Cu	Cu, 0.8 mils
MSL	G4	G3	G4

Upon expiry of this PCN TI will combine lead free solutions in a single ***standard part number***, for the devices in groups 1 & 2. For example; ***SN2903PWR*** – can ship with both Matte Sn and NiPdAu.

Example:

- Customer order for 7500 units of SN358DR 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.

SOT- 23 Package:

	NFME	HNA	HFTF	TIPI
Mount Compound	A-03	400180	A-03	8095733
Mold Compound	R-04	450207	R-27	4222198
Lead finish, Prep	NiPdAu	NiPdAu	Matte Sn	NiPdAu
Bond wire, diam	1.0 mil Au	1.0 mil Au	1.0 mil Cu	Cu, 0.8 mils
MSL	G4	G4	G3	G4

Upon expiry of this PCN TI will combine lead free solutions in a single ***standard part number***, for the devices in groups 1 & 2. For example; ***TL331KDBVR/T***– can ship with both Matte Sn and NiPdAu.

Example:

- Customer order for 7500 units of SN358DR 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.

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

Anticipated impact on Material Declaration

☐	No Impact to the Material Declaration	☒	Material Declarations or Product Content reports are driven from production data and will be available following the production release. Upon production release the revised reports can be obtained from the TI ECO website.

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**

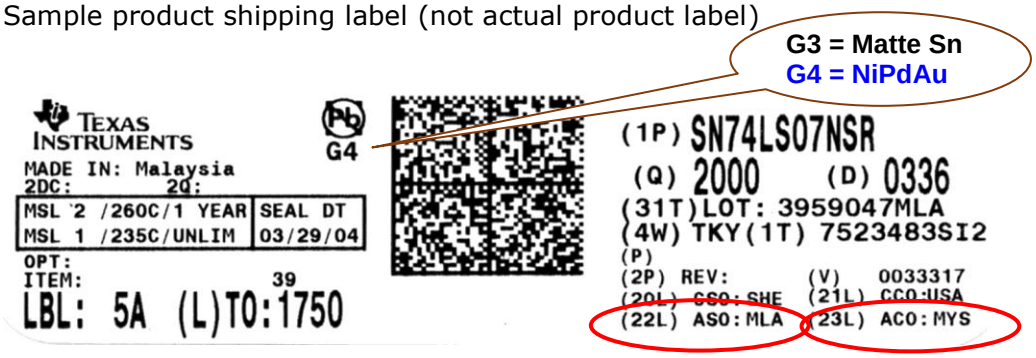
Die Rev:

Product Family	**Current**	**New**
	Die Rev [2P]	**Die Rev [2P]**
LM293/393/LM2903	A, B	**A**
TL331x	A	**A**

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
TAI	TAI	TWN	Chung Ho, New Taipei City
ASESH	ASH	CHN	Shanghai
NFME	NFM	CHN	Nantong
HNA	HNT	THA	Ayutthaya
HFTF	HFT	CHN	Hefei
FMX	**MEX**	**MEX**	**Aguascalientes**
MLA	**MLA**	**MYS**	**Kuala Lumpur**
TIPI	**PHI**	**PHL**	**Baguio City**

Sample product shipping label (not actual product label)



Product Affected: SOIC Package

Group 1 Device list (CFAB/Process migration & BOM Update at FMX/MLA):

LM2903AVQDR	LM2903DR-S	LM293DR	LM393ADRG4
LM2903AVQDRG4	LM2903VQDR	LM293DRE4	LM393DR
LM2903DR	LM2903VQDRG4	LM293DRG4	LM393DRE4
LM2903DRE4	LM293ADR	LM393ADR	LM393DRG4
LM2903DRG4	LM293ADRG4	LM393ADRE4	SN293DR

Group 2 Device list (CFAB/Process migration & AT Site TAI to FMX/MLA):

LM2903QDRG4

Group 3 Device list (CFAB/Process migration & AT Site ASESH to FMX/MLA):

SN393DR

Product Affected: TSSOP Package

Group 1 Device list (CFAB/Process migration & BOM Update at MLA):

LM2903AVQPWR	LM2903PWRG4	LM393APWRE4	LM393PWRG4
LM2903AVQPWRG4	LM2903VQPWR	LM393APWRG4	
LM2903PWR	LM393APWR	LM393PWR	

Group 2 Device list (CFAB/Process migration & AT Site ASESH to MLA):

SN2903PWR

Product Affected: SOT-23 Package

Group 1 Device list (CFAB/Process migration & AT Site NFME/HNA to TIPI):

TL331IDBVR	TL331IDBVRG4	TL331IDBVT	TL331IDBVTG4
TL331IDBVRE4			

Group 2 Device list (CFAB/Process migration & AT Site HFTF to TIPI):

TL331KDBVR	TL331KDBVRG4	TL331KDBVT

SOIC Qual Memo:

Qualification Report

LM393 / LM2903 SOIC
Approve Date 20-Oct-2020

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

Type	Test Name / Condition	Duration	Qual Device: LM2903AVQDR	QBS Product Reference: LM2903BIDR(MSL1)	QBS Product Reference: LM2903BIDR(MSL2)	QBS Package Reference: LM358BIDR
MSL1	Moisture Sensitivity	Level 1, 260C	-	3/45/0	-	-
PC	Preconditioning Level 2	Level 2, 260C	-	-	Pass	Pass
HTOL	Life Test, 150C	300 Hours	-	-	3/231/0	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	1/77/0	3/231/0
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	-	1/77/0	3/231/0
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	1/77/0	3/231/0
HTSL	High Temp Storage Bake 175C	500 Hours	-	-	1/77/0	3/231/0
CDM	ESD - CDM	1500 V	-	-	3/9/0	-
HBM	ESD - HBM	2000 V	-	-	3/9/0	-
LU	Latch-up	(per JESD78)	-	-	3/18/0	-
ED	Electrical Characterization	Per Datasheet Parameters	-	-	3/90/0	-
WBP	Bond Pull	Wires	-	-	1/240/0	3/228/0
WBS	Ball Shear	Wires	-	-	1/240/0	3/228/0

- QBS: Qual By Similarity
- Qual Device LM2903AVQDR is qualified at LEVEL1-260C
- 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/

Green/Pb-free Status:
Qualified Pb-Free (SMT) and Green

Qualification Report

LM2903DR & LM393DR
Approve Date 05-Feb-2021

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

Type	Test Name / Condition	Duration	Qual Device: LM2903DR	QBS Product Reference: LM393BIDR	QBS Product Reference: LM2903BQDRQ1	QBS Package Reference: TMP1075D
PC	Preconditioning	level 1@ 260C		1/308/0	-	3/924/0
HTOL	High Temp Operating Life , 150C	300 Hours		-	3/231/0	-
HAST	**Biased HAST, 130C/85%RH	96 Hours		1/77/0	-	3/231/0
UHAST	**Unbiased HAST, 130C/85%RH	96 Hours		1/77/0	-	3/231/0
TC	**Temperature Cycles, -65C/150C	500 Cycles		1/77/0	-	3/231/0
HTSL	**High Temp. Storage Bake , 150C	1000 Hours		1/77/0	-	-
HTSL	**High Temp. Storage Bake , 170C	420 Hours		-	-	3/231/0
HBM	ESD HBM	2000V		-	3/9/0	-
CDM	ESD CDM	1500V		1/3/0	3/9/0	-
LU	Latch-up	JESD78		-	3/18/0	-
ED	Electrical Characterization	Per Datasheet Parameters		1/30/0	3/90/0	-
MQ	Manufacturability (Assembly)	(per mfg. Site specification)		Pass	-	-
MQ	Manufacturability (Test)	(per mfg. Site specification)		Pass	-	-
MQ	Manufacturability (Wafer Fab)	(per mfg. Site specification)		Pass	-	-

- QBS: Qual By Similarity
- Qual Device LM2903DR/L393DR are qualified at LEVEL1-260C

- 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/

Green/Pb-free Status:

Qualified Pb-Free (SMT) and Green

TSSOP Qual Memo:

Qualification Report

LM393/LM2903 TSSOP
Approve Date 30-Sep-2020

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

Type	Test Name / Condition	Duration	Qual Device: LM2903AVQPWR	QBS Product Reference: LM2903BIPWR	QBS Product Reference: LM393BIDR
PC	Preconditioning Level 1	Level 1, 260C	-	Pass	-
HTOL	Life Test, 150C	300 Hours	-	3/231/0	3/231/0
HAST	Biased HAST, 130C/85%RH	96 Hours	-	3/231/0	-
UHAST	Unbiased HAST 130C/85%RH	96 Hours	-	3/231/0	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	3/231/0	-
HTSL	High Temp Storage Bake 175C	500 Hours	-	3/231/0	-
CDM	ESD - CDM	1500 V	-	1/3/0	-
HBM	ESD - HBM	2000 V	-	1/3/0	-
LU	Latch-up	(per JESD78)	-	-	3/18/0
ED	Electrical Characterization	Per Datasheet Parameters	-	3/90/0	-
WBP	Bond Pull	Wires	-	1/100/0	-
WBS	Ball Shear	Wires	-	1/100/0	-

- QBS: Qual By Similarity
- Qual Device LM2903AVQPWR is qualified at LEVEL1-260C

- 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/

Green/Pb-free Status:

Qualified Pb-Free (SMT) and Green

SOT-23 Qual Memo:

Qualification Report

TL331KDBVR/TL331IDBVR/TL331IDBVRG4
Approve Date 26-Oct-2020

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

Type	Test Name / Condition	Duration	Qual Device: TL331KDBVR	QBS Product Reference: TL331BIDBVR	QBS Product Reference: TL391BIDBVR	QBS Product Reference: LM393BIDR	QBS Package Reference: TLV9001DBVR
PC	Preconditioning	(level 1 @ 260C peak +5/-0C)	-	-	1/308/0	-	Pass
HTOL	High Temp Operating Life, 150C	300 Hours	-	-	1/77/0	3/231/0	-
HAST	**Biased HAST, 130C/85%RH	96 Hours	-	-	1/77/0	-	3/231/0
HTSL	**High Temp. Storage Bake, 150C	1000 Hours	-	-	1/77/0	-	-
HTSL	**High Temp. Storage Bake, 170C	420 Hours	-	-	-	-	3/231/0
TC	**T/C -65C/150C	500 Cycles	-	-	1/77/0	-	3/231/0
UHAST	**Unbiased HAST, 130C/85%RH	96 Hours	-	-	1/77/0	-	3/231/0
HBM	ESD HBM	2500V	-	-	1/3/0	-	-
HBM	ESD HBM	2000V	-	-	-	3/9/0	-
CDM	ESD CDM	1500V	-	-	1/3/0	3/9/0	-
LU	Latch-up 25C and 125C	(per JESD78)	-	-	1/6/0	3/18/0	-
ED	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	-	-
ED	Bench Characterization	Per Datasheet Parameters	Pass	-	-	-	-
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	-	Pass	Pass	-	-

- QBS: Qual By Similarity
- Qual Device TL331KDBVR is qualified at LEVEL 1-260C

- 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/

For questions regarding this notice, e-mails can be sent to the contacts shown below or your local Field Sales Representative.

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
WW PCN Team	PCN_ww_admin_team@list.ti.com

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