PCN Number:	20240723003.1	PCN Date:	July 23, 2024
Title:	Qualification of RFAB using qualified Process Technology, Die Revision, and additional Assembly site (MLA) & BOM options for select devices		
Customer Contact:	Change Management Team	Dept:	Quality Services
Proposed 1st Ship Date:	October 21, 2024	Sample requests accepted until:	August 22, 2024*

***Sample requests received after August 22, 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 Material
☒	Packing/Shipping/Labeling	☐	Test Process	☒	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 an Assembly site (MLA) and BOM options for the devices listed below.

Current Fab Site			Additional Fab Site		
Fab Site	**Process**	**Wafer Diameter**	**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 BOM Table (RFAB/Process migration, die change plus MLA (VSSOP Packaged devices) as new Assembly site):

What	UTL2	HNA	ASESH	MLA
Bond Wire composition, diameter	Au, 1.0 mil	Au, 1.0 mil	Cu, 1.0 mil	Cu, 0.8 mil
Mold Compound	SID#CZ0094	SID#450179	SID#EN2000763	4211880
Mount Compound	SID#PZ0013	SID#400180	SID#EY1000063	4147858

Group 2 BOM Table (RFAB/Process migration, die change plus BOM update):

What	Current	Additional
Bond Wire composition, diameter	Cu, 0.96 or 1.0 mil	Cu, 0.8 mil

Group 3 BOM Table (RFAB/Process migration, die change plus MLA (D packaged Devices) as new Assembly site):

What	FMX	MLA
Bond Wire composition, diameter	Cu, 0.96	Cu, 0.8 mil

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
☒ 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-BIP-1	SHE	USA	Sherman
RFAB	**RFB**	**USA**	**Richardson**

Die Rev:

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

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
UTL2	NS2	THA	Bangpakong, Chachoengsao
HNA	HNT	THA	Ayutthaya
ASESH	ASH	CHN	Shanghai
FMX	MEX	MEX	Aguascalientes
TIM	**MLA**	**MYS**	**Kuala Lumpur**

Sample product shipping label (not actual product label):

Product Affected:

Group 1 Device list: RFAB/Process migration, die change plus MLA (VSSOP Packaged devices) as new Assembly site:

RC4558DGKR	RC4558IDGKR	RC4558IDGKRG4

Group 2 Device list: RFAB/Process migration, die change plus BOM update:

RC4558IP	RC4558P	RC4559P	RC4559PE4

RC4558IPWR	RC4558PWR		

Group 3 Device list: RFAB/Process migration, die change plus MLA (D packaged Devices) as new Assembly site:

RC4558DR	RC4558IDR	RC4558IDRG4	RC4559DR

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

TI Information
Selective Disclosure

Qualification Report

RC4558IDGKR- Redbull device
Approve Date 07-JUNE -2024

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IDGKR	QBS Product Reference: RC4580IPWR	QBS Process Reference: LM2902BQPWRQ1	QBS Process Reference: LM324BIPWR	QBS Package Reference: SN74LV244AQDGSRQ1	QBS Package Reference: SN74LV541AQDGSRQ1	QBS Package Reference: TLV1812QDGKRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	3/231/0	1/77/0	1/77/0	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	-	1/77/0	1/77/0	-
UHAST	A3	Unbiased HAST	110C/85%RH	264 Hours	-	-	3/231/0	-	-	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	3/231/0	-	-	1/77/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	3/231/0	1/77/0	1/77/0	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/231/0	3/231/0	1/45/0	1/45/0	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	-	1/77/0
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	3/231/0	1/77/0	-	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	-	-	1/77/0
HTOL	B1	Life Test	150C	408 Hours	-	-	3/231/0	-	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	3/2400/0	-	-	-

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IDGKR	QBS Product Reference: RC4580IPWR	QBS Process Reference: LM2902BQPWRQ1	QBS Process Reference: LM324BIPWR	QBS Package Reference: SN74LV244AQDGSRQ1	QBS Package Reference: SN74LV541AQDGSRQ1	QBS Package Reference: TLV1812QDGKRQ1
SD	C3	PB Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	-	1/15/0	-	1/15/0
SD	C3	PB-Free Solderability	Precondition w.155C Dry Bake (4 hrs +/- 15 minutes)	-	-	-	-	-	1/15/0	-	1/15/0
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	1/10/0	1/10/0	1/10/0
ESD	E2	ESD CDM	-	1500 Volts	-	-	3/9/0	-	-	-	-
ESD	E2	ESD CDM	-	250 Volts	-	1/3/0	-	1/3/0	-	-	-
ESD	E2	ESD CDM	-	500 Volts	-	-	-	-	1/3/0	1/3/0	1/3/0
ESD	E2	ESD HBM	-	1000 Volts	-	1/3/0	-	1/3/0	-	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	-	3/9/0	-	1/3/0	1/3/0	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	1/3/0	3/18/0	1/3/0	1/6/0	1/6/0	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	1/30/0	3/90/0	1/30/0	1/30/0	1/30/0	1/30/0
FTY	E6	Final Test Yield	-	-	1/Pass	-	-	-	-	-	-

- QBS: Qual By Similarity
- Qual Device RC4558IDGKR 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-2307-024

TI Information
Selective Disclosure

Qualification Report

RC4558IPWR - Redbull device
Approve Date 07-June-2024

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IPWR	QBS Product Reference: RC4580IPWR	QBS Package/Process Reference: LM2902BQPWRQ1	QBS Process Reference: LM324BIPWR	QBS Package Reference: OPA4991QPWRQ1
HAST	A2	Biased HAST	110C/85%RH	264 Hours	-	-	-	-	1/77/0
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	110C/85%RH	264 Hours	-	-	3/231/0	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	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	150C	1000 Hours	-	-	3/231/0	3/231/0	1/45/0
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	3/231/0	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	3/231/0
HTOL	B1	Life Test	150C	408 Hours	-	-	3/231/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	3/2400/0	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	1/10/0
ESD	E2	ESD CDM	-	1500 Volts	-	-	3/9/0	-	1/3/0

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IPWR	QBS Product Reference: RC4580IPWR	QBS Package/Process Reference: LM2902BQPWRQ1	QBS Process Reference: LM324BIPWR	QBS Package Reference: OPA4991QPWRQ1
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	-	2000 Volts	-	-	3/9/0	-	-
ESD	E2	ESD HBM	-	4000 Volts	-	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	1/3/0	3/18/0	1/3/0	3/18/0
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	-	3/90/0
FTY	E6	Final Test Yield	-	-	1/Pass	-	-	-	-

- QBS: Qual By Similarity
- Qual Device RC4558IPWR 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-2307-023

TI Information
Selective Disclosure

Qualification Report

RC4558IDR- Redbull device
Approve Date 04-JUNE -2024

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IDR	QBS Process Reference: LM2902BQPWRQ1	QBS Process Reference: TL431BQDBZR	QBS Process Reference: TL431AIDBZR	QBS Package Reference: LM2901BQDRQ1	QBS Package Reference: MC33063ADR
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0	1/77/0	3/231/0	3/231/0
UHAST	A3	Unbiased HAST	110C/85%RH	264 Hours	-	3/231/0	-	-	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	3/231/0	1/77/0	3/231/0	3/231/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	3/231/0	3/231/0	1/77/0	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/231/0	3/231/0	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	-	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	-	1/77/0	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	-	-	2/154/0	1/77/0

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IDR	QBS Process Reference: LM2902BQPWRQ1	QBS Process Reference: TL431BQDBZR	QBS Process Reference: TL431AIDBZR	QBS Package Reference: LM2901BQDRQ1	QBS Package Reference: MC33063ADR
HTOL	B1	Life Test	150C	300 Hours	-	-	3/231/0	1/77/0	-	-
HTOL	B1	Life Test	150C	408 Hours	-	3/231/0	-	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	3/2400/0	-	-	1/800/0	2/1600/0
ESD	E2	ESD CDM	-	1500 Volts	-	3/9/0	-	-	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	-	-	-	1/3/0	-
ESD	E2	ESD CDM	-	500 Volts	-	-	1/3/0	1/3/0	-	-
ESD	E2	ESD HBM	-	1000 Volts	1/3/0	-	-	-	1/3/0	-
ESD	E2	ESD HBM	-	2000 Volts	-	3/9/0	1/3/0	1/3/0	-	-
LU	E4	Latch-Up	Per JESD78	-	1/3/0	3/18/0	1/6/0	1/6/0	1/3/0	-
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/30/0	3/90/0	3/90/0	1/30/0	1/30/0	1/30/0
FTY	E6	Final Test Yield	-	-	1/Pass	-	-	-	-	-

- QBS: Qual By Similarity
- Qual Device RC4558IDR 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-2401-091

Qualification Report

RC4558IP- Redbull Project
Approve Date 05-JULY -2024

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IP	QBS Product Reference: RC4580IPWR	QBS Process Reference: LM2902BQPWRQ1	QBS Package Reference: NE5532P	QBS Package Reference: UCC37322P	QBS Package Reference: OPA2277P
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	110C/85%RH	264 Hours	-	-	3/231/0	-	-	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	-	-	1/77/0
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	-	3/231/0	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	3/231/0	-	-	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	-	3/231/0	-
HTOL	B1	Life Test	150C	300 Hours	-	-	-	3/231/0	-	-
HTOL	B1	Life Test	150C	408 Hours	-	-	3/231/0	-	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	-	-	-
SD	C3	PB-Free Solderability	8 Hours Steam Age	-	-	-	-	3/66/0	3/66/0	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	-	-

Type	#	Test Name	Condition	Duration	Qual Device: RC4558IP	QBS Product Reference: RC4580IPWR	QBS Process Reference: LM2902BQPWRQ1	QBS Package Reference: NE5532P	QBS Package Reference: UCC37322P	QBS Package Reference: OPA2277P
ESD	E2	ESD CDM	-	1500 Volts	-	-	3/9/0	-	-	-
ESD	E2	ESD CDM	-	250 Volts	1/3/0	1/3/0	-	-	-	1/3/0
ESD	E2	ESD HBM	-	1000 Volts	-	1/3/0	-	-	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	-	3/9/0	-	-	-
LU	E4	Latch-Up	Per JESD78	-	-	1/3/0	3/18/0	-	-	1/3/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	1/10/0	1/30/0	3/90/0	-	-	1/30/0
FTY	E6	Final Test Yield	-	-	1/Pass	-	-	-	-	-

- QBS: Qual By Similarity
- Qual Device RC4558IP 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-2307-021

For questions regarding this notice, e-mails can be sent to the Change Management team or your local Field Sales Representative.