12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20230128000.1
Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision and Assembly Site/BOM options for select devices
Change Notification / Sample Request

Date: January 30, 2023
To: TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments. The details of this change are on the following pages.

Texas Instruments 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 this notification.

The changes discussed within this PCN will not take effect any earlier than the proposed first ship date on Page 3 of this notification, unless customer agreement has been reached on an earlier implementation of the change.

This notice does not change the end-of-life status of any product. Should product affected be on a previously issued product withdrawal/discontinuance notice, this notification does not extend the life of that product or change the life time buy offering/discontinuance plan.

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.

PCN Team
SC Business Services

20230128000.1
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
LMV358IDR	null
LMV324IDR	null
LMV324IPWR	null
TLV9004IPWR	null
LMV324IPWRG4	null
LMV358IPWR	null
LMV358IDRG4	null

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

PCN Number:	20230128000.1	PCN Date:	Jan 30, 2023
Title:	Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision and Assembly Site/BOM options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Apr 30, 2023	Sample requests accepted until:	Mar 01, 2023*

*Sample requests received after Mar 01, 2023 will not be supported.

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 & process technology (RFAB, LBC9) and Assembly BOM options for selected devices as listed below in the product affected section.

Current Fab Site			New Fab Site		
Fab Site	**Process**	**Wafer Diameter**	**Fab Site**	**Process**	**Wafer Diameter**
FR-BIP-1	BCB	200 mm	RFAB	LBC9	300 mm

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

Construction differences are noted below:

Group 1 Wafer fab, Die revision, Assembly Site:

	FMX (Current)	MLA (New)
Wire type	0.96mil Cu	0.8mil Cu

Group 2 Wafer fab, Die revision, Assembly Site:

	ASESH (Current)	MLA (New)
Lead finish	Matte Sn	NiPdAu
Mount compound	EY1000063	4147858
Mold compound	EN2000508	4211471

Group 3 Wafer fab, Die revision, Assembly BOM:

	Current	Additional
Wire type	0.8mil Au, 0.96mil Cu	0.8mil Cu

Qual details are provided in the Qual Data Section.

Reason for Change:

Continuity of supply.

1) To align with world technology trends and use wiring with enhanced mechanical and electrical properties
2) Maximize flexibility within our Assembly/Test production sites.
3) Cu is easier to obtain and stock

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:

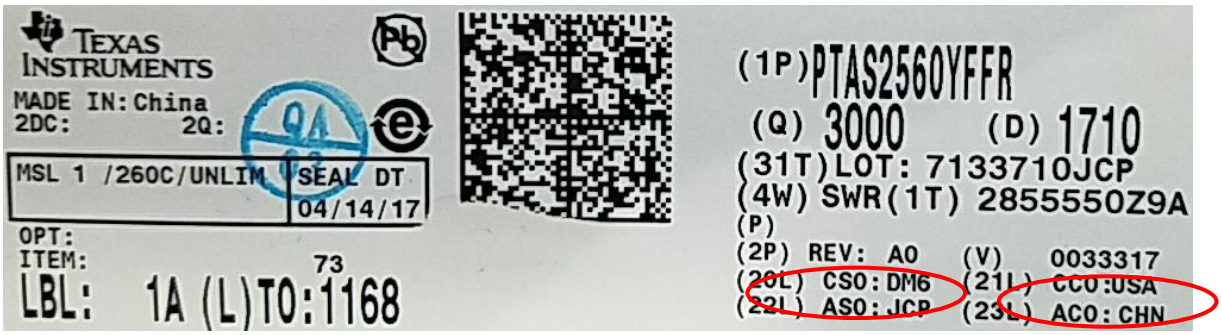
Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
FFAB	TID	DEU	Freising
RFAB	**RFB**	**USA**	**Richardson**

Die Rev:

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

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
ASESH	ASH	CHN	Shanghai
TI Mexico	MEX	MEX	Aguascalientes
TI Malaysia	**MLA**	**MYS**	**Kuala Lumpur**

Sample product shipping label (not actual product label)



Product Affected:

Group 1 Device list (Wafer fab, Die revision, Assembly Site)

LMV358IDRG4	LMV358QDR

Group 2 Device list (Wafer fab, Die revision, Assembly Site)

TLV9004IPWR

Group 3 Device list (Wafer fab, Die revision, Assembly BOM)

LMV324IDR	LMV324IPWRE4	LMV324QDRG4	LMV358IPWRG4
LMV324IDRE4	LMV324IPWRG4	LMV358IDR	SN0402093PWR
LMV324IDRG4	LMV324IPWRRB	LMV358IDRE4	
LMV324IPWR	LMV324QDR	LMV358IPWR	

Qualification Report

Approved 18-Aug-2022

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLV9004IDR	QBS Reference: SN74HCS74QDRQ1	QBS Reference: OPA4991QDRQ1	QBS Reference: LMV393QDRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	-	-
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	130C/85%RH	96 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	1/77/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	2/154/0	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/135/0	-	-
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	1/45/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	-	3/231/0
HTOL	B1	Life Test	150C	408 Hours	-	-	1/77/0	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	3/2400/0
PD	C4	Physical Dimensions	Cpk>1.67	-	-	3/30/0	-	3/30/0
ESD	E2	ESD CDM	-	1500 Volts	-	-	1/3/0	-
ESD	E2	ESD CDM	-	500 Volts	-	1/3/0	-	1/3/0
ESD	E2	ESD HBM	-	2000 Volts	-	1/3/0	-	1/3/0
ESD	E2	ESD HBM	-	4000 Volts	-	-	1/3/0	-
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	3/90/0	3/90/0	3/90/0

QBS: Qual By Similarity

Qual Device TLV9004IDR 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/
Green/Pb-free Status: Qualified Pb-Free(SMT) and Green

Qualification Report

Approved 13-Jan-2023

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLV9004IPWR	QBS Reference: TLV7031QDCKRQ1	QBS Reference: SN74HCS74QPWRQ1	QBS Reference: OPA4991QPWRQ1	QBS Reference: TLV9004QPWRQ1
HAST	A2	Biased HAST	110C/85%RH	264 Hours	-	-	-	1/77/0	-
HAST	A2	Biased HAST	110C/85%RH	264 Hours	-	-	-	2/154/0	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	3/231/0	3/231/0	-	1/77/0
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	3/231/0	1/77/0
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	3/231/0	1/77/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	3/231/0	3/135/0	3/135/0	-
HTOL	B1	Life Test	125C	1000 Hours	-	3/231/0	3/231/0	-	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	3/2400/0	-	-
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	3/30/0	1/10/0	-
ESD	E2	ESD CDM	-	500 Volts	-	1/3/0	1/3/0	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	1/3/0	1/3/0	-	-
LU	E4	Latch-Up	Per JESD78	-	-	1/6/0	1/6/0	3/18/0	1/6/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	3/90/0	3/90/0	3/90/0	3/90/0

QBS: Qual By Similarity

Qual Device TLV9004IPWR 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/
Green/Pb-free Status: Qualified Pb-Free(SMT) and Green

Qualification Report

Approved 12-Jan-2023

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLV9002IPWR	Qual Device: OPA2991IPWR	Qual Device: OPA2990IPWR	Qual Device: TLV9062IPWR	QBS Reference: OPA4990IDR	QBS Reference: OPA2992IDR	QBS Reference: OPA4991QPWRQ1	QBS Reference: OPA2990IPWR
HAST	A2	Biased HAST	110C/85%RH	264 Hours	-	-	-	-	-	-	3/231/0	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	3/231/0	-	-	3/231/0
UHAST	A3	Autoclave	121C, 2 atm	96 Hours	-	-	-	-	3/231/5[1]	-	3/231/0	-
UHAST	A3	Unbiased HAST	130C/85%RH	96 Hours	-	-	-	-	-	-	-	3/231/0
TC	A4	Temperature Cycle	-65/150C	500 Cycles	-	-	-	-	3/231/0	-	3/231/0	3/231/0
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	-	-	1/45/0	-
HTSL	A6	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	-	-	2/90/0	-
HTSL	A6	High Temperature Storage Life	170C	420 Hours	-	-	-	-	3/231/0	-	-	3/231/0
HTOL	B1	Life Test	150C	300 Hours	-	-	-	-	3/231/10[2,3]	1/77/0	3/231/0	-
ELFR	B2	Early Life Failure Rate	125C	48 Hours	-	-	-	-	1/800/0	-	-	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	-	-	-	-	1/10/0	-
ESD	E2	ESD CDM	-	1500 Volts	-	-	-	-	-	1/3/0	-	1/3/0
ESD	E2	ESD HBM	-	2500 Volts	-	-	-	-	-	-	-	1/3/0
LU	E4	Latch-Up	Per JESD78	-	-	-	-	-	3/18/0	1/3/0	3/18/0	1/6/0
CHAR	E5	Electrical Characterization	Per Datasheet Parameters	-	-	-	-	-	3/90/0	1/30/0	-	1/30/0

QBS: Qual By Similarity
Qual Device TLV9002IPWR is qualified at MSL2 260C
Qual Device OPA2991IPWR is qualified at MSL1 260C
Qual Device OPA2990IPWR is qualified at MSL1 260C
Qual Device TLV9062IPWR 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/
Green/Pb-free Status: Qualified Pb-Free(SMT) and Green
[1]-Mechanical damage from mis-handling @ test.
[2]-Faulty BI sockets.
[3]-Faulty BI sockets.

Qualification Report

Approved 08-June-2022

Qualification Results

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

Type	#	Test Name	Condition	Duration	Qual Device: TLV9002IDR	Qual Device: TLV9062IDR	QBS Reference: TLV1805QDBVRQ1	QBS Reference: TLV9002QDRQ1	QBS Reference: TLV9062QDRQ1	QBS Reference: TLV9002QDRQ1	QBS Reference: TLV9002QDRQ1	QBS Reference: TLV9062QDRQ1	QBS Reference: TLV9062QDRQ1
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	3/231/0	-	-	-	-	-	-
HAST	A2	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	-	-	1/77/0	3/231/0	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	3/231/0	-	-	-	-	-	-
UHAST	A3	Autoclave	121C/15psig	96 Hours	-	-	-	1/77/1[1]	1/77/0	-	1/77/0	3/231/0	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	3/231/0	-	-	-	-	-	-
TC	A4	Temperature Cycle	-65C/150C	500 Cycles	-	-	-	1/77/0	1/77/0	-	1/77/0	2/154/0	1/77/0
HTSL	A6	High Temperature Storage Life	175C	500 Hours	-	-	3/135/0	-	-	-	-	-	-
HTOL	B1	Life Test	125C	1000 Hours	-	-	3/231/0	-	-	-	-	-	-
HTOL	B1	Life Test	150C	408 Hours	-	-	-	-	-	-	1/77/0	1/77/0	-
PD	C4	Physical Dimensions	Cpk>1.67	-	-	-	3/30/0	-	-	-	-	3/30/0	-
ESD	E2	ESD CDM	-	1000 Volts	-	-	-	-	-	1/3/0	-	-	1/3/0
ESD	E2	ESD CDM	-	500 Volts	-	-	1/3/0	-	-	-	-	-	-
ESD	E2	ESD HBM	-	2000 Volts	-	-	1/3/0	-	-	-	-	-	-
ESD	E2	ESD HBM	-	4000 Volts	-	-	-	-	-	1/3/0	-	-	1/3/0
CHAR	E5	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	-	-	3/90/0	-	-	1/30/0	-	2/60/0	1/30/0

QBS: Qual By Similarity

Qual Device TLV9002IDR is qualified at MSL1 260C
Qual Device TLV9062IDR 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/
Green/Pb-free Status: Qualified Pb-Free(SMT) and Green

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

Location	E-Mail
WW Change Management Team	PCN_ww_admin_team@list.ti.com