

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

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

**Change Type:**

<input checked="" type="checkbox"/>	Assembly Site	<input checked="" type="checkbox"/>	Assembly Process	<input checked="" type="checkbox"/>	Assembly Materials
<input checked="" type="checkbox"/>	Design	<input type="checkbox"/>	Electrical Specification	<input type="checkbox"/>	Mechanical Specification
<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process
<input type="checkbox"/>	Wafer Bump Site	<input type="checkbox"/>	Wafer Bump Material	<input type="checkbox"/>	Wafer Bump Process
<input checked="" type="checkbox"/>	Wafer Fab Site	<input checked="" type="checkbox"/>	Wafer Fab Materials	<input checked="" type="checkbox"/>	Wafer Fab Process
		<input type="checkbox"/>	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
<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change

**Changes to product identification resulting from this PCN:**

**Fab Site Information:**

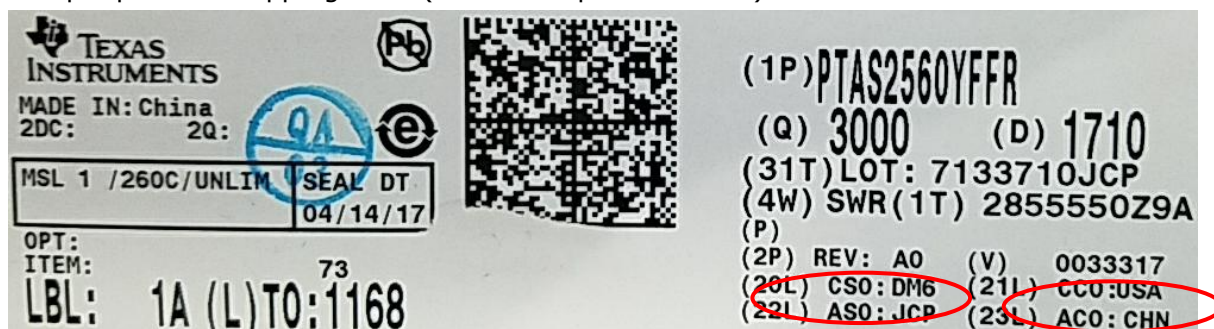
Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
FFAB	TID	DEU	Freising
<b>RFAB</b>	<b>RFB</b>	<b>USA</b>	<b>Richardson</b>

**Die Rev:**

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

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

Sample product shipping label (not actual product label)



**Product Affected:**

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

LMV358IDRG4	LMV358QDR
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**Group 2 Device list (Wafer fab, Die revision, Assembly Site)**

TLV9004IPWR
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**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 <sup>1</sup>	-	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 <sup>2,3</sup>	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 <sup>1</sup>	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	<a href="mailto:PCN_ww_admin_team@list.ti.com">PCN_ww_admin_team@list.ti.com</a>

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