12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN#20191122000.1
Qualification of additional Fab site (RFAB) and Assembly site options for select devices
Change Notification / Sample Request

Date: December 03, 2019
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

20191122000.1
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
LMV358IDGKR	null
LMV321IDBVT	null
LMV324MTX/NOPB	null
LMV358IPWR	null
LMV321IDBVR	null
LMV321M5/NOPB	null
LMV324IPWRG4	null
LMV358MM/NOPB	null
LMV358MMX/NOPB	null
LMV358IPWRG4	null
LMV321M5X/NOPB	null
LMV324QPWR	null
LMV358QDGKR	null

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

PCN Number:	20191122000.1	PCN Date:	Dec 3, 2019
Title:	Qualification of additional Fab site (RFAB) and Assembly site options for select devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Mar 1, 2020	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 an additional fab (RFAB) and assembly (ASESH, TIPI, or HFTAT) site for selected devices as listed below in the product affected section.

Current Fab Site			Additional Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
FFAB	BCB	200 mm	RFAB	LBC9	300 mm

Current Fab Site			Additional Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
MFAB	CS080	200mm	RFAB	LBC9	300 mm

Construction differences are noted below:

Group 1 BOM Comparison (RFAB only):

	Current	New
Bond Wire	Au/0.7	Cu/0.8
MSL	Level 1 – 260C	Level 2 – 260C

Group 2 BOM Comparison (RFAB plus ASESH AT):

	HNA	MLA	TIEM	ASESH
Mount Compound	SID#400180	4147858 or 4042500	8075531	SID#EY1000063
Mold Compound	SID#450179	4211471 or 4206193	8095181 or 8096859	SID#EN2000508, SID#EN2000763, or SID#EN2000507
Lead Finish	NiPdAu	NiPdAu	Matte Sn	NiPdAuAg, Matte Sn (PW)
Bond wire composition/diameter	Au/1.0	Au/0.8 or Cu 0.96	Cu/0.96	Cu/0.8
ECAT	G4	G4	G3	G3 or G4
MSL	Level 1 – 260C	Level 1 – 260C	Level 1 – 260C	Level 2 – 260C

Group 3 BOM Comparison (RFAB plus TIPI AT):

	NFME	TIEM	TIPI
Mount Compound	SID# A-03	8075531	4207123

Mold Compound	SID# R-04	8097131	4222198
Bond wire composition/diameter	Au/1.0	Cu/0.96	Cu/0.8
Lead Finish	NiPdAu	SnPb or Matte Sn	NiPdAu
ECAT	G4	e0 or G3	G4
MSL	Level 2 – 260C	Level 1 – 260C	Level 1 – 260C

Group 4 BOM Comparison (RFAB plus HFTF AT):

	NFME	TIEM	HFTF
Mount Compound	SID# A-03	8075531	SID# A-03
Mold Compound	SID# R-07	8095181	SID#R-27
Bond wire composition/diameter	Au/1.0	Au/0.96	Cu/0.8
Lead Finish	NiPdAu	Matte Sn or SnPb	Matte Sn
ECAT	G4	G3 or e0	G3
MSL	Level 1 – 260C	Level 1 – 260C	Level 2 – 260C

Upon expiry of this PCN TI will combine lead free solutions in a single ***standard part number***, for example; ***LMV321M5/NOPB*** – can ship with both Matte Sn and NiPdAu/Ag.

Example:

- Customer order for 7500units of LMV321M5/NOPB 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:

Continuity of Supply

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:

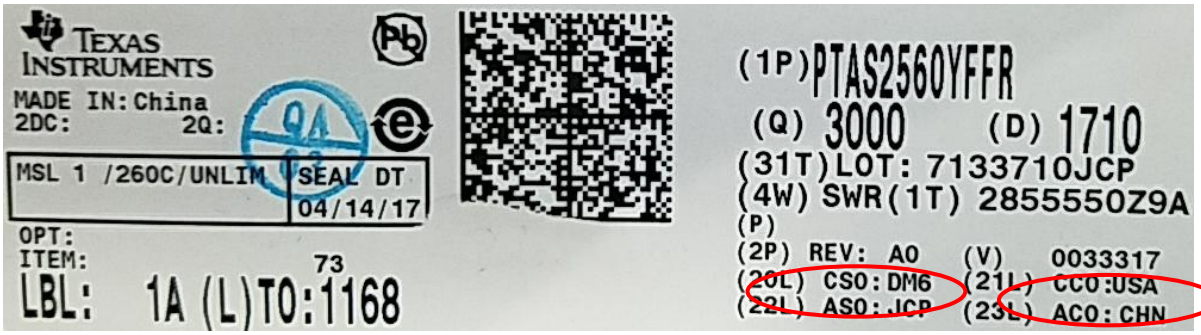
Fab Site Information:

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
FR-BIP-1	TID	DEU	Freising
MAINEFAB	CUA	USA	South Portland
RFAB	**RFB**	**USA**	**Richardson**

Assembly Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
NFME	NFM	CHN	Economic Development Zone
MLA	MLA	MYS	Kuala Lumpur
TIEM	CU6	MYS	Melaka
HNA	HNT	THA	Ayutthaya
ASESH	**ASH**	**CHN**	**Shanghai**
TIPI	**PHI**	**PHL**	**Baguio City**
HFTFAT	**HFT**	**CHN**	**Hefei**

Sample product shipping label (not actual product label)



Product Affected:

Group 1 Device list (RFAB only):

LMV324IPWR

Group 2 Device list (RFAB plus ASESH AT):

LMV324IPWRG4	LMV358IDGKR	LMV358MM/NOPB	LMV358QDGKR
LMV324MTX/NOPB	LMV358IDGKRG4	LMV358MMX/E7002183	LMV358QDGKRG4
LMV324QPWR	LMV358IPWR	LMV358MMX/NOPB	LMV358QPWR
LMV358IPWRG4			

Group 3 Device list (RFAB plus TIPI AT):

LMV321IDBVR	LMV321IDBVT	LMV321M5/NOPB	LMV321M5X/SL110546
LMV321IDBVRG4	LMV321M5	LMV321M5X/NOPB	

Group 4 Device list (RFAB plus HFTF AT):

LMV321IDCKR	LMV321M7/NOPB	LMV321M7X	LMV321M7X/NOPB
LMV321IDCKT			

Group 1 & 2 Qual Memo (RFAB plus ASESH AT):

TI Information
Selective Disclosure

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: LMV324IPWR	Qual Device: LMV324MT/NOPB	Qual Device: LMV324QPW	Qual Device: LMV358IPW	Qual Device: LMV358QPWR	Qual Device: LMV358IDGKR
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	Pass	Pass	Pass
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	1/77/0	1/77/0	1/77/0	-	-	-
HBM	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0	-	-	-
CDM	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
HTOL	Life Test, 140C	480 Hours	-	-	-	-	-	-
HTOL	Life Test, 150C	300 Hours	-	-	-	-	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	-
LU	Latch-up	(per JESD78)	2/12/0	2/12/0	2/12/0	-	-	-
SD	Solderability	Pb Free	-	-	-	-	-	-
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	1/77/0	1/77/0	3/231/0	3/231/0	1/77/0
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	1/77/0	1/77/0	1/77/0	-	-	-

Type	Test Name / Condition	Duration	Qual Device: LMV358MMX	Qual Device: LMV358MMX/NOPB	QBS Product/Process Reference: TLV9002ID	QBS Process Reference: TLV9062ID	QBS Package Reference: TLV9062IPW
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	Pass	Pass
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	3/2400/1 (A)	
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	1/77/0	3/231/0	3/231/0
HBM	ESD - HBM	2000 V	-	-	-	2/6/0	1/3/0
CDM	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0	3/9/0	1/3/0
HTOL	Life Test, 140C	480 Hours	-	-	-	-	-
HTOL	Life Test, 150C	300 Hours	-	-	1/77/0	3/231/0	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	1/77/0	3/231/0	3/231/0
LU	Latch-up	(per JESD78)	-	-	1/6/0	3/18/0	1/6/0
SD	Solderability	Pb Free	-	-	-	3/66/0	-
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	1/77/0	1/77/1 (B)	3/231/0	3/231/0
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	-	-	1/77/0	3/231/0	3/231/0

Type	Test Name / Condition	Duration	QBS Process Reference: TLV9064ID	QBS Process Reference: TPA3221DDV	QBS Package Reference: TLV9002IPWR - New Capillary Qual.	QBS Package Reference: TLV9062IDGKR	QBS Package Reference: TLV9064PW
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	Pass	Pass
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	-
HAST	Biased HAST, 130C/85%RH	96 Hours	1/77/0	2/154/0	-	3/231/0	2/154/0
HBM	ESD - HBM	2000 V	1/3/0	1/3/0	-	-	1/3/0
CDM	ESD - CDM	1000 V	1/3/0	2/6/0	1/3/0	-	1/3/0
HTOL	Life Test, 140C	480 Hours	-	3/231/3 (C)	-	-	-
HTOL	Life Test, 150C	300 Hours	1/77/0	-	-	-	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	1/76/0	2/154/0	3/231/0	3/231/1(e)	2/154/0
LU	Latch-up	(per JESD78)	1/6/0	3/18/0	-	-	1/6/0
SD	Solderability	Pb Free	-	-	-	3/66/0	-
TC	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	3/231/0	3/231/0	2/153/1 (D)
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	1/77/0	-	-	3/231/0	2/154/0

- QBS: Qual By Similarity
- Qual Devices are qualified at LEVEL2-260C
- 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

- (A) Die EOS, 1 unit – discounted
- (B) The reason for failure was an Offset wire bond on pin #7 resulting in metal to metal contact between bond pad edge to adjacent active metal. Corrective action is to implement 100% ball on pad inspection. Corrective action completed and qualification was run with new capillary (TLV9002IPWR - New Capillary Qual).
- (C) Three BST_LKG fails due to test pgm error that's been corrected. Discounted per QEM 1709-00190.
- (D) The failure was an offset wire bond on pin #6 resulting in metal to metal contact between bond pad edge. Metal to metal short was observed between the outer GND trace and the INN2 bond pad. Corrective action is to implement 100% ball on pad inspection
- (E) The failure was an offset wire bond on pin #5 resulting in a metal-metal short was observed between IN2P and VCC traces. Corrective action is to implement 100% ball on pad inspection and optimize the WB parameter to reduce ball size.

Group 3 Qual Memo (RFAB plus TIPI AT):

TI Information
Selective Disclosure

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: LMV321IDBVR	Qual Device: LMV321M5	Qual Device: LMV321M5/NOPB	QBS Process Reference: TLV9002ID	QBS Process Reference: TLV9062ID	QBS Package Reference: TLV9001IDBVR
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	Pass	Pass	Pass
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	3/2400/1[A]	-
HAST	Biased HAST, 130C/85%RH	96 Hours	-	-	-	1/77/0	3/231/0	3/231/0
HBM	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0	1/3/0	3/9/0	1/3/0
CDM	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0	1/3/0	3/9/0	1/3/0
HTOL	Life Test, 150C	300 Hours	-	-	-	1/77/0	3/231/0	-
HTSL	High Temp. Storage Bake, 170C	420 Hours	-	-	-	1/77/0	3/231/0	3/231/0
LU	Latch-up	(per JESD78)	1/6/2000	1/6/0	1/6/0	1/6/0	3/18/0	1/6/0
SD	Solderability	Pb Free	-	-	-	-	3/66/0	-
TC	Temperature Cycle, -65/150C	500 Cycles	-	-	-	1/77/1[B]	3/231/0	3/231/0
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	-	-	-	1/77/0	3/231/0	3/231/0

- QBS: Qual By Similarity
- Qual Devices 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

- (A) Die EOS, 1 unit – discounted
- (B) The reason for failure was an Offset wire bond on pin #7 resulting in metal to metal contact between bond pad edge to adjacent active metal. Corrective action is to implement 100% ball on pad inspection.

Group 4 Qual Memo (RFAB plus HFTF AT):

TI Information
Selective Disclosure

Qualification Results

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

Type	Test Name / Condition	Duration	Qual Device: LMV321IDCKR	Qual Device: LMV321M7X	Qual Device: LMV321M7/NOPB	QBS Process Reference TLV9002ID	QBS Process Reference TLV9062ID
ED	Electrical Characterization	Per Datasheet Parameters	Pass	Pass	Pass	Pass	Pass
ELFR	Early Life Failure Rate, 125C	48 Hours	-	-	-	-	3/2400/1[B]
HAST	Biased HAST, 130C/85%RH	96 Hours	3/231/0	3/231/0	3/231/0	1/77/0	3/231/0
HBM	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0	1/3/0	3/9/0
CDM	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0	1/3/0	3/9/0
HTOL	Life Test, 150C	300 Hours	-	-	-	1/77/0	3/231/0
HTSL	High Temp Storage Bake 170C	420 Hours	3/231/0	3/231/0	3/231/0	1/77/0	3/231/0
LU	Latch-up	(per JESD78)	1/6/0	1/6/0	1/6/0	1/6/0	3/18/0
SD	Solderability	Pb Free	-	-	-	-	3/66/0
TC	Temperature Cycle, -65/150C	500 Cycles	3/231/0	3/231/0	3/231/0	1/77/1[A]	3/231/0
UHAST	Unbiased HAST, 130C/85%RH	96 Hours	3/231/0	3/231/0	3/231/0	1/77/0	3/231/0

- QBS: Qual By Similarity
- Qual Devices are qualified at LEVEL2-260C
- 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

- (A) Die EOS, 1 unit – Failure mechanism was ball off pad. Corrective action was to implement 100% ball on pad inspection.
- (B) Die EOS, 1 unit – discounted

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