PCN Number:	20220926003.2	**PCN Date:**	September 29, 2022
Title:	Qualification of new Fab site (RFAB) using qualified Process Technology, Die Revision, additional Assembly/Test site and BOM options for select devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Mar 28, 2023	**Sample requests accepted until:**	Oct 28, 2022*

***Sample requests received after October 28, 2022 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 additional Assembly/Test site (HFTF) 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**
DL-LIN	LBC3S	150 mm	RFAB	LBC9	300 mm

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

Construction differences are noted below:

Material Differences:

	LEN	**TFME**	**HFTF**
Wire type	1.0 mil Au	1.0 mil Au	0.8 mil Cu
Mount Compound	SID#0003C10332	SID# A-03	SID#A-18
Mold Compound	SID#0011G60007	SID#R-13	SID#R-27
Pin 1 Marking	Pin 1 stripe	Pin 1 Dot	Pin 1 Dot

Test Site:

	Current	**New**
Final Test Site (FT)	TFME	HFTF

Test coverage, insertions, conditions will remain consistent with current testing.

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-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

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
DL-LIN	DLN	USA	Dallas
RFAB	**RFB**	**USA**	**Richardson**

Die Rev:

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

Assembly/Test Site Information:

Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City
Lingsen (LEN)	LIN	TWN	Taichung
Tongfu Microelectronics (TFME)	NFM	CHN	Chongchuan
Hefei Tongfu Microelectronics (HFTF)	**HFT**	**CHN**	**Hefei**

Sample product shipping label (not actual product label)

Product Affected:

2T09I50QDBVRG4Q	TPS3809I50QDBVRQ1	TPS3809K33QDBVRQ1	TPS3809L30QDBVRQ1

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

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)

Approve Date 12-August-2022

Qualification Results

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

Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: TPS3809I50QDBVRQ1	QBS Product Reference: TPS3840DBVRQ1	QBS Process Reference: TLC6C5816PWPRQ1
Test Group A – Accelerated Environmental Stress TestsTests										
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	-	3/693/0	3/693/0	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 3-260C	-	-	-	3/693/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0	3/231/0	3/231/0
ACLV	A3	JESD22-A102	3	77	Autoclave	121C/100%RH	96 Hours	-	-	3/231/0
UHST	A3	JESD22-A102	3	77	UnBiased HAST	130C/85%RH	96 Hours	3/231/0	3/231/0	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65/150C	500 Cycles	3/231/0	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp. Cycle Bond Pull	per MIL-STD 883 Method 2011	-	1/5/0	1/5/0	1/5/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	-40C to 125C	1000 Cycles	N/A	N/A	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake	150C	1000 Hours	3/231/0	3/231/0 (Note A)	3/231/0 (Note A)
Test Group B – Package Assembly Integrity Tests										
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	125C	1000 Hours	1/77/0	3/231/0	3/231/0
ELFR	B2	AEC Q100-008	1	800	Early Life Failure Rate, 125C	125C	48 Hours	-	-	3/2400/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	150C	500 Hours	-	3/231/0	3/231/0
Test Group C – Package Assembly Integrity Tests										
WBS	C1	AEC Q100-001	1	30	Bond Shear (Cpk>1.67)	-	Wires	1/30/0	1/30/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	-	Wires	1/30/0	1/30/0	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	-	Pb Free	1/15/0	1/15/0	1/15/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	-	Pb	1/15/0	1/15/0	1/15/0

- 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

Note:

A – High Temperature Storage Life test results were extended as NVM Retention Data.

Ambient Operating Temperature by Automotive Grade Level:

- Grade 0 (or E): -40C to +150C
- Grade 1 (or Q): -40C to +125C
- Grade 2 (or T): -40C to +105C Grade 3
- (or I): -40C to +85C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

- Room/Hot/Cold: HTOL, ED
- Room/Hot: THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
- Room: AC/uHAST

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

Automotive New Product Qualification Summary

(As per AEC-Q006 and JEDEC Guidelines)

Approve Date 12-August-2022

Qualification Results

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

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: TPS3809I50QDBVRQ1
Test Group A – Accelerated Environment Stress Tests								
	PC	A1		3	22	SAM Analysis, Pre Stress	Completed	3/66/0
	PC	**A1**	**JEDEC J-STD-020 JESD22-A113**	**3**	**77**	**Automotive Preconditioning**	**Level 1-260C**	**3/693/0**
	PC	A1		3	22	SAM Analysis, Post Stress	Completed	3/66/0
	HAST	**A2**	**JEDEC JESD22-A110**	**3**	**77**	**Biased HAST, 130C/85%RH**	**96 Hours**	**3/231/0**
	HAST	A2		3	1	Cross Section, Post HAST 96 Hours	Completed	3/3/0
	HAST	A2		3	22	SAM Analysis, Post HAST, 96 Hours	-	3/66/0
	HAST	A2		3	3	Wire Bond Shear, Post HAST, 96 Hours	Wires	3/9/0
	HAST	A2		3	3	Bond Pull over Stitch, post HAST, 96 Hours	Wires	3/9/0
	HAST	A2		3	3	Bond Pull over Ball, Post HAST, 96 Hours	Wires	3/9/0
	HAST	**A2**	**JEDEC JESD22-A110**	**3**	**77**	**Biased HAST, 130C/85%RH**	**192 Hours**	**3/210/0**
	HAST	A2		3	1	Cross Section, Post HAST, 192 Hours	Completed	3/3/0
	HAST	A2		3	22	SAM Analysis, Post HAST, 192 Hours	Completed	3/66/0
	HAST	A2		3	3	Wire Bond Shear, Post HAST,192 Hours	Wires	3/9/0
	HAST	A2		3	3	Bond Pull over Stitch, Post HAST, 192 Hours	Wires	3/9/0
	HAST	A2		3	3	Bond Pull over Ball, Post HAST, 192 Hours	Wires	3/9/0
	TC	**A4**	**JEDEC JESD22-A104 and Appendix 3**	**3**	**77**	**Temperature Cycle, -65/150C**	**500 Cycles**	**3/231/0**
	TC	A4	-	3	1	Cross Section, Post T/C 500 Cycles	Completed	3/3/0
	TC	A4	-	3	22	SAM Analysis, Post T/C, 500 Cycles	Completed	3/66/0
	TC	A4	-	3	3	Wire Bond Shear, Post T/C 500 Cycles	Wires	3/9/0
	TC	A4	-	3	3	Bond Pull over Stitch Post T/C 500 Cycles	Wires	3/9/0
	TC	A4	-	3	3	Bond Pull over Ball Post T/C 500 Cycles	Wires	3/9/0
	TC	**A4**	**JEDEC JESD22-A104 and Appendix 3**	**3**	**77**	**Temperature Cycle, -65/150C**	**1000 Cycles**	**3/210/0**
	TC	A4	-	3	1	Cross Section, Post T/C 1000 Cycles	Completed	3/3/0
	TC	A4	-	3	22	SAM Analysis, Post T/C, 1000 Cycles	Completed	3/66/0
	TC	A4	-	3	3	Wire Bond Shear, Post T/C 1000 Cycles	Wires	3/9/0
	TC	A4	-	3	3	Bond Pull over Stitch, Post T/C, 1000 Cycles	Wires	3/9/0
	TC	A4	-	3	3	Bond Pull over Ball, Post T/C, 1000 Cycles	Wires	3/9/0
	HTSL	**A6**	**JEDEC JESD22-A103**	**3**	**45**	**High Temp. Storage Bake, 150C**	**1000 Hours**	**3/135/0**
	HTSL	A6	-	3	1	Cross Section, Post HTSL 1000 Hours	Completed	3/3/0
	HTSL	**A6**	**JEDEC JESD22-A103**	**3**	**44**	**High Temp Storage Bake 150C**	**2000 Hours**	**3/132/0**
	HTSL	A6	-	3	1	Cross Section, Post HTSL 2000 Hours	Completed	3/3/0

Test Group C – Package Assembly Integrity Tests								
	WBS	C1	AEC Q100-001	3	3	Bond Shear (Cpk>1.67)	Wires	3/9/0
	WBP	C2	MIL-STD883 Method 2011	3	3	Bond Pull (Cpk>1.67)	Wires	3/9/0

- QBS: Qual By Similarity
- Qual Device TPS3809I50QDBVRQ1 is qualified at MSL1 260C

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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 contact below or your local Field Sales Representative.

Location	**E-Mail**
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