PCN Number:	20170523001	PCN Date:	June 8, 2017
Title:	LMV932Q1 Performance improvement, Datasheet Update, and Elimination of Tungsten at Metal One		
Customer Contact:	PCN Manager	Dept:	Quality Services
Proposed 1st Ship Date:	Dec 8, 2017	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:

Group 1 Devices: Design, Datasheet, and Metallization Changes

This notification is to announce a minor design change to improve the AC performance of the LMV932Q1 product families. This change virtually eliminates the device's sensitivity to certain types of AC input signals. The change consists of 1) increasing a current mirror ratio by disconnecting one of two parallel diode connected N_MOS transistors and 2) shortening the channel of another N-MOS transistor. The typical slew rate behavior has changed due to the design change. The datasheet will have a new graph specific to the LMV932-N_Q1 for the slew rate vs. supply voltage in the "Typical Characteristics" section. The datasheet literature number will also be changing as shown below:

	Current	New
Product Family	Datasheet Number	**Datasheet Number**
LMV932Q1	SNOS993O	SNOSD49

The product datasheet(s) is also updated as seen in the change revision history below:

TEXAS INSTRUMENTS

LMV931-N-Q1
LMV932-N-Q1, LMV934-N-Q1
SNOSD49 – MAY 2017

LMV93x-N-Q1 Automotive Single, Dual, Quad 1.8-V, RRIO Operational Amplifiers

4 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
May 2017	*	Initial release.

This datasheet may be reviewed at the below datasheet link:
http://www.ti.com/lit/ds/symlink/lmv932-n-q1.pdf

This change notification also includes the replacement of Tungsten at Metal one with standard aluminum metallization architecture on select devices in the CS80 Fab process at Maine Fab.

Current

Chip Site	Fab Process	Wafer Diameter	Metal One Composition
MAINEFAB	CS80	200mm	Tungsten contact fill and metal 1

New

Chip Site	Fab Process	Wafer Diameter	Metal One Composition
MAINEFAB	CS80	200mm	Tungsten contact fill plus CMP and Al/Cu 0.5% metal 1

Group 2 Devices: Datasheet Changes only
No design or Metallization changes.

Affected devices are listed in the product affected section of this document.

Reason for Change:

Improved performance for certain AC input signal conditions and continuity of supply.

Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):

None

Changes to product identification resulting from this PCN:

None

Product Affected: Group 1 Devices

LMV932Q1MA/NOPB	LMV932Q1MAX/NOPB

Product Affected: Group 2 Devices

LMV931Q1MF/NOPB	LMV931Q1MG/NOPB	LMV934Q1MT/NOPB
LMV931Q1MFX/NOPB	LMV931Q1MGX/NOPB	LMV934Q1MTX/NOPB

Qualification Report
LMV932 Design Change
Approved 02-Mar-2017

Product Attributes

Attributes	Qual Device: LMV932Q1MA/NOPB (New Design)	Qual Device: LMV932Q1MA/NOPB (Old Design)	QBS Package Reference: LMP8601QMA
Automotive Grade Level	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Signal Chain	Signal Chain	-
Wafer Fab Supplier	MFAB	MFAB	-
Die Revision	A	A	D
Assembly Site	TIEM-AT	TIEM-AT	TIEM-AT
Package Type	SOIC	SOIC	SOIC
Package Designator	D	D	D
Ball/Lead Count	8	8	8

- QBS: Qual By Similarity
- Qual Device LMV932Q1MA/NOPB is qualified at LEVEL1-260C

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: LMV932Q1MA/NOPB (New Design)	Qual Device: LMV932Q1MA/NOPB (Old Design)	QBS Package Reference: LMV932Q1MA/NOPB (Old Design)
Test Group A – Accelerated Environment Stress Tests									
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning Level 1	MSL1 260C	1/160/0	1/231/0	3/693/0
THBT	A2	JEDEC J-STD-020 JESD22-A101	3	77	THBT 85°C, 85%,	1000 Hours	-	-	3/230/0
HAST	A3	JEDEC J-STD-020 JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	1/77/0	-
AC	A4	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	1/77/0	3/231/0
TC	A5	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	1/77/0	3/231/0
PTC	A6	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A
HTSL	A7	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	-	-	1/77/0
Test Group B – Accelerated Lifetime Simulation Tests									
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	1/77/0	-	
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	500 Hours	-	3/231/0	-
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 150C	24 Hours	-	3/2400/0	-
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	NA
Test Group C – Package Assembly Integrity Tests									
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	-	-	-	-
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	-	-	-	-
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	-	-	-	-
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	-	-	-
Test Group D – Die Fabrication Reliability Tests									
EM	D1	JESD61	-	-	Electromigration	-	-	-	-
TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	-	-	-
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	-	-	-
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	-	-	-
SM	D5	-	-	-	Stress Migration	-	-	-	-
Test Group E – Electrical Verification Tests									
HBM	E2	AEC Q100-002	1	3	ESD - HBM	2500 V	1/3/0	1/3/0	-
CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	1/3/0	1/3/0	-
LU	E4	AEC Q100-004	1	6	Latch-up (125C, 25C)	(Per AEC-Q100-004)	1/6/0	1/6/0	-
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold test	3/90/0	-	-

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST &TC samples, as applicable.
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40°C to +150°C
Grade 1 (or Q): -40°C to +125°C
Grade 2 (or T): -40°C to +105°C
Grade 3 (or I): -40°C to +85°C

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

Automotive CS080 Process Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)

CS080 ALCu Back End Conversion
Approved 20-Oct-2016

Product Attributes

Attributes	Qual Device: LMV824Q1MT/NOPB
Assembly Site	TIEM-AT
Package Family	TSSOP
Flammability Rating	UL 94 V-0
Wafer Fab Supplier	MFAB
Wafer Fab Process	CS080

- QBS: Qual By Similarity
- Qual Device LMV824Q1MT/NOPB is qualified at LEVEL1-260CG

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: LMV824Q1MT/NOPB
			Test Group A – Accelerated Environment Stress Tests					
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Automotive Preconditioning Level 1	Level 1-260C	3/720/0
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	3/231/0
	TC-BP		MIL-STD883 Method 2011	1	30	Post Temp. Cycle Bond Pull	500 Cycles	1/30/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A
			Test Group B – Accelerated Lifetime Simulation Tests					
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	3/231/0
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	3/2400/1*
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A
			Test Group C – Package Assembly Integrity Tests					
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	Wires	1/30/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	Wires	1/30/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	Pb Free	1/15/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	Pb	1/15/0
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	3/30/0
			Test Group D – Die Fabrication Reliability Tests					
	EM	D1	JESD61	-	-	Electromigration	-	Completed Per Process Technology Requirements
	TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	Completed Per Process Technology Requirements
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements
	SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST &TC samples, as applicable.
*One Continuity failure due to EOS

Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40°C to +150°C
Grade 1 (or Q): -40°C to +125°C
Grade 2 (or T): -40°C to +105°C
Grade 3 (or I): -40°C to +85°C

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

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

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