PCN Number:	20230328008.2	**PCN Date:**	March 30, 2023
Title:	Qualify New Assembly Material set for Selected Device(s)		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Sept 29, 2023	**Sample requests accepted until:**	Apr 29, 2023*

*Sample requests received after Apr 29, 2023 will not be supported.

Change Type:

☐	Assembly Site	☐	Design	☐	Wafer Bump Material
☒	Assembly Process	☐	Data Sheet	☐	Wafer Bump Process
☒	Assembly Materials	☐	Part number change	☐	Wafer Fab Site
☐	Mechanical Specification	☐	Test Site	☐	Wafer Fab Materials
☐	Packing/Shipping/Labeling	☐	Test Process	☐	Wafer Fab Process

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of new assembly material for devices listed in "Product affected" section below. Devices will remain in current assembly facility and piece part changes as follows:

Material	Current	Proposed
Mount compound	4208458, 4211470	4147858
Mold compound	4209640	4211880

Reason for Change:

Continuity of supply.

Anticipated impact on Fit, Form, 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:

None.

Product Affected:

HVDA5405QDRQ1	HVDA542QDRQ1	MLA00058DR	SN105099DR
HVDA540QDRQ1	LBT-LM2901DR	MLA00058DRG4	SN65HVDA1050AQDR-M
HVDA5415QDRQ1	LBT-LM2902DR	MLA00151DR	ULQ2003ATDRRBG4
HVDA541QDRQ1	LBT-LM2902DRG4	MLA00197DR	
HVDA5425QDRQ1	LM2902KVZQDRQ1	MLA00197DRG4	

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

Qualification Report

Approved 14-Mar-2023

Product Attributes

Attributes	Qual Device: MLA00197DRG4	Qual Device: SN65HVDA1050AQDR-M
Automotive Grade Level	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125
Product Function	Signal Chain	Signal Chain
Wafer Fab Supplier	SH-BIP-1	DL-LIN
Assembly Site	TAI	TAI
Package Group	SOIC	SOIC
Package Designator	D	D
Pin Count	14	8

QBS: Qual By Similarity
Qual Device MLA00197DRG4 is qualified at MSL3 260C
Qual Device SN65HVDA1050AQDR-M is qualified at MSL1 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: MLA00197DRG4	Qual Device: SN65HVDA1050AQDR-M
Test Group A - Accelerated Environment Stress Tests									
AC	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	3/231/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0	3/231/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0	1/5/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	3/135/0	-
Test Group B - Accelerated Lifetime Simulation Tests									
Test Group C - Package Assembly Integrity Tests									
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0	3/90/0
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	3/45/0	3/45/0
PD	C4	JEDEC JESD22-B100 and B108	1	10	Physical Dimensions	Cpk>1.67	-	3/30/0	3/30/0
Test Group D - Die Fabrication Reliability Tests									
EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

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

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-Q100 and JEDEC Guidelines)

Qualification Report

Approved 21-Sept-2021

Product Attributes

Attributes	Qual Device: CD4093BQM96Q1	Qual Device: K3HVD1781QDRQ1	Qual Device: SE555DR	Qual Device: SN103592DR	Qual Device: SN74HCS08QDRQ1	Qual Device: TCAN1043GDRQ1	Qual Device: TCAN1044VDRQ1	Qual Device: TLC5916QDRQ1	Qual Device: TMS3705DDRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 3
Operating Temp Range	-40 to +125 C	-40 to +125 C	-55 to +125 C	-40 to +125 C	-40 to +125 C	-55 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +85 C
Product Function	Signal Chain	Signal Chain	Signal Chain	Power Management	Signal Chain	Signal Chain	Signal Chain	Power Management	Logic
Wafer Fab Supplier	SH-BIP-1	DP1DM5	SH-BIP-1	SH-BIP-1	RFAB	MH8	RFAB	MH8	DL-LIN
Die Revision	-	-	B	C	B0	C	PG2.0	-	C
Assembly Site	FMX	MLA	TAI	TAI	MLA	FMX	MLA	FMX	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	D	D	D	D	D	D	D	D	D
Ball/Lead Count	14	8	8	8	14	14	8	16	16

- QBS: Qual By Similarity
- Qual Devices CD4093BQM96Q1, K3HVD1781QDRQ1, SE555DR, SN103592DR, SN74HCS08QDRQ1, TCAN1043GDRQ1, TCAN1044VDRQ1,TLC5916QDRQ1 are qualified at LEVEL1-260CG
- Qual Device TMS3705DDRQ1 is qualified at LEVEL3-260CG

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: CD4093BQM96Q1	Qual Device: K3HVD1781QDRQ1	Qual Device: SE555DR	Qual Device: SN103592DR	Qual Device: SN74HCS08QDRQ1	Qual Device: TCAN1043GDRQ1	Qual Device: TCAN1044VDRQ1	Qual Device: TLC5916QDRQ1	Qual Device: TMS3705DDRQ1
Test Group A – Accelerated Environment Stress Tests																
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	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	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0	3/231/0
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Group B – Accelerated Lifetime Simulation Tests																
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Test Group C – Package Assembly Integrity Tests																
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	-	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	-	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	PB-Free Solder	3/45/0	3/45/0	3/45/0	3/45/0	3/45/0	3/45/0	3/45/0	3/45/0	3/45/0
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	3/30/0	3/30/0	3/30/0	3/30/0	3/30/0	3/30/0	3/30/0	3/30/0	3/30/0
	SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	Solder Balls	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	LI	C6	JEDEC JESD22-B105	1	50	Lead Fatigue	Leads	3/66/0	3/66/0	3/66/0	3/66/0	3/66/0	3/66/0	3/66/0	3/66/0	3/66/0
	LI	C6	JEDEC JESD22-B105	1	50	Lead Pull	Leads	3/72/0	3/72/0	3/72/0	3/72/0	3/72/0	3/72/0	3/72/0	3/72/0	3/72/0
Test Group D – Die Fabrication Reliability Tests																
	EM	D1	JESD 61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	TDDB	D2	JESD 35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology	Completed Per Process Technology Requirements	Completed Per Process Technology	Completed Per Process Technology	Completed Per Process Technology Requirements	Completed Per Process Technology	Completed Per Process Technology	Completed Per Process Technology	Completed Per Process Technology

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: CD4093BQM96Q1	Qual Device: K3HVD1781QDRQ1	Qual Device: SE555DR	Qual Device: SN103592DR	Qual Device: SN74HCS08QDRQ1	Qual Device: TCAN1043GDRQ1	Qual Device: TCAN1044VDRQ1	Qual Device: TLC5916QDRQ1	Qual Device: TMS3705DDRQ1
								Requirements		Requirements	Requirements		Requirements	Requirements	Requirements	Requirements
	HCI	D3	JESD 60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
	SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST, TC & PTC 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

ZVEI reference ID: SEM-PA-07, SEM-PA-11

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

Location	**E-Mail**
WW PCN Team	PCN_ww_admin_team@list.ti.com

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.