PCN Number:	20220718000.2	**PCN Date:**	July 18, 2022
Title:	Qualification of TI Chengdu as an additional Probe, Assembly and Test site for select devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Jan 21, 2023	**Sample requests accepted until:**	Aug 21, 2022*

*Sample requests received after (Aug 21, 2022) will not be supported.

Change Type:

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

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of TI Chengdu as additional Probe, Assembly and Test Site for Select Devices listed in the "Product Affected" Section. Material differences are as follows.

Assembly Site	Assembly Site Origin	Assembly Country Code	Assembly City
TI Clark	QAB	PHL	Angeles City, Pampanga
TI Chengdu	CDA	CHN	Chengdu

Material Differences:

	TI Clark	TI Chengdu
Mold Compound	4208625	4222198

Group 1 Probe/Test site:

	From	To
Probe/Test Site	TI Clark	TI Chengdu

Group 2 Probe/Test site:

	From	To
Probe Site	TI Clark	TI Clark
Test site	TIEM	TI Chengdu

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

Reason for Change:

Continuity of supply.

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:

Assembly Site		
TI Clark	Assembly Site Origin (22L)	ASO: QAB
CDAT	Assembly Site Origin (22L)	ASO: CDA

Sample product shipping label (not actual product label)

Group 1 Product Affected: Probe, Assembly & Test site

DS90UB929TRGCRQ1	DS90UB949ATRGCRQ1	DS90UB958TRGZRQ1	DS90UH949ATRGCRQ1
DS90UB929TRGCTQ1	DS90UB949ATRGCTQ1	DS90UB958TRGZTQ1	DS90UH949ATRGCTQ1
DS90UB934TRGZRQ1	DS90UB949TRGCRQ1	DS90UH929ETRGCRQ1	DS90UH949TRGCRQ1
DS90UB934TRGZTQ1	DS90UB949TRGCTQ1	DS90UH929ETRGCTQ1	DS90UH949TRGCTQ1
DS90UB936TRGZRQ1	DS90UB954TRGZRQ1	DS90UH929TRGCRQ1	
DS90UB936TRGZTQ1	DS90UB954TRGZTQ1	DS90UH929TRGCTQ1	

Group 2 Product Affected: Assembly & Test site

DS90UB964TRGCRQ1	DS90UB964TRGCTQ1

Qualification Report

Automotive Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)
Approve Date 12-July-2022

Product Attributes

Attributes	Qual Device: DS90UB934TRGZRQ1 DS90UB954TRGZRQ1	Qual Device: DS90UB964TRGCTQ1 DS90UH949TRGCRQ1	QBS Qual Device: DS90UB964TRGCRQ1
Automotive Grade Level	Grade 2	Grade 2	Grade 2
Operating Temp Range	-40 to +105 C	-40 to +105 C	-40 to +105 C
Product Function	Interface	Interface	Interface
Wafer Fab Supplier	UMC12A	UMC12A	UMC12A
Assembly Site	CDAT	CDAT	CLARK-AT
Package Type	QFN	QFN	QFN
Package Designator	RGZ	RGC	RGC
Ball/Lead Count	48	64	64

- QBS: Qual by Similarity
- Qual Devices qualified at LEVEL3-260C: DS90UB964TRGCRQ1, DS90UB949TRGCRQ1

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: DS90UB934TRGZRQ1 DS90UB954TRGZRQ1	Qual Device: DS90UB964TRGCTQ1 DS90UH949TRGCRQ1	QBS Qual Device: DS90UB964TRGCRQ1
Test Group A – Accelerated Environment Stress Tests									
PC	A 1	Automotive Preconditioning			Level 3-260C	3/Pass			
PC	A 1	AEC-Q006			Pre-Preconditioning SAM	3/Pass			
HAST	A 2	JEDEC JESD22-A110	3	77	Biased HAST, 110C/85%RH	264 Hours			3/231/0
UHAST	A 3	JEDEC JESD22-A118	3	77	Unbiased HAST, 110C/85%RH	264 Hours			3/231/0
TC	A 4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles		3/231/0	3/231/0
		AEC-Q006			Temp Cycle SAM	Post 500 Cycles		3/36/0	
		AEC-Q006			Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles		3/9/0	
		AEC-Q006			Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles		3/9/0	
		AEC-Q006			Temp Cycle Bond Shear	Post 500 Cycles		3/9/0	
		AEC-Q006			Temp Cycle Cross-Section	Post 500 Cycles		1/1/0	
TC	A 4	JEDEC JESD22-A104 and Appendix 3			Temperature Cycle, -65/150C	1000 Cycles		3/231/0	
		AEC-Q006			Temp Cycle SAM	Post 1000 Cycles		3/36/0	
		AEC-Q006			Temp Cycle Bond Pull (Ball Bond)	Post 1000 Cycles		3/9/0	
		AEC-Q006			Temp Cycle Bond Pull (Stitch Bond)	Post 1000 Cycles		3/9/0	
		AEC-Q006			Temp Cycle Bond Shear	Post 1000 Cycles		3/9/0	
		AEC-Q006			Temp Cycle Cross-Section	Post 1000 Cycles		1/1/0	
TC-BP	A 4	MIL-STD883 Method 2011	1	30	Post Temp Cycle Bond Pull	Wires			3/90/0
PTC	A 5	JEDEC JESD22-	1	45	Power Temperature	1000 Cycles			N/A

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: DS90UB934TRGZRQ1 DS90UB954TRGZRQ1	Qual Device: DS90UB964TRGCTQ1 DS90UH949TRGCRQ1	QBS Qual Device: DS90UB964TRGCRQ1
		A105			Cycle				
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours			1/45/0
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			3/2400/0
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	2/60/0	2/60/0	1/30/0
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull (Cpk>1.67)	Wires	2/60/0	3/60/0	1/30/0
SD	C3	JESD22-B102	1	15	Surface Mount Solderability (>95% Lead Coverage)				1/15/0
SD	C4	JESD22-B102	1	15	Surface Mount Solderability (>95% Lead Coverage)				1/15/0
PD	C5	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	2/60/0	6/60/0	3/30/0
LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	-			N/A
Test Group D – Die Fabrication Reliability Tests									
EM	D1	JESD61	-	-	Electromigration	-			Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependant 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

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: DS90UB934TRGZRQ1 DS90UB954TRGZRQ1	Qual Device: DS90UB964TRGCTQ1 DS90UH949TRGCRQ1	QBS Qual Device: DS90UB964TRGCRQ1
SM	D5	-	-	-	Stress Migration	-			Completed Per Process Technology Requirements
Test Group E – Electrical Verification Tests									
HBM	E2	AEC Q100-002	1	3	ESD - HBM - Q100	4000 V All pins			1/3/0
HBM	E2	AEC Q100-002	1	3	ESD - HBM - Q100	8000V RIn+[3:0] and RIN-[3:0] pins			1/3/0
CDM	E3	AEC Q100-011	1	3	ESD - CDM - Q100	1000 V			1/3/0
LU	E4	AEC Q100-004	1	6	Auto Latch-up	Ta(max)			1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	6/180/0	6/180/0	3/90/0

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

Qualification Report

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

Approve Date 12-July-2022

Product Attributes

	Qual Device: DS90UB934TRGZRQ1 DS90UB954TRGZRQ1	Qual Device: DS90UB964TRGCTQ1 DS90UH949TRGCRQ1	QBBS Device: DS90UB964TRGCTQ1	QBS Device: DS90UH949TRGCRQ1
Automotive Grade Level	**2**	**2**	**2**	**2**
Operating Temp Range	-40C to +105C	-40C to +105C	-40C to +105C	-40C to +105C
Wafer Fab Site	DMOS6	DMOS6	DMOS6	DMOS6
Assembly Site	CDAT	CDAT	CLARK AT	CLARK AT
Package Type	QFN	QFN	QFN	QFN
Package Designator	RGZ	RGC	RGC	RGC
Ball/Lead Count	48	64	64	64

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL3-260C: DS90UH949TRGCRQ1, DS90UB964TRGCRQ1

Qualification Results

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

Type	#	Test Spec	Test Name / Condition	Duration	Qual Device: DS90UB934TRGZRQ1 DS90UB954TRGZRQ1	Qual Device: DS90UB964TRGCTQ1 DS90UH949TRGCRQ1	QBS Device: DS90UB964TRGCTQ1	QBS Device: DS90UH949TRGCRQ1
Test Group A - Accelerated Environment Stress Test								
PC	A1	AEC-Q006	Pre-Preconditioning SAM	3/Pass				
PC	A1	JESD22-113	Automotive Preconditioning	Level 3-260C			1/308/0	3/912/0
HAST	A2	JESD22-A110	Biased HAST, 130C/85%RH	96 Hours			1/77/0	3/231/0
AC	A3	JESD22-A102	Autoclave 121C	96 Hours			1/77/0	3/231/0
UHAST	A3	JESD22-A118	Unbiased HAST 130C/85%RH	96 Hours			-	-
TC-BP	A4	JESD22-A104	Post Temp. Cycle Bond Pull	Wires			1/3/0	1/30/0
TC	A4	JESD22-A104	Temperature Cycle, -65/150C	500 Cycles		3/231/0	1/77/0	3/231/0
		AEC-Q006	Temp Cycle SAM	Post 500 Cycles		3/36/0		
		AEC-Q006	Temp Cycle Bond Pull (Ball Bond)	Post 500 Cycles		3/9/0		
		AEC-Q006	Temp Cycle Bond Pull (Stitch Bond)	Post 500 Cycles		1/9/0		
		AEC-Q006	Temp Cycle Bond Shear	Post 500 Cycles		3/9/0		
		AEC-Q006	Temp Cycle Cross-Section	Post 500 Cycles		1/1/0		
TC	A4		Temperature Cycle, -65/150C	1000 Cycle		3/231/0		
		AEC-Q006	Temp Cycle SAM	Post 1000 Cycles		3/36/0		
		AEC-Q006	Temp Cycle Bond Pull (Ball Bond)	Post 1000 Cycles		3/9/0		
		AEC-Q006	Temp Cycle Bond Pull (Stitch Bond)	Post 1000 Cycles		3/9/0		
		AEC-Q006	Temp Cycle Bond Shear	Post 1000 Cycles		3/9/0		
		AEC-Q006	Temp Cycle Cross-Section	Post 1000 Cycles		1/1/0		
HTSL	A6	JESD22-A103	High Temp Storage Bake 150C	1000 Hours			1/77/0	3/179/0
PTC	A5	JESD22-A105	Power Temp Cycle, -40C/105C	1000 Cycles			NA	NA
Test Group B - Accelerated Lifetime Simulation Test								
HTOL	B1	JESD22-A108	Life Test, 125C	1000 Hours			2/77/0	1/77/0
HTOL	B1	JESD22-A108	Life Test, 125C	1000 Hours			-	2/154/0
ELFR	B2	AEC-Q100-008	Early Life Failure Rate, 125C	24 Hours			-	3/2400/0

Test Group C - Package Assembly Integrity Tests								
WBS	C1	AEC-Q100-001	Ball Bond Shear	Wires	1/30/0	2/60/0	1/30/0	1/30/0
WBS	C2	MIL-STD883 Method 2011	Auto Wire Bond Pull	Wires	2/60/0	2/60/0	1/76/0	-
SD	C3	JESD22-B102	Surface Mount Solderability (>95% Lead Coverage)	Pb			2/30/0	-
SD	C4	JESD22-B102	Surface Mount Solderability (>95% Lead Coverage)	Pb-Free			2/30/0-	-
PD	C5	JESD22 B100 and B108	Physical Dimensions (Cpk>1.33 Ppk>1.67)	--	1/30/0	6/60/0	3/10/0	1/10/0
PDA	C6	Q006	Physical Destructive Analysis Post 500 Temp Cycles				1/1/0	
ESD	C7		ESD - IEC Air Gap	18 KV			1/6/0	1/6/0
ESD	C8		ESD - IEC Contact	10 KV			1/6/0	1/6/0
ESD	C9		ESD-ISO- Air Gap	18KV			1/6/0	1/6/0
ESD	C10		ESD-ISO-Contact	10KV			1/6/0	1/6/0
EM	D1	JESD61	Electromigration				Completed Per Process Technology Requirements	-
TDDB	D2	JESD35	Time Dependant 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	-
Test Group E - Electrical Verification								
HBM	E2	AEC-Q100-002	ESD - HBM	4000 V			1/3/0	1/3/0
CDM	E3	AEC-Q100-011	ESD - CDM	1000 V			1/3/0	1/3/0
LU	E4	AEC-Q100-004	Latch-up @105C	(Per AEC Q100-004)			1/6/0	1/6/0
ED	E5	AEC-Q100-009	Electrical Characterization	Cpk>1.67 Room, hot, and cold test	6/180/0	6/180/0	3/90/0	3/90/0

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.
Junction 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
Grade 4 (or C): -40C to +70C
E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold : HTOL
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST
Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green

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

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