PCN Number:	20230210001.2A	**PCN Date:**	April 11, 2023
Title:	Qualification of TI Malaysia as an additional Assembly and Test site for select devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	Aug 13, 2023	**Sample requests accepted until:**	Mar 13, 2023*

***Sample requests received after Mar 13, 2023 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:

Revision A is to remove devices in the Product Affected Section (in **bold** character with ~~strikethrough~~). This device will continue to be manufactured as prior and will not be subjected to the change described in this notification.

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

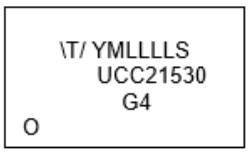
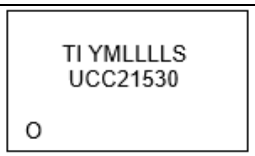
Assembly Site	Assembly Site Origin	Assembly Country Code	Assembly City
TI Taiwan	TAI	TWN	Chung Ho, New Taipei City
TI Malaysia	MLA	MYS	Kuala Lumpur

Material Differences:

	TAI	MLA
Wire type	0.96mil Au	1.0mil Cu (Die to leadframe) *

*Wire type Die to Die: 0.96mil Au

Package Marking Differences:

	TAI	MLA
TI Bug	Include	Replace with "TI" text
**ECAT	Include Value	Remove
Example	 \TI/ = TI LOGO YM = YEAR MONTH DATE CODE S = ASSY SITE CODE LLLL = LOT TRACE CODE G4 = ECAT VALUE O = PIN 1 INDICATOR	 TI = TI LETTER YM = YEAR MONTH DATE CODE S = ASSY SITE CODE LLLL = LOT TRACE CODE O = PIN 1 INDICATOR

** - Not all devices have ECAT information included in the symbolization, but for the ones that do, this information will be removed.

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

Reason for Change:

Continuity of supply.

1) To align with world technology trends and use wiring with enhanced mechanical and electrical properties
2) Maximize flexibility within our Assembly/Test production sites.
3) Cu is easier to obtain and stock

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 Taiwan	Assembly Site Origin (22L)	ASO: TAI
TI Malaysia	Assembly Site Origin (22L)	ASO: MLA

Sample product shipping label (not actual product label)

Product Affected:

~~**SN21530QDWKQ1**~~	~~**UCC21320QDWKQ1**~~	UCC21530BQDWKRQ1	UCC21540AQDWKRQ1
SN21530QDWKRQ1	UCC21320QDWKRQ1	~~**UCC21530QDWKQ1**~~	UCC21540QDWKRQ1
SN21540QDWKRQ1	~~**UCC21530BQDWKQ1**~~	UCC21530QDWKRQ1	

Qualification Report

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

Approve Date 31-Jan-2023

Product Attributes

Attributes	Qual Device: UCC21320QDWKRQ1	QBS Reference: ISOW7841FQDWEQ1	QBS Reference: UCC21520QDWRQ1	QBS Reference: ISO7741FEDWRQ1	QBS Reference: ISO6741QDWQ1	QBS Reference: UCC21520AQDWRQ1	QBS Reference: TMP451AQDQFRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 0	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 150	-40 to 125	-40 to 125	-40 to 125
Product Function	Power Management	Interface	Power Management	Interface	Interface	Power Management	Power Management
Wafer Fab Supplier	DP1DM5, DP1DM5, DP1DM5	DP1DM5, DP1DM5	DP1DM5, DP1DM5	MH8, MH8	MH8, MH8	MH8, MH8, MH8	DP1DM5
Assembly Site	MLA	TAI	TAI	TAI	MLA	MLA	UTL1
Package Group	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC	QFN
Package Designator	DWK	DWE	DW	DW	DW	DW	DQF
Pin Count	14	16	16	16	16	16	8

QBS: Qual By Similarity
Qual Device UCC21320QDWKRQ1 is qualified at MSL2 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: UCC21320QDWKRQ1	QBS Reference: ISOW7841FQDWEQ1	QBS Reference: UCC21520QDWRQ1	QBS Reference: ISO7741FEDWRQ1	QBS Reference: ISO6741QDWQ1	QBS Reference: UCC21520AQDWRQ1	QBS Reference: TMP451AQDQFRQ1
Test Group A - Accelerated Environment Stress Tests														
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	1 Step	No Fails	-	-	-	No Fails	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL3 260C	1 Step	-	-	-	-	-	No Fails	-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	-	-	-	3/231/0	3/231/0	-
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	3/231/0	-	-	-	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	3/231/0	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	-	-	-	-	3/135/0	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	175C	500 Hours	-	-	-	-	-	3/135/0	-
Test Group B - Accelerated Lifetime Simulation Tests														
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	125C	1000 Hours	-	3/231/0	3/231/0	-	3/231/0	1/77/0	-
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	150C	1000 Hours	-	-	-	3/231/0	-	-	-
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	150C	408 Hours	-	-	-	-	-	-	3/231/0
ELFR	B2	AEC Q100-008	1	77	Early Life Failure Rate	125C	48 Hours	-	3/840/3[1]	-	-	-	-	-
ELFR	B2	AEC Q100-008	1	77	Early Life Failure Rate	150C	24 Hours	-	-	-	-	-	-	3/2400/0
ELFR	B2	AEC Q100-008	1	77	Early Life Failure Rate	150C	48 Hours	-	-	-	3/2400/0	-	-	-

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	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	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0
SD	C3	JEDEC J-STD-002	1	15	PB Solderability	>95% Lead Coverage	-	-	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	-
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	-	1/15/0	1/15/0	1/15/0	1/15/0	1/15/0	-
PD	C4	JEDEC JESD22-B100 and B108	1	10	Physical Dimensions	Cpk>1.67	-	3/30/0	2/20/0	3/30/0	3/30/0	3/30/0	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	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	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	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
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	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
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
Test Group E - Electrical Verification Tests														
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	-	1/3/0	1/3/0	1/3/0	1/3/0	-	1/3/0
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0	1/3/0
LU	E4	AEC Q100-004	1	6	Latch-Up	Per AEC Q100-004	-	-	1/6/0	1/6/0	1/6/0	1/6/0	-	1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	1/30/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0	3/90/0

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
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

Qualification Report

Automotive New Product Qualification Summary
(As per AEC-Q100, AEC-Q006 and JEDEC Guidelines)

Approve Date 16-Feb-2021

Product Attributes

Attributes	Qual Device: ISO6741QDWRQ1
Operating Temp Range	-40 to +125 C
Automotive Grade Level	Grade 1
Product Function	Interface
Wafer Fab Supplier	MH8
Assembly Site	MLA

Attributes	Qual Device: ISO6741QDWRQ1
Package Type	SOIC
Package Designator	DW
Ball/Lead Count	16

- QBS: Qual By Similarity
- Device ISO6741QDWRQ1 contains multiple dies.

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: ISO6741QDWRQ1
Test Group A – Accelerated Environment Stress Tests							
PC	A1	-	3	22	SAM Analysis, Pre Stress	Completed	-
PC	**A1**	**JEDEC J-STD-020 JESD22-A113**	**3**	**77**	**Preconditioning**	**Level 2 -260C**	**No fails**
PC	A1	-	3	22	SAM Analysis, Post Stress	Completed	2/44/0
HAST	**A2**	**JEDEC JESD22-A110**	**3**	**77**	**Biased HAST, 130C/85%RH**	**96 Hours**	**3/231/0**
HAST	A2	-	3	1	Cross Section, Post bHAST 96 Hours	Completed	-
HAST	A2	-	3	30	Wire Bond Shear, Post bHast, 96 Hours	Wires	-
HAST	A2	-	3	30	Bond Pull over Stitch, post bHAST, 96 Hours	Wires	-
HAST	A2	-	3	30	Bond Pull over Ball, Post bHAST, 96 Hours	Wires	-
HAST	**A2**	**JEDEC JESD22-A110**	**3**	**77**	**Biased HAST, 130C/85%RH**	**192 Hours**	**3/210/0**
HAST	A2	-	3	1	Cross Section, Post bHAST 192 Hours	Completed	3/3/0
HAST	A2	-	3	22	SAM Analysis, Post bHAST, 192 Hours	Completed	3/66/0
HAST	A2	-	3	30	Wire Bond Shear, Post bHast, 192 Hours	Wires	3/90/0
HAST	A2	-	3	30	Bond Pull over Stitch, post bHAST, 192 Hours	Wires	3/90/0
HAST	A2	-	3	30	Bond Pull over Ball, Post bHAST, 192 Hours	Wires	3/90/0
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	-
TC	A4	-	3	22	SAM Analysis, Post T/C, 500 Cycles	Completed	-
TC	A4	-	3	30	Wire Bond Shear, Post T/C 500 Cycles	Wires	-
TC	A4	-	3	30	Bond Pull over Stitch Post T/C 500 Cycles	Wires	-
TC	A4	-	3	30	Bond Pull over Ball Post T/C 500 Cycles	Wires	-
TC	**A4**	**JEDEC**	**3**	**77**	**Temperature Cycle, -**	**1000 Cycles**	**3/210/0**

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: ISO6741QDWRQ1
		JESD22-A104 and Appendix 3			**65/150C**		
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	30	Wire Bond Shear, Post T/C 1000 Cycles	Wires	3/90/0
TC	A4	-	3	30	Bond Pull over Stitch, Post T/C, 1000 Cycles	Wires	3/90/0
TC	A4	-	3	30	Bond Pull over Ball, Post T/C, 1000 Cycles	Wires	3/90/0
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	-
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	30	Wire Bond Shear, Cpk>1.67	Wires	3/90/0
WBP	C2	MIL-STD883 Method 2011	3	30	Bond Pull over Ball, Cpk >1.67	Wires	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): -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

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

ZVEI ID reference: SEM-PA-08, SEM-PA-13, SEM-PA-18, SEM-TF-01

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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