

<b>PCN Number:</b>	20230210001.1		<b>PCN Date:</b>	February 13, 2023												
<b>Title:</b>	Qualification of TI Malaysia as an additional Assembly site for select devices															
<b>Customer Contact:</b>	<a href="#">PCN Manager</a>	<b>Dept:</b>	Quality Services													
<b>Proposed 1<sup>st</sup> Ship Date:</b>	May 13, 2023	<b>Sample requests accepted until:</b>	Mar 13, 2023*													
<b>*Sample requests received after Mar 13, 2023 will not be supported.</b>																
<b>Change Type:</b>																
<input checked="" type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Site											
<input type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Material											
<input type="checkbox"/>	Assembly Materials	<input type="checkbox"/>	Part number change	<input type="checkbox"/>	Wafer Bump Process											
<input type="checkbox"/>	Mechanical Specification	<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Wafer Fab Site											
<input checked="" type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input type="checkbox"/>	Wafer Fab Materials											
		<input type="checkbox"/>		<input type="checkbox"/>	Wafer Fab Process											
<b>PCN Details</b>																
<b>Description of Change:</b>																
Texas Instruments is pleased to announce the qualification of TI Malaysia as additional Assembly Site for Select Devices listed in the "Product Affected" Section. No material differences between sites.																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Assembly Site</th> <th style="width: 25%;">Assembly Site Origin</th> <th style="width: 25%;">Assembly Country Code</th> <th style="width: 25%;">Assembly City</th> </tr> </thead> <tbody> <tr> <td>TI Taiwan</td> <td>TAI</td> <td>TWN</td> <td>Chung Ho, New Taipei City</td> </tr> <tr> <td><a href="#">TI Malaysia</a></td> <td><a href="#">MLA</a></td> <td><a href="#">MYS</a></td> <td><a href="#">Kuala Lumpur</a></td> </tr> </tbody> </table>					Assembly Site	Assembly Site Origin	Assembly Country Code	Assembly City	TI Taiwan	TAI	TWN	Chung Ho, New Taipei City	<a href="#">TI Malaysia</a>	<a href="#">MLA</a>	<a href="#">MYS</a>	<a href="#">Kuala Lumpur</a>
Assembly Site	Assembly Site Origin	Assembly Country Code	Assembly City													
TI Taiwan	TAI	TWN	Chung Ho, New Taipei City													
<a href="#">TI Malaysia</a>	<a href="#">MLA</a>	<a href="#">MYS</a>	<a href="#">Kuala Lumpur</a>													
<b>Package Marking Differences:</b>																
	<b>TAI</b>	<b>MLA</b>														
TI Bug	Include	Replace with "TI" text														
**ECAT	Include Value	Remove														
Example	<div style="border: 1px solid black; padding: 5px; text-align: center;">           \T/YMLLLLS            UCC21530            G4            O         </div> <p>           \T/ = TI LOGO            YM = YEAR MONTH DATE CODE            S = ASSY SITE CODE            LLLL = LOT TRACE CODE            G4 = ECAT VALUE            O = PIN 1 INDICATOR         </p>	<div style="border: 1px solid black; padding: 5px; text-align: center;">           TI YMLLLLS            UCC21530            O         </div> <p>           TI = TI LETTER            YM = YEAR MONTH DATE CODE            S = ASSY SITE CODE            LLLL = LOT TRACE CODE            O = PIN 1 INDICATOR         </p>														
** - Not all devices have ECAT information included in the symbolization, but for the ones that do, this information will be removed.																
<b>Reason for Change:</b>																
Continuity of supply.																
<b>Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):</b>																
None																
<b>Impact on Environmental Ratings</b>																

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
<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> No Change	<input checked="" type="checkbox"/> 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:**

UCC21530DWK	UCC21540ADWK	UCC21540DWK	UCC21542ADWKR
UCC21530DWKR	UCC21540ADWKR	UCC21540DWKR	UCC21542DWKR

## 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: ISQW7841EQDWEQ1	QBS Reference: UCC21520QDWRQ1	QBS Reference: ISQW741FEDWRQ1	QBS Reference: ISO6741QDWRQ1	QBS Reference: UCC21520AQRWRQ1	QBS Reference: TMP451AQQERQ1
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: UCC21520QDVKRQ1	QBS Reference: ISOW7841QDWEQ1	QBS Reference: UCC21520QDWRQ1	QBS Reference: SO7741FEDWRQ1	QBS Reference: IS06741QDWRQ1	QBS Reference: UCC21520AQDWRQ1	QBS Reference: TMP451AQDFRQ1
<b>Test Group A - Accelerated Environment Stress Tests</b>														
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	-
ACUHA	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	-
<b>Test Group B - Accelerated Lifetime Simulation Tests</b>														
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 <sup>1</sup>	-	-	-	-	-
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	-	-	-
<b>Test Group C - Package Assembly Integrity Tests</b>														
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
<b>Test Group D - Die Fabrication Reliability Tests</b>														
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
TDD8	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 & 2B	-	-	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
<b>Test Group E - Electrical Verification Tests</b>														
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>

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
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