


PCN Number:	20230707001.2		PCN Date:	July 07, 2023	
Title:	Cu bond wire Qualification plus reel dimension change and Qualification of RFAB as an additional fab site for select devices				
Customer Contact:	Change Management team		Dept:	Quality Services	
Proposed 1st Ship Date:	Jan 3, 2024		Sample requests accepted until:	Aug 7, 2023	
*Sample requests received after July 7, 2023 will not be supported.					
Change Type:					
<input type="checkbox"/>	Assembly Site	<input type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Material
<input checked="" type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Process
<input checked="" type="checkbox"/>	Assembly Materials	<input type="checkbox"/>	Part number change	<input checked="" type="checkbox"/>	Wafer Fab Site
<input type="checkbox"/>	Mechanical Specification	<input type="checkbox"/>	Test Site	<input checked="" type="checkbox"/>	Wafer Fab Material
<input checked="" type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input type="checkbox"/>	Wafer Fab Process
PCN Details					
Description of Change:					
Texas Instruments is pleased to announce the additional Assembly BOM options plus reel dimension changes and qualification of its RFAB fabrication facility as an additional Wafer Fab source for the list of devices in the "Product Affected" section below..					
Current Fab Site			Additional Fab Site		
Current Fab Site	Process	Wafer Diameter	Additional Fab Site	Process	Wafer Diameter
MIHO8	LBC7	200 mm	RFAB	LBC7	300 mm
Construction differences for Group 2 & 3 are as follows:					
What	Current		Additional		
Current Bond wire, Diameter	Die to LF: 1mil Cu or 0.96 Au Die to Die: 0.96 mil Au		Die to LF: 0.8 mil Cu Die to Die: 0.8 mil Cu		
Additionally, below only applies to Group 3:					
What	From	To			
Reel Width	24.4 mm	16.4 mm			
Carrier Tape Width	24 mm	16 mm			
Qual details are provided in the Qual Data Section.					
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		
<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:					
Fab Site Information:					

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
MIHO8	MH8	JPN	Ibaraki
RFAB	RFB	USA	Richardson

Sample product shipping label (not actual product label)

 **TEXAS INSTRUMENTS**
 MADE IN: Malaysia
 2DC: 20:
 MSL 2 / 260C / 1 YEAR SEAL DT
 MSL 1 / 235C / UNLIM 03/29/04
 OPT: 39
 ITEM:
LBL: 5A (L)T0:1750



(1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483SI2
 (P)
 (2P) REV: (V) 0033317
 (20L) CS0: SHE (21L) CC0:USA
 (22L) AS0: MLA (23L) AC0: MYS

Product Affected:

Group 1 device list - MIHO adding RFAB as an additional Fab site + Cu Wire:

ISO5451QDWQ1	ISO5851QDWQ1	ISO5452QDWRQ1	ISO5852SQDWQ1
ISO5452QDWQ1	ISO5451QDWRQ1	ISO5851QDWRQ1	ISO5852SQDWRQ1

Group 2 device list - Cu Wire only:

UCC21520QDWQ1	UCC21520AQDWQ1	UCC21320QDWRQ1	UCC21530QDWRQ1
SN21530QDWRQ1	UCC21520QDWRQ1	UCC21520AQDWRQ1	UCC21530BQDWRQ1
UCC21320QDWRQ1	UCC21530QDWRQ1	UCC21530BQDWRQ1	

Group 3 device list - Cu Wire & Reel diameter only:

ISO1640QDWRQ1	ISO6760QDWRQ1	ISO6731FQDWRQ1	ISO6760FQDWRQ1
ISO6731QDWRQ1	ISO6761QDWRQ1	ISO6740FQDWRQ1	ISO6761FQDWRQ1
ISO6740QDWRQ1	ISO6762QDWRQ1	ISO6741FQDWRQ1	ISO6762FQDWRQ1
ISO6741QDWRQ1	ISO6763QDWRQ1	ISO6742FQDWRQ1	ISO6763FQDWRQ1
ISO6742QDWRQ1			

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: <u>SN3257QDYRQ1</u>
Test Group A – Accelerated Environment Stress Tests							
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 1-260C	No fails
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-WBP	A4	MIL-STD883 Method 2011	1	60	Bond Pull Post Temp Cycle	Wires	1/60/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	3/135/0
Test Group B – Accelerated Lifetime Simulation Tests							
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	300 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
Test Group C – Package Assembly Integrity Tests							
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk >1.67	Wires	3/90/0

Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: SN3257QDYRQ1
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull, Cpk >1.67	Wires	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free Solder	1/15/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Solder	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 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 Tests							
HBM	E2	AEC Q100-002	1	3	ESD - HBM	2000 V	1/3/0
CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	1/3/0
LU	E4	AEC Q100-004	1	6	Latch-up	Per AEC Q100-004	1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	3/90/0

- Qual Device SN3257QDYRQ1 is qualified at LEVEL1-260C

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 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: UCC21520QDWRQ1	Qual Device: IS06452DWR	QES Reference: UCC21520QDWRQ1	QES Reference: IS06351QDWRQ1	QES Reference: TMP451AQDQFRQ1	QES Reference: AMC1395M25QDWRQ1	QES Reference: AMC1395M25QDWRQ1
Test Group A - Accelerated Environment Stress Tests														
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL1 260C	-	-	-	-	-	No Fails	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	No Fails	No Fails	No Fails	No Fails	-	-	-

PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL3 260C	-	-	-	-	-	-	3/0/0	3/0/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	1/77/0	-	3/231/0	3/231/0	3/231/0	3/231/0
ACU/HAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	-	1/77/0	1/77/0	1/77/0	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	1/77/0	1/77/0	1/77/0	1/77/0	3/231/0	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	-	-	1/5/0	1/5/0	1/5/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	-	1/45/0	-	-	3/135/0	3/135/0	3/135/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	175C	500 Hours	-	-	-	1/45/0	1/45/0	-	-
Test Group B - Accelerated Lifetime Simulation Tests														
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	125C	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	-	-	-	3/2400/0	-	-	-
ELFR	B2	AEC Q100-008	1	77	Early Life Failure Rate	150C	24 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 Opko1.67	Wires	1/30/0	1/30/0	-	1/30/0	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 Opko1.67	Wires	1/30/0	1/30/0	-	1/30/0	3/90/0	3/90/0	3/90/0
SD	C3	JEDEC J-STD-002	1	15	PB Solderability	>95% Lead Coverage	-	-	-	-	-	-	-	-
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	-	-	-	-	-	-	-
PD	C4	JEDEC JESD22-B100 and B108	1	10	Physical Dimensions	Opko1.67	-	-	-	-	1/10/0	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
TDOB	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	Device specific data [1]	Device specific data [1]	1/3/0	1/3/0	1/3/0	-	-
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	Device specific data [1]	Device specific data [1]	1/3/0	1/3/0	1/3/0	-	-
LU	E4	AEC Q100-004	1	6	Latch-Up	Per AEC Q100-004	-	Device specific data [1]	Device specific data [1]	1/6/0	1/6/0	1/6/0	-	-
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Opko1.67 Room, hot and cold	-	1/30/0	1/30/0	1/30/0	1/30/0	3/90/0	3/90/0	3/90/0
Additional Tests														
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device	Qual Device	QBS Reference	QBS Reference	QBS Reference	QBS Reference	QBS Reference

- 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 J): -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 : AG/HAST

Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

TI Qualification ID: R-CHG-2203-108

[1] Qual Device: UCC21520QDWRQ1 and QBS Reference: UCC21520QDWRQ1 use the same silicon die and bondout. Qual Device: ISO5452DWR and QBS Reference: ISO5851QDWRQ1 use the same silicon die and bondout.

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: AMC1305M25QDWRQ1	Qual Device: AMC1305M25QDWRQ1
Test Group A - Accelerated Environment Stress Tests									
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL3 260C	1 Step	No Fails	No Fails
PC	A1.1	-	3	22	SAM Precon Pre	Review for delamination	1 Step	3/66/0	3/66/0
PC	A1.2	-	3	22	SAM Precon Post	Review for delamination	1 Step	3/66/0	3/66/0
HAST	A2.1	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	-	-
HAST	A2.1.2	-	3	1	Cross Section, post bHAST, 1X	Post stress cross section	Completed	-	-
HAST	A2.1.3	-	3	30	Wire Bond Shear, post bHAST, 1X	Post stress	Wires	-	-
HAST	A2.1.4	-	3	30	Bond Pull over Stitch, post bHAST, 1X	Post stress	Wires	-	-
HAST	A2.1.5	-	3	30	Bond Pull over Ball, post bHAST, 1X	Post stress	Wires	-	-
HAST	A2.2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	192 Hours	3/231/0	3/231/0
HAST	A2.2.1	-	3	22	SAM Analysis, post bHAST 2X	Review for delamination	Completed	3/66/0	3/66/0
HAST	A2.2.2	-	3	1	Cross Section, post bHAST, 2X	Post stress cross section	Completed	3/3/0	3/3/0
HAST	A2.2.3	-	3	30	Wire Bond Shear, post bHAST, 2X	Post stress	Wires	3/9/0	3/9/0
HAST	A2.2.4	-	3	30	Bond Pull over Stitch, post bHAST, 2X	Post stress	Wires	3/9/0	3/9/0
HAST	A2.2.5	-	3	30	Bond Pull over Ball, post bHAST, 2X	Post stress	Wires	3/9/0	3/9/0
TC	A4.1	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0	3/231/0
TC	A4.1.1	-	3	22	SAM Analysis, post TC 1X	Review for delamination	Completed	-	-
TC	A4.1.2	-	3	1	Cross Section, post TC, 1X	Post stress cross section	Completed	-	-
TC	A4.1.3	-	3	30	Wire Bond Shear, post TC, 1X	Post stress	Wires	-	-
TC	A4.1.4	-	3	30	Bond Pull over Stitch, post TC, 1X	Post stress	Wires	-	-
TC	A4.1.5	-	3	30	Bond Pull over Ball, post TC, 1X	Post stress	Wires	-	-
TC	A4.2	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	1000 Cycles	3/210/0	3/210/0
TC	A4.2.1	-	3	22	SAM Analysis, post TC, 2X	Review for delamination	Completed	3/66/0	3/66/0

TC	A4.2.2	-	3	1	Cross Section, post TC, 2X	Post stress cross section	Completed	3/3/0	3/3/0
TC	A4.2.3	-	3	30	Wire Bond Shear, post TC, 2X	Post stress	Wires	3/9/0	3/9/0
TC	A4.2.4	-	3	30	Bond Pull over Stitch, post TC, 2X	Post stress	Wires	3/9/0	3/9/0
TC	A4.2.5	-	3	30	Bond Pull over Ball, post TC, 2X	Post stress	Wires	3/9/0	3/9/0
HTSL	A6.1	JEDEC JESD22-A103	3	45	High Temperature Storage Life	150C	1000 Hours	3/135/0	3/135/0
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL, 1X	Post stress cross section	Completed	-	-
HTSL	A6.2	JEDEC JESD22-A103	3	45	High Temperature Storage Life	150C	2000 Hours	3/132/0	3/132/0
HTSL	A6.2.1	-	3	1	Cross Section, post HTSL, 2X	Post stress cross section	Completed	3/3/0	3/3/0

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 Solderability	>95% Lead Coverage	-	-	-
SD	C3	JEDEC J-STD-002	1	15	PB-Free Solderability	>95% Lead Coverage	-	-	-
PD	C4	JEDEC JESD22-B100 and B108	1	10	Physical Dimensions	Cpk>1.67	-	-	-

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

Test Group E - Electrical Verification Tests

- QBS: Qual By Similarity
- Qual Device AMC1305M25QDWQ1 is qualified at MSL3 260C
- Qual Device AMC1305M25QDWQ1 is qualified at MSL3 260C
- 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)

ISO67xxDW-Q1 and ISO164xDW-Q1 Full PCC Qual in TIM - Automotive Approve Date 20-June-2023

Product Attributes

Attributes	Qual Device: ISO6763QDWRQ1	QBS Reference: UCC23513QDWYQ1	QBS Reference: ISO6763QDWRQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125
Product Function	Interface	Power Management	Interface
Wafer Fab Supplier	RFAB, RFAB	RFAB, RFAB	RFAB, RFAB
Assembly Site	MLA	TAI	MLA
Package Group	SOIC	SOIC	SOIC
Package Designator	DW	DWY	DW
Pin Count	16	6	16

- QBS: Qual By Similarity
- Qual Device ISO6763QDWRQ1 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: ISO6763QDWRQ1	QBS Reference: UCC23513QDWYQ1	QBS Reference: ISO6763QDWRQ1
Test Group A - Accelerated Environment Stress Tests										
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	No Fails	No Fails	No Fails
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0	3/231/0	1/77/0
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	3/231/0	3/231/0	1/77/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0	3/231/0	1/77/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	1/5/0	1/5/0	1/5/0
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	1/45/0
Test Group B - Accelerated Lifetime Simulation Tests										
HTOL	B1	JEDEC JESD22-A108	1	77	Life Test	125C	1000 Hours	-	3/231/0	-
ELFR	B2	AEC Q100-008	1	77	Early Life Failure Rate	125C	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	-

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 Solderability	>95% Lead Coverage	-	-	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
PD	C4	JEDEC JESD22-B100 and B108	1	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	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
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	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
SM	D5	-	-	-	Stress Migration	-	-	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	Device specific data [1]	-	1/3/0
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	1500 Volts	Device specific data [1]	-	1/3/0
LU	E4	AEC Q100-004	1	6	Latch-Up	Per AEC Q100-004	-	Device specific data [1]	1/6/0	1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	3/90/0	3/90/0	-
Additional Tests										
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device	QBS Reference	QBS Reference

- 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

Orderable Part Numbers

The following table contains a list of all TI Orderable Part Numbers (OPNs) released by this qualification per Product Qualification Family definition (AEC Q100 Appendix 1). Group E results shown above cover all part numbers listed here.

ISO1640QDWRQ1	ISO6731FQDWRQ1
ISO6731QDWRQ1	ISO6740FQDWRQ1
ISO6740QDWRQ1	ISO6741FQDWRQ1
ISO6741QDWRQ1	ISO6742FQDWRQ1
ISO6742QDWRQ1	ISO6760FQDWRQ1
ISO6760QDWRQ1	ISO6761FQDWRQ1
ISO6761QDWRQ1	ISO6762FQDWRQ1
ISO6762QDWRQ1	ISO6763FQDWRQ1
ISO6763QDWRQ1	

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/>

TI Qualification ID: R-CHG-2203-118

[1] Qual Device: ISO6763QDWRQ1 and QBS Reference: ISO6763QDWRQ1 product use the the same die sourced from the same Fab and use the same package and bondout. Change from hybrid Au and Cu wires to full Cu wire in assembly will not impact HBM, CDM, and LU result.

TI Information
Selective Disclosure

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

Q006 report: 0.8mil Cu wire Qual in SOIC with CEL-8240HF-10GK at TIM
Approve Date 20-June-2023

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: ISO6763QDWRQ1
Test Group A - Accelerated Environment Stress Tests								
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	No Fails
PC	A1.1	-	3	22	SAM Precon Pre	Review for delamination	-	3/66/0
PC	A1.2	-	3	22	SAM Precon Post	Review for delamination	-	3/66/0
HAST	A2.1	JEDEC JESD22-A110	3	77	Biased HAST	130C/85%RH	96 Hours	3/231/0
HAST	A2.1.2	-	3	1	Cross Section, post bHAST, 1X	Post stress cross section	Completed	-
HAST	A2.1.3	-	3	30	Wire Bond Shear, post bHAST, 1X	Post stress	Wires	-
HAST	A2.1.4	-	3	30	Bond Pull over Stitch, post bHAST, 1X	Post stress	Wires	-

HAST	A2.1.5	-	3	30	Bond Pull over Ball, post bHAST, 1X	Post stress	Wires	-
HAST	A2.2	JEDEC JESD22-A110	3	70	Biased HAST	130C/85%RH	192 Hours	3/210/0
HAST	A2.2.1	-	3	22	SAM Analysis, post bHAST 2X	Review for delamination	Completed	3/66/0
HAST	A2.2.2	-	3	1	Cross Section, post bHAST, 2X	Post stress cross section	Completed	3/3/0
HAST	A2.2.3	-	3	30	Wire Bond Shear, post bHAST, 2X	Post stress	Wires	3/9/0
HAST	A2.2.4	-	3	30	Bond Pull over Stitch, post bHAST, 2X	Post stress	Wires	3/9/0
HAST	A2.2.5	-	3	30	Bond Pull over Ball, post bHAST, 2X	Post stress	Wires	3/9/0
TC	A4.1	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	3/231/0
TC	A4.1.1	-	3	22	SAM Analysis, post TC 1X	Review for delamination	Completed	-
TC	A4.1.2	-	3	1	Cross Section, post TC, 1X	Post stress cross section	Completed	-
TC	A4.1.3	-	3	30	Wire Bond Shear, post TC, 1X	Post stress	Wires	-
TC	A4.1.4	-	3	30	Bond Pull over Stitch, post TC, 1X	Post stress	Wires	-
TC	A4.1.5	-	3	30	Bond Pull over Ball, post TC, 1X	Post stress	Wires	-
TC	A4.2	JEDEC JESD22-A104 and Appendix 3	3	70	Temperature Cycle	-65C/150C	1000 Cycles	3/210/0
TC	A4.2.1	-	3	22	SAM Analysis, post TC, 2X	Review for delamination	Completed	3/66/0
TC	A4.2.2	-	3	1	Cross Section, post TC, 2X	Post stress cross section	Completed	3/3/0
TC	A4.2.3	-	3	30	Wire Bond Shear, post TC, 2X	Post stress	Wires	3/9/0
TC	A4.2.4	-	3	30	Bond Pull over Stitch, post TC, 2X	Post stress	Wires	3/9/0
TC	A4.2.5	-	3	30	Bond Pull over Ball, post TC, 2X	Post stress	Wires	3/9/0
HTSL	A6.1	JEDEC JESD22-A103	3	45	High Temperature Storage Life	150C	1000 Hours	3/135/0
HTSL	A6.1.1	-	3	1	Cross Section, post HTSL, 1X	Post stress cross section	Completed	-
HTSL	A6.2	JEDEC JESD22-A103	3	44	High Temperature Storage Life	150C	2000 Hours	3/132/0
HTSL	A6.2.1	-	3	1	Cross Section, post HTSL, 2X	Post stress cross section	Completed	3/3/0
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
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/90/0
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EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requirements
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HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	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 Tests								

- QBS: Qual By Similarity
- Qual Device ISO6763QDWRQ1 is qualified at MSL2 260C

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
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TI Qualification ID: R-CHG-2203-118

Affected ZVEI IDs: SEM-PW-02, SEM-PW-13, SEM-PA-08, SEM-PS-03

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