PCN Number:	20190829001	**PCN Date:**	Oct 1. 2019
Title:	Qualification of MIHO8 as an additional Fab site option for select LBC8LVISO devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	April 1, 2020	**Estimated Sample Availability:**	Date provided at sample request
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 its MIHO8 fabrication facility as an additional Wafer Fab source for the selected devices listed in the “Product Affected” section.

Current Fab Site			**Additional Fab Site**		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
DMOS5	LBC8LVISO	200 mm	MIHO8	LBC8LVISO	200 mm

Reason for Change:

Continuity of Supply.

Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):

None.

Changes to product identification resulting from this PCN:

Current:

Current Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
DMOS5	DM5	USA	Dallas

Additional Fab Site:

New Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
MIHO8	**MH8**	**JPN**	**Ibaraki**

Sample product shipping label (not actual product label)

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

G4

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

Product Affected:

ISO7730FQDWQ1
ISO7730FQDWRQ1
ISO7730QDWQ1
ISO7730QDWRQ1
ISO7731FQDWQ1
ISO7731FQDWRQ1
ISO7731QDWQ1
ISO7731QDWRQ1
ISO7740FQDWQ1
ISO7740FQDWRQ1
ISO7740QDWQ1
ISO7740QDWRQ1
ISO7742FQDWQ1
ISO7742FQDWRQ1
ISO7742QDWQ1
ISO7742QDWRQ1
ISO7710FQDWQ1
ISO7710FQDWRQ1
ISO7710QDWQ1
ISO7710QDWRQ1
ISO7720FQDWQ1
ISO7720FQDWRQ1
ISO7720QDWQ1
ISO7720QDWRQ1
ISO7721FQDQ1
ISO7721FQDRQ1
ISO7721FQDWQ1
ISO7721FQDWRQ1
ISO7721QDQ1
ISO7721QDRQ1
ISO7721QDWQ1
ISO7721QDWRQ1
ISO7710FQDQ1
ISO7710FQDRQ1
ISO7710QDQ1
ISO7710QDRQ1
ISO7720FQDQ1
ISO7720FQDRQ1
ISO7720QDQ1
ISO7720QDRQ1

Supporting Qualification Data: ISO7710FQDQ1, ISO7710QDQ1, ISO7710FQDRQ1, ISO7710QDRQ1

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

Approved 09-May-2019

Updated 9/16/2019 – Updated Results

Product Attributes

Attributes	Qual Device: .ISO7710QDQ1	Qual Device: ISO7710FQDQ1	QBS Product/ Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1	QBS Process Reference: ISO7741FQDWQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	DMOS5	DMOS5	DMOS5	MIHO8
Die Revision	A	A	A	A	A	A
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	D	D	D	D	D	DW
Ball/Lead Count	8	8	8	8	8	16

- QBS: Qual By Similarity
- Qual Devices ISO7710FQDQ1 and ISO7710QDQ1 are qualified at LEVEL2-260C
- Devices ISO7710FQDQ1 and ISO7710QDQ1 contain 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: .ISO7710QDQ1	Qual Device: ISO7710FQDQ1	QBS Product/ Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1	QBS Process Reference: ISO7741FQDWQ1
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	No Fails	No Fails	No Fails

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7710QDQ1	Qual Device: ISO7710FQDQ1	QBS Product/ Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1	QBS Process Reference: ISO7741FQDWQ1
			JESD22-A113										
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/1 (1)
	TC-BP	A4	MIL-STD883 Method 2011	1	60	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/45/0	1/45/0	1/45/0	3/231/0
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	1/77/0	-	-	-	1/77/0	3/231/0
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 140C	480 Hours	-	-	1/77/0	1/77/0	-	-
	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	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0
	WBP	C2	MIL-STD88	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7710QDQ1	Qual Device: ISO7710FQDQ1	QBS Product/ Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1	QBS Process Reference: ISO7741FQDWQ1
			3 Method 2011										
	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	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	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													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-	3	30	Electrical	Cpk>1.	3/90/0	1/30/0	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7710QDQ1	Qual Device: ISO7710FQDQ1	QBS Product/ Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1	QBS Process Reference: ISO7741FQDWQ1
			009			Distributions	67						

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

Notes/ Comments:
(1)EOS. QTS487131-1. Discounted

Supporting Qualification Data: ISO7710FQDWQ1, ISO7710QDWQ1, ISO7710FQDWRQ1, ISO7710QDWRQ1

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

Approved 09-May-2019

Updated 9/16/2019 – Updated QBS data

Product Attributes

Attributes	Qual Device: .ISO7710QDWQ1	Qual Device: ISO7710FQDWQ1	QBS Product Reference: ISO7710QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	DMOS5	MIHO8	DMOS5, MIHO8	DMOS5, MIHO8
Die Revision	A	A	A	A	A0, B1	A0, B0
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package	DW	DW	DW	DW	DW	DW

Attributes	Qual Device: .ISO7710QDWQ1	Qual Device: ISO7710FQDWQ1	QBS Product Reference: ISO7710QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Designator						
Ball/Lead Count	16	16	16	16	16	16

- QBS: Qual By Similarity
- Qual Devices ISO7710FQDWQ1 and ISO7710QDWQ1 are qualified at LEVEL2-260C
- Devices ISO7710FQDWQ1 and ISO7710QDWQ1 contain 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: .ISO7710QDWQ1	Qual Device: ISO7710FQDWQ1	QBS Product Reference: ISO7710QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	-	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	-	3/231/0	3/231/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	-	3/231/0	1/77/0	2/154/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	-	3/231/1 (1)	1/77/0	2/154/0
	TC-BP	A4	MIL-STD883 Method 2011	1	50	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/45/0	3/231/0	1/45/0	-
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC	3	77	Life Test, 125C	1000 Hours	1/77/0	-	-	3/231/0	3/231/0	-

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: .ISO7710QDWQ1	Qual Device: ISO7710FQDWQ1	QBS Product Reference: ISO7710QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
			JESD22-A108										
	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	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	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	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	NBTI	D4	-	-	-	Negative Bias	-	Completed Per Process	Completed Per Process	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7710QDWQ1	Qual Device: ISO7710FQDWQ1	QBS Product Reference: ISO7710QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
						Temperature Instability		Technology Requirements	Technology Requirements				
	SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
Test Group E – Electrical Verification Tests													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	3/90/0	1/30/0	-	-	-	-

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

Notes/ Comments:
(1)EOS. QTS487131-1. Discounted

Supporting Qualification Data: ISO7720FQDQ1, ISO7720FQDRQ1, ISO7720QDQ1, ISO7720QDRQ1

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

Approved 09-May-2019

Updated 9/16/2019 – Updated QBS Data

Product Attributes

Attributes	Qual Device: .ISO7720QDQ1	Qual Device: ISO7720FQDQ1	QBS Product/ Package Reference: .ISO7721QDQ1 (M8)	QBS Product/ Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1 (D5)	QBS Process Reference: ISO7741FQDWQ1

Attributes	**Qual Device: .ISO7720QDQ1**	**Qual Device: ISO7720FQDQ1**	**QBS Product/ Package Reference: .ISO7721QDQ1 (M8)**	**QBS Product/ Package Reference: ISO7720QDQ1**	**QBS Package Reference: ISO7721QDQ1 (D5)**	**QBS Process Reference: ISO7741FQDWQ1**
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	MIHO8	DMOS5	DMOS5	MIHO8
Die Revision	A	A	A	A	A	A
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	D	D	D	D	D	DW
Ball/Lead Count	8	8	8	8	8	16

- QBS: Qual By Similarity
- Qual Devices .ISO7720QDQ1and ISO7720FQDQ1 are qualified at LEVEL2-260C
- Device .ISO7720QDQ1 and ISO7720FQDQ1 contain 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: .ISO7720QDQ1**	**Qual Device: ISO7720FQDQ1**	**QBS Product/ Package Reference: .ISO7721QDQ1 (M8)**	**QBS Product/ Package Reference: ISO7720QDQ1**	**QBS Package Reference: ISO7721QDQ1 (D5)**	**QBS Process Reference: ISO7741FQDWQ1**
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/1(1)
	TC-BP	A4	MIL-STD8	1	60	Post Temp Cycle Bond	Wires	1/50/0	-	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7720QDQ1	Qual Device: ISO7720FQDQ1	QBS Product/Package Reference: .ISO7721QDQ1 (M8)	QBS Product/Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1 (D5)	QBS Process Reference: ISO7741FQDWQ1
			83 Method 2011			Pull							
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	-	1/45/0	1/45/0	3/231/0
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	1/77/0	-	1/77/0	-	1/77/0	3/231/0
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 140C	480 Hours	-	-	-	1/77/0	-	-
	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	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0
	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	3	10	Physical Dimension	Cpk > 1.67	-	-	-	-	3/30/0	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7720QDQ1	Qual Device: ISO7720FQDQ1	QBS Product/ Package Reference: .ISO7721QDQ1 (M8)	QBS Product/ Package Reference: ISO7720QDQ1	QBS Package Reference: ISO7721QDQ1 (D5)	QBS Process Reference: ISO7741FQDWQ1
			JESD22-B100 and B108			s							
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 Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	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													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	1/30/0	1/30/0	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

Notes/ Comments:
(1)EOS. QTS 487131-1. Discounted

Supporting Qualification Data: ISO7720FQDWQ1, ISO7720FQDWRQ1, ISO7720QDWQ1, ISO7720QDWRQ1

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

Approved 09-May-2019

Updated 9/16/2019 – Updated QBS data

Product Attributes

Attributes	Qual Device: .ISO7720QDWQ1	Qual Device: ISO7720FQDWQ1	QBS Product Reference: .ISO7721QDWQ1 (M8)	QBS Product Reference: ISO7721QDWQ1 (D5)	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	MIHO8	DMOS5	MIHO8	DMOS5, MIHO8	DMOS5, MIHO8
Die Revision	A	A	A	A	A	A0, B1	A0, B0
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	DW	DW	DW	DW	DW	DW	DW
Ball/Lead Count	16	16	16	16	16	16	16

- QBS: Qual By Similarity
- Qual Devices ISO7720QDWQ1 and ISO7720FQDWQ1 are qualified at LEVEL2-260C
- Devices .ISO7720QDWQ1 and ISO7720FQDWQ1 contain 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: .ISO7720QDWQ1	Qual Device: ISO7720FQDWQ1	QBS Product Reference: .ISO7721QDWQ1 (M8)	QBS Product Reference: ISO7721QDWQ1 (D5)	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Test Group A – Accelerated Environment Stress Tests														

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7720Q DWQ1	Qual Device: ISO7720FQ DWQ1	QBS Product Reference: .ISO7721Q DWQ1 (M8)	QBS Product Reference: ISO7721Q DWQ1 (D5)	QBS Process Reference: ISO7741FQ DWQ1	QBS Package Reference: ISO5851 DWQ1 (B1)	QBS Package Reference: ISO5851 DWQ1 (B0)
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	-	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85 %RH	96 Hours	1/77/0	-	1/77/0	-	3/231/0	3/231/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	-	3/231/0	1/77/0	2/154/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	-	3/231/1 (1)	1/77/0	2/154/0
	TC-BP	A4	MIL-STD883 Method 2011	1	50	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	-	1/45/0	3/231/0	1/45/0	-
Test Group B – Accelerated Lifetime Simulation Tests														
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	1/77/0	-	1/77/0	-	3/231/0	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	-	N/A	N/A	-	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: .ISO7720Q DWQ1	Qual Device: ISO7720FQ DWQ1	QBS Product Reference: .ISO7721Q DWQ1 (M8)	QBS Product Reference: ISO7721Q DWQ1 (D5)	QBS Process Reference: ISO7741FQ DWQ1	QBS Package Reference: ISO5851 DWQ1 (B1)	QBS Package Reference: ISO5851 DWQ1 (B0)
						, and Operational Life								
Test Group C – Package Assembly Integrity Tests														
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	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	Completed Per Process Technology Requirements	-	-	-	-	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-	-
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Completed Per Process Technology Requireme	Completed Per Process Technology Requirements	-	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7720QDWQ1	Qual Device: ISO7720FQDWQ1	QBS Product Reference: .ISO7721QDWQ1 (M8)	QBS Product Reference: ISO7721QDWQ1 (D5)	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
								nts						
	SM	D5	-	-	-	Stress Migration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-	-
Test Group E – Electrical Verification Tests														
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk > 1.67	1/30/0	1/30/0	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

Notes/ Comments:
(1)EOS. QTS487131-1. Discounted

Supporting Qualification Data: ISO7721FQDQ1, ISO7721FQDRQ1

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

ISO7721QDQ1 and ISO7721FQDQ1 (Q100H, Grade 1, -40 to 125C) in Miho8
Approved 09-May-2019

Updated 9/16/2019 – Updated QBS data

Product Attributes

Attributes	Qual Device: .ISO7721QDQ1	Qual Device: ISO7721FQDQ1	QBS Product / Package Reference: ISO7721QDQ1	QBS Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Process Reference: ISO7741FQDWQ1
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	DMOS5	DMOS5	DMOS5	MIHO8
Die Revision	A	A	A	A	A	A
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	D	D	D	D	D	DW
Ball/Lead Count	8	8	8	8	8	16

- QBS: Qual By Similarity
- Qual Devices ISO7721FQDQ1 and .ISO7721QDQ1 are qualified at LEVEL2-260C
- Devices ISO7721FQDQ1 and ISO7721QDQ1 contain 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: .ISO7721QDQ1	Qual Device: ISO7721FQDQ1	QBS Product / Package Reference: ISO7721QDQ1	QBS Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Process Reference: ISO7741FQDWQ1
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	1/77/0	1/77/0	3/231/1(1)
	TC-BP	A4	MIL-STD883 Method 2011	1	60	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/45/0	1/45/0	1/45/0	3/231/0
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	1/77/0	-	1/77/0	-	-	3/231/0
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 140C	480 Hours	-	-	-	1/77/0	1/77/0	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate,	48 Hours	-	-	-	-	-	3/2400/0

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7721QDQ1	Qual Device: ISO7721FQDQ1	QBS Product / Package Reference: ISO7721QDQ1	QBS Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Process Reference: ISO7741FQDWQ1
						125C							
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	1/30/0	1/30/0	3/228/0
	SD	C3	JEDEC JESD 22-B102	1	15	Surface Mount Solderability	Pb Free Solder	-	-	1/15/0	-	-	-
	SD	C3	JEDEC JESD 22-B102	1	15	Surface Mount Solderability	Pb Solder	-	-	1/15/0	-	-	-
	PD	C4	JEDEC JESD 22-B100 and B108	3	10	Physical Dimensions	Cpk > 1.67	-	-	3/30/0	-	-	-
Test Group D – Die Fabrication Reliability Tests													
	EM	D1	JESD 61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD 35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD 60 & 28	-	-	Hot Injection Carrier	-	Completed Per Process Technology Requireme	Completed Per Process Technology Requirements	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7721QDQ1	Qual Device: ISO7721FQDQ1	QBS Product / Package Reference: ISO7721QDQ1	QBS Package Reference: ISO7710QDQ1	QBS Package Reference: ISO7720QDQ1	QBS Process Reference: ISO7741FQDWQ1
								nts					
	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													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	3/90/0	1/30/0	-	-	-	-

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

Notes/ Comments:
(1)EOS. QTS 487131-1. Discounted

Supporting Qualification Data: ISO7721FQDWQ1, ISO7721FQDWRQ1

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

Approved 09-May-2019

Updated 9/16/2019 – Updated QBS

Product Attributes

Attributes	Qual Device: .ISO7721QDWQ1	Qual Device: ISO7721FQDWQ1	QBS Product Reference: ISO7721QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DW _Q1 (B1)	QBS Package Reference: ISO5851DW_Q1 (B0)
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	DMOS5	MIHO8	DMOS5, MIHO8	DMOS5, MIHO8
Die Revision	A	A	A	A	A0, B1	A0, B0
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	DW	DW	DW	DW	DW	DW
Ball/Lead Count	16	16	16	16	16	16

- QBS: Qual By Similarity
- Qual Devices ISO7721FQDWQ1 and ISO7721QDWQ1 are qualified at LEVEL2-260C
- Devices ISO7721FQDWQ1 and ISO7721QDWQ1 contain 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: .ISO7721QDWQ1	Qual Device: ISO7721FQDWQ1	QBS Product Reference: ISO7721QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DW_Q1 (B1)	QBS Package Reference: ISO5851DW_Q1 (B0)
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	-	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	-	3/231/0	3/231/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	-	3/231/0	1/77/0	2/154/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	-	3/231/1 (1)	1/77/0	2/154/0
	TC-BP	A4	MIL-STD883 Method 2011	1	50	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/45/0	3/231/0	1/45/0	-
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	1/77/0	-	-	3/231/0	3/231/0	-
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	-	-	-	3/2400/0	-	-
	EDR	B3	AEC Q100-	3	77	NVM Endurance,	-	N/A	N/A	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: .ISO7721QDWQ1	Qual Device: ISO7721FQDWQ1	QBS Product Reference: ISO7721QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DW_Q1 (B1)	QBS Package Reference: ISO5851DW_Q1 (B0)
			005			Data Retention, and Operational Life							
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	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	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	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 Requirement	Completed Per Process Technology Requirements	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: .ISO7721QDWQ1	Qual Device: ISO7721FQDWQ1	QBS Product Reference: ISO7721QDWQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DW_Q1 (B1)	QBS Package Reference: ISO5851DW_Q1 (B0)
								s					
Test Group E – Electrical Verification Tests													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	3/90/0	1/30/0	-	-	-	-

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

Notes/ Comments:
(1)EOS. QTS 487131-1. Discounted

Supporting Qualification Data: ISO7730FQDWQ1, ISO7730QDWQ1, ISO7730FQDWRQ1, ISO7730QDWRQ1

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)
Approved 08-May-2019

Updated 09/14/2019 – Updated QBS data

Product Attributes

Attributes	Qual Device: ISO7730FQDWQ1	Qual Device: ISO7730QDWQ1	QBS Product Reference: ISO7730FQDBQ_Q1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	MIHO8	MIHO8	DMOS5, MIHO8	DMOS5, MIHO8

Attributes	Qual Device: ISO7730FQDWQ1	Qual Device: ISO7730QDWQ1	QBS Product Reference: ISO7730FQDBQ_Q1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Die Revision	A	A	A	A	A0, B1	A0, B0
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	DW	DW	DBQ	DW	DW	DW
Ball/Lead Count	16	16	16	16	16	16

- QBS: Qual By Similarity
- Qual Devices ISO7730QDWQ1 and Qual Device ISO7730FQDWQ1 are qualified at LEVEL2-260C
- Devices ISO7730QDWQ1 and ISO7730FQDWQ1 contain 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: ISO7730FQDWQ1	Qual Device: ISO7730QDWQ1	QBS Product Reference: ISO7730FQDBQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	1/77/0	3/231/0	3/231/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	3/231/0	1/77/0	2/154/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	3/231/1 (1)	1/77/0	2/154/0
	TC-BP	A4	MIL-STD883 Method 2011	1	60	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/50/0	3/231/0	1/45/0	-

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: ISO7730FQDWQ1	Qual Device: ISO7730QDWQ1	QBS Product Reference: ISO7730FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
			A103										
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test 140C	480 Hours	-	-	1/77/0	-	-	-
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	-	-	3/231/0	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	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	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	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD35	-	-	Time Dependant	-	Completed Per Process	Completed Per Process	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: ISO7730FQDWQ1	Qual Device: ISO7730QDWQ1	QBS Product Reference: ISO7730FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
						Dielectric Breakdown		Technology Requirements	Technology Requirements				
	HCI	D3	JESD 60 & 28	-	-	Hot Injection Carrier	-	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													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	1/30/0	1/30/0	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

Notes/ Comments:
(1)EOS. QTS487131-1. Discounted

Supporting Qualification Data: ISO7731FQDWQ1, ISO7731QDWQ1, ISO7731FQDWRQ1, ISO7731QDWRQ1

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)
Approved 08-May-2019

Updated 9/14/2019 – Updated QBS data

Product Attributes

Attributes	Qual Device: ISO7731FQDWQ1	Qual Device: ISO7731QDWQ1	QBS Product Reference: ISO7731FQDBQ_Q1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	MIHO8	MIHO8	DMOS5, MIHO8	DMOS5, MIHO8
Die Revision	A	A	A	A	A0, B1	A0, B0
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	DW	DW	DBQ	DW	DW	DW
Ball/Lead Count	16	16	16	16	16	16

- QBS: Qual By Similarity
- Qual Devices ISO7731QDWQ1 and ISO7731FQDWQ1 are qualified at LEVEL2-260C
- Devices ISO7731FQDWQ1 and ISO7731QDWQ1 contain 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: ISO7731FQDWQ1	Qual Device: ISO7731QDWQ1	QBS Product Reference: ISO7731FQDBQ_Q1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	1/77/0	3/231/0	3/231/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	3/231/0	1/77/0	2/154/0
	TC	A4	JEDEC JESD22-A104	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	3/231/1 (1)	1/77/0	2/154/0

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: ISO7731FQDWQ1	Qual Device: ISO7731QDWQ1	QBS Product Reference: ISO7731FQDBQ_Q1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
			and Appendix 3										
	TC-BP	A4	MIL-STD883 Method 2011	1	60	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/45/0	3/231/0	1/45/0	-
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test 140C	480 Hours	-	-	1/77/0	-	-	-
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	-	-	3/231/0	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	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability	Pb Free Solder	-	-	-	-	-	1/15/0
	SD	C3	JEDEC JESD	1	15	Surface Mount Solderabilit	Pb Solder	-	-	-	-	-	1/15/0

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: ISO7731FQDWQ1	Qual Device: ISO7731QDWQ1	QBS Product Reference: ISO7731FQDBQ_Q1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
			22-B102			y							
	PD	C4	JEDEC JESD 22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	-	-	-	-	-	3/30/0
Test Group D – Die Fabrication Reliability Tests													
	EM	D1	JESD 61	-	-	Electromigration	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD 35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD 60 & 28	-	-	Hot Injection Carrier	-	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													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/6/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	1/30/0	1/30/0	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

Notes/ Comments:
(1)EOS. QTS487131-1. Discounted

Supporting Qualification Data: ISO7740QDWQ1, ISO7740FQDWQ1, ISO7740QDWRQ1, ISO7740FQDWRQ1,

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)
Approved 08-May-2019

Updated -09/14/2019 – updated QBS Data

Product Attributes

Attributes	Qual Device: ISO7740FQDWQ1	Qual Device: ISO7740QDWQ1	QBS Product Reference: ISO7740FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	MIHO8	MIHO8	DMOS5, MIHO8	DMOS5, MIHO8
Die Revision	A	A	A	A	A0, B1	A0, B0
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	DW	DW	DBQ	DW	DW	DW
Ball/Lead Count	16	16	16	16	16	16

- QBS: Qual By Similarity
- Qual Devices ISO7740QDWQ1 and ISO7740FQDWQ1 are qualified at LEVEL2-260C
- Devices ISO7740FQDWQ1 and ISO7740QDWQ1 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: ISO7740FQDWQ1	Qual Device: ISO7740QDWQ1	QBS Product Reference: ISO7740FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DW Q1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	1/77/0	3/231/0	3/231/0	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: ISO7740FQDWQ1	Qual Device: ISO7740QDWQ1	QBS Product Reference: ISO7740FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	3/231/0	1/77/0	2/154/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	3/231/1 (1)	1/77/0	2/154/0
	TC-BP	A4	MIL-STD883 Method 2011	1	60	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/45/0	3/231/0	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	3/231/0	-
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 140C	480 Hours	-	-	1/77/0	-	-	-
	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	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: ISO7740FQDWQ1	Qual Device: ISO7740QDWQ1	QBS Product Reference: ISO7740FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	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	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	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													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	1/3/0	1/3/0	-	-	-	-
	LU	E4	AEC Q100-	1	6	Latch-up	Per AEC	1/6/0	1/6/0	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: ISO7740FQDWQ1	Qual Device: ISO7740QDWQ1	QBS Product Reference: ISO7740FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DW Q1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
			004				Q100-004						
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	1/30/0	1/30/0	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

Notes/ Comments:

(1) EOS. QTS487131-1. Discounted

Supporting Qualification Data: ISO7742QDWQ1, ISO7742FQDWQ1, ISO7742QDWRQ1, ISO7742FQDWRQ1

Automotive New Product Qualification Summary
(As per AEC-Q100 and JEDEC Guidelines)
Approved 08-May-2019

Updated 09/14/2019 – Updated QBS data

Product Attributes

Attributes	Qual Device: ISO7742FQDWQ1	Qual Device: ISO7742QDWQ1	QBS Product Reference: ISO7742FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Interface	Interface	Interface	Interface	Interface	Interface
Wafer Fab Supplier	MIHO8	MIHO8	MIHO8	MIHO8	DMOS5, MIHO8	DMOS5, MIHO8
Die Revision	A	A	A	A	A0, B1	A0, B0
Assembly Site	TAI	TAI	TAI	TAI	TAI	TAI
Package Type	SOIC	SOIC	SOIC	SOIC	SOIC	SOIC
Package Designator	DW	DW	DBQ	DW	DW	DW
Ball/Lead Count	16	16	16	16	16	16

- QBS: Qual By Similarity
- Qual Devices ISO7742FQDWQ1 and ISO7742QDWQ1 are qualified at LEVEL2-260C
- Devices ISO7742FQDWQ1 and ISO7742QDWQ1 contain 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: ISO7742FQDWQ1	Qual Device: ISO7742QDWQ1	QBS Product Reference: ISO7742FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
Test Group A – Accelerated Environment Stress Tests													
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	Level 2-260C	No Fails	-	No Fails	No Fails	No Fails	No Fails
	HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85% RH	96 Hours	1/77/0	-	1/77/0	3/231/0	3/231/0	-
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	-	1/77/0	3/231/0	1/77/0	2/154/0
	TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, -65/150C	500 Cycles	1/77/0	-	1/77/0	3/231/1 (1)	1/77/0	2/154/0
	TC-BP	A4	MIL-STD883 Method 2011	1	50	Post Temp Cycle Bond Pull	Wires	1/50/0	-	-	-	-	-
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	-	-	-	-
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 175C	500 Hours	-	-	1/45/0	3/231/0	1/45/0	-
Test Group B – Accelerated Lifetime Simulation Tests													
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 140C	480 Hours	-	-	1/77/0	-	-	-
	HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	-	-	3/231/0	3/231/0	-
	ELFR	B2	AEC Q100-	3	800	Early Life Failure	48 Hours	-	-	-	3/2400/0	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: ISO7742FQDWQ1	Qual Device: ISO7742QDWQ1	QBS Product Reference: ISO7742FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
			008			Rate, 125C							
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	N/A	N/A	-	-	-	-
Test Group C – Package Assembly Integrity Tests													
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull Cpk>1.67	Wires	1/30/0	1/30/0	1/30/0	3/228/0	1/76/0	2/152/0
	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	Completed Per Process Technology Requirements	-	-	-	-
	TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	-	-	-	-
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	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	Completed Per Process Technology	-	-	-	-

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: ISO7742FQDWQ1	Qual Device: ISO7742QDWQ1	QBS Product Reference: ISO7742FQDBQQ1	QBS Process Reference: ISO7741FQDWQ1	QBS Package Reference: ISO5851DWQ1 (B1)	QBS Package Reference: ISO5851DWQ1 (B0)
								Requirements	Requirements				
Test Group E – Electrical Verification Tests													
	HBM	E2	AEC Q100-002	1	3	ESD - HBM	6000 V	1/3/0	1/3/0	-	-	-	-
	CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500 V	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	-	-	-	-
	ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67	1/30/0	1/30/0	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

Notes/ Comments:

(1)EOS. QTS487131-1.Discounted

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