Diodes Incorporated
Discrete and Analog Semiconductors

Qualification Report – PCN-2196

Manufacturer No.: Additional Qualified (FAB) Wafer Fabrication / (AT) Assembly Test Sites on selected devices

Revision: 0

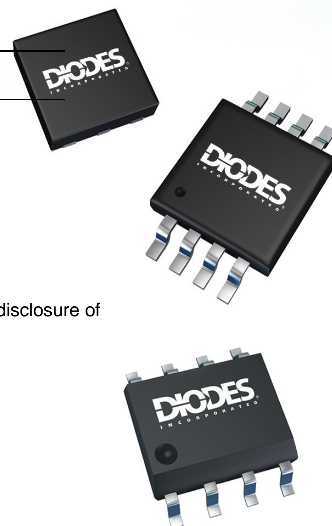
Date: July 12, 2016

Qualified By: Diodes Incorporated

Also Applicable To: The part numbers listed in the associated PCN are Qualified by Similarity (QBS) to the devices included in this report.

Please go to www.diodes.com for current data sheets on associated devices

Prepared By:	Diodes US Document Control	Date	July 12, 2016
Approved By:	Diodes US QRA Department	Date	July 12, 2016



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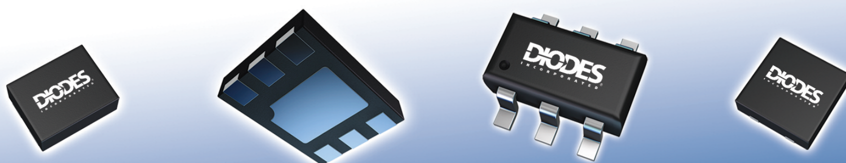

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DATE: 12th July, 2016

PCN #: 2196

PCN Title: Additional Qualified (FAB) Wafer Fabrication / (AT) Assembly Test Sites on selected devices

Dear Customer:

This is an announcement of change(s) to products that are currently being offered by Diodes Incorporated.

We request that you acknowledge receipt of this notification within 30 days of the date of this PCN. If you require samples for evaluation purposes, please make a request within 30 days as well. Otherwise, samples may not be built prior to this change. Please refer to the implementation date of this change as it is stated in the attached PCN form. Please contact your local Diodes sales representative to acknowledge receipt of this PCN and for any sample requests.

The changes announced in this PCN will not be implemented earlier than 90 days from the notification date stated in the attached PCN form.

Previously agreed upon customer specific change process requirements or device specific requirements will be addressed separately.

For questions or clarification regarding this PCN, please contact your local Diodes sales representative.

Sincerely,

Diodes Incorporated PCN Team

PRODUCT CHANGE NOTICE PCN-2196 REV 00

Notification Date:	Implementation Date:	Product Family:	Change Type:	PCN #:
12th July, 2016	10th Oct, 2016	Analog Semiconductors	Additional FAB/AT Sites	**2196**

TITLE

Additional Qualified (FAB) Wafer Fabrication / (AT) Assembly Test Sites on selected devices

DESCRIPTION OF CHANGE

This PCN is being issued to notify customers that in order to assure continuity of supply, Diodes has qualified additional FAB/AT Sites on selected devices. Full electrical characterization and high reliability testing has been completed on representative part numbers to ensure there is no change to device functionality or electrical specifications in the datasheet.

IMPACT

Continuity of Supply. No change in data sheet parameters and product performance.

PRODUCTS AFFECTED

Please see the parts list below in the following Tables:

Table 1 - Qualify Additional AT Source (HuaDa) Nantong Huada Microelectronics Co., Ltd. Jiangsu, China

Table 2 - Qualify Additional Fab Source (SFAB2) Diodes Shanghai SIM-BCD Semiconductor Manufacturing Co., Shanghai, China and AT Source (SAT) Diodes Incorporated / Shanghai, China

Table 3 - Qualify Additional AT Source (SAT) Diodes Incorporated / Shanghai, China

Table 4 - Qualify Additional AT Source (CAT) Diodes Incorporated / Chengdu, China

Table 5 - Qualify Additional AT Source (UNISEM) UNISEM Chengdu Co., Ltd. Chengdu, China

WEB LINKS

Manufacturer's Notice:	http://www.diodes.com/quality/pcns
For More Information Contact:	http://www.diodes.com/contacts
Data Sheet:	http://www.diodes.com/products

DISCLAIMER

Unless a Diodes Incorporated Sales representative is contacted in writing within 30 days of the posting of this notice, all changes described in this announcement are considered approved.

DIODES INCORPORATED

Table 1 - Qualify Additional AT Source (HuaDa)					
AH276Q-PG-B-A	AH276Q-PG-B-B	AH276Q-PG-B-C	AH2984-PG-B		

Table 2 - Qualify Additional Fab Source (SFAB2) / AT Source (SAT)					
AP3586AMPTR-G1	AP3586BMPTR-G1	AP3586CMPTR-G1	AP3586AMTR-G1	AP3586BMTR-G1	AP3586CMTR-G1

Table 3 - Qualify Additional AT Source (SAT)					
LM4041CFTA	LM4041DFTA	LM4041DADJFTA			

Table 4 - Qualify Additional AT Source (CAT)					
AL9910AS-13	AL9910A-5S-13	AL9910ASP-13	AL9910A-5SP-13	74LVC1G10W6-7	74LVC1G11W6-7
74LVC1G57W6-7	74LVC1G58W6-7	74LVC1G97W6-7	74LVC1G98W6-7		

Table 5 - Qualify Additional AT Source (Unisem)					
AP91350MN1-DT8-7					

Certificate of Design, Construction & Qualification

Description: 74LVC1GXXW6 (XX indicates 10, 11, 57, 58, 97 and 98) Qualification

				Qual Device 1		**QBS Device 1**	
	Part Number			**74LVC1GXXW6 (XX indicates 10, 11, 57, 58, 97 and 98)**		**74LVC1GXXW6 (XX indicates 10, 11, 57, 58, 97 and 98)**	
	Package			SOT-26		SOT-26	
	Package Size			3.0*2.8*1.15		3.0*2.8*1.15	
	Die Name(s)			A0266A0		A0266A0	
	Wafer FAB			Nuvoton		Nuvoton	
	Wafer Diameter			150 mm		150 mm	
	Bond Type (at Die)			Ball		Ball	
	Bond Type (at LF)			Wedge bond		Wedge bond	
	No. of bond over active area			6		6	
	Glass Transistion Temp			110°C		130°C	
	Lead Material Manufacture			Pure Tin		ND	
	Header plating (Die Land Area)			NA(bare copper)		Ag	
	Max Junction Temp			150°C degree C		150°C degree C	
	Max Thermal resistance Junc (case)			52°C/W		NA	
	Max Thermal resistance Junc (amibent)			204°C/W		NA	
	Front Metal Type			Ti/Al/Si/Cu/TiN		Ti/Al/Si/Cu/TiN	
	Die passivation thickness range			Oxide 3kA SiN 5kA		Oxide 3kA SiN 5kA	
	No of masks Steps			13		13	
	Die Size (W/L/Thickness)			614*373*205um		614*373*205um	
	Die Process / Technology			CMOS 0.5u 5V LVT 1P3M		CMOS 0.5u 5V LVT 1P3M	
	Die Quantity (eg. Die per package)			1		1	
	DB Epoxy/Solder Type			84-1LMISR4		84-1LMISR4	
	Die Attach Material			EPOXY		EPOXY	
	Wire Bond Material (Au, Cu, Al)			Cu		Au	
	Wire Diameter			0.8mil		0.7mil	
	Front Metal Thickness			AlCu 20kA		AlCu 20kA	
	Leadframe Type			TSOT23-6L R		SOT-26A	
	Leadframe Material			CDA194		EFTEC-64T	
	Molding Compound Type			CEL-1700-D3		EME-G700	
	Green Compound (Yes/No)			YES		YES	
	Lead-Free (Yes/No)			YES		YES	
	Assembly Site			CAT		SAT	
	FT Test Site			CAT		SAT	
	DataSheet			74LVC1G		74LVC1G	
	Realibility Testing						
Test	**Test Conditions**	**Duration / Limits**	**Fail/SS**	**X = Test Needed**	**Results Pass/Fail**	**QBS Test Completed**	**Results Pass/Fail**
MSL1 Pre-cond	Bake 125C	24 Hrs	0/154	X	Pass	X	Pass
	Soak 85C, 85% RH	168Hrs	0/154	X	Pass	X	Pass
	IR reflow 260C	3 cycles	0/154	X	Pass	X	Pass
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS to Device 1		X	Pass
		500 Hrs	0/77	QBS to Device 1		X	Pass
		1000 Hrs	0/77	QBS to Device 1		X	Pass
TC	-65C-150C	500 cycles	0/77	X	Pass	X	Pass
		1000 cycles	0/77	X	Pass	X	Pass
HAST	130C, 85%RH 33.3 psia 100% Bias	96 Hrs	0/77	X	Pass	X	Pass
HTSL	150C	168 Hrs	0/77	X	Pass	X	Pass
		500 Hrs	0/77	X	Pass	X	Pass
		1000 Hrs	0/77	X	Pass	X	Pass
Latch-up	JESD78	100mA	0/6	QBS to Device 1		X	Pass
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	QBS to Device 1		X	Pass
	MM (AEC-Q100-003)	+-200V	0/3	QBS to Device 1		X	Pass
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	X	Pass	X	Pass
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	Pass	X	Pass
WBS	JESD22-B116B	Cpk>1.66	0/30	X	Pass	X	Pass
PD	JESD22-B100B	Package Outline	0/30	X	Pass		
Solderability	245C +0/5C	5 Seconds	0/10	X	Pass		
Char	-40C, 0C, 25C, 85C, 125C	Operating Range	0/30	X	Pass	X	Pass
Summary:	David tang 2/11/15						
Submitted By:	Mark Li 2/11/15						
Approved By:	Hiwen Hu 2/12/15						

Certificate of Design, Construction & Qualification

Description: AP3585/AP3586A SOP8 Qualification

				Qual Device 1		QBS Device 1	
	Part Number			AP3585MTR-G1/AP3586AMTR-G1		AP3585MPTR-G1	
	Package			SOP-8L		SOP-8-EP	
	Package Size			4.9*6.0*1.6		4.9*6.0*1.6	
	Die Name(s)			BN013AA-2		BN013AA-2	
	Wafer FAB			BCD FAB2		BCD FAB2	
	Wafer Diameter			6		6	
	Bond Type (at Die)			ball		ball	
	Bond Type (at LF)			wedge		wedge	
	No. of bond over active area			4		4	
	Glass Transistion Temp			130℃		130℃	
	Lead Material Manufacture			NBKQ		NBKQ	
	Header plating (Die Land Area)			Ag		Ag	
	Max Junction Temp			150℃		150℃	
	Max Thermal resistance Junc (case)			22℃/w		22℃/w	
	Max Thermal resistance Junc (amibent)			70℃/w		70℃/w	
	Front Metal Type			AL/CU		AL/CU	
	Die passivation thickness range			1u		1u	
	No of masks Steps			14		14	
	Die Size (W/L/Thickness)			1840*1410*250		1840*1410*250	
	Die Process / Technology			BCD 1.2U		BCD 1.2U	
	Die Quantity (eg. Die per package)			1		1	
	DB Epoxy/Solder Type			Epoxy		Epoxy	
	Die Attach Material			84-1LMISR4		84-1LMISR4	
	Wire Bond Material (Au, Cu, Al)			Cu		Cu	
	Wire Diameter			1.0mil		1.0mil	
	Front Metal Thickness			1.5um		1.5um	
	Leadframe Type			SOIC-8(K)		SOIC8L-EP	
	Leadframe Material			CDA194FH		CDA194FH	
	Molding Compound Type			EME-G600		EME-G600	
	Green Compound (Yes/No)			Yes		Yes	
	Lead-Free (Yes/No)			Yes		Yes	
	Assembly Site			SAT		SAT	
	Test Site			SAT		SAT	
	DataSheet			AP3585 D1.0/AP3586A D1.2		AP3585D1.0	
	Realibility Testing						
Test	**Test Conditions**	**Duration / Limits**	**Fail/SS**	**X = Test Needed**	**Results Pass/Fail**	**QBS Test Completed**	**Results Pass/Fail**
MSL3 Pre-cond	Bake 125C	24 Hrs	0/154	X	Pass	X	Pass
	Soak 85C, 85% RH	168Hrs	0/154	X	Pass	X	Pass
	IR reflow 260C	3 cycles	0/154	X	Pass	X	Pass
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS TO QBS decice 1	Pass	X	Pass
		500 Hrs	0/77	QBS TO QBS decice 1	Pass	X	Pass
		1000 Hrs	0/77	QBS TO QBS decice 1	Pass	X	Pass
TC	-65C-150C	500 cycles	0/77	X	Pass	X	Pass
		1000 cycles	0/77	X	Pass	X	Pass
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	X	Pass	X	Pass
HTSL	150C	168 Hrs	0/77	X	Pass	X	Pass
		500 Hrs	0/77	X	Pass	X	Pass
		1000 Hrs	0/77	X	Pass	X	Pass
Latch-up	JESD78	100mA	0/6	QBS TO QBS decice 1	Pass	X	Pass
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	QBS TO QBS decice 1	Pass	X	Pass
	MM (AEC-Q100-003)	+-200V	0/3	QBS TO QBS decice 1	Pass	X	Pass
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	Pass	X	Pass
WBS	JESD22-B116B	Cpk>1.66	0/30	X	Pass	X	Pass
Char	-40C, 25C, 90C	5 Seconds	0/10	QBS TO QBS decice 1	Pass	X	Pass
Summary:	Piqin Sun,2014/06/11						
Submitted By:	DaQing Xu,2014/06/18						
Approved By:	DaQing Xu,2014/06/18						

Certificate of Design, Construction & Qualification

Description: AP3585/AP3586A Qualification

Parameter	Qual Device 1	Qual Device 2
Part Number	AP3585MPTR-G1	AP3586AMPTR-G1
Package	SOP-8-EP	SOP-8-EP
Package Size	4.9*6.0*1.6	4.9*6.0*1.6
Die Name(s)	BN013AA-2	BN013AA-2
Wafer FAB	BCD FAB2	BCD FAB2
Wafer Diameter	6	6
Bond Type (at Die)	ball	ball
Bond Type (at LF)	wedge	wedge
No. of bond over active area	4	4
Glass Transistion Temp	130℃	130℃
Lead Material Manufacture	NBKQ	NBKQ
Header plating (Die Land Area)	Ag	Ag
Max Junction Temp	150℃	150℃
Max Thermal resistance Junc (case)	22℃/w	22℃/w
Max Thermal resistance Junc (amibent)	70℃/w	70℃/w
Front Metal Type	AL/CU	AL/CU
Die passivation thickness range	1u	1u
No of masks Steps	14	14
Die Size (W/L/Thickness)	1840*1410*250	1840*1410*250
Die Process / Technology	BCD 1.2U	BCD 1.2U
Die Quantity (eg. Die per package)	1	1
DB Epoxy/Solder Type	Epoxy	Epoxy
Die Attach Material	84-1LMISR4	84-1LMISR4
Wire Bond Material (Au, Cu, Al)	Cu	Cu
Wire Diameter	1.0mil	1.0mil
Front Metal Thickness	1.5um	1.5um
Leadframe Type	SOIC8L-EP	SOIC8L-EP
Leadframe Material	CDA194FH	CDA194FH
Molding Compound Type	EME-G600	EME-G600
Green Compound (Yes/No)	Yes	Yes
Lead-Free (Yes/No)	Yes	Yes
Assembly Site	SAT	SAT
Test Site	SAT	SAT
DataSheet	AP3585 D1.0	AP3586A_B_C D1.2

Realibility Testing

Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail
MSL3 Pre-cond	Bake 125C	24 Hrs	0/154	X	Pass	QBS to Device 1	Pass
	Soak 85C, 85% RH	168Hrs	0/154	X	Pass	QBS to Device 1	Pass
	IR reflow 260C	3 cycles	0/154	X	Pass	QBS to Device 1	Pass
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	X	Pass	QBS to Device 1	Pass
		500 Hrs	0/77	X	Pass	QBS to Device 1	Pass
		1000 Hrs	0/77	X	Pass	QBS to Device 1	Pass
TC	-65C-150C	500 cycles	0/77	X	Pass	QBS to Device 1	Pass
		1000 cycles	0/77	X	Pass	QBS to Device 1	Pass
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	X	Pass	QBS to Device 1	Pass
HTSL	150C	168 Hrs	0/77	X	Pass	QBS to Device 1	Pass
		500 Hrs	0/77	X	Pass	QBS to Device 1	Pass
		1000 Hrs	0/77	X	Pass	QBS to Device 1	Pass
Latch-up	JESD78	100mA	0/6	X	Pass	QBS to Device 1	Pass
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	X	Pass	QBS to Device 1	Pass
	MM (AEC-Q100-003)	+-200V	0/3	X	Pass	QBS to Device 1	Pass
	CDM (AEC-Q100-011)	+-750V	0/3	X	Pass	X	Pass
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	X	Pass	QBS to Device 1	Pass
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	Pass	QBS to Device 1	Pass
WBS	JESD22-B116B	Cpk>1.66	0/30	X	Pass	QBS to Device 1	Pass
Char	-40C, 25C, 90C	5 Seconds	0/10	X	Pass	QBS to Device 1	Pass

Summary:	
Submitted By:	DaQing Xu, 2014/05/06
Approved By:	DaQing Xu, 2014/05/06

Certificate of Design, Construction & Qualification

Description: AP3586B_C/A3585A_B_C Qualifiication

	Qual Device 1	Qual Device 2	Qual Device 3	QBS Device 1
Part Number	AP3585AMPTR-G1	AP3585BMPTR-G1,AP3585CMPTR-G1	AP3586BMPTR-G1,AP3586CMPTR-G1	AP3585MPTR-G1,AP3586AMPTR-G1
Package	SOP-8-EP	SOP-8-EP	SOP-8-EP	SOP-8-EP
Package Size	4.9*6.0*1.6	4.9*6.0*1.6	4.9*6.0*1.6	4.9*6.0*1.6
Die Name(s)	BN013AC-2	BN013AD-2	BN013AB-2	BN013AA-2
Wafer FAB	BCD FAB2	BCD FAB2	BCD FAB2	BCD FAB2
Wafer Diameter	6	6	6	6
Bond Type (at Die)	ball	ball	ball	ball
Bond Type (at LF)	wedge	wedge	wedge	wedge
No. of bond over active area	4	4	4	4
Glass Transistion Temp	130℃	130℃	130℃	130℃
Lead Material Manufacture	NBKQ	NBKQ	NBKQ	NBKQ
Header plating (Die Land Area)	Ag	Ag	Ag	Ag
Max Junction Temp	150℃	150℃	150℃	150℃
Max Thermal resistance Junc (case)	22℃/w	22℃/w	22℃/w	22℃/w
Max Thermal resistance Junc (amibent)	70℃/w	70℃/w	70℃/w	70℃/w
Front Metal Type	AL/CU	AL/CU	AL/CU	AL/CU
Die passivation thickness range	1u	1u	1u	1u
No of masks Steps	14	14	14	14
Die Size (W/L/Thickness)	1840*1410*250	1840*1410*250	1840*1410*250	1840*1410*250
Die Process / Technology	BCD 1.2U	BCD 1.2U	BCD 1.2U	BCD 1.2U
Die Quantity (eg. Die per package)	1	1	1	1
DB Epoxy/Solder Type	Epoxy	Epoxy	Epoxy	Epoxy
Die Attach Material	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4
Wire Bond Material (Au, Cu, Al)	Cu	Cu	Cu	Cu
Wire Diameter	1.0mil	1.0mil	1.0mil	1.0mil
Front Metal Thickness	1.5um	1.5um	1.5um	1.5um
Leadframe Type	SOIC8L-EP	SOIC8L-EP	SOIC8L-EP	SOIC8L-EP
Leadframe Material	CDA194FH	CDA194FH	CDA194FH	CDA194FH
Molding Compound Type	EME-G600	EME-G600	EME-G600	EME-G600
Green Compound (Yes/No)	Yes	Yes	Yes	Yes
Lead-Free (Yes/No)	Yes	Yes	Yes	Yes
Assembly Site	SAT	SAT	SAT	SAT
Test Site	SAT	SAT	SAT	SAT
DataSheet	AP3585A_B_C R1.2	AP3585A_B_C R1.2	AP3586A_B_C D1.2	AP3585D1.0

Realibility Testing

Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail
MSL3 Pre-cond	Bake 125C	24 Hrs	0/154	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
	Soak 85C, 85% RH	168Hrs	0/154	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
	IR reflow 260C	3 cycles	0/154	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
		500 Hrs	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
		1000 Hrs	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
TC	-65C-150C	500 cycles	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
		1000 cycles	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
HTSL	150C	168 Hrs	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
		500 Hrs	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
		1000 Hrs	0/77	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
Latch-up	JESD78	100mA	0/6	X	Pass	X	Pass	X	Pass	X	PASS
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	X	Pass	X	Pass	X	Pass	X	PASS
	MM (AEC-Q100-003)	+-200V	0/3	X	Pass	X	Pass	X	Pass	X	PASS
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
WBP	MIL-STD883-2011	Cpk>1.66	0/30	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
WBS	JESD22-B116B	Cpk>1.66	0/30	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS
Char	-40C, 25C, 90C	5 Seconds	0/10	QBS TO QBS Device 1		QBS TO QBS Device 1		QBS TO QBS Device 1		X	PASS

Summary: Piqin Sun,2014/06/30
Submitted By: Piqin Sun,2014/07/10
Approved By: DaQing Xu,2014/07/11

Certificate of Design, Construction & Qualification

Description: Add additional A/T site (HuaDa) for AH276

	Qual Device 1		QBS Device 1		QBS Device 2	
Part Number	AH276Q-PG-B-X		ATS276-PG-B-X		AH276Q-PG-B-X	
Package	SIP-4L(TO-94)		SIP-4L(TO-94)		SIP-4L(TO-94)	
Package Size	5.22*18.15*1.56 mm		5.22*18.15*1.56 mm		5.22*18.15*1.56 mm	
Die Name(s)	A0099G0		ATC1179L0		A0099G0	
Wafer FAB	LSC		LSC		LSC	
Wafer Diameter	150mm		150mm		150mm	
Bond Type (at Die)	Ball		Ball		Ball	
Bond Type (at LF)	Wedge		Wedge		Wedge	
No. of bond over active area	0		0		0	
Glass Transistion Temp	135 degree C		165 degree C		135 degree C	
Header plating (Die Land Area)	Ag		NA		Ag	
Max Junction Temp	150 degree C		150 degree C		150 degree C	
Max Thermal resistance Junc (case)	20 degree C/W		185 degree C/W		20 degree C/W	
Max Thermal resistance Junc (amibent)	146 degree C/W Device mounted on FR-4 substate, 2"*2", 2oz, copper, double-sided, PC boards.		27 degree C/W no heatsink, no air flow		146 degree C/W Device mounted on FR-4 substate, 2"*2", 2oz, copper, double-sided, PC boards.	
Front Metal Type	98.5% Al+1.0% Si+0.5%Cu		98.5% Al+1.0% Si+0.5%Cu		98.5% Al+1.0% Si+0.5%Cu	
Die Conforming Coating	Q1-4399		Q1-4399		N/A	
Die passivation thickness range	SiO2 (0.6um) SiN (0.6um)		SiO2 (0.6um) SiN (0.6um)		SiO2 (0.6um) SiN (0.6um)	
No of masks Steps	8		8		8	
Die Size (W/L/Thickness)	1430*1100*350 (um)		1445*1020*350 um		1430*1100*350 (um)	
Die Process / Technology	Bipolar/2um/20V/SM		Bipolar/2um/20V/SM		Bipolar/2um/20V/SM	
Die Quantity (eg. Die per package)	1		1		1	
DB Epoxy/Solder Type	Epoxy		Epoxy		Epoxy	
Die Attach Material	84-1LMISR4		84-1LMISR4		84-1LMISR4	
Wire Bond Material (Au, Cu, Al)	Cu		Cu		Au	
Wire Diameter	1mil		1mil		1.2mil	
Front Metal Thickness	1.5um		1.5um		1.5um	
Leadframe Type	TO-94		TO-94		SIP-4L	
Leadframe Material	KFC		KFC		KFC	
Molding Compound Type	EK5600G		EK5600G		G600	
Green Compound (Yes/No)	Yes		Yes		Yes	
Lead-Free (Yes/No)	Yes		Yes		Yes	
Assembly Site	HuaDa		HuaDa		SAT	
FT Test Site	HuaDa		HuaDa		SAT	
Realibility Test Site	DHC		DHC		DHC	
DataSheet	AH276Q		ATS276G		AH276Q	

Realibility Testing

Test	**Test Conditions**	**Duration / Limits**	**Fail/SS**	**X = Test Needed**	**Results Pass/Fail**	**QBS Test Completed**	**Results Pass/Fail**	**QBS Test Completed**	**Results Pass/Fail**
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS to QBS Device 2		X	Pass	X	Pass
		500 Hrs	0/77	QBS to QBS Device 2		X	Pass	X	Pass
		1000 Hrs	0/77	QBS to QBS Device 2		X	Pass	X	Pass
TC	-65C-150C	500 cycles	0/77	QBS to QBS Device 1		X	Pass	X	Pass
		1000 cycles	0/77	QBS to QBS Device 1		X	Pass	X	Pass
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	QBS to QBS Device 1		X	Pass	X	Pass
HTSL	150C	168 Hrs	0/77	QBS to QBS Device 1		X	Pass	X	Pass
		500 Hrs	0/77	QBS to QBS Device 1		X	Pass	X	Pass
		1000 Hrs	0/77	QBS to QBS Device 1		X	Pass	X	Pass
Latch-up	JESD78	100mA	0/6	X	Pass	X	Pass		
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	X	Pass	X	Pass		
	MM (AEC-Q100-003)	+-200V	0/3	X	Pass	X	Pass		
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	X	Pass	X	Pass		
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	Pass	X	Pass		
WBS	JESD22-B116B	Cpk>1.66	0/30	X	Pass	X	Pass		
PD	JESD22-B100B	Package Outline	0/30	X	Pass	X	Pass		
Solderability	245C +0/5C	5 Seconds	0/10	X	Pass	X	Pass		
Char	-20C, 0C, 25C, 85C	Operating Range	0/30	X	Pass	X	Pass		

Summary: ______________________________

Submitted By:

Approved By:

Certificate of Design, Construction & Qualification

Description: AP91350MN1-DT8-7(W-QFN3020-12)_Unisem Qualification

				Qual Device 1		QBS Device 1		QBS Device 2		QBS Device 3	
	Part Number			AP91350MN1-DT8-7		AP91351MN1-DT8-7		AP91351MN1-DT8-7		AP91350MNx-DT8-7	
	Package			W-QFN3020-12 (Unisem)		W-QFN3020-12 (Unisem)		W-QFN3020-12 (JCAP/JCET)		W-QFN3020-12 (JCAP/JCET)	
	Package Size			2*3*0.75mm		2*3*0.75mm		2*3*0.75mm		2*3*0.75mm	
	Die Name(s)			A0364F0 (A0364C0 de-zebra)		A0364E0		A0364E0		A0364C0	
	Wafer FAB			Dongbu		Dongbu		Dongbu		Dongbu	
	Wafer Diameter			8"		8"		8"		8"	
	Bond Type (at Die)			Copper Pillar Bump(45um Cu + 35um Sn(after reflow)		Copper Pillar Bump(45um Cu + 35um Sn(after reflow)		Copper Pillar Bump(65um Cu + 25um Sn(before reflow)		Copper Pillar Bump(65um Cu + 25um Sn(before reflow)	
	Bond Type (at LF)			Copper Pillar Bump(45um Cu + 35um Sn(after reflow)		Copper Pillar Bump(45um Cu + 35um Sn(after reflow)		Copper Pillar Bump(65um Cu + 25um Sn(before reflow)		Copper Pillar Bump(65um Cu + 25um Sn(before reflow)	
	No. of bond over active area			13		13		13		13	
	Glass Transistion Temp			135 degree C		135 degree C		135 degree C		135 degree C	
	Lead Material Manufacture			Shinko		Shinko		Kangqiang		Kangqiang	
	Max Junction Temp			150 degree C		150 degree C		150 degree C		150 degree C	
	Front Metal Type			AlCu		AlCu		AlCu		AlCu	
	Die passivation thickness range			Oxide 8kA, SiN 6kA		Oxide 8kA, SiN 6kA		Oxide 8kA, SiN 6kA		Oxide 8kA, SiN 6kA	
	No of masks Steps			24		24		24		24	
	Die Size (W/L/Thickness)			1.89*0.985mm		1.89*0.985mm		1.89*0.985mm		1.89*0.985mm	
	Die Process / Technology			0.18um 30V BCD 1P3M thick top-metal 2.75um		0.18um 30V BCD 1P3M thick top-metal 2.75um		0.18um 30V BCD 1P3M thick top-metal 2.75um		0.18um 30V BCD 1P3M thick top-metal 2.75um	
	Die Quantity (eg. Die per package)			1		1		1		1	
	DB Epoxy/Solder Type			Flux		Flux		Flux		Flux	
	Die Attach Material			TACflux-010		TACflux-010		TAC026		TAC026	
	Wire Bond Material (Au, Cu, Al)			Copper Pillar		Copper Pillar		Copper Pillar		Copper Pillar	
	Wire Diameter			Bump size(90um), Bump height(80um)		Bump size(90um), Bump height(80um)		Bump size(90um), Bump height(90um)		Bump size(90um), Bump height(90um)	
	Front Metal Thickness			2.75 um		2.75 um		2.75 um		2.75 um	
	Leadframe Type			421011		409000		QFNFC2x3-13L-E		QFNFC2x3-13L-B	
	Leadframe Material			A194		A194		A194 FH.		A194 FH.	
	Molding Compound Type			G770HP		G770HP		G770HCD		G770HCD	
	Green Compound (Yes/No)			Yes		Yes		Yes		Yes	
	Lead-Free (Yes/No)			Yes		Yes		Yes		Yes	
	Assembly Site			Unisem		Unisem		JCAP / JCET		JCAP / JCET	
	Test Site			Unisem		Unisem		JCAP / JCET		JCAP / JCET	
	DataSheet			AP91350		AP91351		AP91351		AP91350	

Realibility Testing

Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail
MSL1 Pre-cond	Bake 125C	24 Hrs	0/154	QBS to QBS Device 1	Pass	X	Pass	X	Pass	X	Pass
	Soak 85C, 85% RH	168Hrs	0/154	QBS to QBS Device 1	Pass	X	Pass	X	Pass	X	Pass
	IR reflow 260C	3 cycles	0/154	QBS to QBS Device 1	Pass	X	Pass	X	Pass	X	Pass
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS to QBS Device 1	Pass	X	Pass	X	Pass		
		500 Hrs	0/77	QBS to QBS Device 1	Pass	X	Pass	X	Pass		
		1000 Hrs	0/77	QBS to QBS Device 1	Pass	X	Pass	X	Pass		
TC	-65C-150C	500 cycles	0/77	X	Pass	X	Pass	X	Pass	X	Pass
		1000 cycles	0/77	X	Pass	X	Pass	X	Pass	X	Pass
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	QBS to QBS Device 1	Pass	X	Pass	X	Pass	X	Pass
uHAST	130C, 85%RH 33.3 psia	96 Hrs	0/77	X	Pass						
HTSL	150C	168 Hrs	0/77	QBS to QBS Device 1	Pass	X	Pass	X	Pass	X	Pass
		500 Hrs	0/77	QBS to QBS Device 1	Pass	X	Pass	X	Pass	X	Pass
		1000 Hrs	0/77	QBS to QBS Device 1	Pass	X	Pass	X	Pass	X	Pass
Latch-up	JESD78	100mA	0/6	X	Pass	QBS to Device 2	Pass	X	Pass	X	Pass
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	X	Pass	QBS to Device 2	Pass	X	Pass	X	Pass
	MM (AEC-Q100-003)	+-200V	0/3	X	Pass	QBS to Device 2	Pass	X	Pass	X	Pass
	CDM (AEC-Q100-011)	+-750V	0/3	X	Pass	QBS to Device 2	Pass	X	Pass	X	Pass
PD	JESD22-B100B	Package Outline	0/30	QBS to QBS Device 1	Pass	X	Pass	X	Pass		
Solderability	245C +0/5C	5 Seconds	0/10	QBS to QBS Device 1	Pass	X	Pass	X	Pass		
Char	-40C, 0C, 25C, 85C	)perating Ranc	0/30	QBS to QBS Device 3	Pass	QBS to Device 2		X	Pass	X	Pass

Summary:
Submitted By:
Approved By:

Certificate of Design, Construction & Qualification

Description: AL9910AS-13 & AL9910A-5S-13 Qualification

				Qual Device 1		Qual Device 2		QBS Device 1	
	Part Number			**AL9910AS-13**		**AL9910A-5S-13**		**AL9910AS-13**	
	Package			SOP-8L		SOP-8L		SOP-8L	
	Package Size			4.9*6*1.45mm		4.9*6*1.45mm		4.9*6*1.45mm	
	Die Name(s)			A0272D0		A0272D0		A0272D0	
	Wafer FAB			Maxchip		Maxchip		Maxchip	
	Wafer Diameter			8"		8"		8"	
	Bond Type (at Die)			Ball		Ball		Ball	
	Bond Type (at LF)			Wedge		Wedge		Wedge	
	No. of bond over active area			10		10		10	
	Glass Transistion Temp			130 Deg C		130 Deg C		130 Deg C	
	Lead Material Manufacture			ASM		ASM		ASM	
	Header plating (Die Land Area)			No		No		No	
	Max Junction Temp			125 degreeC		125 degreeC		125 degreeC	
	Front Metal Type			Al alloy (99.5% Al / 0.5%Cu),		Al alloy (99.5% Al / 0.5%Cu),		Al alloy (99.5% Al / 0.5%Cu),	
	Die passivation thickness range			SiN (0.93 um)		SiN (0.93 um)		SiN (0.93 um)	
	No of masks Steps			13		13		13	
	Die Size (W/L/Thickness)			1750um x 1650um x 254um		1750um x 1650um x 254um		1750um x 1650um x 254um	
	Die Process / Technology			BCD/3um/700V 1P1M		BCD/3um/700V 1P1M		BCD/3um/700V 1P1M	
	Die Quantity (eg. Die per package)			1		1		1	
	DB Epoxy/Solder Type			Epoxy		Epoxy		Epoxy	
	Die Attach Material			9005SP		9005SP		84-1LMISR4	
	Wire Bond Material (Au, Cu, Al)			Cu		Cu		Cu	
	Wire Diameter			0.8mil		0.8mil		0.8mil	
	Front Metal Thickness			1um		1um		1um	
	Leadframe Type			SOP-8L C		SOP-8L C		SOIC-8 K	
	Leadframe Material			CDA194		CDA194		A194	
	Molding Compound Type			EME-G631K		EME-G631K		EME-G700	
	Green Compound (Yes/No)			Yes		Yes		Yes	
	Lead-Free (Yes/No)			Yes		Yes		Yes	
	Assembly Site			CAT		CAT		SAT	
	Test Site			CAT		CAT		SAT	
	DataSheet			AL9910A		AL9910A		AL9910A	

Realibility Testing

Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail
MSL1 Pre-cond	Bake 125C	24 Hrs	0/154	X	Pass	QBS to Qual Device 1		X	Pass
	Soak 85C, 85% RH	168Hrs	0/154	X	Pass	QBS to Qual Device 1		X	Pass
	IR reflow 260C	3 cycles	0/154	X	Pass	QBS to Qual Device 1		X	Pass
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
		500 Hrs	0/77	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
		1000 Hrs	0/77	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
TC	-65C-150C	500 cycles	0/77	X	Pass	QBS to Qual Device 1		X	Pass
		1000 cycles	0/77	X	Pass	QBS to Qual Device 1		X	Pass
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
HTSL	150C	168 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
		500 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
		1000 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
Latch-up	JESD78	100mA	0/6	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
	MM (AEC-Q100-003)	+-200V	0/3	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	X	Pass	QBS to Qual Device 1		X	Pass
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	Pass	QBS to Qual Device 1		X	Pass
WBS	JESD22-B116B	Cpk>1.66	0/30	X	Pass	QBS to Qual Device 1		X	Pass
PD	JESD22-B100B	Package Outline	0/30	X	Pass	QBS to QBS Device 1			
Solderability	245C +0/5C	5 Seconds	0/10	X	Pass	QBS to QBS Device 1			
Char	-40C, 0C, 25C, 85C	Operating Range	0/30	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass

Summary:
Submitted By:
Approved By: __________

Certificate of Design, Construction & Qualification

Description: AL9910ASP-13 & AL9910A-5SP-13 Qualification

	Qual Device 1		Qual Device 2		QBS Device 1	
Part Number	**AL9910ASP-13**		**AL9910A-5SP-13**		**AL9910ASP-13**	
Package	SO-8-EP		SO-8-EP		SO-8-EP	
Package Size	4.9*6*1.45mm		4.9*6*1.45mm		4.9*6*1.45mm	
Die Name(s)	A0272D0		A0272D0		A0272D0	
Wafer FAB	Maxchip		Maxchip		Maxchip	
Wafer Diameter	8"		8"		8"	
Bond Type (at Die)	Ball		Ball		Ball	
Bond Type (at LF)	Wedge		Wedge		Wedge	
No. of bond over active area	10		10		10	
Glass Transistion Temp	130 Deg C		130 Deg C		130 Deg C	
Lead Material Manufacture	NBKQ/MHT		NBKQ/MHT		NBKQ/MHT	
Header plating (Die Land Area,	No		No		No	
Max Junction Temp	125 degreeC		125 degreeC		125 degreeC	
Front Metal Type	Al alloy (99.5% Al / 0.5%Cu)		Al alloy (99.5% Al / 0.5%Cu)		Al alloy (99.5% Al / 0.5%Cu)	
Die passivation thickness range	SiN (0.93 um)		SiN (0.93 um)		SiN (0.93 um)	
No of masks Steps	13		13		13	
Die Size (W/L/Thickness)	1750um x 1650um x 254um		1750um x 1650um x 254um		1750um x 1650um x 254um	
Die Process / Technology	BCD/3um/700V 1P1M		BCD/3um/700V 1P1M		BCD/3um/700V 1P1M	
Die Quantity (eg. Die per package)	1		1		1	
DB Epoxy/Solder Type	Epoxy		Epoxy		Epoxy	
Die Attach Material	9005SP		9005SP		84-1LMISR4	
Wire Bond Material (Au, Cu, Al)	Cu		Cu		Cu	
Wire Diameter	0.8mil		0.8mil		0.8mil	
Front Metal Thickness	1um		1um		1um	
Leadframe Type	SOP-8L EP C		SOP-8L EP C		SOIC8-EP J	
Leadframe Material	CDA194		CDA194		A194	
Molding Compound Type	EME-G631K		EME-G631K		EME-G700	
Green Compound (Yes/No)	Yes		Yes		Yes	
Lead-Free (Yes/No)	Yes		Yes		Yes	
Assembly Site	CAT		CAT		SAT	
Test Site	CAT		CAT		SAT	
DataSheet	AL9910A		AL9910A		AL9910_A	

Realibility Testing

Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail
MSL1 Pre-cond	Bake 125C	24 Hrs	0/154	X	Pass	QBS to Qual Device 1		X	Pass
	Soak 85C, 85% RH	168Hrs	0/154	X	Pass	QBS to Qual Device 1		X	Pass
	IR reflow 260C	3 cycles	0/154	X	Pass	QBS to Qual Device 1		X	Pass
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
		500 Hrs	0/77	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
		1000 Hrs	0/77	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
TC	-65C-150C	500 cycles	0/77	X	Pass	QBS to Qual Device 1		X	Pass
		1000 cycles	0/77	X	Pass	QBS to Qual Device 1		X	Pass
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
HTSL	150C	168 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
		500 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
		1000 Hrs	0/77	X	Pass	QBS to Qual Device 1		X	Pass
Latch-up	JESD78	100mA	0/6	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
	MM (AEC-Q100-003)	+-200V	0/3	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	X	Pass	QBS to Qual Device 1		X	Pass
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	Pass	QBS to Qual Device 1		X	Pass
WBS	JESD22-B116B	Cpk>1.66	0/30	X	Pass	QBS to Qual Device 1		X	Pass
PD	JESD22-B100B	Package Outline	0/30	X	Pass	QBS to QBS Device 1			
Solderability	245C +0/5C	5 Seconds	0/10	X	Pass	QBS to QBS Device 1			
Char	-40C, 0C, 25C, 85C	Operating Range	0/30	QBS to QBS Device 1		QBS to QBS Device 1		X	Pass

Summary:
Submitted By:
Approved By: __________

Certificate of Design, Construction & Qualification

Description: AP3586B_C/A3585A_B_C Qualification

	Qual Device 1	Qual Device 2	Qual Device 3	QBS Device 1	QBS Device 2
Part Number	AP3585AMTR-G1	AP3585BMTR-G1,AP3585CMTR-G1	AP3586BMTR-G1,AP3586CMTR-G1	AP3585MTR-G1,AP3586AMTR-G1	AP3585MPTR-G1,AP3586AMPTR-G1
Package	SOP-8L	SOP-8L	SOP-8L	SOP-8L	SOP-8-EP
Package Size	4.9*6.0*1.6	4.9*6.0*1.6	4.9*6.0*1.6	4.9*6.0*1.6	4.9*6.0*1.6
Die Name(s)	BN013AC-2	BN013AD-2	BN013AB-2	BN013AA-2	BN013AA-2
Wafer FAB	BCD FAB2	BCD FAB2	BCD FAB2	BCD FAB2	BCD FAB2
Wafer Diameter	6	6	6	6	6
Bond Type (at Die)	ball	ball	ball	ball	ball
Bond Type (at LF)	wedge	wedge	wedge	wedge	wedge
No. of bond over active area	4	4	4	4	4
Glass Transistion Temp	130℃	130℃	130℃	130℃	130℃
Lead Material Manufacture	NBKQ	NBKQ	NBKQ	NBKQ	NBKQ
Header plating (Die Land Area)	Ag	Ag	Ag	Ag	Ag
Max Junction Temp	150℃	150℃	150℃	150℃	150℃
Max Thermal resistance Junc (case)	22℃/w	22℃/w	22℃/w	22℃/w	22℃/w
Max Thermal resistance Junc (amibent)	70℃/w	70℃/w	70℃/w	70℃/w	70℃/w
Front Metal Type	AL/CU	AL/CU	AL/CU	AL/CU	AL/CU
Die passivation thickness range	1u	1u	1u	1u	1u
No of masks Steps	14	14	14	14	14
Die Size (W/L/Thickness)	1840*1410*250	1840*1410*250	1840*1410*250	1840*1410*250	1840*1410*250
Die Process / Technology	BCD 1.2U	BCD 1.2U	BCD 1.2U	BCD 1.2U	BCD 1.2U
Die Quantity (eg. Die per package)	1	1	1	1	1
DB Epoxy/Solder Type	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy
Die Attach Material	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4
Wire Bond Material (Au, Cu, Al)	Cu	Cu	Cu	Cu	Cu
Wire Diameter	1.0mil	1.0mil	1.0mil	1.0mil	1.0mil
Front Metal Thickness	1.5um	1.5um	1.5um	1.5um	1.5um
Leadframe Type	SOIC-8(K)	SOIC-8(K)	SOIC-8(K)	SOIC-8(K)	SOIC8L-EP
Leadframe Material	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH
Molding Compound Type	EME-G600	EME-G600	EME-G600	EME-G600	EME-G600
Green Compound (Yes/No)	Yes	Yes	Yes	Yes	Yes
Lead-Free (Yes/No)	Yes	Yes	Yes	Yes	Yes
Assembly Site	SAT	SAT	SAT	SAT	SAT
Test Site	SAT	SAT	SAT	SAT	SAT
DataSheet	AP3585A_B_C R1.2	AP3585A_B_C R1.2	AP3586A_B_C D1.2	AP3585 D1.0/AP3586A D1.2	AP3585 D1.0/AP3586A D1.2

Realibility Testing

Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail
MSL3 Pre-cond	Bake 125C	24 Hrs	0/154	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
	Soak 30C, 60% RH	192Hrs	0/154	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
	IR reflow 260C	3 cycles	0/154	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	X	PASS
		500 Hrs	0/77	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	X	PASS
		1000 Hrs	0/77	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	X	PASS
TC	-65C-150C	500 cycles	0/77	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
		1000 cycles	0/77	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
HTSL	150C	168 Hrs	0/77	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
		500 Hrs	0/77	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
		1000 Hrs	0/77	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
Latch-up	JESD78	100mA	0/6	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
	MM (AEC-Q100-003)	+-200V	0/3	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
WBP	MIL-STD883-2011	Cpk>1.66	0/30	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
WBS	JESD22-B116B	Cpk>1.66	0/30	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	QBS TO QBS Device 1	PASS	X	PASS	X	PASS
Char	-40C, 25C, 90C	5 Seconds	0/10	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	QBS TO QBS Device 2	PASS	X	PASS

Summary:	DaQing Xu,2014/07/25
Submitted By:	Piqin Sun,2014/07/22
Approved By:	DaQing Xu, 2014/08/19

Certificate of Design, Construction & Qualification

Description: To add a new A/T site (HuaDa) for AH2984-PG-B

	Qual Device 1	QBS Device 1	QBS Device 2	QBS Device 3	QBS Device 4
Part Number	AH2984-PG-B	AH2984-PG-B	ATS276-PG-B-X	AH277AZ4-CG1	MH276
Package	SIP-4L(TO-94)	SIP-4L(SIP-4L)	SIP-4L(TO-94)	SIP-4L(TO-94)	SIP-4L(TO-94)
Package Size	5.22*18.15*1.56 mm	5.22*18.15*1.56 mm	5.22*18.15*1.56 mm	5.22*18.15*1.56 mm	5.22*18.15*1.56 mm
Die Name(s)	A0197C0	A0197C0	ATC1179L0	N/A	N/A
Wafer FAB	LSC	LSC	LSC	BCD	N/A
Wafer Diameter	150mm	150mm	150mm	150mm	N/A
Bond Type (at Die)	Ball	Ball	Ball	Ball	Ball
Bond Type (at LF)	Wedge	Wedge	Wedge	Wedge	Wedge
No. of bond over active area	0	0	0	0	0
Glass Transistion Temp	135 degree C	135 degree C	165 degree C	N/A	N/A
Header plating (Die Land Area	Ag	Ag	NA	N/A	N/A
Max Junction Temp	150 degree C	150 degree C	150 degree C	150 degree C	150 degree C
Max Thermal resistance Junc (case)	15 degree C/W	15 degree C/W	185 degree C/W	49 degree C/W	N/A
Max Thermal resistance Junc (amibent)	125 degree C/W Device mounted on FR-4 substrate, 2"*2", 2oz, copper, double-sided PC boards.	125 degree C/W Device mounted on FR-4 substrate, 2"*2", 2oz, copper, double-sided PC boards.	27 degree C/W no heatsink, no air flow	227 degree C/W	N/A
Front Metal Type	98.5% Al+1.0% Si+0.5%Cu	98.5% Al+1.0% Si+0.5%Cu	98.5% Al+1.0% Si+0.5%Cu	N/A	N/A
Die passivation thickness range	SiO2 (0.6um) SiN (0.6um)	SiO2 (0.6um) SiN (0.6um)	SiO2 (0.6um) SiN (0.6um)	N/A	N/A
No of masks Steps	15	15	8	N/A	N/A
Die Size (W/L/Thickness)	1690*1300*340 (um)	1690*1300*355 (um)	1445*1020*350 um	N/A	980umx1030um (W/L)
Die Process / Technology	CMOS/1um/40V/15V/2P2M	CMOS/1um/40V/15V/2P2M	Bipolar/2um/20V/SM	N/A	N/A
Die Quantity (eg. Die per package)	1	1	1	1	1
DB Epoxy/Solder Type	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy
Die Attach Materia	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4
Wire Bond Material (Au, Cu, Al	Au	Au	Cu	Au	Au
Wire Diameter	1.1mil	1.2mil	1mil	1.1mil	1.0mil
Front Metal Thickness	1.5um	1.5um	1.5um	N/A	N/A
Leadframe Type	TO-94	SIP-4L	TO-94	TO-94	TO-94
Leadframe Materia	KFC	KFC	KFC	KFC	KFC
Molding Compound Type	EK5600G	G600	EK5600G	EK5600G	EK5600G
Green Compound (Yes/No	Yes	Yes	Yes	Yes	Yes
Lead-Free (Yes/No	Yes	Yes	Yes	Yes	Yes
Assembly Site	HuaDa	SAT	HuaDa	HuaDa	HuaDa
FT Test Site	HuaDa	SAT	HuaDa	HuaDa	HuaDa
Realibility Test Site	DHC	DHC	DHC	BCD	HuaDa
DataSheet	AH2984	AH2984	ATS276G	AH277A	MH276

Realibility Testing

Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail		Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	QBS to QBS Device 1		X	pass	X	pass				
		500 Hrs	0/77	QBS to QBS Device 1		X	pass	X	pass				
		1000 Hrs	0/77	QBS to QBS Device 1		X	pass	X	pass				
TC	-65C-150C	500 cycles	0/77	X	pass	X	pass	X	pass	X	pass	X	pass
		1000 cycles	0/77	X	pass			X	pass			X	pass
HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	X	pass	X	pass	X	pass	X	pass		
HTSL	150C	168 Hrs	0/77	X	pass	X	pass	X	pass	X	pass	X	pass
		500 Hrs	0/77	X	pass	X	pass	X	pass			X	pass
		1000 Hrs	0/77	X	pass	X	pass	X	pass			X	pass
Latch-up	JESD78	100mA	0/6	X	pass	X	pass	X	pass				
ESD	HBM (AEC-Q100-002)	+-2KV	0/3	X	pass	X	pass	X	pass				
	MM (AEC-Q100-003)	+-200V	0/3	X	pass	X	pass	X	pass				
Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	X	pass			X	pass				
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	pass			X	pass				
WBS	JESD22-B116B	Cpk>1.66	0/30	X	pass			X	pass				
PD	JESD22-B100B	Package Outline	0/30	X	pass			X	pass				
Solderability	245C +0/5C	5 Seconds	0/10	X	pass			X	pass				
Char	-40C, 25C, 85C, 105C	Operating Range	0/30	QBS to QBS Device 1		X	pass	X	pass				

Summary: ____________________________

Submitted By:

Approved By:

Certificate of Design, Construction & Qualification

Automotive Grade Level		
	Grade 0	-40C to +150C ambient operating temperature range
	Grade 1	-40C to +125C ambient operating temperature range
	Grade 2	-40C to +105C ambient operating temperature range
	Grade 3	-40C to +85C ambient operating temperature range
	Grade 4	-0C to +70C ambient operating temperature range

Description: AEC-Q100 Qualification

	Qual device 1	Qual device 2	Qual device 3	Qual device 4	Qual device 5	QBS device 1	QBS device 2	QBS device 3	QBS device 4	QBS device 5	QBS device 6
Part Number	TLV431AQFTA, TLV431BQFTA	ZTL431AQFTA	LM4041CFTA, LM4041DFTA, LM4041CQFTA, LM4041DQFTA	LM4041DADJFTA, LM4041DADJQFTA	LM4040C50QFTA	TL431ASA-7	TLV431AF	ZTL431AF	TLV431AE5 Die qual	TLV431AF Die qual	TLV431AH6 Die qual
Automotive Grade	1	1	1	1	1	1	1	1	1	1	1
Package	SSOT23	SSOT23	SSOT23	SSOT23	SSOT23	SSOT23	SSOT23	SSOT23	SOT235	SOT23	SOT363
Package Size	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	3 x 1.4 x 1.1	2.15 x 1.3 x 1.0
Parent die name	ZAD06A	ZAD205A	ZAD06A	ZAD06A	ZAD06A	ZDH368A	ZAD06A	ZAD205A	ZAD06A	ZAD06A	ZAD06A
Die Name(s)	TLV431N	ZTL43101F	LM4041N	LM4041ADJN	LM404050N	TL431N	TLV431N	ZTL43101F	TLV431N	TLV431N	TLV431N
Wafer FAB	OFAB	OFAB	OFAB	OFAB	OFAB	OFAB	OFAB	OFAB	OFAB	OFAB	OFAB
Wafer Diameter	150mm	150mm	150mm	150mm	150mm	150mm	150mm	150mm	150mm	150mm	150mm
Bond Type (at Die)	Ball	Ball	Ball	Ball	Ball	Ball	Ball	Ball	Ball	Ball	Ball
Bond Type (at LF)	Stitch	Stitch	Stitch	Stitch	Stitch	Stitch	Stitch	Stitch	Stitch	Stitch	Stitch
No. of bond over active area	3	3	3	3	2	3	3	3	3	3	3
Glass Transistion Temp	125°C	125°C	125°C	125°C	125°C	125°C	125°C	125°C	120	160	120
Lead Material Manufacture	100% Tin	100% Tin	100% Tin	100% Tin	100% Tin	100% Tin	100% Tin	100% Tin	100% Tin	100% Tin	100% Tin
Header plating (Die Land Area)	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	Ag 3.0-8.0um	3.0-8.0um Ag
Max Junction Temp	150°C	150°C	150°C	150°C	150°C	150°C	150°C	150°C	150°C	150°C	150°C
Max Thermal resistance Junc (amibent)	380°C/W	380°C/W	380°C/W	380°C/W	380°C/W	380°C/W	380°C/W	380°C/W	250C/W	380°C/W	380C/W
Front Metal Type	AlCu0.5%	AlCu0.5%	AlCu0.5%	AlCu0.5%	AlCu0.5%	AlSi1%Cu0.5%	AlCu0.5%	AlCu0.5%	AlCu0.5%	AlCu0.5%	AlCu0.5%
Die passivation thickness range	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN	5000Å(+/-500Å)SiO2 + 5000Å(+/-500Å)SiN
No of masks Steps	13	13	13	13	13	13	13	13	13	13	13
Die Size (W/L/Thickness)	680 x 680 x 203	510 x 540 x 203	680 x 680 x 203	680 x 680 x 203	680 x 680 x 203	510 x 540 x 203	680 x 680 x 203	510 x 540 x 203	680 x 680 x 203	680 x 680 x 203	680 x 680 x 203
Die Process / Technology	ZAD 20V Bipolar	ZAD 20V Bipolar	ZAD 20V Bipolar	ZAD 20V Bipolar	ZAD 20V Bipolar	ZDH 40V bipolar	ZAD 20V Bipolar	ZAD 20V Bipolar	ZAD 20V Bipolar	ZAD 20V Bipolar	ZAD 20V Bipolar
Die Quantity (eg. Die per package)	1	1	1	1	1	1	1	1	1	1	1
DB Epoxy/Solder Type	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy
Die Attach Material	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4	84-1LMISR4	8200TI	8200TI	8200TI
Wire Bond Material (Au, Cu, Al)	Cu	Cu	Cu	Cu	Cu	Cu	Cu	Cu	Au	Au	Au
Wire Diameter	20um	20um	20um	20um	20um	20um	20um	20um	25um	25um	25um
Front Metal Thickness	2.6um	2.6um	2.6um	2.6um	2.6um	2.6um	2.6um	2.6um	2.6um	2.6um	2.6um
Leadframe Type	DLF00648 (SOT23-U)	DLF00648 (SOT23-U)	DLF00648 (SOT23-U)	DLF00648 (SOT23-U)	DLF00648 (SOT23-U)	DLF00648 (SOT23-U)	DLF00648 (SOT23-U)	DLF00648 (SOT23-U)	SOT-25A	SOT-23R	SOT363R
Leadframe Material	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	EFTEC64T	CDA194	Alloy 42
Molding Compound Type	CEL1700HF40SK-D3	CEL1700HF40SK-D3	CEL1700HF40SK-D3	CEL1700HF40SK-D3	CEL1700HF40SK-D3	CEL1700HF40SK-D3	CEL1700HF40SK-D3	CEL1700HF40SK-D3	CEL1702HF9SK	KTMC1050G	CEL1702HF9SK
Green Compound (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Free (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Assembly Site	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SAT	UNISEM
Test Site	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SAT	SAT	UNISEM
DataSheet	DS36916	DS36915	DS37001	DS37001	DS36989	DS35044	DS32088	DS33263	DS32088	DS32088	DS32088

Reliability Testing

Test	Test Name	Test Conditions	Duration / Limits	Test Method	Test Group	Lots	Fail/SS	Test Temp	Qual device 1: X = Test Needed	Results Pass/Fail	Qual device 2: X = Test Needed	Results Pass/Fail	Qual device 3: X = Test Needed	Results Pass/Fail	Qual device 4: X = Test Needed	Results Pass/Fail	Qual device 5: X = Test Needed	Results Pass/Fail
Test Group A - Accelerated Environment Stress Tests																		
MSL1 Pre-cond	Pre-Conditioning	Bake 125C	24 Hrs	JESD22 A113 JEDC J-STD-020	A	3 WF	0/154	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
		Soak 85C, 85% RH	168Hrs	JEDC J-STD-020	A	3 WF	0/154	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
		IR reflow 260C	3 cycles	JEDC J-STD-020	A	3 WF	0/154	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
HAST	Highly Accelerated Stress Test	130C, 85%RH 33.3 psia 100% Bias	96 Hrs	JESD22-A110	A	3 WF	0/77	Room/Hot	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
AC	Autoclave	T=121℃ 15PSIG 100%RH	96 Hrs	JEDD22 A102	A	3 WF	0/77	Room/Hot	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
TC	Temperature Cycle	-65C-150C (Grade 1)	500 cycles	JEDD22 A104	A	3 WF	0/77	Hot	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
		-65C-150C (Grade 1)	1000 cycles	JEDD22 A104	A	3 WF	0/77	Hot	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
WBP after TC	Wire Bond After Temp Cycle	MIL-STD883-2011	500 & 1000 cycles	MIL-STD883-2011	A	3 WF	0/30 bonds	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
HTSL	High Temp Storage Life	150C (Grade 1)	168 Hrs	JESD11 A103	A	1 WF	0/45	Room/Hot	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
		150C (Grade 1)	500 Hrs	JESD11 A103	A	1 WF	0/45	Room/Hot	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
		150C (Grade 1)	1000 Hrs	JESD11 A103	A	1 WF	0/45	Room/Hot	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
Test Group B - Accelerated Lifetime Simulation Tests																		
HTOL	High Temp Operating Life	Ta=125C, 100% Vcc	168 Hrs	JESD22 A108	B	3 WF	0/77	Room/Hot/Cold	QBS to QBS device 2,4,5		QBS to QBS device 3,4,5		QBS to QBS device 2,4,5		QBS to QBS device 2,4,5		QBS to QBS device 2,4,5	
		or Ta=150 for 408 hrs	500 Hrs	JESD22 A108	B	3 WF	0/77	Room/Hot/Cold	QBS to QBS device 2,4,5		QBS to QBS device 3,4,5		QBS to QBS device 2,4,5		QBS to QBS device 2,4,5		QBS to QBS device 2,4,5	
			1000 Hrs	JESD22 A108	B	3 WF	0/77	Room/Hot/Cold	QBS to QBS device 2,4,5		QBS to QBS device 3,4,5		QBS to QBS device 2,4,5		QBS to QBS device 2,4,5		QBS to QBS device 2,4,5	
Test Group C - Package Assembly Integrity Tests																		
WBS	Wire Bond Shear	JESD22-B116B	Cpk>1.66	AEC-Q100-001	C	30 Bonds	0/5	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
WBP	Wire Bond Pull	MIL-STD883-2011	Cpk>1.66	MIL-STD883-2011	C	30 Bonds	0/5	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
SD	Solderability	>95% Coverage	5 Seconds	JESD22 B102	C	3 WF	0/15	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
PD	Physical Dimensions	Ppk>1.67 and Cpk>1.33	Package Outline	JESD22 B100 JESD22 B108	C	3 WF	0/10	Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	
Test Group E - Electrical Verification																		
ESD	Human Body Model	HBM (AEC-Q100-002)	+-2KV	(AEC-Q100-002)	E	1 Assy	0/3	Room/Hot	QBS to QBS device 2		QBS to QBS device 3		>4000V R/T only	Pass	QBS to Qual device 3		3500V	Pass
	Machine Model	MM (AEC-Q100-003)	+-200V	(AEC-Q100-003)	E	1 Assy	0/3	Room/Hot	QBS to QBS device 2		QBS to QBS device 3		>400V R/T only	Pass	QBS to Qual device 3		350V	Pass
	Charged Device Model	CDM (AEC-Q100-011)	+-750V	(AEC-Q100-011)	E	1 Assy	0/3	Room/Hot	QBS to QBS device 2		QBS to QBS device 3		QBS to QBS device 2		QBS to Qual device 3		>1000V	Pass
LU	Latch-up (Class I)	Max Operating Ta or Tc or Tj	100mA	JESD78	E	1 Assy	0/6	Room	QBS to QBS device 2		x		QBS to QBS device 2		QBS to Qual device 3		0/6	Pass
Char	Characterization	Typ -40C, 0C, 25C, 85C, 125C	Operating Range	AEC-Q003	E		0/30	Room	complete		complete		complete		complete		complete	
Test Group G - Cavity Package Integrity Tests (Ceramic Testing Only)																		
DS	Die Shear	Die Shear		Mil-STD-883 Method 2019	G			Room	QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3		QBS to QBS device 1, 2, 3	

Test	Test Name	QBS device 1: X = Test Needed	Results Pass/Fail	QBS device 2: X = Test Needed	Results Pass/Fail	QBS device 3: X = Test Needed	Results Pass/Fail	QBS device 4: X = Test Needed	Results Pass/Fail	QBS device 5: X = Test Needed	Results Pass/Fail	QBS device 6: X = Test Needed	Results Pass/Fail
Test Group A - Accelerated Environment Stress Tests													
MSL1 Pre-cond	Pre-Conditioning	0/231	Pass	0/231	Pass	0/231	Pass						
		0/231	Pass	0/231	Pass	0/231	Pass						
		0/231	Pass	0/231	Pass	0/231	Pass						
HAST	Highly Accelerated Stress Test	0/77	Pass	0/77	Pass	0/77	Pass						
AC	Autoclave	0/77	Pass	0/77	Pass	0/77	Pass						
TC	Temperature Cycle	0/77	Pass	0/77	Pass	0/77	Pass						
		0/77	Pass	0/77	Pass	0/77	Pass						
WBP after TC	Wire Bond After Temp Cycle	0/30	Pass	0/30	Pass	0/30	Pass						
HTSL	High Temp Storage Life	0/45	Pass	0/45	Pass	0/45	Pass						
		0/45	Pass	0/45	Pass	0/45	Pass						
		0/45	Pass	0/45	Pass	0/45	Pass						
Test Group B - Accelerated Lifetime Simulation Tests													
HTOL	High Temp Operating Life	0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass
		0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass
		0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass	0/77	Pass
Test Group C - Package Assembly Integrity Tests													
WBS	Wire Bond Shear	0/5	Pass	0/5	Pass	0/5	Pass						
WBP	Wire Bond Pull	0/5	Pass	0/5	Pass	0/5	Pass						
SD	Solderability	0/45	Pass	0/45	Pass	0/45	Pass						
PD	Physical Dimensions	0/10	Pass	0/10	Pass	0/10	Pass						
Test Group E - Electrical Verification													
ESD	Human Body Model	1000V R/T only	Pass	>4000V 25 & +125	Pass	2000V R/T only	Pass						
	Machine Model	>400V R/T only	Pass	>400v 25 & +125	Pass	200V R/T only	Pass						
	Charged Device Model	>1000V R/T only	Pass	>1000V 25 & + 125	Pass	>1000V R/T only	Pass						
LU	Latch-up (Class I)			0/6	Pass								
Char	Characterization												
Test Group G - Cavity Package Integrity Tests (Ceramic Testing Only)													
DS	Die Shear	X	Pass	X	Pass	X	Pass						

Summary: S Mann
Submitted By: S Mann
Approved By: ____________________