DATE: 27th May, 2021

PCN #: 2520

PCN Title: Qualified Additional Bump Site and Assembly/Test (A/T) Sites

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-2520 REV 1

Notification Date:	Implementation Date:	Product Family:	Change Type:	PCN #:
27th May, 2021	27th Aug, 2021	Analog Semiconductors	Qualified Additional Bump Site and A/T Sites	**2520**

TITLE

Qualified Additional Bump Site and Assembly/Test (A/T) Sites

DESCRIPTION OF CHANGE

This PCN is being issued to notify customers that in order to assure continuity of supply, Diodes has qualified an additional internal A/T site "Diodes Technology (Cheng Du) Company Limited" (CAT) located in Chengdu, China (to include use of PdCu bond wire), an additional bump facility SJ Semiconductor Corporation (SJ-Semi) located in JiangYin City, China, and an additional A/T site Greatek Electronics Inc. Greatek Toufen Facility (GTK Toufen) located in Toufen, Taiwan.

Full electrical characterization and high reliability testing has been completed on representative part numbers to ensure no change to device functionality or electrical specifications in the datasheet. Refer to the attached qualification report embedded in this file (to view, download this PCN file then open it with a PDF viewer to see the attached qual report).

IMPACT

Continuity of Supply. There will be no change to the Form, Fit or Function of products affected, unless specifically indicated. No change in datasheet parameters and product performance.

PRODUCTS AFFECTED

Table 1 - Qualified Additional A/T Site (CAT) with PdCu Bond Wire

Table 2 - Qualified Additional Bump Site (SJ-Semi) and A/T Site (CAT)

Table 3 - Qualified Additional A/T Site (GTK Toufen)

WEB LINKS

Manufacturer's Notice:	https://www.diodes.com/quality/product-change-notices/diodes-product-change-notices/
For More Information Contact:	https://www.diodes.com/about/contact-us/contact-sales/
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.

Table 1 - Qualified Additional A/T Site (CAT) with PdCu Bond Wire

AP64350SP-13	AP64351SP-13	AP64352SP-13	AP64500SP-13	AP64501SP-13	

Table 2 - Qualified Additional Bump Site (SJ-Semi) and A/T Site (CAT)

AP62150Z6-7	AP62200Z6-7	AP62201Z6-7	AP62250Z6-7	AP62300Z6-7	AP62301Z6-7

Table 3 - Qualified Additional A/T Site (GTK Toufen)

PI1EQX512AXUAEX	PI3DPX8100ZLDEX	PI3HDMI245-AZLEX	PI3VDP12412ZHEX	PI6C59S6005ZDIEX	PI6CG33402CZHIEX
PI1EQX522ZLEX	PI3DPX8121ZLDEX	PI3HDMI301ZLEX	PI3VDP1430ZBEX	PI6CB18200ZDIEX	PI6CG33402CZHIEX-13R
PI2DBS212ZHEX	PI3EQX1001XUAEX	PI3HDMI412ADZBEX	PI3VDP1431AZLSEX	PI6CB18200ZDIEX-13R	PI6CG33402ZHIEX
PI2DDR3212ZLEX	PI3EQX1002B1ZLEX	PI3HDMI412FT-BZHEX	PI3VDP1431ZLSEX	PI6CB18401ZHIEX	PI6CG33402ZHIEX-13R
PI2DDR321ZLEX	PI3EQX1002B2ZLEX	PI3HDMI511AZLEX	PI3VDP3212ZLEX	PI6CB18401ZHIEX-13R	PI6CG33601CZLAIEX
PI2EQX3201BZFEX	PI3EQX1002BZLEX	PI3HDMI511ZLEX	PI3VDP411LSAZBEX	PI6CB18601ZLAIEX	PI6CG33601CZLAIEX-13R
PI2EQX3232AZDEX	PI3EQX1002E2ZREX	PI3HDX1204B1ZHEX	PI3VDP411LSRZBEX	PI6CB18601ZLAIEX-13R	PI6CG33602CZLAIEX
PI2EQX4401DZFEX	PI3EQX1002EZREX	PI3HDX1204B1ZHIEX	PI3VDP411LSTZBEX	PI6CB18801ZLIEX	PI6CG33602CZLAIEX-13R
PI2EQX4432DZDEX	PI3EQX1004B1ZHEX	PI3HDX1204DZHEX	PI3VDP411LSZBEX	PI6CB18801ZLIEX-13R	PI6CG33801CZLIEX
PI2EQX502TZHEX	PI3EQX1004B2ZHEX	PI3HDX1204EZHEX	PI3VDP612-AZFEX	PI6CB332000ZDIEX	PI6CG33801CZLIEX-13R
PI2EQX5964ZFEX	PI3EQX1004E2ZTFEX	PI3HDX1204EZLEX	PI3VDP612-AZHEX	PI6CB33201ZDIEX	PI6CG33801ZLIEX
PI2EQX5984ZLEX	PI3EQX1004EZTFEX	PI3HDX12211ZHEX	PI3VEDP212ZLEX	PI6CB33201ZDIEX-13R	PI6CG33801ZLIEX-13R
PI2EQX5984ZLIEX	PI3EQX1004ZHEX	PI3HDX12221ZLDEX	PI3WVR12412ZHEX	PI6CB33202ZDIEX	PI6CG33802CZLIEX
PI2EQX6812ZHEX	PI3EQX10312ZHEX	PI3HDX231ZLEX	PI3WVR12612ZLEX	PI6CB33202ZDIEX-13R	PI6CG33802CZLIEX-13R
PI2EQX6874ZFEX	PI3EQX10612ZLCEX	PI3HDX412BDZBE	PI3WVR13412ZHEX	PI6CB33401ZHIEX	PI6CG33802ZLIEX
PI2EQXDP101-AZFEX	PI3EQX10908AZFEX	PI3HDX412BDZBEX	PI3WVR31310AZLEX	PI6CB33401ZHIEX-13R	PI6CG33802ZLIEX-13R
PI2PCIE2212ZHEX	PI3EQX1204-CZHEX	PI3HDX511AZLSEX	PI3WVR626XEBEX	PI6CB33402ZHIEX	PI6LC4820ZDEX
PI2PCIE2412ZHEX	PI3EQX1204EZHEX	PI3HDX511DZLEX	PI4IOE5V6416ZDEX	PI6CB33402ZHIEX-13R	PI6LC4830ZHEX
PI2PCIE2422ZHEX	PI3EQX12902AZLEX	PI3HDX511EZLSEX	PI4IOE5V9535ZDEX	PI6CB33601ZLAIEX	PI6LC4831BZBIEX
PI2PCIE2442ZHEX	PI3EQX12902BZLEX	PI3HDX511FZLEX	PI4IOE5V9539ZDEX	PI6CB33601ZLAIEX-13R	PI6LC4833ZBIE
PI2USB3212ZHEX	PI3EQX12904AZHEX	PI3HDX511FZLIEX	PI4IOE5V9554ZHEX	PI6CB33602ZLAIEX	PI6LC4833ZBIEX
PI2USB4122ZHEX	PI3EQX12908A2ZFEX	PI3L2500ZHEX	PI4IOE5V9555ZDEX	PI6CB33602ZLAIEX-13R	PI6LC4840ZHEX
PI3A6386ZLEX	PI3EQX12908AZFEX	PI3L500-AZFEX	PI4IOE5V96224ZLEX	PI6CB33801ZLIEX	PI6LC4872-01ZDIEX
PI3CH3244ZHEX	PI3EQX16000ZHEX	PI3L720ZHEX	PI4IOE5V96248ZLEX	PI6CB33801ZLIEX-13R	PI6LC48L0201AZHIE
PI3CH3345ZHEX	PI3EQX16012ZLDEX	PI3PCIE2215ZHEX	PI4IOE5V9673ZDEX	PI6CB33802ZLIEX	PI6LC48L0201AZHIEX
PI3CH800ZHEX	PI3EQX16021ZLDEX	PI3PCIE2415ZHEX	PI4MSD5V9548AZDEX	PI6CB33802ZLIEX-13R	PI6LC48P0201AZHIE
PI3CSW12ZUAEX	PI3EQX16612ZLDEX	PI3PCIE2612-AZFEX	PI5USB2546HZHEX	PI6CBF18501ZLAIEX	PI6LC48P0201AZHIEX
PI3DBS12212AZBSEX	PI3EQX16621ZLDEX	PI3PCIE3212ZBEX	PI5USB30216BXUAEX	PI6CBF18501ZLAIEX-13R	PI6LC48P0301AZHEX
PI3DBS12412AZLEX	PI3EQX16812ZLDEX	PI3PCIE3412AZLEX	PI6C49021ZDIEX	PI6CDBL401BZHIEX	PI6LC48P0301AZHIEX
PI3DBS16212ZBSEX	PI3EQX16821ZLDEX	PI3PCIE3415AZHE+DRX	PI6C4911510ZHIEX	PI6CFGL201BZDIEX	PI6LC48P03AZHIEX
PI3DBS16213ZLEX	PI3EQX16908GLZLEX	PI3PCIE3415AZHEX	PI6C49S1510AAZDIEX	PI6CFGL401BZHIEX	PI6LC48S0401ZLIEX
PI3DBS16215ZBBEX	PI3EQX2004ZHEX	PI3PCIE3442AZHEX	PI6C49S1510AZDIEX	PI6CFGL601BZHIEX	PI6LC48S04ZHIEX
PI3DBS16222ZLEX	PI3EQX502IZHEX	PI3USB102EZLIEX	PI6C49S1510BZDIEX	PI6CG15401ZHIEX	PI6LC48S25AZBBIEX
PI3DBS16412ZHEX-G	PI3EQX5801ZDEX	PI3USB302-AZBEX	PI6C49X0208ZHIEX	PI6CG18200ZDIEX	PI6LC48S25BZBBIEX
PI3DBS16415ZHEX	PI3EQX6741STZDEX	PI3USB30532ZLEX	PI6C49X0210-AZHIEX	PI6CG18200ZDIEX-13R	PI6LC48S25ZBBEX
PI3DBS16415ZLCEX	PI3EQX6801AZDEX	PI3USB31531ZLCEX	PI6C49X0210ZHIEX	PI6CG18201ZDIEX-13R	PI6LC48S25ZBBIEX
PI3DPX1202ZLAEX	PI3EQX7502AIZDEX	PI3USB31531ZTFAEX	PI6C557-01BZHIEX	PI6CG18401ZHIEX	PI6LC58S1101ZDIEX
PI3DPX1203BZHEX	PI3EQX7502BZDEX	PI3USB31532ZLCEX	PI6C5912006ZHIEX	PI6CG18401ZHIEX-13R	PI6LC58S11ZDIEX
PI3DPX1203BZHIEX	PI3EQX7502MZDEX	PI3USB31532ZLEX	PI6C5912012ZDIEX	PI6CG18801ZLIEX	PI6PCIEB24ZDEX
PI3DPX1203BZLEX	PI3EQX7741AIZDEX	PI3USB31534ZTFEX	PI6C5912016ZDIEX	PI6CG18801ZLIEX-13R	PI7C1401AZFEX
PI3DPX1203CZHEX	PI3EQX7742AIZHEX	PI3USB31ZUAEX	PI6C5913004-01ZHIEX	PI6CG33201CZDIEX	PI7C9X1170CZDEX
PI3DPX1203CZHIEX	PI3EQX7841ZDEX	PI3USB3200ZBBEX	PI6C5913004ZHIEX	PI6CG33201CZDIEX-13R	PI7C9X1172CZHEX
PI3DPX1203CZLEX	PI3EQX8908A2ZFEX	PI3USB3200ZREX	PI6C5916004ZHIEX	PI6CG33202CZDIEX	PI7C9X754ZBEX
PI3DPX1203ZHE+DRX	PI3EQX8908AZFEX	PI3USB32212ZLEX	PI6C5921512ZDIEX	PI6CG33202CZDIEX-13R	PI7C9X760CZDEX
PI3DPX1203ZHEX	PI3HDMI101-BZHEX	PI3USB4000DZUAEX	PI6C5921516ZDIEX	PI6CG33401CZHIEX	PI7C9X762CZHE
PI3DPX1207B1ZHEX	PI3HDMI101ZHEX	PI3USB4002AZUAEX	PI6C5922504ZHIEX	PI6CG33401CZHIEX-13R	PI7C9X762CZHEX
PI3DPX1207B1ZHIEX	PI3HDMI1310-AZLEX	PI3V713-AZLEX	PI6C5946002ZHIEX	PI6CG33401ZHIEX	
PI3DPX1207CZHEX	PI3HDMI201ZFEX	PI3V724ZLEX	PI6C5946004ZHIEX	PI6CG33401ZHIEX-13R	

Certificate of Design, Construction & Qualification

Description: Qualification of AP64350SP-13 AP64351SP-13 AP64352SP-13 AP64500SP-13 AP64501SP-13 AP64502SP-13

			Qual Device 1	Qual Device 2	Qual Device 3	Qual Device 4	Qual Device 5	Qual Device 6	QBS Device 1	QBS Device 2	QBS Device 3	QBS Device 4	QBS Device 5	QBS Device 6
General	Part Number		AP64351SP-13	AP64352SP-13	AP64350SP-13	AP64500SP-13	AP64501SP-13	AP64502SP-13	AP64351**Q**SP-13	AP64352**Q**SP-13	AP64350**Q**SP-13	AP64500**Q**SP-13	AP64501**Q**SP-13	AP64502**Q**SP-13
	Package		SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP	SO8-EP
	Wire Bond, Cu Piller, CSP		Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond	Wire Bond
	MSL Leve		1	1	1	1	1	1	1	1	1	1	1	1
	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	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	4.9*6.0*1.6	4.9*6.0*1.6
	Die Quantity (eg. Die per package)		1	1	1	1	1	1	1	1	1	1	1	1
	Die Name(1)		HA003A	HA003A	HA003A	HA004A	HA004A	HA004A	HA003A	HA003A	HA003A	HA004A	HA004A	HA004A
	Die Size (W/L/Thickness		2172 * 1860 (um^2)	2172 * 1860 (um^2)	2172 * 1860 (um^2)	2172 * 3060 (um^2)	2172 * 3060 (um^2)	2172 * 3060 (um^2)	2172 * 1860 (um^2)	2172 * 1860 (um^2)	2172 * 1860 (um^2)	2172 * 3060 (um^2)	2172 * 3060 (um^2)	2172 * 3060 (um^2)
	Die Process / Technology		0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)	0.18um 40V BCD (5045BD18BA)
	Wire Bond Material (Au, Cu, Al)		PdCu	PdCu	PdCu	PdCu	PdCu	PdCu	PdCu	PdCu	PdCu	PdCu	PdCu	PdCu
	Wire Diameter		1.7 mil	1.7 mil	1.7 mil	2.0 mil	2.0 mil	2.0 mil	1.7 mil	1.7 mil	1.7 mil	2.0 mil	2.0 mil	2.0 mil
Fab	Wafer FAB		Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek	Dongbu Hitek
	Wafer Diameter		8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"
	Wafer Thickness		725um	725um	725um	725um	725um	725um	725um	725um	725um	725um	725um	725um
	Top Metal Type/Bond Pad Composition		Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu	Thick Cu
	Top Metal Thickness	RDL layer	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)	13um (10umCu+2umNi+1umAu)
	Die passivation thickness range		0.9um	0.9um	0.9um	0.9um	0.9um	0.9um	0.9um	0.9um	0.9um	0.9um	0.9um	0.9um
	No. of bond over active are a		17	17	17	23	23	23	17	17	17	23	23	23
	Max Junction Temp		125 degree C	125 degree C	125 degree C	125 degree C	125 degree C	125 degree C	125 degree C	125 degree C	125 degree C	125 degree C	125 degree C	125 degree C
	Max Thermal resistance Junc (case)		45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W	45.8 °C/W
	Max Thermal resistance Junc (amibent)		42°C/W	42°C/W	42°C/W	42°C/W	42°C/W	42°C/W	42°C/W	42°C/W	42°C/W	42°C/W	42°C/W	42°C/W
	No of masks Steps		22	22	22	22	22	22	22	22	22	22	22	22
	Metal Layers		2	2	2	2	2	2	2	2	2	2	2	2
	RDL Design and Process		1P1M	1P1M	1P1M	1P1M	1P1M	1P1M	1P1M	1P1M	1P1M	1P1M	1P1M	1P1M
	Number of Transistors		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Package	*BackgrindThinkness*		250um	250um	250um	250um	250um	250um	250um	250um	250um	250um	250um	250um
	Backgrind Location		CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT
	Bond Type (at Die)		Ball	ball	ball	ball	ball	ball	Ball	ball	ball	ball	ball	ball
	Bond Type (at LF)		Wedge	wedge	wedge	wedge	wedge	wedge	Wedge	wedge	wedge	wedge	wedge	wedge
	DB Epoxy/Solder Type		Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy
	Die Attach Materia		9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)	9005SP(导电胶)
	Min Bond Pad Pitch		140*140um	140*140um	140*140um	140*140um	140*140um	140*140um	140*140um	140*140um	140*140um	140*140um	140*140um	140*140um
	# of pad/ball/pin Pitch			23	23	23	23	23		23	23	23	23	23
	Leadframe Type		SOP-8L EP E TYPE 12ROW	SOP-8L EP E TYPE 12ROW	SOP-8L EP E TYPE 12ROW	SOP-8L EP **D** TYPE 12ROW	SOP-8L EP **D** TYPE 12ROW	SOP-8L EP **D** TYPE 12ROW	SOP-8L EP E TYPE 12ROW	SOP-8L EP E TYPE 12ROW	SOP-8L EP E TYPE 12ROW	SOP-8L EP **D** TYPE 12ROW	SOP-8L EP **D** TYPE 12ROW	SOP-8L EP **D** TYPE 12ROW
	Leadframe Materia		CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194	CDA194
	Molding Compound Type		EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S	EME-G700L Type S
	Green Compound (Yes/No		Yes	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	Yes
AT/Rel	Assembly Site		CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT
	FT Test Site		CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT
	Realibility Test Site		CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT	CAT
	Qual Plan #		**20050301**	**20050301**	**20050301**	**20050301**	**20050301**	**20050301**	**19041604**	**19041604**	**19041604**	**20072103**	**20072103**	**20072103**

Realibility Testing

Test	Test Conditions	Duration / Limits	Test Method	Fail/SS	Lots Required	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail
MSL1 Pre-cond	**(JESD22-A113)** Bake 125C	24 Hrs	JESD22 A113 JEDC J-STD-020	0/154	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
	Soak 85C, 85% RH	168Hrs		0/154	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
	IR reflow 260C	3 cycles		0/154	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
Temp Cycle (TC)	**(JESD22-A104)** -65C-150C	500 cycles	JEDD22 A104	0/77	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
	Mounted on PCB Board (Daughter Card)	1000 cycles		0/77	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
HAST	**JESD22-A101/A110** 130C, 85%RH 33.3 psia Vcc = Op Max	96 Hrs	JESD22-A110	0/77	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
HTSL High Temperature Storage	**(JESD22-A103)** Ta>150C	168 Hrs	JESD A103	0/77	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
		500 Hrs		0/77	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
		1000 Hrs		0/77	3 Assy lots	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
HTOL	Ta=125C, 100% Vcc	168 Hrs	JESD22 A108	0/77	3 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	QBS to Qual Device 1		QBS to Qual Device 1		X	Pass	X	Pass	X	Pass
	or Ta=150 for 408 hrs	500 Hrs	JESD22 A108	0/77	3 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	QBS to Qual Device 1		QBS to Qual Device 1		X	Pass	X	Pass	X	Pass
		1000 Hrs	JESD22 A108	0/77	3 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	QBS to Qual Device 1		QBS to Qual Device 1		X	Pass	X	Pass	X	Pass
ELFR Earlier Life Failure Rate	Ta=125C, 100% Vcc	48 hrs	AEC-Q100-008	0/800	3 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	QBS to Qual Device 1		QBS to Qual Device 1		X	Pass	QBS to Qual Device one & QBS device 1-4		QBS to Qual Device one & QBS device 1-4	
WBS	JESD22-B116B	Cpk>1.66	AEC-Q100-001	0/5	30 Bonds	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
WBP	MIL-STD883-2011	Cpk>1.66	MIL-STD883-2011	0/5	30 Bonds	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
SD Solderability	>95% Coverage	5 Seconds	JESD22 B102	0/15	1 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
PD Physical Dimensions		Package Outline	JESD22 B100 JESD22 B108	Ppk>1.67 Cpk>1.33	**3 Assy**	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
Human Body Model	HBM (AEC-Q100-002)	+-2KV	(AEC-Q100-002)	0/3	1 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass 2KV	X	Pass 2KV	X	Pass 2KV	X	Pass 2KV with 25C 3.5KV with 125C	X	Pass 2KV with 25C 2.5KV with 125C	X	Pass 3KV with 25C & 125C
Charged Device Model	CDM (AEC-Q100-011)	+-750V	(AEC-Q100-011)	0/3	1 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass 1000V	X	Pass 1000V	X	Pass 1000V	X	Pass 2000V	X	Pass 2000V	X	Pass 2000V
LU Latch-up (Class II)	Max Operating Ta or Tc or Tj	100mA	JESD78	0/6	1 WF	QBS		QBS		QBS		QBS		QBS		QBS		X	Pass 100mA with 25C & 125C	X	Pass 100mA with 25C & 125C	X	Pass 100mA with 25C & 125C	X	Pass 200mA with 25C & 125C	X	Pass 200mA with 25C & 125C	X	Pass 200mA with 25C & 125C
Char Characterization	Typ -40C, ~~0C~~, 25C, 85C, 125C, 150C	Operating Range	AEC-Q003	0/30		QBS		QBS		QBS		QBS		QBS		QBS		Additional	Pass	Additional	Pass	Additional	Pass	X	Pass	X	Pass	X	Pass

Submitted By: Mike Yu 1/14/2021
Approved By:

Certificate of Design, Construction & Qualification

Description: Qualification of AP622xx_3xx SOT563 package parts SJSemi CAT MGF Flow

			Qual Device 1		Qual Device 2		Qual Device 3	
General	Part Number		AP62200WU-7-02		AP62200Z6-7-02		AP62200WU-7-02	
	Package		TSOT26		SOT563		TSOT26	
	Wire Bond, Cu Piller, CSP		Cu Pillar		Cu Pillar		Cu Pillar	
	MSL Level		1		1		1	
	Package Size		2.9*1.6*0.8		1.2*1.1*0.6		2.9*1.6*0.8	
	Die Quantity (eg. Die per package)		1		1		1	
	Die Name(1)		AD08070463B0		AD08070463B0		AD08070463B0	
	Die Size (W/L/Thickness)		708 /1206 (um)		708 /1206 (um)		708 /1206 (um)	
	Die Process / Technology		BCD, 0.18um, 16V/5V, 1P3M 1830BD15BA		BCD, 0.18um, 16V/5V, 1P3M 1830BD15BA		BCD, 0.18um, 16V/5V, 1P3M 1830BD15BA	
Fab	Wafer FAB		Dongbu Hitek		Dongbu Hitek		Dongbu Hitek	
	Wafer Diameter		8"		8"		8"	
	Wafer Thickness		725um		725um		725um	
	Top Metal Type/Bond Pad Composition		Thick Al		Thick Al		Thick Al	
	Top Metal Thickness		4um		4um		4um	
	No. of bond over active area		0		0		0	
	Max Junction Temp		125 degree C		125 degree C		125 degree C	
	Max Thermal resistance Junc (case)		12 °C/W		12 °C/W		12 °C/W	
	Max Thermal resistance Junc (amibent)		88°C/W		88°C/W		88°C/W	
	No of masks Steps		23		23		23	
	Metal Layers		3		3		3	
	Min Metal Width		0.196um		0.196um		0.196um	
	Min Metal Spacing		0.21um		0.21um		0.21um	
	Power Consumption		0.2W		0.8W		0.2W	
Package	*BackgrindThinkness*		280um		200um		280um	
	Backgrind Location		CAT		CAT		CAT	
	DB Epoxy/Solder Type		Solder		Solder		Solder	
	Die Attach Material		TF38		TF38		TF38	
	Min Bond Pad Pitch		160um		160um		160um	
	# of pad/ball/pin Pitch		6		6		6	
	Leadframe Type		TSOT23-6L FC-A TYPE 16ROW		SOT-563 FC-C Type 16R		TSOT23-6L FC-A TYPE 16ROW	
	Leadframe Material		A194 Etching, 0.152, Bare Cu		EFTE64 Etching, 0.100, Bare Cu		A194 Etching, 0.152, Bare Cu	
	Molding Compound Type		CEL-1700HF40SK-D3(M2)		CEL-1700HF40SK-D3(M2)		CEL-1700HF40SK-D3(M2)	
	Green Compound (Yes/No)		Yes		Yes		Yes	
	Lead-Free (Yes/No)		Yes		Yes		Yes	
AT/Rel	Assembly Site		CAT		CAT		CAT	
	FT Test Site		CAT		CAT		CAT	
	Realibility Test Site		CAT		CAT		CAT	
	Qual Plan #		20102005		20102005		20102005	

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
MSL1 Pre-cond	**(JESD22-A113)** Bake 125C	24 Hrs	0/154	X	Pass	X	Pass	X	Pass
	Soak 85C, 85% RH	168Hrs	0/154	X	Pass	X	Pass	X	Pass
	IR reflow 260C	3 cycles	0/154	X	Pass	X	Pass	X	Pass
Temp Cycle (TC)	**(JESD22-A104)** -65C-150C Mounted on PCB Board (Daughter Card)	500 cycles	0/77	X	Pass	X	Pass	X	Pass
		1000 cycles	0/77	X	Pass	X	Pass	X	Pass
HAST	**JESD22-A101/A110** 130C, 85%RH 33.3 psia Vcc = Op Max	96 Hrs	0/77	X	Pass	X	Pass	X	Pass
HTSL High Temperature Storage	**(JESD22-A103)** Ta>150C	168 Hrs	0/77	X	Pass	X	Pass	X	Pass
		500 Hrs	0/77	X	Pass	X	Pass	X	Pass
		1000 Hrs	0/77	X	Pass	X	Pass	X	Pass
SD Solderability	>95% Coverage	5 Seconds	0/15	X	Pass	X	Pass	X	Pass
PD Physical Dimensions		Package Outline	0/30	X	Pass	X	Pass	X	Pass
Human Body Model	HBM (AEC-Q100-002)	+-2KV	0/3	X	Pass 4.5KV	X	Pass 4.5KV	X	Pass 5KV
Charged Device Model	CDM (AEC-Q100-011)	+-750V	0/3	X	Pass 2000V	X	Pass 1500V	X	Pass 1500V
LU Latch-up (Class II)	Max Operating Ta or Tc or Tj	100mA	0/6	X	Pass 200mA	X	Pass 200mA	X	Pass 200mA
Char Characterization	Typ -40C, 0C, 25C, 85C, 125C	Operating Range	0/30	X	Pass				

Summary: Helen Hu 3/30/21
Submitted By: Mark Li 3/31/21
Approved By: Hiwen Hu 3/31/21

Certificate of Design, Construction & Qualification

DIODES
INCORPORATED

Description: Qualification of GTK QFN (F1 to F3) for non-automotive products

				Pkg QBS 1		Pkg QBS 2	
General	Part Number			PI1EQX512AXUAEX		PI2DPX1217XUAEX	
	DIO Package			X2-QFN2020-18		X2-QFN2845-32	
	PTC Package Code			XUA18 (PdCu) Sn		XUA32 (PdCu) Sn	
	Wire Bond, Cu Piller, CSP			Wirebond		Wirebond	
	MSL Level			MSL1		MSL1	
	Package Size			2.0mm x 2.0mm		2.85 x 4.5 x 0.35 mm	
	Die Quantity (eg. Die per package)			1		1	
Die # 1	**Die Name(1)**			S752-CD (1.17mm2)		LE11-ENG, AA (4.76mm2)	
	Die Size (W/L/Thickness			0.890 x 1.310 mm		1.39 x 3.42 mm	
	Die Process / Technology			MGN_0.13um_GT_1P4M		CSM, 0.13um, 1P7M, 1.2v/2.5v/3.3v, SiGE 8XP	
	Wire Bond Material (Au, Cu, Al)			Au		PdCu	
	Wire Diameter			0.8mil		0.8 mil	
Fab	Wafer FAB			MGN		GF Fab 9	
	Wafer Diameter			8"		8"	
	Wafer Thickness			4mil		725um	
	Top Metal Type/Bond Pad Composition			Alumimum		Al	
	Top Metal Thickness			0.8um		4 um	
	Die passivation thickness range			NA		Si3N4/SiO2 = 0.45um/1.35um	
	No. of bond over active area			zero		zero	
	Glass Transistion Temp			130 degree C		130 degree C	
	Header plating (Die Land Area)			NA		PPF	
	Max Junction Temp			125C		125 degree C	
Package	*BackgrindThinkness*			<8mil (Saw)		<8mil (Saw)	
	Backgrind Location			GTK		GTK	
	Bond Type (at Die)			Ball		Ball	
	Bond Type (at LF)			Wedge		Wedge	
	DB Epoxy/Solder Type			Epoxy		Epoxy	
	Die Attach Material			EM-430JI-P		EM-430J1-P	
	Min Bond Pad Pitch			75um			
	# of pad/ball/pin Pitch			18/0.35mm		32 Lead/ pitch=0.4mm	
	Leadframe Type			Etched		Etched	
	Leadframe Material and Finish			Cu/matte Sn		C7025/Matte Sn	
	Molding Compound Type			EME-631B		EME 631B	
	Green Compound (Yes/No)			Yes		Yes	
	Lead-Free (Yes/No)			Yes		Yes	
Assy / Test / Rel	Assembly Site			GTK		GTK	
	FT Test Site			GTK		GTK	
	Reliability Test Site			GTK		GTK, iST	
	Qual Plan #			20020501		19121001	

Reliability Test Site

Test	**Test Conditions**	**Duration / Limits**	**Fail/SS**	**X = Test Needed**	**Results Pass/Fail**	**X = Test Needed**	**Results Pass/Fail**
MSL1 Pre-cond	**(JESD22-A113)** Bake 125C	24 Hrs	0/154	0 / 3 x 154pcs	Pass	0 / 3 x 231pcs	Pass
	Soak 85C, 85% RH	168Hrs	0/154	0 / 3 x 154pcs	Pass	0 / 3 x 231pcs	Pass
	IR reflow 260C	3 cycles	0/154	0 / 3 x 154pcs	Pass	0 / 3 x 231pcs	Pass
Temp Cycle (TC)	**(JESD22-A104)** -65C-150C Mounted on PCB Board (Daughter Card)	500 cycles	0/77	0/ 3x 77pcs	Pass	0/ 3x 77pcs	Pass
		1000 cycles	0/77	0/ 3x 77pcs	Pass	0/ 3x 77pcs	Pass
HAST	**JESD22-A101/A110** 130C, 85%RH, 192hrs 33.3 psia Vcc = Op Max	96 Hrs	0/77			0/ 3x 77pcs	Pass
UHAST	**JESD22-A118** 130C, 85%RH 33.3 psia	96 Hrs	0/77	0/ 3x 77pcs	Pass	0/ 3x 77pcs	Pass
HTSL **High Temperature Storage**	**(JESD22-A103)** Ta>150C	500 Hrs	0/77	0/ 3x 77pcs	Pass	0/ 3x 77pcs	Pass
		1000 Hrs	0/77	0/ 3x 77pcs	Pass	0/ 3x 77pcs	Pass
WBS	JESD22-B116B	Cpk>1.66	0/5	0 / 1 x 5pcs	Pass	0 / 1 x 5pcs Avg: 20.440 / Cpk: 3.82 Avg: 20.720 / Cpk: 4.83 Avg: 21.30 / Cpk: 2.63	Pass
WBP	MIL-STD883-2011	Cpk>1.66	0/5	0 / 1 x 5pcs	Pass	0 / 1 x 5pcs Avg: 7.00g / Cpk: 2.90 Avg: 7.16g / Cpk: 2.83 Avg: 7.33g / Cpk: 3.61	Pass
SD **Solderability**	>95% Coverage	5 Seconds	0/15	0 / 3 x 15pcs	Pass	0 / 3 x 15pcs	Pass
PD **Physical Dimensions**		Package Outline	Ppk>1.67 Cpk>1.33	0 / 3 x 30pcs / Cpk >1.33	Pass	0 / 3 x 30pcs / Cpk >1.33	Pass

Summary:

Submitted By: Virginia Cheung

Approved By: Pam Finer 02/19/2020 plus Qual Pack approval 06April2021