DATE: 27th May, 2021

PCN #: 2520 – Rev 2

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 2

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).

Rev 2: Devices in red strikethrough font (in Table 3) are being removed from PCN-2520.

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 AT 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~~	~~PI3EQX10008AZFEX~~	~~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	AP64351QSP-13	AP64352QSP-13	AP64350QSP-13	AP64500QSP-13	AP64501QSP-13	AP64502QSP-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 area		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 (ambient)			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

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