



DATE: April 9, 2021

PCN #: 2477 REV 3 – FINAL UPDATE

PCN Title: Additional Wafer Source (GFAB), Additional Assembly/Test (A/T) Site (SAT), and Transfer Assembly/Test Site to DIYI

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.

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-2477 REV 3 –
FINAL UPDATE**

Notification Date:	Implementation Date:	Product Family:	Change Type:	PCN #:
August 17, 2020	May 9, 2021	Discrete	Additional Wafer Source / Assembly and Test Site / Assembly BOM	2477
TITLE				
Additional Wafer Source (GFAB), Additional Assembly/Test (A/T) Site (SAT) and Transfer Assembly/Test Site to DIYI				
DESCRIPTION OF CHANGE				
<p>REV 3: This update provides a final listing of affected part numbers for which qualification is complete for the changes listed in the title of the tables below. All applicable qualification reports are attached (embedded in this file).</p> <p>For select part numbers, some planned changes previously announced in Rev 1 (Advance Notice) of this PCN will not be implemented under this PCN. Therefore, some part numbers were removed from this PCN (Table 5) compared to the initial Rev 1 of this PCN.</p> <p>This PCN is being issued to notify customers that in order to assure continuity of supply, Diodes is qualifying an additional internal wafer source located in Greenock, Scotland (GFAB).</p> <p>Diodes Incorporated has qualified “Shandong DIYI Electronic Science and Technology Co., LTD.” (DIYI) in Shandong China and Diodes internal assembly and test site (SAT) in Shanghai, China as additional A/T sites.</p> <p>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).</p> <p>In conjunction with adding a wafer source (GFAB), assembly site (SAT), and transferring assembly and test site to DIYI, several additional changes will be implemented on select part numbers to ensure continuity of supply, to standardize manufacturing processes, and to enhance manufacturability. This includes alignment of wafer fab and assembly bill of material (BOM), i.e. wafer process metal system, mold compound, die attach type, bond wire material and/or wire diameter.</p>				
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: Additional wafer source (GFAB) Table 2: Additional wafer source (GFAB) and transfer assembly and test site to DIYI Table 3: Additional wafer source (GFAB) and assembly BOM change Table 4: Additional wafer source (GFAB) and add Diodes internal SAT Table 5: Parts removed from PCN-2477				
WEB LINKS				



Manufacturer's Notice:	https://www.diodes.com/quality/product-change-notices/diodes-product-change-notices/
For More Information Contact:	http://www.diodes.com/contacts.html
Data Sheet:	http://www.diodes.com/catalog
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 - Additional Wafer Source (GFAB)					
1N5819HW1-7-F	B160AE-13	B250-13-F	B340A-13-G	BAS40-05-7-F*	BAT54WS-13-F
1N5819HW-7-F	B160AF-13	B250A-13-F	B340AE-13	BAS40-06-7-F*	BAT54WS-7-F*
B0520WS-7-F	B160B-13-F	B250AF-13	B340AF-13	BAS40-7-F*	BAT64C-7-F
B0530WS-13-F	B160S1F-7	B260-13-F	B340B-13-F	BAS70-04-7-F*	BAT64S-7-F
B0530WS-7-F	B170-13-F	B260A-13-F	B340CE-13	BAS70-05-7-F*	BAT64SW-7-F
B0540WS-7	B170B-13-F	B260AE-13	B340LA-13-F	BAS70-06-7-F*	BAT64W-7-F
B1100-13-F	B180-13-F	B260AF-13	B340LB-13-F	BAS70-7-F*	BAT750-7-F
B1100B-13-F	B180B-13-F	B260BE-13	B345AF-13	BAS70LP-7B*	BAT760-7
B1100LB-13-F	B190-13-F	B260S1F-7	B350-13-F	BAT1000-7-F	MBR0580S1-7
B120-13-F	B190B-13-F	B270-13-F	B350A-13-F	BAT42W-7-F*	MBR180S1-7
B120AF-13	B2100-13-F	B280-13-F	B350AF-13	BAT42WS-7-F*	MBR230S1F-7
B120B-13-F	B2100A-13-F	B280AE-13	B350B-13-F	BAT43W-7-F*	PD3S0230-7*
B130-13-F	B2100AE-13	B290-13-F	B360-13-F	BAT43WS-7-F*	PD3S120L-7
B130AF-13	B2100AF-13	B290AE-13	B360A-13-F	BAT54-13-F*	PD3S130H-7
B130B-13-F	B220-13-F	B3100-13-F	B360AE-13	BAT54-7-F*	PD3S130L-7
B130L-13-F	B220A-13-F	B3100B-13-F	B360AF-13	BAT54A-7-F*	PD3S140-7
B130LAW-7-F	B220AF-13	B3100BE-13	B360AM-13-F	BAT54AW-13-F*	PD3S160-7
B130LB-13-F	B230-13-F	B320-13-F	B360B-13-F	BAT54AW-7-F*	PD3S220L-7
B140-13-F	B230A-13-F	B320A-13-F	B370-13-F	BAT54AW-7-F-79*	PD3S230H-7
B140AF-13	B230AF-13	B320AE-13	B380-13-F	BAT54C-7-F*	PD3S230L-7
B140B-13-F	B240-13-F	B320AF-13	B380B-13-F	BAT54C-7-F-31*	PDS1040-13
B140HB-13-F	B240A-13-F	B320B-13-F	B390-13-F	BAT54CW-7-F*	PDS1040CTL-13
B140HW-7	B240AE-13	B330-13-F	B3L30LP-7	BAT54DW-7-F*	PDS1040L-13
B140S1F-7	B240AF-13	B330A-13-F	B520C-13-F	BAT54S-7-F*	PDS1040S-13
B150-13-F	B240LA-13-F	B330AF-13	B530C-13-F	BAT54S-7-F-31*	PDS1045-13
B150AF-13	B240S1F-7	B330B-13-F	B540C-13-F	BAT54SW-13-F*	PDS1240CTL-13
B150B-13-F	B240T-01DL-F	B340-13-F	B550C-13-F	BAT54SW-7-F*	PDS3100-13
B160-13-F	B245AF-13	B340A-13-F	B560C-13-F	BAT54W-7-F*	PDS3200-13

Table 1 Cont. - Additional Wafer Source (GFAB)

PDS340-13	SDM1100S1F-7	SDT12A120P5-13	SDT20B100D1-13	SDT40A120CT	SDT5H100LP5-7
PDS360-13	SDM160S1F-7	SDT12A120P5-13D	SDT20G120D1-13	SDT40B100ST	SDT5H100LP5-7D
PDS4150-13	SDM1U100S1F-7	SDT12A120P5-7	SDT30100CT	SDT40H100CT	SDT5H100P5-13
PDS4200H-13	SDM20E40C-7-F	SDT15H100P5-13	SDT30100CTFP	SDT40H120CT	SDT5H100P5-7
PDS5100-13	SDM2100S1F-7	SDT15H100P5-7	SDT30100CTFP-S	SDT5100D1-13	SDT660VD1-13
PDS5100H-13	SDT10100CT	SDT15U120P5-13	SDT30100VCT	SDT5100LP5-13	SDT8A100P5-13
PDS540-13	SDT10100P5-13	SDT15U120P5-13D	SDT30120CT	SDT5100LP5-13D	SDT8A100P5-13D
PDS560-13	SDT10100P5-13D	SDT15U120P5-7	SDT30A100CT	SDT5100LP5-7	SDT8A100P5-7
PDS760-13	SDT10100P5-7	SDT20100CT	SDT30A120CT	SDT5100LP5-7D	SDT8A100P5-7D
PDS835L-13	SDT10A100CT	SDT20120CT	SDT30B100D1-13	SDT5A100P5-13	SDT8A120P5-13
PDS835L-7	SDT10A100P5-13	SDT20120VCT	SDT40100CT	SDT5A100P5-7D	SDT8A120P5-7D
SDM02M30CLP3-7B	SDT10A100P5-13D	SDT20A100CT	SDT40120CT	SDT5H100LP5-13	SDT8A60VP5-13
SDM02M30LP3-7B*	SDT10A100P5-7	SDT20A120CT	SDT40A100CT	SDT5H100LP5-13D	SDT8A60VP5-7
SDM02U30LP3-7B*	SDT10A100P5-7D	SDT20B100CT	SDT40A100VCT		

Note: "*" Also affected by Phenitex Wafer Manufacturing Site Change announced via PCN 2461

Table 2 - Additional Wafer Source (GFAB) and Transfer Assembly and Test Site to DIYI

1N5817-B**	SB1100-T**	SB160-T**	SB340-A	SB380-T	SB540-T
1N5817-T**	SB130-T**	SB180-T**	SB340-T	SB5100-T	SB550-T
1N5818-T**	SB140-T**	SB190-T**	SB360-A	SB520-T	SB560-A
1N5819-B**	SB150-T**	SB3100-T	SB360-T	SB530-T	SB560-T
1N5819-T**					

Note: "*" Change package dimension as listed below (DO-41)

Package	From : Current Baseline	Change To : DIYI																																										
DO-41	<table border="1"> <thead> <tr> <th colspan="3">DO-41</th> </tr> <tr> <th>Dim</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>25.4</td> <td>--</td> </tr> <tr> <td>B</td> <td>4.1</td> <td>5.2</td> </tr> <tr> <td>C</td> <td>0.71</td> <td>0.86</td> </tr> <tr> <td>D</td> <td>2</td> <td>2.7</td> </tr> <tr> <td colspan="3">All Dimensions in mm</td> </tr> </tbody> </table>	DO-41			Dim	Min	Max	A	25.4	--	B	4.1	5.2	C	0.71	0.86	D	2	2.7	All Dimensions in mm			<table border="1"> <thead> <tr> <th colspan="3">DO-41</th> </tr> <tr> <th>Dim</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>25.4</td> <td>--</td> </tr> <tr> <td>B</td> <td>4.1</td> <td>5.2</td> </tr> <tr> <td>C</td> <td>0.6</td> <td>0.8</td> </tr> <tr> <td>D</td> <td>2</td> <td>2.7</td> </tr> <tr> <td colspan="3">All Dimensions in mm</td> </tr> </tbody> </table>	DO-41			Dim	Min	Max	A	25.4	--	B	4.1	5.2	C	0.6	0.8	D	2	2.7	All Dimensions in mm		
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Table 3 - Additional Wafer Source (GFAB) and Assembly BOM Change

1N5711W-7-F	BAS40V-7*	BAT46W-7-F	BAT54TW-7-F*	DFLS260-7	SDM20N40A-7
1N5711WS-7-F	BAS40W-04-7-F*	BAT54-7-F-79*	BAT54V-7*	QSG0115UDJ-7***	SDM20U30-7*
1N6263W-7-F	BAS40W-05-7-F*	BAT54A-13-F*	BAT54W-13-F*	SD101AW-7-F	SDM20U30LP-7*
B0520LW-7-F*	BAS40W-06-7-F*	BAT54A-7-F-79*	BAT54WS-7-F-79*	SD101AWS-7-F	SDM40E20LA-7
B0520WS-7-F-79	BAS40W-13-F*	BAT54ADW-7-F*	BAT54WT-7*	SD101BW-7-F	SDM40E20LC-7*
B0530W-7-F	BAS40W-7-F*	BAT54AT-7-F*	BAT750TA	SD101BWS-7-F	SDM40E20LS-7-F*
B0540W-7-F	BAS70-04T-7-F*	BAT54ATA*	BAT760-7-79	SD101CW-7-F	ZHCS1000TA
B130LAW-7-F-79	BAS70-05T-7-F*	BAT54BRW-7-F*	DFLS1100-7	SD101CWS-7-F	ZHCS1000TC
B140WS-7	BAS70-06T-7-F*	BAT54C-7-F-79*	DFLS1150-7	SD103ASDM-7-F*	ZHCS2000TA
BAS40-04-7-F*	BAS70BRW-7-F*	BAT54CDW-7-F*	DFLS1200-7	SD103ATW-7-F*	ZHCS350TA
BAS40-04T-7-F*	BAS70DW-04-7-F*	BAT54CT-7-F*	DFLS120L-7	SD103AW-13-F*	ZHCS400TA
BAS40-05-13-F*	BAS70DW-05-7-F*	BAT54CTA*	DFLS130-7	SD103AW-7-F*	ZHCS400TC
BAS40-05T-7-F*	BAS70DW-06-7-F*	BAT54CW-13-F*	DFLS130L-7	SD103AWS-7-F*	ZHCS500TA
BAS40-06-13-F*	BAS70JW-7-F*	BAT54JW-7-F*	DFLS140-7	SD103BW-7-F*	ZHCS506TA
BAS40-06T-7-F*	BAS70T-7-F*	BAT54LP-7*	DFLS140L-7	SD103BWS-7-F*	ZHCS750TA
BAS40BRW-7-F*	BAS70TW-13-F*	BAT54LP-7B*	DFLS160-7	SD103CW-13-F*	ZLLS1000TA
BAS40DW-04-7-F*	BAS70TW-7-F*	BAT54LPS-7*	DFLS2100-7	SD103CW-7-F*	ZLLS2000TA
BAS40DW-05-7-F*	BAS70W-04-7-F*	BAT54S-7-F-79*	DFLS220L-7	SD103CWS-7-F*	ZLLS350TA
BAS40DW-06-7-F*	BAS70W-05-7-F*	BAT54SDW-7-F*	DFLS230-7	SD107WS-7-F*	ZLLS400TA
BAS40LP-7*	BAS70W-06-7-F*	BAT54ST-7-F*	DFLS230L-7	SDM100K30L-7	ZLLS400TC
BAS40LP-7B*	BAS70W-7-F*	BAT54STA*	DFLS230LH-7	SDM10K45-7-F*	ZLLS410TA
BAS40T-7-F*	BAT400D-7-F	BAT54T-7-F*	DFLS240-7	SDM1100LP-7***	ZLLS500TA
BAS40TW-7-F*	BAT42W-7-F-79*	BAT54TA*	DFLS240L-7	SDM1M40LP8-7***	

Note: "*" Also affected by Phenitec Wafer Manufacturing Site Change announced via PCN 2461

Note: "****" change bond wire from Cu to Au

Table 4 - Additional Wafer Source (GFAB) and Add Diodes internal SAT

SDT10100CTFP	SDT20120CTFP	SDT20A60VCT	SDT30120CTFP	SDT30A120CTFP	SDT40A60VCT
SDT10A100CTFP	SDT2060VCT	SDT20A60VCTFP	SDT3060VCT	SDT40100CTFP	SDT40A60VCTFP
SDT10A60VCT	SDT20A100CTFP	SDT20B100CTFP	SDT3060VCTFP	SDT40120CTFP	SDT40H100CTFP
SDT10A60VCTFP	SDT20A120CTFP	SDT20B60VCT	SDT30A100CTFP	SDT40A100CTFP	SDT40H120CTFP
SDT20100CTFP					

Table 5 - Parts Removed from PCN-2477

MBR10100CTF-G1	MBR20200CT-G1	MBRB10200CT	MBRD20200CT-13	SDM1A40CSP-7	SDM2U40EP3-7
MBR10100CT-G1	MBR2045CTF-G1	MBRB10200CT-13	SDM01U50CP3-7	SDM1L20DCP3-7	SDM4A30EP3-7B
MBR10150CTF-G1	MBR2045CT-G1	MBRB20100CT	SDM02A20CP4-7	SDM1L30CSP-7	SDM4A40EP3-7B
MBR10150CT-G1	MBR2060CTF-G1	MBRB20100CT-13	SDM02A30CP4-7	SDM1U20CSP-7	SDT20100CTB-13
MBR10200CTF-G1	MBR2060CT-G1	MBRB20150CT	SDM02L30CP3-7	SDM1U30CP3-7	SDT30100CTE
MBR10200CT-G1	MBR30100CTF-G1	MBRB20150CT-13	SDM02M30DCP3-7	SDM1U40CSP-7	SDT30100CTFP-H
MBR1060CTF-G1	MBR30100CT-G1	MBRB20200CT	SDM02U30CSP-7	SDM2A20CSP-7	SDT30A100CTE
MBR1060CT-G1	MBR3045CTF-G1	MBRB20200CT-13	SDM05A30CP3-7	SDM2A40CSP-7B	SDT40A100CTE
MBR20100CTF-G1	MBR3045CT-G1	MBRD10100CT-13	SDM05U20CSP-7	SDM2U20CSP-7	SDT40A120CTE
MBR20100CT-G1	MBRB10100CT	MBRD10150CT-13	SDM05U20S3-7	SDM2U20SD3-7	SDT5A100SAF-13
MBR20150SCTF-G1	MBRB10100CT-13	MBRD10200CT-13	SDM05U40CSP-7	SDM2U30CSP-7	SDT5A100SB-13
MBR20150SCT-G1	MBRB10150CT	MBRD20100CT-13	SDM1A30CSP-7	SDM2U30CSP-7B	SDT5H100SB-13
MBR20200CTF-G1	MBRB10150CT-13	MBRD20150CT-13	SDM1A40CP3-7	SDM2U40CSP-7B	SDT60100CTB-13



Certificate of Design, Construction & Qualification

Description: GFAB wafer porting- TISI process + PD323 product qual

				Qual Device 1 (1st TISI)	Qual Device 1 (2nd TISI)	Qual Device 1 (3rd TISI)	Qual Device 2						
Category	Product	Part Number		PD3S130L-7	PD3S130L-7	PD3S130L-7	PD3S230L-7						
	Assembly	Package Type		PD323	PD323	PD323	PD323						
	Assembly	Package Size		1.95*2.6*0.7mm	1.95*2.6*0.7mm	1.95*2.6*0.7mm	1.95*2.6*0.7mm						
	Wafer	Die Name(s)		GY034AA0030PAA7-4C	GY034AA0030PAA7-4C	GY034AA0030PAA7-4C	GY034AA0030PAA7-4C						
	Wafer	Die Size (W/L/Thickness) - After Saw		0.85 x 0.9 x 0.14 mm	0.85 x 0.9 x 0.14 mm	0.85 x 0.9 x 0.14 mm	0.85 x 0.9 x 0.14 mm						
	Wafer	Die Process / Technology		SKY	SKY	SKY	SKY						
	Wafer	Wafer FAB/ Location		GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK						
	Wafer	Wafer Diameter		6"	6"	6"	6"						
	Wafer	Front Metal Type		AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu						
	Wafer	Front Metal Layer Number/ Thickness		4um	4um	4um	4um						
	Wafer	Back Metal Type (All Layers)		TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au						
	Wafer	Back Metal Thickness (All Layers)		0.5um	0.5um	0.5um	0.5um						
	Wafer	No of masks Steps		3	3	3	3						
	Assembly	Die quantity per package (e.g. single or dual dies)		Single	Single	Single	Single						
	Assembly	Die Attach Method (DB Epoxy/Solder Type)		Solder	Solder	Solder	Solder						
	Assembly	Die Attach Material/ Supplier		Indium83552	Indium83552	Indium83552	Indium83552						
	Assembly	Bond Wire/Clip Bond Material/ Supplier		Clip/KLP00015	Clip/KLP00015	Clip/KLP00015	Clip/KLP00015						
	Assembly	Bond Type (at Die)		Clip	Clip	Clip	Clip						
	Assembly	Bond Type (at LF)		Clip	Clip	Clip	Clip						
	Assembly	No. of bond over active area		1	1	1	1						
	Assembly	Glass Transition Temp		130 °C	130 °C	130 °C	130 °C						
	Assembly	Terminal Finish (Plating) Material		Sn	Sn	Sn	Sn						
	Assembly	Wire Diameter		Clip	Clip	Clip	Clip						
	Assembly	Leadframe Type		KLF00457/KLF00623	KLF00457/KLF00623	KLF00457/KLF00623	KLF00457/KLF00623						
	Assembly	Leadframe Material		CDA194HH	CDA194HH	CDA194HH	CDA194HH						
	Assembly	Lead Frame Manufacturer		SSHP/PBE	SSHP/PBE	SSHP/PBE	SSHP/PBE						
	Assembly	Molding Compound Type		EME-G700H	EME-G700H	EME-G700H	EME-G700H						
	Assembly	Mold Compound Material Manufacturer		Sumitomo	Sumitomo	Sumitomo	Sumitomo						
	Assembly	Green Compound (Yes/No)		Yes	Yes	Yes	Yes						
	Assembly	Lead-Free (Yes/No)		Yes	Yes	Yes	Yes						
	Assembly	Assembly Site/ Location		SAT/SH	SAT/SH	SAT/SH	SAT/SH						
	Assembly	Test Site/ Location		SAT/SH	SAT/SH	SAT/SH	SAT/SH						
	Product	Max Junction Temp		150 °C	150 °C	150 °C	150 °C						
	Product	DataSheet		DS30671	DS30671	DS30671	DS31751						
	Product	Qual Plan Number		20051201	20051201	20051201	20051201						
Reliability and Characterization Testing													
# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail
2	MSL1 Pre-conditioning	Bake 125C Soak 85C, 85% RH IR reflow 260C	24 Hrs 168Hrs 3 cycles	SMD only, for Test #7, 8, 9 &	3 Assembly lots	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X	Pass	X	Pass	X	Pass	X	Pass
4	PARAMETRIC VERIFICATION (PV) FORWARD SURGE	Test all parameters per Data Sheet including AC & DC across data sheet temperature range MIL-750D, METHOD 4066	Operating Range, Per Data Sheet (AC, DC) PER DATA SHEET	0/25 0/50	3 wafer lots 3 wafer lots	X X	Pass Pass	X X	Pass Pass	X X	Pass Pass	X X	Pass Pass
5	HTRB	Ta=150 °C or Max Tj, Vd=100%, PER MIL-STD-750-1	168 Hrs 500 Hrs 1000 Hrs	0/77 0/77 0/77	3 wafer lots	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-104	168 Cycles 500 Cycles 1000 Cycles	0/77 0/77 0/77	3 Assembly lots	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass
8 (alt)	PCT/AC	Ta=121 °C 15PSIG 100%RH; PER JESD22-A102	96 Hrs	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass
9 alt	H3TRB	Ta=85°C, 85% RH, with 40% Maximum Reverse Bias. JESD22A-101	168 Hrs 500 Hrs 1000 Hrs	0/77 0/77 0/77	3 wafer lots	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass
10	IOL	MIL-STD-750 Method 1037 (Not required for TVS)	2520 Cycles 7560 Cycles 15000 Cycles	0/77 0/77 0/77	3 wafer lots	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass	X X X	Pass Pass Pass
11	ESD	HBM (AEC-Q101-001) CDM (AEC-Q101-005)	PER DATA SHEET PER DATA SHEET	0/30 0/30	1 wafer lot 1 wafer lot	X X	Pass Pass	X X	Pass Pass	X X	Pass Pass	X X	Pass Pass
12	DPA	AEC Q101-004 SEC. 4		0/2	1 Assembly lot	X	Pass	QBS to 1st lot		QBS to 1st lot		QBS to 1st lot	
13	Package Physical Dimensions (PD)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass
20	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass
21	Solderability	J-STD-002; JESD22B102 (245C +0/5S)	5 Seconds	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass
Summary:		_William_lai_2020/09/18											
Submitted By:		William_lai_2020/09/18											
Approved By:		Frank Chen, 9/30/2020											

Category	Qual Device (Mo Process qual in ERIS)	Qual Device (Mo Process qual in LiteOn seeful)	Qual Device (Mo-SOD123F Package qual)
Product	Part Number	B360A-13-F	B280S1F-7
Assembly	Package Type	SMA	SOD-123F
Assembly	Package Size	2.6mm*5.0mm*2.0mm	3.5*1.8*0.98 mm*3
Wafer	Die Name(s)	GY055AA0060PMD1-4C	GY045AA0060PMD2-4C
Wafer	Die Size (W/L/Thickness) - After Saw	1.39 x1.39 x0.29mm	1.14*1.14*0.25mm
Wafer	Die Process / Technology	SKY	SKY
Wafer	Wafer FAB/ Location	GFAB/UK	GFAB/UK
Wafer	Wafer Diameter	6"	6"
Wafer	Front Metal Type	AlCu+NiAu	Ti/Ni/Ag
Wafer	Front Metal Layer Number/ Thickness	4um	4um
Wafer	Back Metal Type (All Layers)	TiNiV/Au	Ti/Ni/Ag
Wafer	Back Metal Thickness (All Layers)	0.5um	0.5um
Wafer	No of masks Steps	3	3
Assembly	Die quantity per package (e.g. single or dual dies)	single	single
Assembly	Die Attach Method (DB Epoxy/Solder Type)	Solder	Solder
Assembly	Die Attach Material/ Supplier	Solder Paste/REDSUN	Solder Paste/REDSUN
Assembly	Bond Wire/Clip Bond Material/ Supplier	Cu Clip/JIH LONG	Clip/JIH LONG
Assembly	Bond Type (at Die)	solder	solder
Assembly	Bond Type (at LF)	solder	solder
Assembly	No. of bond over active area	1 clip	1 clip
Assembly	Glass Transition Temp	150 °C	150 °C
Assembly	Terminal Finish (Plating) Material	Sn	Sn
Assembly	Wire Diameter	clip	clip
Assembly	Leadframe Type	CDA19210	CDA19400
Assembly	Leadframe Material	Cu	Bare copper
Assembly	Lead Frame Manufacturer	JIH LONG INDUSTRY CO., LTD.	JIH LONG INDUSTRY CO., LTD.
Assembly	Molding Compound Type	EME-E110G	ELER-8-500C
Assembly	Mold Compound Material Manufacturer	Tsu Kong Co., Ltd	E'DALE
Assembly	Green Compound (Yes/No)	Yes	Yes
Assembly	Lead-Free (Yes/No)	Yes	Yes
Assembly	Assembly Site/ Location	ERIS/TW	ERIS/TW
Assembly	Test Site/ Location	ERIS/TW	ERIS/TW
Product	Max Junction Temp	150	150°C
Product	DataSheet	DS30891	DS39237
Product	Qual Plan Number	20051203	20051203
Product			16092601

Reliability and Characterization Testing

# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail
2	MSL1 Pre-conditioning	Bake 125C	24 Hrs	SMD only, for Test #7, 8, 9 &	3 Assembly lots	X	Pass	X	Pass	X	Pass
		Soak 85C, 85% RH	168Hrs			X	Pass	X	Pass		
		IR reflow 260C	3 cycles			X	Pass	X	Pass		
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X	Pass	X	Pass	X	Pass
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/25	3 wafer lots	X	Pass	X	Pass	X	Pass
5	FORWARD SURGE	MIL-750D, METHOD 4086	PER DATA SHEET	0/50	3 wafer lots	X	Pass	X	Pass	X	Pass
			168 Hrs	0/77	X	Pass	X	Pass			
			500 Hrs	0/77	X	Pass	X	Pass			
7	HTRB	Ta=150°C or Max TJ, Vd=100%, PER MIL-STD-750-1	1000 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass
			168 Cycles	0/77	X	Pass	X	Pass			
			500 Cycles	0/77	X	Pass	X	Pass			
8 (alt)	TC	Ta=-55C to 150C or Max TJ, PER JESD22A-104	1000 Cycles	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass
			96 Hrs	0/77	X	Pass	X	Pass			
			168 Hrs	0/77	X	Pass	X	Pass			
9 alt	PCT/AC	Ta=121°C 15PSIG 100%RH; PER JESD22-A102	500 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass
			1000 Hrs	0/77	X	Pass	X	Pass			
			2520 Cycles	0/77	X	Pass	X	Pass			
10	H3TRB	MIL-STD-750 Method 1037 (Not required for TVS)	7560 Cycles	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass
			15000 Cycles	0/77	X	Pass	X	Pass			
			500 Hrs	0/77	X	Pass	X	Pass			
11	IOL	HBM (AEC-Q101-001)	PER DATA SHEET	0/30	1 wafer lot	X	Pass	X	Pass	X	Pass
		CDM (AEC-Q101-005)	PER DATA SHEET	0/30	1 wafer lot	X	Pass	X	Pass	X	Pass
12	ESD	AEC Q101-004 SEC. 4	PER DATA SHEET	0/2	1 Assembly lot	X	Pass	X	Pass	X	Pass
13	DPA	JESD22-B100	Package Outline	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass
20	Package Physical Dimensions (PD)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	Package Outline	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass
21	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass
22	Solderability	J-STD-002; JESD22B102 (245C +0/5S)	5 Seconds	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X	Pass	X	Pass	X	Pass

Summary: William_lai_2020/08/9
 Submitted By: William_lai_2020/08/9
 Approved By: Frank Chen, 9/3/2020



Certificate of Design, Construction & Qualification

Description: GFAB wafer porting for planner schottky

Category		Qual Device 1 - Lot 1 (Metal pre clean_SAT)	Qual Device 1 - Lot 2 (Metal pre clean_SAT)	Qual Device 1 - Lot 3 (Metal pre clean_SAT)	Qual Device 1 - Lot 4 (Metal pre clean_FSI)	Qual Device 2 - Lot 1 (1st NiPt20% GTI EPI)	Qual Device 2 - Lot 2 (2nd NiPt20% GTI EPI)	Qual Device 2 - Lot 3 (3rd NiPt20% GTI EPI)	Qual Device 3 (NiPt3% in SAT_GTI EPI)	Qual Device 3 (NiPt3% in CAT_GTI EPI)
Product	Part Number	PDS5100-13	PDS5100-13	PDS5100-13	PDS5100-13	DFLS1200-7	DFLS1200-7	DFLS1200-7	BAT54CW-7-F	BAT54CW-7-F
Assembly	Package Type	PDi5	PDi5	PDi5	PDi5	PD123	PD123	PD123	SOT323	SOT323
Assembly	Package Size	4mm*5.35*1.1	4mm*5.35*1.1	4mm*5.35*1.1	4mm*5.35*1.1	3.7*1.775*0.98mm	3.7*1.775*0.98mm	3.7*1.775*0.98mm	2.9*2.4*1.0	2.9*2.4*1.0
Wafer	Die Name(s)	GY073AA0100PTB2-4C-NNT	GY073AA0100PTB2-4C-NNT	GY073AA0100PTB2-4C-NNT	GY073AA0100PTB2-4C-NNT	GY045AA0200PUA2-4C	GY045AA0200PUA2-4C	GY045AA0200PUA2-4C	GY012AA0030ASA3-AIN	GY012AA0030ASA3-AIN
Wafer	Die Size (W/L/Thickness) - After Saw	1.84 x1.84 x 0.25mm	1.84 x1.84 x 0.25mm	1.84 x1.84 x 0.25mm	1.84 x1.84 x 0.25mm	1.14 x 1.14*0.25mm	1.14 x 1.14*0.25mm	1.14 x 1.14*0.25mm	0.31 x 0.31 x 0.22mm	0.31 x 0.31 x 0.22mm
Wafer	Die Process / Technology	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY
Wafer	Wafer FAB/ Location	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK
Wafer	Wafer Diameter	6"	6"	6"	6"	6"	6"	6"	6"	6"
Wafer	Front Metal Type	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlSiCu	AlSiCu
Wafer	Number of Poly Layers	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wafer	Back Metal Type (All Layers)	TiN/Au	TiN/Au	TiN/Au	TiN/Au	TiN/Au	TiN/Au	TiN/Au	NiV/Au	NiV/Au
Wafer	Back Metal Thickness (All Layers)	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um
Wafer	No of masks Steps	3	3	3	3	4	4	3	3	3
Assembly	Die quantity per package (e.g. single or dual dies)	Single	Single	Single	Single	single	single	single	single	single
Assembly	Die Attach Method (DB Epoxy/Solder Type)	Solder	Solder	Solder	Solder	Solder	Solder	Solder	EUTECTIC	EUTECTIC
Assembly	Die Attach Material/ Supplier	NC-SM051SC/Indium	NC-SM051SC/Indium	NC-SM051SC/Indium	NC-SM051SC/Indium	ES-500-SPA	ES-500-SPA	ES-500-SPA	NA	NA
Assembly	Bond Wire/Clip Bond Material/ Supplier	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip	Clip	Clip	Au	Cu
Assembly	Bond Type (at Die)	Solder	Solder	Solder	Solder	Thermo Sonic	Thermo Sonic	Thermo Sonic	Thermo-Ultrasonic	Thermo-Ultrasonic
Assembly	Bond Type (at LF)	Solder	Solder	Solder	Solder	Thermo Sonic	Thermo Sonic	Thermo Sonic	Thermo-Ultrasonic	Thermo-Ultrasonic
Assembly	No. of bond over active area	1	1	1	1	1	1	1	1	1
Assembly	Glass Transition Temp	130°C	130°C	130°C	130°C	135 °C	135 °C	135 °C	160C	160C
Assembly	Terminal Finish (Plating) Material	Pbfree	Pbfree	Pbfree	Pbfree	N/A	N/A	N/A	100% Matte Tin	100% Matte Tin
Assembly	Header plating (Die Land Area)	Spot Ag	Spot Ag	Spot Ag	Spot Ag	Bare copper	Bare copper	Bare copper	Ag	Ag
Assembly	Wire Diameter	KL P00014	KL P00014	KL P00014	KL P00014	Clip	Clip	Clip	0.8 mil	0.8 mil
Assembly	Leadframe Type	PowerDI-5 F type	PowerDI-5 F type	PowerDI-5 F type	PowerDI-5 F type	PowerDI-5 C type	PowerDI-5 C type	PowerDI-5 C type	SOT323	SOT323 H
Assembly	Leadframe Material	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	Alloy 42	Alloy 42
Assembly	Lead Frame Manufacturer	NBKQ	NBKQ	NBKQ	NBKQ	HITACHI CABLE	HITACHI CABLE	HITACHI CABLE	PBE	PBE/MHT
Assembly	Molding Compound Type	EME-G700LA	EME-G700LA	EME-G700LA	EME-G700LA	EME-G700LA Type L-A	EME-G700LA Type L-A	EME-G700LA Type L-A	CEL-1700HF40SK-D3	CEL-1702HF9SK
Assembly	Mold Compound Material Manufacturer	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	HITACHI	HITACHI
Assembly	Green Compound (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Assembly	Lead-Free (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Assembly	Assembly Site/ Location	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	CAT/Chengdu
Assembly	Test Site/ Location	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	CAT/Chengdu
Product	Max Junction Temp	150 °C	150 °C	150 °C	150 °C	150 °C	150 °C	150 °C	150 °C	150 °C
Product	DataSheet	DS30483	DS30483	DS30483	DS30483	DS30628	DS30628	DS30628	DS30065	DS30065
Product	Qual Plan Number	20052008	20052008	20052008	20052008	20052008	20052008	20052008	20052008	20052008

Reliability and Characterization Testing

# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	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	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail		
2	MSL1 Pre-conditioning	Bake 125C Soak 85C, 85% RH IR reflow 260C	24 Hrs 168Hrs 3 cycles	SMD only, for Test #7, 8, 9 &	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/25	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
5	HTRB	Ta=150°C or Max Tj, Vd=100%, PER MIL-STD-750-1	PER DATA SHEET	0/50	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-104	PER DATA SHEET	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
8 (alt)	PCT/AC	Ta=121°C 15PSIG 100%RH; PER JESD22-A102	PER DATA SHEET	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
9 alt	H3TRB	Ta=85°C, 85% RH, with 80% Maximum Reverse Bias. JESD22A-101	PER DATA SHEET	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
10	IOL	MIL-STD-750 Method 1037 (Not required for TVs)	PER DATA SHEET	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
11	ESD	HBM (AEC-Q101-001) CDM (AEC-Q101-005)	PER DATA SHEET	0/30	1 wafer lot	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
12	DPA	AEC Q101-004 SEC. 4	PER DATA SHEET	0/2	1 Assembly lot	X	Pass	QBS to 1st lot	Pass	QBS to 1st lot	Pass	QBS to 1st lot	Pass	QBS to 1st lot	Pass	QBS to 1st lot	Pass	QBS to 1st lot	Pass	QBS to 1st lot	Pass	QBS to 1st lot	Pass	QBS to 1st lot	
13	Package Physical Dimensions (PD)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
20	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
21	Solderability	J-STD-002; JESD22B102 (245C +0/5S)	PER SPEC	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	QBS to 1st lot	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass

Summary: William_Lai 2020_1014
Submitted By: William_Lai 2020_1014
Approved By: Frank Chen, 10/20/2020

Category				Qual Device 1	Qual Device 2	Qual Device 3	Qual Device 4						
Product	Part Number			SDT20120CT	SDT20120CT	SDT20120CT	SDT20B60VCTFP						
Assembly	Package Type			TO220AB	TO220AB	TO220AB	ITO220AB						
Assembly	Package Size			29*10.16*4.70mm	29*10.16*4.70mm	29*10.16*4.70mm	29.05*10.11*4.70mm						
Wafer	Die Name(s)			GK081A0120AU2-HGT	GK081A0120AU2-HGT	GK081A0120AU2-HGT	GK072AU060AU2-HGT						
Wafer	Die Size (W/L/Thickness) - After Saw			2052 x 2052 x 250 um3	2052 x 2052 x 250 um3	2052 x 2052 x 250 um3	1828*1828*250 um3						
Wafer	Die Process / Technology			Trench Schottky	Trench Schottky	Trench Schottky	Trench Schottky						
Wafer	Wafer FAB/ Location			GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK						
Wafer	Wafer Diameter			8"	8"	8"	6 inch						
Wafer	Front Metal Type			AlCu	AlCu	AlCu	AlCu						
Wafer	Front Metal Layer Number/ Thickness			1/ 4um	1/ 4um	1/ 4um	1 / 4um						
Wafer	Number of Poly Layers			1	1	1	1 Poly						
Wafer	Back Metal Type (All Layers)			TiNiAg	TiNiAg	TiNiAg	Ti-Ni-Ag						
Wafer	Back Metal Thickness (All Layers)			1K/3K/10K	1K/3K/10K	1K/3K/10K	1kA/ 3kA/ 10kA						
Wafer	No of masks Steps			3	3	3	3						
Assembly	Die quantity per package (e.g. single or dual dies)			DUAL	DUAL	DUAL	Dual						
Assembly	Die Attach Method (DB Epoxy/Solder Type)			SOFT SOLDER	SOFT SOLDER	SOFT SOLDER	soft solder						
Assembly	Die Attach Material/ Supplier			Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5						
Assembly	Bond Wire/Clip Bond Material/ Supplier			Al	Al	Al	Al						
Assembly	Bond Type (at Die)			Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic						
Assembly	Bond Type (at LF)			Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic						
Assembly	No. of bond over active area			4	4	4	4						
Assembly	Glass Transition Temp			140°C	140°C	140°C	160°C						
Assembly	Terminal Finish (Plating) Material			Sn	Sn	Sn	100% Matte Tin						
Assembly	Header plating (Die Land Area)			Bare copper	Bare copper	Bare copper	Bare copper						
Assembly	Wire Diameter			15 mil Al	15 mil Al	15 mil Al	12mil						
Assembly	Leadframe Type			TO220-3L	TO220-3L	TO220-3L	TO220-3L						
Assembly	Leadframe Material			KFC	KFC	KFC	KFC						
Assembly	Lead Frame Manufacturer			XMYM/ NBKQ	XMYM/ NBKQ	XMYM/ NBKQ	XMYM/ JihLin						
Assembly	Molding Compound Type			EME-G630AY	EME-G630AY	EME-G630AY	CEL-3600HF						
Assembly	Mold Compound Material Manufacturer			Sumitomo	Sumitomo	Sumitomo	HITACHI						
Assembly	Green Compound (Yes/No)			Yes	Yes	Yes	Yes						
Assembly	Lead-Free (Yes/No)			Yes	Yes	Yes	Yes						
Assembly	Assembly Site/ Location			SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai						
Assembly	Test Site/ Location			SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai						
Product	Max Junction Temp			150°C	150°C	150°C	150°C						
Product	DataSet			DS#38471	DS#38471	DS#38471	DS#41697						
Product	Qual Plan Number			QP#20072801	QP#20072801	QP#20072801	QP#20072801						
Reliability and Characterization Testing													
# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail	X = Test Needed	Results Pass/Fail
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	0/25	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/50	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
5	HTRB	Ta=150°C or Max Tj, Vd=100%, PER MIL-STD-750-1	168 Hrs	0/77	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-104	500 Cycles	0/77	3 Assembly lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
8 (alt)	PCT/AC	Ta=121°C 15PSIG 100%RH; PER JESD22-A102	96 Hrs	0/77	3 Assembly lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
9 alt	H3TRB	Ta=85°C, 85% RH, with 80% Maximum Reverse Bias. JESD22A-101	500 Hrs	0/77	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
10	IOL	MIL-STD-750 Method 1037 (Not required for TVS)	2520 Cycles	0/77	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
11	ESD	HBM (AEC-Q101-001)	PER DATA SHEET	0/30	1 wafer lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
12	DPA	CDM (AEC-Q101-005)	PER DATA SHEET	0/30	1 wafer lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
13	Package Physical Dimensions (PD)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
20	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
21	Solderability	J-STD-002; JESD22B102 (245C +0/5S)	5 Seconds	0/10	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
23	Wire Bond Strength	MIL-STD-750 METHOD 2037 (JESD22-B116B)	Cpk>1.66	0/ min of 5	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
24	BOND SHEAR	AEC-Q101-003	Cpk>1.66	0/ min of 5	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS
Summary: Submitted By: Carol Yang_2020/10/16 Approved By: Carol Yang_2020/10/7 Frank Chen, 3/29/2021													



Certificate of Design, Construction & Qualification

Description: Qualify ERIS subcon DiYi DO package line

Category	Part Number	Package Type	Package Size	Die Name(s)	Die Size (W/L/Thickness) - After Saw	Die Process / Technology	Wafer FAB/ Location	Wafer Diameter	Front Metal Type	Front Metal Layer Number/ Thickness	Back Metal Type (All Layers)	Back Metal Thickness (All Layers)	No of masks Steps	Die quantity per package (e.g. single or dual dies)	Die Attach Method (DB Epoxy/Solder Type)	Die Attach Material/ Supplier	Bond Wire/Clip Bond Material/ Supplier	Bond Type (at Die)	Bond Type (at LF)	Glass Transistion Temp	Terminal Finish (Plating) Material	Leadframe Type	Leadframe Material	Lead Frame Manufacturer	Molding Compound Type	Mold Compound Material Manufacturer	Green Compound (Yes/No)	Lead-Free (Yes/No)	Assembly Site/ Location	Test Site/ Location	Max Junction Temp	DataSheet	Qual Plan Number
Qual Device 1 (1st lot)	SB5100-T	DO-201	9.5 x 5.3 mm	GY073AA0100PTB2-4C	1.84 x1.84 x 0.25mm	SKY	GFAB/UK	6"	AlCu+NiAu	4um	TiNiVAu	0.5um	3	1	Solder	BONDTRON ELECTRONIC	Clip / YIZHEN ELECTRONIC	solder	170°C	Pure tin	SKY-128-60-260	OFC	YIZHEN ELECTRONIC	EK-1800G	ETERNAL ELECTRONIC MATERIALS	Yes	Yes	DiYi/ China	DiYi/ China	150C	ds30135	QP# 20051203	
Qual Device 1 (2ndlot)	SB5100-T	DO-201	9.5 x 5.3 mm	GY073AA0100PTB2-4C	1.84 x1.84 x 0.25mm	SKY	GFAB/UK	6"	AlCu+NiAu	4um	TiNiVAu	0.5um	3	1	Solder	BONDTRON ELECTRONIC	Clip / YIZHEN ELECTRONIC	solder	170°C	Pure tin	SKY-128-60-260	OFC	YIZHEN ELECTRONIC	EK-1800G	ETERNAL ELECTRONIC MATERIALS	Yes	Yes	DiYi/ China	DiYi/ China	150C	ds30135	QP# 20051203	
Qual Device 1 (3rd lot)	SB5100-T	DO-201	9.5 x 5.3 mm	GY073AA0100PTB2-4C	1.84 x1.84 x 0.25mm	SKY	GFAB/UK	6"	AlCu+NiAu	4um	TiNiVAu	0.5um	3	1	Solder	BONDTRON ELECTRONIC	Clip / YIZHEN ELECTRONIC	solder	170°C	Pure tin	SKY-128-60-260	OFC	YIZHEN ELECTRONIC	EK-1800G	ETERNAL ELECTRONIC MATERIALS	Yes	Yes	DiYi/ China	DiYi/ China	150C	ds30135	QP# 20051203	
Qual Device 2	SBR12A45SD1-T	DO-201	9.5 x 5.3 mm	C150BA0045LBC2	2.85 x 2.85 x 0.25mm	SBR	CSMC/China	6"	TiNiAg	4um	TiNiVAu	1.1um	5	1	Solder	BONDTRON ELECTRONIC	Clip / YIZHEN ELECTRONIC	solder	170°C	Pure tin	SKY-128-60-395	OFC	YIZHEN ELECTRONIC	EK-1800G	ETERNAL ELECTRONIC MATERIALS	Yes	Yes	DiYi/ China	DiYi/ China	150C	ds31452	QP# 20051203	
Qual Device 3	SB1100-T	DO-41	5.21 x 2.72mm	GY039AA0100PTB1-4C	1.00 x1.00 x 0.29mm	SKY	GFAB/UK	6"	AlCu+NiAu	4um	TiNiVAu	0.5um	3	1	Solder	BONDTRON ELECTRONIC	Clip / YIZHEN ELECTRONIC	solder	170°C	Pure tin	SKY-68-58-126	OFC	YIZHEN ELECTRONIC	EK-1800G	ETERNAL ELECTRONIC MATERIALS	Yes	Yes	DiYi/ China	DiYi/ China	125C	ds30116	QP# 20051203	

Reliability and Characterization Testing																
# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	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	Results Pass/Fail
2	MSL1 Pre-conditioning	Bake 125C Soak 85C, 85% RH IR reflow 260C	24 Hrs 168Hrs 3 cycles	SMD only, for Test #7, 8, 9 &	3 Assembly lots	non-surface mount part non-surface mount part non-surface mount part		non-surface mount part non-surface mount part non-surface mount part		non-surface mount part non-surface mount part non-surface mount part		non-surface mount part non-surface mount part non-surface mount part		non-surface mount part non-surface mount part non-surface mount part		
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC accross data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/25	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
	FORWARD SURGE	MIL-750D, METHOD 4066	PER DATA SHEET	0/50	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
5	HTRB	Ta=150°C or Max Tj, Vd=100%, PER MIL-STD-750-1	168 Hrs 500 Hrs 1000 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-104	168 Cycles 500 Cycles 1000 Cycles	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
8 (alt)	PCT/AC	Ta=121°C 15PSIG 100%RH; PER JESD22-A102	96 Hrs	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
9 alt	H3TRB	Ta=85°C, 85% RH, with 80% Maximum Reverse Bias. JESD22A-101	168 Hrs 500 Hrs 1000 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
10	IOL	MIL-STD-750 Method 1037 (Not required for TVS)	2520 Cycles 7560 Cycles 15000 Cycles	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
11	ESD	HBM (AEC-Q101-001) CDM (AEC-Q101-005)	PER DATA SHEET	0/30	1 wafer lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
12	DPA	AEC Q101-004 SEC. 4	PER DATA SHEET	0/2	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
13	Package Physical Dimensions (PD)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
14	Terminal Strength (TS)	MIL-STD-750 METHOD 2036 (For Axial leaded devices only)	PER SPEC	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
20	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
21	Solderability	J-STD-002; JESD22B102 (245C +0/5S)	5 Seconds	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	Pass

Summary: William Lai_2020/07/30
 Submitted By: William Lai_2020/07/30
 Approved By: Frank Chen, 4/1/2021



Certificate of Design, Construction & Qualification

Category				DFN Package Qual Device	QBS source Device 1 (1st TIS)	QBS source Device 1 (2nd TIS)	QBS source Device 1 (3rd TIS)	QBS source Device 2 (1st NiPt15%)	QBS source Device 2 (2nd NiPt15%)	QBS source Device 2 (3rd NiPt15%)	QBS source Device 3 (1st NiPt20%)	QBS source Device 3 (2nd NiPt20%)	QBS source Device 3 (3rd NiPt20%)	QBS source Device 4 (Cr in CAT)																		
Product	Part Number			BAT54LP-7	PD3S130L-7	PD3S130L-7	PD3S130L-7	PD3S130L-13	PD3S130L-13	PD3S130L-13	PD3S130L-13	PD3S130L-13	PD3S130L-13	PD3S130L-13																		
Assembly	Package Type			DFN1006-2	PD323	PD323	PD323	PD15	PD15	PD15	PD15	PD15	PD15	PD15																		
Assembly	Package Size			1.0"6"0.5	1.95"2.6"0.7mm	1.95"2.6"0.7mm	1.95"2.6"0.7mm	4mm"5.35"1.1	4mm"5.35"1.1	4mm"5.35"1.1	4mm"5.35"1.1	4mm"5.35"1.1	4mm"5.35"1.1	4mm"5.35"1.1																		
Wafer	Die Name(s)			GY012AA0030ASA7-BHN	GY034AA0030PAA7-4C	GY034AA0030PAA7-4C	GY034AA0030PAA7-4C	GY073AA0100PTB2-4C-NNT	GY073AA0100PTB2-4C-NNT	GY073AA0100PTB2-4C-NNT	GY073AA0100PTB2-4C-NNT	GY045AA0200PUA2-4C	GY045AA0200PUA2-4C	GY045AA0200PUA2-4C																		
Wafer	Die Size (MIL/Thickness) - After Saw			0.31"0.31	0.85 x 0.9 x 0.14 mm	0.85 x 0.9 x 0.14 mm	0.85 x 0.9 x 0.14 mm	1.84 x 1.84 x 0.25mm	1.84 x 1.84 x 0.25mm	1.84 x 1.84 x 0.25mm	1.84 x 1.84 x 0.25mm	1.14 x 1.14"0.25mm	1.14 x 1.14"0.25mm	1.14 x 1.14"0.25mm																		
Wafer	Die Process / Technology			SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY																		
Wafer	Wafer FAB Location			GFAB	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK																		
Wafer	Wafer Diameter			6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"																		
Wafer	Front Metal Type			TiAlSiCu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu																		
Wafer	Front Metal Layer Number/ Thickness			2um	4um	4um	4um	4um	4um	4um	4um	4um	4um	4um																		
Wafer	Back Metal Type (All Layers)			TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au	TiNiV-Au																		
Wafer	Back Metal Thickness (All Layers)			0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um																		
Assembly	Die quantity per package (e.g. single or dual dies)			single	single	single	single	single	single	single	single	single	single	single																		
Assembly	Die Attach Method (DB Epoxy/Solder Type)			EMPOXY	Solder	Solder	Solder	Solder	Solder	Solder	Solder	Solder	Solder	Solder																		
Assembly	Die Attach Material/ Supplier			QMI519 / HENKEL	Indium83552	Indium83552	Indium83552	NC-SMQ515C/Indium	NC-SMQ515C/Indium	NC-SMQ515C/Indium	NC-SMQ515C/Indium	ES-500-SPA	ES-500-SPA	ES-500-SPA																		
Assembly	Bond Wire/Clip Bond Material/ Supplier			PdCu / Heesung	Clip/KLP0001E	Clip/KLP0001E	Clip/KLP0001E	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip	Clip	Clip																		
Assembly	Bond Type (at Die)			Thermo sonic	Clip	Clip	Clip	Solder	Solder	Solder	Solder	Thermo Sonic	Thermo Sonic	Thermo-Ultrasonic																		
Assembly	Bond Type (at LF)			Thermo sonic	Clip	Clip	Clip	Solder	Solder	Solder	Solder	Thermo Sonic	Thermo Sonic	Thermo-Ultrasonic																		
Assembly	Glass Transition Temp			135°C	130°C	130°C	130°C	130°C	130°C	130°C	130°C	135°C	135°C	160°C																		
Assembly	Terminal Finish (Plating) Material			NiPdAu plating	Sn	Sn	Sn	Pbfree	Pbfree	Pbfree	Pbfree	N/A	N/A	Pb free																		
Assembly	Header plating (Die Land Area)			NiPdAu plating	N/A	N/A	N/A	Spot Ag	Spot Ag	Spot Ag	Spot Ag	Bare copper	Bare copper	Copper																		
Assembly	Wire Diameter			1.0mil	Clip	Clip	Clip	KLP00014	KLP00014	KLP00014	KLP00014	Bare copper	Bare copper	2 mil																		
Assembly	Leadframe Type			SLP1006P2-U	KLF00457/KLF00623	KLF00457/KLF00623	KLF00457/KLF00623	PowerDi-5 F type	PowerDi-5 F type	PowerDi-5 F type	PowerDi-5 F type	PowerDi-123 C type	PowerDi-123 C type	PowerDi-123 C type																		
Assembly	Leadframe Material			C7025HH	CDA194HH	CDA194HH	CDA194HH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH																		
Assembly	Lead Frame Manufacture			MHT / ASM	SSH/P/PBE	SSH/P/PBE	SSH/P/PBE	NBKQ	NBKQ	NBKQ	NBKQ	HITACHI CABLE	HITACHI CABLE	HITACHI CABLE																		
Assembly	Molding Compound Type			EME-G770HCD	EME-G770H	EME-G770H	EME-G770H	EME-G700LA	EME-G700LA	EME-G700LA	EME-G700LA	EME-G700LA Type L-A	EME-G700LA Type L-A	EME-G700LA Type L-A																		
Assembly	Mold Compound Material Manufacture			SUMITOMO	Sumitomo	Sumitomo	Sumitomo	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO																		
Assembly	Green Compound Yes/No			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes																		
Assembly	Lead-Free (Yes/No)			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes																		
Assembly	Assembly Site/ Locator			CAT / CHENGDU	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH																		
Assembly	Test Site/ Locator			CAT / CHENGDU	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH																		
Product	Max Junction Temp			125 C	150 C	150 C	150 C	150 C	150 C	150 C	150 C	150 C	150 C	150 C																		
Product	Data Sheet			DS30504	DS30671	DS30671	DS30671	DS30483	DS30483	DS30483	DS30483	DS30628	DS30628	DS30628																		
Product	Qual Plan Number			20100601	20051201	20051201	20051201	20052008	20052008	20052008	20052008	20052008	20052008	20052008																		
Reliability and Characterization Testing																																
# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	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	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	QBS Test Completed	Results Pass/Fail	X = Test Needed	Results Pass/Fail							
J	MSL1 Pre-conditioning	Bake 125C Soak 85C, 85% RH IR reflow 280C	24 Hrs 168Hrs 3 cycles	SMD only, for Test #7	3 Assembly lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/50	3 wafer lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	FORWARD SURGE	MIL-750D, METHOD 4066	PER DATA SHEET	0/77	3 wafer lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	HTRB	Ta=150°C or Max TJ, Vd=100%, PER MIL-STD-750-1	168 Hrs 1000 Hrs 168 Cycles	0/77	3 wafer lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	1-Nov							
J	TC	Ta=-55C to 150C or Max TJ, PER JESD22A-104	500 Cycles 1000 Cycles	0/77	3 Assembly lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	1-Nov							
8 (alt)	PCT/AC	Ta=121C 15PSIG 100%RH, PER JESD22-A102	96 Hrs	0/77	3 Assembly lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	HAST	Ta=130C, 85%RH 33.3 psia 80% Bias; PER JESD22-A110	96 Hrs	0/77	3 wafer lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
9 alt	H3TRB	Ta=85°C, 85% RH, with 80% Maximum Reverse Bias, JESD22A-101	168 Hrs 500 Hrs 1000 Hrs	0/77	3 wafer lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	IOL	MIL-STD-750 Method 1037 (Not required for TVS)	2520 Cycles 7500 Cycles 15000 Cycles	0/77	3 wafer lots	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	ESD	HBM (AEC-Q101-001) CDM (AEC-Q101-005)	PER DATA SHEET	0/30	1 wafer lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	DPA	AEC-Q101-004 SEC. 4	PER DATA SHEET	0/30	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	Package Physical Dimensions (PD)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	Solderability	J-STD-002, JESD22B102 (245C +0/5S)	5 Seconds	0/10	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	Wire Bond Strength	MIL-STD-750 METHOD 2037 (JESD22-B116B)	Cpk>1.66	0/ min of 8	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	BOND SHEAR	AEC-Q101-003	Cpk>1.66	0/ min of 8	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
J	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X = Test Needed	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass							
Summary: Submitted By: William Lai 20201020 Approved By: Frank Chen, 10/21/2020																																



Certificate of Design, Construction & Qualification

Category	Qual Device 1 (Build in CAT)	Qual Device 2 (Build in SAT)	QBS source Device 1 - Lot 1 (Au Wire at SAT)	QBS source Device 1 - Lot 2 (Cu Wire at CAT)	QBS source Device 1 (DFN Package qual)
Product	BAS70-7-F	BAS70DW-04-7-F	BAT54CW-7-F	BAT54CW-7-F	BAT54LP-7
Assembly	SOT-23	SOT-363	SOT323	SOT323	DFN1006-2
Assembly	2.9*2.4*1.0mm	2.15*2.1*1.0	2.9*2.4*1.0	2.9*2.4*1.0	1.0*0.6*0.5
Wafer	GY010AA0070ANB3-AIN	GY010AA0070ANB3-AIN	GY012AA0030ASA3-AIN	GY012AA0030ASA3-AIN	GY012AA0030ASA7-BHN
Wafer	Die Size (W/L/Thickness) - After Saw	0.280 x 0.280 x 0.22mm	0.28*0.28*0.22 mm	0.31 x 0.31 x 0.22mm	0.31*0.31
Wafer	Die Process / Technology	SKY	SKY	SKY	SKY
Wafer	Wafer FAB/ Location	GFAB/UK	GFAB/UK	GFAB/UK	GFAB
Wafer	Wafer Diameter	6"	6"	6"	6"
Wafer	Front Metal Type	AlSiCu	AlSiCu	AlSiCu	TiAlSiCu
Wafer	Front Metal Layer Number/ Thickness	2um	2um	2um	2um
Wafer	Back Metal Type (All Layers)	NiVAu	NiVAu	NiVAu	Ti-NiV-Au
Wafer	Back Metal Thickness (All Layers)	0.5um	0.5um	0.5um	0.5um
Wafer	No of masks Steps	3	3	3	3
Assembly	Die quantity per package (e.g. single or dual dies)	single	single	single	single
Assembly	Die Attach Method (DB Epoxy/Solder Type)	EUTECTIC	EUTECTIC	EUTECTIC	EUTECTIC
Assembly	Bond Wire/Clip Bond Material/ Supplier	Cu	Au	Au	PdCu / Heesung
Assembly	Bond Type (at Die)	Thermo-Ultrasonic	Thermo-Ultrasonic	Thermo-Ultrasonic	Thermo sonic
Assembly	Bond Type (at LF)	Thermo-Ultrasonic	Thermo-Ultrasonic	Thermo-Ultrasonic	Thermo sonic
Assembly	No. of bond over active area	1	1	1	1
Assembly	Glass Transition Temp	160C	160C	160C	135°C
Assembly	Terminal Finish (Plating) Material	100% Matte Tin	100% Matte Tin	100% Matte Tin	NiPdAu plating
Assembly	Header plating (Die Land Area)	Ag	Ag	Ag	NiPdAu plating
Assembly	Wire Diameter	1mil	0.8mil	0.8 mil	1.0mil
Assembly	Leadframe Type	SOT-23C	SOT-363G	SOT323	SLP1006P2-U
Assembly	Leadframe Material	ALLOY42	Alloy 42	Alloy 42	C7025HH
Assembly	Lead Frame Manufacturer	SHEC	PBE	PBE	MHT / ASM
Assembly	Molding Compound Type	GR640HV-L1	CEL-1700HF40SK-D3	CEL-1700HF40SK-D3	EME-G770HCD
Assembly	Mold Compound Material Manufacturer	HENKEL	HITACHI	HITACHI	SUMITOMO
Assembly	Green Compound (Yes/No)	Yes	Yes	Yes	YES
Assembly	Lead-Free (Yes/No)	Yes	Yes	Yes	N/A
Assembly	Assembly Site/ Location	CAT/Chengdu	SAT/SH	SAT/SH	CAT / CHENGDU
Assembly	Test Site/ Location	CAT/Chengdu	SAT/SH	SAT/SH	CAT / CHENGDU
Product	Max Junction Temp	150 °C	150 °C	150 °C	N/A
Product	DataSheet	DS11007	DS30158	DS30065	BAT54LP-7
Product	Qual Plan Number	20120201	20120201	20052008	20100601

Reliability and Characterization Testing

# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	Results Pass/Fail	Results Pass/Fail	Results Pass/Fail	Results Pass/Fail	Results Pass/Fail	Results Pass/Fail	Results Pass/Fail	X = Test Needed	Results Pass/Fail
2	MSL1 Pre-conditioning	Bake 125C	24 Hrs	SMD only, for Test #7, 8, 9 &	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	Pass
		Soak 85C, 85% RH	168Hrs			X	Pass	X	Pass	X	Pass	X	Pass	
		IR reflow 260C	3 cycles			X	Pass	X	Pass	X	Pass	X	Pass	
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X	Pass	X	Pass	X	Pass	X	Pass	Pass
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/25	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	Pass
		FORWARD SURGE	MIL-750D, METHOD 4066	PER DATA SHEET	0/50	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass
5	HTRB	Ta=150°C or Max Tj, Vd=100%, PER MIL-STD-750-1	168 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	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	
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-104	168 Cycles	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	Pass
			500 Cycles	0/77		X	Pass	X	Pass	X	Pass	X	Pass	
			1000 Cycles	0/77		X	Pass	X	Pass	X	Pass	X	Pass	
7b	Wire Bond Integrity	MIL-STD-750, Method 2037 (For bonding of dissimilar metals, eg: Au/Al)	500 Hrs	0/5	3 Assembly lots	X	Pass	X	Pass					
8 (alt)	PCT/AC	Ta=121°C 15PSIG 100%RH; PER JESD22-A102	96 Hrs	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	Pass
9	HAST	Ta=130C, 85%RH 33.3 psia 80% Bias; PER JESD22-A110	96 Hrs	0/77	3 wafer lots							X	Pass	Pass
9 alt	H3TRB	Ta=85°C, 85% RH, with 80% Maximum Reverse Bias. JESD22A-101	168 Hrs	0/77	3 wafer lots	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	
10	IOL	MIL-STD-750 Method 1037 (Not required for TVS)	2520 Cycles	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	Pass
			7560 Cycles	0/77		X	Pass	X	Pass	X	Pass	X	Pass	
			15000 Cycles	0/77		X	Pass	X	Pass	X	Pass	X	Pass	
11	ESD	HBM (AEC-Q101-001)	PER DATA SHEET	0/30	1 wafer lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
		CDM (AEC-Q101-005)	PER DATA SHEET	0/30	1 wafer lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
12	DPA	AEC Q101-004 SEC. 4		0/2	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
13	Package Physical Dimemions (PD)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
20	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
21	Solderability	J-STD-002; JESD22B102 (245C +0/5S)	5 Seconds	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
23	Wire Bond Strength	MIL-STD-750 METHOD 2037 (JESD22-B116B)	Cpk>1.66	0/ min of 5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
24	BOND SHEAR	AEC-Q101-003	Cpk>1.66	0/ min of 5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	Pass

Summary:
 Submitted By: William_Lai 2/25, 2020
 Approved By: William_Lai 2/25, 2020
 Frank Chen, 4/7/2021



Certificate of Design, Construction & Qualification

Description: GFAB wafer for SOD123F and DFN package qual in SAT.

Category				SOD123F Package Qual Device In SAT	DFN Package Qual Device In SAT	QBS source Device 1 (1st TIS)	QBS source Device 1 (2nd TIS)	QBS source Device 1 (3rd TIS)	QBS source Device 2 (1st NIP15%)	QBS source Device 2 (2nd NIP15%)	QBS source Device 2 (3rd NIP15%)	QBS source Device 3 (1st NIP20%)	QBS source Device 3 (2nd NIP20%)	QBS source Device 3 (3rd NIP20%)	QBS source Device 4 (Cr In SAT)		
Product	Part Number	1N5819HW-7-F	1N5819HW-7-F	SDM02U30LP3-B	PD3S130L-7	PD3S130L-7	PD3S130L-7	PD3S130L-7	PDSS100-13	PDSS100-13	PDSS100-13	PDSS100-13	DFLS1200-7	DFLS1200-7	DFLS1200-7	1N5819HW-7-F	
Assembly	Package Type	SOD-123F	SOD-123F	DFN0603B3-2	PD323	PD323	PD323	PD323	PDIS	PDIS	PDIS	PDIS	PD123	PD123	PD123	SOD123	
Wafer	Die Name(s)	2.71/80.98 mm	2.71/80.98 mm	0.82/0.32/0.3 mm	1.95*2.6*0.7mm	1.95*2.6*0.7mm	1.95*2.6*0.7mm	1.95*2.6*0.7mm	4mm*5.35*1.1	4mm*5.35*1.1	4mm*5.35*1.1	4mm*5.35*1.1	3.7*1.775*0.98mm	3.7*1.775*0.98mm	3.7*1.775*0.98mm	1.55*3.7*1.06	
Wafer	Die Size (W/L/Thickness) - After Saw	0.610.81/0.24 mm	0.610.81/0.24 mm	0.220/0.22/0.14 mm	0.65 x 0.9 x 0.14 mm	0.65 x 0.9 x 0.14 mm	0.65 x 0.9 x 0.14 mm	0.65 x 0.9 x 0.14 mm	1.84 x1.84 x 0.25mm	1.84 x1.84 x 0.25mm	1.84 x1.84 x 0.25mm	1.84 x1.84 x 0.25mm	1.14 x 1.14*0.25mm	1.14 x 1.14*0.25mm	1.14 x 1.14*0.25mm	0.810.81/0.24 mm	
Wafer	Die Process / Technology	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	SKY	
Wafer	Wafer FAB/Location	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	
Wafer	Wafer Diameter	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	
Wafer	Front Metal Type	AlCu+NiAu	AlCu+NiAu	AlSiCu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlCu+NiAu	AlSiCu	
Wafer	Front Metal Layer Number/ Thickness	4um	4um	4um	4um	4um	4um	4um	4um	4um	4um	4um	4um	4um	4um	4um	
Wafer	Back Metal Type (All Layers)	TiNiV/Au	TiNiV/Au	NiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	TiNiV/Au	
Wafer	Back Metal Thickness (All Layers)	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	0.5um	
Wafer	No. of masks Steps	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Assembly	Die quantity per package (e.g. single or dual)	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	Single	
Assembly	Die Attach Method (DB Epoxy/Solder Type)	Solder	Solder	EUTECTIC	Solder	Solder	Solder	Solder	Solder	Solder	Solder	Solder	Solder	Solder	Solder	EPOXY	
Assembly	Die Attach Material/ Supplier	NC-SMOS15C/Indium	NA	Indium83552	Indium83552	Indium83552	Indium83552	Indium83552	NC-SMOS15C/Indium	NC-SMOS15C/Indium	NC-SMOS15C/Indium	NC-SMOS15C/Indium	ES-500-SPA	ES-500-SPA	ES-500-SPA	9005SP	
Assembly	Bond Wire/Clip Bond Material/ Supplier	Clip / MSMM	Au	Clip/KLP00015	Clip/KLP00015	Clip/KLP00015	Clip/KLP00015	Clip/KLP00015	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip/HITACHI CABLE	Clip	Clip	Clip	Cu	
Assembly	Bond Type (at Die)	Solder	Thermo Sonic	Clip	Clip	Clip	Clip	Clip	Solder	Solder	Solder	Solder	Thermo Sonic	Thermo Sonic	Thermo Sonic	Thermo-Ultrasonic	
Assembly	Bond Type (at LFL)	Solder	Thermo Sonic	Clip	Clip	Clip	Clip	Clip	Solder	Solder	Solder	Solder	Thermo Sonic	Thermo Sonic	Thermo Sonic	Thermo-Ultrasonic	
Assembly	No. of bond over active are	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
Assembly	Glass Transition Temp	130C	160C	130C	130C	130C	130C	130C	130C	130C	130C	130C	135C	135C	135C	160C	
Assembly	Terminal Finish (Plating) Material	Pbfree	Matte Tin	Pbfree	Sn	Pbfree	Sn	Pbfree	N/A	Pbfree	N/A	Pbfree	N/A	N/A	N/A	Pb free	
Assembly	Header plating (Die Land Area)	Spot Ag	Ag Plating	Spot Ag	N/A	Spot Ag	N/A	Spot Ag	Spot Ag	Spot Ag	Spot Ag	Spot Ag	Bare copper	Bare copper	Bare copper	Ag	
Assembly	Wire Diameter	KL200033	0.8mm	Clip	Clip	Clip	Clip	Clip	KL200014	KL200014	KL200014	KL200014	Clip	Clip	Clip	2 mil	
Assembly	Leadframe Type	SOD-123F C	SLP0603P2-D	KLFD0457/KLF00623	KLFD0457/KLF00623	KLFD0457/KLF00623	KLFD0457/KLF00623	KLFD0457/KLF00623	PowerDI-5 F typ	PowerDI-5 F typ	PowerDI-5 F typ	PowerDI-5 F typ	PowerDI-123 C typ	PowerDI-123 C typ	PowerDI-123 C typ	SOD-123	
Assembly	Leadframe Material	C194FH	EFTEC64T	CDA194HH	CDA194HH	CDA194HH	CDA194HH	CDA194HH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	CDA194FH	Alloy 42	
Assembly	Lead Frame Manufacture	SDI	DNP	SSHP/PBE	SSHP/PBE	SSHP/PBE	SSHP/PBE	SSHP/PBE	NBKQ	NBKQ	NBKQ	NBKQ	HITACHI CABLE	HITACHI CABLE	HITACHI CABLE	MHT/JHL/IN/NBKQ/XMYH/JYK	
Assembly	Molding Compound Type	EME-G700LA Type L-A	EME-G770HCD	EME-G700H	EME-G700H	EME-G700H	EME-G700H	EME-G700LA	EME-G700LA	EME-G700LA	EME-G700LA	EME-G700LA	EME-G700LA Type L-A	EME-G700LA Type L-A	EME-G700LA Type L-A	GR64HW-L1	
Assembly	Mold Compound Material Manufacture	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	SUMITOMO	Henkel	
Assembly	Green Compound (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Assembly	Lead-Free (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Assembly	Assembly Site/Localor	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	
Assembly	Test Site/Localor	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	SAT/SH	
Product	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	150 C	150 C	150 C	150 C	
Product	DataSheet	DS37090	DS35774	DS30671	DS30671	DS30671	DS30671	DS30671	DS30483	DS30483	DS30483	DS30483	DS30628	DS30628	DS30628	DS30217	
Product	Qual Plan Number	20091402	20091402	20051201	20051201	20051201	20051201	20051201	20052008	20052008	20052008	20052008	20052008	20052008	20052008	20081801	
Reliability and Characterization Testing																	
# In AEC-Q101	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	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
2	MSL1 Pre-conditioning	Bake 125C Soak 85C, 85% RH IB reflow 265C	24 Hrs 168Hrs 3 cycles	SMD only for Test #7, 8, 9, &	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/25	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
5	FORWARD SURGE	MIL-750D, METHOD 4066	PER DATA SHEET	0/50	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
5	HTRB	Ta=150C or Max Tj, Vd=100%, PER MIL-STD-750-1	168 Hrs 500 Hrs 1000 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-10	168 Cycles 500 Cycles 1000 Cycles	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
8 (alt)	PCTIAC	Ta=121C 15PSIG 100%RH; PER JESD22-A102	96 Hrs	0/77	3 Assembly lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
9	HAST	Ta=130C, 85%RH 33.3 psia 80% Bias; PER JESD22-A110	96 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
9 alt	H3TRB	Ta=85C, 85% RH, with 80% Maximum Reverse Bias, JESD22A-101	168 Hrs 500 Hrs 1000 Hrs	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
10	IOL	MIL-STD-750 Method 1037 (Not required for TVs)	2520 Cycles 7500 Cycles 15000 Cycles	0/77	3 wafer lots	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
11	ESD	HBM (AEC-Q101-001) CDM (AEC-Q101-005)	PER DATA SHEET PER DATA SHEET	0/30 0/30	1 wafer lot 1 wafer lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
12	Package Physical Dimensions (PD)	AEC Q101-004 SEC. 4	0/2		1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
13	RESISTANCE TO SOLDER HEAT (RSH)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
20	Solderability	ESD22 A-111 (SMD), B-106 (PTH) (260C @10 J-STD-002, JESD22B102 (245C +0/5S)	PER SPEC	0/30	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
22	THERMAL RESISTANCE (TR)	JESD22-B102 (245C +0/5S)	PER SPEC	0/10	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
23	Wire Bond Strength	MIL-STD-750 METHOD 2037 (JESD22-B116B)	Cpk-1.66	0/ min of 5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
24	BOND SHEAR	AEC-Q101-003	Cpk-1.66	0/ min of 5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
26	Die Shear	MIL-STD-750 (2017)	Cpk-1.66	0/5	1 Assembly lot	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass	X	Pass
Summary: Submitted By: William_Lai 20210209 Approved By: William_Lai 20210209 Frank Chen, 2/22/2021																	



Certificate of Design, Construction & Qualification

Description: SDT40A120CT,SDT40H120CT,SDT30120CT, SDT30100CT,SDT40A100CT,SDT40B100ST full qual for GFAB SDT 100V and 120V process release

Category	Part Number	Qual Device 1	Qual Device 2	Qual Device 3	Qual Device 4	Qual Device 5	Qual Device 6
Product	SDT40A120CT	SDT40H120CT	SDT30120CT	SDT30100CT	SDT40A100CT	SDT40B100ST	
Assembly	TO220AB	TO220AB	TO220AB	TO220AB	TO220AB	TO220AB	
Assembly	Package Size	29*10.16*4.70mm	29*10.16*4.70mm	29*10.16*4.70mm	29*10.16*4.70mm	29*10.16*4.70mm	29*10.16*4.70mm
Wafer	Die Name(s)	GK112AA0120AUB2-HGT	GK123AA0120AUB2-HGT	GK092AA0120AUF2-HGT	GK092AA0100AUA2-HGT	GK112AA0120AUB2-HGT	GK135AA0100AUA2-HGT
Wafer	Die Size (W/L/Thickness) - After Saw	2844*2844*250um3	3124*3124*250um3	2336*2336*250um3	2336*2336*250um3	2844*2844*250um3	3600 x 3280 x 250um3
Wafer	Die Process / Technology	Trench Schottky	Trench Schottky	Trench Schottky	Trench Schottky	Trench Schottky	Trench Schottky
Wafer	Wafer FAB/ Location	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK	GFAB/UK
Wafer	Wafer Diameter	8"	8"	8"	8"	8"	8"
Wafer	Front Metal Type	AlCu	AlCu	AlCu	AlCu	AlCu	AlCu
Wafer	Front Metal Layer Number/ Thickness	1/ 4um	1/ 4um	1/ 4um	1/ 4um	1/ 4um	1/ 4um
Wafer	Number of Poly Layers	1	1	1	1	1	1
Wafer	Back Metal Type (All Layers)	TiNiAg	TiNiAg	TiNiAg	TiNiAg	TiNiAg	TiNiAg
Wafer	Back Metal Thickness (All Layers)	1K/3K/10K	1K/3K/10K	1K/3K/10K	1K/3K/10K	1K/3K/10K	1K/3K/10K
Wafer	No of masks Steps	3	3	3	3	3	3
Assembly	Die quantity per package (e.g. single or dual dies)	DUAL	DUAL	DUAL	DUAL	DUAL	Single
Assembly	Die Attach Method (DB Epoxy/Solder Type)	SOFT SOLDER	SOFT SOLDER	SOFT SOLDER	SOFT SOLDER	SOFT SOLDER	soft solder
Assembly	Die Attach Material/ Supplier	Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5	Pb92.5Sn5Ag2.5
Assembly	Bond Wire/Clip Bond Material/ Supplier	Al	Al	Al	Al	Al	Al/ TANAKA
Assembly	Bond Type (at Die)	Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic
Assembly	Bond Type (at LF)	Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic	Ultrasonic
Assembly	No. of bond over active area	4	4	4	4	4	2
Assembly	Glass Transition Temp	140°C	140°C	140°C	140°C	140°C	140°C
Assembly	Terminal Finish (Plating) Material	Sn	Sn	Sn	Sn	Sn	100% Matte Tin
Assembly	Header plating (Die Land Area)	Bare copper	Bare copper	Bare copper	Bare copper	Bare copper	Bare copper
Assembly	Wire Diameter	20 mil Al	20 mil Al	20 mil Al	15 mil Al	20 mil Al	20mil
Assembly	Leadframe Type	TO220-3L G	TO220-3L G	TO220-3L G	TO220-3L G	TO220-3L G	TO-220AB-3L
Assembly	Leadframe Material	KFC	KFC	KFC	KFC	KFC	KFC
Assembly	Lead Frame Manufacturer	XMYM/ NBKQ	XMYM/ NBKQ	XMYM/ NBKQ	XMYM/ NBKQ	XMYM/ NBKQ	SDI
Assembly	Molding Compound Type	EME-G630AY	EME-G630AY	EME-G630AY	EME-G630AY	EME-G630AY	EME-G630AY
Assembly	Mold Compound Material Manufacturer	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo	Sumitomo
Assembly	Green Compound (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes
Assembly	Lead-Free (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes
Assembly	Assembly Site/ Location	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	HYME/ Xi'an
Assembly	Test Site/ Location	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	SAT/ Shanghai	SAT / Shanghai
Product	Max Junction Temp	150°C	150°C	150°C	150°C	150°C	150°C
Product	DataSheet	DS39115	DS38895	DS39112	DS38964	DS38960	DS# 40921
Product	Qual Plan Number	QP#21011201	QP#21011201	QP#21011201	QP#21011201	QP#21011201	QP#21011201

Reliability and Characterization Testing

# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	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	
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/25	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
	FORWARD SURGE	MIL-750D, METHOD 4066	PER DATA SHEET	0/50	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
5	HTRB	Ta=150°C or Max Tj, Vd=100%, PER MIL-STD-750-1	168 Hrs	0/77	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
			500 Hrs	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
			1000 Hrs***	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-104	168 Cycles	0/77	3 Assembly lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
			500 Cycles	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
			1000 Cycles	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
8 (alt)	PCT/AC	Ta=121°C 15PSIG 100%RH; PER JESD22-A102	96 Hrs	0/77	3 Assembly lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
8 (alt)	HHT	Ta=85°C, 85% RH,	168 Hrs	0/77	3 wafer lots											X = Test Needed	PASS	
			500 Hrs	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	X = Test Needed	PASS
			1000 Hrs	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	X = Test Needed	PASS
9 alt	H3TRB	Ta=85°C, 85% RH, with 80% Maximum Reverse Bias. JESD22A-101	168 Hrs	0/77	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
			500 Hrs	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	X = Test Needed	PASS
			1000 Hrs	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	X = Test Needed	PASS
10	IOL	MIL-STD-750 Method 1037 (Not required for TVs)	2520 Cycles	0/77	3 wafer lots	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
			7560 Cycles	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	X = Test Needed	PASS
			15000 Cycles	0/77		X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	X = Test Needed	PASS
11	ESD	HBM (AEC-Q101-001)	PER DATA SHEET	0/30	1 wafer lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
		CDM (AEC-Q101-005)	PER DATA SHEET	0/30	1 wafer lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
12	DPA	AEC Q101-004 SEC. 4	X = Test Needed	0/2	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
20	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 A-111 (SMD), B-106 (PTH) (260C @10S)	PER SPEC	0/30	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
21	Solderability	J-STD-002; JESD22B102 (245C +0/5S)	5 Seconds	0/10	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
23	Wire Bond Strength	MIL-STD-750 METHOD 2037 (JESD22-B116B)	Cpk>1.66	0/ min of 5	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
24	BOND SHEAR	AEC-Q101-003	Cpk>1.66	0/ min of 5	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/5	1 Assembly lot	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	X = Test Needed	PASS	

Summary: Carol Yang
 Submitted By: Carol Yang_2021/2/5
 Approved By: Frank Chen, 4/7/2021



Certificate of Design, Construction & Qualification

Description: Qualify NiVSi CSP process

Category				Qual Source Device 2 Lot 1 (Phase 1)			
Product	Part Number					SDM05A30CP3-7	
Assembly	Package					CSP	
Assembly	Package Type					X3-WLB0603-2	
Wafer	Die Name(s)					GY0603AA030AOAX	
Wafer	Die Size (W/L/Thickness)					0.6*0.3*0.25mm	
Wafer	Die Process / Technology					SKY	
Wafer	Wafer FAB/ Location					GFAB	
Wafer	Wafer Diameter					6"	
Wafer	Wafer Thickness					625 um	
Wafer	Front Metal Type					AlCu	
Wafer	Front Metal Layer Number/ Thickness					2um	
Wafer	Die Conforming Coating (Passivation)					oxide/nitride	
Wafer	Die passivation thickness range					9000A	
Wafer	No of masks Steps					5	
Wafer	Passivation opening					145umx240um & 145umx240um	
Assembly	Die Quantity (eg. Die per package)					1	
Assembly	Plating/Ball Bump material type					NiAu	
Assembly	Plating/Bump height					5 um	
Assembly	No. of Bumps per die					2	
Assembly	Bump shape dimension					Rectangle/145umx240um	
Assembly	Backside lamination material					LC2824H	
Assembly	Backside lamination Supplier					Lintec	
Assembly	Overall Package Height					250um	
Assembly	Assembly Site/ Location					CAT/China	
Assembly	Test Site/ Location					CAT/China	
Product	Max Junction Temp					150C	
Product	DataSheet					DS41115	
Product	Qual Plan Number					20081803	
Reliability and Characterization Testing							
# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Accept on # Failed/ Sample Size per Lot	# of Lots	X = Test Needed	Results Pass/Fail
2	MSL1 Pre-conditioning	Bake 125C	24 Hrs	SMD only, for Test #7, 8, 9 & 10	3 Assembly lots	X	Pass
		Soak 85C, 85% RH	168Hrs			X	Pass
		IR reflow 260C	3 cycles			X	Pass
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	All qualification parts submitted for testing		X	Pass
4	PARAMETRIC VERIFICATION (PV)	Test all parameters per Data Sheet including AC & DC across data sheet temperature range	Operating Range, Per Data Sheet (AC, DC)	0/50	3 wafer Lots	X	Pass
	FORWARD SURGE	MIL-750D, METHOD 4066	PER DATA SHEET	0/45	3 wafer lots	X	Pass
5	HTRB	Ta=150°C or Max Tj, Vd=100%, PER MIL-STD-750-1	168 Hrs	0/77	3 wafer lots	X	Pass
			500 Hrs	0/77		X	Pass
			1000 Hrs	0/77		X	Pass
7	TC	Ta=-55C to 150C or Max Tj, PER JESD22A-10	168 Cycles	0/77	3 Assembly lots	X	Pass
			500 Cycles	0/77		X	Pass
			1000 Cycles	0/77		X	Pass
8	uHAST	Ta=130°C/85%RH, 96Hrs for release, 168, 240 Hrs for information; PER JESD22-A118	96 Hrs	0/77	3 Assembly lots	X	Pass
9a	H3TRB	Ta=85°C, 85% RH, 80% reverse biase (Vds)	168 Hrs	0/77	3 wafer lots	X	Pass
			500 Hrs	0/77		X	Pass
			1000 Hrs	0/77		X	Pass
10	IOL	MIL-STD-750 Method 1037 (N/A for TVS)	2520 Cycles	0/77	3 wafer lots	X	Pass
			7560 Cycles	0/77		X	Pass
			15000 Cycles	0/77		X	Pass
11	ESD	HBM (AEC-Q101-001)	PER DATA SHEET	0/30	1 wafer lot	X	Pass
		MM (AEC-Q101-002)	PER DATA SHEET	0/30	1 wafer lot	X	Pass
13	Package Physical Dimemions (PD)	JESD22-B100	Package Outline	0/30	1 Assembly lot	X	Pass
20	RESISTANCE TO SOLDER HEAT (RSH)	Surface Mount Devices only: Reflow Soldering - Per IPC/JEDEC J-STD-020	3 Reflow cycles / PER SPEC	0/77	1 Assembly lot	X	Pass
21	Solderability	Paragraph 2 of Reference Spec, Require 8 hrs steam aging; PER MIL-STD-202 (M208)	5 Seconds	0/10	1 Assembly lot	X	Pass
22	THERMAL RESISTANCE (TR)	JESD 24-3, 24-4, 24-6 AS APPROPRIATE	PER SPEC	0/10	1 Assembly lot	X	Pass
Summary:		2020/12/16					
Submitted By:		William Lai					
Approved By:		Frank Chen, 2/22/2021					