



Diodes Incorporated Discrete and Analog Semiconductors

Qualification Report – PCN-2197



Manufacturer No.:

PCN-2197 - Qualification of "Diodes Technology (Chengdu) Company Limited" (CAT) as an Additional Plating Site

Revision:

0

Date:

July 29, 2015

Qualified By:

Diodes Incorporated

Also Applicable To:

The part numbers listed in the associated PCN are Qualified by Similarity (QBS) to the devices for which test results are included in this report.

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

Prepared By:

Diodes US Document Control

Date

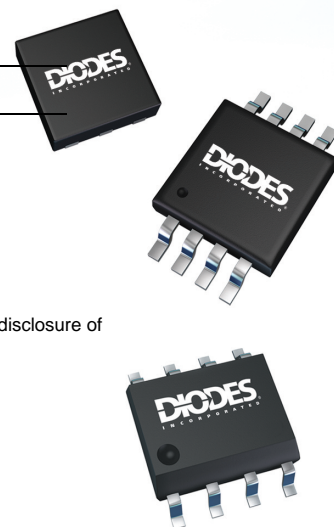
July 29, 2015

Approved By:

Diodes US QRA Department

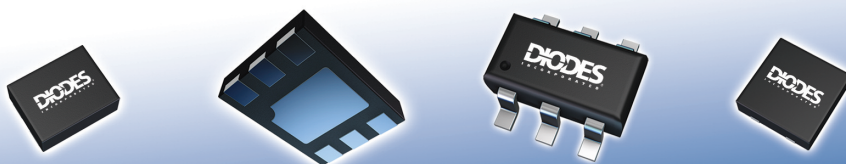
Date

July 29, 2015



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diodes.com



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DATE: 29th July, 2015

PCN #: 2197

PCN Title: Qualification of "Diodes Technology (Chengdu) Company Limited"
(CAT) as an Additional Plating Site

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-2197 REV 00**

Notification Date:	Implementation Date:	Product Family:	Change Type:	PCN #:
29 th July, 2015	27 th October, 2015	Discrete/Analog Semiconductors	Plating Site	2197
TITLE				
Qualification of "Diodes Technology (Chengdu) Company Limited" (CAT) as an Additional Plating Site.				
DESCRIPTION OF CHANGE				
This PCN is being issued to notify customers that in order to assure continuity of supply, Diodes has qualified "Diodes Technology (Chengdu) Company Limited" (CAT) located in Chengdu, China as an additional plating site.				
Full electrical characterization and high reliability testing has been completed on representative part numbers built using CAT plating service to ensure there is no change to device functionality or electrical specifications in the datasheet.				
IMPACT				
Continuity of Supply. No change in datasheet parameters and product performance.				
PRODUCTS AFFECTED				
Please see the attached part list below				
WEB LINKS				
Manufacturer's Notice:	http://www.diodes.com/quality/pcns			
For More Information Contact:	http://www.diodes.com/contacts			
Data Sheet:	http://www.diodes.com/products			
DISCLAIMER				
Unless a Diodes Incorporated Sales representative is contacted in writing within 30 days of the posting of this notice, all changes described in this announcement are considered approved.				

Affected Part List				
MMDT3904-7-F	BC846B-7-F	DMN601K-7	AS358MTR-E1	AP2128K-ADJTRG1
2N7002-7-F	BC847B-7-F	DMP2035U-7	AP2125K-3.3TRG1	AP2111H-3.3TRG1
2N7002A-7	AZ1117CH-3.3TRG1	DMP2215L-7	AP3770AK6TR-G1-2	AP2114HA-2.5TRG1
2N7002DW-7-F	BS870-7-F	DMP2305U-7	AP3770BK6TR-G1-2	AP1117E18G-13-20
2N7002E-7-F	BSS123-7-F	DMP3098L-7	AZ23C16-7-F	AP1117EG-13
2N7002K-7	BSS138-7-F	AZ1117H-ADJTRG1	MMBZ5222B-7-F	AP1117EG-13-20
2N7002W-7-F	BSS84-7-F	DZ23C12-7-F	AS393MTR-E1	AP2171SG-13
AS358UMTR-G1	BZT52C15S-7-F	DZ23C13-7-F	AZ4558CMTR-E1	AP2331SA-7
AP1117E33G-13	BZT52C6V8S-7-F	DZ23C15-7-F	AS431ANTR-E1	B0530WS-7-F
AZ23C10-7-F	BZX84C10-7-F	DZ23C3V6-7-F	AS431BNTR-E1	BAT760-7
AZ23C11-7-F	BZX84C11-7-F	DZ23C5V6-7-F	AN431AN-ATRG1	BSN20-7
AZ23C12-7-F	BZX84C12-7-F	MMBD4148-7-F	AN431BN-ATRG1	DMG2301U-7
AZ23C13-7-F	BZX84C13-7-F	MMBD7000-7-F	DT955-7	DMG4435SSS-13
AZ23C15-7-F	BZX84C15-7-F	MMBD914-7-F	AS431ANTR-G1	DMN2004DWK-7
AZ23C18-7-F	BZX84C16-7-F	MMBF170-7-F	AS431BNTR-G1	DMP3160L-7
AZ23C20-7-F	BZX84C18-7-F	MMBT2222A-7-F	AT1042K6-5.0TRG1	MMBZ5229B-7-F
AZ23C22-7-F	BZX84C20-7-F	MMBT2907A-7-F	AZ1117H-3.3TRE1	AZV331KTR-G1
AZ23C27-7-F	BZX84C22-7-F	MMBT3904-7-F	AZ1117H-3.3TRG1	AZ1117EH-3.3TRG1
AZ23C2V7-7-F	BZX84C24-7-F	MMBT3906-7-F	AZ1117H-1.2TRG1	AZ1117CH-1.8TRG1
AZ23C36-7-F	BZX84C27-7-F	MMBT4401-7-F	AZ1117H-ADJTRE1	AP2127K-1.8TRG1
AZ23C3V3-7-F	BZX84C2V7-7-F	MMBTA05-7-F	AT2042K6-5.0TRG1	DMG6402LDM-7
AZ23C3V6-7-F	BZX84C30-7-F	MMBTA06-7-F	AS393MTR-G1	AL8811M8-13
AZ23C4V7-7-F	BZX84C33-7-F	MMBZ15VAL-7-F	AZ431AN-ATRG1	AP1694AMTR-G1
AZ23C5V1-7-F	BZX84C36-7-F	MMBZ15VDL-7-F	AZ431BN-ATRG1	AP2204K-ADJTRG1
AZ23C5V6-7-F	BZX84C39-7-F	MMBZ27VCL-7-F	AS358MTR-G1	AP2204K-5.0TRG1
AZ23C6V2-7-F	BZX84C3V3-7-F	MMBZ5223B-7-F	AZ432ANTR-E1	AP1117EG-13-32
AZ23C9V1-7-F	BZX84C3V6-7-F	MMBZ5226B-7-F	AZ432BNTR-E1	AL9910AS-13
AZ34063UMTR-G1	BZX84C3V9-7-F	MMBZ5230B-7-F	AP2127K-ADJTRG1	AL9910ASP-13
AZ431AN-ATRE1	BZX84C43-7-F	MMBZ5231B-7-F	AP2125K-2.5TRG1	MBR0580S1-7
AZ431BN-ATRE1	BZX84C47-7-F	MMBZ5232B-7-F	DMN601DWK-7	DMN62D4SDW-7
AZ431AUN-ATRG1	BZX84C4V3-7-F	MMBZ5233B-7-F	DMG6968UDM-7-01	AZ431AN-BTRE1
BAL99-7-F	BZX84C4V7-7-F	MMBZ5234B-7-F	AP2125K-2.8TRG1	AZ1117H-2.5TRG1
BAS16-7-F	BZX84C51-7-F	MMBZ5235B-7-F	BSS138DW-7-F	AZ1117H-1.5TRG1
BAS40-04-7-F	BZX84C5V1-7-F	MMBZ5236B-7-F	DMN65D8LDW-7	AZ1117CH-2.5TRG1
BAS40-05-7-F	BZX84C5V6-7-F	MMBZ5237B-7-F	AP2125K-1.8TRG1	AZ1117CH-1.5TRG1
BAS40-06-7-F	BZX84C6V2-7-F	MMBZ5239B-7-F	AZ1117H-1.8TRG1	DMP2035UVT-7

Affected Part List				
BAS40-7-F	BZX84C6V8-7-F	MMBZ5240B-7-F	AZ1117CH-1.2TRG1	74LVC1G58W6-7
BAS70-04-7-F	BZX84C7V5-7-F	MMBZ5241B-7-F	AZ1117EH-ADJTRG1	AL1678-10BS7-13
BAS70-05-7-F	BZX84C8V2-7-F	MMBZ5242B-7-F	AZ1117EH-1.8TRG1	AP1695-20CS7-13
BAS70-06-7-F	BZX84C9V1-7-F	MMBZ5244B-7-F	AP3772BK6TR-G1-2	AL1678-20BS7-13
BAS70-7-F	DDZX16-7	MMBZ5245B-7-F	AP3762BK6TR-G1	1N4148W-7-F
BAT54-7-F	DDZX24C-7	MMBZ5246B-7-F	AS331KTR-G1	BZT52C3V3-7-F
BAT54A-7-F	DDZX30D-7	MMBZ5248B-7-F	AS321KTR-E1	D5V0F4U6SO-7
BAT54C-7-F	DDZX5V1B-7	MMBZ5256B-7-F	AZV393MTR-G1	DMG6968UDM-7
BAT54S-7-F	DDZX6V2B-7	MMBZ5257B-7-F	AZV358MTR-G1	DMN2100UDM-7
BAT54SW-7-F	DMG3415U-7	MMBZ5258B-7-F	AS358AMTR-E1	DMN3033LDM-7
BAT54WS-7-F	DMG6968U-7	MMBZ5259B-7-F	BAT54CW-7-F	DMP2066LDM-7
BAV70-7-F	DMN2004K-7	SDM10K45-7-F	AP2127K-4.75TRG1	DMP3056LDM-7
BAV99-7-F	DMN2075U-7	BAT54AW-7-F	AP3502EMTR-G1	DMT6016LSS-13
BAW56-7-F	DMN3404L-7	AZ1117CH-ADJTRG1		



Certificate of Design, Construction & Qualification

Description: CAT Plating Qualification - Discrete Devices

Category				Qual Device 1		
Product	Part Number			MMDT3904-7-F		
Assembly	Package Type			SOT-363		
Assembly	Package Size			2.15*2.1*1.05		
Wafer	Die Name(s)			C3904E		
Wafer	Die Size (W/L/Thickness) - After Saw			0.31*0.4*0.216		
Wafer	Die Process / Technology			TRANSISTOR		
Wafer	Wafer FAB			KFAB		
Wafer	Wafer Diameter			6"		
Wafer	Front Metal Type			Al		
Wafer	Front Metal Thickness			3.5um		
Wafer	Back Metal Type (All Layers)			Ni/Au		
Wafer	Back Metal Thickness (All Layers)			125A NiV and 5150A Au		
Wafer	Die Conforming Coating (Passivation)			PECVD Oxide-6kA PECVD Nitride-1.5kA		
Wafer	Die passivation thickness range			6kA / 1.5kA		
Wafer	No of masks Steps			9		
Assembly	Die quantity per package (e.g. single or dual dies)			Dual		
Assembly	Die Attach Method (DB Epoxy/Solder Type)			Eutectic		
Assembly	Die Attach Material			NA		
Assembly	Bond Wire/Clip Bond Material			Cu		
Assembly	Bond Type (at Die)			Ball		
Assembly	Bond Type (at LF)			Wedge		
Assembly	No. of bond over active area			B: 1 wire/die; E: 2wire/die		
Assembly	Glass Transition Temp			130°C		
Assembly	Terminal Finish (Plating) Material			100% matte tin		
Assembly	Header plating (Die Land Area)			Full Cu plating		
Assembly	Wire Diameter			1.0mil		
Assembly	Leadframe Type			SOT-363 K		
Assembly	Leadframe Material			A42		
Assembly	Lead Frame Manufacturer			SDI / NBKQ		
Assembly	Molding Compound Type			CEL-1700		
Assembly	Mold Compound Material Manufacturer			HITACHI		
Assembly	Green Compound (Yes/No)			YES		
Assembly	Lead-Free (Yes/No)			YES		
Assembly	Assembly Site			CAT		
Assembly	Test Site			CAT		
Product	Max Junction Temp			150°C		
Product	Max Thermal resistance Junc (ambient)			625°C/W		
Product	DataSheet			MMDT3904 / DS30088		
Reliability and Characterization Testing						
# in AEC-Q101 (D)	Test	Test Conditions	Duration / Limits	Fail/SS - Sample Size	X = Test Needed	Results Pass/Fail
2	MSL1 Pre-conditioning	Bake 125C	24 Hrs	0/154	X	Passed
		Soak 85C, 85% RH	168Hrs	0/154	X	Passed
		IR reflow 260C	3 cycles	0/154	X	Passed
3	EXTERNAL VISUAL (EV)	MIL-STD-750 METHOD 2071	PER SPEC	0/500	X	Passed
4	PARAMETRIC VERIFICATION (PV)	-55C, 25C, 85C, 125C, 150C	Operating Range, Per Data Sheet	0/25	X	Passed
5	HTRB	T=150°C Vd=100%, PER JESD22 A-108	168 Hrs	0/77	X	Passed
			500 Hrs	0/77	X	Passed
			1000 Hrs	0/77	X	Passed
7	TC	-65C to 150C PER JESD22A-104	168 Cycles	0/77	X	Passed
			500 Cycles	0/77	X	Passed
			1000 Cycles	0/77	X	Passed
9	HAST	130C, 85%RH 33.3 psia 80% Bias	96 Hrs	0/77	x	Passed
8 alt	PCT/AC	T=121°C 15PSIG 100%RH	96 Hrs	0/77	X	Passed
10	IOL	MIL-STD-750 Method 1037 (N/A for TVS)	2520 Cycles	0/77	X	Passed
			7560 Cycles	0/77	X	Passed
			15000 Cycles	0/77	X	Passed
11	ESD	HBM (AEC-Q101-001)	PER DATA SHEET	0/30	X	Passed
		MM (AEC-Q101-002)	PER DATA SHEET	0/30	X	Passed
13	PD	JESD22-B100B	Package Outline	0/30	X	Passed
20	RESISTANCE TO SOLDER HEAT (RSH)	JESD22 B-106 (260C @30S)	PER SPEC	0/30	X	Passed
21	Solderability	J-STD-002 (245C +0/5S)	5 Seconds	0/10	X	Passed
23	Wire Bond Strength	MIL-STD-750 METHOD 2037 (JESD22-B116B)	Cpk>1.66	0/30	X	Passed
24	BOND SHEAR	AEC-Q101-003	Cpk>1.66	0/30	X	Passed
25	Die Shear	MIL-STD-750 (2017)	Cpk>1.66	0/30	X	Passed
Remark:						
Summary:		David tang 7/6/15				
Submitted By:		Mark Li 7/6/15				
Approved By:		Hiwen Hu 7/6/15				

New Site Plating Qual Summary

PKG: SOT-363		Part No. : MMDT3904-7-F		Lot No. : SWB1504063		
Items	Test	Test Conditions	Duration / Limits	Fail/SS	Test Time	Result
1	Appearance	VM	C-QIII-Q011	0/30 Stips	-	Passed
2	Flash	VM	C-QIII-Q011	0/30 Stips	-	Passed
3	Physical Dimensions	Projector	C-QIII-Q011	0/30 Units	-	Passed
4	Plating Thickness	XRF Test	THK: 8-15.5um Cpk>1.67	0/3 Stips	-	Passed
5	Grain Size	Microscope	Grain size: <15um	0/3 Stips	-	Passed
6	Solderbility	Solderbility Test	245℃~260℃,5S/>95%	0/33 Units	-	Passed
7	SGS	XRF Test	RoHS & JSTD-609	0/3 Strips	-	Passed
8	Anti-discolor	85℃/85%RH	24hrs	0/77 Units	2 days	Passed
9	TC (Whisker)	TC -55 +0/-10 °C to 85 +10/-0 °C,	500cycles (Conditional release)	0/77 Units	11 days	Passed
			1500 cycles (Full release)	0/77 Units	32 days	Passed
Summary:						

Dep. QRA

Prepared by: David Tang 6/23/15

Dep. QRA

Reviewed by: Mark Li 6/23/15

Certificate of Design, Construction & Qualification



Description: CAT Plating Qualification - Analog Devices

				Qual Device 1	
	Part Number			AS358AMTR-E1	
	Package			SOP-8L	
	MSL Level			1	
	Package Size			4.9*6.0*1.6mm	
	Die Quantity (eg. Die per package)			1	
	Die Name(1)			AA064	
	Die Size (W/L/Thickness)			1.03*0.71mm	
	Die Process / Technology			BIPOlar 2.0cont	
	Wire Bond Material (Au, Cu, Al)			Cu	
	Wire Diameter			1.0 mil	
	Wafer FAB			SFAB	
	Wafer Diameter			6"	
	Bond Type (at Die)			Ball	
	Bond Type (at LF)			Wedge	
	No. of bond over active area			8	
	Glass Transition Temp			130 °C	
	Lead Material Manufacture			ASM / SHE	
	Header plating (Die Land Area)			N/A (Bare Cu)	
	Max Junction Temp			150 °C	
	Max Thermal resistance Junc (ambient)			85 °C/W	
	Front Metal Type			AlSiCu	
	Back Metal Type (All Layers)			Si/SiO2	
	Die passivation thickness range			Si3N4 0.5um+SiO2 0.5um	
	No of masks Steps			10	
	DB Epoxy/Solder Type			Epoxy	
	Die Attach Material			84-1LMISR4	
	Front Metal Thickness			1.2um	
	Leadframe Type			SOP-8L C TYPE 12ROW	
	Leadframe Material			CDA-194	
	Molding Compound Type			EME-G600	
	Green Compound (Yes/No)			Yes	
	Lead-Free (Yes/No)			Yes	
	Assembly Site			CAT	
	FT Test Site			CAT	
	Reliability Test Site			CAT	
	DataSheet			AS358A	
	Reliability Testing				
Test	Test Conditions	Duration / Limits	Fail/SS	X = Test Needed	Results Pass/Fail
MSL1 Pre-cond	Bake 125C	24 Hrs	0/154	X	Passed
	Soak 85C, 85% RH	168Hrs	0/154	X	Passed
	IR reflow 260C	3 cycles	0/154	X	Passed
HTOL	Tj>125C, 100% Vcc	168 Hrs	0/77	X	Passed
		500 Hrs	0/77	X	Passed
		1000 Hrs	0/77	X	Passed
TC	-65C-150C	168 cycles	0/77	X	Passed
		1000 cycles	0/77	X	Passed
HAST	130C, 85%RH 33.3 psia 100% Bias	96 Hrs	0/77	X	Passed
AC	T=121°C 15PSIG 100%RH	96 Hrs	0/77	X	Passed
HTSL	150C	168 Hrs	0/77	X	Passed
		500 Hrs	0/77	X	Passed
		1000 Hrs	0/77	X	Passed
			0/77	X	Passed
ESD	HBM (AEC-Q100-002)	+350V	0/12	X	Passed
	MM (AEC-Q100-003)	+150V	0/6	X	Passed
WBP	MIL-STD883-2011	Cpk>1.66	0/30	X	Passed
WBS	JESD22-B116B	Cpk>1.66	0/30	X	Passed
PD	JESD22-B100B	Package Outline	0/30	X	Passed
Solderability	245C +0/5C	5 Seconds	0/10	X	Passed
Remark:					
Summary: David tang 7/6/15					
Submitted By: Mark Li 7/6/15					
Approved By: Hiwen Hu 7/6/15					

New Site Plating Qual Plan

PKG: SOP8		Part No. AS358AMTR-E1		Lot No. SWB1504054		
Items	Test	Test Conditions	Duration / Limits	Fail/SS	Test Time	Result
1	Appearance	VM	C-QIII-Q011	0/30 Stips	-	Passed
2	Flash	VM	C-QIII-Q011	0/30 Stips	-	Passed
3	Physical Dimensions	Projector	C-QIII-Q011	0/30 Units	-	Passed
4	Plating Thickness	XRF Test	THK: 8-15.5um Cpk>1.67	0/3 Stips	-	Passed
5	Grain Size	Microscope	Grain size: <15um	0/3 Stips	-	Passed
6	Solderbility	Solderbility Test	245℃~260℃,5S/>95%	0/33 Units	-	Passed
7	SGS	XRF Test	RoHS & JSTD-609	0/3 Strips	-	Passed
8	Anti-discolor	85℃/85%RH	24hrs	0/77 Units	2 days	Passed
9	TC (Whisker)	TC -55 +0/-10 °C to 85 +10/-0 °C,	500cycles (Conditional release)	0/77 Units	11 days	Passed
			1500 cycles (Full release)	0/77 Units	32 days	Passed
Summary:						

Dep. QRA
Prepared by: David Tang 6/23/15

Dep. QRA
Reviewed by: Mark Li 6/23/15