

Process Change Notification

This is to inform you that a design and/or process change will be implemented to the affected product(s) and this notification is for your information and concurrence. This change is planned to take effect in 90 calendar days from the date of this notification.

Please work with your local Taiwan Semiconductor Sales Representative to manage your inventory of unchanged product if your evaluation of this change will require more than 90 calendar days.

Please contact your local Taiwan Semiconductor Field Quality Service or Customer Quality Engineer within 45 days of receipt of this notification if you require any additional data or samples.

PCN No: PCN24002 rev0

Title: Qualifying additional supplier for affected parts of SOD-123

Issue Date: 2024/05/09

If you have any questions concerning this change, please contact:

PCN Coordinator

Name : Sunnie Lin

E-Mail: sunnie.lin@mail.ts.com.tw

Phone: +886-2-8913-1588 Ext: 2205

PCN Originator

Name : Melinda Luo

E-Mail: Melinda_luo@mail.tew.com.cn

Phone: 0086-22-59816699 Ext: 2032

Reliability Engineer

Name : Aiping Zhang

E-Mail: aiping@mail.tew.com.cn

Phone: 0086-22-59816699 Ext: 2034

PCN Type:

Qualifying additional supplier for affected parts of SOD-123

Effectivity:

Expected 1st device shipment date: 2024/08/07

Product Category (Description):

1N4148W-G and BZT52Bxx-G provided by Taiwan Semiconductor Co. Ltd.

Description of Change:

This PCN is being issued to inform TSC customers of qualifying additional supplier for affected SOD-123 devices. The QBE and generic data will be used in the qualification because the same package and same family from the additional supplier have been qualified and in mass production for years.

This will ensure the continuity of supply and guarantee commitment on customer service and satisfaction.

Item	From	To	Remarks
Supplier Code(factory code)	3876(N)	3876(N) 4793(P)	Additional Source

BOM:

Item	Supplier(3876)	Supplier(4793)	Remarks
Wafer	S	P	Different
Lead frame	Alloy 42	Alloy 42	Same material, different supplier
Wire bond	Cu Wire	Cu Wire	Same
Compound	GR640	EME-E500DJ	Different but with the same MSL level
Plating	Pure Sn	Pure Sn	Same material, different supplier

Electrical Test Comparison:

1N4148W-G	ITEM	VR(V)	IR1(nA)	IR2(nA)	VF1(V)	VF2(V)	VF3(V)	VF4(V)
	TEST Condition	IR=100uA	VR= 75V	VR= 20V	IF=1mA	IF=10mA	IF=50mA	IF=150mA
	SPEC.	> 100	<2500	<25	< 0.715	< 0.855	< 1	< 1.25
Current	MIN	149.890	21.000	13.450	0.581	0.713	0.837	1.001
	MAX	166.780	23.200	16.480	0.583	0.718	0.844	1.012
	AVG.	157.780	21.847	14.443	0.582	0.715	0.840	1.006
	CPK	3.263	1459.152	5.630	62.433	42.629	38.335	32.294
Additional	MIN	145.390	11.520	7.320	0.597	0.716	0.819	0.912
	MAX	157.290	13.750	8.960	0.603	0.722	0.825	0.919
	AVG.	152.583	12.590	8.260	0.600	0.719	0.822	0.915
	CPK	5.170	1290.780	12.650	28.650	32.560	39.920	53.940

BZT52B9V1-G	ITEM	VZ(V)	IR(nA)	ZZT(Ω)	ZZK(Ω)	VF(V)
	TEST Condition	IZT=5mA	VR=6V	IZT=5mA	IZK=1mA	IF=10mA
	SPEC.	8.92~9.28	< 20	<13.5	<90	< 0.9
Current	MIN	9.027	0.900	1.500	5.000	0.787
	MAX	9.084	2.900	3.400	11.000	0.790
	AVG.	9.068	1.927	2.853	8.983	0.788
	CPK	3.808	12.424	7.397	20.025	41.796
Additional	MIN	8.946	0.010	1.400	3.000	0.807
	MAX	8.976	3.550	1.800	9.000	0.810
	AVG.	8.958	0.487	1.583	4.733	0.808
	CPK	1.748	10.113	34.353	24.495	50.149

Conclusion: Additional supplier does not affect product electrical performance and product reliability.

Qualification and Reliability Result:

NO.	Test	Test Conditions/ Standard	No. of Lots	Sample Size	Result
1	PV	Test over the part temp range	4	10	PASS
2	ESD characterization	HBM, JS-001 per product spec	4	30	Cap: 8KV
		CDM, JS-002 per product spec	4	30	Cap: 1KV

Reliability result of the same family parts with the same BOM:

NO.	Test	Test Conditions/ Standard	No. of Lots	Sample Size	Result
1	Preconditioning	JESD22A-113 1.Baking 125°C 24H 2.85°C 85%RH 168H 3.Reflow 260°C 3×	3	77	PASS
2	High Temperature Reverse Bias	JESD22-A108, MIL-STD-750 M1038 Tj=Tjmax, at least 80% rated Vr, 1000Hours	3	77	PASS
3	Temperature Cycling	JESD22-A104 -55(-10/+0)°C/15min to 150(+15/-0)°C/15min, 1000 cycles	3	77	PASS
4	Unbiased Highly Accelerated Stress Test	JESD22-A118, Ta=130°C, 85%RH, 96hrs	3	77	PASS
5	Highly Accelerated Stress Test	JESD22-A110, 130°C/85% RH; V=80% VR; 42V max, 96Hours	3	77	PASS
6	Intermittent Operational Life	JESD22A122, Ta=25°C; ΔT_j =100°C; 2.0 min on/off, 6000 cycles	3	77	PASS
7	Resistance to Solder Heat	JESD22-A111 SMD Pb free: 260(+5/-0)°C, 10+2-0 sec	3	77	PASS

NO.	Test	Test Conditions/ Standard	No. of Lots	Sample Size	Result
8	Destructive Physical Analysis	AEC-Q101-004 TC passed choose 1 lot 2pcs HAST or H3TRB passed choose 1lot 2 pcs;Visual inspection,SAM,X-ray,de-capsulation than Visual inspection	3	4	PASS
9	Whisker	JESD201, TC, RTHS & HTHS conditions, 1500cycles, 4000hrs,4000hrs	3	9	PASS
10	Solderability	J-STD-002 245 °C ± 5 °C (Pb-free)5sec	3	10	PASS
11	Wire Bond Shear	MIL-STD-750per assembly spec	3	10	PASS
12	Wire Bond Pull	MIL-STD-750per assembly spec	3	10	PASS
13	Die Shear	MIL-STD-750-2per assembly spec	3	5	PASS
14	ESD characterization	HBM, JS-001per product spec	3	30	Cap: 4KV
		CDM, JS-002 per product spec	3	30	Cap: 750V

Conclusion: Additional supplier successfully passed consumer product reliability requirement.

Identification and Traceability:

Item	Identification
Traceability	Product date code on the label

Effect of Change:

There is no impact in product electrical specification, functionality, quality and reliability. This change will guarantee Taiwan Semiconductor commitment on customer service and satisfaction through continuous improvement.

List of Affected Devices:

Package	P/N	Package	P/N
SOD-123	1N4148W-G	SOD-123	BZT52B13-G
SOD-123	BZT52B2V4-G	SOD-123	BZT52B15-G
SOD-123	BZT52B2V7-G	SOD-123	BZT52B16-G
SOD-123	BZT52B3V0-G	SOD-123	BZT52B18-G
SOD-123	BZT52B3V3-G	SOD-123	BZT52B20-G
SOD-123	BZT52B3V6-G	SOD-123	BZT52B22-G
SOD-123	BZT52B3V9-G	SOD-123	BZT52B24-G
SOD-123	BZT52B4V3-G	SOD-123	BZT52B27-G

Package	P/N	Package	P/N
SOD-123	BZT52B4V7-G	SOD-123	BZT52B30-G
SOD-123	BZT52B5V1-G	SOD-123	BZT52B33-G
SOD-123	BZT52B5V6-G	SOD-123	BZT52B36-G
SOD-123	BZT52B6V2-G	SOD-123	BZT52B39-G
SOD-123	BZT52B6V8-G	SOD-123	BZT52B43-G
SOD-123	BZT52B7V5-G	SOD-123	BZT52B47-G
SOD-123	BZT52B8V2-G	SOD-123	BZT52B51-G
SOD-123	BZT52B9V1-G	SOD-123	BZT52B56-G
SOD-123	BZT52B10-G	SOD-123	BZT52B62-G
SOD-123	BZT52B11-G	SOD-123	BZT52B68-G
SOD-123	BZT52B12-G	SOD-123	BZT52B75-G