

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: PCN23007 rev1

Title: Qualifying additional supplier for affected parts of SOD-323F

Issue Date: 2023/9/14

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

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PCN Type:

Qualifying additional supplier for affected parts of SOD-323F

Effectivity:

Expected 1st device shipment date: 2023/12/13

Product Category (Description):

Affected SOD-323F parts provided by Taiwan Semiconductor Co. Ltd. The full lists of products affected are listed in the "List of Affected Devices" section.

Description of Change:

This PCN is being issued to inform TSC customers of qualifying additional supplier for affected SOD-323F devices. In addition, two suppliers use different raw material in the production. For the details, please see table of BOM difference.

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

Supplier Change:

Item	From	To	Remarks
Supplier Code(factory code)	4999(B)	4999(B) 4793(P)	Additional Source

BOM Difference:

Item	Supplier 4999	Supplier 4793	Remarks
Die Source	SI	PH	Different
Lead Frame	Fe-Ni alloy	Cu alloy	Different
Wire	Au for B0530WS Cu for other parts	Cu	Different
Mold Compound	HGR640HV-L1	EME-E500DJ	Different
Plating	Sn	Sn	Same

Electrical Test Comparison:

PN:1N4148WS	ITEM	VR1	VR2	IR1	IR2	VF
	TEST Condition	IR=5uA	IR=100uA	VR= 20V	VR= 75V	IF=10mA
	SPEC.	>75 V	>100 V	<25nA	<5uA	< 1.00V
Current	MIN	121.90	123.59	11.58	0.01	0.70
	MAX	166.65	168.31	14.08	0.02	0.72
	AVG.	145.89	147.48	12.86	0.02	0.71
	CPK	3.66	2.44	10.18	1736.32	31.08
Additional	MIN	125.35	122.25	4.76	0.01	0.72
	MAX	168.21	164.78	7.54	0.01	0.73
	AVG.	161.06	157.10	6.49	0.01	0.73
	CPK	4.15	2.76	15.98	4515.78	51.92

PN: B0530WS	ITEM	VR	IR1	IR2	IR3	VF1	VF2
	TEST Condition	IR=500uA	VR=15V	VR= 20V	VR= 30V	IF=100mA	IF=500mA
	SPEC.	>30 V	< 80uA	<100uA	<500uA	< 360mV	< 470mV
Current	MIN	45.00	5.21	12.90	28.81	329.92	425.30
	MAX	45.30	5.70	15.30	32.82	332.36	431.86
	AVG.	45.02	5.43	14.35	31.16	330.98	428.42
	CPK	76.55	209.82	38.55	157.16	15.68	8.13
Additional	MIN	41.47	17.58	23.49	46.56	283.50	394.50
	MAX	44.59	19.88	26.82	89.27	294.00	452.50
	AVG.	43.37	18.56	24.86	51.74	285.62	406.83
	CPK	24.65	28.85	24.42	16.69	9.24	10.57

PN:BZT52B18S	ITEM	VZ(V)	ZZT(mΩ)	ZZK(mΩ)	IR(nA)	VF(V)
	TEST Condition	IZT=5.00mA	IZT=5.00mA	IZK=1.00mA	VR= 12.6V	IF=10mA
	SPEC.	17.64~18.36	<45000	<212000	<45	<1.00
Current	MIN	17.96	6689.75	3483.43	0.41	0.77
	MAX	18.01	8330.89	7988.14	0.51	0.77
	AVG.	17.98	7277.15	5722.72	0.45	0.77
	CPK	9.14	29.05	69.98	522.96	84.95
Additional	MIN	17.85	5000.00	1500.00	0.10	0.80
	MAX	17.92	5600.00	7000.00	6.70	0.80
	AVG.	17.89	5220.00	3666.67	1.07	0.80
	CPK	4.99	85.12	55.68	6.80	90.45

PN:BZT52C10S	ITEM	VZ(V)	ZZT(Ω)	ZZK(Ω)	IR(nA)	VF(V)
	TEST Condition	IZT=5.00mA	IZT=5.00mA	IZK=1.00mA	VR= 7.00V	IF=10mA
	SPEC.	9.5~10.5	<20	<141	<180	<1.00
Current	MIN	10.00	3.60	85.32	0.76	0.77
	MAX	10.03	3.92	87.76	1.06	0.78
	AVG.	10.02	3.72	86.59	0.93	0.78
	CPK	21.04	69.24	31.00	927.43	72.70
Additional	MIN	10.00	2.10	3.50	0.10	0.81
	MAX	10.06	2.80	16.00	0.30	0.81
	AVG.	10.01	2.40	6.57	0.17	0.81
	CPK	11.47	37.35	15.02	813.22	74.81

PN:1SS355	ITEM	VBR(V)	VF(V)	IR(nA)
	TEST Condition	IR=100uA	IF=100mA	VR= 80V
	SPEC.	>80	<1.2	<100
Current	MIN	136.22	0.95	13.28
	MAX	148.34	0.97	14.56
	AVG.	141.47	0.96	14.00
	CPK	6.20	15.66	86.62
Additional	MIN	152.86	0.88	8.05
	MAX	155.87	0.89	10.50
	AVG.	154.25	0.88	9.35
	CPK	28.15	74.44	59.71

PN:RB500V-40	ITEM	VBR(V)	VF(V)	IR(uA)
	TEST Condition	IR=100uA	IF=10mA	VR= 10V
	SPEC.	>45	<0.45	<1
Current	MIN	49.06	0.34	0.09
	MAX	50.51	0.34	0.09
	AVG.	49.85	0.34	0.09
	CPK	5.34	42.07	142.18
Additional	MIN	55.85	0.34	0.001
	MAX	59.92	0.36	0.12
	AVG.	57.01	0.35	0.06
	CPK	5.42	9.13	11.05

Conclusion: Qualifying 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	Preconditioning	J-STD-020MSL-1 (3x reflow at 260°C)	10 lots	77	PASS
2	Temperature Cycling	JESD22-A104 -55(-10/+0)°C/15min to 150(+15/-0)°C/15min, 1000 cycles	10 lots	77	PASS
3	Unbiased Highly Accelerated Stress Test	JESD22-A118, Ta=130°C, 85%RH, 96hrs	10 lots	77	PASS
4	Highly Accelerated Stress Test	JESD22-A110, 130°C/85% RH; V=80% VR; 42V max, 96Hours	10 lots	77	PASS
5	High Temperature Storage Life	Ta=max TSTG, 1000Hours	10 lots	77	PASS
6	Intermittent Operational Life	MIL-STD-750 Ta=25°C; ΔTj=100°C; 2.0 min on/off, 15000 cycles	10 lots	77	PASS
7	Resistance to Solder Heat	JESD22-A111 SMD Pb free: 260(+5/-0)°C , 10+2-0 sec	10 lots	77	PASS

NO.	Test	Test Conditions/ Standard	No. of Lots	Sample Size	Result
8	High Temperature Reverse Bias	MIL-STD-750-1M1038Tj=Tjmax, at least 80% rated Vr, 1000Hours	8 lots	77	PASS
9	Steady State Operational	MIL-STD-750-1, Rated IZ max, Tj max	2 lots	77	PASS
10	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	10 lots	4	PASS
11	Cross-section + SEM	AEC-Q006, Post-TC, Post-HAST	10 lots	2	PASS
12	Whisker	JESD201, TC, RTHS & HTHS conditions, 15000 cycs& 4000 hrs	3 lots	9	PASS
13	Solderability	J-STD-002 245 °C ± 5 °C (Pb-free)5sec	7 lots	10	PASS
14	Wire Bond Shear	MIL-STD-750per assembly spec	8 lots	30	PASS
15	Wire Bond Pull	MIL-STD-750per assembly spec	8 lots	30	PASS
16	Thermal Resistance	JESD24per product datasheet	6 lots	5	PASS
17	Die Shear	MIL-STD-750-2per assembly spec	3 lots	5	PASS
18	ESD characterization	HBM, JS-001per product spec	8 lots	30	Cap 2KV~8KV
		CDM, JS-002 per product spec	8 lots	30	Cap 1KV

Conclusion: Qualifying 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	Part Number	Package	Part Number
SOD-323F	1N4148WS	SOD-323F	BZT52B75S
SOD-323F	1N4448WS	SOD-323F	BZT52C2V4S
SOD-323F	1N914BWS	SOD-323F	BZT52C2V7S
SOD-323F	B0530WS	SOD-323F	BZT52C3V0S
SOD-323F	BZT52B2V4S	SOD-323F	BZT52C3V3S
SOD-323F	BZT52B2V7S	SOD-323F	BZT52C3V6S
SOD-323F	BZT52B3V0S	SOD-323F	BZT52C3V9S
SOD-323F	BZT52B3V3S	SOD-323F	BZT52C4V3S
SOD-323F	BZT52B3V6S	SOD-323F	BZT52C4V7S
SOD-323F	BZT52B3V9S	SOD-323F	BZT52C5V1S
SOD-323F	BZT52B4V3S	SOD-323F	BZT52C5V6S
SOD-323F	BZT52B4V7S	SOD-323F	BZT52C6V2S
SOD-323F	BZT52B5V1S	SOD-323F	BZT52C6V8S
SOD-323F	BZT52B5V6S	SOD-323F	BZT52C7V5S
SOD-323F	BZT52B6V2S	SOD-323F	BZT52C8V2S
SOD-323F	BZT52B6V8S	SOD-323F	BZT52C9V1S
SOD-323F	BZT52B7V5S	SOD-323F	BZT52C10S
SOD-323F	BZT52B8V2S	SOD-323F	BZT52C11S
SOD-323F	BZT52B9V1S	SOD-323F	BZT52C12S
SOD-323F	BZT52B10S	SOD-323F	BZT52C13S
SOD-323F	BZT52B11S	SOD-323F	BZT52C15S
SOD-323F	BZT52B12S	SOD-323F	BZT52C16S
SOD-323F	BZT52B13S	SOD-323F	BZT52C18S
SOD-323F	BZT52B15S	SOD-323F	BZT52C20S
SOD-323F	BZT52B16S	SOD-323F	BZT52C22S
SOD-323F	BZT52B18S	SOD-323F	BZT52C24S
SOD-323F	BZT52B20S	SOD-323F	BZT52C27S
SOD-323F	BZT52B22S	SOD-323F	BZT52C30S
SOD-323F	BZT52B24S	SOD-323F	BZT52C33S
SOD-323F	BZT52B27S	SOD-323F	BZT52C36S
SOD-323F	BZT52B30S	SOD-323F	BZT52C39S
SOD-323F	BZT52B33S	SOD-323F	BZT52C43S
SOD-323F	BZT52B36S	SOD-323F	BZT52C47S
SOD-323F	BZT52B39S	SOD-323F	BZT52C51S
SOD-323F	BZT52B43S	SOD-323F	BZT52C56S
SOD-323F	BZT52B47S	SOD-323F	BZT52C62S
SOD-323F	BZT52B51S	SOD-323F	BZT52C68S
SOD-323F	BZT52B56S	SOD-323F	BZT52C75S
SOD-323F	BZT52B62S	SOD-323F	1SS355
SOD-323F	BZT52B68S	SOD-323F	RB500V-40