

Process Change Notification

This is to inform you that a design and/or process change/s will be implemented to the following product(s) listed below. This notification requires your concurrence within 45 days upon receipt of this notification.

The plan change/s will take effect 90 calendar days from the date of this notification.

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

For additional data and samples, you can contact your local Taiwan Semiconductor Field Quality Service or Customer Quality Engineer within 45 days upon receipt of this notification

PCN No: PCN22017

Title: 200V UG Series, SOD123W & DO-15 & DO-201AD & TO-220 Additional Wafer Source

Issue Date: 2022/11/9

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

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PCN Type: Additional Wafer Source

Effectivity:

Expected 1st device shipment date: 2023/2/7

Product Category (Description) :

200V Ultra Fast Rectifier in SOD123W & DO-15 & DO-201AD & TO-220 package.
See detailed part numbers in the List of Affected Devices.

Description of Change:

This change notification is being issued to notify customer that in order to assure continuity of supply, Taiwan Semiconductor Company is qualifying its own wafer fabrication located in Li-je for 200V, Ultra Fast Rectifier assembled in SOD123W & DO-15 & DO-201AD & TO-220 package.

Full electrical characterization and high reliability testing has been completed on the representative devices to ensure no change to the device functionality or electrical specifications in the datasheet.

Wafer Structure Comparison:

Item	Current	Additional	Remarks
Die Source	Silan	Lije	Add second source
Wafer Diameter	5"	6"	Larger wafer diameter
Top/Back Metal Layer	Ti-Ni-Ag	Al-Ti-Ni-Ag	Different metal layer
Die Passivation	Polyimide	SiO ₂ /Polyimide	Different passivation material
Die Dimension (UF1DLW- SOD123W)	42.5mil*42.5mil 230µm	41mil*41mil 280µm	Different die size and thickness
Die Dimension (UG54G- DO-201AD UG54GS- DO-15 UG1004G- TO-220)	57mil*57mil 280µm	57mil*57mil 280µm	Same die dimension

Remarks: No major differences that can affect product quality and reliability. No expected impact to the product functionality (form, fit and function).

Qualification Results:

Qual Vehicle: PU1DLSH (1 lot), UG54G (1 lot), UG1004G (1 lot)
Qualification/Reliability Result (AECQ-101)

Item	Test Condition / Duration	Reference Standard	#lot	Sample Size	Remarks
Pre- and Post-Stress Electrical Test	Electrical characteristic @25°C	Data sheet	3	540*1 555*2	Pass

Item	Test Condition / Duration	Reference Standard	#lot	Sample Size	Remarks
Pre-conditioning ^①	Bake:125°C 24hrs Soak:85°C RH:85% 168hrs IR Reflow: Tpeak=245± 5°C 3cycles	JESD22A-113	1	308*1	Pass
EV (External Visual)	Inspect part construction and marking, per TSC Spec.	JESD22B-101	3	540*1 555*2	Pass
PV (Parameter Verification)	Electrical characterization @-55/25/150°C	Data sheet	3	30*3	Pass
HTRB (High Temperature Reverse Bias)	100% Rated VR (Tj=175°C) / 1008hrs	MIL-STD-750 Method 1038	3	77*1 80*2	Pass
TC (Temp. Cycling)	150°C(+15,-0)/15mins, -55°C(-10,+0)/15mins, 1016 cycles	JESD22A-104 Appendix 6	3	77*1 80*2	Pass
UFAST (Unbiased Highly Accelerated Stress Test)	Ta=130°C, 85% RH/ 96hrs	JESD22-A118	3	77*1 80*2	Pass
HAST (Highly Accelerated Stress Test)	Ta=110°C, 85% RH 80% rated VR up to 42Vmax /264H	JESD22-A110	3	77*1 80*2	Pass
IOL (Intermittent Operational Life)	For PU1DLSH&UG54G: On/ 2mins, Off/ 2mins, ΔTj ≥ 100°C, 15120cycles For UG1004G: On/ 3.5mins, Off/ 3.5mins, ΔTj ≥100°C, 8640cycles	MIL-STD-750 Method 1037 AEC-Q101 Table 2A	3	77*1 80*2	Pass
ESD (IEC)	Contact: (C=150pf R:330 Ω) / 10Pulses	IEC-61000-4-2	3	15*3	Pass
ESD HBM	HBM: (C=100pf R:1500 Ω) / 6Pulses	AEC-Q101-001	3	30*3	8KV/H3B
ESD CDM	CDM: (Field induced charge) / 6Pulses	AEC-Q101-005	3	30*3	>1KV/C5
DPA (Destructive Physical Analysis)	TC passed chose 2pcs of the 1 lot HAST or HTRB passed chose 2pcs of the 1 lot	AEC-Q101-004	3	4*3	Pass

Item	Test Condition / Duration	Reference Standard	#lot	Sample Size	Remarks
RSH (Resist.to Solder Heat)	Ta=260±5°C/ 10secs	JESD22-A111 (SMD)	3	30*3	Pass
TR (Thermal Resistance)	Per. TSC Spec.	JESD24-3, 24-4, 24-6 as appropriate	3	10*3	Pass

Note: ① Pre-conditioning only available for SMD series product.

Conclusion: The product passed the full reliability required in AECQ101 standard.

Identification and Traceability:

Item	Identification
Traceability	Product date code

Effect of Change:

There is no impact in product Form, Fit and Function. This change will guarantee Taiwan Semiconductor commitment on customer service and satisfaction through continuous improvement.

List of Affected Devices:

Family	Package	Ordering Code
Ultra Fast Surface Mount Rectifier	SOD-123W	UF1DLW
Ultra Fast Surface Mount Rectifier	SOD-123W	UF1DLWH
Ultra Fast Rectifier	DO-204AC (DO-15)	UG54GS
Ultra Fast Rectifier	DO-204AC (DO-15)	UG54GS A0G
Ultra Fast Rectifier	DO-204AC (DO-15)	UG54GSH
Ultra Fast Rectifier	DO-204AC (DO-15)	UG54GSHA0G
Ultra Fast Rectifier	DO-201AD	UG54G
Ultra Fast Rectifier	DO-201AD	UG54G A0G
Ultra Fast Rectifier	DO-201AD	UG54GH
Ultra Fast Rectifier	DO-201AD	UG54GHA0G
Ultra Fast Rectifier	TO-220AB	UG1004G
Ultra Fast Rectifier	TO-220AB	UG1004GH