

## Process Change Notification

**PCN No:** PCN22011

**Title:** 600V UG Series, TO-220 and ITO-220 Additional Wafer Source

**Issue Date:** 2022/6/15

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

**PCN Coordinator**

Name : Delia Chang

E-Mail: [delia.chang@mail.ts.com.tw](mailto:delia.chang@mail.ts.com.tw)

Phone: +886 8913 1588 ext. 2205

**PCN Originator**

Name : Daisy Liang

E-mail: [daisy@mail.tsyew.com.cn](mailto:daisy@mail.tsyew.com.cn)

Phone: +86 5438691091 ext. 3103

**Reliability Engineer**

Name : Roben Jiao

E-mail: [roben@mail.tsyew.com.cn](mailto:roben@mail.tsyew.com.cn)

Phone: + 86 5438691091 ext. 3110

**PCN Type:** Additional Wafer Source

**Effectivity:**

Expected 1st device shipment date: 2022/9/13

Last order date: 2022/12/12

Last delivery date: 2023/12/12

**Product Category (Description) :**

600V Ultra Fast Rectifier in TO-220/ITO-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 600V, Ultra Fast Rectifier assembled in TO-220/ITO-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	Ti-Al-Ti-Ni-Ag	Different metal layer
Die Passivation	Polyimide	SiO <sub>2</sub> /TEOS/Polyimide	Different passivation material
Die Size	57mil	57mil	Same die size

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: UGF1008G, UG8J, UGF10J

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	555*3	Pass
Pre-conditioning	Bake:125°C 24hrs Soak:85°C RH:85% 168hrs IR Reflow: Tpeak=245 ± 5°C 3cycles	JESD22A-113	3	308*3	Pass
EV (External Visual)	Inspect part construction and marking, per TSC Spec.	JESD22B-101	3	555*3	Pass
PV (Parameter Verification)	Electrical characterization @-55/25/150°C	Data sheet	3	25 *3	Pass

Item	Test Condition / Duration	Reference Standard	#lot	Sample Size	Remarks
HTRB (High Temperature Reverse Bias)	100% Rated VR (Tj=175°C) / 1008hrs	MIL-STD-750 Method 1038	3	77*3	Pass
TC (Temp. Cycling)	150°C(+15,-0)/15mins, -55°C(-10,+0)/15mins, 1016 cycles	JESD22A-104 Appendix 6	3	77*3	Pass
UHASt (Unbiased Highly Accelerated Stress Test)	Ta=130°C, 85% RH/ 96hrs	JESD22-A118	3	77*3	Pass
HAST (Highly Accelerated Stress Test)	Ta=110°C, 85% RH 80% rated VR up to 42Vmax /264H	JESD22-A110	3	77*3	Pass
IOL (Intermittent Operational Life)	On/3.5mins, Off/3.5mins, ΔTj≥100°C, 8640cycles	MIL-STD-750 Method 1037 AEC-Q101 Table 2A	3	77*3	Pass
ESD (IEC)	Contact: (C=150pf R:330Ω)/ 10Pulses	IEC-61000-4-2	3	15*3	Pass
ESD HBM	HBM: (C=100pf R:1500Ω)/ 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	4	4*4	Pass
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	1	10*1	Pass

**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 Rectifier	TO-220AB	UG1008G
Ultra Fast Rectifier	TO-220AB	UG1008GH
Ultra Fast Rectifier	ITO-220AB	UGF1008G
Ultra Fast Rectifier	ITO-220AB	UGF1008GH
Ultra Fast Rectifier	ITO-220AB	UGF1008GA
Ultra Fast Rectifier	ITO-220AB	UGF1008GAH