

Process Change Notification

This is to inform you that a design and/or process change will be implemented to the affected 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 unchanged/ existing 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.

Change No: PCN25007 rev0**Title:** FRED 600V Wafer Process, Passivation Material and Datasheet Change**Issue Date:** 2025/4/25

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

Change Coordinator

Name : Nica Maderazo
E-Mail : nica.maderazo @ts.com.tw
Phone : +886 8913 1588 ext. 2204

Change Originator

Name : Jille Villanueva
E-mail : jille.villanueva@ts.com.tw
Phone : +886 3 9901998 ext. 6711

Reliability Engineer

Name : Charne Abellana
E-mail : charne.abellana.ts.com.tw
Phone : +886-2-8913-1588 Ext. 2216

Change Type: Wafer Process, Passivation Material and Datasheet Change**Effectivity:**

Expected 1st device shipment date: 2025/7/24 or earlier if approved by customer

Last Order Date: 2025/10/22

Last Delivery Date: 2026/10/16

Product Category (Description):

FRED 600V products in TO-277A (SMPC4.6U), SOD-128, SOD-123W, SOD-123HE, DO-214AC (SMA), DO-214AA (SMB) and DO-214AB (SMC)

Full list of products affected are listed in "List of Affected Devices" section.

Description of Change:

This PCN is being issued to notify customers that in order to ensure product robustness and enhanced application capability, TSC has successfully qualified new wafer process for FRED 600V products.

Full electrical characterization and reliability testing have been completed on representative part numbers to ensure that there is no change on product reliability and functionality.

Wafer Process and Material

Item	Current	New
Die Passivation	Polyimide	SiN + Polyimide
Wafer Process	TEOS	PSG + TEOS

Datasheet and Electrical Specification

Item	Current		New
Junction Temperature (All Affected parts)	Tjmax = 150°C		Tjmax = 175°C
Forward Voltage, V _F at maximum specification (Specified Parts)	PUUP3J	1.7	1.5
	PUUP6J	1.8	1.7
	PUUP8J	2.0	1.7
	PUUP10J	2.0	1.8
	PUUP12J	2.1	1.9
	PU3JFS	1.7	1.5
	PU3JA	1.7	1.5
	PU3JB	1.7	1.5
	PU3JC	1.7	1.5
	PU8JC	2.0	1.7

Qualification and Reliability Result:

No	Test	Specification	Condition	Readpoint	#of Lots	Result
1	Pre and Post Stress Electrical Test	Product Data Sheet	Test at room temp	-	7	Pass
2	External Visual	JESD22-B101	Per reference standard	-	7	Pass
3	Preconditioning	J-STD-020	MSL-1 (3x reflow at 260°C)	-	7	0/539
4	Temperature Cycle	JESD22-A104	-55°C to +150°C; 15 mins dwell	1000 cycs	7	0/539

No	Test	Specification	Condition	Readpoint	#of Lots	Result
5	Unbiased HAST	JESD22-A118	130°C/85% RH; unbiased	96 hrs	7	0/539
6	Highly Accelerated Stress Test	JESD22-A110	130°C/85% RH; V=80% VR; 42V max	96 hrs	7	0/539
7	Resistance to Solder Heat	JESD22-A111	SMD (Pb free): 260°C; 10 sec	10 secs	7	0/70
8	High Temp Storage Life	JESD22-A103	175°C	1000 hrs	7	0/539
9	High Temp Reverse Bias	MIL-STD-750-1	175°C; V=100% rated V	1000 hrs	7	0/539
10	Intermittent Operating Life (SMPC4.6U package)	MIL-STD-750	Ta=25°C; ΔTj=125°C; 2.0 min (on/off)	7500 cycs	3	0/231
11	Intermittent Operating Life (Other packages)	MIL-STD-750	Ta=25°C; ΔTj=100°C; 2.0 min (on/off)	15120 cycs	4	0/320
12	Destructive Physical Analysis	AEC-Q101-004	1000cyc TC	Results	7	0/14
13	Destructive Physical Analysis	AEC-Q101-004	96hrs HAST	Results	7	0/14
14	Parametric Verification	TSC Datasheet	per product datasheet	Results	7	0/210
15	ESD - Human Body Model	AEC-Q101-001	per product spec	Results	7	0/210
16	ESD - Charged Device Model	AEC-Q101-005	per product spec	Results	7	0/210

Conclusion:

Qualification test vehicles for each packages successfully passed Automotive-grade qualification per AEC-Q101.

Effect of Change:

There is no impact in product function.

Identification and Traceability:

Product Marking Date Code

List of Affected Devices:

Family	Package	TSC Part No.
Ultra Fast Recovery	TO-277A (SMPC4.6U)	PUUP3J
Ultra Fast Recovery	TO-277A (SMPC4.6U)	PUUP6J
Ultra Fast Recovery	TO-277A (SMPC4.6U)	PUUP8J
Ultra Fast Recovery	TO-277A (SMPC4.6U)	PUUP10J
Ultra Fast Recovery	TO-277A (SMPC4.6U)	PUUP12J
Ultra Fast Recovery	SOD-123W	PU1JLW

Family	Package	TSC Part No.
Ultra Fast Recovery	SOD-123W	PU2JLW
Ultra Fast Recovery	SOD-123HE	PU1JLS
Ultra Fast Recovery	SOD-123HE	PU2JLS
Ultra Fast Recovery	SOD-128	PU1JFS
Ultra Fast Recovery	SOD-128	PU2JFS
Ultra Fast Recovery	SOD-128	PU3JFS
Ultra Fast Recovery	DO-214AC (SMA)	PU1JA
Ultra Fast Recovery	DO-214AC (SMA)	PU2JA
Ultra Fast Recovery	DO-214AC (SMA)	PU3JA
Ultra Fast Recovery	DO-214AA (SMB)	PU2JB
Ultra Fast Recovery	DO-214AA (SMB)	PU3JB
Ultra Fast Recovery	DO-214AA (SMB)	PU6JB
Ultra Fast Recovery	DO-214AB (SMC)	PU3JC
Ultra Fast Recovery	DO-214AB (SMC)	PU6JC
Ultra Fast Recovery	DO-214AB (SMC)	PU8JC