

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: PCN22009

Title: TSM253xx New Foundry and Assembly & Test Site Qualification

Issue Date: 2022/6/7

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

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PCN Type: Assembly & Test Site Transfer, Fab Source and Datasheet Change

Effectivity:

Expected 1st device shipment date: 2022/9/5

Last order date: 2022/12/4

Last delivery date: 2023/12/14

Product Category (Description):

Affected devices in TDFN 2x2 packages supplied by Taiwan Semiconductor Co. Ltd
Complete product part numbers are listed below.

Description of Change:

Taiwan Semiconductor is qualifying new assembly and test supplier for TSM2537CQ and TSM2538CQ devices assembled in TDFN 2x2 packages.

Assembly and test will be transferred from Supplier 3467 in China to Supplier 4848 in Laguna Philippines. Fab source will be change thus device datasheet will be updated. This change will secure the production delivery requirement with better product performance.

Wafer Change:

Item	From	To	Remarks
Wafer Source	Fab 1 & Fab 2	Fab 3	Different
Location	China	Taiwan	Different
Wafer Size	8"	8"	Same
P-Channel	900*700	755x644	Different
N-Channel	980*680	920x750	Different

BOM Change:

Item	From	To	Remarks
Assembly & Test	Supplier 3467	Supplier 4848	Different
Location	China	Philippines	Different
Leadframe	C194	C194	Same
Wire Material	Cu 1.2 Wire	Cu 1.2 Wire	Same
Die Attach	Ag Epoxy	Ag Epoxy	Same
Molding Compound	G770	G770	Same
Plating Material	100% Sn	100% Sn	Same

Data Sheet Parameter Change:**TSM2537CQ**

Test Parameter	From	To	Remarks
V _{th}	N-ch: 0.5V to 1.0V P-ch: -0.45V to -1.0V	N-ch: 0.4V to 0.8V P-ch: -0.4V to -0.8V	Updated based on product capability
VSD	N-ch: 0.7V typ P-ch: -0.8V typ	N-ch: 1 V max P-ch: -1 V max	Updated based on product capability
RDSon (test condition)	N-ch: V _{gs} =1.8V, I _D = 5.4A P-ch: V _{gs} =-1.8V, I _D = -3.5A	N-ch: V _{gs} =1.8V, I _D = 3.9A P-ch: V _{gs} =-1.8V, I _D = -3.9A	Updated based on product capability

TSM2538CQ

Test Parameter	From	To	Remarks
V _{th}	N-ch: 0.5V to 1.0V P-ch: -0.45V to -1.0V	N-ch: 0.4V to 0.8V P-ch: -0.4V to -0.8V	Updated based on product capability
VSD	N-ch: 0.7V typ	N-ch: 0.9V typ	Updated based on

	P-ch: -0.8V typ	P-ch: -0.87V typ	product capability
RDSon (test condition)	N-ch: Vgs=1.8V, ID = 4.8A P-ch: Vgs=-1.8V ID = -3.5A	N-ch: Vgs =1.8V ID = 3.9A P-ch: Vgs=-1.8V ID = -3.9A	Updated based on product capability

Note: All other aspects of the impacted products (form, fit, function) will remain unchanged.

Full electrical characterization and reliability testing has been completed on the products.

The device has successfully passed the qualification tests. Potential impacts can be identified but due to testing performed in relation to the PCN, associated risks are verified and excluded.

Refer to below qualification and reliability data summary:

Qualification and Reliability Results:

Qual Vehicle: TSM250N02DCQ , TSM500P02DCQ and TSM2537CQ

Package: TDFN2x2

Stress Test	Abbrev	Test Methods	Test Conditions	Final Read point	Req'ts		Results	
					SS	*# Lots	Rej/SS	Remarks
Environmental and Lifetime Stress Tests								
Pre- and Post-Stress Electrical Test	TEST	Product Datasheet	Test at room temp	-	All	3	0 Fails	Passed
External Visual	EV	JESD22-B101	per reference standard	-	All	3	0 Fails	Passed
Preconditioning	PC	J-STD-020	MSL-1 (3x reflow at 260°C)	-	308	3	0/924	Passed
Temperature Cycle	TC	JESD22-A104	-55°C to +150°C; 15 mins dwell	1000 cycs	77	3	0/231	Passed
Unbiased HAST	UHAST	JESD22-A118	110°C/85% RH; unbiased	264 hrs	77	3	0/231	Passed
Highly Accelerated Stress Test	HAST	JESD22-A110	110°C/85% RH; V=80% VR; 42V max	264 hrs	77	3	0/231	Passed
High Temp Reverse Bias	HTRB	MIL-STD-750-1	150°C; V=80% rated V	1000 hrs	77	3	0/231	Passed
High Temp Gate Bias	HTGB	JESD22-A108	150°C; V=100% rated Vgs	1000 hrs	77	3	0/231	Passed
Intermittent Operating Life	IOL	MIL-STD-750	Ta=25°C; ΔTj=100°C; 2.0 min on/off	6000 cycs	77	3	0/231	Passed
Package Assembly Integrity Tests								
Wire Bond Pull	WBP	MIL-STD-750-2	per assembly spec	results	30	3	0/90	Passed
Wire Bond Shear	WBS	AEC Q101-003	per assembly spec	results	30	3	0/90	Passed
Solderability	SD	J-STD-002	260°C	results	10	1	0/10	Passed
Physical Dimension	PD	JESD22-B100	per assembly spec	results	30	1	0/30	Passed
Die Shear	DS	MIL-STD-750-2	per assembly spec	results	5	3	0/15	Passed
Electrical Verification Tests								
Parametric Verification	PV	TSC Datasheet	per product datasheet	results	10	1	0/10	Passed
ESD - Human Body Model	ESD - HBM	AEC-Q101-001	per product spec	results	10 per level	1	±250V	Class H1A
ESD - Charged Device Model	ESD - CDM	AEC-Q101-005	per product spec	results	10 per level	1	±1kV	Class C5

List of Affected Devices:

Package	Part Number
TDFN2x2	TSM2537CQ RFG
TDFN2x2	TSM2538CQ RFG