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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: PCN22016
Title: New Fab Source, New OSAT and Device Datasheet update for selected SOT-223/ TO-252/ TO-251 products.
Issue Date: 2022/10/10

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

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PCN Type:
New wafer source, New OSAT and Datasheet update

Effectivity:
Expected 1st device shipment date: 2023/1/8
Last Order Date: 2023/4/8
Last Delivery Date: 2024/4/7

Product Category (Description):
Selected SOT-223/ TO-252/ TO-251 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:
Taiwan Semiconductor Company is qualifying new wafer source and OSAT for selected SOT-223/ TO-252/ TO-251 parts since current wafer source and OSAT site (vendor code: 3253) will end of life.

This will secure the production delivery requirement with the similar or comparable wafer supplier performance.

Full electrical characterization and high reliability testing has been completed on representative part numbers to ensure no change on device functionality.

BOM & Datasheet Change (TO-251 & TO-252)

Item	Current	New	Remarks
OSAT	Vendor 3083	Vendor 3083	Same
Die Source	Supplier A (Vendor 3253)	Supplier B (Vendor 5075)	New Source
Leadframe	Cu Alloy	Cu Alloy	Same
Die Attach Epoxy	Soft Solder	Soft Solder	Same
Wirebond	Al Wire	Al Wire	Same
EMC	EME-G630AY / E500HM	EME-G630AY / E500HM	Same
Plating	Pure Sn	Pure Sn	Same
Packing Method	Dry Pack	Dry Pack	Same
Datasheet	Updated based on new wafer specification		

BOM & Datasheet Change (SOT-223)

Item	Current	New	Remarks
OSAT	Vendor 1258	Vendor 1628	New Source
Die Source	Supplier A (Vendor 3253)	Supplier B (Vendor 5075)	New Source
Leadframe	Cu Alloy	Cu Alloy	Same
Die Attach Epoxy	Ag Epoxy	Ag Epoxy	Same
Wirebond	Cu Wire	Cu Wire	Same
EMC	G600	CEL-1702HF9TS-G1	Different
Plating	Pure Sn	Pure Sn	Same
Packing Method	Dry Pack	Dry Pack	Same
Datasheet	Updated based on new wafer specification		

Note: Detailed wafer change and datasheet update in comparison report.

Qualification and Reliability Result:

Stress Test	Abbrev	Test Methods	Test Conditions	Final Readpoint	Requirements		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	4	0 Fails	Passed
External Visual	EV	JESD22-B101	per reference standard	-	All	4	0 Fails	Passed
Preconditioning	PC	J-STD-020	MSL-1 (3x reflow at 260ºC)	-	320	3	0/960	Passed
Temperature Cycle	TC	JESD22-A104	-55°C to +150°C; 15 mins dwell	1000 cycs	80	4	0/320	Passed
Unbiased HAST	UHAST	JESD22-A118	130°C/85% RH; unbiased	96 hrs	80	4	0/320	Passed
Highly Accelerated Stress Test	HAST	JESD22-A110	110°C/85% RH; V=80% VR; 42V max	528 hrs	80	1	0/80	Passed
Highly Accelerated Stress Test	HAST	JESD22-A110	130°C/85% RH; V=80% VR; 42V max	96 hrs	80	3	0/240	Passed
Resistance to Solder Heat	RSH	JESD22-A111	SMD (Pb free): 260°C; 10 sec	10 secs	10	3	0/30	Passed
Resistance to Solder Heat	RSH	JESD22-A111	PTH (SnPb): 260°C; 10 sec	10 secs	10	1	0/10	Passed
High Temp Storage Life	HTSL	JESD22-A103	150°C	1000 hrs	80	4	0/320	Passed
High Temp Reverse Bias	HTRB	MIL-STD-750-1	150°C; V=80% rated V	1000 hrs	80	4	0/320	Passed
High Temp Gate Bias	HTGB	JESD22-A108	150°C; V=100% rated Vgs	1000 hrs	80	4	0/320	Passed
Intermittent Operating Life	IOL	MIL-STD-750	Ta=25°C; ΔTj=100°C; 2.0 min on/off	75000 cycs	80	3	0/240	Passed
Intermittent Operating Life	IOL	MIL-STD-750	Ta=25°C; ΔTj=100°C; 2.0 min on/off	15000 cycs	80	1	0/80	Passed
Package Assembly Integrity Tests								
Destructive Physical Analysis	DPA	AEC-Q101-004	Post-TC	1000 cycs	2	4	0/8	Passed
Destructive Physical Analysis	DPA	AEC-Q101-004	Post-HAST	96 hrs	2	3	0/6	Passed
Destructive Physical Analysis	DPA	AEC-Q101-004	Post-HAST	528 hrs	2	1	0/2	Passed
Cross-section Analysis	X-section	AEC-Q006	Post-TC	1000 cycs	1	1	0/1	Passed
Cross-section Analysis	X-section	AEC-Q006	Post-HAST	528 hrs	1	1	0/1	Passed
Cross-section Analysis	X-section	AEC-Q006	Post-HTSL	1000 hrs	1	1	0/1	Passed
Wire Bond Pull	WBP	MIL-STD-750-2	per assembly spec	results	30	4	0/120	Passed
Wire Bond Shear	WBS	AEC Q101-003	per assembly spec	results	30	4	0/120	Passed
Thermal Resistance	TR	JESD24	per product datasheet	results	5	4	0/20	Passed
Die Shear	DS	MIL-STD-750-2	per assembly spec	results	5	4	0/20	Passed
Electrical Verification Tests								
Parametric Verification	PV	TSC Datasheet	per product datasheet	results	10	4	0/40	Passed
ESD - Human Body Model	ESD - HBM	AEC-Q101-001	per product spec	results	30	4	0/120	Class H1B
ESD - Charged Device Model	ESD - HBM	AEC-Q101-005	per product spec	results	30	4	0/120	Class C5

Effect of Change:

There is no impact in product functionality, quality and reliability. This change will guarantee Taiwan Semiconductor commitment on customer service and satisfaction through continuous improvement.

List of Affected Devices:

Family	Package	TSC P/N	New TSC P/N
N-Channel Power MOSFET	SOT-223	TSM1NB60CW	No Change
N-Channel Power MOSFET	TO-252	TSM2NB60CP	No Change
N-Channel Power MOSFET	TO-252	TSM4NB60CP	No Change
N-Channel Power MOSFET	TO-251	TSM2NB60CH	No Change
N-Channel Power MOSFET	TO-251	TSM4NB60CH	No Change