

Report Date: December 16, 2024

Product Details:

Supplier:	Taiwan Semiconductor Co., Ltd.		
Test Vehicle/s:	TQM123KCX, TQM138KCU, TQM138KDCU6, TQM84KCX, TQM84KCU, TQM84KDCU6		
Reason for Rel:	New Product Qualification		
Part Description:	N-Channel/ P-Channel Power MOSFET		
Package Type:	SOT-23, SOT-323, SOT-363 Dual		
Assembly Site:	China (4793)	General Specification:	AEC-Q101 Rev. E

Product Series Covered:

TQM123KCX, TQM138KCU, TQM138KDCU6, TQM84KCX, TQM84KCU, TQM84KDCU6, TQM2N7002KCX, TQM138KCX, TQM2N7002KCU, TQM2N7002KDCU6, TQM2N7002CX, TQM2N7002CU, TQM2N7002DCU6

Reliability Test Results Summary:

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	6	PASS	PASS
External Visual	EV	JESD22-B101	per reference standard	-	All	6	PASS	PASS
Preconditioning	PC	J-STD-020	MSL-1 (3x reflow at 260°C)	-	308 ^a	3	0/924	PASS
				-	154 ^b	3	0/462	PASS
Temperature Cycle	TC	JESD22-A104	-55°C to +150°C; 15 mins dwell	1000 cycs	77	5	0/385	PASS
				2000 cyc*	77	1	0/77	PASS
Unbiased HAST	UHA	JESD22-A118	130°C/85% RH; unbiased	96 hrs	77	5	0/385	PASS
				192 hrs*	77	1	0/77	PASS
Highly Accelerated Stress Test	HAST	JESD22-A110	130°C/85% RH; V=80% VR; 42V max	96 hrs	77	4	0/308	PASS
				192 hrs*	77	2	0/154	PASS
Resistance to Solder Heat	RSH	JESD22-B106	SMD (Pb free): 260°C; 10 sec	10 secs	10	3	0/30	PASS
High Temp Reverse Bias	HTRB	MIL-STD-750-1	150°C; V=100% rated V	1000 hrs	77	4	0/308	PASS
				2000hrs*	77	2	0/154	PASS
High Temp Gate Bias	HTGB	JESD22-A108	150°C; V=100% rated Vgs	1000 hrs	77	4	0/308	PASS
				2000 hrs*	77	2	0/154	PASS
Intermittent Operating Life	IOL	MIL-STD-750	Ta=25°C; ΔTj=100°C; 3.5 min on/off	15000 cycs	77	6	0/462	PASS
Package Assembly Integrity Tests								
Destructive Physical Analysis	DPA	AEC-Q101-004	Post-TC	results	2	3	0/6	PASS
Destructive Physical Analysis	DPA	AEC-Q101-004	Post-HAST	results	2	3	0/6	PASS
Wire Bond Pull	WBP	MIL-STD-750-2	per assembly spec	results	30	6	0/180	PASS
Wire Bond Shear	WBS	AEC Q101-003	per assembly spec	results	30	6	0/180	PASS
Solderability	SD	J-STD-002	245°C	results	10	3	0/30	PASS
Die Shear	DS	MIL-STD-750-2	per assembly spec	results	30	6	0/180	PASS
Electrical Verification Tests								
Parametric Verification	PV	TSC Datasheet	per product datasheet	results	25	6	0/150	PASS
ESD - Human Body Model	ESD - HBM	AEC-Q101-001	per product spec	results	30	6	1kV	PASS
ESD - Charged Device Model	ESD - CDM	AEC-Q101-005	per product spec	results	30	6	1kV	PASS

Note: * - extended timepoints for robustness testing.

a - Preconditioning for IOL, HAST, UHA, TC on N-Ch devices. Package related tests done on N-Ch devices only.

b - Preconditioning for IOL & HAST on P-Ch devices

Conclusion: TQM123KCX, TQM138KCU, TQM138KDCU6, TQM84KCX, TQM84KCU and TQM84KDCU6 successfully passed automotive-grade qualification per AEC-Q101.

Prepared by: Charne Ann Abellana
Rel/ FA Asst Manager

Approved by: Rexis Manabit
QRA and Subcon Engg AVP