

Taiwan Semiconductor Co., Ltd.11th Floor, No. 205, Section 3, Beishin Road
Xindian, New Taipei City, Taiwan, R.O.C., 231

PRODUCT RELIABILITY TEST REPORT

TQM025NB04CR | TQM033NB04CR | TQM070NB04CR | TQM110NB04CR |
TQM130NB06CR | TQM250NB06CR | TQM300NB06CR | TQM110NB04DCR |
TQM250NB06DCR | TQM300NB06DCR | TQM050NB06CR | TQM150NB04CR and
TQM150NB04DCR

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This report summarizes the product reliability test results for product TQMxxxNB0XLCR, TQMxxxNB0XCR and TQMxxxNB0XDCR using generic family data from the same product and package technology. Accelerated environmental and lifetime tests have been performed according to AEC-Q101 Rev. E and internal TSC quality and reliability requirements. Product details and reliability test results are summarized as follows.

Product Details:

Supplier:	Taiwan Semiconductor Co., Ltd.		
Test Vehicles:	TQM050NB06CR TQM150NB04CR TQM150NB04DCR		
Reason for Rel:	New Product Qualification		
Part Description:	Auto Dual/Single N-Channel 40V/60V 175°C MOSFET		
Package Type:	PDFN56U		
Assembly Site:	Taiwan	General Specification:	AEC-Q101 Rev. E

Product Series Covered:

TQM025NB04CR TQM033NB04CR TQM070NB04CR TQM110NB04CR TQM130NB06CR TQM250NB06CR TQM300NB06CR TQM110NB04DCR TQM250NB06DCR and TQM300NB06DCR
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Reliability Test Results Summary:

Stress Test	Test Methods	Test Conditions	Final Readpoint	Requirements		Results	
				SS	# Lots	Rej/SS	Remarks
Environmental and Lifetime Stress Tests							
TEST	Product Datasheet	Test at room temp	-	All	3	0 Fails	Passed
EV	JESD22-B101	per reference standard	-	All	3	0 Fails	Passed
PC	J-STD-020	MSL-1 (3x reflow at 260°C)	-	308	3	0/924	Passed
TC + PC	JESD22-A104	-55°C to +150°C; 15 mins dwell	1000 cycs	77	3	0/231	Passed
UHASt+ PC	JESD22-A118	130°C/85% RH; unbiased	96 hrs	77	3	0/231	Passed
HAST+ PC	JESD22-A110	110°C/85% RH; V=80% VR; 42V max	264 hrs	77	3	0/231	Passed
HTRB	MIL-STD-750-1	175°C; Vr = 60V	1000 hrs	77	3	0/231	Passed
HTGB	JESD22-A108	175°C; Vgs = +20V	1000 hrs	77	3	0/231	Passed
RSH	MIL-STD-750	SMD (Pb free): 260°C; 10 sec	10 secs	10	3	0/30	Passed
IOL+ PC	JESD22-B106	Ta=25°C; ΔTj=100°C; 2.0 min on/off	15000 cycs	77	3	0/231	Passed
Package Assembly Integrity Tests							
DPA	AEC-Q101-004	Post-TC	1000 cycs	2	3	0/6	Passed
DPA	AEC-Q101-004	Post-HAST	264 hrs	2	3	0/6	Passed
SD	J-STD-002	245°C	10 secs	10	3	0/30	Passed
TR	JESD24	per product datasheet	results	10	3	0/30	Passed
DS	MIL-STD-750-2	per assembly spec	results	5	3	0/15	Passed
Electrical Verification Tests							
PV	TSC Datasheet	per product datasheet	results	25	3	0/75	Passed
ESD-HBM	AEC-Q101-001	per product spec	results	30	3	0/90	Passed
ESD-CDM	AEC-Q101-005	per product spec	results	30	3	0/90	Passed

Conclusion: Qualification test vehicles representing devices TQM050NB06C, TQM150NB04C and TQM150NB04DCR were successfully passed Automotive-grade qualification per AEC-Q101 Rev. E.