

AEC-Q100G Qual Report

Customer: 0.25um Copper Wire Qualification and X flag to Solid Flag Conversion for FSL-KLM-FM at TSMC/TSMC11 fab	Product Name: FSL-KLM-FM	Part Name: Customized	Material: VLSI	PIB or RESID: Revision # & Date:
Technology: Package	Design Engr: Not applicable	Product Engr: Refer below	QUARTZ Tracking #:	Refer below
Fab / Assembly: Final Test SMC3 and TSMC11 FSL-KLM-FM FSL-KLM-FM	Design Engr: Not applicable	Product Engr: Refer below	Signature/Date (shown below may be electronic):	
Material: Refer below	QA/QC/Global Assembly Approval: Eng: Pub-Lang Eu-RM158, Lim_Jeanine B15239	QA/QC Approval: For Lm_Jeanine B15239	Signature & Date:	3/14/2014
Die Size (mm): 10 x 11	Refer below	NPI PRJCE: Nussach Annual: RES3712	NPI PRJCE Approval: Signature & Date:	3/14/2014
Part Operating Temp. Grade: -40C to 125C	Grade 1	Trace/ClassCode: LOT A (144) (SFP) RESA(A22) (SFP) LOT B (144) (SFP) RESB(A22) (SFP) LOT C (144) (SFP) RESC(A22) (SFP)	CAB Approval: 132213798	Signature & Date: 3/14/2014
		Trace/ClassCode: LOT D (280) (SFP) RESD(A22) (SFP)	Customer Approval: Signature & Date: May be N/A	

TESTS HIGHLIGHTED IN YELLOW WILL BE PERFORMED FOR THIS STUDY

This testing is performed by Freescale Reliability Lab (KLM-RAL LAB) unless otherwise noted in the Comments.

Device Name: BSLFIN_AUTO
Technology Code: EG25AFXQ
Maskset: L15V
Die Size (mm): 6.830 x 6.410
Package code/ dimension: S059, 144 (20x20) LQFP 14P0.5
Device Temperature: -40C to 125C
PE: Tan Wu Ming B37999 Mohd Tarmizi Suhab-B4812
Quartz ID: Z25439

Device Name: BSLFIN_AUTO
Technology Code: EG25AFXQ
Maskset: L15V
Die Size (mm): 6.830 x 6.410
Package code/ dimension: S019, 80 (14x14) QFP
Device Temperature: -40C to 125C
PE: Tan Wu Ming B37999 Mohd Tarmizi Suhab-B4812
Quartz ID: Z25439

GROUP A - ACCELERATED ENVIRONMENTAL STRESS TESTS

Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data
PC	JESD22-A111 J-S1D-020	Temperature Cycling (TC) For AEC: -40C to 125C only. Min: 3 @ 20°C, 45°C	TEST @ RH	All failure mount devices prior to T8E, T85T, AC, U85T, TC, PC/PTC and as required per test conditions.	77	0	0	Lot A: 077 Lot B: 074	TEST @ RH	All failure mount devices prior to T8E, T85T, AC, U85T, TC, PC/PTC and as required per test conditions.	77	0	0	Lot B: 077
HAST	JESD22-A111	Highly Accelerated Stress Test (HAST) For AEC: -40C to 125C only. Min: 3 @ 20°C, 45°C. Max: 120°C for 24hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH		77	0	0	Pass	TEST @ RH		77	0	0	Pass
UHST	JESD22-A111	Unbiased HAST (UHST) For AEC: -40C to 125C only. Min: 3 @ 20°C, 45°C. Max: 120°C for 24hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ R		77	3	291	Lot A: 077 Lot B: 077	TEST @ R		77	0	0	Not required
TC	JESD22-A111	Temperature Cycling (TC) For AEC: -40C to 125C only. Min: 3 @ 20°C, 45°C. Max: 120°C for 24hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ R		77	3	291	Lot A: 077 Lot B: 077	TEST @ R		77	1	77	Lot B: 077
PC + PTC	JESD22-A111	Temperature Cycling (TC) For AEC: -40C to 125C only. Min: 3 @ 20°C, 45°C. Max: 120°C for 24hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH		20	0	0	Not required	TEST @ RH		20	0	0	Not required
PTC	JESD22-A111	Power Temperature Cycle (PTC) For AEC: -40C to 125C only. Min: 3 @ 20°C, 45°C. Max: 120°C for 24hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH		20	0	0	Not required	TEST @ RH		20	0	0	Not required
HTSL	JESD22-A111	High Temperature Storage Life (HTSL) For AEC: -40C to 125C only. Min: 3 @ 20°C, 45°C. Max: 120°C for 24hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH		77	1	77	Lot A: 077	TEST @ RH		77	0	0	Not required

TEST GROUP B - ACCELERATED LIFETIME SIMULATION TESTS

Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data
HTOL	JESD22-A111	High Temperature Operating Life (HTOL) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RHC		77	0	0	Not required	TEST @ RHC		77	0	0	Not required
ELFR	AEC-Q100-026	Early Life Failure Rate (ELFR) For AEC: -40C to 125C for 48 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH		800	0	0	Pass	TEST @ RH		800	0	0	Pass
EDR	AEC-Q100-026	Electrical Drive Rate (EDR) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RHC		77	0	0	Not required	TEST @ RHC		77	0	0	Not required

TEST GROUP C - PACKAGE ASSEMBLY INTEGRITY TESTS

Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data
WBS	AEC-Q100-007	Wire Bond Shear (WBS) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	Cpk >= 1.67	30 bonds from minimum 5 units	3	15	Lot A: Cpk: 1.67 Lot B: Cpk: 1.67		Cpk >= 1.67	30 bonds from minimum 5 units	1	5	Lot B: Cpk: 1.67	
WBP	JESD22-A111	Wire Bond Pull (WBP) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	Cpk >= 1.67	30 bonds from minimum 5 units	3	15	Lot A: Cpk: 1.67 Lot B: Cpk: 1.67		Cpk >= 1.67	30 bonds from minimum 5 units	1	5	Lot B: Cpk: 1.67	
SD	JESD22-A111	Solderability (SD) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	>= 95% lead coverage of critical areas	15	2	30	YFAE1011200000: Pass YFAE1011200000: Pass		>= 95% lead coverage of critical areas	15	2	30	YFAE1011200000: Pass YFAE1011200000: Pass	
PD	JESD22-A111	Physical Dimension (PD) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	Cpk >= 1.67	10	2	20	YFAE1011200000: Cpk >= 1.67 YFAE1011200000: Cpk >= 1.67		Cpk >= 1.67	10	2	20	YFAE1011200000: Cpk >= 1.67 YFAE1011200000: Cpk >= 1.67	
QW	JESD22-A111	Dimensional (QW) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable		Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
SBS	AEC-Q100-010	Solder Ball Shear (SBS) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	Cpk >= 1.67	10 (5 balls from each of 10 packages)	1	5	Not applicable		Cpk >= 1.67	10 (5 balls from each of 10 packages)	1	5	Not applicable	
LI	JESD22-A111	Lead Integrity (LI) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	No lead breakage or cracks	5 (10 leads from each of 5 parts)	1	5	Not applicable		No lead breakage or cracks	5 (10 leads from each of 5 parts)	1	5	Not applicable	

TEST GROUP D - DIE FABRICATION RELIABILITY TESTS

Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments
EM		Electron Migration (EM)						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.
TDOB		Time Dependent Dielectric Breakdown (TDOB)						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.
HCI		Hot Carrier Injection (HCI)						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.
SM		Stress Migration (SM)						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.
NBTI		Negative Bias Temperature Instability (NBTI)						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.

TEST GROUP E - ELECTRICAL VERIFICATION TESTS

Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID/WR/SS) (N/A/Not Applicable)	Comments or Generic Data
TEST	Freescale 48A	High Voltage Functional (HVF) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	0 Fail	All	All	All	See Results Summary	This action refers to Full testing of all qualification units.	0 Fail	All	All	All	See Results Summary	This action refers to Full testing of all qualification units.
HBM	AEC-Q100-002 / JEDEC-414E Jan 2007	Electrostatic Discharge (ESD) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH	3 units per Voltage level	1	12	Lot A: 100% Pass Lot B: 100% Pass		TEST @ RH	3 units per Voltage level	0	0	Not required	
MM	AEC-Q100-003	Electrostatic Discharge (ESD) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH	3 units per Voltage level	0	0	Not required		TEST @ RH	3 units per Voltage level	0	0	Not required	
COM	AEC-Q100-011	Electrostatic Discharge (ESD) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH	3 units per Voltage level	0	0	Not required		TEST @ RH	3 units per Voltage level	0	0	Not required	
LU	JESD22-A111	Lead Underplating (LU) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RH	6	0	0	Not required		TEST @ RH	6	0	0	Not required	
ED	AEC-Q100-005	Electrical Distribution (ED) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	TEST @ RHC	30 units	1 + 1	30 + 30	Lot A: Cpk: 1.67 Lot B: Cpk: 1.67		TEST @ RHC	30 units	0	0	Not required	
FG	For AEC: AEC-Q100-007	Fault Grading (FG) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX	FG shall be <= 0.5% for qual units				FG: No Change		FG shall be <= 0.5% for qual units				FG: No Change	
CHAR	For AEC: AEC-Q100-008	Characterization (CHAR) For AEC: -40C to 125C for 1000 hrs. Test Rate: 100°C/hr. Ramp RO of 40hrs. MAX					Not required						Not required	

