

AEC-Q100G Qual Report

Objective: 0.25um Copper Wire Qualification and X flag to Solid Flag Conversion for FSL-KLM-FM at FSL-ATMC-FAB	Customer Name: United PMS	Part Name: FSL-KLM-FM	Plan or Request: Revision # & Date
Technology: Package: Reflow below	Design Engr: Not applicable	Product Engr: Refer below	QUARTZ Tracking #: Refer below
Final Test S/N: FSL-ATMC-FAB FSL-KLM-FM FSL-KLM-FM	Trace/Date/Code: Trace/Date/Code	Trace/Date/Code: Trace/Date/Code	Signature/Date shown below: Signature/Date shown below
Masking: Reflow: Refer below	GAO/Global Assembly Approval/Engr: Poh-Liang Eu/R31818, Lin-Jasmine B18239	Trace/Date/Code: Trace/Date/Code	GAO Approval for Lin-Jasmine B18239: GAO Approval for Lin-Jasmine B18239
Die Size (in mil): Refer below	NPI CODE: Nursari Ahmad- R63712	Trace/Date/Code: Trace/Date/Code	NPI PROE Approval Signature & Date: Signature/Date
Part Operating Temp. Grade: -40C to 125C Grade 1	Trace/Date/Code: Trace/Date/Code	Trace/Date/Code: Trace/Date/Code	CAB Approval: Signature & Date 3 May 2014
	Trace/Date/Code: Trace/Date/Code	Trace/Date/Code: Trace/Date/Code	Customer Approval: Signature & Date May be NA

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: Bluefin AUTO	Technology Code: E625AFKXQ	Maskset: 0M235	Die Size (mm): 6.630 X 6.410
Package code dimension: 6019 80 14x14 OFP	Device Temperature: 400 to 125C	PE: Tan Wei Ming B37999 Mohd Tarmizi Suhab-B48012	Quartz ID: 225243

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, (WIP/SS) NA=Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID, (WIP/SS) NA=Not Applicable)	Comments or Generic Data
PC	JESD2-A113 J410-030	Preconditioning (PC) PC before HAST for SMDs only. Min. 3 @ 200C, 45@125C	TEST @ RH	77	0	0	Pass	Lot A: 144(OFP) SEMA42URW10 Lot B: 144(OFP) SEMA42URW10 Lot C: 144(OFP) SEMA42URW10	TEST @ RH	77	0	0	Pass	Generic Data: BLUEFIN (M235), 144LOFP 20x20, Q225428 = 2424
HAST	JESD2-A113	Highly Accelerated Stress Test (HAST) PC before HAST (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	77	0	0	Pass	Generic Data: 0217034, LOFP 80 14x14 O174 M235BAC128 (9794) Q210577, LOFP 80 14x14 O777	TEST @ RH	77	0	0	Pass	Generic Data: BLUEFIN (M235), 144LOFP 20x20, Q225428 = 2424
UHST	JESD2-A113	Unbiased HAST (UHST) PC before UHST (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ R	77	3	251	Lot A: 077 Lot B: 077 Lot C: 077		TEST @ R	77	0	0	Not required	
TC	JESD2-A113 AEC Q100G Appendix 3	Temperature Cycles (TC) PC before TC (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	77	3	251	Lot A: 077 Lot B: 077 Lot C: 077	Post TC500, WP: Pass, > 3 grams	TEST @ RH	77	1	77	Post TC500, WP: Pass, > 3 grams	
PC + PFC	JESD2-A105	Preconditioning plus Power Cycle (PC+PFC) PC before PC+PFC (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	77	0	0	Not required		TEST @ RH	77	0	0	Not required	
PFC	JESD2-A105	Power Temperature Cycle (PFC) PC before PFC (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	77	0	0	Not required		TEST @ RH	77	0	0	Not required	
HTSL	JESD2-A105	High Temperature Storage Life (HTSL) PC before HTSL (for SMDs only). Duration: 1200 cycles for 20mins. Timed 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, (WIP/SS) NA=Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID, (WIP/SS) NA=Not Applicable)	Comments or Generic Data
HTOL	JESD2-A105	High Temperature Operating Life (HTOL) PC before HTOL (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	77	0	0	Not required		TEST @ RH	77	0	0	Not required	
ELFR	AEC Q100-008	Early Life Failure Rate (ELFR) PC before ELFR (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	800	1	800	Lot A: 0900		TEST @ RH	800	0	0	Pass	Generic Data: BLUEFIN (M235), Q225213, LOFP 144 20x20 O700
EOR	AEC Q100-005	Wet Endurance, Salt Massivation, and Corrosion (EOR) PC before EOR (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	77	0	0	Not required		TEST @ RH	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, (WIP/SS) NA=Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID, (WIP/SS) NA=Not Applicable)	Comments or Generic Data
WBS	AEC Q100-001	Wire Bond Shear (WBS) Cpk >= 1.37	Cpk >= 1.37	30 units from minimum 5 units	3	15	Lot A: Cpk = 1.87 Lot B: Cpk = 1.87 Lot C: Cpk = 1.87		Cpk >= 1.37	30 units from minimum 5 units	1	5	Lot A: Cpk = 1.87	
WSP	MIS0003 2011	Wire Bond Pull (WSP) Cpk >= 1.37	Cpk >= 1.37	30 units from minimum 5 units	3	15	Lot A: Cpk = 1.87 Lot B: Cpk = 1.87 Lot C: Cpk = 1.87		Cpk >= 1.37	30 units from minimum 5 units	1	5	Lot A: Cpk = 1.87	
SD	JESD2-B102	Solderability (SD) 95% lead coverage of critical areas	Cpk >= 1.37	15	2	30	17ARL1011000001 Pass 17ARL1011000002 Pass		Cpk >= 1.37	15	2	30	17ARL10000001 Pass 17ARL10000002 Pass	
PD	JESD2-B102	Physical Dimensions (PD) per P&S BSA drawing	Cpk >= 1.37	10	2	20	17ARL1011000001 Cpk = 1.87 17ARL1011000002 Cpk = 1.87		Cpk >= 1.37	10	2	20	17ARL10000001 Cpk = 1.87 17ARL10000002 Cpk = 1.87	
DM & BCM	AEC Q100-010	Dimensional (DM) and Bonding (BCM) results against BOM	Cpk >= 1.37	10	0	0	DM: Not applicable BCM: Pass		DM: Not applicable BCM: Pass	10	0	0	DM: Not applicable BCM: Pass	
SSS	AEC Q100-010	Solderability (SSS) 95% lead coverage of critical areas	Cpk >= 1.37	10	0	0	17ARL1011000001 Pass 17ARL1011000002 Pass		Cpk >= 1.37	10	0	0	17ARL10000001 Pass 17ARL10000002 Pass	
LI	JESD2-B102	Lead Integrity (LI) No lead breakage or cracks	No lead breakage or cracks	10	0	0	10 leads from 5 parts		No lead breakage or cracks	10	0	0	10 leads from 5 parts	

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, (WIP/SS) NA=Not Applicable)	Comments	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID, (WIP/SS) NA=Not Applicable)	Comments
EM		Electro Migration (EM)						The data, test method, calculations and internal criteria should be available to the customer upon request for new technologies.						
IDOB		Ion-Dependent Dielectric Breakdown (IDOB)						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.						
SM		Stress Migration (SM)						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.						

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, (WIP/SS) NA=Not Applicable)	Comments or Generic Data	End Point Requirements	Minimum Sample Size	# of Lots	Total Units including spares	Results (Lot ID, (WIP/SS) NA=Not Applicable)	Comments or Generic Data
TEST	Freescale 484	Pre- and Post-Fabrication / Post-Assembly (TEST) All units shall meet minimum requirements for qualification levels.	0 Fail	All	All	All	See Results Summary	This action refers to Final Testing of all qualification units.	0 Fail	All	All	All	See Results Summary	This action refers to Final Testing of all qualification units.
HBM	AEC Q100-007 JESD2-A115 Jan 2007	Electrostatic Discharge (ESD) Body Model Classification For AEC, see AEC-Q100-007 for classification levels.	TEST @ RH 20V min.	3 units per Voltage level	1	12	Lot A: 1500V O3 1500V O3 2000V O3		TEST @ RH 20V min.	3 units per Voltage level	0	0	Not required	
MM	AEC Q100-003 or JESD2	Electrostatic Discharge (ESD) Human Model Classification For AEC, see AEC-Q100-003 for classification levels.	TEST @ RH 200V only	3 units per Voltage level	0	0	Not required		TEST @ RH 200V only	3 units per Voltage level	0	0	Not required	
COM	AEC Q100-011	Electrostatic Discharge (ESD) Contact Model Classification For AEC, see AEC-Q100-011 for classification levels.	TEST @ RH 200V only	3 units per Voltage level	0	0	Not required		TEST @ RH 200V only	3 units per Voltage level	0	0	Not required	
LU	JESD2-A113 AEC Q100-004 for AEC	Latch-up (LU) PC before LU (for SMDs only). Duration: 1200 cycles for 20mins. Timed RO of 40hrs. MAX	TEST @ RH	6	0	0	Not required		TEST @ RH	6	0	0	Not required	
ED	AEC Q100-009 Freescale 484 spec	Electrical Distribution (ED) Cpk >= 1.67	TEST @ RH	30 units	1+1	30+30	Pass Cpk >= 1.67	Comparison between Copper and Aluminum at TL	TEST @ RH	30 units	0	0	Not required	

Flipped Pin Solder Test		Customer Name(s) - Various					Part of PSE/2E		Revision # & Date					
FG	For AEC: AEC-Q100-007	Fault Grading (FG)	FG shall be = or > 90% for equal units				POH: No Change	Production Test requirement: 100% TYPE2 built-in detection	FG shall be = or > 90% for equal units				POH: No Change	Production Test requirement: 100% TYPE2 built-in detection
CHAR	For AEC: AEC-Q003	Characterization (CHAR): Only performed on new technologies and part families per AEC-Q003.					Not required						Not required	
NET1		Identify the spread pattern that will be used and create spreadsheet if applicable (File #88 - Thermal and Pad at 100% deflmt spreadsheet) Refer to AEC-Q100-007 and AEC-Q100-008.	TEST B RHC	144 29x29 LQFP	6.630 X 6.410	0	Not required		TEST B RHC	144 29x29 LQFP	6.630 X 6.410	0	Not required	
CL (for information only)	For AEC: AEC-Q100-008	Electro-Thermally Induced Gate Leakage (ETGL): Only performed on new technologies and part families per AEC-Q100-008. For all devices, perform spreadsheet Refer to AEC-Q100-007 and AEC-Q100-008.	TEST B R	144 29x29 LQFP	6.630 X 6.410	0	Not required		TEST B R	144 29x29 LQFP	6.630 X 6.410	0	Not required	

Logic Part	FAB/Mark set	WAFER TECH CD	Assembly Site	PACK DESCRIPTION	DE SIZE(mm/mm)	MOLD COMPOUND	EPOXY DESCRIPTION	Wire	Lead Frame Flag Type
BLUEFIN	FSL-ATMC-FAB/M35S	ED2FAVQ	FSL-KLM-FM	144 29x29 LQFP	6.630 X 6.410	CEL-6000PF10M-CW	CRM-1054MBL	25um 1.0ml, Cu	Sold
BLUEFIN	FSL-ATMC-FAB/M35S	ED2FAVQ	FSL-KLM-FM	80 14x14 QFP	6.630 X 6.410	CEL-6000PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu	Sold

Logic Part	FAB/Mark set	WAFER TECH CD	Assembly Site	PACK DESCRIPTION	DE SIZE(mm/mm)	MOLD COMPOUND	EPOXY DESCRIPTION	Wire Description	CAB
21716	S08AC18	TSMC3 N78A ED2FAVQ	FSL-KLM-FM	80LQFP 14x14	3.395 X 3.583	HITACHI 9200PF10M	CRM-1054MBL	25um 1.0ml, Cu	1144313M
21784	KIRINSE (MCF2230)	TSMC11 M2/EI ED2FAVQ	FSL-KLM-FM	LQFP 80 14x14	7.150 X 6.940	HITACHI 9200PF10M	CRM-1054MBL	25um 1.0ml, Cu	1144313M

Logic Part	Package Description Code	Mark set	FAB	Wafer Tech	Die Size	Assembly Site	MOLD COMPOUND	Epoxy	Wire Description
IN260	100 14x14 LQFP E264	M35S	FSL-ATMC-FAB	ED2FAVQ	3.320X3.802	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
BLUEFIN_AUTO	144 29x29 LQFP E559	M35S	FSL-ATMC-FAB	ED2FAVQ	6.630 X 6.410	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
BONITO	112 20x20 LQFP E555	M35E	FSL-ATMC-FAB	ED2FAV5	4.462 X 4.122	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
BONITO	80 14x14 QFP E613	M35E	FSL-ATMC-FAB	ED2FAV5	4.462 X 4.122	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
BLACKFIN_SH	112 20x20 LQFP E555	M35P	FSL-ATMC-FAB	ED2FAV5	5.922 X 5.175	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
BLACKFIN_SH	144 29x29 LQFP E559	M35P	FSL-ATMC-FAB	ED2FAV5	5.922 X 5.175	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
YELLOWFIN_AUTO	112 20x20 LQFP E555	M35E	FSL-ATMC-FAB	ED2FAV5	5.922 X 5.102	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
YELLOWFIN_AUTO	144 29x29 LQFP E559	M35E	FSL-ATMC-FAB	ED2FAV5	5.922 X 5.102	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
YELLOWFIN_AUTO	80 14x14 QFP E613	M35E	FSL-ATMC-FAB	ED2FAV5	5.922 X 5.102	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
BARRACUDA4	80 14x14 QFP E613	L51Y	FSL-ATMC-FAB	ED2FAVY	5.500X5.574	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
BARRACUDA4	112 20x20 LQFP E555	L51Y	FSL-ATMC-FAB	ED2FAVY	5.500X5.574	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
GOLFISH	80 14x14 QFP E613	M35C	FSL-ATMC-FAB	ED2FAVQ	3.990X3.199	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
K9	80 14x14 QFP E613	M35C	FSL-ATMC-FAB	ED2FAVY	4.230X4.244	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
MARLIN2	80 14x14 QFP E613	L59W	FSL-ATMC-FAB	ED2FAVY	5.180X5.427	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
MARLIN2	112 20x20 LQFP E555	L59W	FSL-ATMC-FAB	ED2FAVY	5.180X5.427	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
STURGEON	80 14x14 QFP E613	M35G	FSL-ATMC-FAB	ED2FAVY	4.715X4.260	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
STURGEON	112 20x20 LQFP E555	M35G	FSL-ATMC-FAB	ED2FAVY	4.715X4.260	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
TORPEDO	80 14x14 QFP E613	M35C	FSL-ATMC-FAB	ED2FAVY	4.400X4.780	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu
TORPEDO	112 20x20 LQFP E555	M35C	FSL-ATMC-FAB	ED2FAVY	4.400X4.780	FSL-KLM-FM	CEL-6200PF10M-CW	CRM-1054MBL	25um 0.9ml, Cu

Part #	Rev	Comments
21716	001	Final Qualification Report