PF0100 ASECL Cu Qual Results for Automotive

Objective: **Qualify PF0100 ASECL Cu for Automotive tier**

Freescale PN: PF0100xxAZES/R2 Part Name: PF0100 Auto series Qual Vehicle PN: MMPF0100NPA Qual Vehicle Name: PF0100 Auto	Customer Name(s): Open Market & Customs PN(s):	Test Program ID: Test Program Rev: Rel.Circuits Doc.#:	Report Type: Results Revision Date: 26Mar14		
Technology: SM10W Package Description: 56L QFN 8x8x0.5 (Cu wire)	Mask set#: N18J Revision #: P2.1	CAB #: 13372348M FSL Qual Quartz Tracking #: 225399	Rel. Engr. Approval Signature: Tom Kazor Date: 26Mar14		
Fab site: ATMC Assembly site: ASE-CI Final Test site: FSL-TJN-NPI Rel Test site: FSL-TMP-ARAL	Product Engr: Muhammed Zubair Prod. Pkg. Engr: Garry Ge Rel. Engr: Tom Kazor	Target Dates Test Start: Test Finish:	CAB Approval Signature: Yanil Cruz Date: 3Apr2014		
	Part Operating Automotive Temp. Range (Ta): -40°C to 85°C Grade 3	Freescale Contact: Phone Number:	Customer Approval Signature: Date: NA		

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PRE-STRESS REQUIREMENTS

Stress	JEDEC22 FSL Reference	Test Conditions	End Point Requirements	Minimum Sample Size per lot	# of Lots	Total Units including spares (Note 1)	Results					Comments (Generic Data: Note 2)
							Lot A Nominal	Lot B Nominal	Lot C Nominal	Lot D HH	Lot E LL	
PC	A113 J-STD-020	**Preconditioning (PC)** MSL 3 at 260°C, +5/-0°C CSAM: Note 3	TEST at R w/H-C temp guardbands; CSAM; Ext. Visual	All surface mount devices prior to THB/HAST, AC/UHST, TC, or as required per individual stress Test Conditions.								PC is performed as part of the individual stress tests.

ACCELERATED ENVIRONMENTAL STRESS TESTS

Stress	JEDEC22 Reference	Test Conditions	End Point Requirements	Minimum Sample Size per lot	# of Lots	Total Units including spares (Note 1)	Results					Comments (Generic Data: Note 2)
							Lot A Nominal	Lot B Nominal	Lot C Nominal	Lot D HH	Lot E LL	
HAST	A110	**Highly Accelerated Stress Test (HAST):** CSAM/PC required before HAST. HAST = 130°C/85%RH **96 hrs** Bias: 3.6V,3.1V, 2.0V (CC3)	TEST @ R,H	77	5	400	96hrs: 0/80	96hrs: 0/80	96hrs: 0/80	96hrs: 0/80	96hrs: 0/80	
UHST	A118	**Unbiased HAST (UHST):** PC before UHST if required. UHST = 130°C/85%RH **96 hrs**	TEST @ R	77	5	400	96hrs: 0/80	96hrs: 0/80	96hrs: 0/80	96hrs: 0/80	96hrs: 0/80	
TC	A104	**Temperature Cycle (TC):** PC before TC if required. TC = -50°C to +125°C **500 cycles** WBP after 500 cycles on 5 devices from each lot; 2 bonds per corner and one mid-bond per side on each device. Record which pins were used.	TEST @ R, H	90	5	450	500cy: 0/90 WBP: Passed	500cy: 0/90 WBP: Passed	500cy: 0/90 WBP: Passed	500cy: 0/90 WBP: Passed	500cy: 0/90 WBP: Passed	
HTSL	A103	**High Temperature Storage Life (HTSL):** HTSL = 150°C **1008 hrs**	TEST @ R, H	48	5	240	1000hr: 0/48	1000hr: 0/48	1000hr: 0/48	1000hr: 0/48	1000hr: 0/48	

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ACCELERATED LIFETIME SIMULATION TESTS

Stress	JEDEC22 Reference	Test Conditions	End Point Requirements	Minimum Sample Size per lot	# of Lots	Total Units including spares (Note 1)	Results					Comments (Generic Data: Note 2)
							Lot A Nominal	Lot B Nominal	Lot C Nominal	Lot D HH	Lot E LL	
HTOL	A108	**High Temperature Operating Life (HTOL):** HTOL = 110°C Ta **408 hrs** Bias: 3.6V, 3.1V, 2.0V	TEST @ R, H, C	77	3	231	408hr: 0/80	408hr: 0/80	408hr: 0/80			
ELFR	AEC Q100-008	**Early Life Failure Rate (ELFR):** ELFR = 110°C Ta for 48 hrs Bias: 3.6V, 3.1V, 2.0V	TEST @ R, H H = 85C	800	3	2409	0/803	0/803	0/803			Generic die data from the P1.1 & P1.2 qualifications.

PACKAGE ASSEMBLY INTEGRITY TESTS

Stress	JEDEC22 MilStd883 Reference	Test Conditions	End Point Requirements	Minimum Sample Size per lot	# of Lots	Total Units including spares	Results					Comments (Generic Data: Note 2)
							Lot A Nominal	Lot B Nominal	Lot C Nominal	Lot D HH	Lot E LL	
Full Assy. CZ	FSL Internal Requirement	Full assembly process CZ Data collection per FSL CZ template; includes WBS, WBP, PD.			5		Pass	Pass	Pass	Pass	Pass	Performed as part of Assembly CZ during qual lot builds

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ELECTRICAL VERIFICATION TESTS

Stress	JEDEC22	Test Conditions	End Point Requirements	Minimum Sample Size per lot	# of Lots	Total Units including spares	Results					Comments (Generic Data: Note 2)
							Lot A Nominal	Lot B Nominal	Lot C Nominal	Lot D HH	Lot E LL	
TEST	Freescale 48A	**Pre- and Post Functional / Parametrics (TEST):** Testing performed at room temp w/tri-temp guardbanded limits.	0 Fails	All	All	All						TEST results is shown for each individual stress test in the qual results report generated upon qual completion.
HBM	A114	**ElectroStatic Discharge/ Human Body Model Classification (HBM):** Test @ 250/500/1000/1500/2000V for qual; 2500V for information only.	TEST @ R, H	3 units per Voltage level	1	18	Passed at 2500V					
MM	A115	**ElectroStatic Discharge/ Machine Model Classification m(MM):** Test @ 50/100/150/200V for qual; 250V for information only.	TEST @ R, H	3 units per Voltage level	1	15	Passed at 250V					
CDM	C101	**ElectroStatic Discharge/ Charged Device Model Classification (CDM):** Test @ 125/250/500V all pins for qual; 750V for information only. 750V corner pins for qual; 1000V for information only. Timed RO of 96hrs MAX.	TEST @ R, H	3 units per Voltage level	1	15	Passed at 1000V					
LU	JESD78	**Latch-up (LU)** Test per JEDEC JESD78 with the AEC-Q100-004 requirements. >100ma+Inom Ta= 105C	TEST @ R, H	6	1	6	Passed					
ED	AEC-Q100-009, Freescale 48A spec	**Electrical Distribution (ED)**	TEST @ R, H, C Cpk = or > 1.67	30	3	90	See Justifications Report for low Cpk	See Justifications Report for low Cpk	See Justifications Report for low Cpk			

General Notes:
1- Optional Spare Units: 'xx+3' indicates an additional 3 units have been added to the sample size to be used ONLY in the event of lost or mechanically damaged units so as to have the required number of samples at test completion; these 'spares' shall not be used to replace failing units; ALL failures found in the total sample size shall be recorded and acted upon accordingly.
2- Generic Data: Document source of all generic data in the Generic Data Reference List below.
3- CSAM SS=11 units for each stress test for each lot when required.

Generic Data Reference List:
ELFR: Generic die data from the P1.1 & P1.2 qualifications Q#219250/219251/220806