

Commercial Tier / Industrial Tier Results

Objective: Qualifying Cu wire 20um Pd Copper Wire PBGA package for Non-EPP and EPP package.					
Freescale PN: MPC5200, MCF547X/MCF548X, MPC5200B Part Name:		Design Engineer: Not Applicable			Revision: Refer to Table below
H013HXX6, / Hip 7 MPC5200: 5047 / PBGA 272 27*27*1.25P1.27 Technology: MCF547X/MCF548X: 5367 PBGA 388 27*27*2.25P1.0 Package: MPC5200B: 5192/ PBGAPGE 272 27SQ1.2P1.27		Product Engineer: Yang Lei-B46636			Revision Date: Refer to Table below
Fab / Assembly: FSL-ATMC-FAB/ FSL-KLM-FM MPC5200: 4L25R Maskset#: MCF547X/MCF548X: 2L14S Rev#: MPC5200B: 1M62C		Package Engineer: Lim Jasmine-B18239			QUARTZ Tracking #: Not applicable
Datasheet Operating Temp (provide junction if defined in the datasheet): -40 °C to +85°C/105°C Ambient (detail refer to datasheet)		R&QA Engineer: Nurazah Ahmad- R63712			CAB Approval 15201198M Number & Date: 29 May 2015
		Trace/Date Code:	Lot A	Lot B	Lot C

ACCELERATED ENVIRONMENTAL STRESS TESTS								
Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units	Results(#Rej/SS) NA=Not Applicable	Comments or Generic Data
PC	JESD22-A113 J-STD-020	Preconditioning (PC) : PC required for SMDs only. MSL 3 @ 260°C, +5/-0°C	TEST @ RH	All surface mount devices prior to THB and TC as required per test conditions.			Pass	Generic Data: MPC5566 (M60E), 5252, PBGA 416 27*27*1.25P1.0, Q227216: 0/77 MPC5554 (M68C), 5252, PBGA 416 27*27*1.25P1.0, Q226744: 0/ 231 MPC5565 (M49H), 5366, PBGAPGE 324 23SQ1.25P1.0, Q227254: 0/77
THB	JESD22-A101 (THB) A110 (HAST)	Temperature-Humidity-Bias (THB): PC before THB (for SMDs only): Required THB = 85°C/85%RH for 1000 hrs. Bias = Max Vdd	TEST @ RH	25	0	0	Pass	Generic Data: MPC870 (5K51M) Q212437 0/231 MPC859 (6L96R) Q212436 , 0/231
TC	JESD22-A104	Temperature Cycle (TC): PC before TC (for SMDs only): Required TC = -65°C to 150°C for 500 cycles.	TEST @ H	25	0	0	Pass	Generic Data: MPC5566 (M60E), 5252, PBGA 416 27*27*1.25P1.0, Q227216: 0/77 MPC5554 (M68C), 5252, PBGA 416 27*27*1.25P1.0, Q226744: 0/ 231 MPC5565 (M49H), 5366, PBGAPGE 324 23SQ1.25P1.0, Q227254: 0/77
HTSL	JESD22-A103	High Temperature Storage Life (HTSL): 150°C for 1008 hrs	TEST @ RH	25	0	0	Pass	Generic Data: MPC5554 (M68C), 5252, PBGA 416 27*27*1.25P1.0, Q226744: 0/ 77
ACCELERATED LIFETIME SIMULATION TESTS								
Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units	Results(#Rej/SS) or PASS NA=Not Applicable	Comments or Generic Data
Industrial Tier HTOL	JESD22-A108	High Temperature Operating Life (HTOL): Ta = 125°C Bias = Max Voltage Devices incorporating NVM shall receive 1X 'NVM endurance preconditioning'(W/E cycling) at Ta = 125 °C. Test R, H, C after W/E cycling.	TEST @ RHC	0			Not required	
Industrial Tier ELFR	JESD22-A108	Early Life Failure Rate (ELFR): Ta = 125°C, Bias = Max Voltage	TEST @ RH	611			Pass	Generic Data: MPC5554 (M68C), 5252, PBGA 416 27*27*1.25P1.0, Q226744: 0/611
EDR	JESD22-A108 / JESD22-A103	NVM Endurance, Data Retention, and Operational Life (EDR): 150°C for 1008 hrs or 175°C for 504hrs Devices incorporating NVM shall receive 1X 'NVM endurance preconditioning'(W/E cycling). Test R, H, C after W/E cycling.	TEST @ RHC	77	0	0	Not required	



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DIE FABRICATION RELIABILITY TESTS								
Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units	Results(#Rej/SS) NA=Not Applicable	Comments
EM		Electro Migration (EM)						The data, test method, calculations and internal criteria is available to the customer upon request for new technologies after qualification.
TDDB		Time Dependent Dielectric Breakdown (TDDB)						The data, test method, calculations and internal criteria is available to the customer upon request for new technologies after qualification.
HCI		Hot Carrier Injection (HCI)						The data, test method, calculations and internal criteria is available to the customer upon request for new technologies after qualification.
SM		Stress Migration (SM)						The data, test method, calculations and internal criteria is available to the customer upon request for new technologies after qualification.
NBTI		Negative Bias Temperature Instability (NBTI)						The data, test method, calculations and internal criteria is available to the customer upon request for new technologies after qualification.
ELECTRICAL VERIFICATION TESTS								
Stress Test	Reference	Test Conditions	End Point Requirements	Minimum Sample Size	# of Lots	Total Units	Results(#Rej/SS) NA=Not Applicable	Comments or Generic Data
HBM	JESD22-A114	ElectroStatic Discharge/ Human Body Model Classification (HBM): Test @ 2000 Volts	TEST @ RH	3 units per Voltage level	0	0	Not required	
CDM	JESD22-C101	ElectroStatic Discharge/ Charged Device Model Classification (CDM): Test @ 500 Volts	TEST @ RH	3 units per Voltage level	0	0	Not required	
LU	JESD78	Latch-up (LU): Ta during stress = Max Ta °C Vsupply = Maximum operating voltage May allow alternate condition as per JESD78	TEST @ RH	3	0	0	Not required	
ED	Freescale Datasheet	Electrical Distribution (ED) T0 comparison between Au and Cu Wire	TEST @ HC	5	0	0	Pass	Generic Data: MPC5554 (M68C), 5252, PBGA 416 27*27*1.25P1.0, Q226744: Pass
EMC	IEC 61967-2 - Radiated Emission Measurement (TEM Cell)	Electromagnetic Compatibility (EMC) Test per IEC 61967-2. Ta= Room Temp Vsupply = Typical operating voltage	< 40dbuV 150KHz - 1GHz running RE application code	1	0	0	Not required	

Products Being Qualified:

Mask Set/ Part number	Fab site/ Assembly Site	Package code/ Package Description	Die size (mm x mm)	Solder ball type	Mold Compound	Epoxy	Wire size/ description
4L25R/MPC5200BV	FSL-ATMC-FAB/ FSL-KLM-FM	5047 / PBGA 272 27*27*1.25P1.27	6.532 X 6.532	SODBF 30MILS Sn62/Pb36/Ag2 (NON EPP)	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um
4L25R/MPC5200VR	FSL-ATMC-FAB/ FSL-KLM-FM	5047 / PBGA 272 27*27*1.25P1.27	6.532 X 6.532	SODBF 30MILS SN-AG-CU (EPP)	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um
2L14S/MCF547XZP/MCF548XCZP	FSL-ATMC-FAB/ FSL-KLM-FM	5367 PBGA 388 27*27*2.25P1.0	6.900 X 6.900	SODBF 23.6MILS Sn62/Pb36/Ag2 (NON EPP)	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um
2L14S/MCF547XVR/MCF548XCVR	FSL-ATMC-FAB/ FSL-KLM-FM	5367 PBGA 388 27*27*2.25P1.0	6.900 X 6.900	SODBF23.6MILS SN-AG-CU (EPP)	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um
1M62C/MPC5200B	FSL-ATMC-FAB/ FSL-KLM-FM	5192/ PBGAPGE 272 27SQ1.2P1.27	5.310 X 5.610	SODBF 30MILS SN-AG-CU (EPP)	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um

Generic Data List:

Quartz	Device name/ Part number	Mask Set/ Die size (mm x mm)	Fab site/ Technology	Assembly site	Package Code/ Description	Solder ball type	Mold Compound	Epoxy	Wire Type/ Diameter
227216	Viper/ MPC5566	3M60E/ 7.0 x 10.0	FSL-ATMC-FAB /H013FHL6	FSL-KLM-FM	5252/ TEPBGA 416 27*27*1.25 P1	SODBF23.6MILS SN-AG-CU	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um
226744	Cu Head/ MPC5554	6M68C/ 7.82 x 7.82	FSL-ATMC-FAB/ H013FHL6	FSL-KLM-FM	5252/ TEPBGA 416 27*27*1.25 P1	SODBF23.6MILS SN-AG-CU	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um
227254	Taipan/ MPC5565	5M49H/ 6.96 x 8.07	FSL-ATMC-FAB/ H013FHL6	FSL-KLM-FM	5366/ PBGAPGE 324 23SQ1.25P1.0	SODBF23.6MILS SN-AG-CU	MC SUMITOMO G760L	CRM-1525	Pd Cu/ 20 um
212437	Duet/ MPC870	5K51M/ 6.728 x 5.909	FSL-ATMC-FAB/ C016HXXT	FSL-KLM-FM	5061/ PBGA 256 23*23*1.22P1.27	SODBF 30MILS SN-AG-CU	MC SUMITOMO G760L	CRM-1525	Bare Cu/ 20um
212436	Tantra/MPC859	6L96R/ 5.128 X 5.422	FSL-ATMC-FAB/ C016HXXT	FSL-KLM-FM	5061/ PBGA 256 23*23*1.22P1.27	SODBF 30MILS SN-AG-CU	MC SUMITOMO G760L	CRM-1525	Bare Cu/ 20um

Revision	Date	Comments	Author
Rev O	28-May-15	Qualification Report	Nurazah Ahmad