



PowerQUICC Communications Processor

MPC8544 Product Family Rev. 2.1
783 Lead and Leadfree FC-PBGA Package
Global Foundries 90nm SOI CMOS

Industrial Qualification Report

Industrial part is at 1.0 V at 105°C use

MPC8544VTALFA
MPC8544VTANGA
MPC8544VTAQGA
MPC8544VTARJA
MPC8544CVTALFA
MPC8544CVTANGA
MPC8544CVTAQGA
MPC8544EVTALFA
MPC8544EVTANGA
MPC8544EVTAQGA
MPC8544EVTARJA
MPC8544ECVTALFA
MPC8544ECVTANGA
MPC8544ECVTAQGA
SC8544ECPXALFA
SC8544CPXANGA
SC8544CPXAQGA
SC8544PXANGA
SC8544PXARJA

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Description: PowerQUICC38K		Date: 2/8/2011
Technology: Global Foundries CMOS 90 SOI	Package:783leadfree FC-PBGA	Page 1 of 7



Product Information

Package	783 FC-PBGA, 29 x 29 mm (w/ o lid)
Device	MPC8544
Mask Set	2M35S
Die Size	(62.88 mm ² w/ o scribe)
Die Coating(s)	Polyimide
Product Specs	1.0V+/- 5%, 105C max, 14w
Memory	2x32KB L1 cache, 256KB L2 cache (all with ECC)
Name/ Location of Die Fab Facility	Global Foundries / Singapore
Process Technology	CMOS90SOI, bit cell size 1.115, SiCOH/ SiCOH Mx
Poly / Metal layers	1P / 7M
Gox Thickness	15 Å
C4 Bump Site	Amkor T5
C4 Sphere Size and Composition	Ni-UBM (Ni ₂), 95um Diameter, 185um pitch, 95/ 5 Pb/ Sn
Test Location	KLM
Assembly Location	KLM
Moisture Sensitivity Level	MSL3 / 260°C Reflow
Substrate Supplier	Supplier M

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MPC8544 Rev 2.1 Industrial Product Reliability Data Summary

High Temperature Operating Life Test (HTOL) Tj=130°C, V=1.4V

Wafer Lot	Trace Code	Rev	31 hours Fail/Sample Size	79 hours Fail/Sample Size	5 years 177 hours Fail/Sample Size	10 years 351 hours Fail/Sample Size
QA18200	ZLMHA19CTG00	2.1	0/120	0/120	0/120	0/120
QA1830	ZLMHA19FFV00	2.1	0/80	0/80	0/80	0/80
QA1840	ZLMHA19FFW00	2.1	0/120	0/120	0/120	0/120
Totals			0/320	0/320	0/320	0/320

Electrostatic Discharge (ESD)

Wafer Lot	Rev	Substrate Supplier	2KV HBM Fail/Sample Size	250V CDM All Pins Fail/Sample Size	500V CDM Excluding Lynx Pins Fail/Sample Size
QA9035	2.0	M	0/3	0/3	0/3
QA8028	2.0	M	0/3	0/3	0/3
QA8033	2.0	M	0/3	0/3	0/3
QA9034	2.0	N	0/3	0/3	0/3
QA18200	2.1	M	N/A	0/3	0/3
Totals			0/12	0/15	0/15

Moisture Sensitivity Level Characterization

Wafer Lot	Substrate Supplier	Rev	MSL3 / 260°C
QA0184	M	2.1	0/80
QA9034	M	2.0	0/22
QA8028	N	2.0	0/22
Totals			0 / 124

Temperature Cycle / -55°C to 125°C Air to Air with Preconditioning @ MSL3 / 260°C IR Reflow

Wafer Lot	Assembly Lot	Substrate Supplier	Rev	500 Cycles	1000 Cycles
QA9034	WEMHA0ZRF300	M	2.0	0/80	0/80
QA8028	WEMHA0Y1W00	N	2.0	0/79 ^A	0/79
QA8174	WEMHA0YA8C00	M	2.0	0/80	0/80
QA8174	WEMHA0YA8Z00	M	2.0	0/79 ^A	0/79
QA8174	WEMHA0YA8A00	M	2.0	1/80 ^B	0/79
Total				1/398	0/397

^A Failed electrical test. FA indicated a C4 solder bump defect. Improved clean fixed the issue.

^B Failed electrical test. Unit removed from analysis, as number of units successfully run through temp cycle exceeds Freescale requirement of 0/231 units from 3 lots.

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Temperature Humidity Bias / 85°C, 85%R.H., 1.0v with Preconditioning @ MSL3 / 260°C IR Reflow

Wafer Lot	Assembly Lot	Substrate Supplier	Rev	504 Hours	1008 Hours
QA9034	WEMHA0ZRF300	M	2.0	0/15	0/15
QA8028	WEMHA0Y1W00	N	2.0	0/15	0/15
QA8174	WEMHA0YA8C00	M	2.0	0/15	0/15
QA8174	WEMHA0YA8Z00	M	2.0	0/15	0/15
QA8174	WEMHA0YA8A00	M	2.0	0/15	0/15
Total				0/75	0/75

High Temperature Bake / 150°C

Wafer Lot	Assembly Lot	Substrate Supplier	Rev	504 Hours	1008 Hours
QA9034	WEMHA0ZRF300	M	2.0	0/80	0/80
QA8028	WEMHA0Y1W00	N	2.0	0/80	0/80
QA8174	WEMHA0YA8C00	M	2.0	0/40	0/40
QA8174	WEMHA0YA8Z00	M	2.0	0/80	0/80
QA8174	WEMHA0YA8A00	M	2.0	0/80	0/80
Total				0/360	0/360

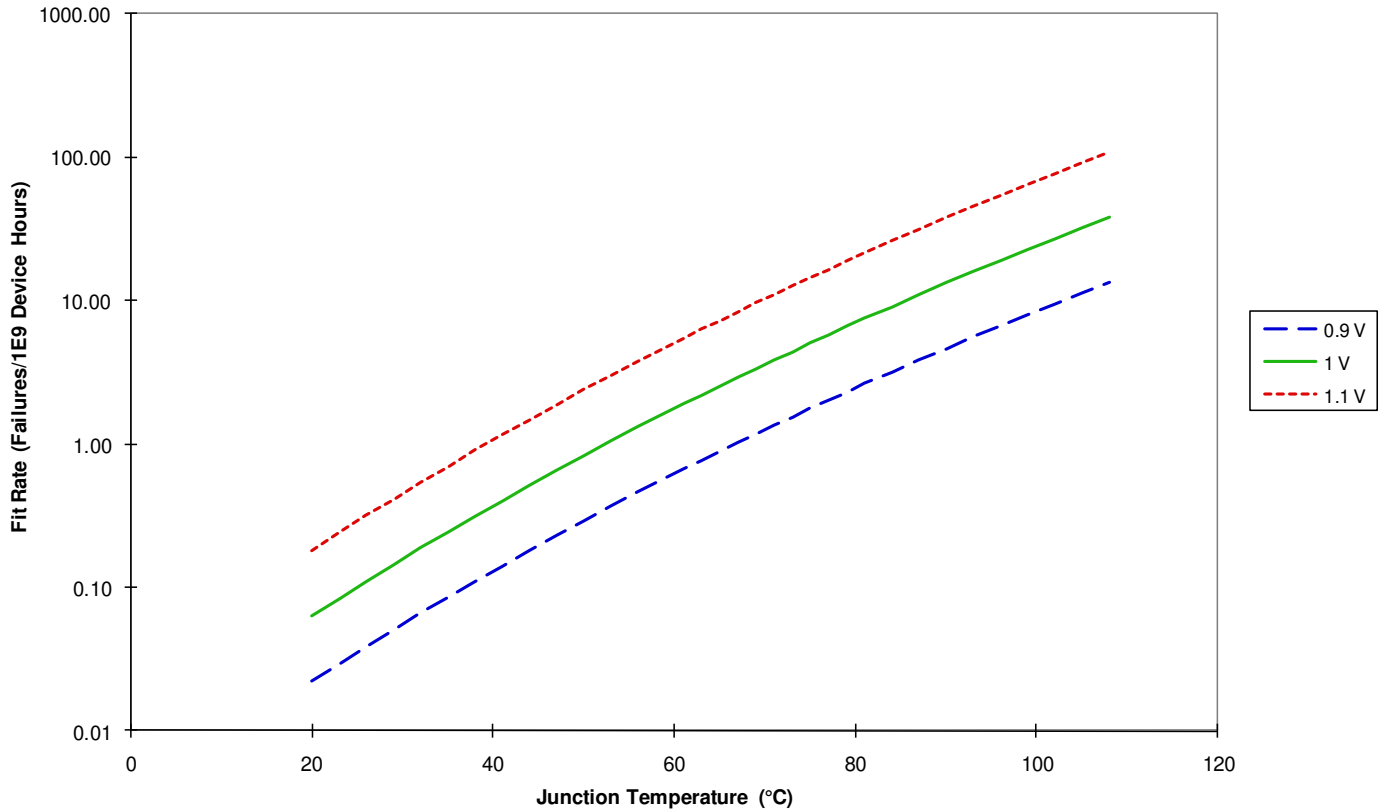
uHAST / 130°C/85%RH/33PSI, with Preconditioning @ MSL3 / 260°C IR Reflow

Wafer Lot	Assembly Lot	Substrate Supplier	Rev	96 Hours
QA9034	WEMHA0ZRF300	M	2.0	0/80
QA8028	WEMHA0Y1W00	N	2.0	0/80
QA8174	WEMHA0YA8C00	M	2.0	0/80
QA8174	WEMHA0YA8Z00	M	2.0	1/80 ^C
QA8174	WEMHA0YA8A00	M	2.0	0/80
Total				1/400

^C Failed electrical test. FA indicated a C4 solder bump defect. Improved clean fixed the issue.

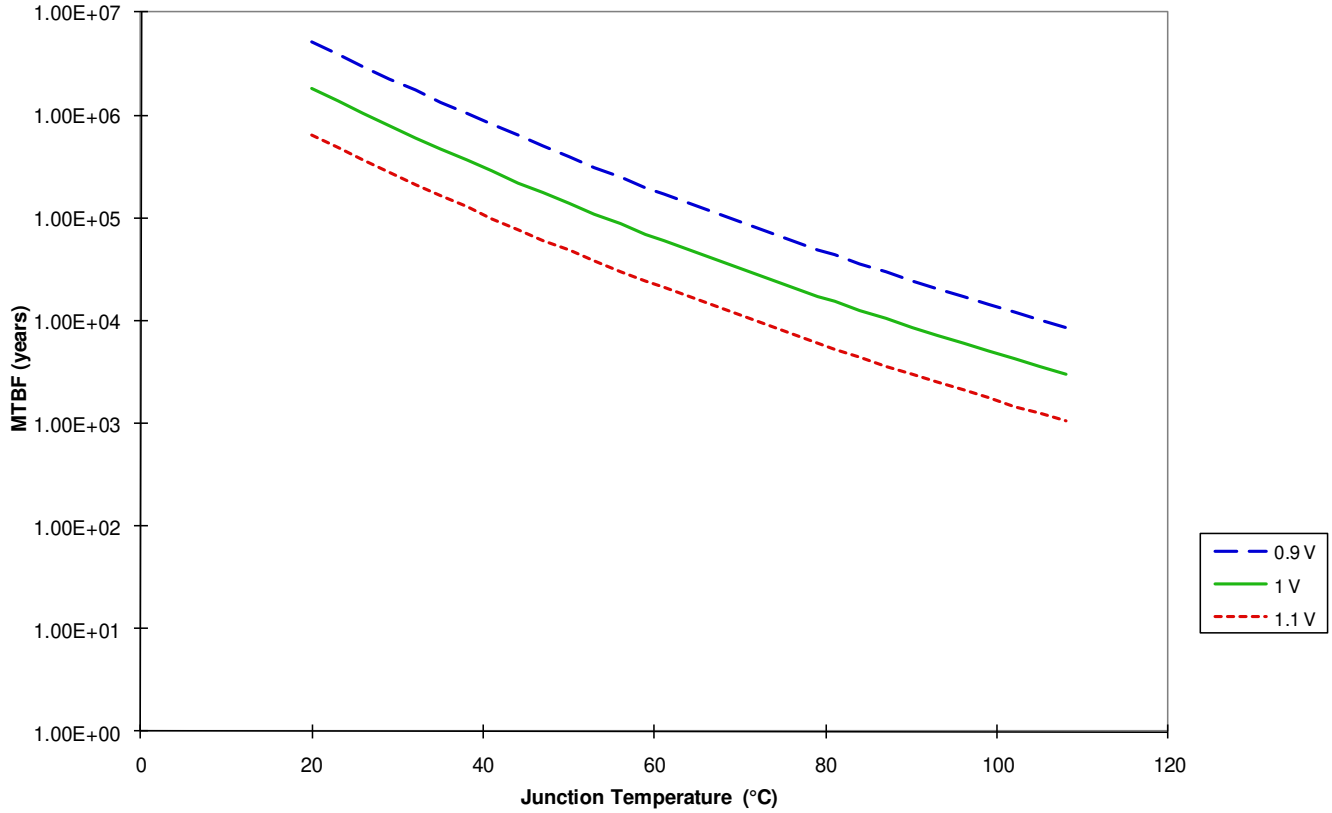
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FITs vs Junction Temperature: MPC8544
Thermal and Voltage Acceleration
eA = 0.7 eV, Beta = 10.5, 60% Confidence



Tj	0.9 V	1 V	1.1 V
95 °C	6	17	51
105 °C	11	32	92
115 °C	19	56	160

MTBF vs Junction Temperature: MPC8544
Thermal and Voltage Acceleration
eA = 0.7 eV, Beta = 10.5, 60% Confidence



Tj	0.9 V	1 V	1.1 V
95 °C	1.8E+4	6.3E+3	2.2E+3
105 °C	1.0E+4	3.5E+3	1.2E+3
115 °C	5.8E+3	2.0E+3	7.1E+2



Revision History

Revision History			
Revision	Date	Comment	Author
A.3	2/8/2011	Original	Kathy Badger Torres

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