



MPC880/885, MPC870/875 Product Family

ATMC(MOS 13) HiP6W

Qualification Report PowerQUICC Communications Processor

KMPC870CVR133	KMPC875CVR133	KMPC880CVR133	KMPC885CVR133
KMPC870CVR66	KMPC875CVR66	KMPC880CVR66	KMPC885CVR66
KMPC870VR133	KMPC875VR133	KMPC880VR133	KMPC885VR133
KMPC870VR66	KMPC875VR66	KMPC880VR66	KMPC885VR66
KMPC870VR80	KMPC875VR80	KMPC880VR80	KMPC885VR80
MPC870CVR133	KSC875CVR66	MPC880CVR133	MPC885CVR133
MPC870CVR66	MPC875CVR133	MPC880CVR66	MPC885CVR66
MPC870VR133	MPC875CVR66	MPC880VR133	MPC885VR133
MPC870VR66	MPC875VR133	MPC880VR66	MPC885VR66
MPC870VR80	MPC875VR66	MPC880VR80	MPC885VR80
	MPC875VR80		SC41489CVR133
	SC875CVR66		
KMPC870CZT133	KMPC875CZT133	KMPC880CZP133	KMPC885CZP133
KMPC870CZT66	KMPC875CZT66	KMPC880CZP66	KMPC885CZP66
KMPC870ZT133	KMPC875ZT133	KMPC880ZP133	KMPC885ZP133
KMPC870ZT80	KMPC875ZT80	KMPC880ZP80	KMPC885ZP80
MPC870CZT133	KSC875CZT66	MPC880CZP133	MPC885CZP133
MPC870CZT66	MPC875CZT133	MPC880CZP66	MPC885CZP66
MPC870ZT133	MPC875CZT66	MPC880ZP133	MPC885ZP133
MPC870ZT66	MPC875ZT133	MPC880ZP66	MPC885ZP66
MPC870ZT80	MPC875ZT66	MPC880ZP80	MPC885ZP80
SC41040ZT66	MPC875ZT80		SC41489CZP133
	SC875CZT66		
	SC875NBZT133		



MPC880/885, MPC870/875 Product Family Information:

Product / Technology / Fab / Package Description	
Device	MPC885ZP MPC885CZP MPC885VR MPC885CVR MPC880ZP MPC880CZP MPC880VR MPC880CVR MPC870ZT MPC870CZT MPC870VR MPC870CVR MPC875ZT MPC875CZT MPC875VR MPC875CVR
Package	MPC880/885 - 357 PBGA , MPC870/875 – 256 PBGA
Mask Set	K51M
Die Size	6.856 x 6.037 (41.39 mm ²)
Die Coating	Polyimide - Hitachi S200
Name/Location of Wafer Fab Facility	ATMC(MOS 13) / Austin, Texas
Wafer Fab Process Technology	HiP6W - 0.18μm, 35Å/70 Å DGO
Poly / Metal layers	Single Level Poly, Triple Level Metal
Assembly Location	Freescall, KLM
Mold compound / Mfg. Supplier	Bi-phenyl mold compound
Die Attach Material	Conductive
Wire Material	Au; Cu
Moisture Sensitivity Level	MSL 3 260°C
Lead Frame / Substrate Supplier	Suppliers A, supplier B added

Device No./Rev.: MPC 880/885 , MPC 870/875		Report Rev.: F
Description: PowerQUICC MPC880/885, MPC870/875		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357 and 256 PBGA	Page 2 of 11



MPC880/885, MPC870/875 Product Reliability Data Summary:

MPC866 data is included in the summary; re-used by similarity.

Early Life Failure Rate (ELFR) – Vd1 2.5v, Vd2 2.5v, Ta 125°C

Lot / Mask Set / Rev	1 Year (7h) <1000 PPM Criteria	2.5 Years (18h) For info only	10 Years (72h) For info only	20 Years (144h) For info only
D67865 / K51M / Rev 0	0 / 214	0 / 214	0 / 214	-
D49055 / L90H / Rev 0	0 / 1000	0 / 996	0 / 993	0 / 992
D54660 / L90H / Rev 0.3	0 / 992	1 / 991	0 / 986	0 / 981
D54905 / L90H / Rev 0.3	0 / 1003	0 / 1002	0 / 1002	0 / 999
Totals	0 / 2995 306 PPM @ 60% C.L.	1 / 2989	0 / 2981	0 / 2972
Failure Comments		Functional-passivation integrity failure.		

High Temperature Operating Life Test (HTOL) – Vd1 2.3v, Vd2 2.3v, Ta 125°C

Lot / Mask Set / Rev	1 Year (17h) <1000 PPM Criteria	2.5 Years (48h) For info only	10 Years (168h) For info only	20 Years (336h) For info only
D67865 / K51M / Rev 0	0 / 214	0 / 214	0 / 214	---

High Temperature Operating Life Test (HTOL) – Vd1 2.5v, Vd2 2.5v, Ta 125°C

Lot / Mask Set / Rev	1 Year (7h) For info only	2.5 Years (18h) For info only	10 Years (72h) <200 FITs	20 Years (144h) For info only
D64512 / L96R / Rev A	0 / 240	0 / 240	0 / 240	---
D49055 / L90H / Rev 0	0 / 77	0 / 77	0 / 77	0 / 77
D54660 / L90H / Rev 0.3	0 / 77	0 / 77	0 / 77	0 / 77
D54905 / L90H / Rev 0.3	0 / 77	0 / 77	0 / 77	0 / 77

Totals	0 / 685	0 / 685	0 / 685 <1 FITs @ Ta 55°C, 60% C.L.	0 / 231
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MPC880/885, MPC870/875 Product Reliability Data Summary (cont.):

High Temperature Operating Life Test (HTOL) Drift Analysis – Vd1 2.5v, Vd2 2.5v, Ta 125°C

Lot / Mask Set / Rev	10 Years (72h)
D54660 / L90H / Rev 0.3	0 / 5
D54905 / L90H / Rev 0.3	0 / 5
Totals	0 / 10

Electrical Characterization –45°C, 25°C and 105°C

Lot / Mask Set / Rev	10 Years (72h)
D64512 / L96R / Rev A	0 / 5
D54660 / L90H / Rev 0.3	0 / 5
D54905 / L90H / Rev 0.3	0 / 5
Totals	0 / 10

Electrostatic Discharge and Latch-up Test

Lot / Mask Set / Rev	HBM / 2KV	MM / 200V	CDM / 500V – No Skt	Latch-up / 200mA
D67865 / K51M / Rev 0	0 / 3	0 / 3	0 / 3	0 / 6
Totals	0 / 3	0 / 3	0 / 3	0 / 6



MPC880/885, MPC870/875 Product Reliability Data Summary (cont.):

Test Vehicle: MPC565 Product Reliability Data Summary for Supplier A:

Electrical Characterization	
Lot /	Units
Lot 1,2,3	0/ 15
Comments	

High Temperature Bake without Preconditioning			
Lot		504 Hours	1008 Hours
Lot 1		0/ 45	0/ 45

Temperature Cycle / -65° C - 150° C Air to Air with Preconditioning @MSL3/ 260° C			
Lot	MSL3 260°C	500 Cycles	1000 Cycles
Lot 1	0/ 77	0/ 77	0/ 77
Lot 2	0/ 77	0/ 77	0/ 77
Lot 3	0/ 77	0/ 77	0/ 77
Total	0/ 231	0/ 231	0/ 231
Comments			

Autoclave / 121°C, 100% RH, 15 PSIG with Preconditioning @ MSL3 / 260°C	
Assy Site / Substr. Supplier / Lots	96 Hours
Lot 1, 2, 3 (77 units each)	0 / 231
Totals	0 / 231

Temperature Humidity Bias / 85° C, 85%R.H. 2.6V, with Preconditioning @MSL3 / 260° C			
Lot		504 Hours	1008 Hours
Lot 1		0/ 80	0/ 80
Lot 2		2/ 80*	0/ 78
Lot 3		0/ 80	0/ 80
Totals		0/ 240	0/ 238
Comments		* 2 THB fails at 504 hours, FA and 8D report done	

Device No./Rev.: MPC 880/885 , MPC 870/875	Report Rev.: F
Description: PowerQUICC MPC880/885, MPC870/875	Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357 and 256 PBGA
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MPC880/885, MPC870/875 Product Reliability Data Summary (cont.):

Package Reliability Data for 357 Duet MPC 885 for Supplier B:

Electrical Characterization	
Lot /	Units
Lot 1	0/ 10
Comments	

Moisture Sensitivity Level Preconditioning Characterization/ MSL3/260° C	
Lot	Units
Lot 1	0/ 22
Lot 2	0/ 22
Lot 3	0/ 22
Total	0/ 66
Comments	

Temperature Cycle / -65° C - 150° C Air to Air with Preconditioning @MSL3/ 260° C			
Lot	MSL3 260°C	500 Cycles	1000 Cycles
Lot 1	0/ 80	0/ 80	0/ 80
Lot 2	0/ 80	0/ 80	0/ 80
Lot 3	0/ 80	0/ 80	0/ 80
Total	0/ 240	0/ 240	0/ 240
Comments			

Temperature Humidity / 85° C, 85%R.H., without Preconditioning @ MSL3 / 260° C			
Lot		504 Hours	1008 Hours
Lot 1		0/ 80	0/ 80
Lot 2		0/ 80	0/ 80
Lot 3		0/ 80	0/ 80
Totals		0/ 240	0/ 239
Comments			



MPC880/885, MPC870/875 Product Reliability Data Summary (cont.):

High Temperature Bake without Preconditioning			
Lot		504 Hours	1008 Hours
Lot 1		0/ 80	0/ 79*
Lot 2		0/ 80	0/ 80
Lot 3		0/ 80	0/ 80
Totals		0/ 240	0/ 239
Comments			*mechanical damaged ball caused by handling

Electrical CZ Data for 256 LC Duet MPC 870/875 for Supplier B:

Electrical Characterization	
Lot /	Units
Lot 1	0/ 10
Comments	

Copper Wire Qualification Data Summary – KLM Assembly Site Reliability Data is from Qualification Vehicle MPC875

Moisture Sensitivity Level Characterization

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/10
MXDD872861	ZLMHA1CDTV00	0/10
MXDD875151	ZLMHA1CDU000	0/10
Totals		0/30

Substrate Supplier V

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/10
MXDD872861	ZLMHA1CDTU00	0/10
MXDD875151	ZLMHA1CDUY00	0/10
Totals		0/30

Device No./Rev.: MPC 880/885 , MPC 870/875		Report Rev.: F
Description: PowerQUICC MPC880/885, MPC870/875		Revision date: 12/06/11
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Temperature Cycle / -55°C to 125°C Air to Air with Preconditioning @ MSL3 / 245°C IR Reflow

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size	400 Cycles Fail/Sample Size	700 Cycles Fail/Sample Size	1000 Cycles Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/80	0/80	0/80	0/80
MXDD872861	ZLMHA1CDTV00	0/80	0/80	0/80	0/80
MXDD875151	ZLMHA1CDU000	0/80	0/80	0/80	0/80
Totals		0/240	0/240	0/240	0/240

Substrate Supplier V

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size	400 Cycles Fail/Sample Size	700 Cycles Fail/Sample Size	1000 Cycles Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/80	0/80	0/80	0/80
MXDD872861	ZLMHA1CDTU00	0/80	0/80	0/80	0/80
MXDD875151	ZLMHA1CDUY00	0/80	0/80	0/80	0/80
Totals		0/240	0/240	0/240	0/240

Unbiased HAST / 130°C, 85% RH, 33 psig

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/260°C Fail/Sample Size	96 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/80	0/80
MXDD872861	ZLMHA1CDTV00	0/80	0/80
MXDD875151	ZLMHA1CDU000	0/80	0/80
Totals		0/240	0/240

Substrate Supplier V

Wafer Lot	Assy Lot	MSL3/260°C Fail/Sample Size	96 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/80	0/80
MXDD872861	ZLMHA1CDTU00	0/80	0/80
MXDD875151	ZLMHA1CDUY00	0/80	0/80
Totals		0/240	0/240

High Temperature Bake / 150°C

Substrate Supplier B

Wafer Lot	Assy Lot	504 Hours Fail/Sample Size	1008 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/80	0/80
MXDD872861	ZLMHA1CDTV00	0/80	0/80
MXDD875151	ZLMHA1CDU000	0/80	0/80
Totals		0/240	0/240



Substrate Supplier V

Wafer Lot	Assy Lot	504 Hours Fail/Sample Size	1008 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/80	0/80
MXDD872861	ZLMHA1CDTU00	0/80	0/80
MXDD875151	ZLMHA1CDUY00	0/80	0/80
Totals		0/80	0/80

High Temperature Operating Life Test (HTOL)

HTOL conditions: Ta=125°C, Vd1 = 2.3v, Vd2 = 2.3V

Wafer Lot	Assy Lot	84 hours (5 yrs) Fail/Sample Size	168 hours (10 yrs) Fail/Sample Size
MXDD926241	ZLMHA1G1QM01	0/80	0/80
MXDD926231	ZLMHA1FZJR01	0/80	0/80
MXDD928351	ZLMHA1FYD102	0/80	0/80
Totals		0/240	0/240

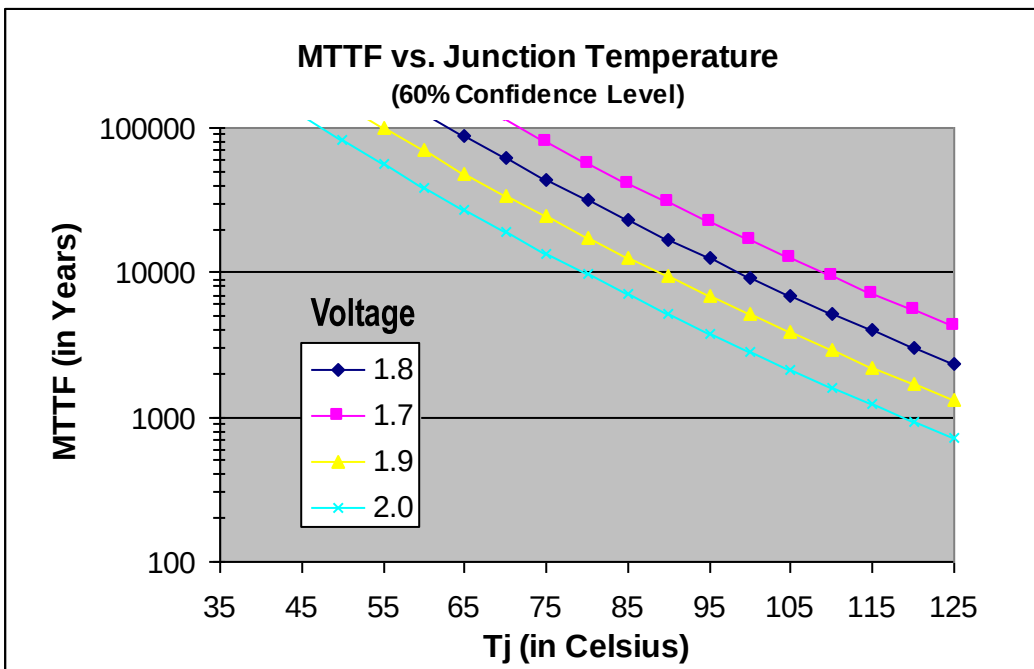
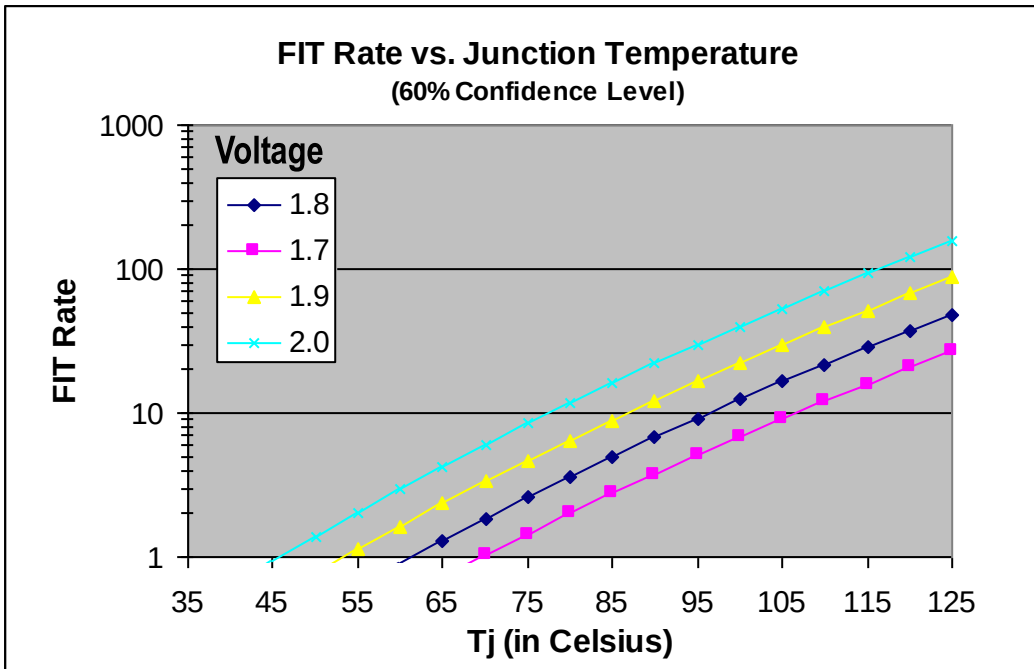
Temperature Humidity Bias from MPC859 (25x25mm 357 PBGA):

Temperature Humidity Bias / 85°C, 85%R.H., x.xV, with Preconditioning @ MSL3 / 245°C IR Reflow

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size	504 Hours Fail/Sample Size	1008 Hours Fail/Sample Size
MXDD881221	ZLMHA1DPTE06	0/77	0/77	0/77
MXDD896271	ZLMHA1DZ6001	0/77	0/77	0/77
MXDD893311	ZLMHA1DZ5Z01	0/77	0/77	0/77
Totals		0/231	0/231	0/231

MPC880/885, MPC870/875 Product FIT Rate and MTTF Derated Curves:





Revision History:

Revision History			
Revision	Date	Comment	Author
Original	10/17/03	Original Rev 0 Qualification Report.	Aaron Chapa
Rev A	8/31/06	Supplier B added	Dipak Gandhi
Rev B	10/06/06	MPC565 Supplier A data added	Dipak Gandhi
Rev C	5/15/07	Listed part numbers.	Dipak Gandhi
Rev D	6/22/07	Updated title and part list	Dipak Gandhi
Rev E	6/25/07	Update for reflow clarification	Dipak Gandhi
Rev F	12/06/11	Added Cu wirebond data	Dean Dreier

Device No./Rev.: MPC 880/885 , MPC 870/875		Report Rev.: F
Description: PowerQUICC MPC880/885, MPC870/875		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357 and 256 PBGA	Page 11 of 11



MPC866/859/852T Product Family
ATMC
(MOS 13) HiP6W
Rev. A
Qualification Report
PowerQUICC Communications Processor

MPC866TZP
MPC866TCZP
MPC866PZP
MPC866PCZP
MPC859TZP
MPC859TCZP
MPC859DSLZP
MPC859DSDLZP
MPC859PZP
MPC859PCZP
MPC852TVR
MPC852TCVR
MPC852TZT
MPC852TCZT

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DSDLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
Description: PowerQUICC Rev A		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 1 of 16



PART ID for Green Substrates
MPC852TCVR100A
MPC852TCVR50A
MPC852TCVR66A
MPC852TCVR80A
MPC852TVR100A
MPC852TVR50
MPC852TVR50A
MPC852TVR66
MPC852TVR66A
MPC852TVR80A
MPC853TVR100A
MPC853TVR66A
MPC859DSLVCVR50A
MPC859DSLVCVR66A
MPC859DSLVR50A
MPC859DSLVR66A
MPC859PCVR100A
MPC859PVR100A
MPC859PVR133A
MPC859TCVR100A
MPC859TVR100A
MPC859TVR133A
MPC866PCVR100A
MPC866PVR100A
MPC866PVR133A
MPC866TCVR100A
MPC866TVR100A
MPC866TVR133A

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DLCZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
Description: PowerQUICC Rev A		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 2 of 16



MPC866/859/852T Product Family Information:

Product / Technology / Fab / Package Description	
Device	MPC866TZP MPC866TCZP MPC866PZP MPC866PCZP MPC859TZP MPC859TCZP MPC859DSLZP MPC859DSLCZP MPC859PZP MPC859PCZP MPC852TVR MPC852TCVR MPC852TZT MPC852TCZT
Package	MPC866 - 357 Lead PBGA (ZP) MPC852T – 256 Lead PBGA (VR)
Mask Set	L96R
Die Size	5.128 x 5.422 mm (27.80mm ²)
Die Coating	Polyimide - Hitachi S200
Name/Location of Wafer Fab Facility	ATMC(MOS 13) / Austin, Texas
Wafer Fab Process Technology	HiP6W - 0.18μm, 35Å/70 Å DGO
Poly / Metal layers	Single Level Poly, Triple Level Metal
Assembly Location	Freescale, KLM
Mold compound / Mfg. Supplier	Bi-phenyl mold compound
Die Attach Material	Conductive
Wire Material	Au
Moisture Sensitivity Level	MSL 3 – 245°C and MSL 3 - 260°C
Lead Frame / Substrate Supplier	Suppliers A and B, Green suppliers A and B

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DSLCZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
Description: PowerQUICC Rev A		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 3 of 16



Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DSDLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
Description: PowerQIICC Rev A		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 4 of 16



MPC866/859/852T Product Reliability Data Summary:

Early Life Failure Rate (ELFR) – Vd1 2.5v, Vd2 2.5v, Ta 125°C

Lot / Mask Set / Rev	1 Year (7h) <1000 PPM Criteria	2.5 Years (18h) For info only	10 Years (72h) For info only	20 Years (144h) For info only
D49055 / L90H / Rev 0	0 / 1000	0 / 996	0 / 993	0 / 992
D54660 / L90H / Rev 0.3	0 / 992	1 / 991	0 / 986	0 / 981
D54905 / L90H / Rev 0.3	0 / 1003	0 / 1002	0 / 1002	0 / 999
Totals	0 / 2995 306 PPM @ 60% C.L.	1 / 2989	0 / 2981	0 / 2972
Failure Comments		Functional-passivation integrity failure.		

High Temperature Operating Life Test (HTOL) – Vd1 2.5v, Vd2 2.5v, Ta 125°C

Lot / Mask Set / Rev	1 Year (7h) For info only	2.5 Years (18h) For info only	10 Years (72h) <200 FITs	20 Years (144h) For info only
D64512 / L96R / Rev A	0 / 240	0 / 240	0 / 240	---
D49055 / L90H / Rev 0	0 / 77	0 / 77	0 / 77	0 / 77
D54660 / L90H / Rev 0.3	0 / 77	0 / 77	0 / 77	0 / 77
D54905 / L90H / Rev 0.3	0 / 77	0 / 77	0 / 77	0 / 77
Totals	0 / 471	0 / 471	0 / 471 3 FITs @ Ta 55°C, 60% C.L.	0 / 231

High Temperature Operating Life Test (HTOL) Drift Analysis – Vd1 2.5v, Vd2 2.5v, Ta 125°C

Lot / Mask Set / Rev	10 Years (72h)
D54660 / L90H / Rev 0.3	0 / 5
D54905 / L90H / Rev 0.3	0 / 5
Totals	0 / 10

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DZLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
Description: PowerQUICC Rev A		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 5 of 16



MPC866/859/852T Product Reliability Data Summary (cont.):

Electrical Characterization –45°C, 25°C and 105°C

Lot / Mask Set / Rev	10 Years (72h)
D64512 / L96R / Rev A	0 / 5
D54660 / L90H / Rev 0.3	0 / 5
D54905 / L90H / Rev 0.3	0 / 5
Totals	0 / 15

Electrostatic Discharge and Latch-up Test

Lot / Mask Set / Rev	HBM / 2KV	MM / 200V	CDM / 500V – No Skt	Latch-up / 200mA
D64512 / L96R / Rev A	0 / 3	0 / 3	0 / 3	0 / 6
MPC866 - 357 PBGA D54905 / L90H / Rev 0.3	0 / 3	0 / 3	0 / 3	0 / 6
MPC852 - 256 PBGA D54660 / L90H / Rev 0.3	0 / 3	0 / 3	0 / 3	0 / 6
Totals	0 / 9	0 / 9	0 / 9	0 / 18

Moisture Sensitivity Level Characterization

Test Vehicle: 357 lead PBGA with MPC860P Product

Assy Site / Substrate Supplier / Lots	MSL3 / 245°C	MSL3 / 260°C
KLM / Substrate Supplier A / 3 assy lots	0 / 72	0 / 72
KLM / Substrate Supplier B / 3 assy lots	0 / 66	0 / 66
Totals	0 / 138	0 / 138

Autoclave / 121°C, 100% RH, 15 PSIG with Preconditioning @ MSL3 / 245°C IR Reflow

Test Vehicle: 357 lead PBGA with MPC860P Product

Assy Site / Substr. Supplier / Lots	48 Hours	96 Hours	144 Hours
KLM / Substr. Supplier A / 3 assy lots	0 / 246	0 / 246	0 / 246
Totals	0 / 246	0 / 246	0 / 246

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DCLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
Description: PowerQUICC Rev A		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 6 of 16



MPC866/859/852T Product Reliability Data Summary (cont.):

Temperature Cycle / -65°C to 150°C Air to Air with Preconditioning @ MSL3 / 245°C IR Reflow
Test Vehicle: 357 lead PBGA with MPC860P Product

Assy Site / Substrate Supplier / Lots	200 Cycles	500 Cycles
KLM / Substr. Supplier A / 3 assy lots	0 / 486*	0 / 486*
KLM / Substr. Supplier B / 3 assy lots	0 / 240	0 / 240
Totals	0 / 726	0 / 726

* Actual MPC866/852T product included in results 3 lots x 80 units, 240 units total.

Temperature Cycle / -65°C to 150°C Air to Air with Preconditioning @ MSL3 / 260°C IR Reflow
Test Vehicle: 357 lead PBGA with MPC860P Product

Assy Site / Substrate Supplier / Lots	200 Cycles	500 Cycles
KLM / Substr. Supplier A / 3 assy lots	0 / 246	0 / 246
KLM / Substr. Supplier B / 3 assy lots	0 / 240	0 / 240
Totals	0 / 486	0 / 486

Temperature Humidity Bias / 85°C, 85%R.H., Nominal Bias with Preconditioning @ MSL3 / 245°C IR Reflow
Test Vehicle: 357 lead PBGA with MPC860P Product

Assy Site / Substr. Supplier / Lots	504 Hours	1008 Hours
KLM / Substr. Supplier A / 3 assy lots	0 / 219	0 / 217
Totals	0 / 219	0 / 217

Temperature Humidity / 85°C, 85%R.H. with Preconditioning @ MSL3 / 260°C IR Reflow
Test Vehicle: 357 lead PBGA with MPC860P Product

Assy Site / Substr. Supplier / Lots	504 Hours	1008 Hours
KLM / Substr. Supplier A / 3 assy lots	0 / 240	0 / 240
KLM / Substr. Supplier B / 3 assy lots	0 / 240	0 / 240
Totals	0 / 480	0 / 480

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DZLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 7 of 16



MPC866/859/852T Product Reliability Data Summary (cont.):

High Temperature Bake (HTB) 150°C
Test Vehicle: 357 lead PBGA with MPC860P Product

Assy Site / Substr. Supplier / Lots	504 Hours	1008 Hours
KLM / Substr. Supplier A / 3 assay lots	0 / 240	0 / 240
KLM / Substr. Supplier B / 3 assay lots	0 / 240	0 / 240
Totals	0 / 480	0 / 480

Test Vehicle: MPC880/885 Product Reliability Data Summary for Green Supplier A:

Electrical Characterization	
Lot /	Units
Lot 1	0 / 10
Comments	

Moisture Sensitivity Level Characterization

Assy Site / Substrate Supplier / Lots	MSL3 / 245°C	MSL3 / 260°C
KLM / Substrate Supplier A / 3 assay lots	0 / 66	---
Totals	0 / 66	---

Temperature Cycle / -65°C to 150°C Air to Air with Preconditioning @ MSL3 / 245°C IR Reflow

Assy Site / Substrate Supplier / Lots	200 Cycles	500 Cycles
KLM / Substrate Supplier A / 3 assay lots	0 / 236	0 / 236
Totals	0 / 236	0 / 236

Temperature Humidity / 85°C, 85%R.H. with Preconditioning @ MSL3 / 245°C IR Reflow

Assy Site / Substrate Supplier / Lots	504 Hours	1008 Hours
KLM / Substrate Supplier A / 3 assay lots	0 / 238	---
Totals	0 / 238	---

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DSLZCP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
Description: PowerQUICC Rev A		Revision date: 12/06/11
Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 8 of 16



Test Vehicle: MPC565 Product Reliability Data Summary for Green Supplier A:

Electrical Characterization	
Lot /	Units
Lot 1,2,3	0/ 15
Comments	

High Temperature Bake without Preconditioning			
Lot		504 Hours	1008 Hours
Lot 1		0/ 45	0/ 45

Temperature Cycle / -65° C - 150° C Air to Air with Preconditioning @MSL3/ 260° C			
Lot	MSL3 260°C	500 Cycles	1000 Cycles
Lot 1	0/ 77	0/ 77	0/ 77
Lot 2	0/ 77	0/ 77	0/ 77
Lot 3	0/ 77	0/ 77	0/ 77
Total	0/ 231	0/ 231	0/ 231
Comments			

Autoclave / 121°C, 100% RH, 15 PSIG with Preconditioning @ MSL3 / 260°C	
Assy Site / Substr. Supplier / Lots	96 Hours
Lot 1, 2, 3 (77 units each)	0 / 231
Totals	0 / 231

Temperature Humidity Bias / 85° C, 85%R.H. 2.6V, with Preconditioning @MSL3 / 260° C			
Lot		504 Hours	1008 Hours
Lot 1		0/ 80	0/ 80
Lot 2		2/ 80*	0/ 78
Lot 3		0/ 80	0/ 80
Totals		0/ 240	0/ 238
Comments		*2 THB fails at 504 hours, FA and 8D report done	

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DLCZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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Technology: ATMC HiP6W	Package: 357,256 lead PBGA	Page 9 of 16



Electrical CZ Data for 357 Tantra MPC 859/866 for Green Supplier A:

Electrical Characterization	
Lot /	Units
Lot 1	0/ 10
Comments	

Electrical CZ Data for 256 LC Tantra MPC 852 for Green Supplier A:

Electrical Characterization	
Lot /	Units
Lot 1	0/ 10
Comments	

Test Vehicle: Package Reliability Data for 357 Duet MPC 885 for Green Supplier B:

Electrical Characterization	
Lot /	Units
Lot 1	0/ 10
Comments	

Moisture Sensitivity Level Preconditioning Characterization/ MSL3/260° C	
Lot	Units
Lot 1	0/ 22
Lot 2	0/ 22
Lot 3	0/ 22
Total	0/ 66
Comments	

Temperature Cycle / -65° C - 150° C Air to Air with Preconditioning @MSL3/ 260° C			
Lot	MSL3 260°C	500 Cycles	1000 Cycles
Lot 1	0/ 80	0/ 80	0/ 80
Lot 2	0/ 80	0/ 80	0/ 80
Lot 3	0/ 80	0/ 80	0/ 80
Total	0/ 240	0/ 240	0/ 240
Comments			

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DLCZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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Temperature Humidity / 85° C, 85%R.H., with Preconditioning @MSL3 / 260° C			
Lot		504 Hours	1008 Hours
Lot 1		0/ 80	0/ 80
Lot 2		0/ 80	0/ 80
Lot 3		0/ 80	0/ 80
Totals		0/ 240	0/ 240
Comments			

High Temperature Bake without Preconditioning			
Lot		504 Hours	1008 Hours
Lot 1		0/ 80	0/ 79*
Lot 2		0/ 80	0/ 80
Lot 3		0/ 80	0/ 80
Totals		0/ 240	0/ 239
Comments			*mechanical damaged ball caused by handling

Electrical CZ Data for 357 Tantra MPC 859/866 for Green Supplier B:

Electrical Characterization	
Lot /	Units
Lot 1	0/ 10
Comments	

Electrical CZ Data for 256 LC Tantra MPC 852 for Green Supplier B:

Electrical Characterization	
Lot /	Units
Lot 1	0/ 10
Comments	

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DSDLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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Copper Wire Qualification Data Summary – KLM Assembly Site

Reliability Data is from Qualification Vehicle MPC859

Temperature Humidity Bias / 85°C, 85%R.H., x.xV, with Preconditioning @ MSL3 / 245°C IR Reflow

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size	504 Hours Fail/Sample Size	1008 Hours Fail/Sample Size
MXDD881221	ZLMHA1DPTE06	0/77	0/77	0/77
MXDD896271	ZLMHA1DZ6001	0/77	0/77	0/77
MXDD893311	ZLMHA1DZ5Z01	0/77	0/77	0/77
Totals		0/231	0/231	0/231

High Temperature Bake / 150°C

Substrate Supplier B

Wafer Lot	Assy Lot	504 Hours Fail/Sample Size	1008 Hours Fail/Sample Size
MXDD867521	ZLMHA1CUYA00	0/80	0/80
Totals		0/80	0/80

Moisture Sensitivity Level CZ, Temperature Cycle, uHAST, High Temperature Bake and HTOL from MPC875 (23x23mm 256 PBGA):

Moisture Sensitivity Level Characterization

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/10
MXDD872861	ZLMHA1CDTV00	0/10
MXDD875151	ZLMHA1CDU000	0/10
Totals		0/30

Substrate Supplier V

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/10
MXDD872861	ZLMHA1CDTU00	0/10
MXDD875151	ZLMHA1CDUY00	0/10
Totals		0/30

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DZSLCZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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Temperature Cycle / -55°C to 125°C Air to Air with Preconditioning @ MSL3 / 245°C IR Reflow

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size	400 Cycles Fail/Sample Size	700 Cycles Fail/Sample Size	1000 Cycles Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/80	0/80	0/80	0/80
MXDD872861	ZLMHA1CDTV00	0/80	0/80	0/80	0/80
MXDD875151	ZLMHA1CDU000	0/80	0/80	0/80	0/80
Totals		0/240	0/240	0/240	0/240

Substrate Supplier V

Wafer Lot	Assy Lot	MSL3/245°C Fail/Sample Size	400 Cycles Fail/Sample Size	700 Cycles Fail/Sample Size	1000 Cycles Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/80	0/80	0/80	0/80
MXDD872861	ZLMHA1CDTU00	0/80	0/80	0/80	0/80
MXDD875151	ZLMHA1CDUY00	0/80	0/80	0/80	0/80
Totals		0/240	0/240	0/240	0/240

Unbiased HAST / 130°C, 85% RH, 33 psig

Substrate Supplier B

Wafer Lot	Assy Lot	MSL3/260°C Fail/Sample Size	96 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/80	0/80
MXDD872861	ZLMHA1CDTV00	0/80	0/80
MXDD875151	ZLMHA1CDU000	0/80	0/80
Totals		0/240	0/240

Substrate Supplier V

Wafer Lot	Assy Lot	MSL3/260°C Fail/Sample Size	96 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/80	0/80
MXDD872861	ZLMHA1CDTU00	0/80	0/80
MXDD875151	ZLMHA1CDUY00	0/80	0/80
Totals		0/240	0/240

High Temperature Bake / 150°C

Substrate Supplier B

Wafer Lot	Assy Lot	504 Hours Fail/Sample Size	1008 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTT00	0/80	0/80
MXDD872861	ZLMHA1CDTV00	0/80	0/80
MXDD875151	ZLMHA1CDU000	0/80	0/80
Totals		0/240	0/240

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DLCZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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Substrate Supplier V

Wafer Lot	Assy Lot	504 Hours Fail/Sample Size	1008 Hours Fail/Sample Size
MXDD867521	ZLMHA1CDTQ00	0/80	0/80
MXDD872861	ZLMHA1CDTU00	0/80	0/80
MXDD875151	ZLMHA1CDUY00	0/80	0/80
Totals		0/80	0/80

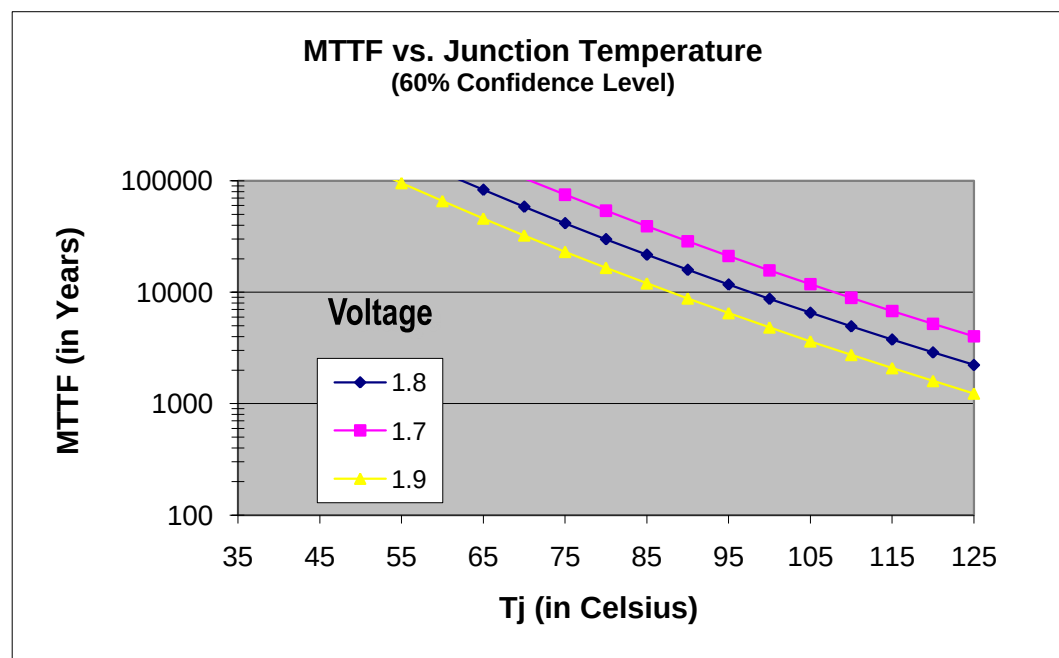
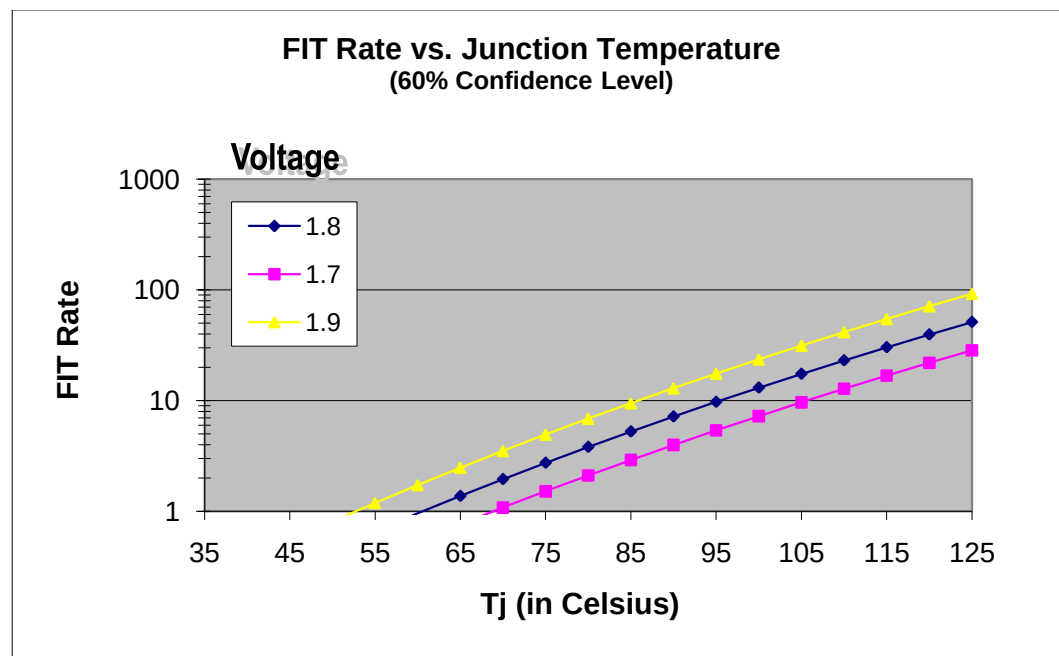
High Temperature Operating Life Test (HTOL)

HTOL conditions: Ta=125°C, Vd1 = 2.3v, Vd2 = 2.3V

Wafer Lot	Assy Lot	84 hours (5 yrs) Fail/Sample Size	168 hours (10 yrs) Fail/Sample Size
MXDD926241	ZLMHA1G1QM01	0/80	0/80
MXDD926231	ZLMHA1FZJR01	0/80	0/80
MXDD928351	ZLMHA1FYD102	0/80	0/80
Totals		0/240	0/240

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DSDLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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MPC866/859/852T Product FIT Rate and MTTF Derated Curves:





Revision History:

Revision History			
Revision	Date	Comment	Author
Original	12/13/02	Original Rev 0.3 Qualification Report.	Aaron Chapa
A	6/25/03	Updated qual results. Added new part numbers.	Aaron Chapa
B	10/17/03	Corrected total quantities.	Aaron Chapa
C	6/14/04	Added MPC853 part numbers.	Aaron Chapa
D	7/2/04	Corrected mask to L96R from L90H.	Aaron Chapa
E	9/8/04	Removed 2.0v from FIT rate and MTTF tables.	Aaron Chapa
F	10/26/04	Removed MPC853 part numbers.	Aaron Chapa
G	09/07/06	Tantra, LC Tantra Green suppliers A & B data added	Dipak Gandhi
H	12/06/11	Added Cu wirebond data	Dean Dreier

Device No./Rev.: MPC866TZP, MPC866TCZP, MPC866PZP, MPC866PCZP, MPC859TZP, MPC859TCZP, MPC859DSLZP, MPC859DSDLZP, MPC859PZP, MPC859PCZP, MPC852TVR, MPC852TCVR, MPC852TZT, MPC852TCZT / Rev.A		Report Rev.: H
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