



MC7448 Microprocessor ATMC CMOS90SOI (HiP8SOI) Qualification Report

Device No./Rev.: MC7448 Rev. 2.1	Report Rev.: 1
Description: 7448 (VU) Pb-free RoHS 7448 (VS) LGA RoHS 7448 (HX) Leaded BGA	Revision date: 11-Jan-06
Technology: ATMC HiP8SOI	Package: 360 HiCTE
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MC7448 Product Information:

Product / Technology / Wafer Fab / Package Description	
Package	MC7448: 360 HCTE, 25 mm (VU), with lead free solder spheres (SnAgCu) - RoHS MC7448: 360 HCTE, 25 mm (VS), with land grid array (LGA) - RoHS MC7448: 360 HCTE, 25 mm (HX), with lead bearing solder spheres - (SnPbAg)
Device	7448
Mask Set	Z21 / m00a
Die Coating	Yes
Name/Location of Die Fab Facility	AMTC / Austin TX
Process Technology	CMOS90SOI (HiP8SOI)
Poly / Metal layers	1P / 9M
Assembly Location	Freescale - KLM / Kuala Lumpur, Malaysia
Underfill Material	UL94SPEC Compliant
Bump Location	Research Triangle Park, NC
Bump Material / Diameter	Lead Bearing: 5Sn/95Pb / 120µm
Moisture Sensitivity Level	MSL1 @ 260degC

MC7448 Product Specification (ROHS Compliant LGA - VS):

Spec	Application Tier	Nom Vdd	Tj max	Speed (MHz)	Package	Part Number
L	Industrial	1.15V	105C	1000	360 HTCE LGA	MC7448VS1000LC
		1.2V	105C	1420	360 HTCE LGA	MC7448VS1420LC
		1.25V	105C	1600	360 HTCE LGA	MC7448VS1600LC
		1.3V	105C	1700	360 HTCE LGA	MC7448VS1700LC
N	Industrial	1.0V	105C	600/667/867/1000	360 HTCE LGA	MC7448VS600NC/667/867/1000
		1.1V	105C	1250/1400	360 HTCE LGA	MC7448VS1250NC/1400

MC7448 Product Specification (Leaded BGA - HX):

Spec	Application Tier	Nom Vdd	Tj max	Speed (MHz)	Package	Part Number
L	Industrial	1.15V	105C	1000	360 HTCE BGA	MC7448HX1000LC
		1.2V	105C	1420	360 HTCE BGA	MC7448HX1420LC
		1.25V	105C	1600	360 HTCE BGA	MC7448HX1600LC
		1.3V	105C	1700	360 HTCE BGA	MC7448HX1700LC
N	Industrial	1.0V	105C	600/667/867/1000	360 HTCE BGA	MC7448HX600NC/667/867/1000
		1.1V	105C	1250/1400	360 HTCE BGA	MC7448HX1250NC/1400

MC7448 Product Specification (RoHS Compliant Pb Free - VU):

Spec	Application Tier	Nom Vdd	Tj max	Speed (MHz)	Package	Part Number
L	Industrial	1.15V	105C	1000	360 HTCE Pb free	MC7448VU1000LC
		1.2V	105C	1420	360 HTCE Pb free	MC7448VU1420LC
		1.25V	105C	1600	360 HTCE Pb free	MC7448VU1600LC
		1.3V	105C	1700	360 HTCE Pb free	MC7448VU1700LC
N	Industrial	1.0V	105C	600/667/867/1000	360 HTCE Pb free	MC7448VU600NC/667/867/1000
		1.1V	105C	1250/1400	360 HTCE Pb free	MC7448VU1250NC/1400

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Product Reliability Data Summary:

HTOL - MC7448 1.60V, 130C Tj						
Lot / Mask Set	130 Hours (10 yr N-spec)	512 Hours	750 Hours	1008 Hours (10 yr L-spec)		
D95553/ Rev 2.0	0 / 109	0 / 81	---	0 / 78		
D95554/ Rev 2.0	0 / 102	0 / 136	---	2 / 131 (c,d)		
D95556/ Rev 2.0	2 / 186 (a,b)	0 / 155	---	0 / 150		
D97869/ Rev 2.1	0 / 234	0 / 228	0 / 228	0 / 223		
Totals	2 / 631	0 / 372	0 / 228	2 / 582		
Failure Comments	(a) L2 Cache single bit – NFET gate/drain short pass gate - no visible defect (b) Vmin shift - partial bake recovery. Unit did not shift into L-spec operating range. (c) functional fails L2V pattern across temp. In analysis. (d) fail for BIST and bitshmo0 at hot: passes to 1.175V at cold. In analysis					

ESD / Latch-up					
Lot / Mask Set	Human Body Model	Machine Model	Charged Device Model	Latch-up / 200mA	
D98769	0 / 5 @ 2KV	0 / 5 @ 200V	0 / 5 @ 500V	0 / 5	
Totals	0 / 5	0 / 5	0 / 5	0 / 5	
Failure Comments					

HTCE Environmental Reliability Data

Moisture Sensitivity Level Characterization				
Lot		MSL1 @ 260degC		
D95131		0/449		
D95132		0/37		
D95133		0/427		
D93648		0/292		
Totals		0/1205		
Failure Comments				

Temperature Cycle / -55°C +125°C Air-to-Air, with MSL1 @ 260degC Preconditioning				
Lot	500 Cycles	1000 Cycles		
D95131	0 / 117	0 / 117		
D95132	0 / 37	0 / 37		
D95133	0 / 91	0 / 91		
Totals	0 / 245	0 / 245		
Failure Comments				

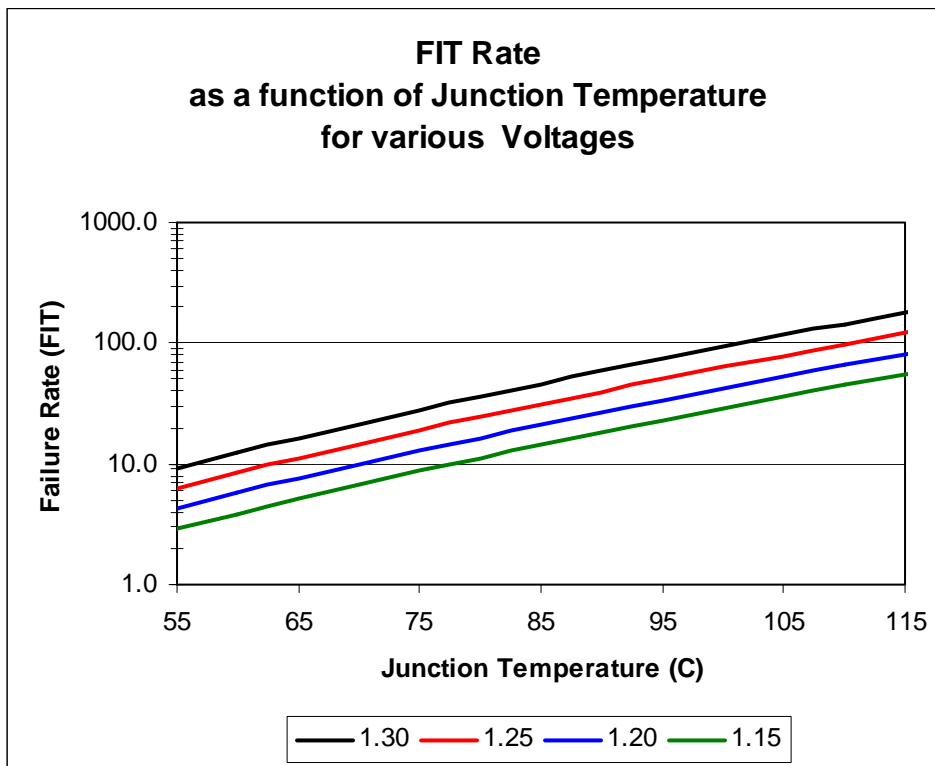
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Thermal Shock / -55°C +125°C Liquid-to-Liquid, with MSL1 @ 260degC Preconditioning					
Lot	100 Cycles	500 Cycles	1000 Cycles		
D95131	0 / 80	0 / 80	0 / 80		
D95133	0 / 80	0 / 80	0 / 80		
D93648	0 / 80	0 / 80	0 / 80		
Totals	0 / 240	0 / 240	0 / 240		
Failure Comments					

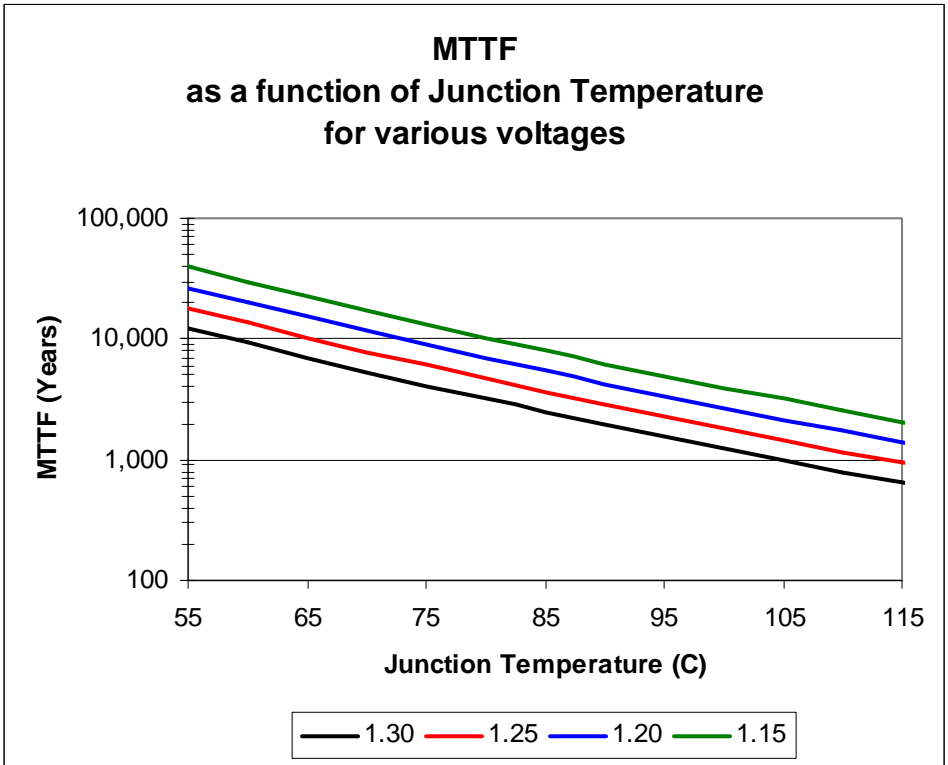
HAST / with MSL1 @ 260degC Preconditioning					
Lot	96 hrs				
D95131	0 / 77				
D95133	0 / 81				
D93648	0 / 82				
Totals	0 / 240				
Failure Comments					

MC7448 FIT Rate and MTTF Derated 60% C.L. Curves.

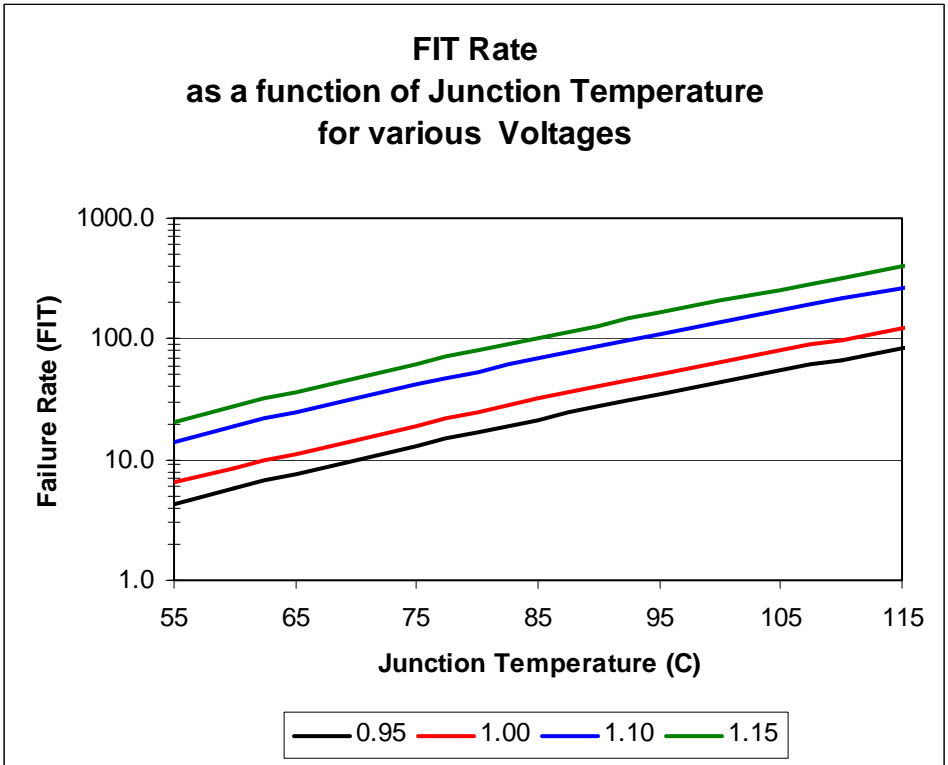
Industrial Tier L-spec: 1.3V, 105degC Tj, 10 Year Operation, eA = 0.7 eV



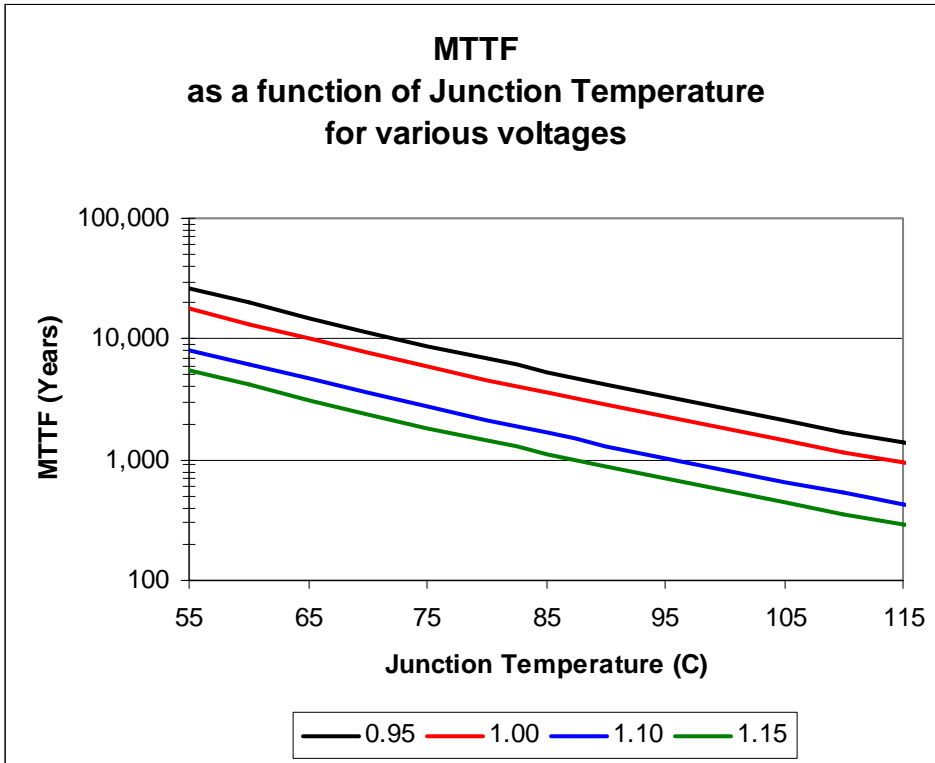
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Industrial Tier N-spec: 1.1V, 105degC Tj, 10 Year Operation, eA = 0.7 eV



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Revision History:

Revision History			
Revision	Date*	Comment	Author
0	16-Nov-05	Initial Release – Industrial Qual N-spec / L-spec (MC7448)	Keith Minwell
1	11-Jan-06	Rev 2.1 – 1008hr HTOL read point	Keith Minwell