



XPC7445/7455 Microprocessor
MOS-13 HiP6SOI Node 5
Rev 3.4
Qualification Report

Device No./Rev.: XPC7445/7455, Rev 3.4		Report Rev.: 0
Description: XPC7445/7455		Revision date: 6/27/03
Technology: MOS13 HiP6SOI Node 5	Package: 360CBGA / 484CBGA	Page 1 of 9


XPC7445/7455 Product Information:

Product / Technology / Fab / Package Description	
Package	XPC7445: 360 CBGA (RX), 25 x 25 mm XPC7455: 484 CBGA (RX), 29 x 29 mm
Device	XPC7445/7455
Mask Set	5L64M
Die Size	8.69 x 12.17 mm
Die Coating	5878 HD Microelectronics
Name/Location of Die Fab Facility	MOS-13 / Austin TX
Process Technology	0.18um HiP6SOI Node 5
Poly / Metal layers	1P / 6M
Assembly Location	Motorola, KLM / Kuala Lumpur, Malaysia and Oak Hill NPI / Austin TX
Die Attach Material	Alpha Metals 9154Q
Bump Material / Diameter	97% Pb, 3% Sn / 4.0 mils
Moisture Sensitivity Level	MSL1
Substrate Supplier	NTK

XPC7445/7455 Node 5 Product Reliability Data Summary:

ELFR / 1.85V, 90°C						
Lot / Mask Set	1 Hour	3 Hours	6 Hours	12 Hours	24 Hours	48 Hours
D51410.88A / 1L96C / Rev 2.1					0 ⁽¹⁾ / 106	0 / 104
D51411.92R / 1L96C / Rev 2.1					0 / 104	0 / 104
D51417 / 1L96C / Rev 2.1	0 / 105	0 / 89	0 / 85		0 / 79	0 / 78
D54056.94H / 0L64M / Rev 3.0			0 / 64		0 / 64	0 / 48
D54076 / 1L64M / Rev 3.1	0 / 450	0 / 393	0 / 349	0 / 294	1 ⁽²⁾ / 251	0 / 238
D54961.93N / 2L64M / Rev 3.2			0 / 91		0 / 36	0 / 34
D51700 / 2L64M / Rev 3.2	0 / 231	0 / 199	0 / 194	0 / 169	0 / 154	
D54961.92J / 2L64M / Rev 3.2	0 / 366	0 / 306	0 / 240	0 ⁽¹⁾ / 611	0 / 539	
D54961.94W / 2L64M / Rev 3.2	0 / 500	0 / 480	0 / 461	(Combined with D54961.92J)		
D54961.91C / 2L64M / Rev 3.2	0 / 500	0 / 465	0 / 446	0 / 435	0 / 412	
D569752 / 3L64M / Rev 3.3	0 / 530				0 / 529	0 / 472
D56982 / 3L64M / Rev 3.3					0 / 112	
D64422 / 5L64M / Rev 3.4	0 / 299					
Totals	0 / 2981	0 / 1932	0 / 1930	0 / 1509	1 / 2386	0 / 1078
Failure Comments				⁽¹⁾ 1 - Mech. Damage	⁽¹⁾ 1 - Mech. Damage ⁽²⁾ 1 - Leakage Hi Z; no defect found	

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HTOL / 1.85V, 90°C					
Lot / Mask Set	91 Hours	144 Hours	288 Hours ⁽¹⁾	912 Hours ^(**)	1008 Hours
D51410.88A / 1L96C / Rev 2.1		0 ⁽¹⁾ / 104	0 / 103	0 / 103	0 / 90
D51411.92R / 1L96C / Rev 2.1		0 / 104	0 / 104	0 / 104	0 / 102
D51417 / 1L96C / Rev 2.1		0 / 78	0 / 76		
D54056.94H / 0L64M / Rev 3.0		0 / 47			
D54076 / 1L64M / Rev 3.1		1 ⁽²⁾ / 229	0 / 212		
D56982 / 3L64M / Rev 3.3		1 ⁽³⁾ / 110	0 / 107	1 ⁽¹⁾ / 106	
D64422 / 5L64M / Rev 3.4	0 / 144				
Totals	0 / 144	2 / 672	0 / 602	1 / 313	0 / 192
Failure Comments		(1) 1 - EOS (2) 1- ABIST; no defect found (3) 1- BIST - needs bitmap		(1) 1- SYSCCLK input leakage - pending evaluation/FA	

Note: ⁽¹⁾ Commercial-tier qualification readpoint based on 5 years operation at 1.55V and 65°C Tj.

^(**) Industrial-tier qualification readpoint based on 10 years operation at 1.3V at 105°C Tj. The 91 hour readpoint represents

1 year usage in 1.3V, 105°C Tj operation.

ESD / Latch-up					
Lot / Mask Set	HBM	MM	CDM (No Skt)	Latch-up	
D53872 / 0L64M / Rev 3.0	0 / 3 @ 2KV	0 / 3 @ 200V	3 / 3 @ 500V		
D54084 / 2L64M / Rev 3.2				0 / 6 @ 200mA	
D56982 / 3L64M / Rev 3.3	0 / 3 @ 2KV	0 / 3 @ 200V	3 / 3 @ 500V	0 / 9 @ 200mA	
D56982 / 3L64M / Rev 3.3			0 / 3 @ 250V		
D64422 / 5L64M / Rev 3.4	0 / 3 @ 2KV	0 / 3 @ 200V	3 / 3 @ 500V	0 / 4 @ 200mA	
Failure Comments					

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HiP6SOI Node 5	484CBGA		


484 CBGA Package Reliability Data (by similarity):

Moisture Sensitivity Level Characterization				
Lot / Mask Set	MSL1			
D34398 / 3K51S (XPC7450RX)	0 / 77			
D34417 / 3K51S (XPC7450RX)	0 / 77			
D34608 / 3K51S (XPC7450RX)	0 / 77			
Totals	0 / 231			
Failure Comments				

Temperature Cycle / -55°C +125°C Air-to-Air, with MSL1 Preconditioning				
Lot / Mask Set	100 Cycles	500 Cycles	1000 Cycles	
D34398 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 77	
D34417 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 77	
D34608 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 77	
Totals	0 / 231	0 / 231	0 / 231	
Failure Comments				

Thermal Shock / -55°C +125°C Liquid-to-Liquid, with MSL1 Preconditioning				
Lot / Mask Set	100 Cycles	500 Cycles	1000 Cycles	
D34398 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 72	
D34417 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 76	
D34608 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 72	
Totals	0 / 231	0 / 231	0 / 220	
Failure Comments				

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Autoclave / 121°C, 100% RH, 2 atm, with MSL1 Preconditioning					
Lot / Mask Set	48 hrs	96 hrs	144 hrs		
D34398 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 77		
D34417 / 3K51S (XPC7450RX)	0 / 77	0 / 77	0 / 77		
D34608 / 3K51S (XPC7450RX)	0 / 77	0 / 75	0 / 75		
Totals	0 / 231	0 / 229	0 / 229		
Failure Comments					

High Temperature Bake / 175°C					
Lot / Mask Set	168 hrs	504 hrs	1008 hrs		
U23353 (XPC7410RX)	0 / 65	0 / 65	0 / 62		
U23467 (XPC7410RX)	0 / 70	0 / 70	0 / 70		
U23537 (XPC7410RX)	0 / 87	0 / 87			
Totals	0 / 222	0 / 222	0 / 132		
Failure Comments					

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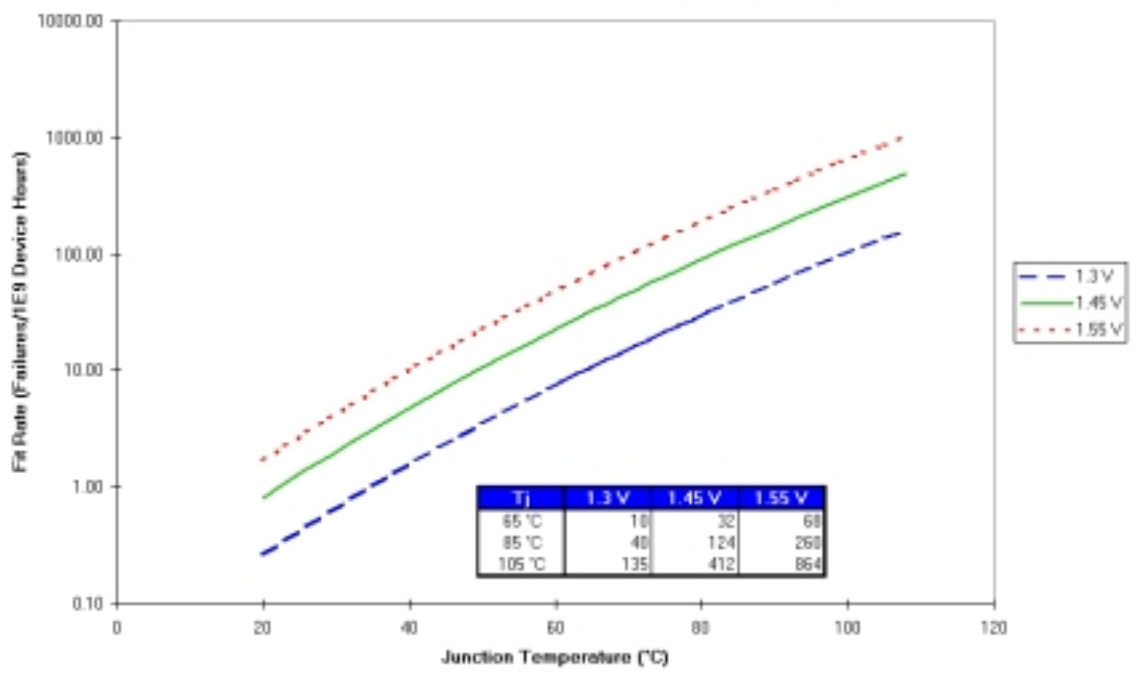


XPC7445/7455 Node 5 Product FIT Rate and MTBF Derated Curves:

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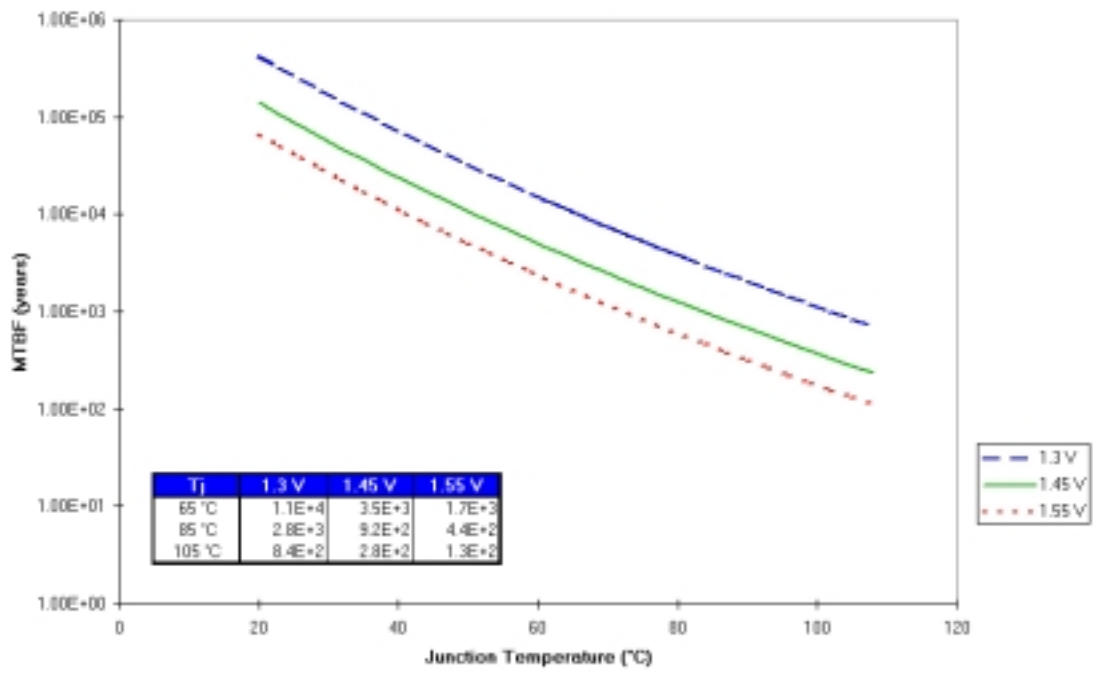
FITs vs Junction Temperature: 7445/7455
 Thermal and Voltage Acceleration
 eA = 0.7 eV, Beta = 7.4, 60% Confidence



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MTBF vs Junction Temperature: 7445/7455
 Thermal and Voltage Acceleration
 eA = 0.7 eV, Beta = 7.4, 60% Confidence



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HiP6SOI Node 5	484CBGA	



Revision History:

Revision History			
Revision	Date*	Comment	Author
0	6/27/03	Original Release	Leo Loc

Update Revision Date in Footer

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