



**MC7447/MC7457 Microprocessor**  
**MOS-13 HiP7SOI**  
**Rev. 1.1 / 1.2**  
**Qualification Report**

Device No./Rev.: MC7447/MC7457 Rev. 1.1/1.2		Report Rev.: G
Description: L/N/W-spec MC7447/MC7457		Revision date: 21-April-2005
Technology: MOS13 HiP7SOI Industrial	Package: 360CBGA / 483CBGA MSL1 260°C	Page 1 of 9

### MC7447/MC7457 Product Information:

Product / Technology / Fab / Package Description	
Package	MC7447: 360 CBGA (RX), 25 x 25 mm / MC7457: 483 CBGA (RX) 29 x 29mm
Device	MC7447/MC7457
Mask Set	(Z35-Z41) : L65N
Die Size	9.1mm x 10.8mm
Underfill	UL94SPEC Compliant
Name/Location of Die Fab Facility	MOS-13 / Austin TX
Process Technology	0.18um HiP7SOI
Poly / Metal layers	1P / 9M
Assembly Location	Freescale, KLM / Austin TX
Bump Tech/Location	Electroplate Phoenix, Az & Research Triangle Park, NC
Moisture Sensitivity Level	MSL1 @ 260degC
Capacitor	Pb Free Capacitor Attach
Substrate Material	Ceramic

### MC7447/MC7457 Product Specification:

Spec	Customer/App	Nom Vdd	Tj	Speed	Pkg	Part#
W	Commercial Laptop	1.3V	85C	1333/1250	360	MC7447RX1333WB
W	Commercial Laptop	1.2V	85C	1000	360	MC7447RX1000WB
Y	Commercial Laptop	1.32V	85C	1333	360	MC7447RX1333YB
N	Industrial	1.1V	105	1000/867/733/600	483	MC7457RX1000NB/867/733/600
N	Industrial	1.1V	105	1000/867/733/600	360	MC7447RX1000NB/867/733/600
L	Industrial	1.3V	105	1267/1200/1000/867	360/483	MC7447/57RX1267/1200/1000/867LB

### Product Reliability Data Summary:

HTOL Results 1.85V 105C Tj							
Lot / Mask Set	6 Hours	12 Hours	24 Hours	81 Hours (5yr-Commercial) P-Spec	217 Hours (10yr-Industrial) N-Spec	434 Hours	813 Hours (10yr-Industrial) L-Spec
Q65238/ Rev 1.1	0 / 224	0 / 224	0 / 177	0 / 177	1 / 132 a	0 / 127	0 / 127
Q66343/ Rev 1.1	0 / 237	0 / 237	0 / 237	0 / 237	0 / 131	0 / 129	0 / 128
Q66354/ Rev 1.1	0 / 241	0 / 241	0 / 239	0 / 239	0 / 132	0 / 130	0 / 128
D73773/ Rev 1.2				0 / 129	0 / 129		
Totals	0 / 702	0 / 702	0 / 653	0 / 782	1 / 524	0 / 386	0 / 383
Failure Comments					a 1 fail = scan at FA.		

ESD / Latch-up					
Lot / Mask Set	HBM	MM	CDM / 500V – No Skt	Latch-up / 200mA	
Q65238/ Rev 1.1	0 / 5 @ 2KV	0 / 5 @ 200V	0 / 5	0 / 3	
Q66343/ Rev 1.1	0 / 5 @ 2KV	0 / 5 @ 200V	0 / 5	0 / 3	
D73773/ Rev 1.2	0 / 5 @ 2KV	0 / 5 @ 200V	0 / 5	0 / 3	
Totals	0 / 15	0 / 15	0 / 15	0 / 9	
Failure Comments					

### 360 CBGA Package Reliability Data: (MC7447)

Moisture Sensitivity Level 1 Characterization @245degC					
Lot / Mask Set	MSL1				
D62673	0 / 80				
D64054	1 / 85 b				
D34608	0 / 75				
WED63901000	0 / 80				
WED63068100A	0 / 80				
WED63068100B	0 / 80				
Totals	(1) / 480				
Failure Comments	b B8 confirmed from foreign matter / corrective action implemented.				

Thermal Shock / -55°C +125°C Liquid-to-Liquid, with MSL1 Preconditioning @245degC					
Lot / Mask Set	MSL1	500 Cycles	1000 Cycles		
D62673	0 / 80	0 / 80	0 / 80		
D64054	0 / 84	0 / 84	0 / 84		
D34608	0 / 75	0 / 75	0 / 75		
WED63901000	0 / 80	0 / 80	0 / 80		
WED63068100A	0 / 80	0 / 80	0 / 80		
WED63068100B	0 / 80	0 / 80	0 / 80		
Totals	0 / 479	0 / 479	0 / 479		
Failure Comments					

THB 85/85, with MSL1 Preconditioning @245degC					
Lot / Mask Set	MSL1	504 Hours	1008 Hours		
D62673	0 / 80	0 / 80	0 / 80		
D64054	0 / 85	0 / 85	0 / 85		
D34608	0 / 74	0 / 74	0 / 74		
Totals	0 / 239	0 / 239	0 / 239		
Failure Comments					

### 483 CBGA Package Reliability Data: (MC7457)

Moisture Sensitivity Level 1 Characterization @245degC				
Lot / Mask Set	MSL1			
D62673	0 / 80			
D60685	0 / 80			
D6108442	0 / 42			
D64054	0 / 99			
WED63901000	0 / 80			
WED63068100A	0 / 80			
WED63068100B	0 / 80			
Totals	0 / 541			
Failure Comments				

Moisture Sensitivity Level 1 Characterization @260degC				
Lot / Mask Set	MSL1			
KLD827691001	0 / 80			
KLD827691002	0 / 80			
KLD827691003	0 / 80			
D700731003/EYAAQ	0 / 77			
D700731004/EYAAQ	0 / 77			
D700731005/EYAAQ	0 / 77			
Totals	0 / 471			
Failure Comments				

Temperature Cycle / -55°C +125°C Air-to-Air, with MSL1 Preconditioning @245degC				
Lot / Mask Set	100 Cycles	400 Cycles	800Cycles	
D62673	0 / 80	0 / 80	0 / 80	
D60685	0 / 80	0 / 80	0 / 80	
D64054	0 / 80	0 / 80	0 / 80	
WED63901000	0 / 80	0 / 80	0 / 80	
WED63068100A	0 / 80	0 / 80	0 / 80	
WED63068100B	0 / 80	0 / 80	0 / 80	
Totals	0 / 480	0 / 480	0 / 480	
Failure Comments				

Temperature Cycle / -55°C +125°C Air-to-Air, with MSL1 Preconditioning @260degC				
Lot / Mask Set	100 Cycles	400 Cycles	800Cycles	1000Cycles
D700731003/EYAAQ	0 / 80	0 / 80	0 / 80	0 / 80
D700731004/EYAAQ	0 / 80	0 / 80	0 / 80	0 / 80
D700731005/EYAAQ	0 / 80	0 / 80	0 / 80	0 / 80
Totals	0 / 240	0 / 240	0 / 240	0 / 240
Failure Comments				

Thermal Shock / -55°C +125°C Liquid-to-Liquid, with MSL1 Preconditioning					
Lot / Mask Set	100 Cycles	500 Cycles	1000Cycles		
D62673	0 / 80	0 / 80	0 / 80		
D6108442	0 / 80	0 / 80	0 / 80		
D64054	0 / 80	0 / 80	0 / 80		
WED63901000	0 / 80	0 / 80	0 / 80		
WED63068100A	0 / 80	0 / 80	0 / 80		
WED63068100B	0 / 80	0 / 80	0 / 80		
Totals	0 / 480	0 / 480	0 / 480		
Failure Comments					

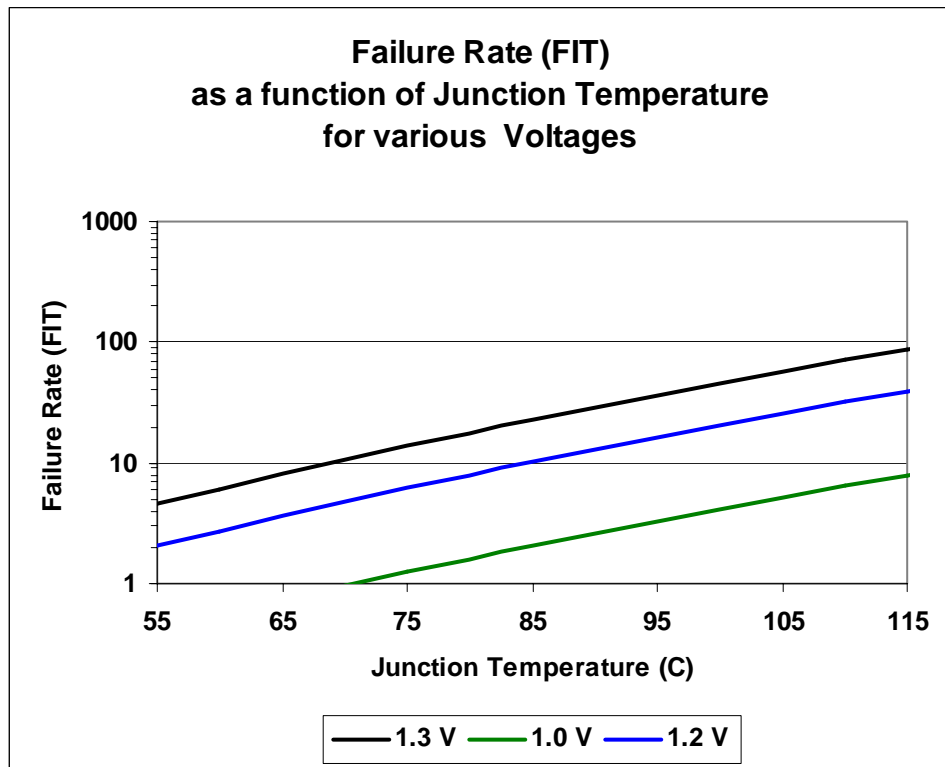
Thermal Shock / -55°C +125°C Liquid-to-Liquid, with MSL1 260°C Preconditioning					
Lot / Mask Set	100 Cycles	500 Cycles			
KLD827691001	0 / 80	0 / 80			
KLD827691002	0 / 80	0 / 80			
KLD827691003	0 / 80	0 / 80			
Totals	0 / 240	0 / 240			
Failure Comments					

HAST, with MSL1 260°C Preconditioning					
Lot / Mask Set	48Hours	96Hours			
KLD827691001	0 / 80	0 / 80			
KLD827691002	0 / 80	0 / 80			
KLD827691003	0 / 80	0 / 80			
Totals	0 / 240	0 / 240			
Failure Comments					

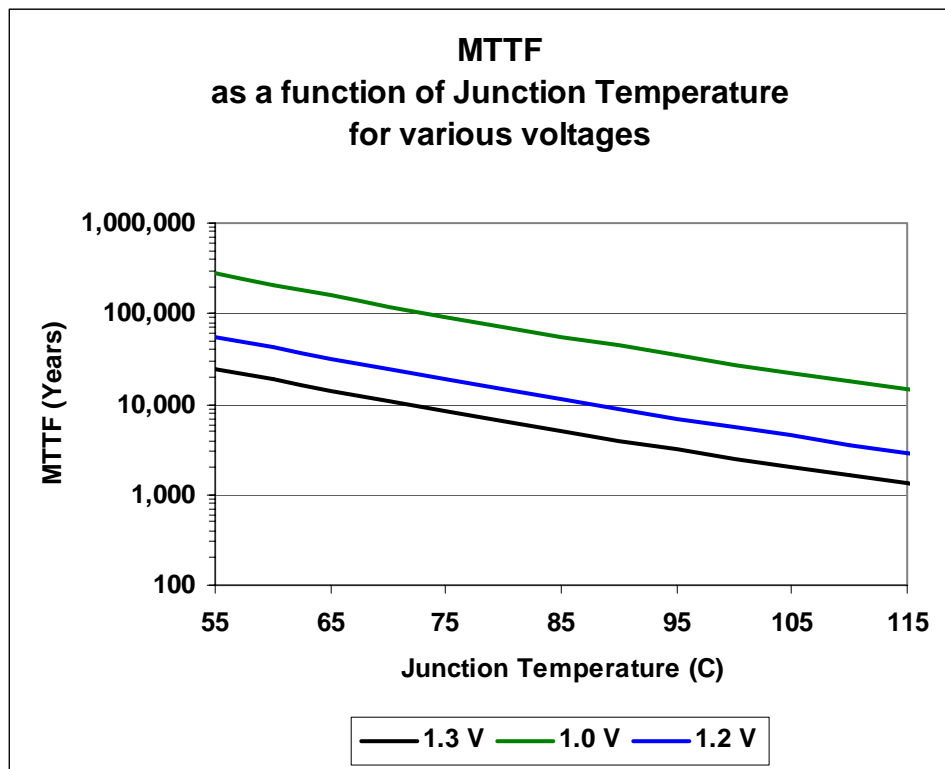
High Temperature Bake / 175°C					
Lot / Mask Set	504 Hours				
D62673	0 / 80				
D60685	0 / 80				
D64054	0 / 80				
WED63901000	0 / 80				
WED63068100A	0 / 80				
WED63068100B	0 / 80				
Totals	0 / 480				
Failure Comments					

**MC7447/7457 FIT Rate and MTTF Derated 60% C.L. Curves.**

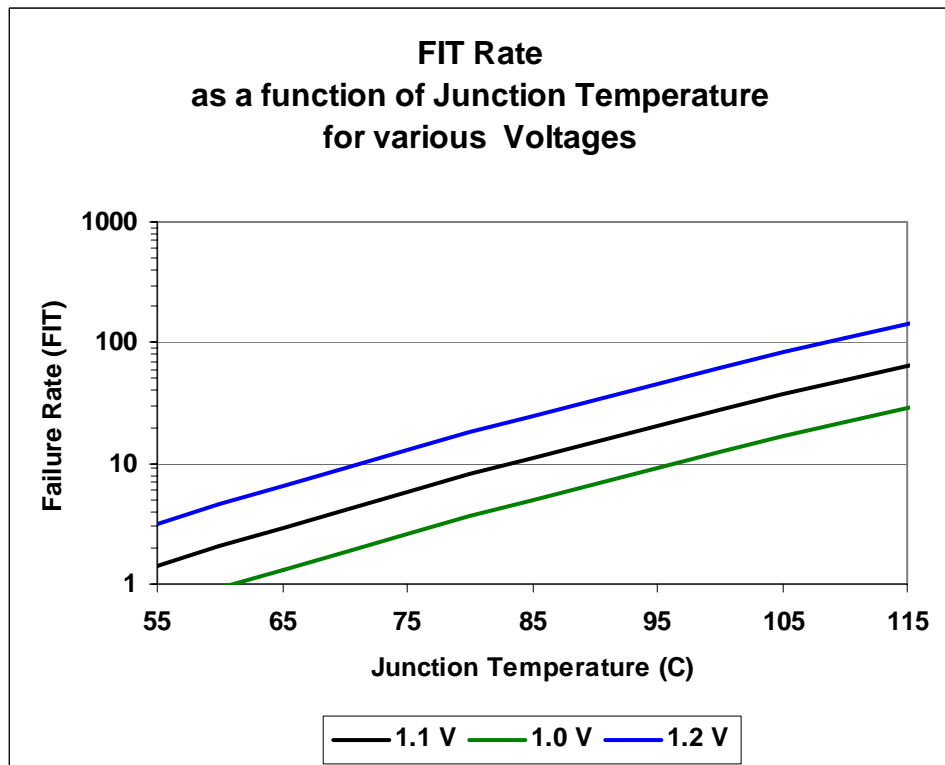
Industrial Tier L-spec: 1.3V, 105degC Tj, 10 Year Operation



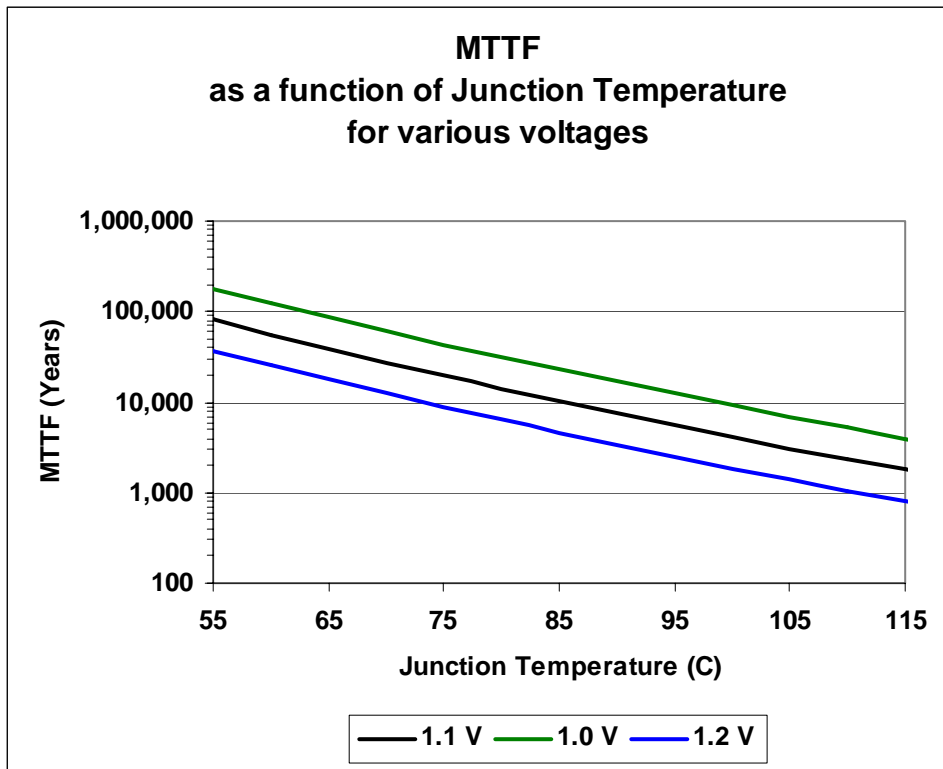
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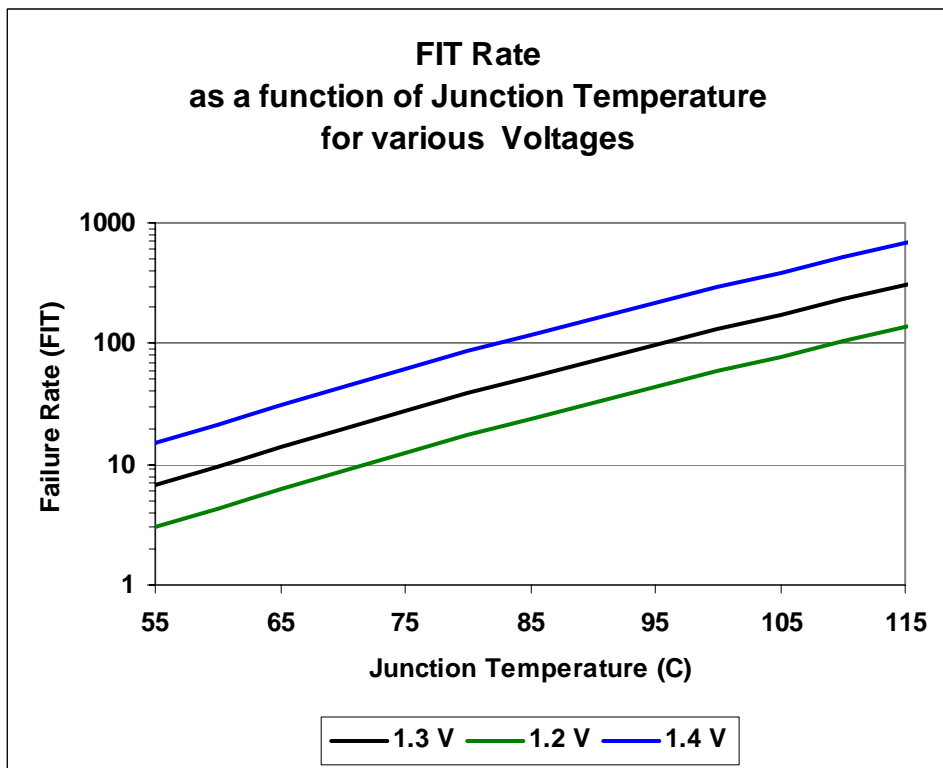
Industrial Tier N-spec: 1.1V, 105degC Tj, 10 Year Operation



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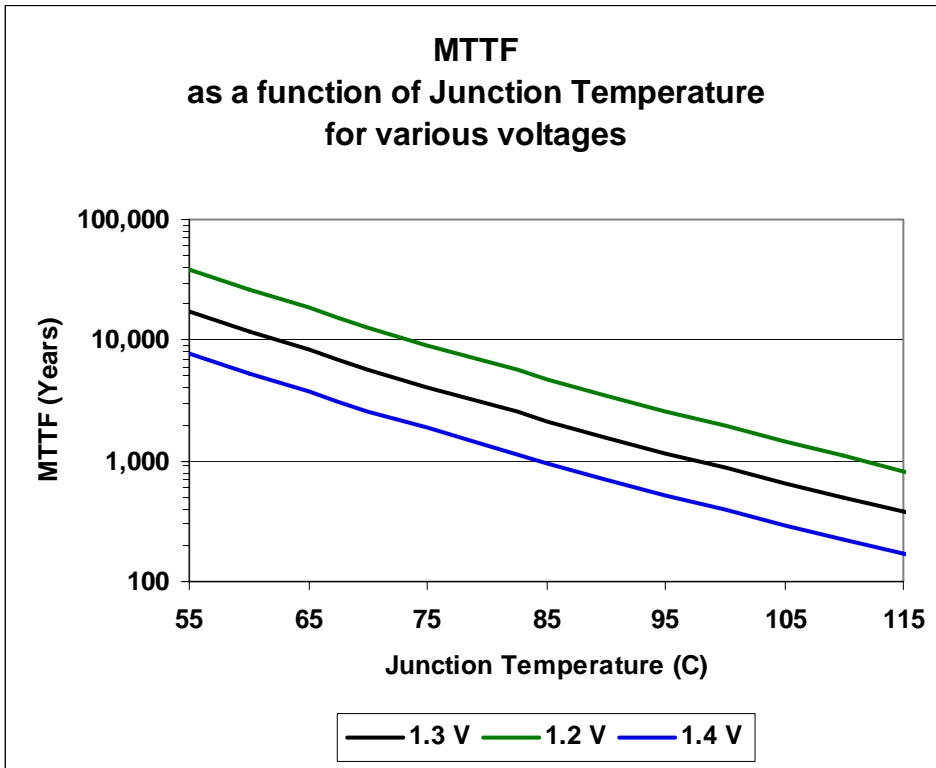


Commercial Tier W-spec and P-spec: 1.2V, 1.3V, 1.32V, 85degC Tj, 5 Year Operation



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**Revision History:**

Revision History			
Revision	Date*	Comment	Author
0	08/08/03	Initial Release – Commercial Tier	Keith Minwell
A	09/11/03	Industrial Qual N-spec (MPC7447)	Keith Minwell
B	10/06/03	Industrial Qual N-spec (MPC7447/MPC7457)	Keith Minwell
C	10/13/03	Updated Z35L65N for ""MC" "N" spec	Keith Minwell
D	10/27/03	Industrial Qual L-spec (MPC7447/MPC7457)	Keith Minwell
E	12/05/03	Adjusted the FIT rate/HTOL results	Keith Minwell
F	03/30/04	Industrial Rev 1.2 Qual	John Alvarado
G	04/21/05	MSL1 260°C, Pb-free CAP, Unitive Bump, Research Triangle Park, NC	Keith Minwell

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