



04/27/2005

RELIABILITY MONITOR REPORT
FOR

BGA Package

Dallas Semiconductor

4401 South Beltwood Parkway
Dallas, TX 75244-3292

This Report was prepared by
Dallas Semiconductor Reliability Engineering

Summary:

The data in the tables that follow was generated as the result of an on-going Package Reliability Monitor. The assemblies covered by this package monitor are:

ASSY SITE	PINS	PACKAGE		
ASAT	256	CSBGA	ASAT	349 CSBGA
ASAT	100	CSBGA (Pb-Free)	ASAT	49 CSBGA (Pb-Free)
ASAT	400	TE-PBGA	ATP (Amkor, PI)	256 BGA
ATP (Amkor, PI)	272	BGA	ATP (Amkor, PI)	100 CSBGA
ATP (Amkor, PI)	16	CSBGA	ATP (Amkor, PI)	169 CSBGA
ATP (Amkor, PI)	25	CSBGA	ATP (Amkor, PI)	256 CSBGA
ATP (Amkor, PI)	49	CSBGA	ATP (Amkor, PI)	144 TE-PBGA
ATP (Amkor, PI)	144	TECSBGA	ATP (Amkor, PI)	256 TECSBGA
Carsem	25	CSBGA	Stats	256 BGA
Stats	100	CSBGA	Stats	16 CSBGA
Stats	25	CSBGA	Stats	49 CSBGA
Stats	16	CSBGA (Pb-Free)	Stats	25 CSBGA (Pb-Free)

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 44022 FITS: 2.6

The parameters used to calculate this failure rate are as follows:

Cf: 60% Ea: 0.7 B: 0 Tu: 25 °C Vu: 5.5 Volts

The reliability data follows. At the start of this data is a description of the assembly vehicle used to generate this reliability data. The next section is the detailed reliability data for each stress. The reliability data section includes the latest data available. This report covers data between 04/01/2004 and 03/31/2005.

Assembly Information:

Package Type: CSBGA 13 mm
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 3
 Date Code Range: 0501 to 0501

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0501	DS3254	125C, 3.5 VOLTS	192 HRS	45	0	
Total:						0	

Assembly Information:

Package Type: CSBGA 17 mm
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 3
 Date Code Range: 0417 to 0417

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
EXTERNAL VISUAL	0417	DS21458	J-STD-020, 6.1a		8	0	
ULTRASOUND			J-STD-020		8	0	

STORAGE LIFE	0417	DS21458	125C	48	HRS	8		
MOISTURE SOAK			30C/60% R.H.	192	HRS	8		
CONVECTION REFLOW			220C +5/-0C	3	PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a			8	0	
PRECONDITION U/S			J-STD-020			8	0	
Total:							0	

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0417	DS21458	125C, 3.5 VOLTS	1000	HRS	45	0
Total:							0

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
X-RAY	0417	DS21458	MIL-STD-883-2012 : TOP & SIDE VIEW			6	0
PHYSICAL DIMENSIONS			JESD22-B100			6	0
BALL SHEAR			JESD22-B117			6	0
Total:							0

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0417	DS21458	125C	48	HRS	276	
MOISTURE SOAK			30C/60% R.H.	192	HRS	276	
CONVECTION REFLOW			220C +5/-0C	3	PASS	276	0
Total:							0

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0417	DS21458	150C	1000	HRS	77	0
Total:							0

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0417	DS21458	-55C TO 125C	1000	CYS	77	0
Total:							0

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE CYCLING	0417	DS21458	85/85, 3.5 VOLTS	1000	HRS	45	0
Total:							0

Assembly Information:

Package Type: CSBGA 4 mm
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 3
 Date Code Range: 0420 to 0420

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
EXTERNAL VISUAL	0420	DS1845	J-STD-020, 6.1a		8	0	
ULTRASOUND			J-STD-020		8	0	
STORAGE LIFE			125C	24 HRS	7	0	
MOISTURE SOAK			30C/60% R.H.	192 HRS	7	0	
CONVECTION REFLOW			235C +/-0C	3 PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		8	0	
PRECONDITION U/S			J-STD-020		8	0	
					Total:	0	

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0420	DS1845	125C, 5.5 VOLTS	1000 HRS	77	0	
					Total:	0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
X-RAY	0420	DS1845	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
BALL SHEAR			JESD22-B117		6	0	
					Total:	0	

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0420	DS1845	125C	24 HRS	244	0	
MOISTURE SOAK			30C/60% R.H.	192 HRS	244	0	
CONVECTION REFLOW			235C +/-0C	3 PASS	244	0	
					Total:	0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0420	DS1845	150C	1000 HRS	77	0	
					Total:	0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0420	DS1845	-55C TO 125C	1000 CYS	76	0	
					Total:	0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	0420	DS1845	85 C/85% R.H.	1000 HRS	77	0	
					Total:	0	

Assembly Information:

Package Type: CSBGA 5 mm
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 3
Date Code Range: 0447 to 0447

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0447	DS1849	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0447	DS1849	-55C TO 125C	1000 CYS	77	0	
Total:						0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	0447	DS1849	85 C/85% R.H.	1000 HRS	77	0	
Total:						0	

Assembly Information:

Package Type: CSBGA (Pb-Free) 5 mm
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 3
Date Code Range: 0430 to 0430

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
EXTERNAL VISUAL	0430	DS1849	J-STD-020, 6.1a		8	0	
ULTRASOUND			J-STD-020		8	0	
STORAGE LIFE			125C	24 HRS	8		
MOISTURE SOAK			30C/60% R.H.	192 HRS	8		
CONVECTION REFLOW			260C +/-5C	3 PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		8	0	
PRECONDITION U/S			J-STD-020		8	0	
Total:						0	

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0430	DS1849	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
X-RAY	0430	DS1849	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	

PHYSICAL DIMENSIONS 0430 DS1849 JESD22-B100

6 0
Total: 0

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0430	DS1849	125C	24 HRS	308		
MOISTURE SOAK			30C/60% R.H.	192 HRS	308		
CONVECTION REFLOW			260C +/-5C	3 PASS	308	0	
Total:						0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0430	DS1849	150C	1000 HRS	76	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0430	DS1849	-55C TO 125C	1000 CYS	77	0	
Total:						0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	0430	DS1849	85 C/85% R.H.	1000 HRS	77	0	
Total:						0	

Assembly Information:

Package Type: TE-PBGA 27 mm
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 3
Date Code Range: 0403 to 0442

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0403	DS3184	125C, 3.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0442	DS3184	125C, 3.5 VOLTS	1000 HRS	45	0	
Total:						0	

FAILURE RATE: MTTF (YRS): 44022 FITS: 2.6