

RELIABILITY MONITOR REPORT
FOR

BGA Package

Dallas Semiconductor

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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 DongGuan	16	CSBGA	ASAT DongGuan	25 CSBGA
ASAT DongGuan	256	CSBGA	ASAT DongGuan	100 CSBGA (Pb-Free)
ASAT DongGuan	16	CSBGA (Pb-Free)	ASAT DongGuan	25 CSBGA (Pb-Free)
ASAT DongGuan	256	CSBGA (Pb-Free)	ASAT DongGuan	49 CSBGA (Pb-Free)
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)	100	CSBGA (Pb-Free)	ATP (Amkor, PI)	16 CSBGA (Pb-Free)
ATP (Amkor, PI)	169	CSBGA (Pb-Free)	ATP (Amkor, PI)	25 CSBGA (Pb-Free)
ATP (Amkor, PI)	256	CSBGA (Pb-Free)	ATP (Amkor, PI)	100 TECSBGA
ATP (Amkor, PI)	144	TECSBGA	ATP (Amkor, PI)	256 TECSBGA
ATP (Amkor, PI)	144	TE-PBGA	ATP (Amkor, PI)	400 TE-PBGA
ATP (Amkor, PI)	484	TE-PBGA	Carsem	25 CSBGA
SCS (Stats Chippac S	256	BGA	SCS (Stats Chippac S	100 CSBGA
SCS (Stats Chippac S	16	CSBGA	SCS (Stats Chippac S	25 CSBGA
SCS (Stats Chippac S	49	CSBGA	SCS (Stats Chippac S	16 CSBGA (Pb-Free)
SCS (Stats Chippac S	25	CSBGA (Pb-Free)		

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 49822 FITS: 2.3

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. A 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 7/1/2005 and 6/30/2006 .

Assembly Information:

Package Type: CSBGA 5x5x1
 Flammability: UL 94-V0
 Moisture Sensitivity Level 3
 (JEDEC J-STD20A)
 Date Code Range: 0525 to 0525

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0525	DS1852	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

Assembly Information:

Package Type: CSBGA (Pb-Free) 10x10x1.0
 Flammability: UL 94-V0
 Moisture Sensitivity Level 3
 (JEDEC J-STD20A)
 Date Code Range: 0617 to 0617

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0617	DS2155	J-STD-020			8	0
STORAGE LIFE			125C	48 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	0617	DS2155	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	0617	DS2155	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	0617	DS2155	125C	48 HRS		244	
MOISTURE SOAK			30C/60% R.H.	192 HRS		244	
CONVECTION REFLOW			260C +/-5C	3 PASS		244	0
						Total:	0

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0617	DS2155	150C	1000 HRS		77	0
						Total:	0

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0617	DS2155	-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	0617	DS2155	85/85, 3.5 VOLTS	1000 HRS		45	0
						Total:	0

Assembly Information:

Package Type: CSBGA (Pb-Free) 17x17x1.26
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 3
Date Code Range: 0616 to 0616

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0616	DS26401	J-STD-020		8	0	
STORAGE LIFE			125C	48 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	
ULTRASOUND	0616	DS26401	J-STD-020		8	0	
STORAGE LIFE			125C	48 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	
ULTRASOUND	0616	DS26401	J-STD-020		8	0	
STORAGE LIFE			125C	48 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	0616	DS26401	125C, 3.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0616	DS26401	125C, 3.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0616	DS26401	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	0616	DS26401	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
BALL SHEAR			JESD22-B117		6	0	
X-RAY	0616	DS26401	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
BALL SHEAR			JESD22-B117		6	0	
X-RAY	0616	DS26401	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	0616	DS26401	125C	48 HRS	199		
MOISTURE SOAK			30C/60% R.H.	192 HRS	199		
CONVECTION REFLOW			260C +/-5C	3 PASS	199	0	
STORAGE LIFE	0616	DS26401	125C	48 HRS	199		
MOISTURE SOAK			30C/60% R.H.	192 HRS	199		
CONVECTION REFLOW			260C +/-5C	3 PASS	199	0	
STORAGE LIFE	0616	DS26401	125C	48 HRS	199		
MOISTURE SOAK			30C/60% R.H.	192 HRS	199		
CONVECTION REFLOW			260C +/-5C	3 PASS	199	0	
Total:						0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0616	DS26401	150C	1000 HRS	77	0	
STORAGE LIFE	0616	DS26401	150C	1000 HRS	77	0	
STORAGE LIFE	0616	DS26401	150C	1000 HRS	77	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0616	DS26401	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0616	DS26401	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0616	DS26401	-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	0616	DS26401	85/85, 3.5 VOLTS	1000 HRS	45	0	
BIASED MOISTURE	0616	DS26401	85/85, 3.5 VOLTS	1000 HRS	45	0	
BIASED MOISTURE	0616	DS26401	85/85, 3.5 VOLTS	1000 HRS	45	0	
Total:						0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	0616	DS26401	130C, 85% R.H.	200 HRS	77	0	
HAST, NO BIAS	0616	DS26401	130C, 85% R.H.	200 HRS	73	0	
HAST, NO BIAS	0616	DS26401	130C, 85% R.H.	200 HRS	70	0	
Total:						0	

Assembly Information:

Package Type: CSBGA (Pb-Free) 5x5x1
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 3
Date Code Range: 0543 to 0548

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0543	DS3610	125C, 3.6 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0548	DS1862	125C, 5.5V (PSA) & 3.6V (PSB)	1000 HRS	77	0	
Total:						0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0543	DS3610	150C	1000 HRS	77	0	
Total:						0	

Assembly Information:

Package Type: TE-PBGA 27x27x2.33
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 3
Date Code Range: 0536 to 0536

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0536	DS33R41	J-STD-020		8	0	
STORAGE LIFE			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	0536	DS33R41	125C, 3.5V (PSA) & 2.0V (PSB)	1000 HRS	45	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
X-RAY	0536	DS33R41	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	0536	DS33R41	125C	48 HRS	308		
MOISTURE SOAK			30C/60% R.H.	192 HRS	308		
CONVECTION REFLOW			220C +5/-0C	3 PASS	308	0	
					Total:	0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0536	DS33R41	150C	1000 HRS	77	0	
					Total:	0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0536	DS33R41	-55C TO 125C	1000 CYS	76	0	
					Total:	0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0536	DS33R41	85/85, 2.0 VOLTS	1000 HRS	45	0	
					Total:	0	

FAILURE RATE:**MTTF (YRS): 49822****FITS: 2.3**