

**RELIABILITY MONITOR REPORT
FOR**

LQFP 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		
ATK (Amkor, K)	100	LQFP	ATK (Amkor, K)	128 LQFP
ATK (Amkor, K)	48	LQFP	ATK (Amkor, K)	64 LQFP
ATK (Amkor, K)	100	LQFP (Pb-Free)	ATK (Amkor, K)	128 LQFP (Pb-Free)
ATK (Amkor, K)	48	LQFP (Pb-Free)	ATK (Amkor, K)	64 LQFP (Pb-Free)
ATK (Amkor, K)	144	LQFP Exposed Pad (Pb-Free)	ATK (Amkor, K)	48 LQFP Exposed Pad (Pb-Free)
ATP (Amkor, PI)	100	LQFP	ATP (Amkor, PI)	128 LQFP
SCS (Stats Chippac S	100	LQFP	SCS (Stats Chippac S	128 LQFP
SCS (Stats Chippac S	48	LQFP	SCS (Stats Chippac S	64 LQFP

The calculated failure rate for this assembly is:

FAILURE RATE: **MTTF (YRS): 51937** **FITS: 2.2**

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 04/01/2005 and 03/31/2006 .

Assembly Information:

Package Type: LQFP 551
Flammability: UL 94-V0
Moisture Sensitivity
(JEDEC J-STD20A) Level 4
Date Code Range: 0448 to 0550

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0517	DS21352	125C, 3.3 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0518	DS21352	125C, 3.3 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0532	DS2155	125C, 3.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0550	DS2155	125C, 3.5 VOLTS	1000 HRS	77	0	
					Total:	0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
DROP	0517	DS21352	25 C	36 CYS	250	0	
DROP	0518	DS21352	25 C	36 CYS	250		
					Total:	0	

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0448	DS21352	J-STD-020		4	0	

STORAGE LIFE	0448	DS21352	125C	24	HRS	241		
MOISTURE SOAK			30C/60% R.H.	192	HRS	241		
CONVECTION REFLOW			235C +5/-0C	3	PASS	241	0	
PRECONDITION U/S	0448	DS21352	J-STD-020			4	0	
ULTRASOUND	0517	DS21352	J-STD-020			4	0	
STORAGE LIFE	0517	DS21352	125C	24	HRS	241		
MOISTURE SOAK			30C/60% R.H.	192	HRS	241		
CONVECTION REFLOW			235C +5/-0C	3	PASS	241	0	
PRECONDITION U/S	0517	DS21352	J-STD-020			4	0	
STORAGE LIFE	0518	DS21352	125C	24	HRS	241		
MOISTURE SOAK			30C/60% R.H.	192	HRS	241		
CONVECTION REFLOW			235C +5/-0C	3	PASS	241	0	
PRECONDITION U/S	0518	DS21352	J-STD-020			4	0	
ULTRASOUND	0541	DS21352	J-STD-020			4	0	
STORAGE LIFE	0541	DS21352	125C	24	HRS	241		
MOISTURE SOAK			30C/60% R.H.	192	HRS	241		
CONVECTION REFLOW			235C +5/-0C	3	PASS	241	0	
Total:							0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0448	DS21352	-55C TO 125C	1000 CYS	80	0	
TEMP CYCLE	0517	DS21352	-55C TO 125C	1000 CYS	80	0	
TEMP CYCLE	0518	DS21352	-55C TO 125C	1000 CYS	80	0	
TEMP CYCLE	0532	DS2155	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0550	DS2155	-55C TO 125C	1000 CYS	77	0	
Total:						0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST	0532	DS2155	130C, 85%R.H.,3.5V	96 HRS	45	0	
HAST	0550	DS2155	130C, 85%R.H.,3.5V	96 HRS	45	0	
Total:						0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	0448	DS21352	130C, 85% R.H.	100 HRS	80	0	
HAST, NO BIAS	0517	DS21352	130C, 85% R.H.	100 HRS	80	0	
HAST, NO BIAS	0518	DS21352	130C, 85% R.H.	100 HRS	77	0	
HAST, NO BIAS	0532	DS2155	130C, 85% R.H.	200 HRS	77	0	
HAST, NO BIAS	0550	DS2155	130C, 85% R.H.	200 HRS	77	0	
Total:						0	

Assembly Information:

Package Type: LQFP (Pb-Free) 394
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 3
Date Code Range: 0520 to 0520

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0520	DS26504	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	0520	DS26504	125C, 3.5 VOLTS	1000 HRS	44	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0520	DS26504	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	
X-RAY	0520	DS26504	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
MARK PERMANENCY			JESD22-B107		6	0	
LEAD INTEGRITY			JESD22-B105, COND B		6	0	
EXTERNAL VISUAL			JESD22-B101		6	0	
EDX			25 C		6	0	
Total:						0	

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0520	DS26504	125C	24 HRS	321		
MOISTURE SOAK			30C/60% R.H.	192 HRS	321		
CONVECTION REFLOW			260C +/-5C	3 PASS	321	0	
Total:						0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0520	DS26504	150C	1000 HRS	76	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0520	DS26504	-55C TO 125C	1000	CYS	76	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
					Total:	0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST	0520	DS26504	130C, 85%R.H.,3.5V	96	HRS	45	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
					Total:	0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	0520	DS26504	130C, 85% R.H.	200	HRS	76	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
					Total:	0	

Assembly Information:

Package Type: LQFP (Pb-Free) 787
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 4
Date Code Range: 0520 to 0521

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0520	DS21Q43	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
ULTRASOUND	0521	DS21Q43	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	0520	DS21Q43	125C, 3.5 VOLTS	1000	HRS	45	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
HIGH TEMP OP LIFE	0521	DS21Q43	125C, 3.5 VOLTS	1000	HRS	45	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
					Total:	0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0520	DS21Q43	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	
X-RAY	0520	DS21Q43	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
MARK PERMANENCY			JESD22-B107		6	0	
LEAD INTEGRITY			JESD22-B105, COND B		6	0	
EXTERNAL VISUAL			JESD22-B101		6	0	
EDX			25 C		6	0	
SOLDERABILITY (Sn/Pb)	0521	DS21Q43	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	
X-RAY	0521	DS21Q43	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
MARK PERMANENCY			JESD22-B107		6	0	
LEAD INTEGRITY			JESD22-B105, COND B		6	0	
EXTERNAL VISUAL			JESD22-B101		6	0	
EDX			25 C		6	0	
					Total:	0	

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0520	DS21Q43	125C	24 HRS	321		
MOISTURE SOAK			30C/60% R.H.	192 HRS	321		
CONVECTION REFLOW			260C +/-5C	3 PASS	321	0	
STORAGE LIFE	0521	DS21Q43	125C	24 HRS	321		
MOISTURE SOAK			30C/60% R.H.	192 HRS	321		
CONVECTION REFLOW			260C +/-5C	3 PASS	321	0	
					Total:	0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0520	DS21Q43	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
STORAGE LIFE	0521	DS21Q43	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
					Total:	0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0520	DS21Q43	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0521	DS21Q43	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
					Total:	0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0520	DS21Q43	85/85, 5.5 VOLTS	1000 HRS	45	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
BIASED MOISTURE	0521	DS21Q43	85/85, 5.5 VOLTS	1000 HRS	45	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
					Total:	0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	0520	DS21Q43	130C, 85% R.H.	200 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
HAST, NO BIAS	0521	DS21Q43	130C, 85% R.H.	200 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
					Total:	0	

FAILURE RATE:**MTTF (YRS): 51937****FITS: 2.2**