

RELIABILITY MONITOR REPORT
FOR

TSOP Package

Dallas Semiconductor

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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)	28	TSOP	ATK (Amkor, K)	32 TSOP
ATP (Amkor, PI)	28	TSOP	ATP (Amkor, PI)	32 TSOP
NSEB	28	TSOP	NSEB	32 TSOP
NSEB	28	TSOP (Pb-Free)	NSEB	32 TSOP (Pb-Free)

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 50527 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. 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 7/1/04 and 6/30/05 .

Assembly Information:

Package Type: TSOP 8 mm
 Flammability: UL 94-V0
 Moisture Sensitivity
 (JEDEC J-STD20A) Level 3
 Date Code Range: 0429 to 0429

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0429	DS1501	JESD22-B102, COND C		15	0	
Total:						0	

Assembly Information:

Package Type: TSOP (Pb-Free) 8 mm
 Flammability: UL 94-V0
 Moisture Sensitivity
 (JEDEC J-STD20A) Level 3
 Date Code Range: 0427 to 0433

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
EXTERNAL VISUAL	0427	DS1553	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	
EXTERNAL VISUAL	0429	DS1501	J-STD-020, 6.1a		8	0	
ULTRASOUND			J-STD-020		8	0	
STORAGE LIFE			125C	24 HRS	8		

MOISTURE SOAK	0429	DS1501	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	0429	DS1501	J-STD-020			8	0
EXTERNAL VISUAL			J-STD-020, 6.1a			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
EXTERNAL VISUAL	0432	DS1501	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
EXTERNAL VISUAL	0433	DS1553	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
EXTERNAL VISUAL	0433	DS1501	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:						8	0

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0427	DS1553	125C, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
HIGH TEMP OP LIFE	0429	DS1501	125C, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
HIGH TEMP OP LIFE	0429	DS1501	125C, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
HIGH TEMP OP LIFE	0432	DS1501	125C, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			77	0
HIGH TEMP OP LIFE	0433	DS1553	125C, 5.5 VOLTS	1000	HRS	45	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
HIGH TEMP OP LIFE	0433	DS1501	125C, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			76	0
Total:						0	0

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0427	DS1553	JESD22-B102, COND C		3	0	
X-RAY	0427	DS1553	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	
SOLDERABILITY (Sn/Pb)	0429	DS1501	JESD22-B102, COND C		3	0	
X-RAY	0429	DS1501	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	
SOLDERABILITY (Sn/Pb)	0429	DS1501	JESD22-B102, COND C		3	0	
X-RAY	0429	DS1501	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	
SOLDERABILITY (Sn/Pb)	0432	DS1501	JESD22-B102, COND C		3	0	
X-RAY	0432	DS1501	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	
SOLDERABILITY (Sn/Pb)	0433	DS1553	JESD22-B102, COND C		3	0	
X-RAY	0433	DS1553	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	
SOLDERABILITY (Sn/Pb)	0433	DS1501	JESD22-B102, COND C		3	0	
X-RAY	0433	DS1501	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	
					Total:	0	

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0427	DS1553	125C	24 HRS	385		
MOISTURE SOAK			30C/60% R.H.	192 HRS	385		
CONVECTION REFLOW			260C +0/-5C	3 PASS	385	0	
STORAGE LIFE	0429	DS1501	125C	24 HRS	385		
MOISTURE SOAK			30C/60% R.H.	192 HRS	385		
CONVECTION REFLOW			260C +0/-5C	3 PASS	385	0	
STORAGE LIFE	0429	DS1501	125C	24 HRS	385		
MOISTURE SOAK			30C/60% R.H.	192 HRS	385		
CONVECTION REFLOW			260C +0/-5C	3 PASS	385	0	
STORAGE LIFE	0432	DS1501	125C	24 HRS	385		

MOISTURE SOAK	0432	DS1501	30C/60% R.H.	192	HRS	385	
CONVECTION REFLOW			260C +0/-5C	3	PASS	385	0
STORAGE LIFE	0433	DS1553	125C	24	HRS	353	
MOISTURE SOAK			30C/60% R.H.	192	HRS	353	
CONVECTION REFLOW			260C +0/-5C	3	PASS	353	0
STORAGE LIFE	0433	DS1501	125C	24	HRS	385	
MOISTURE SOAK			30C/60% R.H.	192	HRS	385	
CONVECTION REFLOW			260C +0/-5C	3	PASS	385	0
Total:							0

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0427	DS1553	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
STORAGE LIFE	0429	DS1501	150C	1000 HRS	77	0	
STORAGE LIFE	0429	DS1501	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
STORAGE LIFE	0432	DS1501	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		77	0	
STORAGE LIFE	0433	DS1553	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
STORAGE LIFE	0433	DS1501	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	0427	DS1553	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0429	DS1501	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0429	DS1501	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0432	DS1501	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0433	DS1553	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0433	DS1501	-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
HAST	0427	DS1553	130C, 85%R.H.,5.5V	96 HRS	57	0	
HAST	0429	DS1501	130C, 85%R.H.,5.5V	96 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
HAST	0429	DS1501	130C, 85%R.H.,5.5V	96 HRS	77	0	

VISUAL INSPECTION	0429	DS1501	WHISKERS < 50uM			3	0
HAST	0432	DS1501	130C, 85%R.H.,5.5V	96	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			77	0
HAST	0433	DS1553	130C, 85%R.H.,5.5V	96	HRS	73	0
HAST	0433	DS1501	130C, 85%R.H.,5.5V	96	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			75	0
Total:						0	0

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	0427	DS1553	130C, 85% R.H.	200	HRS	77	0
HAST, NO BIAS	0429	DS1501	130C, 85% R.H.	200	HRS	76	0
HAST, NO BIAS	0429	DS1501	130C, 85% R.H.	200	HRS	77	0
HAST, NO BIAS	0432	DS1501	130C, 85% R.H.	200	HRS	74	0
VISUAL INSPECTION			WHISKERS < 50uM			74	0
HAST, NO BIAS	0433	DS1553	130C, 85% R.H.	200	HRS	77	0
HAST, NO BIAS	0433	DS1501	130C, 85% R.H.	200	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			77	0
Total:						0	0

FAILURE RATE:

MTTF (YRS): 50527

FITS: 2.3