

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): 18096**                      **FITS: 6.3**

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 10/1/04 and 9/30/05 .

**Assembly Information:**

Package Type:                      TSOP (Pb-Free) 528  
 Flammability:                      UL 94-V0  
 Moisture Sensitivity                      Level 3  
 (JEDEC J-STD20A)  
 Date Code Range:                      0432      to      0433

**MOISTURE SENSITIVITY LEVEL 3**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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	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	
<b>Total:</b>						<b>0</b>	

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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	DS1501	125C, 5.5 VOLTS	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		76	0	

Total: 0

### PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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	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	
<b>Total:</b>						<b>0</b>	

### PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0432	DS1501	125C	24 HRS	385		
MOISTURE SOAK			30C/60% R.H.	192 HRS	385		
CONVECTION REFLOW			260C +/-5C	3 PASS	385	0	
STORAGE LIFE	0433	DS1501	125C	24 HRS	385		
MOISTURE SOAK			30C/60% R.H.	192 HRS	385		
CONVECTION REFLOW			260C +/-5C	3 PASS	385	0	
<b>Total:</b>						<b>0</b>	

### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0432	DS1501	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		77	0	
STORAGE LIFE	0433	DS1501	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
<b>Total:</b>						<b>0</b>	

### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0432	DS1501	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0433	DS1501	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
<b>Total:</b>						<b>0</b>	

### TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST	0432	DS1501	130C, 85%R.H.,5.5V	96 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		77	0	
HAST	0433	DS1501	130C, 85%R.H.,5.5V	96 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		75	0	

**Total: 0**

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**UNBIASED MOISTURE RESISTANCE**

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

**FAILURE RATE: MTTF (YRS): 18096 FITS: 6.3**