

RELIABILITY MONITOR REPORT  
FOR

**PLCC 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)	32	PLCC	ATK (Amkor, K)	68 PLCC
ATP (Amkor, PI)	28	PLCC	ATP (Amkor, PI)	32 PLCC
ATP (Amkor, PI)	44	PLCC	ATP (Amkor, PI)	52 PLCC
ATP (Amkor, PI)	68	PLCC	ATP (Amkor, PI)	28 PLCC (Pb-Free)
ATP (Amkor, PI)	44	PLCC (Pb-Free)	ATP (Amkor, PI)	52 PLCC (Pb-Free)
ATP (Amkor, PI)	68	PLCC (Pb-Free)	OSEP	28 PLCC
OSEP	44	PLCC	OSEP	52 PLCC
OSEP	44	PLCC (Pb-Free)		

The calculated failure rate for this assembly is:

**FAILURE RATE:                    MTTF (YRS): 23383                    FITS: 4.9**

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 10/1/2005 and 9/30/2006.

**Assembly Information:**

Package Type:                    PLCC (Pb-Free) 750x750x3.87  
 Flammability:                    UL 94-V0  
 Moisture Sensitivity                    Level 4  
 (JEDEC J-STD20A)  
 Date Code Range:                    0609 to 0609

**MOISTURE SENSITIVITY LEVEL 4**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0609	DS87C530	J-STD-020		8	0	
STORAGE LIFE			125C	48 HRS	8		
MOISTURE SOAK			30C/60% R.H.	96 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	0609	DS87C530	125C, 5.5 VOLTS	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0609	DS87C530	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	

X-RAY	0609	DS87C530	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>	<b>0</b>

#### PRECONDITIONING LEVEL 4

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0609	DS87C530	125C	48 HRS	385		
MOISTURE SOAK			30C/60% R.H.	96 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	0609	DS87C530	150C	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

#### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0609	DS87C530	-55C TO 125C	1000 CYS	77	0	
<b>Total:</b>						<b>0</b>	

#### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	0609	DS87C530	130C, 85% R.H.	200 HRS	77	0	
AUTOCLAVE	0609	DS87C530	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
<b>Total:</b>						<b>0</b>	

#### Assembly Information:

Package Type: PLCC (Pb-Free) 950x950x3.87  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 4  
 Date Code Range: 0602 to 0617

#### MOISTURE SENSITIVITY LEVEL 4

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0602	DS87C550	J-STD-020		8	0	
STORAGE LIFE			125C	48 HRS	8		
MOISTURE SOAK			30C/60% R.H.	96 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	0617	DS87C550	J-STD-020		8	0	
STORAGE LIFE			125C	48 HRS	8		
MOISTURE SOAK			30C/60% R.H.	96 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

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0602	DS87C550	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0617	DS87C550	125C, 5.5 VOLTS	1000 HRS	45	0	
Total:						0	

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**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0602	DS87C550	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	
X-RAY	0602	DS87C550	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)	0617	DS87C550	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	
X-RAY	0617	DS87C550	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	

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**PRECONDITIONING LEVEL 4**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0602	DS87C550	125C	48 HRS	378		
MOISTURE SOAK			30C/60% R.H.	96 HRS	378		
CONVECTION REFLOW			260C +/-5C	3 PASS	378	0	
STORAGE LIFE	0617	DS87C550	125C	48 HRS	353		
MOISTURE SOAK			30C/60% R.H.	96 HRS	353		
CONVECTION REFLOW			260C +/-5C	3 PASS	353	0	
Total:						0	

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**SOLDER HEAT**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDER DIP (HEAT RESISTANCE)	0617	DS87C550	380C +/-10C, 3SEC	1 PASS	15	0	
Total:						0	

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**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0602	DS87C550	150C	1000 HRS	77	0	
STORAGE LIFE	0617	DS87C550	150C	1000 HRS	77	0	
Total:						0	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0602	DS87C550	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0617	DS87C550	-55C TO 125C	1000 CYS	77	0	
<b>Total:</b>						<b>0</b>	

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**TEMPERATURE HUMIDITY BIAS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0602	DS87C550	85/85, 5.5 VOLTS	1000 HRS	70	0	
BIASED MOISTURE	0617	DS87C550	85/85, 5.5 VOLTS	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0602	DS87C550	121C, 2 ATM STEAM, UNBIASED	168 HRS	75	0	
AUTOCLAVE	0617	DS87C550	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
<b>Total:</b>						<b>0</b>	

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**FAILURE RATE:**                      **MTTF (YRS): 23383**                      **FITS: 4.9**