

RELIABILITY MONITOR REPORT  
FOR

**SOIC 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)	14	SOIC	ATK (Amkor, K)	16 SOIC
ATK (Amkor, K)	20	SOIC	ATK (Amkor, K)	24 SOIC
ATK (Amkor, K)	28	SOIC	ATK (Amkor, K)	8 SOIC
ATP (Amkor, PI)	14	SOIC	ATP (Amkor, PI)	16 SOIC
ATP (Amkor, PI)	20	SOIC	ATP (Amkor, PI)	24 SOIC
ATP (Amkor, PI)	28	SOIC	ATP (Amkor, PI)	8 SOIC
Carsem	14	SOIC	Carsem	16 SOIC
Carsem	20	SOIC	Carsem	24 SOIC
Carsem	28	SOIC	Carsem	8 SOIC
Hana	8	SOIC	NSEB	8 SOIC
OSEP	14	SOIC	OSEP	16 SOIC
OSEP	20	SOIC	OSEP	24 SOIC
OSEP	28	SOIC	OSEP	8 SOIC

The calculated failure rate for this assembly is:

**FAILURE RATE:                      MTTF (YRS): 46009                      FITS: 2.5**

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 7/1/03 and 6/30/04 .

**Assembly Information:**

Package Type:                      SOIC 150 mil  
 Flammability:                      UL 94-V0  
 Moisture Sensitivity                      Level 1  
 (JEDEC J-STD20A)  
 Date Code Range:                      0247      to      0409

**MOISTURE SENSITIVITY LEVEL 1**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
EXTERNAL VISUAL	0409	DS2129	J-STD-020, 6.1a		8	0	
ULTRASOUND			J-STD-020		8	0	
STORAGE LIFE			125C	24 HRS	8		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	8		
CONVECTION REFLOW			235C +/-0C	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	0247	DS1621	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0323	DS1100	125C, 5.5 VOLTS	1000 HRS	80	0	

HIGH TEMP OP LIFE	0324	DS2470	125C, 5.25 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0326	DS1621	125C, 5.5 VOLTS	1000 HRS	77	2	30020537
HIGH TEMP OP LIFE	0327	DS1232	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	0329	DS2502	125C, 6.0 VOLTS	1000 HRS	76	0	
HIGH TEMP OP LIFE	0330	DS4301	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0333	DS1087L	125C, 3.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0336	DS1307	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0345	DS2502	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0348	DS1086L	125C, 3.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0408	DS2502	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0409	DS2505	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0409	DS2129	125C, 5.5 VOLTS	1000 HRS	45	0	
<b>Total:</b>						<b>2</b>	

### PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY	0409	DS2129	JESD22-B102		3	0	
X-RAY	0409	DS2129	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 TEST CONDITION B		6	0	
<b>Total:</b>						<b>0</b>	

### PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0247	DS1621	J-STD-020		4	0	
STORAGE LIFE	0247	DS1621	125C	24 HRS	241		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	241		
CONVECTION REFLOW			235C +/-0C	3 PASS	241	0	
PRECONDITION U/S	0247	DS1621	J-STD-020		4	0	
ULTRASOUND	0323	DS1100	J-STD-020		4	0	
STORAGE LIFE	0323	DS1100	125C	24 HRS	241		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	241		
CONVECTION REFLOW			235C +/-0C	3 PASS	241	0	
PRECONDITION U/S	0323	DS1100	J-STD-020		4	0	
ULTRASOUND	0326	DS1621	J-STD-020		4	0	
STORAGE LIFE	0326	DS1621	125C	24 HRS	241		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	241		
CONVECTION REFLOW			235C +/-0C	3 PASS	241	0	
PRECONDITION U/S	0326	DS1621	J-STD-020		4	0	
ULTRASOUND	0327	DS1232	J-STD-020		4	0	
STORAGE LIFE	0327	DS1232	125C	24 HRS	241		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	241		

CONVECTION REFLOW	0327	DS1232	235C +5/-0C	3	PASS	241	0
PRECONDITION U/S	0327	DS1232	J-STD-020			4	0
STORAGE LIFE	0333	DS1087L	125C	24	HRS	393	
MOISTURE SOAK			85 C/85% R.H.	168	HRS	393	
CONVECTION REFLOW			235C +5/-0C	3	PASS	393	0
STORAGE LIFE	0348	DS1086L	125C	24	HRS	400	
MOISTURE SOAK			85 C/85% R.H.	168	HRS	400	
CONVECTION REFLOW			235C +5/-0C	3	PASS	400	0
STORAGE LIFE	0409	DS2129	125C	24	HRS	199	
MOISTURE SOAK			85 C/85% R.H.	168	HRS	199	
CONVECTION REFLOW			235C +5/-0C	3	PASS	199	0
<b>Total:</b>							<b>0</b>

### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0247	DS1621	150C	1000 HRS	50	0	
STORAGE LIFE	0326	DS1621	150C	1000 HRS	50	0	
STORAGE LIFE	0329	DS2502	150C	1000 HRS	76	0	
STORAGE LIFE	0345	DS2502	150C	1000 HRS	77	0	
STORAGE LIFE	0408	DS2502	150C	1000 HRS	77	0	
STORAGE LIFE	0409	DS2505	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	0247	DS1621	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0323	DS1100	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0326	DS1621	-55C TO 125C	1000 CYS	40	1	30018138
TEMP CYCLE	0327	DS1232	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0333	DS1087L	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0345	DS2502	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0348	DS1086L	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0409	DS2129	-55C TO 125C	1000 CYS	77	0	
<b>Total:</b>							<b>1</b>

### TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0247	DS1621	85/85, 5.5 VOLTS	1000 HRS	70	0	
BIASED MOISTURE	0323	DS1100	85/85, 5.5 VOLTS	1000 HRS	77	0	
BIASED MOISTURE	0326	DS1621	85/85, 5.5 VOLTS	1000 HRS	70	0	
HAST	0327	DS1232	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0333	DS1087L	130C, 85%R.H.,3.5V	96 HRS	77	0	
BIASED MOISTURE	0345	DS2502	85/85, 5.5 VOLTS	1000 HRS	77	0	

HAST	0348	DS1086L	130C, 85%R.H.,5.5V	96	HRS	77	0
<b>Total:</b>							<b>0</b>

**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0323	DS1100	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
AUTOCLAVE	0327	DS1232	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
AUTOCLAVE	0333	DS1087L	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0345	DS2502	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0348	DS1086L	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0409	DS2129	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
<b>Total:</b>							<b>0</b>

**Assembly Information:**

Package Type: SOIC 300 mil  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 1  
 Date Code Range: 0309 to 0403

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
LOW TEMP OP LIFE	0309	DS2490	25C, 6.0V(PSA) & 12.25V(PSB)	1000	HRS	80	0
HIGH TEMP OP LIFE	0320	DS1123L	125C, 3.6 VOLTS	1000	HRS	77	0
HIGH TEMP OP LIFE	0321	DS2422	125C, 5.5V (PSA) & 3.0V (PSB)	1000	HRS	77	0
HIGH TEMP OP LIFE	0340	DS2422	125C, 5.5V (PSA) & 3.0V (PSB)	1000	HRS	77	0
HIGH TEMP OP LIFE	0403	DS12R885-5	125C, 5.5 VOLTS	1000	HRS	77	0
<b>Total:</b>							<b>0</b>

**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0320	DS1123L	150C	1000	HRS	77	0
<b>Total:</b>							<b>0</b>

**FAILURE RATE: MTTF (YRS): 46009 FITS: 2.5**