

RELIABILITY MONITOR REPORT  
FOR

**Flip Chip 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		
Dallas		Bump, 1 layer, glob	Dallas	Bump, 1 layer, no encap.
Dallas		Bump, 1 layer, underfill	Dallas	Bump, 2 layer, glob
Dallas		Bump, 2 layer, no encap.	Dallas	Bump, 2 layer, underfill
Dallas		Bump, 2 layer, underfill, resistor	Dallas	Bump, RDL layer, BCB Passivation

The calculated failure rate for this assembly is:

**FAILURE RATE:**                      **MTTF (YRS): 16392**                      **FITS: 7.0**

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 10/1/03 and 9/30/04 .

**Assembly Information:**

Package Type:                      Flip Chip RDL (Solder Bump)  
 Flammability:                      UL 94-V0  
 Moisture Sensitivity  
 (JEDEC J-STD20A)                      Level 1  
 Date Code Range:                      0411                      to 0411

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0411	DS2411	125C, 5.25 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0411	DS2411	125C, 5.25 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0411	DS2411	125C, 5.25 VOLTS	1000 HRS	45	0	
<b>Total:</b>						<b>0</b>	

**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0411	DS2411	125C	1000 HRS	77	0	
STORAGE LIFE	0411	DS2411	125C	1000 HRS	77	0	
STORAGE LIFE	0411	DS2411	125C	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	0411	DS2411	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0411	DS2411	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0411	DS2411	-40 TO 85C	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	0411	DS2411	85/85, 5.5 VOLTS	1000 HRS	77	2	30022659
BIASED MOISTURE	0411	DS2411	85/85, 5.5 VOLTS	1000 HRS	77	0	
BIASED MOISTURE	0411	DS2411	85/85, 5.5 VOLTS	1000 HRS	77	2	30022660
<b>Total:</b>						<b>4</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0411	DS2411	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0411	DS2411	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0411	DS2411	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
<b>Total:</b>						<b>0</b>	

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**Assembly Information:**

Package Type: Flip Chip (Solder Bump)  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 1  
Date Code Range: 0413 to 0414

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0413	DS2401	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE	0413	DS2401	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE	0413	DS2401	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE	0413	DS2401	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE	0414	DS2502	-40 TO 85C	1000 CYS	80	1	30021606
TEMP CYCLE	0414	DS2502	-40 TO 85C	1000 CYS	80	0	
<b>Total:</b>						<b>1</b>	

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**Assembly Information:**

Package Type: Flip Chip RDL (Solder Bump)  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 1  
Date Code Range: 0418 to 0428

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0418	DS2502	125C, 6.0 VOLTS	1000 HRS	48	0	
HIGH TEMP OP LIFE	0418	DS2502	125C, 6.0 VOLTS	1000 HRS	48	0	
HIGH TEMP OP LIFE	0418	DS2502	125C, 6.0 VOLTS	1000 HRS	48	0	
<b>Total:</b>						<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0418	DS2502	125C	1000 HRS	80	0	
STORAGE LIFE	0418	DS2502	125C	1000 HRS	80	0	
STORAGE LIFE	0418	DS2502	125C	1000 HRS	80	0	
					<b>Total:</b>	<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0418	DS2502	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE	0418	DS2502	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE	0418	DS2502	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE	0428	DS2761	-40 TO 85C	1000 CYS	80	0	
TEMP CYCLE, SLOW	0428	DS2761	-40C TO +125C	1500 CYS	80	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	0418	DS2502	85/85, 5.5 VOLTS	1000 HRS	80	0	
BIASED MOISTURE	0418	DS2502	85/85, 5.5 VOLTS	1000 HRS	80	0	
BIASED MOISTURE	0418	DS2502	85/85, 5.5 VOLTS	1000 HRS	80	0	
					<b>Total:</b>	<b>0</b>	

**FAILURE RATE:****MTTF (YRS): 16392****FITS: 7.0**