

RELIABILITY MONITOR REPORT
FOR

Single Piece Module 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		
Carsem	48	Single Piece BGA Module w/Batter	Dallas	256 Single Piece BGA Module w/Batter
Dallas	256	Single Piece BGA Module w/Batter	Dallas	256 Single Piece BGA Module w/Batter

The calculated failure rate for this assembly is:

FAILURE RATE: **MTTF (YRS): 1622** **FITS: 70.4**

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. A 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 7/1/2005 and 6/30/2006 .

Assembly Information:

Package Type: SPM 15.3x11.8x3.06
 Flammability: UL 94-V0
 Moisture Sensitivity Level 4
 (JEDEC J-STD20A)
 Date Code Range: 0522 to 0527

MOISTURE SENSITIVITY LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0522	DS12R887	J-STD-020		8	0	
STORAGE LIFE			125C	48 HRS	8		
MOISTURE SOAK			30C/60% R.H.	192 HRS	8		
CONVECTION REFLOW			220C +5/-0C	2 PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		8	0	
PRECONDITION U/S			J-STD-020		8	0	
ULTRASOUND	0527	DS12R887	J-STD-020		8	0	
STORAGE LIFE			125C	48 HRS	8		
MOISTURE SOAK			30C/60% R.H.	192 HRS	8		
CONVECTION REFLOW			220C +5/-0C	2 PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		8	0	
PRECONDITION U/S			J-STD-020		8	0	
ULTRASOUND	0527	DS12R887	J-STD-020		8	0	
STORAGE LIFE			125C	48 HRS	8		
MOISTURE SOAK			30C/60% R.H.	192 HRS	8		
CONVECTION REFLOW			220C +5/-0C	2 PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		8	0	
PRECONDITION U/S			J-STD-020		8	0	
Total:						0	

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0522	DS12R887	85 C, 3.3 VOLTS	1000 HRS	45	0	

HIGH TEMP OP LIFE	0527	DS12R887	85 C, 3.3 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0527	DS12R887	85 C, 3.3 VOLTS	1000 HRS	45	0
Total:						0

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
X-RAY	0522	DS12R887	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
X-RAY	0527	DS12R887	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
X-RAY	0527	DS12R887	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
Total:						0	

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0522	DS12R887	125C	48 HRS	271		
MOISTURE SOAK			30C/60% R.H.	192 HRS	271		
CONVECTION REFLOW			220C +5/-0C	2 PASS	271	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		271	0	
X-RAY			MIL-STD-883-2012 : TOP & SIDE VIEW		271	0	
STORAGE LIFE	0527	DS12R887	125C	48 HRS	270		
MOISTURE SOAK			30C/60% R.H.	192 HRS	270		
CONVECTION REFLOW			220C +5/-0C	2 PASS	270	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		271	0	
X-RAY			MIL-STD-883-2012 : TOP & SIDE VIEW		271	0	
STORAGE LIFE	0527	DS12R887	125C	48 HRS	271		
MOISTURE SOAK			30C/60% R.H.	192 HRS	271		
CONVECTION REFLOW			220C +5/-0C	2 PASS	271	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		271	0	
X-RAY			MIL-STD-883-2012 : TOP & SIDE VIEW		271	0	
Total:						0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0522	DS12R887	85 C	1000 HRS	76	0	
STORAGE LIFE	0527	DS12R887	85 C	1000 HRS	76	0	
STORAGE LIFE	0527	DS12R887	85 C	1000 HRS	77	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0522	DS12R887	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0527	DS12R887	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0527	DS12R887	-40 TO 85C	1000 CYS	77	0	
Total:						0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0522	DS12R887	85/85, 3.5 VOLTS	1000 HRS	72	0	

BIASED MOISTURE	0527	DS12R887	85/85, 3.5 VOLTS	1000 HRS	70	0
BIASED MOISTURE	0527	DS12R887	85/85, 3.5 VOLTS	1000 HRS	72	0
Total:						0

Assembly Information:

Package Type: SPM (RoHS) 27x27x7.9
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 3
 Date Code Range: 0606 to 0615

MECHANICAL LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MECHANICAL SHOCK	0606	DS3065W	200G, 1/2 SINE, 6 MS	30 CYS	22	0	
VIBRATION, VARIABLE FREQUENCY	0606	DS3065W	10g or 0.06", 5Hz-2KHz, X Y Z axis	9 HRS	22	0	
MECHANICAL SHOCK	0615	DS2045W	200G, 1/2 SINE, 6 MS	30 CYS	22	0	
VIBRATION, VARIABLE FREQUENCY	0615	DS2045W	10g or 0.06", 5Hz-2KHz, X Y Z axis	9 HRS	22	0	
MECHANICAL SHOCK	0615	DS3065W	200G, 1/2 SINE, 6 MS	30 CYS	22	0	
VIBRATION, VARIABLE FREQUENCY	0615	DS3065W	10g or 0.06", 5Hz-2KHz, X Y Z axis	9 HRS	22	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
X-RAY	0606	DS3065W	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
X-RAY	0615	DS2045W	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
X-RAY	0615	DS3065W	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
Total:						0	

PRECONDITIONING LEVEL 3

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0606	DS3065W	125C	48 HRS	275		
MOISTURE SOAK			30C/60% R.H.	192 HRS	275		
CONVECTION REFLOW			220C +5/-0C	2 PASS	275		
GROSS LEAK			25 C, AIR PRESSURE DECAY		275	0	
STORAGE LIFE	0615	DS2045W	125C	48 HRS	275		
MOISTURE SOAK			30C/60% R.H.	192 HRS	275		
CONVECTION REFLOW			220C +5/-0C	2 PASS	275		
GROSS LEAK			25 C, AIR PRESSURE DECAY		275	0	
STORAGE LIFE	0615	DS3065W	125C	48 HRS	275		
MOISTURE SOAK			30C/60% R.H.	192 HRS	275		
CONVECTION REFLOW			220C +5/-0C	2 PASS	275		
GROSS LEAK			25 C, AIR PRESSURE DECAY		275	0	
Total:						0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0606	DS3065W	85 C	1000 HRS	77	0	
STORAGE LIFE	0615	DS2045W	85 C	1000 HRS	77	0	
STORAGE LIFE	0615	DS3065W	85 C	1000 HRS	77	0	
					Total:	0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0606	DS3065W	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0615	DS2045W	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0615	DS3065W	-40 TO 85C	1000 CYS	77	0	
					Total:	0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
FLUX DIP & H2O RINSE	0606	DS3065W	JESD22-A113	1 HRS	77	0	
BIASED MOISTURE (BATTERY)			60C/90% R.H., BATTERY BIAS	1000 HRS	77	0	
FLUX DIP & H2O RINSE	0615	DS2045W	JESD22-A113	1 HRS	77	0	
BIASED MOISTURE (BATTERY)			60C/90% R.H., BATTERY BIAS	1000 HRS	77	0	
FLUX DIP & H2O RINSE	0615	DS3065W	JESD22-A113	1 HRS	77	0	
BIASED MOISTURE (BATTERY)			60C/90% R.H., BATTERY BIAS	1000 HRS	77	0	
					Total:	0	

FAILURE RATE:**MTTF (YRS): 1622****FITS: 70.4**