

RELIABILITY MONITOR REPORT  
FOR

**SPM 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<br>w/Battery & Crystal               | Dallas | 256 Single Piece BGA Module<br>w/Battery & Crystal     |
| Dallas    | 256  | Single Piece BGA Module<br>w/Battery & Crystal (Server RoHS) | Dallas | 256 Single Piece BGA Module<br>w/Battery (Server RoHS) |

Note: Due to the nature of the construction on this assembly, there is no operating life data collected.

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 4/1/2006 and 3/31/2007.

**Assembly Information:**

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

**MECHANICAL LIFE**

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

**PACKAGE TESTS**

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

**PRECONDITIONING LEVEL 3**

| DESCRIPTION       | DATE CODE | TEST VEHICLE | CONDITION                | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|--------------------------|-----------|----------|-------|-------|
| 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**

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**STORAGE LIFE**

| DESCRIPTION   | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS    | FA NO |
|---------------|-----------|--------------|-----------|-----------|----------|----------|-------|
| STORAGE LIFE  | 0615      | DS2045W      | 85 C      | 1000 HRS  | 77       | 0        |       |
| STORAGE LIFE  | 0615      | DS3065W      | 85 C      | 1000 HRS  | 77       | 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    | 0615      | DS2045W      | -40 TO 85C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE    | 0615      | DS3065W      | -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 |
|---------------------------|-----------|--------------|----------------------------|-----------|----------|----------|-------|
| 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        |       |
| <b>Total:</b>             |           |              |                            |           |          | <b>0</b> |       |