



4/8/2009

RELIABILITY MONITOR REPORT  
FOR

**LQFP Package**

**MAXIM Integrated Products**

120 San Gabriel Dr.  
Sunnyvale, CA 94086

This Report was prepared by  
Maxim Reliability Engineering

**Summary:**

The data in the tables that follow was generated as the result of an on-going Package Reliability Monitor. The specific assemblies included in this package monitor are:

| ASSY SITE      | PINS | PACKAGE                    | ASSY SITE      | PINS | PACKAGE        |
|----------------|------|----------------------------|----------------|------|----------------|
| ATK (Amkor, K) | 48   | LQFP (Pb-Free)             | ATK (Amkor, K) | 144  | LQFP (Pb-Free) |
| ATK (Amkor, K) | 144  | LQFP Exposed Pad (Pb-Free) |                |      |                |

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 57342 FITS: 2.0**

The parameters used to calculate this failure rate are as follows:

**Cf: 60% Ea: 0.7 Tu: 25 °C**

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 7/1/2007 and 6/30/2008.

**Assembly Information:**

Package Type: LQFP (Pb-Free)  
Date Code Range: 0716 to 0811

**OPERATING LIFE**

| DESCRIPTION       | DATE CODE | TEST VEHICLE | CONDITION       | READPOINT | QUANTITY | FAILS    | FA NO |
|-------------------|-----------|--------------|-----------------|-----------|----------|----------|-------|
| HIGH TEMP OP LIFE | 0716      | DS26900      | 125C, 3.5 VOLTS | 1000 HRS  | 45       | 0        |       |
| HIGH TEMP OP LIFE | 0724      | DS8007       | 125C, 6.0 VOLTS | 1000 HRS  | 45       | 0        |       |
| HIGH TEMP OP LIFE | 0724      | DS8007       | 125C, 6.0 VOLTS | 1000 HRS  | 45       | 0        |       |
| HIGH TEMP OP LIFE | 0740      | DS8007       | 125C, 6.0 VOLTS | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0740      | DS8007       | 125C, 6.0 VOLTS | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0740      | DS8007       | 125C, 6.0 VOLTS | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0740      | DS8007       | 125C, 6.0 VOLTS | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0811      | DS26303      | 125C, 3.5 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  | 0740      | DS8007       | 150C      | 1000 HRS  | 77       | 0        |       |
| STORAGE LIFE  | 0740      | DS8007       | 150C      | 1000 HRS  | 77       | 0        |       |
| STORAGE LIFE  | 0740      | DS8007       | 150C      | 1000 HRS  | 77       | 0        |       |
| STORAGE LIFE  | 0740      | DS8007       | 150C      | 1000 HRS  | 77       | 0        |       |
| <b>Total:</b> |           |              |           |           |          | <b>0</b> |       |

**TEMPERATURE CYCLE**

| DESCRIPTION                    | DATE CODE | TEST VEHICLE | CONDITION                 | READPOINT | QUANTITY | FAILS | FA NO |
|--------------------------------|-----------|--------------|---------------------------|-----------|----------|-------|-------|
| BOND STRENGTH                  | 0740      | DS8007       | MIL-STD-883-2011 : COND D | 40 WIRES  | 5        | 0     |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0740      | DS8007       | -65C TO 150C              | 1000 CYS  | 77       | 0     |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0740      | DS8007       | -65C TO 150C              | 1000 CYS  | 77       | 0     |       |

|                                   |      |        |                           |      |       |          |          |
|-----------------------------------|------|--------|---------------------------|------|-------|----------|----------|
| BOND STRENGTH                     | 0740 | DS8007 | MIL-STD-883-2011 : COND D | 40   | WIRES | 5        | 0        |
| BOND STRENGTH                     | 0740 | DS8007 | MIL-STD-883-2011 : COND D | 40   | WIRES | 5        | 0        |
| TEMP CYCLE, 5' RAMP,<br>10' DWELL | 0740 | DS8007 | -65C TO 150C              | 1000 | CYS   | 77       | 0        |
| TEMP CYCLE, 5' RAMP,<br>10' DWELL | 0740 | DS8007 | -65C TO 150C              | 1000 | CYS   | 77       | 0        |
| BOND STRENGTH                     | 0740 | DS8007 | MIL-STD-883-2011 : COND D | 40   | WIRES | 5        | 0        |
| <b>Total:</b>                     |      |        |                           |      |       | <b>0</b> | <b>0</b> |

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#### TEMPERATURE HUMIDITY BIAS

| DESCRIPTION   | DATE<br>CODE | TEST<br>VEHICLE | CONDITION          | READPOINT | QUANTITY | FAILS    | FA NO    |
|---------------|--------------|-----------------|--------------------|-----------|----------|----------|----------|
| HAST          | 0740         | DS8007          | 130C, 85%R.H.,5.5V | 96        | HRS      | 77       | 0        |
| HAST          | 0740         | DS8007          | 130C, 85%R.H.,5.5V | 96        | HRS      | 77       | 0        |
| HAST          | 0740         | DS8007          | 130C, 85%R.H.,5.5V | 96        | HRS      | 77       | 0        |
| HAST          | 0740         | DS8007          | 130C, 85%R.H.,5.5V | 96        | HRS      | 77       | 0        |
| <b>Total:</b> |              |                 |                    |           |          | <b>0</b> | <b>0</b> |

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#### UNBIASED MOISTURE RESISTANCE

| DESCRIPTION   | DATE<br>CODE | TEST<br>VEHICLE | CONDITION                      | READPOINT | QUANTITY | FAILS    | FA NO    |
|---------------|--------------|-----------------|--------------------------------|-----------|----------|----------|----------|
| AUTOCLAVE     | 0740         | DS8007          | 121C, 2 ATM STEAM, UNBIASED168 | HRS       | 76       | 0        |          |
| AUTOCLAVE     | 0740         | DS8007          | 121C, 2 ATM STEAM, UNBIASED168 | HRS       | 76       | 0        |          |
| AUTOCLAVE     | 0740         | DS8007          | 121C, 2 ATM STEAM, UNBIASED168 | HRS       | 76       | 0        |          |
| AUTOCLAVE     | 0740         | DS8007          | 121C, 2 ATM STEAM, UNBIASED168 | HRS       | 76       | 0        |          |
| <b>Total:</b> |              |                 |                                |           |          | <b>0</b> | <b>0</b> |

**FAILURE RATE: MTTF (YRS): 57342 FITS: 2.0**