

**4/17/2013**



**RELIABILITY MONITOR REPORT  
FOR**

**uMAX Package**

**MAXIM INTEGRATED**

**160 RIO ROBLES  
SAN JOSE, CA 95134**

**This Report was prepared by  
MAXIM INTEGRATED 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           |                 |                     |
|-----------------|------|-------------------|-----------------|---------------------|
| ATP (Amkor, PI) | 8    | uMax (Pb-Free)    | ATP (Amkor, PI) | 10 uMax (Pb-Free)   |
| Unisem Malaysia | 8    | uMax (Pb-Free)    | UTL Thailand    | 8 uMax (Pb-Free)    |
| UTL Thailand    | 10   | uMax (Pb-Free)    | UTL Thailand    | 8 uMax-EP (Pb-Free) |
| UTL Thailand    | 10   | uMax-EP (Pb-Free) |                 |                     |

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 62279 FITS: 1.8**

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

**Cf: 60% Ea: 0.7 Tu: 25 °C**

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 4/1/2012 and 3/31/2013.

## Assembly Information:

Package Type: uMax (Pb-Free)  
Date Code Range: 1147 to 1240

## OPERATING LIFE

| DESCRIPTION       | DATE CODE | TEST VEHICLE  | CONDITION       | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|---------------|-----------------|-----------|----------|-------|-------|
| HIGH TEMP OP LIFE | 1147      | DS1308        | 125C, 5.5 VOLTS | 240 HRS   | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1205      | MAX5217GUA+   | 135°C           | 192 HRS   | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1209      | MAX44246AUA+  | 135°C           | 192 HRS   | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1213      | MAX1744EUB/V+ | 135°C           | 1000 HRS  | 79       | 0     |       |
| HIGH TEMP OP LIFE | 1213      | MAX1744EUB/V+ | 135°C           | 500 HRS   | 79       | 0     |       |
| HIGH TEMP OP LIFE | 1217      | MAX2750AUA+   | 135°C           | 500 HRS   | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1218      | MAX5805AAUB+  | 135°C           | 192 HRS   | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1224      | DS1339A       | 125C, 5.5 VOLTS | 192 HRS   | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1231      | DS1390        | 125C, 5.5 VOLTS | 192 HRS   | 45       | 0     |       |
| HIGH TEMP OP LIFE | 1231      | DS1390        | 125C, 5.5 VOLTS | 192 HRS   | 45       | 0     |       |
| HIGH TEMP OP LIFE | 1233      | MAX14639EUB+  | 135°C           | 192 HRS   | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1236      | MAX31180      | 125C, 3.6 VOLTS | 1000 HRS  | 80       | 0     |       |
| HIGH TEMP OP LIFE | 1238      | MAX3747BEUB+  | 135°C           | 500 HRS   | 34       | 0     |       |
| HIGH TEMP OP LIFE | 1240      | MAX14654EUB+  | 135°C           | 192 HRS   | 79       | 0     |       |
| Total:            |           |               |                 |           |          | 0     |       |

## STORAGE LIFE

| DESCRIPTION  | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|--------------|-----------|--------------|-----------|-----------|----------|-------|-------|
| STORAGE LIFE | 1210      | MAX31722     | 150°C     | 1000 HRS  | 50       | 0     |       |

|               |      |                |       |      |     |          |   |
|---------------|------|----------------|-------|------|-----|----------|---|
| STORAGE LIFE  | 1213 | MAX1744EUB/V+  | 150°C | 500  | HRS | 50       | 0 |
| STORAGE LIFE  | 1224 | MAX16916GUB/V+ | 150°C | 1000 | HRS | 50       | 0 |
| STORAGE LIFE  | 1224 | MAX16916GUB/V+ | 150°C | 500  | HRS | 80       | 0 |
| <b>Total:</b> |      |                |       |      |     | <b>0</b> |   |

#### TEMPERATURE CYCLE

| DESCRIPTION                    | DATE CODE | TEST VEHICLE   | CONDITION    | READPOINT | QUANTITY | FAILS    | FA NO |
|--------------------------------|-----------|----------------|--------------|-----------|----------|----------|-------|
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1210      | MAX31722       | -55C TO 125C | 1000      | CYS      | 77       | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1213      | MAX1744EUB/V+  | -65C TO 150C | 500       | CYS      | 80       | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1214      | MAX3747AEUB+   | -65C TO 150C | 1000      | CYS      | 77       | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1214      | MAX3747AEUB+   | -65C TO 150C | 1000      | CYS      | 77       | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1215      | MAX1744EUB+    | -65C TO 150C | 500       | CYS      | 80       | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1218      | MAX1744EUB/V+  | -65C TO 150C | 500       | CYS      | 80       | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1224      | MAX16916GUB/V+ | -65C TO 150C | 500       | CYS      | 80       | 0     |
| <b>Total:</b>                  |           |                |              |           |          | <b>0</b> |       |

#### TEMPERATURE HUMIDITY BIAS

| DESCRIPTION     | DATE CODE | TEST VEHICLE   | CONDITION           | READPOINT | QUANTITY | FAILS    | FA NO |
|-----------------|-----------|----------------|---------------------|-----------|----------|----------|-------|
| HAST            | 1210      | MAX31722       | 130C, 85%R.H., 3.7V | 96        | HRS      | 79       | 0     |
| BIASED MOISTURE | 1224      | MAX16916GUB/V+ | 130C, 85% R.H.      | 100       | HRS      | 80       | 0     |
| BIASED MOISTURE | 1228      | MAX9924UAUB/V+ | 130C, 85% R.H.      | 96        | HRS      | 80       | 0     |
| BIASED MOISTURE | 1228      | MAX9924UAUB/V+ | 130C, 85% R.H.      | 96        | HRS      | 80       | 0     |
| BIASED MOISTURE | 1228      | MAX9924UAUB/V+ | 130C, 85% R.H.      | 96        | HRS      | 80       | 0     |
| <b>Total:</b>   |           |                |                     |           |          | <b>0</b> |       |

#### UNBIASED MOISTURE RESISTANCE

| DESCRIPTION   | DATE CODE | TEST VEHICLE  | CONDITION      | READPOINT | QUANTITY | FAILS    | FA NO |
|---------------|-----------|---------------|----------------|-----------|----------|----------|-------|
| HAST, NO BIAS | 1210      | MAX31722      | 130C, 85% R.H. | 96        | HRS      | 77       | 0     |
| MOISTURE SOAK | 1213      | MAX1744EUB/V+ | 130C, 85% R.H. | 240       | HRS      | 80       | 0     |
| MOISTURE SOAK | 1213      | MAX1744EUB/V+ | 85 C/85% R.H.  | 240       | HRS      | 80       | 0     |
| MOISTURE SOAK | 1213      | MAX1744EUB/V+ | 85 C/85% R.H.  | 1000      | HRS      | 80       | 0     |
| MOISTURE SOAK | 1215      | MAX1744EUB+   | 85 C/85% R.H.  | 1000      | HRS      | 80       | 0     |
| MOISTURE SOAK | 1218      | MAX1744EUB/V+ | 85 C/85% R.H.  | 1000      | HRS      | 78       | 0     |
| <b>Total:</b> |           |               |                |           |          | <b>0</b> |       |

#### Assembly Information:

Package Type: uMax-EP (Pb-Free)

Date Code Range: to 1231

| DESCRIPTION   | DATE CODE | TEST VEHICLE  | CONDITION | READPOINT | QUANTITY | FAILS    | FA NO |
|---------------|-----------|---------------|-----------|-----------|----------|----------|-------|
| STORAGE LIFE  | 1114      | MAX11666AUB+  | 150°C     | 500       | HRS      | 45       | 0     |
| STORAGE LIFE  | 1231      | MAX1792EUA33+ | 150°C     | 500       | HRS      | 50       | 0     |
| <b>Total:</b> |           |               |           |           |          | <b>0</b> |       |

| DESCRIPTION                    | DATE CODE | TEST VEHICLE    | CONDITION    | READPOINT | QUANTITY | FAILS | FA NO |
|--------------------------------|-----------|-----------------|--------------|-----------|----------|-------|-------|
| TEMP CYCLE, 5' RAMP, 10' DWELL |           | MAX44247AUA+    | -65C TO 150C | 1000      | CYS      | 74    | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1114      | MAX11666AUB+    | -65C TO 150C | 500       | CYS      | 77    | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1231      | MAX1792EUA33/V+ | -65C TO 150C | 500       | CYS      | 80    | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1231      | MAX1792EUA33/V+ | -65C TO 150C | 500       | CYS      | 80    | 0     |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1231      | MAX1792EUA33/V+ | -65C TO 150C | 500       | CYS      | 80    | 0     |
| Total:                         |           |                 |              |           |          | 0     |       |

| DESCRIPTION     | DATE CODE | TEST VEHICLE    | CONDITION      | READPOINT | QUANTITY | FAILS    | FA NO |
|-----------------|-----------|-----------------|----------------|-----------|----------|----------|-------|
| BIASED MOISTURE | 1231      | MAX1792EUA33/V+ | 130C, 85% R.H. | 100       | HRS      | 80       | 0     |
| BIASED MOISTURE | 1231      | MAX1792EUA33/V+ | 130C, 85% R.H. | 100       | HRS      | 79       | 0     |
| <b>Total:</b>   |           |                 |                |           |          | <b>0</b> |       |

| DESCRIPTION   | DATE CODE | TEST VEHICLE    | CONDITION      | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|-----------------|----------------|-----------|----------|-------|-------|
| MOISTURE SOAK | 1114      | MAX11666AUB+    | 130C, 85% R.H. | 100       | HRS      | 77    | 0     |
| MOISTURE SOAK | 1231      | MAX1792EUA33/V+ | 130C, 85% R.H. | 100       | HRS      | 80    | 0     |
| MOISTURE SOAK | 1231      | MAX1792EUA33/V+ | 130C, 85% R.H. | 100       | HRS      | 80    | 0     |
| Total:        |           |                 |                |           |          | 0     |       |

**FAILURE RATE:     MTTF (YRS): 62279     FITS: 1.8**

# Mouser Electronics

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