



5/18/2009

RELIABILITY MONITOR REPORT  
FOR

**PDIP Package**

**MAXIM Integrated Products**

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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        |                 |                   |
|-----------------|------|----------------|-----------------|-------------------|
| ATP (Amkor, PI) | 20   | PDIP (Pb-Free) | Cirtek          | 28 PDIP (Pb-Free) |
| Cirtek          | 40   | PDIP (Pb-Free) | ISPL (ATEC, PI) | 28 PDIP (Pb-Free) |
| UTL (NSEB) UTAC | 8    | PDIP (Pb-Free) |                 |                   |

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 151673 FITS: 0.8**

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 and

**Assembly Information:**

Package Type: PDIP (Pb-Free)  
Date Code Range: 0736 to 0833

**OPERATING LIFE**

| DESCRIPTION       | DATE CODE | TEST VEHICLE | CONDITION        | READPOINT | QUANTITY | FAILS    | FA NO |
|-------------------|-----------|--------------|------------------|-----------|----------|----------|-------|
| HIGH TEMP OP LIFE | 0736      | MAX3223EPP+  | 135C             | 1000 HRS  | 240      | 0        |       |
| HIGH TEMP OP LIFE | 0750      | DS1302       | 125C, 5.5 VOLTS  | 1000 HRS  | 80       | 0        |       |
| HIGH TEMP OP LIFE | 0808      | DS80C320     | 125C, 5.5 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0808      | DS80C320     | 125C, 5.5 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0808      | DS80C320     | 125C, 5.5 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0808      | DS80C320     | 125C, 5.5 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0810      | DS1284       | 125C, 7.0 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0810      | DS1284       | 125C, 7.0 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0810      | DS1284       | 125C, 7.0 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0810      | DS80C320     | 125C, 5.5 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0810      | DS80C320     | 125C, 5.5 VOLTS  | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0817      | DS2432       | 125C, 5.25 VOLTS | 1000 HRS  | 77       | 0        |       |
| HIGH TEMP OP LIFE | 0833      | DS1501       | 125C, 6.0 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 | 0750      | DS1302       | 150C      | 1000 HRS  | 77       | 0     |       |
| STORAGE LIFE | 0808      | DS80C320     | 150C      | 1000 HRS  | 77       | 0     |       |
| STORAGE LIFE | 0808      | DS80C320     | 150C      | 1000 HRS  | 77       | 0     |       |
| STORAGE LIFE | 0808      | DS80C320     | 150C      | 1000 HRS  | 77       | 0     |       |

|               |      |          |      |          |    |          |
|---------------|------|----------|------|----------|----|----------|
| STORAGE LIFE  | 0808 | DS80C320 | 150C | 1000 HRS | 77 | 0        |
| STORAGE LIFE  | 0810 | DS1284   | 150C | 1000 HRS | 77 | 0        |
| STORAGE LIFE  | 0810 | DS1284   | 150C | 1000 HRS | 77 | 0        |
| STORAGE LIFE  | 0810 | DS1284   | 150C | 1000 HRS | 77 | 0        |
| STORAGE LIFE  | 0810 | DS80C320 | 150C | 1000 HRS | 77 | 0        |
| STORAGE LIFE  | 0810 | DS80C320 | 150C | 1000 HRS | 77 | 0        |
| STORAGE LIFE  | 0833 | DS1501   | 150C | 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, 5' RAMP, 10' DWELL | 0750      | DS1302       | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0808      | DS80C320     | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0808      | DS80C320     | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0808      | DS80C320     | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0808      | DS80C320     | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0810      | DS1284       | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0810      | DS1284       | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0810      | DS1284       | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0810      | DS80C320     | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0810      | DS80C320     | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0817      | DS2432       | -55C TO 125C | 1000 CYS  | 77       | 0        |       |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 0833      | DS1501       | -55C TO 125C | 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 | 0750      | DS1302       | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0808      | DS80C320     | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0808      | DS80C320     | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0808      | DS80C320     | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0808      | DS80C320     | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0810      | DS1284       | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0810      | DS1284       | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0810      | DS1284       | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0810      | DS80C320     | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |
| BIASED MOISTURE | 0810      | DS80C320     | 85/85, 5.5 VOLTS | 1000 HRS  | 77       | 0     |       |

|                 |      |        |                  |      |     |               |          |
|-----------------|------|--------|------------------|------|-----|---------------|----------|
| BIASED MOISTURE | 0833 | DS1501 | 85/85, 5.5 VOLTS | 1000 | HRS | 77            | 0        |
|                 |      |        |                  |      |     | <b>Total:</b> | <b>0</b> |

**UNBIASED MOISTURE RESISTANCE**

| DESCRIPTION   | DATE<br>CODE | TEST<br>VEHICLE | CONDITION      | READPOINT | QUANTITY | FAILS         | FA NO    |
|---------------|--------------|-----------------|----------------|-----------|----------|---------------|----------|
| HAST, NO BIAS | 0750         | DS1302          | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
| HAST, NO BIAS | 0808         | DS80C320        | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
| HAST, NO BIAS | 0808         | DS80C320        | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
| HAST, NO BIAS | 0808         | DS80C320        | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
| HAST, NO BIAS | 0808         | DS80C320        | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
| HAST, NO BIAS | 0810         | DS80C320        | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
| HAST, NO BIAS | 0810         | DS80C320        | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
| HAST, NO BIAS | 0833         | DS1501          | 130C, 85% R.H. | 96        | HRS      | 77            | 0        |
|               |              |                 |                |           |          | <b>Total:</b> | <b>0</b> |

**WE ENDURANCE AND DATA RET'N**

| DESCRIPTION                  | DATE<br>CODE | TEST<br>VEHICLE | CONDITION       | READPOINT | QUANTITY | FAILS         | FA NO    |
|------------------------------|--------------|-----------------|-----------------|-----------|----------|---------------|----------|
| WRITE CYCLE STRESS<br>(KCYS) | 0817         | DS2432          | 25 C, 5.0 VOLTS | 50        | KCYS     | 77            | 0        |
| STORAGE LIFE                 | 0817         | DS2432          | 150C            | 1000      | HRS      | 77            | 0        |
|                              |              |                 |                 |           |          | <b>Total:</b> | <b>0</b> |

**FAILURE RATE: MTTF (YRS): 151673 FITS: 0.8**