

2/15/2020



**RELIABILITY MONITOR REPORT
FOR**

iButton 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 |
|-----------|--------------|
| MPOC | 2 iButton |

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 10/1/2019 and 1/31/2020

Assembly Information:

Package Type: iButton
 Flammability: UL 94-V0
 Date Code Range: 1848 to 1946

PACKAGE TESTS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|------------------------------|-----------|--------------|-----------|-----------|----------|----------|-------|
| Variable Frequency Vibration | | 90-1990A+F50 | | 1 | 50 | 0 | |
| Variable Frequency Vibration | | 90-1990A+F50 | | 1 | 50 | 0 | |
| Variable Frequency Vibration | 1907 | 90-1921G#F50 | | 1 | 50 | 0 | |
| Variable Frequency Vibration | 1907 | 90-1921G#F50 | | 1 | 50 | 0 | |
| Total: | | | | | | 0 | |

STORAGE LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|--------------|-----------|--------------|-----------|-----------|----------|-------|-------|
| STORAGE LIFE | | 90-1921G#F50 | 150°C | 1000 HRS | 85 | 0 | |
| STORAGE LIFE | | 90-1990A+F50 | 150°C | 1000 HRS | 85 | 0 | |
| STORAGE LIFE | 1848 | 90-19850+F30 | 150°C | 1000 HRS | 85 | 0 | |
| STORAGE LIFE | 1848 | 90-19850+F30 | 150°C | 1000 HRS | 85 | 0 | |
| STORAGE LIFE | 1851 | 90-1921G#F50 | 150°C | 1000 HRS | 85 | 0 | |
| STORAGE LIFE | 1904 | 90-1922L#F51 | 150°C | 1000 HRS | 85 | 0 | |
| STORAGE LIFE | 1907 | 90-1921G#F50 | 150°C | 1000 HRS | 80 | 0 | |
| STORAGE LIFE | 1907 | 90-1921G#F50 | 150°C | 1000 HRS | 80 | 0 | |
| STORAGE LIFE | 1907 | 90-1921G#F50 | 150°C | 1000 HRS | 80 | 0 | |

| | | | | | | | |
|---------------|------|--|-------|----------|--|----|----------|
| STORAGE LIFE | 1907 | 90- 1921G#F50 | 150°C | 1000 | | 80 | 0 |
| STORAGE LIFE | 1907 | 90- 1921G#F50 | 150°C | 1000 HRS | | 80 | 0 |
| STORAGE LIFE | 1907 | 90- 1921G#F50 | 150°C | 1000 | | 80 | 0 |
| STORAGE LIFE | 1916 | 90- 1990A+F50 | 150°C | 1000 HRS | | 80 | 0 |
| STORAGE LIFE | 1916 | 90- 1990A+F50 | 150°C | 1000 HRS | | 80 | 0 |
| STORAGE LIFE | 1926 | 90- 1904L#F50 | 150°C | 1000 HRS | | 80 | 0 |
| STORAGE LIFE | 1926 | 90- 1904L#F50 | 150°C | 1000 | | 80 | 0 |
| STORAGE LIFE | 1926 | 90- 1995L+F50 | 150°C | 1000 HRS | | 80 | 0 |
| STORAGE LIFE | 1926 | 90- 1995L+F50 | 150°C | 1000 | | 80 | 0 |
| STORAGE LIFE | 1931 | 90- 12887+C06/ DS12C887+ | 150°C | 1000 HRS | | 80 | 0 |
| STORAGE LIFE | 1931 | 90- 12887+C06 / DS12C887+ | 150°C | 1000 HRS | | 80 | 0 |
| STORAGE LIFE | 1931 | 90- 1904L#F50 / DS1904L- F5# | 150°C | 1000 | | 80 | 0 |
| STORAGE LIFE | 1931 | 90- 1904L#F50 / DS1904L- F5# | 150°C | 1000 | | 80 | 0 |
| STORAGE LIFE | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | 150°C | 500 HRS | | 80 | 0 |
| STORAGE LIFE | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | 150°C | 500 HRS | | 80 | 0 |
| STORAGE LIFE | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | 150°C | 500 HRS | | 80 | 0 |
| STORAGE LIFE | 1946 | 90- 1922L#F52 / DS1922L- F5#C02 | 150°C | 500 HRS | | 80 | 0 |
| STORAGE LIFE | 1946 | 90- 1922L#F52 / DS1922L- F5#C02 | 150°C | 500 HRS | | 80 | 0 |
| Total: | | | | | | | 0 |

TEMPERATURE CYCLE

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

| | | | | | | |
|-----------------------------------|------|--|-----------------------------|----------|----|---|
| TEMP CYCLE, 5' RAMP, 10' DWELL | | 90- 1921G#F50 | -65C TO +150C (Condition C) | 1000 CYS | 85 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | | 90- 1990A+F50 | -40C TO +125C (Condition G) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1848 | 90- 19850+F30 | -40C TO +125C (Condition G) | 1000 CYS | 85 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1848 | 90- 19850+F30 | -65C TO +150C (Condition C) | 1000 CYS | 85 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1851 | 90- 1921G#F50 | -65C TO +150C (Condition C) | 1000 CYS | 85 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1907 | 90- 1921G#F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1907 | 90- 1921G#F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1907 | 90- 1921G#F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1916 | 90- 1990A+F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1916 | 90- 1990A+F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1926 | 90- 1904L#F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1926 | 90- 1904L#F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1926 | 90- 1995L+F50 | -65C TO +150C (Condition C) | 500 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1926 | 90- 1995L+F50 | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1931 | 90- 12887+C06/ DS12C887+ | -65C TO +150C (Condition C) | 500 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1931 | 90- 1904L#F50 / DS1904L- F5# | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1931 | 90- 1904L#F50 / DS1904L- F5# | -65C TO +150C (Condition C) | 1000 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | -65C TO +150C (Condition C) | 500 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | -65C TO +150C (Condition C) | 500 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | -65C TO +150C (Condition C) | 500 CYS | 80 | 0 |
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1946 | 90- 1922L#F52 / DS1922L- F5#C02 | -65C TO +150C (Condition C) | 500 CYS | 80 | 0 |

| | | | | | | | |
|-----------------------------------|------|--|-----------------------------|-----|-----|----------|---|
| TEMP CYCLE, 5' RAMP, 10' DWELL | 1946 | 90- 1922L#F52 / DS1922L- F5#C02 | -65C TO +150C (Condition C) | 500 | CYS | 80 | 0 |
| Total: | | | | | | 0 | |

TEMPERATURE HUMIDITY BIAS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-----------------|-----------|--|----------------|-----------|----------|-------|-------|
| BIASED MOISTURE | | 90- 1990A+F50 | 85 C/85% R.H. | 1000 HRS | 85 | 0 | |
| BIASED MOISTURE | | 90- 1990A+F50 | 85 C/85% R.H. | 1000 HRS | 85 | 0 | |
| BIASED MOISTURE | 1848 | 90- 19850+F30 | 85 C/85% R.H. | 1000 HRS | 85 | 0 | |
| BIASED MOISTURE | 1848 | 90- 19850+F30 | 85 C/85% R.H. | 1000 HRS | 85 | 0 | |
| BIASED MOISTURE | 1904 | 90- 1922L#F51 | 85 C/85% R.H. | 1000 HRS | 85 | 0 | |
| BIASED MOISTURE | 1907 | 90- 1921G#F50 | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1907 | 90- 1921G#F50 | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1907 | 90- 1921G#F50 | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1916 | 90- 1990A+F50 | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1916 | 90- 1990A+F50 | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1926 | 90- 1904L#F50 | 85 C/85% R.H. | 500 HRS | 80 | 0 | |
| BIASED MOISTURE | 1926 | 90- 1904L#F50 | 130C, 85% R.H. | 96 HRS | 80 | 0 | |
| BIASED MOISTURE | 1926 | 90- 1995L+F50 | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1926 | 90- 1995L+F50 | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1931 | 90- 12887+C06/ DS12C887+ | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1931 | 90- 12887+C06 / DS12C887+ | 85 C/85% R.H. | 1000 HRS | 80 | 0 | |
| BIASED MOISTURE | 1931 | 90- 1904L#F50 / DS1904L- F5# | 130C, 85% R.H. | 96 HRS | 80 | 0 | |
| BIASED MOISTURE | 1931 | 90- 1904L#F50 / DS1904L- F5# | 130C, 85% R.H. | 96 HRS | 80 | 0 | |
| BIASED MOISTURE | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | 85 C/85% R.H. | 500 HRS | 80 | 0 | |

| | | | | | | | |
|-----------------|------|--|---------------|-----|-----|----|----------|
| BIASED MOISTURE | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | 85 C/85% R.H. | 500 | HRS | 80 | 0 |
| BIASED MOISTURE | 1944 | 90- 1922L#F52 / DS1922L- F5#C02 | 85 C/85% R.H. | 500 | HRS | 80 | 0 |
| BIASED MOISTURE | 1946 | 90- 1922L#F52 / DS1922L- F5#C02 | 85 C/85% R.H. | 500 | HRS | 80 | 0 |
| BIASED MOISTURE | 1946 | 90- 1922L#F52 / DS1922L- F5#C02 | 85 C/85% R.H. | 500 | HRS | 80 | 0 |
| Total: | | | | | | | 0 |

UNBIASED MOISTURE RESISTANCE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|--------------|------------------|----------------|-----------|----------|-------|----------|
| MOISTURE SOAK | | 90- 1921G#F50 | 130C, 85% R.H. | 500 | HRS | 85 | 0 |
| MOISTURE SOAK | | 90- 1921G#F50 | 130C, 85% R.H. | 1000 | HRS | 85 | 0 |
| MOISTURE SOAK | 1851 | 90- 1921G#F50 | 130C, 85% R.H. | 1000 | HRS | 83 | 0 |
| Total: | | | | | | | 0 |