



9/28/2009

RELIABILITY REPORT
FOR

DS1972, iButton IC Assembly, Pb-Free

Maxim Integrated Products

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Prepared by:

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Conclusion:

The following qualification successfully meets the quality and reliability standards required of all Dallas Semiconductor products and processes:

DS1972, iButton IC Assembly, Pb-Free

In addition, Dallas Semiconductor's continuous reliability monitor program ensures that all outgoing product will continue to meet Maxim's quality and reliability standards. The current status of the reliability monitor program can be viewed at <http://www.maxim-ic.com/TechSupport/dsreliability.html>.*

Module Description

A description of this Module can be found in the product data sheet. You can find the product data sheet at http://dbserv.maxim-ic.com/l_datasheet3.cfm.*

Reliability Derating:

A module device consists of one or more IC's in a single, upward integrated, package. This package is assembled to include batteries, crystals, and other piece parts that make up the configuration of the Module. Because of either the complexity of the package or the included piece parts, standard high temperature reliability testing is not possible. Therefore, in order to determine the reliability of module products, the reliability of each of the piece parts is individually determined, then summed to determine the reliability of the integrated module product. If there are "n" significant components in the module then:

$$Fr(\text{module}) = Fr(1) + Fr(2) + Fr(3) + \dots + Fr(n)$$

Fr (module) = Failure rate of module
 Fr(n) = Failure rate of the nth component

Failure Rates are reported in FITs (Failures in Time) or MTTF (Mean Time To Failure). The FIT rate is related to MTTF by:

$$MTTF = 1/Fr$$

NOTE: MTTF is frequently used interchangeably with MTBF.

The calculated failure rate for this module/assembly is:

<u>Module Device:</u>	<u>Module Units:</u>	<u>Quantity:</u>	<u>Fails:</u>	<u>Ea:</u>	<u>Beta:</u>	<u>MTTF (Yrs):</u>	<u>FITs:</u>
DS2431	1	276	0	0.7	0.0	<u>32431</u>	<u>3.5</u>
Totals:						32431	3.5

The parameters used to calculate the module failure rate are as follows

Cf: 60% **Tu: 25 °C** **Vu: 5.5 Volts**

The reliability data follows. At the start of this data is the module assembly information. This is a description of the module. The next section is the detailed reliability data for each stress found in the qualification / monitor. If there are additional processes or assemblies used as part of this report, a description of each will follow which includes the respective reliability data for that process/ assembly. The reliability data section includes the latest data available. Some of this data may be generic with other packages or products.

* Some proprietary products may be excepted from this requirement

Assembly Information:

Assembly Site: Batangas Assembly
 Pin Count: 2
 Package Type: iButton F50 ICs (Pb-Free)
 Body Size: 68
 Mold Compound: ?
 Lead Frame: PCB; FR4
 Lead Finish: Sn Plate/Ni/Stainless Steel
 Die Attach: ?
 Bond Wire / Size: NA / NA
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) NA
 Date Code Range: 0549 to 0804

DATE CODE: 0549 **LOT NUMBER:** MA350039AAC **VEHICLE:** DS1904

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0549	85 C	1000 HRS	77	0	
Total:					0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0549	-40 TO 85C	1000 CYS	77	0	
Total:					0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0549	60C/90% R.H.	1000 HRS	77	0	
Total:					0	

DATE CODE: 0549 **LOT NUMBER:** MA350040AAC **VEHICLE:** DS1904

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0549	85 C	1000 HRS	77	0	
Total:					0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0549	-40 TO 85C	1000 CYS	77	0	
Total:					0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
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MOISTURE SOAK 0549 60C/90% R.H. 1000 HRS 77 0
Total: **0**

DATE CODE: 0549 **LOT NUMBER:** MA350041AAC **VEHICLE:** DS1904

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0549	85 C	1000 HRS	77	0	
Total:					0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0549	-40 TO 85C	1000 CYS	77	0	
Total:					0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0549	60C/90% R.H.	1000 HRS	77	0	
Total:					0	

DATE CODE: 0716 **LOT NUMBER:** MG360509-QUAL1 **VEHICLE:** DS1990

MECHANICAL LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MECHANICAL SHOCK	0716	JESD22-B104C CONDITION F	30 CYS	50	0	
VIBRATION, VARIABLE FREQUENCY	0716	JESD22-B103-B CONDITION 2	9 HRS	50	0	
Total:					0	

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0716	85 C	1000 HRS	77	0	
Total:					0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0716	85 C/85% R.H.	959 HRS	77	0	
Total:					0	

DATE CODE: 0804 **LOT NUMBER:** MG362158AAA-1 **VEHICLE:** DS1990

STORAGE LIFE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0804	70 C	1000 HRS	77	0	
Total:					0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE, 5' RAMP, 10' DWELL	0804	-40 TO 85C	500 CYS	77	0	
Total:					0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0804	60C/90% R.H.	1000 HRS	77	0	
Total:					0	

