

RELIABILITY REPORT
FOR

DS1971, Rev A3

Dallas Semiconductor

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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:

DS1971, Rev A3

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>Quantity:</u>	<u>MTTF (Yrs):</u>	<u>FITs:</u>
DS2430A	1	87145	1.3
Totals:		87145	1

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

Cf: 60% **Ea: 0.7** **B: 0** **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 proprietary products may be excepted from this requirement.

Assembly Information:

Qualification Vehicle: DS1971
 Assembly Site: Dallas
 Pin Count: 2
 Package Type: iButton F50 w/Bump
 Body Size: 0
 Mold Compound: FP4323, Dexter Hysol
 Lead Frame: Printed Crt Brd; FR4
 Lead Finsh:
 Die Attach: Underfill FP4527, Dexter Hysol
 Bond Wire / Size: Al / 1.25 mil
 Flammability: UL 94-V0
 Moisture Sensitivity
 (JEDEC J-STD20A)
 Date Code Range: 9801 to 9801

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
MOISTURE SOAK	9801	85 C/85% R.H.	959 HRS	150	0
			Total:		0

Assembly Information:

Qualification Vehicle: DS1973
 Assembly Site: Dallas
 Pin Count: 2
 Package Type: iButton F50 w/Bump
 Body Size: 0
 Mold Compound: FP4323, Dexter Hysol
 Lead Frame: Printed Crt Brd; FR4
 Lead Finsh:
 Die Attach: Underfill FP4527, Dexter Hysol
 Bond Wire / Size: Al / 1.25 mil
 Flammability: UL 94-V0
 Moisture Sensitivity
 (JEDEC J-STD20A)
 Date Code Range: 9918 to 9918

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
TEMP CYCLE	9918	-40 TO 85C	1000 CYS	77	0
			Total:		0

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
MOISTURE SOAK	9918	85 C/85% R.H.	959 HRS	77	0
Total:					0

Assembly Information:

Qualification Vehicle: DS1990
Assembly Site: Dallas
Pin Count: 2
Package Type: iButton F50 w/Bump
Body Size: 0
Mold Compound: FP4323, Dexter Hysol
Lead Frame: Printed Crt Brd; FR4
Lead Finsh:
Die Attach: Underfill FP4527, Dexter Hysol
Bond Wire / Size: Al / 1.25 mil
Flammability: UL 94-V0
Moisture Sensitivity
(JEDEC J-STD20A)
Date Code Range: 9818 to 9902

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
TEMP CYCLE	9820	-40 TO 85C	1000 CYS	77	0
TEMP CYCLE	9852	-40 TO 85C	1000 CYS	77	0
TEMP CYCLE	9902	-40 TO 85C	1000 CYS	77	0
Total:					0

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
MOISTURE SOAK	9818	85 C/85% R.H.	959 HRS	150	0
MOISTURE SOAK	9820	85 C/85% R.H.	959 HRS	77	0
MOISTURE SOAK	9852	85 C/85% R.H.	959 HRS	77	0
Total:					0

Assembly Information:

Qualification Vehicle: DS1991
Assembly Site: Dallas
Pin Count: 2
Package Type: iButton F50 w/Bump
Body Size: 0
Mold Compound: FP4323, Dexter Hysol
Lead Frame: Printed Crt Brd; FR4
Lead Finsh:
Die Attach: Glob Top 4323, Dexter Hysol
Bond Wire / Size: Al / 1.25 mil
Flammability: UL 94-V0
Moisture Sensitivity
(JEDEC J-STD20A)
Date Code Range: 0048 to 0048

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
TEMP CYCLE	0048	-40 TO 85C	1000 CYS	77	0
TEMP CYCLE	0048	-40 TO 85C	1000 CYS	77	0
Total:					0

Assembly Information:

Qualification Vehicle: DS1992
Assembly Site: Dallas
Pin Count: 2
Package Type: iButton F50 w/Bump
Body Size: 0
Mold Compound: FP4323, Dexter Hysol
Lead Frame: Printed Crt Brd; FR4
Lead Finsh:
Die Attach: Glob Top 4323, Dexter Hysol
Bond Wire / Size: Al / 1.25 mil
Flammability: UL 94-V0
Moisture Sensitivity
(JEDEC J-STD20A)
Date Code Range: 0122 to 0201

STORAGE LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
STORAGE LIFE	0122	70 C	1000 HRS	77	0
STORAGE LIFE	0136	70 C	1000 HRS	77	0
STORAGE LIFE	0201	70 C	1000 HRS	77	0
Total:					0

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
TEMP CYCLE	0122	-40 TO 85C	300 CYS	77	0

TEMP CYCLE	0136	-40 TO 85C	300	CYS	77	0
TEMP CYCLE	0201	-40 TO 85C	300	CYS	77	0
Total:					0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
MOISTURE SOAK	0122	60C/90% R.H.	960 HRS	77	0
MOISTURE SOAK	0136	60C/90% R.H.	960 HRS	77	0
MOISTURE SOAK	0201	60C/90% R.H.	960 HRS	77	0
Total:					0

Assembly Information:

Qualification Vehicle: DS1992
 Assembly Site: Fastech
 Pin Count: 2
 Package Type: iButton F50 w/Bump
 Body Size: 0
 Mold Compound: FP4323, Dexter Hysol
 Lead Frame: Printed Crt Brd; FR4
 Lead Finsh:
 Die Attach: Underfill FP4527, Dexter Hysol
 Bond Wire / Size: Al / 1.25 mil
 Flammability: UL 94-V0
 Moisture Sensitivity
 (JEDEC J-STD20A)
 Date Code Range: 0133 to 0315

MECHANICAL LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
MECHANICAL SHOCK	0133	200G, 1/2 SINE, 6 MS	30 CYS	50	0
VIBRATION, VARIABLE F	0133	10g or 0.06", 5Hz-2KHz, X Y Z axis	9 HRS	50	0
Total:					0

STORAGE LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
STORAGE LIFE	0133	85 C	1000 HRS	77	0
STORAGE LIFE	0209	70 C	1000 HRS	77	0
STORAGE LIFE	0220	70 C	1000 HRS	77	0
STORAGE LIFE	0238	70 C	1000 HRS	77	0
Total:					0

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
TEMP CYCLE	0133	-40 TO 85C	1000 CYS	77	0
TEMP CYCLE	0209	-40 TO 85C	300 CYS	77	0

TEMP CYCLE	0220	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0238	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0315	-40 TO 85C	500	CYS	77	0
Total:						0

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
MOISTURE SOAK	0133	60C/90% R.H.	960 HRS	77	0
MOISTURE SOAK	0209	60C/90% R.H.	960 HRS	77	0
MOISTURE SOAK	0220	60C/90% R.H.	1000 HRS	77	0
MOISTURE SOAK	0238	60C/90% R.H.	1000 HRS	77	0
Total:					0