



05/25/2005

**RELIABILITY REPORT  
FOR**

**DS1922T, Rev A4**

**Dallas Semiconductor**

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**Conclusion:**

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

DS1922T, Rev A4

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](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:

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

$$Fr(\text{module}) = \text{Failure rate of module}$$

$$Fr(n) = \text{Failure rate of the nth component}$$

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:

<b><u>Module Device:</u></b>	<b><u>Module Units:</u></b>	<b><u>Quantity:</u></b>	<b><u>Fails:</u></b>	<b><u>Ea:</u></b>	<b><u>MTTF (Yrs):</u></b>	<b><u>FITs:</u></b>
<b>BR1225</b>	<b>1</b>	<b>100</b>	<b>1</b>	<b>1.0</b>	<b>175984</b>	<b>0.6</b>
<b>CRYSTAL</b>	<b>1</b>	<b>100</b>	<b>0</b>	<b>0.7</b>	<b>12463</b>	<b>9.2</b>
<b>DS2422</b>	<b>1</b>	<b>231</b>	<b>0</b>	<b>0.7</b>	<b>19833</b>	<b>5.8</b>
<b>DS9503</b>	<b>1</b>	<b>152</b>	<b>0</b>	<b>0.7</b>	<b>17861</b>	<b>6.4</b>
<b>Totals:</b>					<b>5199</b>	<b>22.0</b>

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

**Cf: 60%**      **Tu: 25 °C**

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: Dallas  
 Pin Count: 2  
 Package Type: Puk Can F50 Insert Mold w/Bump/Battery  
 Body Size: 17.35  
 Mold Compound: BCB  
 Lead Frame: PCB; FR4  
 Lead Finsh: High Pb Ball  
 Die Attach: Underfill FP4527, Dexter Hysol  
 Bond Wire / Size: /  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A)  
 Date Code Range: 0343 to 0514

**ELECTRICAL CHARACTERIZATION**

DESCRIPTION	DATE	CD	CONDITION	READPOINT	QTY	FAILS	FA#
ESD SENSITIVITY	0343		IEC 61000-4-2 CONTACT 2000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 CONTACT 4000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 CONTACT 6000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 CONTACT 8000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 AIR 2000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 AIR 4000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 AIR 8000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 AIR 15000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0343		IEC 61000-4-2 AIR 20000 VOLTS	10 PUL'S	3	0	
<b>Total:</b>						<b>0</b>	

**STORAGE LIFE**

DESCRIPTION	DATE	CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0441		125C	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

**TEMPERATURE CYCLE**

DESCRIPTION	DATE	CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0514		0C TO +125C	1500 CYS	77	0	
<b>Total:</b>						<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

<b>DESCRIPTION</b>	<b>DATE CD</b>	<b>CONDITION</b>	<b>READPOINT</b>	<b>QTY</b>	<b>FAILS</b>	<b>FA#</b>
MOISTURE SOAK	0343	85 C/85% R.H.	1000 HRS	75	0	
MOISTURE SOAK	0441	60C/90% R.H.	1000 HRS	77	0	
			<b>Total:</b>		<b>0</b>	