

**RELIABILITY REPORT  
FOR**

**DS1254Y w/DS3800 Cap, Fastech, Single Sided PCB**

**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:

DS1254Y w/DS3800 Cap, Fastech, Single Sided PCB

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:

$$\begin{aligned} Fr(\text{module}) &= Fr(1) + Fr(2) + Fr(3) + \dots + Fr(n) \\ Fr(\text{module}) &= \text{Failure rate of module} \\ Fr(n) &= \text{Failure rate of the nth component} \end{aligned}$$

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>Quantity:</u></b>	<b><u>MTTF (Yrs):</u></b>	<b><u>FITs:</u></b>
<b>BR2032</b>	<b>2</b>	<b>11598</b>	<b>9.8</b>
<b>CRYSTAL</b>	<b>1</b>	<b>12458</b>	<b>9.2</b>
<b>DS1321</b>	<b>1</b>	<b>29745</b>	<b>3.8</b>
<b>DS1315</b>	<b>1</b>	<b>33764</b>	<b>3.4</b>
<b>8 MEG SRAM 5V</b>	<b>2</b>	<b>50468</b>	<b>2.3</b>
<b>Totals:</b>		<b>4007</b>	<b>28</b>

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.

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**Assembly Information:**

Qualification Vehicle: DS1254  
 Assembly Site: Fastech  
 Pin Count: 168  
 Package Type: BGA Module, 1 Side  
 Body Size: 40x40x5.0  
 Lead Frame: PCB; Tape  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 4  
 Date Code Range: 0348 to 0348

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**INITIAL TEST**

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
0 HR TEST	0348	Connect Cap & Base	1	135	0
<b>Total:</b>					<b>0</b>

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**PACKAGE TESTS**

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
X-RAY	0348	MIL-STD-883-2012 : TOP & SIDE VIEW	3	DYS 6	0
PHYSICAL DIMENSIONS		JESD22-B100	3	DYS 6	0
MARK PERMANENCY		JESD22-B107	3	DYS 6	0
BALL SHEAR		JESD22-B117	3	DYS 6	0
<b>Total:</b>					<b>0</b>

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
STORAGE LIFE	0348	125C	24	HRS 135	
MOISTURE SOAK		30C/60% R.H.	192	HRS 135	
CONVECTION REFLOW		220C	2	PASS 135	0
EXTERNAL VISUAL		JESD22-B101	2	DYS 135	0
<b>Total:</b>					<b>0</b>

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
TEMP CYCLE	0348	0C TO 70C	1000	CYS 45	0
EXTERNAL VISUAL		JESD22-B101	1000	DYS 45	0
<b>Total:</b>					<b>0</b>

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
MOISTURE SOAK	0348	60C/90% R.H.	1000	HRS 45	0
<b>Total:</b>					<b>0</b>