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PRODUCT RELIABILITY REPORT
FOR

DS8113, Rev A3

Maxim Integrated Products

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Conclusion:

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

DS8113, 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.

Device Description:

A description of this device 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:

The Arrhenius model will be used to determine the acceleration factor for failure mechanisms that are temperature accelerated.

$AfT = \exp((Ea/k)*(1/Tu - 1/Ts)) = tu/ts$
AfT = Acceleration factor due to Temperature
tu = Time at use temperature (e.g. 55°C)
ts = Time at stress temperature (e.g. 125°C)
k = Boltzmann’s Constant (8.617 x 10-5 eV/°K)
Tu = Temperature at Use (°K)
Ts = Temperature at Stress (°K)
Ea = Activation Energy (e.g. 0.7 ev)

The activation energy of the failure mechanism is derived from either internal studies or industry accepted standards, or activation energy of 0.7ev will be used whenever actual failure mechanisms or their activation energies are unknown. All deratings will be done from the stress ambient temperature to the use ambient temperature.

An exponential model will be used to determine the acceleration factor for failure mechanisms, which are voltage accelerated.

$AfV = \exp(B*(Vs - Vu))$
AfV = Acceleration factor due to Voltage
Vs = Stress Voltage (e.g. 7.0 volts)
Vu = Maximum Operating Voltage (e.g. 5.5 volts)
B = Constant related to failure mechanism type (e.g. 1.0, 2.4, 2.7, etc.)

The Constant, B, related to the failure mechanism is derived from either internal studies or industry accepted standards, or a B of 1.0 will be used whenever actual failure mechanisms or their B are unknown. All deratings will be done from the stress voltage to the maximum operating voltage. Failure rate data from the operating life test is reported using a Chi-Squared statistical model at the 60% or 90% confidence level (Cf).

The failure rate, Fr, is related to the acceleration during life test by:

$Fr = X/(ts * AfV * AfT * N * 2)$
X = Chi-Sq statistical upper limit
N = Life test sample size

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 device/process is:

FAILURE RATE:	**MTTF (YRS):**	**13994**	**FITS:**	**8.2**
	DEVICE HOURS:	**119090**	**FAILS:**	**0**

Only data from Operating Life or similar stresses are used for this calculation.

The parameters used to calculate this 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 device information. The next section is the detailed reliability data for each stress. The reliability data section includes the latest data available and may contain some generic data. "*" after DATE CODE denotes specific product data.

Device Information:

Process:	
Passivation:	OxyNit LaserNoA&E - Pass/Nov.TEOS/OxyNit -Gen.LaserP
Die Size:	103 x 82
Number of Transistors:	7925
Interconnect:	Aluminum / 0.5% Copper
Gate Oxide Thickness:	

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE		CONDITION	READPOINT		QTY	FAILS	FA#
ESD SENSITIVITY	0744	*	EOS/ESD S5.1 HBM 500 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0744	*	EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0744	*	EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0744	*	EOS/ESD S5.1 HBM 6000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 CONTACT 2000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 CONTACT 4000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 CONTACT 6000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 CONTACT 8000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 AIR 2000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 AIR 4000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 AIR 8000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	IEC 61000-4-2 AIR 15000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0744	*	EOS/ESD S5.1 HBM 8000 VOLTS	1	PUL'S	3	0	
LATCH-UP	0744	*	JESD78, V-SUPPLY TEST 25C			6	0	
LATCH-UP	0744	*	JESD78, V-SUPPLY TEST 125C			6	0	
					Total:		**0**	

OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0724	125C, 6.0 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0740	125C, 6.0 VOLTS	425 HRS	77	0	
HIGH TEMP OP LIFE	0744 *	125C, 6.0 VOLTS	192 HRS	45	0	
HIGH TEMP OP LIFE	0750	125C, 6.0 VOLTS	425 HRS	77	0	
			Total:		**0**	

FAILURE RATE:	**MTTF (YRS):**	**13994**	**FITS:**	**8.2**
	DEVICE HOURS:	**119090**	**FAILS:**	**0**