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PRODUCT RELIABILITY REPORT
FOR

DS2502, Rev D3

Dallas Semiconductor

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Conclusion:

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

DS2502, Rev D3

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):**	**113097**	**FITS:**	**1.0**
	DEVICE HOURS:	**962500**	**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: 3 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 and SEQ No. to identify specific line items in the report for comments when required.

Device Information:

Process:	E6ES-2P1M,HPVt,EPROM,NRDSD,ESD-PD,N+ESD ALOCOS:GOI
Passivation:	Pass w/Nov.TEOS Oxide-OxyNit (NO REGLASS)
Die Size:	65 x 38
Number of Transistors:	6400
Interconnect:	Aluminum / 0.5% Copper
Gate Oxide Thickness:	150 Å

DATA RETENTION

DESCRIPTION	DATE CODE/SEQ	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0441 * 3	150C	1000 HRS	77	0	
			Total:		**0**	

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE/SEQ	CONDITION	READPOINT	QTY	FAILS	FA#
ESD SENSITIVITY	0408	IEC 61000-4-2 CONTACT 1000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0408	IEC 61000-4-2 CONTACT 2000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0408	IEC 61000-4-2 CONTACT 4000 VOLTS	10 PUL'S	3	2	No FA
ESD SENSITIVITY	0408	EOS/ESD S5.1 HBM 500 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0408	EOS/ESD S5.1 HBM 1000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0408	EOS/ESD S5.1 HBM 2000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0408	EOS/ESD S5.1 HBM 4000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0408	EOS/ESD S5.1 HBM 8000 VOLTS	1 PUL'S	3	0	
LATCH-UP	0408	JESD78, V-SUPPLY TEST 125C		6	0	
ESD SENSITIVITY	0441 * 2	IEC 61000-4-2 CONTACT 1000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0441 * 3	IEC 61000-4-2 CONTACT 2000 VOLTS	10 PUL'S	3	0	

ESD SENSITIVITY	0441	* 4	IEC 61000-4-2 CONTACT 4000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0441	* 5	EOS/ESD S5.1 HBM 500 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0441	* 6	EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0441	* 7	EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0441	* 8	EOS/ESD S5.1 HBM 4000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0441	* 10	EOS/ESD S5.1 HBM 8000 VOLTS	1	PUL'S	6	0	
ESD SENSITIVITY	0647		IEC 61000-4-2 CONTACT 1000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0647		IEC 61000-4-2 CONTACT 2000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0647		IEC 61000-4-2 CONTACT 4000 VOLTS	10	PUL'S	3	3	No FA
ESD SENSITIVITY	0647		EOS/ESD S5.1 HBM 500 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0647		EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0647		EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0647		EOS/ESD S5.1 HBM 4000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0647		EOS/ESD S5.1 HBM 8000 VOLTS	1	PUL'S	3	0	
LATCH-UP	0647		JESD78, V-SUPPLY TEST 125C			6	0	
ESD SENSITIVITY	0717		IEC 61000-4-2 CONTACT 1000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	0717		IEC 61000-4-2 CONTACT 2000 VOLTS	10	PUL'S	3	1	No FA
ESD SENSITIVITY	0717		IEC 61000-4-2 CONTACT 4000 VOLTS	10	PUL'S	3	3	No FA
ESD SENSITIVITY	0717		EOS/ESD S5.1 HBM 500 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0717		EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0717		EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0717		EOS/ESD S5.1 HBM 4000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0717		EOS/ESD S5.1 HBM 8000 VOLTS	1	PUL'S	3	0	
LATCH-UP	0717		JESD78, V-SUPPLY TEST 125C			6	0	
					Total:		**9**	

OPERATING LIFE

DESCRIPTION	DATE CODE/SEQ	CONDITION	READPOINT		QTY	FAILS	FA#
HIGH TEMP OP LIFE	0408	125C, 6.0 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	0409	125C, 6.0 VOLTS	1000	HRS	77	0	
HIGH VOLTAGE LIFE	0411	125C, 6.0 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	0418	125C, 6.0 VOLTS	1000	HRS	48	0	
HIGH TEMP OP LIFE	0418	125C, 6.0 VOLTS	1000	HRS	48	0	
HIGH TEMP OP LIFE	0418	125C, 6.0 VOLTS	1000	HRS	48	0	
HIGH TEMP OP LIFE	0435	125C, 6.0 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	0435	125C, 6.0 VOLTS	1000	HRS	77	0	

HIGH TEMP OP LIFE	0441	* 2	125C, 6.0 VOLTS	1000	HRS	77	0
HIGH TEMP OP LIFE	0525	* 9	125C, 5.5 VOLTS	1000	HRS	87	0
HIGH TEMP OP LIFE	0606		125C, 5.5 VOLTS	1000	HRS	77	0
HIGH TEMP OP LIFE	0626	* 2	125C, 6.0 VOLTS	500	HRS	77	0
HIGH TEMP OP LIFE	0629		125C, 6.0 VOLTS	1000	HRS	77	0
HIGH TEMP OP LIFE	0647	* 3	125C, 6.0 VOLTS	1000	HRS	77	0
					Total:		**0**

FAILURE RATE: **MTTF (YRS):** **113097** **FITS:** **1.0**

DEVICE HOURS: **962500** **FAILS:** **0**