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PROCESS RELIABILITY REPORT
FOR

DS1819, Rev B6

Dallas Semiconductor

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Conclusion:

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

DS1819, Rev B6

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.

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):**	**150114**	**FITS:**	**0.8**
	DEVICE HOURS:	**1277528**	**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.

Device Information:

Process:	1P, 1M, 0.8um,Neg ZTC P1R,PdplD,Low Vts,BPSG ILO, N
Passivation:	Passivation w/Nov TEOS Oxide-Nitride
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	175 Å

OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
INFANT LIFE	9925	125C, 7.0 VOLTS	48	HRS	767	0	
HIGH VOLTAGE LIFE	9925	125C, 7.0 VOLTS	1000	HRS	190	0	
INFANT LIFE	0014	125C, 7.0 VOLTS	48	HRS	186	0	
HIGH VOLTAGE LIFE	0014	125C, 7.0 VOLTS	1000	HRS	114	0	
INFANT LIFE	0029	125C, 7.0 VOLTS	48	HRS	183	0	
HIGH VOLTAGE LIFE	0029	125C, 7.0 VOLTS	1000	HRS	114	0	
HIGH VOLTAGE LIFE	0147	125C, 6.0 VOLTS	1000	HRS	80	0	
HIGH VOLTAGE LIFE	0210	125C, 7.0 VOLTS	1000	HRS	78	0	
HIGH VOLTAGE LIFE	0218	125C, 6.0 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	0430	125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	0430	125C, 5.5 VOLTS	1000	HRS	45	0	
HIGH TEMP OP LIFE	0430	125C, 5.5 VOLTS	1000	HRS	45	0	
HIGH TEMP OP LIFE	0436	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	0444	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	0515	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	0524	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	0547	125C, 5.5 VOLTS	1000	HRS	80	0	
			Total:			**0**	

STORAGE LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0430	150C	1000 HRS	77	0	
STORAGE LIFE	0430	150C	1000 HRS	77	0	
STORAGE LIFE	0430	150C	1000 HRS	77	0	
			Total:		**0**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0014	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0029	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0430	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0430	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0430	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0436	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0444	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0515	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0524	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0547	-55C TO 125C	1000 CYS	40	0	
			Total:		**0**	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0014	85/85, 5.5 VOLTS	959 HRS	72	0	
BIASED MOISTURE	0029	85/85, 5.5 VOLTS	959 HRS	69	0	
HAST	0430	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0430	130C, 85%R.H.,5.5V	96 HRS	76	0	
HAST	0430	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0436	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0444	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0515	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0524	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0547	130C, 85%R.H.,5.5V	96 HRS	77	0	
			Total:		**0**	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
AUTOCLAVE	0014	121C, 2 ATM STEAM, UNBIASED	168 HRS	45	0	
AUTOCLAVE	0029	121C, 2 ATM STEAM, UNBIASED	168 HRS	45	0	
AUTOCLAVE	0430	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	

AUTOCLAVE	0430	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0430	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0436	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
AUTOCLAVE	0444	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
AUTOCLAVE	0515	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
AUTOCLAVE	0524	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
AUTOCLAVE	0547	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
				Total:		**0**

FAILURE RATE:	**MTTF (YRS):**	**150114**	**FITS:**	**0.8**	
	DEVICE HOURS:	**1277528**	**FAILS:**	**0**	