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RELIABILITY REPORT
FOR

DS1666, Rev A2

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:

DS1666, Rev A2

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): 43328 FITS: 2.6

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. A 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, 1.2um, II Poly1 , TEOS Spacer,
Passivation:	Passivation w/Nov TEOS Oxide-Nitride
Die Size:	64 x 136
Number of Transistors:	0
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	225 Å

OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
INFANT LIFE	9930	125C, 6.0 V, -4.0V	48 HRS	226	0	
HIGH VOLTAGE LIFE	9930	125C, 6.0 V, -4.0V	1000 HRS	77	0	
INFANT LIFE	0021	125C, 6.0 V, -4.0V	48 HRS	224	0	
HIGH VOLTAGE LIFE	0021	125C, 6.0 V, -4.0V	1000 HRS	77	0	
HIGH VOLTAGE LIFE	0037	125C, 6.0 V, -4.0V	1000 HRS	116	1	30000884
INFANT LIFE	0102	125C, 6.0 V, -4.0V	48 HRS	234	0	
HIGH VOLTAGE LIFE	0102	125C, 6.0 V, -4.0V	1000 HRS	77	0	
HIGH VOLTAGE LIFE	0104	125C, 6.0 V, -4.0V	1000 HRS	75	0	
HIGH VOLTAGE LIFE	0237	125C, 6.0 V, -4.0V	1000 HRS	79	0	
HIGH TEMP OP LIFE	0309	125C, 5.5 V, -4.0V	1000 HRS	80	0	
HIGH VOLTAGE LIFE	0340	125C, 6.0 V, -4.0V	1000 HRS	80	0	
HIGH VOLTAGE LIFE	0357	125C, 5.5 V, -4.0V	1000 HRS	80	0	
HIGH VOLTAGE LIFE	0408	125C, 5.5 V, -4.0V	500 HRS	80	0	
			Total:		**1**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	9930	-55C TO 125C	1000 CYS	36	0	
TEMP CYCLE	0021	-55C TO 125C	1000 CYS	35	0	

TEMP CYCLE	0037	-55C TO 125C	1000	CYS	74	0	
TEMP CYCLE	0102	-55C TO 125C	1000	CYS	40	0	
TEMP CYCLE	0104	-55C TO 125C	1000	CYS	35	0	
TEMP CYCLE	0237	-55C TO 125C	1000	CYS	40	0	
TEMP CYCLE	0309	-55C TO 125C	1000	CYS	40	0	
TEMP CYCLE	0340	-55C TO 125C	1000	CYS	40	0	
TEMP CYCLE	0357	-55C TO 125C	1000	CYS	40	0	
TEMP CYCLE	0408	-55C TO 125C	1000	CYS	40	0	
				Total:		**0**	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
BIASED MOISTURE	9930	85/85, 5.5 VOLTS	959	HRS	77	0	
BIASED MOISTURE	0021	85/85, 5.5 VOLTS	959	HRS	75	0	
BIASED MOISTURE	0037	85/85, 5.5 VOLTS	959	HRS	77	0	
BIASED MOISTURE	0102	85/85, 5.5 VOLTS	959	HRS	77	0	
BIASED MOISTURE	0104	85/85, 5.5 VOLTS	959	HRS	75	0	
BIASED MOISTURE	0237	85/85, 5.5 VOLTS	1000	HRS	77	0	
BIASED MOISTURE	0309	85/85, 5.5 VOLTS	1000	HRS	77	0	
BIASED MOISTURE	0340	85/85, 5.5 VOLTS	1000	HRS	77	0	
BIASED MOISTURE	0357	85/85, 5.5 VOLTS	1000	HRS	77	0	
BIASED MOISTURE	0408	85/85, 5.5 VOLTS	500	HRS	77	0	
				Total:		**0**	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
AUTOCLAVE	9930	121C, 2 ATM STEAM, UNBIASED	96	HRS	36	0	
AUTOCLAVE	0021	121C, 2 ATM STEAM, UNBIASED	96	HRS	35	0	
AUTOCLAVE	0037	121C, 2 ATM STEAM, UNBIASED	168	HRS	44	0	
AUTOCLAVE	0102	121C, 2 ATM STEAM, UNBIASED	96	HRS	40	0	
AUTOCLAVE	0104	121C, 2 ATM STEAM, UNBIASED	96	HRS	34	0	
AUTOCLAVE	0237	121C, 2 ATM STEAM, UNBIASED	96	HRS	40	5	30014721
AUTOCLAVE	0309	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0	
AUTOCLAVE	0340	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0	
AUTOCLAVE	0357	121C, 2 ATM STEAM, UNBIASED	96	HRS	40	0	
AUTOCLAVE	0408	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0	
				Total:		**5**	

FAILURE RATE: **MTTF (YRS): 43328** **FITS: 2.6**