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RELIABILITY REPORT
FOR

DS1669, Rev B3

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:

DS1669, Rev B3

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): 45632 FITS: 2.5

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, E2PROM, NdDiode, PdDiode,SBC Vt,TEOS Spacer,
Passivation:	Passivation w/Nov TEOS Oxide-Nitride
Die Size:	97 x 101
Number of Transistors:	4500
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	225 Å

OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
INFANT LIFE	9501	125C, 7.0 VOLTS	48	HRS	231	0
HIGH VOLTAGE LIFE	9501	125C, 7.0 VOLTS	1000	HRS	77	0
INFANT LIFE	9615	125C, 7.0 VOLTS	48	HRS	231	0
HIGH VOLTAGE LIFE	9615	125C, 7.0 VOLTS	1000	HRS	77	0
INFANT LIFE	9621	125C, 7.0 VOLTS	48	HRS	231	1
HIGH VOLTAGE LIFE	9621	125C, 7.0 VOLTS	1000	HRS	77	0
INFANT LIFE	9636	125C, 7.0 VOLTS	48	HRS	375	0
HIGH TEMP OP LIFE	9636	125C, 5.5 VOLTS	1000	HRS	88	0
INFANT LIFE	9642	125C, 7.0 VOLTS	48	HRS	226	0
HIGH VOLTAGE LIFE	9642	125C, 7.0 VOLTS	1000	HRS	77	0
INFANT LIFE	9701	125C, 7.0 VOLTS	48	HRS	230	0
HIGH VOLTAGE LIFE	9701	125C, 7.0 VOLTS	1000	HRS	77	0
INFANT LIFE	9702	125C, 7.0 VOLTS	48	HRS	392	0
HIGH VOLTAGE LIFE	9702	125C, 7.0 VOLTS	1000	HRS	116	0
INFANT LIFE	9706	125C, 7.0 VOLTS	48	HRS	229	0
HIGH VOLTAGE LIFE	9706	125C, 7.0 VOLTS	1000	HRS	77	0
INFANT LIFE	9744	125C, 7.0 VOLTS	48	HRS	232	0
HIGH VOLTAGE LIFE	9744	125C, 7.0 VOLTS	1000	HRS	77	0

						Total:	**1**

STORAGE LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	9501	150C	1000	HRS	38	0
STORAGE LIFE	9615	150C	1000	HRS	38	0
STORAGE LIFE	9621	150C	1000	HRS	38	0
STORAGE LIFE	9636	150C	1000	HRS	77	0
STORAGE LIFE	9642	150C	1000	HRS	38	0
STORAGE LIFE	9701	150C	1000	HRS	38	0
STORAGE LIFE	9702	150C	1000	HRS	77	0
STORAGE LIFE	9706	150C	1000	HRS	38	1
STORAGE LIFE	9744	150C	1000	HRS	38	0
				Total:		**1**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	9501	-55C TO 125C	1000	CYS	39	0
TEMP CYCLE	9615	-55C TO 125C	1000	CYS	39	0
TEMP CYCLE	9621	-55C TO 125C	1000	CYS	35	0
TEMP CYCLE	9636	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	9642	-55C TO 125C	1000	CYS	36	0
TEMP CYCLE	9701	-55C TO 125C	1000	CYS	38	0
TEMP CYCLE	9702	-65C TO 150C	1000	CYS	77	0
TEMP CYCLE	9706	-55C TO 125C	1000	CYS	37	0
TEMP CYCLE	9744	-55C TO 125C	1000	CYS	40	0
				Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	9501	85/85, 5.5 VOLTS	959	HRS	77	0
BIASED MOISTURE	9615	85/85, 5.5 VOLTS	959	HRS	77	0
BIASED MOISTURE	9621	85/85, 5.5 VOLTS	959	HRS	77	0
HAST	9636	120C, 85%R.H.,5.5V	100	HRS	77	0
BIASED MOISTURE	9642	85/85, 5.5 VOLTS	959	HRS	70	0
BIASED MOISTURE	9701	85/85, 5.5 VOLTS	959	HRS	76	0
HAST	9702	120C, 85%R.H.,5.5V	300	HRS	77	0
BIASED MOISTURE	9706	85/85, 5.5 VOLTS	959	HRS	75	0
BIASED MOISTURE	9744	85/85, 5.5 VOLTS	959	HRS	73	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	9636	121C, 2 ATM STEAM, UNBIASED	168	HRS	45	0
AUTOCLAVE	9702	121C, 2 ATM STEAM, UNBIASED	336	HRS	43	0
				Total:		**0**

FAILURE RATE: **MTTF (YRS): 45632** **FITS: 2.5**