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RELIABILITY REPORT
FOR

DS2417, Rev A1

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:

DS2417, Rev A1

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): 42016 FITS: 2.7

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, 0.6um, Pd, Low Vts, Ti/TiN M1 , WJ BPSG ,
Passivation:	Laser/TEOS Ox - Pass/Nit - Gen.LaserPrb
Die Size:	56 x 45
Number of Transistors:	4836
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	150 Å

LOW TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
LOW TEMPERATURE REVERSE BIAS	0118	-20C, 6.0 VOLTS	1000 HRS	77	0	
			Total:		**0**	

OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH VOLTAGE LIFE	9952	125C, 6.0 VOLTS	1000 HRS	256	2	20000083
INFANT LIFE	0005	125C, 6.0 VOLTS	48 HRS	234	0	
HIGH VOLTAGE LIFE	0005	125C, 6.0 VOLTS	1000 HRS	75	0	
INFANT LIFE	0020	125C, 6.0 VOLTS	48 HRS	234	0	
HIGH VOLTAGE LIFE	0020	125C, 6.0 VOLTS	1000 HRS	77	0	
INFANT LIFE	0022	125C, 6.0 VOLTS	48 HRS	256	0	
HIGH VOLTAGE LIFE	0022	125C, 6.0 VOLTS	1000 HRS	136	0	
HIGH VOLTAGE LIFE	0030	125C, 6.0 VOLTS	1000 HRS	116	0	
INFANT LIFE	0033	125C, 6.0 VOLTS	48 HRS	231	0	
HIGH VOLTAGE LIFE	0033	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH VOLTAGE LIFE	0106	125C, 6.0 VOLTS	1000 HRS	112	0	
HIGH VOLTAGE LIFE	0115	125C, 6.0 VOLTS	1000 HRS	80	0	
HIGH VOLTAGE LIFE	0117	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH VOLTAGE LIFE	0118	125C, 6.0 VOLTS	1000 HRS	80	0	

HIGH VOLTAGE LIFE	0126	125C, 6.0 VOLTS	1000	HRS	80	0	
				Total:		**2**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
TEMP CYCLE	0005	-55C TO 125C	1000	CYS	35	0	
TEMP CYCLE	0020	-55C TO 125C	1000	CYS	40	0	
TEMP CYCLE	0022	-55C TO 125C	1000	CYS	77	0	
TEMP CYCLE	0030	-55C TO 125C	1000	CYS	77	0	
TEMP CYCLE	0033	-55C TO 125C	1000	CYS	77	0	
TEMP CYCLE	0106	-55C TO 125C	1000	CYS	77	0	
TEMP CYCLE	0117	-55C TO 125C	1000	CYS	80	0	
TEMP CYCLE	0118	-55C TO 125C	1000	CYS	77	0	
				Total:		**0**	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
AUTOCLAVE	0005	121C, 2 ATM STEAM, UNBIASED	96	HRS	32	0	
AUTOCLAVE	0020	121C, 2 ATM STEAM, UNBIASED	96	HRS	37	0	
AUTOCLAVE	0030	121C, 2 ATM STEAM, UNBIASED	168	HRS	102	0	
AUTOCLAVE	0033	121C, 2 ATM STEAM, UNBIASED	96	HRS	77	0	
AUTOCLAVE	0106	121C, 2 ATM STEAM, UNBIASED	168	HRS	100	0	
AUTOCLAVE	0117	121C, 2 ATM STEAM, UNBIASED	96	HRS	77	0	
AUTOCLAVE	0118	121C, 2 ATM STEAM, UNBIASED	168	HRS	100	0	
				Total:		**0**	

FAILURE RATE: **MTTF (YRS): 42016** **FITS: 2.7**