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PRODUCT RELIABILITY REPORT
FOR

DS1861, Rev B2

Dallas Semiconductor

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Conclusion

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

DS1861, Rev B2

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): 33446 FITS: 3.4

The parameters used to calculate this failure rate are as follows:

Cf: 60% Ea: 0.7 B: 0 Tu: 25 °C Vu: 5.5 Volt

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. "*" after DATE CODE denotes specific product

Device Information:

Process:	E6WA-2P2M,HPVt,E2,EPROGVt,TCZ,PF ALOCOS:GOI
Passivation:	Passivation w/Nov TEOS Oxide-Nitride
Die Size:	142 x 108
Number of Transistors:	55677
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	150 Å

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE		CONDITION	READPOINT		QTY	FAILS	FA#
ESD SENSITIVITY	0509	*	EOS/ESD S5.1 HBM 500 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0509	*	EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0509	*	EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0509	*	EOS/ESD S5.1 HBM 4000 VOLTS	1	PUL'S	3	2	No FA
ESD SENSITIVITY	0509	*	EOS/ESD S5.1 HBM 8000 VOLTS	1	PUL'S	3	3	No FA
LATCH-UP	0509	*	JESD78, I-TEST 25C	2	DYS	6	0	
LATCH-UP	0509	*	JESD78, Vsupply TEST 125C	2	DYS	6	0	
					Total:		**5**	

OPERATING LIFE

DESCRIPTION	DATE CODE		CONDITION	READPOINT		QTY	FAILS	FA#
HIGH TEMP OP LIFE	0440		125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	0443		125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	0450		125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	0507		125C, 5.5 V (PSA) & 17.0 V (PSB)	1000	HRS	45	0	
HIGH TEMP OP LIFE	0509	*	125C, 5.5 VOLTS	192	HRS	45	0	
					Total:		**0**	

W/E ENDURANCE AND DATA RET'N

DESCRIPTION	DATE CODE		CONDITION	READPOINT		QTY	FAILS	FA#
WRITE CYCLE STRESS (KCYS)	0440		70 C, 5.5 VOLTS	30	KCYS	77	1	30032101
STORAGE LIFE			150C	1000	HRS	74	0	
WRITE CYCLE STRESS (KCYS)	0443		70 C, 5.5 VOLTS	30	KCYS	77	0	
STORAGE LIFE			150C	1000	HRS	77	0	
WRITE CYCLE STRESS (KCYS)	0450		70 C, 5.5 VOLTS	30	KCYS	77	0	
STORAGE LIFE			150C	1000	HRS	77	0	
WRITE CYCLE STRESS (KCYS)	0509	*	70 C, 5.5 VOLTS	30	KCYS	77	0	
STORAGE LIFE		*	150C	96	HRS	77	0	
					Total:		**1**	

FAILURE RATE: **MTTF (YRS): 33446** **FITS: 3.4**

30032101 - The cause of failure for the DS2764 unit is due to gate oxide defect.