1/31/2007

RELIABILITY REPORT
FOR

DS3234, Rev A1

Dallas Semiconductor

4401 South Beltwood Parkway
Dallas, TX 75244-3292

Prepared by:

Don Lipps
Staff Reliability Engineer
Dallas Semiconductor
4401 South Beltwood Pkwy.
Dallas, TX 75244-3292
Email: don.lipps@dalsemi.com
ph: 972-371-3739
fax: 972-371-6016

Conclusion:

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

DS3234, Rev A1

Device Description:

A description of the device used in this qualification 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/assembly i

FAILURE RATE:	**MTTF (YRS):**	**5288**	**FITS:**	**21.6**
	DEVICE HOURS:	**45000**	**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. This is a description of the device for this report. Following this is the assembly information. This section includes a description of the assembly vehicle used to generate this reliability data for both qualifications and monitors. The next section is the detailed reliability data for each stress found in the qualification / monitor. If there are additional assemblies used as part of this report, a description of each will follow which includes the respective reliability data for that assembly. The reliability data section includes the latest data available.

Device Information:

Device:	DS3234
Process:	E6E-2P2M,HPVt,EPROM,LV-NRDSD,PF ALOCOS:GOI
Passivation:	Passivation w/Nov TEOS Oxide-OxyNitride
Die Size:	102 x 141
Number of Transistors:	0
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	150 Å

Assembly Information:

Qualification Vehicle	DS3234
Assembly Site:	CIRTEK
Pin Count:	20
Package Type:	SOIC Welded Crystal (RoHS)
Body Size:	300x2.3
Mold Compound:	Sumitomo G600
Lead Frame:	Etched Copper CDA194 & welded With Oscilent crystal onl
Lead Finsh:	Sn Plate 100% Matte (With Anneal Bake)
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.0 mil
Theta JA:	
Theta JC:	
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0601 to 0601

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 500 VOLTS	1	PUL'S	3	0	

ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 3000 VOLTS	1	PUL'S	3	2	No FA
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 4000 VOLTS	1	PUL'S	3	3	No FA
LATCH-UP	0601	JESD78, I-TEST 125C			6	0	
LATCH-UP	0601	JESD78, V-SUPPLY TEST 125C			6	0	
				Total:		**5**	

MOISTURE SENSITIVITY LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
ULTRASOUND	0601	J-STD-020			22	0	
STORAGE LIFE		125C	24	HRS	22		
MOISTURE SOAK		85 C/85% R.H.	168	HRS	22		
CONVECTION REFLOW		260C +0/-5C	2	PASS	22	0	
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW			22	0	
EXTERNAL VISUAL		J-STD-020, 6.1a			22	0	
PRECONDITION U/S		J-STD-020			22	0	
				Total:		**0**	

OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
HIGH TEMP OP LIFE	0601	125C, 5.5 VOLTS	1000	HRS	45	0	
				Total:		**0**	

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0601	JESD22-B102, COND C			6	0	
SOLDERABILITY (Sn/Pb)		JESD22-B102, COND C			6	0	
X-RAY	0601	MIL-STD-883-2012 : TOP & SIDE VIEW			6	0	
PHYSICAL DIMENSIONS		JESD22-B100			6	0	
MARK PERMANENCY		JESD22-B107			6	0	
LEAD INTEGRITY		JESD22-B105, COND B			6	0	
				Total:		**0**	

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
STORAGE LIFE	0601	125C	24	HRS	353		
MOISTURE SOAK		85 C/85% R.H.	168	HRS	353		
CONVECTION REFLOW		260C +0/-5C	2	PASS	353	0	
				Total:		**0**	

STORAGE LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QTY	FAILS	FA#
STORAGE LIFE	0601	125C	1000	HRS	77	0	
				Total:		**0**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#

TEMP CYCLE	0601	-40 TO 85C	1000 CYS	77	0	
			Total:		**0**	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0601	85/85, 5.5 VOLTS	1000 HRS	45	0	
			Total:		**0**	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
AUTOCLAVE	0601	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
			Total:		**0**	

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