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PRODUCT RELIABILITY REPORT
FOR

DS18S20, Rev C4

Maxim Integrated Products

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Conclusion:

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

DS18S20, Rev C4

In addition, Maxim'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):**	**51730**	**FITS:**	**2.2**
	DEVICE HOURS:	**916418895**	**FAILS:**	**1**

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. 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. **Bold** Product Number denotes specific product data.

Device Information:

Process:	SA E6W, 0.6um BiCMOS, 2 Poly, 2 Metal, EEPROM, 8 inch wafer
Passivation:	TEOS Oxide-Nitride Passivation
Die Size:	78 x 54
Number of Transistors:	8503
Interconnect:	Aluminum / 0.5% Copper
Gate Oxide Thickness:	150 Å

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE	PRODUCT	LOT	CONDITION	READPOIN		QTY	FAILS	FA#
ESD SENSITIVITY	0539	**DS1820B**	QH603640A	EOS/ESD S5.1 HBM 500 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0539	**DS1820B**	QH603640A	EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0539	**DS1820B**	QH603640A	EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0539	**DS1820B**	QH603640A	EOS/ESD S5.1 HBM 3000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0539	**DS1820B**	QH603640A	EOS/ESD S5.1 HBM 4000 VOLTS	1	PUL'S	3	0	
LATCH-UP	0539	**DS1820B**	QH603640A	JESD78, I-TEST 125C			6	0	
LATCH-UP	0539	**DS1820B**	QH603640A	JESD78, V-SUPPLY TEST 125C			6	0	
					Total:			**0**	

OPERATING LIFE

DESCRIPTION	DATE CODE	PRODUCT	LOT	CONDITION	READPOIN		QTY	FAILS	FA#
HIGH TEMP OP LIFE	0720	DS1851	QK707606BB	125C, 5.5 VOLTS	192	HRS	77	0	

HIGH TEMP OP LIFE	0948	DS1856	WM049367A	125C, 5.5 VOLTS	1000	HRS	77	1	40023508
HIGH TEMP OP LIFE	1021	DS1804	WD049849A	125C, 5.5 VOLTS	192	HRS	45	0	
HIGH TEMP OP LIFE	1035	DS18S20	FJ157931AB	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	1050	DS1856	WM158219A	125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	1050	DS1856	WM158219A	125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	1052	DS1856	FJ162135DB	125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	1052	DS1856	FJ162135DB	125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	1052	DS1856	FJ162076CC	125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	1052	DS1856	FJ162076CC	125C, 5.5 VOLTS	1000	HRS	77	0	
HIGH TEMP OP LIFE	1103	DS18S20	FD162367AC	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	1113	DS18S20	FD166067AB	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	1113	DS3911	ZJ167332AB-	125C, 5.5 VOLTS	192	HRS	48	0	
HIGH TEMP OP LIFE	1128	DS18S20	FH167920AB	125C, 5.5 VOLTS	1000	HRS	80	0	
HIGH TEMP OP LIFE	1138	DS18S20	FD271756AB	125C, 5.5 VOLTS	1000	HRS	80	0	
					Total:			**1**	

FAILURE RATE:	**MTTF (YRS):**	**51730**	**FITS:**	**2.2**	
	DEVICE HOURS:	**916418895**	**FAILS:**	**1**	