7/21/2010

PRODUCT RELIABILITY REPORT
FOR

MAXQ1010, Rev A1

Maxim Integrated Products

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Conclusion:

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

MAXQ1010, Rev A1

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):**	**45978**	**FITS:**	**2.5**
	DEVICE HOURS:	**369049974**	**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. 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:	TSMC 0.18um Mixed signal, Embedded Flash, General Purpose, Two Poly Five Metal, 1.8V/3.3V Polyimide - No
Passivation:	SiO/SiN
Die Size:	109 x 111
Number of Transistors:	1740608
Interconnect:	Aluminum / 0.5% Copper
Gate Oxide Thickness:	32 Å

ESD HBM

DESCRIPTION	DATE CODE/PRODUCT/LOT			CONDITION	READPOIN		QTY	FAILS	FA#
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	JESD22-A114 HBM 500 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	JESD22-A114 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	JESD22-A114 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	JESD22-A114 HBM 4000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	JESD22-A114 HBM 8000 VOLTS	1	PUL'S	3	3	No FA
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	HBM 6000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	HBM 8000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	HBM 10000 VOLTS	1	PUL'S	3	3	No FA
					Total:			**6**	

ESD IEC

DESCRIPTION	DATE CODE/PRODUCT/LOT			CONDITION	READPOIN		QTY	FAILS	FA#
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 CONTACT 2000 VOLTS	10	PUL'S	3	0	

ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 CONTACT 4000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 CONTACT 6000 VOLTS	10	PUL'S	3	2	No FA
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 AIR 2000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 AIR 4000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 AIR 8000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 AIR 10000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 AIR 12000 VOLTS	10	PUL'S	3	0	
ESD SENSITIVITY	1024	**MAXQ1010**	QJ101790AG	IEC 61000-4-2 AIR 15000 VOLTS	10	PUL'S	1	1	No FA
					Total:			**3**	

LATCH-UP

DESCRIPTION	DATE CODE/PRODUCT/LOT			CONDITION	READPOIN		QTY	FAILS	FA#
LATCH-UP I	1024	**MAXQ1010**	QJ101790AG	JESD78A, I-TEST 125C			6	0	
LATCH-UP V	1024	**MAXQ1010**	QJ101790AG	JESD78A, V-SUPPLY TEST 125C			6	0	
					Total:			**0**	

OPERATING LIFE

DESCRIPTION	DATE CODE/PRODUCT/LOT			CONDITION	READPOIN		QTY	FAILS	FA#
HIGH TEMP OP LIFE	0814	MAXQ1103	QN089294A	125C, 3.6V (PSA) & 2.0V (PSB)	1000	HRS	77	0	
HIGH TEMP OP LIFE	0828	MAXQ2010	QK086138C	125C, 3.6 VOLTS	1000	HRS	76	0	
HIGH TEMP OP LIFE	0837	MAX2990	QN096322A	125C, 3.6V (PSA) & 2.0V (PSB)	1000	HRS	77	0	
HIGH TEMP OP LIFE	0851	MAXQ3108	QJ091011AC	125C, 3.6 VOLTS	192	HRS	73	0	
HIGH TEMP OP LIFE	0851	MAXQ610	QJ091123AB	125C, 3.6V (PSA) & 2.0V (PSB)	1000	HRS	77	0	
HIGH TEMP OP LIFE	0906	MAXQ61H	QJ091049AB	125C, 3.6 VOLTS	192	HRS	45	0	
HIGH TEMP OP LIFE	0909	MAXQ8913	NQQ8ZAD	125C, 3.6V (PSA) & 5.0V (PSB)	192	HRS	77	0	
HIGH TEMP OP LIFE	0934	MAXQ1103	QN101437A	125C, 3.6V (PSA) & 2.0V (PSB)	192	HRS	77	0	
HIGH TEMP OP LIFE	0946	MAXQ622	QN091481C	125C, 3.6V (PSA) & 5.5V (PSB)	192	HRS	77	0	
HIGH TEMP OP LIFE	1006	MAXQ1004	QS101775A	125C, 3.6V (PSA) & 5.0V (PSB)	192	HRS	45	0	
HIGH TEMP OP LIFE	1024	**MAXQ1010**	QJ101790AG	125C, 5.5V (PS1) & 3.6V (PS2)	192	HRS	45	0	
					Total:			**0**	

FAILURE RATE:	**MTTF (YRS):**	**45978**	**FITS:**	**2.5**
	DEVICE HOURS:	**369049974**	**FAILS:**	**0**