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**PRODUCT RELIABILITY REPORT
FOR**

DS1841, Rev A2

Maxim Integrated Products

**4401 South Beltwood Parkway
Dallas, TX 75244-3292**

Prepared by:

**Ken Wendel
Director, Reliability Engineering
Maxim Integrated Products
4401 South Beltwood Pkwy.
Dallas, TX 75244-3292
Email : ken.wendel@maxim-ic.com
ph: 972-371-3726
fax: 972-371-6016
mbl: 214-435-6610**

Conclusion:

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

DS1841, Rev A2

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):	39456	FITS:	2.9
	DEVICE HOURS:	335784	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: E6WA-2P2M,HPVt,E2,EPROGVt,TCZ,PF ALOCOS:GOI
 Passivation: Passivation w/Nov TEOS Oxide-Nitride
 Die Size: 90 x 66
 Number of Transistors: 1
 Interconnect: Aluminum / 0.5% Copper
 Gate Oxide Thickness: 150 Å

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE	CODE/PRODUCT/LOT	CONDITION	READPOINT	QTY	FAILS	FA#
ESD SENSITIVITY	0738	DS1841 QJ734261A	EOS/ESD S5.1 HBM 500 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0738	DS1841 QJ734261A	EOS/ESD S5.1 HBM 1000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0738	DS1841 QJ734261A	EOS/ESD S5.1 HBM 2000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0738	DS1841 QJ734261A	EOS/ESD S5.1 HBM 4000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0738	DS1841 QJ734261A	EOS/ESD S5.1 HBM 8000 VOLTS	1 PUL'S	3	3	No FA
LATCH-UP	0738	DS1841 QJ734261A	JESD78, I-TEST 125C		6	0	
LATCH-UP	0738	DS1841 QJ734261A	JESD78, V-SUPPLY TEST 125C		6	0	
Total:						3	

OPERATING LIFE

DESCRIPTION	DATE	CODE/PRODUCT/LOT	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0612	DS3901A QE620608	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0623	DS1882 QM619648	125C, 5.5V (PSA), -7.0V (PSC) & +7.0V (PSD)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0645	DS3501 QD651637	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0718	DS1124 QD730629	125C, 5.25 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0718	DS1124 QD730629	125C, 5.25 VOLTS	1000 HRS	45	0	

HIGH TEMP OP LIFE	0738	DS1841	QJ734261A	125C, 5.5 VOLTS	192	HRS	77	0
					Total:			0

W/E ENDURANCE AND DATA RET'N

DESCRIPTION	DATE	CODE/PRODUCT/LOT	CONDITION	READPOINT	QTY	FAILS	FA#
WRITE CYCLE STRESS (KCYS)	0612	DS3901A QE620608	70 C, 5.5 VOLTS	30 KCYS	77	0	
STORAGE LIFE	0612	DS3901A QE620608	150C	1000 HRS	77	0	
WRITE CYCLE STRESS (KCYS)	0623	DS1882 QM619648	70C, 5.5 V (PSA), -7.0 V (PSC) & +7.0V (PSD)	30 KCYS	77	0	
STORAGE LIFE	0623	DS1882 QM619648	150C	1000 HRS	77	0	
WRITE CYCLE STRESS (KCYS)	0709	DS3501 VD714640A	25 C, 5.5 VOLTS	200 KCYS	77	0	
STORAGE LIFE	0709	DS3501 VD714640A	150C	1000 HRS	77	0	
STORAGE LIFE	0718	DS1124 QD730629	150C	1000 HRS	77	0	
WRITE CYCLE STRESS (KCYS)	0738	DS1841 QJ734261A	25 C, 5.5 VOLTS	200 KCYS	77	0	
STORAGE LIFE	0738	DS1841 QJ734261A	150C	96 HRS	77	0	
					Total:		0

FAILURE RATE:	MTTF (YRS):	39456	FITS:	2.9
	DEVICE HOURS:	335784	FAILS:	0