



6/16/2010

**PRODUCT RELIABILITY REPORT
FOR**

DS2430A, Rev B1

Maxim Integrated Products

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Prepared by:

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Conclusion

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

DS2430A, Rev B1

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):** **112374** **FITS:** **1.0**
DEVICE HOURS: **901990573** **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: 5.25 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 E35W-0.5um, 5V CMOS with embedded Array EEPROM, embedded RSE EEPROM, 18V CMOS, VNPN, P2-P1 Cap, LVMOSCAP, HVMOSCAP, Varactor Cap, NTC poly R's, 3LM, M3 Laser Fuses
 Passivation: TEOS Oxide-Nitride Passivation
 Die Size: 67.716535 x 76.377952
 Number of Transistors: 38595
 Interconnect: Aluminum / 0.5% Copper
 Gate Oxide Thickness: 120 Å

DATA RETENTION

DESCRIPTION	DATE	CODE/PRODUCT/LOT	CONDITION	READPOIN	QTY	FAILS	FA#
STORAGE LIFE	0922	DS36A92	WJ946542AB 150C	192 HRS	77	0	
STORAGE LIFE	0932	MAX17043	WJ946441PC 150C	192 HRS	77	0	
Total:						0	

ESD HBM

DESCRIPTION	DATE	CODE/PRODUCT/LOT	CONDITION	READPOIN	QTY	FAILS	FA#
ESD SENSITIVITY	0951	DS2430A	WH048838A JESD22-A114 HBM 500 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A JESD22-A114 HBM 1000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A JESD22-A114 HBM 2000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A JESD22-A114 HBM 4000 VOLTS	1 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A JESD22-A114 HBM 8000 VOLTS	1 PUL'S	3	0	
Total:						0	

ESD IEC

DESCRIPTION	DATE	CODE/PRODUCT/LOT	CONDITION	READPOIN	QTY	FAILS	FA#
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 CONTACT 2000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 CONTACT 4000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 CONTACT 6000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 CONTACT 8000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 AIR 2000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 AIR 4000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 AIR 8000 VOLTS	10 PUL'S	3	0	
ESD SENSITIVITY	0951	DS2430A	WH048838A IEC 61000-4-2 AIR 15000 VOLTS	10 PUL'S	3	0	
Total:						0	

LATCH-UP

DESCRIPTION	DATE	CODE/PRODUCT/LOT	CONDITION	READPOIN	QTY	FAILS	FA#
LATCH-UP V	0951	DS2430A	WH048838A 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	0839	DS2784	WJ942986TC 125C, 4.6 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0843	DS2784	WJ941766OA 125C, 4.6 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0848	DS2784	WJ943239LC 125C, 4.6 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0914	DS2780	WJ944804AB 125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0916	DS2784	WJ943240IC- 125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0916	DS2784	WJ945481AC 125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0922	DS36A92	WJ946542AB 125C, 3.6 VOLTS	192 HRS	45	0	
HIGH TEMP OP LIFE	0932	MAX17043	WJ946441PC 125C, 4.5V (PSA) & 9.2V (PSB)	192 HRS	45	0	
HIGH TEMP OP LIFE	0933	DS1873	QJ917612BC 125C, 4.2 VOLTS	192 HRS	77	0	
HIGH TEMP OP LIFE	0937	DS2784	WJ046898JC 125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0940	DS2784	WJ048759AC 125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	80	0	
HIGH TEMP OP LIFE	0946	DS1876	WJ048840AA 125C, 4.2 VOLTS	192 HRS	77	0	

HIGH TEMP OP LIFE	0948	DS1091L	WJ946344EA 150C, 3.6 VOLTS	408	HRS	45	0
HIGH TEMP OP LIFE	0948	DS1091L	WJ946344EA 150C, 3.6 VOLTS	408	HRS	45	0
HIGH TEMP OP LIFE	0951	DS2784	WJ049559AB 125C, 5.5 V (PSA) & 15.0 V (PSB)	1000	HRS	80	0
HIGH TEMP OP LIFE	0951	DS1877	WJ048842AA 125C, 4.2 VOLTS	192	HRS	77	0
HIGH TEMP OP LIFE	0951	DS2430A	WH048838A 125C, 5.25 VOLTS	192	HRS	50	0
HIGH TEMP OP LIFE	1004	DS3644	WS046549D 125C, 3.6V (PSA) & 3.3V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	1009	DS1624	WJ048844BB 125C, 5.5 VOLTS	192	HRS	77	0
HIGH TEMP OP LIFE	1013	DS2784	WJ050375AB 125C, 5.5 V (PSA) & 15.0 V (PSB)	500	HRS	80	0
						Total:	0

W/E ENDURANCE AND DATA RET'N

DESCRIPTION	DATE CODE/PRODUCT/LOT	CONDITION	READPOIN	QTY	FAILS	FA#	
WRITE CYCLE STRESS (KCYS)	0839 DS2784	WJ942986TC 50 C, 4.6 V (PSA) & 15.0 V (PSB)	50 KCYS	77	0		
STORAGE LIFE	0839 DS2784	WJ942986TC 150C	1000 HRS	77	0		
WRITE CYCLE STRESS (KCYS)	0843 DS2784	WJ941766OA 50 C, 4.6 V (PSA) & 15.0 V (PSB)	50 KCYS	77	0		
STORAGE LIFE	0843 DS2784	WJ941766OA 150C	1000 HRS	77	0		
WRITE CYCLE STRESS (KCYS)	0848 DS2784	WJ943239LC 50 C, 4.6 V (PSA) & 15.0 V (PSB)	50 KCYS	77	0		
STORAGE LIFE	0848 DS2784	WJ943239LC 150C	1000 HRS	77	0		
WRITE CYCLE STRESS (KCYS)	0916 DS2784	WJ943240IC- 50 C, 5.5 V (PSA) & 15.0 V (PSB)	50 KCYS	77	0		
STORAGE LIFE	0916 DS2784	WJ943240IC- 150C	1000 HRS	77	0		
WRITE CYCLE STRESS (KCYS)	0916 DS2784	WJ945481AC 50 C, 5.5 V (PSA) & 15.0 V (PSB)	50 KCYS	77	0		
STORAGE LIFE	0916 DS2784	WJ945481AC 150C	1000 HRS	77	0		
WRITE CYCLE STRESS (KCYS)	0940 DS3882	WJ946345AC 85 C, 5.25 VOLTS	30 KCYS	77	0		
STORAGE LIFE	0940 DS3882	WJ946345AC 150C	1000 HRS	77	0		
WRITE CYCLE STRESS (KCYS)	0951 DS2430A	WH048838A 25 C, 5.25 VOLTS	200 KCYS	77	0		
STORAGE LIFE	0951 DS2430A	WH048838A 150C	96 HRS	77	0		
WRITE CYCLE STRESS (KCYS)	1009 DS1624	WJ048844BB 85 C, 5.5 VOLTS	25 KCYS	77	0		
STORAGE LIFE	1009 DS1624	WJ048844BB 150C	96 HRS	77	0		
						Total:	0

FAILURE RATE: MTTF (YRS): 112374 FITS: 1.0
DEVICE HOURS: 901990573 FAILS: 0