

11/28/2012



**PRODUCT RELIABILITY REPORT
FOR**

DS2480B, Rev B3

Maxim Integrated

**14460 Maxim Dr.
Dallas, TX 75244**

Approved by:

**Don Lipps
Manager, Reliability Engineering**

Conclusion:

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

DS2480B, Rev B3

In addition, Maxim Integrated'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.maximintegrated.com/qa/reliability/monitor>.

Device Description:

A description of this device can be found in the product data sheet. You can find the product data sheet at <http://www.maximintegrated.com/search/parts.mvp>.

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:

$$\text{MTTF} = 1/\text{Fr}$$

NOTE: MTTF is frequently used interchangeably with MTBF.

The calculated failure rate for this device/process is:

FAILURE RATE: **MTTF (YRS):** **147937** **FITS:** **0.8**
DEVICE HOURS: **1187447397** **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: SA EC8, 0.8um BiCMOS, 2 Poly, 3 Metal, 5 inch Reticles, 8 inch Wafer.
 Passivation: TEOS Oxide-Nitride Passivation
 Die Size: 114 x 77
 Number of Transistors: 7000
 Interconnect: Aluminum / 0.5% Copper
 Gate Oxide Thickness: 175 Å

OPERATING LIFE

DESCRIPTION	DATE CODE/PRODUCT/LOT	CONDITION	READPOIN	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0851 DS75 WJ943229R	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0903 DS87C520 WK943232A	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0905 DS75 WJ943230BA	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0906 DS75 WJ945780B	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0906 DS87C520 WK943228G	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0907 DS32KHZS WH943227P	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0930 DS1302 WJ946666A	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	1004 DS75 FD051295AC	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	1016 DS75 FD054294AB	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	1022 DS75 FJ047086AB	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	1044 DS75 FJ160750AC	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	1051 DS75 FD162044AC	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	1138 DS75 FD272216AE	125C, 5.5 VOLTS	1000 HRS	80	0	

HIGH TEMP OP LIFE	1146	DS75	WD273776A	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	1225	DS75	FK277512AA	125C, 5.5 VOLTS	1000 HRS	80	0
HIGH TEMP OP LIFE	1234	DS75	FK380548AF	125C, 5.5 VOLTS	1000 HRS	80	0
Total:						0	0
FAILURE RATE:	MTTF (YRS):		147937	FITS:	0.8		
	DEVICE HOURS:		1187447397	FAILS:	0		

DS2480B passes ESD HBM +/-8KV.