

4/16/2014



RELIABILITY MONITOR REPORT  
FOR

**BGA Package**

**MAXIM INTEGRATED**

160 RIO ROBLES  
SAN JOSE, CA 95134

This Report was prepared by  
**MAXIM INTEGRATED Reliability Engineering**

## Summary:

The data in the tables that follow was generated as the result of an on-going Package Reliability Monitor. The specific assemblies included in this package monitor are:

ASSY SITE	PINS	PACKAGE		
AMKOR CHINA	90	BGA-FC (Pb-Free)	ASE Chung-Li	144 CSBGA (Pb-Free)
ASE Kaohsiung	90	BGA-FC (Pb-Free)	ASE Kaohsiung	196 BGA-FC (Pb-Free)
ASE Kaohsiung	169	CSBGA (Pb-Free)	ASE Kaohsiung	336 CSBGA Hybrid (Pb-Free)
ASEK-ASY	196	BGA-FC (Pb-Free)	ASEK-ASY	336 CSBGA Hybrid (Pb-Free)
ASEK-BMP/ASEK-ATP	196	BGA-FC (Pb-Free)	ATP	100 CSBGA (Pb-Free)
	192	SBGA		

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 72505 FITS: 1.6**

The parameters used to calculate this failure rate are as follows:

**Cf: 60% Ea: 0.7 Tu: 25 °C**

The reliability data follows. A the start of this data is a description of the assembly vehicle used to generate this reliability data. The next section is the detailed reliability data for each stress. The reliability data section includes the latest data available. This report covers data between 4/1/2013 and 3/31/2014

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### Assembly Information:

Package Type: BGA-FC (Pb-Free)

Date Code Range: 1310 to N/A

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### OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1326	MAX24106EXV+	135°C	1000 HRS	25	0	
HIGH TEMP OP LIFE	1326	MAX24106EXV+	135°C	1000 HRS	25	0	
HIGH TEMP OP LIFE	1330	MAX24106EXV+	135°C	1000 HRS	30	0	
HIGH TEMP OP LIFE	1335	MAX24106EXV+	135°C	476 HRS	80	0	
HIGH TEMP OP LIFE	1407	MAX24106EXV+	135°C	500 HRS	25	0	
HIGH TEMP OP LIFE	1407	MAX24106EXV+	135°C	500 HRS	25	0	
HIGH TEMP OP LIFE	N/A	MAX77612AEMJ+	135°C	1000 HRS	45	0	
<b>Total:</b>						<b>0</b>	

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### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1326	MAX24106EXV+	150°C	1000 HRS	80	0	
STORAGE LIFE	1326	MAX24106EXV+	150°C	1000 HRS	80	0	
STORAGE LIFE	1330	MAX24106EXV+	150°C	1000 HRS	80	0	
STORAGE LIFE	1407	MAX24106EXV+	150°C	250 HRS	80	0	
STORAGE LIFE	1407	MAX24106EXV+	150°C	250 HRS	80	0	
STORAGE LIFE	1407	MAX24106EXV+	150°C	250 HRS	80	0	
STORAGE LIFE	N/A	MAX77612AEMJ+	150°C	1000 HRS	77	0	

**Total: 0**

**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	1310	MAX24106EXV+	-65C TO 150C	1000 CYS	50	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1310	MAX24106EXV+	-65C TO 150C	1000 CYS	50	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1310	MAX24106EXV+	-65C TO 150C	1000 CYS	50	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1326	MAX24106EXV+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1326	MAX24106EXV+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1330	MAX24106EXV+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1344	MAX77663KEXJ+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1407	MAX24106EXV+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1407	MAX24106EXV+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1407	MAX24106EXV+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 15' RAMP, 15' DWELL	N/A	MAX77612AEMJ+	-40C TO +125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	N/A	MAX77612AEMJ+	-65C TO 150C	1000 CYS	77	0	
<b>Total:</b>						<b>0</b>	

**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	1310	MAX24106EXV+	85 C/85% R.H.	1000 HRS	30	0	
MOISTURE SOAK	1310	MAX24106EXV+	85 C/85% R.H.	1000 HRS	30	0	
MOISTURE SOAK	1310	MAX24106EXV+	85 C/85% R.H.	1000 HRS	20	0	
MOISTURE SOAK	1326	MAX24106EXV+	85 C/85% R.H.	1000 HRS	80	0	
MOISTURE SOAK	1326	MAX24106EXV+	85 C/85% R.H.	1000 HRS	80	0	
MOISTURE SOAK	1330	MAX24106EXV+	85 C/85% R.H.	1000 HRS	78	0	
MOISTURE SOAK	1344	MAX77663KEXJ+	85 C/85% R.H.	500 HRS	80	1	
MOISTURE SOAK	1407	MAX24106EXV+	85 C/85% R.H.	250 HRS	80	0	
MOISTURE SOAK	1407	MAX24106EXV+	85 C/85% R.H.	250 HRS	80	0	
MOISTURE SOAK	1407	MAX24106EXV+	85 C/85% R.H.	250 HRS	78	0	
MOISTURE SOAK	N/A	MAX77612AEMJ+	85 C/85% R.H.	1000 HRS	18	0	
MOISTURE SOAK	N/A	MAX77612AEMJ+	130C, 85% R.H.	1000 HRS	77	0	
<b>Total:</b>						<b>1</b>	

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**Assembly Information:**

Package Type: CSBGA (Pb-Free)

Date Code Range: 1312 to 1321

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1312	MAX5870EXE+	135°C	192 HRS	78	0	
HIGH TEMP OP LIFE	1317	MAX34462	125C, 3.6 VOLTS	264 HRS	80	0	
HIGH TEMP OP LIFE	1317	MAX34462	125C, 3.6 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	1320	DS3177	125C, 3.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	1321	806-0724	49C;VEE -4.35V/VDD 2.5V/VTC 1.2V/VCC 7.6V/V+17.6V	1000 HRS	45	0	
HIGH TEMP OP LIFE	1321	806-0724	49C;VEE -4.35V/VDD 2.5V/VTC 1.2V/VCC 7.6V/V+17.6V	1000 HRS	45	0	
HIGH TEMP OP LIFE	1321	806-0724	49C;VEE -4.35V/VDD 2.5V/VTC 1.2V/VCC 7.6V/V+17.6V	1000 HRS	45	0	
<b>Total:</b>						<b>0</b>	

**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1321	806-0724	150°C	1000 HRS	77	0	
STORAGE LIFE	1321	806-0724	150°C	1000 HRS	77	0	
STORAGE LIFE	1321	806-0724	150°C	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	1321	806-0724	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1321	806-0724	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1321	806-0724	-55C TO 125C	1000 CYS	77	0	
<b>Total:</b>						<b>0</b>	

**TEMPERATURE HUMIDITY BIAS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST	1321	806-0724	110C/85%R.H./-3.5V2/+2.5V5/+1.2V3/+7.6V1/+11.5V4	264 HRS	45	0	
HAST	1321	806-0724	110C/85%R.H./-3.5V2/+2.5V5/+1.2V3/+7.6V1/+11.5V4	264 HRS	45	0	
HAST	1321	806-0724	110C/85%R.H./-3.5V2/+2.5V5/+1.2V3/+7.6V1/+11.5V4	264 HRS	90	0	
<b>Total:</b>						<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	1321	806-0724	110C, 85% R.H.	264 HRS	77	0	
HAST, NO BIAS	1321	806-0724	110C, 85% R.H.	264 HRS	77	0	
HAST, NO BIAS	1321	806-0724	110C, 85% R.H.	264 HRS	77	0	
<b>Total:</b>						<b>0</b>	

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**Assembly Information:**

Package Type: CSBGA Hybrid (Pb-Free)  
Date Code Range: 1309 to 1327

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1309	MAX2082CXD+	135°C	1000 HRS	20	0	
HIGH TEMP OP LIFE	1327	MAX2082CXD+	135°C	500 HRS	23	0	
HIGH TEMP OP LIFE	1327	MAX2082CXD+	135°C	500 HRS	22	0	
HIGH TEMP OP LIFE	1327	MAX2082CXD+	135°C	1000 HRS	20	0	
HIGH TEMP OP LIFE	1327	MAX2082CXD+	135°C	1000 HRS	20	0	
<b>Total:</b>						<b>0</b>	

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**Assembly Information:**

Package Type: SBGA  
Date Code Range: 1233 to 1237

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	1233	MAX108CHC-B50105	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1237	MAX108CHC-B50105	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1237	MAX108CHC-B50105	-65C TO 150C	1000 CYS	80	0	
<b>Total:</b>						<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	1237	MAX108CHC-B50105	85 C/85% R.H.	1000 HRS	80	0	
MOISTURE SOAK	1237	MAX108CHC-B50105	85 C/85% R.H.	1000 HRS	80	0	
MOISTURE SOAK	1237	MAX108CHC-B50105	85 C/85% R.H.	500 HRS	80	0	
MOISTURE SOAK	1237	MAX108CHC-B50105	85 C/85% R.H.	1000 HRS	80	0	
<b>Total:</b>						<b>0</b>	

**FAILURE RATE: MTTF (YRS): 72505 FITS: 1.6**