



4/13/2009

RELIABILITY MONITOR REPORT  
FOR

**uMAX Package**

**MAXIM Integrated Products**

120 San Gabriel Dr.  
Sunnyvale, CA 94086

This Report was prepared by  
Maxim 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		
ATP (Amkor, PI)	8	uMAX	ATP (Amkor, PI)	8 uMAX (Pb-Free)
ATP (Amkor, PI)	10	uMAX (Pb-Free)	Hana AYUTHAYA	8 uMAX
ISPL (ATEC, PI)	8	uMAX (Pb-Free)	Unisem Malaysia	8 uMAX
Unisem Malaysia	8	uMAX (Pb-Free)	Unisem Malaysia	10 uMAX (Pb-Free)
UTL (NSEB) UTAC	8	uMAX (Pb-Free)		

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 129890 FITS: 0.9**

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

**Cf: 60% Ea: 0.7 Tu: 25 °C**

The reliability data follows. At 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 10/1/2007 and 9/30/2008.

**Assembly Information:**

Package Type: uMAX  
Date Code Range: 0515 to 0825

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0825	MAX1790EUA+	135C	1000 HRS	80	0	
<b>Total:</b>						<b>0</b>	

**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0515	MAX4402AUA	J-STD-020		22	0	
PHYSICAL DIMENSIONS	0515	MAX4402AUA	JESD22-B100		10	0	
ULTRASOUND	0735	MAX7500MUA	J-STD-020		22	0	
SOLDERABILITY (Pb-Free)	0735	MAX7500MUA+	JESD22-B102, COND C (245C)		15	0	
SOLDERABILITY (Pb-Free)	0741	MAX7500MUA+	JESD22-B102, COND C (245C)		15	0	
<b>Total:</b>						<b>0</b>	

**PRECONDITIONING LEVEL 1**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
CONVECTION REFLOW	0515	MAX4402AUA	260C +/-5C	1	PASS	250	0
CONVECTION REFLOW	0735	MAX7500MUA+	260C +/-5C	3	PASS	240	0
CONVECTION REFLOW	0825	MAX1790EUA+	260C +/-5C	3	PASS	230	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	0735	MAX7500MUA+	150C	1000 HRS	80	0	
STORAGE LIFE	0735	MAX7500MUA+	150C	500 HRS	80	0	
STORAGE LIFE	0741	MAX7500MUA+	150C	1000 HRS	48	0	
STORAGE LIFE	0825	MAX1790EUA+	150C	1000 HRS	80	0	
					<b>Total:</b>	<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	0515	MAX4402AUA	-65C TO 150C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0735	MAX7500MUA+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0825	MAX1790EUA+	-65C TO 150C	200 CYS	80	0	
					<b>Total:</b>	<b>0</b>	

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**TEMPERATURE HUMIDITY BIAS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0515	MAX4402AUA	130C, 85% R.H.	96 HRS	40	0	
BIASED MOISTURE	0735	MAX7500MUA+	130C, 85% R.H.	96 HRS	40	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	0515	MAX4402AUA	130C, 85% R.H.	96 HRS	77	0	
					<b>Total:</b>	<b>0</b>	

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**Assembly Information:**

Package Type: uMAX (Pb-Free)

Date Code Range: 0549 to 0818

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0648	MAX9588AUA+	135C	192 HRS	48	0	
HIGH TEMP OP LIFE	0719	DS1091L	125C, 3.6 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0719	DS1091L	125C, 3.6 VOLTS	1000 HRS	32	0	
HIGH TEMP OP LIFE	0732	DS1099	125C, 5.5 VOLTS	408 HRS	45	0	
HIGH TEMP OP LIFE	0732	DS1099	125C, 5.5 VOLTS	408 HRS	32	0	
HIGH TEMP OP LIFE	0732	DS1080L	125C, 3.6 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0732	DS1080L	125C, 3.6 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0737	MAX1790EUA+	135C	1000 HRS	50	0	
HIGH TEMP OP LIFE	0737	MAX1790EUA+	135C	1000 HRS	50	0	
HIGH TEMP OP LIFE	0737	MAX1790EUA+	135C	1000 HRS	50	0	

HIGH TEMP OP LIFE	0742	MAX2750AUA+	135C	1000 HRS	74	0
HIGH TEMP OP LIFE	0744	DS2745	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0745	DS1099	125C, 5.5 VOLTS	240 HRS	45	0
HIGH TEMP OP LIFE	0752	MAX6683AUB+	135C	192 HRS	54	0
HIGH TEMP OP LIFE	0802	DS3502	125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0
HIGH TEMP OP LIFE	0806	DS1086H	125C, 5.25 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0811	DS1080CL	125C, 3.6 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0811	MAX1162ACUB+	135C	96 HRS	79	0
HIGH TEMP OP LIFE	0814	MAX2130EUA+	135C	1000 HRS	48	0
HIGH TEMP OP LIFE	0818	MAX1792EUA18+	135C	138 HRS	79	0
<b>Total:</b>						<b>0</b>

### PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
PHYSICAL DIMENSIONS	0549	LMX358AUA+	JESD22-B100		10	0	
ULTRASOUND	0631	MAX4402AUA+	J-STD-020		22	0	
PHYSICAL DIMENSIONS	0631	MAX4402AUA+	JESD22-B100		10	0	
LEAD FINISH ADHESION	0631	MAX4402AUA+	MIL-STD-883-2025		10	0	
SOLDERABILITY (Pb-Free)	0631	MAX4402AUA+	JESD22-B102, COND C (245C)		15	0	
BOND STRENGTH	0631	MAX4402AUA+	> 5 GMS	30 WIRES	10	0	
SOLDERABILITY (Pb-Free)	0742	MAX2750AUA+	JESD22-B102, COND C (245C)		15	0	
LEAD FINISH ADHESION	0746	MAX668EUB+	MIL-STD-883-2025		10	0	
SOLDERABILITY (Pb-Free)	0746	MAX668EUB+	JESD22-B102, COND C (245C)		15	0	
ULTRASOUND	0814	MAX2130EUA+	J-STD-020		22	0	
SOLDERABILITY (Pb-Free)	0814	MAX2130EUA+	JESD22-B102, COND C (245C)		15	0	
ULTRASOUND	0816	MAX1806EUA25+	J-STD-020		22	0	
ULTRASOUND	0818	MAX1792EUA18+	J-STD-020		22	0	
PHYSICAL DIMENSIONS	0818	MAX1792EUA18+	JESD22-B100		10	0	
SOLDERABILITY (Pb-Free)	0818	MAX1792EUA18+	JESD22-B102, COND C (245C)		15	0	
<b>Total:</b>						<b>0</b>	

### PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
CONVECTION REFLOW	0631	MAX4402AUA+	260C +/-5C	1 PASS	250	0	
CONVECTION REFLOW	0659	LMX358AUA+	260C +/-5C	3 PASS	317	0	
CONVECTION REFLOW	0732	MAX2130EUA+	260C +/-5C	3 PASS	150	0	
CONVECTION REFLOW	0732	MAX2130EUA+	260C +/-5C	3 PASS	150	0	

CONVECTION REFLOW	0732	MAX2130EUA+	260C +0/-5C	3	PASS	150	0
CONVECTION REFLOW	0737	MAX1790EUA+	260C +0/-5C	3	PASS	230	0
CONVECTION REFLOW	0737	MAX1790EUA+	260C +0/-5C	3	PASS	230	0
CONVECTION REFLOW	0737	MAX1790EUA+	260C +0/-5C	3	PASS	230	0
CONVECTION REFLOW	0747	MAX668EUB+	260C +0/-5C	3	PASS	240	0
CONVECTION REFLOW	0750	MAX668EUB+	260C +0/-5C	3	PASS	240	0
CONVECTION REFLOW	0814	MAX2130EUA+	260C +0/-5C	3	PASS	240	0
<b>Total:</b>							<b>0</b>

### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0732	DS1099	150C	1000 HRS	77	0	
STORAGE LIFE	0732	DS1080L	150C	1000 HRS	55	0	
STORAGE LIFE	0732	DS1080L	150C	1000 HRS	55	0	
STORAGE LIFE	0737	MAX1790EUA+	150C	1000 HRS	77	0	
STORAGE LIFE	0746	MAX668EUB+	150C	1000 HRS	80	0	
STORAGE LIFE	0806	DS1086H	150C	1000 HRS	75	0	
STORAGE LIFE	0810	DS1086L	150C	1000 HRS	75	0	
STORAGE LIFE	0814	MAX2130EUA+	150C	1000 HRS	45	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	0631	MAX4402AUA+	-65C TO 150C	1000 CYS	77	0	
BOND STRENGTH	0732	DS1099	MIL-STD-883-2011 : COND D	30 WIRES	5	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0732	DS1099	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0732	DS1080L	-65C TO 150C	500 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0732	DS1080L	-65C TO 150C	500 CYS	77	0	
BOND STRENGTH	0732	DS1080L	MIL-STD-883-2011 : COND D	40 WIRES	5	0	
BOND STRENGTH	0732	DS1080L	MIL-STD-883-2011 : COND D	40 WIRES	5	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0732	MAX2130EUA+	-65C TO 150C	500 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0732	MAX2130EUA+	-65C TO 150C	500 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0732	MAX2130EUA+	-65C TO 150C	500 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0737	MAX1790EUA+	-65C TO 150C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0737	MAX1790EUA+	-65C TO 150C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0746	MAX668EUB+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0806	DS1086H	-55C TO 125C	1000 CYS	77	0	

BOND STRENGTH	0806	DS1086H	MIL-STD-883-2011 : COND D	30	WIRES	5	0
BOND STRENGTH	0810	DS1086L	MIL-STD-883-2011 : COND D	40	WIRES	5	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0810	DS1086L	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0814	MAX2130EUA+	-65C TO 150C	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0818	MAX1792EUA18+	-65C TO 150C	500	CYS	80	0
<b>Total:</b>						<b>0</b>	<b>0</b>

#### TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0631	MAX4402AUA+	130C, 85% R.H.	96	HRS	27	0
HAST	0732	DS1099	130C, 85%R.H.,5.5V	96	HRS	77	0
HAST	0732	DS1080L	130C, 85%R.H.,3.5V	96	HRS	77	0
HAST	0732	DS1080L	130C, 85%R.H.,3.5V	96	HRS	77	0
BIASED MOISTURE	0737	MAX1790EUA+	130C, 85% R.H.	96	HRS	50	0
BIASED MOISTURE	0737	MAX1790EUA+	130C, 85% R.H.	96	HRS	50	0
BIASED MOISTURE	0737	MAX1790EUA+	130C, 85% R.H.	96	HRS	50	0
BIASED MOISTURE	0746	MAX668EUB+	130C, 85% R.H.	96	HRS	40	0
HAST	0806	DS1086H	130C, 85%R.H.,5.5V	96	HRS	77	0
HAST	0810	DS1086L	130C, 85%R.H.,3.5V	96	HRS	77	0
BIASED MOISTURE	0818	MAX1792EUA18+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	0818	MAX1792EUA18+	130C, 85% R.H.	96	HRS	40	0
<b>Total:</b>						<b>0</b>	<b>0</b>

#### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	0631	MAX4402AUA+	130C, 85% R.H.	96	HRS	77	0
AUTOCLAVE	0732	DS1099	121C, 2 ATM STEAM, UNBIASED168	HRS	77	0	0
AUTOCLAVE	0732	DS1080L	121C, 2 ATM STEAM, UNBIASED168	HRS	77	0	0
AUTOCLAVE	0732	DS1080L	121C, 2 ATM STEAM, UNBIASED168	HRS	77	0	0
MOISTURE SOAK	0746	MAX668EUB+	130C, 85% R.H.	96	HRS	80	0
AUTOCLAVE	0806	DS1086H	121C, 2 ATM STEAM, UNBIASED168	HRS	77	0	0
AUTOCLAVE	0810	DS1086L	121C, 2 ATM STEAM, UNBIASED168	HRS	77	0	0
MOISTURE SOAK	0814	MAX2130EUA+	130C, 85% R.H.	96	HRS	80	0
<b>Total:</b>						<b>0</b>	<b>0</b>

#### W/E ENDURANCE AND DATA RET'N

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0802	DS3502	150C	1000	HRS	72	0
WRITE CYCLE STRESS (KCYS)	0802	DS3502	25 C, 5.5 V (PSA) & 15.0 V (PSB)	200	KCYS	77	0
STORAGE LIFE	0802	DS3502	150C	1000	HRS	77	0

WRITE CYCLE STRESS (KCYS)	0802	DS3502	85 C, 5.5 V (PSA) & 15.0 V (PSB) 50	KCYS	77	0
STORAGE LIFE	0810	DS1086L	150C	500 HRS	77	0
WRITE CYCLE STRESS (KCYS)	0810	DS1086L	70 C, 3.6 VOLTS	10 KCYS	77	0
<b>Total:</b>						<b>0</b>

**W/E ENDURANCE AND OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0810	DS1086L	125C, 3.6 VOLTS	408 HRS	75	0	
WRITE CYCLE STRESS (KCYS)	0810	DS1086L	70 C, 3.6 VOLTS	10 KCYS	77	0	
<b>Total:</b>						<b>0</b>	

**FAILURE RATE: MTTF (YRS): 129890 FITS: 0.9**