



4/8/2009

RELIABILITY MONITOR REPORT
FOR

TSSOP 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	TSSOP	ATP (Amkor, PI)	20 TSSOP
ATP (Amkor, PI)	8	TSSOP (Pb-Free)	ATP (Amkor, PI)	14 TSSOP (Pb-Free)
ATP (Amkor, PI)	20	TSSOP (Pb-Free)	ATP (Amkor, PI)	24 TSSOP (Pb-Free)
ATP (Amkor, PI)	28	TSSOP (Pb-Free)	ATP (Amkor, PI)	48 TSSOP (Pb-Free)
Carsem	28	TSSOP (Pb-Free)	Carsem-M	28 TSSOP
Carsem-M	16	TSSOP (Pb-Free)	Carsem-S	14 TSSOP
Carsem-S	14	TSSOP (Pb-Free)	Unisem Malaysia	8 TSSOP
UTL (NSEB) UTAC	16	TSSOP	UTL (NSEB) UTAC	28 TSSOP
UTL (NSEB) UTAC	14	TSSOP (Pb-Free)	UTL (NSEB) UTAC	20 TSSOP (Pb-Free)
UTL (NSEB) UTAC	28	TSSOP (Pb-Free)		

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 175542 FITS: 0.7

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 7/1/2007 and 6/30/2008.

Assembly Information:

Package Type: TSSOP
Date Code Range: 0515 to 0804

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0601	MAX1082AEUE	135C	0 HRS	80	0	
HIGH TEMP OP LIFE	0601	MAX1082AEUE	135C	0 HRS	80	0	
HIGH TEMP OP LIFE	0713	MAX3317EEUP+	135C	1000 HRS	80	0	
HIGH TEMP OP LIFE	0713	MAX3317EEUP+	135C	1000 HRS	80	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0515	MAX4402AUA	J-STD-020		22	0	
ULTRASOUND	0515	MAX4402AUA	J-STD-020		22	0	
PHYSICAL DIMENSIONS	0515	MAX4402AUA	JESD22-B100		10	0	
PHYSICAL DIMENSIONS	0515	MAX4402AUA	JESD22-B100		10	0	
SOLDERABILITY (Pb-Free)	0616	MAX7033EUI+	JESD22-B102, COND C (245C)		15	0	
SOLDERABILITY (Pb-Free)	0616	MAX7033EUI+	JESD22-B102, COND C (245C)		15	0	
BOND STRENGTH	0616	MAX7033EUI+	> 5 GMS	30 WIRES	5	0	
BOND STRENGTH	0616	MAX7033EUI+	> 5 GMS	30 WIRES	5	0	

SOLDERABILITY (Pb-Free)	0703	MAX3318EEUP+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0703	MAX3318EEUP+	JESD22-B102, COND C (245C)	15	0
PHYSICAL DIMENSIONS	0711	MAX3318EEUP+	JESD22-B100	11	0
PHYSICAL DIMENSIONS	0711	MAX3318EEUP+	JESD22-B100	11	0
SOLDERABILITY (Pb-Free)	0711	MAX3318EEUP+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0711	MAX3318EEUP+	JESD22-B102, COND C (245C)	15	0
PHYSICAL DIMENSIONS	0719	MAX2750EUA+	JESD22-B100	10	0
PHYSICAL DIMENSIONS	0719	MAX2750EUA+	JESD22-B100	10	0
LEAD FINISH ADHESION	0719	MAX2750EUA+	MIL-STD-883-2025	5	0
LEAD FINISH ADHESION	0719	MAX2750EUA+	MIL-STD-883-2025	5	0
SOLDERABILITY (Pb-Free)	0719	MAX2750EUA+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0719	MAX2750EUA+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0735	MAX7500MUA+	JESD22-B102, COND C (245C)	15	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
SOLDERABILITY (Pb-Free)	0741	MAX7500MUA+	JESD22-B102, COND C (245C)	15	0
LEAD FINISH ADHESION	0747	MAX4394EUD+	MIL-STD-883-2025	5	0
LEAD FINISH ADHESION	0747	MAX4394EUD+	MIL-STD-883-2025	5	0
SOLDERABILITY (Pb-Free)	0747	MAX4394EUD+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0747	MAX4394EUD+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0804	MAX7034AUI+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0804	MAX7034AUI+	JESD22-B102, COND C (245C)	15	0
				Total:	0

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
CONVECTION REFLOW	0515	MAX4402AUA	260C +0/-5C	1	PASS	250	0
CONVECTION REFLOW	0515	MAX4402AUA	260C +0/-5C	1	PASS	250	0
CONVECTION REFLOW	0601	MAX1082AEUE	260C +0/-5C	3	PASS	240	0
CONVECTION REFLOW	0601	MAX1082AEUE	260C +0/-5C	3	PASS	240	0
CONVECTION REFLOW	0747	MAX4394EUK+	260C +0/-5C	3	PASS	324	0
CONVECTION REFLOW	0747	MAX4394EUK+	260C +0/-5C	3	PASS	324	0
CONVECTION REFLOW	0804	MAX7034AUI+	260C +0/-5C	3	PASS	400	0
CONVECTION REFLOW	0804	MAX7034AUI+	260C +0/-5C	3	PASS	400	0
				Total:		0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0616	MAX7033EUI+	150C	1000 HRS	78	0	

STORAGE LIFE	0616	MAX7033EUI+	150C	1000 HRS	78	0
STORAGE LIFE	0747	MAX4394EUD+	150C	1000 HRS	80	0
STORAGE LIFE	0747	MAX4394EUD+	150C	1000 HRS	80	0
STORAGE LIFE	0804	MAX7034AUI+	150C	1000 HRS	80	0
STORAGE LIFE	0804	MAX7034AUI+	150C	1000 HRS	80	0
Total:						0

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	0515	MAX4402AUA	-65C TO 150C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0747	MAX4394EUD+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0747	MAX4394EUD+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0747	MAX4394EUD+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0747	MAX4394EUD+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0804	MAX7034AUI+	-65C TO 150C	500 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0804	MAX7034AUI+	-65C TO 150C	500 CYS	80	0	
Total:						0	

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	0515	MAX4402AUA	130C, 85% R.H.	96 HRS	40	0	
BIASED MOISTURE	0711	MAX3318EEUP+	130C, 85% R.H.	3 HRS	45	0	
BIASED MOISTURE	0711	MAX3318EEUP+	130C, 85% R.H.	3 HRS	45	0	
BIASED MOISTURE	0747	MAX4394EUD+	130C, 85% R.H.	96 HRS	96	0	
BIASED MOISTURE	0747	MAX4394EUD+	130C, 85% R.H.	96 HRS	96	0	
BIASED MOISTURE	0747	MAX4394EUD+	130C, 85% R.H.	96 HRS	48	0	
BIASED MOISTURE	0747	MAX4394EUD+	130C, 85% R.H.	96 HRS	48	0	
Total:						0	

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	
MOISTURE SOAK	0515	MAX4402AUA	130C, 85% R.H.	96 HRS	77	0	
MOISTURE SOAK	0601	MAX1082AEUE	130C, 85% R.H.	100 HRS	80	0	
MOISTURE SOAK	0601	MAX1082AEUE	130C, 85% R.H.	100 HRS	80	0	
MOISTURE SOAK	0711	MAX3318EEUP+	130C, 85% R.H.	96 HRS	33	0	
MOISTURE SOAK	0711	MAX3318EEUP+	130C, 85% R.H.	96 HRS	33	0	
MOISTURE SOAK	0747	MAX4394EUD+	130C, 85% R.H.	96 HRS	80	0	
MOISTURE SOAK	0747	MAX4394EUD+	130C, 85% R.H.	96 HRS	80	0	
Total:						0	

Assembly Information:

Package Type: TSSOP (Pb-Free)

Date Code Range: 0626 to 0817

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0626	MAX5406EUM+	135C	192 HRS	55	0	
HIGH TEMP OP LIFE	0702	MAX5079EUD+	135C	192 HRS	55	0	
HIGH TEMP OP LIFE	0727	DS2781	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0732	DS2784	125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0734	DS1081L	125C, 3.6 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0734	MAX2027EUP+	135C	1000 HRS	48	0	
HIGH TEMP OP LIFE	0736	DS1181L	125C, 3.6 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0736	DS1181L	125C, 3.6 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0736	DS2788	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0749	DS2782	125C, 5.5 VOLTS	1000 HRS	75	0	
HIGH TEMP OP LIFE	0749	MAXQ3180	125C, 3.6 VOLTS	1000 HRS	44	0	
HIGH TEMP OP LIFE	0751	DS2119M	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0803	MAX3388ECUG+	135C	1000 HRS	50	0	
HIGH TEMP OP LIFE	0803	MAX3388ECUG+	135C	500 HRS	50	0	
HIGH TEMP OP LIFE	0803	MAX3388ECUG+	135C	500 HRS	50	0	
HIGH TEMP OP LIFE	0804	DS2780	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0804	MAX3222EEUP+	135C	138 HRS	45	0	
HIGH TEMP OP LIFE	0806	DS2710	125C, 5.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0807	DS2119M	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0807	DS2119M	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0807	DS2119M	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Pb-Free)	0649	MAX1082AEUE+	JESD22-B102, COND C (245C)		15	0	
SOLDERABILITY (Pb-Free)	0801	MAX9246EUM+	JESD22-B102, COND C (245C)		15	0	
PHYSICAL DIMENSIONS	0803	MAX3388ECUG+	JESD22-B100		15	0	
SOLDERABILITY (Pb-Free)	0803	MAX3388ECUG+	JESD22-B102, COND C (245C)		15	0	
PHYSICAL DIMENSIONS	0803	MAX3388ECUG+	JESD22-B100		15	0	
SOLDERABILITY (Pb-Free)	0803	MAX3388ECUG+	JESD22-B102, COND C (245C)		15	0	
PHYSICAL DIMENSIONS	0803	MAX3388ECUG+	JESD22-B100		15	0	

SOLDERABILITY (Pb-Free)	0803	MAX3388ECUG+	JESD22-B102, COND C (245C)	15	0
SOLDERABILITY (Pb-Free)	0808	MAX3225EUP+	JESD22-B102, COND C (245C)	15	0
				Total:	0

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
CONVECTION REFLOW	0648	MAX1082AEUE+	260C +0/-5C	3	PASS	48	0
CONVECTION REFLOW	0734	MAX2027EUP+	260C +0/-5C	3	PASS	140	0
CONVECTION REFLOW	0734	MAX9144EUD+	260C +0/-5C	3	PASS	140	0
CONVECTION REFLOW	0803	MAX3388ECUG+	260C +0/-5C	3	PASS	255	0
CONVECTION REFLOW	0804	MAX3222EEUP+	260C +0/-5C	3	PASS	240	0
CONVECTION REFLOW	0808	MAX3225EUP+	260C +0/-5C	3	PASS	240	0
CONVECTION REFLOW	0817	MAX3222EEUP+	260C +0/-5C	3	PASS	240	0
				Total:		0	

SOLDER HEAT

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDER HEAT	0803	MAX3388ECUG+	260 C, 10SEC	1	PASS	17	0
SOLDER HEAT	0803	MAX3388ECUG+	260 C, 10SEC	1	PASS	17	0
SOLDER HEAT	0803	MAX3388ECUG+	260 C, 10SEC	1	PASS	17	0
				Total:		0	

SOLDER SHOCK

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDER SHOCK	0803	MAX3388ECUG+	300C	1	PASS	17	0
SOLDER SHOCK	0803	MAX3388ECUG+	300C	1	PASS	17	0
SOLDER SHOCK	0803	MAX3388ECUG+	300C	1	PASS	17	0
				Total:		0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0649	MAX1082AEUE+	150C	1000	HRS	45	0
STORAGE LIFE	0734	DS1081L	150C	1000	HRS	77	0
STORAGE LIFE	0751	DS2119M	150C	1000	HRS	77	0
STORAGE LIFE	0803	MAX3388ECUG+	150C	1000	HRS	80	0
STORAGE LIFE	0803	MAX3388ECUG+	150C	1000	HRS	80	0
STORAGE LIFE	0803	MAX3388ECUG+	150C	1000	HRS	80	0
STORAGE LIFE	0807	DS2119M	150C	1000	HRS	77	0
STORAGE LIFE	0807	DS2119M	150C	1000	HRS	77	0
STORAGE LIFE	0807	DS2119M	150C	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	0649	MAX1082AEUE+	-65C TO 150C	1000 CYS	78	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0734	DS1081L	-65C TO 150C	500 CYS	77	0	
BOND STRENGTH	0734	DS1081L	MIL-STD-883-2011 : COND D	40 WIRES	5	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0734	MAX2027EUP+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0751	DS2119M	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0803	MAX3388ECUG+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0803	MAX3388ECUG+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0803	MAX3388ECUG+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0804	MAX3222EEUP+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0807	DS2119M	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0807	DS2119M	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0807	DS2119M	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0808	MAX3225EUP+	-65C TO 150C	1000 CYS	80	0	
Total:						0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0649	MAX1082AEUE+	130C, 85% R.H.	96 HRS	33	0	
HAST	0734	DS1081L	130C, 85%R.H.,3.5V	96 HRS	77	0	
BIASED MOISTURE	0734	MAX2027EUP+	130C, 85% R.H.	96 HRS	40	0	
BIASED MOISTURE	0734	MAX9144EUD+	130C, 85% R.H.	96 HRS	50	0	
BIASED MOISTURE	0751	DS2119M	85/85, 5.5 VOLTS	1000 HRS	77	0	
HAST, NO BIAS	0751	DS2119M	130C, 85% R.H.	96 HRS	77	0	
BIASED MOISTURE	0803	MAX3388ECUG+	130C, 85% R.H.	96 HRS	46	0	
BIASED MOISTURE	0803	MAX3388ECUG+	130C, 85% R.H.	96 HRS	50	0	
BIASED MOISTURE	0803	MAX3388ECUG+	130C, 85% R.H.	96 HRS	50	0	
BIASED MOISTURE	0804	MAX3222EEUP+	130C, 85% R.H.	96 HRS	25	0	
BIASED MOISTURE	0807	DS2119M	85/85, 5.5 VOLTS	1000 HRS	45	0	
BIASED MOISTURE	0807	DS2119M	85/85, 5.5 VOLTS	1000 HRS	45	0	
BIASED MOISTURE	0807	DS2119M	85/85, 5.5 VOLTS	1000 HRS	45	0	
BIASED MOISTURE	0808	MAX3225EUP+	130C, 85% R.H.	96 HRS	21	0	
BIASED MOISTURE	0817	MAX3222EEUP+	130C, 85% R.H.	96 HRS	26	0	

Total: 0

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	0649	MAX1082AEUE+	130C, 85% R.H.	96 HRS	80	0	
AUTOCLAVE	0734	DS1081L	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
MOISTURE SOAK	0804	MAX3222EEUP+	130C, 85% R.H.	96 HRS	80	0	
MOISTURE SOAK	0808	MAX3225EUP+	130C, 85% R.H.	96 HRS	80	0	
MOISTURE SOAK	0817	MAX3222EEUP+	130C, 85% R.H.	96 HRS	80	0	
Total:						0	

W/E ENDURANCE AND DATA RET'N

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
WRITE CYCLE STRESS (KCYS)	0732	DS2784	50 C, 5.5 V (PSA) & 15.0 V (PSB)	50 KCYS	77	0	
STORAGE LIFE	0732	DS2784	150C	1000 HRS	77	0	
WRITE CYCLE STRESS (KCYS)	0736	DS2788	50 C, 5.5 VOLTS	50 KCYS	77	0	
STORAGE LIFE	0736	DS2788	150C	1000 HRS	77	0	
STORAGE LIFE	0802	DS3508	150C	1000 HRS	77	0	
WRITE CYCLE STRESS (KCYS)	0802	DS3508	85 C, 5.5 V (PSA) & 15.0 V (PSB)	50 KCYS	77	0	
Total:						0	

FAILURE RATE: MTTF (YRS): 175542 FITS: 0.7