



5/18/2009

RELIABILITY MONITOR REPORT  
FOR

**QFN 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		
ASAT Hong Kong	8	TDFN	ASAT-DongGuan (C	10 TDFN
ASAT-DongGuan (C	16	TQFN (Pb-Free)	ASAT-DongGuan (C	28 TQFN (Pb-Free)
ASAT-DongGuan (C	40	TQFN (Pb-Free)	ASAT-DongGuan (C	48 TQFN (Pb-Free)
ISPL (ATEC, PI)	8	TDFN	ISPL (ATEC, PI)	10 TDFN
Unisem Malaysia	8	TDFN	UTL (NSEB) UTAC	6 TDFN
UTL (NSEB) UTAC	8	TDFN	UTL (NSEB) UTAC	10 TDFN
UTL (NSEB) UTAC	14	TDFN	UTL (NSEB) UTAC	12 TQFN (Pb-Free)
UTL (NSEB) UTAC	16	TQFN (Pb-Free)	UTL (NSEB) UTAC	20 TQFN (Pb-Free)
UTL (NSEB) UTAC	28	TQFN (Pb-Free)	UTL (NSEB) UTAC	32 TQFN (Pb-Free)
UTL (NSEB) UTAC	36	TQFN (Pb-Free)	UTL (NSEB) UTAC	38 TQFN (Pb-Free)
UTL (NSEB) UTAC	40	TQFN (Pb-Free)	UTL (NSEB) UTAC	48 TQFN (Pb-Free)
UTL (NSEB) UTAC	56	TQFN (Pb-Free)	UTL (NSEB) UTAC	6 uDFN (Pb-Free)

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 187444 FITS: 0.6**

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 and

**Assembly Information:**

Package Type: TDFN  
 Date Code Range: 0711 to 0903

**DATA RETENTION**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0822	MAX17041	150C	1000 HRS	77	0	
STORAGE LIFE	0825	DS1190	150C	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0711	MAX8625AETD+	135C	192 HRS	50	0	
HIGH TEMP OP LIFE	0811	MAX4981ETA+	135C	192 HRS	48	0	
HIGH TEMP OP LIFE	0815	MAX15032ATA+T	135C	192 HRS	48	0	
HIGH TEMP OP LIFE	0816	MAX5418META+	135C	192 HRS	48	0	
HIGH TEMP OP LIFE	0820	MAX4989ETD+	135C	192 HRS	50	0	
HIGH TEMP OP LIFE	0822	MAX17041	125C, 5.5V (PSA) & 9.2V (PSB)	192 HRS	45	0	
HIGH TEMP OP LIFE	0822	MAX8856ETD+	135C	192 HRS	48	0	
HIGH TEMP OP LIFE	0823	MAX5417LETA+	135C	192 HRS	48	0	

HIGH TEMP OP LIFE	0823	MAX16023LTAS18+	135C	192	HRS	50	0
HIGH TEMP OP LIFE	0824	DS2786B	125C, 5.5 VOLTS	1000	HRS	45	0
HIGH TEMP OP LIFE	0825	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	0825	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	0825	MAX8606ETD+T	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0828	MAX1558ETB+T	135C	1000	HRS	80	0
HIGH TEMP OP LIFE	0838	MAX5423ETA+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0839	MAX17022ETA+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0841	MAX5418NETA+	135C	192	HRS	50	0
HIGH TEMP OP LIFE	0842	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	0842	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	0846	MAX1558ETB+T	135C	1000	HRS	80	0
HIGH TEMP OP LIFE	0850	MAX15027ATB/V+	135C	192	HRS	50	0
HIGH TEMP OP LIFE	0851	MAX6496ATA+	135C	652	HRS	48	0
HIGH TEMP OP LIFE	0902	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	0902	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	0903	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
HIGH TEMP OP LIFE	0903	DS1190	125C, 4.0V (PSA) & 6.0V (PSB)	192	HRS	45	0
<b>Total:</b>						<b>0</b>	<b>0</b>

#### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0810	MAX1976AETA130+ T	150C	1000	HRS	80	0
STORAGE LIFE	0828	MAX1558ETB+T	150C	1000	HRS	80	0
STORAGE LIFE	0846	MAX1558ETB+T	150C	1000	HRS	80	0
STORAGE LIFE	0851	MAX6495ATT+	150C	1000	HRS	45	0
<b>Total:</b>						<b>0</b>	<b>0</b>

#### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	0737	MAX8586ETA+	-65C TO 150C	1000	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0751	MAX4990ETD+	-65C TO 150C	1000	CYS	500	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0810	MAX1976AETA130+ T	-65C TO 150C	1000	CYS	79	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0810	MAX1976AETA130+ T	-65C TO 150C	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0828	MAX1558ETB+T	-65C TO 150C	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0846	MAX1558ETB+T	-65C TO 150C	1000	CYS	80	0

TEMP CYCLE, 5' RAMP, 10' DWELL	0851	MAX6495ATT+	-65C TO 150C	500	CYS	80	0
						<b>Total:</b>	<b>0</b>

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

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
WRITE CYCLE STRESS (CYS)	0824	DS2786B	50 C, 5.5 VOLTS (PSA), 15.0 VOLTS (PSB)	100	CYS	77	0
STORAGE LIFE	0824	DS2786B	150C	1000	HRS	77	0
						<b>Total:</b>	<b>0</b>

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**Assembly Information:**

Package Type: TQFN (Pb-Free)

Date Code Range: 0634 to 0852

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE		MAX5478ETE+	135C	1000	HRS	45	0
HIGH TEMP OP LIFE	0634	MAX8731AETI+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0640	MAX9788ETI+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0726	DS3690	125C, 3.6 VOLTS	1000	HRS	45	0
HIGH TEMP OP LIFE	0743	MAX7477CTI+	135C	1000	HRS	24	0
HIGH TEMP OP LIFE	0748	MAX15021ATI+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0748	MAX15022AT1	135C	192	HRS	50	0
HIGH TEMP OP LIFE	0751	MAX2051ETP+	135C	240	HRS	50	0
HIGH TEMP OP LIFE	0802	MAX9724DETC+	135C	192	HRS	50	0
HIGH TEMP OP LIFE	0802	MAX8631XETI+	135C	192	HRS	80	0
HIGH TEMP OP LIFE	0807	MAX16836ATE+	135C	500	HRS	80	0
HIGH TEMP OP LIFE	0808	MAX16836ATE+	135C	500	HRS	69	0
HIGH TEMP OP LIFE	0809	MAX19996ETP+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0810	MAX9724CENGETC +	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0812	DS2726	125C, 50.0 VOLTS (PSD)	1000	HRS	45	0
HIGH TEMP OP LIFE	0813	MAX9791AETI+	135C	192	HRS	50	0
HIGH TEMP OP LIFE	0814	MAX15036ATE+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0818	MAX11043ATL+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0819	MAX13173EETU+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0824	MAX8819AETI+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0827	MAX5963UTL+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0827	MAX8785ETI+	135C	192	HRS	48	0
HIGH TEMP OP LIFE	0827	MAX9669ETI+	135C	500	HRS	80	0
HIGH TEMP OP LIFE	0832	MAX1541ETL+	135C	138	HRS	31	0
HIGH TEMP OP LIFE	0833	DS3514	125C, 5.5 V (PSA) & 15.0 V (PSB)	1000	HRS	77	0

HIGH TEMP OP LIFE	0833	DS3514	125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0
HIGH TEMP OP LIFE	0835	DS8500	125C, 3.6 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0842	MAX17108ETI+	135C	192 HRS	48	0
HIGH TEMP OP LIFE	0844	MAX17412ETI+	135C	192 HRS	50	0
HIGH TEMP OP LIFE	0850	MAX17088ETX+	135C	192 HRS	50	0
HIGH TEMP OP LIFE	0851	MAX9669ETI+	135C	1000 HRS	77	0
<b>Total:</b>					<b>0</b>	<b>0</b>

### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0743	MAX7477CTI+	150C	1000 HRS	80	0	
STORAGE LIFE	0805	MAX4928AETN+	150C	1000 HRS	77	0	
STORAGE LIFE	0805	MAX4928AETN+	150C	1000 HRS	77	0	
STORAGE LIFE	0805	MAX4928AETN+	150C	1000 HRS	77	0	
STORAGE LIFE	0807	MAX16836ATE+	150C	1000 HRS	80	0	
STORAGE LIFE	0816	MAX1782ETM+	150C	500 HRS	80	0	
STORAGE LIFE	0816	MAX1782ETM+	150C	1000 HRS	80	0	
STORAGE LIFE	0816	MAX1782ETM+	150C	1000 HRS	80	0	
STORAGE LIFE	0816	MAX1782ETM+	150C	500 HRS	80	0	
STORAGE LIFE	0825	MAX17061ETI+	150C	1000 HRS	80	0	
STORAGE LIFE	0827	MAX9669ETI+	150C	500 HRS	80	0	
STORAGE LIFE	0827	MAX9669ETI+	150C	880 HRS	80	0	
STORAGE LIFE	0851	MAX9669ETI+	150C	500 HRS	80	0	
STORAGE LIFE	0852	MAX1781ETM+C8B	150C	500 HRS	77	0	
STORAGE LIFE	0852	MAX1781ETM+C8B	150C	500 HRS	77	0	
STORAGE LIFE	0852	MAX1781ETM+C8B	150C	500 HRS	77	0	
<b>Total:</b>					<b>0</b>	<b>0</b>	

### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	0725	DS3690	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0726	DS3690	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0726	DS3690	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0751	MAX8556ETE+	-65C TO 150C	400 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0751	MAX8557ETE+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0805	MAX4928AETN	-65C TO 150C	1000 CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0807	MAX16836ATE+	-65C TO 150C	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	0809	MAX1781ETM+	-65C TO 150C	1000 CYS	77	0	

TEMP CYCLE, 5' RAMP, 10' DWELL	0809	MAX1781ETM+	-65C TO 150C	1000	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0809	MAX1781ETM+	-65C TO 150C	1000	CYS	76	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0815	MAX8556ETE+	-65C TO 150C	881	CYS	76	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0815	MAX8556ETE+	-65C TO 150C	1000	CYS	76	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0816	MAX1782ETM+	-65C TO 150C	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0816	MAX1782ETM+	-65C TO 150C	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0825	MAX17061ETI+	-65C TO 150C	950	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0852	MAX1781ETM+C8B	-65C TO 150C	500	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0852	MAX1781ETM+C8B	-65C TO 150C	500	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0852	MAX1781ETM+C8B	-65C TO 150C	500	CYS	77	0

**Total: 0**

#### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST, NO BIAS	0725	DS3690	130C, 85% R.H.	96	HRS	77	0
HAST, NO BIAS	0726	DS3690	130C, 85% R.H.	96	HRS	77	0
HAST, NO BIAS	0726	DS3690	130C, 85% R.H.	96	HRS	77	0

**Total: 0**

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

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0833	DS3514	150C	1000	HRS	77	0
WRITE CYCLE STRESS (KCYS)	0833	DS3514	70 C, 5.5V (PSA) & 15.0V (PSB)	50	KCYS	77	0
WRITE CYCLE STRESS (KCYS)	0833	DS3514	70 C, 5.5V (PSA) & 15.0V (PSB)	50	KCYS	77	0
STORAGE LIFE	0833	DS3514	150C	1000	HRS	77	0

**Total: 0**

#### Assembly Information:

Package Type: uDFN (Pb-Free)  
Date Code Range: 0821 to 0821

#### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	0821	DS2413	-55C TO 125C	2000	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0821	DS2413	-55C TO 125C	2000	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0821	DS2413	-55C TO 125C	2000	CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0821	DS2413	-55C TO 125C	2000	CYS	77	0

TEMP CYCLE, 5' RAMP, 10' DWELL	0821	DS2413	-55C TO 125C	1000 CYS	77	0
TEMP CYCLE, 5' RAMP, 10' DWELL	0821	DS2413	-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	0821	DS2413	130C, 85%R.H.,3.5V	96	HRS	45	0
HAST	0821	DS2413	130C, 85%R.H.,3.5V	96	HRS	45	0
HAST	0821	DS2413	130C, 85%R.H.,3.5V	96	HRS	45	0
HAST	0821	DS2413	130C, 85%R.H.,3.5V	96	HRS	45	0
HAST	0821	DS2413	130C, 85%R.H.,3.5V	96	HRS	45	0
HAST	0821	DS2413	130C, 85%R.H.,3.5V	96	HRS	45	0
<b>Total:</b>						<b>0</b>	

**FAILURE RATE: MTTF (YRS): 187444 FITS: 0.6**