1/10/2018

RELIABILITY MONITOR REPORT
FOR

TSSOP 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 specifc assemblies included in this package monitor are:

ASSY SITE	PINS	PACKAGE			
ATP (Amkor, PI)	16	TSSOP (Pb-Free)	ATP (Amkor, PI)	20	TSSOP (Pb-Free)
ATP (Amkor, PI)	38	TSSOP (Pb-Free)	ATP (Amkor, PI)	20	TSSOP-EP (Pb-Free)
ATP (Amkor, PI)	28	TSSOP-EP (Pb-Free)	Carsem-M	14	TSSOP (Pb-Free)
Greatek	56	TSSOP (Pb-Free)	UTL (NSEB) UTAC	14	TSSOP (Pb-Free)
UTL (NSEB) UTAC	16	TSSOP (Pb-Free)	UTL (NSEB) UTAC	20	TSSOP (Pb-Free)
UTL (NSEB) UTAC	14	TSSOP-EP (Pb-Free)			

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 353458 FITS: 0.3

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 10/1/2017 and 12/31/2017 .

Assembly Information:

Package Type: TSSOP (Pb-Free)

Date Code Range: 1618 to 1733

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1618	MAX16833CAUE/V+	135°C	1000 HRS	78	0	
HIGH TEMP OP LIFE	1629	MAX15005BAUE/V+	135°C	1000 HRS	33	0	
HIGH TEMP OP LIFE	1631	MAX1785EUU+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1642	MAX9201EUE+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1644	MAX3232EUE+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1653	MAX9201EUE+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1701	MAX4478AUD+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1703	MAX3232EUE+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1711	MAX1281BEUP+	135°C	1000 HRS	78	0	
HIGH TEMP OP LIFE	1711	MAX1281BEUP+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1711	MAX1281BEUP+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1715	MAX2235EUP+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1717	MAX9144EUD+	135°C	1000 HRS	78	0	
HIGH TEMP OP LIFE	1718	MAX3222EEUP+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1720	MAX17840AGUN/V+ CQ	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1720	MAX17840AGUN/V+ CQ	135°C	500 HRS	80	0	

HIGH TEMP OP LIFE	1720	MAX17840AGUN/V+ CQ	135°C	1000	HRS	80	0	
HIGH TEMP OP LIFE	1721	MAX4581EUE+	135°C	1000	HRS	79	0	
HIGH TEMP OP LIFE	1724	MAX2235EUP+	135°C	1000	HRS	80	0	
HIGH TEMP OP LIFE	1727	MAX9144EUD+	135°C	1000	HRS	78	0	
HIGH TEMP OP LIFE	1733	MAX15005BAUE/V+	135°C	1000	HRS	48	0	
HIGH TEMP OP LIFE	1733	MAX15005BAUE/V+	135°C	1000	HRS	32	0	
					Total:		**0**	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
BOND STRENGTH	1711	MAX1281BEUP+	> 5 GMS	200	WIRES	20	0	
BOND STRENGTH	1711	MAX1281BEUP+	> 5 GMS	200	WIRES	20	0	
BOND STRENGTH	1711	MAX1281BEUP+	> 5 GMS	200	WIRES	20	0	
					Total:		**0**	

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
CONVECTION REFLOW	1720	MAX17840AGUN/V+ CQ	260C +0/-5C		PASS	25	0	
CONVECTION REFLOW	1720	MAX17840AGUN/V+ CQ	260C +0/-5C		PASS	391	0	
CONVECTION REFLOW	1720	MAX17840AGUN/V+ CQ	260C +0/-5C		PASS	25	0	
CONVECTION REFLOW	1720	MAX17840AGUN/V+ CQ	260C +0/-5C		PASS	399	0	
CONVECTION REFLOW	1720	MAX17840AGUN/V+ CQ	260C +0/-5C		PASS	25	0	
CONVECTION REFLOW	1720	MAX17840AGUN/V+ CQ	260C +0/-5C		PASS	399	0	
CONVECTION REFLOW	1721	MAX4581EUE+	260C +0/-5C		PASS	320	0	
CONVECTION REFLOW	1724	MAX2235EUP+	260C			320	0	
CONVECTION REFLOW	1725	MAX17840AGUN/V+	260C +0/-5C		PASS	98	0	
CONVECTION REFLOW	1725	MAX17840AGUN/V+	260C +0/-5C		PASS	40	0	
CONVECTION REFLOW	1725	MAX17840AGUN/V+	260C +0/-5C		PASS	40	0	
CONVECTION REFLOW	1730	MAX3232EEUP+	260C			320	0	
CONVECTION REFLOW	1733	MAX15005BAUE/V+	260C			320	0	
					Total:		**0**	

SOLDER SHOCK

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDER SHOCK	1725	MAX17840AGUN/V+ CQ	300C		14	0	
SOLDER SHOCK	1725	MAX17840AGUN/V+ CQ	300C		5	0	

SOLDER SHOCK	1725	MAX17840AGUN/V+ CQ	300C		5	0
SOLDER SHOCK	1725	MAX17840AGUN/V+ CQ	300C		15	0
				Total:		**0**

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1631	MAX1785EUU+	150°C	1000 HRS	80	0	
STORAGE LIFE	1642	MAX9201EUE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1644	MAX3232EUE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1653	MAX9201EUE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1701	MAX4478AUD+	150°C	1000 HRS	80	0	
STORAGE LIFE	1703	MAX3232EUE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1711	MAX1281BEUP+	150°C	1000 HRS	90	0	
STORAGE LIFE	1711	MAX1281BEUP+	150°C	1000 HRS	90	0	
STORAGE LIFE	1711	MAX1281BEUP+	150°C	1000 HRS	90	0	
STORAGE LIFE	1715	MAX2235EUP+	150°C	1000 HRS	80	0	
STORAGE LIFE	1717	MAX9144EUD+	150°C	1000 HRS	80	0	
STORAGE LIFE	1718	MAX3222EEUP+	150°C	1000 HRS	80	0	
STORAGE LIFE	1720	MAX17840AGUN/V+ CQ	150°C	1000 HRS	80	0	
STORAGE LIFE	1720	MAX17840AGUN/V+ CQ	150°C	2000 HRS	80	0	
STORAGE LIFE	1720	MAX17840AGUN/V+ CQ	150°C	1000 HRS	80	0	
STORAGE LIFE	1720	MAX17840AGUN/V+ CQ	150°C	1000 HRS	80	0	
STORAGE LIFE	1721	MAX4581EUE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1724	MAX2235EUP+	150°C	1000 HRS	80	0	
STORAGE LIFE	1730	MAX3232EEUP+	150°C	1000 HRS	80	0	
STORAGE LIFE	1733	MAX15005BAUE/V+	150°C	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	1631	MAX1785EUU+	-65C TO +150C (Condition C)	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1642	MAX9201EUE+	-65C TO +150C (Condition C)	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1644	MAX3232EUE+	-65C TO +150C (Condition C)	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1653	MAX9201EUE+	-65C TO +150C (Condition C)	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1701	MAX4478AUD+	-65C TO +150C (Condition C)	1000 CYS	80	0	

TEMP CYCLE, 5' RAMP, 10' DWELL	1703	MAX3232EUE+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1711	MAX1281BEUP+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1711	MAX1281BEUP+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1711	MAX1281BEUP+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1715	MAX2235EUP+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1717	MAX9144EUD+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1718	MAX3222EEUP+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1720	MAX17840AGUN/V+CQ	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1720	MAX17840AGUN/V+CQ	-65C TO +150C (Condition C)	500	CYS	110	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1720	MAX17840AGUN/V+CQ	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1721	MAX4581EUE+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1724	MAX2235EUP+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1730	MAX3232EEUP+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1733	MAX15005BAUE/V+	-65C TO +150C (Condition C)	1000	CYS	80	0
					Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
BIASED MOISTURE	1631	MAX1785EUU+	130C, 85% R.H.	96	HRS	80	0	
BIASED MOISTURE	1642	MAX9201EUE+	130C, 85% R.H.	96	HRS	80	0	
BIASED MOISTURE	1644	MAX3232EUE+	130C, 85% R.H.	96	HRS	80	0	
BIASED MOISTURE	1653	MAX9201EUE+	130C, 85% R.H.	96	HRS	79	0	
BIASED MOISTURE	1701	MAX4478AUD+	130C, 85% R.H.	96	HRS	80	0	
BIASED MOISTURE	1703	MAX3232EUE+	130C, 85% R.H.	96	HRS	80	0	
BIASED MOISTURE	1715	MAX2235EUP+	130C, 85% R.H.	96	HRS	79	0	
BIASED MOISTURE	1717	MAX9144EUD+	130C, 85% R.H.	96	HRS	58	0	
BIASED MOISTURE	1717	MAX9144EUD+	130C, 85% R.H.	96	HRS	32	0	
BIASED MOISTURE	1718	MAX3222EEUP+	130C, 85% R.H.	96	HRS	78	0	
BIASED MOISTURE	1720	MAX17840AGUN/V+CQ	130C, 85% R.H.	96	HRS	59	0	
BIASED MOISTURE	1720	MAX17840AGUN/V+CQ	130C, 85% R.H.	96	HRS	20	0	
BIASED MOISTURE	1720	MAX17840AGUN/V+CQ	130C, 85% R.H.	96	HRS	19	0	

BIASED MOISTURE	1720	MAX17840AGUN/V+ CQ	130C, 85% R.H.	96	HRS	20	0	
BIASED MOISTURE	1720	MAX17840AGUN/V+ CQ	130C, 85% R.H.	96	HRS	60	0	
BIASED MOISTURE	1720	MAX17840AGUN/V+ CQ	130C, 85% R.H.	96	HRS	20	0	
BIASED MOISTURE	1721	MAX4581EUE+	130C, 85% R.H.	96	HRS	78	0	
BIASED MOISTURE	1724	MAX2235EUP+	130C, 85% R.H.	96	HRS	80	0	
BIASED MOISTURE	1730	MAX3232EEUP+	130C, 85% R.H.	96	HRS	40	0	
BIASED MOISTURE	1730	MAX3232EEUP+	130C, 85% R.H.	96	HRS	40	0	
BIASED MOISTURE	1733	MAX15005BAUE/V+	130C, 85% R.H.	96	HRS	78	0	
					Total:		**0**	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
MOISTURE SOAK	1711	MAX1281BEUP+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1711	MAX1281BEUP+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1720	MAX17840AGUN/V+ CQ	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1720	MAX17840AGUN/V+ CQ	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1720	MAX17840AGUN/V+ CQ	130C, 85% R.H.	96	HRS	80	0	
					Total:		**0**	

Assembly Information:

Package Type: TSSOP-EP (Pb-Free)

Date Code Range: 1625 to 1641

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1636	MAX20051AUD/V+CMS	135°C	1000	HRS	80	0	
HIGH TEMP OP LIFE	1640	MAX20051AUD/V+CMS	135°C	1000	HRS	80	0	
HIGH TEMP OP LIFE	1641	MAX2235EUP+	135°C	1000	HRS	80	0	
					Total:		**0**	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
STORAGE LIFE	1625	MAX15034BAUI/V+	150°C	500	HRS	80	0	
STORAGE LIFE	1625	MAX15034BAUI/V+	150°C	500	HRS	80	0	
STORAGE LIFE	1625	MAX15034BAUI/V+	150°C	500	HRS	80	0	
STORAGE LIFE	1641	MAX2235EUP+	150°C	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	1625	MAX15034BAUI/V+	-65C TO +150C (Condition C)	1000	CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1625	MAX15034BAUI/V+	-65C TO +150C (Condition C)	1000	CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1625	MAX15034BAUI/V+	-65C TO +150C (Condition C)	1000	CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1641	MAX2235EUP+	-65C TO +150C (Condition C)	1000	CYS	80	0	
					Total:		**0**	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
BIASED MOISTURE	1641	MAX2235EUP+	130C, 85% R.H.	96	HRS	80	0	
					Total:		**0**	

FAILURE RATE: MTTF (YRS): 353458 FITS: 0.3