6/25/2020

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 specifc assemblies included in this package monitor are:

ASSY SITE	PINS	PACKAGE			
ASE Kaoshiung	336	CSBGA (Pb-Free)	ASE Kaoshiung	49	Flip Chip BGA
ASE Kaoshiung	76	Flip Chip BGA	ATC (Amkor, China)	76	Flip Chip BGA
MPOC	380	CSBGA (Pb-Free)	OUME	380	CSBGA (Pb-Free)

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 84814 FITS: 1.3

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 1/1/2020 and 3/31/2020 .

Assembly Information:

Package Type: CSBGA (Pb-Free)

Date Code Range: 1744 to 1929

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
CONVECTION REFLOW		MAX2086CXD+	85 C/85% R.H.	3	PASS	235	0	
CONVECTION REFLOW		MAX2087CDX+	85 C/85% R.H.	3	PASS	234	0	
CONVECTION REFLOW		MAX2086CXD+	85 C/85% R.H.	3	PASS	235	0	
SOLDERABILITY	1927	90-1554+07I	125°C	1	PASS	15	0	
SOLDERABILITY	1929	90-15540+07I	125°C	1	PASS	15	0	
					Total:		**0**	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
STORAGE LIFE	1927	90-1554+07I	150°C	1000	HRS	80	0	
STORAGE LIFE	1929	90-15540+07I	150°C	500	HRS	80	0	
					Total:		**0**	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL		MAX2086CXD+	-65C TO +150C (Condition C)	1000	CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL		MAX2087CDX+	-65C TO +150C (Condition C)	1000	CYS	77	0	
TEMP CYCLE, 5' RAMP, 10' DWELL		MAX2086CXD+	-65C TO +150C (Condition C)	1000	CYS	77	0	
TEMP CYCLE, 15' RAMP, 15' DWELL	1744	MAX77705FEWN	-40C TO +125C (Condtion G)	500	CYS	80	0	

TEMP CYCLE, 5' RAMP, 10' DWELL	1851	90-1921G#F50	-65C TO +150C (Condition C)	1000	CYS	85	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1927	90-1554+07I	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1929	90-15540+07I	-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		MAX2086CXD+	85 C/85% R.H.	1000	HRS	25	0	
BIASED MOISTURE		MAX2087CDX+	85 C/85% R.H.	1000	HRS	22	0	
BIASED MOISTURE		MAX2086CXD+	85 C/85% R.H.	1000	HRS	24	0	
BIASED MOISTURE	1927	90-1554+07I	130C, 85% R.H.	96	HRS	80	0	
BIASED MOISTURE	1929	90-15540+07I	85 C/85% R.H.	500	HRS	80	0	
					Total:		**0**	

Assembly Information:

Package Type: Flip Chip BGA

Date Code Range: 1737 to 1945

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1827	MAX20024AXG/V+CQK	125°C	1000	HRS	80	0	
HIGH TEMP OP LIFE	1827	MAX20024AXG/V+CQK	125°C	1000	HRS	80	0	
HIGH TEMP OP LIFE	1916	MAX20025MGXXB/V+	125°C	1000	HRS	40	0	
HIGH TEMP OP LIFE	1916	MAX20025MGXXB/V+	125°C	192	HRS	40	0	
HIGH TEMP OP LIFE	1916	MAX20025MGXXB/V+	125°C	1000	HRS	80	0	
HIGH TEMP OP LIFE	1924	MAX77812EXJ+	125°C	1000	HRS	50	0	
HIGH TEMP OP LIFE	1925	MAX77812EXJ+	125°C	1000	HRS	50	0	
HIGH TEMP OP LIFE	1926	MAX77812EXJ+	125°C	1000	HRS	50	0	
					Total:		**0**	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
CONVECTION REFLOW	1737	MAX20024EGXXC/V+		3	PASS	350	0	
CSAM	1911	MAX77812EXJ+		500		22	0	
CSAM	1911	MAX77812EXJ+		96		22	0	
CSAM	1911	MAX77812EXJ+		96		22	0	
CSAM	1911	MAX77812EXJ+		500		22	0	
CSAM	1911	MAX77812EXJ+		500		22	0	

CSAM	1911	MAX77812EXJ+		500		22	0
CONVECTION REFLOW	1911	MAX77812EXJ+	85 C/85% R.H.	3	PASS	400	0
CONVECTION REFLOW	1911	MAX77812EXJ+	85 C/85% R.H.	3	PASS	400	0
CONVECTION REFLOW	1915	MAX20025MGXXB/V+	130C, 85% R.H.	3	PASS	350	0
CONVECTION REFLOW	1916	MAX20025MGXXB/V+		3	PASS	350	0
CONVECTION REFLOW	1916	MAX20025MGXXB/V+	130C, 85% R.H.	3	PASS	350	0
CONVECTION REFLOW	1916	MAX20024GGXXC/V+		3	PASS	178	0
CONVECTION REFLOW	1924	MAX77812EXJ+	130C, 85% R.H.	3	PASS	500	0
CONVECTION REFLOW	1925	MAX77812EXJ+	125°C	3	PASS	500	0
CONVECTION REFLOW	1926	MAX77812EXJ+		3	PASS	500	0
					Total:		**0**

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
STORAGE LIFE	1737	MAX20024EGXXC/V+	150°C	1000	HRS	80	0	
STORAGE LIFE	1913	MAX20024MGXXA/V+	150°C	1000	HRS	80	0	
STORAGE LIFE	1915	MAX20025MGXXB/V+	150°C	1000	HRS	79	0	
STORAGE LIFE	1915	MAX20025MGXXB/V+	150°C	1000	HRS	4	0	
STORAGE LIFE	1916	MAX20025MGXXB/V+	150°C	1000	HRS	80	0	
STORAGE LIFE	1916	MAX20025MGXXB/V+	150°C	500	HRS	80	0	
STORAGE LIFE	1916	MAX20024GGXXC/V+	150°C	1000	HRS	25	0	
STORAGE LIFE	1924	MAX77812EXJ+	150°C	1000	HRS	80	0	
STORAGE LIFE	1925	MAX77812EXJ+	150°C	1000	HRS	80	0	
STORAGE LIFE	1945	MAX20024CGXXE/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	1737	MAX20024EGXXC/V+	-65C TO +150C (Condition C)	1000	CYS	79	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1915	MAX20025MGXXB/V+	-65C TO +150C (Condition C)	1000	CYS	80	0	
TEMP CYCLE, 0' RAMP, 10' DWELL	1916	MAX20025MGXXB/V+	-40C TO +125C (Condtion B)	1000	CYS	25	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1916	MAX20025MGXXB/V+	-65C TO +150C (Condition C)	500	CYS	80	0	

TEMP CYCLE, 5' RAMP, 10' DWELL	1916	MAX20025MGXXB/V+	-65C TO +150C (Condition C)	1000	CYS		80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1916	MAX20024GGXXC/V+	-65C TO +150C (Condition C)	1000	CYS		25	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1924	MAX77812EXJ+	-65C TO +150C (Condition C)	1000	CYS		80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1925	MAX77812EXJ+	-65C TO +150C (Condition C)	1000	CYS		80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1926	MAX77812EXJ+	-65C TO +150C (Condition C)	1000	CYS		80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1945	MAX20024CGXXE/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	1924	MAX77812EXJ+	130C, 85% R.H.	96	HRS	50	0	
BIASED MOISTURE	1925	MAX77812EXJ+	130C, 85% R.H.	96	HRS	50	0	
					Total:		**0**	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT		QUANTITY	FAILS	FA NO
MOISTURE SOAK	1737	MAX20024EGXXC/V+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1911	MAX77812EXJ+	130C, 85% R.H.	96	HRS	100	0	
MOISTURE SOAK	1913	MAX20024MGXXA/V+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1915	MAX20025MGXXB/V+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1916	MAX20025MGXXB/V+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1916	MAX20025MGXXB/V+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1916	MAX20024GGXXC/V+	130C, 85% R.H.	96	HRS	25	0	
MOISTURE SOAK	1924	MAX77812EXJ+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1925	MAX77812EXJ+	130C, 85% R.H.	96	HRS	80	0	
MOISTURE SOAK	1926	MAX77812EXJ+	130C, 85% R.H.	96	HRS	80	0	
					Total:		**0**	

FAILURE RATE: MTTF (YRS): 84814 FITS: 1.3