

7/10/2017



RELIABILITY MONITOR REPORT
FOR

QSOP 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 specific assemblies included in this package monitor are:

ASSY SITE	PINS	PACKAGE			
ASE Chung-Li	16	QSOP (Pb-Free)	ASE Kunshan	16	QSOP (Pb-Free)
ASE Kunshan	24	QSOP (Pb-Free)	ATP (Amkor, PI)	16	QSOP (Pb-Free)
ATP (Amkor, PI)	16	QSOP-CU (Pb-Free)	CARSEM-M	16	QSOP (Pb-Free)
UTL (NSEB) UTAC	16	QSOP (Pb-Free)	UTL (NSEB) UTAC	16	QSOP-CU (Pb-Free)

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 316406 FITS: 0.4

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 4/1/2017 and 6/30/2017.

Assembly Information:

Package Type: QSOP (Pb-Free)

Date Code Range: 1551 to 1646

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1612	MAX11203EEEE+	135°C	500 HRS	78	0	
HIGH TEMP OP LIFE	1612	MAX11203EEEE+	135°C	500 HRS	78	0	
HIGH TEMP OP LIFE	1612	MAX11203EEEE+	135°C	500 HRS	35	0	
HIGH TEMP OP LIFE	1613	MAX3645EEEE+	135°C	1000 HRS	54	0	
HIGH TEMP OP LIFE	1613	MAX3645EEEE+	135°C	1000 HRS	55	0	
HIGH TEMP OP LIFE	1613	MAX3645EEEE+	135°C	1000 HRS	55	0	
HIGH TEMP OP LIFE	1613	MAX16917DGEE/V+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1613	MAX16917DGEE/V+	135°C	1000 HRS	78	0	
HIGH TEMP OP LIFE	1618	MAX14930FAEE+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1618	MAX14930FAEE+	135°C	1000 HRS	79	0	
HIGH TEMP OP LIFE	1619	MAX1168BEEG+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1619	MAX1168BEEG+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1619	MAX1031BEEG+	135°C	1000 HRS	79	0	
HIGH TEMP OP LIFE	1628	MAX1031BEEG+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1630	MAX1617MEE+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1634	MAX6959AAEE+	135°C	1000 HRS	48	0	
HIGH TEMP OP LIFE	1634	MAX6959AAEE+	135°C	1000 HRS	32	0	
HIGH TEMP OP LIFE	1641	MAX5170BEEE+	135°C	1000 HRS	80	0	

HIGH TEMP OP LIFE	1645	MAX11632EEG+	135°C	1000 HRS	88	0
HIGH TEMP OP LIFE	1645	MAX11632EEG+	135°C	1000 HRS	84	0
HIGH TEMP OP LIFE	1645	MAX11632EEG+	135°C	1000 HRS	83	0
HIGH TEMP OP LIFE	1646	MAX6959AAEE+	135°C	1000 HRS	48	0
Total:					0	0

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
CONVECTION REFLOW	1630	MAX1617MEE+	260C +/-5C	12 PASS	320	0	
Total:					0	0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1551	MAX3645EEE+	150°C	1000 HRS	90	0	
STORAGE LIFE	1605	MAX11632EEG+	150°C	1000 HRS	90	0	
STORAGE LIFE	1612	MAX11203EEEE+	150°C	500 HRS	80	0	
STORAGE LIFE	1612	MAX11203EEEE+	150°C	500 HRS	80	0	
STORAGE LIFE	1612	MAX11203EEEE+	150°C	500 HRS	80	0	
STORAGE LIFE	1613	MAX3645EEE+	150°C	1000 HRS	90	0	
STORAGE LIFE	1613	MAX3645EEE+	150°C	1000 HRS	90	0	
STORAGE LIFE	1613	MAX16917DGEE/V+	150°C	1000 HRS	80	0	
STORAGE LIFE	1613	MAX16917DGEE/V+	150°C	1000 HRS	80	0	
STORAGE LIFE	1618	MAX14930FAEE+	150°C	1000 HRS	77	0	
STORAGE LIFE	1618	MAX14930FAEE+	150°C	1000 HRS	79	0	
STORAGE LIFE	1618	MAX14930FAEE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1619	MAX1168BEEG+	150°C	1000 HRS	79	0	
STORAGE LIFE	1619	MAX1168BEEG+	150°C	1000 HRS	80	0	
STORAGE LIFE	1619	MAX1168BEEG+	150°C	1000 HRS	80	0	
STORAGE LIFE	1619	MAX1031BCTI+	150°C	500 HRS	80	0	
STORAGE LIFE	1630	MAX1617MEE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1634	MAX6959AAEE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1641	MAX5170BEEE+	150°C	1000 HRS	80	0	
STORAGE LIFE	1645	MAX11632EEG+	150°C	1000 HRS	80	0	
STORAGE LIFE	1645	MAX11632EEG+	150°C	1000 HRS	80	0	
STORAGE LIFE	1646	MAX6959AAEE+	150°C	1000 HRS	80	0	
Total:					0	0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	1605	MAX11632EEG+	-65C TO +150C (Condition C)	500 CYS	90	0	

TEMP CYCLE, 5' RAMP, 10' DWELL	1612	MAX11203EEEE+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1612	MAX11203EEEE+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1613	MAX16917DGEE/V+	-65C TO +150C (Condition C)	500	CYS	120	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1613	MAX16917DGEE/V+	-65C TO +150C (Condition C)	500	CYS	120	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1618	MAX14930FAEE+	-65C TO +150C (Condition C)	1000	CYS	100	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1618	MAX14930FAEE+	-65C TO +150C (Condition C)	1000	CYS	99	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1618	MAX14930FAEE+	-65C TO +150C (Condition C)	1000	CYS	100	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1619	MAX1168BEEG+	-65C TO +150C (Condition C)	500	CYS	120	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1619	MAX1168BEEG+	-65C TO +150C (Condition C)	500	CYS	120	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1619	MAX1168BEEG+	-65C TO +150C (Condition C)	500	CYS	120	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1630	MAX1617MEE+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1634	MAX6959AAEE+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1635	MAX11632EEG+	-65C TO +150C (Condition C)	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1641	MAX5170BEEE+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1645	MAX11632EEG+	-65C TO +150C (Condition C)	500	CYS	100	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1645	MAX11632EEG+	-65C TO +150C (Condition C)	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1645	MAX11632EEG+	-65C TO +150C (Condition C)	500	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1646	MAX6959AAEE+	-65C TO +150C (Condition C)	1000	CYS	80	0
Total:						0	0

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	1613	MAX3645EEEE+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1613	MAX3645EEEE+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1618	MAX14930FAEE+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1618	MAX14930FAEE+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1618	MAX14930FAEE+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1619	MAX1168BEEG+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1619	MAX1168BEEG+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1619	MAX1168BEEG+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1630	MAX1617MEE+	130C, 85% R.H.	96	HRS	80	0

BIASED MOISTURE	1634	MAX6959AAEE+	130C, 85% R.H.	96	HRS	79	0
BIASED MOISTURE	1641	MAX5170BEEE+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1645	MAX11632EEG+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1645	MAX11632EEG+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1645	MAX11632EEG+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1646	MAX6959AAEE+	130C, 85% R.H.	96	HRS	80	0
Total:							0

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	1613	MAX16917DGEE/V+	130C, 85% R.H.	96	HRS	79	0
MOISTURE SOAK	1613	MAX16917DGEE/V+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1618	MAX14930FAEE+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1618	MAX14930FAEE+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1618	MAX14930FAEE+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1619	MAX1168BEEG+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1619	MAX1168BEEG+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1635	MAX11632EEG+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1645	MAX11632EEG+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1645	MAX11632EEG+	130C, 85% R.H.	96	HRS	100	0
MOISTURE SOAK	1645	MAX11632EEG+	130C, 85% R.H.	96	HRS	100	0
Total:							0

Assembly Information:

Package Type: QSOP-CU (Pb-Free)

Date Code Range: 1544 to 1641

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1636	MAX16971GEEA/V+	135°C	1000	HRS	80	0
Total:							0

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1636	MAX16971GEEA/V+	150°C	1000	HRS	80	0
STORAGE LIFE	1639	MAX20042UGEE/V+	150°C	2000	HRS	48	0
STORAGE LIFE	1639	MAX20042UGEE/V+	150°C	2000	HRS	48	0
STORAGE LIFE	1639	MAX20042UGEE/V+	150°C	2000	HRS	48	0
Total:							0

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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TEMP CYCLE, 5' RAMP, 10' DWELL	1636	MAX16971GEEA/V+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1639	MAX20042UGEE/V+	-65C TO +150C (Condition C)	1000	CYS	72	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1639	MAX20042UGEE/V+	-65C TO +150C (Condition C)	1000	CYS	72	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1639	MAX20042UGEE/V+	-65C TO +150C (Condition C)	1000	CYS	72	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1641	MAX20042UGEE/V+	-65C TO +150C (Condition C)	1000	CYS	72	0
Total:						0	0

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	1544	MAX20042UGEE/V+	130C, 85% R.H.	96	HRS	69	0
BIASED MOISTURE	1636	MAX16971GEEA/V+	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1639	MAX20042UGEE/V+	130C, 85% R.H.	200	HRS	72	0
BIASED MOISTURE	1639	MAX20042UGEE/V+	130C, 85% R.H.	100	HRS	80	0
BIASED MOISTURE	1639	MAX20042UGEE/V+	130C, 85% R.H.	100	HRS	80	0
BIASED MOISTURE	1641	MAX20042UGEE/V+	130C, 85% R.H.	200	HRS	72	0
Total:						0	0

FAILURE RATE: MTTF (YRS): 316406 FITS: 0.4