

**10/27/2017**



**RELIABILITY MONITOR REPORT  
FOR**

**QFP 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	48	TQFP (Pb-Free)	ASE Kaoshiung	48 LQFP (Pb-Free)
ASE Kaoshiung	64	LQFP (Pb-Free)	ASE Kaoshiung	80 LQFP (Pb-Free)
ASE Kaoshiung	48	TQFP (Pb-Free)	ASE Kaoshiung	64 TQFP (Pb-Free)
ASE Kaoshiung	100	TQFP (Pb-Free)	ATP (Amkor, PI)	128 LQFP (Pb-Free)
ATP (Amkor, PI)	32	TQFP (Pb-Free)	Carsem-S	48 LQFP (Pb-Free)

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 156963 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 7/1/2017 and 7/30/2017.

**Assembly Information:**

Package Type: LQFP (Pb-Free)

Date Code Range: 1602 to 1723

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	1602	MAX2982GCD/V+	135°C	500 HRS	80	0	
HIGH TEMP OP LIFE	1702	MAX14803CCM+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1707	MAX14802ECM+	135°C	1000 HRS	80	0	
HIGH TEMP OP LIFE	1722	MAX1308ECM+	135°C	1000 HRS	90	0	
HIGH TEMP OP LIFE	1722	MAX1308ECM+	135°C	1000 HRS	90	0	
HIGH TEMP OP LIFE	1722	MAX1308ECM+	135°C	1000 HRS	90	0	
HIGH TEMP OP LIFE	1722	MAX17845ACB/V+CJ T	135°C	500 HRS	80	0	
<b>Total:</b>						<b>0</b>	

**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BOND STRENGTH	1722	MAX1308ECM+	> 5 GMS	200 WIRES	20	0	
BOND STRENGTH	1722	MAX1308ECM+	> 5 GMS	200 WIRES	20	0	
BOND STRENGTH	1722	MAX1308ECM+	> 5 GMS	200 WIRES	20	0	
BOND STRENGTH	1722	MAX1308ECM+	> 5 GMS	200 WIRES	20	0	
BOND STRENGTH	1722	MAX1308ECM+	> 5 GMS	200 WIRES	20	0	
BOND STRENGTH	1722	MAX1308ECM+	> 5 GMS	200 WIRES	20	0	
BOND STRENGTH	1722	MAX17845ACB/V+CJ T	> 5 GMS	200 WIRES	20	0	

BOND STRENGTH	1722	MAX17845ACB/V+CJ > 5 GMS T	200	WIRES	20	0
BOND STRENGTH	1722	MAX17845ACB/V+CJ > 5 GMS T	200	WIRES	20	0
BOND STRENGTH	1722	MAX17845ACB/V+CJ > 5 GMS T	200	WIRES	20	0
BOND STRENGTH	1723	MAX17823BGCB/V+ > 5 GMS	200	WIRES	20	0
BOND STRENGTH	1723	MAX17823BGCB/V+ > 5 GMS	200	WIRES	20	0
<b>Total:</b>					<b>0</b>	<b>0</b>

### PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
CONVECTION REFLOW	1722	MAX1308ECM+	260C +0/-5C	260	PASS	481	0
CONVECTION REFLOW	1722	MAX1308ECM+	260C +0/-5C	260	PASS	498	0
CONVECTION REFLOW	1722	MAX1308ECM+	260C +0/-5C	260	PASS	494	0
CONVECTION REFLOW	1722	MAX17845ACB/V+CJ T	260C +0/-5C		PASS	477	0
CONVECTION REFLOW	1722	MAX17845ACB/V+CJ T	260C +0/-5C		PASS	500	0
CONVECTION REFLOW	1723	MAX17823BGCB/V+	260C +0/-5C		PASS	500	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	1702	MAX14803CCM+	150°C	1000	HRS	80	0
STORAGE LIFE	1707	MAX14802ECM+	150°C	1000	HRS	80	0
STORAGE LIFE	1710	MAX17845ACB/V+CJ T	150°C	1000	HRS	79	0
STORAGE LIFE	1722	MAX1308ECM+	150°C	500	HRS	90	0
STORAGE LIFE	1722	MAX1308ECM+	150°C	500	HRS	90	0
STORAGE LIFE	1722	MAX1308ECM+	150°C	500	HRS	90	0
STORAGE LIFE	1722	MAX17845ACB/V+CJ T	150°C	500	HRS	90	0
STORAGE LIFE	1722	MAX17845ACB/V+CJ T	150°C	500	HRS	90	0
STORAGE LIFE	1723	MAX17823BGCB/V+	150°C	500	HRS	90	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	1626	MAX9972ACCS+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1707	MAX14802ECM+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1710	MAX17845ACB/V+CJ T	-65C TO +150C (Condition C)	1000	CYS	80	0

TEMP CYCLE, 5' RAMP, 10' DWELL	1722	MAX1308ECM+	-65C TO +150C (Condition C)	500	CYS	110	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1722	MAX1308ECM+	-65C TO +150C (Condition C)	500	CYS	110	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1722	MAX1308ECM+	-65C TO +150C (Condition C)	500	CYS	110	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1722	MAX17845ACB/V+CJ T	-65C TO +150C (Condition C)	500	CYS	110	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1722	MAX17845ACB/V+CJ T	-65C TO +150C (Condition C)	500	CYS	110	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1723	MAX17823BGCB/V+	-65C TO +150C (Condition C)	500	CYS	105	0
<b>Total:</b>						<b>0</b>	<b>0</b>

### TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	1710	MAX17845ACB/V+CJ T	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	45	0
BIASED MOISTURE	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	34	0
BIASED MOISTURE	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	1723	MAX17823BGCB/V+	130C, 85% R.H.	96	HRS	52	0
<b>Total:</b>						<b>0</b>	<b>0</b>

### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	1707	MAX14802ECM+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1710	MAX17845ACB/V+CJ T	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1722	MAX1308ECM+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1722	MAX17845ACB/V+CJ T	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1723	MAX17823BGCB/V+	130C, 85% R.H.	96	HRS	80	0
<b>Total:</b>						<b>0</b>	<b>0</b>

### Assembly Information:

Package Type: TQFP (Pb-Free)  
Date Code Range: 1612 to 1718

### OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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HIGH TEMP OP LIFE	1635	MAX17823BGCB/V+ CV	135°C	1000 HRS	80	0
HIGH TEMP OP LIFE	1641	MAX3815CCM+	135°C	1000 HRS	48	0
HIGH TEMP OP LIFE	1641	MAX3815CCM+	135°C	1000 HRS	32	0
HIGH TEMP OP LIFE	1642	MAX14803CCM+	135°C	750 HRS	80	0
HIGH TEMP OP LIFE	1702	MAX3815CCM+	135°C	1000 HRS	48	0
HIGH TEMP OP LIFE	1702	MAX3815CCM+	135°C	1000 HRS	32	0
<b>Total:</b>						<b>0</b>

#### PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
CONVECTION REFLOW	1718	87-A0430+RB8	260C +0/-5C	PASS	500	0	
CONVECTION REFLOW	1718	87-A0430+RB8	260C +0/-5C	PASS	10	0	
CONVECTION REFLOW	1718	87-A0430+RB8	260C +0/-5C	PASS	499	0	
CONVECTION REFLOW	1718	87-A0430+RB8	260C +0/-5C	PASS	10	0	
<b>Total:</b>						<b>0</b>	

#### Resistance to solder heat

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
Resistance to solder heat	1718	87-A0430+RB8	260 C, 10SEC		15	0	
Resistance to solder heat	1718	87-A0430+RB8	260 C, 10SEC		15	0	
<b>Total:</b>						<b>0</b>	

#### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	1612	MAX3814CHJ+	150°C	1000 HRS	80	0	
STORAGE LIFE	1635	MAX17823BGCB/V+ CV	150°C	1000 HRS	80	0	
STORAGE LIFE	1641	MAX3815CCM+	150°C	1000 HRS	80	0	
STORAGE LIFE	1702	MAX3815CCM+	150°C	1000 HRS	80	0	
STORAGE LIFE	1705	87-A6720+RB8	150°C	1000 HRS	80	0	
STORAGE LIFE	1718	87-A0430+RB8	150°C	500 HRS	80	0	
STORAGE LIFE	1718	87-A0430+RB8	150°C	500 HRS	80	0	
<b>Total:</b>						<b>0</b>	

#### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE, 5' RAMP, 10' DWELL	1612	MAX3814CHJ+	-65C TO +150C (Condition C)	1000 CYS	79	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1635	MAX17823BGCB/V+ CV	-65C TO +150C (Condition C)	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1641	MAX3815CCM+	-65C TO +150C (Condition C)	1000 CYS	80	0	
TEMP CYCLE, 5' RAMP, 10' DWELL	1702	MAX14803CCM+	-65C TO +150C (Condition C)	1000 CYS	80	0	

TEMP CYCLE, 5' RAMP, 10' DWELL	1702	MAX3815CCM+	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1705	87-A6720+RB8	-65C TO +150C (Condition C)	1000	CYS	80	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1718	87-A0430+RB8	-65C TO +150C (Condition C)	500	CYS	100	0
TEMP CYCLE, 5' RAMP, 10' DWELL	1718	87-A0430+RB8	-65C TO +150C (Condition C)	500	CYS	100	0
<b>Total:</b>						<b>0</b>	<b>0</b>

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### TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	1635	MAX17823BGCB/V+ CV	130C, 85% R.H.	96	HRS	80	0
BIASED MOISTURE	1641	MAX3815CCM+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	1641	MAX3815CCM+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	1702	MAX3815CCM+	130C, 85% R.H.	96	HRS	40	0
BIASED MOISTURE	1702	MAX3815CCM+	130C, 85% R.H.	96	HRS	40	0
<b>Total:</b>						<b>0</b>	<b>0</b>

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### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	1702	MAX14803CCM+	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1705	87-A6720+RB8	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1718	87-A0430+RB8	130C, 85% R.H.	96	HRS	80	0
MOISTURE SOAK	1718	87-A0430+RB8	130C, 85% R.H.	96	HRS	80	0
<b>Total:</b>						<b>0</b>	<b>0</b>

**FAILURE RATE: MTTF (YRS): 156963 FITS: 0.7**