

# μModule BGA Level 2 Interconnect Reliability Data

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## Rider Card PCB Details

<b>PCB Material</b>	FR-4 or Polyimide
<b># Metal Layers</b>	4
<b>Board Size</b>	1 1/2" x 1 1/4"
<b>Thickness</b>	93 mils
<b>Pad Type</b>	SMD
<b>Pad Finish</b>	NiAu
<b>Pad Size</b>	0.73mm diameter
<b>Soldermask opening</b>	0.63mm diameter
<b>Soldermask thickness</b>	30µm
<b>Method for Detecting Interconnect Failure</b>	ATE, Functional test

**RIDER CARD MOUNT TEMP CYCLE DATA FOR THE LTM46XX FAMILY**

DATE CODE	DEVICE TYPE	PKG TYPE	PKG DIM	BOARD THICKNESS	SAMPLE SIZE	ATE REJECTS	CYCLES ON TC -40°C TO +125°C	DEVICE CYCLES ON TC -40°C TO +125°C	SOLDER PASTE
1031	LTM4601A	BGA-133	15mm x 15mm x 3.42mm	93 mils	77	0	1,500	115,500	SnAgCu
1	LOTS			0	77	0		115,500	

\* 10 °C per minute ramp rate  
\* 10 minute dwell time

**RIDER CARD MOUNT TEMP CYCLE DATA FOR THE LTM80XX FAMILY**

DATE CODE	DEVICE TYPE	PKG TYPE	PKG DIM	BOARD THICKNESS	SAMPLE SIZE	ATE REJECTS	CYCLES ON TC -40°C TO +125°C	DEVICE CYCLES ON TC -40°C TO +125°C	SOLDER PASTE
1036	LTM8023	BGA-50	11.25mm x 9mm x 3.42mm	93 mils	80	0	500	40,000	SnAgCu
1036	LTM8032	BGA-71	15mm x 9mm x 3.42mm	93 mils	82	0	500	41,000	SnAgCu
2	LOTS			0	162	0		81,000	

\* 10 °C per minute ramp rate  
\* 10 minute dwell time

## Daisy-Chain PCB Details

<b>Material</b>	FR-4
<b># Metal Layers</b>	6
<b>Board Size</b>	6 1/4" x 6 1/4"
<b>Thickness</b>	93 mils
<b>Pad Type</b>	SMD
<b>Pad Finish</b>	NiAu
<b>Pad Size</b>	0.5mm diameter
<b>Soldermask opening</b>	0.4mm diameter
<b>Soldermask thickness</b>	30µm
<b>Test Vehicle</b>	LTM9008
<b>Method for Detecting Interconnect Failure</b>	Daisy Chain with Real-Time Resistivity Monitor

<b>Material</b>	FR-4
<b># Metal Layers</b>	6
<b>Board Size</b>	6 1/4" x 6 1/4"
<b>Thickness</b>	93 mils
<b>Pad Type</b>	SMD
<b>Pad Finish</b>	NiAu
<b>Pad Size</b>	0.73mm x 0.73mm / 0.73mm diameter
<b>Soldermask opening</b>	0.63mm x 0.63mm / 0.63mm diameter
<b>Soldermask thickness</b>	30µm
<b>Test Vehicle</b>	LTM4601A
<b>Method for Detecting Interconnect Failure</b>	Daisy Chain with Real-Time Resistivity Monitor

**DAISY CHAIN TEMP CYCLE DATA**

<b>DATE CODE</b>	<b>DEVICE TYPE</b>	<b>PKG TYPE</b>	<b>PKG DIM</b>	<b>BOARD THICKNESS</b>	<b>SAMPLE SIZE</b>	<b>CONT REJS</b>	<b>CYCLES ON TC 0°C TO +100°C</b>	<b>DEVICE CYCLES ON TC 0°C TO +100°C</b>	<b>SOLDER PASTE</b>	<b>NOTES</b>
0933	LTM9008	BGA-140	11.25mm x 9mm x 2.72mm	93 mils	40	0	6,000	240,000	SnAgCu	0.8mm BGA pitch
1031	LTM4601A	BGA-133	15mm x 15mm x 3.42mm	93 mils	40	0	6,000	240,000	SnAgCu	Square Pad PCB
1031	LTM4601A	BGA-133	15mm x 15mm x 3.42mm	93 mils	40	0	6,000	240,000	SnAgCu	Round Pad PCB
1031	LTM4601A	BGA-133	15mm x 15mm x 3.42mm	93 mils	40	0	6,000	240,000	PbSn	
1108	LTM9012	BGA-221	15mm x 11.25mm x 2.82mm	93 mils	40	0	6,000	240,000	SnAgCu	
1110	LTM2887	BGA-32	15mm x 11.25mm x 3.42mm	93 mils	40	0	6,000	240,000	SnAgCu	
6	LOTS				240	0		1,440,000		

\* 10 °C per minute ramp rate  
 \* 10 minute dwell time

## VIBRATION TEST DATA

- Performed per MIL-STD-202G, METHOD 214A, TEST CONDITION I, LETTER F
- 30 minutes per axis
- 3 boards tested LTM4601ADC BGA
  - 1 board Sn/Pb solder, 2 boards SAC305 solder
  - 20 parts in each board
- All 3 boards passed with no fails

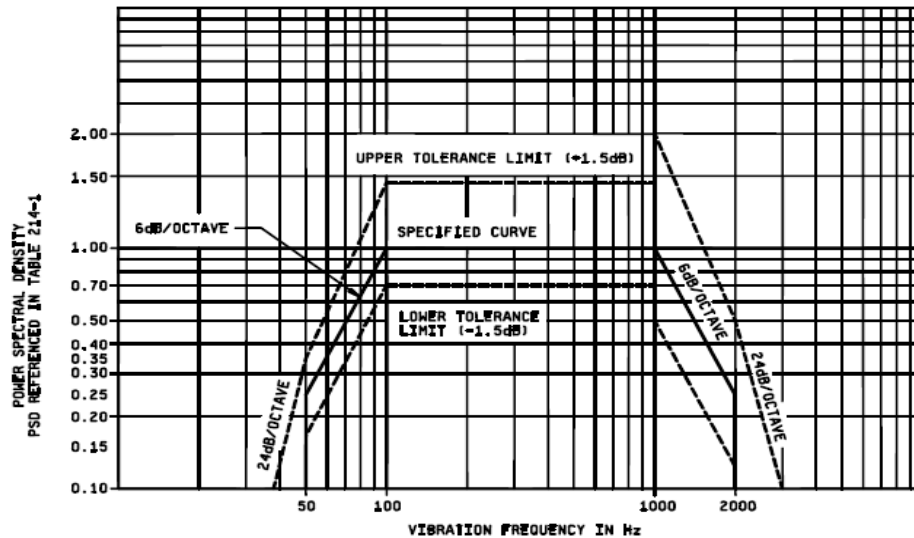


FIGURE 214-1. Test condition I, random vibration test-curve envelope  
(see table 214-1).

TABLE 214-I. Values for test-condition I. 1/

Characteristics		
Test condition letter	Power spectral density	Overall rms G
A	.02	5.35
B	.04	7.56
C	.06	9.26
D	.1	11.95
E	.2	16.91
F	.3	20.71
G	.4	23.91
H	.6	29.28
J	1.0	37.80
K	1.5	46.30