MH1 Qualification Report

MH101 and MH102 Included by Similarity

Introduction

The MH1 is a passive FET mixer that provides high dynamic range performance in a low cost SOIC-8 package. Testing for Conversion Loss and IIP3 were performed at the following 3 discrete test frequency points:

1. RF = 1700 MHz, LO = 1450 MHz, IF = 250 MHz
2. RF = 2000 MHz, LO = 1950 MHz, IF = 50 MHz
3. RF = 2000 MHz, LO = 1750 MHz, IF = 250 MHz

R-I isolation was tested at 1700 MHz, while L-R isolation and L-I isolation were tested at an LO frequency of 1450 and 1950 MHz. Failures are defined as any variation of 10% or greater.

Scope

This report summarizes the reliability qualification of the MH1 mixer produced at the WJ Communications facility in Milpitas, CA and assembled in an SOIC-8 plastic package. The reliability data are obtained through the performance of specified accelerated stress tests described in this document.

Applicable Documents

All the test procedures and test methods are consistent with industry standards. The standards referenced in this document are JEDEC standard 22.

Qualification Test Plan

Stress or Test	Procedures/Conditions	Device Hrs/Cycles	Sample Size	Failed Units	Date	Reference Document	Part Tested
Preconditioning Level 3	Temp. & Humidity Test: 192 hrs, +30°C, 60%RH High Temp. Storage Life: 24 hrs, +125°C Infrared Solder Reflow (IR) test: 3 cycles w/flux immersion	N/A	3 lots of 305 = total 915	0	Q4 2001	JESD22-A113 JESD22-A101 JESD22-B101 JESD22-103 JESD22-A112.4	MH1
Temperature Cycle	-65°C to +150°C Dwell time = 10 ≥ 15	1000 cycles	3 lots of 80 = total 240	0	Q4 2001	JESD22-A104-B	MH1
Unbiased Autoclave	121°C, 15 PSI, 100% RH	96 (-1, +5) hours	3 lots of 105 = total 315	0	Q4 2001	JESD22-A102-C	MH1
Unbiased High Temperature Storage	Temp. 125°C (+/- 5°C)	1000 hours	3 lots of 78 = total 234	0	Q4 2001	JESD22-A108-B	MH1
ESD Details are located on "MH1 ESD Qualification Report"		N/A	3 lots of 16 = total 48	0	Q4 2001	JESD22-A114 JESD22-C101-A	MH1
Physical Dimensions	N/A	N/A	3 lots of 2 = total 6	0	Q4 2001	JESD22-B100-A	MH1
Lead Integrity-Bending Stress	N/A	N/A	3 lots of 4 = total 12	0	Q4 2001	JESD22-B105-A&B	MH1

Note: Mask Set – FM12C

Wafer #:	Lot:
60244239	D086-5
60244243	D056
60244244	D055

Discussion of Results

1. **Pre Conditioning**
   Three lots of 305, a total of 915 MH1 devices, have completed pre conditioning with no failures.

2. **Temperature Cycle**
   Three lots of 80, a total of 240 MH1 devices, have completed 1000 temperature cycles with no failures.

3. **Unbiased Autoclave**
   Three lots of 105, a total of 315 MH1 devices, have completed 96 hours of Autoclave with no failures.

4. **Unbiased High Temperature Storage**
   Three lots of 78, a total of 234 HM1 devices, have completed 1000 hours of Unbiased High Temperature Storage with no failures.

5. **ESD**
   Three lots of 16, a total of 48 MH1 devices, have completed CDM and HBM ESD testing at a variety of different voltage level with no unexpected failures (For complete details see; ESD Classification of MH1 Devices, Class 1B for HBM and Class III for CDM).

6. **Physical Dimensions**
   Three lots of 2, a total of 6 MH1 devices, have completed Inspection with no failures.

7. **Lead Integrity-Bending Stress**
   Three lots of 4, a total of 12 MH1 devices, have completed testing with no failures.

Conclusion

The Reliability Qualification Data demonstrates that the MH1 amplifier fabricated at the WJ Communications Milpitas facility and assembled in a SOIC-8 package demonstrates high reliability and quality levels.