



Hybrid Memory Products Ltd

Qualification Test Report

Device Type: PUMA2E4001MB-15

[66 PIN PGA, 128K X 32 EEPROM Module]

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1.0 Introduction

This report contains the results of qualification approval tests conducted on the PUMA2E4001MB-15 ceramic module. Note that the fixed build module PUMA2E4001MB-15/X489 was used as the test vehicle for qualifying the build.

Test data used for this report consists of:

- ◆ The Atmel Subgroup A, B, C and D test summaries for the LCC.
- ◆ The results of screening and testing of the PUMA2E4001MB-15/X489 module batch 20372-2, Date Code 9823 manufactured using Atmel 5962-3826705MUA (AT28C010-15EM/883) LCC Lot 7A9806A.

2.0 Applicable Documents

MIL-STD-883: Test Methods and Procedures for Microelectronics

3.0 Test Details & Results

The Qualification Test Schedule derived from MIL-STD-883.

3.1 100% Screening Tests

Each Module was subjected to all 100% screening tests as follows:

- I) TEMPERATURE CYCLE :- All modules were subjected to 10 cycles per MIL-STD-883 Method 1010, Condition B (-55/125°C).
- II) PRE BURN-IN ELECTRICALS :- The Modules were tested in accordance with the Mosaic/HMP Data Sheet.
- III) BURN-IN :- Modules were subjected to burn-in per MIL-STD-883 Method 1015, Condition D. The duration was 168 hours at 125°C. The devices were driven in parallel with appropriate signals applied to simulate circuit application.
- IV) POST BURN-IN ELECTRICALS :- Upon completion of the burn-in cycle, the modules were tested in accordance with the Mosaic/HMP Data Sheet at 25°C, -55°C and 125°C respectively.
- V) CARRIER BOND STRENGTH :- A lot a sample of 3 parts were tested for LCC Bond Strength as per MIL-STD-883 Method 2029.

Note 1 - Result of the screening tests can be found in Appendix A - Screening Summary Sheet and Process Traveler (20372-2).

Note 2 - The results of the Carrier Bond Strength test can be found in Appendix C.

3.2 Group A Sample Tests

A sample of modules was subjected to the following Group A sample tests as specified by MIL-STD-883 Method 5005.

1. Group A Electrical Tests

A sample of parts were tested in accordance with MIL-STD-883 Method 5005 and Table I at 25°C, -55°C and 125°C.

Note 1 : The results of the Group A tests can be found in Appendix B

Note 2 : The Group A Datalogs can be found in Appendix H (Note that the Group D initial forms part of the Group A datalogs).

3.3 Group B Acceptance Tests

Group B Tests as follows:

1. *Resistance To Solvents:*

4 Modules were selected at random and subjected to resistance to solvent per MIL-STD-883 Method 2015. The test specimens were split into 4 groups and immersed in the appropriate solvents for one minute, removed and then brushed 10 times with a stiff bristled brush. This procedure was repeated twice more for a total of 3 immersions.

2. *Solderability:*

Solderability testing per MIL-STD-883 Method 2003 was performed on 3 Modules. After cleaning to remove flux residues a visual examination of the dipped portion of the termination revealed adequate solder coverage with less than 5% of total areas exhibiting non-wetting, de-wetting or voids.

Note 1: The results of the Group B testing can be found in Appendix B.

3.4 Group C Acceptance Testing

Group C Tests were not applied to the module build.

Refer to Appendix E for LCC Group C data supplied by Atmel in accordance with the requirements of MIL-STD-883 Method 5005.

3.5 Group D Acceptance Testing

Group D Tests were applied as follows:

- I) **PHYSICAL DIMENSIONS** :- 5 Modules were inspected in accordance with MIL-STD-883 Method 2016. All dimensions were checked against the MOSAIC/HMP Data Sheet.
- II) **LEAD INTEGRITY** :- 3 Modules were tested in accordance with MIL-STD-883 Method 2004, Condition B2. On completion the parts were inspected in accordance with Method 2004 and Seal Tested as per Method 1014 Conditions A and C.
- III) **TEMPERATURE CYCLING** :- 5 Modules subjected to 100 cycles as per MIL-STD-883 Method 1010, Condition C. On completion the parts were Seal Tested as per Method 1014 Conditions A and C, inspected too Method 1010 visual criteria and electrically tested (Subgroups 1, 2, 3, 9, 10, 11 of table II).
- IV) **MECHANICAL SHOCK & VIBRATION** :- A sample of 5 parts were subjected to MIL-STD-883 Method 2002, Condition B followed by Method 2007 Condition A. On completion the parts were Seal Tested as per Method 1014 Conditions A and C, visually inspected to Method 1010 visual criteria and tested electrically (Subgroups 1, 2, 3, 9, 10 and 11 of Table II) at 25°C, -55°C and 125°C.
- V) **SALT ATMOSPHERE** :- A sample of 3 parts were subjected to salt atmosphere per MIL-STD-883 Method 1009, Condition A. On completion the parts were

Seal Tested as per Method 1014 Conditions A and C and visually inspected to the requirements of Method 1009.

Note 1: The results of Group D testing can be found in Appendix F (Group D Test Traveler, Dimensions Data and High-Rel Test Traveler).

Note 2: Refer to Appendix H for the Group D datalogs.

4.0 Conclusion

All modules successfully passed all inspection and conformance testing.

William Robson

MSI / HMP Quality Assurance - 24/9/98

Appendices

(Test Data and Documents held on file by Mosaic/HMP Quality Assurance)

Appendix A: MSI/HMP Assembly Process Traveler and Screening Summary

Appendix B: PUMA2E4001MB-15/X489 Group A and B Test Traveler

Appendix C: PUMA2E4001MB-15/X489 Carrier Bond Strength Data

Appendix D: ATMEL 5962-3826705MUA LCC Certificate of Compliance

Appendix E: ATMEL AT28C010-15EM/883 Group A, C and D Data

Appendix F: PUMA2E4001MB-15/X489 Group D Data

Appendix G: Mosaic/HMP Data Sheet

Appendix H: PUMA2E4001MB-15/X489 Group A and D Datalogs