

Process Qualification Report

Reliability By Design

Qualification Description:

The information contained herein represents proof of Reliability and Performance of the baseline process technology listed below in accordance with the Qualification Plan and test methods referenced in Section 8.0, after exposure to a variety of environments (electrical, thermal, humidity, etc) and mechanical events that may occur during installation and operational lifetime of the product. Upon conclusion of the testing the product continued to operate within specification limits, demonstrating its capability of reliable operation throughout its lifetime.

The purpose of this report is to present Qualification Test results of the of referenced process technology. The Pericom product data presented in this report qualifies all products manufactured using the exact semiconductor materials and processing techniques used in the baseline process and its off-shoot processes. The report describes the qualification test program, procedures used, criteria enforced (at the time of product validation), and the resulting test data obtained during the Qualification Test. The materials and processing techniques used in the baseline process are incorporated into the off-shoot processes, so the quality/integrity of the baseline and off-shoots (i.e.: 2PxM, 1PxM) processes will be equivalent.

Lot Background Information:

| | |
|---------------------|--------------------------|
| Qual Test Date: | Apr-2011 update Feb-2015 |
| Process Technology: | 0.09um 1P8M |
| Foundry & Code: | SMIC (I) |
| Qual Test Number: | QDI10026 |
| Qual Test Number: | <u>QDI11017</u> |

| | |
|------------------|----------------------------------|
| By Ext. Process: | 0.09um 1PxM |
| Qual Vehicle: | PI7C9X113SLBFDE (x2 lots) |
| Qual Vehicle: | <u>PI7C9X440SLBFDE</u> (x3 lots) |

Date Codes: 1136GI, 1148GI, Y1119GI, Y1120GI

Pericom's Qualification Test Results:

| Stress Test | Test Procedure | Test Conditions | Duration | # of Lots | Samples per Lot | Results Pass/Fail |
|---|---|--|--------------------|-----------|-----------------|-------------------|
| Dynamic High Temp | JESD22-A108 | 1000 hrs 1.25V 125°C | 168 hrs | 2 | 60 | 120 / 0 |
| Operating Life (DHTOL- PI7C9X113SLBFDE) | | 1000 hrs 1.25V 125°C | 500 hrs | 2 | 60 | 120 / 0 |
| | | 1000 hrs 1.25V 125°C | 1000 hrs | 2 | 60 | 120 / 0 |
| Dynamic High Temp | JESD22-A108 | 1000 hrs 1.25V 125°C | 168 hrs | 3 | 77 | 231 / 0 |
| Operating Life (DHTOL- PI7C9X440SLBFDE) | | 1000 hrs 1.25V 125°C | 500 hrs | 3 | 77 | 231 / 0 |
| | | 1000 hrs 1.25V 125°C | 1000 hrs | 3 | 77 | 231 / 0 |
| | ELF based on 351 units after 168hrs | ELF Rate (40°C, 0.7 eV, 1.25V, 60% CL) | 53.1 | | | |
| | FIT Rate based on 351 units after 1,000 hrs | FIT Rate (40°C, 0.7 eV, 1.25V, 60% CL) | 8.9 | | | |
| | | Calculated MTBF (hours) | 112,038,668 | | | |
| Temp Cycle Test | JESD22-A104 | -65°C to 150°C, 500cyc | 100 cycles | 4 | 77 | 308 / 0 |
| | | -65°C to 150°C, 500cyc | 500 cycles | 4 | 77 | 308 / 0 |
| High Temp Storage (HTS) | JESD22-A103 | 1000hrs, 0V, 150°C | 168 hrs | 3 | 77 | 231 / 0 |
| | | 1000hrs, 0V, 150°C | 500 hrs | 3 | 77 | 231 / 0 |
| | | 1000hrs, 0V, 150°C | 1000 hrs | 3 | 77 | 231 / 0 |
| Latch Up Test | EIA JESD78 | Report available by Device | | | | |
| ESD-HBM Test | JESD22-A114 | Report available by Device | | | | |

Qualification by Extension Information:

It is valid to use the reliability data of a particular process technology and apply to all products within this process technology family. All parts within the same family are designed to the same rules (layout & electrical), and manufacturing is controlled by SPC. Within a product family, a device can only be fabricated on one process technology option. See Appendix A for other qualified devices.

If there are any questions about this qualification, please contact Quality Support at: customerquestion@pericom.com

