PCN# 20150626000

Address OMAP-L138 Advisory 2.1.4 on

MityDSP-L138(F), MitySOM-1808(F), MitySOM-1810(F) Family of
System On Modules

Date: June 26, 2015
To: Purchasing Agents

Dear Customer,

This is an initial announcement of a change to a product that is currently offered by Critical Link. The details of this change are on the following pages.

For questions regarding this notice, contact the Hardware Manager Bill Halpin (bill.halpin@criticallink.com).

Sincerely,

Critical Link, LLC
Phone: (315) 425-4045
Fax: (315) 425-4048

(CT016, Revision 3)

PCN Number: 20150626000

PCN Date: June 26, 2015

Title: Address OMAP-L138 Advisory 2.1.4

Contact: Bill Halpin

Phone: (315) 425-4045

Ship Date: 01/01/2016

Overview

Changes to MityDSP-L138(F), MitySOM-1808(F), and MitySOM-1810(F) System on Modules are identified in the following sections.

1   Replace Crystal with Clock Oscillator

1.1 Description of Change

The OMAP-L138/AM1808/AM1810 internal 1.2 V crystal oscillator has been replaced with an external 24 MHz 3.3V clock oscillator in accordance with the reference circuit provided in Texas Instruments (TI) OMAP-L138 product advisory number 2.1.4 as documented in the OMAP-L138 Silicon Errata from TI.

1.2 Reason for Change

TI's OMAP-L138 product advisory 2.1.4 indicates that the OMAP-L138/AM1808/AM1810 1.2V crystal oscillator circuit may be susceptible to radiated noise during an electro-static discharge (ESD) strike. The advisory states that using an external 3.3 V oscillator (with an appropriate voltage divider to create a 1.2V signal) to drive the OSCIN clock circuit greatly improves the ESD robustness of designs utilizing these processors.

1.3 Anticipated Impact on Form, Fit, Function (positive / negative)

No impact on form, fit, or function is anticipated with this change.

1.4 Anticipated Impact on Quality or Reliability (positive / negative)

With this change, it is expected that the MityDSP-L138(F)/MitySOM-1808(F)/MitySOM-1810(F) family of System on Modules will be less susceptible to failure modes associated with the system clock due to environments with radiated noise. It is expected that the modules will be more reliable under these operating conditions.

2 Replace Obsolete Parts

2.1 Description of Change
Some parts, listed below, have been updated in order to resolve obsolescence issues. The updated parts are:

- For modules providing 128 MB of DDR memory, the DDR RAM IC has been updated from MT46H64M16LFCK-6:A TR and MT46H64M16LFCK-6 IT:A TR to MT46H64M16LFBF-5 IT:B.

- For modules providing 256 MB of DDR memory, the DDR RAM IC has been updated from MT46H128M16LFB7-6 IT:A to MT46H128M16LFDD-48 IT:C.

- The Silicon Revision for the OMAP-L138 and the AM-1808 processors has been updated to the 2.3 level (device revision code E). Details for the OMAP-L138 Silicon Revisions can be found in the OMAP-L138 Silicon Errata. Details for the AM1808 Silicon Revisions can be found in the AM1810 Silicon Errata.

2.2 Reason for Change
The above mentioned parts must be replaced due to obsolescence.

2.3 Anticipated Impact on Form, Fit, Function (positive / negative)
No impact on form, fit, or function is anticipated with this change.

2.4 Anticipated Impact on Quality or Reliability (positive / negative)
The 2.3 silicon revision for the OMAP-L138 and AM1810 resolves Advisory 2.1.21 of the OMAP-L138 Silicon Errata. On previous versions of the OMAP-L138 silicon, the USB0 phase locked loop (PLL) could lose lock when operating over extreme temperature ranges, requiring a peripheral reset when this occurred. This scenario / issue has been fixed in the newer version of the silicon and will improve the reliability of the USB0 interface of the system on module across wide temperature ranges.

3 Increase Bulk Capacitors on 1.8V Supply (non-FPGA Modules)

3.1 Description of Change

On non-FPGA modules, two bulk capacitors on the local 1.8V power supply of the modules, each 10 µF, have been replaced with 22 µF capacitors. This raises the bulk capacitance of the 1.8V supply on the module from 50 µF to 74 µF (there are also 3 additional 10 µF capacitors on the 1.8V rail that were not altered).

3.2 Reason for Change

The change improves the MityDSP-L138/MitySOM-1808 module susceptibility to advisory 2.3.18 of the [OMAP-L138 Silicon Errata](#) by raising the bulk capacitance on the DVDD18 voltage rail from 50 µF to 74 µF as described in work-around item 1 in the advisory. No changes were made on modules that include FPGAs as that design loads the 1.8V supply more and consumes many of the OMAP-L138 IOs by connecting the UPP and LCD peripherals of the processor directly to the FPGA.

3.3 Anticipated Impact on Form, Fit, Function (positive / negative)

No impact on form, fit, or function is anticipated with this change.

3.4 Anticipated Impact on Quality or Reliability (positive / negative)

Critical Link has observed a significant percentage of modules (without FPGA) that have exhibited the DVDD18 latch-up condition described in the advisory when used with one particular customer designed carrier board. The root cause appeared to be leakage from multiple IO pins driven high at startup, providing a path to charge up the 1.8V rail through the protection diodes of the OMAP-L138 processor. For that customer design, the change in bulk capacitance did show a significant reduction of the failure mode related to the advisory. No other customers have reported observing this issue, and it has not been demonstrated on a stock MitySOM-L138 development kit.

The change should improve the quality of the product by substantially reducing the likelihood of conditions that lead to the latch-up described in advisory 2.3.18 of the errata; therefore, the module should support a wider array of carrier board designs. It should be noted that this advisory can also be addressed with a proper carrier board design. Carrier board designs should include series current limiting resistors into the OMAP-L138 IO pins that are driven high at startup or have more pins initialized low at startup.

(CT016, Revision 3)

4 Products Affected

Details regarding the full revision history can be located in the MityDSP-L138 Revision History section on the Critical Link support site.
https://support.criticallink.com/redmine/projects/arm9-platforms/wiki/Module_Product_Change_Notifications

Table 1: Products Affected

Model Number	Starting PCA	Replacement PCA
1808-FX-225-RC	80-000307RC-4	80-000307RC-6
1810-DX-225-RC	80-000318RC-3	Contact Critical Link
L138-FX-225-RC	80-000325RC-3	80-000325RC-6
L138-DX-225-RI	80-000416RI-3	Contact Critical Link
1808-FG-225-RC	80-000304RC-4	Contact Critical Link
1808-DG-225-RI	80-000417RI-3	Contact Critical Link
1810-DG-225-RC	80-000308RC-3	Contact Critical Link
1810-DG-225-RI	80-000418RI-3	Contact Critical Link
L138-DI-225-RI	80-000419RI-3	80-000419RI-6
L138-DG-225-RI	80-000316RI-3	80-000316RI-6
L138-FG-225-RC	80-000333RC-3	80-000333RC-6
L138-FI-225-RC	80-000354RC-3	80-000354RC-6
L138-FI-236-RC	80-000393RC-3	Contact Critical Link
L138-FI-236-RL	80-000381RL-3	80-000381RL-6
L138-FG-226-RC	80-000631RC-3	80-000631RC-6

See the MityDSP-L138F Carrier Board Design Guide and the MityDSP-L138 Carrier Board Design Guide for migration options across the MityDSP-L138F family.

5 Document Revision History

Date	Version	Change Description
26-JUN-2015	1.0	Initial Version