

MityDSP-L138(F), MitySOM-1808(F), MitySOM-1810(F)

System On Module (SOM) Errata Sheet

1 Introduction

This document describes any known design issues or exceptions to the functional specifications for the MityDSP-L138(F), MitySOM-1808(F) and MitySOM-1810(F) System On Modules (SOMs) developed by Critical Link LLC. For the purposes of this document, reference to a MityDSP SOM implies one of the previously mentioned SOMs.

Details regarding the modules may be accessed at <http://www.mitydsp.com>, and additional support information may be located at support.criticallink.com/redmine/arm9-platforms.

This document is subject to change without notification. However, the most recent version of this document will be made available at the website mentioned above. The website supports email notification (via the “watch option”) for changes to documents published.

2 Product Marking

The Printed Circuit Assembly (PCA) model number, serial number, media access control (MAC) address and, Printed Circuit Board (PCB) revision may be determined by examining the module.

Most recent modules include a single label containing a Data Matrix code as well as a human readable serial number, model number, PCA number, and assigned MAC address.

Earlier models include multiple labels. The model number is located on a factory installed label, beginning with “L138-“, “1808-“ or “1810-“, depending on the family. The MAC address is located on a factory installed label on the NAND flash. The serial number is located on a factory installed label and is of the format “S/NXXXXXX”, where XXXXXX is the serial number.

The PCB revision is etched in copper and begins with a “90-“.

On initial production modules, there was no PCA part number marking. For these modules, the PCA number can be determined by the serial number. Contact Critical Link for details.

3 PCA Product History

The PCA product history for all MityDSP-L138, MitySOM-1808 and MitySOM-1810 modules are listed below. Details for Product Change Notifications (PCNs) may be downloaded from the link below.

http://support.criticallink.com/redmine/projects/arm9-platforms/wiki/Module_Product_Change_Notifications

3.1 PCAs with Spartan-6 FPGA

Table 1 highlights the PCA product history for all MityDSP-L138F, MitySOM-1808F and MitySOM-1810F modules that include a Xilinx Spartan-6 FPGA. Red indicates parts that are not currently in production.

Table 1 PCAs with Spartan 6 FPGA

Model Number	PCA Number	PCB Number	Applicable Design Exceptions	PCNs
L138-CG-225-RC L138-CG-225-RC 1808-FG-225-RC	80-000258RC-1 RevB 80-000258RC-1 RevC 80-000304RC-1 RevA	90-000105-2_RevA	<ul style="list-style-type: none"> • Power On Reset Circuit Unreliable • Minimum Core Voltage is 1.2 Volts • Excessive Battery Draw • TI OMAP-L138 Errata 2.1.23 not addressed • Recommended SATA A/C Decoupling Capacitors not included • TI OMAP-L138 Errata 2.1.4 not addressed • TI OMAP-L138 Errata 2.1.21 not addressed 	
1808-FG-225-RC 1808-DG-225-RI 1810-DG-225-RC 1810-DG-225-RI L138-DI-225-RI L138-DI-225-RI L138-DG-225-RI L138-DG-225-RI L138-FG-225-RC L138-FI-225-RC L138-FI-225-RC L138-FI-236-RC L138-FI-236-RL	80-000304RC-2 RevA 80-000417RI-1 RevA 80-000308RC-1 RevA 80-000418RI-1 RevA 80-000419RI-1 RevA 80-000419RI-1 RevB 80-000316RI-1 RevA 80-000316RI-1 RevB 80-000333RC-1 RevA 80-000354RC-1 RevA 80-000354RC-1 RevB 80-000393RC-1 RevA 80-000381RL-1 RevA	90-000105R-3_RevA	<ul style="list-style-type: none"> • Minimum Core Voltage is 1.2 Volts • Excessive Battery Draw • TI OMAP-L138 Errata 2.1.23 not addressed • Recommended SATA A/C Decoupling Capacitors not included • TI OMAP-L138 Errata 2.1.4 not addressed • TI OMAP-L138 Errata 2.1.21 not addressed 	20110711000 20110711001

Model Number	PCA Number	PCB Number	Applicable Design Exceptions	PCNs
1808-FG-225-RC 1808-DG-225-RI 1810-DG-225-RC 1810-DG-225-RI L138-DI-225-RI L138-DG-225-RI L138-FG-225-RC L138-FI-225-RC L138-FI-236-RC L138-FI-236-RL	80-000304RC-3 RevA 80-000417RI-2 RevA 80-000308RC-2 RevA 80-000418RI-2 RevA 80-000419RI-2 RevA 80-000316RI-2 RevA 80-000333RC-2 RevA 80-000354RC-2 RevA 80-000393RC-2 RevA 80-000381RL-2 RevA	90-000105R-4_RevA	<ul style="list-style-type: none"> • Minimum Core Voltage is 1.2 Volts • Excessive Battery Draw • TI OMAP-L138 Errata 2.1.23 not addressed • TI OMAP-L138 Errata 2.1.4 not addressed • TI OMAP-L138 Errata 2.1.21 not addressed 	20120524000
1808-FG-225-RC 1808-DG-225-RI 1810-DG-225-RC 1810-DG-225-RI L138-DI-225-RI L138-DG-225-RI L138-FG-225-RC L138-FI-225-RC L138-FI-236-RC L138-FI-236-RL	80-000304RC-4 RevA, A2 80-000417RI-3 RevA 80-000308RC-3 RevA, A2 80-000418RI-3 RevA 80-000419RI-3 RevA, A2 80-000316RI-3 RevA, A2 80-000333RC-3 RevA, A2 80-000354RC-3 RevA, A2 80-000393RC-3 RevA 80-000381RL-3 RevA, A2	90-000105R-5_RevA	<ul style="list-style-type: none"> • Minimum Core Voltage is 1.2 Volts • TI OMAP-L138 Errata 2.1.23 not addressed • TI OMAP-L138 Errata 2.1.4 not addressed • TI OMAP-L138 Errata 2.1.21 not addressed 	20120612000
1808-FG-225-RC 1808-DG-225-RI 1810-DG-225-RC 1810-DG-225-RI L138-DI-225-RI L138-DG-225-RI L138-FG-225-RC L138-FI-225-RC L138-FI-236-RC L138-FI-236-RL	80-000304RC-4 RevB 80-000417RI-3 RevB 80-000308RC-3 RevB 80-000418RI-3 RevB 80-000419RI-3 RevB 80-000316RI-3 RevB 80-000333RC-3 RevB 80-000354RC-3 RevB 80-000393RC-3 RevB 80-000381RL-3 RevB	90-000105R-5_RevA	<ul style="list-style-type: none"> • Minimum Core Voltage is 1.2 Volts • TI OMAP-L138 Errata 2.1.4 not addressed • TI OMAP-L138 Errata 2.1.21 not addressed 	20121031000
L138-DI-225-RI L138-DG-225-RI	80-000419RI-3 RevD 80-000316RI-3 RevD	90-000105R-7	<ul style="list-style-type: none"> • Minimum Core Voltage is 1.2 Volts • TI OMAP-L138 Errata 2.1.21 not addressed 	2015062600 (excluding section 2)

Model Number	PCA Number	PCB Number	Applicable Design Exceptions	PCNs
1808-FG-225-RC 1808-DG-225-RI 1810-DG-225-RC 1810-DG-225-RI L138-DI-225-RI L138-DG-225-RI L138-FG-225-RC L138-FI-225-RC L138-FI-236-RL L138-FI-236-RC L138-FG-226-RC	80-000304RC-6 80-000417RI-6 80-000308RC-6 80-000418RI-6 80-000419RI-6 80-000316RI-6 80-000333RC-6 80-000354RC-6 80-000381RL-6 80-000393RC-6 80-000631RC-6	90-000105R-7	<ul style="list-style-type: none"> Minimum Core Voltage is 1.2 Volts 	2015062600
1808-FG-225-RC 1808-DG-225-RI 1810-DG-225-RI L138-DI-225-RI L138-DG-225-RI L138-FG-225-RC L138-FI-225-RC L138-FI-236-RL L138-FI-236-RC L138-FG-226-RC L138-DI-325-RI L138-DG-325-RI L138-DG-325-RI-1 L138-DG-325-RI-CR L138-FG-325-RC L138-FI-325-RC L138-FI-336-RL L138-FG-326-RC	80-000304RC-6 80-000417RI-6 80-000418RI-6 80-000419RI-6 80-000316RI-6 80-000333RC-6 80-000354RC-6 80-000381RL-6 80-000393RC-6 80-000631RC-6 80-001112RI-6 80-001115RI-6 80-001117RI-6 80-001118RI-1 80-001105RC-6 80-001108RC-6 80-001110RL-6 80-001114RC-6	90-000105R-7	<ul style="list-style-type: none"> 16MB NOR Flash Device codes presented to uBoot software 	20180209000

Model Number	PCA Number	PCB Number	Applicable Design Exceptions	PCNs
L138-DI-325-RI L138-DG-325-RI L138-DG-325-RI-1 L138-DG-325-RI-CR L138-FG-325-RC L138-FI-325-RC L138-FI-336-RL L138-FG-326-RC	80-001112RI-7 80-001115RI-7 80-001117RI-7 80-001118RI-1 80-001105RC-7 80-001108RC-7 80-001110RL-7 80-001114RC-7	90-000105R-7	<ul style="list-style-type: none">SATA and JTAG interfaces not available.	20220621000

3.2 PCAs with Artix-7 FPGA

Table 1 highlights the PCA product history for all MityDSP-L138F, MitySOM-1808F and MitySOM-1810F modules that include a Xilinx Artix-7 FPGA. Red indicates parts that are not currently in production.

Table 2 PCAs with Artix-7 FPGA

Model Number	PCA Number	PCB Number	Applicable Design Exceptions	PCNs
L138-FM-336-RL L138-FJ-326-RC L138-DJ-325-RI L138-DM-336-RI L138-FL-336-RL L138-DL-336-RI	80-001538RL-2 80-001539RC-2 80-001540RI-2 80-001541RL-2 80-001565RL-2 80-001566RI-2	90-000449R-1	<ul style="list-style-type: none">SATA and JTAG interfaces not available.	20220621000

3.3 PCAs w/out FPGA

Table 2 highlights the PCA product history for all MityDSP-L138, MitySOM-1808 and MitySOM-1810 modules that do not include an FPGA. Red indicates parts that are not currently in production.

Table 3 PCAs without FPGAs

Model Number	CL Number	PCB Number	Applicable Design Exceptions	PCNs
1808-FX-225-RC 1808-FX-225-RC L138-CX-225-RC L138-CX-225-RC	80-000307RC-1 RevA 80-000307RC-1 RevA2 80-000288RC-1 RevA 80-000288RC-1 RevA2	90-000118-1A	<ul style="list-style-type: none"> Power On Reset Circuit Unreliable Minimum Core Voltage is 1.2 Volts Excessive Battery Draw TI OMAP-L138 Errata 2.1.23 not addressed Recommended SATA A/C Decoupling Capacitors not included TI OMAP-L138 Errata 2.1.4 not addressed TI OMAP-L139 Errata 2.3.18 not addressed 	
1808-FX-225-RC 1808-FX-225-RC 1808-DX-225-RI 1810-DX-225-RC 1810-DX-225-RC 1810-DX-225-RI L138-DX-225-RI L138-DX-225-RC L138-DX-225-RC L138-FX-225-RC L138-FX-225-RC	80-000307RC-2 RevA 80-000307RC-2 RevB 80-000414RI-1 RevA 80-000318RC-1 RevA 80-000318RC-1 RevB 80-000415RI-1 RevA 80-000416RI-1 RevA 80-000355RC-1 RevA 80-000355RC-1 RevB 80-000325RC-1 RevA 80-000325RC-1 RevB	90-000118-2A	<ul style="list-style-type: none"> Minimum Core Voltage is 1.2 Volts Excessive Battery Draw TI OMAP-L138 Errata 2.1.23 not addressed Recommended SATA A/C Decoupling Capacitors not included TI OMAP-L138 Errata 2.1.4 not addressed TI OMAP-L139 Errata 2.3.18 not addressed 	20110711000 20110711001
1808-FX-225-RC 1808-DX-225-RI 1810-DX-225-RC 1810-DX-225-RI L138-DX-225-RI L138-FX-225-RC	80-000307RC-3 RevA 80-000414RI-2 RevA 80-000318RC-2 RevA 80-000415RI-2 RevA 80-000416RI-2 RevA 80-000325RC-2 RevA	90-000118-3A	<ul style="list-style-type: none"> Minimum Core Voltage is 1.2 Volts Excessive Battery Draw TI OMAP-L138 Errata 2.1.23 not addressed TI OMAP-L138 Errata 2.1.4 not addressed TI OMAP-L139 Errata 2.3.18 not addressed 	20120524000
1808-FX-225-RC 1808-DX-225-RI 1810-DX-225-RC	80-000307RC-4 RevA, B 80-000414RI-3 RevA, B 80-000318RC-3 RevA, B	90-000118-4A	<ul style="list-style-type: none"> Minimum Core Voltage is 1.2 Volts TI OMAP-L138 Errata 2.1.23 not 	20120612000

Model Number	CL Number	PCB Number	Applicable Design Exceptions	PCNs
1810-DX-225-RI L138-DX-225-RI L138-FX-225-RC	80-000415RI-3 RevA, B 80-000416RI-3 RevB 80-000325RC-3 RevA, B		addressed <ul style="list-style-type: none"> TI OMAP-L138 Errata 2.1.4 not addressed TI OMAP-L139 Errata 2.3.18 not addressed 	
1808-FX-225-RC 1810-DX-225-RC L138-DX-225-RI L138-FX-225-RC	80-000307RC-4 RevC 80-000318RC-3 RevC 80-000416RI-3 RevC 80-000325RC-3 RevC	90-000118-4A	<ul style="list-style-type: none"> Minimum Core Voltage is 1.2 Volts TI OMAP-L138 Errata 2.1.4 not addressed TI OMAP-L138 Errata 2.1.21 not addressed TI OMAP-L139 Errata 2.3.18 not addressed 	20121031000
L138-FX-225-RC	80-000325RC-3 RevF	90-000118-6	<ul style="list-style-type: none"> Minimum Core Voltage is 1.2 Volts TI OMAP-L138 Errata 2.1.21 not addressed 	2015062600 (excluding section 2)
1808-FX-225-RC 1810-DX-225-RC L138-DX-225-RI L138-FX-225-RC	80-000307RC-6 80-000318RC-6 80-000416RI-6 80-000325RC-6	90-000118-6	<ul style="list-style-type: none"> Minimum Core Voltage is 1.2 Volts 	2015062600
1808-FX-225-RC L138-DX-225-RI L138-FX-225-RC L138-DX-325-RI L138-FX-325-RC	80-000307RC-6 80-000416RI-6 80-000325RC-6 80-001572RI-6 80-001103RC-6	90-000118-6	<ul style="list-style-type: none"> 16MB NOR Flash Device codes presented to uBoot software 	20180209000
L138-DX-325-RI L138-FX-325-RC	80-001572RI-7 80-001103RC-7	90-000118-6	<ul style="list-style-type: none"> SATA and JTAG interfaces not available. 	20220621000

4 Known Design Exceptions and Usage Notes

This section outlines the design exceptions to the baseline module specification for the MityDSP-L138, MitySOM-1808 and MitySOM-1810 family of SOMs.

4.1 Power On Reset Circuit Unreliable

It was noted on some FPGA-less modules that powering the unit while providing RTC battery backup voltage resulted in failure to initialize the CPU properly. This was due to a reset strobe not being generated according to the specification for the CPU. This issue was not observed on modules including an FPGA during similar testing. However, a common reset design was employed for both modules.

PCN 20110711000 addresses this issue.

4.2 Minimum Core Voltage is 1.2 Volts

The MityDSP-L138 family of modules powers the RVDD (internal RAM supply voltage) with the same adjustable voltage supply as is used to power the CVDD (core voltage supply) of the OMAP-L138 or AM1808 CPU. The specification for the processor requires that the RVDD be a minimum of 1.2 Volts for operation at frequencies at or below 375 MHz. While the core voltage may be lower than 1.2 Volts for lower CPU frequencies, the adjustable voltage for the module may not be reduced below 1.2 Volts due to the RVDD specification. This raises the minimum power requirements of the module when running at very low frequencies (e.g., 100 MHz or below), as the core voltage cannot be reduced to the processor specified minimum values without impacting stable operation.

4.3 Recommended SATA A/C Decoupling Capacitors not included

The Texas Instruments datasheets for the OMAP-L138 and AM1801 and AM1810 processors recommend a 10 nf decoupling capacitor placed in line with the SATA Tx and Rx data pairs. Initial versions of the SOM did not include these capacitors.

PCN 20120524000 addresses this issue.

4.4 Excessive Battery Draw

The current consumption of the 3V_RTC_BAT (pin 35) real time clock (RTC) battery backup power rail is in excess of 500 micro-Amps when the 3.3V_IN is not powered and left unconnected. The current draw is occurring in the on-board TPS65023 power management IC (PMIC). Use of a button cell type battery for powering the CPU RTC is not feasible for SOMs suffering this design error.

PCN 20120612000 addresses this issue.

4.5 TI OMAP-L138 Errata 2.1.23

Texas Instruments Errata Advisory number 2.1.23 for the OMAP-L138 and AM-1808 processors indicates that there is a possibility for contention between the processor internal pull-up or pull-down resistors and external pull-up or pull-down resistors (in this case, on the SOM) used to configure the BOOT mode pins during reset. The OMAP-L138 processor internal pull-up or pull-down resistors are specified to be disabled after a power on / reset condition, but the Advisory indicates that TI has observed some instances, categorized as “intermittent”, where the internal resistors were enabled.

In order to ensure that the desired strapped pin value is correctly latched on the boot pins, external pull-up or pull-down resistors must be strong enough (i.e., low enough in resistance value) to overcome the internal resistors. TI recommends a maximum value of 2.03 K ohms to ensure proper leveling across all operating conditions. On fielded units with this issue flagged, the strapping resistors used in the SOM design are 4.7K Ohms.

Critical Link has not observed (or received an RMA request for) any modules with a power on failure mode that has a root-cause which correlates with this Errata Advisory, however it should be addressed in future production runs.

PCN 20121031000 addresses this issue.

4.6 TI OMAP-L138 Errata 2.1.4

Texas Instruments Errata Advisory number 2.1.4 for the OMAP-L138 and AM1808 processors indicates that the OMAP-L138 may be susceptible to radiated noise during an ESD strike, as described in the standard IEC 61000-4-2 when using the 1.2V internal oscillator for the main system clock.

In order to improve the ESD robustness of the MityDSP module design, Critical Link has incorporated an external clock oscillator/driver in lieu of using the OMAP-L138 internal clock oscillator according to the Advisory recommendations.

PCN 20150626000 addresses this issue.

4.7 TI OMAP-L138 Errata 2.1.21

Texas Instruments Errata advisory number 2.1.21 for the OMAP-L138 and AM1808 processors indicates that, with processor silicon revisions lower than 2.3, the USB0 phase locked loop may lose lock when operated across wide temperature ranges. When this situation occurs, the peripheral must be reset in order to restore the PLL lock.

PCN 20150626000 addresses this issue.

4.8 TI OMAP-L139 Errata 2.3.18

This issue only impacts non-FPGA based modules. Texas Instruments Errata advisory number 2.3.18 for the OMAP-L138 and AM1808 processors indicates that it is possible for a 1.8 V latch-up condition to occur if the module is powered on while driving heavy current loads into the 3.3 V I/O pins of the processor.

PCN 20150626000 improves the module's susceptibility to this issue.

5 REVISION HISTORY

Date	Version	Change Description
21-MAY-2012	1.0	Initial release
31-OCT-2012	1.1	Add information for PCNs 20120524000, 20120612000 and 20121031000.
26-JUNE-2015	1.2	Add information for PCN 20150626000. Update nomenclature to use MitySOM where needed. Update product marking section.
29-JAN-2016	1.3	Updated table 1 for 80-000419RI-3 RevD, 80-000316RI-3 RevD. Updated table 2 for 80-000325RC-3 RevF.
12-APR-2017	1.4	Marked 1810-DG-225-RC and 1810-DX-225-RC as obsolete.
3-AUG-2022	1.5	Add information for PCNs 20180209000 and 20220621000.