



Zoom™ AM3517 & OMAP-L138 EVM Development Kit Compatibility

Application Note 440

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Abstract

This application note identifies which board components are compatible between the Zoom AM3517 EVM Development Kit and the Zoom OMAP-L138 EVM Development Kit.

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Revision History

REV	EDITOR	DESCRIPTION	APPROVAL	DATE
A	BSB	-Initial release	BSB	06/15/10
B	SO	-Section 3: Updated documentation information and download links	SO	09/20/11

Table of Contents

1	Introduction	1
1.1	Assumptions.....	1
2	AM3517 SOM-M2 & OMAP-L138 SOM-M1 Compatibility Tables	1
3	Additional Resources	6
3.1	Documentation	6
3.2	Software	7
4	Summary	7

List of Tables

Table 1.1:	Board Schematic Part Number and Revision	1
Table 2.1:	OMAP-L138 Baseboard Compatibility Table	2
Table 2.2:	AM3517 Baseboard Compatibility Table	3
Table 2.3:	OMAP-L138 Baseboard + UI Board Compatibility Table.....	4
Table 2.4:	AM3517 Baseboard + Application Board Compatibility Table	5

1 Introduction

The AM3517 SOM-M2 and the OMAP-L138 SOM-M1 are part of the same form factor family, SOM-Mx. This means that they have the same board-to-board connector layout and share the essential electrical signals. Because of this similarity, it is possible to connect an AM3517 SOM-M2 to an OMAP-L138 baseboard or an OMAP-L138 SOM-M1 to an AM3517 baseboard. This application note provides a list of available features when one of the SOMs is used on its counterpart's baseboard.

1.1 Assumptions

The AM3517 SOM-M2 and the OMAP-L138 SOM-M1 configurations used in writing this document are those included with the EVM Development Kits: SOMXAM3517-10-1780RJCR and SOMXOMAP-L138-11-1602AHCR. Table 1.1 specifies the schematic part number and revision for each component that was used in writing this document. It is the user's responsibility to review the most recent schematics and any Product Change Notifications (PCNs) that could affect available features.

Table 1.1: Board Schematic Part Number and Revision

Board	Schematic Part Number and Rev
AM3517 SOM-M2	1014320 Rev A
AM3517 Baseboard	1013710 Rev A
AM3517 Application Board	1013712 Rev A
OMAP-L138 SOM-M1	1014647 Rev A
OMAP-L138 Baseboard	1013125 Rev 1
OMAP-L138 UI Board	1013887 Rev 1

2 AM3517 SOM-M2 & OMAP-L138 SOM-M1 Compatibility Tables

The compatibility tables in this section list the features available to each SOM when used with the following baseboard and UI/application board combinations.

- OMAP-L138 Baseboard (Table 2.1)
- AM3517 Baseboard (Table 2.2)
- OMAP-L138 Baseboard + EVM User Interface (UI) Board (Table 2.3)
- AM3517 Baseboard + EVM Application Board (Table 2.4)

NOTE: It is not possible to physically connect an OMAP-L138 UI board to an AM3517 baseboard or to connect an AM3517 application board to an OMAP-L138 baseboard; therefore, those combinations are not provided.

NOTE: Some interfaces on the UI board and application board may share the same bus, so not every feature may be accessible at the same time. Please see the respective Development Kit User Manual for specific details.

NOTE: Reference designators appear throughout the tables (e.g., U4, J31, P1). If a reference designator appears in the *Feature* column, that component can be found on the baseboard or UI/application board schematics for that table. If a reference designator appears in either of the SOM columns, that component can be found in the respective SOM schematics.

NOTE: In the tables below, cells that are shaded indicate features with Board Support Library (BSL) tests; the BSL files are available for download from the Logic PD website (see Section 3.2).

Within the tables, abbreviated folder paths are used to indicate where the BSL test is located. The abbreviations are:

- AM3517_exp\ = AM35x_BSL\tests\experimenter\
- AM3517_EVM\ = AM35x_BSL\tests\evm\
- OMAP-L138_exp\ = evmomapl138_v1\tests\experimenter\
- OMAP-L138_EVM\ = evmomapl138_v1\tests\EVM\

Table 2.1: OMAP-L138 Baseboard Compatibility Table

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
PMIC I/O Voltage	Yes (U2)	Yes (U9); BSL at OMAP-L138_exp\pmic
RTC	Yes (U35)	Yes (U1); BSL at OMAP-L138_exp\rtc
SDRAM	Yes (U3, U4)	Yes (U2); BSL at OMAP-L138_exp\ram
NAND	Yes (U5)	No; OMAP-L138 SOM-M1 does not include NAND
SPI Flash	No	Yes (U6); BSL at OMAP-L138_exp\spiflash
Ethernet LAN8710A (J31)	Yes	Yes; BSL at OMAP-L138_exp\emac_loopback_mii and OMAP-L138_exp\read_mac
RS232 (P1)	Yes (UART3)	Yes (UART2); BSL at OMAP-L138_exp\uart
SD/MMC (J14)	Yes (MMC/SD1)	Yes (MMC/SD0); BSL at OMAP-L138_exp\mmc_sd
USB OTG (J6_A1, J6_B1)	Yes (USB0)	Yes (USB0); BSL at OMAP-L138_exp\usb
USB Host (J27)	Yes (USB1)	Yes (USB1); BSL at OMAP-L138_exp\usb
60-pin LCD (J15)	Yes	Yes; BSL at OMAP-L138_EVM\lcd_graphics
4-Wire Touch (J15)	Yes	Yes; BSL at OMAP-L138_EVM\touch
SATA (J32)	No; AM3517 microprocessor does not support SATA	Yes; BSL at OMAP-L138_exp\sata
EDR FM (Tx/Rx) (J32)	Yes	No; OMAP-L138 processor does not support
JTAG Header for TI Processor (J22)	Yes	Yes
JTAG Header for ARM Core (J23)	Yes	Yes
JTAG XDS100 USB EMULATOR (J21)	Yes	Yes
USER LEDs & Switches (U9)	Yes; however, the interrupt signal is used as uP_I2C1_SCL on the SOM	Yes; BSL at OMAP-L138_exp\led_dip
Audio Expansion Header (J30)	No; AM3517 microprocessor does not support McASP	Yes
Onboard Audio TLV320AIC3106IRGZ (U14, J11, J12)	No; AM3517 microprocessor does not support McASP	Yes; BSL at OMAP-L138_exp\audio
PMDC Connector (J13)	No; SPI0_ENA not available on J2.95	Yes

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
Boot from SPI1 Flash	No; AM3517 microprocessor does not support	Yes (U6)
Boot from UART2 (P1)	No; AM3517 SOM-M2 does not support	Yes
Boot from EMU Debug ⁰ (J22)	No; AM3517 SOM-M2 does not support	Yes
Boot from NAND on SOM	Yes (U5)	No; OMAP-L138 SOM-M1 does not include NAND
Boot from EMAC (J31)	Yes	No; OMAP-L138 SOM-M1 does not support
Boot from USB Host (J27)	Yes	No; OMAP-L138 SOM-M1 does not support
Boot from MMC1 (J14)	Yes	No; OMAP-L138 processor does not support

TABLE NOTES:

1. The EMU debug option does not fetch code from any external peripheral. It allows the processor to be powered and then the ARM core executes an idle loop immediately after the device is powered on. To load a program, data, or access any internal registers, an emulation connection through JTAG must be established. For devices that have a DSP core, the internal bootloader powers on the DSP core before entering the idle loop thus allowing an emulator to access the DSP core after the device has been powered on.

Table 2.2: AM3517 Baseboard Compatibility Table

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
PMIC Core DVM	Yes (U2); BSL at AM3517_exp\pmic	Yes (U9)
RTC	Yes (U35); BSL at AM3517_exp\rtc	Yes (U1)
SDRAM	Yes (U3,U4); BSL at AM3517_exp\ram	Yes (U2)
NAND	Yes (U5); BSL at AM3517_exp\nand	No; OMAP-L138 SOM-M1 does not include NAND
Bluetooth	Yes (U12, J4); BSL at AM3517_exp\bluetooth	No; OMAP-L138 processor does not support
Wireless LAN	Yes (U12, J4); BSL at AM3517_exp\wlan	No; OMAP-L138 processor does not support
Ethernet LAN8710A (J31)	Yes; BSL at AM3517_exp\emac_loopback_rmi and AM3517_exp\read_mac	Yes
RS232 (P1)	Yes (UART3); BSL at AM3517_exp\uart	Yes (UART2)
SD/MMC (J14)	Yes (MMC/SD1); BSL at AM3517_exp\mmcscd	Yes (MMC/SD0)
USB OTG (J6_A1, J6_B1)	Yes (USB0)	Yes (USB0)
USB Host (J27)	Yes (USB1); BSL at AM3517_exp\usb_power and AM3517_exp\usb_enumeration	Yes (USB1)
60 pin LCD (J15)	Yes; BSL at AM3517_exp\lcd	Yes
4-Wire Touch (J15)	Yes; BSL at AM3517_exp\touch	Yes
SATA (J32)	No; AM3517 microprocessor does not support SATA	Yes; however, J32 must be populated

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
JTAG Header for TI Processor (J39)	Yes	Yes
JTAG Header for ARM Core (J40)	Yes	Yes
USER LEDS & Switches (U9)	Yes; BSL at AM3517_exp\led_dip	Yes; however, the interrupt signal is used as uP_NMI interrupt from the PMIC on the SOM
S-VIDEO (J37)	Yes; BSL at AM3517_exp\videoenc	No; OMAP-L138 processor does not support S-VIDEO
EDR FM (Tx/Rx) (J32)	Yes (U12); BSL at AM3517_exp\fm	No; OMAP-L138 processor does not support
Boot from SPI1 Flash	No; AM3517 microprocessor does not support	Yes (U6)
Boot from UART2 (P1)	No; AM3517 SOM-M2 does not support	Yes ⁰
Boot from EMU Debug ² (J39)	No; AM3517 microprocessor does not support	Yes ⁰
Boot from NAND on SOM	Yes (U5)	No; OMAP-L138 SOM-M2 does not include NAND
Boot from EMAC (J31)	Yes	No; OMAP-L138 processor does not support
Boot from USB Host (J27)	Yes	No; OMAP-L138 processor does not support
Boot from MMC1 (J14)	Yes	No; OMAP-L138 processor does not support
Boot from USB Host (J27)	Yes	No; OMAP-L138 processor does not support
Boot from UART3 (P1)	Yes	No; OMAP-L138 processor does not support

TABLE NOTES:

1. Requires populating R216, R217, R218, and R239 on baseboard to control Boot1 – Boot4 on the OMAP-L138 SOM-M1. **IMPORTANT NOTE:** Any modification of the baseboard voids warranty.
2. The EMU debug option does not fetch code from any external peripheral. It allows the processor to be powered and then the ARM core executes an idle loop immediately after the device is powered on. To load a program, data, or access any internal registers, an emulation connection through JTAG must be established. For devices that have a DSP core, the internal bootloader powers on the DSP core before entering the idle loop thus allowing an emulator to access the DSP core after the device has been powered on.

Table 2.3: OMAP-L138 Baseboard + UI Board Compatibility Table

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
S-Video Input (J5)	No; AM3517 microprocessor does not support	Yes; BSL at OMAP-L138_EVM\svideo
Composite Video Input (J6)	No; AM3517 microprocessor does not support	Yes; BSL at OMAP-L138_EVM\cvideo
Composite Video (J4), S-Video Output (J3)	No; AM3517 microprocessor does not support	Yes; BSL at OMAP-L138_EVM\cvideo and at OMAP-L138_EVM\svideo
Digital-to-Analog SMA (J9)	No; AM3517 microprocessor does not support	Yes; BSL at OMAP-L138_EVM\upp
Analog-to-Digital SMA (J10)	No; AM3517 microprocessor does not support	Yes; BSL at OMAP-L138_EVM\upp

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
Ethernet Jack (for use with RMII PHY only) (J31)	No; AM3517 microprocessor does not support	Yes
IO Expander User Buttons (U31)	Yes	Yes; BSL at OMAP-L138_EVM\led_pb
Camera Connector (J7)	No; AM3517 microprocessor does not support	Yes; BSL at OMAP-L138_EVM\image_sensor
NAND Flash SMT SOP Socket (J30)	Yes ⁰	Yes; BSL at OMAP-L138_EVM\nand
Onboard NOR Boot Flash (U42)	No	Yes; BSL at OMAP-L138_EVM\nor
48-character LCD Panel (J8)	No; AM3517 microprocessor does not support	Yes; BSL at OMAP-L138_EVM\lcd_char
Boot from NAND-8 EMIFA (J30)	No; AM3517 microprocessor does not support	Yes
Boot from NOR EMIFA (U42)	No; AM3517 microprocessor does not support	Yes
Boot from EMU Debug ² (J21 or J22)	No; AM3517 microprocessor does not support	Yes

TABLE NOTES:

- Both SOMs can access the NAND flash on the OMAP-L138 UI board. However, R242 on the AM3517 SOM-M2 would need to be removed so as not to interfere with the GPMC_nCS4 function; this would prevent interrupt from the onboard RTC controller. **IMPORTANT NOTE:** Any modification of the SOM voids warranty.
- The EMU debug option does not fetch code from any external peripheral. It allows the processor to be powered and then the ARM core executes an idle loop immediately after the device is powered on. To load a program, data, or access any internal registers, an emulation connection through JTAG must be established. For devices that have a DSP core, the internal bootloader powers on the DSP core before entering the idle loop thus allowing an emulator to access the DSP core after the device has been powered on.

Table 2.4: AM3517 Baseboard + Application Board Compatibility Table

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
Video Out (J4)	Yes	No; OMAP-L138 processor does not support
Camera Connector (J5)	Yes	No; OMAP-L138 processor does not support
Video Decoder—S-Video (J6), Component Video (J7), Composite Video (J8)	Yes; BSL at AM3517_EVM\video	No; OMAP-L138 processor does not support
Audio Codec 1 (J9, J12, J13)	Yes; BSL at AM3517_EVM\audio	Yes
Audio Codec 2 (J10, J14)	Yes	Yes
NOR Flash (U14)	Yes; BSL at AM3517_EVM\nor	Yes
CAN (J15, J36)	Yes; BSL at AM3517_EVM\can	No; OMAP-L138 processor does not support
UARTs (J16)	Yes	Yes ⁰

Feature	AM3517 SOM-M2	OMAP-L138 SOM-M1
Dual Ethernet (J19, J20)	Yes	Yes
Keypad (Onboard Switches S1–S10)	Yes	No; OMAP-L138 processor does not support
WILAN Daughter Board (J30, J31, J32, J33, J34, J35)	Yes	No; OMAP-L138 processor does not support
USB Host (J21)	Yes	No; OMAP-L138 processor does not support
Expansion Connector (J25)	Yes	No; not all signals connected on the OMAP-L138 SOM-M1
Expansion Connector (J29)	Yes	No; not all signals connected on the OMAP-L138 SOM-M1
Boot from MMC2 (J22)	Yes	No; OMAP-L138 processor does not support
Boot from UART0 (J16)	Yes	No; OMAP-L138 processor does not support

TABLE NOTES:

1. J2.8 does not connect to the OMAP-L138 SOM-M1 to control GPMC_nBE1, but all other signals do.

3 Additional Resources

Developers using this application note should also be familiar with the following documentation and software, which is available for download from Logic PD’s website after [creating an account](#)¹ and [registering your development kit](#).²

3.1 Documentation

- [Zoom AM3517 EVM User Guide](#)³
- [AM3517 EVM Hardware Design Files](#)⁴ (BOMs, schematics, and layout files for all boards included with the development kit)
- [Zoom OMAP-L138 EVM User Guide](#)⁵
- [OMAP-L138 EVM Hardware Design Files](#)⁶ (BOMs, schematics, and layout files for all boards included with the development kit)
- Any PCN that may have been released affecting the boards listed in Section 1.1. Please refer to the respective product downloads page for released PCNs:
 - [AM3517 EVM Development Kit downloads page](#)⁷
 - [OMAP-L138 EVM Development Kit downloads page](#)⁸

¹ http://support.logicpd.com/auth/create_account.php

² http://support.logicpd.com/auth/register_product.php

³ <http://support.logicpd.com/downloads/1385/>

⁴ <http://support.logicpd.com/downloads/1377/>

⁵ <http://support.logicpd.com/downloads/1214/>

⁶ <http://support.logicpd.com/downloads/1361/>

⁷ <http://support.logicpd.com/auth/downloads/Zoom%20AM3517%20EVM%20Development%20Kit/>

⁸ <http://support.logicpd.com/auth/downloads/Zoom%20OMAP-L138%20EVM%20Development%20Kit/>

3.2 Software

- [AM35xx Board Support Library \(BSL\) Files](#)⁹
- OMAP-L138 SOM-M1 GEL, CCS Setup, & BSL Files
 - [CCS v4.2](#)¹⁰
 - [CCS v3.3](#)¹¹

4 Summary

This application note has shown which features are available when the AM3517 SOM-M2 or OMAP-L138 SOM-M1 is used on the counterpart's baseboard. Additionally, it has indicated which of those features have BSL tests and where those tests can be located.

⁹ <http://support.logicpd.com/downloads/1258/>

¹⁰ <http://support.logicpd.com/downloads/1364/>

¹¹ <http://support.logicpd.com/downloads/1236/>