



# Zoom™ AM3517 EVM User Guide

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## Revision History

REV	EDITOR	DESCRIPTION	APPROVAL	DATE
A	JCA	Initial release	KJH	01/24/11
B	JCA	-Section 2.3: Changed the default boot mode; default is now set to boot from the included SD cards	JCA	02/04/11

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# 1 Introduction

This User Guide continues where the QuickStart Guide documentation ended by providing additional hardware details about the Zoom AM3517 EVM, as well as introductory instructions for using the included Board Support Library (BSL) files.

## 1.1 Scope of Document

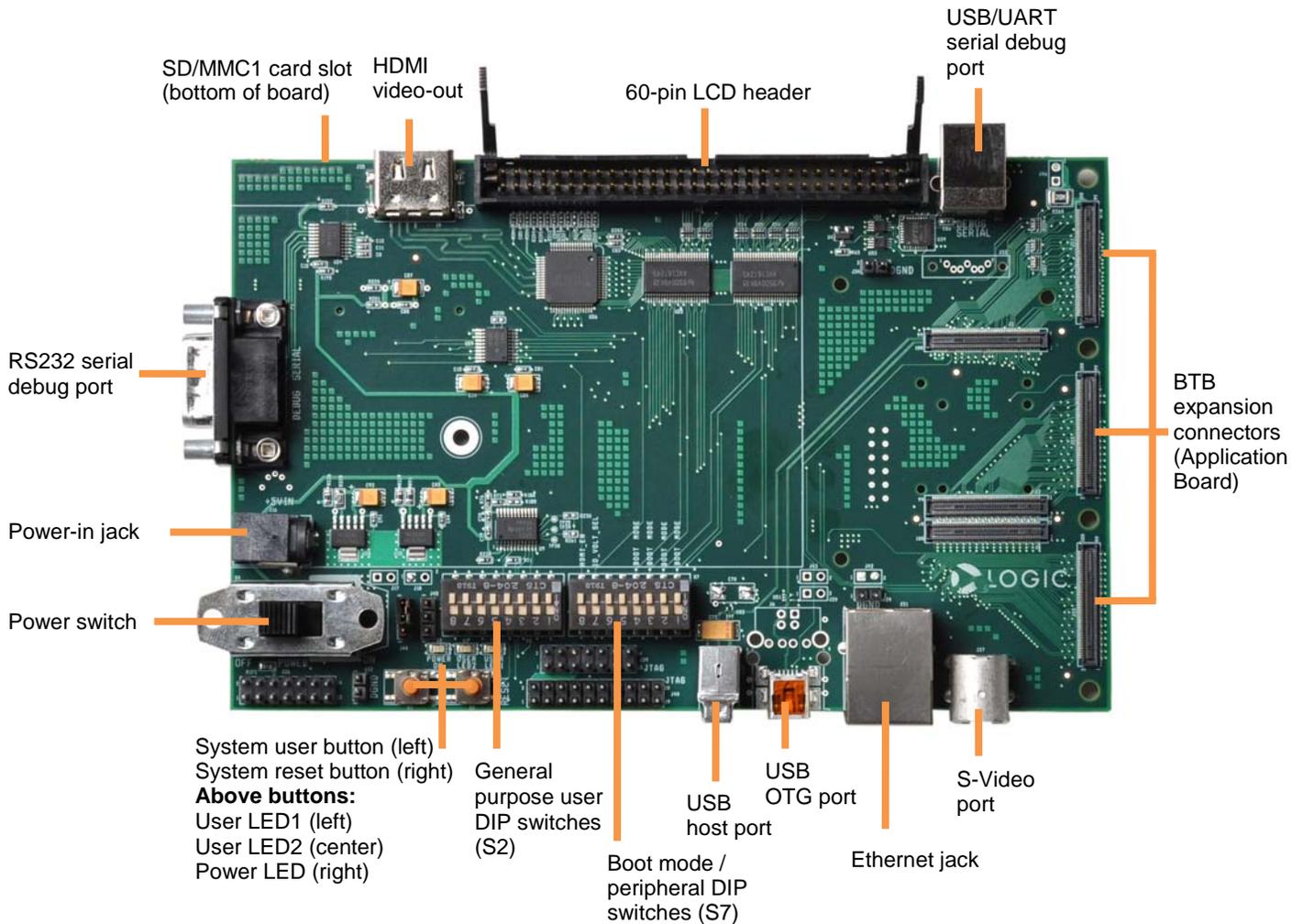
- This User Guide references specific connectors on the baseboard and application board. However, the discussion is limited to special use instructions; detailed information about the connectors should be referenced on the respective schematic and Bill of Material (BOM) documents. See Appendix A for links to these documents.
- This User Guide does not provide detailed instructions for the software included with the kits. Please refer to the specific User Guides for each respective software product for additional information. A list of additional documentation is available in Appendix A.

## 1.2 Requirements

- It is assumed that the associated QuickStart Guide has been read in its entirety. See Appendix A for a link to the QuickStart Guide.
- A host PC with CD/DVD drive, USB port, and at least 2 GB of hard drive space.

## 2 EVM Baseboard

### 2.1 Baseboard Features Diagram



### 2.2 Baseboard Ethernet Jack

The Ethernet jack located on the baseboard is used with the RMI PHY on the SOM and the Ethernet MAC built in to the AM3517 processor; whereas the Ethernet jacks located on the application board are completely independent. It is possible to use the baseboard Ethernet jack and the application board Ethernet jacks simultaneously if supported in software with multiple Ethernet drivers loaded.

### 2.3 DIP Switches

There are two 8-position DIP switches located on the baseboard at reference designators S2 and S7. By default, switches S7:1 and S7:4 are set to the “ON” position to enable booting from the SD cards included with the EVM.

The S2 DIP switch is reserved for user application general purpose. The S7 DIP switch controls the processor’s boot mode, IO voltage, and some peripherals on the baseboard. Table 2.1 describes the function of each switch.

**Table 2.1: S7 DIP Switch Functions**

Switch	OFF Position	ON Position
S7:1*	BOOT[0]	
S7:2	BOOT[2]	
S7:3	Reserved	
S7:4	BOOT[5]	
S7:5	Reserved	
S7:6	Reserved	
S7:7	AM3517 I/O runs at 3.3V	AM3517 I/O runs at 1.8V
S7:8	HDMI transmitter disabled	HDMI transmitter enabled

**\*Note:** S7:1 indicates slide 1 on the S7 DIP switch, S7:2 indicates slide 2 on the S7 DIP switch, and so on.

A default boot mode has been defined by pulling all boot pins (SYS\_BOOT[0:5]) to a default state on the SOM; all available boot modes are described in Table 2.2.

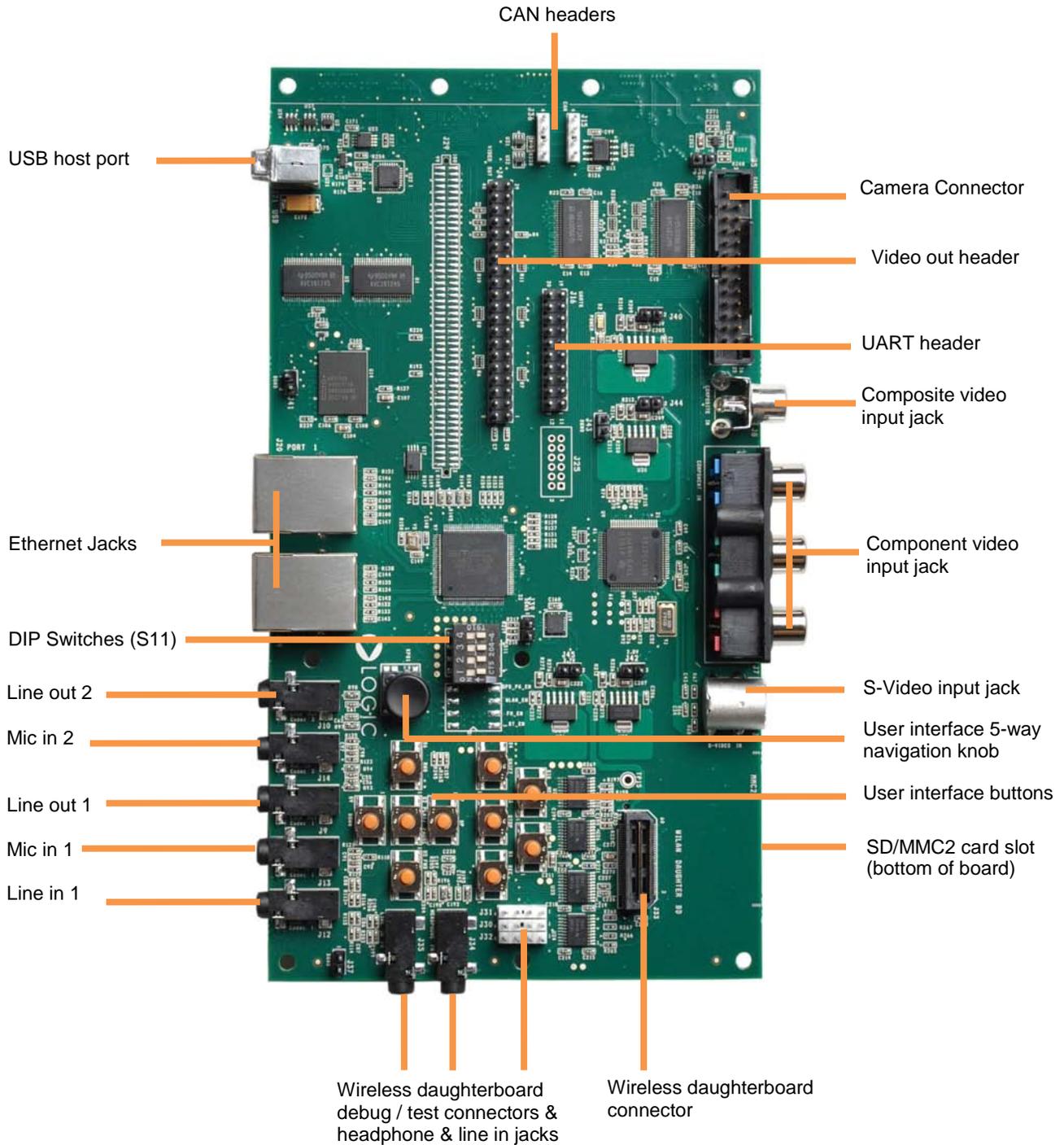
**Table 2.2: S7 DIP Switch Boot Modes**

	Boot Sequence	BOOT[5]	BOOT[2]	BOOT[0]
		S7:4	S7:2	S7:1
	NAND, EMAC, USB MMC1	OFF	OFF	OFF
	EMAC, USB, MMC1, NAND	ON	OFF	OFF
	XIP, USB, UART, MMC1	OFF	OFF	ON
<b>Default</b>	USB, UART, MMC1, XIP	ON	OFF	ON
	XDOC, EMAC, USB, EMAC	OFF	ON	OFF
	USB, XDOC	ON	ON	OFF
	MMC2, EMAC, USB, EMAC	OFF	ON	ON
	USB, MMC2	ON	ON	ON

### 3 Application Board

The application board provides connectors to evaluate additional features beyond those built into the baseboard.

#### 3.1 Application Board Features Diagram



### 3.2 Application Board Feature Usage

Some of the components on the EVM run off the same bus, so not every feature can be used at the same time. The following features are mutually exclusive of each other since they share MMC2:

- SD/MMC2 card slot located on the application board
- Wireless daughterboard connector located on the application board
- Wi-Fi module located on the SOM

The wireless daughterboard interface can be enabled or disabled by switch S11:4 on the application board. The other features are controlled through software. This is something to take into consideration if intending to use the application board with custom software for the SOM.

In addition, the application board supports composite, component, and S-Video analog video inputs, as well as a camera digital input. All input devices may be connected simultaneously, but only one video input device may be selected at a time. The selection between any analog input and the camera input is made with switches S11:1 and S11:2 on the application board. The choice of analog input is controlled through software.

### 3.3 Application Board Ethernet Jacks

The Ethernet jacks located on the application board are connected to the SMSC LAN9311 Ethernet chip on the application board. This chip connects to the processor GPMC bus and is independent of the Ethernet jack located on the baseboard.

### 3.4 User Interface Buttons

Ten user interface buttons are available on the application board to interact with software. All of the buttons run through an I/O switch controlled by I2C. Five of the interface buttons are also connected in parallel with a five-way navigation knob.

## 4 Using USB/UART Serial Debug Interface

If your computer is not equipped with a COM port, the baseboard allows for the option of using the USB/UART serial debug port as a virtual COM port (VCP) — see Section 2.1 for port location. In order to use this feature, you must first download and install the VCP chip driver on your computer.

Please review the FTDI website to make sure your computer meets [recommended specifications for the FT232R device](#).<sup>1</sup>

### 4.1 VCP Driver Installation

The following are brief instructions for installing the FT232R VCP driver. For more detailed instructions, please review the [documentation on FTDI's website](#).<sup>2</sup>

1. The VCP driver is available for download from [FTDI's website](#).<sup>3</sup> (**NOTE:** There may be multiple drivers available on the FTDI website for this device; only the *VCP driver* is required.)
2. The driver will be downloaded as a ZIP file which must be unzipped before the driver can be installed.
3. If running Windows XP SP1, please refer to the *Windows XP Installation Guide* located on the FTDI website for special precautions to observe while installing the driver.

<sup>1</sup> <http://www.ftdichip.com/Products/FT232R.htm>

<sup>2</sup> <http://www.ftdichip.com/Documents/InstallGuides.htm>

<sup>3</sup> <http://www.ftdichip.com/Drivers/VCP.htm>

4. Plug the USB cable into a USB port on your computer and the USB/UART serial debug port on the baseboard. The Windows XP "Found New Hardware Wizard" will automatically appear.
5. When prompted to allow Windows to search for the driver, select "No not this time."
  - Install from a list or specific location (advanced)
  - Browse to the location of the unzipped folder containing driver.
  - The installation process should complete by itself with a message stating "USB Serial Converter successfully installed."
6. A Windows XP Found New Hardware Wizard window will open for a second time. Follow same procedure as Step 5 above. This installation process should complete by itself with a message stating "USB Serial Port successfully installed."
7. Your system should now recognize the new hardware.
8. If you encounter any problems during this installation, please refer to FTDI's website for troubleshooting recommendations.
9. Before using, go to the Device Manager on your computer to determine what COM port is associated with the USB/Serial Port.

#### 4.1.1 Additional Notes

- When using this feature, the DB9 Serial Port on the baseboard is disabled whenever the USB cable is connected to the USB/UART serial debug port.
- The power supply included with the EVM needs to be plugged into an electrical outlet for the USB device to be recognized by the computer. However, the EVM does not need to be powered on for the device to be recognized.

## 4.2 Terminal Emulation Installation

The Zoom AM3517 EVM is designed to communicate with terminal emulation programs using the included null-modem serial cable or Ethernet cable. The terminal emulation program must support binary transfers in order to download software to the kit. Although Logic PD does not support any particular terminal emulation program, we suggest using Tera Term for Windows 2000 or XP (Tera Term is not available for Linux users). Tera Term can be downloaded for free from Logic PD's website. To install Tera Term:

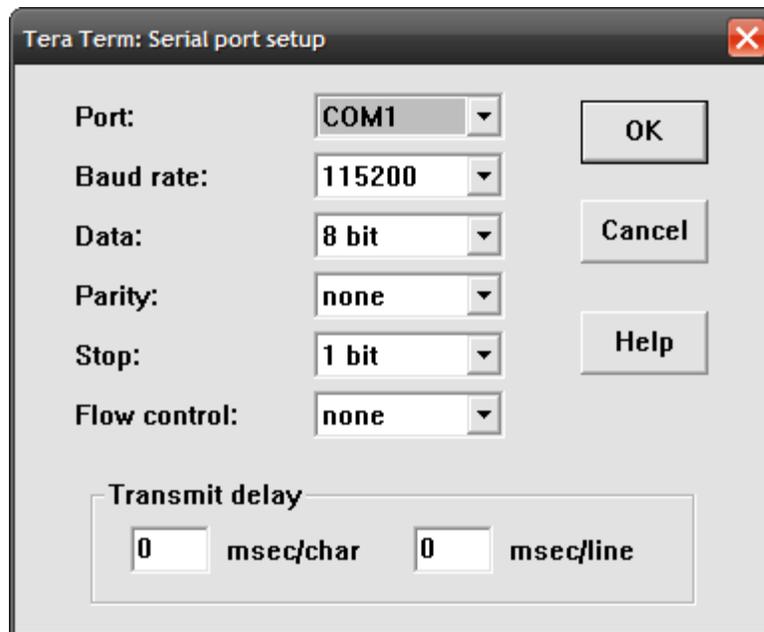
1. Download the .zip file from Logic PD's [downloads site](http://support.logicpd.com/downloads/240/)<sup>4</sup> and unzip the contents.
2. After unzipping the contents, locate the *teraterm-x.xx.exe* file and double-click it.
3. Follow the on-screen instructions to install Tera Term.
4. Start the Tera Term program
5. From the menu, select **Setup > Serial port**

---

<sup>4</sup> <http://support.logicpd.com/downloads/240/>

6. Select the appropriate COM port for your host PC and then change the port settings to:
  - a. Baud rate: 115200
  - b. Data: 8 bit
  - c. Parity: None
  - d. Stop: 1 bit
  - e. Flow control: None

(**Hint:** In Tera Term, you can save these serial port settings by selecting **Setup > Save setup** from the menu bar. After saving, these serial port settings will be in place every time you launch the Tera Term application.)



*Figure 4.1: Serial Port Settings*

## 5 Install Software

The AM3517 EVM includes a Board Support Library (BSL) that allows for interaction with the EVM and helps with diagnostics. This BSL is provided on the Windows CE and Linux software SD cards included with the EVM; they're also available for download from Logic PD's [downloads site](#)<sup>5</sup>. The BSL works in conjunction with toolchains from CodeSourcery which must be installed on the host PC prior to using the BSL.

### 5.1 Install CodeSourcery

The AM3517 EVM includes a DVD with an evaluation version of CodeSourcery's Sourcery G++ Professional Edition and Lite Edition for ARM GNU/Linux. The Professional Edition is designed for enterprise software development and includes the GNU Toolchain, the Eclipse IDE, and other tools to build software. The Lite Edition is a command-line tool and is used as part of the Linux SDK. More information is available on [CodeSourcery's website](#)<sup>6</sup>.

For interaction with the BSL and the instructions within this User Manual, all that is required is a command-line tool. CodeSourcery provides a free, command-line only Lite Edition of Sourcery G++ for ARM EABI; we will use the Lite version in these instructions.

<sup>5</sup> <http://support.logicpd.com/auth/downloads/Zoom%20AM3517%20EVM%20Development%20Kit/#tools>

<sup>6</sup> <http://www.codesourcery.com/sqpp>

1. Download *Sourcery G++ Lite for ARM EABI* from [CodeSourcery's website](#).<sup>7</sup> (NOTE: These instructions were tested with version 2010.09-51.)
2. Locate the downloaded executable on your host PC and double-click to launch the installer.
3. Follow the on screen instructions. When you arrive at the screen for type of installation, select **Typical**.

## 5.2 Install AM35xx BSL

1. Insert the Windows CE or Linux SD card into the included SD card reader. Connect the card reader to an available USB port your host PC and navigate to the BSL folder.
2. Copy the contents of the BSL folder to a directory of your choice on the host PC.
3. Read the *BSL\_ReadMe.txt* file for documentation on the BSL.

# 6 Board Support Library (BSL) Sample Programs

The BSL sample programs are included to test the different features of the EVM and diagnose any potential problems. In order to run these tests, you first have to connect your EVM to a host PC.

## 6.1 Connect EVM to PC

Connect the EVM to your PC by using the provided serial cable and following the instructions in the QuickStart Guide or by using a USB A to B cable and following the instructions in Section 4 of this document.

## 6.2 Run the Test Menu

In order to run a test program, you will have to select the program, compile (or build) the program, and then load the compiled program. The following steps will walk you through that process.

1. Open a command prompt on your host PC and navigate to the `.\tests\test_menu\cs` folder, located in the directory where you installed the BSL.
2. Compile the program by typing `cs-make` at the command prompt.
3. This will create a `test_menu.raw` file in that same folder.
4. Open Tera Term and select the serial COM port connected to your EVM.
5. Make sure one of the included software SD cards is inserted in the EVM and then power on the EVM.
6. When prompted, press any key to stop the autoboot process. This will bring up a bootloader prompt.
7. Load the test menu program by typing `loadb` at the bootloader prompt.
8. If using Tera Term, transfer the file by selecting **File > Transfer > Kermit > Send** from the menu. Navigate to the `.\tests\test_menu\cs` folder and then select the `test_menu.raw` file. Click **Open** to send the file.  
(NOTE: This requires Tera Term version 4.63. If you are not using TeraTerm, please read the documentation for your terminal emulator about using the Kermit protocol to transfer a file.)
9. After the program finishes loading, type `go 0x82000000` and press the Enter key.
10. Run a test by typing in the test number and pressing the Enter key. For example, type 5 to run the LED, DIP Switch test. This test will flash LEDs in different patterns depending on the S2 switch moved and will output the switch number positions.

<sup>7</sup> <http://www.codesourcery.com/sgpp/lite/arm/portal/subscription?@template=lite>

**NOTE:** All of the tests in the *experimenter* folder can be run on both the AM3517 EVM and eXperimenter Kit; the tests in the *evm* folder can only be run on the AM3517 EVM.

## Appendix A: Additional Documentation

### Software Documentation

- The SD cards included with your AM3517 EVM include Software Developer Guides for Android, Linux, and Windows CE. Please see the *setup.htm* files on each SD card for information.
- U-Boot documentation  
<http://www.denx.de/wiki/U-Boot/WebHome>

### Hardware Documentation

All of the following links are also available on your “My Account” page on the Logic PD website (<http://support.logicpd.com/auth/>).

- Logic PD *Zoom AM3517 EVM QuickStart Guide*  
<http://support.logicpd.com/downloads/1376/>
- Logic PD AM3517 EVM Hardware Design Files (BOMs, Schematics, and Layout Files for all boards included in the EVM)  
<http://support.logicpd.com/downloads/1377/>
- Logic PD *AM35x SOM-M2 Hardware Specification*  
<http://support.logicpd.com/downloads/1257/>