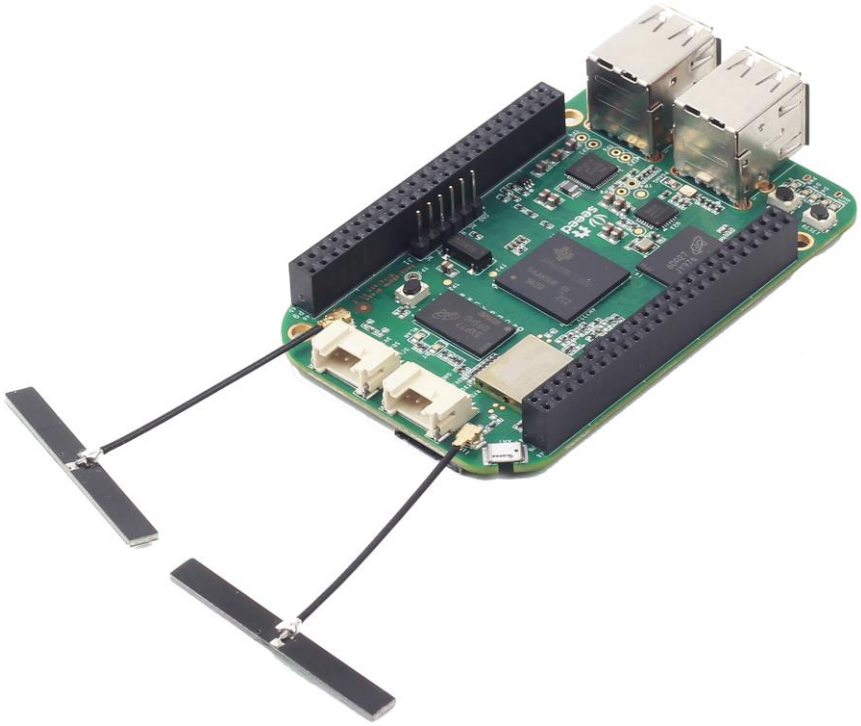

SeeedStudio BeagleBone Green Wireless

System Reference Manual

Revision V1.0

May. 11, 2016

Reference to the BBB_SRM

THIS DOCUMENT

This document is derived from work by Gerald Coley (gerald@beagleboard.org), for hardware questions, please send your email to Zelin Cai (zelin.cai@seeed.cc), for software and ecosystem questions, please direct to Jason Kridner (jkridner@beagleboard.org) and http://beagleboard.org/discuss.

Send all comments and errors concerning this document to the author at zelin.cai@seeed.cc

All information in this document is subject to change without notice.

For an up to date version of this document refer to:

http://www.seeedstudio.com/wiki/beaglebone_green_wireless

BEAGLEBONE DESIGN

These design materials referred to in this document are ***NOT SUPPORTED*** and **DO NOT** constitute a reference design. Only "community" support is allowed via resources at BeagleBoard.org/discuss.

THERE IS NO WARRANTY FOR THE DESIGN MATERIALS, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE DESIGN MATERIALS "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE DESIGN MATERIALS IS WITH YOU. SHOULD THE DESIGN MATERIALS PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

This board was designed as an evaluation and development tool. It was not designed with any other application in mind. As such, the design materials that are provided which include schematic, BOM, and PCB files, may or may not be suitable for any other purposes. If used, the design material becomes your responsibility as to whether or not it meets your specific needs or your specific applications and may require changes to meet your requirements.

Table of Contents

Tables

Figures

1.0 Introduction

This document is the **System Reference Manual** for the SeeedStudio BeagleBone Green Wireless and covers its use and design. The board will primarily be referred to in the remainder of this document simply as the board, although it may also be

referred to as the SeeedStudio BeagleBone Green Wireless as a reminder. There are also references to the original BeagleBone as well, and will be referenced as simply BeagleBone.

This design is subject to change without notice as we will work to keep improving the design as the product matures based on feedback and experience. Software updates will be frequent and will be independent of the hardware revisions and as such not result in a change in the revision number.

Make sure you check the support Wiki frequently for the most up to date information.

http://www.seeedstudio.com/wiki/beaglebone_green_wireless

2.0 Change History

This section describes the change history of this document and board. Document changes are not always a result of a board change. A board change will always result in a document change.

2.1 Document Change History

Table 1. Change History

REV	Description	Date	By
V1.0	*Production release*	*May 11, 2016*	*Zelin*

3.0 Connecting Up Your SeeedStudio BeagleBone Green Wireless

This section will describe how to connect the board for use. The board can be configured in several different ways, but we will discuss the most common scenarios as described in the Quick Start Guide card that came in the box：

1) Connect your SeeedStudio BeagleBone Green Wireless and your computer via Wi-Fi；

2) Connect your SeeedStudio BeagleBone Green Wireless and your computer using the USB cable.

3.1 What's In the Box

In the box you will find three main items as shown in **Figure 1**.

- SeeedStudio BeagleBone Green Wireless
- Micro USB to USB Type A Cable
- Instruction card with link to the support WIKI address.

This is sufficient for the tethered scenario and creates an out of box experience where the board can be used immediately with no other equipment needed.

Figure 1. In The Box

3.2 Power Supply for SeeedStudio BeagleBone Green Wireless

SeeedStudio BeagleBone Green Wireless Board is powered 5V through a Micro USB cable from a good quality 5V power adapter or PC as shown in **Figure 2.**

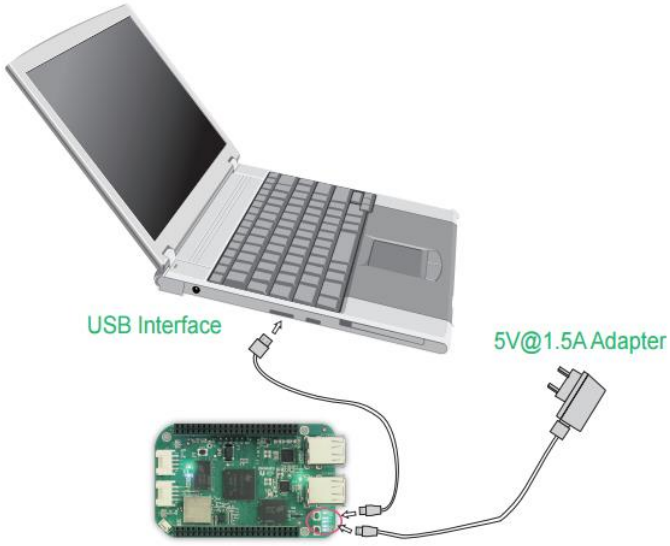

Figure 2. Power Supply for SeeedStudio BeagleBone Green

Wireless

3.3 Connect your SeeedStudio BeagleBone Green Wireless and your computer via Wi-Fi

Get a computer or device with Wi-Fi, use the Wi-Fi icon and scan for an Access Point named BeagleBoneXXXXXX as shown in **Figure 3**.

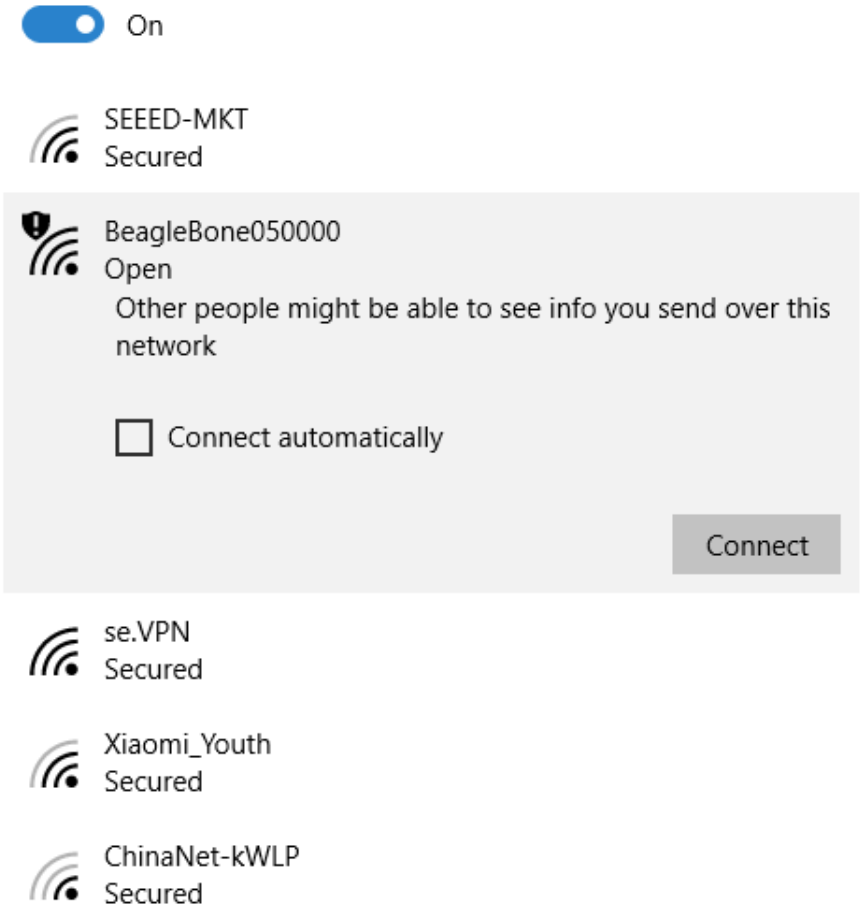

Figure 3. Access Point named BeagleBoneXXXXXX

Connect to the AP and you have access to the board's Wi-Fi configuration as shown in **Figure 4**.

Figure 4. the board's Accessing UI

You could select your SSID and click "OK". If all works well you the board's Wi-Fi configuration like **Figure 5**.

Figure 5. the board's Wi-Fi configuration

Congratulations, your board is connected to the network.

Note: You can use Web browser or SSH(Secure Socket Shell) through 192.168.8.1(AP mode) or an IP address(Station mode) to access your board.

And in general, you shall create a password of accessing your board's AP, please access the files system: **echo "xxxxxx" > /etc/wificonfig/password**. Then the board's AP is protected from unauthorized access as shown in **Figure 6**.

Figure 6. Protected Accessing UI

3.4 Connect your SeeedStudio BeagleBone Green Wireless and your computer using the USB cable

In this configuration, the board is powered by the PC via the provided USB cable--no other cables are required. The board is accessed either as a USB storage drive or via the browser on the PC. You need to use either Firefox or Chrome on the PC, IEx will not work properly.

3.4.1 Connect the Cable to the Board

1. Use the provided USB cable to plug your Beagle into your computer. The board will power on and the power LED will be on as shown in **Figure 7** below.

   When the board starts to the booting process started by the process of applying power, the LEDs will come on in sequence as shown in Figure 5 below. It will take a few seconds for the status LEDs to come on, so be patient. The LEDs will be flashing in an erratic manner as it begins to boot the Linux kernel

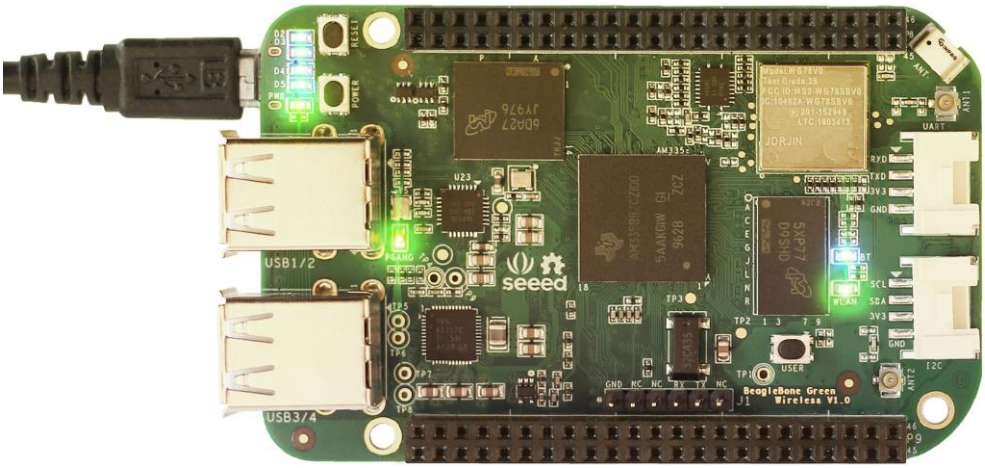

Figure 7. USB Connection to the Board

3.4.2 Accessing the Board as a Storage Drive

The board will appear around a USB Storage drive on your PC after the kernel has booted, which will take a round 10 seconds. The kernel on the board needs to boot before the port gets enumerated. Once the board appears as a storage drive, do the following:

1) Open the USB Drive folder.

2) Click on the file named start.html.

3) The file will be opened by your browser on the PC and you should get a display showing the Quick Start Guide.

4) Your board is now operational! Follow the instructions on your PC screen.

Note: Install the drivers for your operating system to give you network-over-USB access to your Beagle. Additional drivers give you serial access to your board.

For more information please visit http://beagleboard.org/getting-started

4.0 SeeedStudio BeagleBone Green Wireless Overview

SeeedStudio SeeedStudio BeagleBone Green Wireless(SeeedStudio BeagleBone Green Wireless) is a joint effort by BeagleBoard.org and Seeed Studio. It is based on the open-source hardware design of BeagleBone Black and developed into this differentiated version. The SeeedStudio BeagleBone Green Wireless has included two Grove connectors, making it easier to connect to the large family of Grove sensors. The on-board HDMI is removed to make room for these Grove connectors. Compared to the **SeeedStudio BeagleBone Green** it has removed the 10/100M Ethernet Port and supports a 2.4-GHz wireless module（TI WiLink™ 8 2x2 MIMO Wi-Fi + Bluetooth）on board, making it more suitable for IoT prototypes. It has included 4x USB2.0 host ports.

Note: You can control SeeedStudio BeagleBone Green Wireless peripherals such as Grove system through libmraa. Please refer to libmraa for more information.

4.1 BeagleBone Black Compatibility

The board is intended to be compatible with the BeagleBone Black as much as possible. There are several areas where there are differences between the two designs. These differences are listed below, along with the reasons for the differences.

Removed the 5VDC Power Jack

- *Cost down*
- *Rarely used*
- *Normally you can power the board through the Micro USB port*

Removed HDMI framer IC and connector

- *Cost down*
- *If you still need to display with HDMI interface, you can add a HDMI cape*

Replace Mini USB port with Micro USB

- *More commonly used*

Grove interface onboard

- *There are more than 150+ Grove Sensors and Actuators can be easily used*

Replace 10/100M Ethernet Port port with TI WiLink™ 8 module（2x2 MIMO Wi-Fi + Bluetooth）

- *more suitable for the IoT applications*

4.2 SeeedStudio BeagleBone Green Wireless Features and Specification

Table 2. SeeedStudio BeagleBone Green Wireless Features

	Feature
Processor	Sitara AM3358BZCZ100 1GHz, 2000 MIPS
Graphics Engine	SGX530 3D, 20M Polygons/S
SDRAM Memory	512MB DDR3L 933 MHz
Onboard Flash	4GB, 8bit Embedded MMC
Power Source	Micro USB Jack,5VDC External Via Expansion Header
PCB	3.4” x 2.1” , 6 layers
Indicators	1-Power, 1-USB, 1-WiFi, 1-Bluetooth, 4-User Controllable LEDs
HS USB 2.0 Client Port	Access to USB0, Client mode via Micro USB
HS USB 2.0 Host Port	Access to USB1, Type A Socket, Total 1500mA LS/FS/HS, 4 Ports Hub
Serial Port	UART0 access via 6 pin 3.3V TTL Header. Header is populated
WLAN/BT	2x2 MIMO Wi-Fi®, Bluetooth®, and Bluetooth Low Energy (LE)
SD/MMC Connector	microSD , 3.3V
Grove Connectors	1-Uart2, 1-I2C2
User Input	Reset Button Boot Button Power Button
Video Out	Not support
Audio Out	Via A2DP(Advanced Audio Distribution Profile)
Expansion Connectors	Power 5V, 3.3V , VDD_ADC(1.8V)

	3.3V I/O on all signals McASP0, SPI1, I2C, GPIO(69 max), LCD, GPMC, MMC1, MMC2, 7 AIN(1.8V MAX), 4 Timers, 4 Serial Ports, CAN0, EHRPWM(0,2),XDMA Interrupt, Power button, Expansion Board ID (Up to 4 can be stacked)
Weight	1.48 oz (42 grams)
Power	Refer to Section 6.1.7

4.3 Board Component Locations

This section describes the key components on the board. It provides information on their location and function. Familiarize yourself with the various components on the board.

4.3.1 Key Components

Figure 8 below shows the locations of key components on the PCB layout of the board.

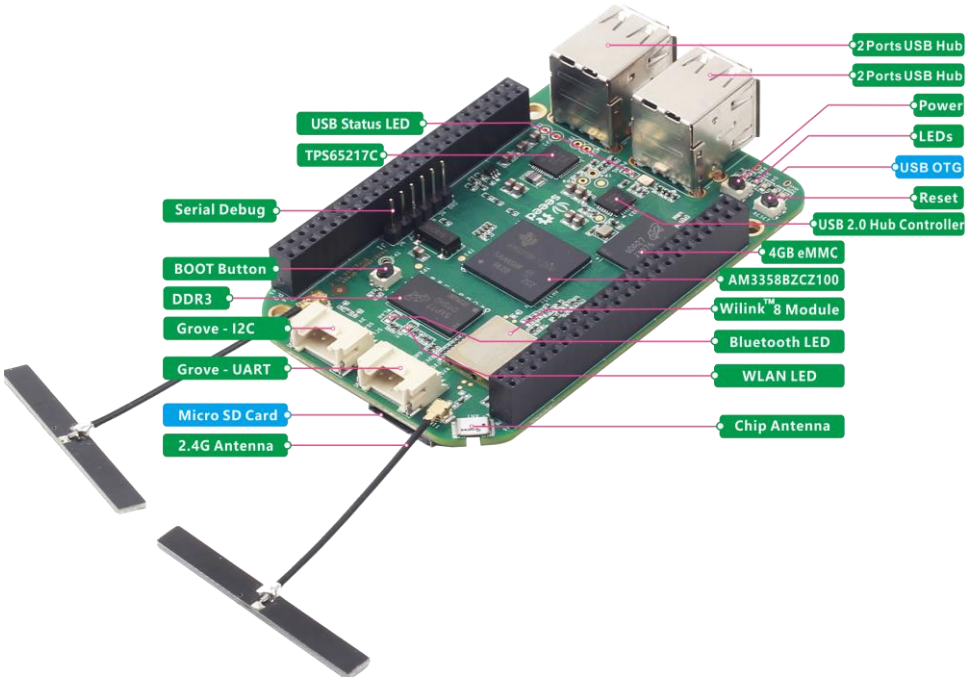

Figure 8. Connectors, LEDs and Switches

- **POWER Button** alerts the processor to initiate the power down sequence and is used to power down the board.
- **RESET Button** allows the user to reset the processor.
- **Serial Debug** is the serial debug port.
- **USB Client** is a Micro USB connection to a PC that can also power the board.
- **BOOT BUTTON** can be used to force a boot from the micro SD card if the power is cycled on the board, removing power and reapplying the power to the board.
- There are four blue **LEDS** that can be used by the user, one green LED to show **USB Status**, one green LED to show **WLAN Status**, one blue LED to show **BT Status**.
- **2.4G Antennas** are external antennas for WLAN and Bluetooth.
- **Micro SD** slot is where a micro SD card can be installed.
- **Grove - UART** is where the Grove - UART device is connected to.
- **Grove – I2C** is where the Grove – I2C device is connected to.
- **4 Ports USB HUB** can be connected different USB interfaces such as Wi-Fi, BT, Keyboard, etc.
- **Sitara AM3358BZCZ100** is the processor for the board.
- **Micron 512MB DDR3L** or Kingston 512mB DDR3 is the Dual Data Rate RAM memory.
- **TPS65217C PMIC** provides the power rails to the various components on the board.
- **Micron eMMC** is an onboard MMC chip that holds up to 4GB of data.
- **WLink™8 Module** is a 2.4-GHz module with WiFi and Bluetooth, two antenna solution. The device is FCC, IC, ETSI/CE, and TELEC certified for AP and client.

5.0 SeeedStudio BeagleBone Green Wireless High Level Specification

This section provides the high level specification of the SeeedStudio BeagleBone Green Wireless.

5.1 Block Diagram

Figure 9 below is the high level block diagram of the SeeedStudio BeagleBone Green Wireless.

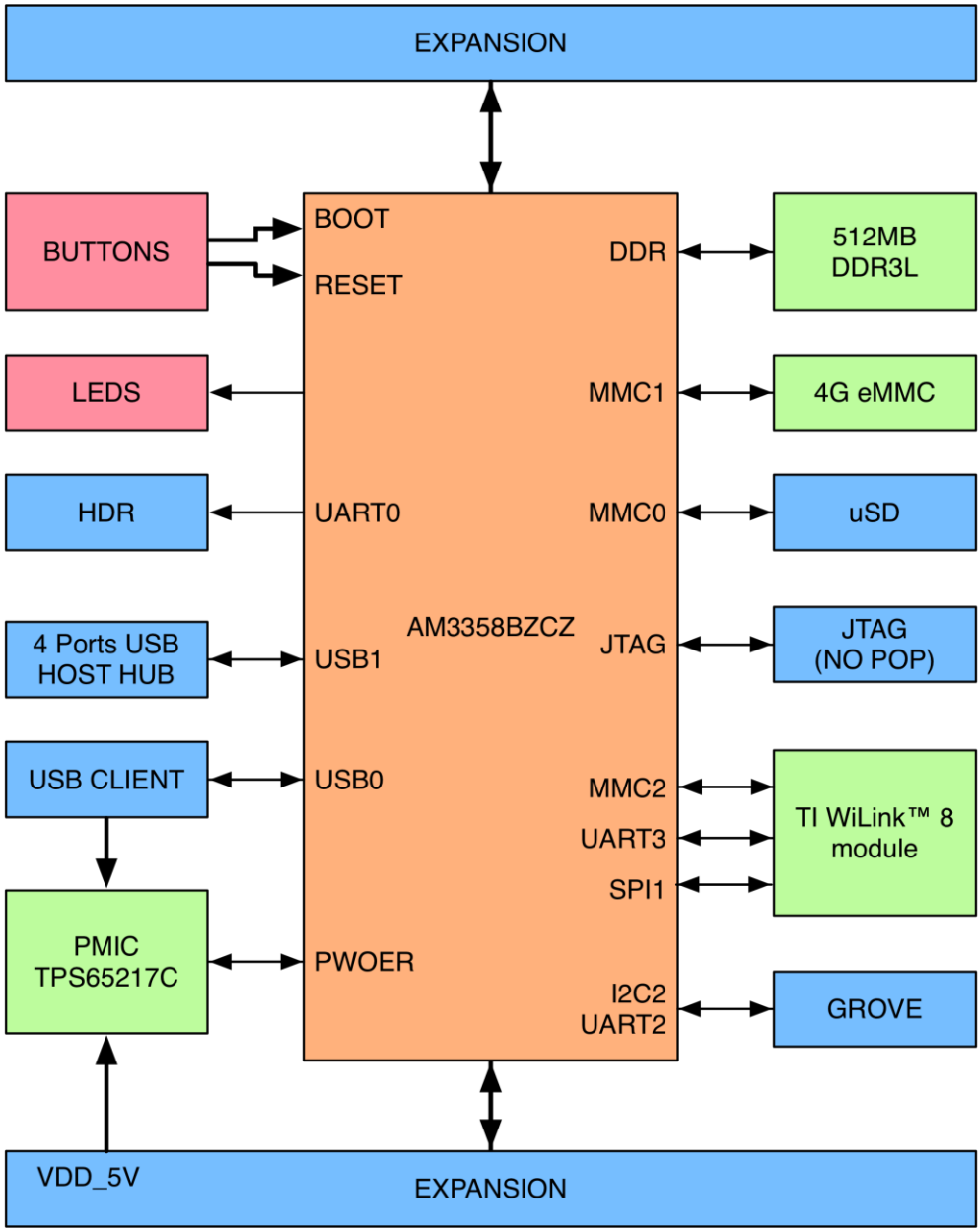

Figure 9. SeeedStudio BeagleBone Green Wireless Block diagram

5.2 Processor

Sitara AM3358BZCZ100

5.3 Memory

Described in the following sections are the three memory devices found on the board.

5.3.1 512MB DDR3L

A single 256Mb x16 DDR3L 4Gb (512MB) memory device is used. The memory used is is one of two devices:

- MT41K256M16TW-107:P from Micron
- D2516EC4BXGGB from Kingston

It will operate at a clock frequency of 400MHz yielding an effective rate of 800MHZ on the DDR3L bus allowing for 1.6GB/S of DDR3L memory bandwidth.

5.3.2 4KB EEPROM

A single 4KB EEPROM is provided on I2C0 that holds the board information. This information includes board name, serial number, and revision information. This is the not the same as the one used on the original BeagleBone. The device was changed for cost reduction reasons. It has a test point to allow the device to be programmed and otherwise to provide write protection when not grounded.

5.3.3 4GB Embedded MMC

A single 4GB embedded MMC (eMMC) device is on the board. The device connects to the MMC1 port of the processor, allowing for 8bit wide access. Default boot mode for the board will be MMC1 with an option to change it to MMC0, the SD card slot, for booting from the SD card as a result of removing and reapplying the power to the board. Simply pressing the reset button will not change the boot mode. MMC0 cannot be used in 8Bit mode because the lower data pins are located on the pins used by the Ethernet port. This does not interfere with SD card operation but it does make it unsuitable for use as an eMMC port if the 8 bit feature is needed.

5.3.4 MicroSD Connector

The board is equipped with a single micro SD connector to act as the secondary boot source for the board and, if selected as such, can be the primary boot source. The connector will support larger capacity micro SD cards. The micro SD card is not provided with the board. Booting from MMC0 will be used to flash the eMMC in the production environment or can be used by the user to update the SW as needed.

5.3.5 Boot Modes

As mentioned earlier, there are four boot modes:

- **eMMC Boot...**This is the default boot mode and will allow for the fastest boot time and will enable the board to boot out of the box using the pre-flashed OS image without having to purchase an microSD card or an microSD card writer.
- **SD Boot...**This mode will boot from the microSD slot. This mode can be used to override what is on the eMMC device and can be used to program the eMMC when used in the manufacturing process or for field updates.
- **Serial Boot...**This mode will use the serial port to allow downloading of the software direct. A separate USB to serial cable is required to use this port.
- **USB Boot...**This mode supports booting over the USB port.

Software to support USB and serial boot modes is not provided by beagleboard.org.

Please contact TI for support of this feature.

A switch is provided to allow switching between the modes.

- Holding the boot switch down during a removal and reapplication of power without a microSD card inserted will force the boot source to be the USB port and if nothing is detected on the USB client port, it will go to the serial port for download.
- Without holding the switch, the board will boot try to boot from the eMMC. If it is empty, then it will try booting from the microSD slot, followed by the serial port, and then the USB port.
- If you hold the boot switch down during the removal and reapplication of power to the board, and you have a microSD card inserted with a bootable image, the board will boot from the microSD card.

NOTE: Pressing the RESET button on the board will NOT result in a change of the boot mode. You MUST remove power and reapply power to change the boot mode. The boot pins are sampled during power on reset from the PMIC to the processor. The reset button on the board is a warm reset only and will not force a boot mode change.

5.4 Power Management

The **TPS65217C** power management device is used along with a separate LDO to provide power to the system. The **TPS65217C** version provides for the proper voltages required for the DDR3L. This is the same device as used on the original BeagleBone with the exception of the power rail configuration settings which will be changed in the internal EEPROM to the **TPS65217C** to support the new voltages.

DDR3L requires 1.5V instead of 1.8V on the DDR2 as is the case on the original BeagleBone. The 1.8V regulator setting has been changed to 1.5V for the DDR3L. The LDO3 3.3V rail has been changed to 1.8V to support those rails on the processor. LDO4 is still 3.3V for the 3.3V rails on the processor. An external **LDOTLV70233** provides the 3.3V rail for the rest of the board.

5.5 PC USB Interface

The board has a Micro USB connector that connects the USB0 port to the processor. This is the most commonly used connector.

5.6 Serial Debug Port

Serial debug is provided via UART0 on the processor via a single 1x6 pin header. In order to use the interface a USB to TTL adapter will be required. The header is compatible with the one provided by FTDI and can be purchased for about $12 to $20 from various sources. Signals supported are TX and RX. None of the handshake signals are supported.

5.7 4 Ports USB Hub

There are four USB Type A female connectors with full LS/FS/HS Host support that connect to USB1 on the processor. These four ports can provide power on/off control and total up to 1500mA of current at 5V. Under USB power, the board will not be able to supply the full 500mA for each port, but should be sufficient to supply enough current for a lower power USB device supplying power between 50 to 100mA.

You can use a wireless keyboard/mouse configuration or you can add a HUB for standard keyboard and mouse interfacing.

5.8 WiLink8™ Module

The certified WiLink 8 module(WL1835/WG7835-V0) from TI offers high throughput and extended range along with Wi-Fi and Bluetooth coexistence in a power-optimized design. The device is a 2.4-GHz module, two antenna solution. The device is FCC, IC, ETSI/CE, and TELEC certified for AP and client.

Wi-Fi

WLAN Baseband Processor and RF Transceiver
Support of IEEE Std 802.11a, 802.11b, 802.11g, and 802.11n

20- and 40-MHz SISO and 20-MHz 2 × 2 MIMO at 2.4 GHz for High Throughput: 80 Mbps (TCP), 100 Mbps (UDP)

2.4-GHz MRC Support for Extended Range

Fully Calibrated: Production Calibration Not Required

4-Bit SDIO Host Interface Support

Wi-Fi Direct Concurrent Operation (Multichannel, Multirole)

Bluetooth and Bluetooth LE

Bluetooth 4.1 Compliance and CSA2 Support

Host Controller Interface (HCI) Transport for Bluetooth Over UART

Dedicated Audio Processor Support of SBC Encoding + A2DP

Dual-Mode Bluetooth and Bluetooth LE

TI's Bluetooth- and Bluetooth LE-Certified Stack

SeeedStudio BeagleBone Green Wireless also provides an easy Configuration way to getting started with WiLink 8 module. You can check wiki for the latest information:

http://www.seeedstudio.com/wiki/beaglebone_green_wireless

5.9 Power Sources

The board can be powered from three different sources:

- USB port on a PC
- A power supply with a USB connector.
- Expansion connectors

The USB cable is shipped with each board. This port is limited to 500mA by the Power Management IC. It is possible to change the settings in the TPS65217C to increase this current, but only after the initial boot. And, at that point the PC most likely will complain, but you can also use a dual connector USB cable to the PC to get to 1A.

The power supply is not provided with the board but can be easily obtained from numerous sources. A 1A supply is sufficient to power the board, but if there is a cape plugged into the board or you have a power hungry device or hub plugged into the host port, then more current may needed from the P9 Expansion connector VDD_5V pin.

Power routed to the board via the expansion header could be provided from power derived on a cape.

5.10 Reset Button

When pressed and released, causes a reset of the board. The reset button used on the BeagleBone Black is a little larger than the one used on the original BeagleBone. It has also been moved out to the edge of the board so that it is more accessible.

5.11 Power Button

A power button is provided near the reset button close to the Ethernet connector. This button takes advantage of the input to the PMIC for power down features. While a lot of capes have a button, it was decided to add this feature to the board to ensure everyone had access to some new features. These features include:

- Interrupt is sent to the processor to facilitate an orderly shutdown to save files and to un-mount drives.
- Provides ability to let processor put board into a sleep mode to save power.
- Can alert processor to wake up from sleep mode and restore state before sleep was entered.

If you hold the button down longer than 8 seconds, the board will power off if you release the button when the power LED turns off. If you continue to hold it, the board will power back up completing a power cycle.

We recommend that you use this method to power down the board. It will also help prevent contamination of the SD card or the eMMC.

If you do not remove the power jack, you can press the button again and the board will power up.

5.12 Indicators

There are a total of eight LEDs on the board.

- One green power LED indicates that power is applied and the power management IC is up. If this LED flashes when applying power, it means that an excess current flow was detected and the PMIC has shut down.
- Four blue LEDs that can be controlled via the SW by setting GPIO pins.
- One green LED shows USB Hub status. If plugging a USB device, the LED will be on.
- One green LED shows WLAN enable status and one blue LED shows BT enable status.

5.13 CTI JTAG Header

A place for an optional 20 pin CTI JTAG header is provided on the board to facilitate the SW development and debugging of the board by using various JTAG emulators. This header is not supplied standard on the board. To use this, a connector will need to be soldered onto the board.

If you need the JTAG connector you can solder it on yourself. No other components are needed. The connector is made by Samtec and the part number is FTR-110-03-G-D-06.

5.14 Grove Interfaces

There are two Grove connectors on the board:

- **I2C…**The J4 connector is I2C interface. It accesses to the processor's I2C2 interface and also connect with the P9 expansion header's I2C2 pins. The Grove I2C connector is for the connection of Grove sensors with I2C interface.
- **Uart…**The J5 connector is UART interface. It accesses to the processor's UART2 interface and also connect with the P9 expansion header's UART2 pins. The Grove UART connector is for the connection of Grove sensors with UART interface.

Because of I2C and UART Interface can be setup to GPIO , the Groves with Digital interface are supported for both Connectors.

If you want to connect more Grove modules , see **Grove Cape for BeagleBone Series** innovated by Seeedstudio:

http://www.seeedstudio.com/depot/Grove-Base-Cape-for-Beaglebone-v20-p-2644.html?ref=newInBazaar

For more information about Grove system, please visit:
http://www.seeedstudio.com/wiki/Grove_System

5.15 Cape Board Support

The SeeedStudio BeagleBone Green Wireless has the ability to accept up to four expansion boards or capes that can be stacked onto the expansion headers. The word cape comes from the shape of the board as it is fitted around the Ethernet connector on the main board. This notch acts as a key to ensure proper orientation of the cape.

The majority of capes designed for the original BeagleBone, BeagleBone Black or BeagleBone Green will work on the SeeedStudio BeagleBone Green Wireless. The two main expansion headers will be populated on the board. There are a few

exceptions where certain capabilities may not be present or are limited to the SeeedStudio BeagleBone Green Wireless. These include:

- GPMC bus may NOT be available due to the use of those signals by the eMMC. If the eMMC is used for booting only and the file system is on the microSD card, then these signals could be used.
- Another option is to use the microSD or serial boot modes and not use the eMMC.
- SPI1 is NOT available because it is default used as I2S for Bluetooth A2DP function.
- MMC2 is NOT available because it is default used for WiLink™8's SDIO.
- The power expansion header is not on the SeeedStudio BeagleBone Green Wireless so those functions are not supported.

5.16 Expansion Board External Power

A cape can have a jack or terminals to bring in whatever voltages may be needed by that board. Care should be taken not to let this voltage be fed back into any of the expansion header pins.

It is possible to provide 5V to the main board from an expansion board. By supplying a 5V signal into the VDD_5V rail, the main board can be supplied. This voltage must not exceed 5V. You should not supply any voltage into any other pin of the expansion connectors. Based on the board design, this rail is limited to 1A per pin to the SeeedStudio BeagleBone Green Wireless.

There are several precautions that need to be taken when working with the expansion headers to prevent damage to the board.

1) Do not apply any voltages to any I/O pins when the board is not powered on.
2) Do not drive any external signals into the I/O pins until after the VDD_3V3B rail is up.
3) Do not apply any voltages that are generated from external sources.
4) If voltages are generated from the VDD_5V signal, those supplies must not become active until after the VDD_3V3B rail is up.
5) If you are applying signals from other boards into the expansion headers, make sure you power the board up after you power up the SeeedStudio BeagleBone Green Wireless or make the connections after power is applied on both boards.

Powering the processor via its I/O pins can cause damage to the processor.

6.0 SeeedStudio BeagleBone Green Wireless Mechanical

6.1 Dimensions and Weight

Size:	3.5” x 2.15” (86.36mm x 53.34mm)
Max height:	.776” (19mm)
PCB Layers:	6
PCB thickness:	.062’’
RoHS Compliant:	Yes
Weight:	1.48 oz

6.2 Board Dimensions

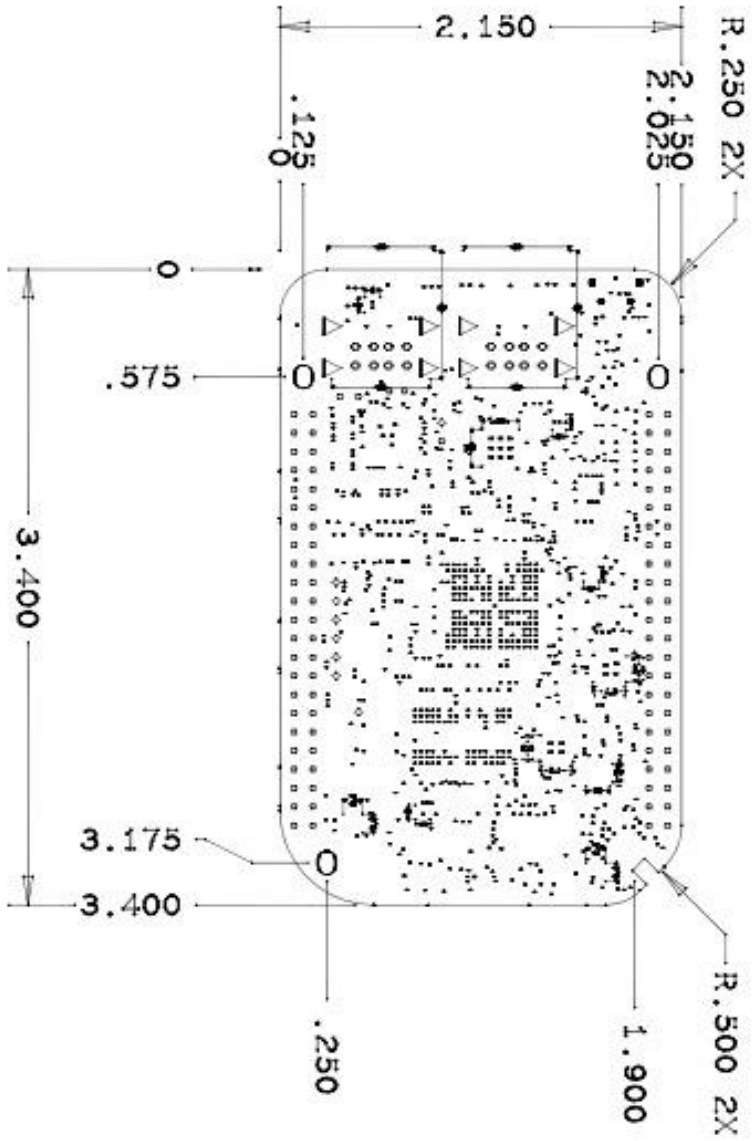

Figure 10. Board Dimensions

7.0 Pictures

Figure 11. Top Side

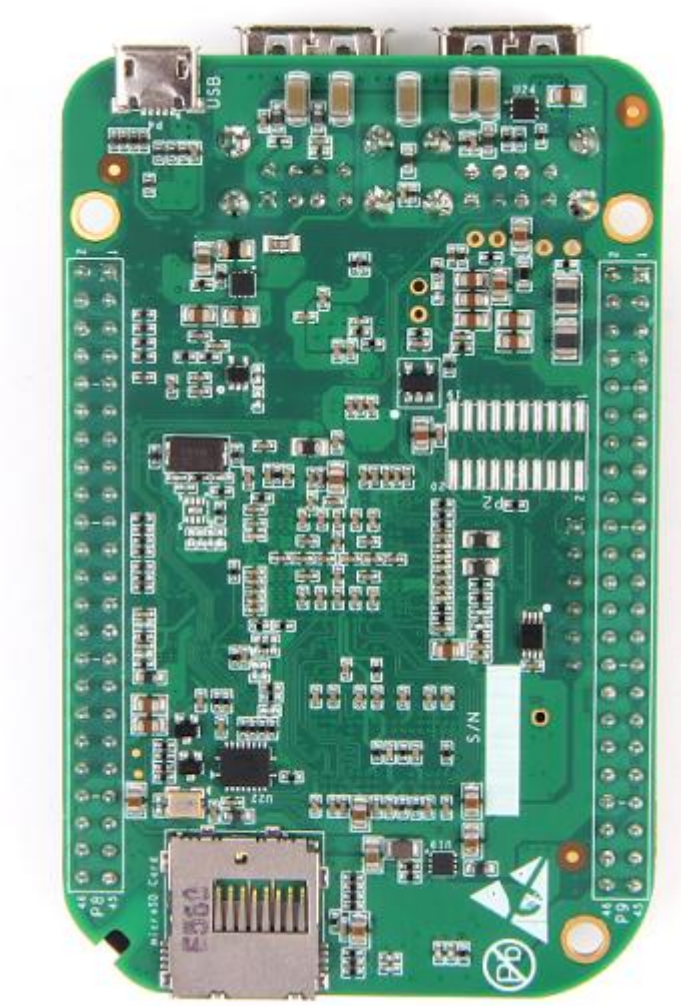

Figure 12. Bottom Side

8.0 Support Information

All support for this design is through the BeagleBoard.org community at:

beagleboard@googlegroups.com
or
http://beagleboard.org/discuss.

8.1 Hardware Design

Design documentation can be found on the eMMC of the board under the documents/hardware directory when connected using the USB cable. Provided there is:

- Schematic in PDF
- Schematic in OrCAD (Cadence Design Entry CIS 16.3)
- PCB Gerber
- PCB Layout File (Allegro)
- Bill of Material
- System Reference Manual (This document).

This directory is not always kept up to date in every SW release due to the frequency of changes of the SW. The best solution is to download the files from the Seeed WIKI at

http://www.seeedstudio.com/wiki/beaglebone_green_wireless

8.2 Software Updates

It is a good idea to always use the latest software. Instructions for how to update your software to the latest version can be found at:

http://beagleboard.org/latest-images