

# BRD4320A Reference Manual



## Wizard Gecko WGM110 Wi-Fi® Module Radio Board Reference Manual

The easy to use Silicon Labs Wizard Gecko WGM110 Wi-Fi Module offers best-in-class size with high RF performance for long range.

WGM110 Module combines an integrated antenna, a high performance Wi-Fi transceiver, an energy efficient 32-bit MCU and a ready to use all inclusive Wi-Fi software and SDK.

A reliable, secure and flexible protocol stack together with the features listed above and the required certifications offer a rapid Time to Market solution. Silicon Labs' BGScript™ scripting language allows standalone application design without the need for an external host CPU.

Silicon Labs offers worldwide application engineering support.



### RADIO BOARD FEATURES

- Wi-Fi Module: WGM110
  - 802.11b/g/n compliant
  - TX power: +16 dBm
  - RX sensitivity: -98 dBm
  - CPU core: 32-bit ARM® Cortex-M3
  - Flash memory: 1 MB
  - RAM: 128 kB
- microSD card slot
- USB 2.0 micro-B connector (Device Mode support)
- Modular certification
  - FCC
  - IC
  - Japan
  - Korea
- CE compliant
- Fully plug-in compatible with Silicon Labs Wireless Starter Kit Mainboard (BRD4001A)

## 1. BRD4320A Radio Board Description

The BRD4320A Radio Board contains the Wizard Gecko WGM110 Wi-Fi Module soldered onto a carrier board with two connectors. The connectors on the carrier board are used for attaching the BRD4320A on to a Silicon Labs Wireless Starter Kit Mainboard BRD4001A and together these two boards and the software in the WGM110 Module make up the Wizard Gecko Wi-Fi Module Wireless Starter Kit.

## 2. Radio Board Key Features

The key features of the Wizard Gecko WGM110 Wi-Fi Module are listed below.

### Key features

- Wizard Gecko WGM110 Wi-Fi Module
- USB connector for:
  - USB data connection
  - Stand-alone powering
- microSD card slot:
  - File system: FAT 16 or FAT 32
  - Supported memory size: max. 32 GB
  - Supported memory card types: microSD or microSDHC

### 3. BRD4320A Connector

The board-to-board connector scheme allows access to all Wizard Gecko WGM110 Wi-Fi Module GPIO pins as well as to the RESET signal. For more information on the functionalities of the available pins please see the *WGM110 Wi-Fi Module Data Sheet*.

#### 3.1 BRD4320A Connector Pin Associations

The figure below shows the pin mapping on the connector to the Module pins and their corresponding function on the Wireless Starter Kit Mainboard.

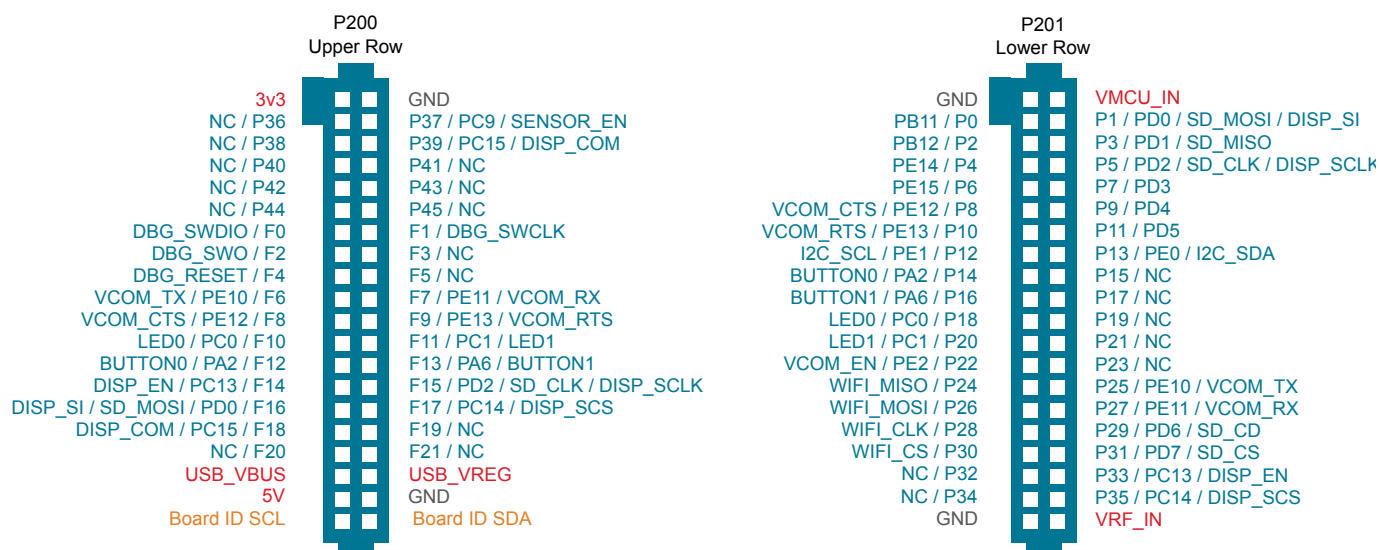


Figure 3.1. Simplicity Connector

#### 3.2 BRD4320A Connector Type

BRD4320A contains two dual-row, female socket, 0.05" pitch polarized connectors (P/N: SFC-120-T2-L-D-A-K-TR) which provide the interface to the Wireless Starter Kit Mainboard. The Mainboard has the corresponding male header pin connectors (P/N: TFC-120-02-F-D-LC-ND).

## 4. MicroSD Card Slot

BRD4320A contains a microSD card slot which is connected to the Wizard Gecko WGM110 Wi-Fi Module. It enables testing of SW applications utilizing a microSD or microSDHC card. The memory card can be accessed from the host processor using BGAPI commands, BGScript commands or by using the internal HTTP Server of the Module.

**Note:** The microSD card slot is located on the bottom side of the BRD4320A Radio Board. To install a microSD or microSDHC card remove the Radio Board from the WSTK Mainboard and push the microSD or microSDHC card into the card slot with the metal contacts of the memory card facing towards the PCB and attach the Radio Board back into WSTK Mainboard connectors.

### CHARACTERISTICS

**Supported file systems:** FAT 16 and FAT 32

**Maximum memory size:** 32 GB.

**Supported memory card types:** microSD and microSDHC.

### Programming related information

The microSD card slot is connected to **USART1 Location 1** of the WGM110 Module and the **Chip Select to Port D Bit 7**.

GPIO pinout, interfaces and alternative locations are described in the *WGM110 Wi-Fi Module Data Sheet*, hardware configuration in the *UG161: WGM110 Wi-Fi Module Configuration User's Guide* and related commands in detail in the *WGM110 API Reference Manual*.

The connection between the microSD card slot and the WGM110 Module are shown below:

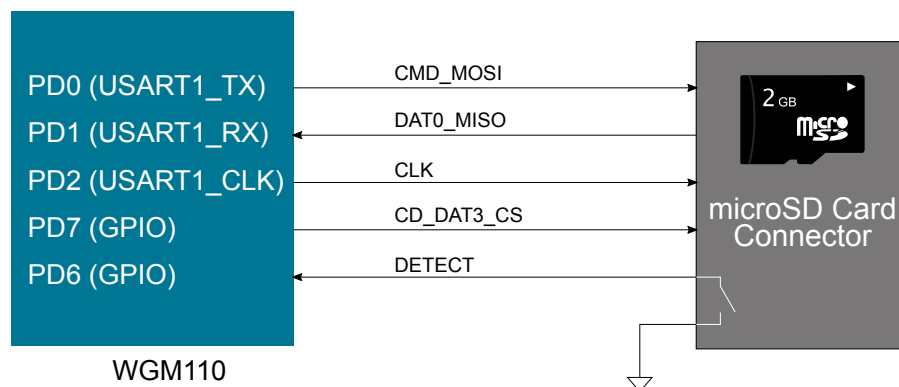


Figure 4.1. Connection between Radio Board microSD Card Slot and WGM110 Module

## 5. USB Connector

BRD4320A contains a micro USB connector which is connected directly to the Wizard Gecko WGM110 Wi-Fi Module's USB port. This USB connector may be used in SW application tests as an interface between the Module and external devices such as a PC and/or simply to provide power to the Module. This is a useful feature since it allows the Module to be powered externally while the WSTK main board can be switched completely off.

The radio board contains a voltage regulator and a transistor switch that automatically connects the regulated supply to the module power supply. The power select slide switch on the WSTK Mainboard should be set to *USB* or *BAT* to avoid conflict with the Mainboard power supply when using the USB connector.

**Note:** Software configuration details for using the USB connector of the Radio Board are described in the "*UG161: WGM110 Wi-Fi Module Configuration User's Guide*".

### CHARACTERISTICS

**Supported USB standards:** USB Full Speed

**USB connector type:** micro USB (female)

**Maximum data transfer speed:** 12 Mb/s.

The connection between the USB connector and the WGM110 Module are shown below:

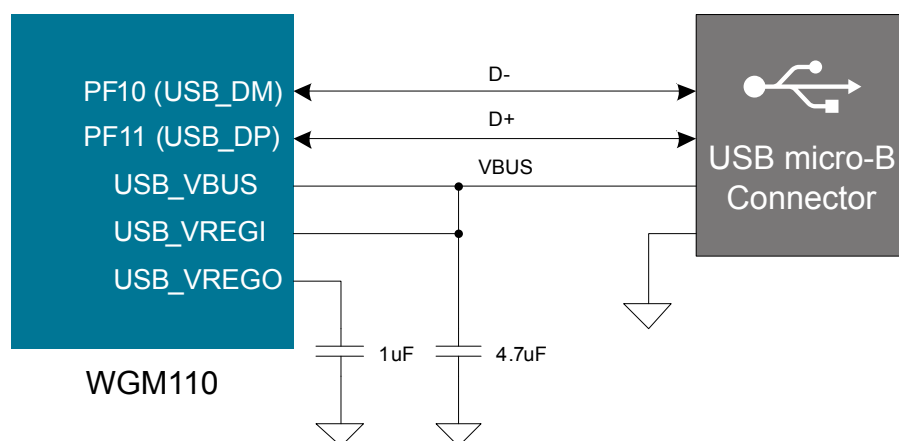


Figure 5.1. Connection between the Radio Board USB Connector and WGM110 Module

## 6. Mechanical Details

The Wizard Gecko WGM110 Wi-Fi Module Radio Board is illustrated in the figures below.

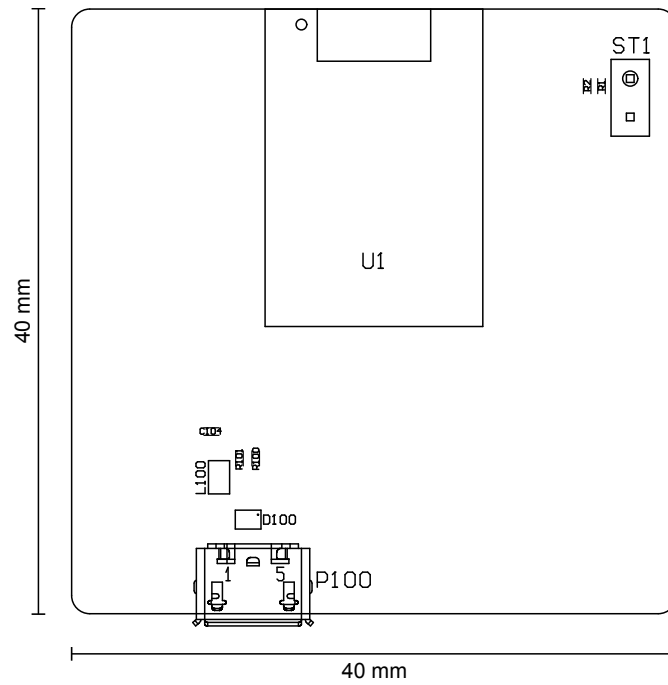


Figure 6.1. BRD4320A Top View

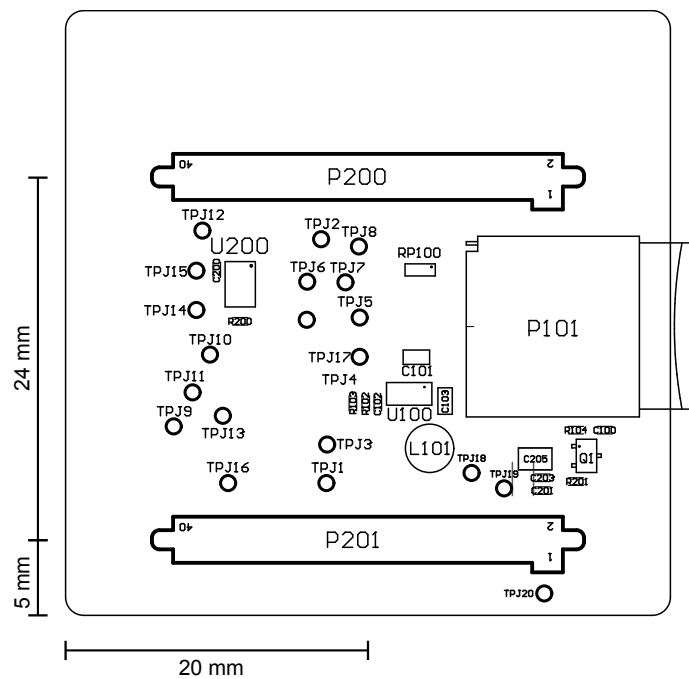


Figure 6.2. BRD4320A Bottom View

## 7. Radio Board Revision History and Errata

### 7.1 Revision History

The kit revision can be found printed on the back side of the Radio Board.

**Table 7.1. Radio Board Revision History**

Kit Revision	Released	Description
A01	22.02.2016	Initial kit release.

### 7.2 Errata

There are no known errata at present.



## 8. Document Revision History

### Revision 1.01

2016-05-23

Full production release with Module certifications.

### Revision 1.00

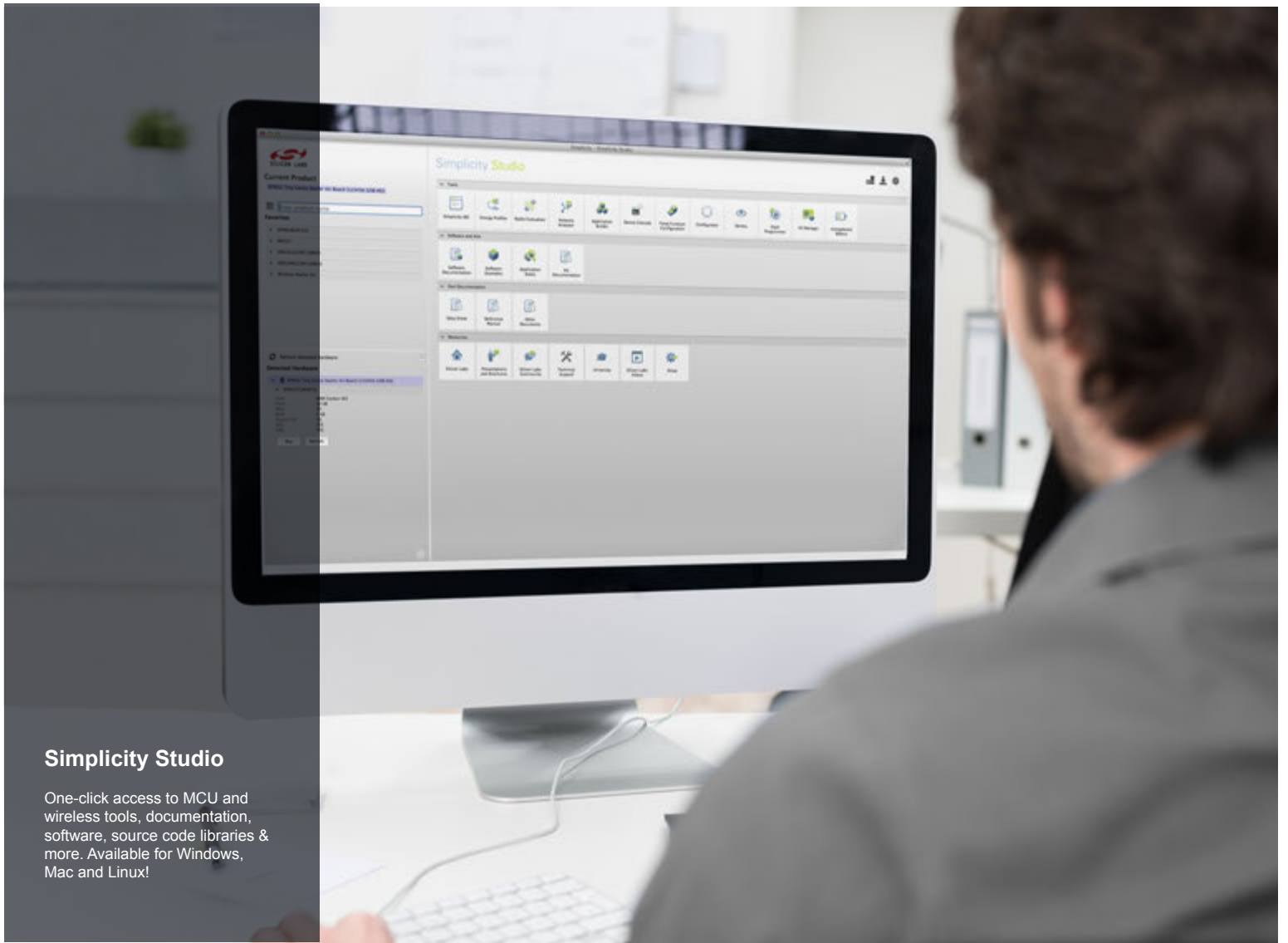
2016-02-22

Initial document release.

---

# Table of Contents

<b>1. BRD4320A Radio Board Description</b>	<b>1</b>
<b>2. Radio Board Key Features</b>	<b>2</b>
<b>3. BRD4320A Connector</b>	<b>3</b>
3.1 BRD4320A Connector Pin Associations	3
3.2 BRD4320A Connector Type	3
<b>4. MicroSD Card Slot</b>	<b>4</b>
<b>5. USB Connector</b>	<b>5</b>
<b>6. Mechanical Details</b>	<b>6</b>
<b>7. Radio Board Revision History and Errata</b>	<b>7</b>
7.1 Revision History	7
7.2 Errata	7
<b>8. Document Revision History</b>	<b>8</b>
<b>Table of Contents</b>	<b>9</b>



## Simplicity Studio

One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!



**IoT Portfolio**  
[www.silabs.com/iot](http://www.silabs.com/iot)



**SW/HW**  
[www.silabs.com/simplicity](http://www.silabs.com/simplicity)



**Quality**  
[www.silabs.com/quality](http://www.silabs.com/quality)



**Support and Community**  
[community.silabs.com](http://community.silabs.com)

### Disclaimer

Silicon Laboratories intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Laboratories products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Laboratories reserves the right to make changes without further notice and limitation to product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Silicon Laboratories shall have no liability for the consequences of use of the information supplied herein. This document does not imply or express copyright licenses granted hereunder to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any Life Support System without the specific written consent of Silicon Laboratories. A "Life Support System" is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Laboratories products are not designed or authorized for military applications. Silicon Laboratories products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons.

### Trademark Information

Silicon Laboratories Inc.®, Silicon Laboratories®, Silicon Labs®, SiLabs® and the Silicon Labs logo®, Bluegiga®, Bluegiga Logo®, Clockbuilder®, CMEMS®, DSPLL®, EFM®, EFM32®, EFR®, Ember®, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Ember®, EZLink®, EZRadio®, EZRadioPRO®, Gecko®, ISOModem®, Precision32®, ProSLIC®, Simplicity Studio®, SIPHY®, Telegesis, the Telegesis Logo®, USBXpress® and others are trademarks or registered trademarks of Silicon Laboratories Inc. ARM, CORTEX, Cortex-M3 and THUMB are trademarks or registered trademarks of ARM Holdings. Keil is a registered trademark of ARM Limited. All other products or brand names mentioned herein are trademarks of their respective holders.



Silicon Laboratories Inc.  
400 West Cesar Chavez  
Austin, TX 78701  
USA

<http://www.silabs.com>