

**GOOWI**

**GWB8P  
Bluetooth Module  
Data Sheet**

(Document Number:GWBM-8P-01A)

# GOOWI

## **GWB8P Module**

**CSRA64215**

**Rev1.0**

**Nov. 2015**

### **Device Features**

- A small and cost effective Bluetooth® System
- Bluetooth® specification v4.2 compliant
- Class 2, up to 10-meter range
- Security simple pairing
- NFC function, let the bluetooth application more simple
- Bluetooth® Profile Supported: A2DP v1.3 ,AVRCP v1.6 HFP v1.6 HSP v1.2 DI v1.3
- Aptx,aptx Low latency,SBC and AAC decoder support
- Multioint support for A2DP connection to 2 A2DP sources for music playback
- TrueWireless Stereo (TWS)
- User and manufacturer configurable EQs
- Wideband speech supported by hfp V1.6 and mSBC codec
- Wired audio support
- Serial interfaces: USB2.0,UART,I2C and SPI
- Audio interfaces:PCM/I2S,SPDIF input,analogue/stereo line and digital microphone
- Power management: low power 1.35V operation for Bluetooth® core
- Compact size: 19.00 mm x 10.00 mm
- Surface mount package for embedded applications
- 3 LED outputs
- Voice Promote(Optional)

### **General Description**

The GWB8P module from GooWi is a complete Bluetooth® solution.It is built on CSRA64215 Multimedia Core .It's a short range,compact and cost effective module. Be able to be embedded into your electronics devices which need Bluetooth® connection, such as, Home Audio, Car kit, Handsfree applications...

### **Applications**

- Bluetooth stereo Speakers
- Sperkerphones
- TWS speakers

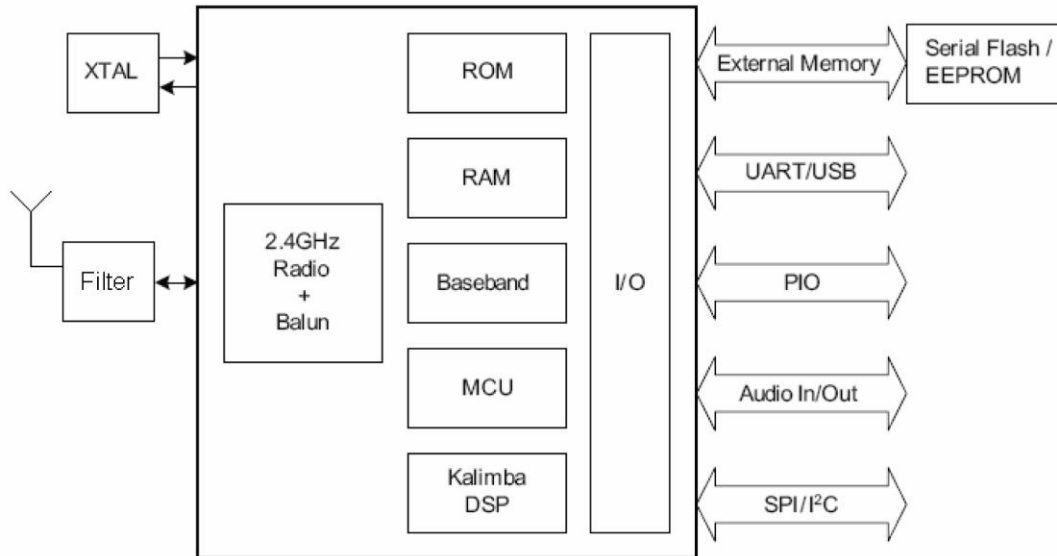
### Version History

| Version No | Author      | Date       | Remark       |
|------------|-------------|------------|--------------|
| Rev1.0     | Alvin-zhang | 2015-11-15 | Init Version |
|            |             |            |              |
|            |             |            |              |
|            |             |            |              |
|            |             |            |              |
|            |             |            |              |

## Content

|                                 |    |
|---------------------------------|----|
| System Architecture .....       | 5  |
| Specifications .....            | 5  |
| Electrical Characteristics..... | 6  |
| Absolute Maximum Ratings .....  | 6  |
| Pin Configurations .....        | 7  |
| Mechanical Drawing .....        | 10 |
| PCB LAYOUT .....                | 11 |
| Package .....                   | 11 |
| Ordering Information .....      | 13 |
| Document Reference.....         | 13 |

## System Architecture



## Specifications

|                          |                                              |
|--------------------------|----------------------------------------------|
| Operating Frequency Band | 2.4GHz ~ 2.48GHz unlicensed ISM band         |
| Bluetooth Specification  | V4.2                                         |
| Output Power Class       | Class 2                                      |
| Operating Voltage        | 3.0V -4.2V                                   |
| Host Interface           | USB 2.0/UART/ I2C/ SPI                       |
| Audio Interface          | Analogue/PCM                                 |
| Dimension                | 19.00mm (L)   x   10 mm (W)   x   2.1 mm (H) |

NOTES: Specifications are subject to change without prior notice

## Electrical Characteristics

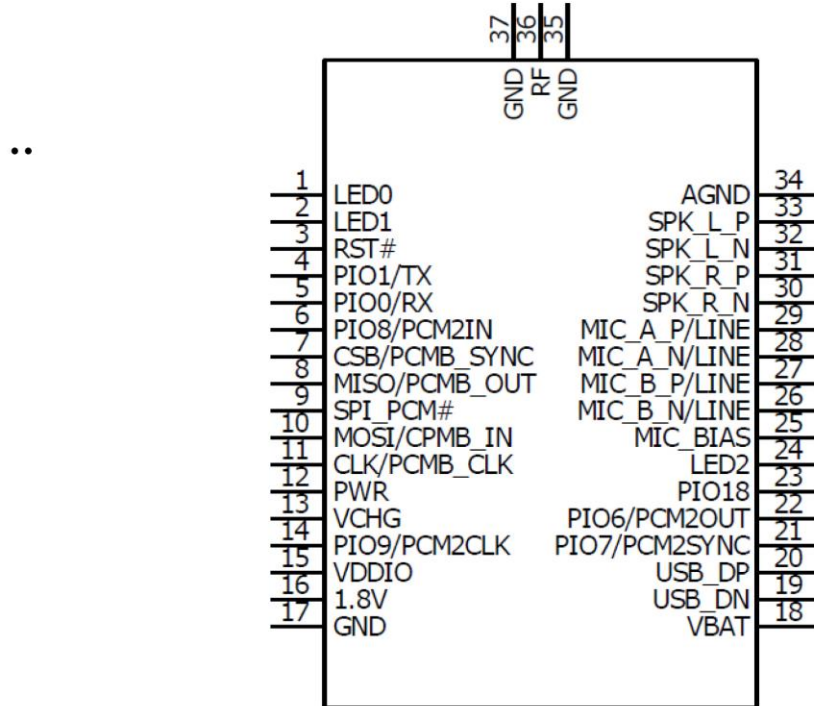
### Absolute Maximum Ratings

| Rating                  |           | Min       | Max       | Unit |
|-------------------------|-----------|-----------|-----------|------|
| Storage temperature     |           | -40       | 105       | °C   |
| Supply Voltage          |           |           |           |      |
| Charger                 | VCHG      | -0.4      | 6.5       | V    |
| USB                     | VDD_USB   | -0.4      | 3.6       | V    |
| LEDs                    | LED[2:0]  | -0.4      | 4.40      | V    |
| Battery                 | VBAT      | -0.4      | 4.25      | V    |
|                         | PWR       | -0.4      | 4.4       | V    |
| IO                      | VDDIO     | -0.4      | 3.60      | V    |
| 1.35V                   | VDD_AUDIO | -0.4      | 1.45      | V    |
| Other terminal voltages |           | VSS - 0.4 | VDD + 0.4 | V    |

### Recommended Operation Conditions

| Rating                      |           | Min         | Typ  | Max  | Unit |
|-----------------------------|-----------|-------------|------|------|------|
| Operating temperature range |           | -40         | 20   | 85   | °C   |
| Supply Voltage              |           |             |      |      |      |
| Charger                     | VCHG      | 4.75 / 3.10 | 5.00 | 6.5  | V    |
| USB                         | VDD_USB   | 3.10        | 3.30 | 3.60 | V    |
| LEDs                        | LED[2:0]  | 1.10        | 3.70 | 4.30 | V    |
| Battery                     | VBAT      | 0           | 3.70 | 4.25 | V    |
|                             | PWR       | 0           | 3.70 | 4.25 | V    |
| IO                          | VDDIO     | 1.70        | 1.80 | 3.60 | V    |
| 1.35V                       | VDD_AUDIO | 1.30        | 1.35 | 1.45 | V    |

## Pin Configurations



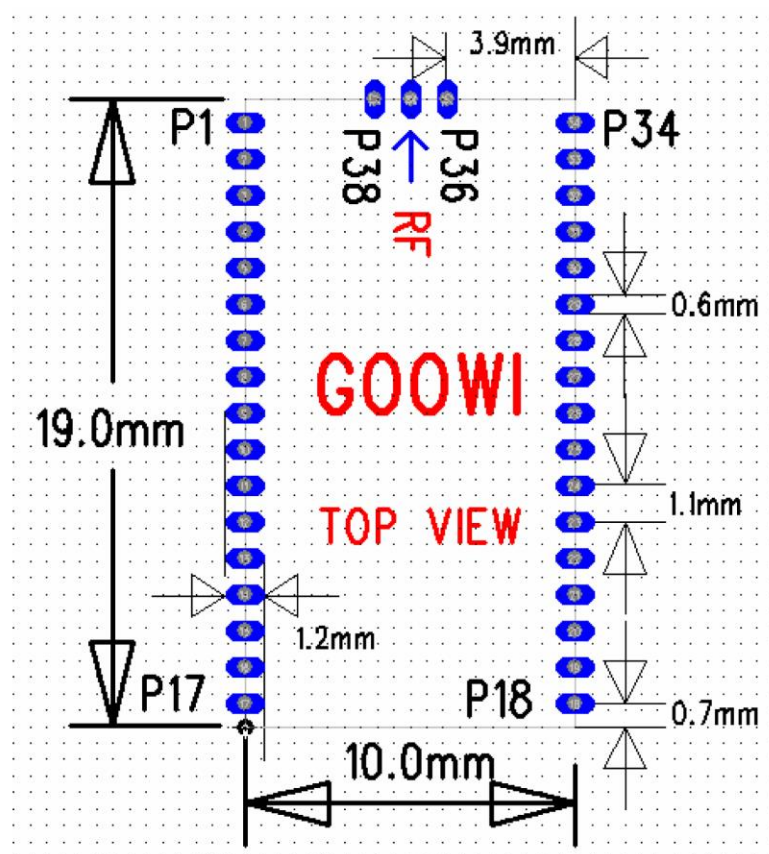
| Pin No. | Name         | Type                      | Function                                                        | Remark |
|---------|--------------|---------------------------|-----------------------------------------------------------------|--------|
| 1       | LED0         | Open drain output         | LED Driver                                                      |        |
| 2       | LED1         | Open drain output         | LED Driver                                                      |        |
| 3       | RST#         | Input with strong pull-up | Reset if low. Pull low for minimum 5ms to cause a reset.        |        |
| 4       | PIO1/TX      | Bi-directional            | Programmable Input/Output Line 1                                |        |
|         |              |                           | UART_TX: UART data output                                       |        |
|         |              |                           | AMP_I2C_SDA:I2C serial data line for external amplifier control |        |
| 5       | PIO0/RX      | Bi-directional            | Programmable Input/Output Line 0                                |        |
|         |              |                           | UART_RX: UART data input                                        |        |
|         |              |                           | AMP_I2C_SCL:I2C serial data line for external amplifier control |        |
| 6       | PIO8/PCM2 IN | Bi-directional            | Programmable Input/Output Line 8                                |        |
|         |              |                           | UART_RTS: UART request to send,active low                       |        |
|         |              |                           | PCM2_IN:PCM2 synchronous data input                             |        |
|         |              |                           | I2S2_SD_IN:I2S2 synchronous data input                          |        |

|    |               |                             |                                                                                                                                                                                                                                                                |  |
|----|---------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 7  | CSB/PCMB_SYNC | Bi-directional              | SPI CSB                                                                                                                                                                                                                                                        |  |
|    |               |                             | Programmable Input/Output Line 4                                                                                                                                                                                                                               |  |
|    |               |                             | PCM1_SYNC:PCM1 synchronous data sync                                                                                                                                                                                                                           |  |
|    |               |                             | I2S1_WS:I2S1 word select                                                                                                                                                                                                                                       |  |
| 8  | MISO/PCMB_OUT | Bi-directional              | SPI MISO                                                                                                                                                                                                                                                       |  |
|    |               |                             | Programmable Input/Output Line 3                                                                                                                                                                                                                               |  |
|    |               |                             | PCM1_OUT:PCM1 synchronous data output                                                                                                                                                                                                                          |  |
|    |               |                             | I2S1_SD_OUT:I2S1 synchronous data output                                                                                                                                                                                                                       |  |
| 9  | SPI_PCM#      | Bi-Input with weak pulldown | SPI/PCM# select input:<br>■ 0 = PCM/PIO interface<br>■ 1 = SPI                                                                                                                                                                                                 |  |
| 10 | MOSI/CPMB_IN  | Bi-directional              | SPI MOSI                                                                                                                                                                                                                                                       |  |
|    |               |                             | Programmable Input/Output Line 2                                                                                                                                                                                                                               |  |
|    |               |                             | PCM1_IN:PCM1 synchronous data input                                                                                                                                                                                                                            |  |
|    |               |                             | I2S1_SD_IN:I2S1 synchronous data input                                                                                                                                                                                                                         |  |
|    |               |                             | SPDIF_IN:SPDIF input                                                                                                                                                                                                                                           |  |
| 11 | CLK/PCMB_CLK  | Bi-directional              | SPI CLK                                                                                                                                                                                                                                                        |  |
|    |               |                             | Programmable Input/Output Line 5                                                                                                                                                                                                                               |  |
|    |               |                             | PCM1_CLK:PCM1 synchronous data clock                                                                                                                                                                                                                           |  |
|    |               |                             | I2S1_CLK:I2S1 synchronous data clock                                                                                                                                                                                                                           |  |
| 12 | PWR           | Analogue                    | Regulator enable input.<br>Can also be sensed as an input.<br>Regulator enable and multifunction button. A high input (tolerant to VBAT) enables the on-chip regulators, which can then be latched on internally and the button used as a multifunction input. |  |
| 13 | VCHG          | Charger input               | Lithium ion/polymer battery charger input                                                                                                                                                                                                                      |  |
| 14 | PIO9/PCM2_CLK | Bi-directional              | Programmable Input/Output Line 9                                                                                                                                                                                                                               |  |
|    |               |                             | UART_CTS:UART clear to send,active low                                                                                                                                                                                                                         |  |
|    |               |                             | PCM2_CLK: PCM2 synchronous data clock                                                                                                                                                                                                                          |  |
|    |               |                             | I2S2_CLK:I2S2 synchronous data clock                                                                                                                                                                                                                           |  |
| 15 | VDDIO         | Power                       | Positive supply input for input/output ports                                                                                                                                                                                                                   |  |
| 16 | 1V8           | Power                       | 1.8V bypass linear regulator output.                                                                                                                                                                                                                           |  |
| 17 | GND           | GND                         | Ground                                                                                                                                                                                                                                                         |  |



|    |                |                    |                                                                                                          |  |
|----|----------------|--------------------|----------------------------------------------------------------------------------------------------------|--|
| 18 | VDD_BAT        | Battery terminal + | Lithium ion/polymer battery positive terminal, Battery charger output and input to switch-mode regulator |  |
| 19 | USB_DN         | Bi-directional     | USB Data Minus                                                                                           |  |
| 20 | USB_DP         | Bi-directional     | USB data plus with selectable internal 1.5k $\Omega$ pull-up resistor                                    |  |
| 21 | PIO7/PCM2 SYNC | Bi-directional     | Programmable Input/Output Line 7                                                                         |  |
|    |                |                    | PCM2_SYNC: PCM2 synchronous data sync                                                                    |  |
|    |                |                    | I2S2_SD_IN:I2S2 synchronous data input                                                                   |  |
| 22 | PIO6/PCM2 OUT  | Bi-directional     | Programmable Input/Output Line 6                                                                         |  |
|    |                |                    | PCM2_OUT: PCM2 synchronous data output                                                                   |  |
|    |                |                    | I2S2_SD_OUT:I2S2 synchronous data output                                                                 |  |
| 23 | PIO18          | Bi-directional     | Programmable Input/Output Line 18                                                                        |  |
| 24 | LED2           | Open drain output  | LED Driver                                                                                               |  |
| 25 | MIC_BIAS       | Analogue           | Microphone bias                                                                                          |  |
| 26 | MIC_B_N/LINE   | Analogue           | Line input negative,channel B                                                                            |  |
| 27 | MIC_B_P/LINE   | Analogue           | Line input positive,channel B                                                                            |  |
| 28 | MIC_A_N/LINE   | Analogue           | Line or microphone input negative, channel A                                                             |  |
| 29 | MIC_A_P/LINE   | Analogue           | Line or microphone input positive, channel A                                                             |  |
| 30 | SPK_R_N        | Analogue           | Speaker output negative                                                                                  |  |
| 31 | SPK_R_P        | Analogue           | Speaker output positive                                                                                  |  |
| 32 | SPK_L_N        | Analogue           | Speaker output negative                                                                                  |  |
| 33 | SPK_L_P        | Analogue           | Speaker output positive                                                                                  |  |
| 34 | AGND           | GND                | Audio Ground                                                                                             |  |
| 35 | GND            | GND                | Ground                                                                                                   |  |
| 36 | RF             | RF                 | RF Interface                                                                                             |  |
| 37 | GND            | GND                | Ground                                                                                                   |  |

## Mechanical Drawing



## PCB LAYOUT

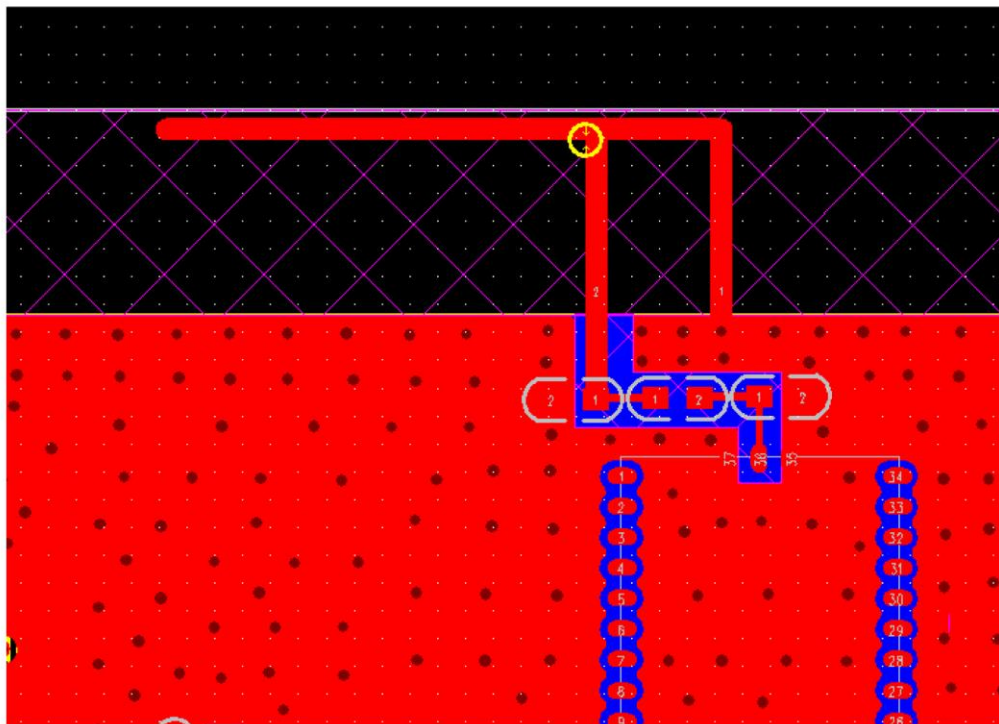
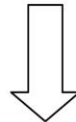
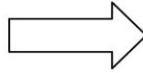


Figure 1: Example layout

The following list is aimed to avoid EMC problems caused by RF part of the module.

- Do not remove copper from the PCB more than needed. Use ground filling as much as possible. However remove small floating islands after copper pour.
- Do not place a ground plane underneath the antenna. The grounding areas under the module should be designed as shown in Figure 1.
- When using overlapping ground areas use conductive vias separated max. 3 mm apart at the edge of the ground areas. This prevents RF to penetrate inside the PCB. Use ground vias extensively all over the PCB. All the traces in (and on) the PCB are potential antennas.
- Avoid loops.
- Ensure that signal lines have return paths as short as possible. With sensitive analog signals, such as analog audio, use solid ground plane and make sure that the return path for the signal lines is low impedance and follows the signal lines all the way.

## Package



Pumping air into vacuum state, anti-static packaging

## Ordering Information

| No. | P/N   | Description    |
|-----|-------|----------------|
| 1   | GWB8P | Basic features |

## Document Reference

| Document                                                              | Reference,Date                               |
|-----------------------------------------------------------------------|----------------------------------------------|
| BlueCore Audio API Specification                                      | CS-209064-DD                                 |
| BlueTest User Guide                                                   | CS-102736-UG                                 |
| Bluetooth and USB Design Considerations                               | CS-1014                                      |
| Core Specification of the Bluetooth System                            | Bluetooth Specification 4.0,17 December 2009 |
| CSRA64215 BGA performance specification                               | CS-334611-DS-2                               |
| Lithium Polymer Battery Charger Calibration and Operation for CSR8670 | CS-204572-AN                                 |
| Selection of I2C EEPROMS for Use with BlueCore                        | bcore-an-008P                                |