

Data sheet version 1.0



Introduction

GWBMA1X is a high performance Bluetooth audio module, It provides various type of wireless audio connection, including Bluetooth, 2.4GHz., allows it to be adopted into different audio application, such as sound bar, Bluetooth speaker.

GWBMA1x embedded with comprehensive firmware, user needs not to spend any engineering effort on audio encode/decoding and RF connection.

GWBMA1x provides different interfaces, which allows it to be connect to different devices in future.

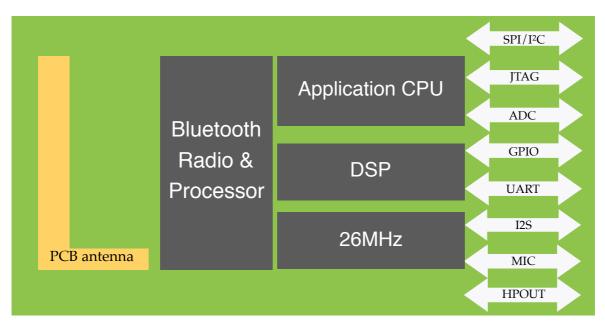
Applications

- Bluetooth speaker
- · Bluetooth Sound-bar with wireless subwoofer
- True wireless stereo Bluetooth speaker
- Bluetooth Audio dongle
- Wireless TV headphone
- Wireless gaming headphone

Feature

- Bluetooth v4.2 specification compliant and support BR/EDR
- Programmable output RF power up to +8dBm
- -93dBm RF sensitivity
- Support A2DP 1.2, HFP 1.5 and AVRCP 1.5
- Support multiple Bluetooth/ proprietary link for wireless subwoofer, true wireless stereo, wireless surround speaker
- Multiple interfaces: UART, I2C, SPI, I2S, ADC, PWM, USB
- · Analog and digital audio output
- On board 16bit stereo DAC and 16bit mono ADC
- Support MP3, SBC, WMA, ACC decoding
- Optional apex socket for external antenna
- FCC/CE certification

Block Diagram



Electrical Specification

Description	Typical
Operation voltage	3.3V to 4.2V DC
Supply current	45mA @play; 20mA @ idle
Antenna	PCB, (optional Ipex connector)
Internal DAC	Stereo 16bit DAC with 94dB S/N
I2S interface	48KHz, 16bit Stereo
Digital I/O	UART, USB, SPI, I2C, GPIO, PWM
Dimension	19 x 32 x 1 mm
Operation temperature	$-10 \sim +60^{\circ}C$
Bluetooth version	Bluetooth v4.2 BR/EDR
Frequency band	2.4GHz ISM (2.402 - 2.480GHz)
Modulation Method	GFSK PI/4-DQPSK, 8 DPSK
Max. Data Rate	3Mbps
TX Power	+8dBm max, 3dB step control
Rx Sensitivity	-92.5dBm
RF Range (indoor)	10m
	Operation voltageSupply currentAntennaInternal DACIzS interfaceDigital I/ODimensionOperation temperatureBluetooth versionFrequency bandModulation MethodaMax. Data RateTX PowerRx Sensitivity

Table 1 Electrical Specification

Hardware information



Pin	name	Туре	Description
1	GND	GND	Ground
2	RXD	I/O	UART RX
3	TXD	I/O	UART TX
4	I2SDI	I/O	I2S Data Input
5	IS2DO	I/O	I2S Data Output
6	LRCK	I/O	I2S Left/Right clock
7	SCLK	I/O	I2S Bit Clock
8	MCLK	I/O	I2S Master Clock, typ 12.288MHz
9	GND	GND	Ground
10	GPIO3.7	I/O	IR input, Standby, GPIO #1
11	SDDAT3	I/O	SD Card Data3, Mute output #2
12	GPADC	Analog	12 bit ADC input
13	SDDAT2	I/O	SD Card Data2
14	SDDAT1	I/O	SD Card Data1
15	SDDAT0	I/O	SD Card Data0
16	SDCLK/HRX	I/O	SD Card Command / Debug Rx
17	SDCMD/HTX	I/O	SD Card Command / Debug Tx
18	GND	GND	Ground

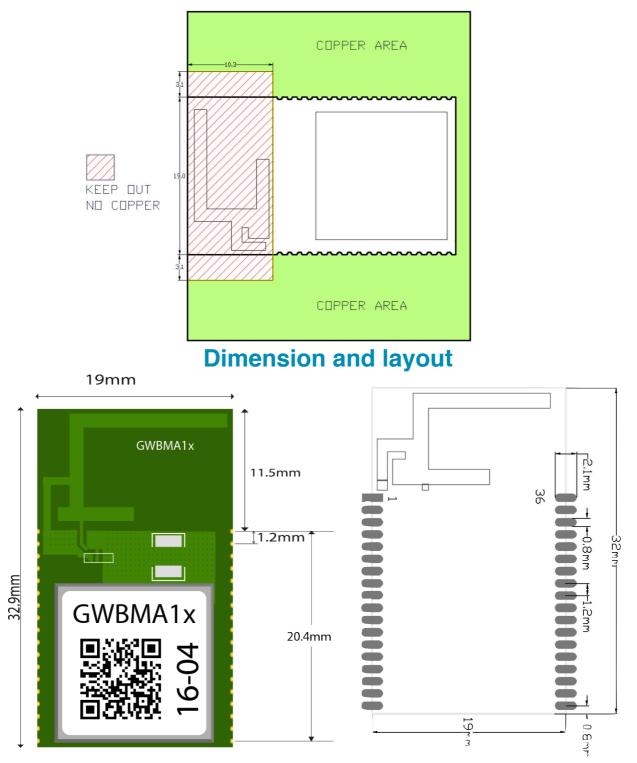
Pin	name	Туре	Description
19	GND	GND	Ground
20	AVDD33	Power	3.3V LDO output
21	nRESET	Ι	Reset, Active Low
22	VIN	Power	Power input
23	USBDN	I/O	USB Data -
24	USBDP	I/O	USB Data +
25	SDA	I/O	I2C Data
26	SCL	I/O	I2C Clock
27	RLED	I/O	Red LED, GPIO
28	BLED	I/O	Blue LED, GPIO
29	LOUT	Analog	Stereo DAC Left Output
30	ROUT	Analog	Stereo DAC Right Output
31	MICP	Analog	Mic Input +
32	MICN	Analog	Mic Input -
33	MICBAS	Analog	Mic Bias voltage
34	AGND	GND	Analog Ground
35	GPIO2.0	I/O	General purpose I/O
36	GND	GND	Ground

Mounting GWBMA0x

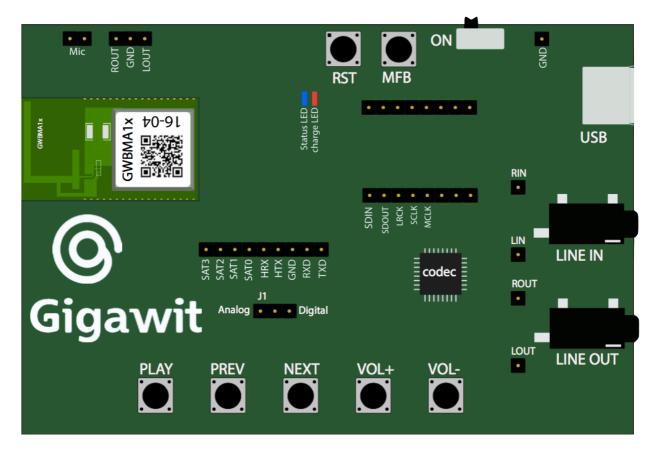
GWBMA0x is RF sensitive; in order to obtain the best performance, it is recommended to mount the module at corner of mother board, and with some marginal space.

Also, keep it away from metal components, such like speakers, transformers, batteries, big aluminum capacitors, heat sinks and Metal Panels.

The figure below illustrates how to mount the GWBMA0x module. Improper mounting will decrease the RF performance dramatically.



Evaluation Board



Description

The EVK contains complete external circuit for GWBMA1x, user can easily connect it to headphone or amplifier for evaluating the performance and feature of GWBMA1x. It is a very good reference for engineer designing the PCB for GWBMA1x.

USB <u>port</u>

USB Besides USB feature (future firmware), the USB port is the major power source for the board. There is a simple charging circuit on board, where a 3.7V Li-ion can be charged up (if connect to the board) once the USB port is connected.

Control keys



Play/Pause a track, go to Previous or Next track, and control the volume up and down.

Audio output



A codec is on board, which connects to module's I2S output. The output of the codec is connected to the LINE OUT socket. User can also connect the I2S output to their own codec directly.

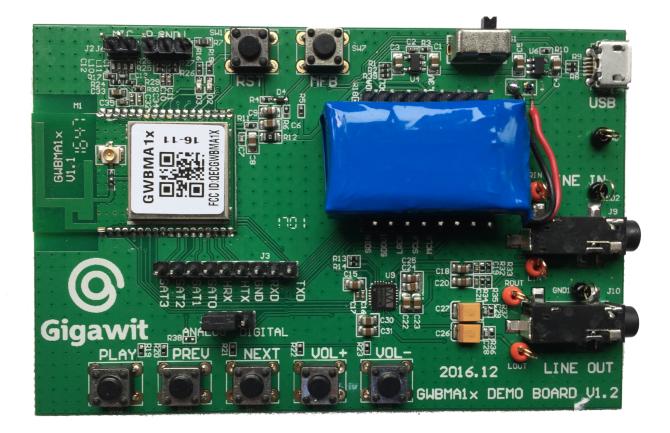


The module's analog audio output are routed to the ROUT, LOUT pins, user can connect it to audio amplifier circuit or ear phone.

Power and reset

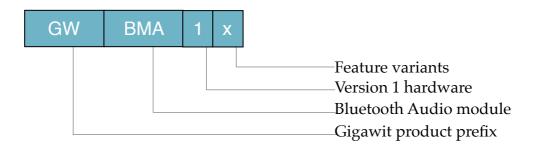


RST MFB The RST button will reset the module, where the MFB button will put the module into firmware update mode (update later).



Part number

GWBMA1x naming rule is as following:



Part number	Description
GWBMA10	Standard Bluetooth Audio
GWBMA1A	Bluetooth Audio with low latency codec *
GWBMA1W	Bluetooth Audio with Wireless Subwoofer *
GWBMA1S	Bluetooth Audio with True Wireless Stereo *
GWBMA1D	Bluetooth Audio with Wireless Surround and Subwoofer *
GWBMA1Q	Bluetooth Audio with low latency codec and voice chat for gaming headphone *
GWBMAH	Proprietary 2.4G wireless low latency mono module*

* future release

All part numbers are base on same hardware with different firmware loaded. Therefore, same PCB can fit with all the part number above.

Customisation

No SDK will be provided for GWBMA1x. However, firmware customisation service will be provided (requires NRE). Customised firmware will be pre-programmed in the GWBMA1x module and delivery to customer.

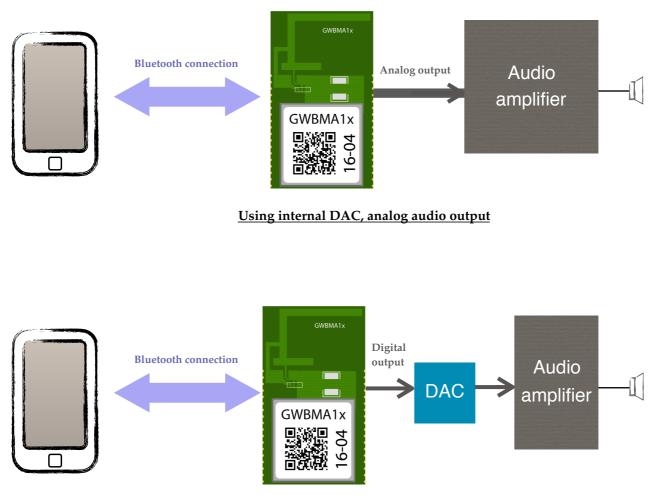
Firmware information

GWBMA10

This section will describe the firmware feature of GWBMA10.

Bluetooth Audio

The basic feature of GWBMA10 is to connect smart phone or tablet through Bluetooth, and output music from them. The basic architecture are as following:



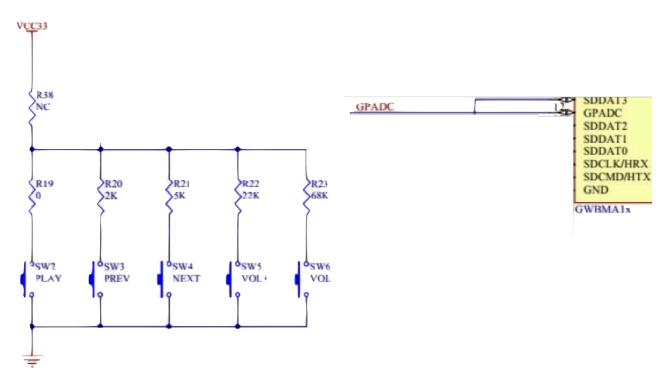
Using external DAC, I2S audio output

Internal and External DAC

GWBMA10 provide the simplest and flexible Bluetooth audio connections. Internal DAC can be either enabled or disabled. With internal DAC enabled, audio signal from wireless side will be decoded inside the module and output as analog audio signal, user can connect it to amplifier for audio playback; if the internal DAC is disabled, audio signal will be output as digital format to the I2S bus, where user can connect it to any DAC chip to achieve higher audio quality. Such flexibility allows GWBMA10 suitable for application from low cost portable speaker to high quality audio system.

Control buttons

In order to provide more IO pins and reduce the module dimension, GWBMA10 use one single pin for five control buttons. The connection is as following:



An ADC pin (GPADC) is used for the connecting five push buttons (PLAY, PREV, NEXT, VOL+, VOL-), therefore user MUST follows the circuit and resister value as stated on the above diagram. **Improper resistors value will cause the push buttons malfunction.** The advantage of such design allows only one pin is used for multiple push button, and the most important is it maintains a flexibility for adding more push buttons in future.

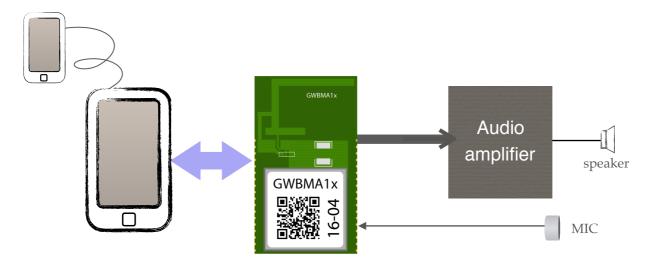
Button	Description
PLAY	Audio playback and pause
PREV	Play the previous track
NEXT	Play the next track
VOL+	Increase sound volume
VOL-	Decrease sound volume

The feature of each buttons is described as the table below:

Button debouncing is already handled by the firmware, however, it is still suggested to use push button with lesser debouncing in order to avoid any denouncing situation which is outside the range which firmware can handle.

Phone call feature

GWBMA10 contains phone call feature, which allows user to answer phone call directly.



When a phone call in, music will be paused (if it is playing) and GWBMA10 will alert user by speaking out the in-coming phone number (as long as caller ID is available). User can then accept the call by pushing the PLAY button.

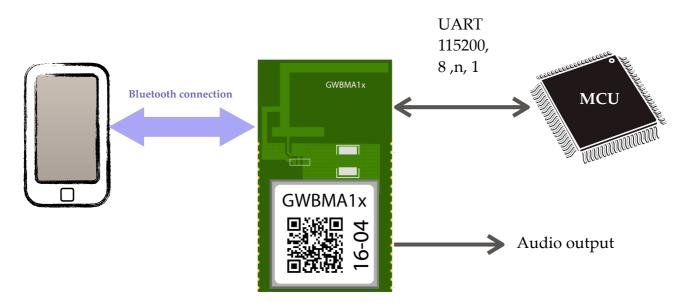
Such caller ID speak out feature is enabled with English language by default, it can be disabled or changed to other language by our engineer. Customer can also provides us their own MP3 files to import to GWBMA10.

GPIO1.3, 1.4

On GWBMA1x EVK, GWBMA10's GPIO 1.3 and GPIO 1.4 (pin 27, 28) are connected two LEDs for indication of pairing and operation. User can simply ignore these two pin if no LEDs display is needed. It is also possible to change the function of this two pins base on customer request.

AT-command (to be released in later firmware version)

GWBMA10 accepts AT-command for configuration, allowing the module to be controlled by micro-controller, so that feature of GWBMA10 can be embedded into system's software



The AT-command syntax is as following: Enquiry: AT+command?\r\n Setting: AT+command= new value\r\n

Aspect	Topic	Enquiry	Response	Set	Response	Note
	Bluetooth name	AT+BTNAME?	Current Bluetooth name	AT+BTNAME={new name}	Хо	
Bluetooth	Bluetooth Address	AT+BTADDR?	Current Bluetooth address	AT+BTADDR={new address}	ý	the address is 6-byte data
	Bluetooth PIN	AT+PINCODE?	Current PIN code	AT+PINCODE={new pin code}	ЮК	PIN code is 4-byte data
	Playback	NA	N/A	AT+PLAY	оĶ	
	Previous track	N/A	N/A	AT+PREV	ок	
Audio operation	Next track	N/A	N/A	AT+NEXT	QK	
	Volume up	NA	N/A	AT+VOLUP	OK	
	Volume down	NA	N/A	AT+VOLDN	ок	
RF testing mode (for FCC)	Testing parameter	NA	NA	AT+FCC={parameter}	ð	parameter format: aabbccddeeff aa: frequency method. Condition: effective only when ff is 01 - 00: fix frequency - 01: frequency hopping bb: RF data rate. Condition: effective only when ff is 01 - 02: Enhanced data rate (2M) - 03: Enhance data rate (2M) - 03: Enhance data rate (2M) - 03: Enhance data rate (2M) - 01: DM1 - 02: Enhance data rate (2M) - 03: DM5 dd: Channel, 0 to 78. Condition: effective only when ff is 01 - 01: DM1 - 02: DM3 dd: Channel, 0 to 78. Condition: effective only when ff is 01 or 02 ff: Testing mode - 00: Rx - 01: Tx modulated - 02: Tx carrier
	Stop testing	N/A	N/A	AT+FCCSTOP	ОК	

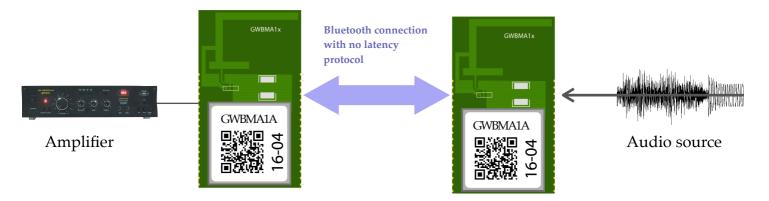
GWBMA10 AT-command are listed as following:

GABMD10 AT-command table

GWBMA1A

GWBMA1A embeds with no latency feature, allows audio signal to be transmitted with very low latency (~40ms). It will be suitable for applications like video playback which requires video and audio synchronisation.

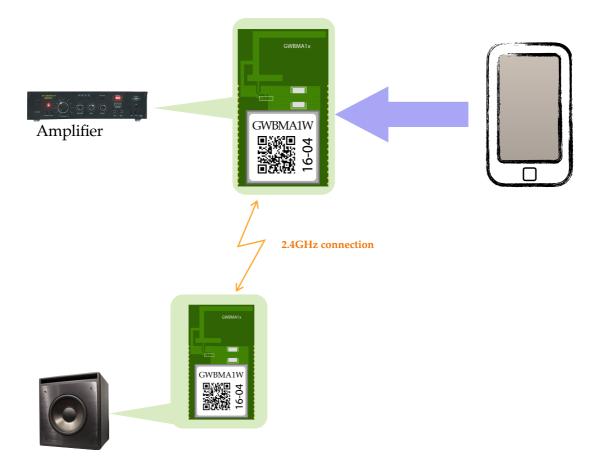
GWBMA1A consists of Gigawit no latency protocol, therefore it requires GWBMA1A to be used in pair as the following diagram, in order to implement such feature.



(Detail information will be release later)

GWBMA1W

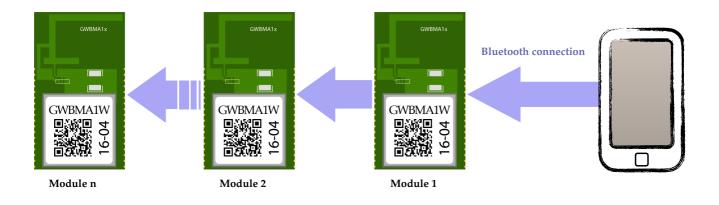
GWBMA1W provides both Bluetooth and proprietary 2.4GHz connection simultaneously, where the 2.4GHz feature provides a wireless connection for sub-woofer. GWBMA1W will be suitable for the 2.1 audio application, such as sound bar.



(Detail information will be release later)

GWBMA1S

GWBMA1S module embeds True Wireless feature, allowing modules cascade connected. It provides a flexible and longer audio routing. The maximum number of modules in a connection will be limited communication latency and CPU processing power.



(Detail information will be release later)

FCC and CE Certification

Certification Issued Under the Authority of the Federal Communications Commission By: PHOENIX TESTLAB GmbH Koonigawihke 10 Date of Grant: 11/15/2011	Certification Issued Under the Additional of the Sectoral Communications Commission By: Date of Grant: 11/15/2011 2023 Blonkerg. Microsoft Sectoral Commission 2023 Blonkerg. Date of Grant: 11/15/2011 2023 Blonkerg. Organvit Electronics Limited 308 Building 25-2, Keyuanzi Inducentry Park Right-toch Park, Nanshan District Shenzken 518057 Shenzken, 518057 Chans Steatuber Park, Nanshan District Shenzken 518057 Shenzken, 518057 Chans Attention: Chartie Pan , Purchasing Manager ECUIPMENT AUTHORIZATION Is hereby issued to the named GRANTEE, and is VALD ONLY for the equipment identified hereon for use under the Commission's Rues and Regulaters issued box. FCC IDENTIFIER: <u>CeCGWBMAIX</u> <u>Burlen of Grantee: Granter Electronics Limited</u> Equipment Sectoration <u>Cristers: Electronics Limited</u> Engineent Containers to the Social Burlen of Collary Tenson States Limited Engineent Collary Tenson States (Limited) Engineent Sectoration Hootal Metary is using Bootalary Grant Motes FC Quelle Fats	Certification Issued Under the Additional of the Sectoral Communications Commission By: Date of Grant: 11/15/2011 2023 Blonkerg. Microsoft Sectoral Commission 2023 Blonkerg. Date of Grant: 11/15/2011 2023 Blonkerg. Organvit Electronics Limited 308 Building 25-2, Keyuanzi Inducentry Park Right-toch Park, Nanshan District Shenzken 518057 Shenzken, 518057 Chans Steatuber Park, Nanshan District Shenzken 518057 Shenzken, 518057 Chans Attention: Chartie Pan , Purchasing Manager ECUIPMENT AUTHORIZATION Is hereby issued to the named GRANTEE, and is VALD ONLY for the equipment identified hereon for use under the Commission's Rues and Regulaters issued box. FCC IDENTIFIER: <u>CeCGWBMAIX</u> <u>Burlen of Grantee: Granter Electronics Limited</u> Equipment Sectoration <u>Cristers: Electronics Limited</u> Engineent Containers to the Social Burlen of Collary Tenson States Limited Engineent Collary Tenson States (Limited) Engineent Sectoration Hootal Metary is using Bootalary Grant Motes FC Quelle Fats	тсв		GRANT OF EQUIPMENT AUTHORIZATION	ТСЕ
Issued Under the Authority of the Federal Communications Commission By: Property TSTLAS Own Communications Commission By: Property TSTLAS Own Communications Commission Communications Commission Statistication Communication Communications Commission Statistication Communication Communications Commission Communications Commission Communications Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commission Commiss	Issued Under the Authority of the Federal Communications Commission By: MCGENIX TESTLAB ComMit Koongewinkei 10 32825 Blombers, Germany Gigawit Electronics Limited 308 Building 25-2, Keyuanxi Induestry Park Righ-tech Park, Nanshan District Shenzhen 518057 Shenzhen, 518057 China Attention: Chartle Pan , Purchasing Manager MCD TRANSFERABLE EQUIPMENT AUTHORIZMUN here's Issued to the named GRANTEE, and is VALD ONLY for the equipment identified hereon for use under the Commission's Rues and Regulators listed below. FCC IDENTIFIER: <u>GECGWBMA1X</u> Mane of Grantee: Gigawit Electronics Limited Equipment Containes Limited Regulare Transmitter Meduar Type in Biopologiar Grant Motes FCC Rue Park	Issued Under the Authority of the Federal Communications Commission By: MCGENIX TESTLAB ComMit Koongewinkei 10 32825 Blombers, Germany Gigawit Electronics Limited 308 Building 25-2, Keyuanxi Induestry Park Righ-tech Park, Nanshan District Shenzhen 518057 Shenzhen, 518057 China Attention: Chartle Pan , Purchasing Manager MCD TRANSFERABLE EQUIPMENT AUTHORIZMUN here's Issued to the named GRANTEE, and is VALD ONLY for the equipment identified hereon for use under the Commission's Rues and Regulators listed below. FCC IDENTIFIER: <u>GECGWBMA1X</u> Mane of Grantee: Gigawit Electronics Limited Equipment Containes Limited Regulare Transmitter Meduar Type in Biopologiar Grant Motes FCC Rue Park				
By: Properties TSTLAS General Comparison of the comparison of the compariso	By: Procenty TESTLAB ombit Consigning By: By: <td>By: Procenty TESTLAB ombit Consigning By: By: <td></td><td>Is</td><td>sued Under the Authority of the</td><td></td></td>	By: Procenty TESTLAB ombit Consigning By: By: <td></td> <td>Is</td> <td>sued Under the Authority of the</td> <td></td>		Is	sued Under the Authority of the	
PHOENIX TESTLAB Grahft Koenigswinkel 10 32823 Blowberg, Germany Date of Grant: 11/15/201 32823 Blowberg, Sermany Gigawit Electronics Limited 308 Building 25-2, Ksyuanki Induestry Park High-tech Park, Kanshan District Shenchen 518057 Shenchen, 518057 China Application Date: 11/15/201 Application	PHOENIX TESTLAB Grahft Kongingwinkel 10 32828 Blomberg, Germany Date of Grant: 11/15/2011 Gigawit Electronics Limited 308 Building 252, Keyaanki Inducestry Park High-tech Park, Kanshan District Shenchen 518057 Application Date: 11/15/2011 Steams Steams Steams Attention: Charlie Pan , Purchasing Manager EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALD ONLY for the equipment iterified hereon for use under the Commission's Walks and Regulations liked toko: ECC IDENTIFIER: PCC IDENTIFIER: QECGWBMAIX Russen of Grantes: Bind toko: Engine Marke of Arantes: Gigawit Electronics Limited Equipment Class: Engine Classica Modular Type: Binderbord Minicipa Single Modular Output Frequency Frequency Enginesion Modular Type: Single Modular Output Frequency Emission Modular Type: Single Modular Output Frequency Emission	PHOENIX TESTLAB Grahft Kongingwinkel 10 32828 Blomberg, Germany Date of Grant: 11/15/2011 Gigawit Electronics Limited 308 Building 252, Keyaanki Inducestry Park High-tech Park, Kanshan District Shenchen 518057 Application Date: 11/15/2011 Steams Steams Steams Attention: Charlie Pan , Purchasing Manager EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALD ONLY for the equipment iterified hereon for use under the Commission's Walks and Regulations liked toko: ECC IDENTIFIER: PCC IDENTIFIER: QECGWBMAIX Russen of Grantes: Bind toko: Engine Marke of Arantes: Gigawit Electronics Limited Equipment Class: Engine Classica Modular Type: Binderbord Minicipa Single Modular Output Frequency Frequency Enginesion Modular Type: Single Modular Output Frequency Emission Modular Type: Single Modular Output Frequency Emission		Fede		
Koenigavinkei 10 Date of Unit: 11/13/2011 32225 Blomberg, Germany Application Date: 11/15/201 308 Building 25-2, Keyuanxi Induestry Park High-tech Park, Kanshan District Shorzhen 518057 Shorzhen, 518057 Shonzhen, 518057 Shorzhen, 518057 China TRANSFERABLE EQUIPMEENT AUTHORIZATION is hereby issued to the named GRANTEE, and is YQLID ONIX for the experiment identified hereon for use under the Commission's Rules and Regulations liated below. FCC IDENTIFIER: GerGWBMAIX Mame of Grante: Gigavit Electronics Limited Equipment Gass: For Electronics Limited Equipment Gass: Notes: Biselecoth Wireles Audio Module Single Modular Type: Notes: Frequency Frequency Single Modular Grant Notes: FOC Rule Parts	Koonigawike 10 Jate of value 11/12/2011 3222 59/bomberg, Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany	Koonigawike 10 Jate of value 11/12/2011 3222 59/bomberg, Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany Germany			By:	
Germany Capitalities in the constant of the co	Germany Commany Application Justice: 11/13/2011 Gigawit Electronics Limited 308 Building 25-2, Keyaanxi Inducetry Park High-tech Park, Kanshan District Shenzhen 518057 Shenzhen, 518057 China Attention: Charlie Pan , Purchasing Manager EQUIPMENT AUTHORIZATION is breizh jasued to the named GRANTEE, and is VALD OAVI. for the equipment inorified hereon for use under the Commission's Reads and Regulations labor tools. FCC IDENTRIFER: QECGWBMA1X Name of Grantee: Gigawit Electronics Limited Equipment Class: Part 15 Auro Power Communication Rediss: Program Single Modular Notes: Biotechoth Wireles Audio Medule Modular Type: Single Modular Frequency Wats Dolerance Designation	Germany Commany Application Justice: 11/13/2011 Gigawit Electronics Limited 308 Building 25-2, Keyaanxi Inducetry Park High-tech Park, Kanshan District Shenzhen 518057 Shenzhen, 518057 China Attention: Charlie Pan , Purchasing Manager EQUIPMENT AUTHORIZATION is breizh jasued to the named GRANTEE, and is VALD OAVI. for the equipment inorified hereon for use under the Commission's Reads and Regulations labor tools. FCC IDENTRIFER: QECGWBMA1X Name of Grantee: Gigawit Electronics Limited Equipment Class: Part 15 Auro Power Communication Rediss: Program Single Modular Notes: Biotechoth Wireles Audio Medule Modular Type: Single Modular Frequency Wats Dolerance Designation			Koenigswinkel 10	
308 Building 25-2, Keyuanxi Induestry Park High-tech Park, Namshan District Shenchen 518057 Shenchen, 518057 China Attention: Charlie Pan , Purchasing Manager EQUIPMENT AUTHORIZATION is breiby issued to the named GRANTEE, and is VALID GNV. for the expansific likelified hereon for use under the Commission's Rec IDENTIFIER: QECGWBMAIX Mane of Grantee: Gigawit Electronics Limited Equipment Class: Part 15 Low Power Communication Equipment Class: Part 15 Low Power Communication Notes: Biblescoft Wineles Audio Module Modular Type: Single Modular: Grant Notes: FCC Rule Parts Frequency Output Frequency Designed Frequency Output Frequency Designed Program Output Frequency Designed Manage (MP2) Manage (MP2) Mana	308 Building 25-2, Keyuanxi Induestry Park High-toch Park, Nanshan District Shenzhen 518057 Shenzhen, 518057 China Attention: Charlie Pan , Purchasing Manager EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALD ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations lister budow. FCC IDENTIFIER: <u>QECGWBMA1X</u> Name of Grantee: <u>Grantified Lettorings Limited</u> Equipment Charlies and the Module Modular Type: Single Modular Modular Type: Single Modular Frequincy Output, Frequency Emission Program Output, Standard Module Modular Type: Single Modular Frequency Mats	308 Building 25-2, Keyuanxi Induestry Park High-toch Park, Nanshan District Shenzhen 518057 Shenzhen, 518057 China Attention: Charlie Pan , Purchasing Manager EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALD ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations lister budow. FCC IDENTIFIER: <u>QECGWBMA1X</u> Name of Grantee: <u>Grantified Lettorings Limited</u> Equipment Charlies and the Module Modular Type: Single Modular Frequency States and S				Application Dated: 11/15/201
NOT TRANSFERABLE EQUIPMENT AUTION/QUATION is brendry issued to the named GRANTEE, and is VALID ONLY for expanyment identified betwork for use under the Commission's Rules and Regulations listed betwork. FC EVENTMENT FCC IDENTIFIER: QECGWBMAIX Mame of Grantee: Granvit Electronics Limited Equipment Grantes: FC EVENTMENT Name of Grantee: Granvit Electronics Limited Equipment Grantes: FC Eventment Audit Module States FC Eventment Forgung Modular Type: Single Modular Single Modular Frequency Frequency Benjamet Ministry Output Frequency Designation Emission	NOT TRANSFERABLE EQUIPMENT ALTYON is benety lased to the named GRAMTEE, and is VALID ONLY for the explanement information for use under the Commission's Rules and Regulations listed below. FCC IDENTRIE: QECGWBMA1X Mame of Grantee: Giggavit Electronics Limited Equipment Class: Fart 15: Vor Power Communication Equipment Class: Ratio Not South Wineles Audio Mobile Modular Type: Single Modular Grant Notes: Electronics Audio Mobile Frequency Emission	NOT TRANSFERABLE EQUIPMENT ALTYON is benety lased to the named GRAMTEE, and is VALID ONLY for the explanement information for use under the Commission's Rules and Regulations listed below. FCC IDENTRIE: QECGWBMA1X Mame of Grantee: Giggavit Electronics Limited Equipment Class: Fart 15: Vor Power Communication Equipment Class: Ratio Not South Wineles Audio Mobile Modular Type: Single Modular Grant Notes: Electronics Audio Mobile Frequency Emission	308 Building 25 High-tech Park, Shenzhen, 5180	-2, Keyuanxi Induestry Nanshan District Shen:		
EQLIPIENT AUTHORIZATION is breeky issued to the named GRANTEE, and is VALID DNX for the explorent identifies herein for use under the Commission's Rules and Regulations listed below. FCC IDENTIFIER: QECGWIBMAIX Name of Grantee: Gigawit Electronics Limited Equipment Class: Brat 15 Low Power Communication Rules: Distribution Wireless Audio Module Modular Type: Single Modular Frequency Cuput Frequency Emission Grant Notes FCC Rule Parts Prequency Design (MP2)	EQLIPIENT AUTHORIZATION is breely issued to the named GRANTEE, and is VALID DNLY for the equipament idmitting hereon for use under the Commission's Rules and Regulations listed below. FCC IDENTIFIER: QECOWBAIX Name of Grantee: Gigawit Electronics Limited Equipment Class: Part 15 Low Power Communication Rules: Biolectoots Wireless Audio Module Modular Type: Single Moduler Grant Notes: Frequency Wats Defrance Designation Grant Notes: Frequency Wats Defrance Designation	EQLIPIENT AUTHORIZATION is breely issued to the named GRANTEE, and is VALID DNLY for the equipament idmitting hereon for use under the Commission's Rules and Regulations listed below. FCC IDENTIFIER: QECOWBAIX Name of Grantee: Gigawit Electronics Limited Equipment Class: Part 15 Low Power Communication Rules: Biolectoots Wireless Audio Module Modular Type: Single Moduler Grant Notes: Frequency Wats Defrance Designation Grant Notes: Frequency Wats Defrance Designation	Attention: Char	lie Pan , Purchasing Ma		
VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations laked below. FCC IDENTIFIER: <u>QECGWBMA1X</u> Name of Grantee: <u>Gigawit Electronics Limited</u> Equipment Class: Part 15 Low Power Communication Device Transmitter Notes: <u>Single Modivater</u> Notes: <u>Single Modivater</u> Notes: <u>FCC Rule Parts</u> Regular() <u>Valits</u> <u>Defignate</u> <u>Designation</u>	VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations laked below.	VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations laked below.				
Name of Grantee: Gigawit Electronics Limited Equipment Glass: Part 15 Low Power Communication Device Transmitter Notes: Blueteooth Wireless Audio Module Modular Type: Single Modular Cyrouth Frequency Emission Grant Notes FCC Rule Parts Range (MHZ) Watts Tokrance Designator	Name of Grantee: Gigawit Electronics Limited Equipment Glass: Part 15 Low Power Communication Device Transmitter Notes: Blueteooth Wireless Audio Module Modular Type: Single Modular Grant Notes FCC Rule Parts Range (MHZ) Wats Tolerance Designator	Name of Grantee: Gigawit Electronics Limited Equipment Glass: Part 15 Low Power Communication Device Transmitter Notes: Blueteooth Wireless Audio Module Modular Type: Single Modular Grant Notes FCC Rule Parts Range (MHZ) Wats Tolerance Designator		VALID ONLY for the equip	oment identified hereon for use under t	GRANTEE, and is the Commission's
Name of Grantee: Granvit Electronics Limited Equipment Gass: Part 15 Low Power Communication Device Transmitter Notes: Bluetooth Mircless Audio Module Modular Type: Single Modular cyc Utgut Frequency Emission Grant Notes FCC Rule Parts Range (MHZ) Watts Tokrance Designator	Name of Grantee: Gigawit Electronics Limited Equipment Glass: Part 15 Low Power Communication Device Transmitter Notes: Bisle Modular Modular Type: Single Modular Frequency Output Frequency Emission Grant Notes FCC Rule Parts Range (MHZ) Witts Tolerance Designator	Name of Grantee: Gigawit Electronics Limited Equipment Glass: Part 15 Low Power Communication Device Transmitter Notes: Bisle Modular Modular Type: Single Modular Frequency Output Frequency Emission Grant Notes FCC Rule Parts Range (MHZ) Witts Tolerance Designator		FCC IDENTIFIER:	OECGWBMA1X	
Device Transmitter Notes: Bloetooth Wireless Audio Module Single Modular Grant Notes FCC Rule Parts Ragio (M/22) Watts Deirance Designator	Bildertoch Viroless Audio Module Notes: Modular Type: Single Modular Grant Notes FCC Rule Parts Range (MHZ) Vutta Tolerance Designator	Bildertoch Viroless Audio Module Notes: Modular Type: Single Modular Grant Notes FCC Rule Parts Range (MHZ) Vutta Tolerance Designator		Name of Grantee:	Gigawit Electronics Limited	
Notes: Bluetooth Wireless Audio Module Modular Type: Single Modular Frequency Output Frequency Emission Grant Notes FCC Rule Parts Range MHZ Watts Tokerance Designator	Notes: Bluetooth Wireless Audio Module Modular Yope: Single Modular Frequency Cutput Prequency Emission Grant Notes FCC Rule Parts Range MHZ Watts Tokrance Designator	Notes: Bluetooth Wireless Audio Module Modular Yope: Single Modular Frequency Cutput Prequency Emission Grant Notes FCC Rule Parts Range MHZ Watts Tokrance Designator		Equipment Class:	Part 15 Low Power Communic	ation
Grant Notes FCC Rule Parts Frequency Output Frequency Emission Designator	Grant Notes FCC Rule Parts Frequency Output Frequency Emission Brant Notes FCC Rule Parts Range (MHZ) Watts Tolerance Designator	Grant Notes FCC Rule Parts Frequency Output Frequency Emission Brant Notes FCC Rule Parts Range (MHZ) Watts Tolerance Designator			Bluetooth Wireless Audio Mod	ule.
Grant Notes FCC Rule Parts Range (MHZ) Watts Tolerance Designator	Grant Notes FCC Rule Parts Range (MHZ) Watts Tolerance Designator	Grant Notes FCC Rule Parts Range (MHZ) Watts Tolerance Designator		Modular Type:		The Friday Friday
			<u>Orant Notes</u>			

FCC certification

Attestation of Global	Compliance	F: 0 E-mail:	086-755-2908 195 086-755-2600 848- agc@agc-cert.con //www.agc-cert.con
	National Accreditation Service for nt & Talwan Accreditation	2F., Building 2, No.1- Technical Industrial Park, Gu Baoan District, Shenzhen, P	shu, Xixiang Stree
EC-R	&TTE Certificat	ion of Conforma	nce
Registration No.	AGC03817160902E0		
Certificate Holder	Gigawit Electronics Limited 308 Building 25-2, Keyuanxi Nanshan District Shenzhen 5	Induestry Park High-tech Park, 518057	
Product Designation	GWBMA1x Bluetooth Wirele	ss Audio Module	
Brand Name	N/A		
Model / Series Mo	dels GWBMA1x		
Manufacturer	Gigawit Electronics Limited 308 Building 25-2, Keyuanxi Nanshan District Shenzhen 5	Induestry Park High-tech Park, 518057	
Requirement	Applied Standards	Document Evidence	Result
Art.3.1(a) Health	EN 62479:2010	Test Report: AGC03817160902EH02	Conform
Art.3.1(a) Safety	EN 60950-1:2006+A11:2009 +A1:2010+A12:2011+A2:2013	Test Report: AGC03817160902ES01	Conform
Art.3.1(b) EMC	EN 301 489-1 V1.9.2 EN 301 489-17 V2.2.1	Test Report: AGC03817160902EE01	Conform
Art.3.2 Radio	EN 300 328 V1.9.1	Test Report: AGC03817160902EE04	Conform
C	R&TTE tested	Solger 2ha Signed by Quality Manag Issue Date: Oct. 18, 201	3
certificate doesn't im connection with EC d This certificate shall n Co., Ltd.	ation of Global Compliance (Glorachin) (co.) by assessment of the production. The App eclaration of conformity to the Directive. The ot be re-produced except in full without the v s part of the full test report(s) and should be a	Nicant of the certificate is authorized to us certificate is only applicable to the optigment witten approval of Attestation of Global Con	s described above.

CE certification

방송통신기자재등의 적합인증서 Certificate of Broadcasting and Communication Equipments · 상호 또는 성명 Trade Name or Applicant 오스턴 일렉트릭(Austin electric) 기자재 명칭 Fauinment Name 특정소출력 무선기기(무선데이터통신시스템용 무선기기) 기본모델명 GWBMA10 Resi: Model Number **QDL Bluetooth® qualified design listing** 파생모델명 Series Model Numbe The Bluetooth SIG Hereby Recognizes K-SOLUTION CONSULTING CO., LIMITED Bluetooth Module(GWBMA1x) Qualified Design Name 인증번호 Certification No. MSIP-CRI-5AE-GWBMA10 Declaration ID: D037124 Qualified Design ID: 101280 Specification Name: 4.2 제조자/제조국가 Manufacturer/ Country of Origin Project Type: End Product Model Number: GWBMA1x Gigawit Electronics Limited / 중국 Listing Date: 22 September 2017 Hardware Version Number: V1.1 Assessment Date: 21 September 2017 Software Version Number: V1.1 인증연월일 2017-06-22 cation 기타 Others This certificate acknowledges the *Bluetooth** Specifications declared by the member are achieved in accordance with the Bluetooth Qualification Process as specified within the Bluetooth Specifications and as required within the current PRD 위 기자재는 「전파법」 제58조의2 제2항에 따라 인증되었음을 증명합니다. It is verified that foregoing equipment has been certificated under the Clause 2, Article 58-2 of Radio 😢 Bluetooth° Waves Act. 2017년(Year) 06월(Month) 22일(Date) 국립전 국립전파연구원장 Director General of National Radio Research Agency **BQB** certification ※ 인증 받은 방송통신기자제는 반드시**"적 합성평가표시** 물 부착하여 유통하여야 합니다. 위반시 과테료 차분 및 인증이 취소될 수 있습니다.

KCC certification

Contact information

Head quarter:

Ι.

B-4E Central Plaza, Baoyuan Rd. Xixiang Ave., Baoan District, Shenzhen 518102, China

Tel: +86-755-86329300

Fax: +86-755-86329882

E-mail: info@gigawit.com

Sales and marketing office:

Tel: +852-91983405

Fax: +852 3013 8763

E-mail: sales@k-sol.com.hk

Revision update

1.0

- update pin assignment
- update suggest PCB design
- BQQ certification added
- UART speed corrected to 115200