

PRODUCT SPECIFICATION

BT V5.3 Dual Mode Bluetooth Stereo Audio Module

WB311L

Realtek RTL8763EAU

Version 1.0

User Manual

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1. FEATURES AND SPECIFICATION

1.1 Description

RTL8763EAU is single-chip Bluetooth SoC audio solution which is a compact, programmable that integrates both Bluetooth Classic and Bluetooth LE audio features. It has the advantages of high-quality audio, ultra-low power consumption and rich external interfaces. The I2S/UART/I2C interfaces are capable of connecting extra audio processor which decodes a variety of digital format such as SPDIF or Ethernet to extend the application aera.

1.2 Block Diagram

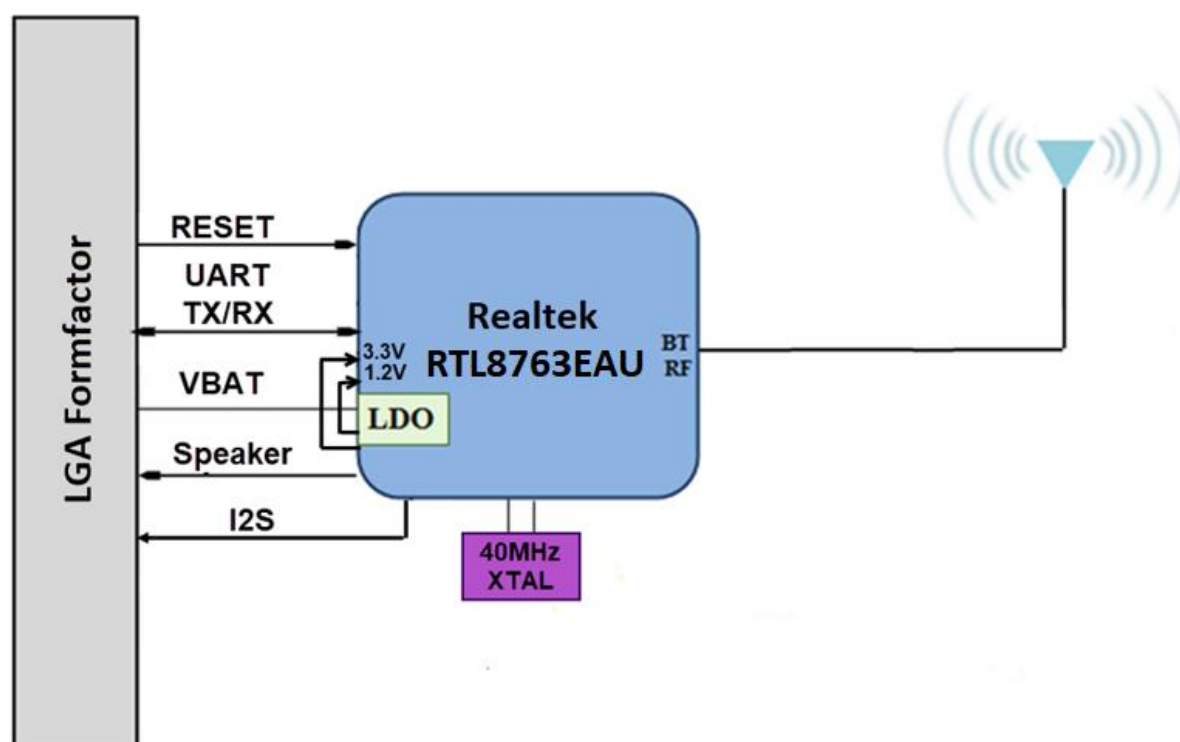


Figure 1-1 RTL8763EAU module block diagram

1.3 Product Feature

- Bluetooth core specification 5.3 compliant
 - GAP, GATT, HFP 1.9, HSP 1.2, A2DP 1.4, AVRCP 1.6.2, SPP 1.2
 - Bluetooth classic (BDR/EDR)
 - Bluetooth low energy (BLE-1M/2M)
 - LE Audio
 - OTA FW upgrade
 - Analog mic input
 - Digital mic input
- PMU
 - Highly integrated PMU
 - Dual switching mode regulator
 - Built-in Li-Ion battery charger with up to 300mA charger current
 - Built-in Over-Voltage Protection(OVP), Over-Current Protection(OVC) and Under Voltage Protection(UDP)
- MCU
 - RealM300(Arm CM55 like) without floating point unit, max frequency 100MHz
 - 532KB embedded shared SRAM with DSP
 - AES 128/256, SHA256, RSA-2048 security engine
- Analog Codec
 - Speaker output
 - Class-D amplifier, differential mode output
 - Stereo digital-to-analog(DAC) with 106dBA SNR
 - Analog-to-digital(ADC) with 96dBA SNR
 - Sampling rates of ADC and DAC support 8, 16, 32, 44.1, 48, 88.2 and 96KHz
 - Built-in MIC bias generator
- DSP audio processing
 - CVSD encoder/decoder
 - SBC encoder/decoder
 - mSBC encoder/decoder
 - AAC-LC decoder
 - LC3 encoder/decoder
 - MP3 decoder
 - Real Clear Voice(RCV) v5.0 for 8/16 kHz 1-microphone noise suppression, echo cancellation and wind noise suppression
 - Packet Loss Concealment(PLC) for voice processing
- Peripheral
 - Flexible GPIO Design

- RTC
- ADC(12bits)
- USB2.0
- I2C
- I2S
- UART
- Aux in L/R channel
- SPI
- PDM
- PWM

● BT Profile Support

Type	Profile	Name	Version	Device Mode: TX	Device Mode: RX
				Role	
Common	Core	Core Spec	5.3	All supported	
	GAP	Generic Access Profile	5.3		
	GATT	Generic Attribute Profile	5.3		
LE Audio	TMAP	Telephony and Media Audio Profile	1.0	CG / UMS / BMS	CT / UMR / BMR
	CAP	Common Audio Profile	1.0	Initiator	Acceptor
	PBP	Public Broadcast Profile	1.0	Source	Sink
	CAS	Common Audio Service	1.0	client	server
	BAP	Basic Audio Profile	1.0.1	Broadcast Source	Broadcast Sink
				Broadcast Assistant	Scan Delegator
				Unicast Client	Unicast Server
	PACS	Published Audio Capabilities Service	1.0.1	client	server
	ASCS	Audio Stream Control Service	1.0	client	server
	BASS	Broadcast Audio Scan Service	1.0	client	server
	MCP	Media Control Profile	1.0	Media Control Server	Media Control Client
	MCS	Media Control Service	1.0	server	client
	CCP	Call Control Profile	1.0	Call Control Server	Call Control Client
	TBS	Telephone Bearer Service	1.0	server	client
	CSIP	Coordinated Set Identification Profile	1.0.1	Set Coordinator	Set Member
	CSIS	Coordinated Set Identification Service	1.0.1	client	server
	MICP	Microphone Control Profile	1.0	Microphone Controller	Microphone Device
	MICS	Microphone Control Service	1.0	client	server (Not enabled by default)
	VCP	Volume Control Profile	1.0	Volume Controller	Volume Render
	VCS	Volume Control Service	1.0	client	server
	AICS	Audio Input Control Service	1.0	client	server

BLE	BAS	Battery Service	1.0	/	server
	DIS	Device Information Service	1.1	/	server
BR/EDR	AVCTP	A/V Control Transport Protocol	1.4	Target	Controller
	AVRCP	A/V Remote Control Profile	1.6.2	Target	Controller
	AVDTP	A/V Distribution Transport Protocol	1.3	SRC	SNK
	A2DP	Advanced Audio Distribution Profile	1.4	SRC	SNK
	HFP	Hands-Free Profile	1.9	AG	HF
	HSP	Headset Profile	1.2	AG	HF
	RFCOMM	RFCOMM	1.2	Server	Client
	SPP	Serial Port Profile	1.2	Server	Client

1.4 PRODUCT SPECIFICATIONS

MAIN CHIPSET

Realtek RTL8763EAU

FUNCTIONAL SPECIFICATIONS

BT Function	
Standard	Bluetooth V5.3
Bus Interface	UART/I2S
Data Rate	1 Mbps, 2Mbps and Up to 3Mbps
Modulation Scheme	GFSK, $\pi/4$ -DQPSK and 8-DPSK
Frequency Range	2.402~2.480 GHz
Channel Number	BR/EDR: 0-78 BLE: 0-39
Transmit Output Power (Tolerance: +/- 2dBm)	BR/EDR: Typical 6dBm BLE 1M/2M: Typical 6dBm Classic BT meet output power Class 1 BLE meet output power Class 1.5
Receiver Sensitivity	BR (BER <0.1%) Typical: -90 dBm EDR 2-DH5 (BER <0.01%) Typical: -89 dBm EDR 3-DH5 (BER <0.01%) Typical: -83 dBm BLE 1M (PER <30.8%) Typical: -92dBm BLE 2M (PER <30.8%) Typical: -92dBm
Operating Voltage	Power input VBAT: 2.8V to 4.5V
Power Consumption (Average)	<i>TX Mode@6dBm:</i> 33 mA <i>RX Mode:</i> 19 mA
Antenna Type	Printed Antenna

2. MODULE PINOUT

2.1 Module Pin Assignment

Table 2-1 Pad Type Definition

Pad Type	Definition
I/O	Bidirectional digital pad
AH	Analog and digital hybrid programmable
PO	Power Output
PI	Power Input
PIO	Power Input and Output
IPU	Input with internal pull high inside
G	Ground

Table 2-2 Module pinout definition

Pin.	Module Pin Define	RTL8763EAU I/O Pin Name	Description	I/O
1	SWDCLK	P1_0	Programmable GPIO	I/O
2	SWDIO	P1_1	Programmable GPIO	I/O
3	UART_RX	P3_0	Programmable GPIO	I/O
4	UART_TX	P3_1	Programmable GPIO	I/O
5	DP	DP	USB data+	I/O
6	DM	DM	USB data-	I/O
7	RESET_N	HW_RST_N	System reset input with internal pull high, low active with at least 8ms low to trigger system reset	IPU
8	ADP_IN	ADP_IN	Adapter input for battery charge	PI
9	MFB	MFB	Multi-function button input	IPU
10	P2_3	P2_3	Programmable GPIO	I/O
11	I2S_BCK	ADC_3	I2S bit clock	I/O
12	I2S_LRCK	ADC_0	I2S left-right clock	I/O
13	VBAT	VBAT	Battery input, Battery charge output	PIO
14	I2S_SDI	ADC_2	I2S serial data input	I
15	HCI_N	P2_0	Programmable GPIO	I/O
16	External_analog amp control	P2_1	Programmable GPIO	I/O
17	P2_2	P2_2	Programmable GPIO	I/O
18	I2S_SDO	ADC_1	I2S serial data output	O
19	GND	GND	Ground	G
20	MICBIAS	MICBIAS	MIC bias output	PO
21	AUX_L	AUX_L	AUX input Left (Max input level: -5.5dBV)	AH
22	AUX_R	AUX_R	AUX input Right	AH

			(Max input level: -5.5dBV)	
23	SPKR_P	AOUT_RP	Right channel speaker output positive	AH
24	SPKR_N	AOUT_RN	Right channel speaker output negative	AH
25	SPKL_N	AOUT_LN	Left channel speaker output negative	AH
26	SPKL_P	AOUT_LP	Left channel speaker output positive	AH
27	GND	GND	Ground	G
28	GND	GND	Ground	G
29	GND	GND	Ground	G
30	GND	GND	Ground	G

3. WARNING STATEMENT

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and a human body.

-for Module

If the identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module, Contains FCC ID: SOP427331A,

Co-location of this module with other transmitters that operate simultaneously are required to be evaluated using the multi-transmitter procedures.

The host integrator must follow the integration instructions provided in this document and ensure that the composite-system end product complies with the requirements by a technical assessment or evaluation to the rules and to KDB Publication 996369.

The host integrator installing this module into their product must ensure that the final composite product complies with the requirements by a technical assessment or evaluation to the rules, including the transmitter operation and should refer to guidance in KDB 996369.

ISED Statement

This device contains licence-exempt transmitter(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference,
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and a human body.

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et un corps humain.

-for Module

If the identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module, Contains IC: 9569A-427331A

Si le numéro d'identification n'est pas visible lorsque le module est installé à l'intérieur d'un autre appareil, alors l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module fourni, Contient IC : : 9569A-427331A

EU Statement

- The frequency and maximum transmitted power in EU are listed as belows,

2402~2480 MHz: 9.61dBm for Bluetooth, 9.68dBm for Bluetooth LE



- Declaration of Conformity

This device complies with Directive 2014/53/EU, issued by the Commission of the European Community.

Safety	EN 62368-1: 2014+A11:2017
EMC	EN 301 489-1 V2.2.3
	EN 301 489-17 V3.2.4
Radio	EN 300 328 V2.2.2
SAR	EN 50663: 2017
	EN 62479: 2010

NCC Statement

「取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。」

此模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求平台廠商於平台上標示

本產品內含發射器模組  CCXXxxLPyyyZzW

Certification ID

USA FCC

FCC ID: SOP427331A

Canada IC

IC: 9569A-427331A

Taiwan NCC

 CCXXxxLPyyyZzW

Japan TELEC

