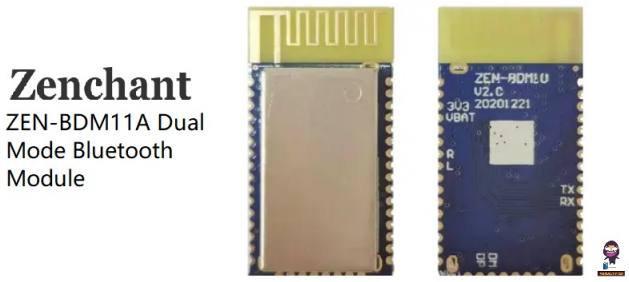


Zenchant ZEN-BDM11A Dual Mode Bluetooth Module Owner's Manual

Contents

Zenchant

Zenchant ZEN-BDM11A Dual Mode Bluetooth Module

Overview

ZEN-BDM11A Bluetooth module is based on AC6963A chip which complies with Bluetooth 5.1 specification. This module supports Bluetooth BLE/SPP data transmission, voice calls, Bluetooth music play, support USB Disk/SPIFLASH audio decoding, ng, and some other functions. It is convenient to use pins to connect the module, which can greatly reduce the difficulty of peripheral circuit design and reduce the cost for customers. This module is an excellent solution for speaksystemstem, home ,some, and other applications.

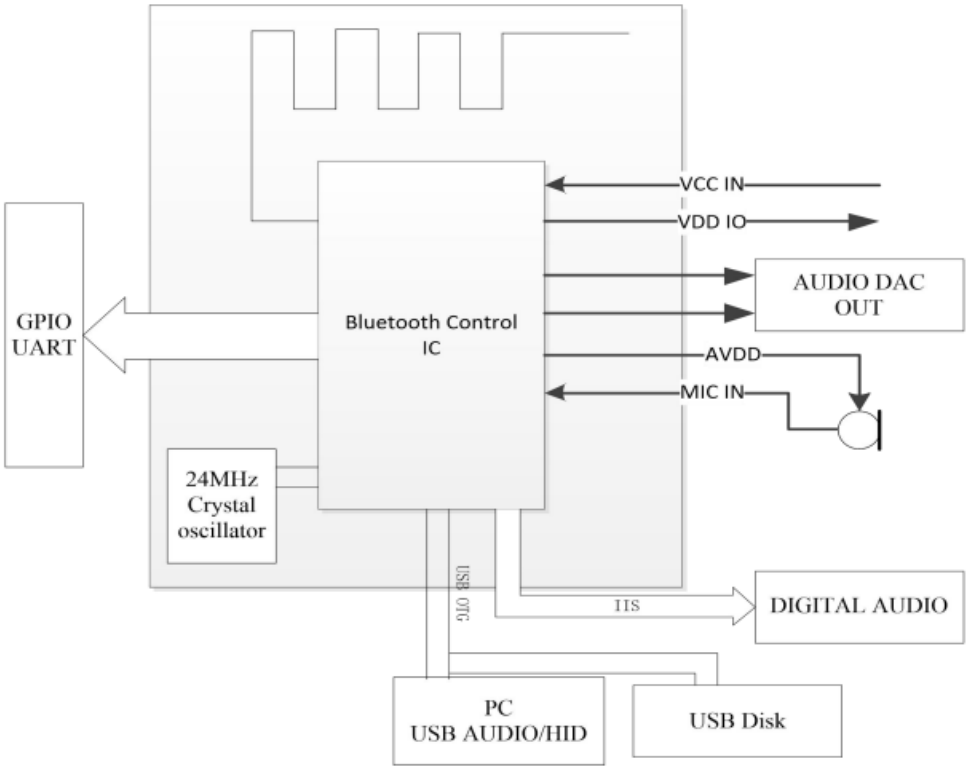
Features

1. Comply with Bluetooth 5.1 specification (BR/EDR/LE)
2. Support classic Bluetooth protocol (A2DP/AVRCP/AVDPT/AVCTP/HFP/SPP/SDP/L2CAP/HID …)
3. Support Bluetooth LE data transmission (LE 1M/2M PHY)
4. 16 Bit stereo audio DAC output
5. 16 Bit stereo audio o AD C Built-in MIC amplifier
6. AUX IN interface
7. High-speed UART interface
8. USB 2.0 Full speed OTG Controller Support USB Disk/USB Audio
9. On-board 2.4G PCB antenna
10. BLE supports multi-master and multi-slave applications
11. Support external SPI Flash as music memory.

Application

1. Bluetooth Speaker
2. Smart-home devices

Block diagram

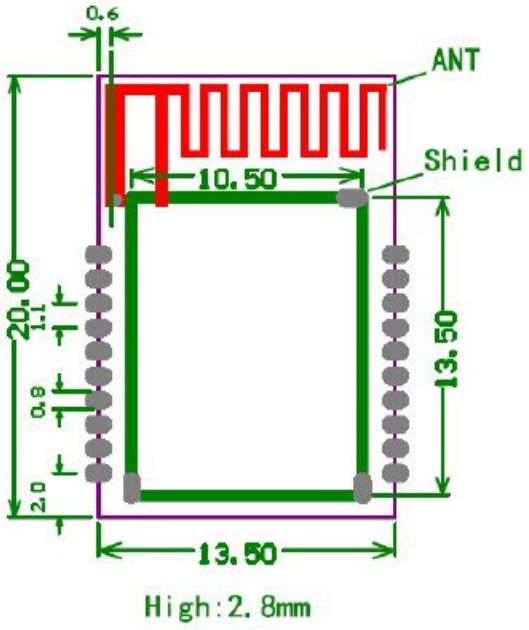


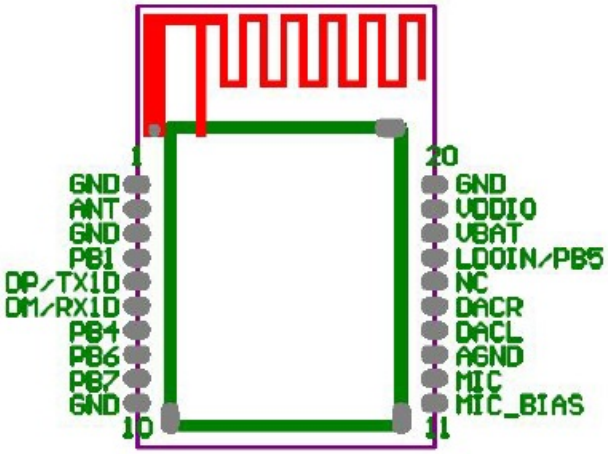
Product Selection

Model	Notes	Photo
ZEN-BDM11	Generic	
ZEN-BDM11A	Shield	

Note: The screen-printing model of the PCB board is ZEN-BDM11, and the suffix -A indicates the shielding cover mounted. The shield can print laser labels or paste paper labels according to customer requirements.

Module Size and Pin Configuration



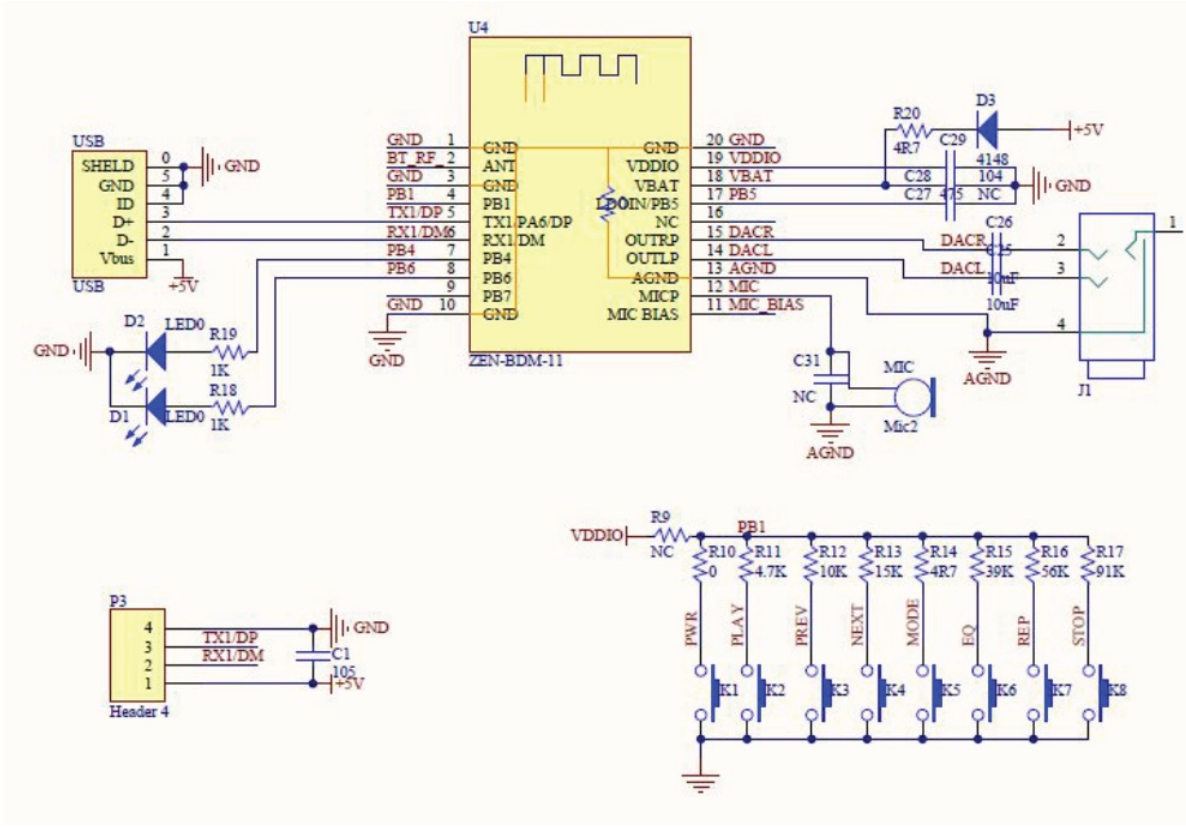


PIN NO.	NAME	I/O Type	Function	Other Function
1	GND	P	Ground	
2	ANT	P	Test RF ANT	
3	GND	P	Ground	
4	PB1	I/O	GPIO (pull up)	Long Press Reset SPI1DOA SPI1 Data Out(A); ADC5 ADC Input Channel 5; TMR2 Timer2 Clock Input; UART0RXB Uart0 Data In(B);
5	DP	I/O	USB Positive Data	SPI2DOB SPI2 Data Out(B); IIC_SDA_A IIC SDA(A); ADC14 ADC Input Channel 14; UART1RXD Uart1 Data In(D);
6	DM	I/O	USB Negative Data	AMUX2R Analog Channel2 Right; SPI2DOA SPI2 Data Out(A); ADC9 ADC Input Channel 9; UART2RXC Uart2 Data In(C);
7	PB4	I/O	GPIO	SPI0_DAT2A(2) SPI0 Data2 Out_A(2); ADC7 ADC Input Channel 7; CLKOUT1 UART2TXC Uart2 Data Out(C);

					UART2RXC Uart2 Data In(C);
8	PB6	I/O	GPIO		AMUX1L Analog Channel1 Left;
					SPI2CLKA SPI2 Data Out(A);
					IIC_SCL_C IIC SCL(C);
					ADC8 ADC Input Channel 8;
					TMR3 Timer3 Clock Input;
					UART1TXA Uart1 Data Out(A);
9	PB7	I/O	GPIO		AMUX1R Analog Channel1Right;
					SPI2DOA SPI2 Data Out(A);
					IIC_SDA_C IIC DAT(C);
					ADC9 ADC Input Channel 9;
					PWM5 Timer5 PWM Output
					UART1RXA Uart1 Data In(A);
10	GND	P	Ground		
11	MIC_B	I/O	Microphone	Bias	PA2;
	IAS		Output		CAP3 Timer3 Capture;
12	MIC	I/O	MIC Input Channel		PA1;
					ADC1 ADC Input Channel 1;
					PWM4 Timer4 PWM Output
					UART1RXC Uart0 Data In(C);
13	AND	P	Ground		
14	DACL	O	DAC Left Channel		
15	DACL	I/O	DAC Right Channel		
16	NC				
17	LDO_I	P	Battery Charger In		
	N				
	PB5	I/O	GPIO		SPI2DIA SPI2 Data Input(A)
			(High Voltage		PWM3 Timer3 PWM Output
			Resistance)		CAP1 Timer1 Capture;
					UART0TXC Uart0 Data Out(C)
					UART0RXC Uart0 Data In(C);
18	VBAT	P	LDO Power		
19	VDDIO	P	IO Power 3.3v		

	20	GND	P	Ground	

Typical application circuits



Module hardware specifications

PMU Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VBAT	Voltage Input	2.2	3.7	5.5	V	
LOGIN	Charge Voltage		4.5	5.5	V	
VDDIO	Voltage output	—	3.3	—	V	VBAT = 4.2V,100mA
IVDDIO	Loading current	—	—	150	mA	VBAT =5V

IO Input/Out Electrical Logical Characteristics

IO Input Characteristics						
Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VIL	Low-Level Input Voltage	-0.3	—	0.3* VDDIO	V	VDDIO = 3.3V
VIA	High-Level Input Voltage	0.7* VDDIO	3.3	—	V	VDDIO = 3.3V
IO output characteristics						
VOL	Low-Level Output Voltage	—	—	0.33	V	VDDIO = 3.3V
VOH	High-Level Output Voltage	2.7	—	—	V	VDDIO=3.3V

Internal Resistor Characteristics

Port	General Output	High Drive	Internal Pull-Up	Internal Pull-Dow	Comment

				Resistor	n Resistor	
	PA1,PA2					1. PB1 default pull up
	PA6,PB1 PB4,PB6,P	8mA	24mA	10K	10K	2. USBDM & USBDP default pull down
	B7					3. PB0, PB2, PB5 can
	PB5	8mA	—	10K	10K	pull-up resistance to 5V
	USBDP	4mA	—	1.5K	15K	4. internal pull-up/pull-down
	UDBDM	4mA	—	180K	15K	resistance | accuracy ± 20%

DAC Characteristics

Parameter	Min	Typ	Max	Unit	Test Conditions
Frequency Response	20	—	20K	Hz	1KHz/0dB 10Kohm Loading With A-Weighted Filter
THD+N	—	-75	—	dB	
S/N	—	95	—	dB	
Crosstalk	—	-90	—	dB	
Output Swing		1		Vrms	
Dynamic Range		90		dB	1KHz/-60dB 10Kohm Loading With A-Weighted Filter
DAC Output Power	11			mW	32-ohm Loading

ADC Characteristics

Parameter	Min	Typ	Max	Unit	Test Conditions
Dynamic Range		80		dB	1KHz/-60dB 10Kohm Loading With A-Weighted Filter
S/N		90	91	dB	1KHz/-60dB 10Kohm Loading With A-Weighted Filter
THD+N		-70		dB	
Crosstalk		-90		dB	

BT Characteristics

- **Transmitter**

Basic Data Rate

Parameter		Min	Typ	Max	Unit	Test Conditions
RF Transmit Power			4	6	dBm	25°C, Power Supply Voltage=5V 2441MHz
RF Power Control Range			20		dB	
20dB Bandwidth			950		KHz	
Adjacent Channel Transmit Power	+2MHz		-40		dBm	
	-2MHz		-38		dBm	
	+3MHz		-44		dBm	
	-3MHz		-35		dBm	

Enhanced Data Rate

Parameter		Min	Typ	Max	Unit	Test Conditions
Relative Power			-1		dBm	25℃, Power Supply Voltage=5V 2441MHz
π/4 DQPSK Modulation	DEVM RMS		6		%	
	DEVM 99%		10		%	

	Accuracy	DEVM Peak		15		%	
	Adjacent	+2MHz		-40		dBm	
	Channel	-2MHz		-38		dBm	
	Transmit	+3MHz		-44		dBm	
	Power	-3MHz		-35		dBm	

Receive

Basic Data Rate

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25℃, Power Supply Voltage=5V 2441MHz
Co-channel Interference Rejection			-13		dB	
Adjacent Channel Transmit Power	+1MHz		+5		dBm	
	+1MHz		+2		dBm	
	+2MHz		+37		dBm	
	-2MHz		+36		dBm	
	+3MHz		+40		dBm	
	-3MHz		+35		dBm	

Enhanced Data Rate

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25°C, Power Supply Voltage=5V 2441MHz
Co-channel Interference Rejection			-13		dB	
Adjacent Channel Transmit Power	+1MHz		+5		dBm	
	+1MHz		+2		dBm	
	+2MHz		+37		dBm	
	-2MHz		+36		dBm	
	+3MHz		+40		dBm	
	-3MHz		+35		dBm	

Release notes

Data	Version	Instructions
2022.03.03	V1.0	New English document

FCC statements

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:

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user’s authority to operate the equipment.

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 the receiver.
- Connect the equipment to 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.

Q: What is the purpose of the shielding cover on the ZEN-BDM11A?
A: The shielding cover provides protection and can be customized with laser labels or paper labels as per customer requirements.

Documents / Resources

	Zenchant ZEN-BDM11A Dual Mode Bluetooth Module [pdf] Owner's Manual ZEN-BDM11A Dual Mode Bluetooth Module, ZEN-BDM11A, Dual Mode Bluetooth Module, Mode Bluetooth Module, Bluetooth Module, Module

References

- User Manual