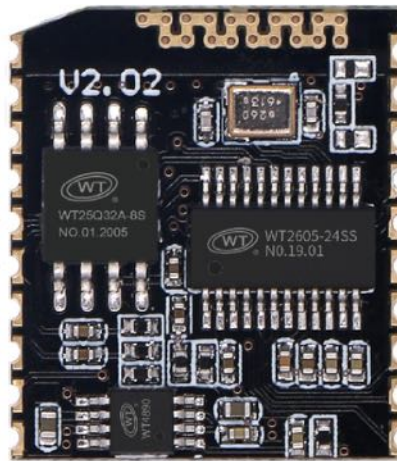# WT2605B03-R Bluetooth Module Specification

Version: V1.04

Note :

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CONTENT

1. Overview

WT2605B03-R audio recording Bluetooth module is an intelligent wireless audio data transmission, recording and MP3 audio playback product independently developed by Shenzhen Weichuang Zhiyin Electronics. It is a low-cost and high-efficiency recording scheme with the characteristics of high integration, small size, low power consumption and stable transmission. Only a few components can be added to the periphery of the module to realize wireless reception of high-quality audio. Self-drive-free mode, no complicated bottom operation, convenient use, stability and reliability are the biggest features of this product. In addition, the chip is also a deeply customized product, a low-cost solution specially developed for the field of recording and playing.

WT2605B03-R mainly has four recording functions: line recording, MIC recording, Bluetooth recording and total recall. Built-in Flash module, which can be used for external USB flash drive and TF card.
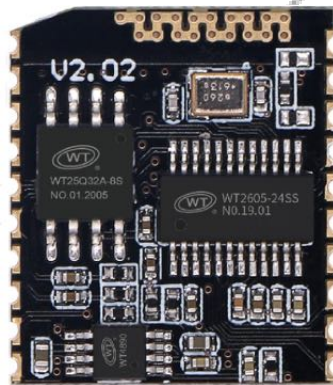
2. Application

The chip is mainly used for short-distance music transmission, and can be easily connected with Bluetooth devices of notebook computers, mobile phones, pads and other digital products to realize wireless music transmission and recording.

➢ Bluetooth audio

➢ Bluetooth stereo headphones

➢ car navigation voice broadcast;

- Low network k song sound card;

- Electronic musical instrument products;

- Recording pen;

- Recording intercom;

- Automatic broadcasting equipment, which broadcasts regularly;

- Electronic dictionary and jukebox;

- Fire voice alarm prompt;

- Voice notice for safe driving of electric sightseeing bus.

3. Characteristics

- Multiple recording modes, which can be supported by the same module: line recording, MIC recording, Bluetooth recording and total recall.

- The sampling rate of high-quality recording, MIC recording and line recording can reach 16Khz, and the sampling rate of Bluetooth recording can reach 44KHz high fidelity.

- Audio codec supports 16-bit stereo DAC and two-channel 16-bit ADC.

- High-performance stereo, ADC has a signal-to-noise ratio of 90dB, and with a recording sampling rate of 16KHz, the original sound can be recorded to the maximum.

- WT2605 is adopted as the core, and three storage modes of SPI-FLASH, TF card and U disk are supported at the same time. SPI-FLASH is stored as a fixed sound source area, and the contents can be changed with U disk.

- The USB interface can automatically switch between the host (USB HID) and the slave (USB card reader) and the USB sound card.

- U disk and TF card support FAT, FAT16, FAT32 file system, MP3 and WAV(PCM, IMA-ADPCM) playback, Flash only supports MP3 format, the maximum Flash support is 128M, and U disk and TF card support 32G.

- Support UART serial port control mode and AD key control mode.

- Support the broadcast language insertion function, pause the background music being played, support the song playing under the specified path, and support the insertion ending in advance.

- Support USB flash drive offline upgrade program.

- Dual-mode Bluetooth function conforms to Bluetooth 5.0 and BLE specifications, with audio Bluetooth distance up

to 20 meters and transparent Bluetooth effective distance of 7 meters.

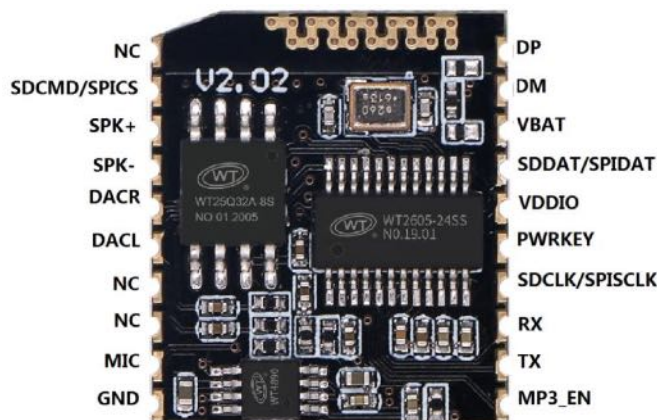➢ Support customized special functions: key control mode, touch control mode, etc.

4. Introduction of Functional Block Diagram

The internal structure of the module consists of audio chip, Flash, 26M crystal oscillator, antenna and 1W power amplifier.
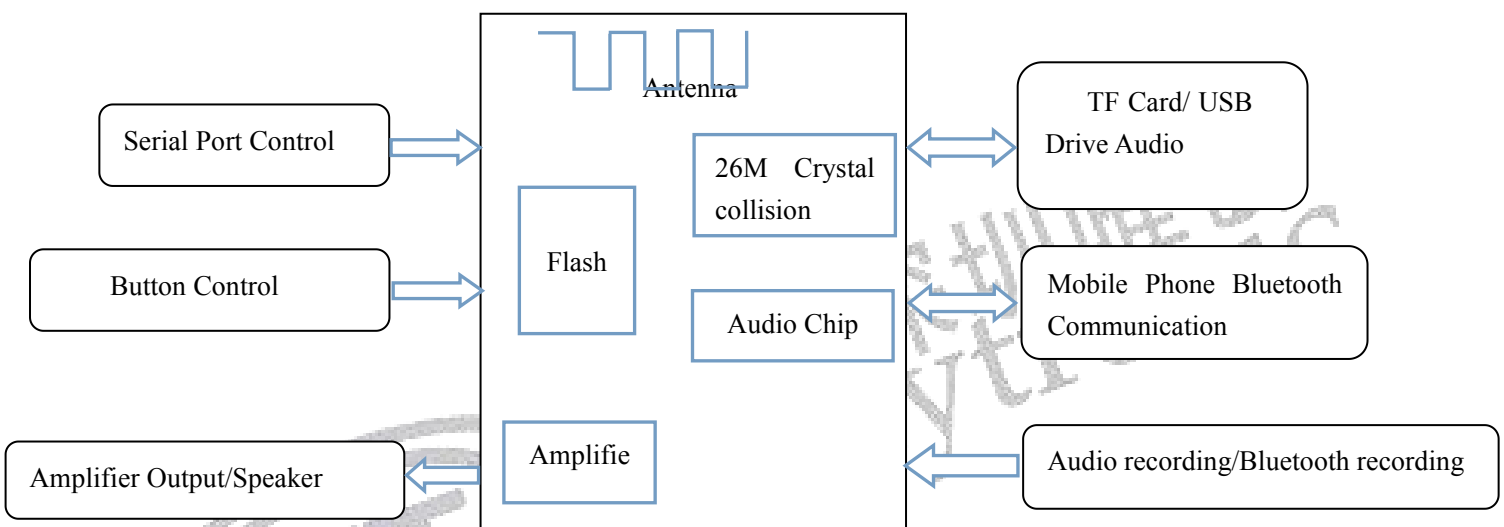
5. Description of PIN

Description of WT2605B03R's pin

● Pin numbers are arranged in the order shown above.

Pin	Name	Type	Description
1	NC		Empty foot
2	SDCMD/SPICS	I/O	TF internal chip selection or chip selection terminal of SPI-FLASH internal memory
3	SPK+	O	Horn terminal 1W 8R
4	SPK−	O	Horn terminal 1W 8R
5	DAC_R	O	DAC right channel output
6	DAC_L	O	DAC left channel output
7	NC		Empty foot
8	NC		Empty foot
9	MIC	I	Microphone terminal
10	GND	POW	Power ground
11	MP3_EN		Empty foot
12	TXD	I/O	UART serial port data output terminal
13	RXD	I/O	UART asynchronous serial port data input terminal
14	SDCLK/SPISCLK	I/O	TF card clock pin or FLASH clock pin
15	PWRKEY	I	Key foot
16	VDDIO	POW	Internal 3.3V digital power output
17	SDDAT/SPIDA	I	TF card data pin or FLASH data pin
18	VBAT	POW	Module power supply terminal (3.6V~5.0V)
19	DM	I/O	USB data terminal DM
20	DP	I/O	USB data terminal DP

6. Introduction of the Detailed Functions

6.1. Introduction of BLE Function

Usage of BLE:

WT2605B03-R module can make MCU interact with APP through BLE Bluetooth.

1. Connect the module with the MCU through Uart serial port, and then connect the BLE Bluetooth on the module with the mobile phone.

2. After connecting with BLE Bluetooth, the data can be sent by the APP to the MCU through BLE Bluetooth.

3. When the MCU sends data to the APP through BLE Bluetooth, first pull the PWRKEY (module 15 pin) pin down twice (that is, double click) quickly to enter BLE Bluetooth mode.

4. After the module enters BLE Bluetooth mode, the data of MCU can be sent to APP through BLE Bluetooth.

5. When the PWRKEY (pin 15 of module) pin is pulled down again (i.e. stand-alone machine), the BL Bluetooth mode will

6. The transmission rate of BLE Bluetooth is about 100B/S, so this function is generally used for sending and receiving small data.

Main application fields of BLE Bluetooth:

The positioning of mobile devices, automotive electronic devices, health medical supplies (heartbeat belt, sphygmomanometer, etc.) should be used (indoor positioning, underground positioning, etc.), short-distance data acquisition (wireless meter reading, wireless telemetry, etc.), data transmission (smart home indoor control, Bluetooth dimming, printer, etc.)

BLE 操作视频观看请点击此处！←Click here to watch the operation video!

6.2. Introduction of Bluetooth Recording

WT2605B03-R Bluetooth recording function can be divided into Bluetooth audio recording and Bluetooth total recall.

Introduction to Bluetooth audio recording:

Record the songs being played in the mobile phone via Bluetooth and store them in the specified drive letter.

1. After the mobile phone is connected to Bluetooth, play the voice in the mobile phone, and send recording instructions (0xE9, 0xEA, 0xEB, 0xEC), and then start recording after returning to 00.

2. Send a stop recording instruction (0xDA) when stopping recording, and return 00 to indicate that the recording file has been successfully saved in the specified drive letter, and the suffix of the file is .mp3 format.

详细指令参考下文。Refer to the following for detailed instructions.

Introduction of Bluetooth total recall:

During the call, the content of the call is recorded by Bluetooth and stored in the specified drive letter.

1. After the mobile phone is connected to Bluetooth, send and send recording instructions (0xE9, 0xEA, 0xEB, 0xEC) during the call, and start recording after returning to 00.

2. Send a stop recording instruction (0xDA) when stopping recording, and return 00 to indicate that the recording file has been successfully saved in the specified drive letter, and the suffix of the file is in the format of. WAV.

详细指令参考下文。Refer to the following for detailed instructions.

蓝牙录音视频观看请点击此处！←Click here to watch Bluetooth recording video!
be exited and the audio Bluetooth mode will be entered.

6.3. Serial Port Control Part

6.3.1. Protocol Command Format

WT2605B03-R has built-in standard UART asynchronous serial interface, which belongs to 3.3V TTL level interface. It can be converted to RS232 level by MAX3232 chip. The format of communication data is: start bit: 1 bit; Data bits: 8 bits; Parity bit: none; Stop bit: 1 bit.The transmitted instructions are all in hexadecimal format.To use the computer serial port debugging assistant, it is necessary to set the serial port parameters correctly, as shown in the figure:

Start Code	Length	Command Code	Parameters	Accumulation and verification	Ending Code
0X7E	As follows	As follows	As follows	As follows	0XEF

Note: "Length" refers to the length+command code+parameter+checksum, and "accumulation and checksum" refers to the lower eight bits of the accumulated sum of length+command code+parameter.

Recording instruction	
CMD(hexadecimal)	Corresponding function
E9	Root directory recording

EA	Root file name recording
EB	Specify folder index recording
EC	Specify folder file name recording.
DA	Stop recording

control command	
CMD(hexadecimal)	Corresponding function
AA	Pause playback command
AB	Stop command
AC	Next song command
AD	Last song command
AE	Volume control command
AF	Specify the playback mode.

Play instruction	
CMD(hexadecimal)	Corresponding function
A0	FLASH index play
A2	TF card root directory index playback
A3	Specify TF card file name to play.
A4	Specify file index play in TF card folder.
A5	Specify file name play in TF card folder.
A6	U disk root index playback
A7	Specify USB disk file name to play.
A8	Specify the file index play in the U disk folder.
A9	Specify the file name play in the U disk folder.

Delete instruction

CMD(hexadecimal)	Corresponding function
E2	SD card /U disk root index deletion (current drive letter)
E3	Delete the file name of SD card /U disk root directory
E4	SD card /U disk folder file index deletion
E5	File name index deletion of SD card /U disk folder
E6	Delete all

Inquiry instruction

CMD(hexadecimal)	Corresponding function
B3	Query the total duration of the currently playing file.
B4	Query the current playing time.
C0	Query version number
C1	Query the currently set volume.
C2	Query the current working status
C5	Query the total number of music files in TF card
C6	Query the total number of music files in the specified folder in TF card.
C7	Query the total number of U disk music
C8	Query the total number of music in the specified folder of U disk.
C9	Query the currently playing file track
CA	Query the current peripheral connection status.
CB	Query the song name of the currently playing song
CC	Query the total number of FLASH tracks
D0	Query the current working disk letter.
E1	Inquire about electricity quantity

Functional instruction	
CMD(hexadecimal)	Corresponding function
B1	Insertion file serial number instruction
B2	Specify EQ format
B5	Insertion file name instruction
BB	Switch working mode
BE	Switch drive letter
E7	U disk copy

Bluetooth command	
CMD(hexadecimal)	Corresponding function
BC	answer a call
BD	hang up
BF	Disconnect Bluetooth connection
D1	Modify Bluetooth name
D2	Query the current Bluetooth name
D3	Query Bluetooth Mac address
D6	Set whether to automatically answer the incoming call.
D7	Set the answering channel during the call
DB	Redial last call instruction

Table 2 Communication control instructions

6.3.2. Write operation instruction

operation code
XX

Note: After each write command is executed, the operation code of one byte corresponding to the command is returned.

Return Code：→:00 means that the command is executed normally;

→:01 means that the command format is wrong and will not be executed;

→: 02 or 05 indicates that the command is executed incorrectly or the device to be operated is not online. (excluding the return code for switching the current working mode BB)

6.4. Recording instruction

Root directory file serial number recording (E9)

Start Code	Length	Command	Parameter	Track high position	Low track	Check Code	End Code
7E	06	E9	XX	00	01	XX	EF

This command can specify the recording method (Bluetooth /MIC) to store the recorded voice in the root directory of the specified drive letter in index order.

Detailed explanation of parameters:

00 means → file serial number of MIC U disk root directory index.

01 means → file serial number of MIC TF card root directory index.

10 means → file serial number of BT U disk root directory index

11 means → file serial number for BT TF card root directory index.

Note: the index number of the recording needs to start from 01.

Root directory recording (EA) (file names can support up to eight bytes)

Start Code	Length	Command	Parameter	Folder Name					Check Code	End Code
7E	09	EA	XX	4D	55	53	49	43	XX	EF

This command can specify the recording method (Bluetooth /MIC) to store the recorded voice in the root directory of the specified drive letter with the specified file name.

Detailed explanation of parameters:

00 means→File name of root directory of MIC U disk

01 means→File name of root directory for MICSD

10 means→File name of BT U disk root directory

11 means→File name of BTSD root directory

The above instruction indicates that the name of the recording is "MUSCI"

Specify the folder index recording (EB) (the folder name is fixed with 5 characters)

Start Code	Length	Command	Parameter	Folder Name					File index		Check Code	End Code
7E	0B	EB	XX	52	45	43	4F	44	00	01	XX	4F

This command can specify the recording method (Bluetooth /MIC), and store the recorded voice in the specified drive letter and in the specified folder in index order.

Parameter: 00 means→Serial number of file for MIC U disk folder index

01 means→Serial number file for indexing MICSD folder

10 means→Serial number of file indexed by BT U disk folder

11 means→processing BT SD   Serial number of folder index file

The above command indicates that the first song is recorded in the "RECOD" folder.

Note: the index number of the recording needs to start from 01.

Specify the folder file name recording (EC) (8 bytes for file name and 5 bytes for folder name)

Start Code	Length	Command	Parameter	Folder Name					File Name				Check Code	End Code
7E	0D	EC	XX	52	45	43	4F	44	31	30	30	31	XX	FEF

This command can specify the recording method (Bluetooth /MIC), store the recorded voice in the specified drive letter, and store the specified file name in the specified folder.

Parameters

00 means→processing MIC USB drive File name recording in specified folder

01 means→processing MIC SD   File name recording in specified folder

10 means→processing BT USB drive   File name recording in specified folder

11 means→processing BT SD   File name recording in specified folder

The above instruction indicates that the root directory RECOD folder recording file name is 1001.MP3 recording.

Stop recording (DA)

Start Code	Length	Command	Check Code	End Code
7E	03	DA	DD	EF

Note: This command is used to stop recording.

6.5. Control instructions

Pause playback command (AA)

Start	Length	Command	Check	End

			Code	Code
7E	03	AA	AD	EF

If the instruction is sent when the audio is playing, the audio will be paused, and the data will be sent again, and the audio will continue to be played from where it was paused.

Stop command (AB)

Start Code	Length	Command	Check Code	End Code
7E	03	AB	AE	EF

If the audio is playing, send this command to stop playing the currently playing music.

Next command (AC)

Start Code	Length	Command	Check Code	End Code
7E	03	AC	AF	EF

This command can trigger the next piece of music to be played, and when the last piece of music is played, sending this command can trigger the first piece of music to be played.

Command of the previous song (AD)

Start Code	Length	Command	Check Code	End Code
7E	03	AD	B0	EF

Volume control command (AE)

There are 31 levels of volume, ranging from 00 to 30, of which 00 is silent and 30 is the maximum volume.

Start Code	Length	Command	Volume Level	Check Code	End Code
7E	04	AE	1E	XX	EF

In the example, in order to send the maximum volume of 30 levels, this instruction can modify the volume in real time.

Specify the playback mode (AF)

Start Code	Length	Command	Parameter	Check Code	End Code
7E	04	AF	00: No-loop single playback mode	B3	EF
			01: Single loop playback mode	B4	
			02: All tracks loop playback mode (default)	B5	

| | | | 03: Folder rotation mode | B6 | |
| | | | 04: Random mode | B7 | |

Note: This instruction modifies the playback mode without power failure, and will not restore the default mode after power failure.

6.6. Play instructions

Index FLASH (A0)

This command can specify the files in Flash to play, which is affected by the order in which the files are stored. The files are sorted in index order.

Start Code	Length	Command	High Track	Low Track	Check Code	End Code
7E	05	A0	00	01	XX	EF

Among them, "7E05A0001A6EF" means that the voice with index number 01 is played in Flash. Check code = length+command+high track position+low track position. Note: When specified to play, if the specified track does not exist, it will not affect the current play.

Note: the index number of playback needs to start from 01.

Specify TF card root index play (A2)

This command can specify the files in TF card to be played, which is affected by the order in which the files are stored. The files are sorted in index order.

Start Code	Length	Command	High Track	Low Track	Check Code	End Code
7E	05	A2	00	01	XX	EF

Among them, "7E 05 A2 00 01 A8 EF" means that the voice with index number 01 is played in TF card. Check code = length+command+high track position+low track position. Note: When specified to play, if the specified track does not exist, it will not affect the current play.

Note: the index number of playback needs to start from 01.

Specify TF card file name to play (A3)

This command can specify the file name in the root directory of TF card to play. （The file name supports up to eight bytes.）

Start Code	Length	Command	File name(high-low)				Check Code	End Code
7E	07	A3	54	30	30	32	XX	EF

Among them, "54, 30, 30 and 32" are ASCLL codes of T002 respectively, and only the file name exists in the form of ASCLL codes; The above instruction indicates that the audio file named "T002.MP3" in the specified root directory is played.

Specify file index play in TF card folder (A4)

This command can specify the file index in the folder under the root directory to play.
（The folder name is fixed with 5 characters.）

Start Code	Length	Command	File name(high-low)					file index (low-high)		Check Code	End Code
7E	0A	A4	4D	55	53	49	43	00	01	XX	EF

Among them: only the folder name exists in the form of ASCLL code; The above instruction indicates that the audio file named "MUSIC" in the specified root directory with quotation mark 01 will be played.
Note: the index number of playback needs to start from 01.

Specify file name play in TF card folder (A5)

This command can specify the file name under the root directory to play. （The folder name is fixed with 5 characters, and the file name can support up to 8 bytes.）

Start Code	Length	Command	File name(high-low)					Folder name (high-low)				Check Code	End Code
7E	0C	A5	4D	55	53	49	43	54	30	30	32	XX	EF

Among them, "54, 30, 30 and 32" are ASCLL codes of T002 respectively, and the folder name and file name exist in the form of ASCLL codes; The above instruction indicates that the audio file named "T002.MP3" in the folder named "MUSIC" in the specified root directory will be played.

Specify the index play of U disk root directory (A6)

This command can specify the files in TF card to be played, which is affected by the order in which the files are stored. The files are sorted in index order.

Start Code	Length	Command	High Track	Low Track	Check Code	End Code
7E	05	A6	00	01	XX	EF

Among them, "7E 05 A6 00 01 AC EF" means that the voice with index number 01 is played in the U disk. Check code = length+command+high track position+low track position. Note: When specified to play, if the specified track does not exist, it will not affect the current play.
Note: the index number of playback needs to start from 01.

Specify the USB flash drive file name to play (A7)

This command can specify the file name in the root directory of TF card to play. （The file name supports up to eight bytes.）

Start Code	Length	Command	File name(high-low)				Check Code	End Code
7E	07	A7	54	30	30	32	XX	EF

Among them, "54, 30, 30 and 32" are ASCLL codes of T002 respectively, and only the file name exists in the form of ASCLL codes; The above instruction indicates that the audio file named "T002.MP3" in the specified root directory will be played.

Specify file index play in USB flash drive folder (A8)

This command can specify the file index in the folder under the root directory to play. (The folder name is fixed with 5 characters.)

Start Code	Length	Command	File name(high-low)					file index (low-high)		Check Code	End Code
7E	0A	A8	4D	55	53	49	43	00	01	XX	EF

Among them: only the folder name exists in the form of ASCLL code; The above instruction indicates that the audio file with index number 01 in the folder named "MUSIC" in the specified root directory will be played.

Note: the index number of playback needs to start from 01.

Specify file name play in USB flash drive folder (A9)

This command can specify the file name under the root directory to play. (The folder name is fixed with 5 characters, and the file name can support up to 8 bytes.)

Start Code	Length	Command	File name(high-low)					Folder name (high-low)				Check Code	End Code
7E	0C	A9	4D	55	53	49	43	54	30	30	32	XX	EF

Among them, "54, 30, 30 and 32" are ASCLL codes of T002 respectively, and only the folder name and file name exist in the form of ASCLL codes; The above instruction indicates that the audio file named "T002.MP3" in the folder named "MUSIC" in the specified root directory will be played.

6.7. The Instruction of Deleting

SD card /U disk root index deletion (current drive letter) (E2)

Start Code	Length	Command	Index		Check Code	End Code
7E	05	E2	00	01	E8	EF

Note: The deleted position is the first voice of the current drive index.

Delete the file name of SD card /U disk root directory (E3)

Start Code	Length	Command	File Name					Check Code	End Code
7E	08	E3	4D	55	53	49	43	6C	EF

Note: The deleted location is the voice whose current drive name is MUSIC.

Delete SD card /U disk folder file index (E4)

Start Code	Length	Command	File Name					Index		Check Code	End Code
7E	0A	E4	52	45	43	4F	44	00	01	5C	EF

Note: The deleted location is the first voice in the index of the current drive RECOD folder.

Delete the file name index of SD card /U disk folder (E5)

Start Code	Length	Command	Folder Name					File Name				Check Code	End Code
7E	0C	E5	52	45	43	4F	44	31	30	30	31	20	EF

Note: The deleted location is the voice with the file name of 1001 in the current drive RECOD file.

Delete all (E6)

Start Code	Length	Command	Check Code	End Code
7E	03	E6	E9	EF

Note: Delete all voices of the current letter.

6.8. Inquiry instruction

Query the total duration of the currently playing file (B3)

Start Code	Length	Command	Check Code	End Code
7E	03	B3	B6	EF

Note: This command can only query files in TF card and U disk, and it can only be queried in the playing state, and the time is accurate to seconds.
Returns 2 bytes of, with the high bit being minutes and the low bit being seconds.

Query the current playing time (B4)

Start Code	Length	Command	Check Code	End Code
7E	03	B4	B7	EF

Note: This command can only query files in TF card and U disk, and it can only be queried in the playing state, and the time is accurate to seconds.

Query version number (C0)

Start Code	Length	Command	Check Code	End Code
7E	03	C0	C3	EF

Return Format

Make code	Return value (hexadecimal)
0XC0	XX XX XX XX XX

Query the currently set volume (C1)

Start Code	Length	Command	Check Code	End Code
7E	03	C1	C4	EF

Return Format

Make code	Return value (hexadecimal)
0XC1	voice volume value (00-1E)

Query the current working status (C2)

Start Code	Length	Command	Check Code	End Code
7E	03	C2	C5	EF

Return Format

Operating Code	Return Value
0XC2	01: MP3 play; 02: MP3 stops; 03: MP3 pause; 04: Bluetooth play; 05: answering status; 06: ringing state; 07: Bluetooth connection (no playback, no answer); 08: Bluetooth disconnected (completed); 09: Bluetooth is not connected; 0A: Bluetooth is in the state of disconnecting (not yet finished); 0B: Bluetooth music is paused;

Query the total number of music files in TF card (C5) (including files in folders)

Start Code	Length	Command	Check Code	End Code
7E	03	C5	C8	EF

Return Format

Make code	Return value (hexadecimal)
0XC5	XX XX

Query the total number of music files in the specified folder in TF card (C6)

Start Code	Length	Command	File name(high-low)					Check Code	End Code
7E	08	C6	4D	55	53	49	43	XX	EF

Among them: the folder name exists in the form of ASCLL code; The above instruction indicates the total number of audio files in the folder named "MUSIC" in the read root directory.

Return format (C6 00 00 means no audio file or this folder)

Make code	Return value (hexadecimal)
0XC6	XX XX (literature review)

Query the total number of music files in the U disk (C7) (including files in folders)

Start Code	Length	Command	Check Code	End Code
7E	03	C7	CA	EF

Return Format

Make code	Return value (hexadecimal)
0XC7	XX XX (literature review)

Query the total number of music files in the specified folder in U disk (C8)

Start Code	Length	Command	File name(high-low)					Check Code	End Code
7E	08	C8	4D	55	53	49	43	XX	EF

Among them: the folder name exists in the form of ASCLL code; The above instruction indicates the total number of audio files in the folder named "MUSIC" in the read root directory.

Return format (C6 00 00 means no audio file or this folder)

Make code	Return value

	(hexadecimal)
0XC8	XX XX (literature review)

Query the currently playing file track (C9)

Start Code	Length	Command	Check Code	End Code
7E	03	C9	CC	EF

Return Format

Operating Code	The file number is eight digits high.	The file number is lower eight digits.
0XC9	XX	XX

Query the current peripheral connection status (CA)

Start Code	Length	Command	Check Code	End Code
7E	03	CA	CD	EF

Return Format

Make code	Return value (hexadecimal)
0XCA	XX

0-exists, 1-does not exist.

Example: 0X01: No PC connection (BIT3=0), no U disk (BIT2=0), no TF card (BIT1=0), and SPI-flash (bit 0 = 1);

0X03: No PC connection (BIT3=0), no U disk (BIT2=0), TF card (BIT1=1) and SPI-flash (Bit0 = 1);

0X05: No PC connection (BIT3=0), U disk (BIT2=1), no TF card (BIT1=0), SPI-flash (Bit0 = 1);

0X07: No PC connection (BIT3=0), U disk (BIT2=1), TF card (BIT1=1) and SPI-FLASH(BIT0=1).

Query the song name (CB) of the currently playing song.

Start Code	Length	Command	Check Code	End Code
7E	03	CB	CE	EF

Return Format

Operating Code	Return value (hexadecimal)
0XCB	XX (8 bytes)

The returned data is represented by ASCLL code. If the song name is less than 8 bytes, the insufficient data will be returned in 20H.

Query the total number of FLASH tracks (CC)

Start Code	Length	Command	Check Code	End Code
7E	03	CC	CF	EF

Return Format

Operating Code	Return value (hexadecimal)
0XCC	XX（8 bytes）

Query Current Work (D0)

Start Code	Length	Command	Check Code	End Code
7E	03	D0	D3	EF

Return Format

Operating Code	Return value (hexadecimal)
0XD0	0、SPI-flash 1、TF card 2、USB drive 3、Bluetooth 4、PC

Inquire about electricity quantity (E1)

Start Code	Length	Command	Check Code	End Code
7E	03	E1	E4	EF

Return Format

Operating Code	Return value (hexadecimal)
0XE1	XX

6.9. Functional instructions

Insertion instruction (B1)

Start Code	Length	Command	Marking word	High Track	Low Track	Check Code	End Code
7E	06	B1	01	00	01	XX	EF

Note: When receiving this instruction, pause the currently playing track, then execute the playing track specified in this instruction, and then play the originally paused track after playing (the deviation can be within 1 second or the whole second).

When the first insertion order is not finished, when the second insertion order is sent, the order is invalid. Only after the first interrupted music is played can the interrupted music be interrupted again. Interruptions between the same device or different devices are supported.

Marking word:　→00；means：Designated index address in insert FLASH

→01；means：Designated index address in inserted TF card；

→02；means：Specify the index address in the inserted USB flash drive.

Specify EQ mode (B2)

Start Code	Length	Command	Parameter	Check Code	End Code
7E	04	B2	00：Normal（default）	B6	EF
			01：Pop	B7	
			02：Rock	B8	
			03：Jazz	B9	
			04：Classic	BA	
			05：Base	BB	

This command can adjust the audio playing effect, and there are five playing effects in total.

Normal (default):
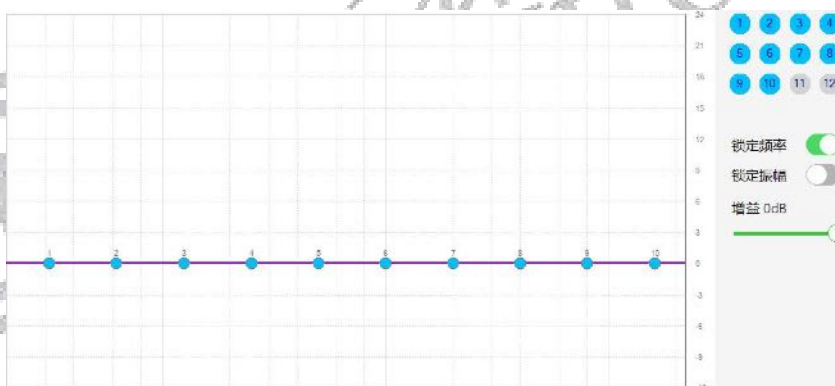
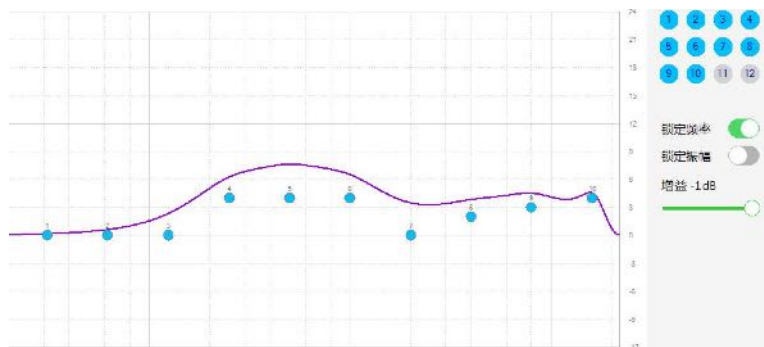

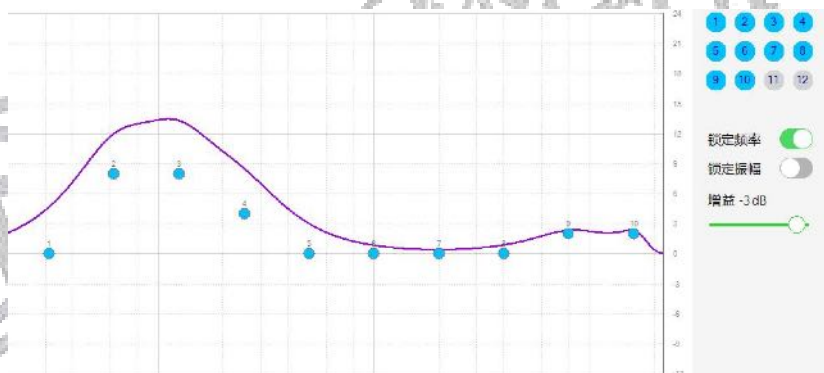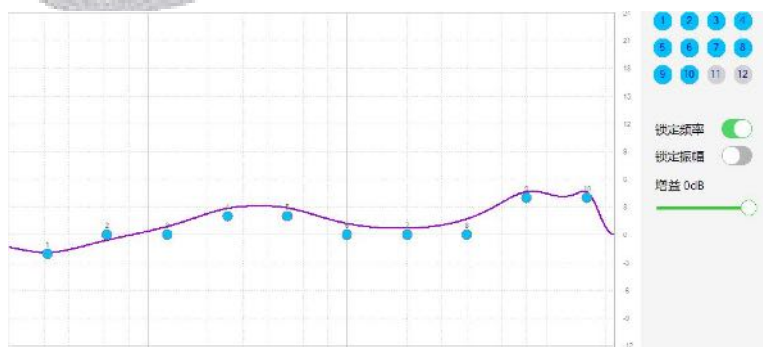Pop:
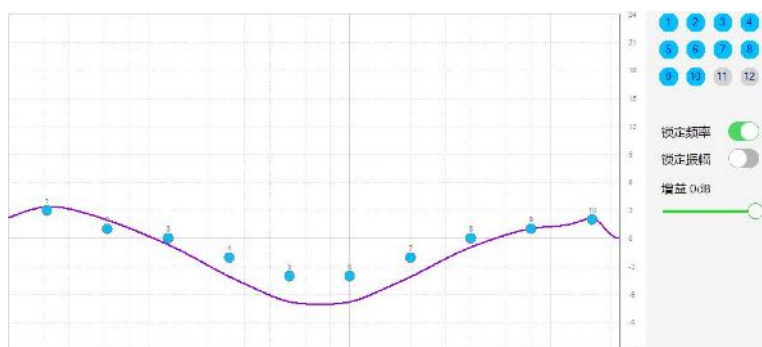
Rock:
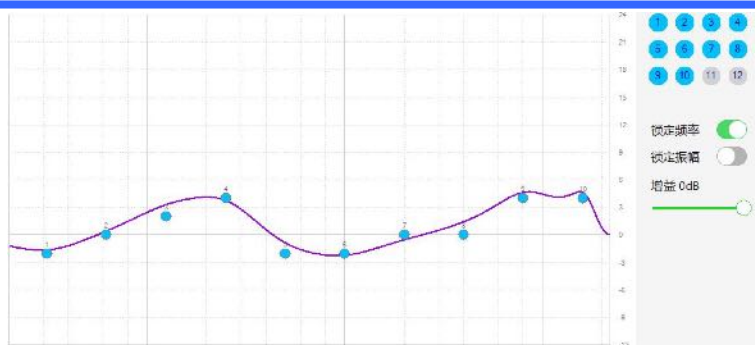
Jazz:

Classic:

Base:

Insert file name (B5)

Start Code	Length	Command	Mark Word	File Name(high-low)				Check Code	End Code
7E	08	B5	XX	54	30	30	32	XX	EF

Note: When receiving this instruction, pause the currently playing track, then execute the playing track specified in this instruction, and then play the originally paused track after playing (the deviation can be within 1 second or the whole second).When the first insertion order is not finished, when the second insertion order is sent, the order is invalid. Only after the first interrupted music is played can the interrupted music be interrupted again. Interruptions between the same device or different devices are supported.

Marking word: →00; means: Specify the index address in the insert FLASH;

→01; means: Designated index address in inserted TF card;

→02; means: Specify the index address in the inserted USB flash drive.

Switch the current working mode (BB)

Start Code	Length	Command	Check Code	End Code
7E	03	BB	BE	EF

If it is currently in Bluetooth mode, send this command, then switch to audio mode, and the correct return code is 02; If the current mode is audio mode, send this command to switch to Bluetooth mode, and the correct return code is 00.

Note: If TF card and U disk do not exist, it can only be in Bluetooth mode and cannot be switched to audio mode.

Switch letter (BE)

Start Code	Length	Command	Parameter	Check Code	End Code
7E	04	BE	00	C2	EF

Parameter: →00; means: Switch to TF card

→01; means: Switch to USB flash drive

U disk copy (E7)

Start Code	Length	Command	Check Code	End Code
7E	03	E7	EA	EF

Note: This function is only used in MP3 mode. If it is not MP3 mode, it needs to send the switching mode.

Telephone answering instruction (BC)

Start Code	Length	Command	Check Code	End Code
7E	03	BC	BF	EF

Enter this command when calling to connect the phone. Note: It must be valid in Bluetooth mode.

Hang-up instruction (BD)

Start Code	Length	Command	Check Code	End Code
7E	03	BD	C0	EF

Enter this command when the phone is connected to hang up the phone. Note: It must be valid in Bluetooth mode.

Disconnect Bluetooth link (BF)

Start Code	Length	Command	Check Code	End Code
7E	03	BF	C2	EF

After Bluetooth is disconnected, if the Bluetooth device wants to connect the module again, it needs to be manually connected.

Modify Bluetooth name (D1) (maximum 20 bytes)

Start Code	Length	Command	Parameter1	Parameter2	Check Code	End Code
7E	XX	D1	00	XX(0~20 bytes)	XX	EF

Note: Bluetooth name is written in ASCLL code, which can support up to 20 bytes (length, parameters and check code should be calculated according to Bluetooth name), for example: 7e0dd101 57 54 32 36 35 5f4c53 55ef.

Length: 0D, command: D1, parameter 1: 00 as audio Bluetooth; 01 is BLE Bluetooth, parameter 2: 57 54 32 36 30 35 5F 4C53 (namely Bluetooth name), check code: 55, after setting, the Bluetooth name can be changed to WT2605_LS; ; When modifying, if the song is playing, it will stop playing. After modifying, you must switch to Bluetooth mode or power on again before updating the Bluetooth name.

Query the current Bluetooth name (D2)

Start Code	Length	Command	Parameter	Check Code	End Code
7E	04	D2	XX	XX	EF

Parameter：　00 indicates→Audio Bluetooth

　　　　　　01 indicates→BLE Bluetooth

Return Format

Operating Code	Return value (hexadecimal)
0XD2	XX (12 bytes, and the insufficient part is represented by 00.)

Query the current Bluetooth MAC address (D3)

Start Code	Length	Command	Check Code	End Code
7E	03	D3	D6	EF

Return Format

Operating Code	Return value (hexadecimal)
0XD3	XX (6 bytes)

Set up automatic answering when calling (D6)

Start Code	Length	Command	Parameter	Check Code	End Code
7E	04	D6	XX	XX	EF

Parameter：　01 means→Don't answer the call automatically.

　　　　　　02 means→Automatically answer incoming calls.

Set the receiving channel during the call (D7)

Start Code	Length	Command	Check Code	End Code
7E	03	D7	DA	EF

Note: When the module is in the call state, send this command to switch the call channel between the mobile phone and Bluetooth.

Redial last call instruction (DB)

Start Code	Length	Command	Check Code	End Code
7E	03	DB	DE	EF

Note: This command is used to replay the last call.

6.11. Operation video

Video Links:
1、BLE 蓝牙使用方法←1. How to use BLE Bluetooth
2、MIC 录音介绍←MIC recording introduction
3、常用播放指令←Common play instruction
4、音频蓝牙+录音←Bluetooth audio+recording

7. Parameter

7.1. Audio Playing Parameters

Audio format	Sampling rate	bit rate	Sound Track	Position speed	TF Card	USB Drive	Flash
MP3	≤48K	≤320Kbps	1/2	16	√	√	√
WAV	≤44.1K	≤384Kbps	1/2	16	√	√	×

Table 3 Audio Parameters

7.2. Bluetooth Radio Frequency Characteristics

transmitting terminal	Unit	Minimum	Typical Value	Maximum	Bluetooth Specification
Radio frequency output power	dBm	0	3	5	-6~5
frequency range	GHz	2.4	-	2.4835	2.4~2.5
Initial carrier frequency tolerance	KHz	-50	-20	50	-75~75
Carrier frequency drift	KHz/50us	-	2	20	<=20

Table 4 Characteristics of transmitter

receiving terminal	Unit	Minimum	Typical Value	Maximum	Bluetooth Specification
sensitivity	dBm	-80	-75	-70	<=-70

Maximum received signal	dBm	−20	−10	–	>=−20

Table 5 Receiver characteristics

7.3. Electrical Parameters

Power consumption: power supply voltage 3.6V

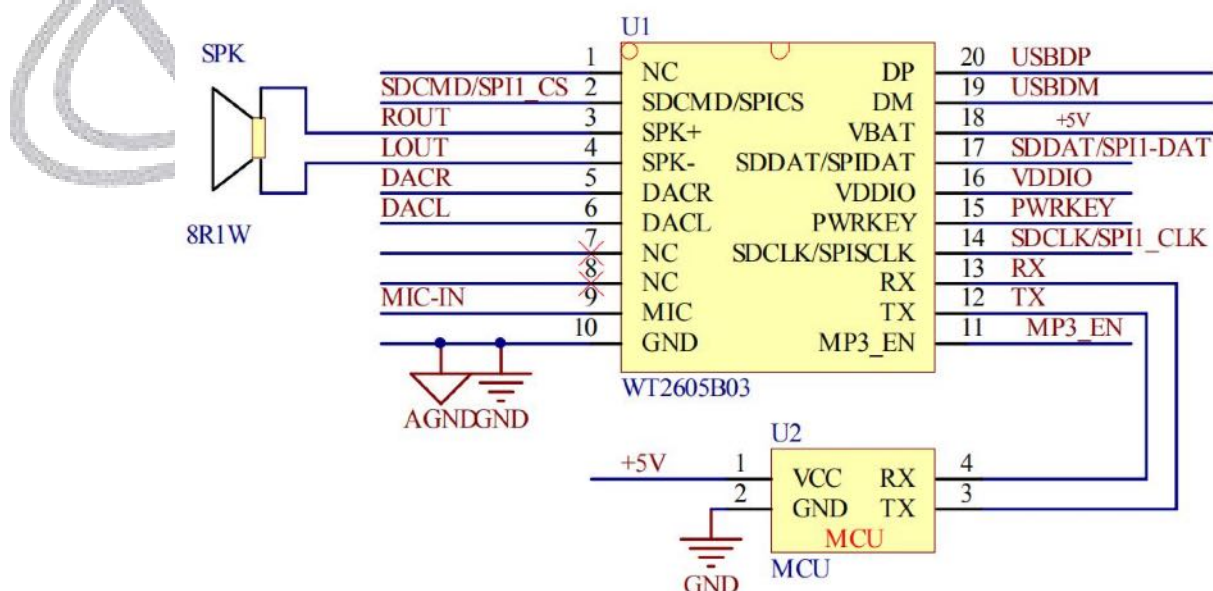| Working Stage	Play missed speakers	Bluetooth is not connected	Connected Bluetooth is not playing
Electrical Current (mA)	20	15	18

7.4. Temperature range

Working Temperature： −40℃ ~ +85℃

8. Application Circuit Diagram

8.1. Application circuit for directly driving horn

Note: the IO port of WT2605B03-R is 3.3V level, so it can be directly connected with the 3.3V MCU. Connecting with 5V single chip computer needs to add level conversion circuit.
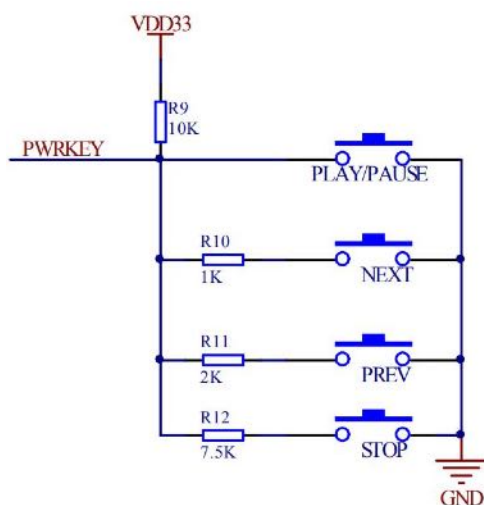
8.2. External power amplifier circuit
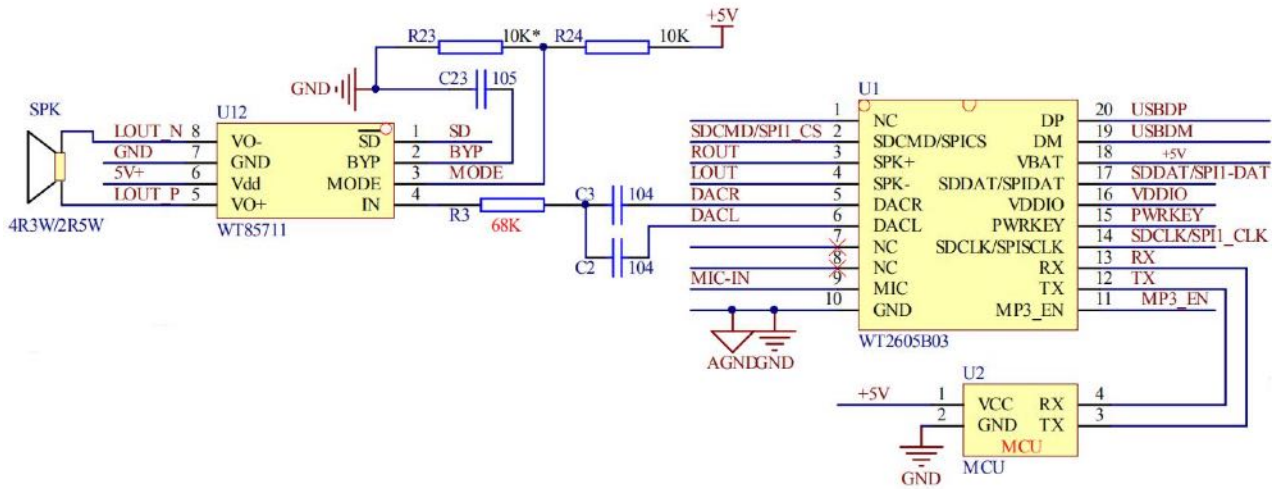
The SD pin of the power amplifier is turned on by pulling high and turned off by pulling low. It is recommended to use MCU to control it. When MCU has no extra IO port, it is recommended to connect 10K pull-up resistor.
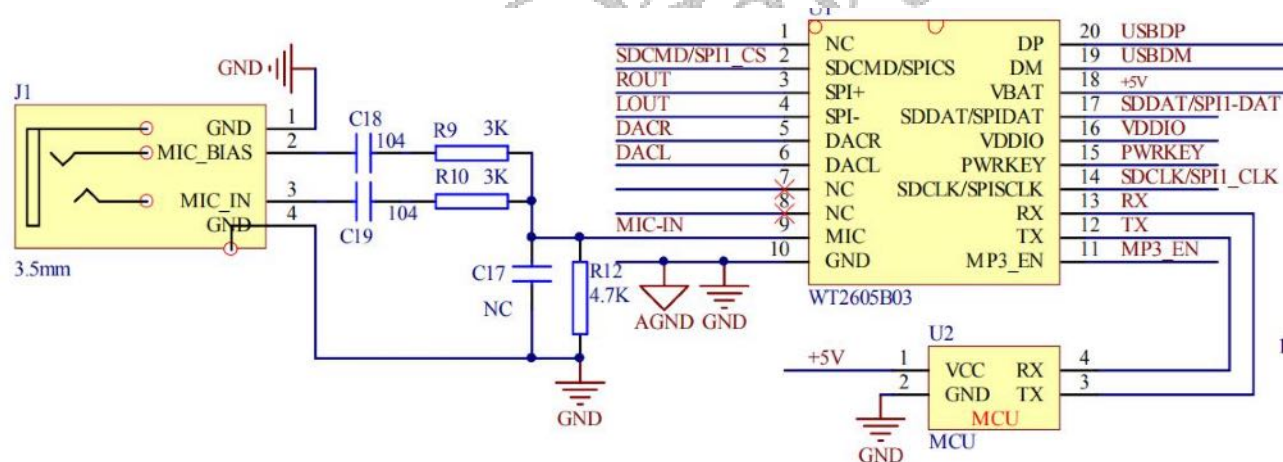
8.3. Schematic diagram of TF card /U disk
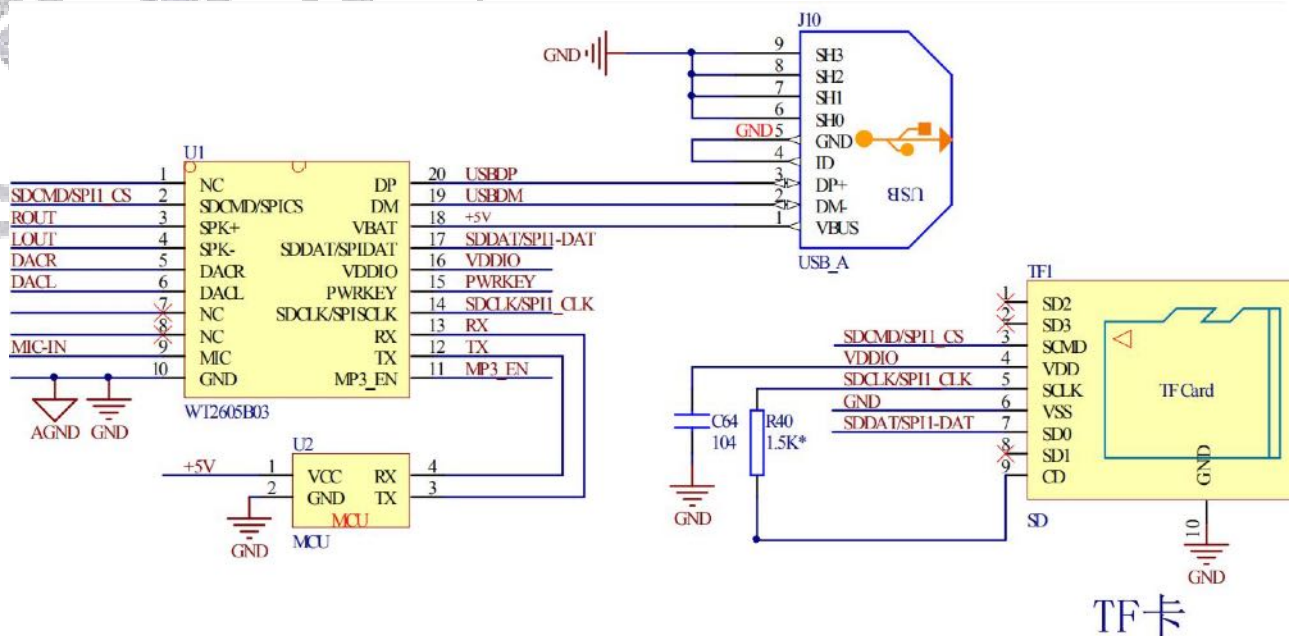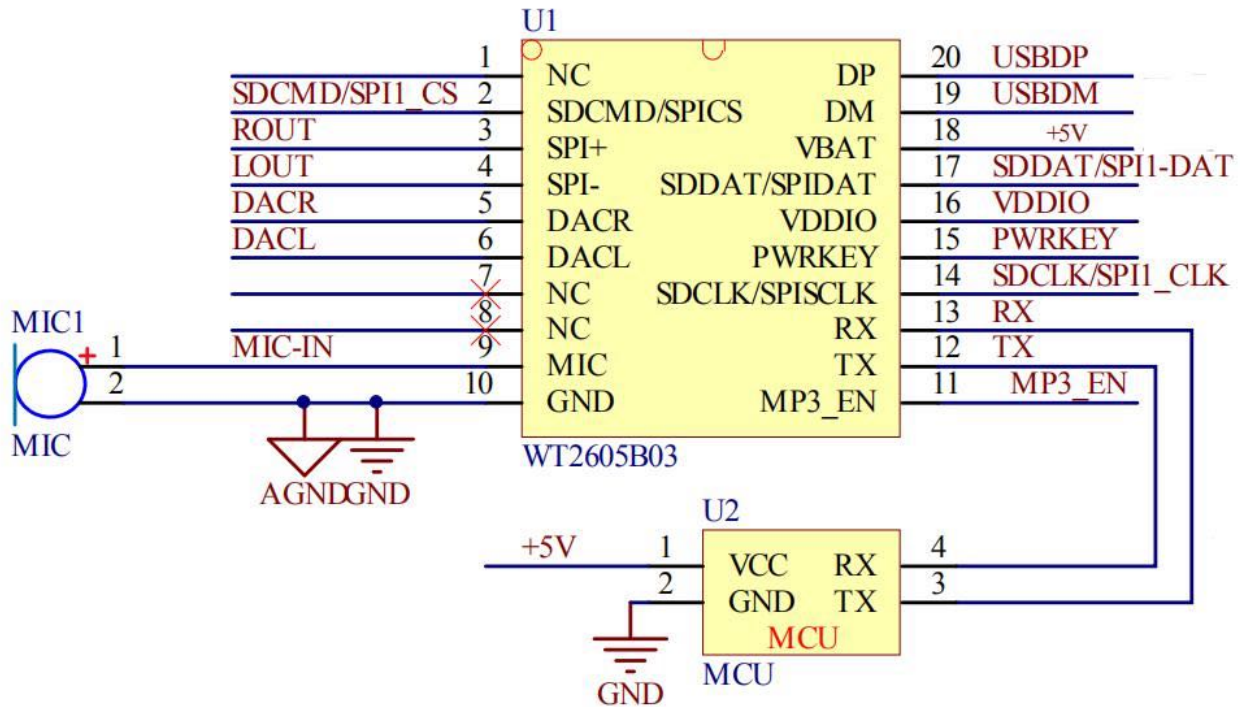
8.4. Key schematic diagram

Note:

Key resistance of standard program: play/pause: 0R Previous: 1K Next: 2K Stop: 7.5K

8.5. MIC/ Line Recording Circuit Diagram

9. Pay Special Attention to

1.The position of Bluetooth chip should not be wired or copper laid as far as possible, especially near the antenna.

2.Usually, the antenna of Bluetooth chip is placed as close to the edge of PCB as possible, and the PCB antenna is slotted.

3.In order to make the performance of the antenna intact, the antenna transmission line should be straight as far as possible, and the antenna should be placed on the top or bottom floor, and no holes should be punched. The distance between the antenna and copper laying should be more than twice that of normal copper laying.

3.The trace length of the antenna transmission line should be as short as possible, and the surface layer should be taken. The length of the antenna is generally 30mm.

4.AGND and GND outside the chip need to be interconnected at a single point at the power inlet.

5.The working voltage range of the chip is 3.6V-5.0V If it is lower than (possibly noisy) or higher than the working voltage range, it is easy to cause the chip to work unsteadily.

10.　Chip Size Drawing