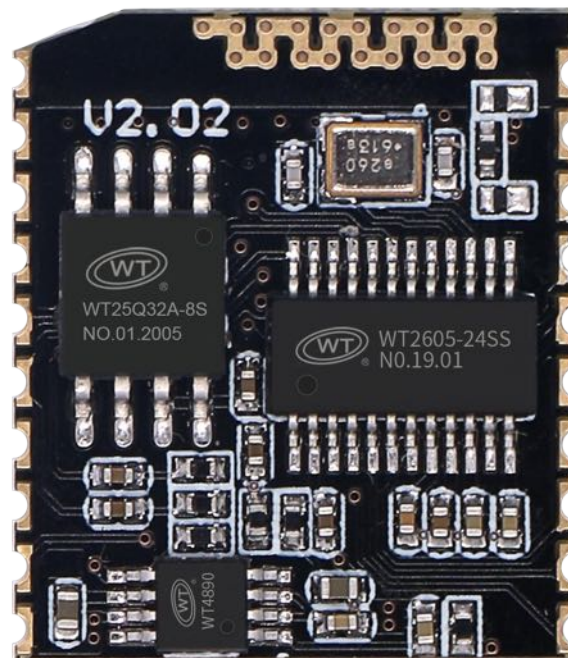


WT2605XB04-RF Recording Module

V1.00



Note :

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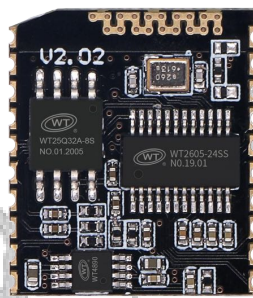
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1.Introduction of the Product

1.1. Description

WT2605XB04-RF is a high-quality MP3 voice codec module developed by Shenzhen Waytronic Electronics Co., Ltd., which contains a powerful DSP (Digital Signal Processor) core, which can access and interact with external devices through UART interface, and is easy to operate. SPI Flash is mainly used as the storage medium, which supports voice file data management, and users can flexibly read and write the audio data of SPI FLASH. The built-in analog interface of the module provides users with high-quality audio input and output.



1-wt2605xb04-appearance of RF module

1.2. Function

- Wide voltage operation, voltage range of 3.0V-5.0V ..
- The module is small in size, 18.2 * 21.2 * 0.8mm.
- Built-in 1W power amplifier can directly drive 8 ohm /1W speakers.
- Standard UART communication interface, baud rate supports 512000 bps at most.
- WT2605 is adopted as the core, and SPI-FLASH is supported for storing MP3 audio data.
- SPI Flash comes standard with 32m, and spiflash supports up to 128M.

- Audio codec supports 16-bit stereo DAC.
- **UART supports online updating of audio files stored in SPI Flash.**
- The USB interface can realize the function of reading U disk, and supports copying audio files to SPI FLash through U disk.
- **Spiflash supports file management, deleting or updating any voice.**
- **Support audio file data reading.**
- **MIC recording is supported.**

1.3. Application

- Elevator floor announcer, voice prompter and other peripheral products.
- Smart home, smart city, smart animal husbandry, etc.
- Internet radio.
- Electronic navigation system.
- Traffic, underground positioning and alarm.
- Intelligent charging equipment (charging treasure, charging pile, etc.).

1.4. Brief Introduction of the Application

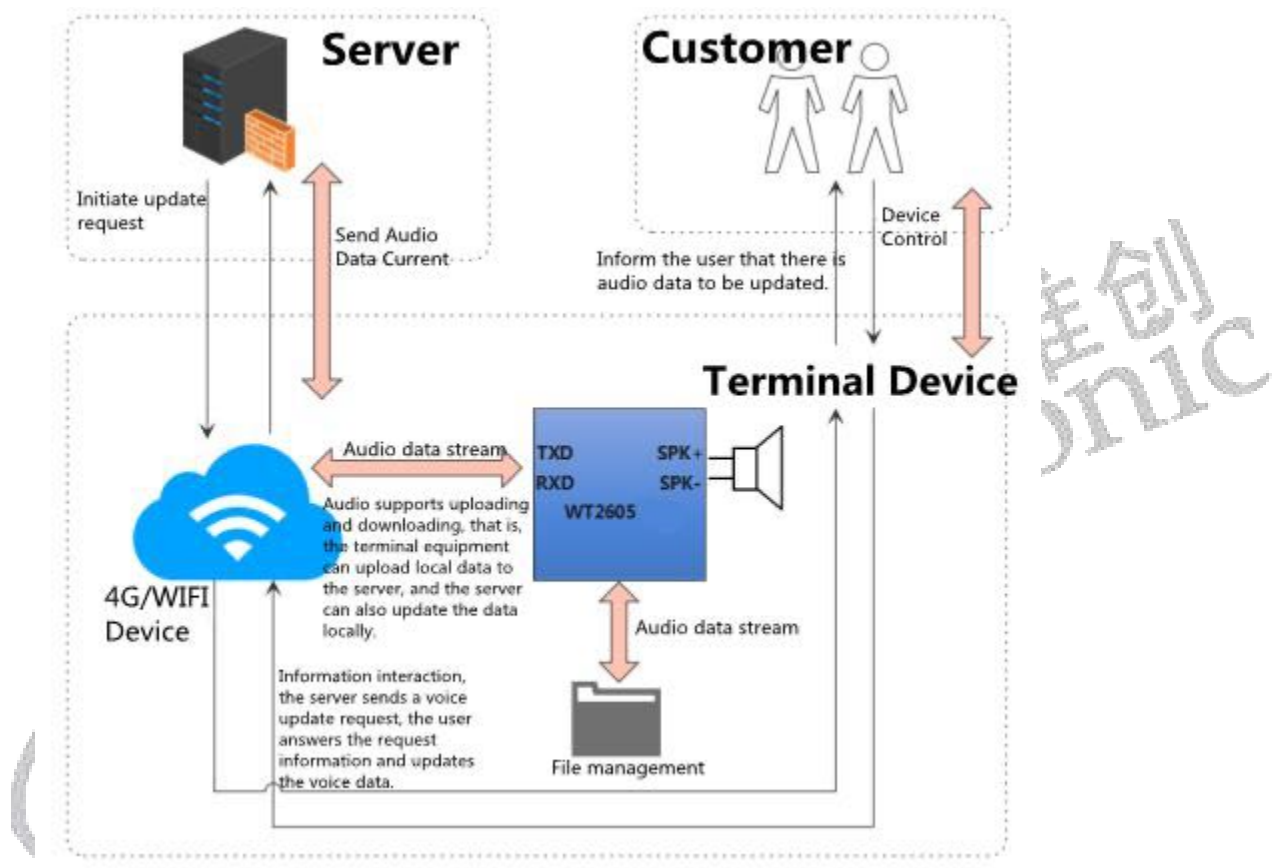
The following figure describes the use flow of WT2605XB04-RF module in the scenario of remote voice update:

1.5. Overview of SPI Flash Document Management

SPI Flash storage is mainly divided into two areas: fixed voice area and non-fixed voice area. The voice files of the two areas support dynamic management (that is, the allocated space of the two areas is not fixed).

Fixed voice area: the voice files in the fixed voice area can only be copied to the SPI Flash fixed voice area through U disk, and reading and writing the SPI Flash fixed voice area files through UART interface is not supported; The files in the general fixed voice area are used to play some audio files that do not need to be modified, such as some fixed prompts or advertising slogans.

Non-fixed voice area: the voice files in the non-fixed voice area can be copied by U disk or operated by UART interface. It is generally used in some scenes where voice needs to be changed remotely, such as some things interconnected products (shared charging equipment, charging piles, outdoor alarm equipment), and voice files can be dynamically updated through UART interface by wireless products such as WiFi, Bluetooth, ZigBee and 4G.



Note: The fixed voice area and the non-fixed voice area are controlled by different instructions. The fixed voice area only supports index serial number playback, while the non-fixed voice area supports file name playback.

2. Definition of the PIN

The module has a total of 20 pins, as shown below:

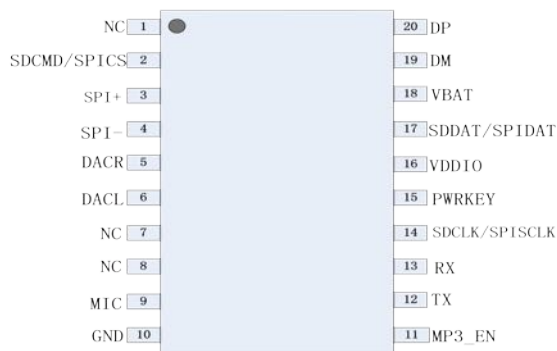


Chart 2-WT2605XB04-Pin Distribution of RF Module

PIN	Name	Type	Explanation
1	NC		Empty foot
2	SDCMD/SPICS	I/O	Chip select terminal of SPI-FLASH internal memory
3	SPI+	O	Horn terminal 1W 8R
4	SPI-	O	Horn terminal 1W 8R
5	DAC R	O	DAC right channel output
6	DAC L	O	DAC left channel output
7	NC	NC	Empty foot
8	NC	NC	Empty foot
9	MIC	I	MIC interface
10	GND	POW	Power ground
11	MP3_EN	NC	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	Internal FLASH clock pin
15	PWRKEY	I	Empty foot
16	VDDIO	POW	Internal 3.3V digital power supply
17	SDDAT/SPIDA	I	Internal FLASH data pin
18	VBAT4.2V	POW	Module power supply terminal
19	DM	I/O	USB data terminal DM
20	DP	I/O	USB data terminal DP

Chart 3-WT2605XB04-RF Module Pin Definition

Definition UART Communication Protocol

3. UART Communication Protocol

UART Communication Protocol

3.1. UART communication connection

WT2605XB04-RF module UART is TTL 3.3V level, and UART interface hardware connection mode is shown in the figure below:

3.2. UART Communication Byte Format

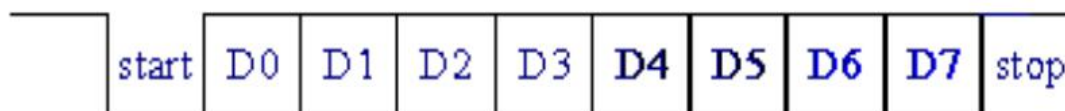
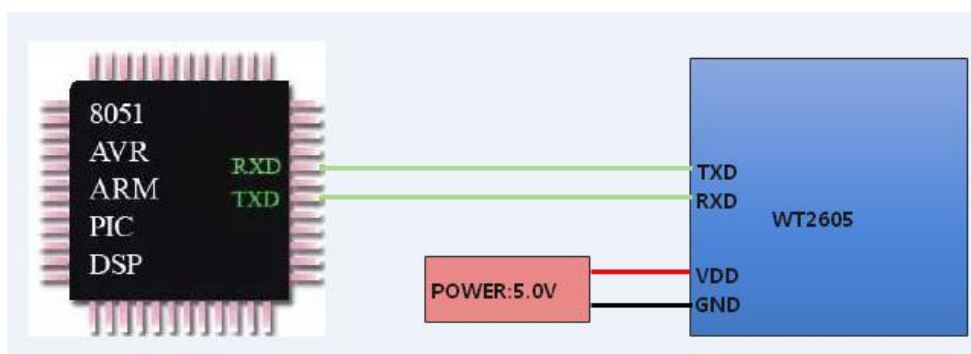


Chart 5-UART bus timing diagram

- ◆ Protocol name: UART
- ◆ Baud rate: 512000 bps
- ◆ Start bit: 1 bit
- ◆ Data bits: 8 bits
- ◆ Stop bit: 1 bit
- ◆ Check digit: none

3.3. UART Communication Commend Format

The communication protocol mainly defines the interaction rules between the processor and WT2605XB04-RF module, how the processor pushes the data to WT2605XB04-RF module for corresponding processing, and WT2605XB04-RF module feeds back the corresponding processing results. Communication data is



mainly in the form of command frame. An effective command frame must include five parts: frame header, command packet length, command packet, check code and frame trailer.

Frame Header	Command package length	Command Packet	Check code	Frame tail
0x7E (1 byte)	0xXX (1 byte)	data (N byte)	0xXX (1 byte)	0xEF (1 byte)

Chart 6-Command Frame Packaging Format

The frame header is represented by a fixed hexadecimal data, and the frame type includes a downlink command frame (the command frame received by the module) and an upload command frame (the command frame fed bACK by the module after receiving the data, that is, ack or NAK).

Command packet length means the number of bytes in the command frame except the header and trailer, that is, command packet length (1 byte)+command packet (n bytes)+check code (1 byte) = N+2 bytes.

Command package is a specific command, which mainly includes: command+parameters.

Check code, which is the sum of command packet length and command packet.

name	length	explanation
frame header	1 byte	"0x7E" defined as hexadecimal
Command package length	1 byte	Command to remove the number of bytes in the header and trailer of the frame, N+2 bytes.
Command package	N bytes	Command word+parameter, refer to the description of each command for details.
check code	1 byte	Checksum = [\sum (command packet length+command packet)] & 0xFF
Frame tail	1 byte	"0xEF" defined as hexadecimal

Chart 7-Command Frame Description

3.4. Upload Command Frame

The upload command frame refers to the command packet sent by WT2605XB04-RF module to the processor, which mainly contains the processing result of WT2605XB04-RF module and the message push of the current running state.

Command	Command Word	Parameter	Type	Description
Communication Result	0xXX	0x00	ACK	Communication result feedback is mainly used to command whether the frame is valid or not.
		0x01	NAK	Communication result feedback, error in

Feedback				receiving command frame
		0x02	NAK	Communication result feedback, file does not exist or parameters are wrong.
		0x05	NAK	Communication result feedback, external device does not exist.
End Feedback	0xC2	0x02	NOTIFY	End of broadcast feedback
Peripheral Plug Feedback	0xCA	0xFF	NOTIFY	Peripheral plugging and unplugging feedback, pushing when plugging and unplugging U disk, refer to Table 20.

Chart 8-Overview of Upload Commands

3.5. Downlink Command Frame

Downlink command frame refers to the command packet sent by the processor to WT2605XB04-RF module, which mainly includes the following instructions:

order	Command Word	explain
Index play command	0xA0	Play the voice files in the FLash fixed voice area according to the index number.
Specify file name playback command.	0xA1	Play the voice file in FLash according to the file name.
Pause command	0xAA	Pause the current voice.
Stop playing command	0xAB	Stop playing the current voice
Next play command	0xAC	Play the next voice
Last play command	0xAD	Play the previous voice
Volume setting command	0xAE	Set playback volume
Version query command	0xC0	Query firmware version
Volume inquiry command	0xC1	Query the currently set volume.
Status inquiry command	0xC2	Query the current working status
Peripheral connection status inquiry command	0xCA	Query the current peripheral connection status.
Total track query command	0xCC	Query the total number of voice files in the non-fixed voice area of FLash
MIC recording command	0xD5	MIC recording command, stored in non-fixed voice area
Delete track command	0xDC	Delete a voice file in the non-fixed voice area of FLash according to the index number.
Delete all command	0xDD	Delete all voice files in the non-fixed voice area of FLash

Fixed voice copy command	0xE7	Copy MP3 file in U disk to fixed voice area in FLash
Non-fixed voice copy command	0xE8	Copy MP3 files in U disk to non-fixed voice area in FLash
Voice update command	0xF0	Specify voice update in Flash by index.
Read file data command	0xF3	Reading voice file data in Flash
Breakpoint file query command	0xF9	Query the breakpoint position when the voice file is updated, and return 0 if there is no breakpoint.
Enter voice update mode.	0xFA	Enter voice update mode.
Serial port setting command	0xFB	Set baud rate of serial port
Timeout setting command	0xFC	Set the timeout for voice file update. If the timeout occurs, the voice update mode will be exited and the current breakpoint position will be recorded.
Voice information setting command	0xFD	Set some information data of voice file update, such as the total number of voice files to be updated at present.
Update command of breakpoint	0xFE	Voice breakpoint update command, continue to update from the position of the last breakpoint.

Chart 9-Overview of Downloading Commands

3.5.1. Index Play Command

Name	Sent Data		Explanation				
Command Word	0xA0		Play the voice files in the FLash fixed voice area according to the index number.				
Parameter List	[INDEX H] Index number high byte	Play the high byte of voice index number in FLash, and form the track number to be played with the low byte of index number; [0x00~0xFF] Valid value;					
	[INDEX L] Index number low byte	Play the low byte of voice index number in FLash, and form the track number to be played with the high byte of index number; [0x00~0xFF] Valid value;					
Command frame format structure	Frame Header	Command Packet Length	Command Packet		Check Code	Frame Tail	
	0x7E	0x05	0xA0	INDEX H	INDEX L	CHK	0xEF
Example	Play the first voice in FLash:						
	0x7E	0x05	0xA0	0x00	0x01	0xA6	0xEF
	As a result, successful execution (ACK):						
	0x7E	0x04	0xA0	0x00	0xA4	0xEF	
	As a result, execution failed, file does not exist (NAK):						

	0x7E	0x04	0xA0	0x02	0xA6	0xEF
As a result, execution failed, SPI Flash is not online (NAK):						
	0x7E	0x04	0xA0	0x05	0xA9	0xEF

Chart 10-Index voice play command

3.5.2. Specify File Name Playback Command

Name	Sent Data	Explanation
Command Word	0xA0	Play the voice in the non-fixed voice area of Flash according to the file name.
Parameter List	[FILE NAME] File name	The file name can support up to 8 bytes, and the file name is represented by hexadecimal ASC code; 【 Please refer to ASC code table 】 Valid values;
Command frame format structure	Frame Header	Command Packet Length
	0x7E	0x05
	0xA1	FILE NAME
	CHK	0xEF
Example	Play the 0001.MP3 voice file in the non-fixed voice area of Flash:	
	0x7E	0x05
	0xA1	0x30
	0x30	0x30
	0x31	0x69
	0xEF	
As a result, successful execution (ACK):		
0x7E	0x04	0xA1
0x00	0xA5	0xEF
As a result, execution failed, file does not exist (NAK):		
0x7E	0x04	0xA1
0x02	0xA7	0xEF
As a result, execution failed, SPI Flash is not online (NAK):		
0x7E	0x04	0xA1
0x05	0xAA	0xEF

Chart 11-Specify file name to play voice command

3.5.3. Command of suspending to play

Name	Sent Data	Explanation
Command Word	0xAA	Stop playing the current voice
Command frame format structure	Frame Header	Command Packet Length
	0x7E	0x03
	0xAA	0xAD
	0xEF	
If Flash voice is currently playing, send the following command to pause the current play:		

Example	0x7E	0x03	0xAA	0xAD	0xEF	
	返回结果, 执行成功 (ACK):					
	0x7E	0x04	0xAA	0x00	0xAE	0xEF

Chart 12-Command of suspending to play

3.5.4. Command of stopping playing

Name	Sent Data		Explanation		
Command Word	0xAB		Stop playing the current voice		
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail
	0x7E	0x03	0xAB	0xAE	0xEF
Example	If FLash voice is currently playing, send the following command to pause the current play:				
	0x7E	0x03	0xAB	0xAE	0xEF
Example	As a result, successful execution (ACK):				
	0x7E	0x04	0xAB	0x00	0xAF

Chart 13-Command of stopping playing

3.5.5. Command of playing next one

Name	Sent Data		Explanation		
Command Word	0xAC		Play the next voice		
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail
	0x7E	0x03	0xAC	0xAF	0xEF
Example	If FLash voice is currently playing, send the following command to play the next voice:				
	0x7E	0x03	0xAC	0xAF	0xEF
Example	As a result, successful execution (ACK):				
	0x7E	0x04	0xAC	0x00	0xB0

Chart 14-Command of playing next one

3.5.6. Command of playing last one

Name	Sent Data		Explanation			
Command Word	0xAD		Play the previous voice			
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail	
	0x7E	0x03	0xAD	0xB0	0xEF	
Example	If FLash voice is currently playing, send the following command to play the previous voice:					
	0x7E	0x03	0xAD	0xB0	0xEF	
Example	As a result, successful execution (ACK):					
	0x7E	0x04	0xAD	0x00	0xB1	0xEF

Chart 15-Command of playing last one

3.5.7. Command of setting the voice volume

Name	Sent Data		Explanation			
Command Word	0xAE		Set playback volume			
Parameter List	[VOL]	Set the volume value of playback;				
	Volume value	[0x00~0x1E] Valid values; [0x14] Default value; [Other] invalid value;				
Command frame format structure	Frame Header	Command Packet Length	Command Packet		Check Code	Frame Tail
	0x7E	0x04	0xAE	VOL	CHK	0xEF
Example	Set the volume to level 30:					
	0x7E	0x04	0xAE	0x1E	0xD0	0xEF
	As a result, successful execution (ACK):					
	0x7E	0x04	0xAE	0x00	0xB2	0xEF
Example	As a result, execution failed (NAK):					
	0x7E	0x04	0xAE	0x02	0xB4	0xEF

Chart 16-Command of setting the voice volume

3.5.8. Command of version query

Name	Sent Data	Explanation
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Command Word	0xC0		Query firmware version number		
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail
	0x7E	0x03	0xC0	0xC3	0xEF
Example	Query the firmware version number:				
	0x7E	0x03	0xC0	0xC3	0xEF
	As a result, successful execution (ACK):				
	0x7E	0x04	0xC0	VERSION(5 byte)	CHK 0xEF

Chart 17-Command of version query

3.5.9. Command of voice volume query

Name	Sent Data	Explanation			
Command Word	0xC1	Query the current volume value.			
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail
	0x7E	0x03	0xC1	0xC4	0xEF
Example	Query the firmware version number:				
	0x7E	0x03	0xC1	0xC4	0xEF
	Return, successful execution, return the current volume value (ACK):				
	0x7E	0x04	0xC1	0xXX	CHK 0xEF
Return Parameters	【0x00~0x1E】 virtual value;				

Chart 18-Command of voice volume query

3.5.10. Command of status query

Name	Sent Data	Explanation			
Command Word	0xC2	Query the current working status			
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail
	0x7E	0x03	0xC2	0xC5	0xEF
Example	Query the current working status:				
	0x7E	0x03	0xC2	0xC5	0xEF
	Return, successful execution, return current status (ACK):				

	0x7E	0x04	0xC2	0XX	CHK	0xEF
Return Parameters	[0x01] MP3 play; [0x02] MP3 stops; [0x03] MP3 pause;					

Chart 19-Command of status query

3.5.11. Peripheral connection status inquiry command

Name	Sent Data		Explanation		
Command Word	0xCA		Query whether the current peripheral is connected.		
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail
	0x7E	0x03	0xCA	0xCD	0xEF
Example	Query the current working status:				
	0x7E	0x03	0xCA	0xCD	0xEF
Return Parameters	Return, successful execution, return current status (ACK):				
	0x7E	0x04	0xC2	0XX	CHK
Return Parameters	[0x00] No connection; [0x01] FLash; is connected; [0x05] FLash and U disk are connected				

Chart 20-Peripheral connection status inquiry command

3.5.12. Total track query command

Name	Sent Data		Explanation		
Command Word	0xCC		Query the total number of tracks in the non-fixed voice area of FLash		
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail
	0x7E	0x03	0xCC	0xCF	0xEF
Example	Query the total number of tracks in the non-fixed voice area of FLash:				
	0x7E	0x03	0xCC	0xCF	0xEF
Return Parameters	Return, successful execution, return current status (ACK):				
	0x7E	0x05	0xCC	TOTAL	CHK
Return Parameters	[0x00~0xFFFF] Valid values;				

Chart 21-Total track query command

3.5.13. Command of deleting voice track

Name	Sent Data		Explanation					
Command Word	0xDC		按照文件名删除 FLash 非固定语音区内语音，只删除一首					
Parameter List	[FILE NAME] File name		The file name can support up to 8 bytes, and the file name is represented by hexadecimal ASC code; 【 Please refer to ASC code table 】 Valid values;					
Command frame format structure	Frame Header	Command Packet Length	Command Packet		Check Code	Frame Tail		
	0x7E	LEN	0xDC	FILE NAME	CHK	0xEF		
Example	Delete the 0001.mp3 file in the non-fixed voice area of FLash:							
	0x7E	0x07	0xDC	0x30	0x30	0x31	0xA4	0xEF
	As a result, successful execution (ACK):							
	0x7E	0x04	0xDC	0x00	0xE0	0xEF		
Example	As a result, the execution failed, and the system is performing other operations (NAK):							
	0x7E	0x04	0xDC	0x01	0xE1	0xEF		

Chart 22-Command of deleting voice track

3.5.14. Command of deleting all

Name	Sent Data		Explanation			
Command Word	0xDD		Delete all voice files in the non-fixed voice area of FLash			
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail	
	0x7E	0x03	0xDD	0xE0	0xEF	
Example	If the FLash voice is currently playing, interrupt the current playing and delete it:					
	0x7E	0x03	0xDD	0xE0	0xEF	
	As a result, successful execution (ACK):					
	0x7E	0x04	0xDD	0x00	0xE1	0xEF
Example	As a result, execution failed (NAK):					
	0x7E	0x04	0xDD	0x01	0xE2	0xEF

Chart 23-Command of deleting all

3.5.15. Fixed voice copy command

Name	Sent Data		Explanation																									
Command Word	0xE7		Copy voice from U disk to FLash fixed voice area. U disk needs to store MP3 files.																									
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail																							
	0x7E	0x03	0xE7	0xEA	0xEF																							
Example	<p>If the FLash voice is currently playing, interrupt the current playing and delete it:</p> <table border="1"> <tr> <td>0x7E</td> <td>0x03</td> <td>0xE7</td> <td>0xEA</td> <td>0xEF</td> </tr> </table> <p>As a result, successful execution (ACK):</p> <table border="1"> <tr> <td>0x7E</td> <td>0x04</td> <td>0xE7</td> <td>0x00</td> <td>0xEB</td> <td>0xEF</td> </tr> </table> <p>As a result, the execution failed, and the FLash space was full (NAK):</p> <table border="1"> <tr> <td>0x7E</td> <td>0x04</td> <td>0xE7</td> <td>0x01</td> <td>0xEC</td> <td>0xEF</td> </tr> </table> <p>As a result, execution failed, SPI FLash is not online (NAK):</p> <table border="1"> <tr> <td>0x7E</td> <td>0x04</td> <td>0xE7</td> <td>0x05</td> <td>0xF0</td> <td>0xEF</td> </tr> </table>					0x7E	0x03	0xE7	0xEA	0xEF	0x7E	0x04	0xE7	0x00	0xEB	0xEF	0x7E	0x04	0xE7	0x01	0xEC	0xEF	0x7E	0x04	0xE7	0x05	0xF0	0xEF
0x7E	0x03	0xE7	0xEA	0xEF																								
0x7E	0x04	0xE7	0x00	0xEB	0xEF																							
0x7E	0x04	0xE7	0x01	0xEC	0xEF																							
0x7E	0x04	0xE7	0x05	0xF0	0xEF																							

Chart 24-Fixed voice copy command

3.5.16. Non-fixed voice copy command

Name	Sent Data		Explanation																									
Command Word	0xE8		Copy voice from U disk to FLash non-fixed voice area. U disk needs to store MP3 files.																									
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail																							
	0x7E	0x03	0xE8	0xEB	0xEF																							
Example	<p>If the FLash voice is currently playing, interrupt the current playing and delete it:</p> <table border="1"> <tr> <td>0x7E</td> <td>0x03</td> <td>0xE8</td> <td>0xEB</td> <td>0xEF</td> </tr> </table> <p>As a result, successful execution (ACK):</p> <table border="1"> <tr> <td>0x7E</td> <td>0x04</td> <td>0xE8</td> <td>0x00</td> <td>0xEC</td> <td>0xEF</td> </tr> </table> <p>As a result, the execution failed, and the FLash space was full (NAK):</p> <table border="1"> <tr> <td>0x7E</td> <td>0x04</td> <td>0xE8</td> <td>0x01</td> <td>0xED</td> <td>0xEF</td> </tr> </table> <p>As a result, execution failed, SPI FLash is not online (NAK):</p> <table border="1"> <tr> <td>0x7E</td> <td>0x04</td> <td>0xE8</td> <td>0x05</td> <td>0xF1</td> <td>0xEF</td> </tr> </table>					0x7E	0x03	0xE8	0xEB	0xEF	0x7E	0x04	0xE8	0x00	0xEC	0xEF	0x7E	0x04	0xE8	0x01	0xED	0xEF	0x7E	0x04	0xE8	0x05	0xF1	0xEF
0x7E	0x03	0xE8	0xEB	0xEF																								
0x7E	0x04	0xE8	0x00	0xEC	0xEF																							
0x7E	0x04	0xE8	0x01	0xED	0xEF																							
0x7E	0x04	0xE8	0x05	0xF1	0xEF																							

Chart 25-Non-fixed voice copy command

3.5.17. Voice update command

Sent Data	Explanation	Sent Data							
Command Word	0xF0	Update the voice in the non-fixed voice area of FLash according to the file name, and if there is a file with the same name in FLash, overwrite it; To send this instruction, you need to enter the voice update mode first. Please refer to: 3.6 Voice file update process.							
Parameter List	[FILE NAME] File name	The file name can support up to 8 bytes, and the file name is represented by hexadecimal ASC code; 【 Please refer to ASC code table 】 Valid values;							
	[FILE SIZE] File size	The file size is represented by 4 bytes, and the file size is represented by hexadecimal. [0x00~0xFFFFFFFF] Valid values;							
Command frame format structure	Frame Header	Command Packet Length	Command Packet			Check Code	Frame Tail		
	0x7E	LEN	0xF0	FILE NAME	FILE SIZE	CHK	0xEF		
Example	Write a 0001.MP3 voice file with a file size of 1MBytes(0x100000) in the non-fixed voice area of FLash:								
	0x7E	0x0B	0xF0	0x30	0x30	0x30	0x31	0x00	0x10
	0x00	0x00	0xCC	0xEF					
	As a result, the file name was created successfully (ACK):								
	0x7E	0x04	0xF0	0x00	0xF4	0xEF			
	As a result, creating file name failed (NAK):								
	0x7E	0x04	0xF0	0x02	0xF6	0xEF			
	As a result, execution failed, SPI Flash is not online (NAK):								
	0x7E	0x04	0xF0	0x05	0xF9	0xEF			
	Send MP3 data file until 1MBytes is sent:								
MP3 file data									
As a result, writing MP3 file data successfully (ACK):									
0x7E	0x04	0xF0	0x00	0xF4	0xEF				
As a result, writing MP3 file data failed with incomplete data (NAK):									
0x7E	0x04	0xF0	0x01	0xF5	0xEF				

Chart 26-Voice update command

3.5.18. Read file data command

Name	Sent Data	Explanation
Command Word	0xF3	Read the voice data in the non-fixed voice area of FLash according to the file name. Only one packet of

		data can be read at a time, and the packet length is 512 bytes.							
Parameter List	[FILE NAME] File name	The file name can support up to 8 bytes, and the file name is represented by hexadecimal ASC code; 【 Please refer to ASC code table 】 Valid values;							
	[PACKET] Data packet	The data packet is represented by 2 bytes, which indicates which packet data is currently read; [0x01~0xFFFF] Valid values; [0x00] Read the size of the file;							
Command frame format structure	Frame Header	Command Packet Length	Command Packet				Check Code	Frame Tail	
	0x7E	LEN	0xF3	FILE NAME	PACKET	CHK	0xEF		
Example	Get the size of 0001.MP3 voice file in the non-fixed voice area of Flash:								
	0x7E	0x09	0xF3	0x30	0x30	0x30	0x31	0x00	0x00
	0xBA	0xEF							
	As a result, successful execution (ACK):								
	0x7E	0x07	0xF3	FILE SIZE(4 字节)	0xF7	0xEF			
As a result, execution failed, SPI Flash is not online (NAK):									
0x7E	0x04	0xF3	0x05	0xF9	0xEF				
Get the first packet data of the FLash non-fixed voice area 0001.MP3 voice file:									
0x7E	0x09	0xF3	0x30	0x30	0x30	0x31	0x00	0x01	
0xBB	0xEF								
Return a packet of MP3 data file with a length of 512 bytes:									
MP3 file data									

Chart 27-Read file data command

3.5.19. Break Point file query command

Name	Sent Data	Explanation							
Command Word	0xF9	0Query the breakpoint position of the last updated voice file. If there is no breakpoint, the parameter is 0.							
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail				
	0x7E	0x03	0xF9	0xFC	0xEF				
Example	If the FLash voice is currently playing, interrupt the current playing and delete it:								
	0x7E	0x03	0xF9	0xFC	0xEF				
With breakpoint data, the number of the breakpoint file, the updated									

	file size and the file name (ACK) are returned: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #ADD8E6;">0x7E</td> <td style="background-color: #00FF00;">LEN</td> <td style="background-color: #FFD700;">0xF9</td> <td style="background-color: #FFD700;">NUMBER</td> <td style="background-color: #FFD700;">SIZE</td> <td style="background-color: #FFD700;">NAME</td> <td style="background-color: #FF0000;">CHK</td> <td style="background-color: #483D8B;">0xEF</td> </tr> </table> No breakpoint data, all parameters return to 0(ACK): <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #ADD8E6;">0x7E</td> <td style="background-color: #00FF00;">LEN</td> <td style="background-color: #FFD700;">0xF9</td> <td style="background-color: #FFD700;">0x00</td> <td style="background-color: #FFD700;">0x00</td> <td style="background-color: #FFD700;">0x00</td> <td style="background-color: #FF0000;">CHK</td> <td style="background-color: #483D8B;">0xEF</td> </tr> </table>	0x7E	LEN	0xF9	NUMBER	SIZE	NAME	CHK	0xEF	0x7E	LEN	0xF9	0x00	0x00	0x00	CHK	0xEF
0x7E	LEN	0xF9	NUMBER	SIZE	NAME	CHK	0xEF										
0x7E	LEN	0xF9	0x00	0x00	0x00	CHK	0xEF										
Return Parameters	[NUMBER] Update to which voice; [SIZE] The file size of the breakpoint file that has been updated; [NAME] The file name of the breakpoint file;																

Chart 28-Breakpoint file query command

3.5.20. Command to enter voice update mode

Name	Sent Data	Explanation																	
Command Word	0xFA	When entering the voice update mode, you must enter this mode to write audio data into the non-fixed voice area of SPI Flash through UART interface.																	
Command frame format structure	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #ADD8E6;">Frame Header</td> <td style="background-color: #00FF00;">Command Packet Length</td> <td style="background-color: #FFD700;">Command Packet</td> <td style="background-color: #FF0000;">Check Code</td> <td style="background-color: #483D8B;">Frame Tail</td> </tr> <tr> <td style="background-color: #ADD8E6;">0x7E</td> <td style="background-color: #00FF00;">0x03</td> <td style="background-color: #FFD700;">0xFA</td> <td style="background-color: #FF0000;">0xFD</td> <td style="background-color: #483D8B;">0xEF</td> </tr> </table>	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail	0x7E	0x03	0xFA	0xFD	0xEF								
Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail															
0x7E	0x03	0xFA	0xFD	0xEF															
Example	Enter voice update mode: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #ADD8E6;">0x7E</td> <td style="background-color: #00FF00;">0x03</td> <td style="background-color: #FFD700;">0xFA</td> <td style="background-color: #FF0000;">0xFD</td> <td style="background-color: #483D8B;">0xEF</td> </tr> </table> As a result, successful execution (ACK): <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #ADD8E6;">0x7E</td> <td style="background-color: #00FF00;">0x04</td> <td style="background-color: #FFD700;">0xFA</td> <td style="background-color: #FFD700;">0x00</td> <td style="background-color: #FF0000;">0xFE</td> <td style="background-color: #483D8B;">0xEF</td> </tr> </table> As a result, execution failed, SPI Flash is not online (NAK): <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #ADD8E6;">0x7E</td> <td style="background-color: #00FF00;">0x04</td> <td style="background-color: #FFD700;">0xFA</td> <td style="background-color: #FFD700;">0x05</td> <td style="background-color: #FF0000;">0x03</td> <td style="background-color: #483D8B;">0xEF</td> </tr> </table>	0x7E	0x03	0xFA	0xFD	0xEF	0x7E	0x04	0xFA	0x00	0xFE	0xEF	0x7E	0x04	0xFA	0x05	0x03	0xEF	
0x7E	0x03	0xFA	0xFD	0xEF															
0x7E	0x04	0xFA	0x00	0xFE	0xEF														
0x7E	0x04	0xFA	0x05	0x03	0xEF														

Chart 29-Command to enter voice update mode

3.5.21. Serial port setting command

Name	Sent Data	Explanation					
Command Word	0xFB	Set baud rate of serial communication with power-off memory.					
Parameters	[BUAD] Baud rate	Set baud rate of serial port, totally 5 files; 【0x01】 9600 bps; 【0x02】 19200 bps; 【0x03】 38400 bps; 【0x04】 115200 bps; 【0x05】 512000 bps; 【others】 Invalid value;					
Command	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #ADD8E6;">Frame</td> <td style="background-color: #00FF00;">Command</td> <td style="background-color: #FFD700;">Command</td> <td style="background-color: #FF0000;">Check</td> <td style="background-color: #483D8B;">Frame</td> </tr> </table>	Frame	Command	Command	Check	Frame	
Frame	Command	Command	Check	Frame			

frame format structure	Header	Packet Length	Packet		Code	Tail
	0x7E	0x04	0xFB	BUAD	0xFD	0xEF
Example	Set baud rate to 115200:					
	0x7E	0x04	0xFB	0x04	0x03	0xEF
	As a result, setting succeeded (ACK):					
	0x7E	0x04	0xFB	0x00	0xFF	0xEF
Example	As a result, setting failed (NAK):					
	0x7E	0x04	0xFB	0x01	0x00	0xEF

Chart 30-Serial port setting command

3.5.22. Command of setting overrun time

Name	Sent Data	Explanation				
Command Word	0xFC	Set the timeout of voice update file. After the timeout, the voice update mode will be exited and the breakpoint information of the current file will be recorded.				
Parameters	[TIME] 超时时间	Set the timeout, two bytes; [0x01~0xFFFF] Valid values; [0x0F] Default value; [unit] second;				
Command frame format structure	Frame Header	Command Packet Length	Command Packet		Check Code	Frame Tail
	0x7E	0x05	0xFC	TIME	0xFD	0xEF
Example	Set the timeout to 30S:					
	0x7E	0x05	0xFC	0x00	0x1E	0xEF
	As a result, setting succeeded (ACK):					
	0x7E	0x04	0xFC	0x00	0x00	0xEF

Chart 31-Command of setting overrun time

3.5.23. Voice information setting command

Name	Sent Data	Explanation
Command Word	0xFD	Set the information of voice update files, mainly including the total number of files for this voice update, which is convenient for recording breakpoint information.
Parameters	[NC] reserve	This bit is reserved; [0x00] Default value, which cannot be set to other values;

	[TOTAL] File number	The total number of files to update the voice this time, which is represented by two bytes; [0x01~0xFFFF] Valid values;						
Command frame format structure	Frame Header	Command Packet Length	Command Packet			Check Code	Frame Tail	
	0x7E	0x06	0xFD	0x00	TOTAL	CHK	0xEF	
Example	Set and update 5 voice files this time:							
	0x7E	0x06	0xFD	0x00	0x00	0x05	0x08	0xEF
	As a result, setting succeeded (ACK):							
	0x7E	0x04	0xFD	0x00	0x01	0xEF		

Chart 32-Voice information setting command

3.5.24. Command of settling voice message

Name	Sent Data	Explanation						
Command Word	0xFE	Voice breakpoint update command, continue to update from the position of the last breakpoint.						
Command frame format structure	Frame Header	Command Packet Length	Command Packet	Check Code	Frame Tail			
	0x7E	0x03	0xFE	0x01	0xEF			
Example	Get the breakpoint location of the last updated file:							
	0x7E	0x03	0xF9	0xFC	0xEF			
	Return breakpoint information (ACK):							
	0x7E	LEN	0xF9	NUMBER	SIZE	NAME	CHK	0xEF
	Continue to update the file from the breakpoint:							
	0x7E	0x03	0xFE	0x01	0xEF			
	As a result, successful execution (ACK):							
	0x7E	0x04	0xFE	0x00	0x02	0xEF		
Send MP3 file data:								
MP3 file data								
As a result, the update succeeded (ACK):								
	0x7E	0x04	0xFE	0x00	0x02	0xEF		

Chart 33-Command of settling voice message

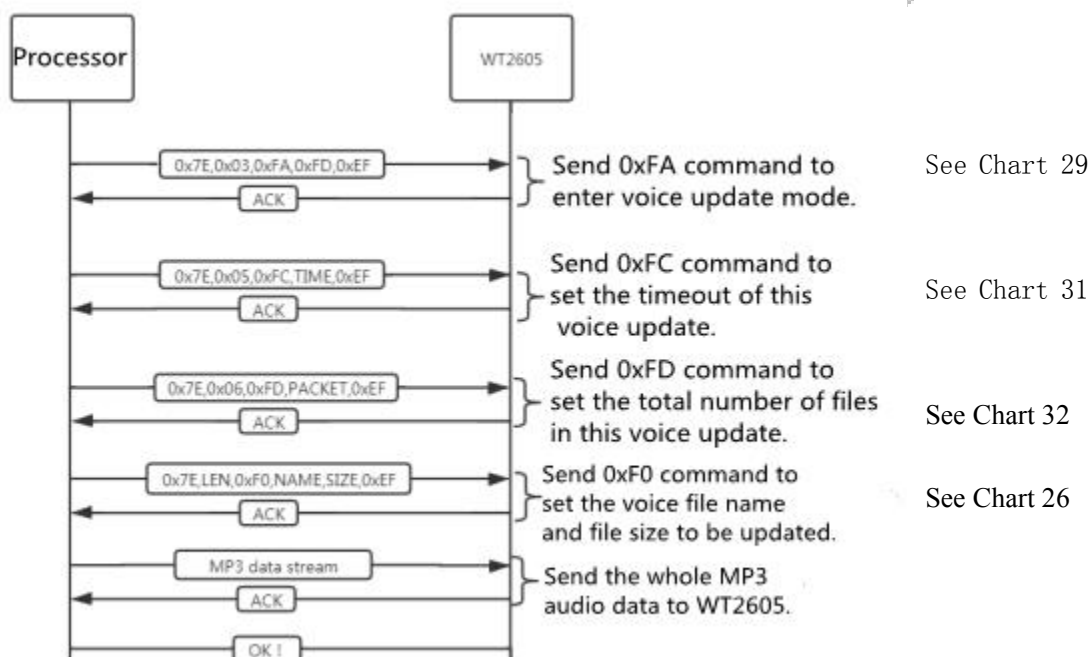
3.5.25. Command of MIC Recording

Name	Sent Data	Explanation
Command	0xD5	MIC recording command, according to the specified file

Word		name to generate a recording file							
Parameters	[NC] Reserve	This bit is reserved; [0x01] Default value, which cannot be set to other values;							
	[FILE NAME] File Name	The file name can support up to 8 bytes, and the file name is represented by hexadecimal ASC code; 【 Please refer to ASC code table 】 Valid values;							
Command frame format structure	Frame Header	Command Packet Length	Command Packet			Check Code	Frame Tail		
	0x7E	0xXX	0xD5	0x01	NAME	CHK	0xEF		
Example	Specify "T002.MP3" recording file:								
	0x7E	0x08	0xD5	0x01	0x54	0x30	0x30	0x32	0xC4
Example	As a result, successful execution (ACK):								
	0x7E	0x04	0xD5	0x00	0xD9	0xEF			

Chart 34-Command of MIC Recording

3.6. The Process of Voice File Update



4. Electrical Parameters

4.1. Working Condition

Symbol	Explanation	Minimum	Typical Value	Maximum	Unit
VBAT	Power supply pin voltage	3.0	3.7	5.0	V
I _{VBAT}	External power supply current, no load	25	--	--	mA
T	Working temperature	-20	--	+85	°C

Chart 35-Working condition

4.2. Characteristics of IO

Symbol	Explanation	Minimum	Typical Value	Maximum	Unit	Condition
V _{IL}	Input low level	-0.3	--	1.27	V	VDDIO=3.3V
V _{IH}	Input high level	2.03	--	3.6	V	VDDIO=3.3V
Driver	Output drive capability	--	8	--	mA	VDDIO=3.3V

Chart 36-Characteristics of IO

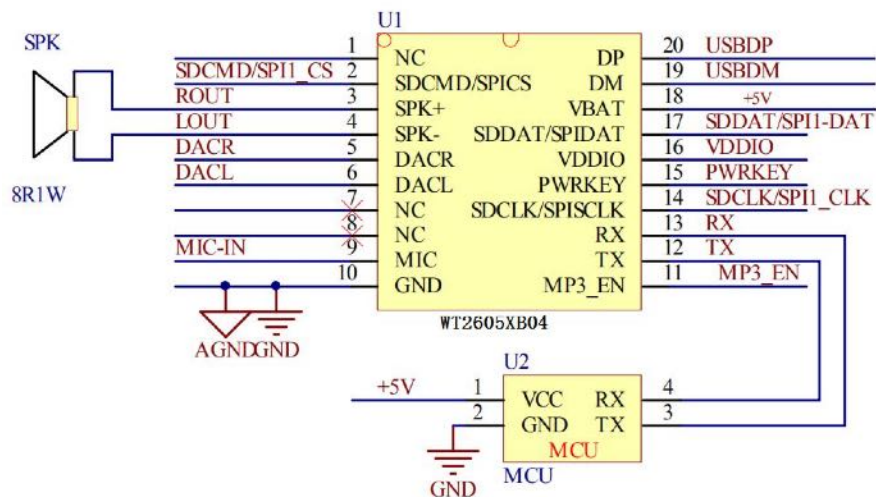
4.3. Characteristics of DAC Audio

Symbol	Explanation	Minimum	Typical Value	Maximum	Unit	Condition
SNR	SNR	--	96	--	dB	VCM cap = 1uF VDDDAC cap = 1uF With A-WT Filter Output -3dBV Fin = 1KHz
THD+N	Total Harmonic Distortion	--	-86	--	dB	VCM cap = 1uF VDDDAC cap = 1uF With A-WT Filter Output -3dBV, 10K loading Fin = 1KHz
Output	Maximum Output	--	2.6	--	V _{peak-peak}	32ohm loading

Chart 37-Characteristics of DAC

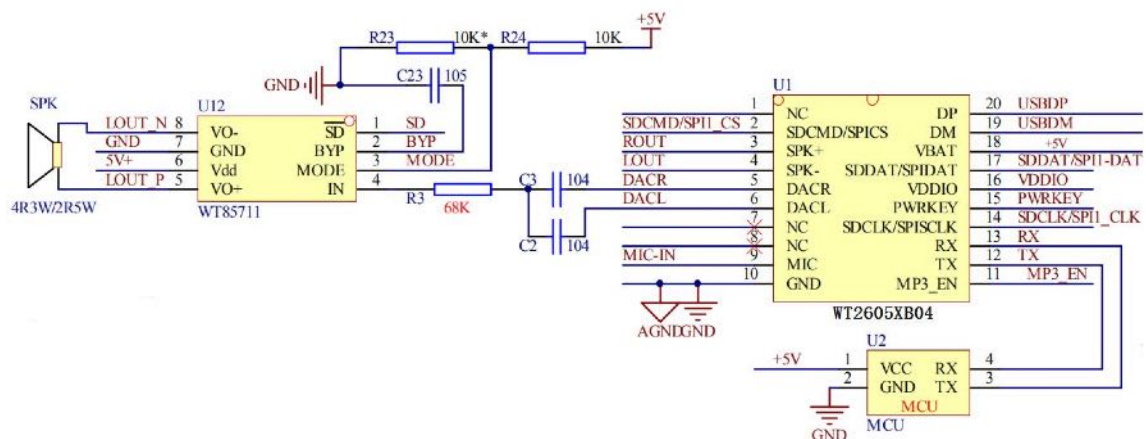
5. Circuit Application

5.1. Circuit Application of Direct Drive Horn



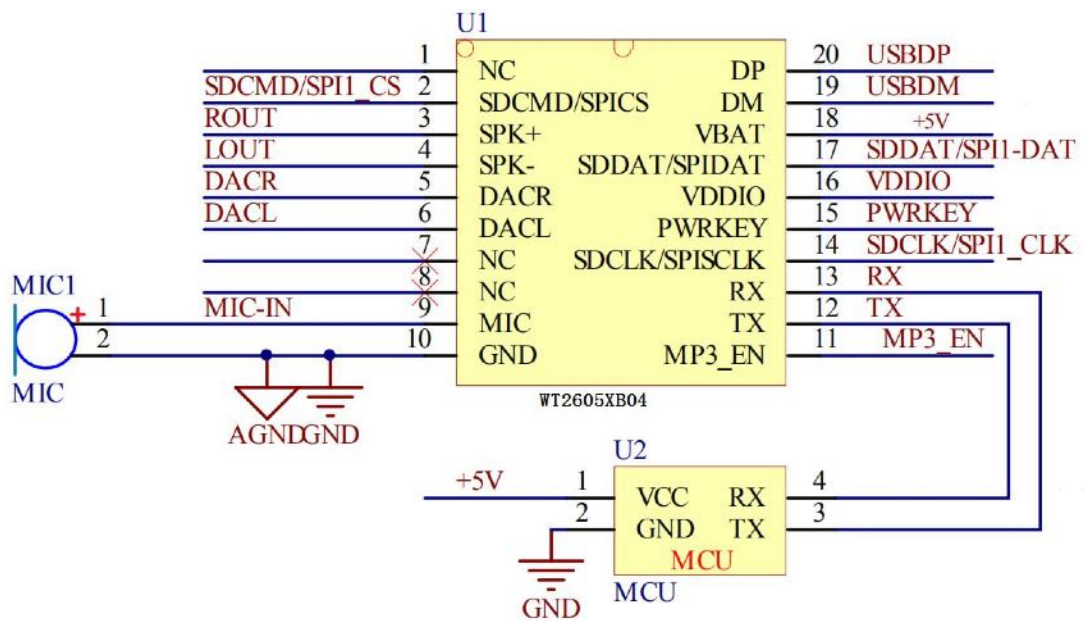
Note: the IO port of WT2605XB04-RF is 3.3V level, which can be directly connected with the 3.3V single chip microcomputer. It is recommended to add level conversion circuit when connecting with 5V single chip microcomputer.

5.2. Circuit Application of External Power Amplifier



Note: The EN pin of the power amplifier chip is the enable pin, and the high level is enabled. Devices marked with * do not need to be soldered.

5.3. MIC Recording Circuit



6. Size of the Module

