WT2605C-A001-Chip information

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Product introduction

WT2605CIt is a powerful high-quality voice chip that adopts high-performance32bit processor, the highest frequency can reach240MHz. It has the characteristics of low cost, low power consumption, high reliability and strong versatility.WT2605C-32N(small volume4*4MM) packaged chip. Customized serial communication protocol standard (AT)instruction. supportSPI-Flash,TFCard,Udisk as storage. It has functions such as file index playback, insertion, single loop, all track loop, random play, etc.31Level volume is adjustable, maximum support for plug-ins128MbitofFlash, 32GofTF kahe32GofUplate.

1. Features

- Support SPI-Flash,support TFCard,Uplate;

- Support FAT,FAT32 File system;

- Control method: customized AT Communication interface, default baud rate115200(Configurable);

- Not played by default after power-on; available BUSY status indication,BUSYHigh level during playback (configurable);

- Audio output mode, sample defaultDACoutput;

- Available via plug-inFlash,TFCard,Udisk, and the three types of peripheral devices copy audio to each other. passTFCard,Udisk, update program

- and other functions.

- Supports voice high-quality audio formats, (8kbps~320kbps) has a beautiful voice.MP3,.WAVFormat;

- Supports random playback by command, seamless loop playback function, etc.;

- The maximum supported128MbitofFlash,32GofTFkahe32GofUplate;

- Adjustable volume, volume level32class;

- High PowerIODriving capability, up to direct driving64mA;

- When using a single chip (using built-in capacity), the built-in voice needs to be written before leaving the factory.

2.Pin description

2.1.Package pin diagram

Pin	Name	Pin	Name
1	VMID	24	ICECLK/D+
2	DACL	23	ICEDAT/D-
3	DACR	22	SPI_CS
4	NC	21	SPI_DI
5	P01	20	SPI_CLK
6	SDCMD	19	SPI_DO
7	SDCLK	18	XOUT
8	SDDAT	17	XIN

Top pins: 32 AGND, 31 VOUT, 30 MIC, 29 VDDDAC, 28 P17, 27 P18, 26 UART_TX, 25 UART_RX

Bottom pins: 9 PWM1, 10 VCC, 11 VREG, 12 PWM2, 13 P05, 14 P06, 15 P07, 16 VCM
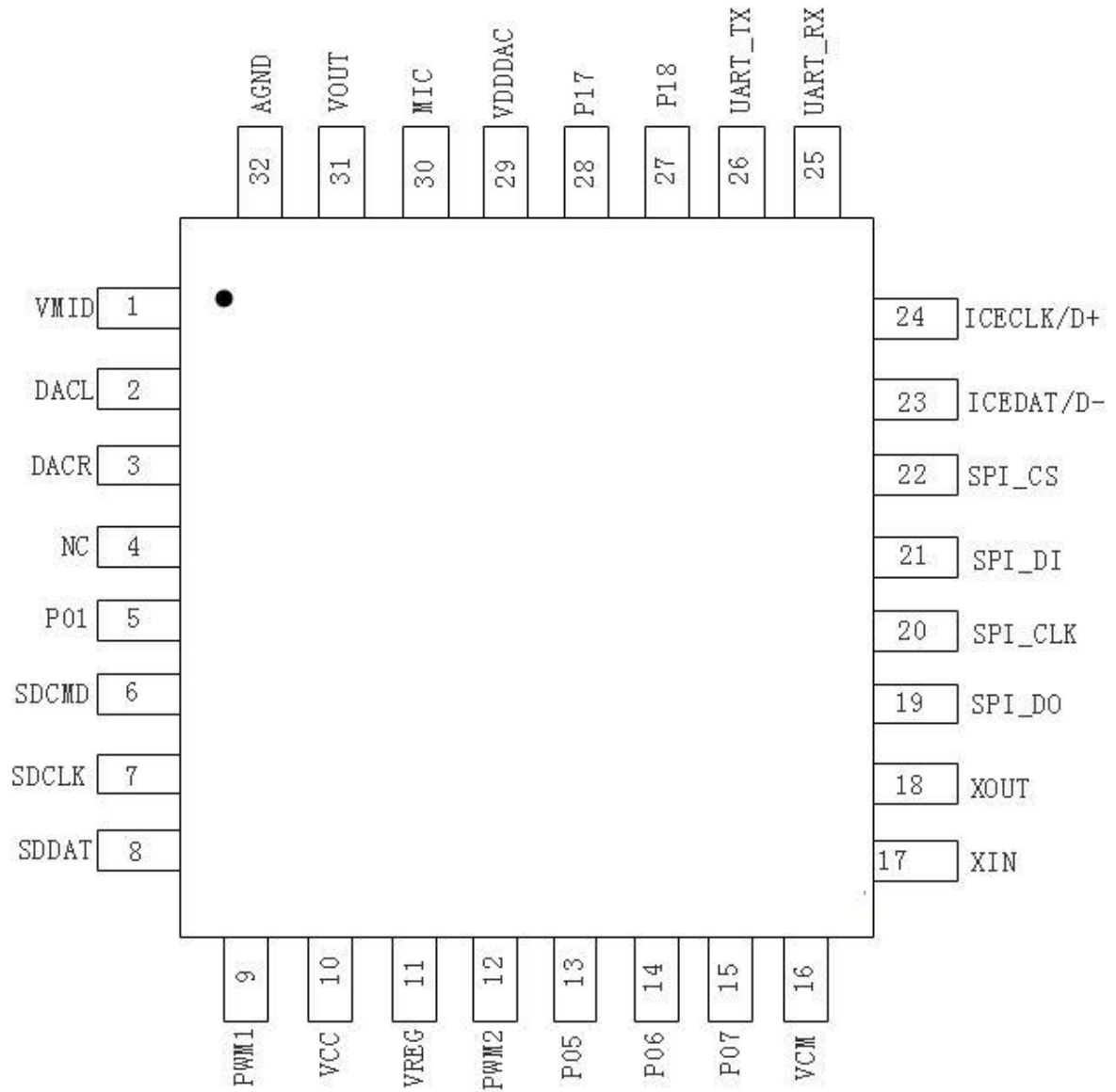
WT2605C-32N

serial number	name	Function Description
0	GND	heat dissipation ground
1	VMID	connect a1uFexternal capacitor to ground
2	DACL	DACLeft channel audio output
3	DACR	DACRight channel audio output
4	NC	Leave this pin floating
5	P01	IOmouth
6	SDCMD	SDCard selection
7	SDCLK	SDcard clock
8	SDDAT	SDcard data
9	PWM1	PWMaisle1
10	VCC	power input
11	VREG	Take one1ufcapacitor to ground
12	PWM2	PWMaisle2
13	P05	IOmouth
14	P06	IOmouth
15	P07	IOmouth
16	VCM	Reference voltage output, connect a0.1uFexternal capacitor to ground
17	XIN	none
18	XOUT	none
19	SPI_DO	SPI Flashdata
20	SPI_DLK	SPI Flashclock
twenty one	SPI_DI	none
twenty two	SPI_CS	SPI FlashChip Select
twenty three	ICEDAT/D-	Burning port
twenty four	ICECLK/D+	Burning port
25	UART_RX	UART1_RX,communication port
26	UART_TX	UART1_TX,communication port
27	P18	Busyshow
28	P17	IOmouth
29	VDDDAC	DACpower supply
30	MIC	Microphone input
31	VOUT	IOpower supply3.3V
32	AGND	Analogly

3. Features

3.1. standardATcommand protocol

3.1.1.   Protocol command format

Standard AT Serial port mode, belongs to3.3V TTLlevel interface. The communication data format is: (BT>MCU)TxDirectly output data; data bits:8bit;parity bit: none; stop bit:1Bit. To use the computer serial port debugging assistant, you need to set the serial port parameters correctly, as shown in the figure:

Start code	Order	parameter	Joiner	Parameter Type	Finish
AT	see below	see below	see below	see below	\r

Note: "Command" refers to the command meaning composed of specific English words. "Parameter" refers to the specific meaning specified by the connector "=" after the command word. "Parameter type"

has ”=[logo]" "[index]" "[name]" "[path]" "[Value]" "[step]" "[logo]" "[slogo]" "[dogo]"etc. (see details below)

Note: all Flash Voice playback refers to internalFLashvoice playback operation. Mainly it can be realized firstFLashIndex playback, insertion and other instructions;

Also TFcard and UDisk peripheral equipment voice playback, etc., can mainly be implemented firstTFkaheUDisc index playback, specified file name playback, insert playback,OTAUpgrade and other instructions;

3.1.2.surface(1) Communication command parameters

CMDDetailed explanation	Corresponding function	Detailed explanation of parameters
AT+PLAY=[logo],[index]	**SpecifyFlashroot directory index lead play**	[logo]="Drive letter "Three drive letter types"fat_nor,sd0, udisk0" [index], index number
	SpecifyTFcard root directory search lead play	
	SpecifyUDisk root directory index play	
AT+LPLAY=[logo],[index] , [headframe],[tailframe]	**Seamless loop playback**	[logo]="Drive letter "Three drive letter types"fat_nor,sd0, udisk0" [index], index number , [headframe] Delete audio start frame , [tailframe] Remove audio end frame
AT+SPLAY=[logo],[name]	**SpecifyTFCard file name broadcast put**	[logo]="Drive letter "Three drive letter types"fat_nor,sd0, udisk0" [name], (under the root directory) file name.mp3or.wav
	SpecifyUdisk file name play	
AT+SPLAY=[logo] ,/[path] /[name]	**SpecifyUIn the disk folder - File name play**	[logo]="Drive letter "Three drive letter types"fat_nor,sd0, udisk0" [path],/"Path" folder name [name], (under the root directory) file name.mp3or.wav
AT+FPLAY=[logo],[path],[index]	**SpecifyTFcard folder index play**	[logo]="Drive letter "Three drive letter types"fat_nor,sd0, udisk0"
	SpecifyUSearch within disk folder lead play	[path],/"Path" folder name [index], index number
AT+PP	**Play pause command**	/
AT+STOP	**stop command**	/
AT+NEXT	**next song command**	/
AT+PREV	**Previous song command**	/
AT+VOL=[Value]	**volume control command**	[Value] =volume level (0~31)
AT+VOLUP	**Volume +**	Volume increases, every time1level volume
AT+VOLDOWN	**volume-**	Volume decreases, each time1level volume
AT+REPEATMODE=[mode]	**Specify playback mode**	[mode] =play mode (1~5) 1: All tracks loop playback mode 2:Single loop playback mode 3: Folder loop mode 4: Random play mode 5:Single non-loop playback mode

AT+STEPINPLAY=[logo],[index]	Interruption instructions	[logo]="Drive letter "Three drive letter types"fat_nor,sd0, udisk0" [index], index number
AT+TOTALTIME?	Get the total number of currently playing files duration	Get duration unit/second
AT+CURTIME?	When getting the currently playing file long	Get duration unit/second
AT+CHANGE_DEV	Switch working drive letter	priority:SD>UDisk>Flash
AT+CHANGE_DEV?	Get the current working drive letter	Three drive letter types"fat_nor,sd0,udisk0"
AT+BUSY=[value]	BUSYstatus (settings)	[value]="0Indicates: the output is low level "default"1 means: static is high level"
	BUSYstatus (get)	"1Indicates: busy signal ""0Indicates free time"
AT+VBATPCT?	Get battery percentage	
AT+GVER?	Get firmware version number	
AT+GCFGVER?	Get configuration version number	
AT+POWEROFF	Enter soft shutdown sleep	
AT+OTA=[logo]	OTAupgrade	[logo]="Drive letter "Three drive letter types"fat_nor,sd0, udisk0"
AT+COPY=[slogo],[dogo]	Voice copy	[slogo]=, copy the source drive letter [dogo](target drive letter)
AT+BAUD=[baud]	Baud rate (setting)	[baud] =Fixed value default115200. Configurable parameters9600,19200,38400,115200,230400, 460800, 921600
	Baud rate (get)	AT+BAUD?

4.Music mode communication command operation

4.1.Music mode command return code format

Start code	Order	parameter	Joiner	Parameter Type	Finish
AT	see below	see below	see below	see below	\r

The instruction return code format is divided into three types: the return code corresponding to successful execution "OK", Execution failed, error return code "see below" result "code", active status return code "message prompt code"

Note: After executing each write command, the one-byte opcode corresponding to the command is returned.

Basic instructions-result codes
-: OK means: the command was executed successfully
-: 1 means: wrong command
-: 2 means: wrong parameter
-: 3 means: reserved
-: 4 means: reserved
-: 5 means: reserved
-: 6 means: the specified device was not found
-: 7 means: device is not online error
-: 8 means: device read error
-: 9 means: device scan failed
-: 10 means: file line not found
-: 11 means: reserved
-: 12 means: file read error
-: 13 means: the mode does not match and cannot be executed normally

4.1.0.Specify Flash Root directory index play (AT+PLAY)

This command indexFlash, the files are played, which is affected by the order in which the files are stored. The files are sorted according to the index order.

Start code	Joiner	Order	Joiner	parameter	Joiner	parameter
AT	+	PLAY	=	fat_nor	,	1

The order of file index is according to the file copied toFlashin order of priority. Example parameters are16hexadecimal code.

Example: send →◇AT+PLAY=fat_nor,1

Receive ←◆+PLAY:START,fat_nor,1,24   //Play drive letter (Flash)Internal audio serial number1, the total audio durationtwenty fourSecond

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:END   //End of play

4.1.1.Specify drive letter to play in a seamless loop (AT+LPLAY)

This command can index the files in SD card, U disk, and Flash, and play them in a loop. Affected by the order in which the files are stored, the files are sorted according to the index order.

Start code	Joiner	Order	Joiner	parameter	Joiner	parameter	Joiner	parameter	Joiner	parameter
AT	+	LPLAY	=	fat_nor	,	1	,	50	,	10

Note: Parameter "50" "10"Represents the audio from the first50Start of frame, to the bottom of the audio10Play in a loop at the end of the frame.

The deleted frame range must not be greater than the length of the audio itself. If it exceeds the length, the code transmission will fail.

This command is to play the current audio in a seamless loop. If you do not need to delete the "start frame" and "end frame", you can directly send the code to play.

Example of direct code playback: Send →◇AT+LPLAY=fat_nor,1   //Represents a single cycle FLASH First song audio

Example: send →◇AT+LPLAY=fat_nor,1,50,10   //ready to playFlashInternal audio serial number1Audio.

No.50Start of frame, to the bottom of the audio10Play within the end of the frame.

Receive ←◆+PLAY:START,fat_nor,1,63   //Play drive letter (Flash)Internal audio serial number1, the total audio duration63Second

Receive ←◆OK   //Command execution successful

4.1.2.SpecifyTFCard root directory index play (AT+PLAY)

This command indexTFIn the card, the files are played, which is affected by the order in which the files are stored. The files are sorted according to the index order.

Start code	Joiner	Order	Joiner	parameter	Joiner	parameter
AT	+	PLAY	=	sd0	,	1

The order of file index is according to the file copied toTFThe cards are arranged in chronological order.

Example: send →◇AT+PLAY=sd0,1

Receive ←◆+PLAY:START,sd0,1,24   //Play drive letter (SDcard) audio, serial number1, the total audio durationtwenty fourSecond

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:END   //End of play

4.1.3.SpecifyTFCard file name play (AT+SPLAY)

This command can specify the file name in the root directory for audio playback and the file name for playback. (The file name must not be larger than8character)

Audio format support:.mp3and .wavTwo kinds

Start code	Joiner	Order	Joiner	parameter	Joiner		parameter			audio format
AT	+	SPLAY	=	sd0	,	0	0	1	1	.mp3

The above instructions indicate the specifiedSDThe file name in the root directory of the card is "0011.mp3audio file is played, in which "0011"is the file name in the root directory, and the audio name isASCIIcode value.

Note: The maximum file name must not exceed8characters, if the file name exceeds8characters, the excess can be replaced by the wildcard character * for playback put.

Example: send →◇AT+SPLAY=sd0,0011.mp3

Receive ←◆+PLAY:START,sd0,1,24   //Play drive letter (SDcard) audio, serial number1, the total audio durationtwenty fourSecond

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:END   //End of play

4.1.4.SpecifyTFIndex playback within card folder (AT+FPLAY)

This command can specify a folder in the root directory and play based on the audio index number in the folder (the folder name must not be greater than8 characters) Folder name supports: Chinese, English, numbers, special symbols.

Note: If you use Chinese to send codes, you need to use "UTF-16 encoding" format to transcode before sending codes.

Start code	Joiner	Order	Joiner	parameter	Joiner	Folder name				Joiner	parameter
AT	+	FPLAY	=	sd0	,	W	C	Z	Y	1	,	1

Example is5character folder name"WCZY1";The above command indicates that the first audio file indexed in the folder will be played in the specified root directory.

Example: send →◇AT+FPLAY=sd0,WCZY1,1

Receive ←◆+PLAY:START,sd0,1,4   //Play drive letter (SDcard) audio, serial number1, the total audio duration4Second

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:END   //End of play

4.1.5.SpecifyUDisk root directory index play (AT+PLAY)

This command indexUIn the disk, the files are played, which is affected by the order in which the files are stored. The files are sorted according to the index order.

Start code	Joiner	Order	Joiner	parameter	Joiner	parameter
AT	+	PLAY	=	udisk0	,	1

The order of file index is according to the file copied toUThe time on the plate is arranged in sequence.

Example: send →◇AT+PLAY=udisk0,1

Receive ←◆+PLAY:START,udisk0,1,24   //Play drive letter (Udisk) audio serial number1, the total audio durationtwenty fourSecond

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:END   //End of play

4.1.6.SpecifyUdisk file name to play (AT+SPLAY)

This command can specify the file name in the root directory for audio playback (the file name must not be larger than8character)

Audio format support:.mp3and .wavTwo kinds

Start code	Joiner	Order	Joiner	parameter	Joiner	parameter[index]				audio format
AT	+	SPLAY	=	udisk	,	0	0	0	4	.mp3

The above instructions indicate the specifiedUThe file name in the root directory of the disk is "0004.mp3audio file is played, in which "0004"is the file name in the root directory, and the audio name isASCIIcode value.

Note: The maximum file name must not exceed8characters, if the file name exceeds8characters, the excess can be replaced by the wildcard character * for playback put.

Example: send →◇AT+SPLAY=udisk0,0004.mp3

Receive ←◆+PLAY:START,udisk0,6,4   //Play drive letter (Udisk) audio serial number6, the total audio duration4Second

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:END   //End of play

4.1.7.SpecifyUIndex playback within disk folder (AT+FPLAY)

This command can specify the first audio index in the folder under the root directory to be played (the folder name must not be larger than8character)

Folder name supports: Chinese, English, numbers, special symbols.

Start code	Joiner	Order	Joiner	parameter	Joiner	Folder name				Joiner	parameter
AT	+	FPLAY	=	udisk0	,	W	C	Z	Y 1	,	1

Example is5character folder name"WCZY1";The above command indicates that the first audio file indexed in the folder will be played in the specified root directory.

Example: send →◇AT+FPLAY=udisk0,wczy1,4

Receive ←◆+PLAY:START,udisk0,1,4   //Play drive letter (Udisk) audio serial number1, the total audio duration4Second

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:END   //End of play

4.1.8.SpecifyUdisk folder - file name play (AT+SPLAY)

This command specifies the file name in the folder under the root directory to play. (The folder name must not be larger than8characters) (the file name must not be larger than 8 character)

Audio format support:.mp3and .wavTwo kinds

Start code	Joiner	Order	Joiner	parameter	Joiner	Folder name				Joiner		parameter				audio format
AT	+	FPLAY	=	udisk0	, /	W	C	Z	Y	1	/	0	0	0	5	.mp3

The above instructions indicate the specifiedUThe folder name in the root directory of the disk is "WCZY1", the audio name in the folder is "0004.mp3 audio file playback, the folder name and audio name adoptASCIIcode value.

Note: The maximum file name must not exceed8characters, if the file name exceeds8characters, the excess can be replaced by the wildcard character * for playback put.

Example: send →◇AT+SPLAY=udisk0,/WCZY1/0005.mp3

Receive ←◆+PLAY:START,udisk0,5,0   //Play drive letter (Udisk) audio serial number5, the total audio duration0Second

Receive ←◆OK //Command execution successful

Receive ←◆+PLAY:END//End of play

Note: The total audio duration is insufficient1seconds, press0seconds display

4.1.9.Pause playback command (AT+PP)

Start code	Joiner	Order
AT	+	PP

In the playback state, if you send this command, the playback will be paused; in the pause state, if you send this command, the music will continue to play from the pause point.

Note: When the playback state is stopped, send this command to restart playing the audio at the current address.

Example: send →◇AT+PP

Receive ←◆OK

4.1.10. stop command (AT+STOP)

Start code	Joiner	Order
AT	+	STOP

Send this command to stop playing the currently playing music.

Example: send →◇AT+STOP

Receive ←◆OK

4.1.11. Next song command (AT+NEXT)

Start code	Joiner	Order
AT	+	NEXT

This command can trigger the playback of the next piece of music in the current directory. When playing the last piece of music, sending this command can trigger the playback of the first piece of music.

Example: send →◇AT+NEXT

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:START,fat_nor,2,0   //Play drive letter (Flash)Internal audio serial number2, the total audio duration0Second

Receive ←◆+PLAY:END   //End of play

4.1.12. Previous song command (AT+PREV)

Start code	Joiner	Order
AT	+	PREV

This command can trigger the playback of the next piece of music in the current directory. When playing the first piece of music, sending this command can trigger the playback of the last piece of music.

Example: Send→◇AT+PREV

Receive ←◆OK   //Command execution successful

Receive ←◆+PLAY:START,fat_nor,1,24   //Play drive letter (Flash)Internal audio serial number1, the total audio durationtwenty fourSecond

Receive←◆+PLAY:END   //End of play

4.1.13.Volume control command (AT+VOL)

Volume levels are shared32levels, respectively0~31,in0is mute, and level 31 is the maximum volume.

Start code	Joiner	Order	Joiner	parameter
AT	+	VOL	=	31

In the example, the maximum volume is sent31Level, this command can modify and adjust the volume in real time.

Example: send →◇AT+VOL=31☑

Receive ←◆OK

4.1.14.Volume plus control command (AT+VOLUP)

Volume levels are shared32levels, respectively0~31,in0is mute, level 31 is the maximum volume

Start code	Joiner	Order
AT	+	VOLUP

Note: This command is an incremental sound adding command. Each time this command is sent, it will increase the volume based on the current volume level.1class. Maximum added to31class

Example: send →◇AT+VOLUP

Receive ←◆OK

4.1.15.Volume down control command (AT+VOLDOWN)

Volume levels are shared31levels, respectively0~31,in0is mute, level 31 is the maximum volume

Start code	Joiner	Order
AT	+	VOLDOWN

Note: This command is a descending sound reduction command. Each time this command is sent, it will be - based on the current volume level.1class. Minimize to0class

Example: send →◇AT+VOLDOWN

Receive ←◆OK

4.1.16.Specify playback mode (AT+REPEATMODE)

This command modifies the playback mode when communication is normal and has a power-off memory function.

Start code	Joiner	Order	Joiner	Parameter [mode]
AT	+	REPEAT MODE	=	1: All tracks loop playback mode
				2: Single loop playback mode
				3: Folder loop mode
				4: Random mode
				5: Single playback mode without loop (default)

Note: "1: All tracks loop playback mode" of this command is to play the entire drive letter, including Flash,TFCard, UAll on the plate audio

Example: send →◇AT+REPEATMODE=5

Receive ←◆OK

4.1.17.Insertion command (AT+STEPINPLAY)

This command can only be inserted in the playing state, and is invalid in the stopped state.

Start code	Joiner	Order	Joiner	parameter	Joiner	parameter
AT	+	STEPINPLAY	=	fat_nor	,	1

When this command is sent, the currently playing track will be paused immediately, and then the playback track specified by this command will be executed. After the playback is completed, the originally paused track will be played.

Note: When the first interruption command is not finished playing, the command will be invalid when the second interruption command is issued. You have to wait until the first inserted music is played before you can insert it again.

parameter:-fat_nor; means: insertFLASHSpecify the index address within;

-sd0;　　　Represents: InterruptionSDSpecify the index address in the card;

-udisk0;　　Represents: InterruptionUSpecify the index address within the disk;

Example: send →◇AT+STEPINPLAY=fat_nor,1

Receive ←◆+PLAY:START,fat_nor,1,24　　//Play drive letter (Flash) audio, serial number1, the total audio durationtwenty fourSecond

Receive ←◆OK　　//Command execution successful

Receive ←◆+PLAY:END　　//End of play

4.1.18.Get the total duration of the currently playing file (AT+TOTALTIME?)

Start code	Joiner	Order
AT	+	TOTALTIME?

Note: This command can only query the total duration of the currently played audio during playback. The command is invalid when the audio stops playing.

Example: Send →◇AT+TOTALTIME?

Receive←◆+TOTALTIME:24   //Duration 24 seconds

4.1.19.Get the currently played audio duration (AT+CURTIME?)

Start code	Joiner	Order
AT	+	CURTIME?

Note: This command can only query the played audio duration during playback. The command is invalid when the audio stops playing.

Example: send →◇AT+CURTIME?

Receive ←◆+CURTIME:10,24   //"10"Indicates the current playing time. "twenty four"Indicates the total audio duration/second

4.1.20.Switch working drive letter (AT+CHANGE_DEV)

The SD card plays by default after initial power-on. If there is no SD card, press the priority: SD>U disk>Flash, and identify the drive letter in sequence.

Start code	Joiner	Order
AT	+	CHANGE_DEV

Note: If you insert an SD card or U disk when playing audio in Flash, the previous and next song command (command without specifying a path to play) will first identify the peripheral drive letter with a higher priority for playback.

Note: A command to switch drive letters occurs during playback and stops the current audio playback.

Example: Send →◇AT+CHANGE_DEV

Receive ←◆+ACTDEV:sd0

Note: "sd0" = SD card drive, "udisk0" = U disk, "fat_nor" = Flash disk

4.1.21.Get the current working drive letter (AT+CHANGE_DEV?)

Start code	Joiner	Order
AT	+	CHANGE_DEV?

This command can be queried in both playback and standby states.

Example: send →◇AT+CHANGE_DEV?

Receive ←◆+ACTDEV:sd0

Note: "sd0" = SD card drive, "udisk0" = U disk, "fat_nor" = Flash disk

4.1.22.BUSY Status (setting/query)

Default BUSY state: static is high level, output is low level

Start code	Joiner	Order	Joiner	parameter
AT	+	BUSY (settings)	=	1
		BUSY? (query)		

parameter:-:0 Indicates: the level is high in the static state (default)

-: 1 Indicates: the level is low in the static state

Example (setting): Send→◇AT+BUSY=1

Receive ←◆OK

Example (query): Send→◇AT+BUSY?

Receive ←◆+BUSY:1

4.1.23.Get battery percentage (AT+VBATPCT?)

Start code	Joiner	Order
AT	+	VBATPCT?

Note: When powering the chip or module, you can query the power percentage (if it is powered by a DC regulated power supply, 100% power will be identified)

Example: Send→◇AT+VBATPCT?

Receive ←◆+VBATPCT:100   //100%

4.1.24.Get the firmware version number (AT+GVER?)

This command is used for version confirmation, traceability query, precise positioning of version problems, etc.

Start code	Joiner	Order
AT	+	GVER?

Example: send →◇AT+GVER?☑

　　　Receive ←◆+VERSION:WTC230302-11-L009V1.00

4.1.25.Get the configuration version number (AT+GCFGVER?)

Start code	Joiner	Order
AT	+	GCFGVER?

Example: send →◇AT+GCFGVER?

　　　Receive ←◆+GCFGVER:Mar 2 2023,11:41:10

4.1.26.Enter soft shutdown sleep (AT+POWEROFF)

Send this command to put the chip into low-power sleep mode

Start code	Joiner	Order
AT	+	POWEROFF

Note: After entering sleep mode, the power consumption is less than5uA,The command wake-up time is100millisecond,Requires IO wake-up function

Example: Send→◇AT+POWEROFF

　　　Receive ←◆OK

4.1.27.OTAupgrade(AT+OTA)

Command copy only supports U disk and SD card, "sd0" = SD card disk, "udisk0" = U disk.

Start code	Joiner	Order	Joiner	parameter
AT	+	OTA	=	udisk0

Note: 1. Currently, the project file in the U disk is copied for code distribution. The "WT2605C.hex" fixed upgrade file is first identified.

If this file name is not recognized, download the audio file mp3 and WAV format from the USB flash drive.

Button upgrade, AD button application upgrade (please refer to the schematic diagram for details)

If you use our company's "B series module test board V1.02" baseboard with the "WT2605C-AT-L009 V1.00" module, the download method is as follows

Insert the U disk and long press the "Play" button. The U disk copies the data to FLASH. 2. Insert the SD card and long press the "Stop" button. The SD card copies the data to FLASH.

Example: Send→◇AT+OTA=udisk0

Receive ←◆+OTA:7	//Detect download project
Receive←◆WT2605C_READY	//Restart after download is complete
Receive ←◆+OTA:8	//Return code for download success
Receive←◆+TASK:1	//Power-on
Receive ←◆+DEVICE:udisk0	//loading finished

4.1.28.Voice copy (AT+COPY)

This command first erases the audio data in the "target drive letter" and then writes the data to be copied.

Start code	Joiner	Order	Joiner	parameter	Joiner	parameter
AT	+	COPY	=	udisk0	,	fat_nor

Note: If the content of the copied file is larger than the total capacity of the "target drive letter", half of the audio will be copied and the return code will prompt failure (audio that has been copied successfully can be played normally)

Note: "sd0" = SD card drive, "udisk0" = U disk, "fat_nor" = Flash disk

Example: Send→◇AT+COPY=udisk0,fat_nor   //Indicates that the audio in the U disk is copied to the Flash disk.
//"1" indicatest hat the first audio track in the current drive letter is recognized."4"Indicates the total number of audio files in the source drive letter.

Receive←◆+COPYSTA:1,4

Receive←◆+COPYSTA:2,4

Receive←◆+COPYSTA:3,4

Receive←◆+COPYSTA:4,4

Receive ←◆.	// downloading
Receive ←◆.	
+COPY:0	// Download completed

Result code: -0; means: success

-1; means: source driver not found

-2; means: target driver not found

-3; means: neither the source driver nor the target driver was found.

-4; means: Failed to open source file

-5; means: Failed to open target file

-6; means: abnormality in finding files

-7; means: file scan failed

4.1.30.Baud rate (AT+BAUD)

The baud rate is modified to "7" fixed parameters, which are: 9600, 19200, 38400,(Default) 115200,230400, 460800, 921600

Start code	Joiner	Order	Joiner	parameter
AT	+	BAUD	=	9600

Example: Send→◇AT+BAUD=9600☑

Receive ←◆OK

Note: After switching the baud rate, the baud rate of the voice chip will be updated immediately. For example, the current communication baud rate is 115200. After sending the "AT+BAUD=9600" command to switch to 9600, the current baud rate set by the MCU or serial port will still be When it is 115200, exceptions will occur when receiving the return code value and sending instructions. Generally, the MCU and serial port baud rates need to be set and modified synchronously within 100ms. The return value after the initial setting is "receive←◆"OK".

When the communication baud rate is set higher, it is necessary to determine the master controlMCUThe highest supported communication baud rate and frequency offset range ensure that no frequency offset will occur.

4.1.31.Set music fast forward (AT+FF)

Start code	Joiner	Order	Joiner	parameter
AT	+	FF	=	[step]

Set command: parameters1~(Current audio maximum duration) Unit/second

supportSDcard playback,Udisk playback,FlashPlay, fast forward response.

Example: send →◇AT+FF=10 //fast forward10Second

Receive ←◆OK

4.1.32.Set music rewind (AT+FR)

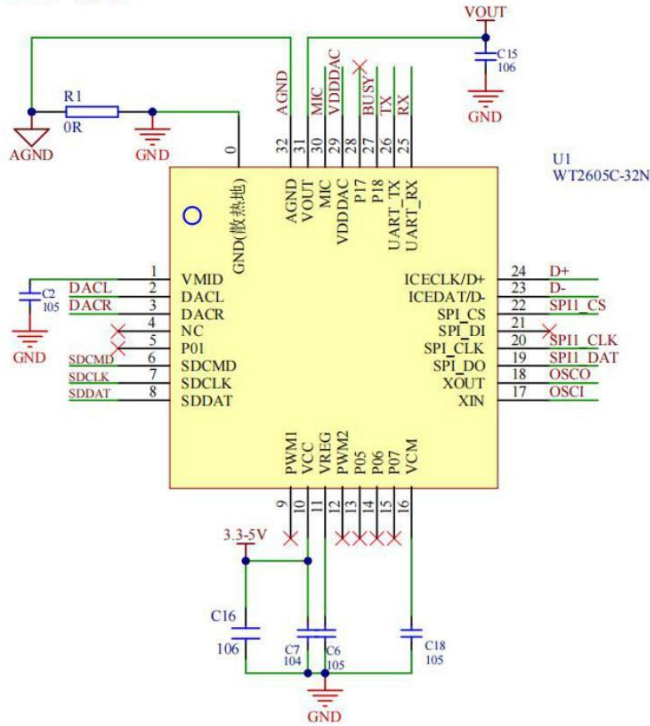| Start code	Joiner	Order	Joiner	parameter
AT	+	FR	=	[step]

supportSDcard playback,Udisk playback,FlashPlay, rewind response. Note: When the rewind playback time is exceeded, the audio will start playing from the beginning
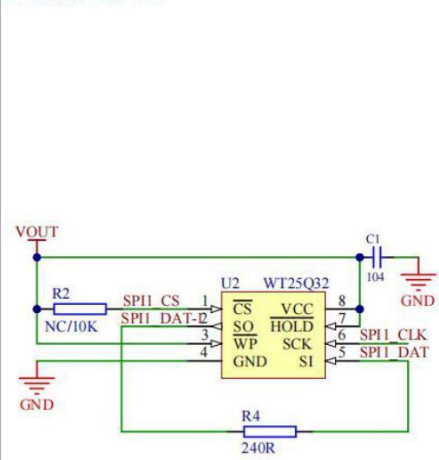
Example: send →◇AT+FR=10   //Rewind10Second

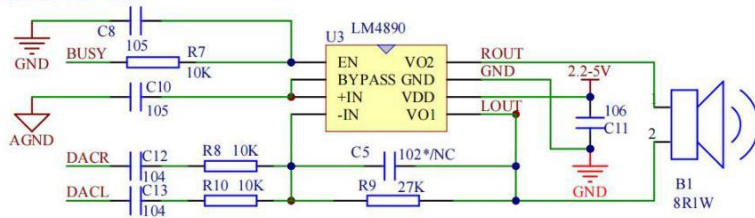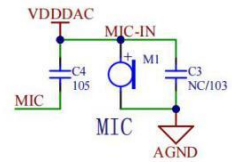Receive ←◆OK

5.Circuit Design Reference

语音芯片电路

VOUT
C15
106
GND

R1
0R
AGND
GND

AGND
MIC
VDDDAC
BUSY
TX
RX

32 31 30 29 28 27 26 25

U1
WT2605C-32N

AGND
VOUT
MIC
VDDDAC
P18
P17
UART_TX
UART_RX

GND(散热地)

C2
105
DACL
DACR

1 VMID
2 DACL
3 DACR
4 NC
5 P01
6 SDCMD
7 SDCLK
8 SDDAT

GND

SDCMD
SDCLK
SDDAT

ICECLK/D+ 24 D+
ICEDAT/D- 23 D-
SPI_CS 22 SPI1_CS
SPI_DI 21
SPI_CLK 20 SPI1_CLK
SPI_DO 19 SPI1_DAT
XOUT 18 OSCO
XIN 17 OSCI

PWM1 VCC VREG PWM2 P05 P06 P07 VCM
9 10 11 12 13 14 15 16

3.3-5V

C16
106
C7
104
C6
105
C18
105
GND

FLASH电路

VOUT
C1
104
GND

R2
NC/10K

SPI1_CS 1
SPI1_DAT-2 3
4

U2 WT25Q32
CS VCC 8
SO HOLD 7
WP SCK 6 SPI1_CLK
GND SI 5 SPI1_DAT

GND

R4
240R

功放电路

C8
105
GND
BUSY
R7
10K
C10
105

AGND

DACR C12 104 R8 10K
DACL C13 104 R10 10K

U3 LM4890
EN VO2
BYPASS GND
+IN VDD
-IN VO1

C5 102*/NC
R9 27K

ROUT
GND
LOUT

2.2-5V

106
C11

GND

B1
8R1W

咪头电路

VDDDAC
MIC-IN
C4 105
MIC
M1
C3 NC/103
MIC
AGND

TF卡电路

TF1
1 SD2
2 SD3
3 SCMD
4 VDD
5 SCLK
6 VSS
7 SD0
8 SD1
9 CD

VOUT
SDCMD
SDCLK
SDDAT

R5 NC
C17 104
R6 NC
GND

TF Card

SD
GND

GND

TF卡卡座

说明：R5、R6电阻建议预留，用于兼容程序；

程序更新及U盘电路

+5V
D-
D+

J1
1
2
3
4

GND
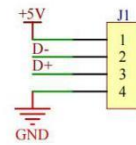
说明：程序更新与U盘接口建议预留

Attention:

Audio Chip:

1.1. When using UART to communicate, if the signal voltage of the master device is 5V, the MCU's TX/RX signal voltage should be within 3.3V, and the MCU's I/O should be 5V-tolerant; a 220Ω resistor can be used in series for protection.

1.2. When using IC|ECLK and IC|EDAT, be sure to set the correct communication mode and verify before use.

1.3. Operating Voltage: The normal operating voltage is 3.3-5V; the output voltage (VCC-5VOUT) of the module must be checked and verified before use, and the absolute error should be within ±1cm.

1.4. Supply 0.3-3.3V to turn on the module; VCC=EVOUT during standby mode, the flash memory is not powered; during operation, the flash memory is powered.

1.5. On the PCB board, the module's power supply ground should be separated from the main board's ground; the module's GND should be connected to the main board's GND within 3-5mm; the module's GND should be connected to the VDD10 within 5mm; the module's GND should be connected to the VDD10 within 5mm.

1.6. The DAC output terminal must be close to the RF chip when designing the circuit board to avoid interference. The positive and negative poles should not be reversed.

1.7. The reset circuit should be kept as far away from the RF circuit as possible to prevent interference; the reset circuit should be grounded.

Power Amplifier Chip:

2.1. On the PCB board, the RF circuit ground should be separated from the main board's ground; the RF circuit's GND should be connected to the VDD within 5mm.

2.2. On the PCB board, the RF circuit ground should be close to the power supply; avoid using multiple layers (especially ground layers) and avoid causing unnecessary interference.

2.3. Antenna Design: When designing the antenna, be sure to verify and measure the module's radiation pattern and parameters.

2.4. Regarding the "POPO" mode: The MCU's I/O port is in a BUSY state when the module is operating.

6.Electrical parameters

6.1.Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Unit
Tamb	Ambient Temperature	- 40	+85	°C
Txt	Storage temperature	- 65	+150	°C
VCC	Supply Voltage	- 0.3	5.5	V
V_{VOUT33}	3.3V IO Input Voltage	- 0.3	3.6	V

6.2. PMUcharacteristic

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VCC	Voltage Input	2.8	3.7	5.5	V	2.8V
V_{out}	Voltage output	2.0	3.0	3.4	V	VBAT = 3.7V, 100mA loading
I_{vout}	Loading current	_	_	100	mA	VBAT=3.7V

6.3.IOInput/output electrical logic characteristics

IO input characteristics						
Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V_{IL}	Low-Level Input Voltage	- 0.3	_	0.3*Vout	V	VOUT = 3.3V
V_{IH}	High-Level Input Voltage	0.7* VOUT	_	VOUT+0.3	V	VOUT = 3.3V
IO output characteristics						
V_{OL}	Low-Level Output Voltage	_	_	0.33	V	VOUT = 3.3V
V_{OH}	High-Level Output Voltage	2.7	_	_	V	VOUT = 3.3V

6.4.simulationDACcharacteristic

Parameter	Min	Typ	Max	Unit	Test Conditions
Frequency Response	20	_	16K	Hz	1KHz/0dB 100kohm loading A-Weighted Filter
THD+N	_	- 65	_	dB	
S/N	_	95	_	dB	
Output Swing	_	0.54	_	Vrms	
Dynamic Range	_	92	_	dB	1KHz/-60dB 100kohm loading With A-Weighted Filter
Output Resistance	_	8.3	_	K	_

6.5. ADCcharacteristic

Parameter	Min	Typ	Max	Unit	Test Conditions
Dynamic Range	_	75	_	dB	1KHz/210mVrms
S/N	_	79	_	dB	line mode:6dB with cap
THD+N	_	- 70	_	dB	PGAIS=2

7.Package information

7.1 QFN32Package size

unit:mm

EXPOSED THERMAL PAD ZONE

BOTTOM VIEW
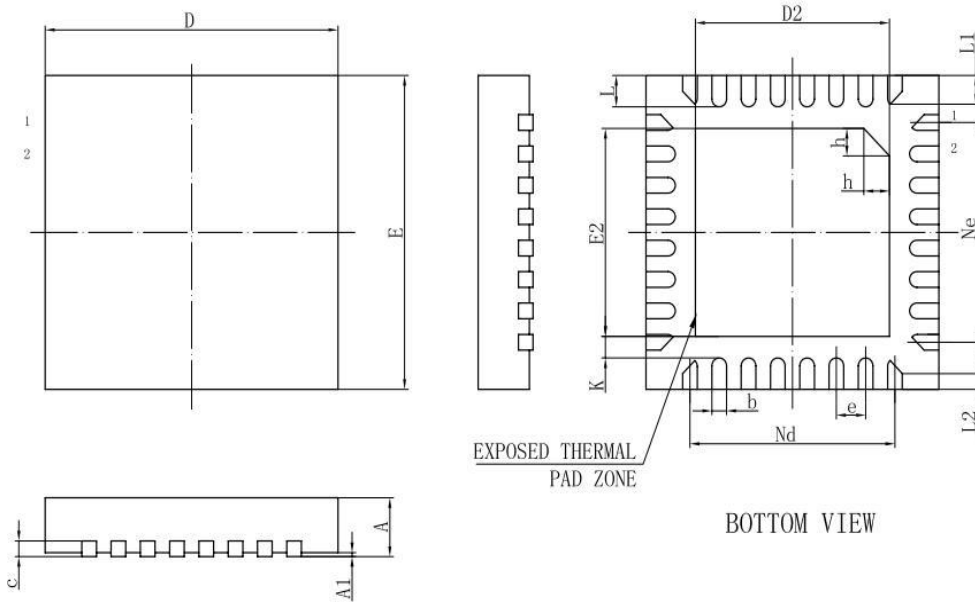
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
b	0.15	0.20	0.25
c	0.18	0.20	0.25
D	3.90	4.00	4.10
D2	2.60	2.65	2.70
e	0.40BSC		
Nd	2.80BSC		
E	3.90	4.00	4.10
E2	2.60	2.65	2.70
Ne	2.80BSC		
K	0.20	−	−
L	0.35	0.40	0.45
L1	0.30	0.35	0.40
L2	0.15	0.20	0.25	△
h	0.30	0.35	0.40
L/F载体尺寸 (MIL)	112*112		

8.revision

Version	date	describe
V1.00	2023-06-29	first edition
V1.01	2023-08-25	Schematic optimization