

Recording Voice Modules

WTV-SR



Manual

Data Sheet

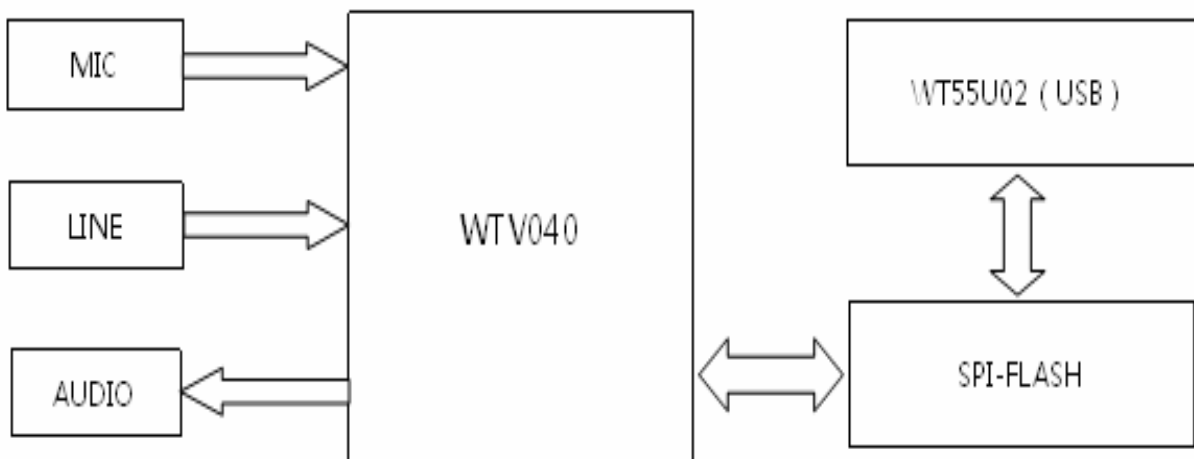
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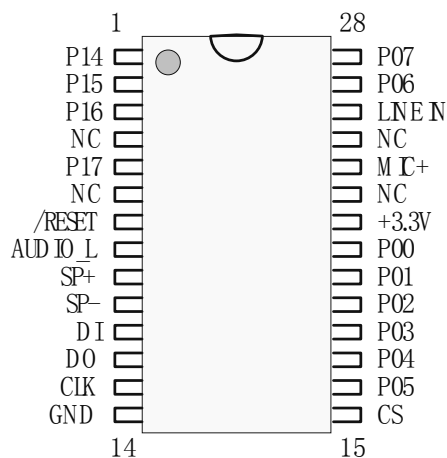
1. Features

- Support MIC & LINE-IN recording
- SPI-FLASH is up to 32M, recording time is up to 12 minutes.
- Support USB (with programmer)
- Support download voice from PC and play recording voice with high quality.
- Support uploads recording voice to computer
- With power down memory to retain.
- Using an independent file manage system, assign SPI-FLASH more reasonable
- Do not come out chips scrape
- Control modes: MCU, key control mode
- 8-level adjustable volume
- Operating voltage: DC3.3V

2. Structured flowchart



3. Packages diagram



Pins description

PINS	DESCRIPTIONS	FUNCTIONS	PINS	DESCRIPTIONS	FUNCTIONS
1	P14	Key	15	CS	SPI-FLASH_CS use for downloading data
2	P15	Key	16	P05	Key
3	P16	Key	17	P04	Key
4	NC	Blank	18	P03	Three-line DATA/One-line DATA/ Key
5	P17	Key	19	P02	Three-line CLK/ Key
6	NC	Blank	20	P01	Three-line CS/ Key
7	/RESET	Reset pin, keep low level 10ms	21	P00	Key
8	AUDIO-L	Positive, external amplifier audio output	22	3.3V	Positive
9	SP-	Negative, Drive speaker directly	23	NC	Blank
10	SP+	Positive, Drive speaker directly	24	MIC+	Microphone recording, positive port
11	DI	SPI-FLASH_DI, use for downloading data	25	NC	Blank
12	DO	SPI-FLASH_DO, use for downloading data	26	LINE IN	LINE-IN input port
13	CLK	SPI-FLASH_CLK, use for downloading data	27	P06	Key
14	GND	GND	28	P07	Key

4. Parameters

Supply voltage : DC 3.3 V, Ambient temperature: 25°C

PARAMETERS	REMARKS	CONDITIONS	MIN VALUE	REPRESENTATIVE VALUE	MAX VALUE	UNITS
SUPPLY VOLTAGE	VCC	All input	2.6	3.3	36	V
QUIESCENT CURRENT	I _{OP1}	RL=32Ω	---	40	---	uA
	I _{OP2}	RL=8Ω	---	40	---	uA
RECORDING CURRENT	I _{R1}	RL=32Ω	10	15	20	mA
	I _{R2}	RL=8Ω	10	15	20	mA
PLAYBACK CURRENT	I _{P1}	RL=32Ω	10	35	50	mA
	I _{P2}	RL=8Ω	10	80	150	mA

5. Environmental Absolute Max Ratings

PARAMETERS	REMARKS	CONDITION	RATING VALUE	UNITS
POWER	$V_{DD} - V_{SS}$	-	-0.3~+7.0	V
INPUT VOLTAGE	V_{IN}	All input	$V_{SS}-0.3 \sim V_{DD}+0.3$	V
STORAGE TEMPERATURE	TSTG	-	-55~+150	°C
USE TEMPERATURE	T_{OPR}	-	-40~+85	°C

6. Control modes

6.1. MP3 mode

MP3 mode, including record, play/ pause, down, up, Volume+, Volume-, stop, delete, etc. as follows:

I/O	FUNCTION
P00	UP
P01	DELETE
P02	STOP
P03	RECORDI
P04	PLAY/ PAUSE
P05	DOWN
P06	V+
P07	V-

6.2. Key control one by one

This mode, can recording 4 section voice, and have 4 key to control play independently. Repeat use the same channel, the pre-recording voice will be recovered.

VOICE	RECORD I/O	RECORD I/O
SECTION 1	P00	P04
SECTION 2	P01	P05
SECTION 3	P02	P06
SECTION 4	P03	P07

6.3. Serial interface control mode

With one-line & three-line serial interface mode. One-line, which use MCU transferred DATA by P03 to controls WTV-SR. Advantages: I/O is high-usage. Three-line, which use MCU to operate WTV-SR by CS、CLK、DATA. Advantages: the speed of communication is very fast.

Functions of this mode, including recording specify file name, playback voice of a specify file name, recording / playback according to serial number, volume adjustment, delete the specified file name, delete the specify serial number, formatting, pause, continued to play from pause and so on.

Control commands Description:

Each control command including start code, identification codes of DL, command codes and the volume level code, all of them are hex. File name is ASCII code, should be transferred to hex code when send it. For example, a file name is A0135, so you need to send the relevant ASCII code 4130313335.

The corresponding list of favorites in the WTV-SR

CHARACTER	ASCII CODE	CHARACTER	ASCII CODE
0	30H	8	38H
1	31H	9	39H
2	32H	A	40H
3	33H	B	41H
4	34H	C	42H
5	35H	D	43H
6	36H	E	44H
7	37H	F	45H

Control commands of one-line and three-one are the same, just timing sequence have a little different. The commands as follows: (Recording file name is A0135 as a example)

(1) Recording specify file name

Start Code	7EH
Data Bit	07H
Command Code	A0H
File Name	41H
	30H
	31H
	33H
	35H

(2) Recording according to serial number

Start Code	7EH
Data Bit	02H
Command Code	A1H

Voice files are generated according to serial number by system, users need not specify the file name. If one of sections is deleted, the subsequent file will moving forward

(3) Playback voice of a specify file name

Start Code	7EH
Data Bit	07H
Command Code	A2H
File Name	41H

	30H
	31H
	33H
	35H

Sending the specify file when playback voice, if the file not-existent, it will not play voice.

(4) To play according to serial number

Start Code	7EH
Data Bit	05H
Command Code	A3H
File Name	30H
	30H
	31H

The example plays the voice of serial number 001, which is the voice of paragraph 2. Serial number has nothing to do with file name, but relate to the order of recording into memory.

(5) Volume adjustment

Start Code	7EH
Data Bit	03H
Command Code	A4H
Volume Levels	08H

9 levels volume, from 00H-08H, 00H is mute, 08H is the max volume.

(6) Stop recording / playing

Start Code	7EH
Data Bit	02H
Command Code	A5H

(7) Delete the specified file name

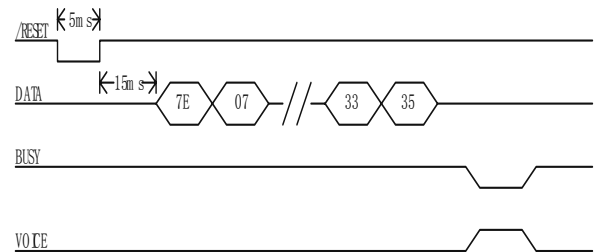
Start Code	7EH
Data Bit	07H
Command Code	A6H
File Name	41H
	30H
	31H

	33H
	35H

the control command has been sent, BUSY change high level to low, playing audio at the same time. BUSY pulled when voice is played completely.

(8) Delete the specify serial number

Start Code	7EH
Data Bit	05H
Command Code	A7H
File Name	30H
	30H
	31H



(9) Formatting

Start Code	7EH
Data Bit	02H
Command Code	A8H

If format SPI-FLASH, it will delete all of voice.

The assignment functions as follows:

I/O	FUNCTION
P00	---
P01	---
P02	---
P03	DATA
P04	---
P05	---
P06	---
P07	---
P14	BUSY
P15	---
P16	---
P17	---

(10) Pause

Start Code	7EH
Data Bit	02H
Command Code	A9H

(11) Continued to play from pause

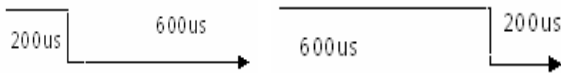
Start Code	7EH
Data Bit	02H
Command Code	AAH



6.4. One-line mode

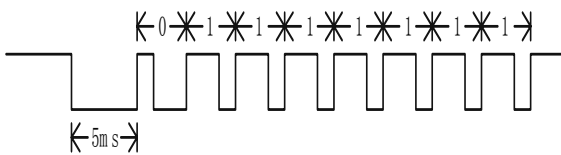
One-line mode, which is MCU send DATA to I / O port P03, achieve the purpose of controlling WTV-SR. In one-line mode, in addition to P03 ports, the others I / O are invalid. Sending / RESET negative pulse 5ms, then send control commands after 15ms (Reference 6.3), when

Each data is a byte in control commands. At first, DATA should be pulled down 5ms to awaken WTV-SR before sending, and then sent low, next high. A byte sent completed, DATA need to be placed at high level 1ms before sending the next byte.



1: 3, DATA 0 3: 1, DATA 1

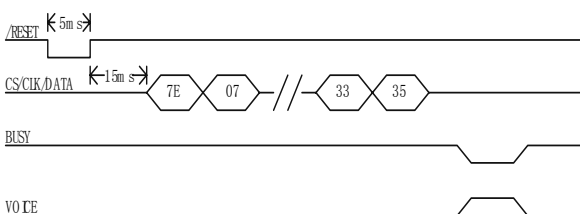
One-line used data duty cycle to determine the data of sending is 0 or 1. If high : low = 1:3, means the data 0, high :low = 3:1, means the data 1.



For example, sending 7EH, its two binary code is 11111110, follow the principle of sending low first, then high, the data as shown below. After sending 7E, DATA need to be placed at high level 1ms before sending the other data.

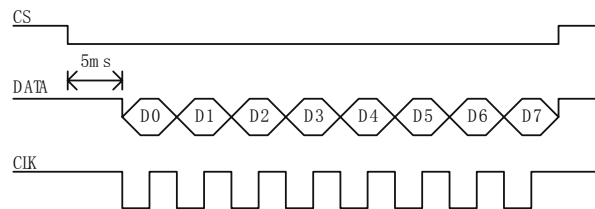
6.5. There-line mode

Three-line, which use MCU to send CS / CLK / DATA to the I / O port P01, P02, P03, achieve the purpose of operating WTV-SR by CS、CLK、DATA. Sending / RESET negative pulse 5ms, then send control commands after 15ms (see 7.3), when control command has been sent, BUSY change high level to low, playing audio at the same time. BUSY pulled when voice is played completely.



The control ports as follows:

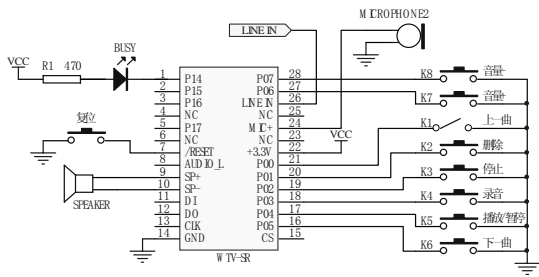
I/O	FUNCTION
P00	---
P01	CS
P02	CLK
P03	DATA
P04	---
P05	---
P06	---
P07	---
P14	BUSY
P15	---
P16	---
P17	---



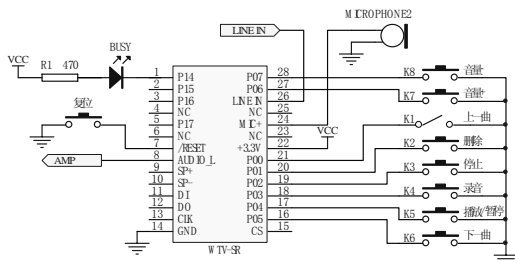
Each data is a byte in control commands. At first, DATA should be pulled down 5ms to awaken WTV-SR before sending, and then sent DATA and CLK, clock cycle recommend use 300us. Please send low DATA first, next high DATA. A byte sent completed, DATA need to be placed at high level 1ms before sending the next byte.

7. Application circuit

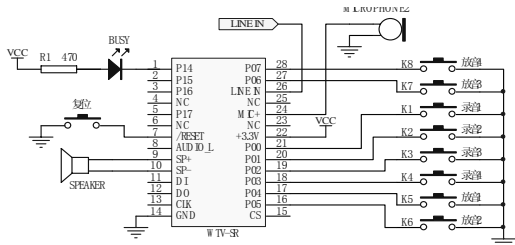
7.1. MP3 control mode (PWM output, drive speakers directly)



7.2. MP3 control mode (DAC output, external amplifiers)

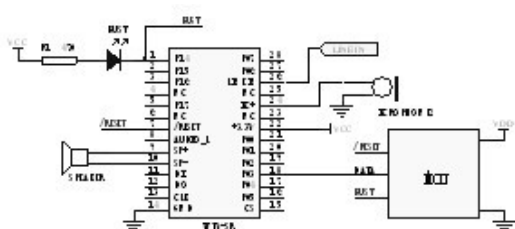


7.3. Key mode one by one



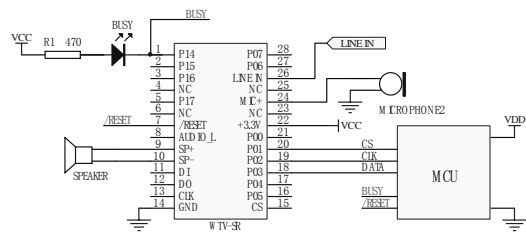
Connect amplifier with AUDIO_L port and GND

7.4. One-line serial interface mode



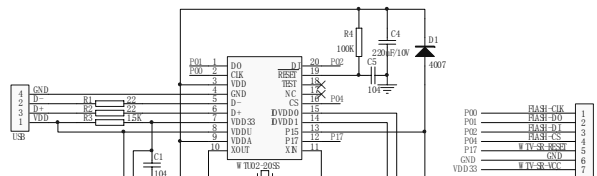
Note: This is a connection when the voltage of VCC = VDD. If VDD=5V, VCC=3.3V, need to connect a resistor 470Ω to DATA line

7.5. Three-line serial interface



Note: This is a connection when the voltage of VCC = VDD. If VDD=5V, VCC=3.3V, need to connect a resistor 470Ω to CS, CLK, DATA line.

8. Download & upload sound file



WTV-SR with relevant host computer software, you can upload sound files to the PC via USB, including recorded voice. Voice file should be WAV format. Of course, you can also download WAV file to WTV-SR for playing. The downloaded sound file names should begin with "F", such as "F0001" means download voice, that is, fixed voice.