



The Manual of WT5001-48L Chips and Modules

1、 Product description and features

1.1、 Description of WT5001 chips and modules

WT5001-48L is a high-quality MP3 voice chip of OTP,8-BIT CISC; supports MP3 decoding, supports WAV format; with a rich set of peripheral interfaces; an SPI ,supports DMA; drives 16Ω headphones; with real-time clock and calendar clock modules; standard RS232 serial controlling. Dual channel LDO, 5.0V-3.3V; 3.3V-1.8V; low power consumption; standby current 60uA; fast response of controlling and playing , superior in similar products; suitable for the occasions where need to replace the voice or where a long time, high quality voice are required.

WT5001M01-16P, WT5001M02-28P and WT5001M03,-28P three MP3 modules are high-quality and stable semi-finished modules developed as WT5001-48L is the master chip. All three modules have the minimum system functions of the WT5001-48L, come with the SPI-FLASH as a storage medium, 1W amplifier; serial port controlling functions, download music files online. Based on this, each has different features, and is flexible with the secondary development in a variety of situations or used directly.

▲Our company can provide development of various functions for customers.

1.2、 Example of application

WT5001-48L chips and modules can be used in automotive electronics (theft alarm, reversing radar, GPS navigation system, electronic dog, central lock), intelligent home systems and home burglar alarm, voice navigation of medical instruments, personalized voice player, household appliances (cooker, rice cooker, microwave oven), entertainment devices (amusement machine, voice advertising machine) learning model (early childhood education, children's audio books), intelligent transporting equipment (bus stop, parking systems), industrial control field(elevators, industrial equipment), voice instructions, fault code language interpreter, toys and other fields.

Suitable for: the occasions where need to replace the voice or where a long time, high quality voice are required

1.3、 WT5001-48L voice chip features

- WT5001-48L chip package is TQFP48, module package are DIP16 and DIP28;
- 8KB OTP, 8-BIT CISC;
- DAC & MP3/WAV Decoder, drive 16Ω headphones, SNR=93dB,support MPEG 1/2/2.5 Layer3, support MP3 decoding, 10 band equalizer to adjust, 32 levels volume to adjust, support WAV format;
- One SPI, support SPI-FLASH download music files online;

- Support SD card 、 U disk、 SPI Flash to store;
- Support 4M、 8M、 16M、 32M and 64M SPI-FLASH;
- Playing content in SPI-FLASH is default when power on
- SD/MMC/MSPRO host Controller, support maximum 2G capacity, playback the contents of SD card controllability, can copy contents of SD card to SPI-FLASH offline;



- USB Host/Device, playback the contents of U disk controllability, can copy contents of U disk to SPI-FLASH offline;
- Change playing mode when power on by setting iSound.mp3, the mode include: auto play or not, single cycle or not, all songs cycle or random play;
- Three method to copy, include: press key power-on to copy、playing key A、B to copy and serial commands to copy;
- Press to copy function key, there are functions of pressing key power on to copy and pressing key to play
- A、B mode function key, there are functions of A、B copy and A、B mode to switch;
- One to one playing key, control to play voice of corresponding address, there are two cycle mode to choose.
- ADC key, support five standard MP3 function key, realize that one pin control more key;
- Standard UART communicating interface, default baud rate 9600, control by commands of MCU or PC serial, stable and efficient communication
- Can control to insert music to playback

- Can control to play compositely and continuously
- Can set RTC, can set timing time;
- fast response of controlling and playing, superior in similar products
- Operating mode of setting memory with EEPROM, identify the mode automatically when power on, when switching mode ,the light flash indicate that the mode is switched and the signal of BUSY goes low.
- Come with a reset module internal;
- RTC real time clock and calendar clock module;
- A signal of BUSY as output pin, it will be high when audios are playing, and it will be low as normal;
- Play mute when the current is lower than 39mA, SPI play time when power on is less than 0.8s, superior performance;
- Support FAT16, FAT32 file system;
- Work stability for long time, strong ability of anti-jamming
- Dual channel LDO, 5.0V-3.3V; 3.3V-1.8V
- Support a variety of voice development programs flexibly.

1.4、 Feature details of WT5001-48L voice chips and modules

WT5001-48L voice chip is a powerful OTP voice microcontroller chip. WT5001-48L makes that voice chip no longer find suitable external microcontroller circuit for the way of controlling, highly integrated single-chip technology is sufficient to replace the complex external controlling circuit. The operation is simple and easy to understand, the time of using and secondary developments are greatly reduced.

SPI Download online: Download through the downloader and the compile software, download the music to the SPI-FLASH simply and easily. The downloader is easy to use, and the compile software is convenient to operate.



ADC standard keys: An interface can control five keys , save I / O resources; fully ingratiate the function of MP3 in market, that play / pause, stop, last song, next song, volume +, volume - and so on;

Press to copy function keys: The key function of normal is: short press, is for the next one, when play the final song, back to the first song ,and the playing mode is single cycle mode; long press, is copy function when power-on , first press the key and hold before power-on, after 5S power on ,BUSY indicator flashes (said to enter the copy), release the button until the BUSY indicator stop flashing and darken, copy success.

A 、 B mode function keys: Short press A key to select last song, long press A key for 3S to set to A mode; short press B key to select next song, long press B key for 3S to set to B mode, the key is active low. Model A: auto play current songs (Memory) each time when power-on, play it once and stop. Mode B: play the next one (Memory) each time when power-on, play it once and stop; when play the finial one power-on, then start to play the first one when power-on next time.

One-to-one function key: When DATA14 is high, DATA16 \ DATA17 \ DATA18 \ DATA19 correspond to 1, 2, 3, 4 pieces of voice, low pulse trigger and play once then stop. When DATA14 is low, DATA16 \ DATA17 \ DATA18 \ DATA19 correspond to 1, 2, 3, 4 pieces of voice, when low to maintain ,the playing mode is single cycle, when jump to high it will finish the current song then stop.

UART serial port control: Standard serial port communications protocol ,by sending a command to control that: specify music file to playback, switch memory, switch cycle mode, music insertion, a combination of songs to playback, set and read RTC, timed wake-up trigger, etc.;

ISound.mp3 document settings: Set “iSound.mp3” file which is the content of the final position in SD card, be copied together to the SPI-FLASH, which can be set to change the mode that if play or not when power on and the cycle mode.

2、 Selection guide

2.1、 Function table

Model	Package	Size (mm)	SPI download	Serial control	ADC_ KEY	SD card	SD card socket	U disk	One to one key control	A、 B mode
WT5001M01-16P	16PIN module	20.9*19.6	√	√	√	×	×		×	×
WT5001M02-28P	28PIN module	36.2*19.1	√	√	√	√	√	√	√	×
WT5001M03-28P	28PIN module	36.1*19.7	√	√	√	√	×	√	×	×
WT5001-48L	TQFP48module	9.0*9.0	√	√	√	√	×	√	√	√

2.2、 Absolute maximum rate

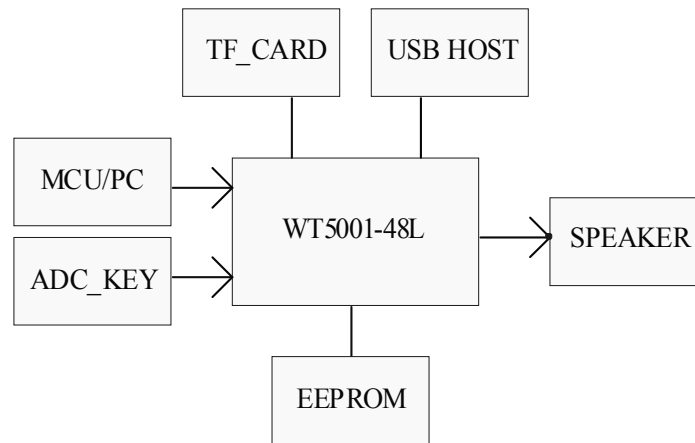
Parameters	Mark	condition	Rated value	Unit	Note
Supply voltage	VDD	Input	-0.3V-5.2V	V	

Operating temperature	Topr	-	-30—75	°C	
Storage temperature	Tstg	-	-20—55	°C	

2.3、Chip electrical parameters

Parameters	Mark	condition	Minimum	Typical value	Maximum	unit	Note
Supply voltage	VDD	RL=8Ω,1W	3.3	5	5.2	V	
Play current	Ip	RL=8Ω,1W	-	39.1	-	mA	Play mute
Pause current	Ir	RL=8Ω,1W	-	37.6	-	mA	
Stop current	Id	RL=8Ω,1W	-	37.6	-	mA	
Copy current	Ic	RL=8Ω,1W	-	42	52	mA	
Button current	Ik	RL=8Ω,1W	-	45	55.6	uA	
Audio output power	Pout	RL=8Ω,1W	-	0.132	-	W	
UART response time	To	-	-	128	-	ms	

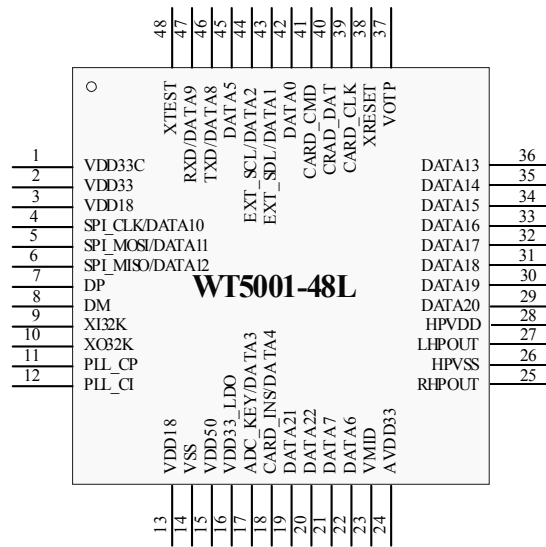
3、Chip typical application block diagram



4、Detailed description of the pin assignment diagram

4.1、WT5001-48L Pin assignment and description

Pin assignments as follows:



Detailed description of pins:

NUM	NAME	ATTR	DESCRIPTION	NOTE
1	VDD33C	PWR	Power switch output,3.3V power supply to external devices	
2	VDD33	PWR	PAD 3.3V power pin	
3	VDD18	PWR	1.8Vpower supply in core	
4	DATA10	IO	function 1: GPIO[10]; function 2: SPI_ CLK.	Default function 2
5	DATA11	IO	function 1: GPIO[11]; function 2: SPI_ MOSI.	Default function 2
6	DATA12	IO	function 1: GPIO[12]; function 2: SPI MISO.	Default function 2
7	DP	IO	USB DP differential line	
8	DM	IO	USB DM differential line	
9	XI32K	I	32.768K crystal oscillator input	
10	XO32K	O	32.768K crystal oscillator output	
11	PLL_CP	ANA	PLL capacity pin, connect 2nF capacity to GND	
12	PLL_C1	ANA	PLL capacity pin, connect 2nF capacity to GND	
13	VDD18_LDO	PWR	1.8Vpower supply in core	
14	VSS	GND	Package GND	
15	VDD50	PWR	LDO total power supply, minimum can not be lower than 3.3V	
16	VDD33_LDO	PWR	LDO 3.3V output, connect to3.3V on the external	
17	DATA3	IO	function 1: GPIO[3]; function 2: ADC_KEY(standard MP3key)	Default function 2



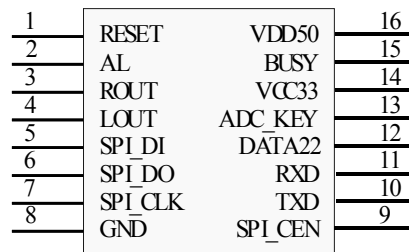
18	DATA4	IO	Function 1: GPIO[4]; Function 2: CARD_INS (SD card detecting pin)	Default function 2
19	DATA21	IO	Function 1: GPIO[21]; Function 2: A mode key ;	Default function 2
20	DATA22	IO	Function 1:GPIO[22]; Function 2: Press to copy function keys ;	Default function 2
21	DATA7	IO	GPIO[7];	
22	DATA6	IO	GPIO[6];	
23	VMID	ANA	Decoupling capacitor connecting pin	
24	AVDD33	PWR	DAC analog power supply pin	
25	RHPOUT	ANA	Headphone right channel output	
26	HPVSS	GND	DAC high power GND	
27	LHPOUT	ANA	Headphone left channel output	
28	HPVDD	PWR	DAC high power supply,3.3V	
29	DATA20	IO	Function 1: GPIO[20]; Function 2: B mode key ;	Default function 2
30	DATA19	IO	Function 1: GPIO[19]; Function 2: One to one function key, corresponding to the address of the fourth song;	Default function 2
31	DATA18	IO	Function 1: GPIO[18]; Function 2: One to one function key, corresponding to the address of the third song;	Default function 2
32	DATA17	IO	Function 1: GPIO[17]; Function 2: One to one function key, corresponding to the address of the second song;	Default function 2
33	DATA16	IO	Function 1: GPIO[16]; Function 2: One to one function key, corresponding to the address of the first song;	Default function 2
34	DATA15	IO	Function 1: GPIO[15]; Function 2: BUSY indicate outout;	Default function 2
35	DATA14	IO	Function 1: GPIO[14]; Function 2: One to one function key, switch cycle mode;	Default function 2
36	DATA13	IO	Function 1: GPIO[13],24mA drive;	
37	VOTP	PWR	OTP programming voltage,6.5Vinput,vacant when actual application	



38	X_RESET_	I	External reset pin	
39	CARD_CLK	IO	SD/MMC/MSPRO clock bus	
40	CARD_DAT	IO	SD/MMC/MSPRO data bus	
41	CARD_CMD	IO	SD/MMC/MSPRO command bus	
42	DATA0	IO	Function 1: GPIO[0]; Function 2: Clock timer wake-up signal output, output 1 second high;	Default function 2
43	DATA1	IO	Function 1: GPIO[1]; Function 2: EXT_SDL (EEPROM data bus);	Default function 2
44	DATA2	IO	Function 1: GPIO[2]; Function 2: EXT_SCL (EEPROM clock bus);	Default function 2
45	DATA5	IO	Function 1: GPIO[5]; Function 2: Reset down into debug mode;	
46	DATA8	IO	Function 1: GPIO[8]; Function 2: Serial port TXD.	Default function 2
47	DATA9	IO	Function 1: GPIO[9]; Function 2: Serial port RXD.	Default function 2
48	X_TEST_MODE	I	Equal 1 then enter to test mode ; equal 0 then enter functional mode	

4.2、WT5001M01-16P Pin assignment and description

Pin assignments as follows:



WT5001M01-16P

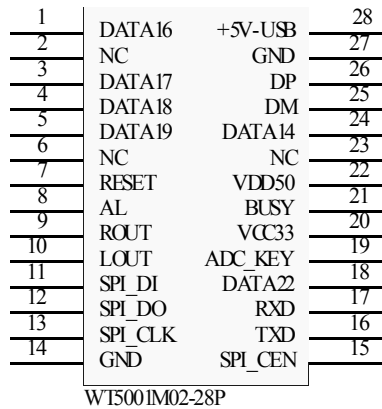
Detailed description of pin:

NUM	NAME	ATTR	DESCRIPTION	NOTE
1	RESET	I	External reset	
2	AL	ANA	ADC audio output	Can be connect to active speaker
3	ROUT	ANA	PWM audio output	Can be connect to 1W8Ωspeaker

4	LOUT	ANA	PWM audio output	Can be connect to 1W8Ωspeaker
5	SPI_DI	IO	SPI main output minor input data bus	SPI download port
6	SPI_DO	IO	SPI main input minor output data bus	SPI download port
7	SPI_CLK	IO	SPI clock bus	SPI download port
8	GND	GND	GND	
9	SPI_CEN	IO	SPI chip select bus	SPI download port
10	TXD	IO	UART send bus	
11	RXD	IO	UART receive bus	
12	DATA22		Press to copy function keys	
13	ADC_KEY	IO	ADC standard MP3 function key	
14	VCC33	PWR	LDO 3.3V output	
15	BUSY	IO	Indication output when the module is busy	
16	VDD50	PWR	Power supply port, DC5V	

4.3、WT5001M02-28P Pin assignment and description

Pin assignments as follows:



Detailed description of pin:

NUM	NAME	ATTR	DESCRIPTION	NOTE
1	DATA16	IO	One to one function key, corresponding to the address of the first song;	
2	NC		Connect to TF socket shell	
3	DATA17	IO	One to one function key, corresponding to the address of the second song;	
4	DATA18	IO	One to one function key, corresponding to the address of the third song;	
5	DATA19	IO	One to one function key, corresponding to the	



			address of the fourth song;	
6	NC		Connect to TF socket shell	
7	RESET	I	External reset	
8	AL	ANA	ADC audio output	Can be connect to active speaker
9	ROUT	ANA	PWM audio output	Can be connect to 1W8Ωspeaker
10	LOUT	ANA	PWM audio output	Can be connect to 1W8Ωspeaker
11	SPI_DI	IO	SPI main output minor input data bus	SPI download port
12	SPI_DO	IO	SPI main input minor output data bus	SPI download port
13	SPI_CLK	IO	SPI clock bus	SPI download port
14	GND	GND	GND	
15	SPI_CEN	IO	SPI chip select bus	SPI download port
16	TXD	IO	UART send bus	
17	RXD	IO	UART receive bus	
18	DATA22	IO	Press to copy function keys	
19	ADC_KEY	IO	ADC standard MP3 function key	
20	VCC33	PWR	LDO 3.3V output	
21	BUSY	IO	Indication output when the module is busy	
22	VDD50	PWR	Power supply port, DC5V	
23	NC		Connect to TF socket shell	
24	DATA14	IO	One to one function key ,switch cycle mode	
25	D-	IO	USB DP differential line	
26	D+	IO	USB DM differential line	
27	GND	GND	U disk socket shell	
28	+5V_USB	PWR	U disk power supply port	

4.4、WT5001M03-28P Pin assignment and description

Pin assignments as follows:

1	CARD_INS	+5V-USB	28
2	CARD_CLK	GND	27
3	CARD_DAT	DP	26
4	CARD_CMD	DM	25
5	VCC33	EXT_SCL	24
6	GND	EXT_SDL	23
7	RESET	VDD50	22
8	AL	BUSY	21
9	ROUT	VCC33	20
10	LOUT	ADC_KEY	19
11	SPI_DI	DATA22	18
12	SPI_DO	RXD	17
13	SPI_CLK	TXD	16
14	GND	SPI_CEN	15

WI5001M03-28P

Detailed description of pin:

NUM	NAME	ATTR	DESCRIPTION	备注
1	CARD_INS	IO	(SD card detect pin)	
2	CARD_CLK	IO	SD/MMC/MSPRO clock bus	
3	CARD_DAT	IO	SD/MMC/MSPRO data bus	
4	CARD_CMD	IO	SD/MMC/MSPRO command bus	
5	VCC33	PWR	SD card power supply	
6	GND	GND	SD card GND	
7	RESET	I	External reset	
8	AL	ANA	ADC audio output	Can be connect to active speaker
9	ROUT	ANA	PWM audio output	Can be connect to 1W8Ωspeaker
10	LOUT	ANA	PWM audio output	Can be connect to 1W8Ωspeaker
11	SPI_DI	IO	SPI main output minor input data bus	SPI download port
12	SPI_DO	IO	SPI main input minor output data bus	SPI download port
13	SPI_CLK	IO	SPI clock bus	SPI download port
14	GND	GND	GND	
15	SPI_CEN	IO	SPI chip select bus	SPI download port
16	TXD	IO	UART send bus	
17	RXD	IO	UART receive bus	
18	DATA22	IO	Press to copy function keys	
19	ADC_KEY	IO	ADC standard MP3 functional key	
20	VCC33	PWR	LDO 3.3V output	
21	BUSY	IO	Indication output when the module is busy	
22	VDD50	PWR	Power supply port, DC5V	
23	EXT_SDL	IO	EEPROM data bus;	

24	EXT_SCL	IO	EEPROM data bus;	
25	D-	IO	USB DP differential line	
26	D+	IO	USB DM differential line	
27	GND	GND	U disk GND	
28	+5V_USB	PWR	U disk power supply port	

5、 Detailed description of the functional operation

5.1、 BUSY indicate output

There is an output signal BUSY, when there are audios playing, the output will be high, and be low as normal.

5.2、 Function detail of ADC standard key mode

Key	operation	Function and operation	
PLAY	Short press	⌘	Play\Pause
	Long press	⌘	Stop
NEXT	Short press	⌘	Select next song
	Long press	⌘	Fast forward (when playing)
LAST	Short press	⌘	Select next song
	Long press	⌘	Fast reverse (when playing)
VOL+	Short press	⌘	Volume increase
	Long press	⌘	Volume increase rapidly
VOL-	Short press	⌘	Volume decrease
	Long press	⌘	Volume decrease rapidly

5.3、 Function setting description

5.3.1、 Setting method

There is an iSound.mp3 document in SD card .Copy all mp3 files in SD card to SPI flash to operate, while all the configurations in iSound.mp3 file is updated to the SPI flash, the specific storing location as below.

Note: you can open iSound.mp3 file on the computer by "Notebook" or "WordPad", modify the setting parameters inside. Please don't mistake the uppercase and lowercase of the "iSound.mp3" file name.

5.3.2、 Function detail

StartP: 00、 No play power-on, 01、 Auto play power-on;



Cycle: 00、No cycle, 01、Single cycle, 02、All songs cycle, 03、Random play

5.3.3、ISound.mp3 file storing location

ISound.mp3 files must put at the final storing address of SD card or U disk, that is the final to deposit to the SD card or U disk (the final of index sequence).

5.4、SPI FLASH copy function

5.4.1、Method of mass production

Edit the project file by PC software, programmed into the SPI FLASH directly.

5.4.2、Copy method of SD card or U disk

First edit iSound.mp3 file, copy it to SD card or U disk, and then copy the voice file you want to put in SD card or U disk in order, finish it; through three operating methods copy to SPI-FLASH, (default the original mode unchanged if there isn't iSound.mp3 file)

1、 Press the key for 5S when power on, the red light BUSY flash that it will start to copy then release the key, red light BUSY flash until the copy ends.

2、 Long press the A key and B key for 5S, the red light BUSY flash that it will start to copy then release the key, red light BUSY flash until the copy ends.

3、 The MCU send serial commands to achieve copying, BUSY light indicates as the first method, when finish the copy, the serial port output an instruction, the specific instructions see agreement below.

Note: The sequence of the music files copied to the SPI-FLASH is the order of the file address stored in SD card or U disk, which is index order of the file in SD card or U disk.

5.4.3、The order of music file stored in SD card :

As the order of file address in SD card is the order of index, that is, who is the first to copy, whose memory address is at first. And the order of WT5001-48L playing music in SD card is in accordance with the order of the memory address in SD card, so be clearly that the order of the file in SD card which WT5001-48L specify to playback with, the first that you must store the file in SD card in order as planed. The following is the method to store files in SD card:

Build a file folder on your computer , to place the music files which will be stored in SD card, and make them in good order (if you want to know the files order clearly , you can add to each music file name with "0001-9999", such as 0001 the Motherland mp3, 0002 love story. mp3, rank in the order of the file, Select all the music files which will be stored in SD card, such as CTRL + A ", and then right-click the first file, select "sent to the removable storage (SD card or U disk), so the order of music files in SD card is desired.

Note: the order of music files stored in the U disk is similar as in SD card.

5.5、 Description of specific function :

5.5.1、 Press to copy function keys

The normal function of the key (DATA22) is: short press, is for the next one, when play the final song, back to the first song ,and the playing mode is single cycle mode; long press, is copy function when power-on , first press the key and hold before power-on, after 5S power on ,BUSY indicator flashes (said to enter the copy), release the button until the BUSY indicator stop flashing and darken, copy success.

5.5.2、 One to one function key

When DATA14 is high, DATA16 \ DATA17 \ DATA18 \ DATA19 correspond to 1, 2, 3, 4 pieces of voice, low pulse trigger and play once then stop.

When DATA14 is low, DATA16 \ DATA17 \ DATA18 \ DATA19 correspond to 1, 2, 3, 4 pieces of voice, when low to maintain ,the playing mode is single cycle, when jump to high it will finish the current song then stop.

5.5.3、 A、 B mode function key

A, B keys are set two different operating modes: short press A key (DATA21) to select last song, long press A key (DATA21) for 3S to set to A mode; short press B key (DATA20) to select next song, long press B key (DATA20) for 3S to set to B mode, the key is active low. When there is an EEPROM, it can remember the operating mode, identify the mode automatically when power on. As switching the mode, the light flashes indicate switching success and BUSY goes low.

Model A: auto play current song (Memory) each time when power-on, play it once and stop.

Mode B: play the next one (Memory) each time when power-on, play it once and stop; when play the final one power-on, then start to play the first one when power-on next time.

Note: when using A, B mode, there must be the EEPROM to memory power-down.

5.6、 Description of storage

5.6.1、 Stored format

The storage of SD card and U disk supports FAT16, FAT32 file system.

5.6.2、 Memory power down

Memory store to the EEPROM when power down that is a standard function, memory power-down include volume value, the current playing song number and the setting of A, B mode referred below; when there isn't external EEPROM, it will be no memory processing when power down ,but can not affect other functions;

5.7、 Process audio files

Support MP3, WMA, WAV format audio files. (It will need different models to support WMA and WAV)
 If the MP3 files store in SPI-FALSH, it can be lower bit rate MP3 format files.

6、 Serial communication control protocol

6.1、 Protocol command format

Start code	Length	Opcode	Parameter	End code
0X7E	See below	See below	See below	0X7E

Note: The "length" refers to the length + opcode + the length of the parameter, as follows 12.2.2 the command that specifying the file in SD card to playback, of which the length is 4 bytes.

6.2、 write instruction

6.2.1、 Format of code returned from writing instruction

Opcode
XX

Note: After perform each writing command, return to one byte operation code corresponded to the command.

6.2.2、 Specify the files in SD card to playback

This command can specify the files in SD card to playback, it doesn't effect by the order of files stored.

Start code	Length	Command	High bit of songs	Low bit of songs	End code
7E	04	A0	00	01	7E

6.2.3、 Specify the files in SPI Flash to playback

This command can specify to the files operate only in SPI Flash.

Start code	Length	Command	High bit of songs	Low bit of songs	End code
7E	04	A1	00	01	7E

6.2.4、 Specify the files in U disk to playback

This command can specify the files to operate only in U disk.

Start code	Length	Command	High bit of songs	Low bit of songs	End code
------------	--------	---------	-------------------	------------------	----------



7E	04	A2	00	01	7E
----	----	----	----	----	----

6.2.5、Pause

Start code	Length	Command	End code
7E	02	A3	7E

Sending the command first time to pause the music, send the data again, continue to play music from the suspension.

6.2.6、Stop

Start code	Length	Command	End code
7E	02	A4	7E

Sending the command to stop the current song.

6.2.7、Next song

Start code	Length	Command	End code
7E	02	A5	7E

The instruction trigger to play the next song, when playing the first song, sending the command can trigger to play the final music.

6.2.8、Last song

Start code	Length	Command	End code
7E	02	A6	7E

The instruction trigger to play the last song, when playing the last song, sending the command can trigger to play the first song.

6.2.9、Volume control

The volume levels are total of 32, from 00 to 31, which 00 is mute, 31 is maximum volume.

Start code	Length	Command	Volume level	End code
7E	03	A7	1F	7E

The command in example is to send a maximum volume 31, this instruction can adjust the volume in real time, and the volume can be in memory power-down.

6.2.10、Combine to play

This command can specify certain files to play continuously in the current directory

Start code	Length	Command	High bit of songs	Low bit of songs	End code
7E	04	A8	00	01	7E

The combination of playing is sending 10 groups or less music combination code to the WT5001-48L continuously, WT5001-48L play the music according to the sequence of code received. Different from sending name to control directly is that the next code can not a music not interrupt the playing until finish the current song , receive the command to do FIFO processing. Example : WT5001 continuously receive "7E 04 A8 00 08 7E ", "7E 04 A8 00 06 7E ", "7E A8 04 00 07 7E ", " 7E A8 04 00 04 7E ", " 7E 04 A8 00 03 7E ", "7E 04 A8 00 02 7E " six sets of data, WT2801-S specify to play SD files named" 0008.mp3 ", " 0006.mp3 ", " 0007.mp3 ", " 0004.mp3 ", "0003.mp3 ", " 0002.mp3 "6 audio files in order.

Note:

Before the combination of playing, if you want to play other mode of files stored, you must first send the specified storage mode playing command, the track in instructions fill in the first one of the combination of playing, and then send the tracks behind in the instructions, to realize combine to play.

B, Combination of playing only in the non-cyclic mode, is invalid in the single cycle mode or all songs cycle mode,;

C, The continuous combination is maximum 10 groups. During playback, if there is a new command it can be interrupted, and implement the new command.

6.2.11、 Set playing mode

Start code	Length	Command	Parameter	End code
7E	03	A9	00: single and no cycle (default)	7E
			01: single and cycle	
			02: all songs cycle	
			03: random play	

Note: The instruction is to modify the playing mode when power on, when power down, the mode will return to the mode which is configured in iSOUND.mp3 file. Using the instructions, it is proposal that MCU set the mode as initializing the module to realize performing as setting each time.

6.2.12、 Instruction of copy the content from SD card to SPI FLASH

Start code	Length	Command	End code
7E	03	AA	7E

Note: it will return "AA" immediately after receive the instruction, while the indicator flashes, if copy successfully it will return "AA 00", if not, it will return "AA 01"; the indicator stop flashing when the copy finished.

6.2.13、 Instruction of copy the content from U disk to SPI FLASH

Start code	Length	Command		End code
7E	03	AB	00	7E

Note: it will return "AB" immediately after receive the instruction, while the indicator flashes, if copy successfully it will return "AB 00", if not, it will return "AB 01"; the indicator stop flashing when the copy finished.

6.2.14、 Instruction of insertion

Start code	Length	Command	High bit of songs	Low bit of songs	End code
7E	04	AC	00	01	7E

Note: When receive the instruction, the current song will pause, and then execute this command to playback the specified song, when finish playing, it will play the original song which is pause. This instruction only can be implemented in SPI- FLASH.

6.3、 Instructions of setting clock

6.3.1、 Set data information

Start code	Length	Opcode	Year (2bytes)	Month(1byte)	Day (1byte)	End code
7E	05	B1	2011	05	08	7E

Note: The year, month, day are hexadecimal code, such as the data of 2011 is 07 DB.

6.3.2、 Set time information

Start code	Length	Opcode	Hour (1byte)	Minute (1byte)	Second(1byte)	End code
7E	06	B2	20	07	08	7E

Note: The hour, minute, second are shown as hexadecimal code.

6.3.3、 Set waking up time information

Start code	Length	Opcode	Hour (1byte)	Minute (1byte)	Second (1byte)	End code
7E	05	B3	0A	05	08	7E



Note: after executing this instruction, the clock of IC will record a time, when it's time to the setting time, DATA0 of IC will output one second pulse signal; after MCU of the controlling side detects the pulse signal from INT, sent the inquiry instruction through the serial port to read the current time, then it will know to perform what procedures this time.

6.3.4、 Set information of time period

Start code	Length	Opcode	Hour (1byte)	Minute (1byte)	Hour (1byte)	Minute(1byte)	End code
7E	06	B4	06	05	06	08	7E

Note: The first two bytes represent the starting time, the latter two represent the cut-off time.

If there is MCU, this function can be implemented through the microcontroller, so we do not consider to performing any function.

6.3.5、 Clear the information of timing

Start code	Length	Opcode	End code
7E	02	B5	7E

6.3.6、 Clear the information of time period

Start code	Length	Command	End code
7E	02	B6	7E

6.4、 The command of reading operation

6.4.1、 Read the current volume value

Start code	Length	Command	End code
7E	02	C1	7E

The format returned:

Opcode	Return value
0XC1	Volume value

6.4.2、 Read the current playing state

Start code	Length	Command	End code
------------	--------	---------	----------

7E	02	C2	7E
----	----	----	----

The format returned:

Opcode	Return value
0XC2	01: Play 02 Stop; 03: Pause

6.4.3、 Read the total number of files in SPI Flash

Start code	Length	Command	End code
7E	02	C3	7E

The format returned:

Opcode	Return value
0XC3	Total number of files

6.4.4、 Read the total number of files in SD card

Start code	Length	Command	End code
7E	02	C4	7E

The format returned:

Opcode	Return value
0XC4	Total number of files

6.4.5、 Read the total number of files in U disk

Start code	Length	Command	End code
7E	02	C5	7E

The format returned:

Opcode	Return value
0XC5	Total number of files

6.4.6、 Read the current audio filename

Start code	Length	Command	End code
7E	02	C6	7E

The format returned:

Opcode	High bit of files number	Low bit of files number
0XC6	XX	XX

6.4.7、 Read the current data information

Start code	Length	Opcode	End code
7E	02	D1	7E

The format returned:

Opcode	Year (2bytes)	Month (1bytes)	Day (1bytes)
0XD1	XX	XX	XX

6.4.8、 Read the current time information

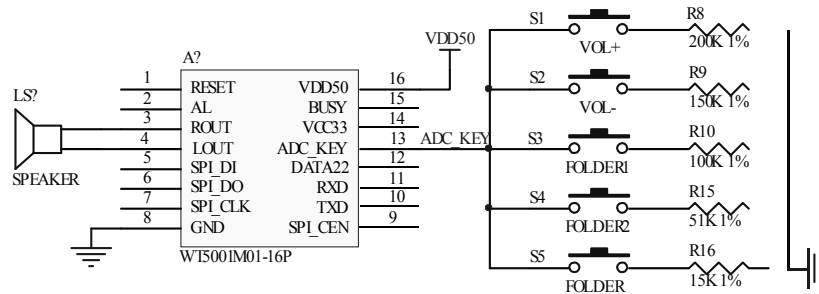
Start code	Length	Opcode	End code
7E	02	D2	7E

The format returned:

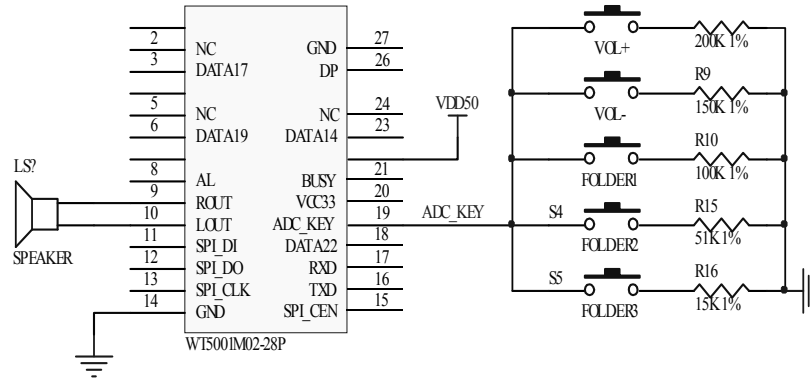
Opcode	Hour (1bytes)	Minute (1bytes)	Second (1bytes)
0XD2	XX	XX	XX

7、 Example of application circuit

7.1、 WT5001M01-16P Minimum application circuit diagram



7.2、 WT5001M02-28P Minimum application circuit diagram



7.3、 WT5001M03-28P Minimum application circuit diagram

