

Shenzhen electronic technology limited company

Shenzhen Balway Electronic Technology Co., Ltd.



BY8301-16P Voice module user manual

1、 Overview

BY8301-16P Is Shenzhen electronic technology limited company independent research and development of a tiny new high quality MP3 Module, using BY8301-SSOP24 MP3 Main control chip, support MP3、WAV Formatting double decoding. Module built-in SPI-FLASH As a storage medium, equipped Micro USB Connector without PC software, can be replaced through data cable connected to the computer free FLASH Audio content. And the built-in 3W Power amplifier, you can directly drive 3W Speakers, easier to use.

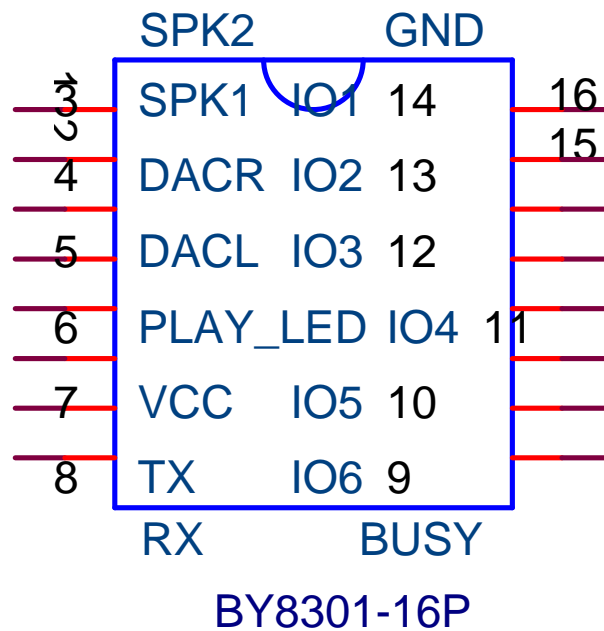
2、Product features

- Support MP3 、 WAVHigh quality audio format, beautiful voice.
- 24 位 DAC Output dynamic range support90dBAnd SNR support85dB.
- Micro USBInterface updated voice files, without having to install the PC software. SupportXP 和 WIN7The system.
- Support21Play voice one trigger,3 IOHardware selection8Triggering modes, more widely used.
- Support UART Asynchronous serial port control: support playback, pause, next song, volume, plus and minus, musical play, breaks, etc.
- Built-in volume, track,EQPower off memory function.
- Maximum support16MByte sizeSPI FLASH。 For example,GD25Q16[2MBytes]、GD25Q128[16MBytes]
- Comes with3WPower amplifier directly to external speakers to complete the play; customers can also add-in single and dual-channel power amplifier.
- Standard2.54mmSpacingDIP16Pin package, small and beautiful.

3、Technical specifications

The name	Parameters
MP3、WAVFile format	Supported sampling rates8 ~ 48K, Bit rate8 ~ 320KbpsAudio files
USBInterface	2.0Standard (Micro USBInterfaces that can be connected to a computer to download the voice can also be readUDisc content)
UARTInterface	Standard serial port,3.3V TTLLevel,Baud rate9600
Input voltage	3.6V-5V(Recommended values4.2V)
Quiescent current	15MA(All modules)
Amplifier power	接 3W/4Ω 或 2W/8ΩHorn
Dimensions	21mm*18mm
Working temperature	-40 °C ~ 70 °C
Humidity	5% ~ 95%

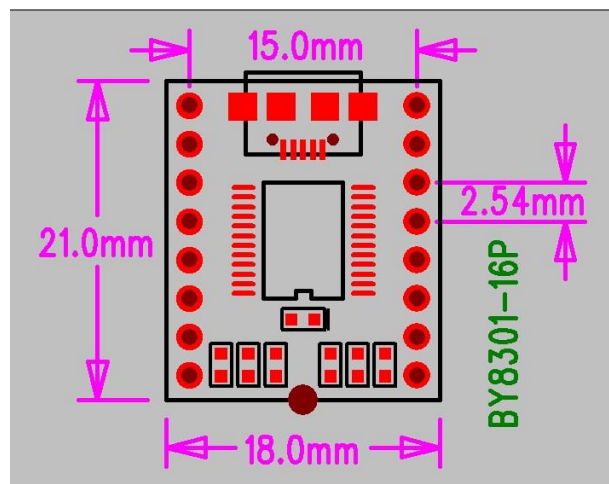
4、Module pin map



PIN number	PIN name	Functional description	Notes
1	SPK2	External monaural speaker	接 3W/4Ω 或 2W/8Ω Passive speakers
2	SPK1	External monaural speaker	接 3W/4Ω 或 2W/8Ω Passive speakers
3	DACR	DACRight channel output	External amplifier, headphone
4	DACL	DACThe left channel output	External amplifier, headphone
5	PLAY_LED	Play indicator	Standby light, play Flash
6	VCC	Positive power supply	3.6-5V
7	TX	UARTAsynchronous serial data output	3.3V 的 TTLLevel

8	RX	UARTAsynchronous serial data input	3.3V 的 TTLLevel
9	BUSY	During playback the output high, stopping for low	Busy signal
10	IO6	Trigger input6	Ground trigger
11	IO5	Trigger input5	Ground trigger
12	IO4	Trigger input4	Ground trigger
13	IO3	Trigger input3	Ground trigger
14	IO2	Trigger input2	Ground trigger
15	IO1	Trigger input1	Ground trigger
16	GND	Power cathode	System

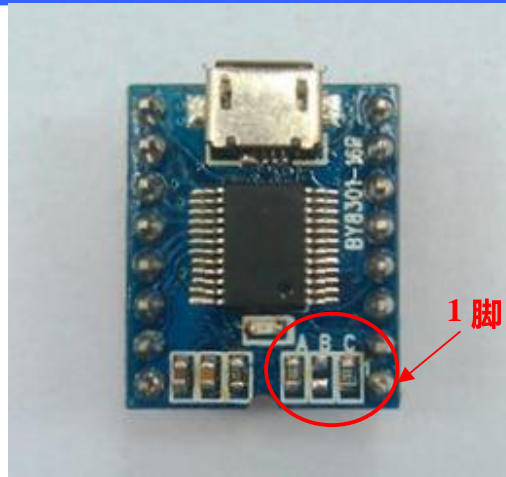
5、Module package sizes



6、IO Key description

This module has six triggerIO, The maximum21Press one to trigger playback. Available through3 个 IOAfter I3.3KGrounding or not to be8Control mode selection for a variety of applications.

Sets the control mode of resistance on the front module, mark A B C Character modulesThe default value 010Customer home can modify:



21Press one application:

IO1	One to play the songs	IO2- IO3	One-on-one play songs 12
IO2	One-on-one play song II	IO2- IO4	One-on-one play song 13
IO3	One-on-one play three songs	IO2- IO5	One-on-one play song 14
IO4	One-on-one play four songs	IO2- IO6	One-on-one play song Shi
IO5	One-on-one play five songs	IO3- IO4	One song is playing 16
IO6	One-on-one play six songs	IO3- IO5	One-on-one play song 17
IO1- IO2	One-on-one play song of seven	IO3- IO6	One-on-one play songs 18
IO1- IO3	One-on-one play eight songs	IO4- IO5	One-on-one play songs 19
IO1- IO4	One to play the songs	IO4- IO6	One-on-one play 20 songs
IO1- IO5	One-on-one play song for ten	IO5- IO6	One-on-one play song 21
IO1- IO6	One-on-one play song XI		

3 IO Choice of control mode(3.3K Grounding for the 0, Loft 1) ,

The default value 010 :

IOA	IOB	IOC	Press one function (key-presses are both effective, without releasing)
0	0	0	Key ground trigger play it again stops, Midway has triggered an invalid long press for longer than the current song, loop lift in the Middle played it again to stop
0	0	1	Key ground,ON/OFF Function. Click playback, during playback, trigger is stopped, trigger is to start from scratch again in a stop State play, stop playing the current song again

0	1	0	Key ground, click on the sound, is ringing in the process, then break and then start playing, play once and then stop	
0	1	1	Key ground, click on the sound, then press in the process cannot be interrupted until finished, again according to valid	
1	0	0	Trigger level holding,Keys has been in play it again, lift the stop button in the middle (This mode is not available for serial control)	
1	0	1	Level holding cycle trigger keys holding down the loop lift the stop button in the middle (This mode is not available for serial control)	
1	1	0	Standard MP3 Model	
			IO1	Play/Pause/Long press 2 Seconds to stop the current song
			IO2	Next track (short press)/Volume+(Long press)
			IO3	Previous track (short press)/Volume-(Long press)
			IO4	Volume+
			IO5	Volume-
			IO6	Level holding trigger keys holding down the play button lift stop (This feature is not available)-
1	1	1	Special features	
			IO1	Key ground trigger play it again stops, Midway has triggered an invalid long press for longer than the current song, loop lift in the Middle played it again to stop
			IO2	Short press the next song/Long press the volume+
			IO3	Short press on one/Long press the volume-
			IO4	Volume+
			IO5	Volume-
			IO6	PLAY Key, press play, during playback, press break, then start playback, play once and then stop

7、Areas of application

- Industrial control field: industrial control equipment;
- Intelligent transportation equipment: charging station,Parking, in-vehicle voice prompts;
- Advertising: advertisements on the air;
- Access control, time attendance: voice prompts such as door is open;
- Security industry: human body induction prompt, secure voice prompts and tips;

- Top toy: swing machines, crash crash game machines;
- Medical: equipment voice prompts;
- Education and communication: education, equipment, communications, electronics;

8、Serial Control Protocol

BY8301 Built-in standard UART asynchronous serial interface, which belongs to the 3.3V TTL Level interface. Available through MAX3232 Chip into RS232 Level. Communication data format is: start bit: 1 Data: 8 Place the parity bit: none; stop bits: 1 People. Using computer serial debugging assistant, you need to correctly set the serial port parameters and settings as shown in Figure:



Protocol

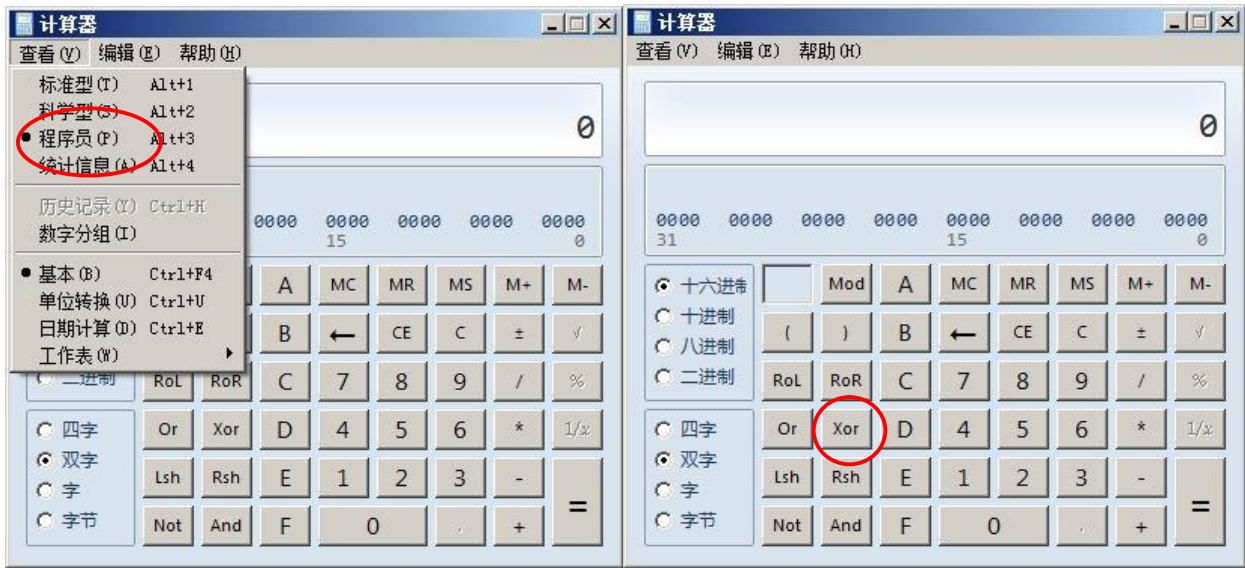
command format:

Start code	Length	Operation code	Parameters	Check code	End code
0X7E	See below	See below	See below	See below	0XEF

Note: all the data as a hexadecimal number. "Length" Refers to the length+Operation code+Parameter length+Check code "Check code" Mean length, opcode, the values of the parameters and check customers can be calculated by calculator.

For example, the playing order for 7E 03 01 02 EF Check code 02 Is this: first of all open the Calculator select programmer model;

And then 16 Binar Doub
Finally click on $\Rightarrow 3 \text{ Xor } 1 = 2$



Return instructions sent successfully OK, The song finishes playing stop returns STOP.

8.1 Instruction list

Traffic control instruction (Company a BY8001-16P TF Card card voice module)

CMD Details	Corresponding function	Parameters
0x01	Play	无
0x02	Pause	无
0x03	The next song	无
0x04	Previous track	无
0x05	Volume plus	无
0x06	Volume reduction	无
0x07	Standby/Normal working	No, standby, Current in the 10MA
0x09	Reset	无
0x0A	F. f	No, FLASH This feature is not
0x0B	Rewind	No, FLASH This feature is not
0x0E	Stop it	无
0x31	Set volume	0-30 Adjustable(Power failure memory)
0x32	Set EQ	0-5(NO\POP\ROCK\JAZZ\CLASSIC\BASS) (Power failure memory)

0x33	Sets the loop mode	0-4 (All/Folder/Singles play/Random/Play again)
0x34	Folder switch	0(The previous folders),1 (Next folder)
0x35	Device switch	0 (U) , 2 (FLASH)
0x41	Select a playlist	1-255 首(Power failure memory)
0x42	Play it a specified folder tracks	Eight-digit folder number(00-99)Low eight bits for the song name (001-255) , FLASH This feature is not
0x43	Spot function	1-65536 , FLASH This feature is not
0x44	Spots inside the specified folder songs	Eight-digit folder number(00-99)Low eight bits for the song name (001-255) , FLASH This feature is not
	Combination play	Right after the stop sending different tracks in a row, maximum support 10 段

Communication query command

CMD Details	Corresponding function	Parameters
0x 10	Query the playback status	0 (Stop it) 1 (Play) 2 (Pause) 3 (F. f) 4 (Rewind)
0x 11	Query volume	0-30 (Power failure memory)
0x 12	Query the current EQ	0-5(NO\POP\ROCK\JAZZ\CLASSIC\BASS(Power failure memory)
0x 13	Queries the current playback mode	0-4 (All/Folder/Singles play/Random/Play again)
0x 14	Query version number	1.0
0x 16	Query U Total file number	1-65535
0x 17	Query FLASH The total number of files	1-255
0x 18	Queries the current playback device	0:USB 2:SPI
0x 1A	Query U The current track	1-65536
0x 1B	Query FLASH The current track	1-255
0x 1C	Queries the current playback time song	Back time (s)

0x 1D	Queries total time of the currently playing song	Back time (s)
0x 1E	Querying the currently playing song title	Return to song (SPI Internal songs cannot return)
0x 1F	Total number of queries the current playback folder	0-65536 (SPI Internal songs cannot return)

8.2 Control commands details

8.2.1 Play

Start code	Length	Operation code	Check code	End code
7E	03	01	02	EF

Send this command to play music, and started playing in a paused or stopped state.

8.2.2 Pause

Start code	Length	Operation code	Check code	End code
7E	03	02	01	EF

Send the command to pause the music.

8.2.3 The next song

Start code	Length	Operation code	Check code	End code
7E	03	03	00	EF

This directive can trigger the next piece of music, playing the last song music, Send the command can trigger the first piece of music.

8.2.4 Previous track

Start code	Length	Operation code	Check code	End code
7E	03	04	07	EF

This directive can trigger the next piece of music, when the first piece of music is played, sending the instruction can be triggered to play one last dance music.

8.2.5 Volume plus

Chip30Level	Start code	Length	Operation code	Check code	End code	volume adjustable
	7E	03	05	06	EF	

Sending a directive, increase volume level.

8.2.6 Volume reduction

Chip30Level	Start code	Length	Operation code	Check code	End code	volume adjustable
	7E	03	06	05	EF	

Sending a directive, decrease the volume by one level.

8.2.7 Standby/Normal working

Working send standby with the	Start code	Length	Operation code	Check code	End code	chips into instruction,
	7E	03	06	05	EF	

send command once again awakens in a standby state chip to work properly.

8.2.8 Reset

Start code	Length	Operation code	Check code	End code
7E	03	09	0A	EF

Send the command reset chip.

8.2.9 F. f

Start code	Length	Operation code	Check code	End code
7E	03	0A	09	EF

Music fast forward sent a directive for some time.

Note: FALSH Does not have this feature.

8.2.9 Rewind

Start code	Length	Operation code	Check code	End code
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7E	03	0B	08	EF
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Music rewind sent a directive for some time.

Note:FALSHDoes not have this feature.

8.2.10 Stop it

Start code	Length	Operation code	Check code	End code
7E	03	0E	0D	EF

Music playing or paused to send the instructions to stop the music.

8.2.11 Set volume

Start code	Length	Operation code	The volume level	Check code	End code
7E	04	31	19	2C	EF

Volume for the0-30Adjustable, which can be modified in real time adjusting the volume, volume can be power off memory, examples sent in volume Class25 .

8.2.12 SetEQ

Start code	Length	Operation code	Parameters	Check code	End code
7E	04	32	00	36	EF

Send this directive can changeEQ.

8.2.13 Sets the loop mode

Start code	Length	Operation code	Parameters	Check code	End code
7E	04	33	02	35	EF

Send this command sets the loop mode, example for single cycle mode is set.

8.2.14 Folder switch

Start code	Length	Operation code	Parameters	Check code	End code
7E	04	34	01	31	EF

Send the command to switch file to play, send1For the next folder0For the previous folder.

Note:FLASH Does not have this feature.

8.2.15 Device switch

Start code	Length	Operation code	Parameters	Check code	End code
7E	04	35	01	30	EF

When there is more than one device, you can send the command select device to read, examples for the selectionTFCard player.

8.2.16 Select a playlist

Start code	Length	Operation code	Track highs	Track low	Check code	End code
7E	05	41	00	01	45	EF

Send this directive to specify the corresponding memory track playback, example play1Song.

Note: tracks1-65536

8.2.17 Play it a specified folder tracks

Start code	Length	Operation code	Folder number	Song name	Check code	End code
7E	05	42	00	02	45	EF

The directive may correspond to tracks within the specified folder, and high8For a folder,8For the song track.

Example for a specified folder00In the2First play.

Note:If you want to use this feature, the folder must be named00-99Songs must be named001-255, Otherwise an error cannot be played.FALSHDoes not have this feature.

8.2.18 Spot function

Start code	Length	Operation code	Track highs	Track low	Check code	End code
7E	05	43	00	03	45	EF

When receiving the instruction, the moratorium on the track that is playing, and then specifies the playlist by the implementation of this directive, when play finished, then play suspended tracks.

Note:FALSHDoes not have this feature.

8.2.19 Announcements specify a folder of songs

Start code	Length	Operation code	Folder number	Song name	Check code	End code
7E	05	44	01	06	46	EF

When receiving the instruction, the moratorium on the track that is playing, and then by the implementation of this directive in the specified file corresponds to the track played, when play finished, then play suspended tracks. High8For a folder,8For the song track.

Note: If you want to use this feature, the folder must be named 00-99 Songs must be named 001-255, Otherwise an error cannot be played. FALSH Does not have this feature.

8.2.20 Combination play Continuous send:

7E 05 41 00 01 45 EF 7E 05 41 00 02 46 EF 7E 05 41 00 03 47 EF 7E 05 41 00 40 EF Show
category 1 , 2 , 3 , 4 Song, right after the stop, up to play continuously 10 Song.

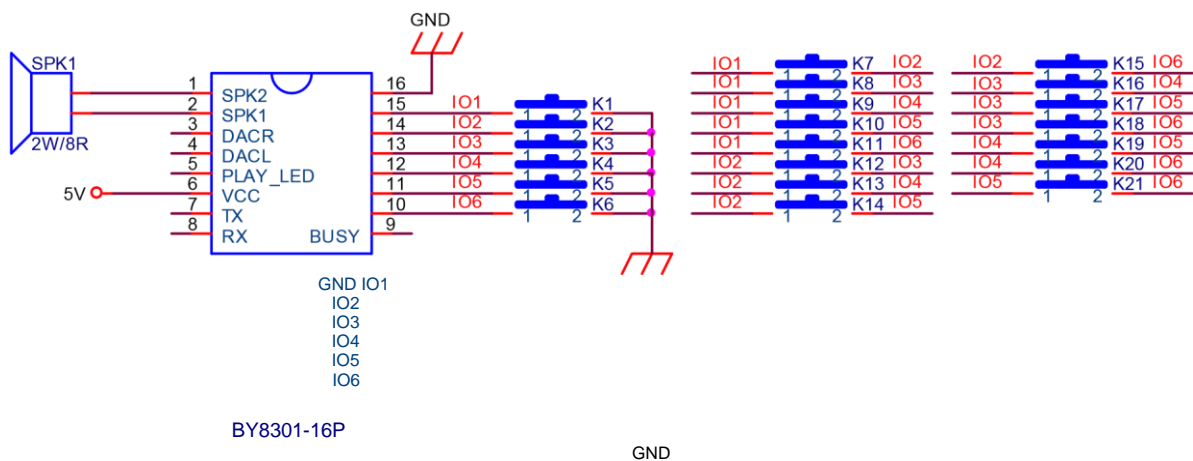
8.3 Query instructions

After you send the query will return the corresponding value, not detailed instructions.

9、Application diagrams

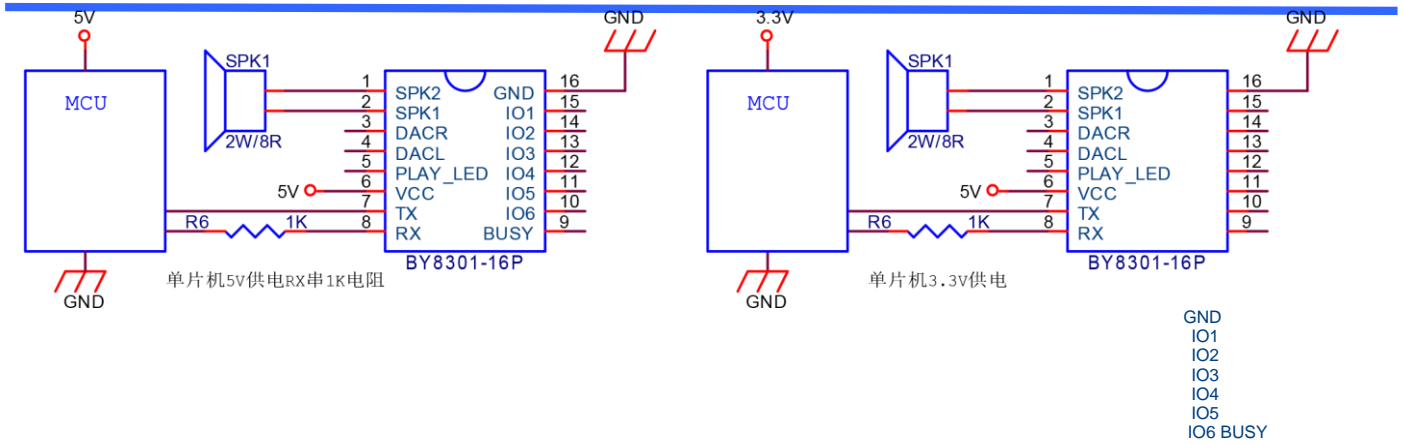
Note that all main control chip IO Mouth is 3.3V Voltages, is other SCM connection voltage matching!

9.1 . 21 Lu press control circuit K1-K21 The corresponding 1-21 Voice



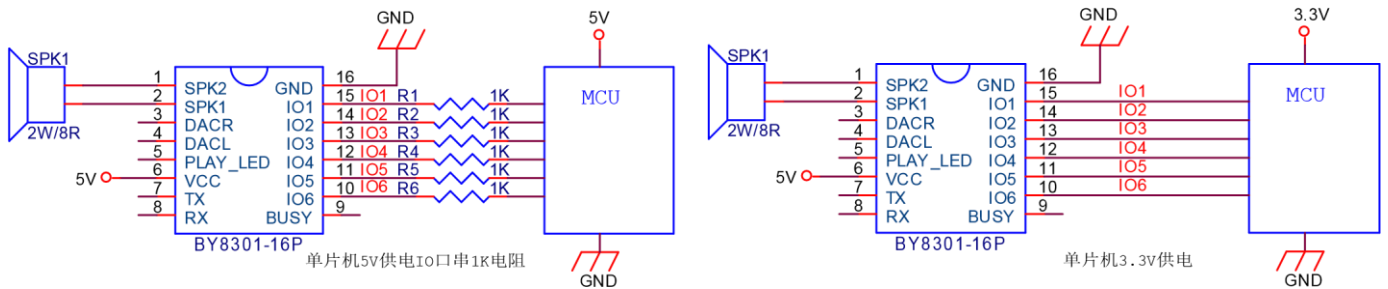
21Channel button is equivalent to switch volume control.

9.2 . Monolithic integrated circuit serial control circuit



Above are standard UART Application of asynchronous serial port connection, this application is quite flexible, and includes play, pause, next song, volume, plus or minus, musical play, ad insertion, and more. Monolithic integrated circuit serial control, computer, or by TTL 转 RS485 Interposer board 485 Control.

9.3 . Single-chip microcomputer IO Application of direct connecting control circuit



Single chip low pulse signal (The equivalent button lift) can trigger IO1-IO6, One-to-one play 6 Voice, as well as the above 3 IO Selectable control modes.

9.4 . For some customers may use level triggered playback, you can use the relay control, you can also run out of control, provide the connection diagram below: Relay

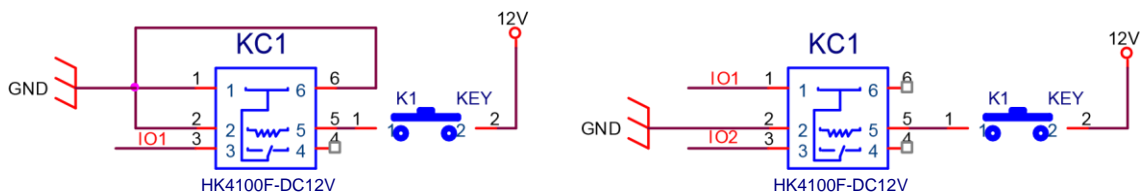


Fig:IODown play, figure to play in the first paragraph rightIOCombination play, relay powerIO1、IO2Short play6Segment.

Optical coupler

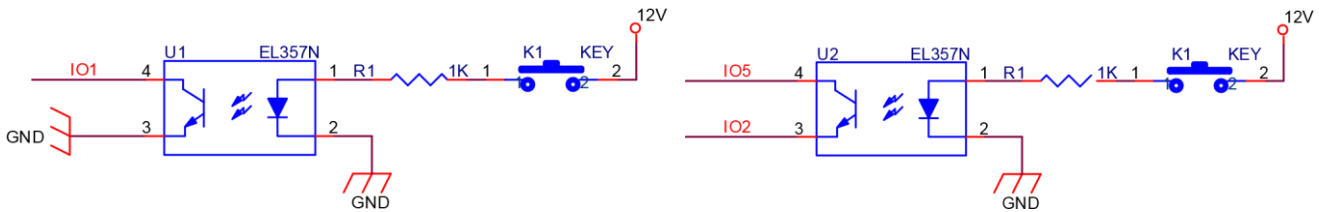
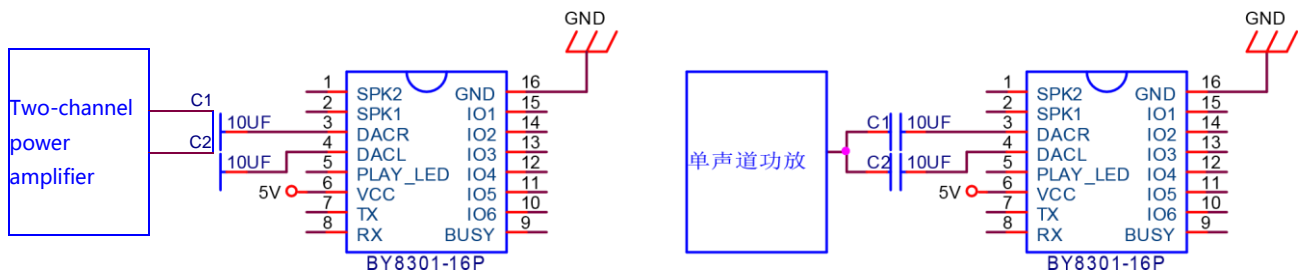


Fig:IODown play, figure to play in the first paragraph rightIOCombination play, the rules of connection areIOLow number of connection coupler3Foot,High number of connections4Foot, figure to play in14Segment.

Given above is 12V Level triggered or can be converted to a single-chip high and low level trigger.

9.5 . An external power amplifier circuit



Power module does not meet requirements, customers can own an external power amplifier.

10、Copy MP3 To the storage FLASH

Our modules can be usedMICRO USBMobile phone data cable directly updates the computer voice, convenient and flexible. Computer the first time you plug in the product, installation takes a little time, please be patient, wait for the next one soon

Without power supply direct plug in the data cable. The computer will pop up the following screen, Then the computer 360 Software or antivirus software off or plug USB After following pop-up window select allow programs to run:



The computer will pop

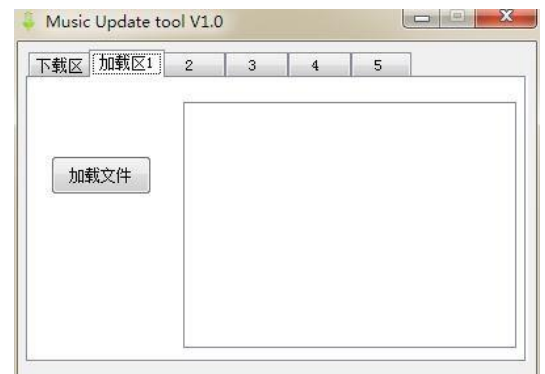
有可移动存储的设备 (3)



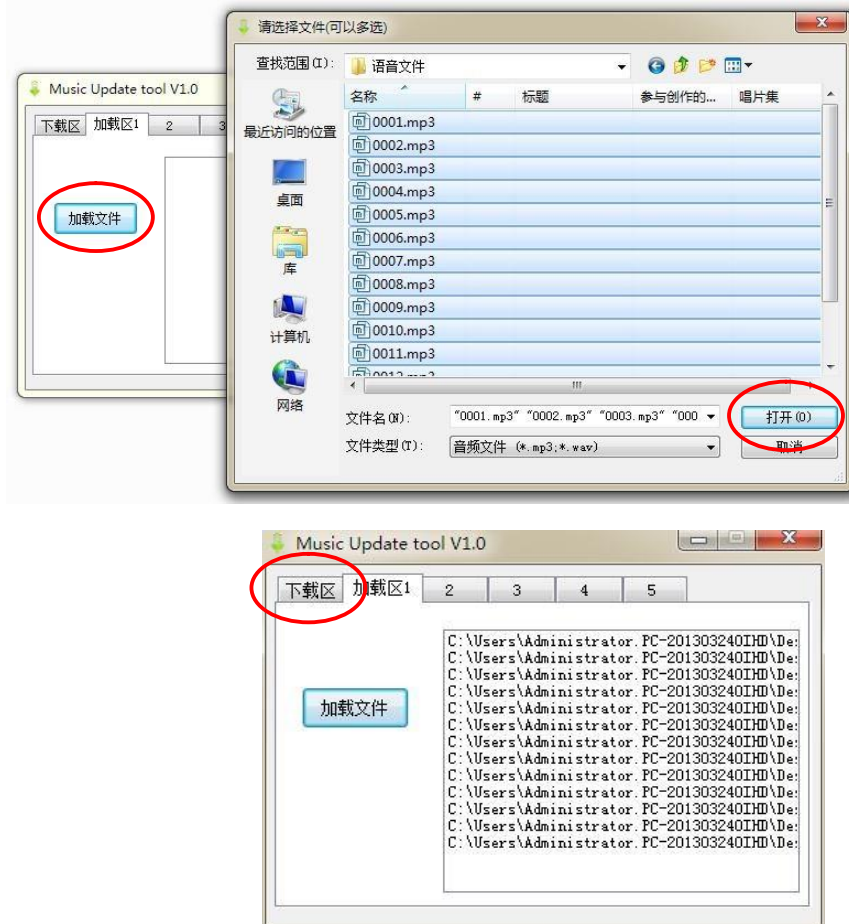
10.1 . Open "CD Drive " , Computer The . Then open the , Will pop 10.2" In the .



10.2 . Select "Loading zone1" Folders, as shown above and click on the "Loading file" , It will pop up a window that loaded voice, as shown below:



10.3 . Select the voice needs to be loaded at this time, need to put much on one-time election finished, **Order all elected Loading zone1(Regional2-5To reserve the With no load)**, Then click on the **“Open it”** Add in the software. Voice file recommended naming 0001XXX.mp3, 0002XXX.mp3



10.4 . Finally, back to the **“Download area”** Interface, click on the **“Click here to download”** Button, the following screen will appear. From left to right 3 Windows the last window shows **“Validation successful”** , On behalf of updated to close this window, unplug the USB Line on it.



11、Manual version

Version	Date	Description
V1.0	The year 2014-3-20	The initial version
V1.1	The year 2014-6-28	Complete serial port control description
V1.2	The year 2014-10-9	Add some application circuit

Shenzhen electronic technology limited is a voice plan, voice of semi-finished products, voice products development, production and service of technology-oriented enterprises, mainly focusing on speech technology research, sound chip,MP3 Modules, voice prompts and voice products, such as hardware and software design and development and customization. And to undertake development and production of electronic products, matureOEMBatch production and supply business in the automotive electronics, security, Home security, communications, home appliances, medical equipment, industrial automation and control, educational equipment, toys and gift consumer products, and other fields.

Shenzhen electronic technology for voice products specializing in the development, design, production and sales. Mainly forBYRange of voice product research and circuit Board to provide voice chip,MP3Voice module, card module TF 卡 MP3ModuleUSB MP3Module12VSoundboard, high-power multiple control panels, door, voice prompts, advertising tip, fork lift speed limiter, while developed for customers with special needs speech product development programs, and the implementation of the programme to complete product development, testing, and product application guide and other services. After years of development,Companies have formed a perfect technical development process system, can quickly develop products that customers demand, always highly enthusiastic and sophisticated technology, always for the purpose of customer service, dedicated to marketing strategy. According to the market demand, the elaborate efforts of all employees of the company, and products to achieve a

comprehensive, thorough, to meet customer demand, improved efficiency, cost-efficient. We adhere to the people-oriented service, two-way communication with our customers, providing high quality

People of quality products and excellent service.

Shenzhen electronic technology company is sales and service strategies for improving customer service quality, assist in the development of the most competitive end-product, We uphold a positive innovation, pioneering, customer satisfaction, teamwork, from the mainland market has been gradually extended to all Districts. Company's competitive advantage includes the following four points:

- (一) Professional and innovative research and development capabilities, high qualified research and development personnel and project technical team;
- (二) Strong long-term relationships in the market, price/performance with absolute advantage;
- (三) A full range of technical support and perfect marketing system;
- (四) Stable product delivery and quality assurance.

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