

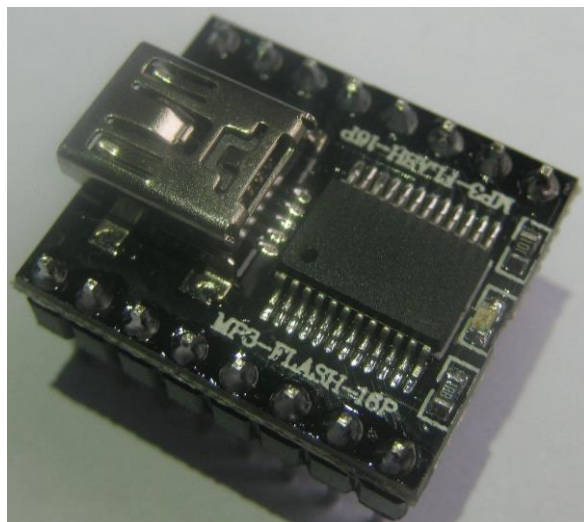
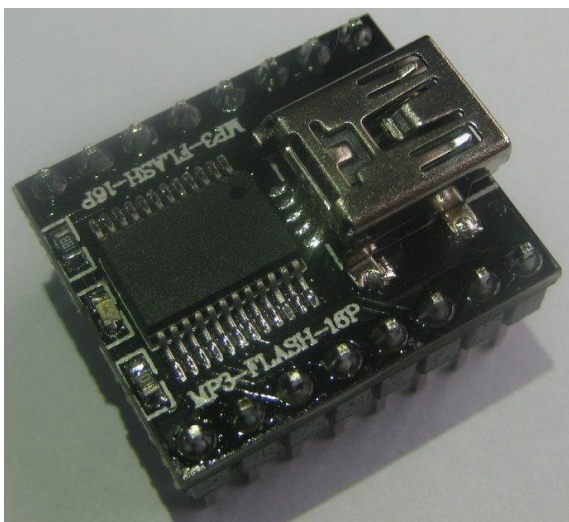


## MP3-FLASH-16P User manual

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## 1. Overview

### 1.1 Profile

**MP3-FLASH-16P** is a voice module provides a serial port, the perfect integration MP3、WAV Hardware decoding. While software support industry-level serial communication protocol, SPIFLASH As storage medium reduces costs

Also increases the stability of the product. Through a simple serial commands complete playback voice and how to

Features such as voice, without cumbersome underlying operation, easy to use, stable and reliable is the most important feature of this product. Depth of the module is customized products, integrated 3W Amplifiers, sound external speakers can be placed directly. While mold

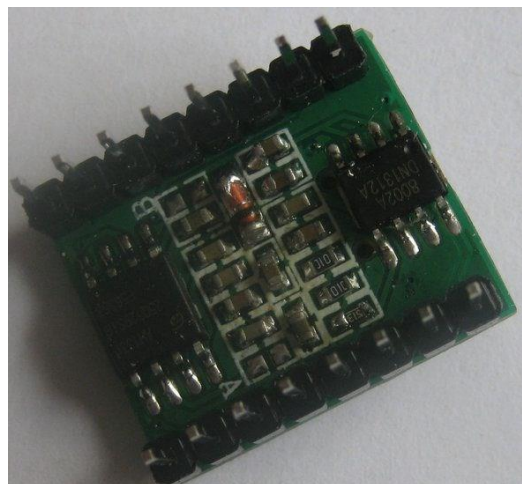
Block support 10 Specified triggering playback of a voice.

### 1.2 Function

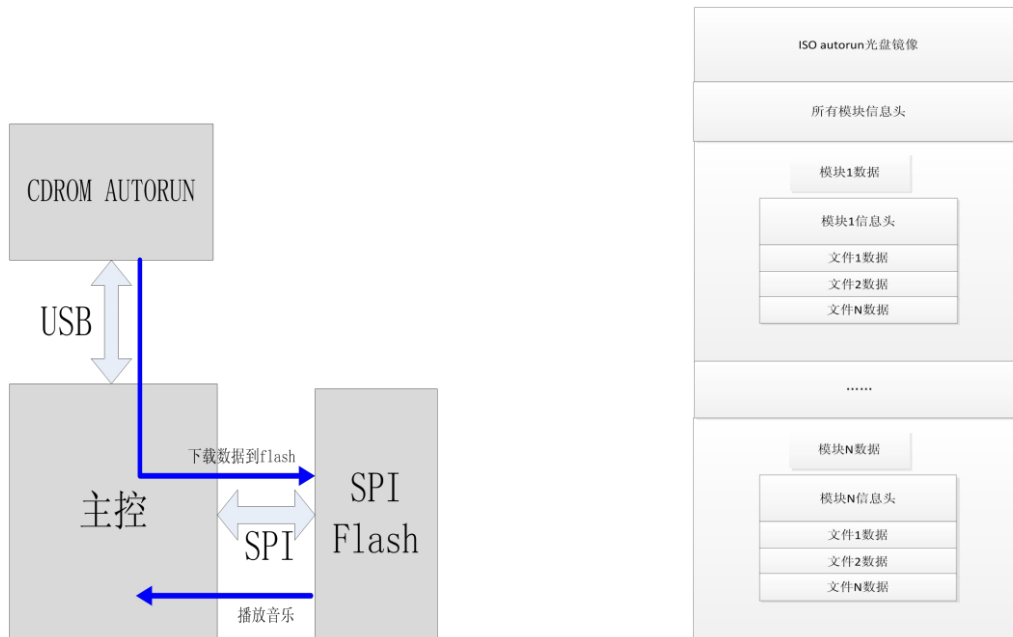
1. Supported sampling rates (KHz):8/11.025/12/16/22.05/24/32/44.1/48
2. 24 位 DAC Output dynamic range support 90dBAnd SNR support 85dB
3. Maximum support 16M Bytes SPIFLASH。 For example, W25Q16 [2M Bytes] 、 W25Q128 [16M Bytes] GD25Q32 [4M Bytes] 1Byte=8Bit
4. Multiple control mode, control mode for the parallel port, serial port mode, AD Press the control mode
5. Microusb Interface updated voice files, without having to install any software. Support XP 和 WIN7 the system.
6. Combination support playback, you can achieve time, temperature, to a certain extent can replace some expensive TTS Program
7. 30 Level volume adjustable5 级 EQ Adjustable
8. Comes with 3W Power amplifier directly to external speakers to complete playback
9. Support
- 10 Play voice trigger, IO Detection methods, so suitable for carbon membrane keys

### 1.3 Application

1. In-car navigation voice broadcast
2. Road transport inspection, toll voice prompts;
3. Train station, bus station safety check voice prompts;
4. Power, communications, financial, business voice prompts;
5. Vehicles entering and leaving the channel validation voice prompts;
6. Public security frontier checkpoint at voice prompts;
7. Multi-channel voice alarm or equipment operation guiding voice;
8. Electric sightseeing cars safe driving voice notices;
9. Mechanical and electrical equipment failure alarm; Fire voice alarm;
11. Automatically broadcast equipment, regular broadcasts



## 2. Function framework



Selection of modules is SOC The program integrates a 16 Bits MCU and a special audio decoder a DSP, Used hard decoding, ensuring system stability and sound quality. Small package size more meet the needs of embedded in other products

### 2.1 Hardware parameter

The name	Parameters
MP3File format	1. Support all bit rates 11/12.5/16/22.05/24/32/44.1/48
	2. Sample rate support (KHZ): 8/11.025/12/16/22.05/24/32/44.1/48
	3. Support Normal Jazz Classic, Pop, Rock Sound effects
USBInterface	2.0 Standard
UARTInterface	Standard serial port, TTL Level, The baud rate can be set [The user cannot be located]
Input voltage	3.3V-5V [7805 Cascade when a diode is the best]
Rated current	10mA [Static]
Low power current	<200uA
Amplifier power	Load 4Ohm support 3W
Dimensions	25 (长) * 20 (宽) [Work unit: mm]
Working temperature	-40 度 --80 度
Humidity	5% ~ 95%

### 2.2 PIN description

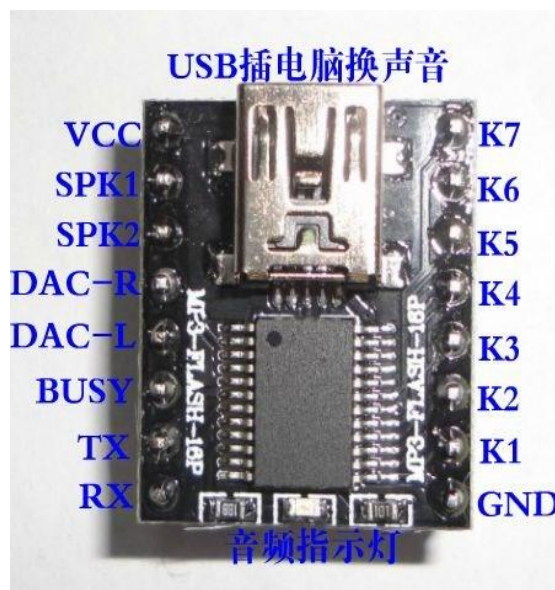
PIN order 号	PIN name	Functional description	Notes
1	VCC	Power supply input[Positive electrode]	Biggest 5.2V
2	SPK1	External monaural speaker	Not more than 4Ohm 3W
3	SPK2	External monaural speaker	Not more than 4Ohm 3W
4	DAC-R	An external amplifier, headphone	
5	DAC-L	An external amplifier, headphone	
6	BUSY	Playing foot	Low output during playback
7	TX	UARTSerial data output	3.3V 的 TTLLevel
8	RX	UARTSerial data input	3.3V 的 TTLLevel
9	GND	地[Negative electrode]	System
10	IO1 (K1)	General purpose input/output port1	
11	IO2(K2)	General purpose input/output port2	
12	IO3(K3)	General purpose input/output port3	
13	IO4(K4)	General purpose input/output port4	
14	IO5(K5)	General purpose input/output port5	
15	IO6(K6)	General purpose input/output port6	
16	IO7 (K7)	General purpose input/output port7	

Note: the module built-in Mono power amplifier. Speckled addition module

2 Foot and 3 脚

Module distribution instructions:

- (1), PIN 1—8 from the left side down
- (2), PIN 9—16 and from then on the right bottom to top
- (3), Amplifier chip [4 Ohm, 3W]
- (4), the main control chip [SSOP24 Package]
- (5) USB Interface carrier [Compatible Miniusb 和 Microusb]
- (6) Own a SPI flash And a 3W after power users get,



connect the speakers to the SPK1 和 SPK2 At both ends, insert USB Lines to a computer, use tweezers to short circuit directly 9 Foot and 10



Foot play trigger module. As a means to test modules properly (modules manufactured prior to downloading the sound test before delivery).

### 3. Serial communication protocol

Serial port as the control fields including communication, we have industrial-level optimization, joined the checksum of the frame, heavy, error handling, and other measures to significantly enhance the stability and reliability of communication, at the same time. To expand more on the basis of this strong RS485 Networking features, serial communication baud rate can be set, the default is 9600

#### 3.1 Communication form

Support for asynchronous serial communication mode accepts the PC through the serial port to send the command

Communication standard: 9600 bps

Data bits: 1

Check digit: none

Flow control: none

Format:\$S VER Len CMD Feedback para1 para2 checksum \$O		
\$S	Start bit0x7E	Feedback from each command are\$Start,即 0x7E
VER	Version	Version information
Len	Len Number of bytes after	Checksums are not counted
CMD	Command words	Represents a specific operation, Such as playing/Pause, and so on
Feedback	Order feedback	Whether you need feedback1Feedback, 0No feedback
dat	Parameters	And the front of the len Associated and unlimited length
checksum	Checksum[Two bytes]	Accumulation and validation[Regardless of the starting\$]
\$O	Stop bits	Stop bits0xEF

For example, if we specify playback **SPIFLASH**, You need to send: **7E FF 06 09 00 00 04 FF dd EF**

Data length is 6, 这 6 Bytes are the **[FF 06 09 00 00 04]**。Not counting the start, end, and validation. And then add the results of, and 0 Reduction, that is, "0-checksum=Calibration data". If it does not understand, you can refer to our"MP3

—**FLASH-16P** Debugging manual". Alternatively users can ignore parity, refer to our 5.3.4 Chapter descriptions.

#### 3.2 Communications instructions



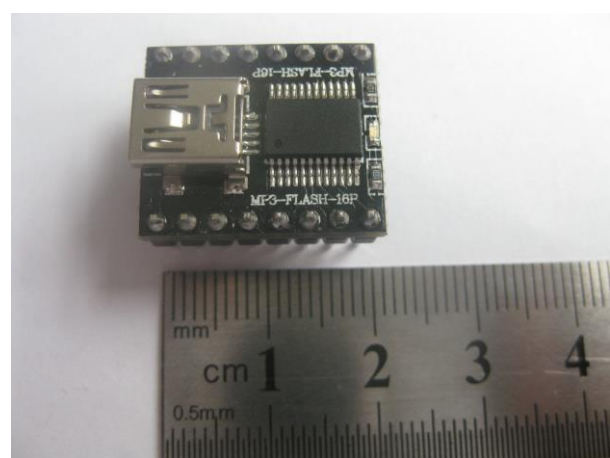
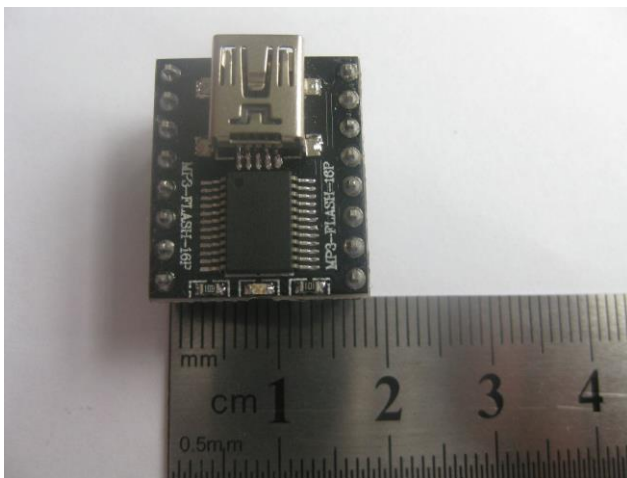
## 1, Send instructions directly, without return parameters

CMD Command(Instructions)	The corresponding function	Parameters(16 位)
0x01	The next song	
0x02	Previous track	
0x03	The specified track(NUM)	1-255
0x04	Volume+	
0x05	Volume-	
0x06	Specifies the volume	0-30
0x07	The specifiedEQ0/1/2/3/4/5	Reservation
0x08	Single cycle specified track playback	1-255
0x09	Specifies the playback SPIFLASH	FLASH
0x0A	Go to sleep -- Low power consumption	Power remained at10MA
0x0B	Reservation	
0x0C	Module reset	
0x0D	Play	
0x0E	Pause	
0x16	Stop it	
0x21	Combination play	See the detailed instructions below
0x22	With volume specified track playback	See the detailed instructions below
0x30	Specifies the file to play	See detailed description
0x31		
0x32		
0x33		

## 2. Querying system parameters



CMD Ordered xiangjie(查询)	The corresponding function	Parameters(16 位)
0x3C	STAY	
0x3D	STAY	
0x3E	STAY	
0x3F	Send initialization parameters	0x1F(低 5Each bit represents a folder)
0x40	Returns an error, request to resend	
0x41	Answer	
0x42	Query the current state	
0x43	Queries the current volume	
0x44	Query the current EQ	Reservation
0x45	Queries the current playback mode	The version retains this feature
0x46	Query the current software version	The version retains this feature
0x49	Query FLASH The total number of files	5Total number of file folders
0x4D	Query FLASH The current track	Return folder and track pointer
0x60	Query current folder	
0x61	Query the current folder pointer	
0x62	The query specifies the total number of tracks	



### 3.3 Module returned data





Module key are returned in data. For users to control module working condition

- Module is powered on successfully initialized data
- Module play current track data
- Returned by the module successfully receive instruction ACK (Answer)
- Module to receive error frame [Including the confiscated data integrity, validation error two cases]
- Module during rush hour, there is data, the module returns the favor instructions

### 3.3.1 Module is powered on the returned data

(1) Module is powered on, you need a certain amount of time to initialize, this time is the need to **SPIFLASH** File number of the device, In normal circumstances is less than 500ms this time. If you exceed this time module initialization data has not been sent out, description Module initialization error, check hardware connections

(2) And module initialization data returned by for current active folder, For example, return **7E FF 06 3F 00 00 03 xx xx EF**

==>Which **0x03** represents the **FOLDER1** 和 **FOLDER2** both regions have a valid audio file if it is **0x07** represents the **FOLDER1** 和 **FOLDER2**、**FOLDER3** Voice file

As a matter of fact5 a folder occupies one byte. FOLDER Occupy the lowest level

(3) MCU must wait for the module initialization after the command is issued corresponding instructions can be sent, otherwise send the command module will not be processed. Will also affect the module's initialize properly.

### 3.3.2 Track is finished playing the return data

FLASH Finished playing1 曲	7E FF 06 3E 00 01 01 xx xx EF	FOLDER1Subsection1Songs played
FLASH Finished playing2 曲	7E FF 06 3E 00 02 02 xx xx EF	FOLDER2Subsection2Songs played

1, many trigger playback needs, after correcting our module to play a song automatically enters a stopped state. If users want this Application class. Only need to specify the track playing. This track is finished playing will automatically stop and wait for instructions

2. We specialize in opening up a IO As decoding and suspended status. Please see section 5 脚

- , Play status output low level[Many amplifiers have a mute feet through this IO Direct control]
- , Play pause state, the output high. Modules to sleep. Low level

3. After the module is powered on, initialize properly, The module will automatically enter the playback status of the device. And stop decoding, waits for the user to send multicast,

Related instruction

4. After a user is in the specified device, you need to wait200msTime, and then send the specified track, because once after the specified track,File system on the specified device system initialization, if you send the specified track command, causes the module to receive neither.



### 3.3.3 Modules answer the returned data

(1), In order to strengthen the communication between the stability, we have increased our response handling, ACKB Byte is set if you need reply should be

Said. The benefit of this is to ensure that each communication has a handshaking signal, receive an answer MCU Sending data, the module has been successfully received, right away.

(2), For general application, customers are free to choose, without this answer can be.

### 3.3.4 Module error returning data

Returns a busy	7E FF 06 40 00 00 01 xx xx EF	Module in the file system initialization
Currently in sleep mode	7E FF 06 40 00 00 02 xx xx EF	Sleep mode only supports the specified device
Serial port receive errors	7E FF 06 40 00 00 03 xx xx EF	Serial frame data is not received
Calibration error	7E FF 06 40 00 00 04 xx xx EF	And calibration error
Specifies the file scope	7E FF 06 40 00 00 05 xx xx EF	File specifies more than the limits set by
The specified file was not found	7E FF 06 40 00 00 06 xx xx EF	Specified for the file could not be found
Data does not conform to the rules	7E FF 06 40 00 00 08 xx xx EF	Such as minimum1Place, send as0

(1), In order to strengthen the communication between the stability, we add a data error handling mechanism. Module received does not conform to the format of the data, there will be feedback

(2), the environment is under harsh circumstances, we strongly recommend customers to process this command. If the application environment, without having to deal with.

(3)Module returns the favor, is basically power-on initialization of the module when they returned, because the module needs to initialize the file system

(4)After, module is powered on, entered the device status, the device is SPIFLASH。 If SPIFLASH If not online, it will automatically Go to sleep.

(5)Tests, as long as the reference is given SDK Program, serial operations part of the transplant, there is no validation errors, here strongly recommends that users use our calibration mode. Because no one can guarantee that data transmission without errors.

(6)Error, files specified section, refer to the following details



### 3.4 Serial command xiangjie

Below we provide detailed information on key areas:

- The specified track playback
- Specifies the volume of the broadcast
- Specify playback device
- All loop instructions
- Combination play [Highlights]
- With volume parameter specifies the track playback

#### 3.4.1 Specifies the play instructions [Can directly reference 3.4.7]

Our instruction is specified track playback support Song selection 0~255. Can actually support more because

Related to document management for the causes support too many songs, will cause the system to slow operations, applications do not need to support such

Number of files. If the customer has a non-conventional applications, please communicate with us beforehand.

(1), for example, select the first song playing, send part of the serial port 7E FF 06 03 00 00 01 FF E6 EF

7E --- Start command FF --- Version information

06--- The length of the data (Do not contain calibration)

03--- Representative product number

00--- Do you need an answer [0x01: Need an answer, 0x00: Don't need to return response]

--- Track the high byte [DH]

--- Track the low byte [DL], Here represents the first song playing

FF --- Check the high byte E6 --- Check the low byte

EF --- End of command

(2), for the choice, if you choose 100 first, you first 100 Translate into 16 Binary, Defaults as a double-byte, for 0x0064。

DH = 0x00 ; DL = 0x64

(3), other operations followed by analogy, as in embedded field 16 Binary is the most convenient one.

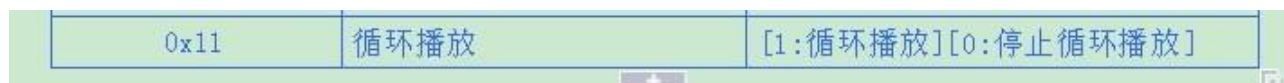
#### 3.4.2 Specify a volume play instructions

(1), we default on the system volume 30 Level, if you want to set the volume, directly send the corresponding command

(2), for example, specifies that the volume is 15 级, Serial port to send instructions: 7E FF 06 06 00 00 0F FF D5 EF

(3)、DH = 0x00; DL = 0x0F, 15 Translate into 16 Binary 0x000F。 Can refer to the playlist section description

### 3.4.3 All loop instructions



1. Requirements for some looping the tracks below the root directory, we add this control instructions 0x11。

Loop start	7E FF 06 11 00 00 01 xx xx EF	Loop playback all tracks
Loop end	7E FF 06 11 00 00 00 xx xx EF	To stop the loop playlist

2. In the looping process, can be played normal operation/Pause, previous track, next track, volume control, including EQ For a while
3. After the loop starts, the module will play equipment inside the track, according to the store's physical order. After finished it again continue playing until receiving has finished playing or pause instruction

### 3.4.4 Single loop instructions

Loop start	7E FF 06 08 00 00 01 xx xx EF	Loop the first song
Loop end	7E FF 06 08 00 00 02 xx xx EF	Loop the second song

(1)And for some single loop's request, we improve the control instructions 0x08。 According to the store's physical order

Specified, this user's attention.

(2), In the looping process, can be played normal operation/Pause, previous track, next track, volume control, including EQ And the State is still looping.Can be triggered by specifying a single play or sleep to close the loop-.

### 3.4.5 Combo playback instructions

Combination play	7E FF 09 21 00 05 01 02 03 04 FE C8 EF	Play5、 1、 2、 3、 4
Combination play	7E FF 0C 21 00 05 01 02 03 04 06 07 08 FE B0 EF	Play5、 1、 2、 3、 4、 6、 7、 8

(1), Many applications need to TTS Features, such as time, temperature, amount, and so on, if the user took the

Modules to imitate simple TTS Function, may in effect discounted above, contradiction is between the voice and speech

Delay. Directly as a file named words, there will be a delay between the voice and speech, this is not

Subject to. So we added the function of combination play, while specifies playback support 12 A voice, in a serial port to send order Times played.

(2), If you send 7E FF 0C 21 00 05 01 02 03 04 06 07 08 FE B0 EF The frame data, we examine the

CMD= 0x21 --- Check out list of instructions

LEN = 0x0c = 12 Bytes --- FF 0C 21 00 05 01 02 03 04 06 07 08[Remove the red flag byte, that is, tracks in the order] Module play 5 ACK, 1 ACK,2、 3、 4、 6、 7 这 7 Tracks. Finished playing stops



(3), playing in the process of combination, is allow the user to enter the playback pause and set volume levels, but does not allow you to specify upper and lower song. If you are using

For combined seeding High expectations for the place, ask users to source edit on their own, remove the muted sound sources and tail.

So you can reduce the delay between speech and speech can be used "Adobe Audition CS5.5"Or

"GoldWave.exe"Professional audio software.

(4), with this function, you can easily achieve "Welcome, now is the time 13 年 12 月 24 日" This flexible way, greatly improving the competitiveness of their products.

### 3.4.6 with volume parameter instructions play

Play with volume	7E FF 06 22 00 1E 01 xx xx EF	30 Level volume play1 曲
	7E FF 06 22 00 0F 02 xx xx EF	15 Level volume play2 曲

(1)And for some users want, to play the different voice setting different volume, according to the old method is to first set the volume, and then specify the track playback, so tedious and inconvenient. Hereby we added this instruction 0x22

(2)And specific actions can refer to two test instructions given above.

### 3.4.7 Play it a specified folder tracks

Specify regional and file playback	7E FF 06 30 00 01 01 FE C9 EF	FOLDER1 Subsection1 曲
	7E FF 06 30 00 02 01 FE C8 EF	FOLDER2 Subsection1 曲

(1), Our modules can be FLASH Regions are divided into 5 Block, you can manipulate any piece of

(2)And specific actions can refer to two test instructions given above.

### 3.4.8 Specify folder tracks single loop

Specifies the folder track loop	7E FF 06 31 00 03 03 FE C4 EF	FOLDER3 Subsection3 Music looping
	7E FF 06 31 00 01 03 FE C6 EF	FOLDER1 Subsection3 Music looping

(1), Users can 5 any of the files inside the folder specified single loop, please refer to the above reference directive

(2), Users can send stop command to stop a single loop.

### 3.4.9 Specifies the track start looping

Specify a folder loop	7E FF 06 32 00 03 01 FE C5 EF	FOLDER3Subsection1Music looping
-----------------------	-------------------------------	---------------------------------

(1), Users can 5 Any folder inside a folder loop please refer to refer to the instructions above.

03 Specified folder is FOLDER3

01 Specifies the first song begins, if there 02。 Then from the 2 Song start loop playback this folder

(2), Users can send stop command to end the loop playback.

## 4. Reference circuit

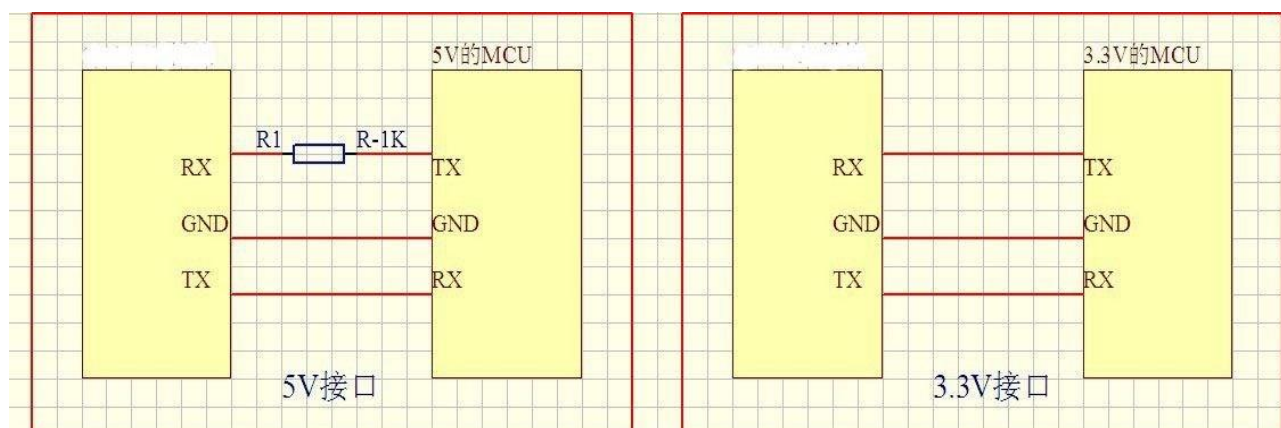
Application of the module, we provide detailed design, so you can quickly get started experiencing the powerful functionality of the module

Serial communication interface, baud rate default 9600And can be modified according to customer requirements

Outside of the IO Key functions can be customized according to customer demand

External reference Mono power amplifier circuit

### 4.1 Serial interface



Module serial as 3.3V 的 TTL Level, so the default interface level 3.3V。 If the system is 5V。 It is recommended that the connection of serial interface series 1K Electrical resistance. This is sufficient to satisfy the General requirements, if applied to strong electromagnetic interference, please refer to "Matters needing attention" Description. Module 5V 和 3.3V Systems are properly tested, everything is normal. In direct mode, no strings 1K Electrical resistance.

## 4.2 Button interface

Modules we are IO Key way, replacing the AD Keyboard method, which is to make full use of the advantages MCU More A growing number of GPIO. Design is cumbersome but not simple, our module the default configuration 10 A key function can be any worse Random control can even be used as MCU Communication interface. Our key distribution 4 Different types of function, According to two resistors to choose, please contact technical support.

- One trigger playback can be interrupted
- One trigger playback, level holding recycled
- One trigger playback should not interrupt the
- Standard playback features, such as next song, play, pause, and so on screen printing 1 The corresponding K1 Silk screen printing 2 The corresponding K2 [See PCB]

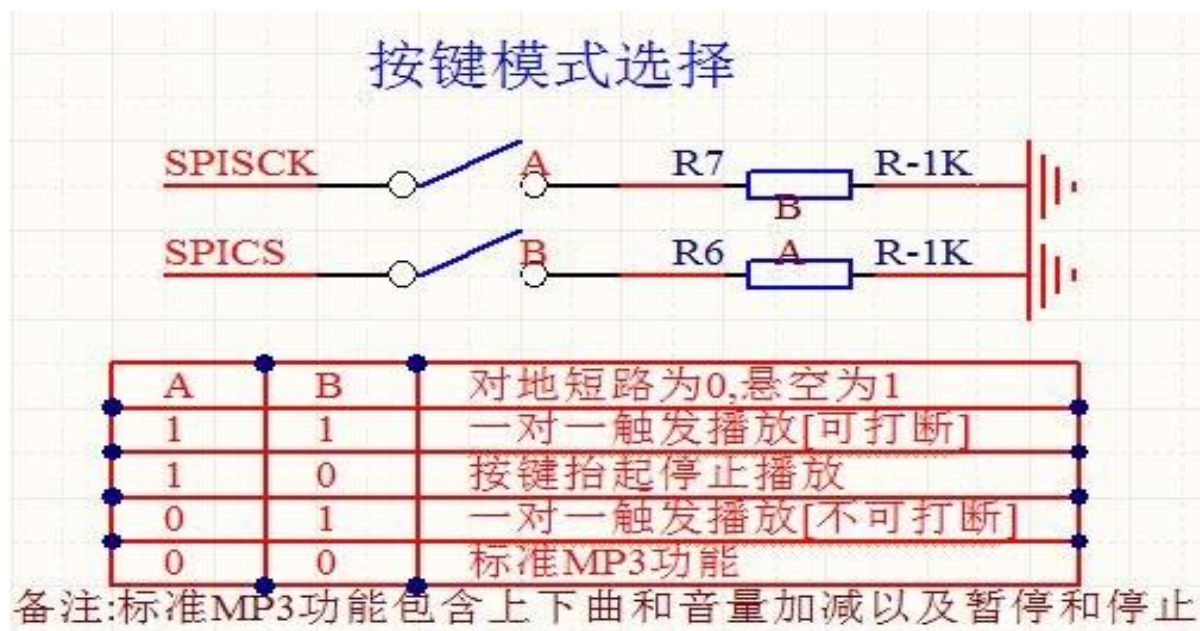
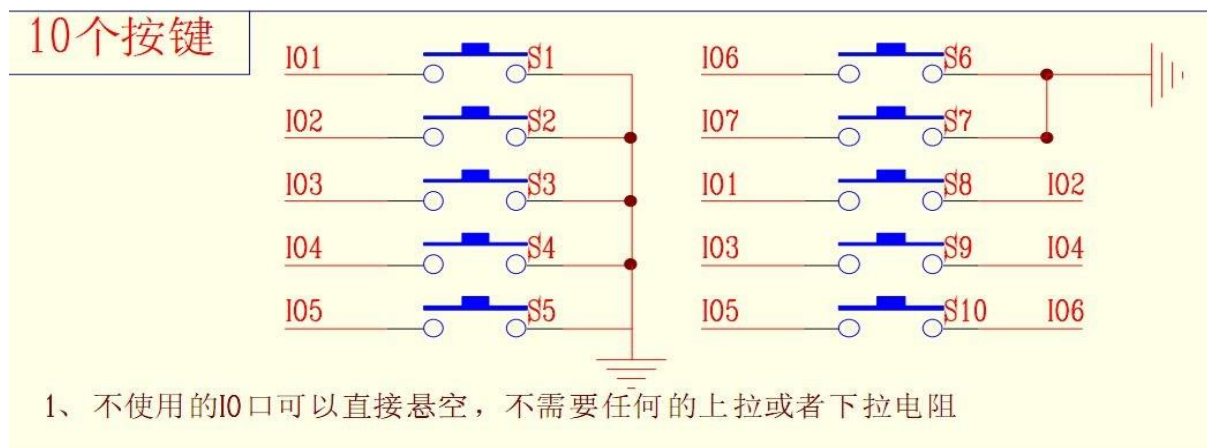


Table for the selection 10 Logical table-key function. Module to factory default[One trigger playback can be interrupted]

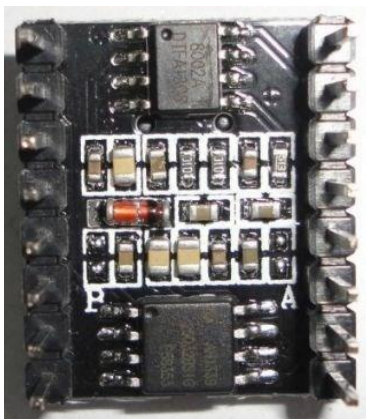


Modules button S1--S7.Other S8--S10 Requires users to follow the principles of wiring



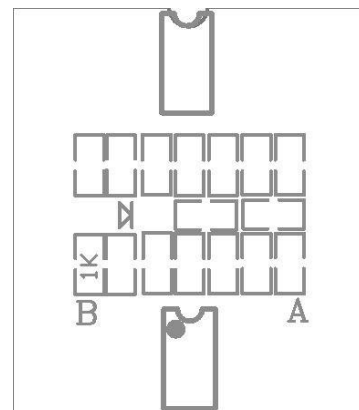
**(1), One-to-one function [Can be interrupted]**

One trigger	Short press	Long press	According to the tight	Button lift
S1	第 1 段 [FOLDER1]			
S2	第 2 段 [FOLDER1]			
S3	第 3 段 [FOLDER1]			
S4	第 4 段 [FOLDER1]			
S5	第 5 段 [FOLDER1]			
S6	第 6 段 [FOLDER1]			
S7	第 7 段 [FOLDER1]			
S8	第 8 段 [FOLDER1]			
S9	第 9 段 [FOLDER1]			
S10	第 10 [FOLDER1]			
Notes: This is one to trigger playback can be interrupted [Short circuit to ground triggers 80ms Effective]				



Default: one can interrupt (Left)

焊 1K Resistance to B, For the level keep recyclable  
(Right)

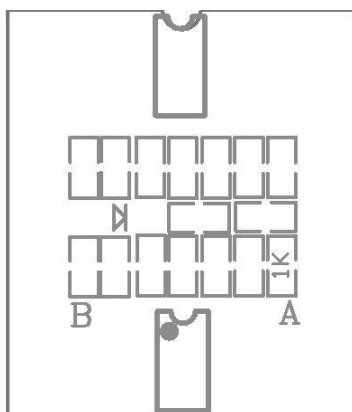


**(2), Press the lift stop playback**

Press the lift stops	Short press	Long press	According to the tight	Button lift
S1		第 1Section repeats[FOLDER1]		Stop it
S2		第 2Section repeats[FOLDER1]		Stop it
S3		第 3Section repeats[FOLDER1]		Stop it
S4		第 4Section repeats[FOLDER1]		Stop it
S5		第 5Section repeats[FOLDER1]		Stop it
S6		第 6Section repeats[FOLDER1]		Stop it
S7		第 7Section repeats[FOLDER1]		Stop it
S8		第 8Section repeats[FOLDER1]		Stop it
S9		第 9Section repeats[FOLDER1]		Stop it
S10		第 10Section repeats[FOLDER1]		Stop it
Notes:This lift to stop long press the loop[Short circuit to ground triggers800msEffective]				

**(3), One trigger cannot be interrupted**

Triggers do not interrupt	Short press	Long press	According to the tight	Button lift
S1	第 1Should not interrupt the[FOLDER1]			
S2	第 2Should not interrupt the[FOLDER1]			
S3	第 3Should not interrupt the[FOLDER1]			
S4	第 4Should not interrupt the[FOLDER1]			
S5	第 5Should not interrupt the[FOLDER1]			
S6	第 6Should not interrupt the[FOLDER1]			
S7	第 7Should not interrupt the[FOLDER1]			
S8	第 8Should not interrupt the[FOLDER1]			
S9	第 9Should not interrupt the[FOLDER1]			
S10	第 10Should not interrupt the[FOLDER1]			
Notes:This is one to trigger playback should not interrupt the[Short circuit to ground triggers80msEffective]				

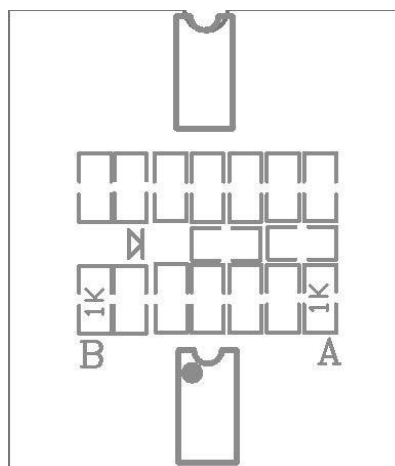


焊 1K Resistance to A, Pulse not interrupt

(Left)

焊 1K Resistance to A, B, 为 MP3 模式

(Right)

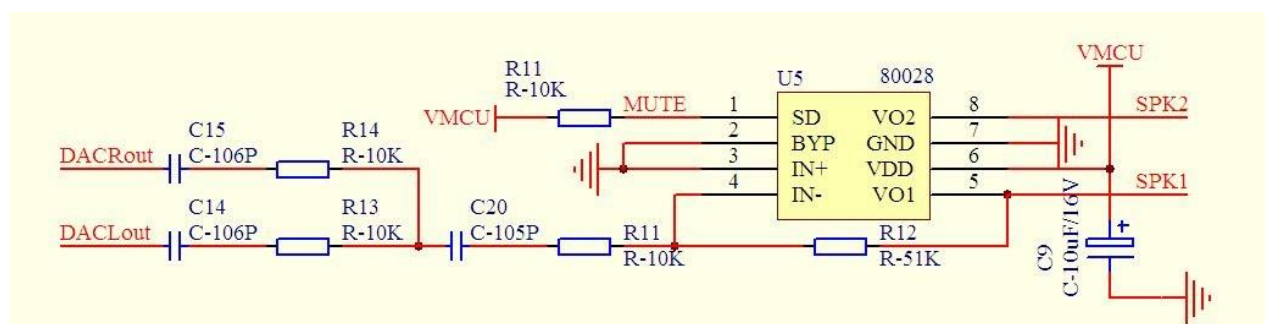


#### (4), Standard playback

Playback function keys	Short press	Long press	According to the tight	Button lift
S1	The next song		Volume+	
S2	Previous track		Volume-	
S3	Play pause			
S4	Low power consumption			
S5	Stop it			
S6	Volume+		Volume+	
S7	Volume-		Volume-	
S8	Reservation			
S9	Reservation			
S10	Reservation			

Notes:The standards ofMP3Function

#### 4.3 An external Mono power amplifier



Power amplifier here we are 8002Specific parameters please refer to IC 的 datasheet。Applied to ordinary enough, if the pursuit of higher quality, refer the customer to find the right power amplifier.

#### 4.4 USB Updated voice instructions

Our modules can be updated directly using a mobile phone charging cable voice, convenient and flexible. Our advantages are as follows

- In accordance with customer requirements, correct voice window information
- There's no need to install any software, updated directly, and does not require a dedicated Download Manager
- On the sound quality without any compression and damage, guarantee a higher quality experience

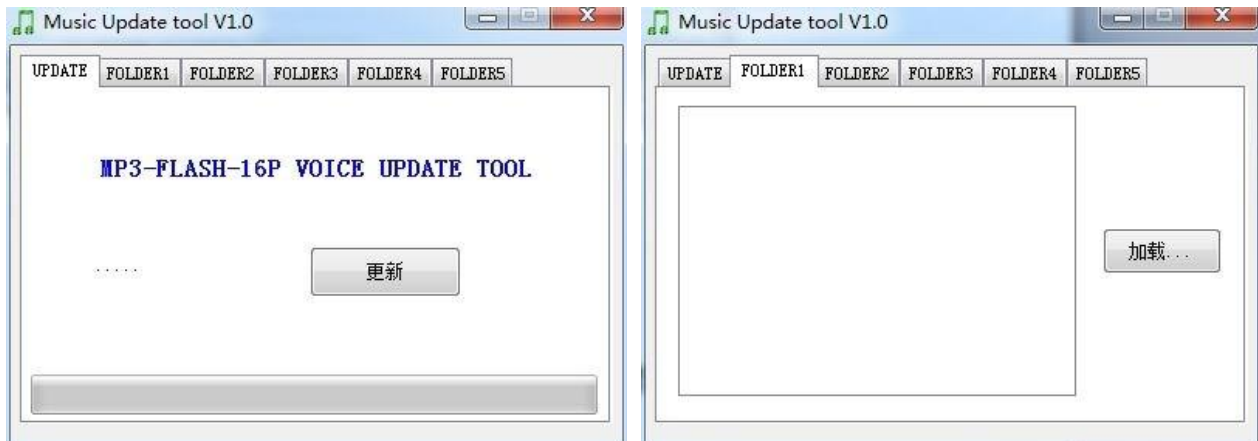
First module, plug the cell phone charging cable, known as the MicroUSB Line. The computer will pop up the following screen, and then Brain 360 Software or antivirus software off or plug USB After following pop-up window select allow programs to run:



The computer will pop up the following screen

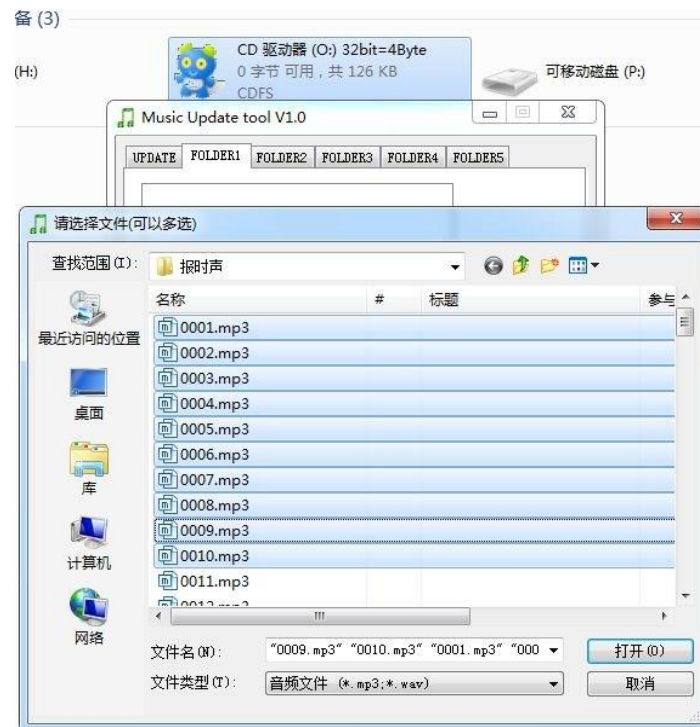


Double-click the left mouse button, the computer will pop up the following screen (1)



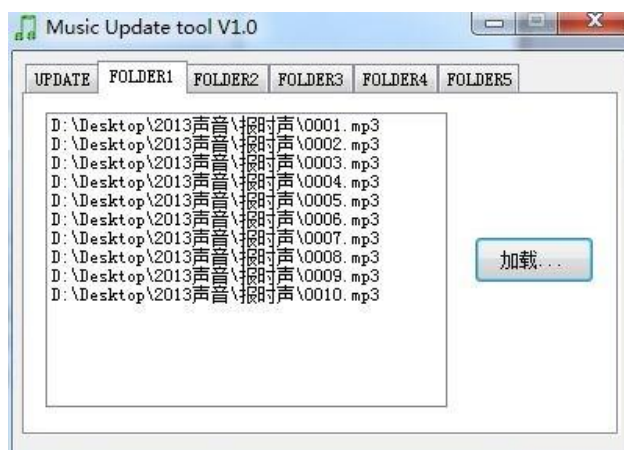
(1) (2)

2, Select "FOLDER1" Folders, as shown above (2) And click on the load, it will pop up a window that loaded voice, as shown below



Point the left mouse button and drag the selected, or press the keyboard Ctrl Keys, a select a sound file

3, Select the voice needs to be loaded at this time, click on the "Open it" Add in the software.



4, Finally, back to the "UPDATE" Interface, click on the "Update" Button will appear the following screen

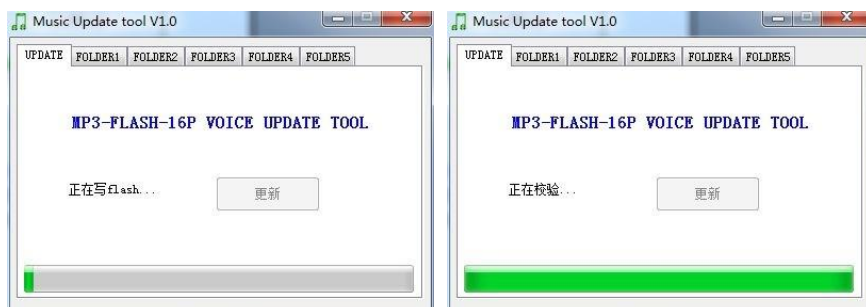


5,

5In turn, from left to right 3 Windows, representative of the last window update is complete, close this window and unplugged USB Lines can

5, Now we've tested SPIFLASH Including Winbond,GD, Macronix, the largest on the market FLASH。 So FLASH 的 Compatibility problem does not exist. We've tested FLASH。 Catalog store 16M Bytes[W25Q128],Are no problem.

6, Because we update the Windows Update progress bar only support 8M Bytes, so use 16M Bytes FLASH , It will The following screen, please friends don't worry, this is normal



While the progress bar is not the same, but it is updated

7, Description of the update:

(1)、 We update the window reserved 5 Regional update, Are named FOLDER1--FOLDER5.This version support 5 个 Named operation area

(2)、FOLDER1--FOLDER5 这 5 A region does not allocate space, is scalable. For example, I just use FOLDER1.

Do not use other 4 A file area, this 4 A region of a file can take up space? Takes less than 10 Bytes,Suddenly

Slightly.

(3)And every FOLDER Regional support up to 255 Voice[In the case of space allows]。 A single voice is not a requirement. Now FLASH Maximum support 128Mbit。 That is, 16M Bytes of voice storage, enough to meet most applications

(4), If users require very high sound quality, can use their own voice compression software, MP3 Or WAV File compression,

Reduce the amount of storage space. In order to reflect the high quality of our products, do not recommend that users use

(5)、USB Updated voice time, based on audio file size, greater voice, updated more slowly.

(6)Once updated after speech, speech will delete all saved before.

7, Notes:

(1), Our modules do not need to install any software, plugged into a computer software that pops up is actually being written to SPIFLASH 。 Accounted for 200kb Empty

Rooms. Very small, so users can be ignored.

(2)To put on their own if necessary, user SPIFLASH。 Please contact our technical support for an updated firmware.

(3), If the computers first use our module, just when plugged into a computer, will take some time because the computer automatically on my module enumeration and identification operations. May need to 1 Minutes or so, until the updates window pops up.

#### 4.5 Users use a blank FLASH Introductions

Users in the debugging process, according to its own needs replacing flash Size to meet your needsDemand, which requires the following three

Steps to complete FLASH Replacement.

Ask us for FLASH Updating the firmware

Pass USB Interface on blank FLASH Firmware burned

Unplug the USB Cable, again working

We divided the firmware 4 Sections below give a detailed explanation

名称	修改日期	类型	名称	修改日期	类型	大小
MP3-FLASH-16P_1M	2014/3/29 23:29	文件夹	32bit=4Byte.iso	2014/3/29 23:24	光盘映像文件	126 KB
MP3-FLASH-16P_2M	2014/3/29 23:28	文件夹	ISODown.exe	2012/12/13 15:34	应用程序	144 KB
MP3-FLASH-16P_4M	2014/3/29 23:29	文件夹	双击本文件烧写模块固件.bat	2014/3/29 23:30	Windows 批处理...	1 KB
MP3-FLASH-16P_8M	2014/3/29 23:28	文件夹				
MP3-FLASH-16P_16M	2014/3/29 23:27	文件夹				

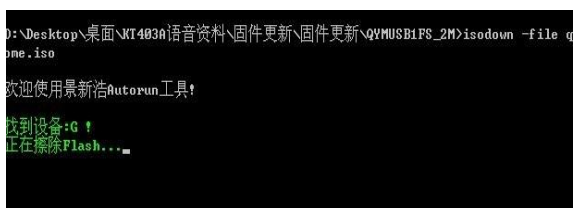
The users according to their FLASH Size to select a firmware update. Size of the firmware is the same.

The figure on the right is actually by "Double-click the firmware file download module .bat"The batch calling" ISDDown.exe "The software will "32bit=4Byte.iso.iso"Writes image files FLASH In the. This is a open source tool, are interested can check out information on their own,

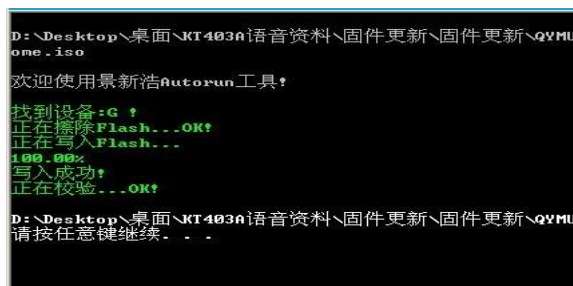
To understand the whole process.

Pass USB Plugged in to a computer, click the"mydown.bat", The following window will pop up





After the update is complete, it will appear the following screen:



After the update is complete, you can see the computer has virtual a"CDROM", This indicates success. Note: If you are in the process of updating, any exception, it is not normal, you can replace theFLASHTo identify the problem.

#### 4.6 Reference routines combination play

##### Serial send and check

```

/*****
- 功能描述: 串口向外发送组合数据
- 隶属模块: 外部
- 参数说明: CMD:表示控制指令, 请查阅指令表, 还包括查询的相关指令
            feedback:是否需要应答 [0:不需要应答, 1:需要应答]
            pbf:传送的参数的指针
            Len:传送的参数的长度
- 返回说明:
- 注:
*****/
void Uart_SendDat (INT8U CMD, INT8U feedback, INT8U *pbf, INT8U Len)
{
    static u8 i = 0;

    Send_buf[0] = 0xff; //保留字节
    Send_buf[1] = 4 + Len; //长度
    Send_buf[2] = CMD; //控制指令
    Send_buf[3] = feedback; //是否需要反馈
    for (i=0; i<Len; i++)
    {
        Send_buf[4+i] = *(pbf+i);
    }
    DoSum(&Send_buf[0], Send_buf[1]); //校验
    SendCmd(Send_buf[1]+2, 1, 30); //发送此帧数据
}

/*****
- 功能描述: 求和校验
- 隶属模块:
- 参数说明:
- 返回说明:
- 注:
*****/
void DoSum (INT8U *Str, INT8U len)
{
    INT16U xorsum = 0;
    INT8U i;

    for (i=0; i<len; i++)
    {
        xorsum = xorsum + Str[i];
    }
    xorsum = 0 - xorsum;
    *(Str+i) = (INT8U) (xorsum >> 8);
    *(Str+i+1) = (INT8U) (xorsum & 0x00ff);
}

```

Function call:

u8 UartDatCnt ;//Length combinations of parameters, user-specified data length u8 PDatBuf[12] ;//Define the data buffer

void DatChangeToBuf(u8 len)//Simple assignment test uses, users own rewriting code

```
{ static u8 i = 0; UartDatCnt = len; for(i=0; i<len; i++)
```

```
{
```

```
PDatBuf[i] = i+1;
```

```
}
```

}

Uart\_SendDat(0x21, 0, PDataBuf, UartDatCnt); //Send broadcast packets

3Effect, the actual data sent



The actual data: 7E FF 0C 21 00 01 02 03 04 05 06 07 08 FE B0 EF

Notes: Where there are still not clear, you can contact us. Provide technical support

#### 4.7 The hardware description

Module power supply

Led module □□3.5 Audio interface

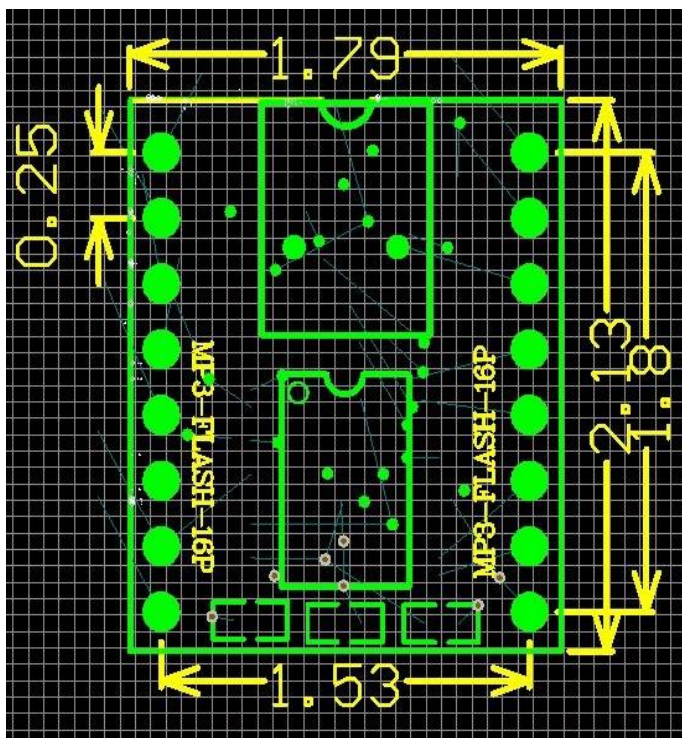
Module power supply modules the ideal working voltage as 4.2V。 So users are using 5V Power supply, it is recommended that thread a diode

Led module

	Download mode	Play voice	Pause	Sleep
Fitness	Flash	Slow Flash	Permanent	灭

3、3.5 Audio interface this interface is for the user to plug in your own headphones to listen to the voice, can only support the headset cannot be jumper connected speakers

#### 4.8 Module size



Above size unit for cm

Without the mm As a unit, pin spacing 2.54mm



## 5. Matters needing attention

Modules used, Crux of the problem do the following description:

Module GPIO The characteristics of

Precautions for use

Serial port programming note

## 5.1 GPIO The characteristics of

IOInput characteristics						
Symbol	Parameters	Smallest	Typical	Biggest	Work unit	Test conditions
VIL	Low-Level Input Voltage	-0.3	-	0.3*VDD	V	VDD=3.3V
VIH	High-Level Input Voltage	0.7VDD	-	VDD+0.3	V	VDD=3.3V
IOOutput characteristics						
Symbol	Parameters	Smallest	Typical	Biggest	Work unit	Test conditions
VOL	Low-Level Output Voltage	-	-	0.33	V	VDD=3.3V
VOH	High-Level Output Voltage	2.7	-	-	V	VDD=3.3V

## 5.2 Points for attention in application

Module external interfaces are 3.3V 的 TTL Level, so in the design of hardware circuit, please note that the level of conversion. In an environment of strong interference, please note that some protective measures of electromagnetic compatibility, GPIO With optical coupling isolation, increase TVS For a while

ADKEY Key values are in accordance with the General environment, in an environment of strong inductive or capacitive load, please note that module

Power supply, separate isolated power supply is recommended, and topped with beads and inductors for power supply filtering, as much as possible to ensure transportation

Into the stability of the power supply and clean. If you can't guarantee, please contact us, reduce the number of keys, and redefine a wide voltage

Match.

Serial communication in the context of general use, you note level. If strong interference environment, or long distance RS485

Application note signal isolation, in strict accordance with industry standard design of communication circuits. You can contact us, we offer design

## Reference

We support the minimum sample rate of the audio file is 8KHZ。 That is less than 8KHZ Audio files are not supported, do not decode properly played. Users can use the audio-processing software, increase the sample rate of the audio file to resolve the problem.

Current module in the sleep state 10mA About playback, depending on the size the volume, peak current can reach 1A。 Power consumption

Will be relatively large. If used in low-power situations, ask users to control the power supply of the module or chip. This reduces the chip's power consumption

User directly using our module's power amplifier, please select the appropriate speaker. Recommend the use of 4 Ohm/3W。 This one one

Is to use the best configuration. Other speakers, please pay attention to the load size and power parameters

The module module support MP3、 WAV Two mainStreaming audio format.

8, Our module support 8/11.025/12/16/22.05/24/32/44.1/48KHZ Sampling rate of the audio file, which is also

Most audio file parameters. The sampling rate of the audio file if the user is not in this range, play is not supported, but

Is available through dedicated software convert it. Our advantage is the lossless playback and high quality, so not recommended for audio

Frequency compression.

### 5.3 Serial port operation

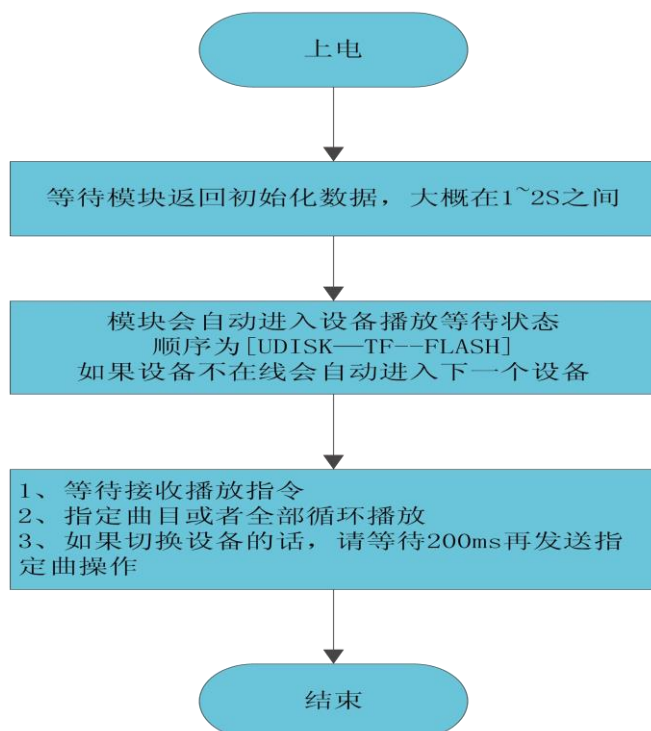
Serial part of the operation, see process below, we provide a complete reference drive as usual, for your reference:

Serial processes

Description of serial programming reference

Considerations for serial operation requires a delay

#### 5.3.1 Serial port operation



We provide all the serial part of the operation of the module, is the same protocol, so you don't have to worry about different modules are not compatible

If operations on the serial port, there is unclear, please do contact us, request for serial programming reference routines.

Our product updates, must be in accordance with the current version of the agreement, so backward compatibility.



### 5.3.2 Description of serial programming reference

Currently we provide serial programming reference code, there are two parts, the first part is our beta test code,

Serial operation to the control of more comprehensive, the other is a basic version, just the specified track examples. User patience to digest

### 5.3.3 Serial port programming requires an appropriate delay attention

1After, module is powered on, need less 500ms Hatsuhana the time of operations, after the initialization is complete,

Related data sent will be initialized. Users can also directly to ignore these data

When specifying the device after the required delay 200ms Time, and then sent the specified track and so on the related instructions.

Because SPIFLASH Itself can store a limited repertoire, unlike TF Card or U Dish. Specifies the file to play, to speech delay between starts playing, can be ignored.

### 5.3.4 Important notes verification

For many users not used to check communication mode, we launch a special compatibility mode with checksum does not verify. Examples. If we send broadcast instructions below:

Combination play[Without calibration]	7E FF 09 21 00 05 01 02 03 04 EF	Play5、1、2、3、4
Combination play[With checksum]	7E FF 09 21 00 05 01 02 03 04 FE C8 EF	Play5、1、2、3、4

Difference of two instructions, omitting the check 2 Bytes. These two frames of data can be received by chip.

Because a lot of users in the course of using, many of which are used without Crystal MCU。 In this case, we must suggest that you add Colonel inspection in this way, to guarantee the stability of communications.

If the user uses STM32 Or STC For a while MCUAnd external crystal oscillator, you can appropriate calibration may be saved. Because Without Crystal MCU, The clock is relatively less, serial error, once the error is too large, can lead to communication errors.

List of users at its sole discretion.

## 6. Disclaimer

### □□Develop preliminary knowledge

MX Products will provide the fullest possible development of templates, drivers and documentation to facilitate the users but also users familiar with design of hardware platform and related C Language knowledge

### □□EMI 和 EMC

MX Series modular mechanical structure determines its EMI Difference in performance and integrated circuit design.MX Series modules EMI 能

Meet the vast majority of applications, users have special requirements, you must consult with us in advance.

MX Series modules EMC Performance is related to user backplane design, especially in power circuits,I/O Isolation, reset circuit, with

In designing the floor must fully take into account the above factors. We will strive to improve MX Electromagnetic compatibility characteristics of series module, but in the end the user application products EMC Provide any performance guarantee.

The power to modify the company can retain the at any time without prior notice for product-related documents under power of amendment

### ESD Electrostatic discharge protection

MX Products parts components built-in ESD Protection circuit, but in the use of environment, still recommends users to design the backplane

When ESD Protection measures, in particular the power to the IO Designed to ensure the stable operation of the product, the installation MX Products in order to ensure

Safety first electrostatic discharge will accumulate in the body, such as wearing a reliable earthing electrostatic ring touch access pipes of the Earth,



Version information

Version	Date	Reason
V1.0	The year 2013/09/18	Beta version
V1.1	The year 2013/12/10	Official releases
V1.2	The year 2014/02/18	Increase the address specified folders and files to play[File partition management] Increase key modes can be selected Add the specified folder loop For more system parameters Added documentation for detailed instructions