

Guangzhou Yue Yan Electronic Technology Co., Ltd.

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MP3-FLASH-16P Instruction Manual V1.0

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1 Overview

1.1 Introduction

MP3-FLASH-16P is a provider of serial voice module, the perfect integration of MP3, WAV hard decoding. While the software support industrial grade serial communication protocol to SPIFLASH as the storage medium, reduces costs

This also increases the stability of the product. Through simple serial commands to complete the play specified voice, and as

It playback voice and other functions, without tedious low-level, easy to use, stable and reliable is the most important feature of this product.

In addition, this module also the depth of customized products, integrated 3W amplifier, external speakers can playback directly. At the same mold

Block supports 10 voice segment specified trigger playback.

1.2 Function

1, supports sampling rates (KHz): 8 / 11.025 / 12/16 / 22.05 / 24/32 / 44.1 / 48

2,24-bit DAC output, dynamic range support 90dB, 85dB SNR support

3, maximum support 16M bytes SPIFLASH. For example W25Q16 [2M bytes], W25Q128 [16M byte] GD25Q32 [4M

byte]

1Byte = 8Bit

4, a variety of control modes, parallel control mode, serial mode, AD key control mode

5, Microusb Interface update voice files, without having to install any software. Support XP and WIN7 system.

6, supports a combination of playback functions, you can achieve timekeeping, reported the temperature, to a certain extent, it can replace some expensive TTS program

7,30 adjustable volume level, Level 5 EQ adjustable
8, comes with 3W amplifier, external speakers directly to complete playback
9, support 10 voice trigger segment broadcast, IO detection mode, it is suitable carbon button
so on occasion

1.3 Applications

- 1, car navigation voice broadcast
- 2, road transport inspectors, toll voice prompts;
- 3, train station, bus station security check voice prompts;
- 4, electric power, telecommunications, financial operating room voice prompts;
- 5, vehicle entrance, the tunnel authentication voice prompts;
- 6, public security frontier passage voice prompts;
- 7, multi-channel voice alarm or voice guidance equipment operation;
- 8, electric sightseeing bus safety with voice notices;
- 9, electrical and mechanical equipment failure automatic alarm;
- 10, fire alarm voice;
- 11, automatic broadcasting equipment, regular broadcast

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2. Chip functional framework Description

SOC program module is selected, it integrates a 16-bit MCU, and a special aDSP for audio decoding, using hard

Decoding the way, more to ensure the stability and quality of the system. Small package size more to meet the needs of embedded other product

2.1 hardware parameters

name

parameter

- 1, supports all bit rates 11172-3 and ISO13813-3 layer3 audio decoding
- 2, the sampling rate support (KHZ): 8 / 11.025 / 12/16 / 22.05 / 24/32 / 44.1 / 48

MP3 file format

- 3, support Normal, Jazz, Classic, Pop, Rock, etc. Sound

USB Interface

2.0 Standard

UART interface

Standard serial port, TTL level, the baud rate can be set [user can not be located]

Input voltage

3.3V-5V [7805 cascade after a diode is the best]

Rated current

10MA [static]

Low Power Current
<200uA
Amplifier power
4 ohm load, support 3W
size
25 (L) * 20 (W) [unit: mm]
Operating temperature
-40 Degrees --80 degrees
humidity
5% 95%

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2.2 Pin Description



Pin order
number
Pin Name

function descriptor

Remark

1

VCC

Power input [positive]

Maximum 5.2V

2

SPK1

External mono speaker

Should not exceed 4 ohms 3W

3

SPK2

External mono speaker

Should not exceed 4 ohms 3W

4

DAC-R

External amplifier, headphones

5

DAC-L

External amplifier, headphones

6

BUSY

Playback status pin

Low output when playing

7

TX

UART serial data output

3.3V TTL level

8

RX

UART serial data input

3.3V TTL level

9

GND

To [negative]

Systematically

10

IO1

General Purpose Input Output 1

11

IO2

Universal input and output ports 2

12

IO3

Universal input and output ports 3

13

IO4

Universal input and output ports 4

14

IO5

Universal input and output ports 5

Fifteen

IO6

Universal input and output ports 6

16

IO7

Universal input and output ports 7

Note: Built-in single-channel amplifier module. Further modules have white spots for the first 2 feet and 3 feet

Module Distribution Note:

(1), the pin 1--8, down from the number on the left

(2), pin 9--16, from the bottom up in turn to the right number

(3), amplifier chip [4 ohms, 3W]

(4), the main chip [SSOP24 package]

(5), USB interfaces transposons [compatible Miniusb and Microusb]

(6), comes with a SPI flash

After the user getting goods, to take a good speaker and SPK2 SPK1 ends, plug the USB cable to the computer, tweezers direct short pin 9 and 10

Feet, to trigger the playback module. As if normal means test module (module factory already downloaded after the sound test before shipment).

3. The serial communication protocol

Serial communication as a common control, we carried out the industrial level of optimization, calibration added frame, retransmission,

Measures for error handling, greatly enhance the stability and reliability of communication, at the same time can be extended on the basis of more powerful RS485

For networking functions, serial communication baud rate can set your own default to 9600

3.1 Communication format

It supports asynchronous serial communication mode, the PC via the serial port to accept commands sent

Communication standard: 9600 bps

Data bits: 1

Parity bit: none

Flow control: none

Format: \$ S VER Len CMD Feedback para1 para2 checksum \$ O

\$ S

Start bit 0x7E

Each command feedback are \$ beginning, that is, 0x7E

VER

version

Version Information

Len

After len number of bytes

The checksum is not counted

CMD

Command word

Showing specific operations, such as play / pause, etc.

Feedback

Command feedback

The need for feedback, a feedback, not feedback 0

dat

parameter

And in front of the associated len, does not limit the length

checksum

Checksum [two bytes]

Cumulative and check [excluding start bit \$]

\$ O

End Bit

End bit 0xEF

For example, if we specify the player SPIFLASH, you need to send: 7E FF 06 09 00 00 04 FF dd EF

Data length is 6, which is 6 bytes, respectively [FF 06 09 00 00 04]. Not counting the start, end, and verification. Then get a

The results are accumulated, then 0 Less, namely "0-checksum = check data." If there do not understand, you can refer to our "MP3

-FLASH-16P Commissioning Manual. "In addition users can also ignore parity, refer to our section 5.3.4 Description.

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3.2 Communication Instruction

1, the command sent directly, without return parameters

CMD command (instruction)

Corresponding function

Parameters (16)

0x01

Under a

0x02

previous piece

0x03

Specify the track (NUM)

1-255

0x04

Volume +

0x05

volume-

0x06

Specify the volume

0-30

0x07

Specifies EQ0 / 1/2/3/4/5

Retention

0x08

Single cycle specified track play

1-255

0x09

Specifies whether the player SPIFLASH

FLASH

0x0A

Goes to sleep - Low Power

Power remained at 10MA

0x0B

Retention

0x0C

Module reset

0x0D

Broadcast

0x0E

time out

0x16

stop

0x21

Combination play

See detailed description below

0x22

Specify the track with volume of playing

See detailed description below

0x30

File playback specified folder

See detailed instructions about

0x31

0x32

0x33

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Parameter 2, Query System

CMD command Detailed (check
Consultation)

Corresponding function

Parameters (16)

0x3C

STAY

0x3D

STAY

0x3E

STAY

0x3F

Send initialization parameters

0x1F (lower 5 each represents a folder)

0x40

Returns an error, request retransmission

0x41

answer

0x42

Query the current status

0x43

Query the current volume

0x44

Query the current EQ

Retention

0x45

Query the current play mode

This version retains this feature

0x46

Query the current software version

This version retains this feature

0x49

Query the total number of files FLASH

Total number of files 5 folders

0x4D

FLASH of the current track query

Returns a folder and track pointer

0x60

Query current online folder

0x61

Discover the current folder pointer

0x62

Total number of tracks specified folder inquiry

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3.3 module returns data

Modules in key areas will return the data. For the user to control the module's work status

The module is electrically successful initialization data

Module finishes playing the current track data

Module successfully received instructions to return the ACK (acknowledge)

Module receives a data error [including the confiscation of complete data, calibration error in both cases]

When the module is busy, the data come, the module will return busy instruction

3.3.1 Module power returned data

(1), the module power, take some time to initialize, this time is the need to determine how much of the device according to the file SPIFLASH,

Normally this time in less than 500ms. If you exceed this time module initialization data has not been sent out, indicating that the module

Initialization error, please check the hardware connection

(2), module initialization return data for the current valid folder, such as return 7E FF 06 3F 00 00 03 xx xx EF

==> Where 0x03 represents FOLDER1 and FOLDER2 these two regions have effective voice files

If it is 0x07 represents FOLDER1 and FOLDER2, FOLDER3 have voice files
In fact, five folders are occupying a byte one. FOLDER occupy the lowest position
(3), MCU must wait until after the module initialization command issued to send the
corresponding control instruction or instruction module will not send
Pre-treatment. But it will also affect the normal initialization module.

3.3.2 tracks finished playing the returned data

FLASH player End of an 7E FF 06 3E 00 01 01 xx xx EF

FOLDER1 first one finished playing

FLASH player End of 2 7E FF 06 3E 00 02 02 xx xx EF

FOLDER2 first two finishes playing

1, the dispute triggered a lot of players demand, we correct module is after playing the song
automatically comes to a halt. If you need this

Class applications. Only you need to specify the track playback can be. Thus, the track finished
playing will automatically stop, waiting for instructions

2. In addition, we opened a special IO as decoding and suspended status indication. See 5 feet
, Playing status output low [many amplifiers mute foot, can be controlled directly through this IO]
, Playback pause status, output high. Module sleep. Also low

3. After the module is powered up, normal initialization, the module will automatically enter the
device playback. And stops decoding, waiting for the user to send broadcast

Put the relevant directives

4, another user after a specified device, you need to wait for 200ms of time, and then sends the
specified track, because once the designated track,

The system will initialize the specified device file system, if you send a command to specify the
track immediately, will lead to the module can not receive.

3.3.3 module response data returned

(1), in order to strengthen the stability of data communication, we increased the response to
treatment, whether ACKB byte is set to be required to reply
answer. Benefits of doing so is to ensure that each communication has handshake receive a
reply sent by the MCU to represent data, the module has become
Gong received treatment immediately.

(2) For general applications, customers can freely choose, without this response processing is
also possible.

3.3.4 Module error returned data

Returns busy

When 7E FF 06 40 00 00 01 xx xx EF module in the file system initialization

The current in sleep mode

7E FF 06 40 00 00 02 xx xx EF sleep mode supports only the specified device
 Serial reception error
 7E FF 06 40 00 00 03 xx xx EF a serial data has not been received
 Error checking
 7E FF 06 40 00 00 04 xx xx EF and check error
 Beyond the scope of the specified file
 7E FF 06 40 00 00 05 xx xx EF specified file exceeds the specified range
 The specified file was not found
 7E FF 06 40 00 00 06 xx xx EF specified as the file is not found
 Data does not conform to the rules
 7E FF 06 40 00 00 08 xx xx EF as a minimum of 1 place, send to 0
 (1), in order to strengthen the stability of data communication between the data we added error handling mechanism. Module receives data format does not conform, Feedback are out there
 (2), in the environment is a bad situation, it is strongly recommended that customers deal with this command. If the application environment in general, can not handle.
 (3), the module returns busy, basically initialized when the module power does not return, because the module need to initialize the file system
 (4) After the power module into the device status, device is SPIFLASH. If SPIFLASH not online, it will automatically
 Go to sleep.
 (5), as long as we give the test reference SDK program, which serial transplant operation section, check the error does not occur in this
 Lane is strongly recommended that users check the way we give. Because no one can guarantee the transmission of data without errors.
 (6), the file specified part of the error, refer to the following Detailed

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Detailed instructions 3.4 serial

The following key areas we described in detail:

Specify the track to play

Specify the playback volume

Specify the playback device

All loop instructions

Combination play function [Highlights]

Specify the track to play with volume parameters

3.4.1 specify the song playback directive [direct reference 3.4.7]

Our instruction is given to support the specified track is playing, the choice of songs for 0255. In fact, that can support more, because

For a reason related to document management, support songs too, will lead to slow system operation, the general application does not need to support such

Many files. If the customer has unconventional application, please communicate with us in advance.

(1), for example, select the first song to play, sending part serial 7E FF 06 03 00 00 01 FF E6 EF

7E --- starting command

FF --- Version Information

06 --- Data length (excluding parity)

03 --- Representative Item No.

00 --- whether to answer [0x01: need answer, 0x00: no return answer]

High byte 00 --- track [DH]

01 tracks low byte --- [DL], where representatives of the first song broadcast

High byte FF --- check

E6 --- low byte checksum

EF --- End Command

(2), for the selections, if you select the first 100, first 100 into hexadecimal, the default is double-byte, it is 0x0064.

DH = 0x00; DL = 0x64

(3), and so can other operations, because in the embedded field in hexadecimal is the most convenient method of operating.

3.4.2 specify the volume of playback instruction

(1), we have the volume on the system power-on default is 30, if you want to set the volume, then sent directly to the appropriate instruction

(2), such as specifying the volume to 15, the instruction serial transmission: 7E FF 06 06 00 00 0F FF D5 EF

(3), DH = 0x00; DL = 0x0F, 15 is converted to hexadecimal 0x000F. You can play the tracks part is explained with reference to

3.4.3 All loop instructions

1, dispute the need for some looping root directory track requirements, we want to add that a control command 0x11.

Loop Start

7E FF 06 11 00 00 01 xx xx EF

Loop All Tracks

Loop Stop

7E FF 06 11 00 00 00 xx xx EF

Stop the looping tracks

2, in the process loop playback, normal operation can play / pause, previous song, next song, adjust volume, including EQ, etc.

3, then loop playback starts, the module will stop playback device inside the track, according to the physical order of the store. It will be aired again after

Play continued for another while, until it receives the playback is finished, or pause, and so instruction

3.4.4 Single loop instruction

Loop Start

7E FF 06 08 00 00 01 xx xx EF

Play the first song cycle

Loop Stop

7E FF 06 08 00 00 02 xx xx EF

Loop second song

(1), dispute the need for some of the requirements of the single loop, we can improve it a control command 0x08. According to the physical order of storage

Specify the user's attention to this point.

(2), in the process loop playback, normal operation can play / pause, previous song, next song, adjust volume, including EQ, etc.

And the state is still the loop can be triggered to play or go to sleep to turn off the loop shape by specifying a single.

3.4.5 combination playback instruction

Combination play

7E FF 09 21 00 05 01 02 03 04 FE C8 EF

Play 5,1,2,3,4

Combination play

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

Play 5,1,2,3,4,6,7,8

(1), many applications need to use TTS functionality, such as timekeeping, reported temperature, etc. amount newspaper application, if a user take our

TTS function module to imitate simple words, the effect of the above might be adversely affected, contradictory point is the delay between the speech and voice.

Directly in accordance with a designated play a file, then there will be delays between voice and speech, this is unacceptable. therefore

We have added a combination of playback functions, while support for designated play 12 speech, in accordance with the order of play one serial port.

(2), if the sending

7E FF 0C 21 00 05 01 02 03 04 06 07 08 FE B0 EF of the frame data, we analyze

CMD = 0x21 --- Read the instruction list

LEN = 0x0c = 12 bytes ---

FF 0C 21 00 05 01 02 03 04 06 07 08 [remove byte marked in red, is the order of the tracks]

Module once play the first five, the first one, 2,3,4,6,7 this 7 tracks. Finished playing stops (3), in the course of the combination playback, allowing users to enter playback pause, and set the volume, but it does not allow to specify down song. If you use Households combination play is relatively high, then please users edit their own sources, some or mute the sound source and remove the tail. such You can reduce the time delay between the voice and speech, you can use "Adobe Audition CS5.5" or "GoldWave.exe" etc. Professional audio software production. (4) With this feature, you can easily achieve "Welcome, the time now is 13 years on December 24," so flexible Broadcast mode, greatly improving the competitiveness of their products.

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Instruction 3.4.6 with volume parameters play

Play with volume

7E FF 06 22 00 1E 01 xx xx EF

30 volume play the first one

7E FF 06 22 00 0F 02 xx xx EF

15 volume play the first two

(1), contention for some users want, set different for different voice playback volume, according to previous old method is to first

After setting the volume, and then specify a track is playing, this operation is complicated, inconvenient. Hereby we add this entry instruction 0x22

(2), the specific operations, refer to the two test instructions given above.

CD player 3.4.7 with the specified folder

Designated areas and file playback

7E FF 06 30 00 01 01 FE C9 EF

FOLDER1 first one

7E FF 06 30 00 02 01 FE C8 EF

FOLDER2 first one

(1), our modules can be divided into five regions FLASH, can operate on any piece inside

(2), the specific operations, refer to the two test instructions given above.

Singles Tracks 3.4.8 specified folder loop

Specify the folder track loop 7E FF 06 31 00 03 03 FE C4 EF FOLDER3 first three loop

7E FF 06 31 00 01 03 FE C6 EF FOLDER1 first three loop

(1), the user can five folders inside a file specified any single loop, please refer to the above reference instruction

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

Tracks 3.4.9 specified folder start loop

Specify the folder loop

7E FF 06 32 00 03 01 FE C5 EF FOLDER3 first a loop

(1), the user can 5 folder inside any folder loop playback, please refer to the above reference instruction.

03 specified folder for FOLDER3

The first song begins 01 specified folder, if there is 02. Well, from the beginning of the first two cycles to play this folder

(2), the user can send a stop command to the end of the loop.

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4. The reference circuit

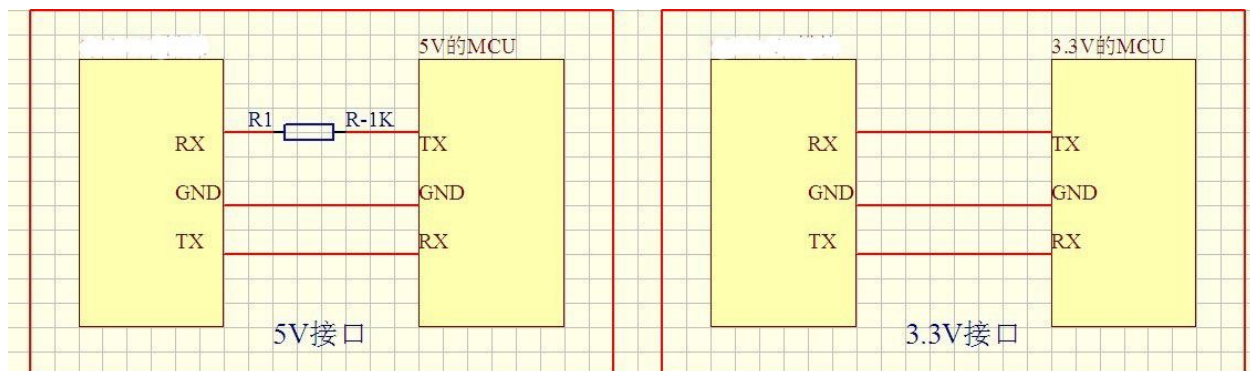
Contention for application modules, we offer a detailed reference design, so you can quickly get started to experience the powerful capabilities of the module

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

External IO function keys can be customized according to customer demand

External mono amplifier reference circuit

4.1 Serial Interface



Serial interface module for 3.3V TTL level, so the default interface level of 3.3V. If the system is 5V. It is recommended that the serial port

Docking interface to a 1K series resistor. This is sufficient to meet the general requirements, if applied to the case of strong electromagnetic interference, see

Textual description "Notes" of. Modules in 5V and 3.3V systems tested were normal, everything is normal. Were used are straight

Even the way, and no serial 1K resistor.

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Fifteen

4.2 key interface

IO module we use is the key way to replace the AD keyboard connection, the benefits of doing so is to take full advantage of increasingly MCU

More and more GPIO. Design tedious but not simple, we default configuration module 10 function keys assignment, can bad in any

Casual occasions control, and even can be used as a communication interface with the MCU.

Our key assignments four different types of functions,

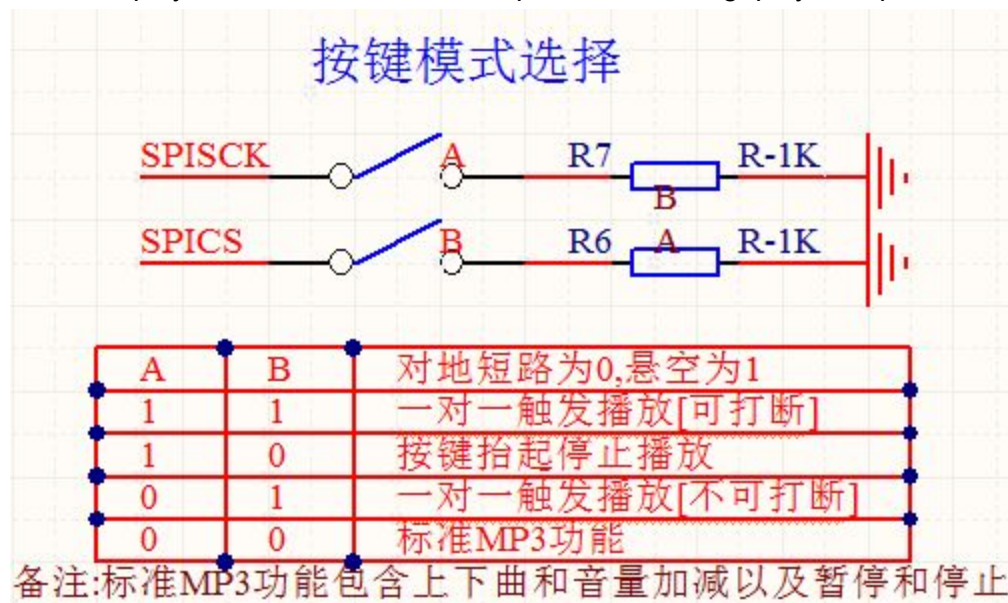
To be selected according to two resistors, please contact technical support.

One trigger playback, you can break

One trigger playback level remains can be recycled

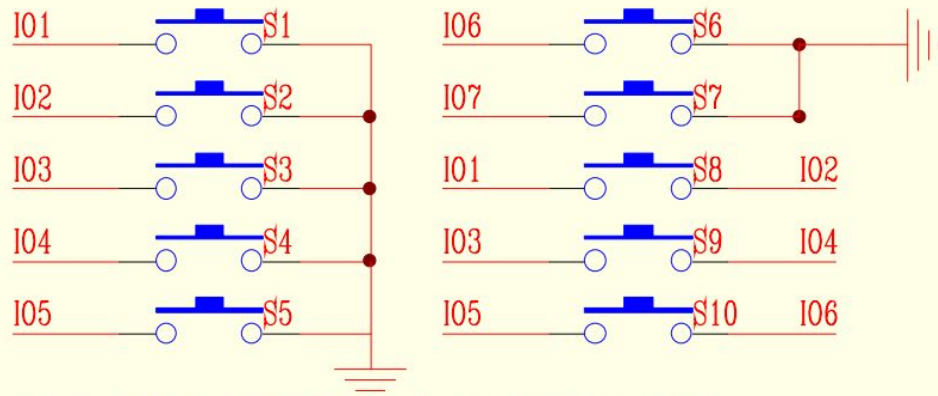
One trigger playback, can not be interrupted

Standard playback functions, such as up and down song, playback pause, etc.



Silk screen printing 2 corresponds to 1 corresponds to K1 K2 [See PCB]

10个按键



1、不使用的I0口可以直接悬空，不需要任何的上拉或者下拉电阻

Select the table for the logic table 10 keys. Module factory default is [one player can trigger interrupted]

Stay out of the key module for the S1 - S7 Other S8 -. S10 requires the user to be in accordance with the principles of the wiring diagram

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(1), one trigger function [to break]

One trigger

Short press

Press

According to not loose

Button lift

S1

Paragraph 1 [FOLDER1]

S2

Paragraph 2 [FOLDER1]

S3

Paragraph 3 [FOLDER1]

S4

Paragraph 4 [FOLDER1]

S5

Paragraph 5 [FOLDER1]

S6

Paragraph 6 [FOLDER1]

S7

Paragraph 7 [FOLDER1]

S8

Paragraph 8 [FOLDER1]

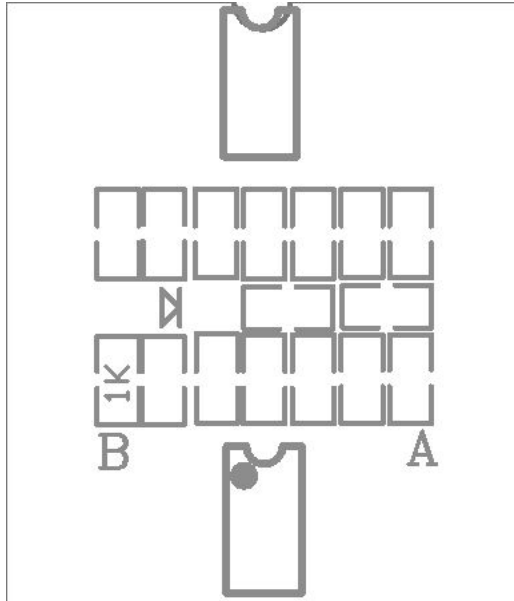
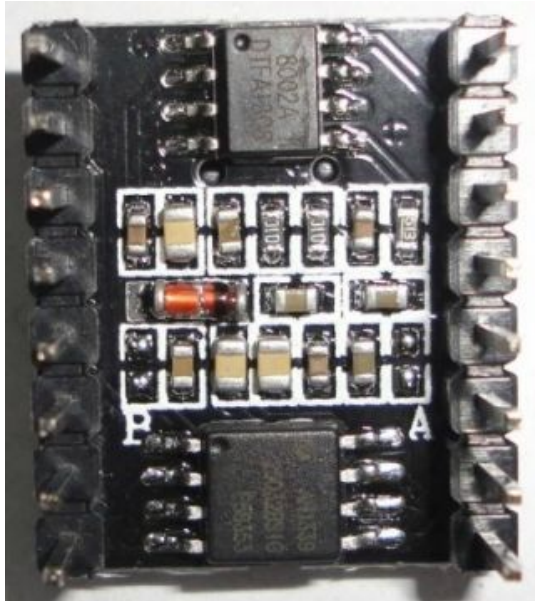
S9

Paragraph 9 [FOLDER1]

S10

Article 10 [FOLDER1]

Note: This is one trigger playback, you can interrupt [for a short to trigger 80ms effective]



Default: one can interrupt (left)

Welding 1K resistor to B, the level can pause

Loop (right)

(2), lift the stop playback button

Lift stop button

Short press

Press

According to not loose

Button lift

S1

Paragraph 1 of the cycle [FOLDER1]

stop

S2

Paragraph 2 cycle [FOLDER1]

stop

S3

Paragraph 3 cycle [FOLDER1]

stop

S4

Paragraph 4 of the cycle [FOLDER1]

stop

S5

Paragraph 5 of the cycle [FOLDER1]

stop

S6

Paragraph 6 cycles [FOLDER1]

stop

S7

Paragraph 7 of the cycle [FOLDER1]

stop

S8

Paragraph 8 cycle [FOLDER1]

stop

S9

Paragraph 9 of the cycle [FOLDER1]

stop

S10

Paragraph 10 cycles [FOLDER1]

stop

NOTE: This is the lift stopped, press and looping [for a short to trigger 800ms effective]

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(3), one trigger can not be interrupted

Do not interrupt trigger

Short press

Press according to not loose

Button lift

S1

Paragraph 1 can not break [FOLDER1]

S2

Paragraph 2 can not be interrupted [FOLDER1]

S3

Paragraph 3 should not interrupt [FOLDER1]

S4

Paragraph 4 can not be interrupted [FOLDER1]

S5

Paragraph 5 can not be interrupted [FOLDER1]

S6

Paragraph 6 can not break [FOLDER1]

S7

Paragraph 7 can not be interrupted [FOLDER1]

S8

Paragraph 8 can not be interrupted [FOLDER1]

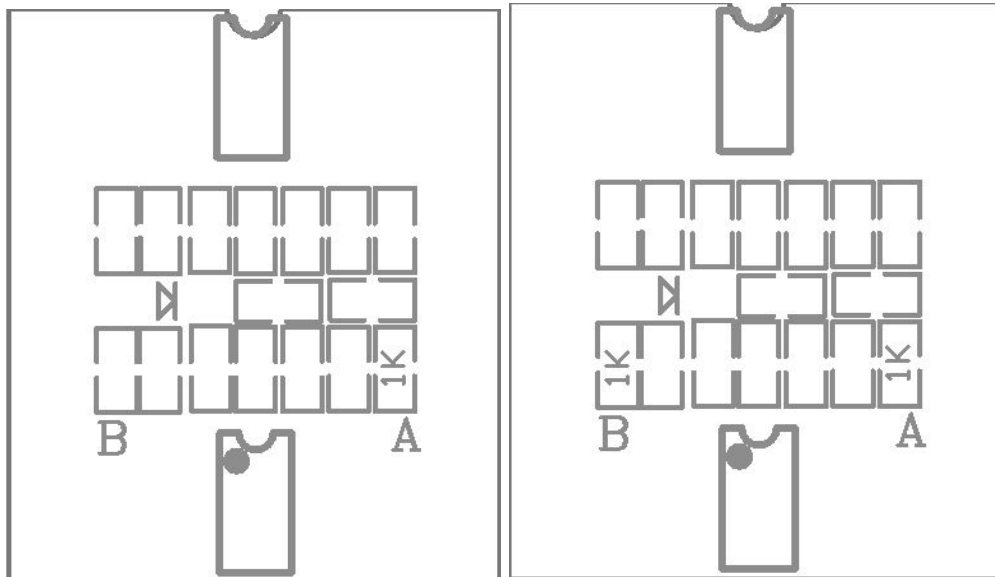
S9

Paragraph 9 should not interrupt [FOLDER1]

S10

Paragraph 10 can not be interrupted [FOLDER1]

Note: This is one trigger playback, can not break [for a short to trigger 80ms effective]



Welding 1K resistor to A, the pulse can not Interrupted (left)

Welding 1K resistor to A, B, to MP3 Mode (right)

(4), the standard playback

Playback function keys

Short press

Press

According to not loose

Button lift

S1

Under a

Volume +

S2

previous piece

volume-

S3

Play Pause

S4

Low power consumption

S5

stop

S6

Volume +

Volume +

S7

volume-

volume-

S8

Retention

S9

Retention

S10

Retention

NOTE: This is the standard MP3 functions

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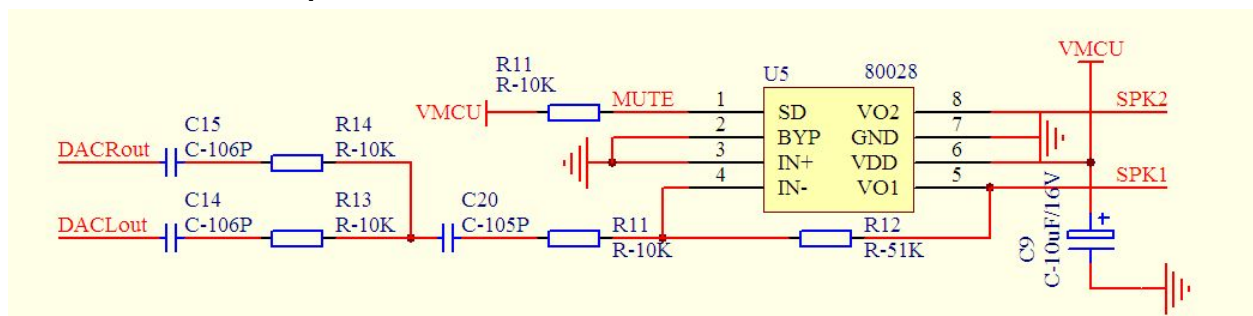
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4.3 External mono amplifier



Here we use the amplifier 8002, the specific parameters refer to the IC's datasheet. General enough to apply to the case, if the pursuit of more High sound quality, customer self to find a suitable amplifier.

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4.4 USB update voice instructions

Our modules can use the phone charging cable directly update voice, convenient and flexible.

Our advantage as follows

In accordance with customer requirements, correct window Download voice

No need to install any software updates directly and does not require dedicated downloader

Sound quality without any compression and damage to ensure higher sound experience

1, give the module power supply, plug in our cell phone charger line, called MicroUSB cable.

The computer will pop up the following interface, and then into electricity

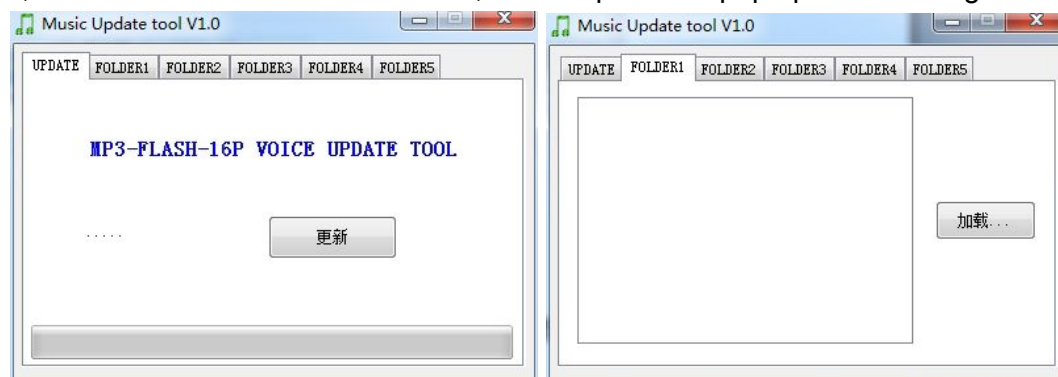
Brain 360 software, or anti-virus software off, or following pop-up window after inserting USB option allows the program to run:



2, the computer will pop up the following interface



1, double-click the left mouse button, the computer will pop up the following interface (1)



- (1)
- (2)

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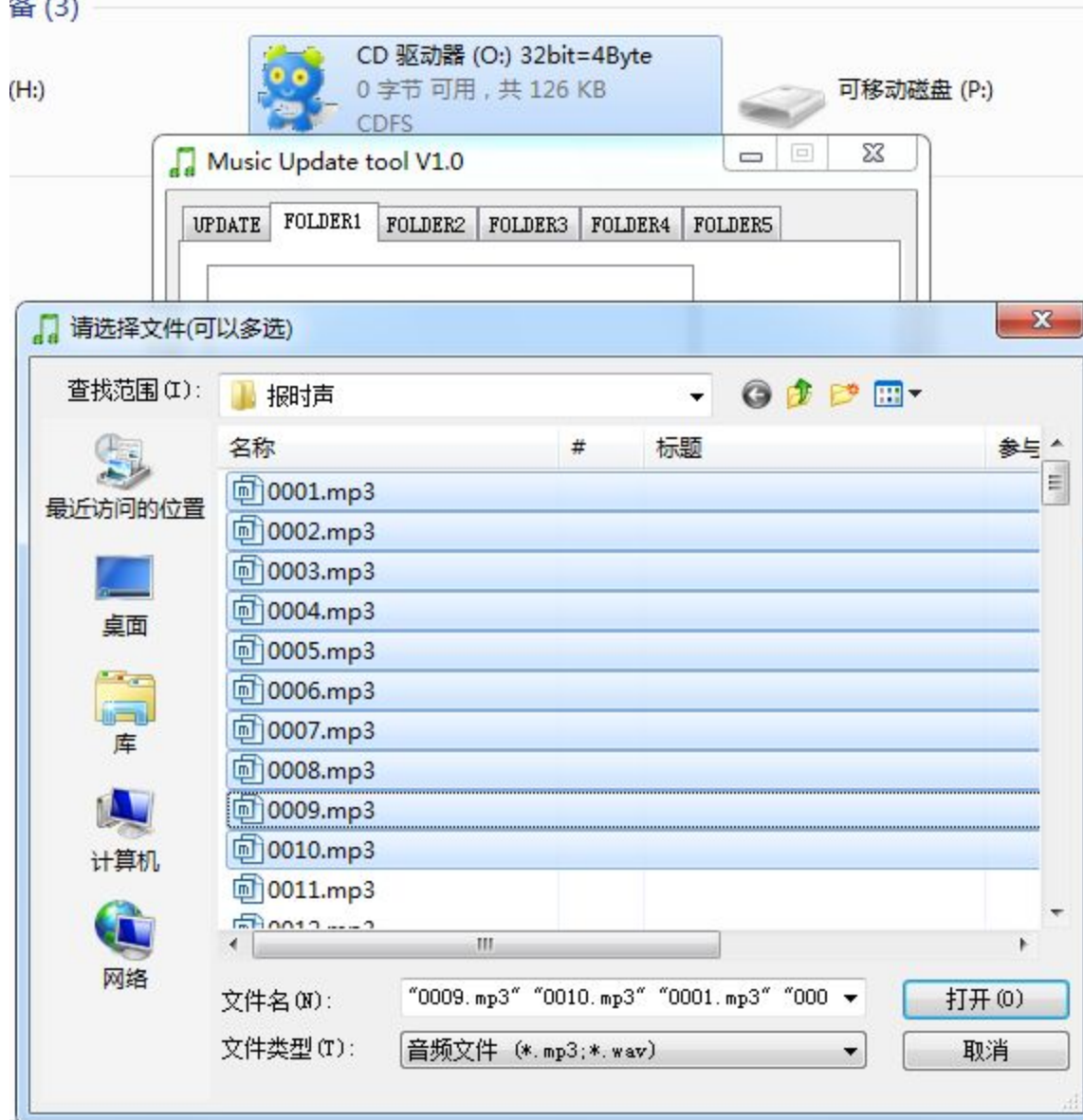
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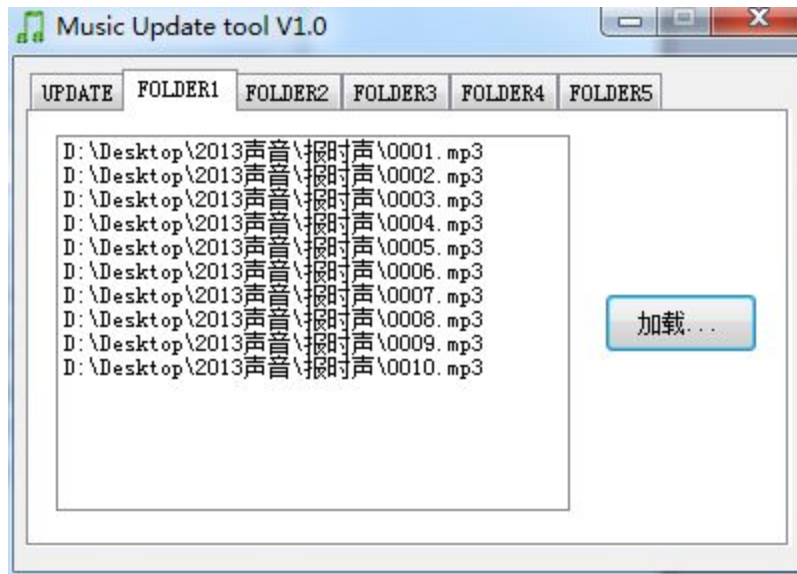
2, select "FOLDER1" folder, as shown above (2) and click load, it will pop up a window to load voice, as shown below

备 (3)

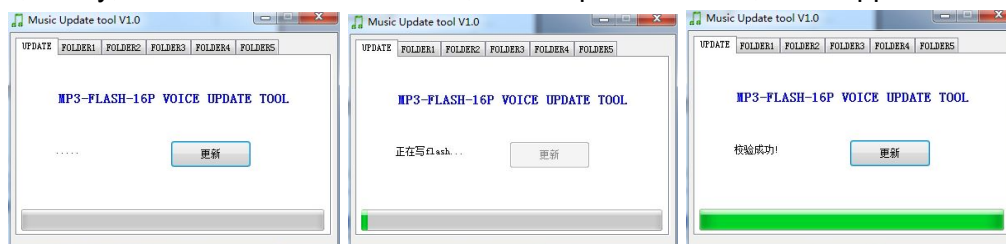


Click the mouse button to drag on, or by pressing Ctrl key keyboard, one by one, select the sound file

3, this time to load the selected voice, click "Open" to add the software.



4, finally, back to "UPDATE" screen, click "Update" button, it will appear the following interface



5,

From left to right, three windows, a window represents the last update is completed, the direct close this window, you can unplug the USB cable

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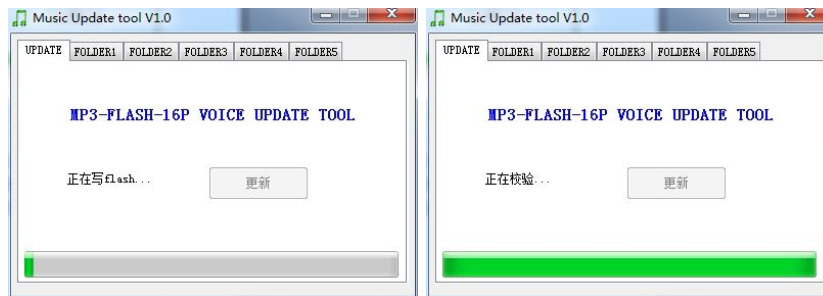
twenty one

5, now we've tested SPIFLASH including Winbond, GD, Macronix largest markets FLASH. So the FLASH

Compatibility problems do not exist. We tested FLASH. A maximum of 16M bytes [W25Q128], are no problem.

6, since the update we update the progress bar window supports a maximum 8M bytes, so the use of 16M bytes of FLASH, will be out

Now following interface, the user need not worry about friends, this is normal



While the progress bar has not changed, but still in more new

7 update:

(1), we update the window reserved for the five regional update, named FOLDER1 -. FOLDER5 This version supports 5

Specifies whether the player operating area

(2), FOLDER1 - FOLDER5 these five regions did not allocate space, it is scalable. For example, I just use FOLDER1,

Do not use the other four files area, and that this region will account for 4 file space? It will occupy less than 10 bytes, and can be ignored.

(3) each FOLDER area supports up to 255 segments voice [in space permits]. The size of the individual voice is not required

of. Currently FLASH maximum support 128Mbit. That is 16M bytes of voice storage, enough to satisfy most applications

(4), if the sound quality less demanding users, they can use their own voice compression software, MP3 or WAV files compressed to

Reduce file storage space occupied. In order to reflect the high quality of our products, so use is not recommended

(5), USB update voice of time, is determined according to the size of the voice file, the voice, the slower the update.

(6) Once the updated voice, a previously saved voice will be deleted.

7, notes:

(1), our modules do not need to install any software, pop into the computer software is actually burned to SPIFLASH. Accounting 200kb empty between. Very small, so the user can simply ignore.

(2) If users need to put their own SPIFLASH. Please contact our technical support for an updated firmware.

(3), if the computer for the first time to use our module, just into the computer, it will take some time, because the computer will automatically

Enumeration of my module to determine the identity, etc. operations. It may take about 1 minute, until the update window pops up.

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twenty two

4.5 Description FLASH users blank

Users in the debugging process, will follow their own needs to replace the size of the flash to meet their own needs, which will require the following three

Steps to complete the replacement of FLASH.

Ask us for updated firmware FLASH of

Via USB interface firmware FLASH blank burn

Unplug the USB cable, and then power can be used normally

1, we firmware into four parts, to explain in detail below

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				

FLASH users according to their size, to select the updated firmware. The firmware is the same size.

Actually right by "double-clicking this file programming module firmware .bat" This batch calls "ISDDown.exe" software

"32bit = 4Byte.iso.iso" image file is written in FLASH. This is an open source tool, interested can access information on their own,

To understand the whole process.

2, then into the computer via USB, click "mydown.bat", the following window will pop up

```
D:\Desktop\桌面\KT403A语音资料\固件更新\固件更新\QYMUSB1FS_2M>isodown -file g
ome.iso

欢迎使用景新浩Autorun工具!

找到设备:G !
正在擦除Flash..._
```

3. After the update is complete, it will appear the following interface:

```
D:\Desktop\桌面\KT403A语音资料\固件更新\固件更新\QYMU
ome.iso

欢迎使用景新浩Autorun工具!

找到设备:G ?
正在擦除Flash...OK!
正在写入Flash...
100.00%
写入成功!
正在校验...OK!

D:\Desktop\桌面\KT403A语音资料\固件更新\固件更新\QYMU
请按任意键继续. . .
```

4. After the update is complete, you can see the computer has been out of a virtual "CDROM", this would explain a success.

NOTE: If during the update process, any exceptions, are not normal, you can replace FLASH to determine the problem.

```

/*****
- 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);
}

```

2, function calls:

u8 UartDatCnt; // combination of parameters length, user specified data length

u8 PDatBuf [12]; // Define data buffer

void DatChangeToBuf (u8 len) // Here is a simple test assignment, the user voluntarily rewrite the code

```

{
    static u8 i = 0;
    UartDatCnt = len;
    for (i = 0; i <len; i++)
    {
        PDatBuf [i] = i + 1;
    }
}

```

```
}  
}
```

```
Uart_SendDat (0x21, 0, PDatBuf, UartDatCnt); // send data packets combination play
```

3, the effect of actually transmitted data



Actual data:

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

Note: There are no clear place, you can contact us. provide technical support

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twenty four

4.7 Module Hardware Description

Module power supply

LED module

3.5 Audio Interface

1, the power supply module

Modules ideal operating voltage 4.2V. So if the user is using a 5V power supply, the proposed series with a diode

2, the module LEDs

Download Mode

Play Voice

time out

Sleeping

status

Flash

Slow flash

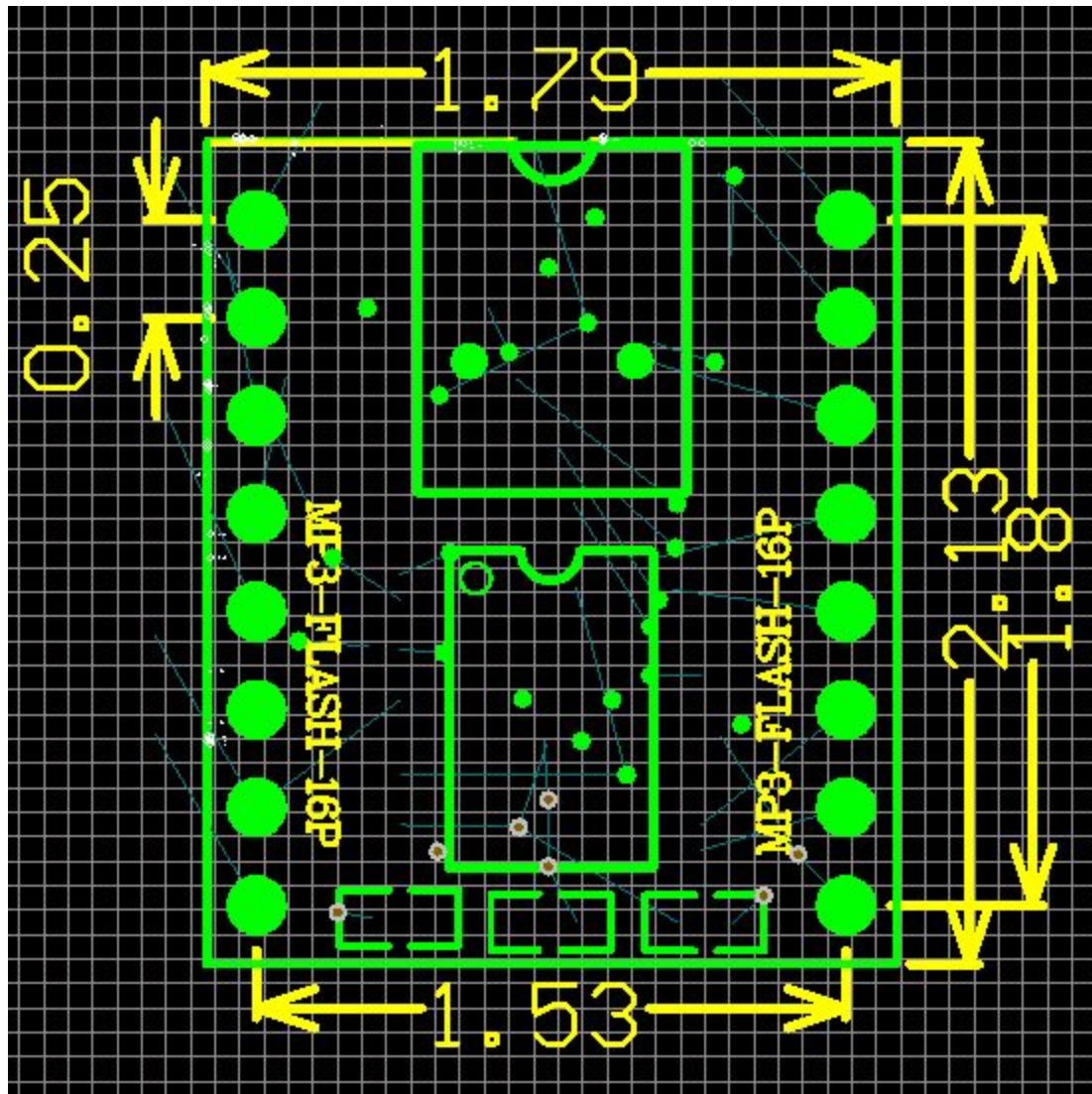
Steady

Destroy

3, 3.5 audio interface

This interface is for users to plug in their own headphones to listen to the voice, and can only support the headset, you can not connect the jumper out of the horn

4.8 Module Size



Dimensions cm above

Mm are not marked as a unit, as 2.54mm pin spacing

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5. Notes

Using the module, the key place to do the following explanation:

The module features GPIO

Precautions Application

Serial programming part of Note

5.1 GPIO features

IO Input characteristics

symbol

parameter

Least

typical

maximum

unit

Test Conditions

V

IL

Low-Level Input

Voltage

-0.3

-

$0.3 * VDD$

V

$VDD = 3.3V$

V

I_H

High-Level Input

Voltage

$0.7VDD$

D

-

$VDD + 0.3$

V

$VDD = 3.3V$

IO output characteristics

symbol

parameter

Least

typical

maximum

unit

Test Conditions

V

OL

Low-Level Output

Voltage

-

-

0.33

V

VDD = 3.3V
V
OH
High-Level Output
Voltage
2.7
-
-
V
VDD = 3.3V

5.2 application note points

1, the external interface module are 3.3V TTL level, so in the design of hardware circuit, please note the level of conversion.

Also in strong interference environment, note that some protective measures electromagnetic compatibility, GPIO optocoupler isolation, increase TVS etc.

2, ADKEY key value in accordance with the general use of the environment, if the strong inductive or capacitive loads environment, please note module

The power supply is recommended to use a separate isolated power supply, in addition to bead and inductor filter matched to the power supply, we must as far as possible to ensure transmission

The stability of the power supply and clean. If you really can not guarantee, please contact us to reduce the number of keys, redefine wider voltage divider

Feature.

Serial communication, in general, use of the environment, pay attention to the good level conversion can be. If strong interference environment, or long distance RS485

Application, then please pay attention to isolation signal to exacting standards of industrial design communication circuit. You can contact us, we provide design reference

We support a minimum sample rate of the audio file is 8KHZ. That is lower than 8KHZ audio file is not supported, you can not

Normal decode and play. Users can use audio processing software, increasing the sampling rate of the audio file to solve this problem.

Module current in the sleep state is about 10MA, playback, based on the size of the volume, the peak current can reach 1A. Power

It will be relatively large. If you use low-power applications, see the user control the power supply module or chip. This can reduce the chip's power consumption

If the user directly using our own amplifier module, you can select the appropriate speaker. Recommended use 4 ohm / 3W. This one

It is to use the best configuration. Choose other speakers, please note the load size, and the power of these two parameters

The module module supports MP3, WAV two kinds of mainstream audio formats.

8, our module supports 8 / 11.025 / 12/16 / 22.05 / 24/32 / 44.1 / 48KHZ sampling rate of an audio file, these are network

The parameters on the vast majority of audio files. If the sample rate of the audio files the user is not in this range, it is not support play, but

What can be converted to dedicated software. Our advantage is high quality playback and non-destructive, so he did not recommend that users of sound

Frequency compression.

5.3 serial operation

Serial section operation, see the following processes, we provide a complete reference routines, for reference:

1. Serial operational processes
2. The serial programming instructions reference

Note 3. Serial operation requires delay

5.3.1 Serial operating procedures

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1, the operation of the serial portion of all modules provided by our company, are the same agreement, so do not worry is not compatible with the different modules

2, if the operation of the serial port, there are any do not understand, be sure to contact us for serial programming reference routine.

3, updating our products, also will be in accordance with the current version of the protocol, so backwards compatibility.

5.3.2 serial programming instructions reference

Currently we offer serial programming reference code, there are two parts, the first part of our beta test code, phase

Off serial operation is more comprehensive, and the other is the basic version, just specify paradigm track. Please be patient digest user

5.3.3 Serial Programming delay the need for appropriate attention to points

1, and the module power, probably less than 500ms need time for the beginning of flower-related operations after initialization is completed,

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

2, when the designated device playback, a 200ms delay time, and then send the specified track, etc. related directives.

3, due SPIFLASH itself can store very limited repertoire, unlike the TF card or U disk. The designated file playback, to voice open

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The delay between the beginning of play, is negligible.

Important 5.3.4 check

1, fight for many users not in the habit of communication check, we launched a special compatibility mode with parity and without verification. For example Bright. If we send a combination of playing instructions are as follows:

Combination play [without parity]

7E FF 09 21 00 05 01 02 03 04 EF

Play 5,1,2,3,4

Combination play [with parity]

7E FF 09 21 00 05 01 02 03 04 FE C8 EF Play 5,1,2,3,4

The differences between two instructions is 2 bytes omit the check. Both frame data can be received by the chip.

2, because many users use the process, many of which are using the MCU without crystal. In this case, we have to recommend that you add

On checking in this way, to ensure the stability of communication.

3, if the user or STC STM32, etc. MCU, and is plug-in crystal, it can be appropriate to dispense with parity. because

MCU without the crystal, the clock is relatively less accurate, so there will be errors serial port, once the error is too large, will lead to a communication error.

Please users friends discretion.

6. Disclaimer

Development Preliminaries

QY series will provide the fullest possible development of templates, driver and application documentation for ease of use but also needs

Users familiar with their design of products used by the hardware platform and the related knowledge of C language

EMI and EMC

QY series module mechanical structure determines its performance will inevitably vary EMI and integration circuit design. EMI QY series modules can

To meet the vast majority of applications, the user any special requirements, you must first consult with us.

EMC performance and user-floor design QY Series modules are closely related, in particular, the power supply circuit, I / O isolation, reset circuit, with

Households in the design of the floor must fully consider the above factors. We will strive to improve QY series module electromagnetic compatibility characteristics, but not with

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Household final EMC performance applications to provide any guarantees.

Modify the powers of the document

The Company will retain any time for product-related documentation modifications without prior notice Power

ESD protection Electrostatic discharge point

QY series some components built-in ESD protection circuit, but the use of harsh environment applications, still recommends that users in the design of the floor

Providing ESD protection measures, particularly with an IO power supply design, in order to ensure the stable operation, installation QY series of products to ensure

Safety first will accumulate in the body of electrostatic discharge, such as wearing a properly grounded wrist strap, touch the earth's water pipe access

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Version History

version

date

the reason

V1.0

2013/09/18 beta version

V1.1

2013/12/10 officially released version

V1.2

2014/02/18

1, an increase in the specified folder and file addresses playback [File Partition Manager]

2, increase the variety of modes selectable buttons

3, increase the specified folder loop

4, for more system parameters

5, increase the detail of the document