BY8001-16P music module, microcontroller serial control, TF / SD card, MP3 sound module chip

BY8001-16P is a compact new high-quality MP3 module card.
Using BY8001-SSOP24 MP3 main chip, support MP3, WAV format double decoding.
Module built TF deck, the card can be replaced voice content;
U can also be an external disk or USB data cable to connect the computer to replace the TF content.
The built-in 3W amplifier module can directly drive 3W.

Features:

Supports MP3, WAV audio formats with high quality, beautiful sound.

24 DAC output, support dynamic range 90dB, SNR support 85dB.

Supports 15 voice one segment to trigger playback, 3 IO port select eight kinds of hardware trigger wider application.

Supports asynchronous serial UART control: Support play, pause, and down song, volume addition and subtraction, playing selections, advertising spots and so on.

Built-in volume, track, EQ down memory function.

Configuration TF (Micro SD) card connector, the card can replace voice content, maximum support 32G memory card.

Read U disk support, maximum support 32G; can use USB data cable to directly replace the contents inside the TF content

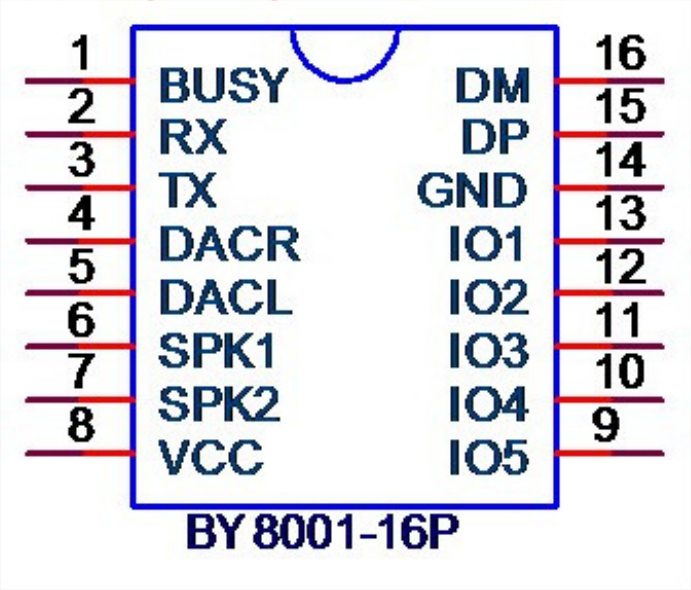
Comes with 3W amplifier, external speakers directly to complete player; customers can also add a single, dual-channel amplifier.

Standard 2.54mm pin spacing DIP16 package, compact appearance

Technical Specifications:

name	Parameters
MP3, WAV file format	Supports sampling rates 8 ~ 48K, 8 ~ 320Kbps bit rate audio files
UART interface	Standard serial port, 3.3V TTL level, baud rate 9600
Input voltage	3.6V-5V (recommended 4.2V)
Quiescent Current	16MA (entire module)
Amplifier power	connect 3W / 4Ω or 2W / 8Ω speaker
size	22mm*21mm
Working temperature	-40℃~70℃
Humidity	5%~95%

Module pin map:



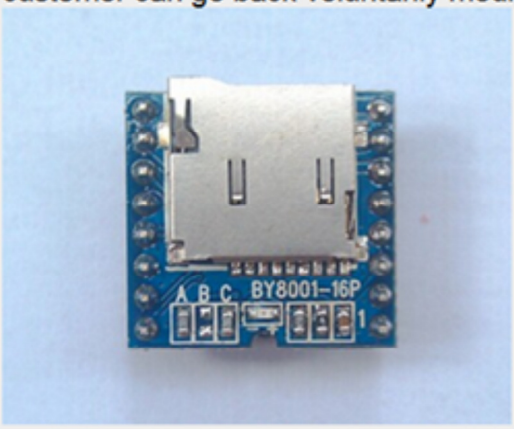
Pin Number	Pin Name	Functional Description	Remark
1	BUSY	when paly Output high level , stop for low level	busy signal
2	RX	UART asynchronous serial data input	3.3V TTL level
3	TX	UART asynchronous serial data output	3.3V TTL level
4	DACR	DAC right channel output	can connect An external amplifier, headphones
5	DACL	DAC left channel output	can connect An external amplifier, headphones
6	SPK1	External mono speaker	can connect 3W / 4Ω or 2W / 8Ω Passive Speaker
7	SPK2	External mono speaker	can connect 3W / 4Ω or 2W / 8Ω Passive Speaker
8	VCC	The positive power supply	3.6-5V
9	IO5	Trigger input port 5	Ground trigger
10	IO4	Trigger input port 4	Ground trigger
11	IO3	Trigger input port 3	Ground trigger
12	IO2	Trigger input port 2	Ground trigger
13	IO1	Trigger input port 1	Ground trigger
14	GND	Negative power supply	Systematically
15	DP	USB data cable	Read U disk or connected to the computer with a USB cable to replace the TF card contents
16	DM	USB data cable	

IO mouth trigger button Description:

This module has five trigger IO ports, supports up to 15 segments one trigger button to play.

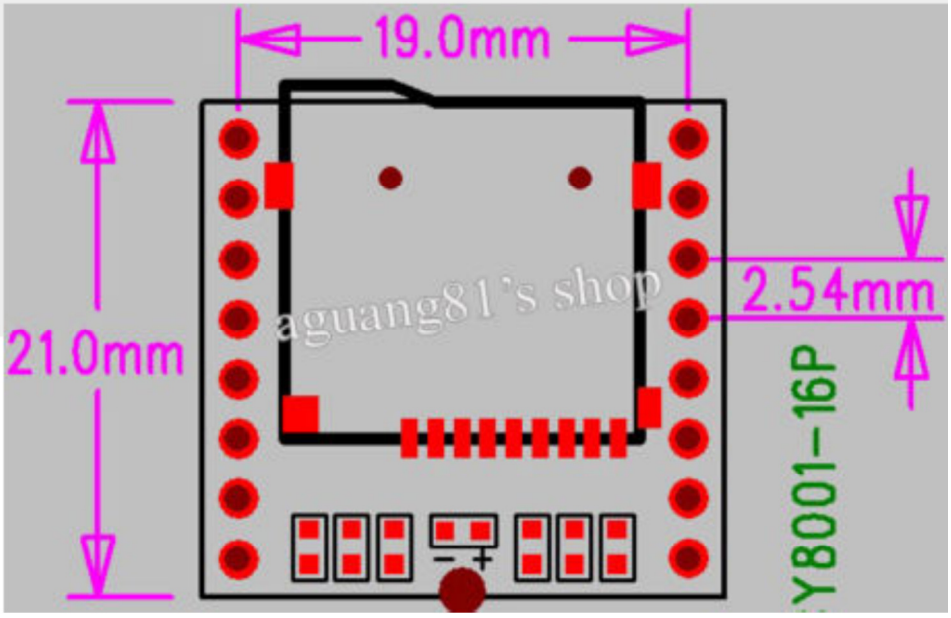
By three IO ports through 3.3K resistor to ground or not connected to eight kinds of control mode selection for a variety of applications.

Resistor settings control mode in front of the module, marked with ABC character defaults module 010, the customer can go back voluntarily modify:



15 paragraph one key applications:

IO1 to the ground: one to play one song
IO2 to the ground: one to play two song
IO3 to the ground: one to play three song
IO4 to the ground: one to play four song
IO5 to the ground: one to play five song
IO1- IO2: one to play six song
IO1- IO3: one to play seven song
IO1- IO4: one to play eight song
IO1- IO5: one to play nine song
IO2- IO3: one to play ten song
IO2- IO4: one to play eleven song
IO2- IO5: one to play twelve song
IO3- IO4: one to play thirteen song
IO3- IO5: one to play fourteen song
IO4- IO5: one to play fifteen song



IO port selection control mode application (3.3K connect ground for 0, suspended for 1):

IOA IOB IOC one to one trigger function (pressed keys have effective , without release)

0 0 0 keys ground, trigger play one time to stop; long time exceed the current song, looping, stop in the middle lift finished playing.

0 0 1 keys ground, ON / OFF function. Click the play, during playback, the trigger again to stop, and then trigger the stop state is played from the beginning, once you finish playing the current song stops.

0 1 0 keys ground, click on the ring, ring in the process, the press will be interrupted, and then re-start playing, once you stop playing completely.

0 1 1 keys ground, click on the ring, in the course of the press can not be interrupted by a loud, loud until finished up, then finished only valid response

1 0 0 level remains trigger button has been pressing play, lift the stop button (not available in this mode for serial control)

1 0 1 trigger level to maintain circulation, has been pressing the button loop, lift the stop button (not for serial control in this mode)

1 1 0 standard MP3 mode

IO1 Play / Pause / long press 2 seconds to stop the current song

IO2 Next / Volume +

IO3 Prev / Volume -

IO4 Volume +

IO5 Volume -

1 1 1 specific application features

IO1 PLAY key, key ground, triggering stop playing it again; when a long time over the current song, loop, stopping in the middle lift finished playing

IO2 Next / Volume + (long press)

IO3 Prev / Volume - (long press)

IO4 PLAY key, press to play the current song during playback, then will break, and then re-start playback of the current song finishes playing time will stop

IO5 Press Shuffle to play all the songs, then stopped.

8.1 Instruction List

Communications Control Instructions (otherwise a plug-FLASH voice module BY8301-16 P companies)

CMD	Comments	The corresponding function	Parameters
0x01	Broadcast	No	
0x02	Time out	No	
0x03	Under a	No	
0x04	On a	No	
0x05	Volume increases	No	
0x06	Volume reduction	No	
0x07	Standby / normal operation	No, enters standby current 10MA	
0x09	Reset	No	
0x0A	Forward	No	
0x0B	Rewind	No	
0x0E	Stop	No	
0x31	Set Volume	0-30 adjustable (down memory)	
0x32	Setting EQ	0-5 (NO \ POP \ ROCK \ JAZZ \ CLASSIC \ BASS) (Power-down record Yi)	
0x33	Set loop mode	0-4 (Full / folder / track / random / no cycle)	
0x34	Folder Switching	0 (a folder), 1 (next folder)	
0x35	Switching equipment	0 (U disk), 1 (SD)	
0x41	Select Play Track	1-65536 first (down memory)	
0x42	Specify the folder track play	High eight for the folder number (00-99), eight low for the song name (001-255)	
0x43	Spots feature	1-65536	
0x44	Spots inside the specified folder of song	High eight for the folder number (00-99), eight low for the song name (001-255)	
	Combination play	Continuous transmission of different tracks will aired stop, up to 10 segments	

Communication query

CMD	Comments	The corresponding function	Return parameter
0x 10	Discover Playback status	0 (stop) 1 (Play) 2 (Pause) 3 (fast forward) 4 (rewind)	
0x 11	Query volume	0-30 (down memory)	
0x 12	Query the current EQ	0-5 (NO \ POP \ ROCK \ JAZZ \ CLASSIC \ BASS (down memory)	
0x 13	Discover the current playback mode	0-4 (Full / folder / track / random / no cycle)	
0x 14	Query version number	1.0	
0x 15	The total number of queries SD card fil	1-65535	
0x 16	Number of Total Document Access U disk	1-65535	
0x 18	Discover the current play equipment	0 (U disk), 1 (SD)	
0x 19	SD card current track query	1-65536	
0x 1A	U disk current track query	1-65536	
0x 1C	Discover the currently playing song time	In return time (sec)	
0x 1D	Query the current total time playing song	In return time (sec)	
0x 1E	Discover currently playing song song	In return the song name (only return the first two)	

0x 1F **Discover the current playback folder and the overall quantity**

Note: continuous transmission interval 20MS above, the combination of the two command playback within 6MS between the two commands.

8.2. Control instruction Description

8.2.1 Play

Startcode	Length	Opcode	Checksum	End code
7E	03	01	02	EF

Send this directive is to play music, in pause or stop state can start playing.

8.2.2 Pause

Startcode	Length	Opcode	Checksum	End code
7E	03	02	01	EF

Send the command to pause music.

8.2.3 under a

Startcode	Length	Opcode	Checksum	End code
7E	03	03	00	EF

The command can trigger to play the next piece of music, a piece of music while playing the final, sending the command can trigger plays the first piece of music.

8.2.4 on a

Startcode	Length	Opcode	Checksum	End code
7E	03	04	07	EF

The command can trigger to play the next piece of music, when playing the first piece of music, send the command can trigger to play the last piece of music.

8.2.5 volume up

Startcode	Length	Opcode	Checksum	End code
7E	03	05	06	EF

Chip has 30 adjustable volume, send a command to increase the volume level.

8.2.6 volume reduction

Startcode	Length	Opcode	Checksum	End code
7E	03	06	05	EF

Chip has 30 adjustable volume, send a command to reduce the volume level.

8.2.7 Standby / normal operation

Startcode	Length	Opcode	Checksum	End code
7E	03	07	04	EF

Send this instruction chip into sleep low power state in working condition in hibernation wakeup command to be sent again
Chip to work properly.

8.2.8 Reset

Startcode	Length	Opcode	Checksum	End code
7E	03	09	0A	EF

Under normal circumstances do not need to use the command sends the command is reset chips, all parameters reply to factory settings (Tone
The largest, returns to the first, no EQ); particular attention needs to be specified using this function after playback device before you can
Normal operation, after sending a reset command, **two seconds later to send the specified command SD card playback 7E 04 35 01 30 EF**
Followed by additional control command operations.

8.2.9 Fast Forward

Startcode	Length	Opcode	Checksum	End code
7E	03	0A	09	EF

Sends a command to fast forward the music for some time.

8.2.10 rewind

Startcode	Length	Opcode	Checksum	End code
7E	03	0B	08	EF

Sends a command to rewind the music for some time.

8.2.11 Stop

Startcode	Length	Opcode	Checksum	End code
7E	03	0E	0D	EF

Music sends the command in the state to stop play or pause music.

8.2.12 Set the volume

Startcode	Length	Opcode	Volume Level	Checksum	End code
7E	04	31	19	2C	EF

0-30 adjustable volume, real-time modification of the directive can adjust the volume, the volume can be powered down memory paradigm hair
Send volume level to 25.

8.2.13 Setting EQ

Startcode	Length	Opcode	Parameters	Checksum	End code
7E	04	32	00	36	EF

Send this instruction can change EQ.

8.2.14 Set loop mode

Startcode	Length	Opcode	Parameters	Checksum	End code
7E	04	33	02	35	EF

Send this instruction cycle mode can be set, for example to set single cycle mode.

8.2.15 Folder Switching

Startcode	Length	Opcode	Parameters	Checksum	End code
7E	04	34	01	31	EF

Send the command to switch folders to play, sending a folder for the next, 0 on a folder.

8.2.16 Device Switch

Startcode	Length	Opcode	Parameters	Checksum	End code
7E	04	35	01	30	EF

When the system has multiple devices, it can send the command to select the device to be read, the example for the selection of TF card player.

8.2.17 choose to play the tracks

Startcode	Length	Opcode	Tracks High	Tracks Low	Checksum	End code
7E	05	41	00	01	Forty five	EF

Send this instruction may specify in the corresponding storage track is playing, play the first example of a song.

Note: The track is 1-65536

8.2.18 specified folder track play

Startcode	Length	Opcode	Folder No.	Song title	Checksum	End code
7E	05	42	00	02	Forty five	EF

This instruction corresponding to track broadcast specify the corresponding folder within a folder high eight numbers, the lower 8 bits of the song tit

Examples for the specified folder 00 in the first two to play.

Note: **If you want to use this feature, the folder must be named 00-99, songs must be named 001 XXX.MP3 -255 XXX.MP3, Otherwise, an error can not be played.**

8.2.19 spots feature

Startcode	Length	Opcode	Tracks High	Tracks Low	Checksum	End code
7E	05	43	00	03	Forty five	EF

Upon receiving the instruction section, then pause a track, and then to implement this directive specified playback tracks,

When finished playing, then play the original pause tracks.

8.2.19 spots designated folder in the song

Startcode	Length	Opcode	Folder No.	Song title	Checksum	End code
7E	05	44	01	06	46	EF

Upon receiving the instruction section, then pause a track, and then to implement this directive in the specified file

Corresponding to the track is playing, when finished playing, then play the original pause tracks. High eight for the folder number, the lower 8 bits The song title.

Note: **If you want to use this feature, the folder must be named 00-99, songs must be named 001 XXX.MP3 -255 XXX.MP3, Otherwise, an error can not be played.**

8.2.20 combination play

Continuous transmission:

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

Play 1,2,3,4 song aired stop, up to 10 continuous playback. Two command interval is less than 6MS.

8.3. Query command Description

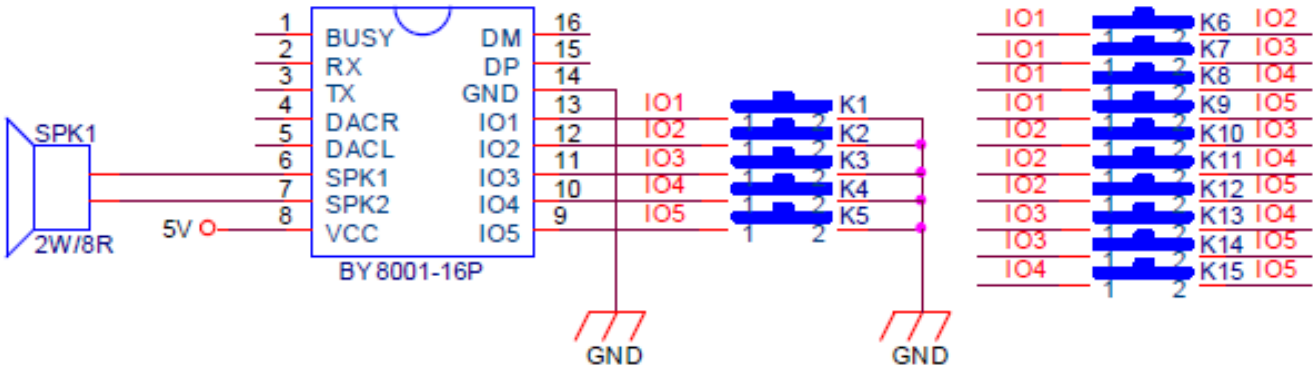
For example: sending a query Player Status command **7E 03 10 13 EF**, return **OK** in the playing state.

After sending the query command returns the corresponding value, not described in detail.

9, application circuit

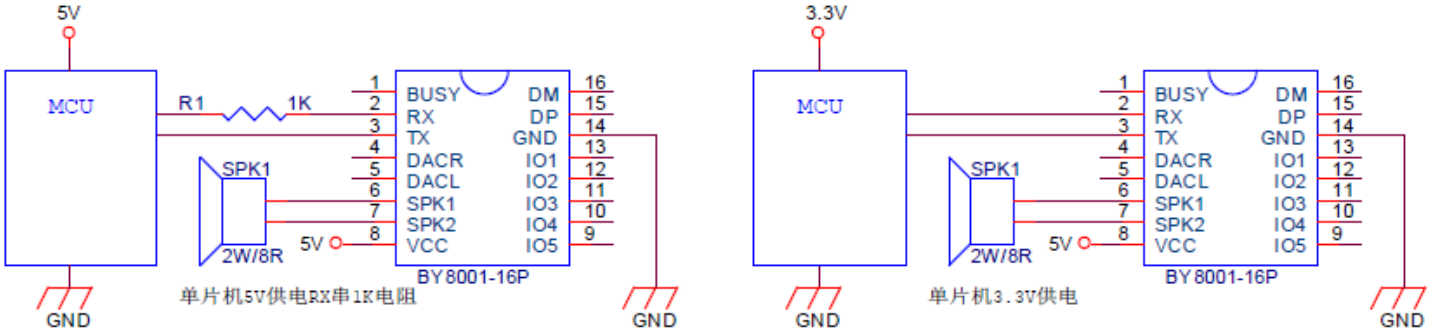
Note that all the main chip IO port voltage is 3.3V, note that the voltage matches other microcontrollers connected!

9.1.15 Road buttons control application circuit K1-K15 correspond to 1-15 Voice



15-way control key has the same switch.

9.2. Application of Serial control circuit



The above is a standard UART asynchronous serial connectivity applications, this application is quite flexible, including play, pause, down song, volume addition and subtraction, playing selections, wide Advertisement spots and so on. Available microcontrollers, computer serial port control 485 can also be controlled by TTL to RS485 adapter plate.

9.3. MCU IO port directly connected to the control application circuit