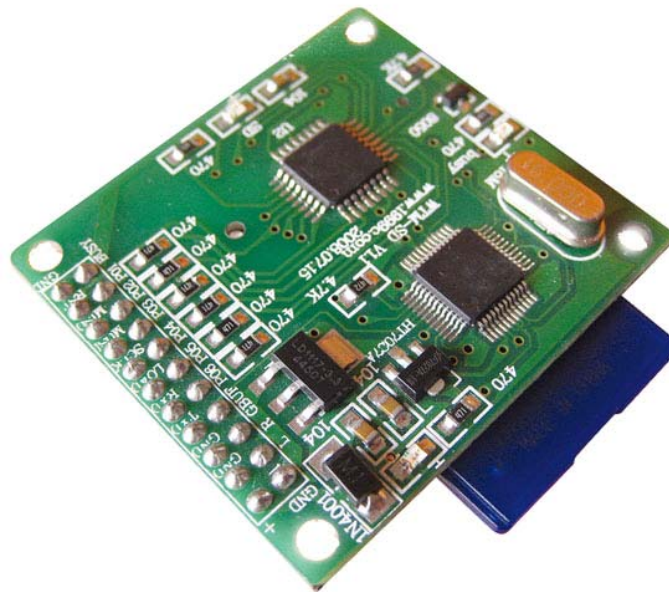# MP3 Module with SD Card
WTM-SD

Manual

Data Sheet

Document Date: Apr. 20th, 2009
Document Revision: V1.1

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1. Features

• Support MP3 format files.

• Support SD card, 2GB max, Therefore, easy to change voice .

• Control modes: Standard mode(mp3 mode), key mode, parallel mode, serial mode

• Support to playback background music and slogans

• Playing any music as you like randomly.

• Widely use in the industry

• Operating voltage: DC5V

• Dimension: 41mm * 39mm

2. PIN DESCRIPTION

GND	22 / 1	DC5V--9V
L	21 / 2	GND
R	20 / 3	GND
GBUF	19 / 4	TXD
P06	18 / 5	RXD
P05	17 / 6	NC
P04	16 / 7	NC
P03	15 / 8	NC
P02	14 / 9	NC
P01	13 / 10	RST
BUSY	12 / 11	GND

No.	Name of pins	Function descriptions
1	DC5V	Direct current power 5V (input)
2	GND	Power ground
3	GND	Audio ground
4	TXD	Transmitting end of serial interface
5	RXD	Receiving end of serial interface
6	NC	Blank
7	NC	Blank
8	NC	Blank
9	NC	Blank
10	RST	Reset pin
11	GND	Power Ground
12	BUSY	Busy signal
13	P01	I/O
14	P02	I/O
15	P03	I/O
16	P04	I/O
17	P05	I/O
18	P06	I/O
19	GBUF*	Ground buffer
20	R	R-channel
21	L	L-channel
22	GND	Date ground

3. Operation

3.1. MP3 mode

MP3 mode, In the normal state, I/O P01~P06 is high level, keep negative pulse 10 ms, as follows:

I/O	P01	P02	P03	P04	P05	P06
FUNCTION	Play / Pause	Up	Down	Vol-	Vol+	Stop

Note: The mp3 files must be named orderly 000.mp3 , 001.mp3, 002.mp3, 003.mp3 ………

3.2. Key mode

Each I/O with one song, all of them is negative pulse. Keep negative pulse 10 ms. At the same time, WTM-SD module can recognize 6 songs only, and renamed as " 001.mp3….006.mp3". The song only plays one time. As follows:

I/O	P01	P02	P03	P04	P05	P06
FUNCTION	001.mp3	002.mp3	003.mp3	004.mp3	005.mp3	006.mp3

3.3. Parallel interface mode

The input interfaces are compose of P02~P06. BST is trigger pin.

I/O	P01	P02	P03	P04	P05	P06
FUNCTION	SBT	A01	A02	A03	A03	A04

In this mode, trigger 32 songs MAX. As follows

Song	Address Pin				
	A4	A3	A2	A1	A0
Play song of add 0	0	0	0	0	0
Play song of add 1	0	0	0	0	1
Play song of add 2	0	0	0	1	0
…………	……..	……..	……..	……..	……..
Play song of add 29	1	1	1	0	1
Play song of add 30	1	1	1	1	0
Play song of add 31	1	1	1	1	1

Control timing diagram

Firstly, set the address of I/O from P02~P06. Then, trigger SBT to playback the voice. SBT is cathode-pulse, as follows:
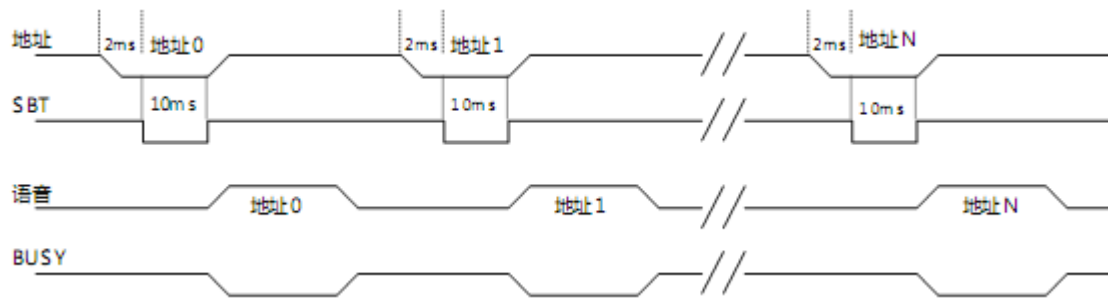
In the process of trigger, can transmit SBT to playback voice after transmit address be transmit 2ms. SBT trigger keep10ms.

3.4. Serial interface mode

On the basis of standard RS232 serial communication timing, baud rate 9600, made the following communication protocol. Its data include start code, data length, data bit, end code.
Data format:

Start code	Data length	Operating code	Folder name(ten digit)	Folder name(unit digit)	Song (hundreds digit)	Song name (tens digit)	Song name (unit digit)	End code
7E	07	XX	XX	XX	XX	XX	XX	7E

Start code: 7E

DATA LENGTH：Include all bytes except start code and end code .Include DATA LENGTH bytes
Operating code:

Descriptions	Operating code	Data
Play advertisement (Replay)	A0H	xx xx xx xx xx
Pause advertisement	A1H	None
Play advertisement from pause	A2H	None
Stop play ads	A3H	None
Adjustable Volume	A4H	0—8 (0-8 levels volume)
Play background	B0H	xx xx xx xx xx
Pause background	B1H	None
Play background from pause	B2H	None
Stop play background	B3H	None

Operating code total 9 operate code, A0、A4、B0 with data bit follow, others only send operating code are ok.

Ten digit, unit digit of Folder

Folder names must be "advert01".   And have to change digital into ASCII value. Take folder advert01 for example:

Ten digit is "0" , so ASCII code is "30H"

Unit digit is "1" , so ASCII code is "31H"

Hundreds digit, ten digit, unit digit of song

In folder advert01, file 682.mp3

Hundreds digit is "6", so ASCII code is "36H"

Ten digit is "8" , so ASCII code is "38H"

Unit digit is "2" , so ASCII code is "32H"

End code: 7E

Must use 7E as end code after sending each code every time.

FOR EXAMPLE:

Play 002.mp3 in advert01, Access to play slogans, so send the following 9 bytes data:

Start code	Data length	Operating code	Folder name(ten digit)	Folder name(unit digit)	Song (hundreds digit)	Song name (tens digit)	Song name (unit digit)	End code
7E	07	A0	30	31	30	30	32	7E

Play 032.mp3 in advert01, Access to play background music, so send the following 9 bytes data:

Start code	Data length	Background operating code	Folder name(ten digit)	Folder name(unit digit)	Song (hundreds digit)	Song name (tens digit)	Song name (unit digit)	End code
7E	07	B0	30	32	30	33	32	7E

When the background music is playing, insert 009.mp3 file into folder advert01 as slogans. As follows. After the slogans played over, the background music will replay from the pause.

Start code	Data length	Background operating code	Folder name(ten digit)	Folder name(unit digit)	Song (hundreds digit)	Song name (tens digit)	Song name (unit digit)	End code
7E	07	A0	30	31	30	30	39	7E

Send the following data to pause the playing slogan:

Start code	Data length	Pause to play slogans	End code

7E	02	A1	7E

Send the following data to replay from the pause:

Start code	Data length	Replay slogans	End code
7E	02	A2	7E

Send the following data to stop playing voice:

Start code	Data length	Stop playing slogans	End code
7E	02	A3	7E

Volume regulation, from 00H to 08H, 8 levels volume,00H is mute, 08H is highest.
Operating data of level 8:

Start code	Data length	Volume regulation	Volume	End code
7E	03	A4	08	7E

Operating data of level 2:

Start code	Data length	Volume regulation	Volume	End code
7E	03	A4	02	7E

4. Files in SD card

Folder must be renamed as "advert01". All of voice must be put into this folder.
Files name in folder must be 000.mp3, 001.mp3 ,002.mp3 ,003.mp3 ,....999.mp3
Note: In serial interface mode, can identify "advert01" , "advert02"…."advert99"

5. How to choose modes

If choose Standard mode (mp3 mode) or key mode or parallel mode , we can project a new ".txt" file in advert01 folder, then open it and write 1 or 2 or 3 (1 means standard mode(mp3 mode), 2 means key mode, 3 means parallel mode) . Next, save and exit.   Finally, rename this file as "cof.mp3"

Digit	Control modes
1	mp3 mode
2	key mode
3	parallel mode

Please notice: that the serial mode can exsit with any other mode at the same time.

6. How to use of background music and slogans
WTM-SD module can play background music and slogans by serial interface mode only.

when the background music is playing, you can squeeze slogans surprised, music will go on to play after playing over the slogans.

For example:
Transmitting the command of background music. Such as we need to play a file folder advert03 following 007.mp3:

7E	07	A0	30	33	30	30	37	7E

At this time the background music starts playing. If you would like to pinch 015.mp3 file (slogans) of folder advert04, do as the follows:
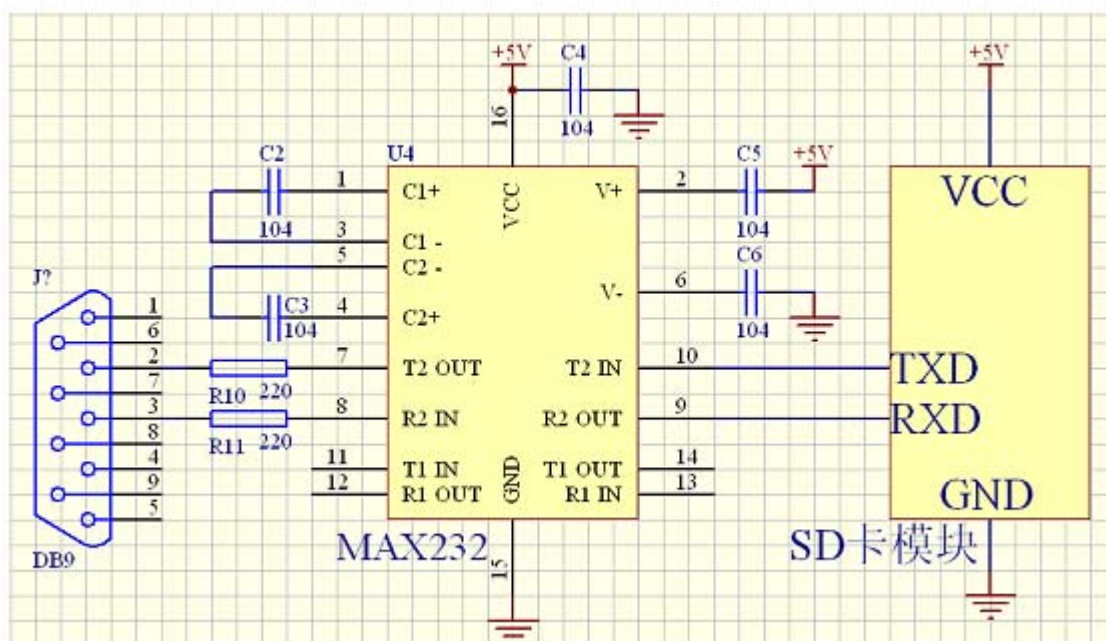
7E	07	B0	30	34	30	31	35	7E

After playing over slogans, WTM-SD go ahead playing background music from the breakpoint.

7. Testing application circuit

This is serial interface mode circuit for debugging, the application circuit is as follows:


RS232 directly connected to the computer's RS232 port, send commands to SD card module by serial port debugging software, to test WTM-SD module. Output of R, L can be used for the input of amplifier.
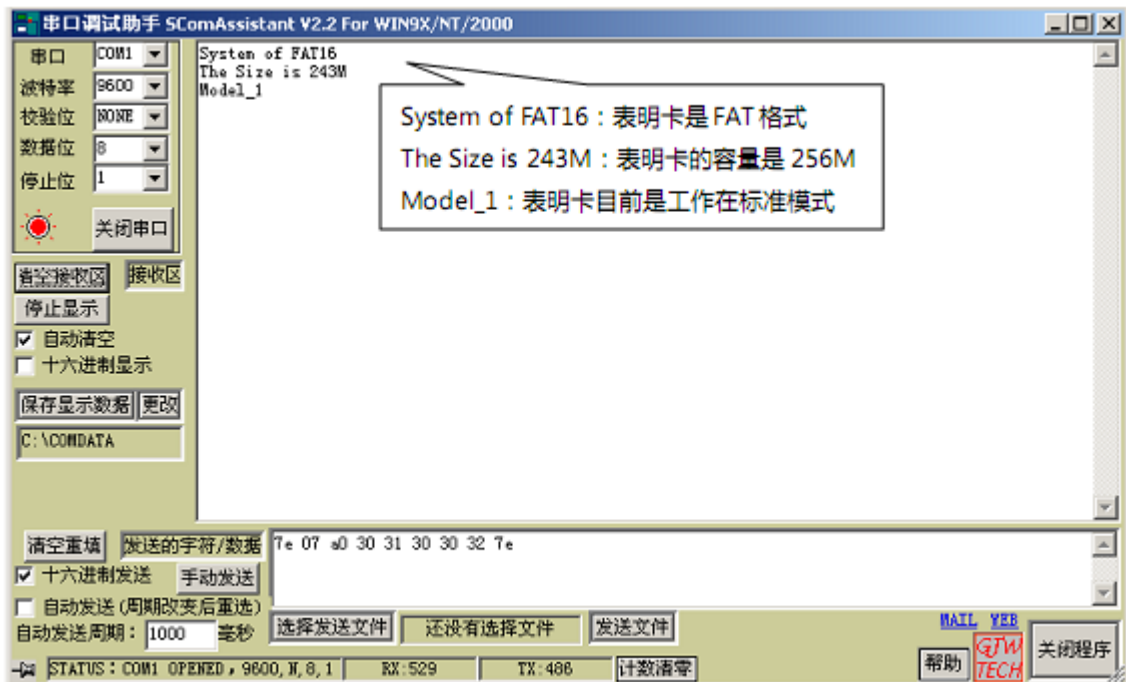
8. Serial debug

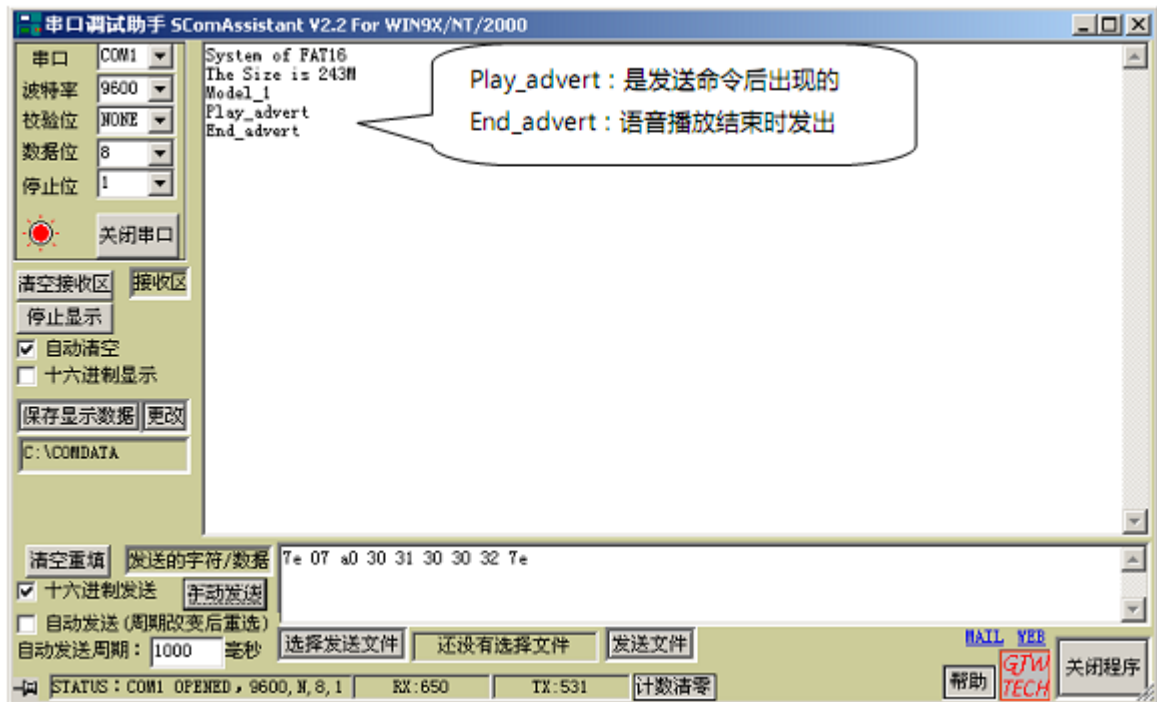You can use general software to complete serial debug. Now, take SComAssistant as a example.

Connect computer with MAX232 chip by RS232 cable, then open the software, and set the data as follows.
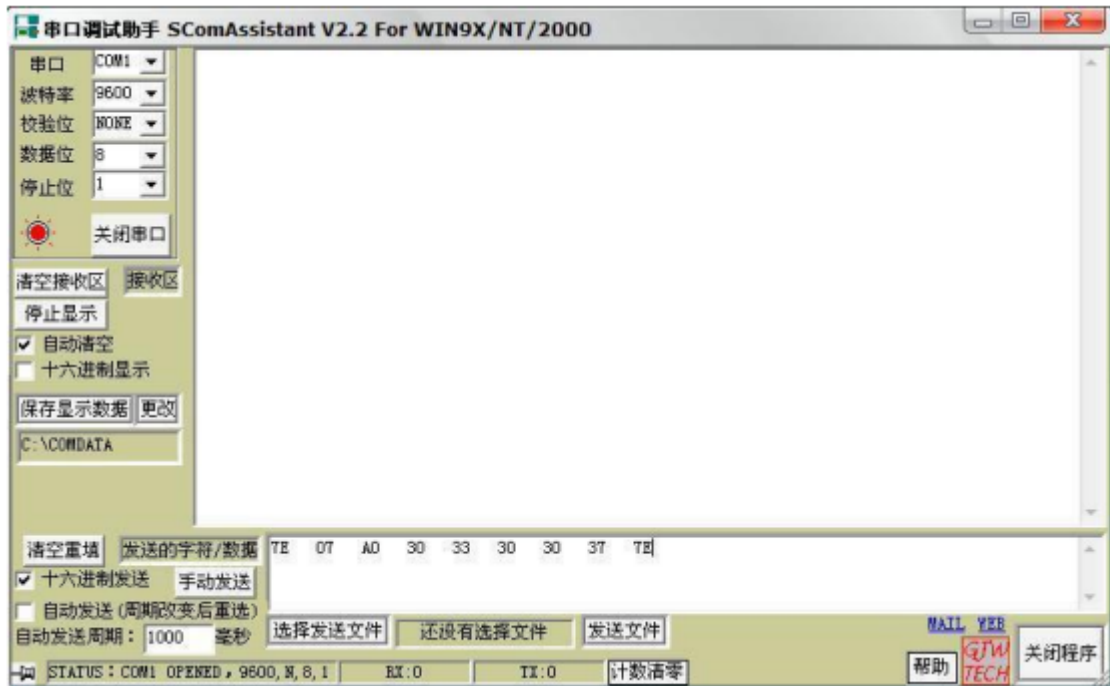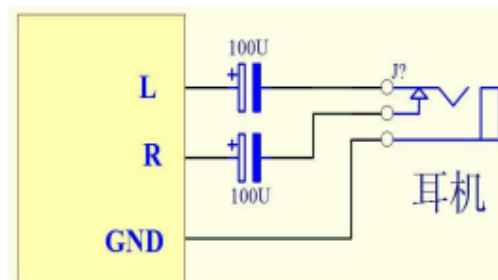

When the hardware is correctly, please plug in power for MAX232 and WTM-SD, serial port software will automatically detect hardware, pop up the following tips:
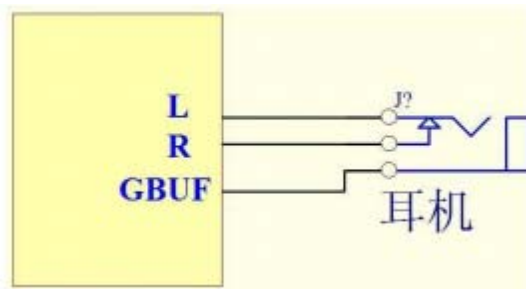
9. Audio output shows

Track L, R output, GND connect to headphone, need to tandem connect with a 100uF capacitance.

Track L, R output, GBUF connect to headphone, connection as follows:

L, R external amplifier output, recommended only GND, should not GBUF output.

Directly connect to amplifier
Directly connect to amplifier

connect to amplifier ground