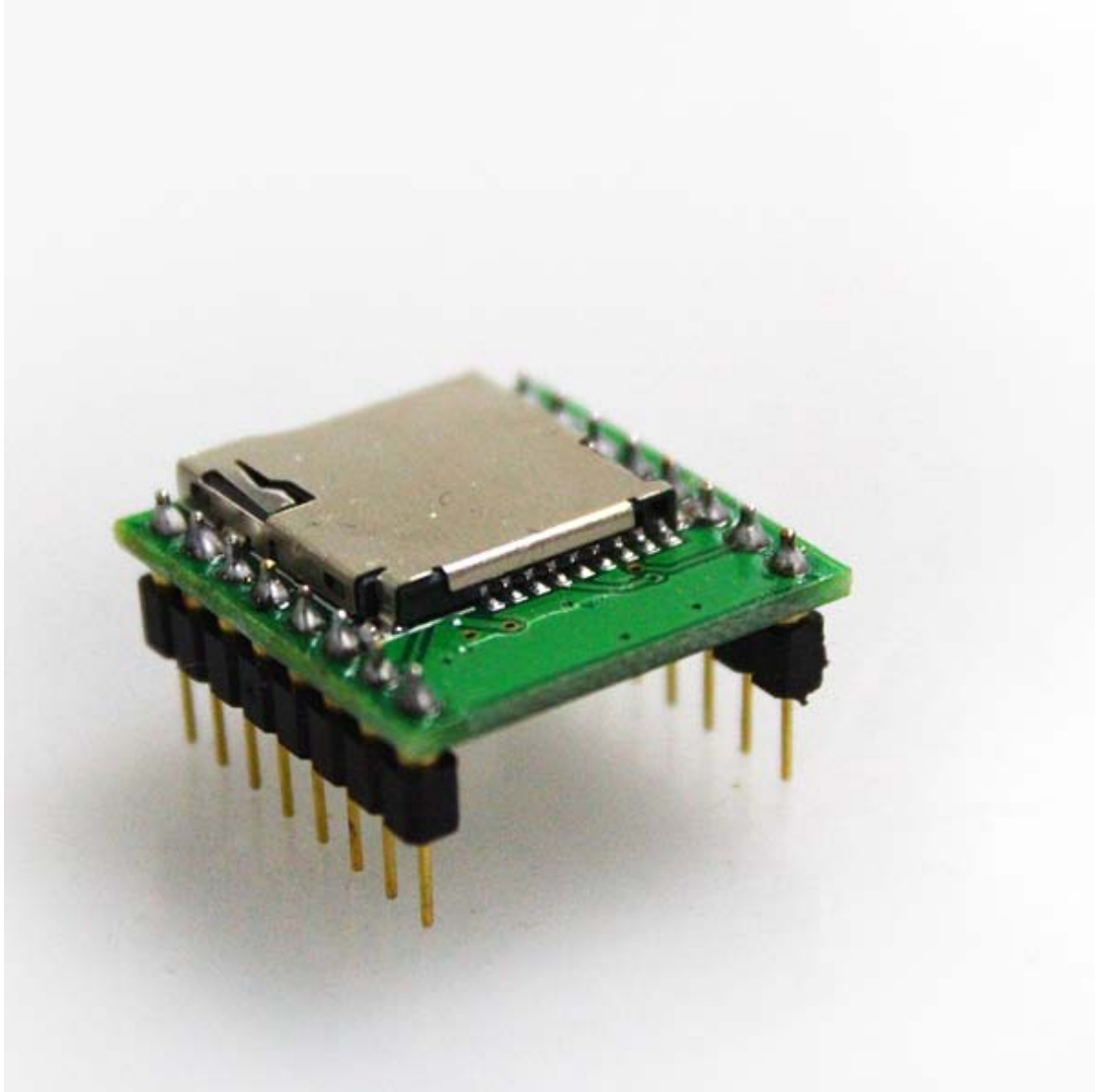


WT2003M03



Version: 1.01

Public Release Date: Dec. 2013

Catalogue

Overview

Feature

Specification

Pin Image

Audio File Sequence and Memory with Power down

Audio File Sequence

Memory with power down

Control Mode

Key Control

One-line Serial Circuit Communication

Application Circuit

Key Control Circuit

Extend Key Application Circuit

One-line Serial Communication Control Application Circuit

External Amplify Application Circuit

Electric Feature

Size

Version History

Overview

WT2003M03 launched by Waytronic, which support WAV, MP3 audio decode, adopt SOP16 packing master control, smaller volume, fast response speed. TF card as storage with USB interface through PC to change audio in TF card, and with function of USB sound card function. Inner 1 watt amplifier, direct drive 1W horn is available.

Features

Support WAV, MP3 audio format

Maximum support 32G TF card, adopt FAT and FAT32 file system

Through USB interface, PC change audio file in TF card is valid

Support USB sound card function

Support key control and one-line serial communication simultaneously

Place up to 65487 sections audio

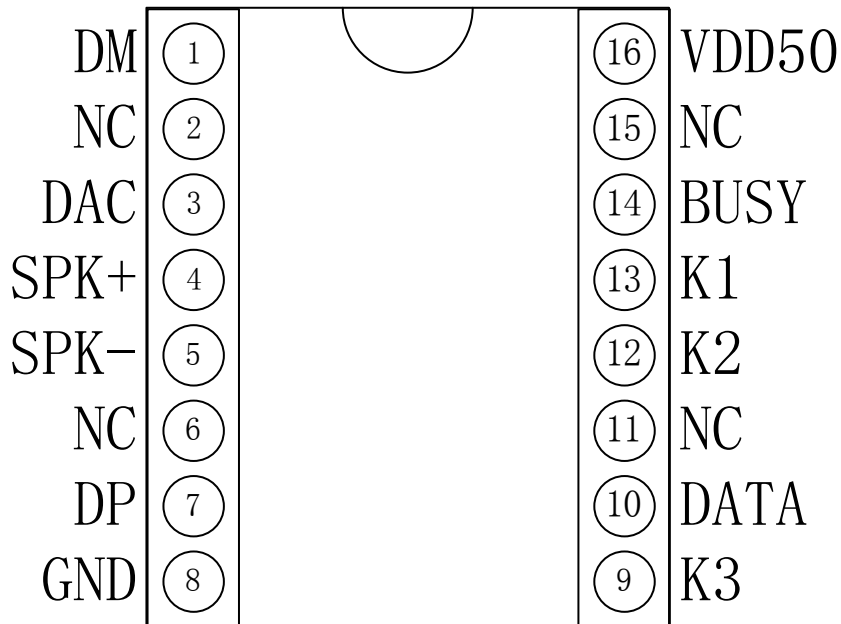
Inner 1w amplifier, direct drive 8ohm/1w horn, 16 levels volume can be choose

Power supply: DC5V

Specification

Name	Function
Audio Format	Sample rate support 8-48KHz, bit rate 8-320Kbps MP3 audio file and support 8-44.1KHz sample rate WAV audio file
Storage	32MB-32GB TF card
USB interface	Full speed 2.0
Voltage	DC3.3-5V
Rated current	12-250 Ma (depend on loading)
IO port level	3.3V TTL level
Size	18mm*21.5mm
Temperature	Within -40-80 degree
Humidity	5%-95%

Pin Image



Pin No.	Name	Type	Function Description
1	DM	IO	USB DATA line DM
2	NC	-	Vacant Pin
3	DAC	AO	DAC output port, use for external amplify
4	SP+	AO	Horn connection terminal
5	SP-	AO	Horn connection terminal
6	NC	-	Vacancy pin
7	DP	IO	USB data line DP
8	GND	PWP	GND
9	K3	I	K3 [Prev]
10	DATA	I/O	One-line serial data port
11	NC	-	Vacancy pin
12	K2	I	K2 [Next]
13	K1/ADC_KEY	I	K1 [Play/Pause]/ADC key input port
14	BUSY	I/O	Busy (use for indicate play status)
15	NC	-	Vacancy pin
16	VDD	PWPU	Module power terminal

Audio File Sequence and Memory Power Down

Audio File Sequence

WT2003 audio file order by file index, that's audio files one after another store in TF card, the module play sequence is not relative of file name.

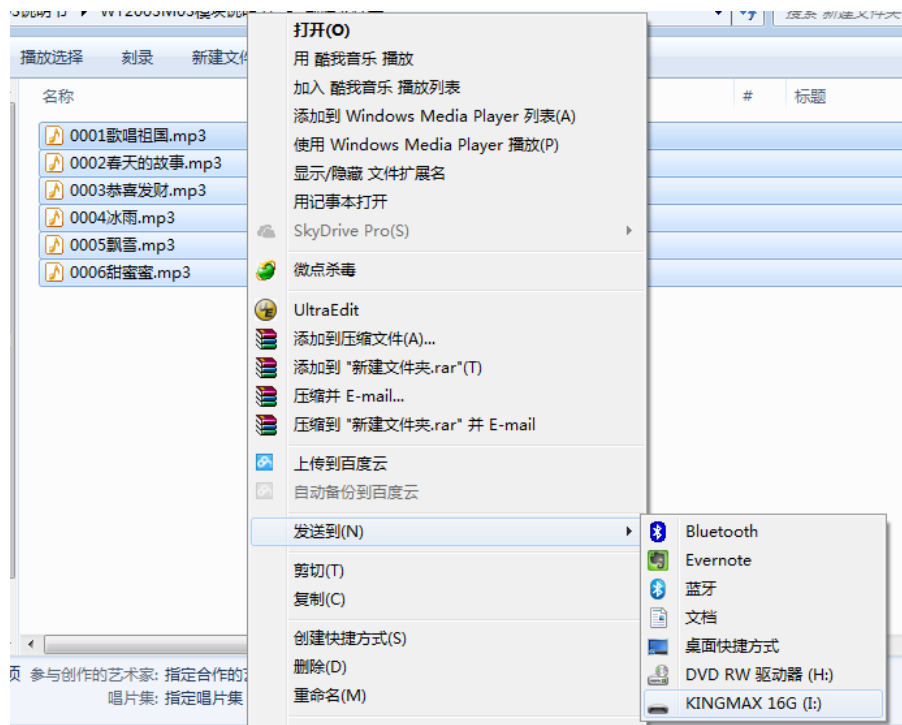
Due to Windows system file in order of file name, named by No. and original file name will be better. For example, 0001 It's Amazing.mp3, 0002 Only Love.mp3, 0003 A Place

Nearby etc. It is a good choose to named all audio file on computer in order first, then copy all to TF card.

Copy measure:

Use short key “Ctrl+C and Ctrl+V” to copy and stick, mouse can’t click any file which ready to send, otherwise, it will interrupt file sequence.

File sequence line up, choose ready to send file and right-hand button to click first file (like 0001 It’s Amazing.mp3), choose it to send TF card root catalogue in right menu. (note: right-hand button click file is first file to send, system send file from it)



Memory Power Down

WT2003M03 with function of memory power down. Every time complete playing audio file, it will store the site in TF card. After change TF card, it will change the site.

Control Mode

There are two control modes, one is key control, another is one-line serial communication. The two control modes use simultaneously.

Key Control Mode

Key Function

Name	K1	K2	K3	K4	K5	K6
Function	Play/pause	Next	Prev	Volume+	Volume-	Pause

K4,K5 and K6 is extend function key with different connection way, refer to extend key application circuit.

One-line serial Communication

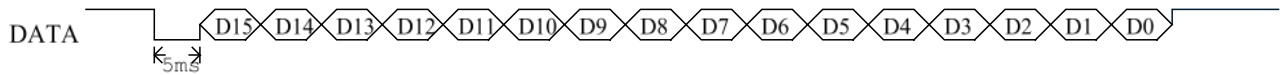
Maximum put in 65487 sections audios in TF card. It can trigger corresponding audio, MCU send 16 digit audio address, Audio address (0x0001-0x0E00)

Command Code	Audio Address	Trigger Status	File name
0x0001	Address 1	Play first section audio	0001
0x0002	Address 2	Play second section audio	0002
...
0x0BB8	Address 3000	Play three thousandth audio	3000
...
0xFFCF	Address 65487	Play sixty five thousand four hundred and eighty seventh section audio	65487

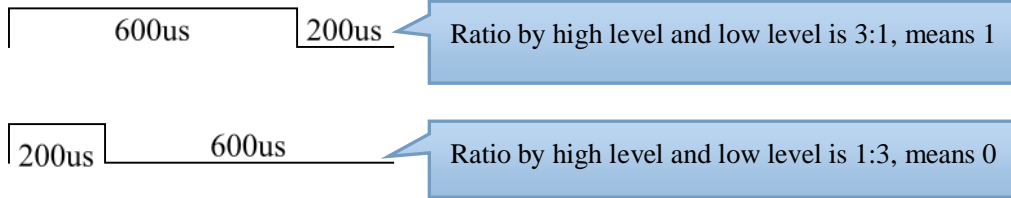
Command Code Description (0xFFE0-0Xffe)

Command Code	Function	Description
FFE0H~ FFEFH	Volume adjustment	16 level volume can be choose when play or standby, FFE0H as min, FFEFH as maximum
FFF0H	Play	Play/recover current address audio
FFF1H	Pause	Pause current address audio
FFF2H	Cycle	After send command, single cycle
FFF3H	Without cycle	After send command, take out cycle
FFF4H	Next	Play next
FFF5H	Last	Play last
FFFEH	Pause	pause

Control Timing:



After data line lower 5ms, send 16 digit data, high digit first, lower behind.
 Use ratio by high lever and low level stand for every data bit value.



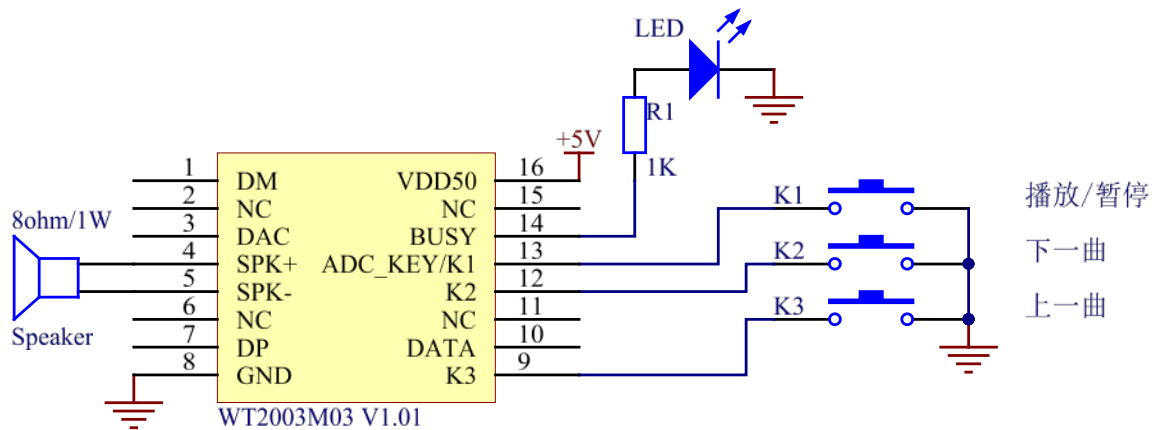
Note:

High level first.

Recommend: 200us:600us. Data range: 150us:450us-400us:1200us. Must use 3:1 and 1:3 ratio, insure communication is stable and reliable.

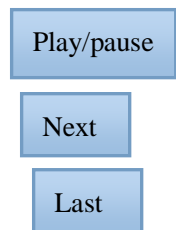
Application Circuit

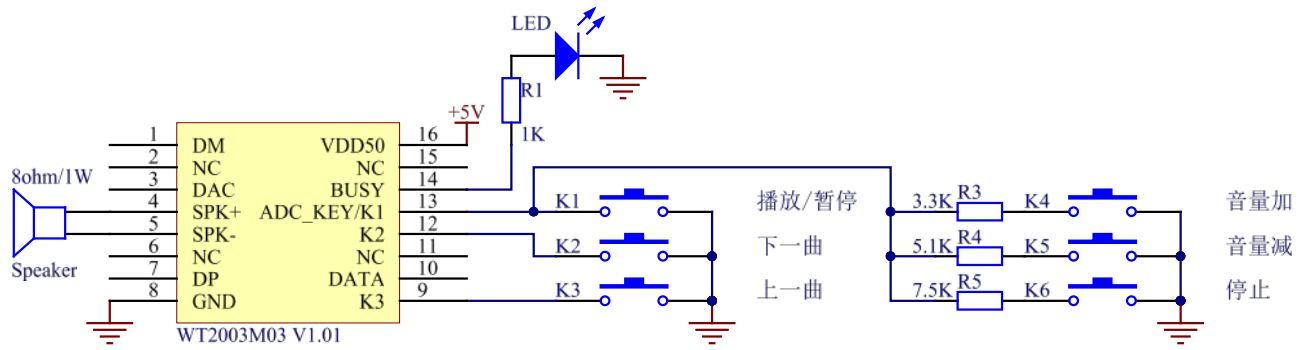
Key Control Circuit



Note: use for extend key function, increase three functions of [volume+],[volume-] and [stop]

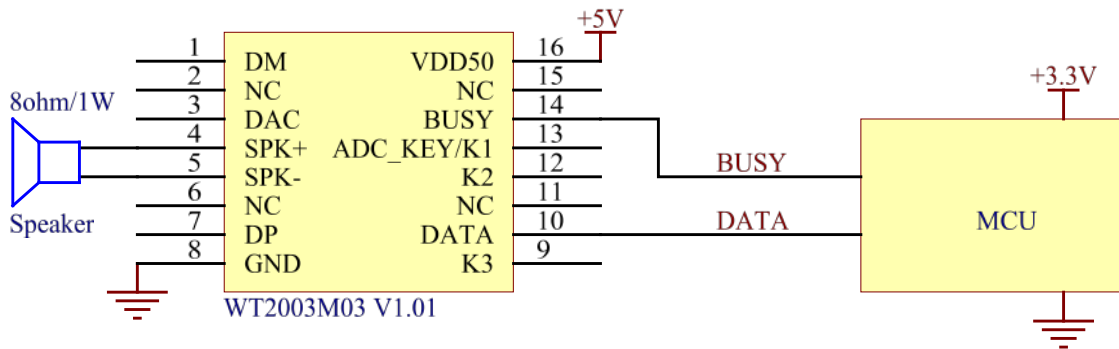
Extend Key Application Circuit





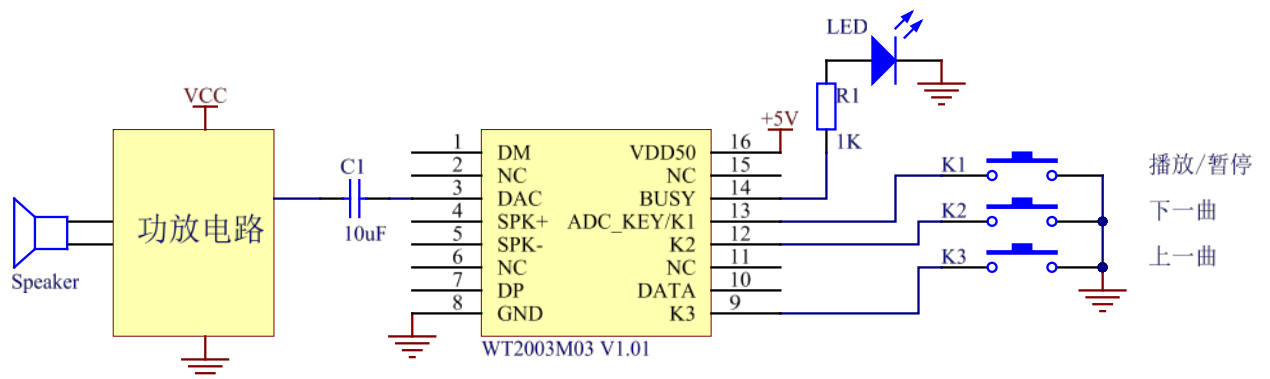
Note: use for extend key function, increase three functions of [volume+],[volume-] and [stop]

One-line Serial Communication Control Application Circuit



Note: IO port is 3.3V level, connect 3.3V MCU directly, if connect with 5V MCU, through level convert into circuit is available.

External Connect Amplifier Application Circuit



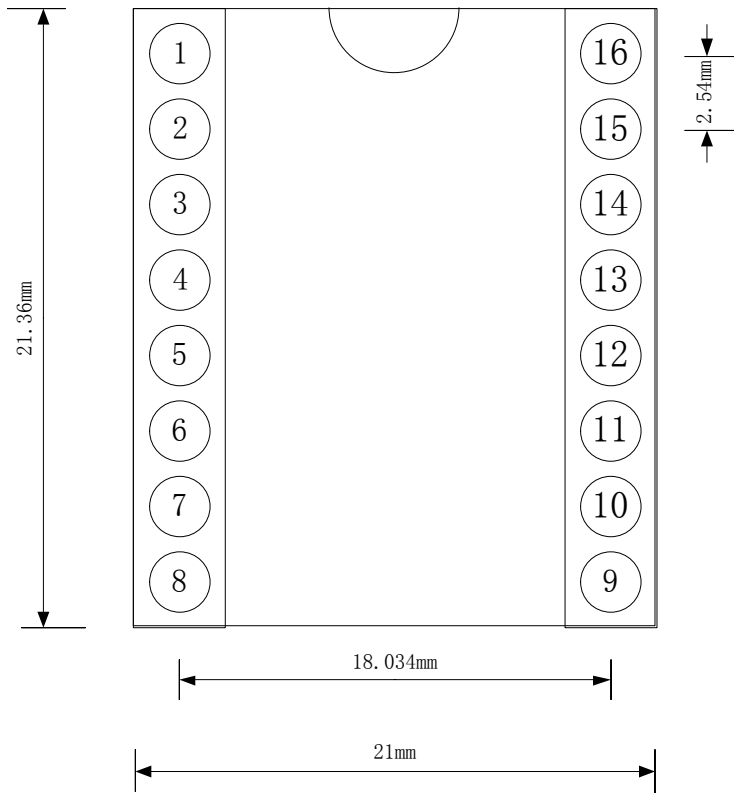
Note: Data range of Coupling capacity C1 depend on amplifier, please refer to amplifier manual. Generally, get value from 0.1uF-10uF.

Electric Features

Name	Function	Min	Typical	Max	Unit	Condition
VDD50	LDO input voltage	3.2	5.0	5.5	V	-
VCC33	LDO 3.3V output current	-	-	200	mA	Vout3.3>3.1V * note 1
SNR	SNR	-	85	-	dB	-
THD+N	THD	-	-70	-	dB	No-load
PWRAB	DAC output power	-	-	16	mW	16ohm load, single track
VPP	DAC maximum output amplitude voltage	-	-	2.8	V	-
Ps1	Standby power consumption (without TF card)	11	11.5	12	mA	
Ps2	Standby power consumption (with TF card)	34.5	-	-	mA	Related of TF card consumption
P	Power consumption when play(no-load)	35.6	-	-	mA	Related of TF card consumption

Note: VCC33 do not supply power to external, avoid getting bad tone quality from WT2003 unstable power. Use external small power dissipation for power supply like external device, pull-up resistor.

Size



Version History

Version No.	Modify Description	Modification Date
1.0	Original Version	18/10/2013
1.1	Adjust the order of second, third, fourteenth, fifteenth pin, so renewal relevant information and increase audio file sequence and memory power down	17/12/2013