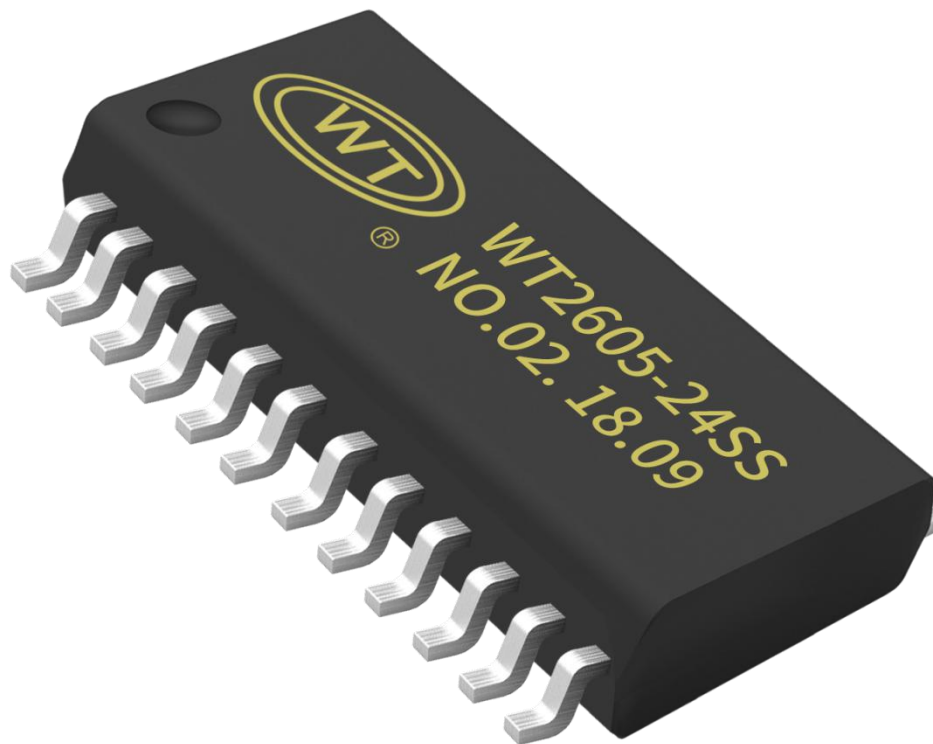


WT2605 Bluetooth Voice Chip Specification

V1.06



Note :

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1. Overview

WT2605 audio recording Bluetooth is an intelligent wireless audio data transmission, recording and MP3 audio playback product independently developed by Shenzhen Waytronic Electronics Co., Ltd. It is a low-cost and high-efficiency stereo wireless transmission scheme, which has the characteristics of high integration, small size, low power consumption, high transmission speed and so on. Only a few components on the periphery of the chip can realize the wireless reception of high-quality stereo audio. By adopting the drive-free mode, customers can quickly realize the wireless transmission of music and enjoy the fun of Bluetooth chip only by connecting the chip into the application product.

WT2605 has three main features, including MP3 function (TF card and U disk can be externally installed), Bluetooth communication of mobile phone and UART serial port control.

2. Applications

The chip is mainly used for short-distance music transmission, and can be easily connected with Bluetooth devices of notebook computers, mobile phones, PDA and other digital products to realize wireless music transmission.

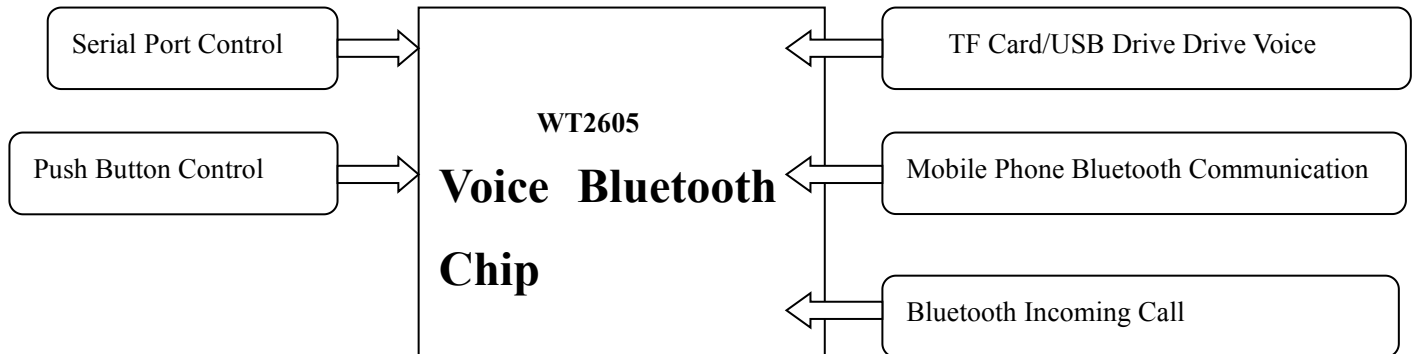
- Bluetooth audio
- Bluetooth stereo headphones
- Hands-free phone
- Bluetooth wireless audio transmission
- Car audio system
- Car hands-free
- Portable navigation equipment
- Bluetooth recording and voice recording

3. Characteristics

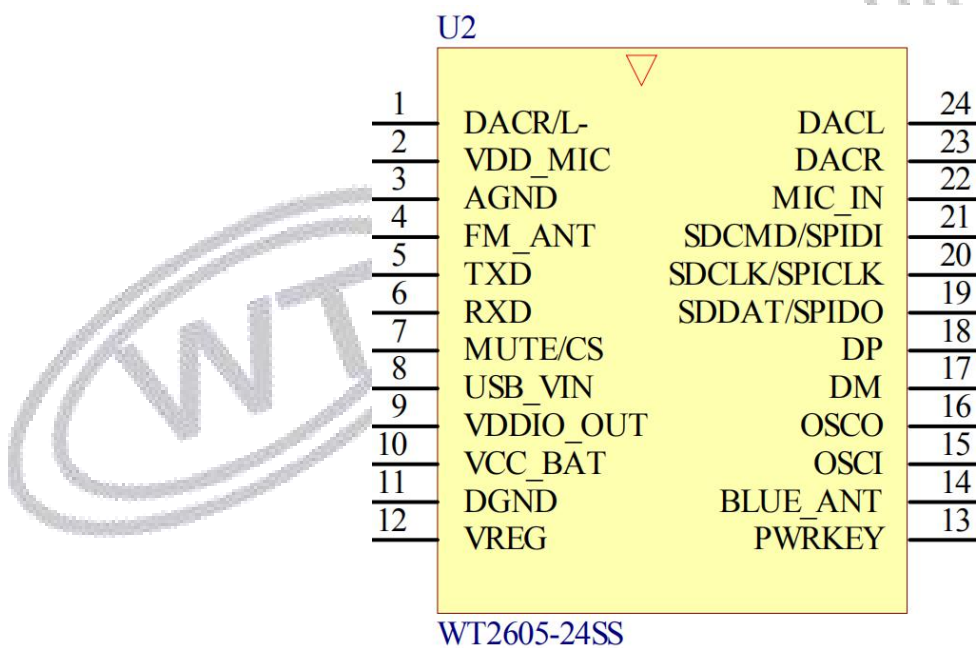
- The standard UART communication interface can flexibly realize the modes of designated address playing and designated file name playing.
- WT2605 is adopted as the core, and it supports SPI-FLASH, SD card and U disk.
- The USB interface can automatically switch between the host (USB HID) and the slave (USB card reader) and the USB sound card.
- Support FAT16 and FAT32 file systems, MP3 and WAV(PCM, IMA-ADPCM).
- Support offline upgrade program.
- Open space can reach 30-50M.
- In MP3 mode, when there are USB flash drives and SD cards, the USB flash drive is first responded to, and then the SD card is responded to.
- Comply with Bluetooth 5.0 and BLE specifications.
- Typical TX output power +2db.
- Audio code c supports 16-bit stereo DAC and two-channel 16-bit ADC.
- High-performance stereo ADC has a signal-to-noise ratio of 90dB.
- Three sets of multifunctional 32-bit timers, supporting capture and PWM modes.
- USB 2.0 master/slave device controller can be used to connect USB flash drive or analog USB flash drive to connect computer.
- With Bluetooth data transmission function.

4. The Brief Introduction of Functional Block Diagram

External circuit of the chip: SPI -flash, 1W power amplifier, U disk, TF card, crystal oscillator.



5. PIN Description

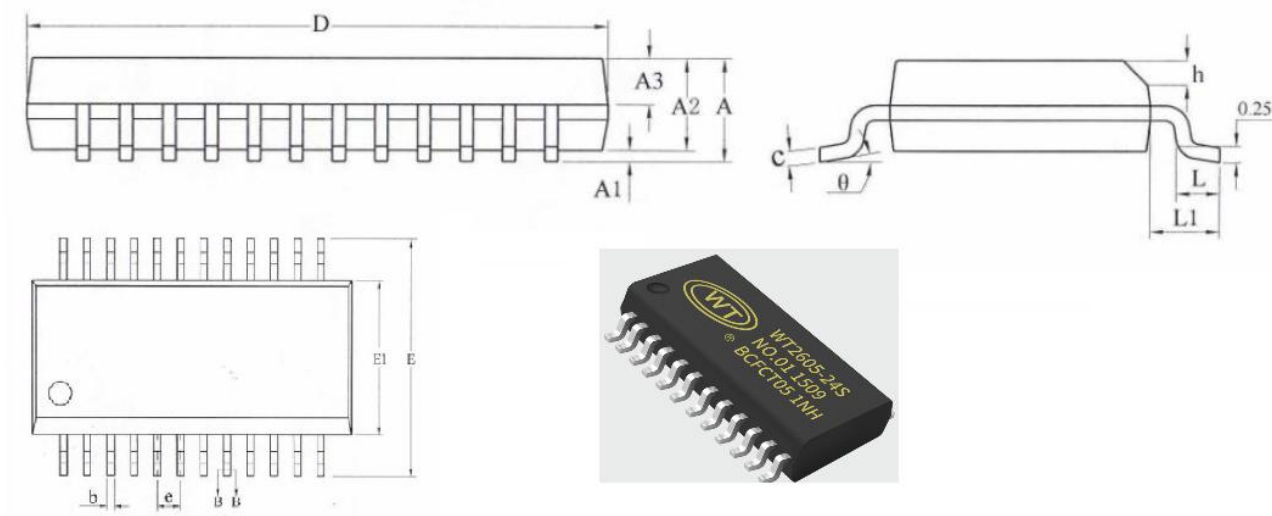


- The pins are arranged in the order shown above.

PIN	Name	Explanation
1	DACR	Audio output negative (default floating)
2	VDD_MIC	DAC power supply

3	AGND	DAC ground
4	FM_ANT	fm antenna
5	TX	UART serial port data output terminal
6	RX	UART asynchronous serial port data input terminal
7	MUTE/CS	MUTE/CS
8	USB_VIN	USB power input (5.0V)
9	VDDIO_OUT	VDDIO power output
10	VCC_BAT	BAT power input (3.6V~5.0V)
11	DGND	land
12	VREG	Decoupling pin (connect a 105 capacitor to ground)
13	PWRKEY	Key input
14	BLUE_ANT	Bluetooth antenna
15	OSCI	26M OSC input
16	OSCO	26M OSC output
17	DM	USB data terminal DM
18	DP	USB data terminal DP
19	SDDAT/SPIDO	TF card data pin or FLASH data pin
20	SDCLK/SPICLKI	TF card clock pin or FLASH clock
21	SDCMD/SPIDI	TF internal chip selection or chip selection terminal of SPI-FLASH internal memory
22	MIC_IN	Mike input
23	DACR	DAC right channel output
24	DACL	DAC left channel output

6. Size of the Chip



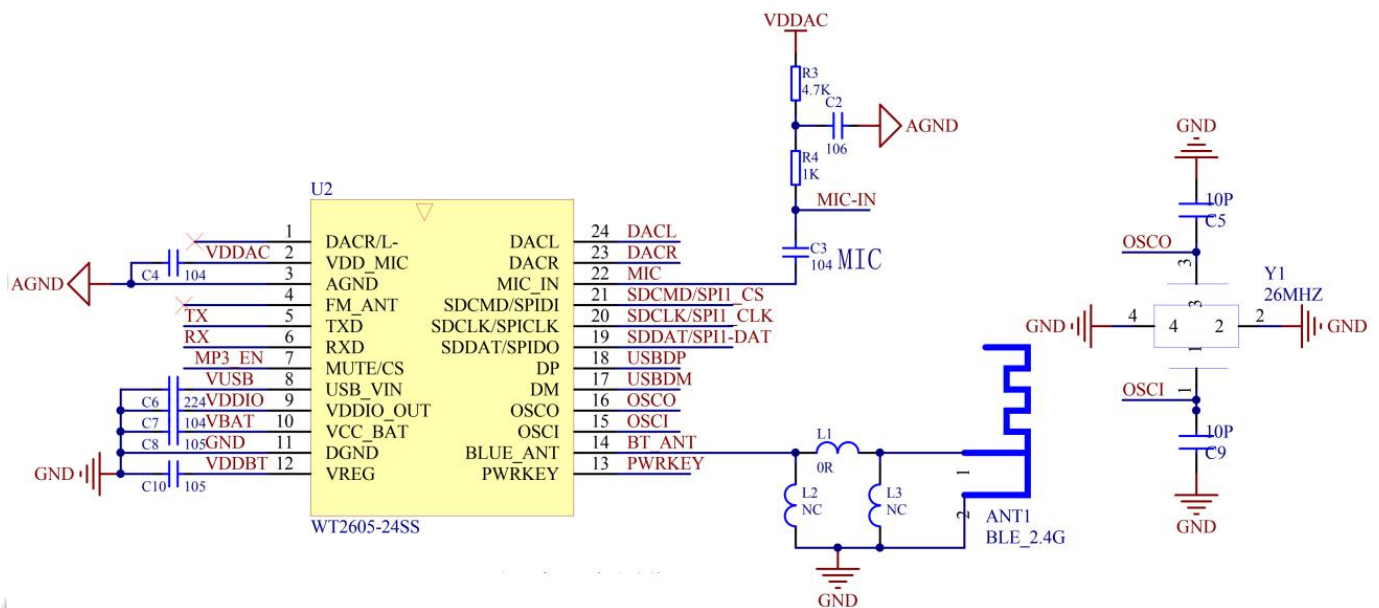
Name	Minimum	Typical Value	Maximum
A	-	-	1.75
A1	0.10	0.15	0.25
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.23	-	0.31
b1	0.22	0.25	0.28
c	0.20	-	0.24
c1	0.19	0.20	0.21
D	8.55	8.65	8.75
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	0.635BSC		
h	0.30	-	0.50
L	0.50	-	0.80
L1	1.05REF		
θ	0	-	8°

7. Detailed Explanation of Chip Schematic Diagram

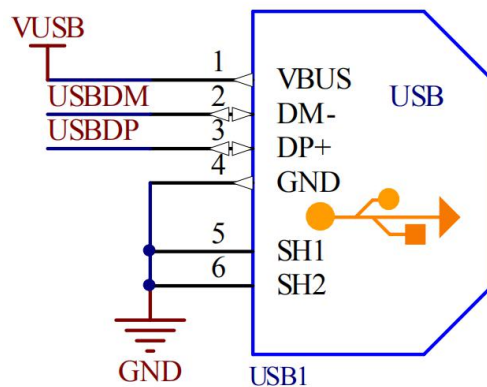
7.1. Schematic Diagram

The Bluetooth audio chip itself has MP3 player function, supports TF card, and is externally connected with U disk. It has the functions of play/pause, previous song, next song, volume up, volume down, stop, etc. The following is a detailed introduction:

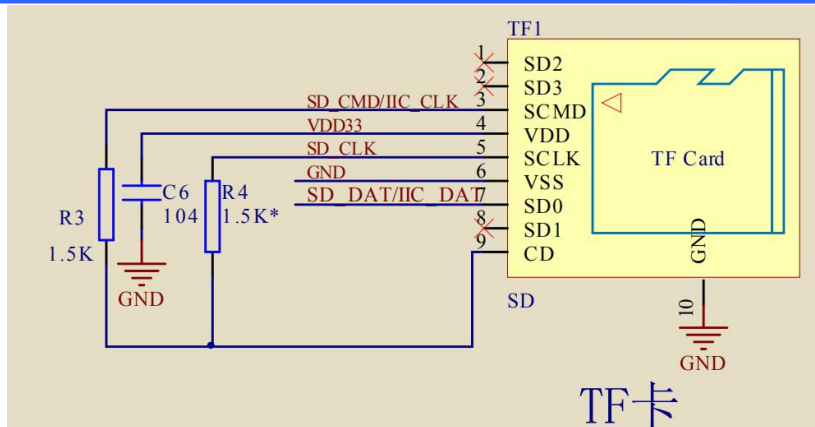
Minimum system circuit



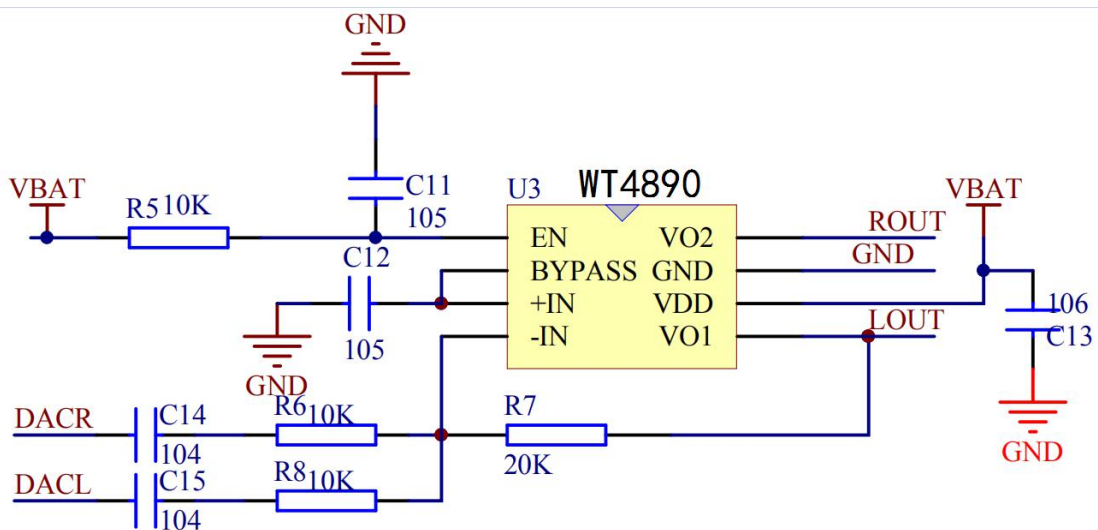
UBS Connection Circuit



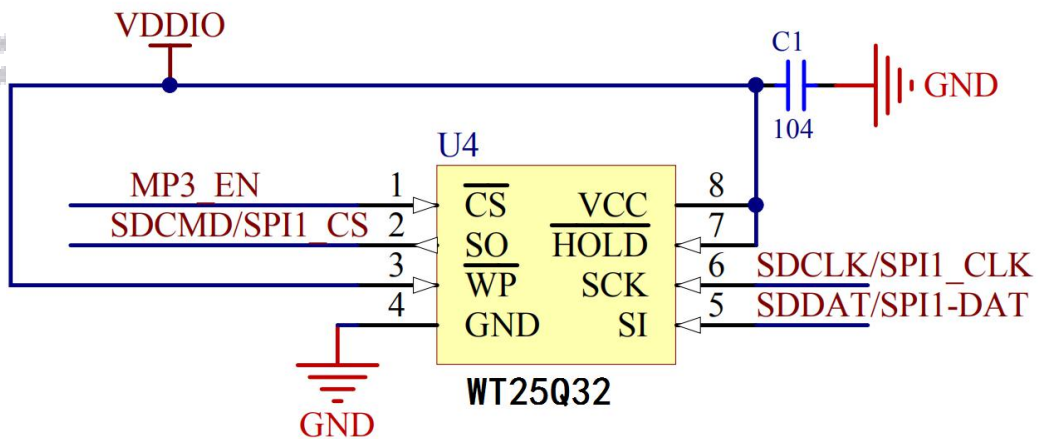
TF card connection circuit



Typical circuit of WT4890 power amplifier



SPI-FLASH connection circuit



8. Parameters

8.1. Range of the Using Temperature

Working Temperature: -40°C ~ +85°C

8.2. Audio Playing Parameters

Audio Format	Sample Rate	Voice Track	Kbps	TF Card	USB Drive	Flash
MP3	≤48K	1/2	16	√	√	√
WAV	≤44.1K	1/2	16	√	√	×

Table 3 Audio Parameter

8.3. Bluetooth Radio Frequency Characteristics

Transmitting Terminal	Unit	Minimum	Typical Value	Maximum	Bluetooth Specification
Radio Frequency Output Power	dBm	0	3	5	-6~5
Frequency Range	GHz	2.4	-	2.4835	2.4~2.5
Initial Carrier Frequency Tolerance	KHz	-50	-20	50	-75~75
Carrier Frequency Drift	KHz/50us	-	2	20	≤20

Table 4 Transmitting Terminal

Receiving Terminal	Unit	Minimum	Typical Value	Maximum	Bluetooth Specification
Sensitivity	dBm	-80	-75	-70	≤-70
Maximum Received Signal	dBm	-20	-10	-	≥-20

Table 5 Receiving Terminal

8.4. Electrical Parameters

Functional Mode	Play	Unconnected	Connected and not played.	
Current (mA)	20	15	13	
Operating Voltage	Unit	Minimum	Typical Value	Maximum
3.6	V	3.6	4.2	5.0

8.5. LDO Parameters

Name	Function	Minimum	Typical Value	Maximum	Unit	Condition
VDDIO	3.3V LDO voltage output	3.3	3.3	3.6	V	Light load condition
ILOAD	Maximum output current	-	-	150	mA	@VBAT=3.6V
ISC	Short-circuit current limit	-	-	300	mA	@VBAT=3.8V

8.6. I/O Parameters

Name	type	Minimum	Typical Value	Maximum	Unit	Condition
VIL	Low-level input voltage	-0.3		1.27	V	VDDIO=3.6V
VIH	Advanced input voltage	2.03		3.6		VDDIO=3.6V
Driver Ability 1	Output drive capability 1		32		mA	VDDIO=3.6V
Driver Ability 0	Output drive capability 0		8		mA	VDDIO=3.6V

8.7. Audio DAC Parameters

Name	Special Model	Minimum	Typical Value	Maximum	Unit	Condition
SNR	SNR		96		dB	VCM cap=1uF / VDDDAC cap=1uF with A-wt filter / Output -3dBV Fin=1KHz
THD+N	Total harmonic distortion plus noise		-86		dB	VCM cap=1uF / VDDDAC cap=1uF with A-wt filter Output -3dBV with 10K loading Fin=1KHz

8.8. BT Parameters

name	Minimum	Typical Value	Maximum	Unit	Condition
Maximum transmission power	-	2	-	dBm	Max TX power 2-DH5 packet
Root mean square deviation	-	5.5	-	%	
Peak deviation	-	12.5	-	%	
EDR relative transmission power	-	-0.2	-	dB	

9. Pay Special Attention to

1. The position of Bluetooth chip should not be wired or copper laid as far as possible, especially near the antenna.
2. Usually, the antenna of Bluetooth chip is placed as close to the edge of PCB as possible, and the PCB antenna is slotted.
3. In order to make the performance of the antenna intact, the antenna transmission line should be straight as far as possible, and the antenna should be placed on the top or bottom floor, and no holes should be punched. The distance between the antenna and the copper laying should be twice that of the normal copper laying.
4. The trace length of the antenna transmission line should be as short as possible, and the surface layer should be taken. The length of the antenna is generally 30mm.
5. AGND and GND outside the chip need to be interconnected at a single point at the power inlet.
6. The working voltage range of the chip is 3.6V-5.0V If it is lower than (possibly noisy) or higher than the working voltage range, it is easy to cause the chip to work unsteadily.