

WTK6900H-24SS

Specification

Version: V1.00



Note :

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1. Overview

WTK6900H-24SS is the identification chip of local voice trigger engine, which has the characteristics of low cost, high reliability and strong versatility. In voice technology, it has achieved high reliable wake-up recognition rate, longer wake-up, lower false wake-up rate, richer number of voice control commands, stronger anti-noise ability and faster response recognition time.

2. Characteristics

● Core and Storage

- High-performance 32-bit kernel, clocked at 240MHz, supports hardware floating-point operation.
- Built-in 1MB SPI FLASH

● AI Algorithm

- Off-line speech recognition, using the latest neural network algorithm, has the advantages of accurate recognition, low misjudgment rate, and reliable recognition at 5 meters distance.
- Speech noise reduction algorithm: It can filter out steady-state noise, and also has a good suppression effect on dynamic noise, and can be accurately identified under noise.
- Audio Decode:
 - ✓ Support MP3 and WAV audio decoding

● Audio

- Two-channel 16-bit DAC with $SNR > 95dB$
- Single channel 16-bit ADC with $SNR > 90dB$
- Sampling rate supports 8khz/11.025khz/16khz/22.05khz/24khz/32khz/44.1khz/48khz.
- DAC supports direct push, single-ended or differential output.

● Power Source

- VBAT is 3.3V to 5.5V
- VDDIO is 2.2V to 3.4V

● Bluetooth

- Comply with bluetooth V5.1+BR+EDR+BLE specification.
- Meet the transmission power consumption requirements of Class1 class2 and class3.
- Support all packaging types of GFSK and $\pi / 4$ DQPSK
- Provide+6dbm transmission power
- Receiver with -90dBm sensitivity
- Fast AGC can enhance dynamic range.
- The a2dp \ avctp \ avdtp \ avrcp \ HFP \ spp \ SMP \ att \ gap \ GATT \ rfcomm \ SDP \ l2ca profile is supported.

● Peripheral Device

- Four multifunctional 16-bit timers supporting capture and PWM modes
- Two 16-bit PWM drive generators
- A full duplex basic UART
- One SPI interface supports host and device modes.
- External wake-up/interrupt on all GPIO

● Working Temperature

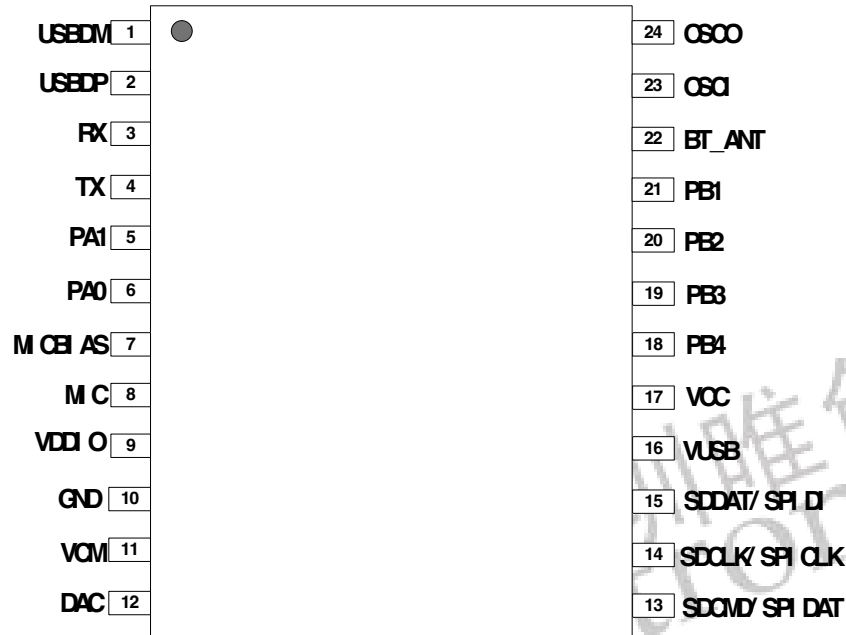
- Operating temperature: -40°C to+85°C
- Storage temperature: -65°C to+150°C

● Application

- Smart home appliances (household appliances, health appliances, kitchen appliances, etc.)
- Smart bathroom, smart lighting, smart electromechanical, smart home.
- Intelligent toy

3. Pin Description

3.1. Pin



WTK6900H-24SS

Table 1-pin distribution of wtk6900h-24ss chip

No.	Name	Description
1	USBDM	Burning port
2	USBDP	Burning port
3	RX	UART asynchronous serial port data input
4	TX	UART asynchronous serial port data output
5	PA1	IO port
6	PA0	IO port
7	MICBIAS	Microphone bias output
8	MIC	Input microphone
9	VDDIO	IO power supply 3.3V
10	GND	GND
11	VCM	Reference voltage output, connect an external capacitor of 1uF to ground.
12	DAC	DAC audio output
13	SDCMD/SPIDAT	SD card selection SPI Flash data
14	SDCLK/SPICLK	SD card clock SPI Flash clock

Table	15	SDDAT/SPIDI	SD card data
			SPI interface data
	16	VUSB	Connect a 1uF external capacitor to ground.
	17	VCC	Power input
	18	PB4	IO port
	19	PB3	IO port
	20	PB2	IO port
	21	PB1	IO port
	22	BT_ANT	Bluetooth antenna
	23	OSCI	Connect 24M crystal oscillator
	24	OSCO	Connect 24M crystal oscillator

2-WTK6900H-24SS Chip Pin Definition

4. Functions

4.1. UART hardware connection

The hardware connection mode of chip UART interface is shown in the following figure:

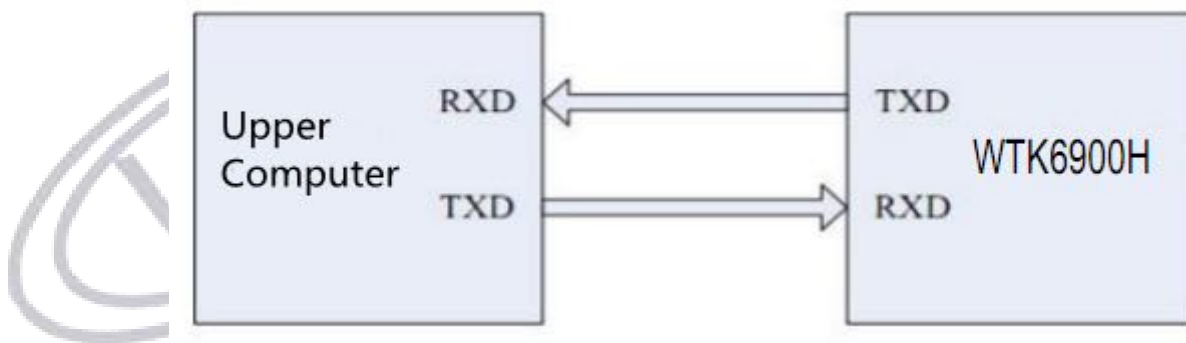


Chart 3-Schematic diagram of UART interface connection 3- WTK6900H-24SS chip

4.2. UART Control Protocol

Standard UART asynchronous serial interface, which belongs to 3.3V TTL level interface. The format of communication data is: start bit: 1 bit; Data bits: 8 bits; Parity bit: none; Stop bit: 1 bit. To use the computer serial port debugging assistant, it is necessary to set the serial port parameters correctly, as shown in the figure:

Serial Port	COM1	
Baud Rate	9600	
Check Digit	No parity	
Data Bit	8	
Stop Bit	1	
	<input checked="" type="radio"/> 十六进制发送 <input type="radio"/> 字符格式发送	Hexadecimal transmission Character format transmission

Note:
refers to

Start Code	Length	Expand Code	Operate Code	Entry ID	Accumulate and check	End Code
0X7E	06	FF 06	01	As follows	As follows	0XEF

"Length"
the

length+extension code+command code+entry ID+ checksum, and "accumulation and checksum" refers to the low byte of the accumulated sum of length+extension code+command code+entry ID.

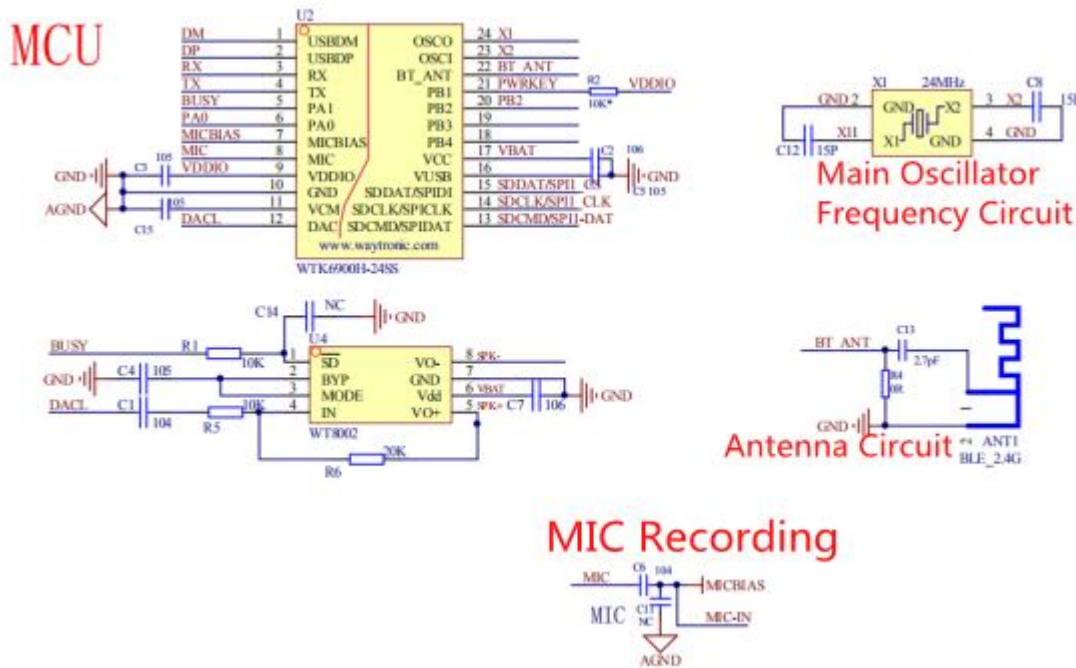
4.3. Standard Entry

NO.	Word Group	Entry	Broadcast	UART serial output
0	Boot language		Welcome to the Bee Butler Smart Switch	7E 06 FF 06 01 01 0D EF
1	10S automatic exit		Panel Back off.	7E 06 FF 06 01 FE 0A EF
2	Awakening words	Bee housekeeper	I am here	7E 06 FF 06 01 01 0D EF
3	Command word	Turn on the lights.	Turn on the lights.	7E 06 FF 06 01 02 0E EF
4		Turn off the lights	Turn off the lights	7E 06 FF 06 01 03 0F EF
5		Dimming light	Dimming light	7E 06 FF 06 01 04 10 EF
6		Dim the light	Dim the light	7E 06 FF 06 01 05 11 EF
7		Tune to yellow light	Tune to yellow light	7E 06 FF 06 01 06 12 EF
8		Tune to white light	Tune to white light	7E 06 FF 06 01 07 13 EF
9		Tune to natural light	Tune to natural light	7E 06 FF 06 01 08 14 EF

Chart 4-Voice Command Table

5. Circuit design reference

5.1. Diagram



6. Chip Electrical Characteristics

Absolute Maximum Ratings

Parameter	Mark	Smallest	Biggest	Unit
Tamb	Ambient Temperature	-40	+85	°C
Tstg	Storage temperature	-65	+150	°C
VBAT	Supply Voltage	-0.3	4.5	V
V3.3IO	3.3V IO Input Voltage	-0.3	3.6	V

Symbol	Definition	Smallest	Typical Value	Biggest	Unit	Test Condition
VBAT	Voltage Input	3.3	3.7	5.5	V	
V3.3	Voltage output	2.2	3.0	3.4	V	VBAT = 4.2V, 100mA loading
VBT_AVDD	Voltage output	1.2	1.25	1.35	V	VBAT = 4.2V, 100mA loading

IO Input/Output Electrical Logical Characteristics

IO input characteristics						
Symbol	Definition	Smallest	Typical Value	Biggest	Unit	Test Condition
VIL	Low-Level Input Voltage	-0.3		0.3* VDDIO	V	VDDIO = 3.3V
VIH	High-Level Input Voltage	0.7*VDDIO		VDDIO+ 0.3	V	VDDIO = 3.3V
IO output characteristics						
VoL	Low-Level output Voltage			0.33	V	VDDIO = 3.3V
VoH	High-Level output Voltage	2.7			V	VDDIO = 3.3V

7、 Package Size

单位: mm

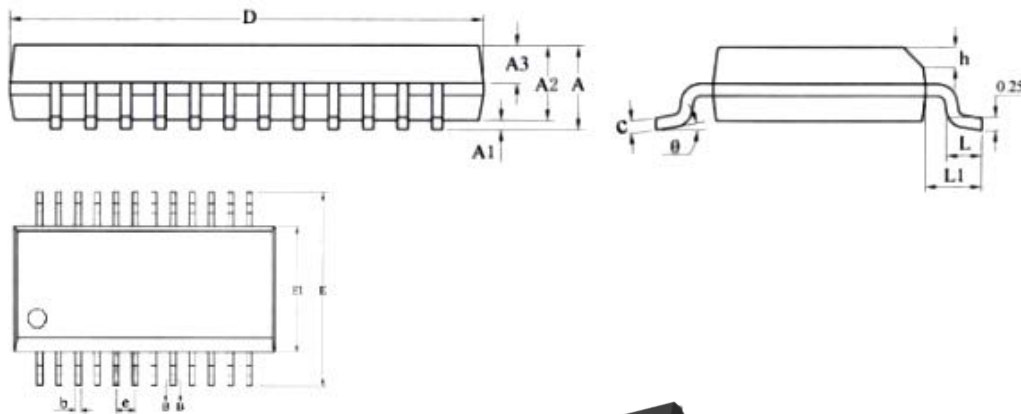


Figure 5-

名称	最小值	典型值	最大值
A	-	0.15	0.75
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°

WTK6900H-24SS chip package