WTK6900M01
Specification

Version: V1.00

Note :

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CONTENT

1. Product Introduction

WTK6900HM01 is the recognition module of the local voice trigger engine, which has the characteristics of low cost, high reliability and strong versatility. In the voice technology, it has realized a highly reliable wake-up recognition rate, a longer-distance wake-up, a lower false wake-up rate, a richer number of voice control commands, a stronger anti-noise ability, and a faster response and recognition time.

2. Feature

Kernel and Storage

High-performance 32-bit core, clocked at 240MHz, supports hardware floating point operations

Built-in 1MB SPI FLASH

AI Algorithm

Offline speech recognition, using the latest neural network algorithm, has the advantages of accurate recognition and low misjudgment rate, and reliable recognition in the far field of 5 meters

Voice noise reduction algorithm: Filters out steady-state noise, has a good suppression effect on dynamic noise, and can be accurately identified under noise

Audio decoding:

Support MP3, WAV audio decoding

Audio

Two-channel 16-bit DAC, SNR>= 95dB

Single-channel 16-bit ADC, SNR> = 90dB

Sampling rate support 8KHz / 11.025KHz / 16KHz / 22.05KHz / 24KHz /32KHz / 44.1KHz / 48KHzz

Power Supply

VBAT is 3.3V to 5.5V

VDDIO is 2.2V to 3.4V

Bluetooth

Comply with Bluetooth V5.1 + BR + EDR + BLE specifications

Meet the transmission power consumption requirements of Class1, Class2 and Class3

Support GFSK and π/4 DQPSK all packaging types

Provide + 6dbm transmit power

Receiver with -90dBm sensitivity

- **Peripherals**

Four multi-function 16-bit timers, support capture and PWM modes

Two 16-bit PWM drive generators

A full-duplex basic UART

An SPI interface supports host and device modes

External wake-up/interrupt on all GPIOs

- **Working Temperature**

Working temperature: -40℃ to +85℃

Storage temperature: -65℃ to +150℃

- **Application Areas**

Smart home appliances (household appliances, health appliances, kitchen appliances, etc.)

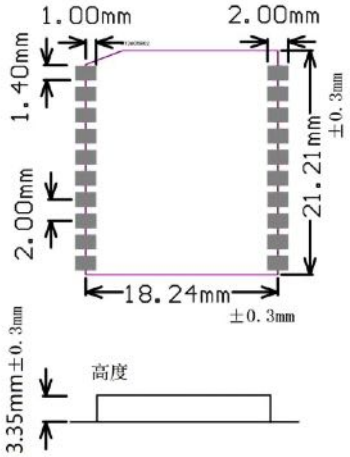
Smart bathroom, smart lighting, smart electromechanical, smart home.

Smart toys

3. Pin Related

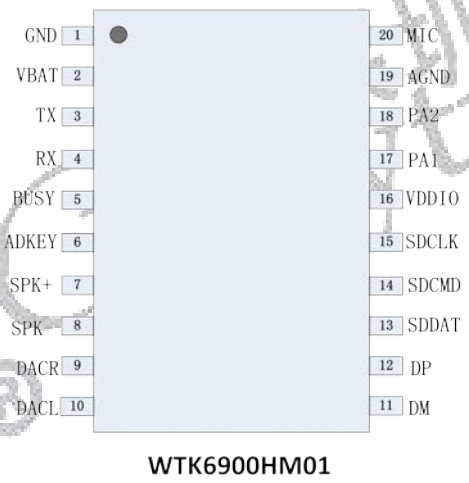
3.1. Size

The module size is 21.21*18.24*3.35MM±0.3MM, the pin spacing is 2.0MM, and the size definition is shown in the figure:



Unit: mm

3.2. Module pin



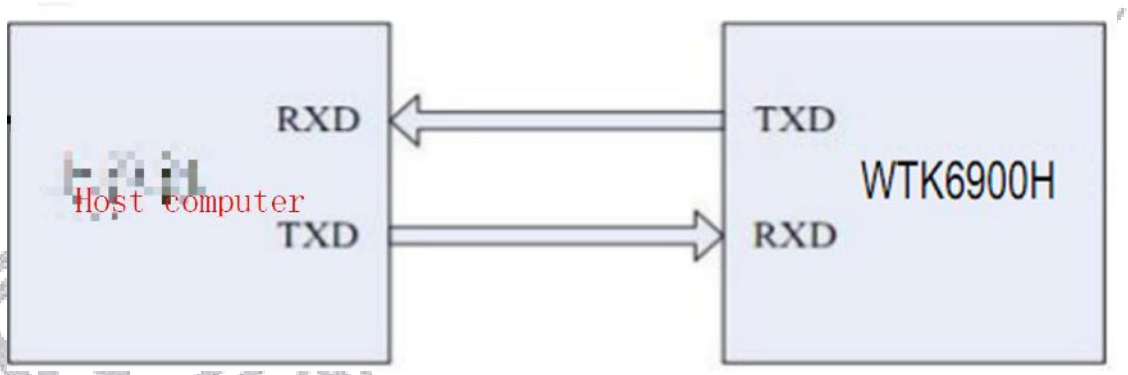
WTK6900HM01

No	Name	Description
1	GND	GND
2	VBAT	Power input
3	TX	UART output
4	RX	UART input
5	BUSY	BUSY pin
6	ADKEY	Push button
7	SPK+	Speaker
8	SPK-	Speaker
9	DACR	DAC Right
10	DACL	DAC LEFT
11	DM	Download

12	DP	Download
13	SDDAT	SD card data
14	SDCMD	SD card select
15	SDCLK	SD card clock
16	VDDIO	3.3Vpower in
17	PA1	IOport
18	PA2	IOport
19	AGND	Audio group
20	MIC	MIC in

4. Function

4.1. UART Hardware Connection



4.2. 4.2, UART Control Protocol

The standard UART asynchronous serial interface is a 3.3V TTL level interface. The communication data format is: start bit: 1 bit; data bit: 8 bits; parity bit: none; stop bit: 1 bit. To use the computer serial debugging assistant, you need to set the parameters of the serial port correctly, as shown in the figure:

Serial port com1

Baud rate 9600

Data bit 8

Stop bit 1

Start code	Length	Extension code	Command code	Entry ID	Accumulation and check	End code
0X7E	06	FF 06	01	see below	see below	0XEF

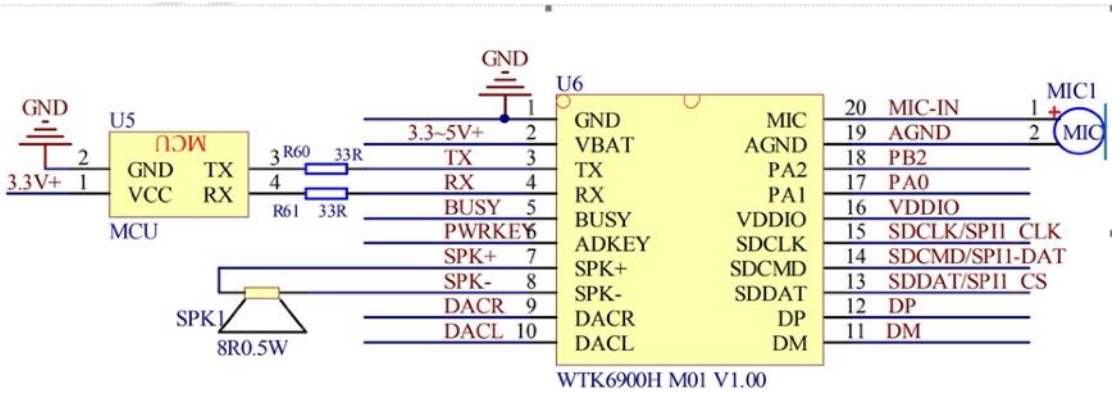
Note: "Length" refers to the length + extension code + command code + entry ID + checksum length, "accumulative sum check" refers to the low byte of the cumulative sum of length + extension code + command code + entry ID .

4.3. Standard Entry

NO	phrase	Entry	Output ...	UART out put
0	Start words			7E 06 FF 06 01 01 0D EF
1	10SAutomatic exit and wake up			7E 06 FF 06 01 FE 0A EF
2	Wakeup words			7E 06 FF 06 01 01 0D EF
3	Command			7E 06 FF 06 01 02 0E EF
4				7E 06 FF 06 01 03 0F EF
5				7E 06 FF 06 01 04 10 EF
6				7E 06 FF 06 01 05 11 EF
7				7E 06 FF 06 01 06 12 EF
8				7E 06 FF 06 01 07 13 EF
9				7E 06 FF 06 01 08 14 EF

5. Circuit design reference

5.1. application block diagram



6. Module Electrical Characteristics

Absolute Maximum Ratings

symbol		Minimum	maximum	Unit
Tamb	Ambient Temperature	-40	+85	℃
Tstg	Storage temperature	-65	+150	℃
VBAT	Supply Voltage	-0.3	4.5	V

PMU Characteristics

symbol		Minimum	typical	maximum	Unit	Test Conditions
VBAT	Voltage Input	3.3	3.7	5.5	V	
VDDIO	Voltage output	2.2	3.0	3.4	V	VBAT = 4.2V, 100mA loading

IO Input/Output Electrical Logical Characteristics

IO input characteristics						
symbol		Minimum	typical	maximum	Unit	Test Conditions
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