Introduction to Voice Interaction Module

1. Introduction to Voice Interaction Module

CI1302 is a new generation of high-performance neural network intelligent voice chip developed by Qiying Tailun. It integrates Qiying Tailun's self-developed brain neural network processor BNPU V3 and CPU core. The system main frequency can reach 220MHz, built-in SRAM up to 640KByte, integrated PMU power management unit and RC oscillator, integrated dual-channel high-performance low-power Audio Codec and multiple UART, IIC, IIS, PWM, GPIO, PDM and other peripheral control interfaces. The chip only needs a small number of peripheral devices such as resistors and capacitors to realize various intelligent voice product hardware solutions, with extremely high cost performance.

Using 3 generations of hardware BNPU technology, supporting neural networks such as DNN\TDNN\RNN\CNN and parallel vector operations, it can realize voice recognition, voiceprint recognition, command word self-learning, voice detection and deep learning noise reduction and other functions. The chip solution also supports multiple global languages such as Chinese, English, and Japanese, and can be widely used in home appliances, lighting, toys, wearable devices, industry, automobiles and other product fields to achieve voice interaction and control and various intelligent voice solution applications.

The CI1302 chip has a brain neural network processor core (BNPU), supports offline NN acceleration calculations and voice signal processing hardware acceleration, etc. The CPU main frequency can reach 220MHz, capable of offline far-field voice recognition, built-in 2MB FLASH storage, and can support 300 command words.

2. Working principle

The module adopts the command mode to wake up. The user needs to say the set wake-up word to activate the voice interaction module first. After activation, voice recognition can be performed. The default wake-up keyword of the factory firmware is "Xiaoya Xiaoya". If no voice is recognized after 20 seconds, the module will enter sleep mode and need to be re-awakened when used again.

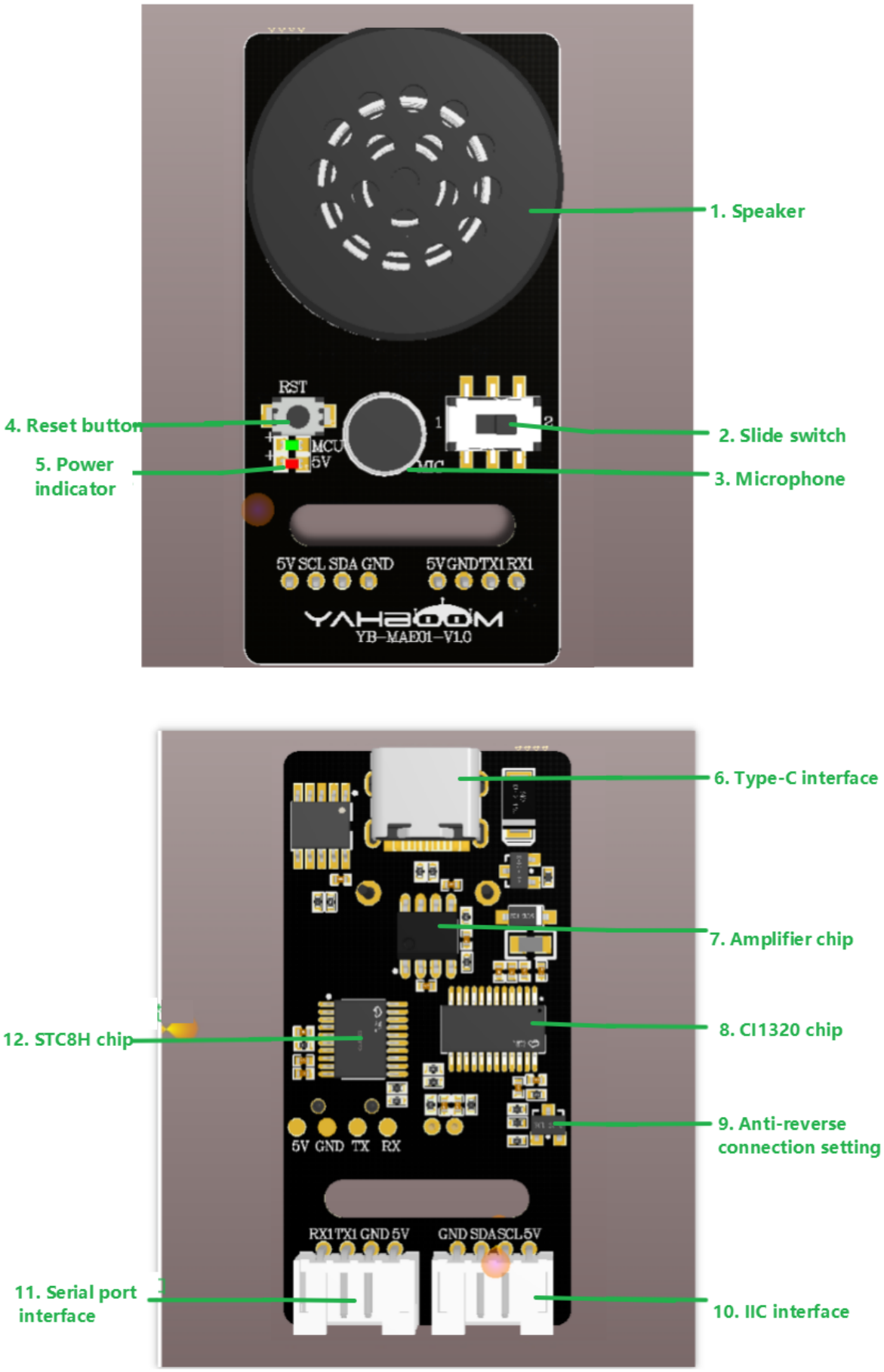
When the CI1302 chip recognizes the corresponding voice entry, it will be sent out through the serial port and IIC interface, and feedback will be broadcast; the IIC chip will store the received voice command and send it out through the IIC slave protocol.

The module supports wake-up word modification, command word modification and custom entry. You can learn how to operate in the tutorials ** "2. Modify wake-up words and command words" and "3. Customize protocol entry production" ** tutorials.

3. Notes

- Use 5V voltage for power supply. Exceeding 5V will damage the module
- The usage scene should be quiet. A noisy environment will affect the recognition effect
- When speaking an entry, the voice should be loud and the speaking speed should not be too fast. It is recommended to keep within 5 meters of the module

4. Hardware interface description



Serial number	Hardware name	Description
1	Speaker	Convert analog signals into sound
2	Slide switch	Switch serial port for firmware burning
3	Microphone	Convert sound into analog signals
4	RST button	Reset button
5	Power indicator (red light)	Always on when power is normal
6	Type-C interface	For power supply and CI1302 chip, SCT8 firmware update download
7	Amplifier chip	Convert digital signals into analog signals to drive speakers
8	CI1302 chip	High-performance voice recognition chip, recognizes voice and outputs signals
9	Anti-reverse connection setting	5v, GND reverse connection protection
10	IIC interface	As a slave, used for power supply and communication with the host device
11	Serial port interface	Provides an external serial port that can control broadcasting through protocols
12	STC8H chip	Converts voice chip instructions into IIC protocol instructions and serial port instructions