

# Operational Description

## Product Description

This product integrated a Bluetooth chipset to support the Bluetooth function that allows users to use it as a speaker as the primary usage of this device.

## The brief introduction of the circuit

1. The Bluetooth signal is transmitted and received through the antenna system consists of the PCB antenna.
2. Power of the whole body is provided by 24VDC.
3. Aux in port, Line in port, USB port, Optical in port and Coaxial in port are to connect audio source by line in cable to input audio signal. ON/OFF button is to turn on or turn off the speaker.
4. AV8314A is MCU master control IC, it is use to button control, input Switch between Bluetooth and aux in, Line in port, USB port, Optical in port, Coaxial in port and output audio source to amplifier IC.
5. FDD8424H is to amplify audio signal provided by master control transistor and motivate loudspeakers.
6. The chipset of BT is CSR 57E687CG, BT version is 2.1+EDR, modulation types are GFSK,  $(\pi/4)$ DQPSK, 8DPSK, The data rate is 1Mbps, 2Mbps or 3Mbps.
7. The clock of BT Module is 26MHz, the clock of Cirrus CS47024 is 24.576MHz, the Clock of SM3G+H-bridges is 12.288MHz.
8. This USB port can't connect to the PC.

## Technical Description of FHSS

a. When power on, this device will loop scan the whole frequency until a connection command from the partner is received.

b. This device transmits a response signal.

c. The partner receives the response signal and recognizes it, then send a connection command to establish the connection.

d. each frequency is used equally on the average by each transmitter that each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event.

e. After the connection establish successfully, the data transmission is beginning. At the same time, the partner and this device will shift frequencies in synchronization per a same pseudo randomly ordered list of hopping frequencies, the hopping rate is 1600 times per second. This device conform to the criteria in FCC Public Notice DA00-705.

f. The bandwidth of the this device, which is set to a fixed width by the software, match the hopping channel bandwidth of their corresponding partner. This device is a true frequency hopping system and does not have the capability to be coordinated with other FHSS systems in an effort to avoid the simultaneous

occupancy of individual hopping frequencies by multiple transmitters.

There are 79 channels in total. The channels hopping from one channel to another channel during the pseudorandom selection process. The hopping interval is 12 millisecond. This system frequency hops between 79 channels. If it is determined that one of the 79 hopping channels is found to be noisy or poor due to other RF interference, then a new channel is selected from the 78 unused channels and the one noisy channel is released to the unused group. This repeats whenever a noisy or poor channel is detected. For example, for the hop pattern of 2414MHz,2434MHz,2444MHz,2434MHz,2451MHz,2441MHz,2454MHz,2434MHz,2427MHz,2461MHz,2461MHz,2444MHz,2414MHz,2448MHz,2451MHz,2417MHz,2478MHz,2469MHz,2473MHz,2403MHz,etc. The sequential hops can not follow any order, is completely random.

The antenna supplied with PCB antenna with a max gain of 2.12 dBi. The antenna is an integral part of the device.

The peak power of the transceiver is approximately 3.91 dBm, and the maximum EIRP is approximately 6.03 dBm.