

## Operation Description

*SBX400* is a standard bluetooth stereo speaker, which plays music from Line in input or compatible Bluetoothaudio devices. The output power is 15.0 watts per channel to 4 ohms speaker. Volume Control tact switches to control Bluetooth volume level. Connect/ pairing button to connect Bluetooth devices.

The speaker consist of several functional blocks (see block diagram).

i.) Bluetooth module (57F68)

- It is a Class 2 bluetooth module, the crystal frequency is 26MHz, Controls the behavior of the speaker.

ii.) Interface controls

- Connect or pair, volume tact switches to adjust Bluetooth volume and LED indications for user interface.

iii.) Line in

- Connect to music player.

iv.) Differential /Summing amp

- Differentiate Bluetooth module out audio signals, sum the Line in and Bluetooth signals together.

v.) 9V regulation circuit

- Provide power supply for operational amplifier.

vi.) 3V3 regulation circuit

- Provide power supply for Bluetooth Module.

vii.) Power supply circuit

- Filter and distribute out supply to other blocks.

viii.) EQ

- Control the frequency response.

ix.) Power Amp

- Amplify the signal

The device is a standard bluetooth stereo speaker, The working frequency of RF module 57F68 is setted to 2402MHz ~ 2480MHz, the frequency separation is 1MHz and there are 79 channels. with the spread spectrum code sequences to hopping constantly.

To make sure the communication stable, Bluetooth special design the fast acknowledge and frequency hopping plan to ensure that link stability. First link, between bluetooth devices will build a pseudorandom code, Only the pseudorandom code is same, the information transfer will be accepted. Other interference is not possible in the same sequence of interference. Bluetooth through the spread spectrum technology, Make the influence of interference may become very small.

The working procedures are:

1. Power on, press and hold the  button, when the indicator light flashes faster, the RS50 enter to pair mode. The SBX400 will do the frequency hopping according to a certain sequence, and then send the connection command.
2. If there is a Device response, the SBX400 will judge whether it can be permitted to connect. Prompt enter a passkey.
3. If the passkey is right, then can be permitted to connect, send the connection command to build up the connection.
4. While the connection build up successfully, the data transmission is beginning. At the same time, the SBX400 and device will shift frequencies in synchronization per a same pseudo randomly ordered list of hopping frequencies, the hopping rate is 1600 times per second.
5. The bandwidth of the receiver, which is set to a fix width by the software, match the hopping channel bandwidth of their corresponding transmitter.