

Technical Description

This device is In-House Bluetooth Speaker with Bluetooth 5.3, without BLE function, for more detail information, please refer to the user manual.

Technical Specification	
Kind of Equipment	In-House Bluetooth Speaker
Operating Frequency	2402 - 2480 MHz
Operating Voltage	AC 100-240V, 50/60Hz, 1A
Type of Modulation	GFSK, $\pi/4$ DQPSK, 8DPSK
Channel Number	BDR & EDR mode: 79 channels
Channel Separation	BDR & EDR mode: 1MHz
Wireless Technology	Bluetooth 5.3
Antenna Type	PIFA Type
Max. Antenna Gain	-0.29 dBi
Max. declared Power	10dBm (10mW)
Main IC function	U3 is Bluetooth module and the Bluetooth chip is BES2600

Frequency Hopping System

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

This device was tested with an Bluetooth system receiver to check that the device maintained hopping synchronization, and the device complied with these requirements for DA 00-705 and FCC Part 15.247 rule.

EUT Pseudorandom Frequency Hopping Sequence

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 33, 04, 21, 44, 23, 42, 53, 46, 55, 48, 40, 59, 72, 29, 76, 31, 08, 73, 07, 75, 09, 45, 60, 39, 58, 13, 47, 11, 77, 52, 35, 50, 65, 54, 67, 56, 69, 62, 71, 64, 7, 25, 27, 66, 57, 70, 74, 61, 78, 63, 10, 41, 05, 43, 15, 44, 64, 68, 02, 70, 06, 01, 51, 03, 55, 05, 03, 66, 53, 49, 36, 47, etc.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.