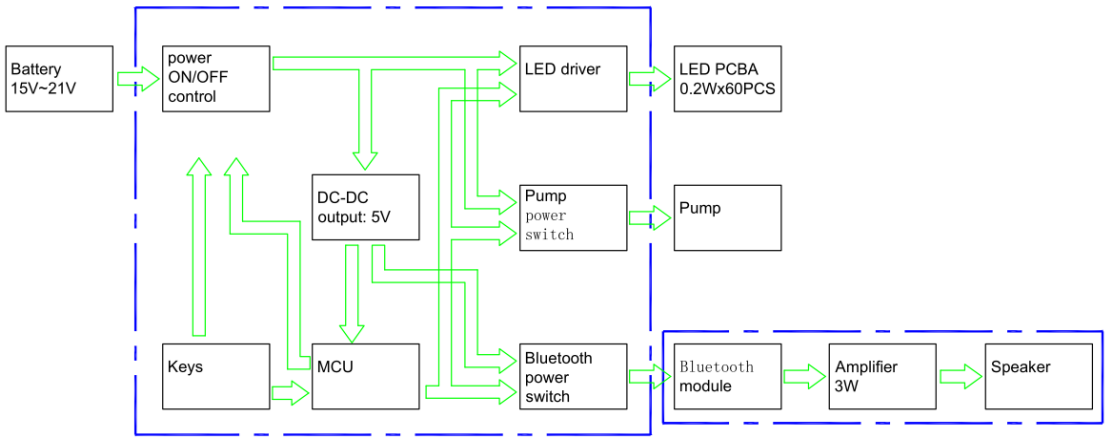
Operating Description

The Bluetooth module used a Blue Core® CSR8605™ QFN is a product from CSR's Connectivity Centre. It is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems including basic rate, EDR to 3Mbps and Bluetooth low energy. The low-cost QFN package and integrated peripherals reduce the number of external components required, including no requirement for external codec, battery charger, SMPS, LDOs, balun or external program memory, ensuring minimum system and production costs. The battery charger architecture enables the CSR8605 QFN to independently operate from the charger supply, ensuring dependable operation for all battery conditions.



The PM provide 3.3VDC to MCM -- CSR8605QFN, then 26MHz crystal works, MCM pin9 will send “du du du “ sound, single is sent or received though MCM pin12, MCU (csr8605) save some data to the memory. it is standby module and low power consumption, when other Bluetooth device find the name “Arctic Cove Misting Tower” and pair with it, it will send “bee bee bee” to indicate after pairing, then can play music and control by that Bluetooth device such as smart phone.

MCU controls a Mosfet to power ON or OFF pump, the voltage of battery is DC15-18V for this.

the voltage of battery is DC15-18V, MCU to control LED driver with PWM according to VR resistance, LED driver provide a constant current to light LED

Frequency Hopping System Requirements

Standard Applicable

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule. 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 channels (1 MHz each; from 2402 to 2480MHz) in the range 2,400-2,483.5MHz. 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:

49	13	17	51	55	19	23	53
57	21	25	27	31	74	78	29
33	76	1	35	39	3	7	37
41	5	9	43	47	11	15	45
49	13	17	51	55	19	23	53
57	21	25	27	31	74	78	29
33	76	1	35	39	3	7	37
41	5	9	43	47	11	15	45	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.