

## **2.4GHz RF module**

### **Working Principle Description**

1. It is a 2.4GHz RF module. It works at the frequency of ISM Band (2.4GHz) by Direct Sequence based on the IEEE802.15.4 standard. There are up to 16 channels. Operation frequency range 2405MHz to 2480MHz, and the frequency interval between each channel is 5MHz.
2. Transmit power is 1.2mW/MHz typical.
3. The module with host function is called a coordinator, and the module with terminal function is called an end device.

#### **The working procedures are:**

- a) When power on, the coordinator will do channel seeking to certain to a certain sequence, and then send the connection command.
- b) If there is a end device response, the HOST will judge whether it can be permitted to connect.
- c) It can be permitted to connect, then send the connection command to build up the connection.
- d) The coordinator and end devices transmit and receive data according to the polling protocol.
- e) The ad-hoc multi-hop communication becomes possible by arranging two or more coordinators in the same network.

#### **Operation**

1. 2.4GHz RF modules incorporates a Transceiver IC, a MCU, a PCB Trace Antenna and Board-to-Board Connector.
2. The MCU controls the Transceiver IC.
3. The RF modules is connected to the Board-to-Board Connector connects the module with other equipment. Moreover, the power supply to the module through this connector. is supplied.
4. This antenna is PCB antenna. The antenna gain of the small mono-pole type is +2.7dBi, and the antenna gain of the omni-directional radiation type is +1.4dBi.
5. It delivers about 100m of peer-to-peer range (under the outdoor range) and a larger range using ZigBee®/mesh or Ad-hoc topologies.