

2.1033 (4) : Description of Circuit Functions For DF1

Power

The DF1 device operates by coincell battery, CR2032. The operating voltage of the main IC is 2.0Volts, and the power is supplied solely by the 3.3V DC coincell. No external power source is needed. The device is entirely battery operated and meant to be portable.

(http://en.wikipedia.org/wiki/CR2032_battery)

Radio

The main IC is Texas Instruments CC2541, which includes the Bluetooth Low Energy radio component. The radio modulation is done within the IC - the radio signal goes through the bandpass filter component, and then to the chip antenna. The CC2541 operates according to the bluetooth low energy specifications. No alterations or modifications have been made to the IC. The CC2541 is used as supplied by TI.

(<http://www.ti.com/product/cc2541>)

Antenna

The DF1 device includes a monopole chip antenna inside the enclosure.

This antenna is designed to work with bluetooth devices and is commonly used by devices using 2.4GHz frequency band for radio.

(http://www.antennafactor.com/documents/ANT-xxx-CHP-x_Data_Guide.pdf)

Ground Plane

The PCB is double sided, and both sides contain the ground plane. The ground plane not only serves for electrical ground against the battery, but also as a counterpoise for the monopole chip antenna.

Operation

There is no physical on/off switch on the device. The DF1 device relies entirely on remote control via bluetooth low energy protocols. The user interacts with the device using bluetooth capable devices such as iPhone, tablets, or PC's.

