

## **Model: NC2500**

### **Circuit Description**

AA/AAA CHARGE system consist of power supply unit, charge conversion unit, input/ output data transmission control unit, logic control processing unit and wireless data transmission unit.

The voltage transform form DC 12V into DC 5V/1A for USB output, LM7805 stabilizer for LCM, AZ431 for 2.5V reference voltage source and LM317 3.3V for CPU and BT module.

Its charge conversion unit , the use of independent Quad charging control loop , the constant current charge- discharge control of the nickel-hydrogen battery , and controlled by a signal received from the logic control unit for input and output data transfer control unit to provide a basis for the voltage , current, analog signal.

Wireless data transmission unit for the the Bluetooth transmission mode, by the IBT-02 MODULE . Identification data from the logic control unit , and data processing , wireless control of the output to the smart phone display communication .

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## **iBT-02 operation description**

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### **iBT-02 Architecture**

The iBT-02 is a Class 2 Bluetooth module supporting Bluetooth V2.1 specification. It is implemented by using the CSR BlueCore4-External chip. iBT-02 is designed to interface with iOS or Android devices for data transfer applications. A simple I2C based protocol (iBridge protocol) or UART based AT command protocol can be used to interface with an external accessory. The iBT-02 interfaces to 8Mbit external Flash memory. When used with the CSR Bluetooth software stack, it provides a fully compliant Bluetooth system to v2.1 of the specification for data communications. The working frequency is 2402~2480MHz and divided into 79 channels with 1MHz per channel. The master crystal frequency is 26MHz. The BlueCore4-Ext is a single chip radio and baseband IC for Bluetooth 2.4G system.

X'TAL: Generate 26MHz system clock.

BALUN: 2.4GHz Balun, the unbalanced signal to balanced signal.

BPF: 2.4GHz Bandpass filter

FLASH: It used to save the firmware.

This Bluetooth module is regulated to Bluetooth V2.1. and set from 2402.00MHz to 2480.00MHz. The separation is 1.0MHz and there are 79 channels in total. The working procedures are:

- a. When power on, this device will loop scan the whole frequency until a connection command from the partner is received.
- b. This device transmits a response signal.
- c. The partner receives the response signal and recognizes it, then send a connection command to establish the connection.
- d. each frequency is used equally on the average by each transmitter that each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event.
- e. After the connection establish successfully, the data transmission is beginning. At the same time, the partner and this device will shift frequencies in synchronization per a same pseudo randomly ordered list of hopping frequencies, the hopping rate is 1600 times per second. This device conform to the criteria in FCC Public Notice DA00-705.
- f. The bandwidth of the this device, which is set to a fixed width by the software, match the hopping channel bandwidth of their corresponding partner. This device is a true frequency hopping system and does not have the capability to be coordinated with other FHSS systems in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

There are 79 channels in total. The channels hopping from one channel to another channel during the pseudorandom selection process. The hopping interval is 12 millisecond. This system frequency hops between 79 channels. If it is determined that one of the 79 hopping channels is found to be noisy or poor due to other RF interference, then a new channel is selected from the 78 unused channels and the one noisy channel is released to the unused group. This repeats whenever a noisy or poor channel is detected. For example, for the hop pattern of 2414MHz,2434MHz,2444MHz,2434MHz,2451MHz,2441MHz,2454MHz,2434MHz,2427MHz,2461MHz,2461MHz,2444MHz,2414MHz,2448MHz,2451MHz,2417MHz,2478MHz,2469MHz,2473MHz,2403MHz,etc. The sequential hops can not follow any order, is completely random.