**Operation Description**

**Purpose:** This product is the Bluetooth carrier board that connects with a Titan Headset via K-cord adding a wireless feature to the headphones so that they can pair with any smart phone for audio and PTT transmission.

**Working Principle:** The board consists of the following components: an attiny microcontroller, a Bluetooth&BLE module, 800mA/3.7V lithium polymer battery, USB debug/charging circuit, the user button, the user LED, the user connection pads to connect K-cord headset.

When the power is off, press the user button once to turn the board on.

Holding down the button for 2 seconds turns the board off.

LED’s status

1. while charging, RED color is ON

2. while full charged, GREEN color is ON

3. while discharged below 10%, RED color blinks 20 times quickly

4. while connected to phone, BLUE is ON

5. when disconnected to phone, white is ON

6. If using YouTube app, PINK color is ON

7. If using any PTT app, BLUE color is ON

* switching between YouTube and PTT app can be done by a quick single click of the user button.
* The board receives the microphone signal and PTT event of K-cord headset and sends them to the smart device and receives the audio signal from the smart device and sends it back to the K-cord headset.
* This board supports quite good sound quality with less interference using the specific noise-cancelling technology.

**Technical Characteristics:**

* 16-bit Stereo DAC with headphone amplifier, SNR >= 95dB
* Bluetooth 5.0, support HFP/A2 DP/AVRCP/HSP/ GAVDP/IoP/SPP/BLE with around 240m
* The frequency is 2.44G
* The frequency band is 0.08G
* The modulation: GFSK (Gaussian Frequency Shift Keying)
* The antenna type: PCB trace antenna
* Number of antennas: 1

**Specifications**

* Power Supply: 3V~5V
* 3.7V lithium polymer Rechargeable battery
* 25h battery Life
* Operating Current: 31mA
* Bluetooth: 5.0
* Answer Phone calls
* Quality Stereo Sound
* Patent Pending Design
* Operating Humidity range: 5%RH~95%RH
* Operating Temperature Range: -40℃~80℃
* Dimension: 55 x 35mm

**Block Diagram**

**Crystal Oscillator frequency**: 24 MHz

**Principle:** This Bluetooth module features Bluetooth/U-disk/TF-card playback, and Bluetooth call function, supporting simple and clear serial port control function, BLE pass-through, and SPP pass-through functions. The highlight of this module is the dual-mode Bluetooth, which also means that it can run Bluetooth audio playback and data transmission at the same time, greatly reducing the development difficulty of embedded Bluetooth in other modules.

BT-401 module is a small form factor and highly economic Bluetooth radio module (class 1 or class 2) that allows us to add wireless capability to our Headset. The module supports multiple interfaces that make it simple to design into fully certified embedded Bluetooth solutions. With its AT command programming interfaces, we can easily customize our applications to support different Bluetooth profiles, such as SPP, DUN, HID, and etc. Class1 module supports Bluetooth® Enhanced Data Rate (EDR) and delivers up to 3 Mbps data rate for distances up to 240 meters with its integrated chip antenna, class 2 module supports 3Mbps data rate Transmission for distances up to 10 meters with its integrated chip antenna.

A diagram of a chip internal block diagram

Description automatically generated

**Circuit Diagram/Schematic**

To refer to the circuit diagram of the board, please refer to the following pdf.

