BK8000L

From ElectroDragon

Contents

Introduction

- This module uses the master Beken (Broadcom) is BK8000L chip module provides high-quality sound and compatibility, overall better performance.
- Bluetooth module uses driver-free way, customers just need to block access to applications, you can quickly and easily implement wireless transmission of music, enjoy wireless music fun.
- SPP supports data transmission, while supporting the key and AT serial command control, SPP and audio can be performed simultaneously.
- Can store six paired devices, the module is automatically switched back even to the last paired device. If six paired devices simultaneously open, then automatically connect to the last paired device.

Applications This module is mainly used for short distance transmission of music, you can easily and notebook computers, mobile phones, PDA and other digital production:

- Bluetooth devices connected to the product, wireless transmission of music.
- Stereo Bluetooth speakers;
- Bluetooth stereo headphones;
- Bluetooth phone;
- Bluetooth control and multimedia equipment;
- Bluetooth SPP serial data transmission.

Basic Features

- Bluetooth v2.1 + EDR,
- A2DP v1.2,

- AVRCP v1.0,
- HFP v1.5,
- GAVDP1.2,
- HSP1.2,
- IOP。

Specifications

- Model EB8000
- Bluetooth specification Bluetooth V2.1
- Supply voltage DC2.8-4.2V, ≤2.9V automatic shutdown, ≤3.1V alarm
- Bluetooth protocol HFPV1.5, A2DPV1.2, AVRCPV1.4, HSP1.2, GAVDP1.2, IOP
- Working current ≤60mA
- Standby current <500uA
- Temperature range -40ºC ~ + 85ºC
- Wireless transmission range ≤10 meters
- Transmission power Class2 4dbm
- Sensitivity -80dBm <0.1% BER
- Frequency Range 2.4GHz ~ 2.480GHz
- External Interface Serial (TTL), connected to the PC need MAX232
- SBC decoding audio performance
- Module size 25x13.5x1.8mm
- Adapter plate size 31x25mm

Pin definitions, Dimension
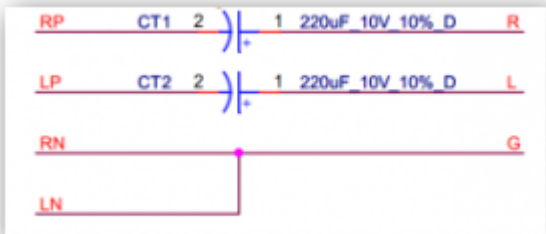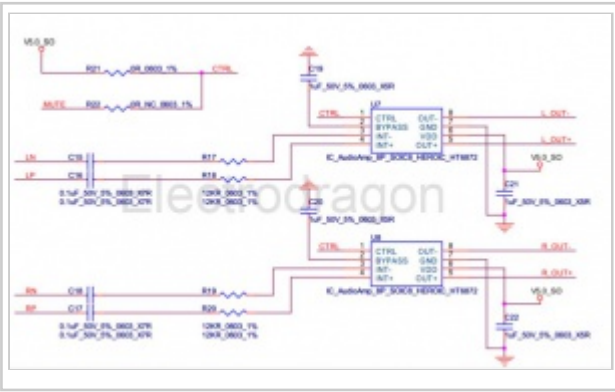
Name Number IO IO IO Description

- 1 GND ground antenna _GND
- 2 ANT antenna (default built-in antenna, external disconnect)
- 3 GND ground antenna _GND
- 4 VOL + (TMS) volume up (programming interface)
- 5 VOL- (TCK) Volume down (programming interface)
- 6 NEXT (TDO) under a (programming interface)
- 7 PREV on (TDI) song (programming interface)
- 8 RSTN low reset (programming interface)
- 9 MBISTEN Memory bit check
- 10 TX (GPIO0) serial TX
- 11 RX (GPIO1) serial RX
- 12 PP / CALL (GPIO2) Play / Pause / receive calls / back / re-pair
- 13 LED0 (GPIO3) status indicator
- 14 LED1 (GPIO4) status indicator
- 15 MUTE (GPIO5) Mute control
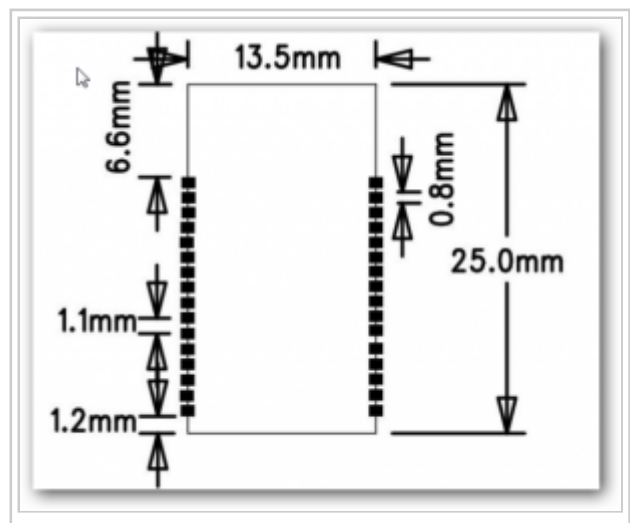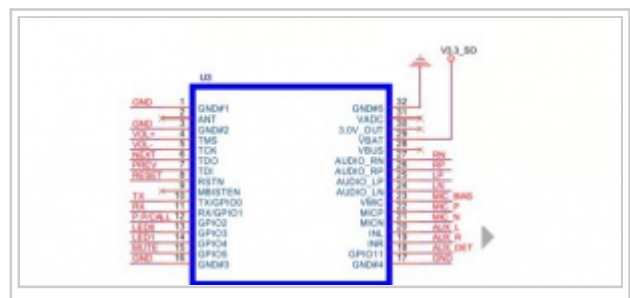
(mute low)
- 16 GND Power ground
- 17 AGND AUX ground
- 18 AUX_DET (GPIO11) AUX insertion detection
- 19 AUX_R AUX right input
- 20 AUX_L AUX left input
- 21 MIC_N microphone negative terminal
- 22 MIC_P microphone positive terminal
- 23 VMIC Mike bias voltage
- 24 LN Audio left channel differential output negative end
- 25 LP audio left channel positive differential output terminal
- 26 RP audio right channel positive differential output terminal
- 27 RN audio right channel negative differential output terminal
- 28 VBUS 5V input charging port (charging is not enabled)
- 29 VBAT power input (2.8 ~ 4.2V)
- 30 3V0 3V output
- 31 ADC ADC input (not enabled)
- 32 GND Power ground

Circuite Design

Function	Description	
Power supply		* VCC voltage range (3.3 supply, use AMS1117 is batteries, lithium guaran ■ Lithium battery-pov Because the genera ■ Recommendations with the capacitor 1 ■ As shown above cor or a computer ident without password a
LRG three wires	 	■ Not recommandded example PAM8403 a current noise. But i still can work ■ When a three-wire, noise and improve s ■ When using three li ■ The default setting ■ Three-wire method ■ Output to 3.5mm he
Differential four wires		Differential four wires: ■ Auto enable on CTR ■ when 5V VCC, spea ■ C21, C22 keep clos ■ Module control chip control, welding R2 ■ Recommendations f is when play a song considered to be mt discontinuities stop
Button Function		

Function	Description

Serial port

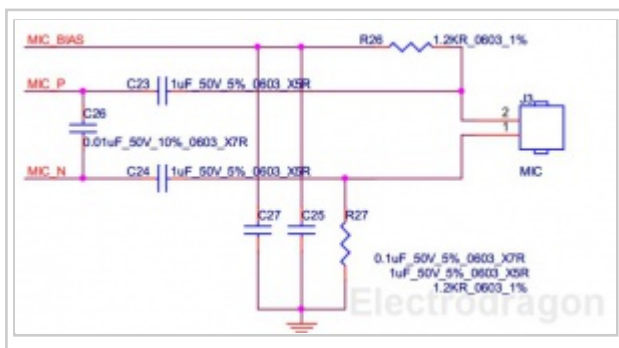9600 , N , 8 , 1 /r/n : carriage return or 0x0D, 0x0A
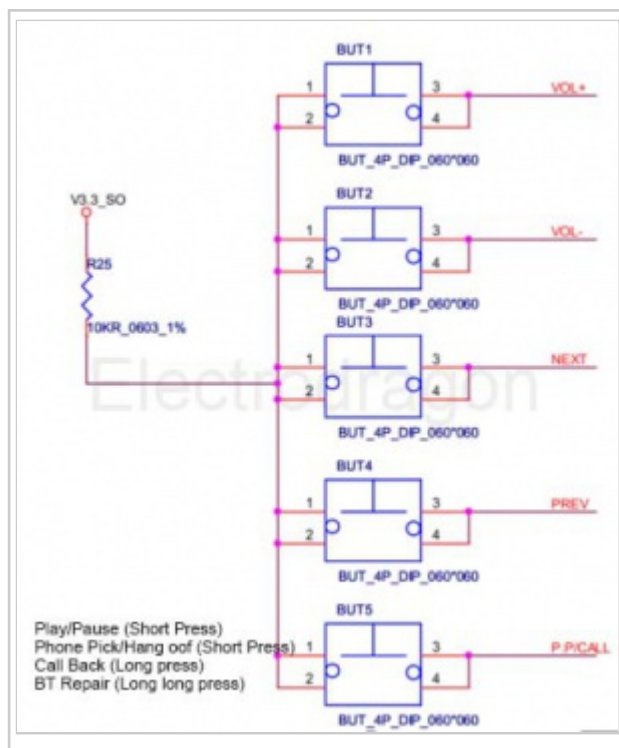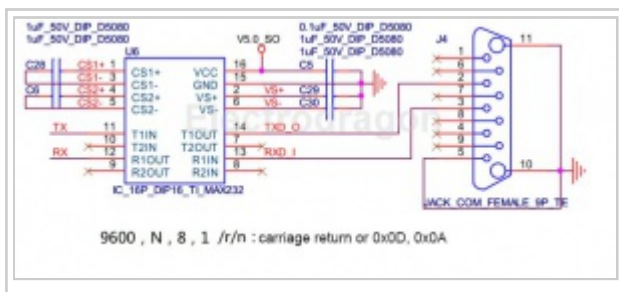
* would be best to use M

* Note that the baud rate, 9600
* Note instruction bottom line
* If the serial port connection

Status LED
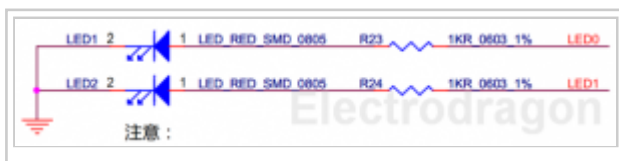
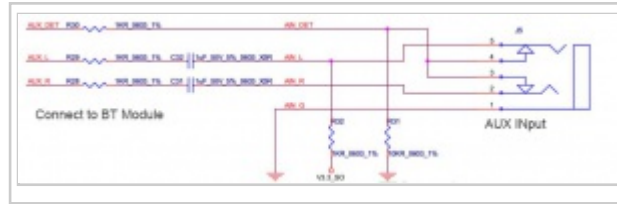* Before pairing, the two

  ▪ After pairing, LED1

MIC input

* Be aware of the MIC se
MIC has polarity

  ▪ IF the mic has too l

AUX input

* When AUX_DET is low
will done the automatica

Function	Description

AT Commands

- **See the demo wiring video here (https://web.archive.org /web/20170707041427/https://www.youtube.com /watch?v=z4KTndMXxmM)**
- Other users demo video: BK8000L Bluetooth module HFP test (https://web.archive.org/web/20170707041427/https://www.youtube.com /watch?v=p5ptruefUnM)
- there are two pins on the breakout board has no mark, please notice
- Use external power source 3.6V on Vbat and gnd, wiring CH340G to RX-TX, TX-RX and GND-GND.
- Logic level of uart is 3V3! not 5V
- All the at commands end up with \r\n (new line)

Basic Controll

Serial instruction Parameter Description Example

- CA enters pairing AT + CA \r\n
- CB exit pairing AT + CB \r\n
- CC last paired device to connect AT + CC \r\n
- CD disconnected AT + CD \r\n
- CE incoming call AT + CE \r\n
- CF reject calls AT + CF \r\n
- CG hang AT + CG \r\n
- CH Redial AT + CH \r\n
- CK volume plus AT + CK \r\n
- CL volume reduction AT + CL \r\n
- CO channel switching AT + CO \r\n
- CW reserved.
- CX reserved.
- CZ clear memory AT + CZ \r\n
- CP off AT + CP \r\n
- CV Open Mobile VOICE AT + CV \r\n
- CM multi-language switching AT + CM \r\n
- CMM <number> :(0-4) to set the number of multi-lingual AT + CMM4 \r\n
- CT test mode AT + CT \r\n
- MA Music Play / Pause AT + MA \r\n
- MC music stops AT + MC \r\n
- MD at an AT + MD \r\n
- ME on an AT + ME \r\n

- Fast forward MF AT + MF \r\n
- MH rewind AT + MH \r\n

Inquiry

Bluetooth serial command Description Example return information

- ERR error ERR \r\n
- OK control command recognition is complete OK \r\n
- MR inquiry Bluetooth address AT + MR \r\n AD: 111111111111 \r\n
- MP PIN code query AT + MP \r\n PN: 0000 \r\n
- MN Bluetooth name query AT + MN \r\n NA: EB8000L \r\n
- MQ query software version AT + MQ \r\n XZX-V1.2 \r\n
- MO Discover Bluetooth connection status AT + MO \r\n

```
connection success: "C1 \r\n"
No connection: "C0 \r\n"
```

- MV inquiry Bluetooth playback status AT + MV \r\n

```
Play: "MB \r\n"
Pause: "MA \r\n"
Disconnect: "M0 \r\n"
```

- MY inquiry Bluetooth HFP status AT + MY \r\n Disconnect: "M0 \r\n"

```
Connection: "M1 \r\n"
Caller: "M2 \r\n"
Outgoing: "M3 \r\n"
Call: "M4 \r\n"
```

Feedback Send from Module

- II connection succeeds \r\n
- IA Disconnect \r\n
- MA Pause: MA \r\n
- MB   Play: MB \r\n
- IR- <Number> call number IR-136XXXXXXX
- PR- <Number> Outgoing number PR-136XXXXXXX
- ON Bluetooth is turned ON \r\n

SPP Commands

Note:

1. Make sure module paied with your device (phone)
2. Use BlueSPP app from Google play, make sure BlueSPP is connected
3. Run following commands.

Commands:

- APT + SPPXXXX four-digit password (8888),

```
Open SPP by using password
e.g. APT + SPPXXXX \r\n as long as the hair once,
The password is correct: OK \r\n
Password Error: ERR \r\n
```

- APT + XXXXXXX total data length of each time send/receive, it recommended not to exceed 64byte

```
e.g. APT + XXXXXX \r\n
The data sent to the mobile phone side
Success: OK \r\n
Error: ERR \r\n
```
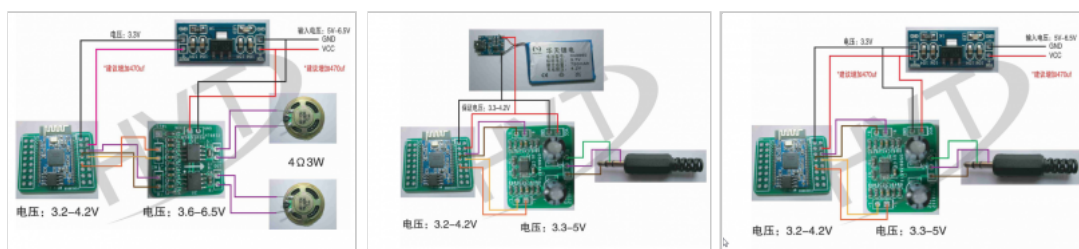
- APR + XXXXXXX total data length of each time send/receive, it recommended not to exceed 64byte

```
e.g. APR + XXXXXX \r\n
Data received from the mobile terminal
Data sent over the phone
APR + XXXXXX \r\n
```
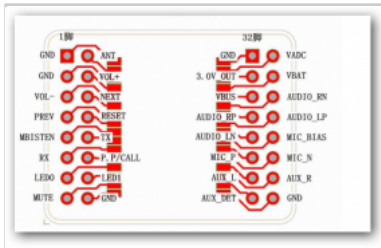
Basic Application Circuit
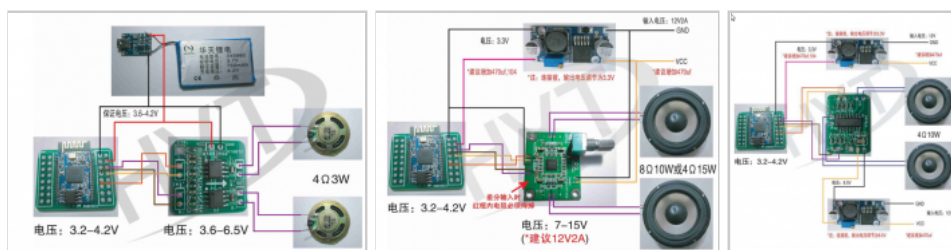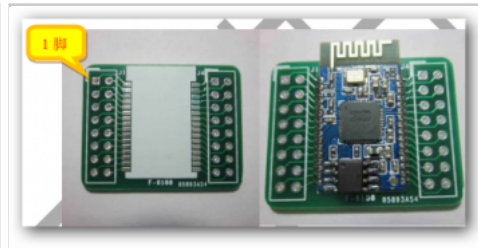

Dual output,
HT6872

Output LRG

Convert board

pin definition

Breakout board

Design Note

1. Module application process, please pay attention to avoid the impact of interference sources amplifier, boost lines, etc. on the module, the module power supply circuit to avoid the formation of a series circuit with the power circuit unit, in order to improve overall SNR.
2. About wireless Bluetooth environment, including Bluetooth wireless signals are greatly affected by the surrounding environment, such as trees, metal and other obstructions the wireless signal will have some absorption, so in practical applications, distance data transmission by certain influences.
3. Since Bluetooth module should be supporting existing systems, placed in the housing. Since the metal casing of the radio frequency signals are shielded effect. It is not recommended to be installed in a metal housing.
4. PCB layout: the antenna is part of the Bluetooth module PCB antenna, since the metal will weaken the function of the antenna, in layout to the module when the module antenna to the following non-paved and traces, if hollowed out better.
5. **Amplifier LM386, PAM8403, etc need isolated ground, otherwise will have a lot noise. Recomandded HT6782**

Suitable Amplifier

- Earphone - SGM4812 (132mw)
- HT6872 (4ohm 3W)
- HT8696 (4ohm 10W)
- PAM8610 (8ohm 10W&4ohm 15W)

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