

## 1. Summary

ZEN-BDM89 Bluetooth module provides an integrated solution for delivering high quality stereo audio. On the module, a low power consumption Bluetooth SoC – BK3260N is employed, and the chip offers the module Bluetooth version 4.2 EDR stack and application profiles. So the module can be used for both control and multimedia hybrid applications.

## 2. Applications

The module is good for audio and small data communication in short distance.

- ※ Wireless stereo speakers and head sets
- ※ Remote control for media player
- ※ Smart phone streaming
- ※ Wireless audio transmitters
- ※ Wireless audio docking station for smartphones

## 3. Features

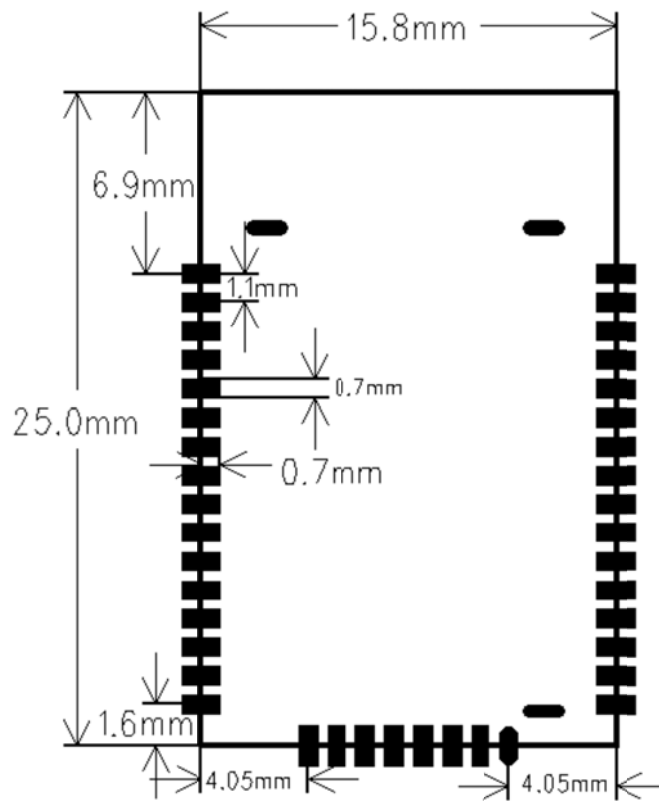
Bluetooth Profiles

- ※ Bluetooth V4.2 specification support
- ※ A2DP V1.2
- ※ AVCTP V1.4
- ※ AVDTP V1.2
- ※ AVRCP V1.5
- ※ GAVDP V1.2
- ※ HFP V1.5
- ※ HSP V1.2

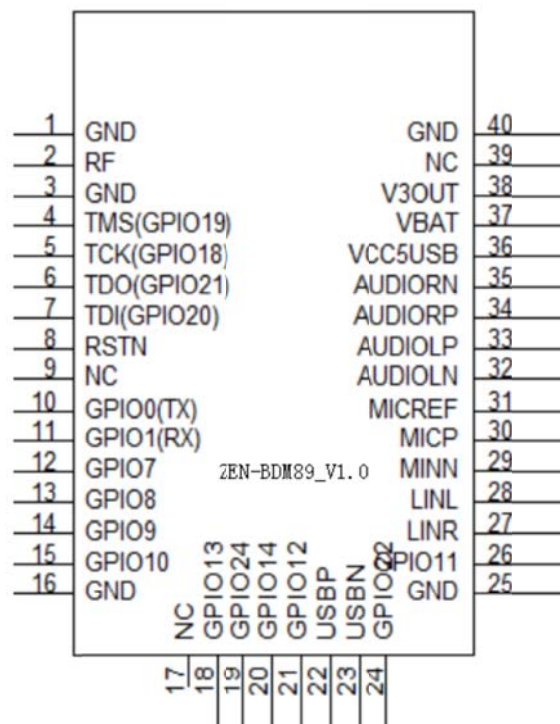
## 4. Parameters

|                         |                                                                             |
|-------------------------|-----------------------------------------------------------------------------|
| Model                   | ZEN-BDM89                                                                   |
| Version                 | Bluetooth V4.2                                                              |
| Operation voltage       | DC3.3-4.2V                                                                  |
| Bluetooth profiles      | A2DP V1.2, AVCTP V1.4, AVDTP V1.2, AVRCP V1.5, GAVDP V1.2, HFPV1.5,HSP V1.2 |
| Operation current       | ≤20mA                                                                       |
| Standby Current         | <10uA                                                                       |
| Work temperature        | -40°C to +80°C                                                              |
| Wireless range          | ≥10 米                                                                       |
| Transmission power      | CLASS2, 4dbm                                                                |
| Sensitivity             | -80dBm<0.1%BER                                                              |
| Frequency               | 2.402GHz-2.480GHz                                                           |
| Communication interface | UART                                                                        |
| Audio decoding          | SBC                                                                         |
| Audio SNR               | ≥75dB                                                                       |
| Module size             | 25×15.8×2.8mm (thickness 2.8mm, including mask)                             |

## 5. Module size for PCB



## 6. Module pin assignment



## 7. Module pin description

| <i>Pin</i> | <i>Name</i> | <i>I/O</i>   | <i>Description</i>                  |
|------------|-------------|--------------|-------------------------------------|
| 1          | GND         | GND          | RF_GND                              |
| 2          | RF          | RF           | RF                                  |
| 3          | GND         | GND          | RF_GND                              |
| 4          | TMS(GPIO19) | Digital I/O  | JTAG pin, key input for voice UP    |
| 5          | TCK(GPIO18) | Digital I/O  | JTAG pin , key input for voice DOWN |
| 6          | TDO(GPIO21) | Digital I/O  | JTAG pin , key input for NEXT       |
| 7          | TDI(GPIO20) | Digital I/O  | JTAG pin , key input for PREVIOUS   |
| 8          | RSTN        | Digital I/O  | JTAG pin / Reset pin , low active   |
| 9          | NC          | NC           | NC                                  |
| 10         | GPIO0(TX)   | Digital I/O  | UART TX                             |
| 11         | GPIO1(RX)   | Digital I/O  | UART RX                             |
| 12         | GPIO7       | Digital I/O  | GPIO7 , key input for PLAY/PAUSE    |
| 13         | GPIO8       | Digital I/O  | GPIO8                               |
| 14         | GPIO9       | Digital I/O  | GPIO9                               |
| 15         | GPIO10      | Digital I/O  | GPIO10, Mute, low active            |
| 16         | GND         | GND          | Ground , connect battery negative   |
| 17         | NC          | NC           | NC                                  |
| 18         | GPIO13      | Digital I/O  | GPIO13                              |
| 19         | GPIO24      | Digital I/O  | GPIO24                              |
| 20         | GPIO14      | Digital I/O  | GPIO14                              |
| 21         | GPIO12      | Digital I/O  | GPIO12                              |
| 22         | USBP        | USB          | Not used                            |
| 23         | USBN        | USB          | Not used                            |
| 24         | GPIO22      | Digital I/O  | GPIO22                              |
| 25         | GND         | GND          | GND                                 |
| 26         | GPIO11      | Digital I/O  | GPIO11                              |
| 27         | LINR        | AUX_INPUT    | LINR                                |
| 28         | LINL        | AUX_INPUT    | LINL                                |
| 29         | MICN        | MICN         | MICN                                |
| 30         | MICP        | MIC+         | MICP                                |
| 31         | MICREF      | VMIC         | MICREF                              |
| 32         | AUDIOLN     | Audio output | Left channel audio output negative  |
| 33         | AUDIOLP     | Audio output | Left channel audio output positive  |
| 34         | AUDIORP     | Audio output | Right channel audio output positive |
| 35         | AUDIORN     | Audio output | Right channel audio output negative |
| 36         | VCC5USB     | VCC5USB      | 5V input charging                   |
| 37         | VBAT        | Power supply | Power supply                        |
| 38         | VCC         | Power        | 3.3v output                         |
| 39         | NC          | NC           | NC                                  |
| 40         | GND         | GND          | GND                                 |

## 8. Control instructions by UART

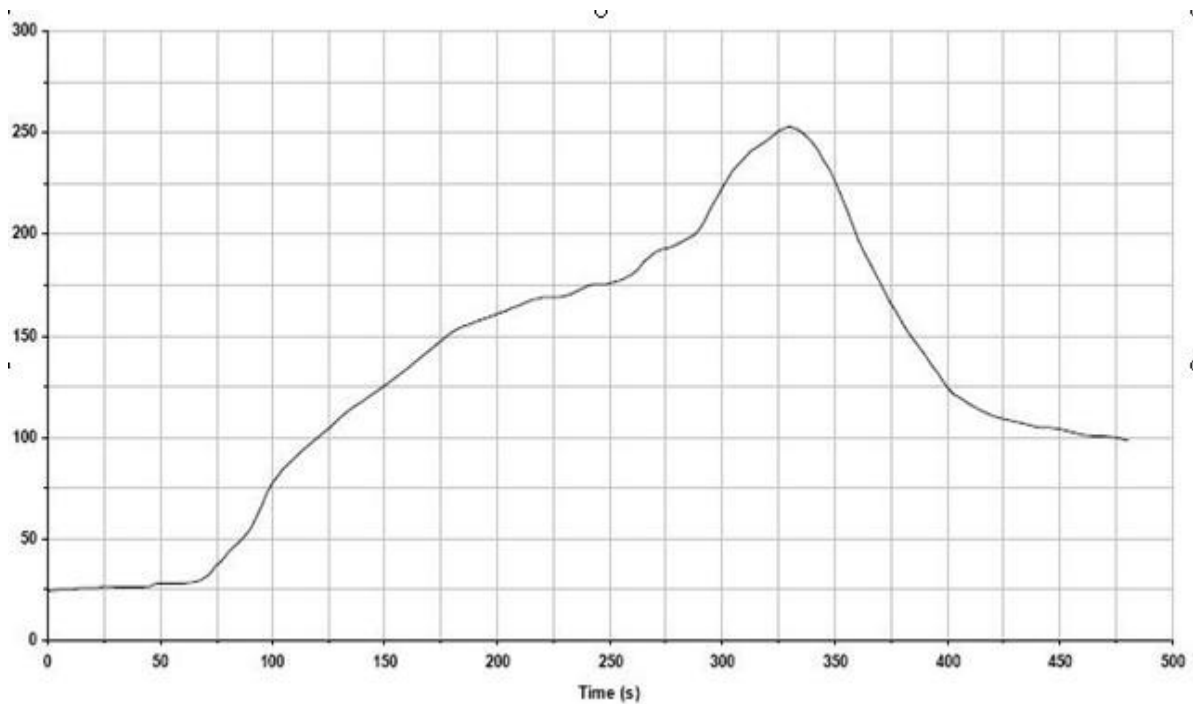
The module can be controlled by instructions input in UART

| <i>Instructions</i>    | <i>format</i>                                                                                                                                                     |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Play/pause             | AT+MA\r\n                                                                                                                                                         |
| Stop                   | AT+MC\r\n                                                                                                                                                         |
| Next                   | AT+MD\r\n                                                                                                                                                         |
| Previous               | AT+ME\r\n                                                                                                                                                         |
| Voice up               | AT+CK\r\n                                                                                                                                                         |
| Voice down             | AT+CL\r\n                                                                                                                                                         |
| Mute on                | AT+CX\r\n                                                                                                                                                         |
| Mute off               | AT+CY\r\n                                                                                                                                                         |
| Baud rate inquiry      | AT+BD\r\n                                                                                                                                                         |
| Baud rate selection    | AT+BD=01\r\n, select 9600bps<br>AT+BD=02\r\n, select 19200bps<br>AT+BD=03\r\n, select 38400bps<br>AT+BD=04\r\n, select 57600bps<br>AT+BD=05\r\n, select 115200bps |
| Change the module name | AT+NM=NAME\r\n                                                                                                                                                    |

## 9. Application note

- 1) The power amplifier and the boost circuit may disturb the module, please avoid to make any series connection with the module and any high power circuit in PCB layout, otherwise, the SNR will be decreased.
- 2) The wireless signal will be influenced by many factor. The signal can be absorbed or blocked by wood, metal, etc., so the wireless range may be shortened in different circumstance.
- 3) Especially, the metal shell is not recommended, it will block the wireless signal badly.
- 4) The module has an on board PCB antenna. Do not place any metal layer under the module PCB antenna when layout your PCB. Cutting the PCB under the module PCB antenna if possible.

## 10. Recommended reflow soldering condition



- Initial Ramp=1-2.5°C/sec to 175°C equilibrium -Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250°C)=3°C/sec Max -Time above liquids temperature(217°C): 45 - 90 seconds -
- Device absolute maximum reflow temperature: 250°C

## **FCC Warning**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## **FCC Radiation Exposure Statement:**

**Note 1:** The modular transmitter must be equipped with either a permanently affixed label or must be capable of electronically displaying its FCC identification number.

**Note 2:** If using a permanently affixed label, the modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2ANMBZEN-BDM89" or "Contains FCC ID: 2ANMBZEN-BDM89." Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization.