BTM-68D

DATA SHEET

10 June 2012

Version 2.0

SHENZHEN TTK TECHNOLOGY CO.,LTD.

1.15

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DESCRIPTION:

BTM-68D is the latest generation of bluetooth
Module. It provides highest level of integration

With integrated 2.4GHz radio, DSP, battery
Charger, stereo codec, and antenna ready.

Mono and stereo audio applications.

BTM-68D is also ready to support the latest

Bluetooth 2.1 standard and   support for secure

Simple pairing.

FEATURES:

- Plug n' Play Bluetooth Solution for mono and Stereo Audio Solutions

- Integrated DSP, Stereo Codec , and Battery Charger

- Integrated Antenna 2402-2480MHz

- Bluetooth 2.1+EDR Compliant

- Class II   Range up to 10 Meters

- Temperature range from -30C to +85C

- Low Power Consumption

- Supported Bluetooth Profiles: A2DP, AVRCP, HFP, HSP

- Supported 5-band EQ

- High-quality Audio 95dB SNR on DAC Playback

APPLICATIONS:

- High quality wireless stereo headsets

- Wireless mono headsets

- Wireless speakers

- Hands-free car kits

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REVISION HISTORY

Version	Comment	Custom	Date
1.0	Preliminary Datasheet	zuoguoqiang	07/2011
2.0	Update Antenna Datasheet	zuoguoqiang	06/2012

1.0   Block Diagram

Block Diagram deleted here. Can be found as confidential exhibit within this FCC Filing (FCC ID: WYHBTM-68D)

Figure 1:   Block diagram of   BTM-68D

- Bluetooth Version   Bluetooth v2.1+EDR
- Operating Frequency   2.4GHz-2.48GHz   ISM band
- Modulation   GFSK(Gaussian Frequency Shift Keying)
- Transmit Power   ≤4dBm, Class 2
- Sensitivity   ≤-81dBm at 0.1% BER
- Transmission rate   1.8M/S—2.1M/S
- Security features   Authentication and encryption
- Support profiles   Hands-Free Profile   v1.5 and Headset Profile   v1.0
                            Advanced Audio Distribution Profile v1.2 and
                            Audio/Video Remote Control Profile V1.0
- Power   3.3V-4.2 LI-batter
- Operating Temperature   −20 ~ +55 Centigrade
- Size   20mm x 25mm x 3mm

2.0   Electrical Characteristics

Recommended operating conditions

	Min	**Typ**	**Max**	**Unit**
Operating temperature	-20	20	70	℃
VDD_BAT	3.0	3.8	4.2	V
VDD_CHG	4.5	5	6.5	V
VDD_IO	1.7	1.8	1.95	V

Table 1:Recommended operating conditions

Battery charger

Charger Mode(BAT_P rising to 4.2V)		**Min**	**Typ**	**Max**	**Unit**
Supply current(a)		--	4.5	6	mA
Battery trickle charge current(b)		--	4	--	mA
Maximum battery fast charge current (I-CTRL = 15)(c) (d)	Headroom(e) > 0.7V	--	140	--	mA
	Headroom = 0.3V	--	120	--	mA
Minimum battery fast charge current (I-CTRL = 0)(c) (d)	Headroom > 0.7V	--	40	--	mA
	Headroom = 0.3V	--	35	--	mA

Trickle charge voltage threshold	--	2.9	--	V
Float voltage (with correct trim value set), VFLOAT (f)	4.10	4.15	4.2	V
Float voltage trim step size(f)	--	50	--	mV
Battery charge termination current, % of fast charge current	5	10	20	**%**

(a) Current into VDD_CHG does not include current delivered to battery (IVDD_CHG - IBAT_P)

(b) BAT_P < trickle charge voltage threshold

(c) Charge current can be set in 16 equally spaced steps

(d) Trickle charge threshold < BAT_P < Float voltage

(e) Where headroom = VDD_CHG - BAT_P

(f) Float voltage can be adjusted in 15 steps. Trim setting is determined in production test and must be loaded into the battery charger by firmware during boot-up sequence

Table 2: Battery charger characteristics

Reset

	Min	Typ	Max	Unit
$V_{TH,res}$ threshold voltage	0.65	0.85	1.50	V
R_{IRES} input resistance	--	220	--	KΩ
C_{IRES} input capacitance	--	220	--	nF

Table 3: Reset terminal characteristics

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The RESET pin is an active low reset and is internally filtered using the internal low frequency clock oscillator. A reset will be performed between 1.5 and 4.0ms following RESET being active. It is recommended that RESET be applied for a period greater than 5ms.BTM-68D has an internal reset circuitry ,when BTM-68D input 5V charging voltage, Module reset once.

The capacitor discharges through 220 k   resistor, which eventually deactivates the reset. Time constant of the RC circuitry is set in a way that the supply voltage is safely stabilized before the reset deactivates.
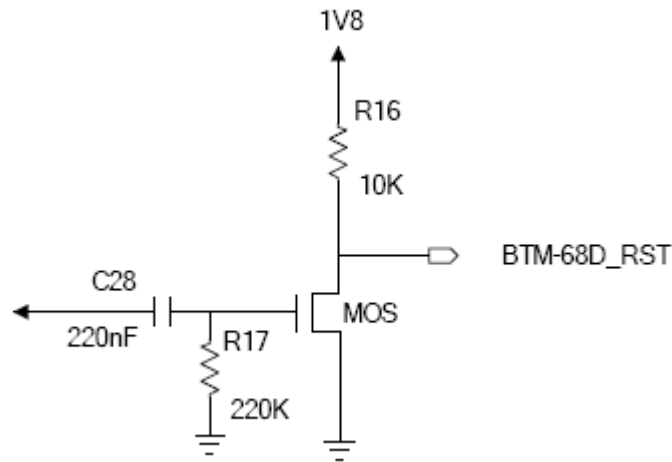

Figure 2: BTM-68D reset circuitry

MUTE

BTM-68D can output a high level to control the amplifier mute. When bluetooth normal working, Module output high level to control the amplifier open. Standby, Module output low level to control the amplifier off.
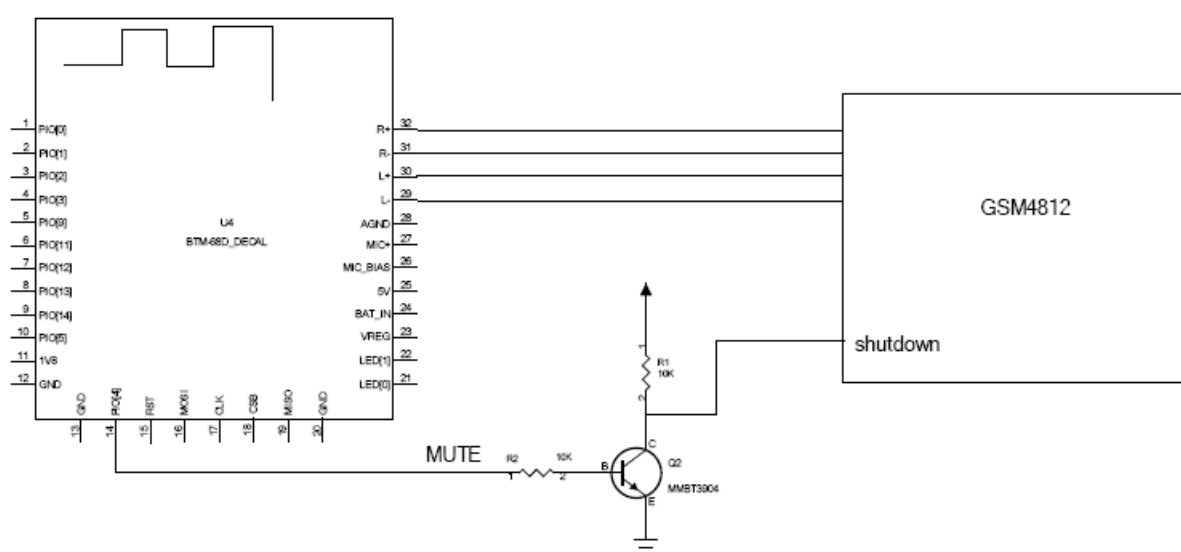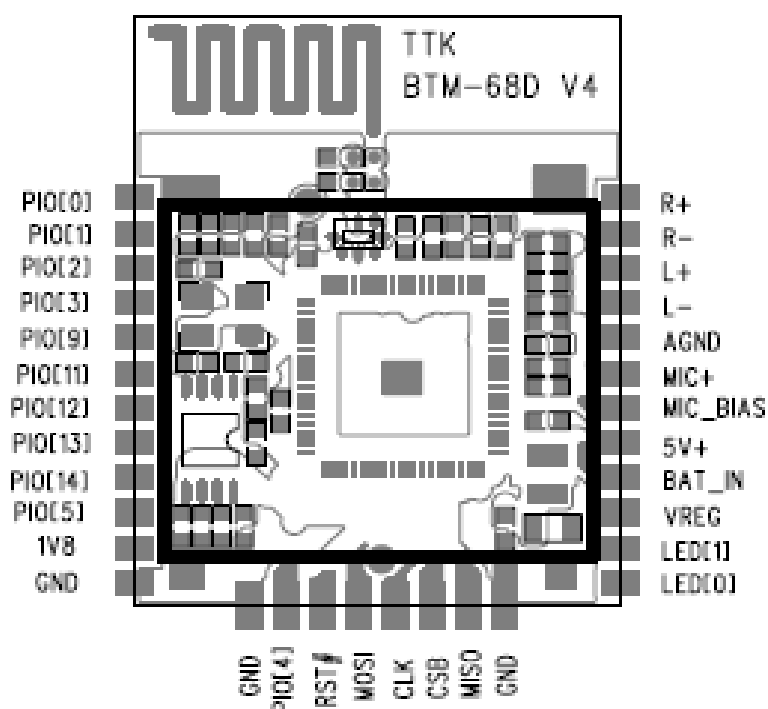

Figure 3: BTM-68D Mute contorl circuitry

3.0   Device Terminal Functions

| Lead	name	Function	Description
1	PIO[0]	PIO port	Programmable input/output line
2	PIO[1]	PIO port	Programmable input/output line
3	PIO[2]	PIO port	Programmable input/output line
4	PIO[3]	PIO port	Programmable input/output line
5	PIO[9]	PIO port	Programmable input/output line
6	PIO[11]	PIO port	Programmable input/output line
7	PIO[12]	PIO port	Programmable input/output line
8	PIO[13]	PIO port	Programmable input/output line
9	PIO[14]	PIO port	Programmable input/output line

10	PIO[5]	PIO port	Programmable input/output line
11	1V8	1.8V POWER	Positive supply for 1.8V regulated output
12	GND	GND	Ground
13	GND	GND	ground
14	PIO[4]	PIO port	Programmable input/output line
15	RST#	Reset	Logic low reset
16	MOSI	SPI interface	SPI data input
17	CLK	SPI interface	SPI Clock
18	CSB	SPI interface	Chip select for SPI
19	MISO	SPI interface	SPI data output
20	GND	GND	Ground
21	LED[0]	Status	LED driver
22	LED[1]	Status	LED driver
23	VREG	POWER ON/OFF	Moudle power on/off active high
24	BAT_IN	Power Input	Lithium ion/polymer battery positive terminal.
25	5V+	5V-charger	Lithium ion/polymer battery charger input
26	MIC_BIAS	MIC power	Microphone bias
27	MIC+	MIC input	Microphone input
28	AGND	AGND	Analogue ground
29	L-	L-	Speaker output, channel L negative
30	L+	L+	Speaker output, channel L positive
31	R-	R-	Speaker output, channel R negative
32	R+	R+	Speaker output, channel R positive

4.0   **Example Application Schematic**

Schematic deleted here. Can be found as confidential exhibit within this FCC Filing (FCC ID: WYHBTM-68D)

## 5.0   Package Dimensions
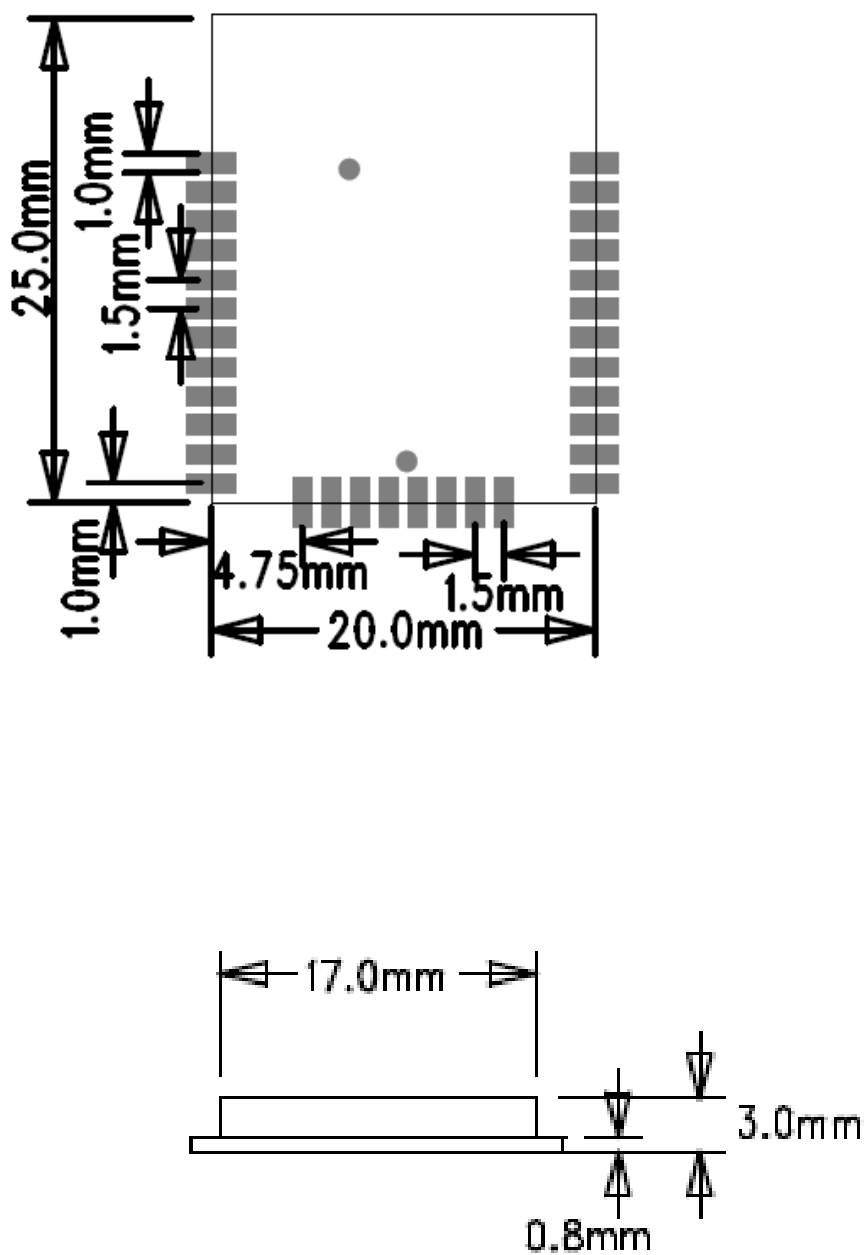
Unit: mm

6.0   Layout Guidelines

6.0.1 Audio Layout

Route audio lines as differential pairs. The positive and negative signals should run parallel and close to each other until they are converted to single-ended signals. Use dedicated audio ground plane for entire audio section.

6.0.2 Antenna Design

Do not place GND plane or any metal directly under the antenna of BTM-68D. To avoid any excess parasitic capacitance in the antenna feed line caused by the RF test pin on the bottom side of the module, the area underneath the RF test pin should also be left free from copper. Any metal in close proximity of the antenna will have an effect on the antenna performance. Thus any metal should be placed as far from the antenna as possible. The module should be placed to an edge of the PCB.
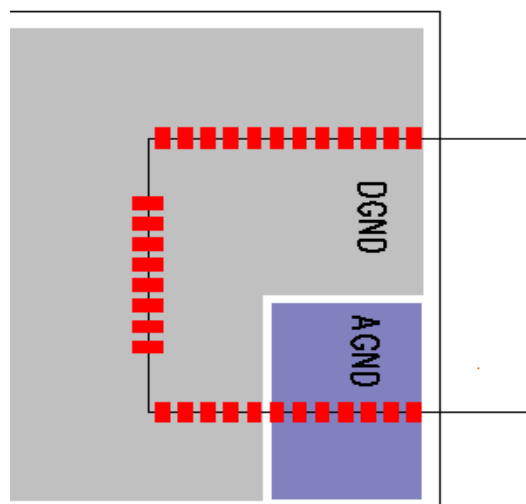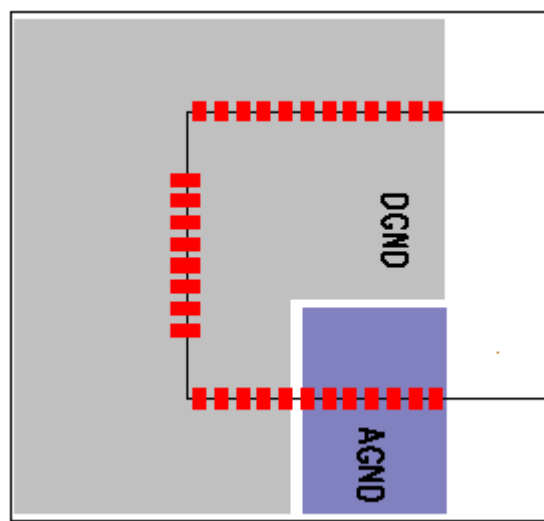
7.0   Contact Information

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