

BTM98-8AA

DATA SHEET

22 June 2012

Version 1.0

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DESCRIPTION:

BTM98-8AA 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.

BTM98-8AA is also ready to support the latest

Bluetooth 4.0 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
- Bluetooth 4.0 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

REVISION HISTORY

Version	Comment	Custom	Date
1.0	Preliminary Datasheet	zuoguoqiang	06/2012

1.0 Block Diagram

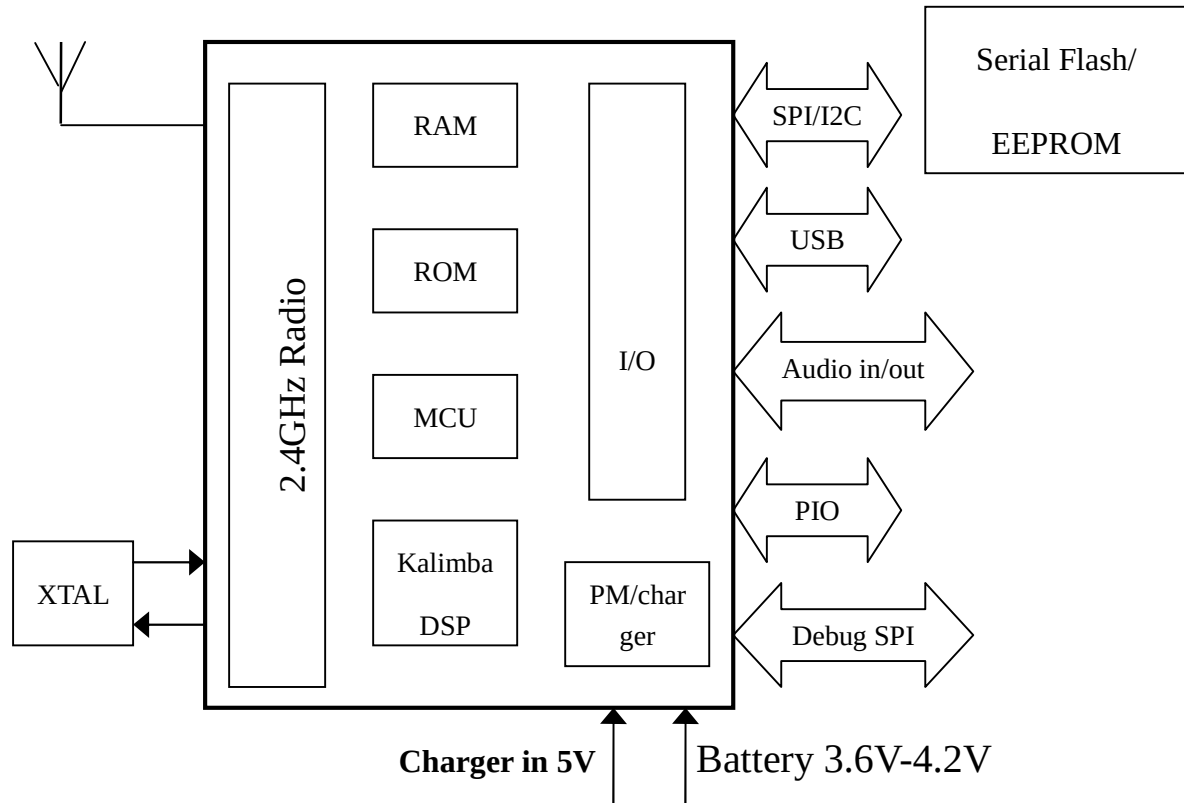


Figure 1: Block diagram of BTM98-8AA

2.0 Electrical Characteristics

Recommended operating conditions

	Min	Typ	Max	Unit
Operating temperature	-20	20	70	°C
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	--	200	--	mA
	Headroom = 0.3V	--	150	--	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	--	K Ω
C_{IRES} input capacitance	--	220	--	nF

Table 3: Reset terminal characteristics

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. BTM98-8AA has an internal reset circuitry, when BTM98-8AA 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.

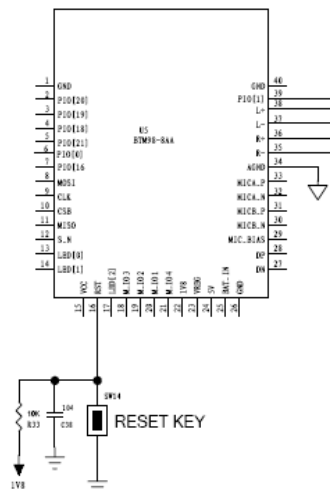


Figure 2: BTM98-8AA reset circuitry

MUTE

BTM98-8AA 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.

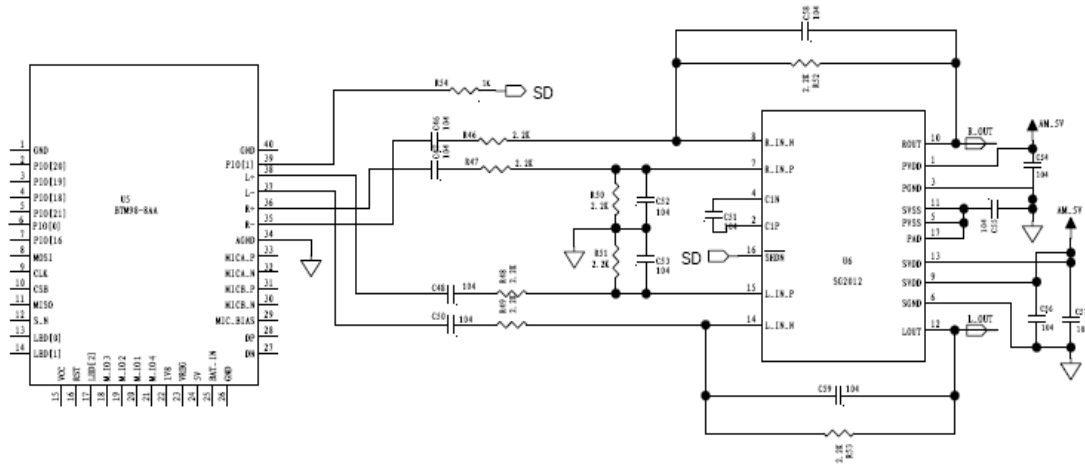
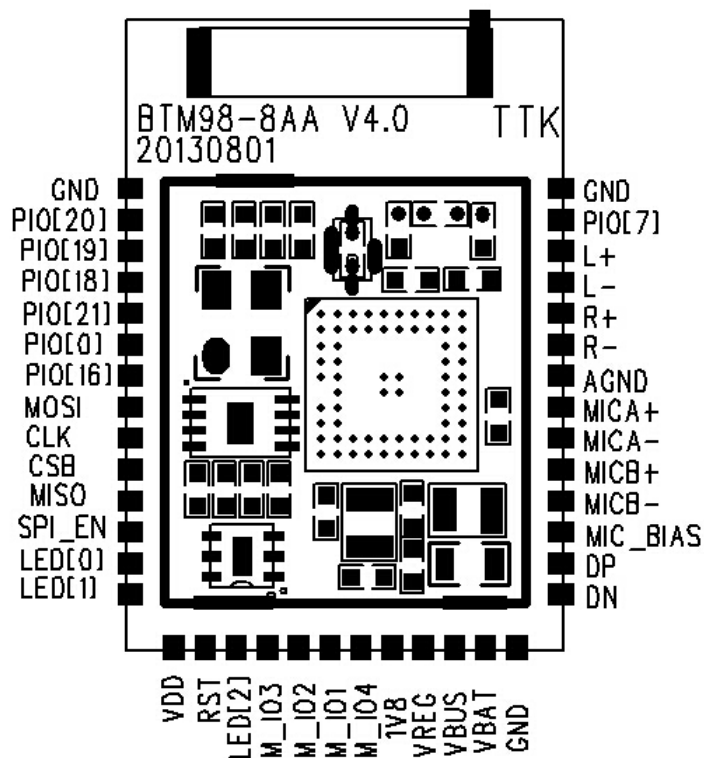


Figure 3: BTM98-8AA Mute control circuitry

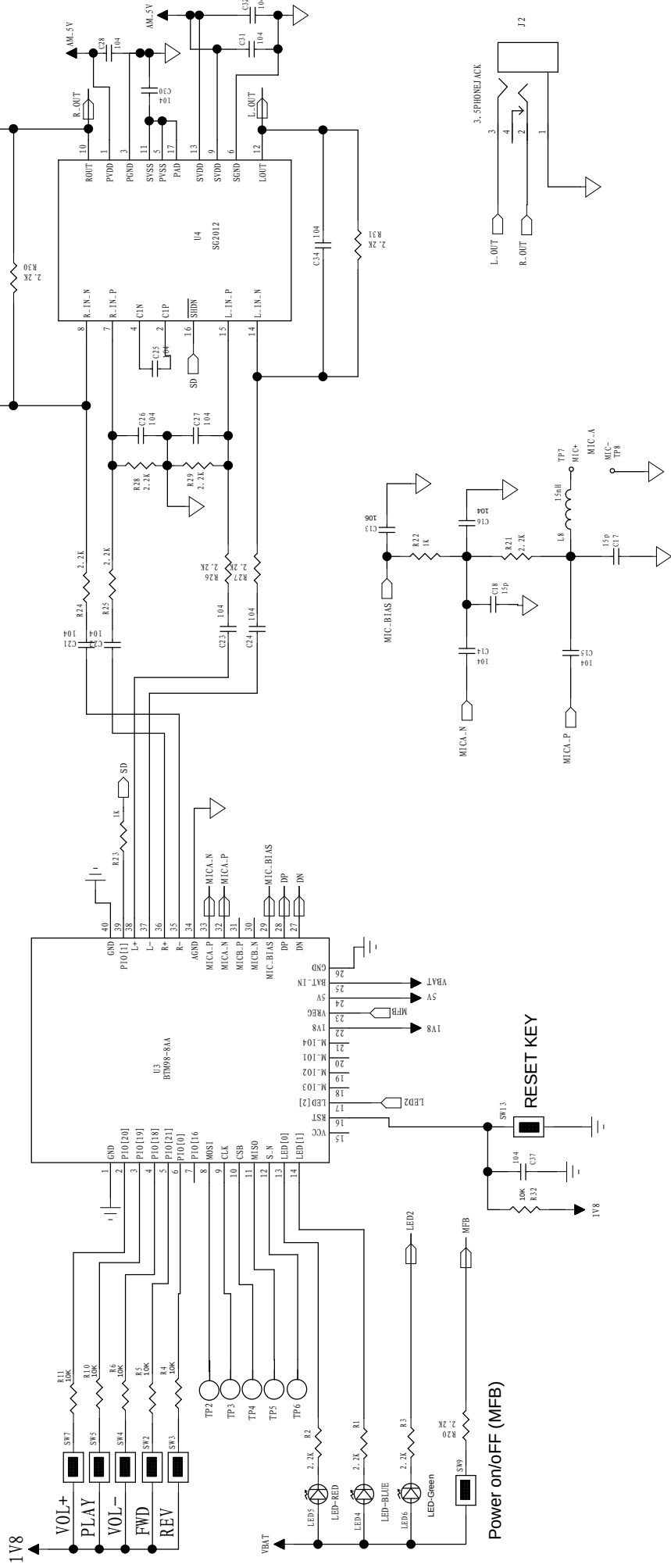
.3.Device Terminal Functions:



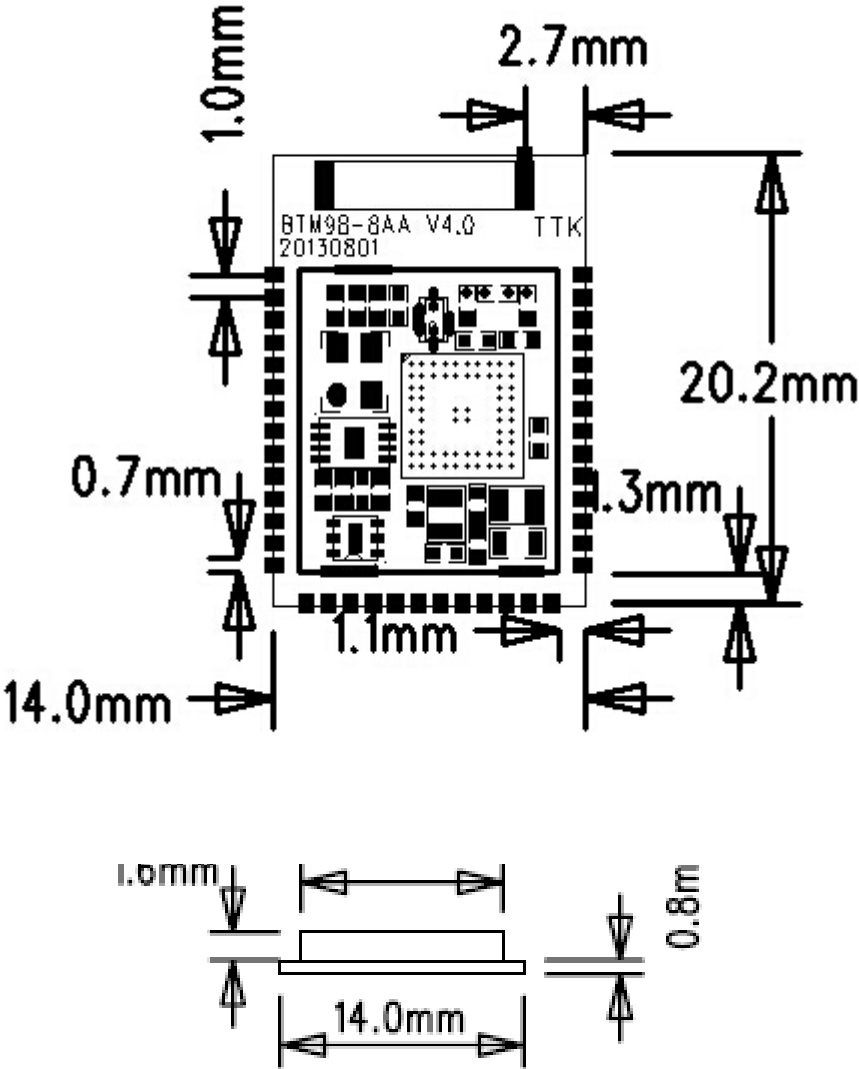
Lead	name	Function	Description
1	GND	GND	Ground
2	PIO[20]	PIO port	Programmable input/output line
3	PIO[19]	PIO port	Programmable input/output line
4	PIO[18]	PIO port	Programmable input/output line
5	PIO[21]	PIO port	Programmable input/output line
6	PIO[0]	PIO port	Programmable input/output line
7	PIO[16]	PIO port	Programmable input/output line
8	MOSI	SPI interface	SPI data input
9	CLK	SPI interface	SPI Clock
10	CSB	SPI interface	Chip select for SPI
11	MISO	SPI interface	SPI data output
12	SPI_N	NC	NC

13	LED[0]	Status	LED driver
14	LED[1]	Status	LED driver
15	VDD	VDD	NC
16	RST	Reset	Logic low reset
17	LED[2]	Status	LED driver
18	M_IO[3]	M_IO[3]	IO
19	M_IO[2]	M_IO[2]	IO
20	M_IO[1]	M_IO[1]	IO
21	M_IO[4]	M_IO[4]	IO
22	1V8	1.8V POWER	Positive supply for 1.8V regulated output
23	VREG	POWER ON/OFF	Module power on/off active high
24	5V	5V-charger	Lithium ion/polymer battery charger input
25	VBAT	Power Input	Lithium ion/polymer battery positive
26	GND	GND	Ground
27	DN	DN	USB Data negative
28	DP	DP	USB Data positive
29	MIC_BIAS	MIC power	Microphone bias
30	MICB_N	MICB_N	MIC input, channel B negative
31	MICB_P	MICB_P	MIC input, channel B positive
32	MICA_N	MICA_N	MIC input, channel A negative
33	MICA_P	MICA_P	MIC input, channel A positive
34	AGND	AGND	Analogue ground
35	R-	R-	Speaker output, channel R negative
36	R+	R+	Speaker output, channel R positive
37	L-	L-	Speaker output, channel L negative
38	L+	L+	Speaker output, channel L positive
39	PIO[1]	MUTE	Amplifier mute PIN
40	GND	GND	Ground

4.0 Example Application Schematic



5.0 Package Dimensions



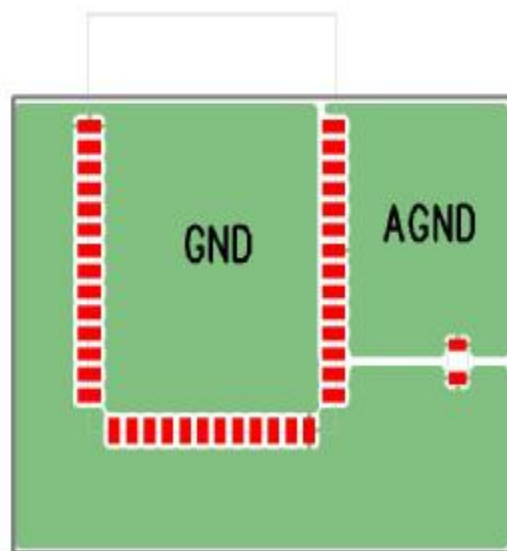
6.0 Layout Guidelines

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

FCC Important Notes:**(1)****FCC Statement**

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment 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.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. Modular could be only used in mobile or fix device, and could not be used in any portable device.

Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.

RF Exposure Statement

RF warning statement: The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

(2)**Co-location Warning:**

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

(3)**OEM integration instructions:**

This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the integral antenna(s) that has been originally tested and certified with this module.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

(4)**Validity of using the module certification:**

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

(5)

End product labeling:

The final end product must be labeled in a visible area with the following:

“Contains Transmitter Module FCC ID: 2AFZG-BTM98-8AA”.

(6)

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.