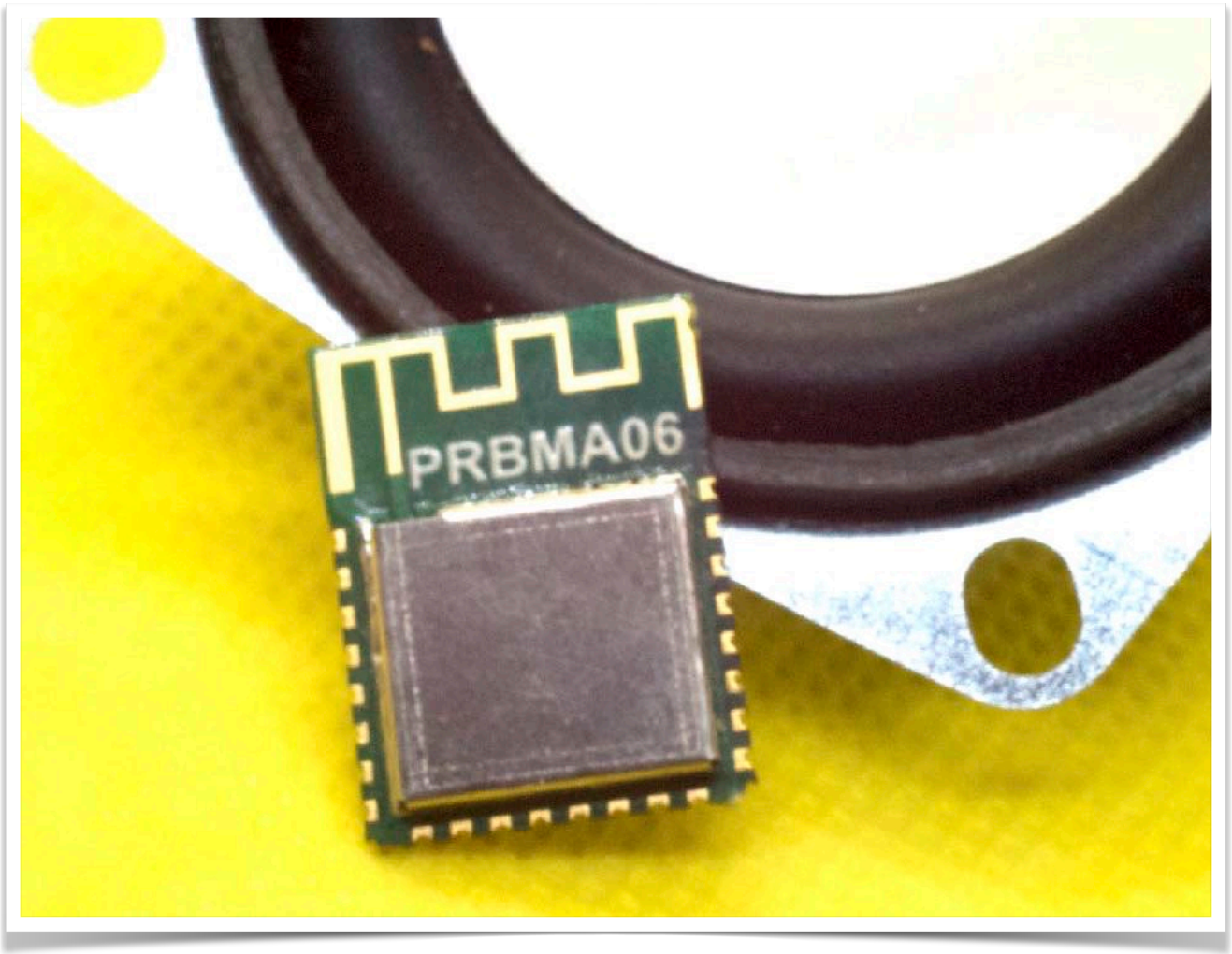
PRBMA06 cost effective Bluetooth audio module

Data sheet version 0.68



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Introduction

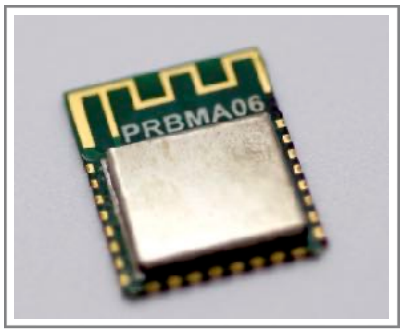
PRBMA06 are a cost effective Bluetooth audio module, supporting Bluetooth 2.1 (audio), Bluetooth 4.x (BLE) and SPP at the same time. They also supports AT-Command for controlling and configuration purpose.

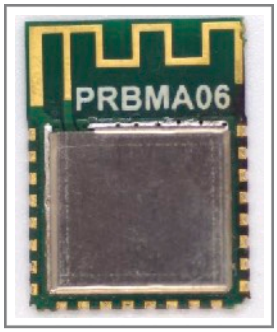
Beside Bluetooth audio, PRBMA06 also supports SD-card mode, and such application can be used in speaker application.

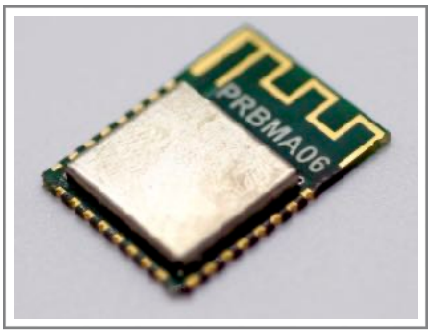
PRBMA06 are fully pin compatible, and PRBMA06 contains metal shielding for application that requires EMC insurance .

PRBMA06 are firmware pre-programmed, user can simply use it after power up without any firmware development.

PRMBA06 is FCC, CE, TELEC and BQB* certified module, which reduces customer's resource for qualification and allows product to be time to market.







Applications

- Phone accessories
- Home Theatre
- Gaming headset
- Party speaker
- TV system
- Projector
- Karaoke system
- Microphone
- PC audio system

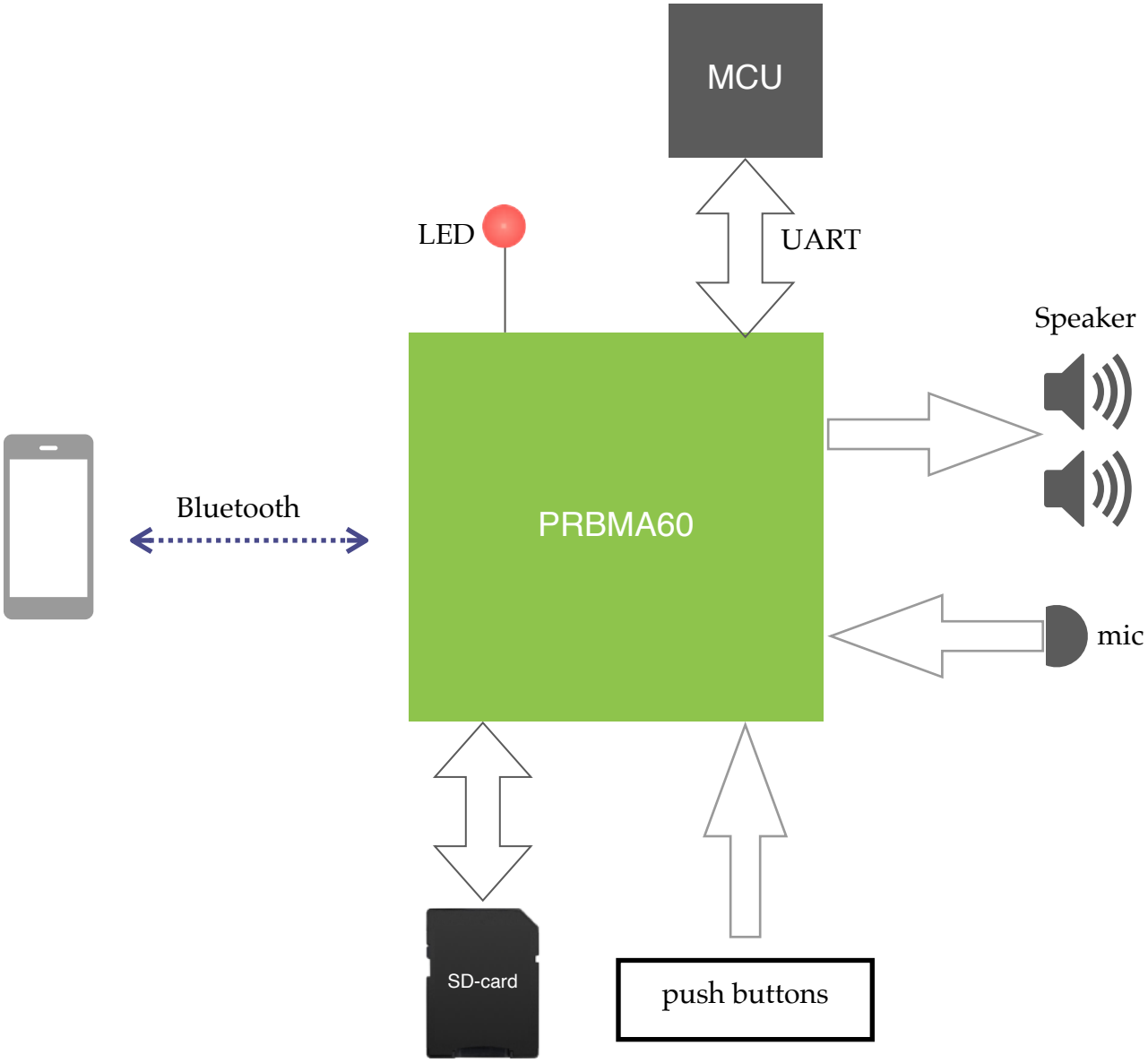
* in progress

Features

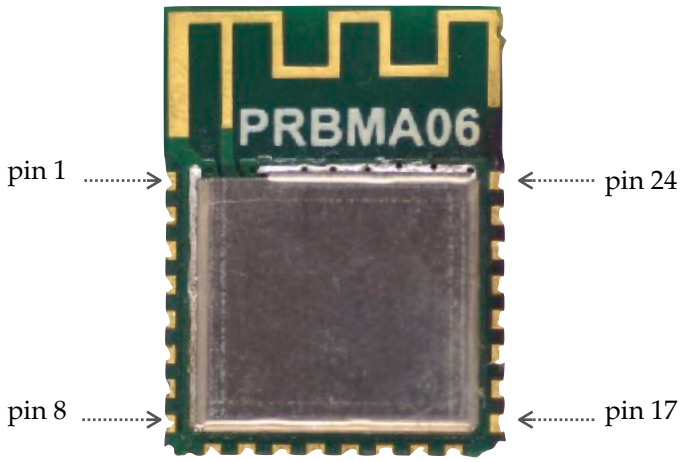
Core chip	Application specific Bluetooth audio IC
Bluetooth version	4.2, 2.1+EDR*
Bluetooth protocol	HFPV1.7、A2DPV1.2、AVRCPV1.5、AVCTPV1.2、AVDTPV1.2、Low Energy
Operating power	3.3-4.2VDC
Power consumption (before connection)	3.5mA
Power consumption (after connection)	20mA
Sleep mode	3uA
Operating temperature	-40°C -80°C
RF distance	15m
Sensitivity	-87dBm
Soldering temperature	<260°C

* Both BLE and BT2.1 are co-exist and can operate at the same time.

System block diagram

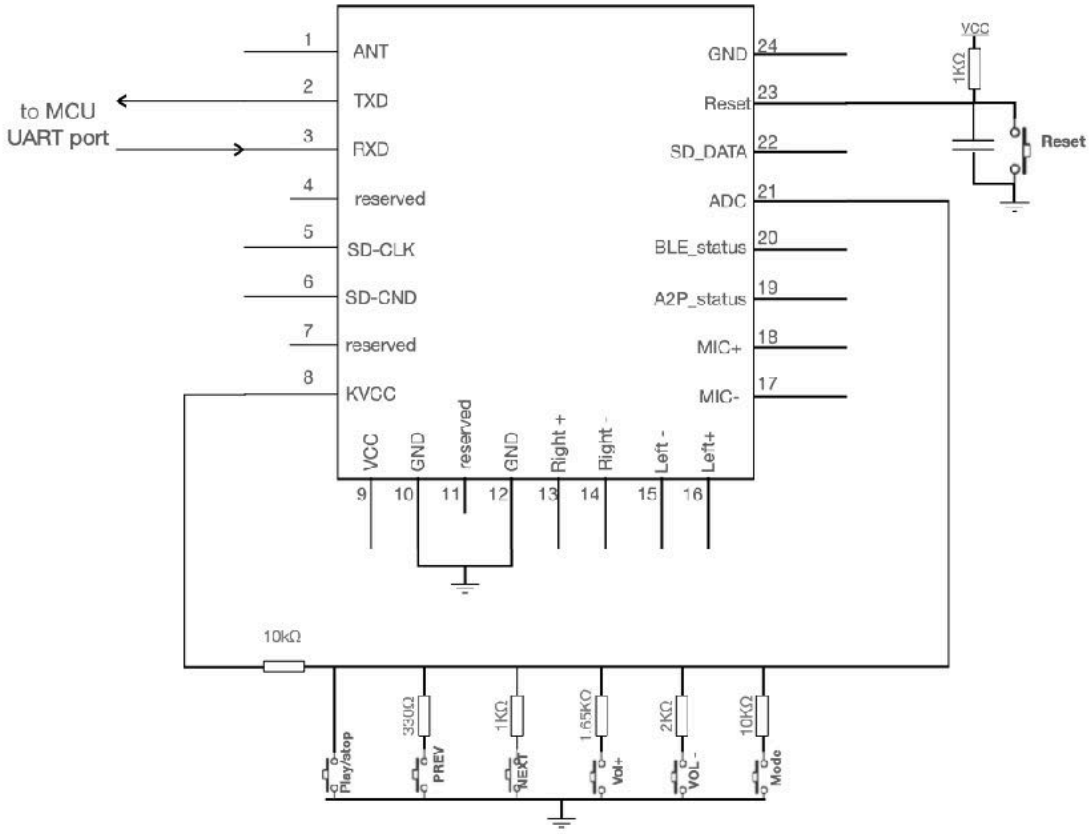


Pin assignment

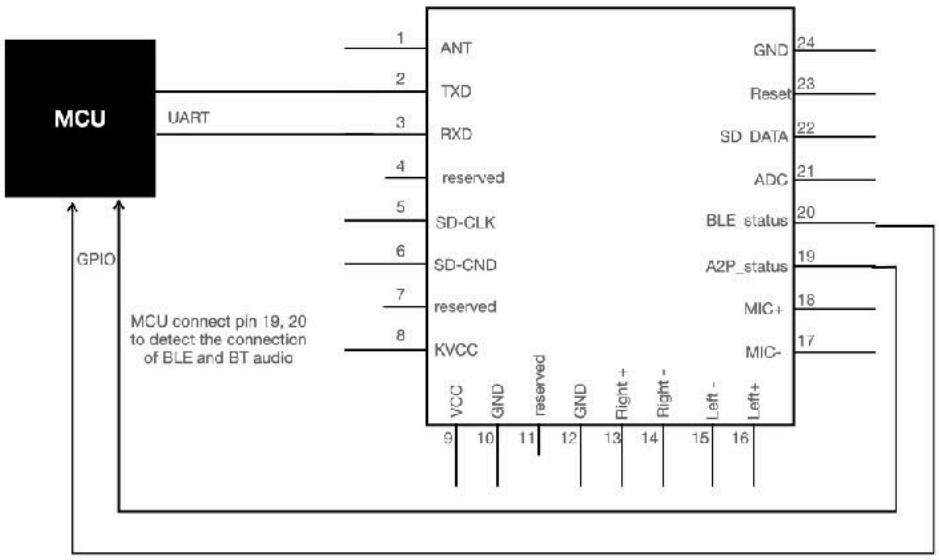


pin	name	Description	note
1	ANT	Connect to ext. antenna	need to pre-set in factory
2	TXD	UART Tx	
3	RXD	UART Rx	
4	reserved	N/A	
5	SD-CLK	SD card clock	
6	SD_CMD	SD card command	
7	reserved	N/A	
8	KVCC	input power	
9	VCC	Power in (3.3-4.2VDC)	
10	GND	ground	
11	reserved	N/A	
12	GND	ground	
13	Right+	Right positive output	
14	Right-	Right negative output	DO NOT connect to ground
15	Left-	Left negative output	DO NOT connect to ground
16	Left+	Left positive output	
17	MIC-	MIC negative input	for phone call purpose
18	MIC+	MIC positive input	
19	A2P_status	Bluetooth audio status	connect to LED status or MCU
20	BLE_status	BLE status	connect to LED status or MCU
21	ADC	Keypad connection	connect a 10K resistor to KVCC pin
22	SD_DATA	SD card data pin	
23	Reset	Reset	Active low
24	GND	ground	

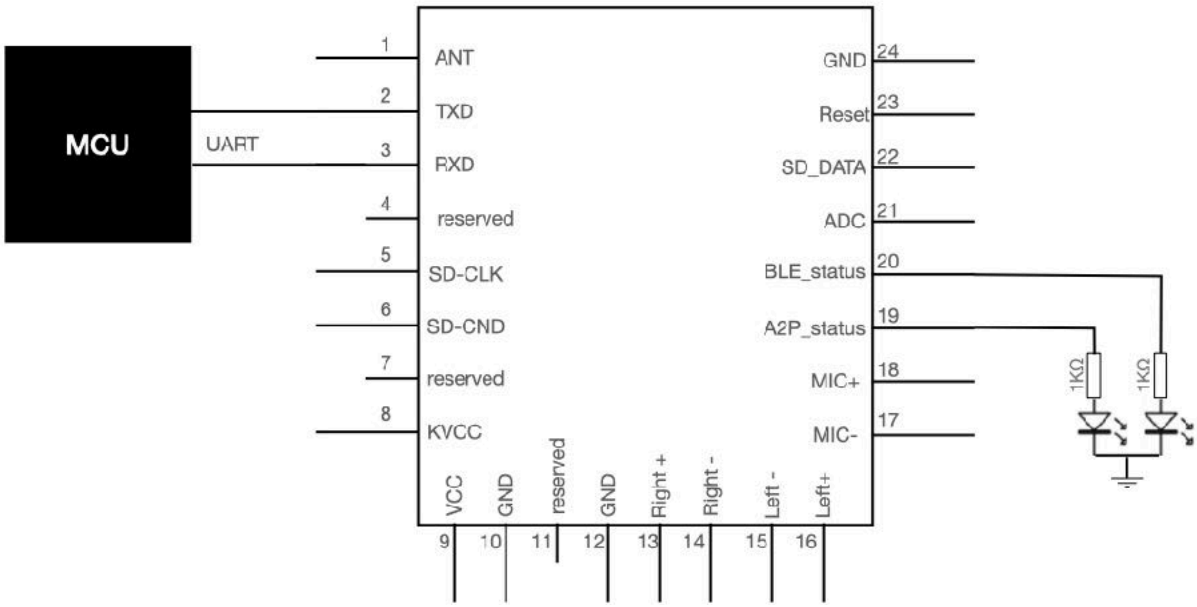
Suggest circuit



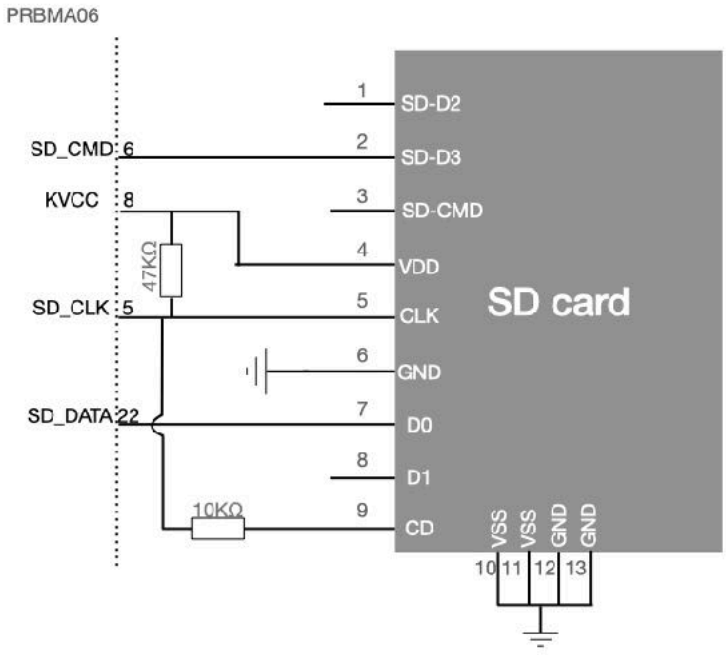
Push button connection



Connection with MCU (option 1)



Connection with MCU (option 2)

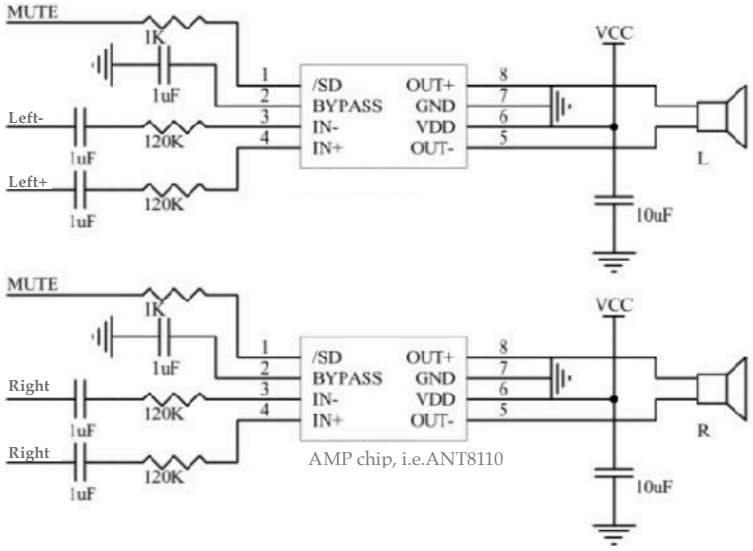


Connection with SD-card

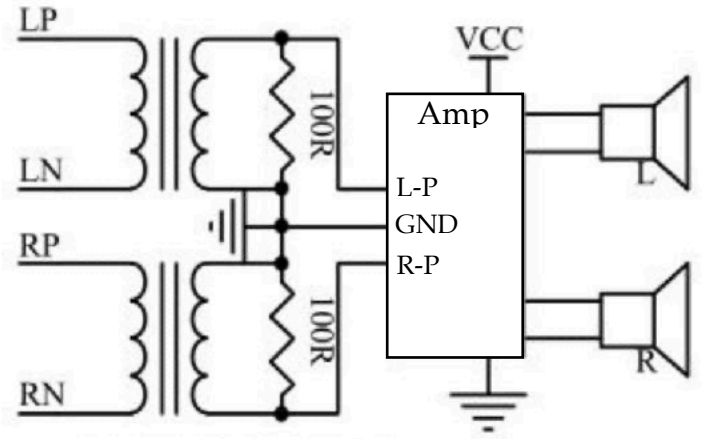
Audio output circuit

PRBMA05/06 audio output is a differential output, and both the RN and LN pins should NOT connected to GND. Below are suggested audio output circuits:

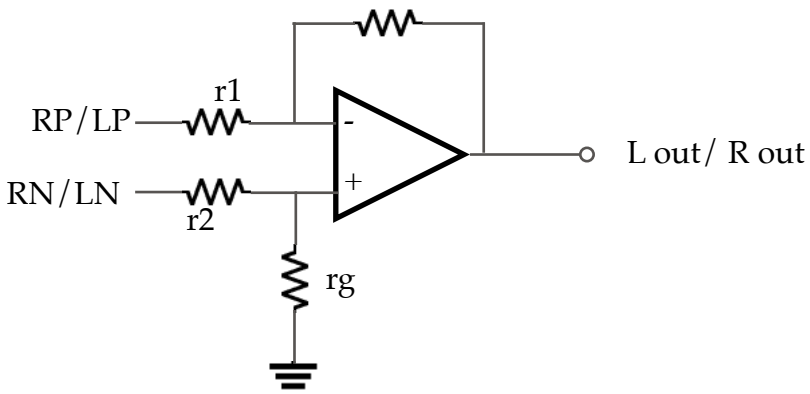
1. connect with differential amplifier



2. connect to transformer coil



3. connect Op-Amp



AT-command

AT-command can be sent to UART port for configuration and control purpose, the syntax of AT command are:

1. setting

   AT+CMD<Parameter> ; setting a parameter

   AT+CMD<Parm1, Parm2> ; setting two parameters, for AT+STAT only

   and the response will be <+OK>

2. enquiry

   AT+CMD

   and the response will be +CMD=<Param>

Below is the AT-CMD table

	Command	Function	Parameter	default value
1	AT+VER	enquiry version #		v1
2	AT+RST	Reset		
3	AT+MAC	enquire MAC address		
4	AT+NAME	set/enquire BLE advertise name	Max 18 character	PRBMDAx
5	AT+NAMA	set/enquire BT audio advertise name	Max 18 character	PRBMA0x
6	AT+ENLOG	set/enquire UART configure	0 close UART printing; 1 open UART printing	1
7	AT+BAUD	set/enquire UART BAUD rate	4:9600; 5: 19200; 6: 38400; 7: 57600; 8: 115200	4
8	AT+STARTEN	set/enquire lower power mode	0: sleep mode after power up 1: working mode after power up	1
9	AT+VOICE	Play audio file from flash memory*		
10	AT+BTMOD	switch audio source between SD card or BT	0: BT audio; 1 SD card	0
11	AT+NEXT	Play next track		
12	AT+LAST	Play previous track		
13	AT+PLAY	Play		
14	AT+PAUSE	Stop		
15	AT+SDINDEX	Play specific MP3 file in SD card #		
16	AT+SDPMODE	Play mode on SD card (single, repeat and repeat all)	0: repeat all; 1: single and stop; 2: single repeat; 3: random	
17	AT+CALL	re-dail last number		
18	AT+REJECT	reject incoming call		
19	AT+ACK	answer incoming call		
20	AT+VOLDN	decrease volume		
21	AT+VOLUP	increase volume		
22	AT+VOLUME	set/enquire volume	0-16	16
23	AT+DISC	disconnect		
24	AT+STAT	enquire connection status	1,0: BLE connect, audio not connected 0,1: audio connect, BLE not connected 1,1: Audio and BLE connected	0,0

* valid only audio file in Flash memory

note: \n\r is needed to appended at the command

valid only when AT+BTMOD1

AT-CMD response list

	Command	Response
1	AT+VER	+VER= version #
2	AT+RST	+OK
3	AT+MAC	+VMAC=<Param>
4	AT+NAME<Param>	+OK
	AT+NAME	+NAME=<Param>
5	AT+NAMA<Param>	+OK
	AT+NAMA	+NAMA=<Param>
6	AT+ENLOG<Param>	+OK
	AT+ENLOG	+ENLOG=<Param>
7	AT+BAUD<Param>	+OK
	AT+BAUD	+BAUD=<Param>
8	AT+STARTEN<Param>	+OK
	AT+STARTEN	+STARTEN=<Param>
9	AT+VOICE<Param>	+OK
10	AT+BTMOD<Param>	+OK
	AT+BTMOD	+BTMOD<Param>
11	AT+NEXT	+OK
12	AT+LAST	+OK
13	AT+PLAY	+OK
14	AT+PAUSE	+OK
15	AT+SDINDEX<Param1><Param2> *	+OK; Param1 represents directory (0-99); Param2 represents files (0-99)
16	AT+SDPMODE<Param>	+OK
	AT+SDPMODE	+SDPMODE=<Param>
17	AT+CALL	+OK
18	AT+REJECT	+OK
19	AT+ACK	+OK
20	AT+VOLDN	+OK
21	AT+VOLUP	+OK
22	AT+VOLUME	+OK
23	AT+DISC	+OK
24	AT+STAT<Param>	+OK
25	AT+STAT	+STAT=<Param1, Param2>

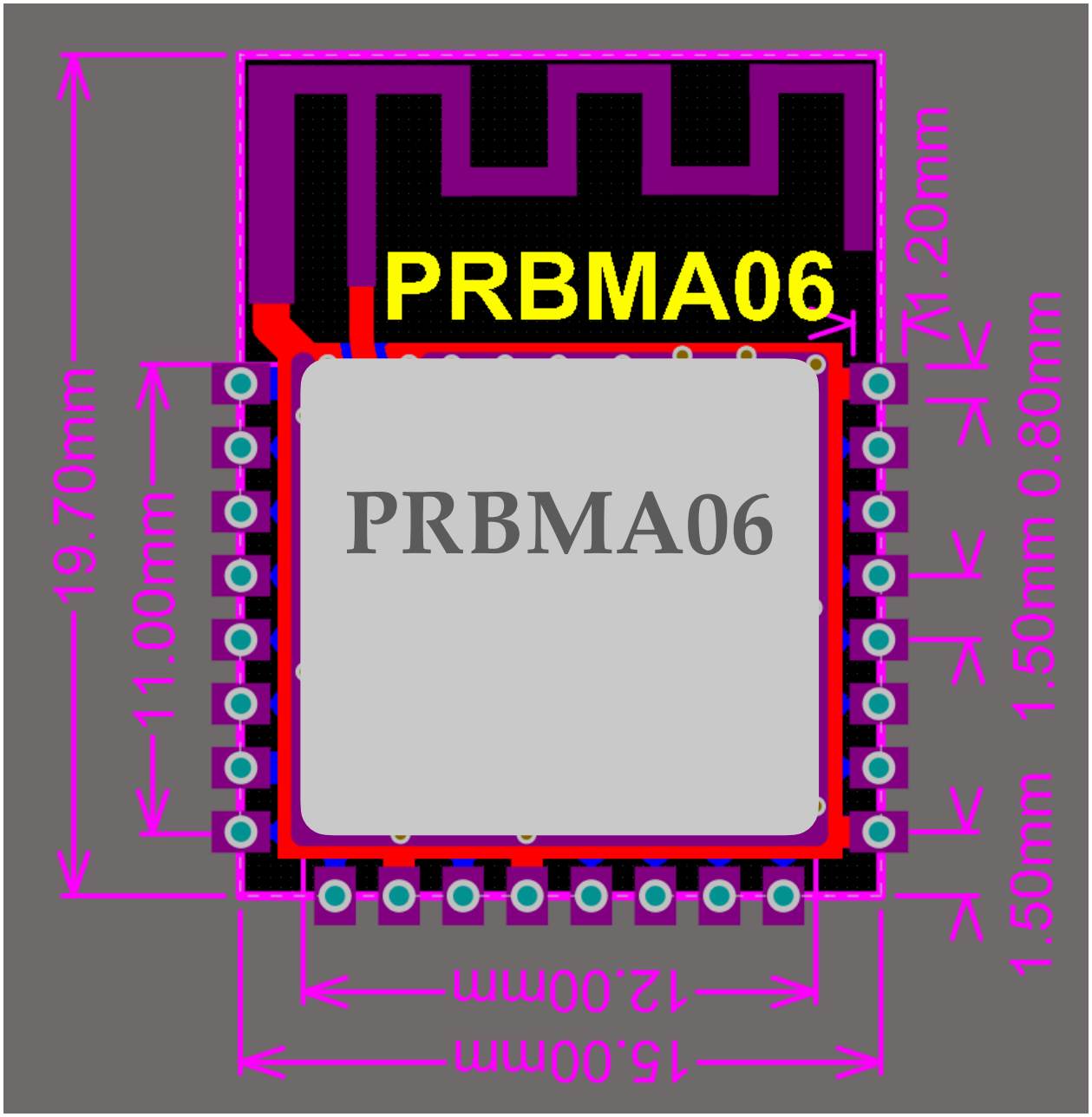
APP UUID command list

PRBMA06 accepts command from smart phone through APP UUID as following:

Service UUID: FFE0
Property UUID: FFE1 (for SSP tunnelling, property: notify, write)
Property UUID: FFE2 (for controlling BT and SD-card audio, property: write)

Feature	Command	Description
Next track	F10101	
Prev track	F10102	
Play	F10103	
Stop	F10104	
Volume -	F10105	
Volume +	F10106	
Play mode	F10201xx	xx: 00 - Repeat ALL 01 - Stop after single play 02 - Single repeat 03 - Random play The setting maintain after reset
Set volume	F10202xx	xx-volume level example: F1020210, volume level =16 The setting maintain after reset
Disconnect	F1020301	disconnect ALL
Setting SD-card or BT mode	F10204xx	xx: 01 - SD card mode; 00 - BT mode
Reset	F1020501	Reset the module
Play audio in Flash	F102060101	valid only if Flash contain audio file
Play specific file in SD-card	F10207xxyy	xx: directory number; yy: track number example: F102070102, play track 02 under directory 01.

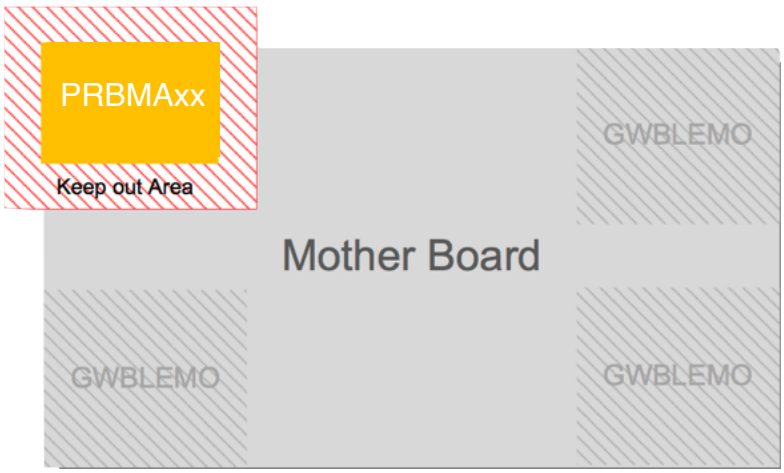
Dimension



unit: mm

Mounting guide

In order to obtain the best RF performance, it is suggest the module should be mounted on the corner of PCB and without ground place near by. Also no metal material on product casing around the module.



Certification

to be updated, only on PRBMA06

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