Rayson *Bluetooth® Module*

Low Energy Smart Module BTM-800

Features

- Bluetooth standard V4.0 conformity.
- Programmable general purpose PIO controller :
- Switch-mode power supply.
- I2C for EEPROM and ICs peripherals.
- -92.5dBm Bluetooth low energy RX sensitivity.
- 12 digital PIOs
- 3 analogue AIOs
- Watchdog timer
- Option for built-in G-sensor
- RoHS Compliant
- Small outline. **20（16） x 12 x2.0**mm (option wo/antenna)

Applications

- Sports and fitness
- Healthcare
- Automotive
- Home entertainment
- Office and mobile accessories
- Commercial

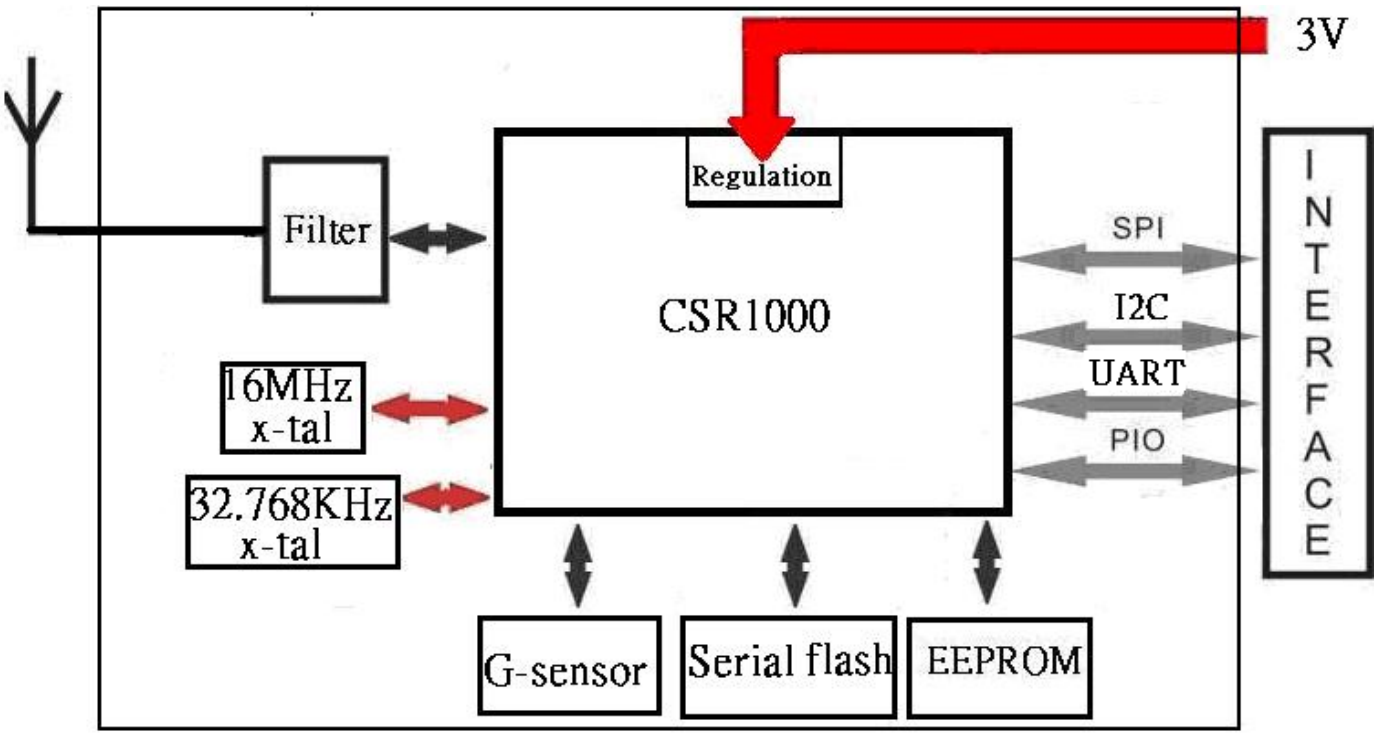
Outline

Electrical Characteristics

Absolute Maximum Ratings		
Ratings	**Min.**	**Max.**
Storage Temperature	**-40** ℃	**+85**℃
Supply Voltage : 3V	**1.8V**	**3.6 V**
Recommended Operating Condition		
Operating Condition	**Min.**	**Max.**
Operating Temperature range	**-30** ℃	**+85**℃
Supply voltage: 3V	**1.8V**	**3.6V**

Current Consumption（CSR1000 QFN total typical current consumption measured at the battery）		
MODE	**Descrisption**	Total Typical Current at 3V
Dormant	functions are shutdown. To wake up toggle the WAKE pin	<600nA
Deep sleep	VDD_PADS = ON, REFCLK = OFF, SLEEPCLK = ON, VDD_BAT = ON, RAM = ON, digital circuits = ON, SMPS = ON (low-power mode), 1ms wake-up time	<5μA
Idle	VDD_PADS = ON, REFCLK = ON, SLEEPCLK = ON, VDD_BAT = ON, RAM = ON, digital circuits = ON, MCU = IDLE, <1μs wake-up time	~1mA
RX / TX active	-	~16mA @ 3V peak current

Block Diagram



Radio Characteristics

Note: **(a) Up to five exceptions are allowed in the Bluetooth V4.0+EDR specification on receiver part..**

(b) Measured at F_0 = 2441MHz.

(c) Measured at f1-f2=5MHz. Measurement is performed in accordance with Bluetooth RF test RCV/CV/05.., i.e., wanted signal at -64dBm

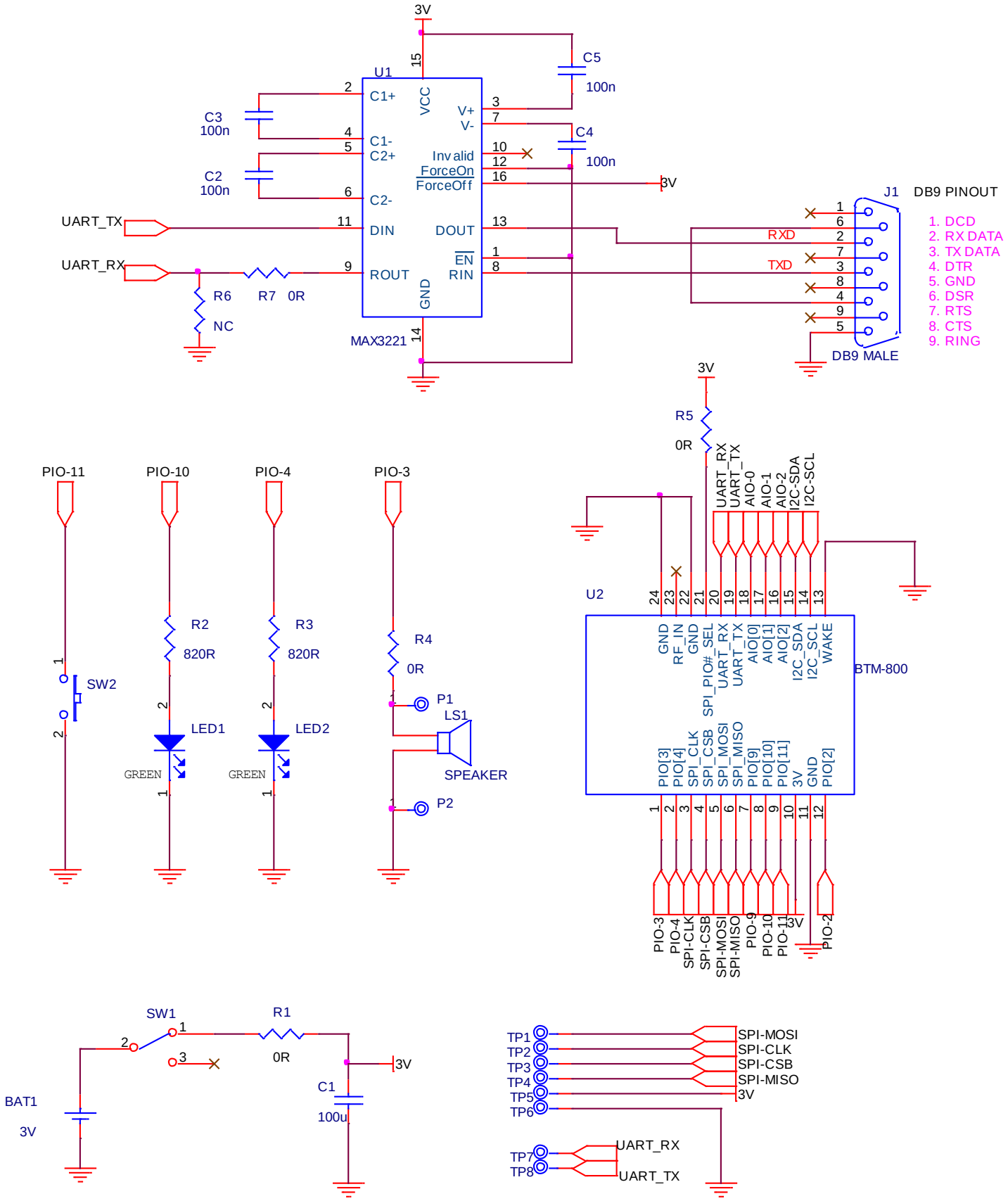
(d) Measured at unbalanced port of balun. Integrated in 100KHz bandwidth and normalised to 1Hz. actual figure is typically below -130dBm/Hz except for peaks -80dBm at 1600MHz, -80dBm in band at 2.4GHz and -80dBm at 3.2GHz

Note: **(1) Measurements methods are in accordance with the Bluetooth V4.0+EDR specification.**

(2) Up to five exceptions are allowed in the Bluetooth V4.0+EDR specification on receiver part.

(3) Measured at F0 = 2405MHz, 2441MHz, 2477MHz.

Application circuit

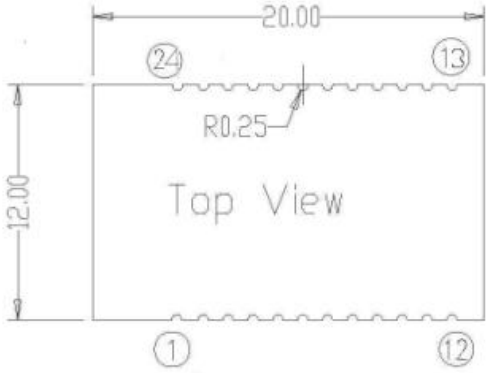


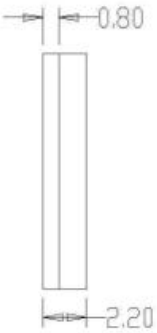
BTM-800 Pins Function

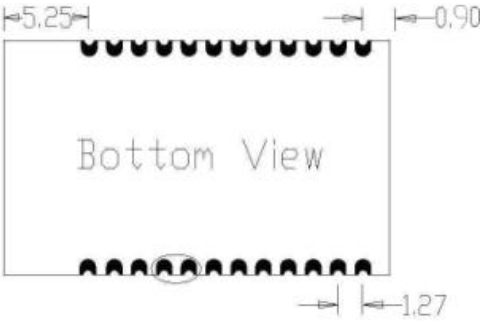
No.	Pin Name	Pin Type	Pin description
1	PIO[3]	Bi-directional	Programmable input/output line or PWN signal output
2	PIO[4]	Bi-directiona	Programmable input/output
3	SPI_CLK(PIO5)	Bi-directiona	Programmable input/output or debug SPI_CLK selected
4	SPI_CSB(PIO6)	Bi-directional	Programmable input/output or debug SPI chip selected
5	SPI_MOSI(PIO7)	Bi-directional	Programmable input/output or debug SPI_MOSI selected
6	SPI_MISO(PIO8)	Bi-directiona	Programmable input/output or debug SPI_MISO selected
7	PIO[9]	Bi-directiona	Programmable input/output line
8	PIO[10]	Bi-directiona	Programmable input/output line
9	PIO[11]	Bi-directional	Programmable input/output line or button input
10	3V	Power input	Connect to external 3V（battery） and regulator enable
11	GND	GND output	Common ground
12	PIO2	Bi-directional	Provide I2C Power can be used for power saving indication
13	WAKE	Bi-directional	Input to wake CSR1000 from domand/hibernate mode
14	I2C-SCL	Bi-directiona	I2C clock or SPI serial flash clock output(SF_CLK)
15	I2C-SDA	Bi-directiona	I2C data input/output or SPI serial flash data output(SF_DOUT)
16	AIO(2)	Bi- Analogue	Analogue Programmable input/output line
17	AIO(1)	Bi- Analogue	Analogue Programmable input/output line
18	AIO(0)	Bi- Analogue	Analogue Programmable input/output line
19	UART TX	Bi-directiona	Programmable input/output or UART TX
20	UART RX	Bi-directional	Programmable input/output or UART RX
21	SPI_PIO#_SEL	Bi-directional	Programmable input/output or SPI/PIO selected，set HI for SPI
22	GND	GND	Common ground
23	RF_IN	Analogue	Antenna interface Request
24	GND	GND	Common ground

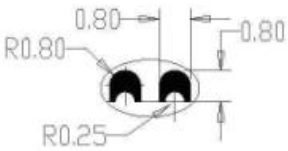
Dimension:

Unit: mm

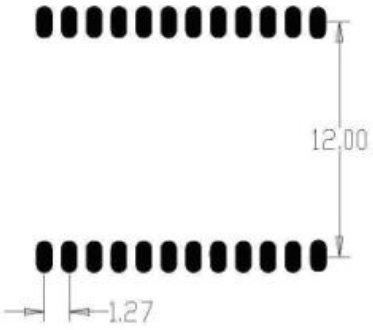




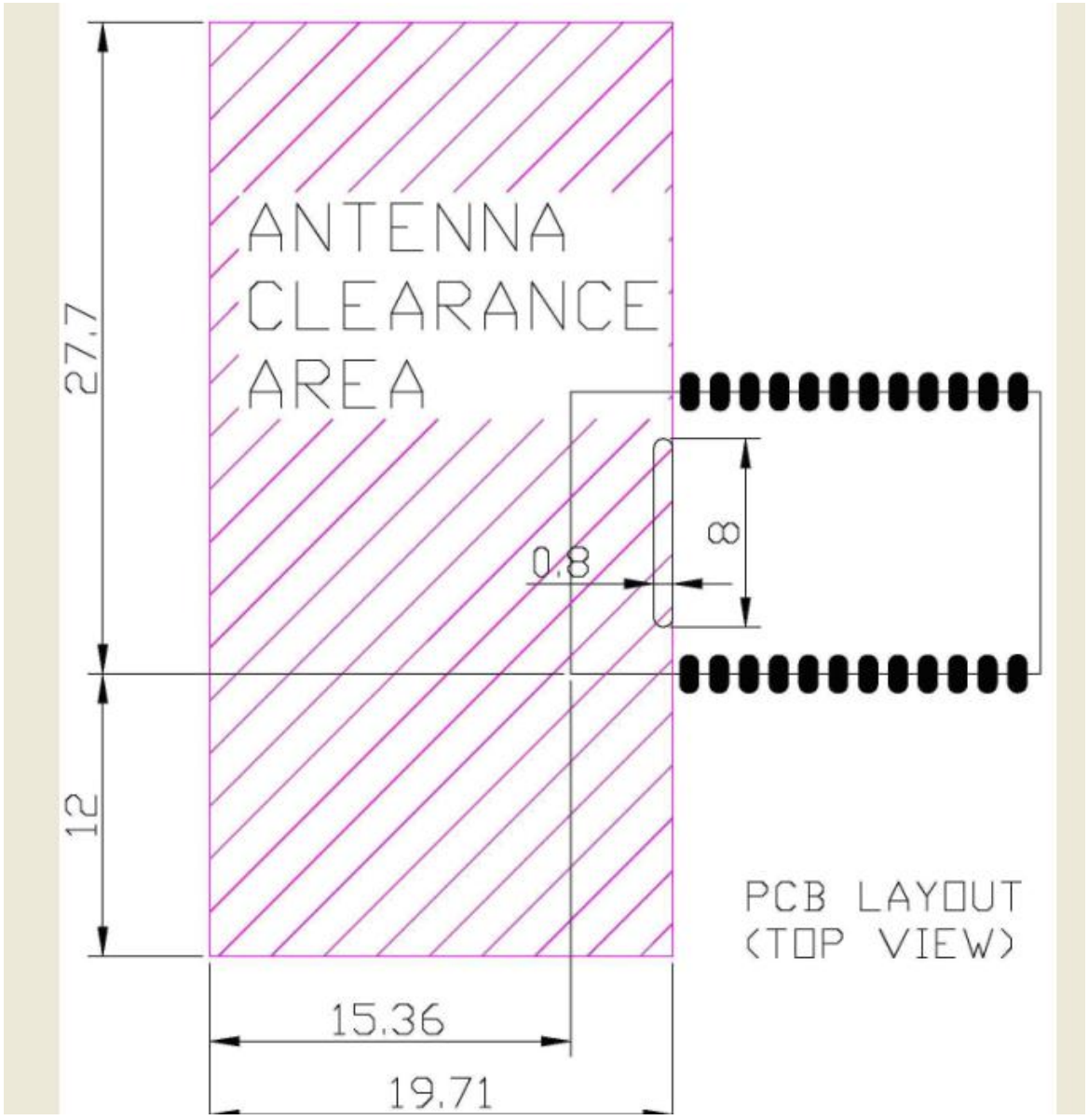




2 : 1



PCB Layout(Top View)


ANTENNA
CLEARANCE
AREA
27.7
12
0.8
8
15.36
19.71
PCB LAYOUT
(TOP VIEW)