

Technical Description

The brief circuit description is listed as below:

- 1) U1 and U2 act as Voltage Regulators (RPZ100C40M/TX6250SP33R).**
- 2) U3 acts as a BLE Module (TNT-BT-AAN-B7493-A).**
- 3) U4 acts as a MCU (GPCE4096A).**
- 4) U6 acts as a Flash (GPR25L3203F).**
- 5) Y1 acts as a Crystal for U3.**
- 6) X1 acts as a Crystal for U4.**

Antenna Type: Internal antenna

Antenna Gain: 0dBi

Nominal rated field strength: 97.0 dB μ V/m at 3m

Maximum allowed field strength of production tolerance: +/- 2dB



Bluetooth BLE Module Datasheet

TNT-BT_M

Release 1.00

May, 07, 2015

Revision History

Revision	Date	Description	Author
1.00	May. 07. 15	Initial version.	

1. Introduction:

Bluetooth low energy (or Bluetooth LE, or BLE, marketed as **Bluetooth Smart**) is a wireless computer network technology designed and marketed by the not-for-profit, non-stock corporation Bluetooth SIG which is aimed at novel applications in the healthcare, fitness, security, and home entertainment industries.. Compared to "Classic" Bluetooth, BLE is intended to provide considerably reduced power consumption and lower cost, while maintaining a similar communication range.

The Bluetooth SIG defines many profiles for Low Energy devices: a profile is a specification for how a device works in a particular application.

- Health care profiles
- Sports and fitness profiles
- Proximity sensing
- Alerts and time profiles

2. Key Features:

- Ultra-low peak, average and idle mode power consumption
- Ability to run for years on standard, coin-cell batteries
- Low cost
- Multi-vendor interoperability
- Enhanced range

3-1. Module Specification:

Radio Frequency	2.4GHz ISM
Operation Distance	10 Meters
Power Supply	Button cell battery / Li-ion Bat
Consumption Current(working)	6mA
Sleeping Mode	4uA
Antenna	PCB
Pairing	BLE Pairing

Radio Frequency	2.4GHz ISM
Operation Distance	10 Meters
Low Voltage Detection	Yes
PWM	Yes
Interface	I2C / SPI / UART

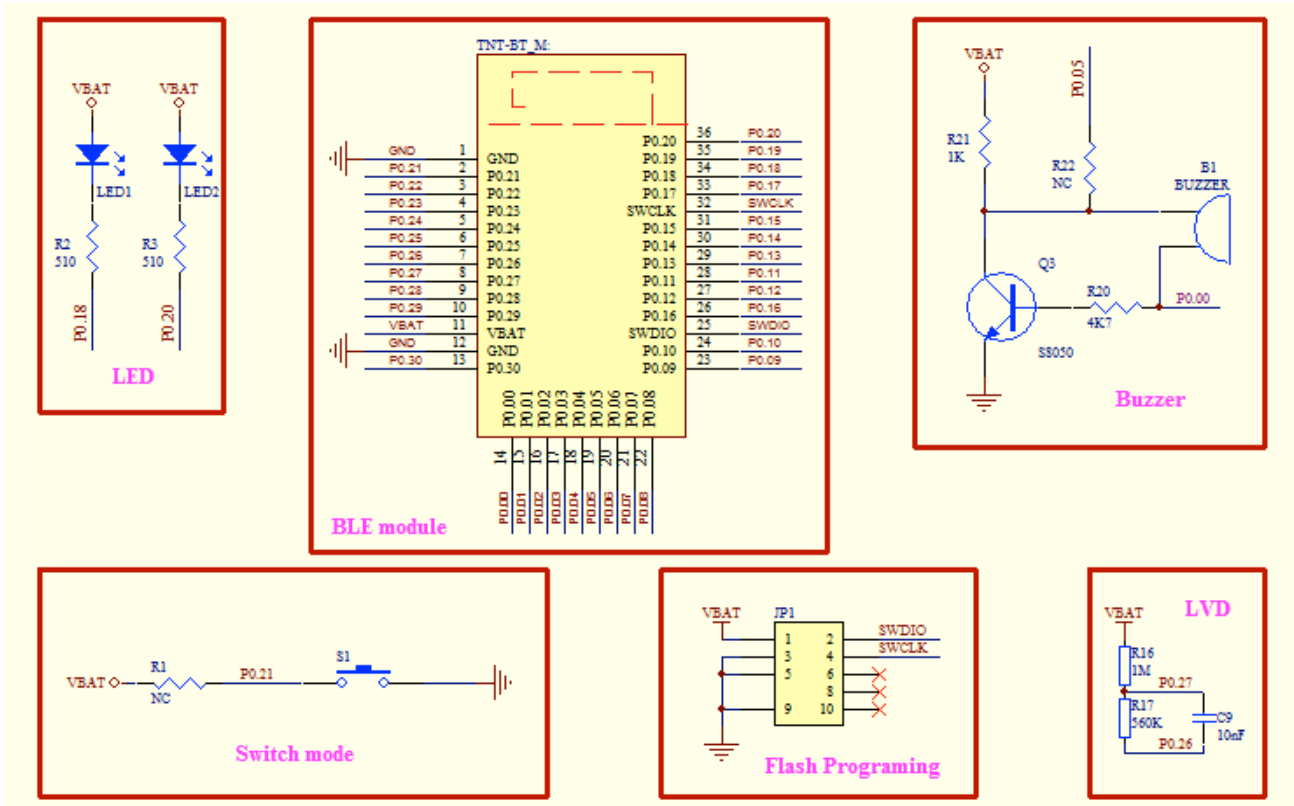
3-2. DC Electrical Specification:

Parameter	Sym.	Specification				Test Conditions
		Min.	TYP.	Max.	Unit	
Operation voltage	VDD	1.8	3.0	3.6	V	
Power Ground	VSS AVSS	0			V	
Operating Current	Active		2		mA	VDD = 3V
	Sleep		4		uA	
IO Leakage Current	ILK	-2	-	+2	m A	
IO Source Current	Digital I/O	0.5		5	mA	

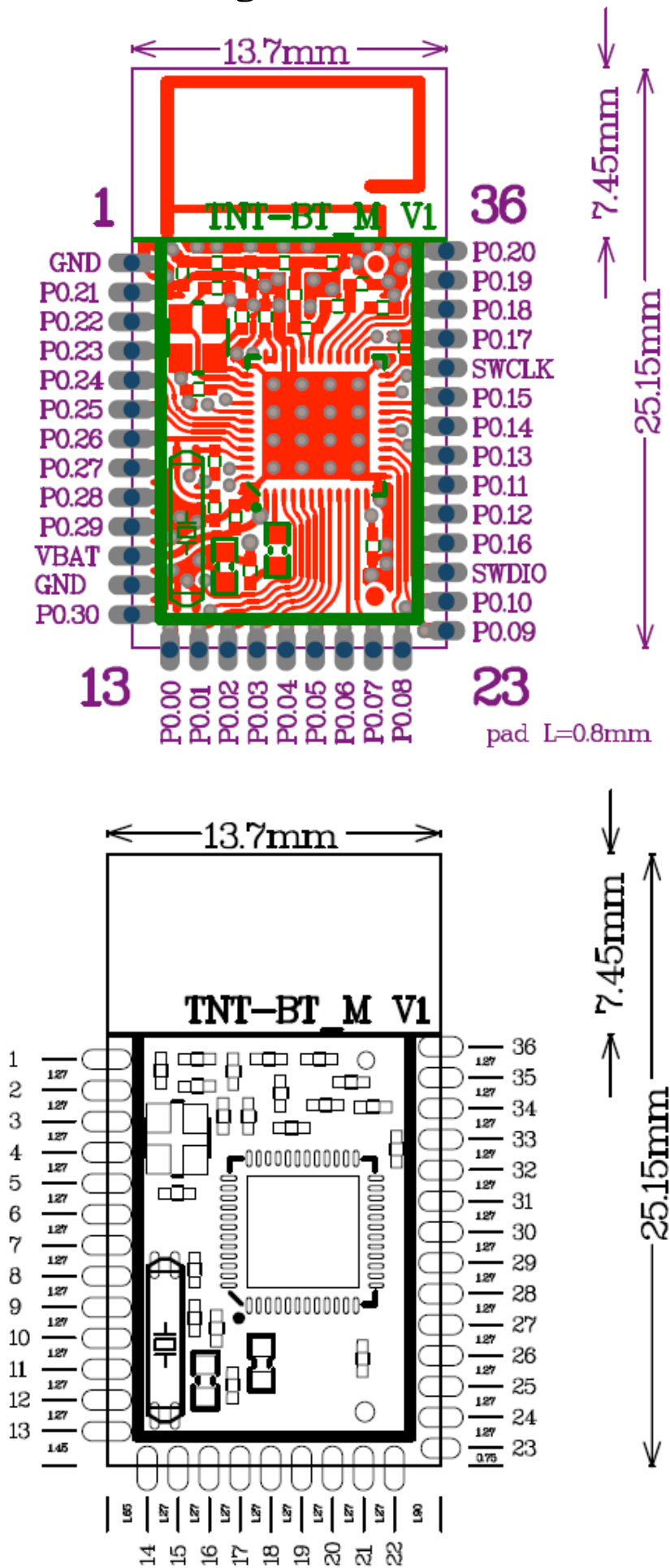
3-3. Radio Frequency Specification:

Parameter	Specification				Test Conditions
	Min.	TYP.	Max.	Unit	
Working Frequency	2400		2483	MHz	
Transmission Power		4		dBm	VDD = 3V
Receiver Sensitivity (1Mbps)		-90		dBm	VDD = 3V
On Air Symbol Rate	250		2000	bps	

3-4. Application Circuit:



3-5. Pin Assignment:



Pin No.	Pin Name	Pin Type	Description
1	GND	P	Ground (0V)
2	P0.21	I/O	General purpose I/O
3	P0.22	I/O	General purpose I/O
4	P0.23	I/O	General purpose I/O
5	P0.24	I/O	General purpose I/O
6	P0.25	I/O	General purpose I/O
7	P0.26	I/O AIN0 XL2	General purpose I/O ADC input0 Crystal connection for 32.768KHz crystal oscillator
8	P0.27	I/O AIN1 XL1	General purpose I/O ADC input1 Crystal connection for 32.768KHz crystal oscillator or external 32.768KHz crystal reference
9	P0.28	I/O	General purpose I/O
10	P0.29	I/O	General purpose I/O
11	VBAT	P	Power Supply
12	GND	P	Ground (0V)
13	P0.30	I/O	General purpose I/O
14	P0.00	I/O AREF0	General purpose I/O ADC Reference voltage
15	P0.01	I/O AIN2	General purpose I/O ADC input2
16	P0.02	I/O AIN3	General purpose I/O ADC input3
17	P0.03	I/O AIN4	General purpose I/O ADC input4
18	P0.04	I/O AIN5	General purpose I/O ADC input5
19	P0.05	I/O AIN6	General purpose I/O ADC input6
20	P0.06	I/O AIN7 AREF1	General purpose I/O ADC input7 ADC Reference voltage
21	P0.07	I/O	General purpose I/O
22	P0.08	I/O	General purpose I/O
23	P0.09	I/O	General purpose I/O
24	P0.10	I/O	General purpose I/O
25	SWDIO	I/O	System reset(active low). Also HW debug and flash programming I/O

26	P0.16	I/O	General purpose I/O
27	P0.12	I/O	General purpose I/O
28	P0.11	I/O	General purpose I/O
29	P0.13	I/O	General purpose I/O
30	P0.14	I/O	General purpose I/O
31	P0.15	I/O	General purpose I/O
32	SWCLK	I	HW debug and flash programming I/O
33	P0.17	I/O	General purpose I/O
34	P0.18	I/O	General purpose I/O
35	P0.19	I/O	General purpose I/O
36	P0.20	I/O	General purpose I/O