

Specification of JBT Mesh Bluetooth Module

Model number	Function	Document Revision/Date
JBT BPS_MODULE_V1	Bluetooth Low Energy (BLE) Module supporting mesh networking	Version 1.0 2015-10-02

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1 General

1.1 INTRODUCTION

This document specifies specifications of JBT Mesh Bluetooth Low Energy (BLE) Module that can be used widely in many applications.

1.2 MODULE DIVERSITY SUPPORTED

JBT BPS_Module_V1 supports diversities based on connectors used as shown in Table 1-1.

Table 1-1

Part No. of System-on-Chip	Protocol Supported	Module Functions	Remarks
BP5988	Bluetooth Low Energy V4.0	BLE with 8-pin 1.27mm pitch connector for smart lighting	BLE supports 79 channels.
BP5988	Bluetooth Low Energy V4.0	BLE with 13-pin PCB edge connector	BLE supports 79 channels.

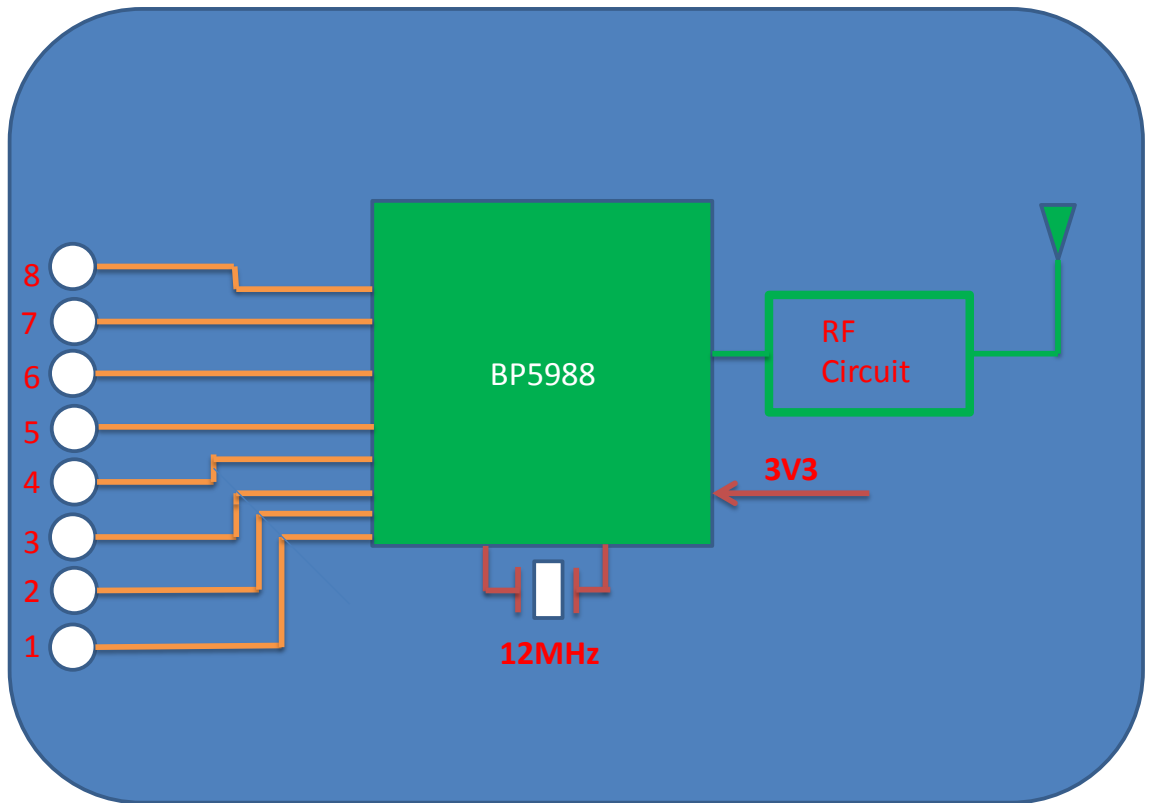
1.3 FEATURES

- ◆ Bluetooth® Specification V4.0 with mesh networking supported
- ◆ Embed 32-bit high performance RISC MCU with clock up to 48MHz
- ◆ Compact package size (18 x 15 x 2.8mm)
- ◆ Host Controller Interface (HCI) over UART, I2C and USB in full speed
- ◆ Class 1 supported with 8dBm maximum TX power
- ◆ Built-in Flash up to 512KBytes, system clock
- ◆ Built-in 16KB SRAM

1.4 APPLICATIONS

- Set Top Box
- **Consumer Electronics:** TV, Home Theatre System, Blue-ray player/Recorder
- **Human-Interface Devices:** Remote Control, Mouse, Keyboard
- LED Lighting
- Smart AC switch
- Home Automation
- Health Care
- Sports and Leisure Equipment
- Mobile Phone Accessories
- Smart Metering
- USB Dongle
- Wearable devices
- Other Hands-Free Devices

1.5 MODULE BLOCK DIAGRAM



2 Characteristics

2.1 ELECTRICAL CHARACTERISTICS

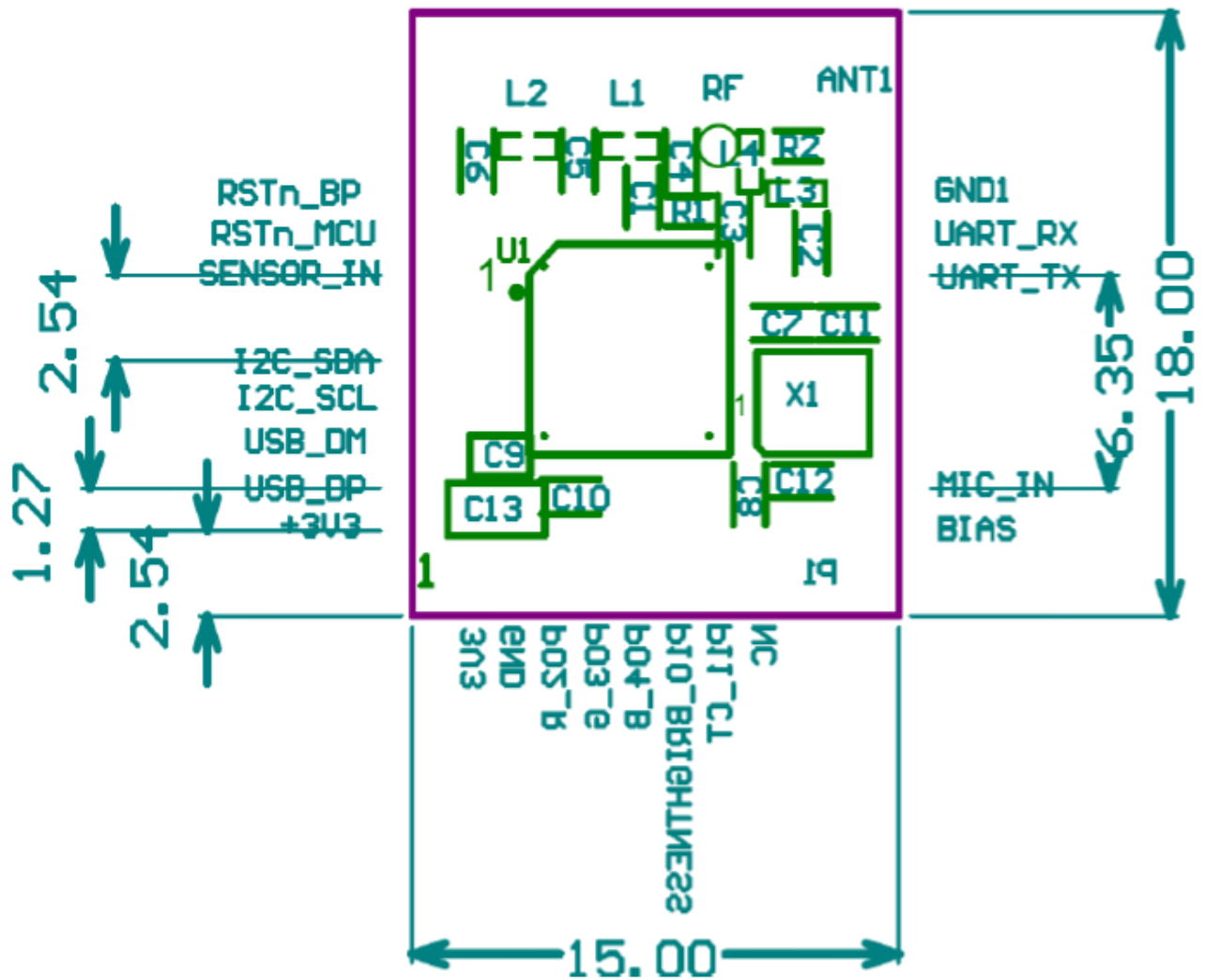
Features	Contents
RF Transmitting Power level	8 dBm Max.
Program memory	In-System-Programmable Flash 512K bytes
RAM	8K bytes x 8 bits
Data Rate	250kbps, 500kbps, 1Mbps, 2Mbps
Receiver Sensitivity	-93dBm at 1Mbps
Antenna	Printed PCB Antenna: Gain -0.15dBi
Operational RF distance	30m in the open field without RF interference
Physical connector	(1) 1x 8 1.27mm pitch through terminal (2) 13-pin PCB board edge connector
Operational Voltage	1.9 to 3.6V
Operating ambient temperature range, TA	Min: -40°C Max: +125°C
Reference oscillator for timer	Built in
Security	128-bit AES encryption
Serial data interface	UART I2C USB
EMC	Europe: ETSI EN 300 328 and EN 300 440 Class 2 USA: FCC CFR47 Part 15 Japan: ARIB STD-T66

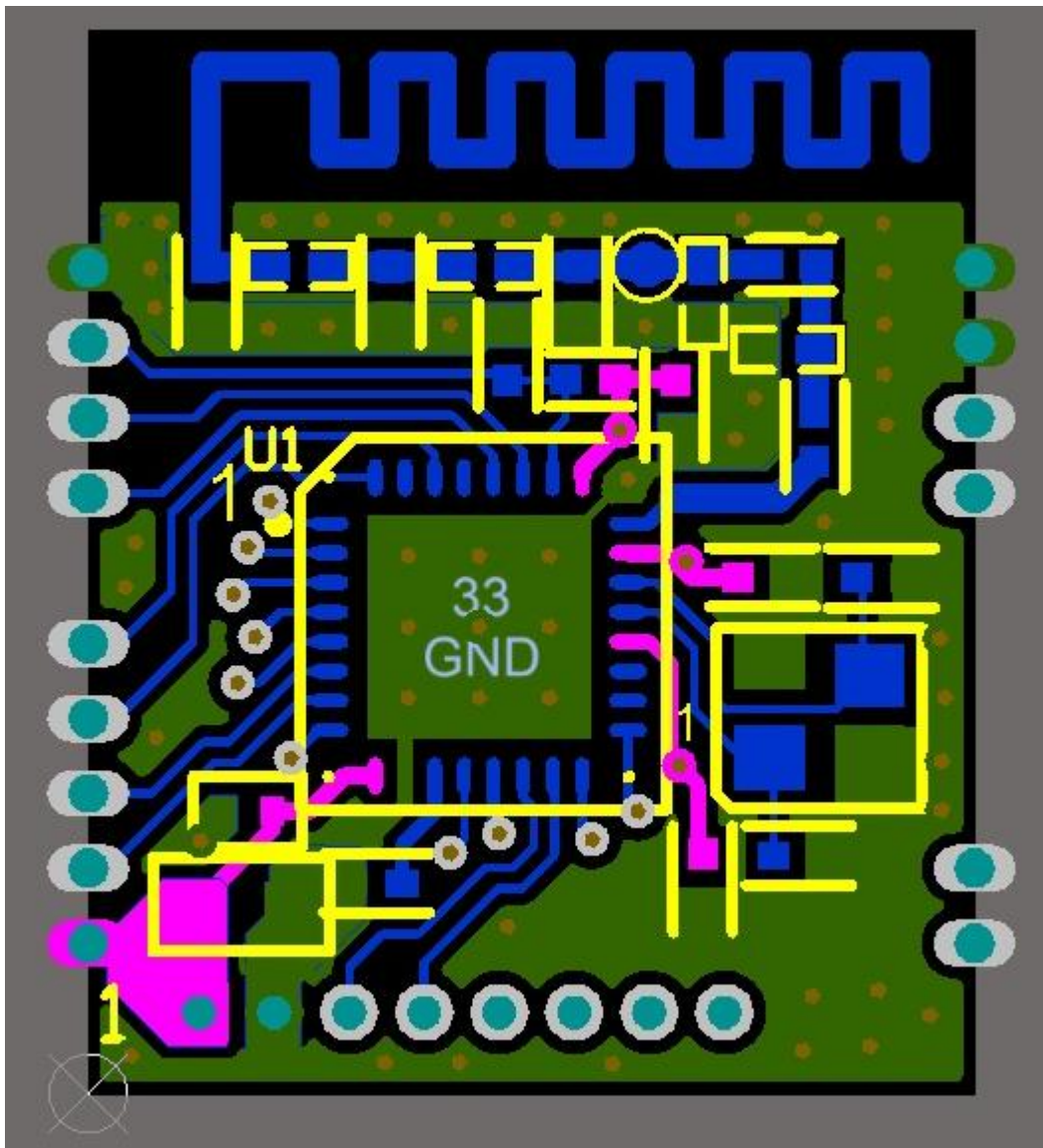
Power Consumption

Operational Mode	Specifications
Operating (TX/RX) 0dBm	15mA
Standby (Deep sleep)	1uA

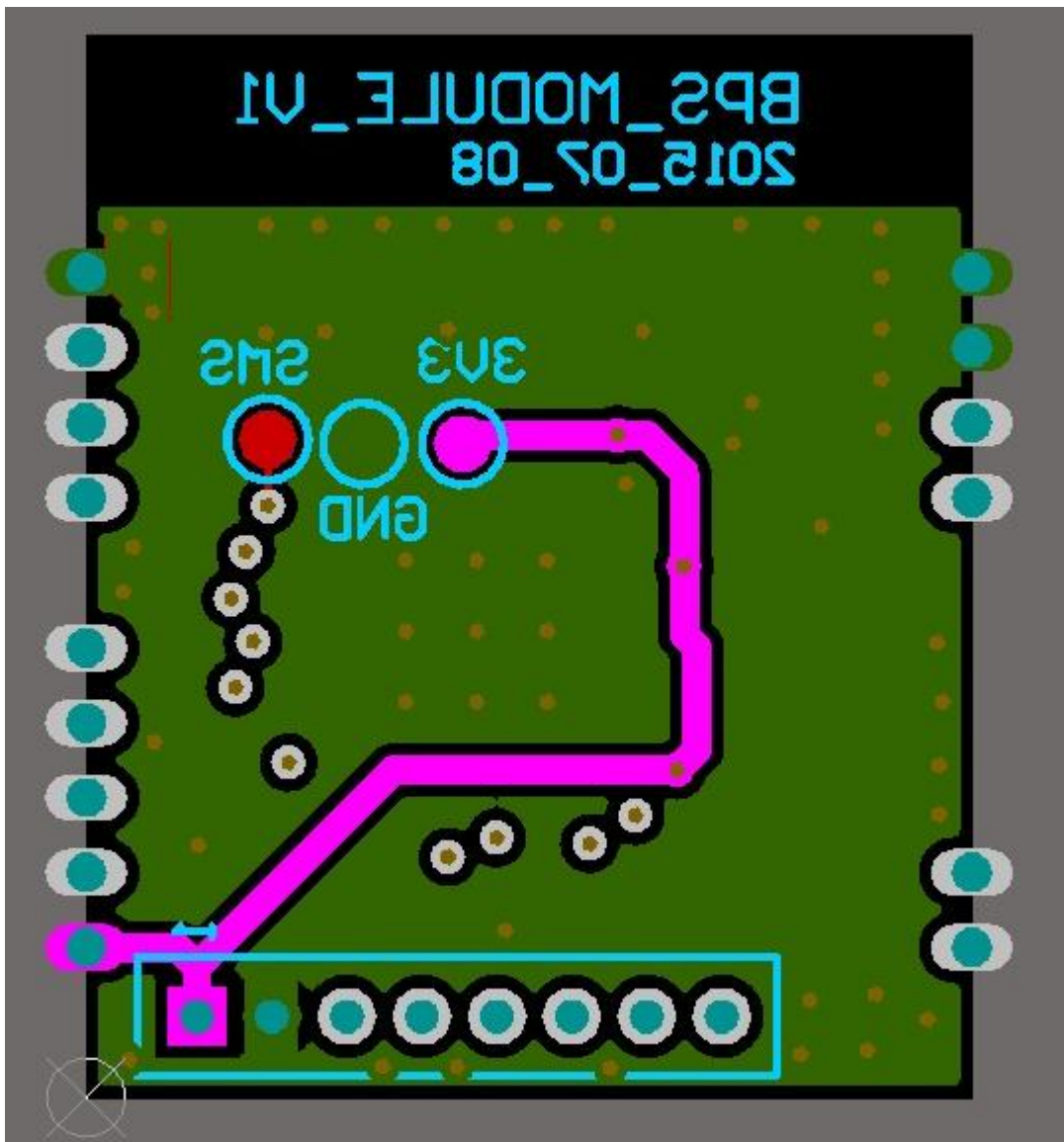
2.2 MECHANICAL CHARACTERISTICS

Dimensions	18 x 15 x 2.8mm typ.
Weight	1.5g Typ.
Connector P1	1 x 8, 1.27mm pitch





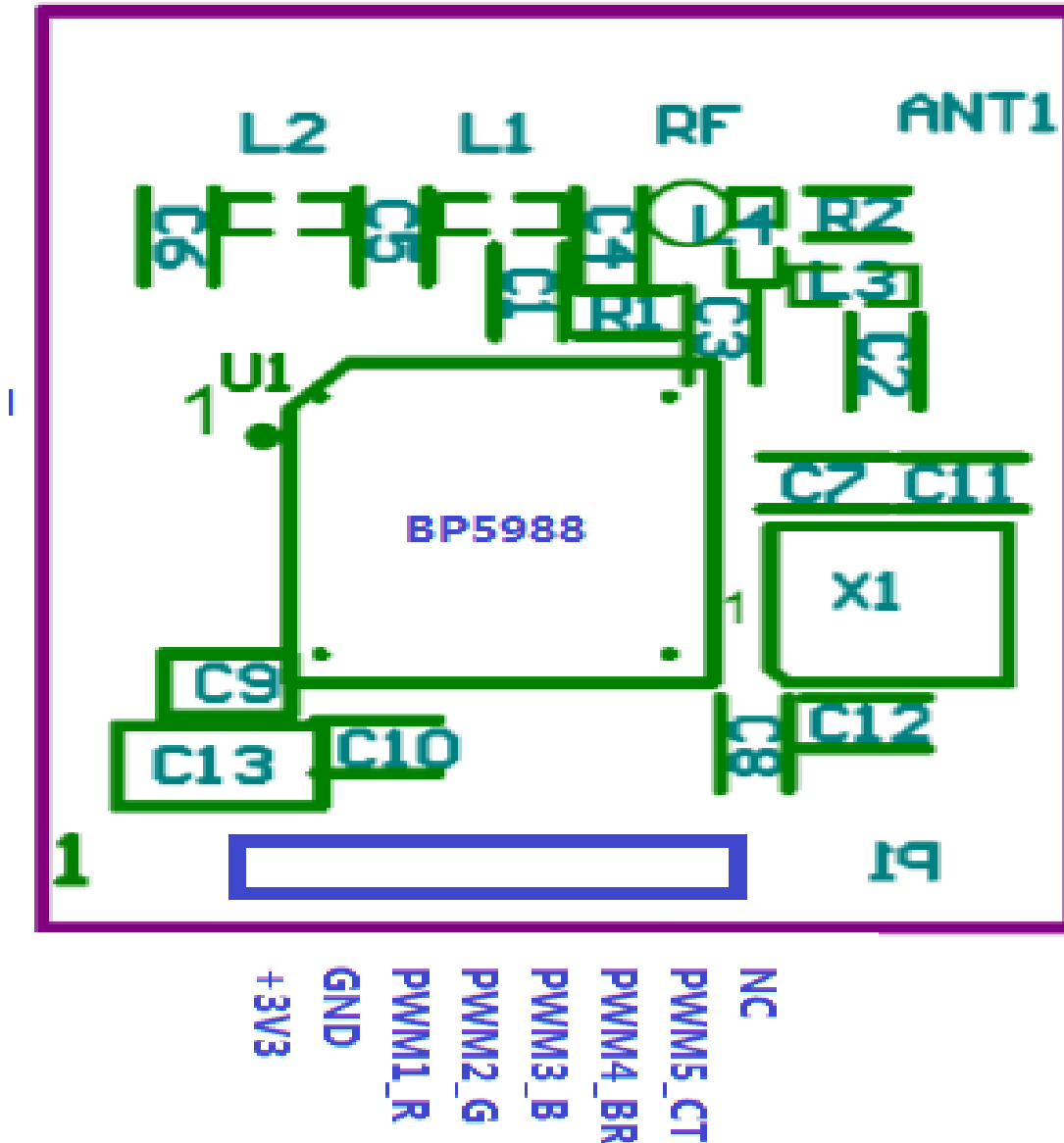
Top View



Bottom View

2.4 MODULE OUTLINE SPECIFICATIONS

2.4.1 BLE Module With 1 x 8 (1.27mm pitch connector)

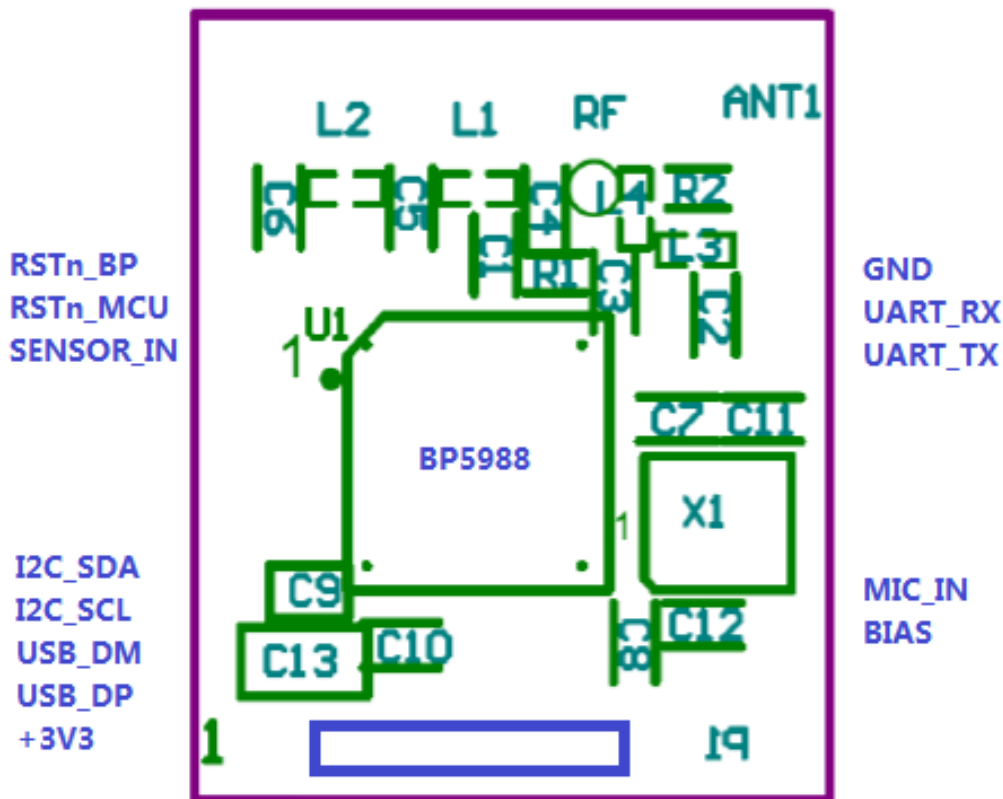


Module Connector Pin-out Definition

Pin No.	Pin Name	Pin Type	Description
1	3V3	Power Supply	2V to 3.6V
2	GND	Ground	
3	PWM1_R	I/O (PWM Output can be supported to control Red color LED)	Configurable I/O Port (Or PWM Output Port)
4	PWM2_G	I/O (PWM Output can be supported to control Green color LED)	Configurable I/O Port (Or PWM Output Port)
5	PWM3_B	I/O	Configurable I/O Port

		(PWM Output can be supported to control Blue color LED)	(Or PWM Output Port)
6	PWM4_BR	I/O (PWM Output can be supported to control brightness of white LED)	Configurable I/O Port (Or PWM Output Port)
7	PWM5_CT	I/O (PWM Output can be supported to control color temperature of warm white color LED)	Configurable I/O Port (Or PWM Output Port)
8	GPIO 2/NC	I/O	Configurable I/O Port

2.4.2 BLE Module With 1 x 13, PCB edge connector



Module Connector Pin-out Definition

Pin No.	Pin Name	Pin Type	Description
1	RSTn_BP	Digital I/O	Reset BLE module by host MCU, active low
2	RSTn_MCU	Digital I/O	Rest host MCU by BLE module, active low
3	SENSOR_IN	Digital I/O	External sensor signal input
4	I2C_SDA	Digital I/O	I2C Data

5	I2C_SCL	Digital I/O	I2C Clock
6	USB_DM	Digital I/O	USB N for Module with BP5988
7	USB_DP	Digital I/O	USB P for Module with BP5988
8	+3V3	Power supply	
9	BIAS	Microphone bias	
10	MIC_IN	Microphone input signal	
11	UART_TX	Digital I/O	UART_TXD
12	UART_RX	Digital I/O	UART_RXD
13	GND	Ground	

1.5 ENVIRONMENTAL SPECIFICATIONS

Conditions	Specifications	
Operating ambient temperature range, TA	Min: -40°C	Max: +85°C
Storage Temperature	Min: -40°C	Max: +125°C
Relative Humidity (Operating)	<=90%	
Relative Humidity (Storage)	<=90%	
ROHS	Pb-Free, free of Bromine (Br) and Antimony (Sb)	

3 Module Flash Memory Programming (in Circuit)

Five test points are provided to do module programming in circuit.

Test Point No. for Programming	Signal Name of Test Point	Description of Test Point	Diameter of Test Point
TP1	3V3	+3.3V Power Supply	1.0mm
TP2	GND	Ground	1.0mm
TP3	SMS	SMS	1.0mm

Test Points provided on Module for programming the flash memory of BP5988 as shown in Figure 3-1.

Programming Points



Figure 3-1 Test Points provided for programming the flash memory of BP5988

Programming tool is BPS's programming tool as seen in Figure 3-2 and the WtcdB from BPS.

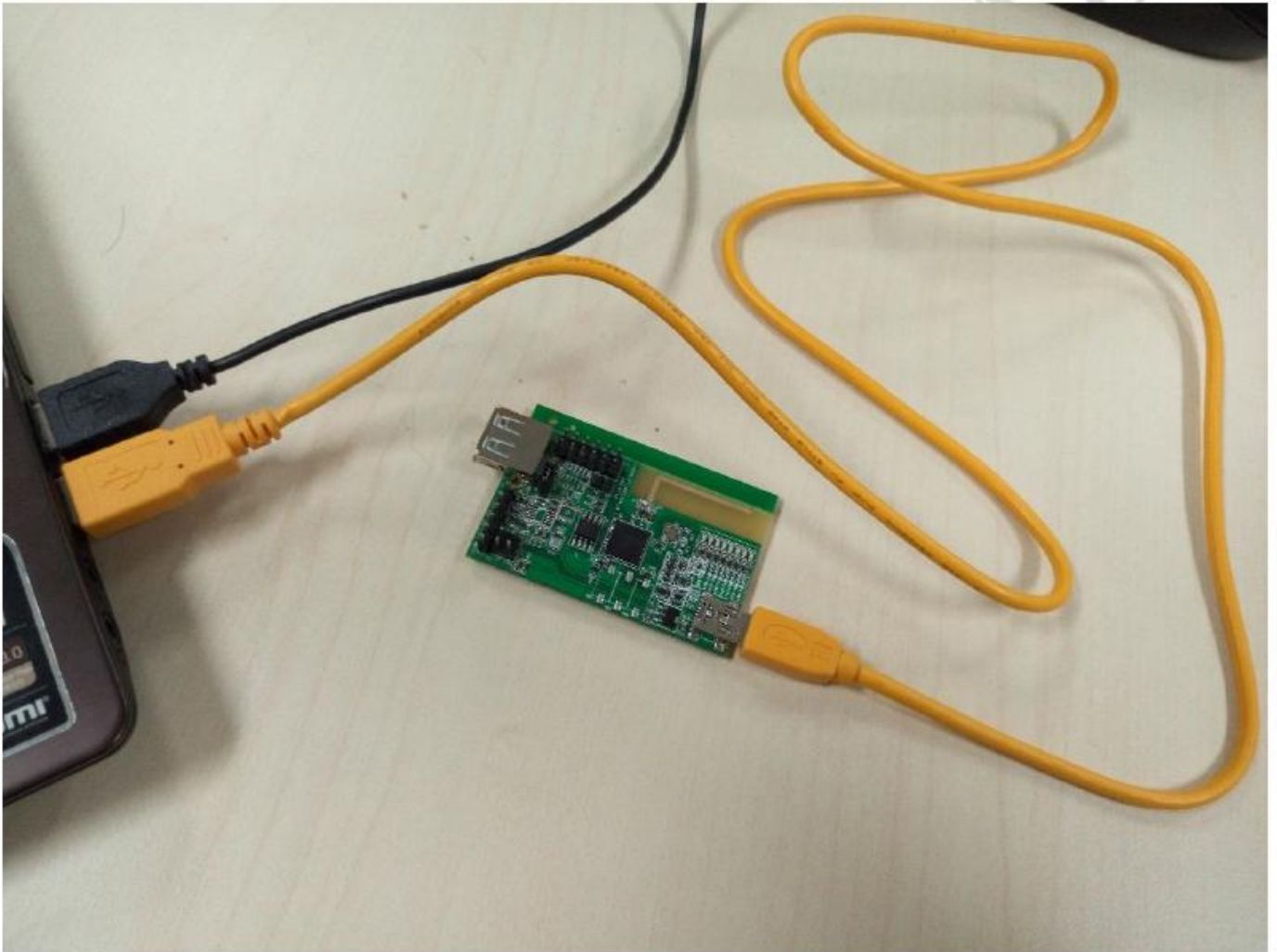


Figure 3-2a Photo of BPS's EVK Board

Connect SMS/+3V3/GND from EVK board to target board (i.e. BLE module) respectively.

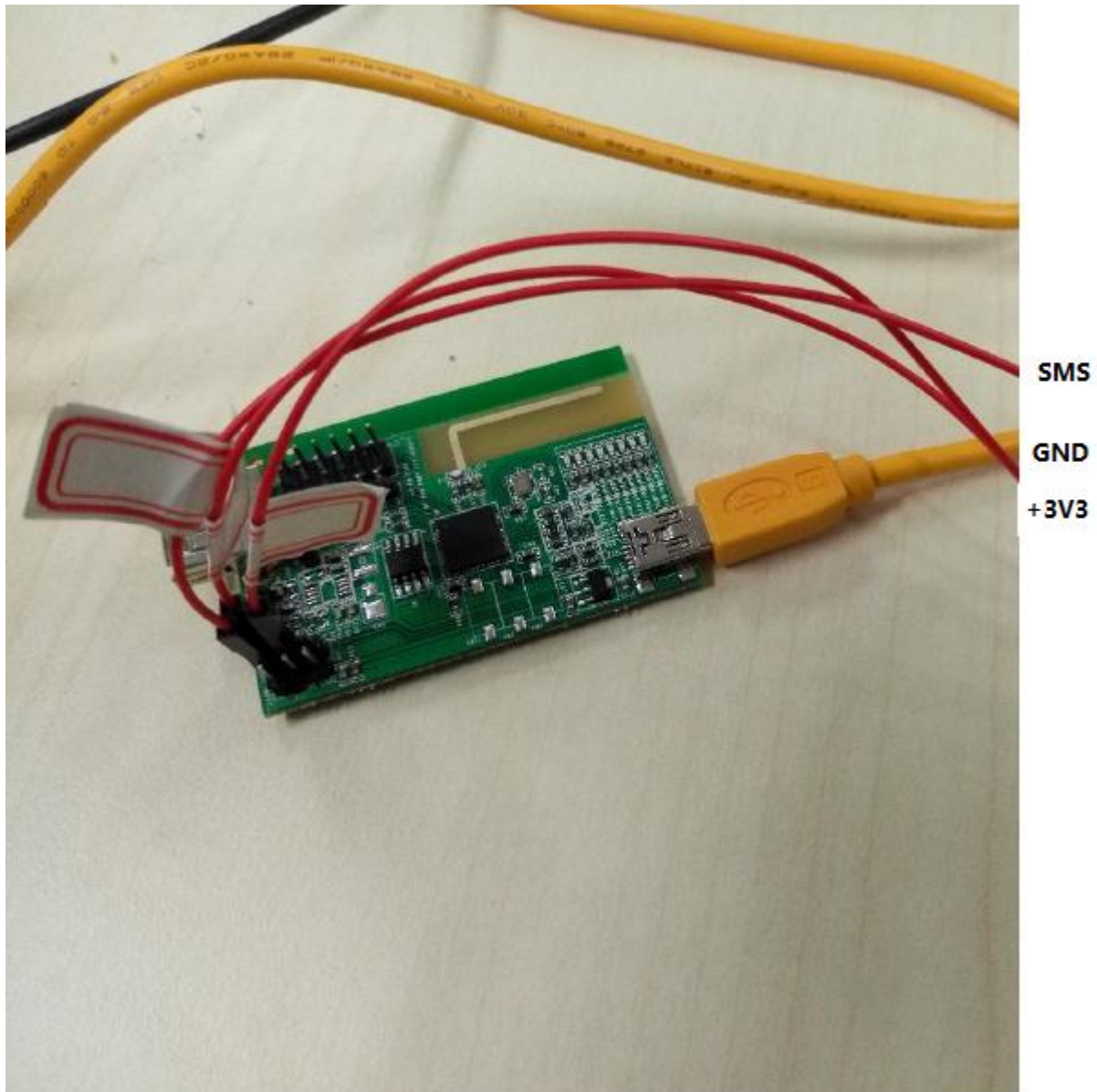


Figure 3-2b Connection between EVK board and BLE module