

BSG-01/BSG-01S

Sub-1G + Bluetooth LE Module

Preliminary

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1. Overview

BSG-01/BSG-01S are RF modules embedding 2 state of the art RF technologies modules, Bluetooth 4.2 and SigFox Technologies that provides low power over long distance data transfer applications. It is implemented by using the ST S2-LP Sub-1G transceiver IC and the ST BlueNRG-1 Bluetooth LE chip.

2. Features

Sub-1G

- Single Chip base band modem using ST S2-LP Sub-1G IC
- Fully programmable packet format
- Automatic packet acknowledgement and re-transmission

Bluetooth LE

- A single chip radio and baseband IC from ST (BlueNRG-1) for Bluetooth applications
- Fully Qualified Bluetooth Smart (V4.2 Low Energy) specification
- Cortex M0 MCU core with 160k flash memory
- 24kB RAM
- Support BLE stack including GAP, GATT, SM and L2CAP
- Hardware I2C master / slave interface
- Hardware UART port with baud rate up to 115,200
- Build-in PCB antenna (BSG-01)

Module Feature

- Support SigFox Specification for RCZ1, RCZ2 and RCZ4 areas
- Low power consumption
- Coin battery friendly 2.0V – 3.6V operation
- Dimension:
- BSG-01 27.0mm(L)x15.0mm(W)x2.2mm(H)
- BSG-01S 27.0mm(L)x15.0mm(W)x3.0mm(H)
- RoHS complaint

3. Applications

- Wireless Alarm System
- Smart Button
- Smart Home
- Access Tracking & Logistics
- Home Energy Management systems
- Building automation
- Industrial monitoring and control

4. Pin Drawing

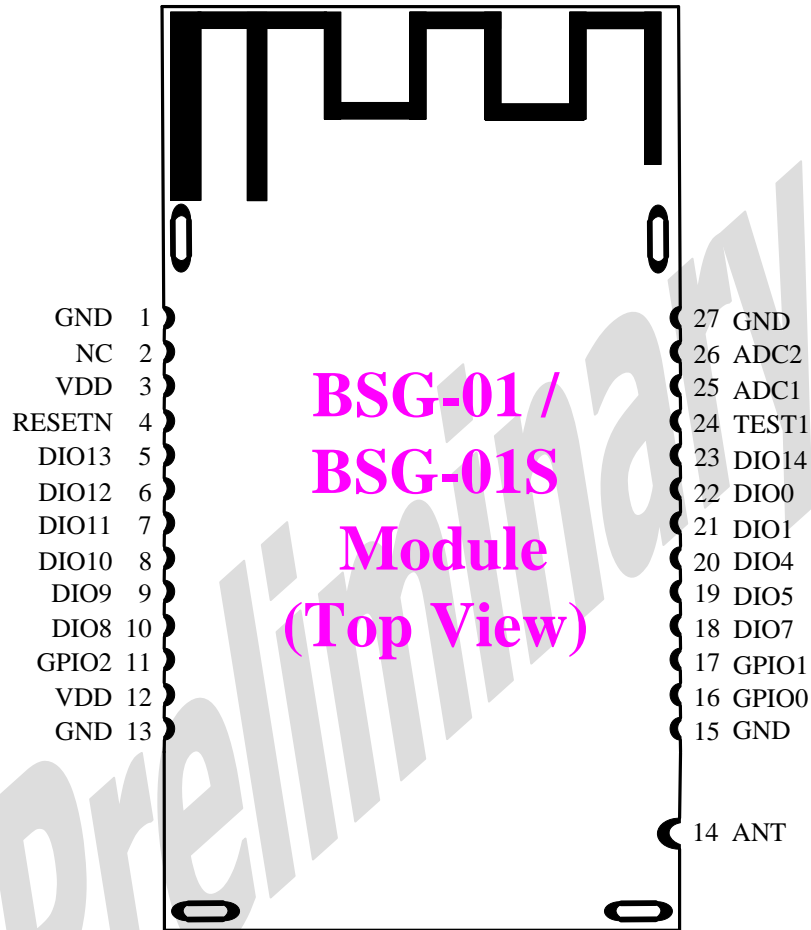


Figure 1 BSG-01/BSG-01S Pin Diagram

5. Ordering Information

Part No.	Dimension			Metal Shield Can
	Length	Width	Height	
BSG-01	27.00 ^{+0.5} / _{-0.1} mm	15.00 ^{+0.5} / _{-0.1} mm	2.2 ^{+0.2} / _{-0.2} mm	-
BSG-01S	27.00 ^{+0.5} / _{-0.1} mm	15.00 ^{+0.5} / _{-0.1} mm	3.0 ^{+0.2} / _{-0.2} mm	√

6. Pin Description

Pin No.	iBT-20 / iBT-20S Pin Name	App Name	Pin Type	Pin Descriptions
1	GND	GND	P	Negative power supply
2	NC	NC		No Connect
3	VDD	VDD	P	Positive power supply, 1.8V – 3.6V
4	RESETN	RESETN	I	Active low module reset
5	DIO13		B	General purpose digital I/O pin from BlueNRG-1
6	DIO12		B	General purpose digital I/O pin from BlueNRG-1
7	DIO11	BT_RXD	B	Bluetooth UART RXD
8	DIO10		B	General purpose digital I/O pin from BlueNRG-1
9	DIO9		B	General purpose digital I/O pin from BlueNRG-1
10	DIO8	BT_TXD	B	Bluetooth UART TXD
11	GPIO2		B	General purpose digital I/O pin from S2LP chip
12	VDD	VDD	B	Positive power supply, 1.8V – 3.6V
13	GND	GND	B	Negative power supply
14	ANT	ANT	RF	Sub-1G Antenna
15	GND		B	Negative power supply
16	GPIO0		B	General purpose digital I/O pin from S2LP chip
17	GPIO1		B	General purpose digital I/O pin from S2LP chip
18	DIO7		B	General purpose digital I/O pin from BlueNRG-1
19	DIO5	SDA	B	General purpose digital I/O pin from BlueNRG-1
20	DIO4	SCL	B	General purpose digital I/O pin from BlueNRG-1
21	DIO1		B	General purpose digital I/O pin from BlueNRG-1
22	DIO0	SPICK	B	General purpose digital I/O pin from BlueNRG-1
23	DIO14	SPICS	B	General purpose digital I/O pin from BlueNRG-1
24	TEST1			Test Pin, no need to connect
25	ADC1		IA	ADC input 1
26	ADC2		IA	ADC input 2
27	GND	GND	P	Negative power supply

I Input
 IA Analog Input
 B Bidirectional
 RF RF I/O pin
 P Power pin

Table 1 BSG-01/BSG-01S Pin Description Table

7. Electrical Specification

7.1. Absolute Maximum Rating

Item	Symbol	Rating	Unit
Power Supply Voltage	VDD	-0.4 to 3.7	V
Peak Current	I _{pk}	0 - 70	mA
Storage Temperature	T _{STG}	-40 to 85	°C

7.2. Recommended Operating Condition

Item	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	VDD	1.8	3.0	3.6	V
RF Operating Temperature		0	25	80	°C
Operating Temperature		-20	25	70	°C

7.3. Digital Input / Output Port Characteristics

VDD=3.0V, operating temperature = 25 °C unless specified otherwise

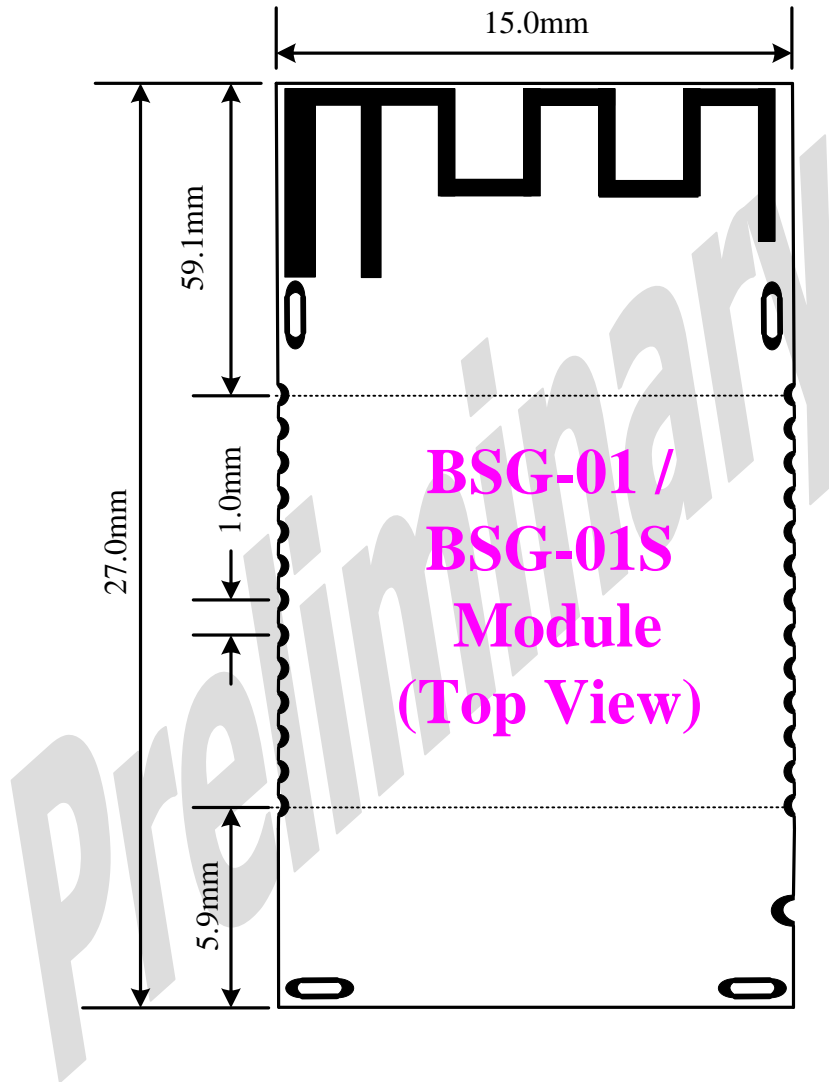
Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Input Voltage Levels						
V _{IL}	Input low voltage				0.5	V
V _{IH}	Input high voltage		2.5			V
Output Voltage Levels						
V _{OL}	Output low voltage	I _{OL} = -4mA			0.5	V
V _{OH}	Output high voltage	I _{OH} = 4mA	2.4			V
Input and Tri-state Current with						
	I/O Pad leakage current		-1	0	1	uA
	Input Capacitance		1		5	pF
Current Consumption						

7.4. RF Characteristics

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7.5. Module Dimension

7.5.1. BSG-01 and iBT-20S (Top View)



7.6. PCB Layout Guideline**7.6.1. BSG-01 and BSG-01S**

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7.7. Packing Information

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