



Sigfox Monarch Module WSG309S

User's Manual

Compact-sized
With Ultra-low Power
Consumption

WSG309S_IPEX



WSG309S_RF_PAD



Sigfox Support (Monarch)



RC1/2/3/4/5/6



AT Commands



Extended Temperature
Range: -40°C to +85°C



Ultra-Low Power Consumption
(5uA @ sleep mode)

WSG309S RC 1/2/3/4/5/6 is a Sigfox +BT5.0 modem module for the low power wide area network (LPWAN) market. It is designed with STM's system S2-LP+BLUENRG248 MCU

The module was designed for high performance, high quality, low cost, small form factor and most importantly. The Sigfox application is running on BLUENRG2 MCU at high efficiency executed at high efficiency using its internal 32bit core Cortex-M0 processor.

Every module is preloaded with Sigfox application software, module specific ID/KEY/PAC as referring to Sigfox network system. The preloaded software also includes a bootloader which allows software update or future user application development.

◆ General Feature

- General Sigfox module for Smart City, Smart Agriculture , Smart Industry, IOT Application
- Compact Form Factor: 28.5 x 16.5 x 3.0 mm
- 59 Pin Stamp Pad for PCB SMT mounting
- Interface : I2C*1/UART*1/GPIO*3/ADC*2/SWD*1
- Temperature range: -40°C to +85°C
- Supply voltage: 2.0 ~ 3.6V
- Preloaded Sigfox application with ID/KEY/PAC

◆ Product Specifications

	RF Function
Standard	Sigfox Network System
Interface	I2C/UART/GPIO/ADC/SWD/DIO
Transmit Output Power	22dBm(RC 2/4) , 14dBm(RC1/6), 13dBm(RC3/5)
Data Rate	Uplink: 100bps Downlink: 600bps
Modulation Techniques	Uplink DBPSK Modulation Downlink GFSK Modulation
Sigfox Frequency bands	RC 1/2/3/4/5/6
Operating Voltage	2.0 ~ 3.6V
Operating Temperature	-40 ~ 85 degree C
Current consumption	121mA Tx at 22dBm (peak current with Sigfox packet transmission) 33mA Tx at 14dBm (peak current with Sigfox packet transmission) 31mA Tx at 13dBm (peak current with Sigfox packet transmission) 22mA Tx at 4dBm with BT packet transmission 6.17uA at sleep mode

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This module is intended for OEM integrators under the following conditions:

This module comply with the requirement of the following standards

47 CFR FCC Part 15.247

1. RF exposure considerations

This module is restricted to installation in products for use only in mobile and fixed applications.

The host product manufacturer must provide following statement in end-product manuals.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

2. Antennas

This module has been approved to operate with the antenna types listed below, with the maximum permissible gain indicated.

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Walsin	RFDPA870900SBAB815	Dipole	I-PEX	2.3
2	Walsin	RFPCA431015IMAB301	PIFA	I-PEX	2.69
3	Walsin	RFDPA131015IMRB301	Dipole	I-PEX	3.01
4	Walsin	RGFRA1204011DCT	Chip	I-PEX	1
5	Ethertronics	M620720	Chip	I-PEX	0.75
6	TEKFUN	IO4-2	Dipole	I-PEX	1.2

3. Label and compliance information

The host product must be labeled in a visible area with the following " Contains FCC ID: **PPQ-WSG309S** ".

The end product shall bear the following 15.19 statement: This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

4. Additional testing, Part 15 Subpart B disclaimer

Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. SDoC) of the host product to be addressed by the integrator/manufacturer.

This module is only FCC authorized for the specific rule parts 15.247 listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host product as being Part 15 Subpart B compliant.

5. The user manual of the end product should include

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.