



BS01 Specification

Version V1.1

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Document Revision History

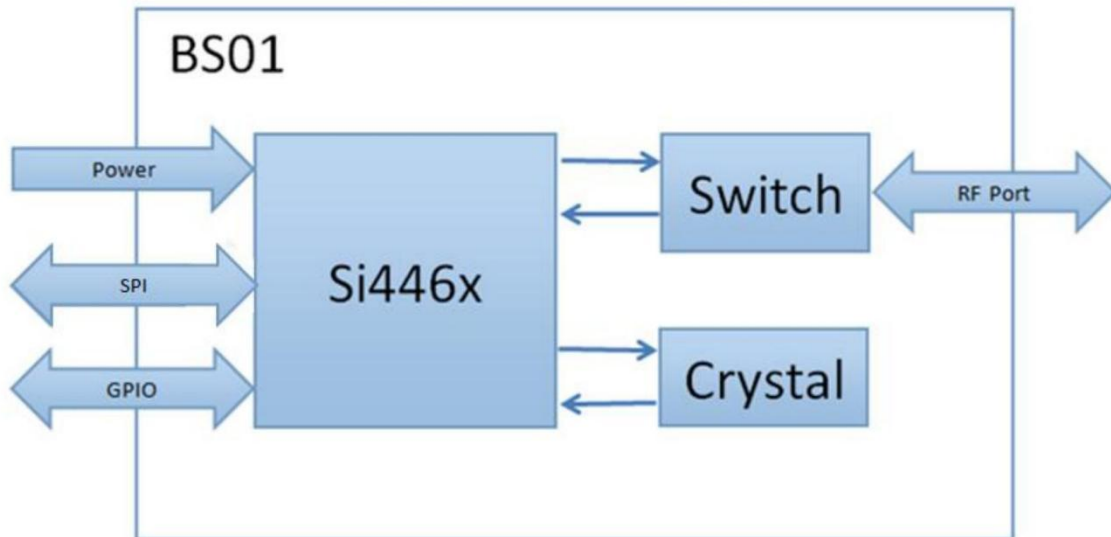
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V1.0	2019-04-16	First edition	Yang Xiaofei	
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1 Product Overview

BS01 is a low-power, compact, and cost-effective Sub-1G RF module. It utilizes the Silicon Laboratories Si4463 chip, featuring up to 20dBm output power and superior receiver sensitivity, covering major application frequency bands.



Features

- Frequency range: 410 – 525MHz (default)
- Receiver sensitivity: -126dBm
- Modulation modes: FSK, GFSK, MSK, GMSK, OOK
- Maximum output power: 20dBm
- Data rate: 100bps – 1Mbps
- Wide supply voltage range: 1.8 – 3.8V
- 64-Byte TX/RX data buffer (FIFO)
- Supports preamble detection mode
- Fast wake-up
- Frequency hopping
- Automatic gain control (AGC)
- Low battery detector
- Temperature sensor

- Compliant with IEEE 802.15.4g and WMBus standard

Key Specifications

Table 1 Key Specifications

Model	BS01
Dimensions	17.3 × 17.0 × 2.5mm (L × W × H) ±0.2mm
Package	DIP-14 or SMD-14
Frequency Range	410 – 525MHz (default)
Output Power	18±2dBm
Receiver Sensitivity	-126dBm
Interface	SPI
Operating Temperature	-40°C – 85 °C
Storage Conditions	-40°C – 125°C, < 90%RH
Supply Power Range	Supply voltage: 1.8V – 3.8V, supply current ≥250mA (3.3V recommended)
Power Consumption	Sleep Mode: Average RX current of 10μA at 50kbps with 1 second sleep interval
	RX: Average RX current of 6mA at 1.2kbps
	TX: 85mA
Transmission Distance	Outdoor open-line-of-sight: ≥1000m

2 Electrical Parameters

Electrical Characteristics

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Unit
Supply Voltage	1.8	3.3	3.8	V
Operating Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C

Power Consumption

Parameter	Typ	Unit
TX Power Consumption	85	mA
RX Power Consumption	6	mA
Sleep	10	uA

RF Parameters

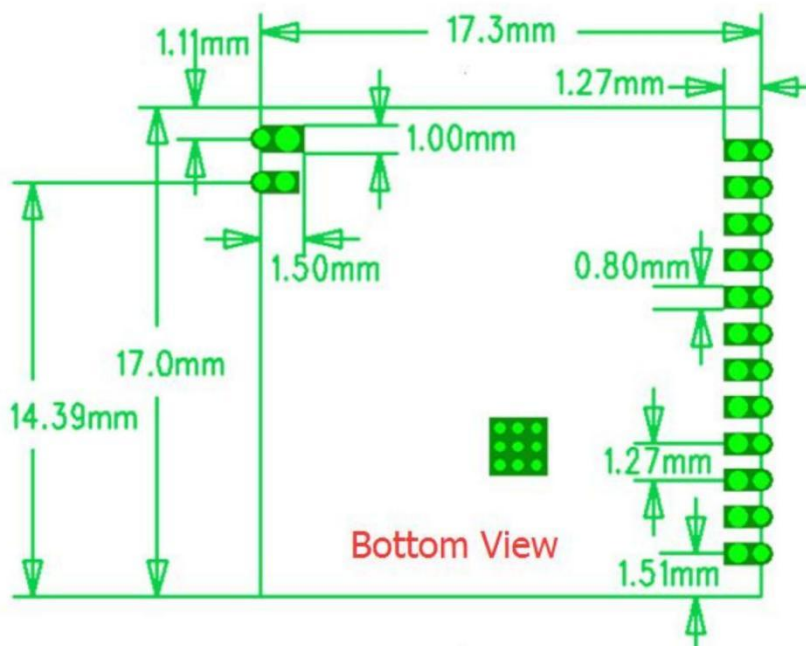
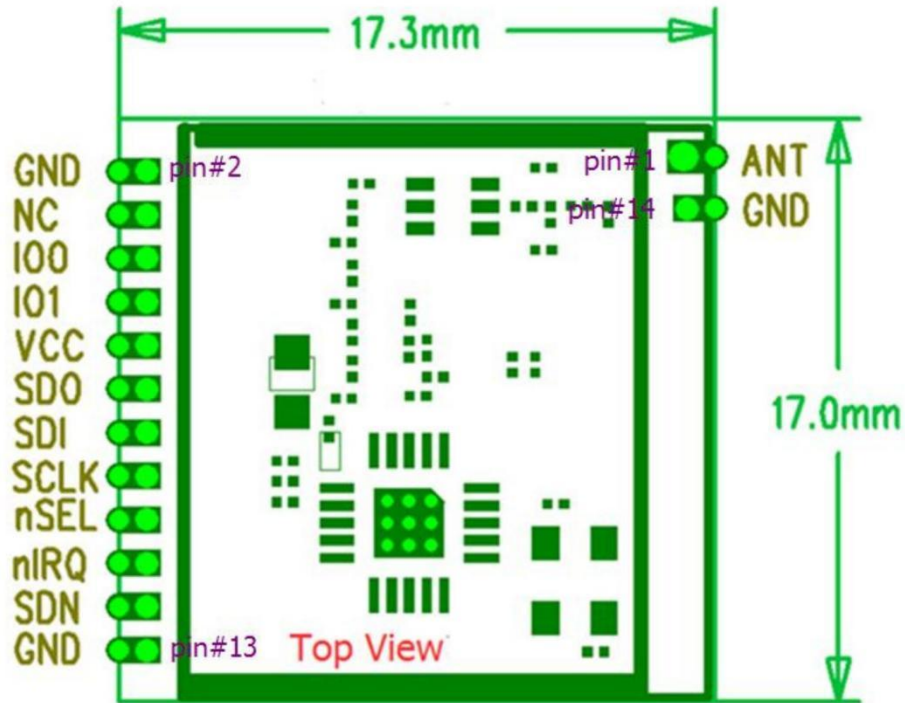
Transmit Power

Parameter	Min	Typ	Max	Unit
Average Power	16	18	20	dBm

Receiver Sensitivity

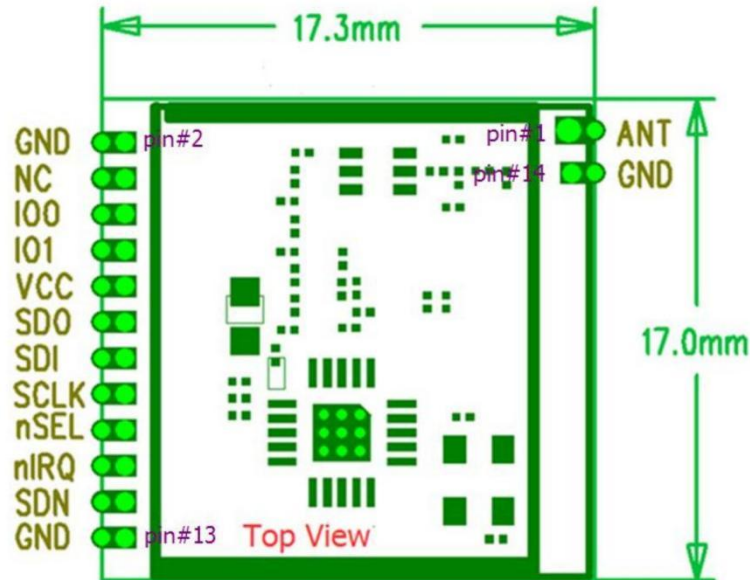
Parameter	Min	Typ	Max	Unit
Receiver Sensitivity	-126	-124	-122	dBm

3 Appearance and Dimensions



4 Pin Definition

The BS01 module exposes a total of 14 pins, as shown in the pin diagram. The pin function definition table provides the detailed interface specifications.

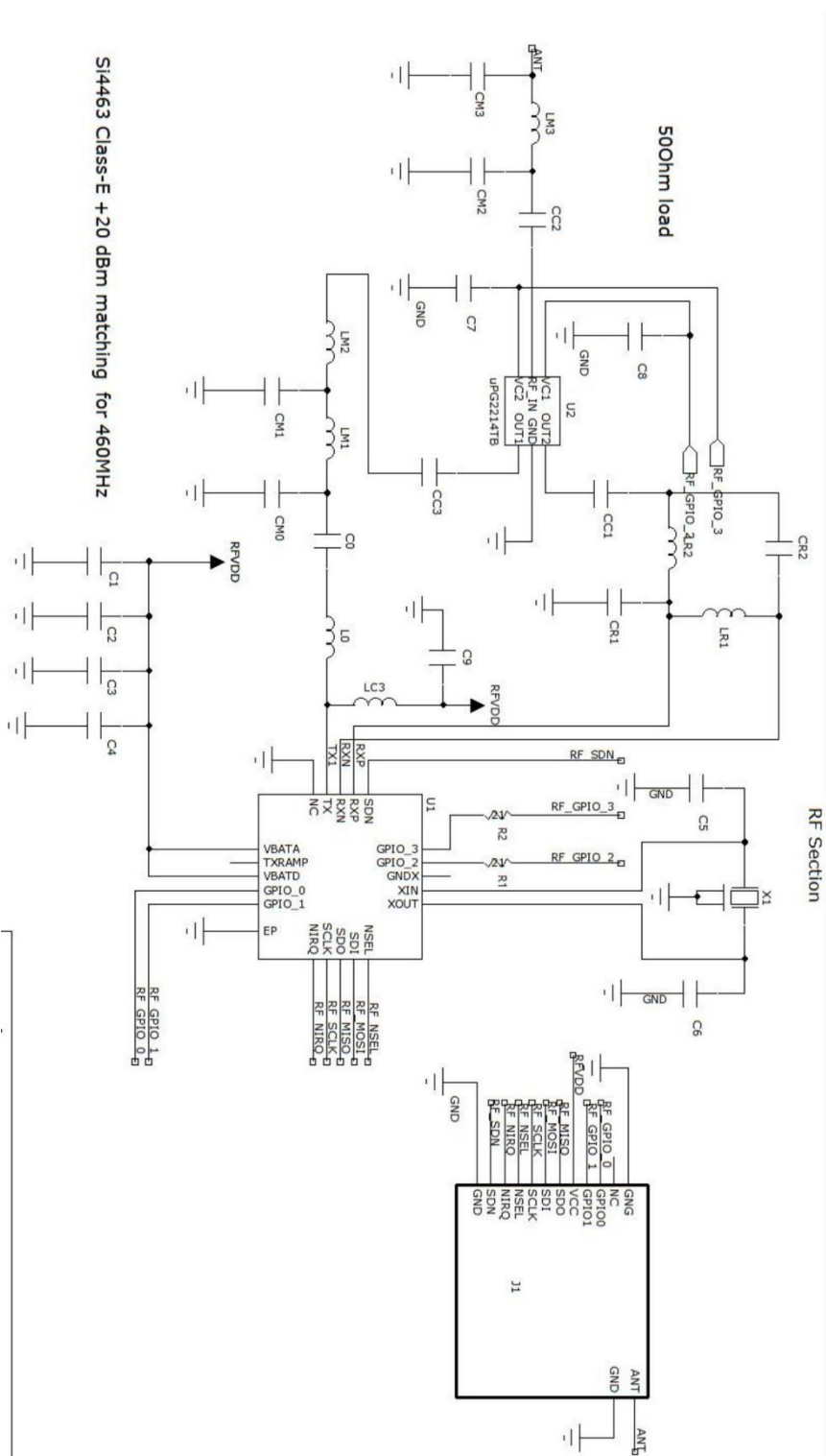


BS01 Pin Diagram

Pin Function Definition

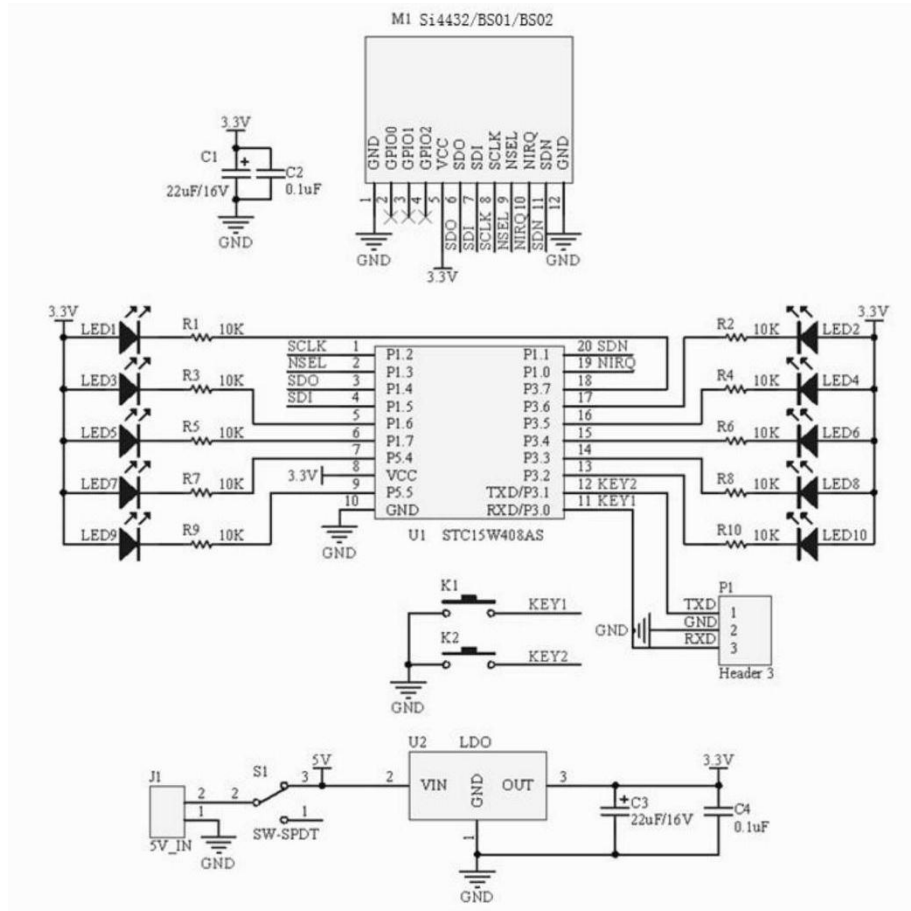
No.	Name	Function
1	ANT	RX: GPIO2=1, GPIO3=0 TX: GPIO2=0, GPIO3=1
2	GND	Ground
3	NC	Not connected
4	IO0	General-purpose digital I/O.
5	IO1	MCU clock output, FIFO status, POR, wake-up timer, low battery detection, TRSW, antenna diversity control, etc.
6	VCC	Power supply
7	SDO	0 – VCC V digital output. Provides serial read-back of internal control registers.
8	SDI	Serial data input. 0 – VCC V digital input. This pin provides the serial data stream for the 4-wire serial data bus.
9	SCLK	Serial clock input. 0 – VCC V digital input. This pin provides the serial data clock function for the 4-wire serial data bus. Data enters the Si4463 on rising edge transitions.

10	nSEL	Serial interface select input. 0 – VCC V digital input. This pin provides the select/enable function for the 4-wire serial data bus.
11	nIRQ	General-purpose MCU interrupt status output. The nIRQ pin will be set LOW = 0 when any interrupt event occurs in the Si4463. The MCU can then determine the interrupt status by reading the interrupt status registers. No external pull-up resistor is required, but it is recommended when multiple interrupt lines are connected together.
12	SDN	0 – VCC V digital input. In all modes except shutdown mode, SDN should be = 0. When SDN = 1, the chip will be completely shut down and register contents will be lost.
13	GND	Ground
14	GND	Ground

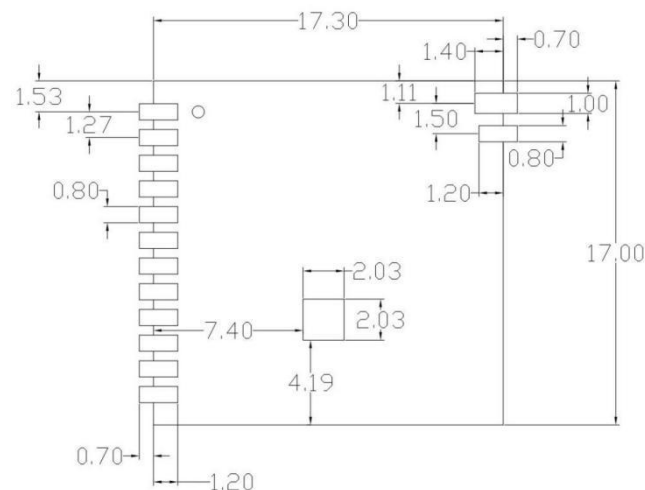


6 Design Guide

1. Application Reference Circuit



2. Recommended PCB Footprint Dimensions



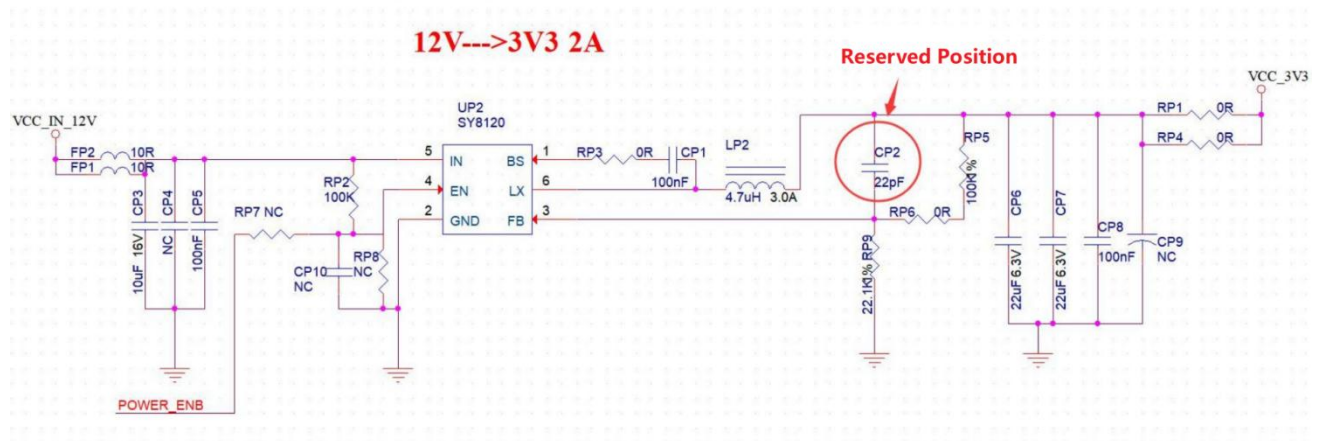
Note: This is the BS01 module footprint. It is recommended to design the PCB based on this drawing so that the module can work properly on the PCB. When designing pads, ensure that the PCB pads are not recessed or offset inward relative to the corresponding module pads. However, expanding the PCB pads outward relative to the module pads will not affect module usage.

3. Antenna Layout Requirements

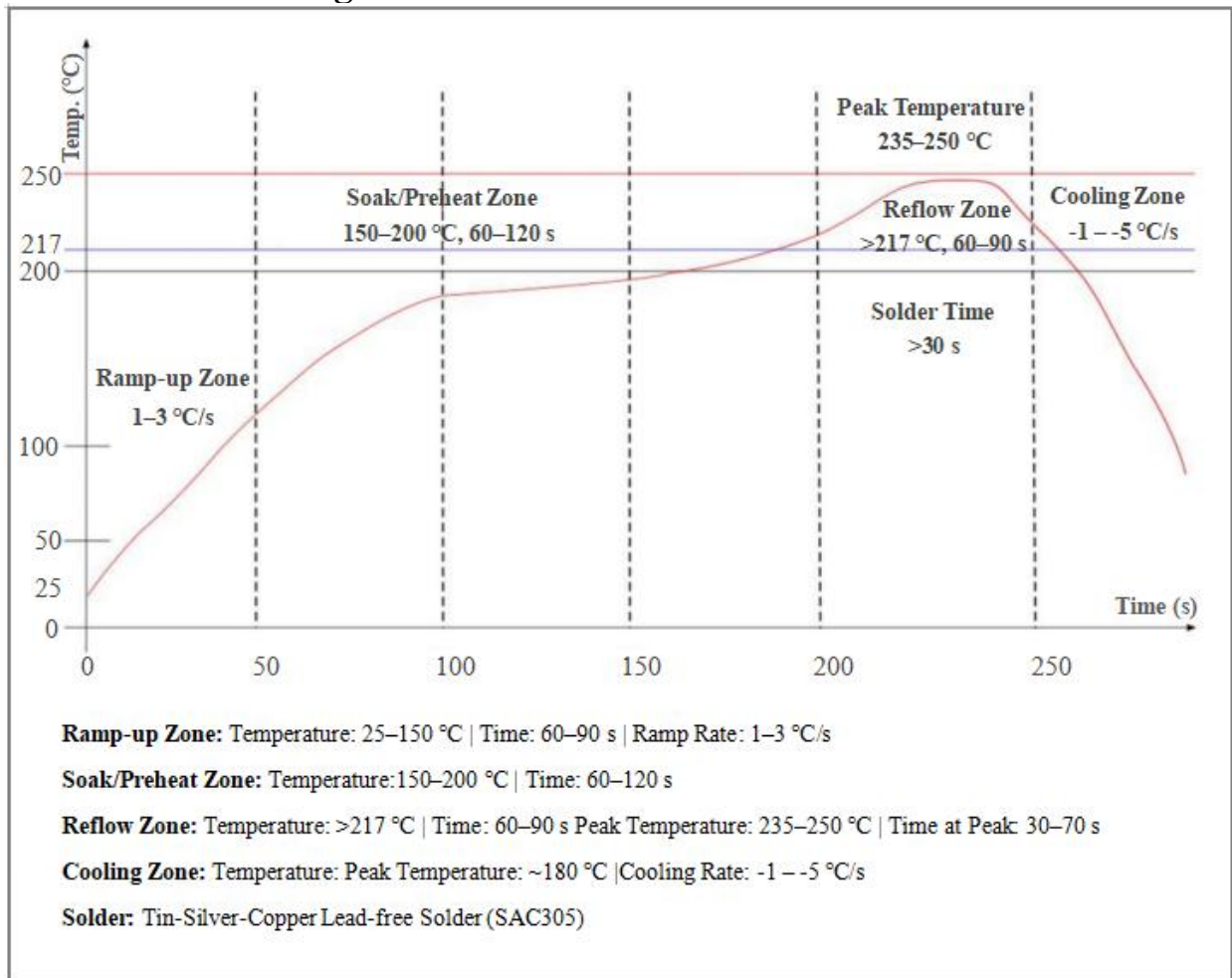
(1) Place the module at the edge of the main board. Metal components should be kept away from the antenna area, and the antenna should be placed as far as possible from high-frequency devices.

4. Power Supply

- (1) A 3.3V supply voltage is recommended, with a peak current above 250mA.
- (2) An LDO is recommended for power supply; if using DC-DC, the ripple should be controlled within 30mV.
- (3) For the DC-DC power supply circuit, it is recommended to reserve space for dynamic response capacitors to optimize output ripple under large load transients.
- (4) It is recommended to add ESD protection devices to the 3.3V power interface.



7 Reflow Soldering Profile



8 Packing Information

As shown in the figure below, the BS01 is packaged in tape and reel.



9 Contact Us

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Sample Purchase: <https://anxinke.taobao.com>

Business Cooperation: sales@aithinker.com

Technical Support: support@aithinker.com



Company Address: Room 410, Building C, Huafeng Smart Innovation Port, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China

Contact Hotline: 0755-29162996