S2SPI-HA/UA/NA-A-434 Module Datasheet V1.0

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Module Name Information

S2SPI - xx - A - xxx

ModuleType:	Antenna Type :	PCB Version: A	Frequency:
S2-LP	UA: UFL Antenna		434=434MHZ
	HA: Helical Antenna		868=868MHZ
	NA: No Antenna		915=915MHZ

Description

S2SPI-HA/UA/NA-A Module is designed based on S2-LP. S2-LP is a high performance ultra-low power RF transceiver, intended for RF wireless applications in the sub-1 GHz band. It is designed to operate in both the license-free ISM and SRD frequency bands at 433, 868 and 920 MHz, but can also be programmed to operate at other additional frequencies in the 430-470MHz, 860-940 MHz bands.

The S2-LP can be used in systems with channel spacing of 12.5/25 kHz enabling. The narrow band operations. The S2-LP shows an RF link budget higher than 140dB for long communication ranges and meets the regulatory requirements applicable in territories worldwide, including Europe, Japan, China and the USA.

Features

- Frequency bands:
  - 430-470 MHz
  - 860-940 MHz
- Modulation schemes:
  - 2(G)FSK, 4(G)FSK
  - OOK, ASK
- Air data rate from 0.3 to 500 kbps
- Ultra-low power consumption:
  - 7 mA RX
  - 10 mA TX @ +10 dBm
- Excellent performance of receiver sensitivity: down to -130 dBm
- Excellent receiver selectivity and blocking
- Programmable RF output power up to +16 dBm
- Bit rate from 0.3 to 500 kbps
- Programmable RX digital filter
- Programmable channel spacing
- Fast startup and frequency synthesizer settling time
- Automatic frequency offset compensation, AGC and symbol timing recovery
- More than 140 dB RF link budget
- Battery indicator and low battery detector
- RX and TX FIFO buffers
- 4 wires SPI interface
- Automatic packet acknowledgment and retransmission
- Embedded timeout protocol engine
- Antenna diversity algorithm
- Fully integrated ultra-low power RC oscillator
- Wake-up driven by internal timer or external event
- Digital real time RSSI
- Flexible packet length with dynamic payload length
- Programmable preamble and SYNC word quality filtering and detection
- Embedded CSMA/CA engine based on listen-before-talk systems
- IEEE 802.15.4g hardware packet support with whitening, FEC, CRC and dual SYNC word detection
- Wireless M-BUS supported
- Enables operations in the SIGFOX™ networks
- Suitable to build systems targeting:
  - Europe: ETSI EN 300 220, ETSI EN 303 131
  - US: FCC part 15 and part 90
  - Japan: ARIB STD T67, T108
  - China: SRRC
- Operating temperature range:
  -40 °C to +85 °C

Antenna Style Selection

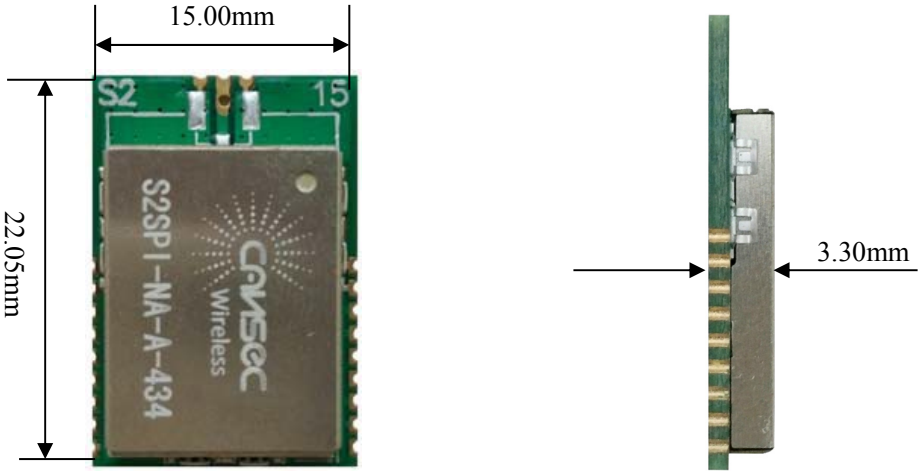
1.S2SPI-UA-A-434(UFL Antenna)

2.S2SPI-NA-A-434(No Antenna)

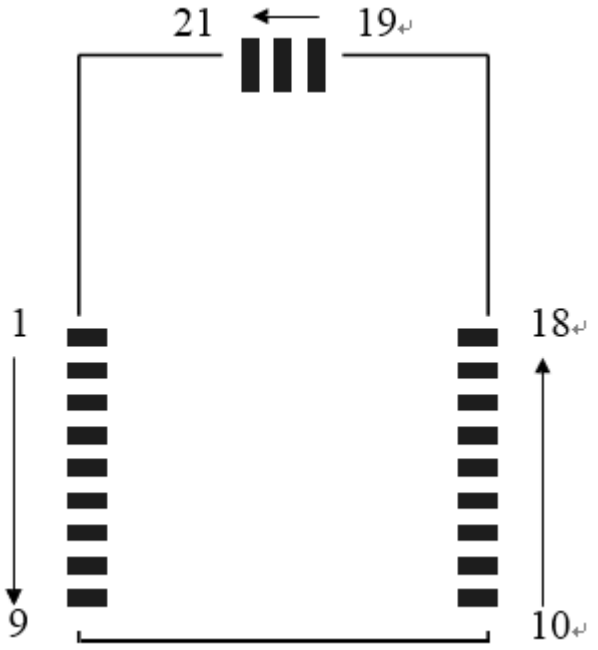
3.S2SPI-HA-A-434(Helical Antenna)

Mechanical Drawing

Tolerance: ±0.2mm



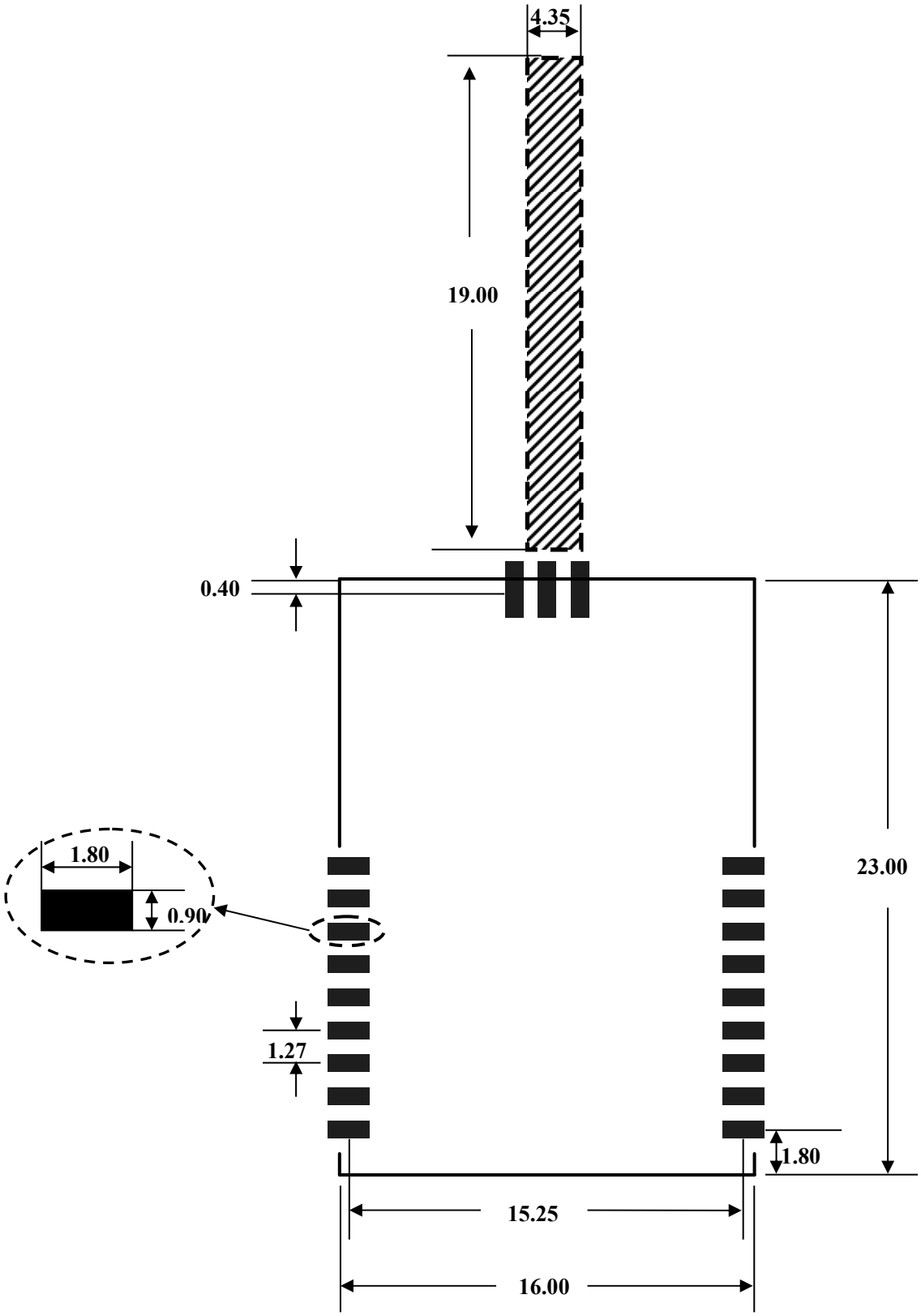
Terminal Description



Pad Number	Name	Description	Pin Type
1	SDO	SPI slave data output	Digital out
2	SDI	SPI slave data input	Digital in
3	SCLK	SPI slave clock input	Digital in
4	CSn	SPI chip select	Digital in
5	GPIO0	General purpose I/O that may be configured through the SPI registers to perform various functions	Digital I/O
6	GPIO1	General purpose I/O that may be configured through the SPI registers to perform various functions	Digital I/O
7	GPIO2	General purpose I/O that may be configured through the SPI registers to perform various functions	Digital I/O
8	GPIO3	General purpose I/O that may be configured through the SPI registers to perform various functions	Digital I/O
9	GND	Connect to GND	Ground pin
10	SDN	Shutdown input pin. SDN should be = '0' in all modes, but SHUTDOWN mode	Digital in
11	GND	Connect to GND	Ground pin
12	GND	Connect to GND	Ground pin
13	VCC	1.8 V to 3.6 V power	Power Supply
14	VCC	1.8 V to 3.6 V power	Power Supply
15	GND	Connect to GND	Ground pin
16	GND	Connect to GND	Ground pin
17	GND	Connect to GND	Ground pin
18	GND	Connect to GND	Ground pin
19	GND	Connect to GND	Ground pin
20	ANT	Connect to an external Antenna	Antenna Interface
21	GND	Connect to GND	Ground pin

Recommended PCB Layout for Package

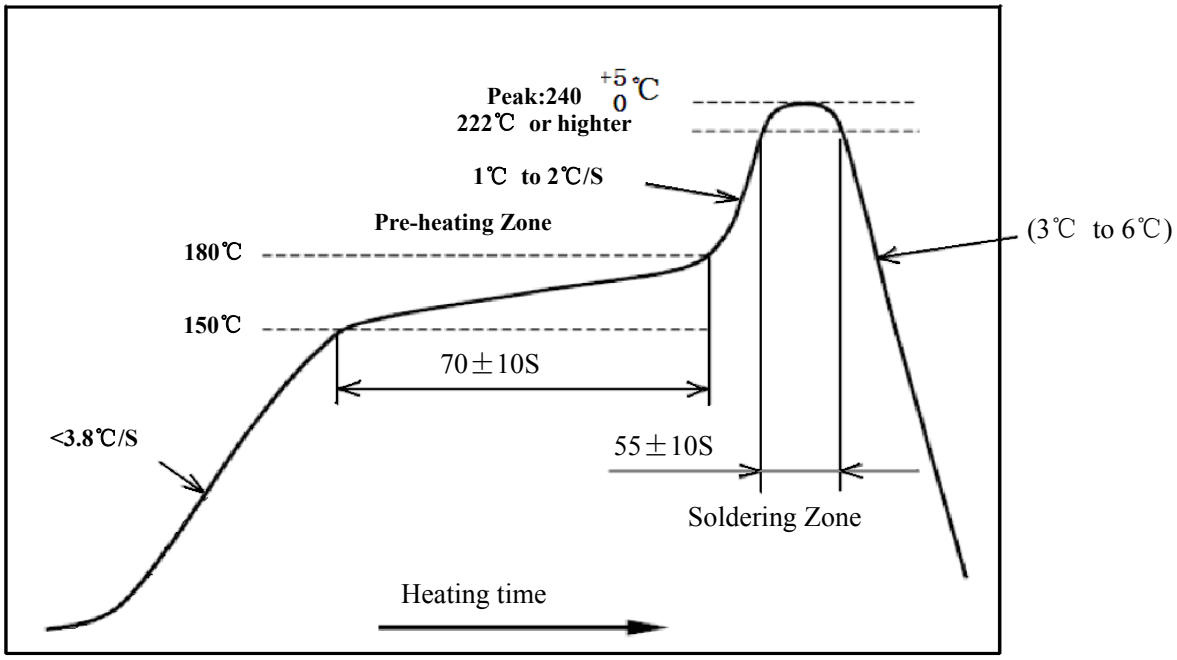
Unit: mm



Specifications

Parameter			Min	Max	Unit
Operating Voltage			1.8	3.6	V
Operating Temperature			-40	85	℃
Current Consumption	TX(CW)	14dBm	-	19	mA
		10dBm	-	10.2	
	RX		-	8	
	Sleep		-	0.6	uA
TX Power			-	14	dBm
RX Sensitivity	DR=0.3Kbps		-	-131	dBm
Storage Temperature			-40	105	℃

Soldering Recommendations



Contact details

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