



LoRa Module WSL303S (without MCU)

Compact-sized
With Ultra-low Power Consumption



LoRaWAN Support



862-1020MHz



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



Ultra-Low Power
Consumption

The WSL303S transceivers SX1276 feature the LoRa™ long range modem that provides ultra-long range spread spectrum communication and high interference immunity whilst minimising current consumption.

LoRa™ also provides significant advantages in both blocking and selectivity over conventional modulation techniques, solving the traditional design compromise between range, interference immunity and energy consumption.

◆ General Feature

- General LoRa module for Smart City, Smart Agriculture , Smart Industry, IOT Application
- Compact Form Factor: 11 x 11.8 x 2.3 mm
- 20 Pin Stamp Pad for PCB SMT mounting
- I/O port: SPI/DIO
- Temperature range: -40°C to +85°C
- Supply voltage: 2.0 ~ 3.6V
- Frequency range: 862–1020MHz, ISM and SRD systems
- IEEE 802.15.4g, Wireless M-Bus and Proprietary Systems
- Low-Power Wireless Systems with 7.8-kHz to 500-KHz Bandwidth

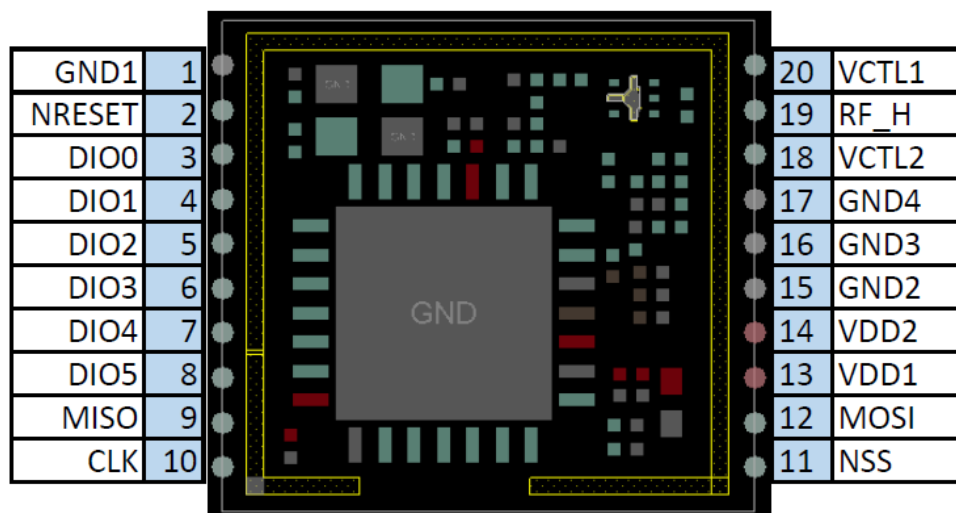
◆ Product Specifications

	RF Function
Standard	IEEE 802.15.4g
Interface	SPI/DIO
Transmit Output Power	19dBm
Data Rate	0.018 - 37.5 kbps
Modulation Techniques	Multilevel (G)FSK and MSK
Frequency bands	862 – 1020MHz
Operating Voltage	2.0 ~ 3.6V
Operating Temperature	-40 ~ 85 degree C

◆ Power Consumption

Item	Min.	Typ.	Max.	Unit	Condition
Transmit mode @20dBm		120		mA	on PA_BOOST
Transmit mode @17dBm		87		mA	on PA_BOOST
Receive mode		12		mA	
Sleep mode		0.2		uA	
Standby mode		1.6	1.8	mA	Crystal oscillator enabled
Synthesizer mode		5.8		mA	

◆ **MODULE PINOUT**

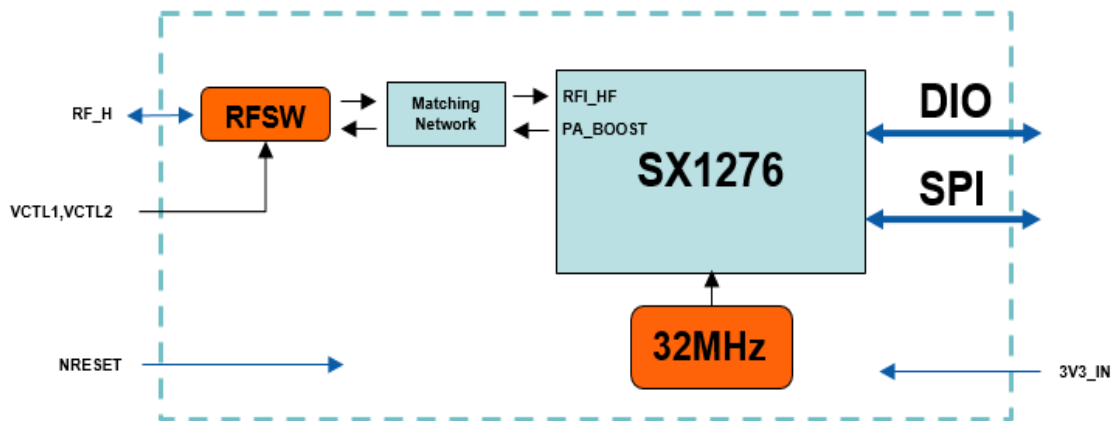


◆ **PIN DEFINITION**

PIN	Name	I/O	Description
1	GND1	-	Ground
2	NRESET	I/O	Reset trigger input
3	DIO0	I/O	Digital I/O, software configured
4	DIO1	I/O	Digital I/O, software configured
5	DIO2	I/O	Digital I/O, software configured
6	DIO3	I/O	Digital I/O, software configured
7	DIO4	I/O	Digital I/O, software configured
8	DIO5	I/O	Digital I/O, software configured
9	MISO	O	SPI Data output
10	CLK	I	SPI Clock input
11	NSS	I	SPI Chip select input
12	MOSI	I	SPI Data input
13	VDD1	Power	Power 3.3V
14	VDD2	Power	Power 3.3V
15	GND2	-	Ground
16	GND3	-	Ground
17	GND4	-	Ground
18	VCTL2	I	RF Switch control
19	RF_H	I/O	RF port
20	VCTL1	I	RF Switch control

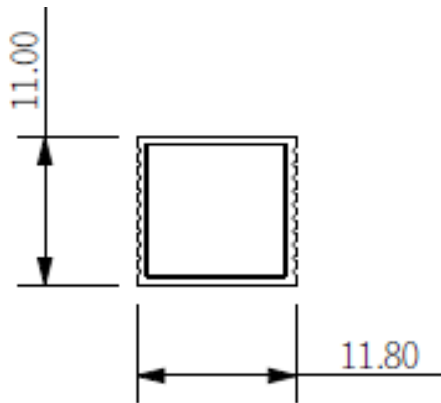
RF Switch (SPDT) control Logic:
 TX mode: VCTL1=High VCTL2=Low
 RX mode: VCTL1=Low VCTL2=High
 (High level = 1.8 ~3.3V, Low Level = 0V)

◆ **BLOCK DIAGRAM**

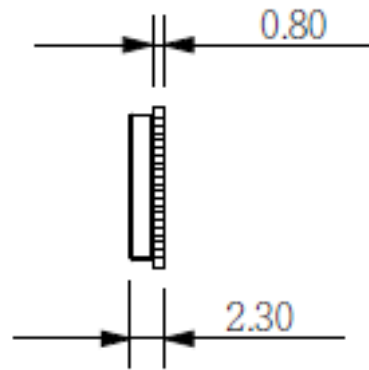


◆ **MODULE DIMENSION**

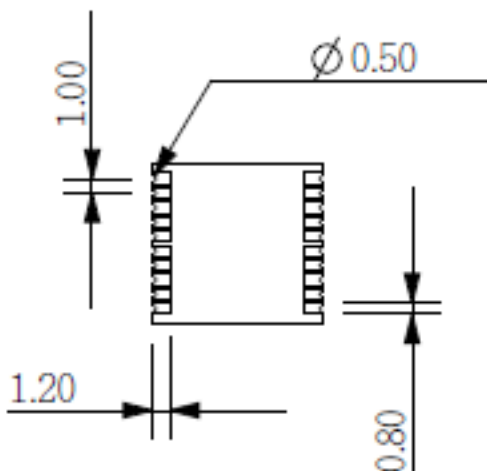
Top View



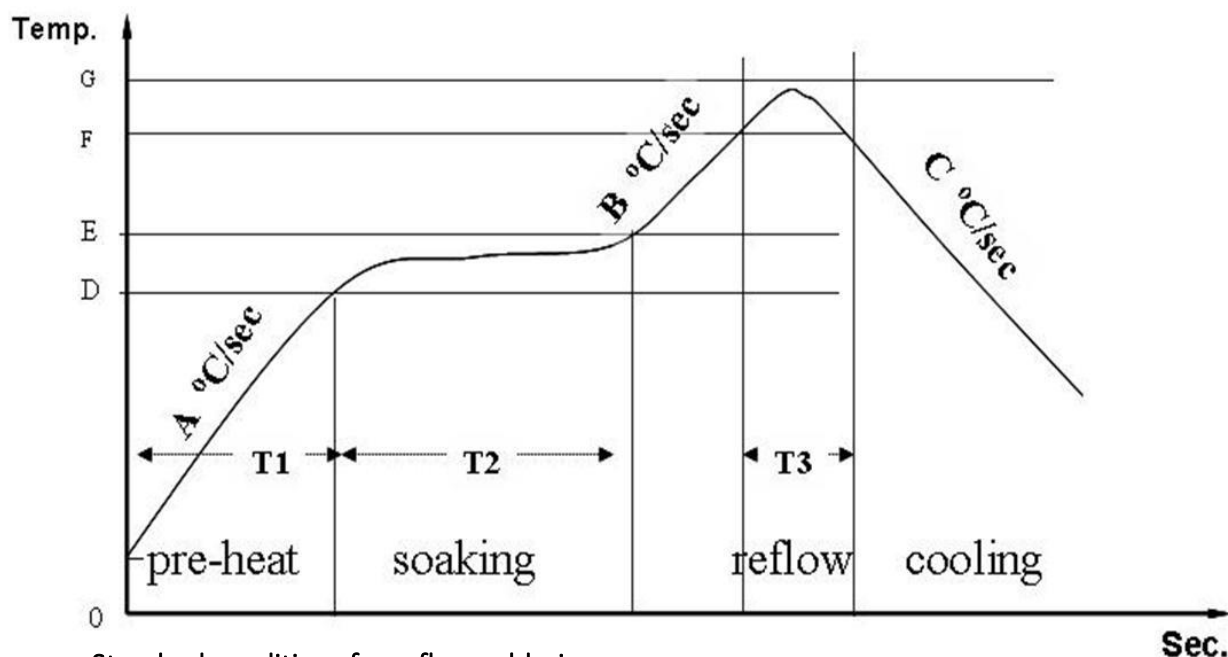
Side View



Bottom View



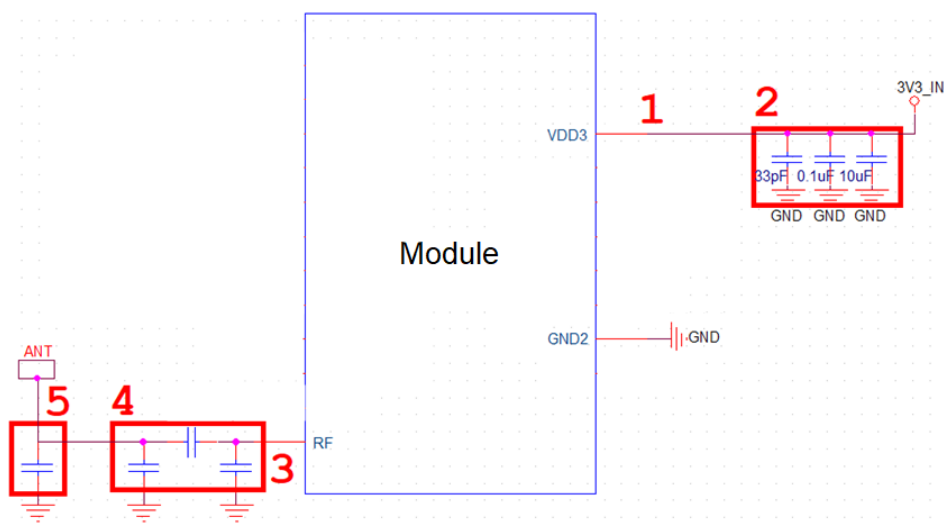
◆ **RECOMMENDED REFLOW PROFILE**



Standard conditions for reflow soldering:

- a. Pre-heating Ramp (A) (Initial temperature: 150°C): 1~2.5°C/sec;
- b. Soaking Time (T2) (150°C~180°C): 60sec~100sec;
- c. Peak Temperature (G): 230~250°C;
- d. Reflow Time (T3) (>220°C): 30~60 sec;
- e. Ramp-up Rate (B): 0~2.5°C/ sec;
- f. Ramp-down Rate (C): 1~3°C/ sec.

◆ **Additional Guidelines**



1. Power output routing width recommended more than 1mm.
2. Recommended to reserve capacitors to suppress ripple and noise.
3. RF output need routing with 50ohm impedance line.
4. Reserve the Pi-Matching for Antenna performance tuning.
5. Reserve the TVS for ESD protection. (Option)

◆ CHANGE LIST

Rev	Date	Author	Change List
V1.0	2018.02.06	Kelly Hsu	Preliminary
V1.1	2018.03.07	Kelly Hsu	Add the true table for RF TRX control Add Power consumption data
V1.2	2018.04.11	Kelly Hsu	Modify Supply Voltage
V1.3	2019.04.18	Kelly Hsu	Add Additional Guidelines