

Wio-SX1262-1W Module

LoRa® Wireless Module SX1262

Datasheet

v1.0

Content

1. Introduction	1
1.1. Feature	1
1.2. Diagram	2
2. Description	3
2.1. Pin Definition	3
3. Electrical Characteristics	4
3.1. Absolute Maximum Ratings	4
3.2. Normal Working Conditions	4
3.3. Module Specifications	4
4. RF Performance	6
4.1 RF Power	6
4.2 Power Consumption	7
4.3 Receiver Sensitivity	8
4.4 Power Measurement Characteristics	9
5. Application Information	10
5.1. Mechanism Dimension (Unit: mm)	10
5.2. Reference Design	11
5.3 External Interface	11
5.4 Designing LoRaWAN® Wireless Sensors with the Wio-SX1262-1W	12
6. Production	12
6.1 Reflow Soldering Parameters	12
7. Version	14

1. Introduction

The Wio-SX1262-1W is a high-power, compact LoRa RF module featuring Semtech's advanced SX1262 wireless communication chip and the highly integrated SKY66122-11 RF front-end module (FEM). Targeting applications in wireless sensor networks and broader IoT domains, this module is especially suitable for scenarios requiring high output power and long-range connectivity.

This specification document details the module's hardware architecture, performance characteristics, and application guidelines. The Wio-SX1262-1W is primarily optimized for long-distance, high-power deployments.

1.1. Feature

- High output power: Transmit power up to 30dBm
- Compact size: 16mm *25mm *3mm @13 pins SMT
- RF communication interface: Available in both IPEX connector and SMT pin versions, selectable based on application requirements:
Wio-SX1262-1W(with IPEX) / Wio-SX1262-1W-N(SMT Pin)
- High performance: TXOP=30dBm@902-928MHz; -137dBm sensitivity for SF12 with 125KHz BW, included line loss



1.2. Diagram

The Wio-SX1262-1W integrates a high-performance LoRa® wireless communication chip and is well-suited for a wide range of IoT node designs. It supports both (G)FSK and LoRa® modulation modes, with the latter offering configurable bandwidths from 7.8kHz to 500kHz.

The module communicates with an external MCU via an SPI interface. Its power supply architecture adopts a DC-DC conversion design, as opposed to the linear regulator (LDO) option also supported by the SX1262. The internal RF reference frequency is provided by an active TCXO, which is powered through the SX1262 **DIO3** pin.

The Wio-SX1262-1W is currently available in two sub-models: Wio-SX1262-1W-HF and Wio-SX1262-1W-N-HF. The former features an **IPEX** connector, while the latter uses **SMT** pins. Both HF variants support 30dBm output power in the 902–928 MHz band.

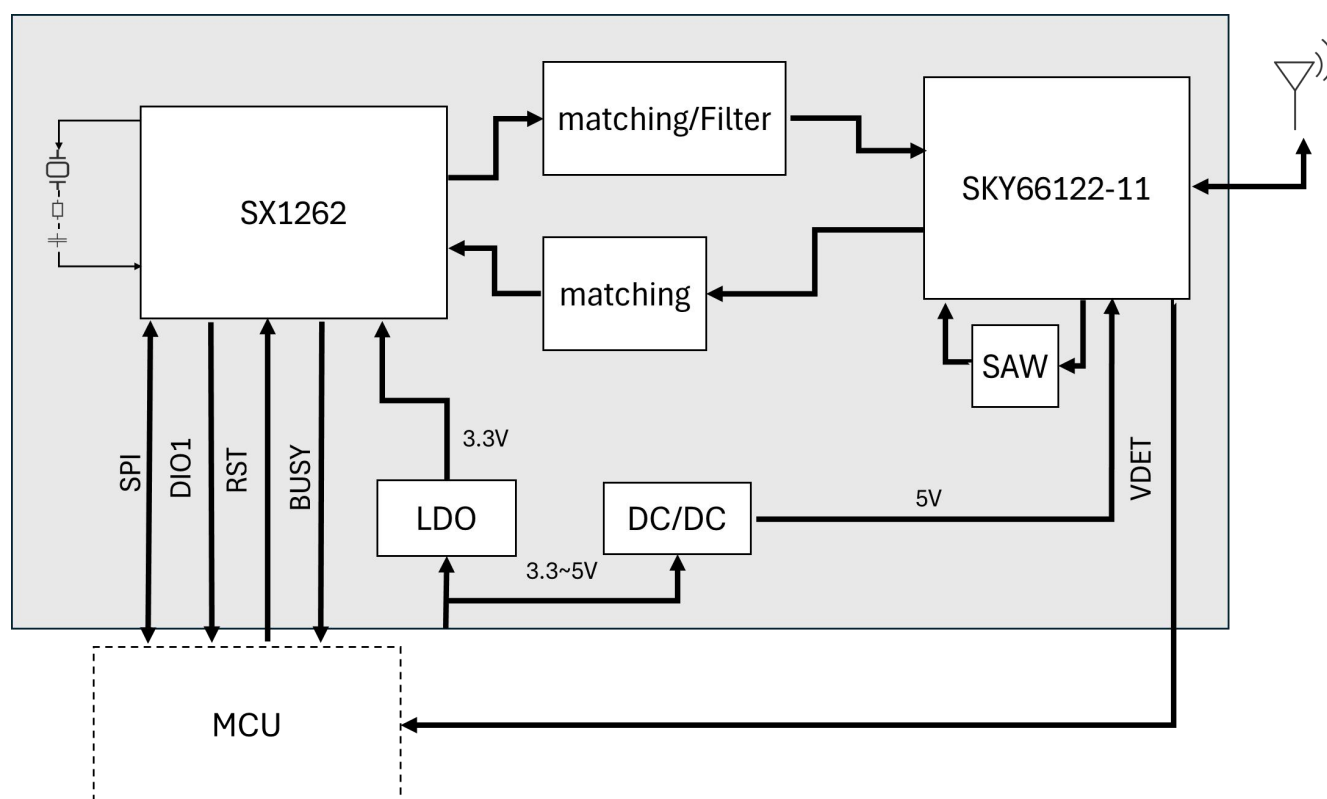


Figure 1 Wio-SX1262-1W Block Diagram

2. Description

2.1. Pin Definition

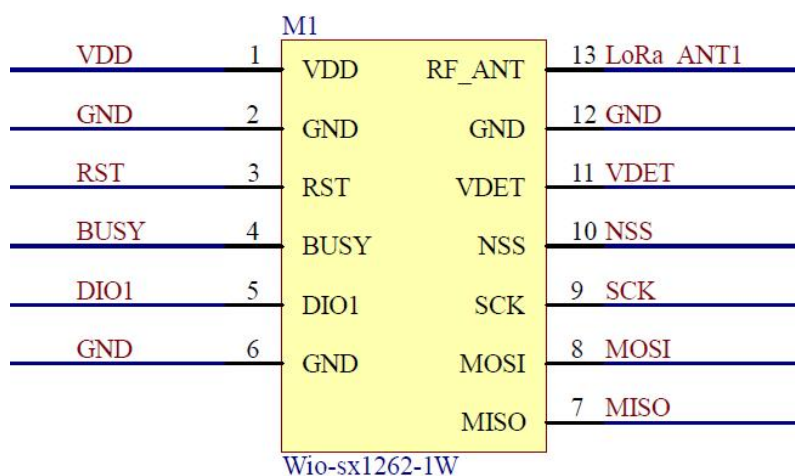


Figure 2 Wio-SX1262-1W Pinout

Number	Name	Type	Description
1	VDD	Power	Power Supply
2	GND	-	Ground
3	RST	I	Reset Signal, Active LOW
4	BUSY	O	Busy Indicator
5	DIO1	I/O	Multi-purpose Digital I/O
6	GND	-	Ground
7	MISO	O	SPI_MISO
8	MOSI	I	SPI_MOSI
9	SCK	I	SPI_SCK
10	NSS	I	SPI_NSS
11	VDET	O	Output Power Detection
12	GND	-	Ground
13	ANT ¹	RF	RF I/O

CAUTION:

[1] This pin only works on Wio-SX1262-1W-N variant. Please note that the Wio-SX1262-1W uses the IPEX connector by default.

3. Electrical Characteristics

3.1. Absolute Maximum Ratings

Please note that exceeding these values will result in permanent damage and functional degradation.

Item	Description	min	max	unit
VCCmr	Supply voltage	-0.5	+5.5	V
Tmr	Operating Temperature	-40	+85	°C
Tstore	Storage Temperature	-40	+105	°C
Pmr	RF Input Power	-	-10	dBm

3.2. Normal Working Conditions

Item	Description	min	max	unit
VCCop	Supply voltage	+3.3	+5	V
Top	Operating Temperature	-40	+85	°C
Pop	RF Input Power	-	-20	dBm

3.3. Module Specifications

Items	Parameter	Specifications	Unit
Structure	Size	16(W) X 25(L) X 3(H)	mm
	Package	13 pins, SMT	
Electrical Characteristics	Supply voltage	3.3~5V typical	V
	Sleep current	13uA@3.3V	uA
		62uA@5V	
	SX1262 power distribution mode	DC-DC Mode	
	TCXO supply mode	By SX1262 DIO3	
	TCXO supply	1.7-3.3V	V

	voltage						
	Frequency range	HF@902-928				MHz	
	Maximum operation current (Transmitter)	1500mA@30dBm /3.3V in 902-928MHz typical				mA	
		960mA@30dBm/5V in 902-928MHz typical					
	Maximum operation current (Receiver)	25mA@3.3V					
		20mA@5V					
	Output power	30dBm max@902-928MHz ¹				dBm	
	Receiver sensitivity included line loss	@SF12, BW125kHz				dBm	
		Fr(MHz)	max	typical	min		
		902-928	-	-137	-138		
Harmonics @HF	≤-10dBm above 1GHz ≤-45dBm above 2GHz				dBm		
Interface	ANT	RF port of IPEX or SMT pin,default IPEX@50 ohm impedance					
	DIO1	Multi-purpose digital IO					
	Busy	Busy signal indicator					
	SPI	1 group of SPI, include 4 pins					
	VDET	Measuring the module's output power					

4. RF Performance

4.1 RF Power

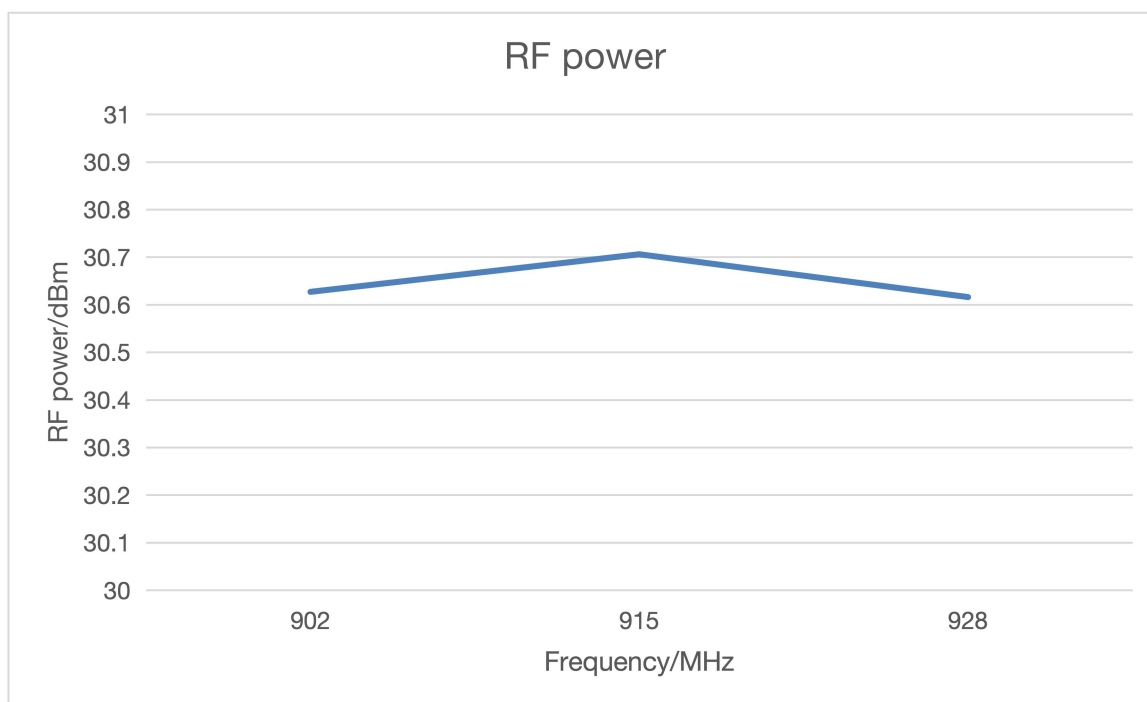


Figure 3 Maximum RF Power @ (VCC = +3.3V, TA = +25 °C)

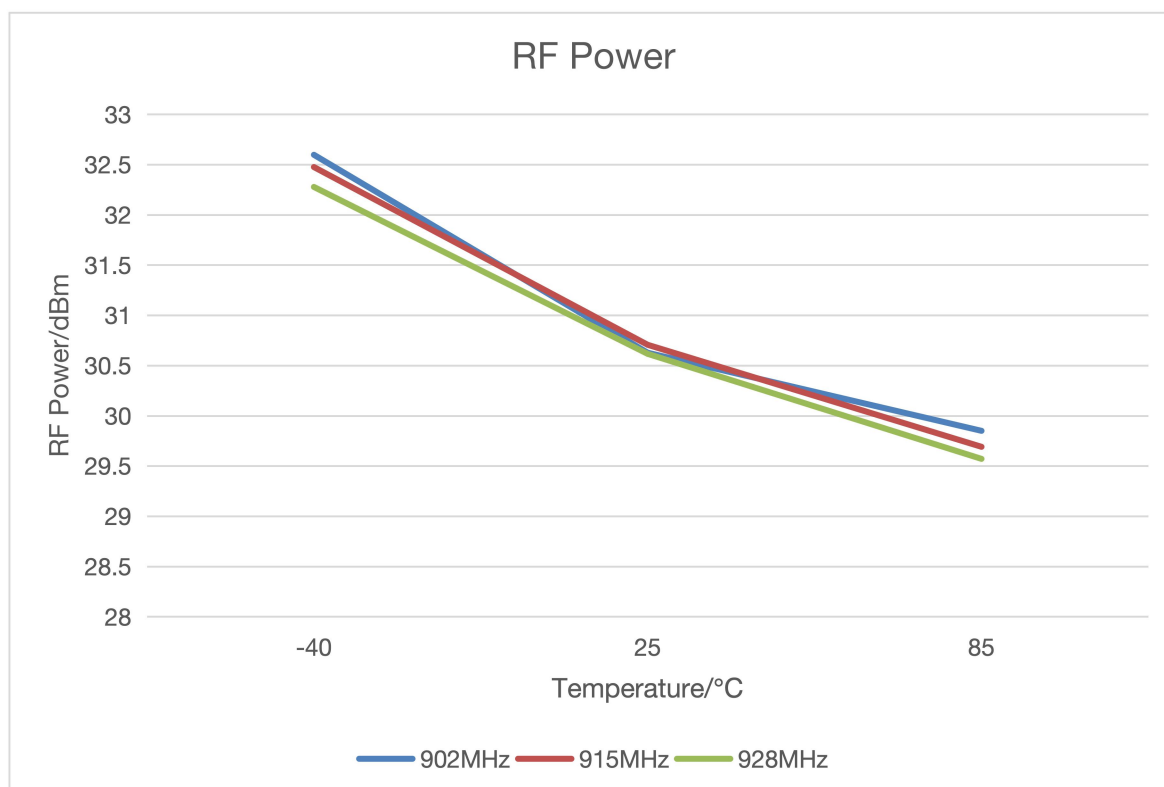


Figure 4 Maximum RF Power VS Temperature (VCC = +3.3V)

4.2 Power Consumption

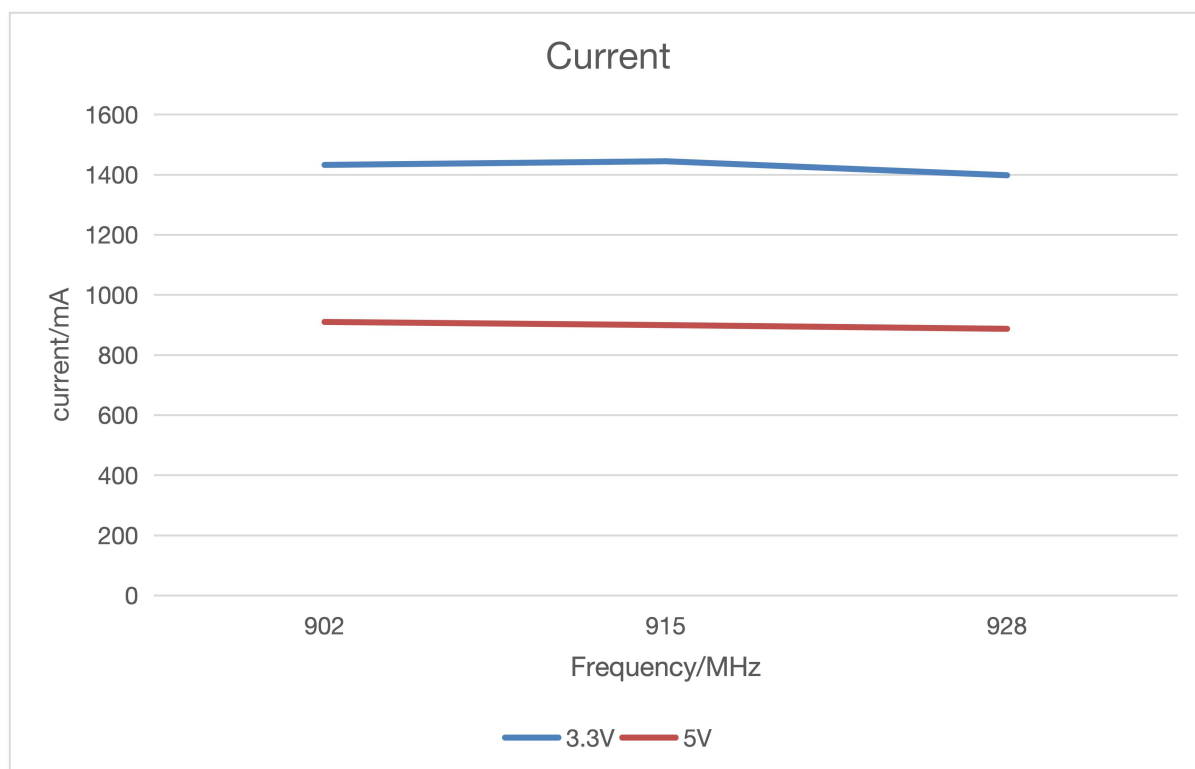


Figure 5 Maximum Transmit Current

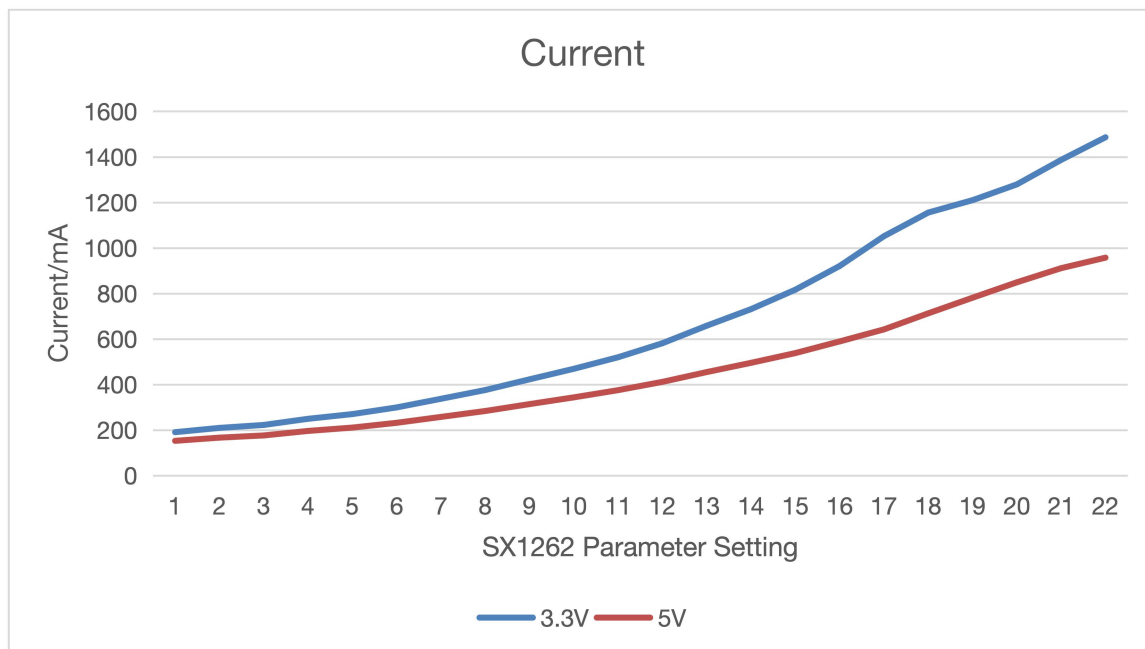


Figure 6 Current VS Parameter Setting

4.3 Receiver Sensitivity

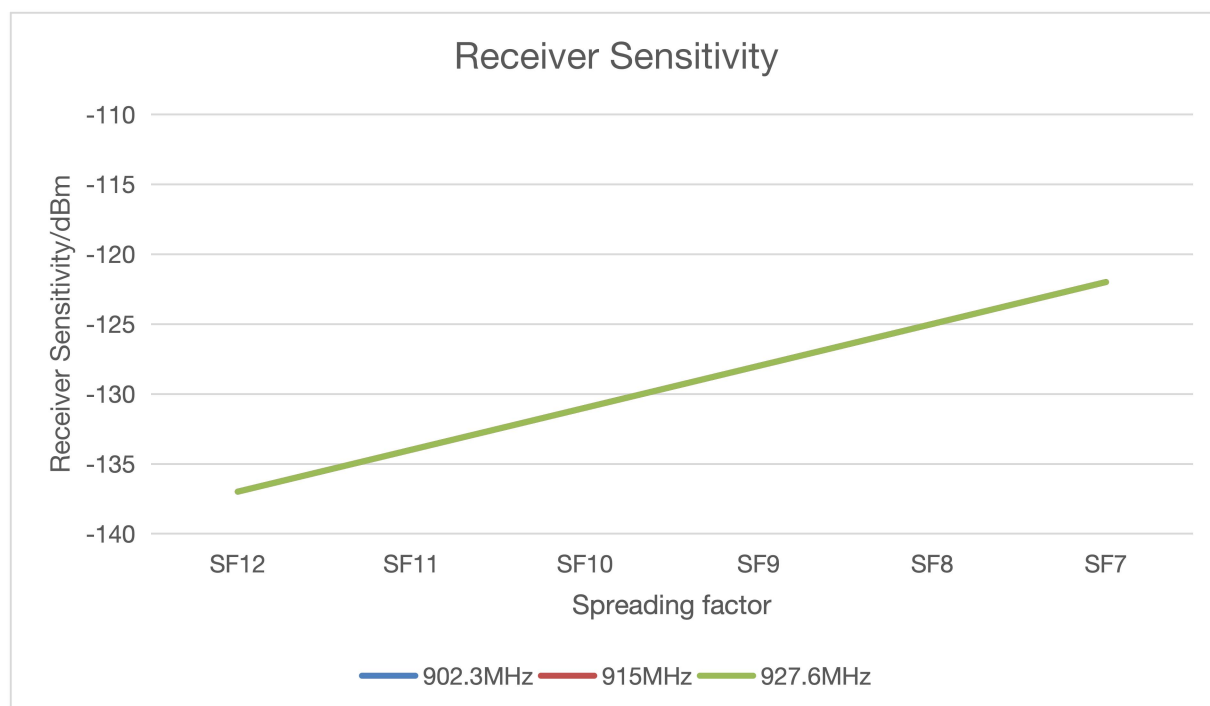


Figure 7 Receiver Sensitivity VS Spreading Factor (902-928MHz, BW 125KHz)

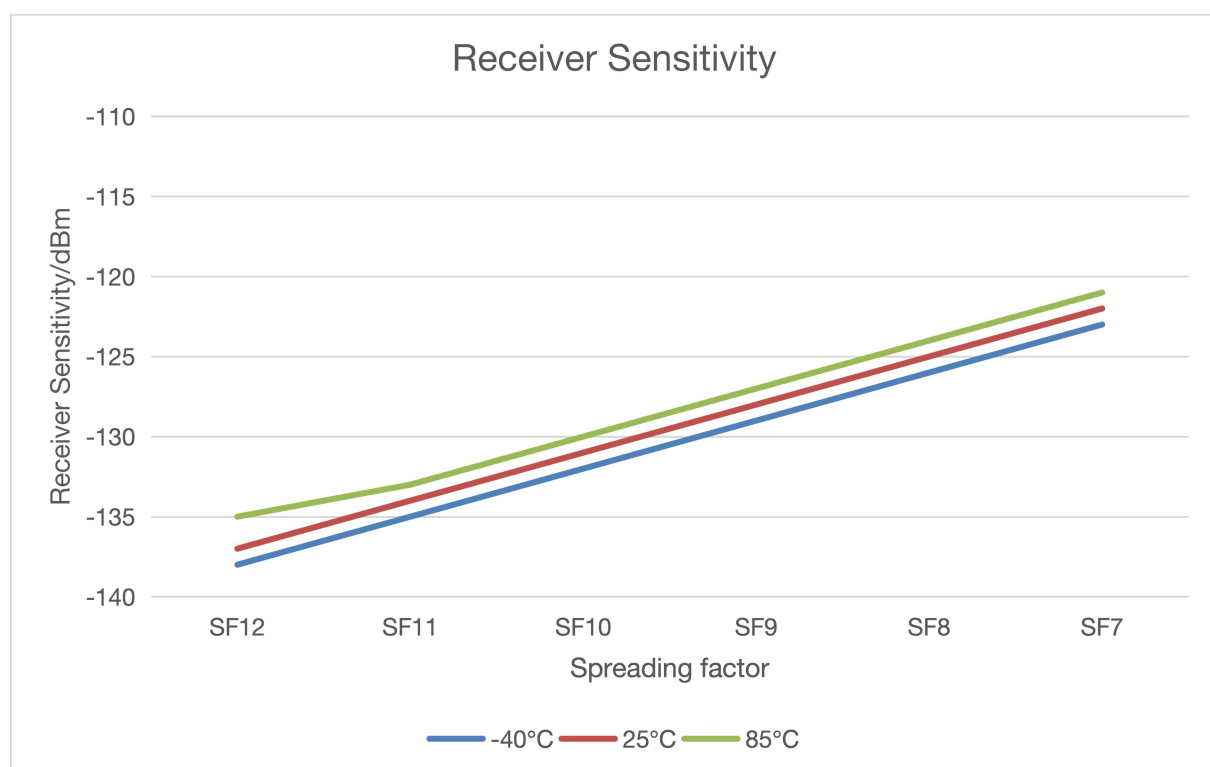


Figure 8 Receiver Sensitivity VS Temperature (915MHz@BW125KHz)

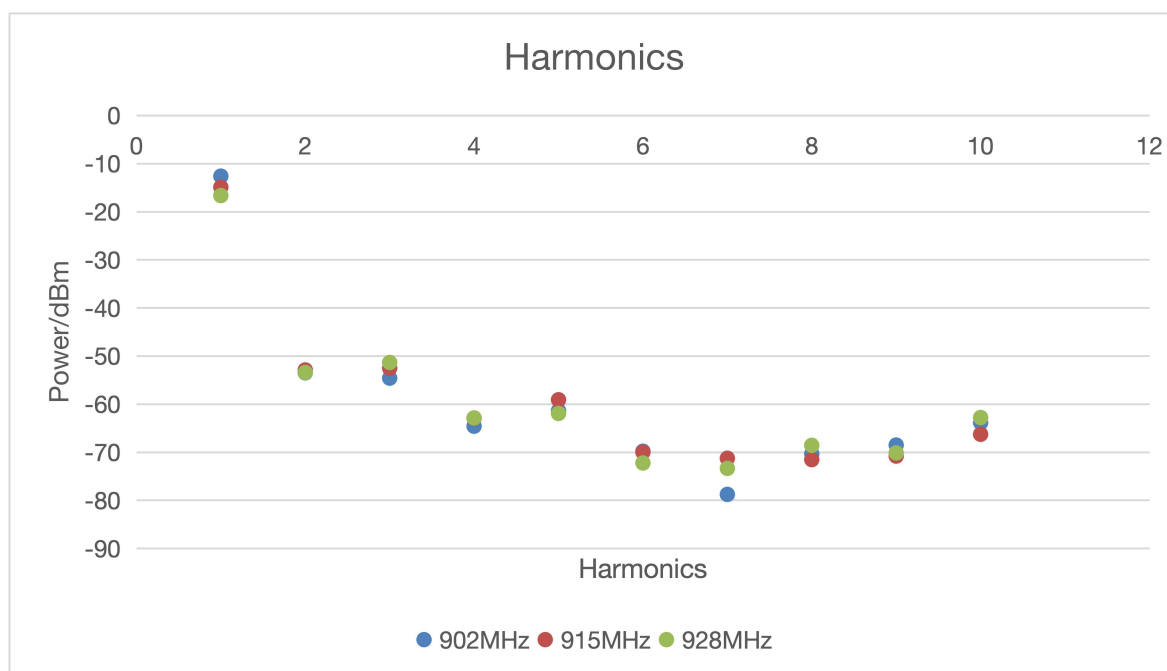


Figure 9 Harmonics @ POUT = +30dBm, VCC = +3.3V

4.4 Power Measurement Characteristics

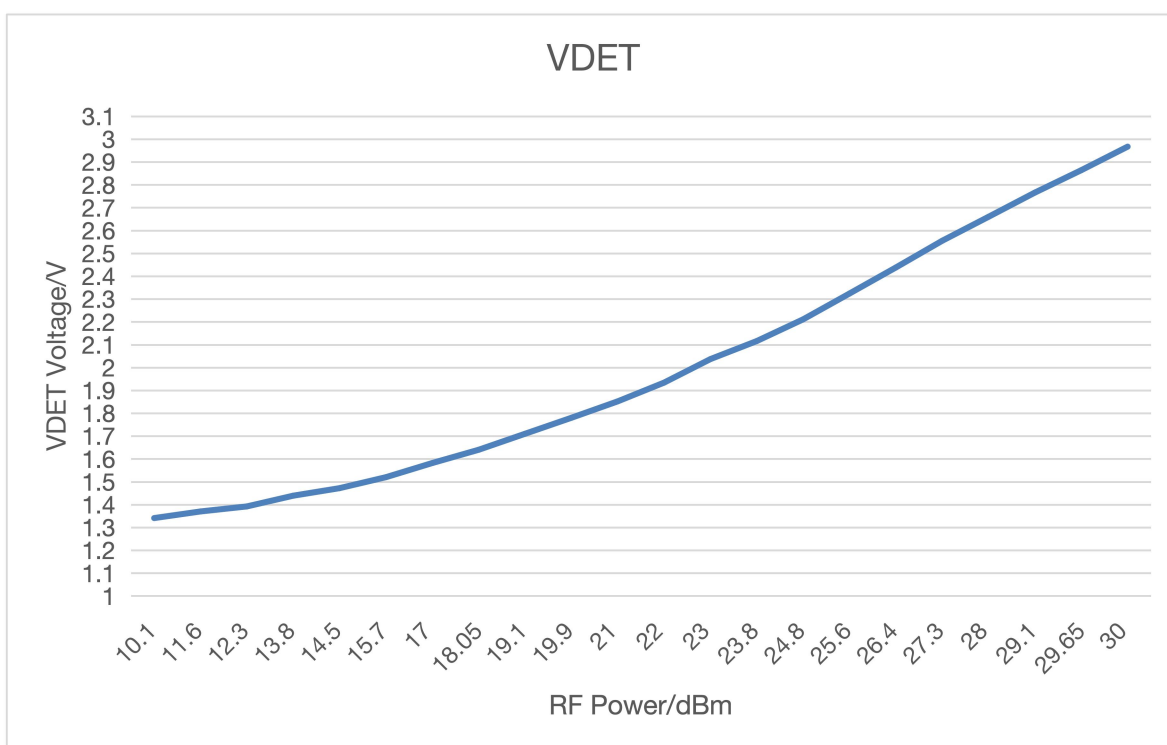


Figure 10 VDET Voltage VS RF Power

5.2. Reference Design

The following is a typical hardware reference design using the Wio-SX1262-1W module. The module can be connected to a host MCU as shown in the reference design:

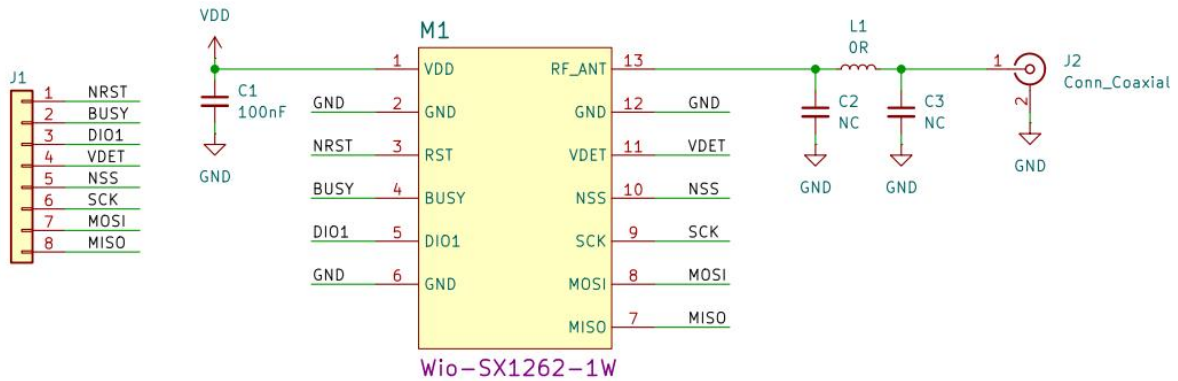


Figure 13 Reference Design Based on Wio-SX1262-1W

Antenna design notes for the Wio-SX1262-1W module:

- The antenna interface is designed with a 50 Ω characteristic impedance.
- It is recommended that users reserve a π -type matching network on the PCB for antenna tuning.

5.3 External Interface

- **SPI interface** – Used to control the internal RF transceiver.
- **DIO1** – Interrupt request line.
- **VDET** – RF output power detection pin.
- **BUSY** – Busy signal indicator. The module is ready to accept new commands only when this pin is low.
- **RF output** – 50 Ω impedance, compatible with both IPEX and SMT-pin interfaces.

5.4 Designing LoRaWAN® Wireless Sensors with the Wio-SX1262-1W

The Wio-SX1262-1W RF module requires only a simple MCU as the host controller. It is controlled via an SPI interface, enabling straightforward implementation of the LoRaWAN® protocol. This allows customers to rapidly bring sensor products to the LoRaWAN® market.

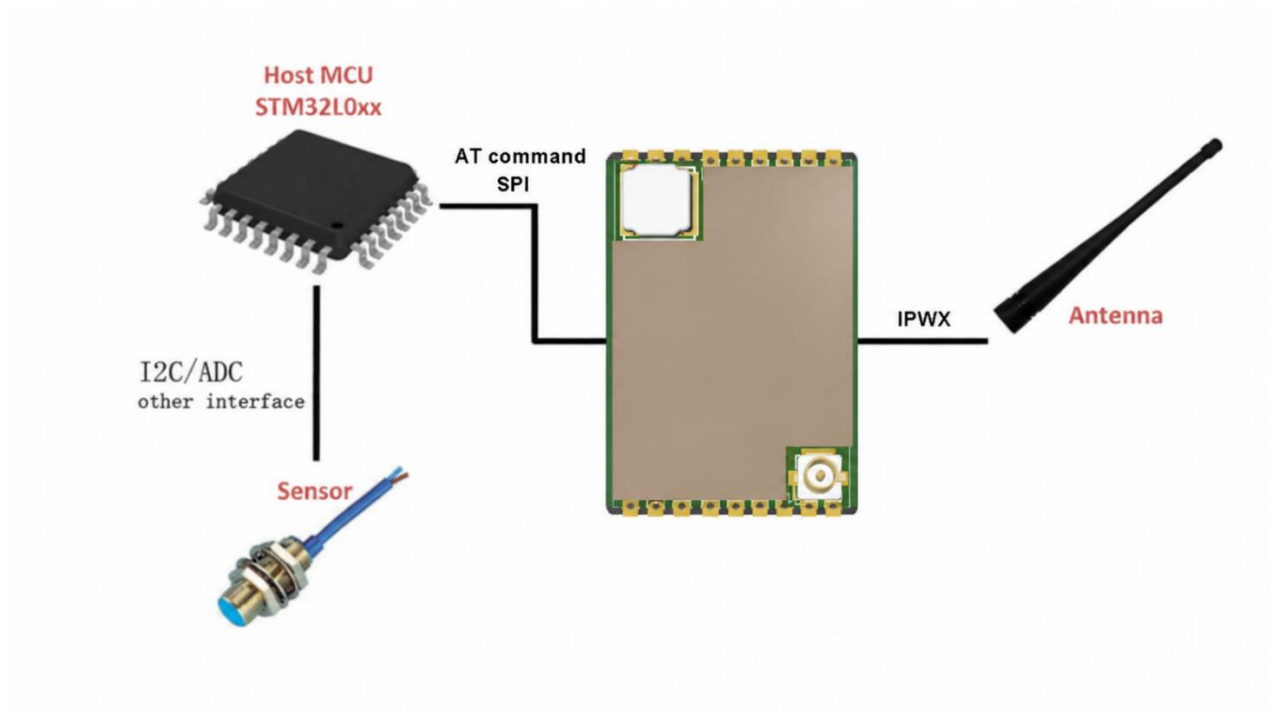


Figure 11 Reference Design of LoRaWAN Wireless sensor based on Wio-SX1262-1W

6. Production

6.1 Reflow Soldering Parameters

The Wio-SX1262-1W module is designed for easy integration into production processes, including reflow soldering onto PCBs. A key requirement is that users must select an appropriate solder paste and ensure that the temperature profile during reflow meets the paste manufacturer's specifications. The Wio-SX1262-1W complies with the reflow soldering temperature requirements defined in the J-STD-020D1 standard.

Note: During reflow soldering, the module temperature must not exceed 260°C, and the duration in the reflow zone should not exceed 30 seconds.

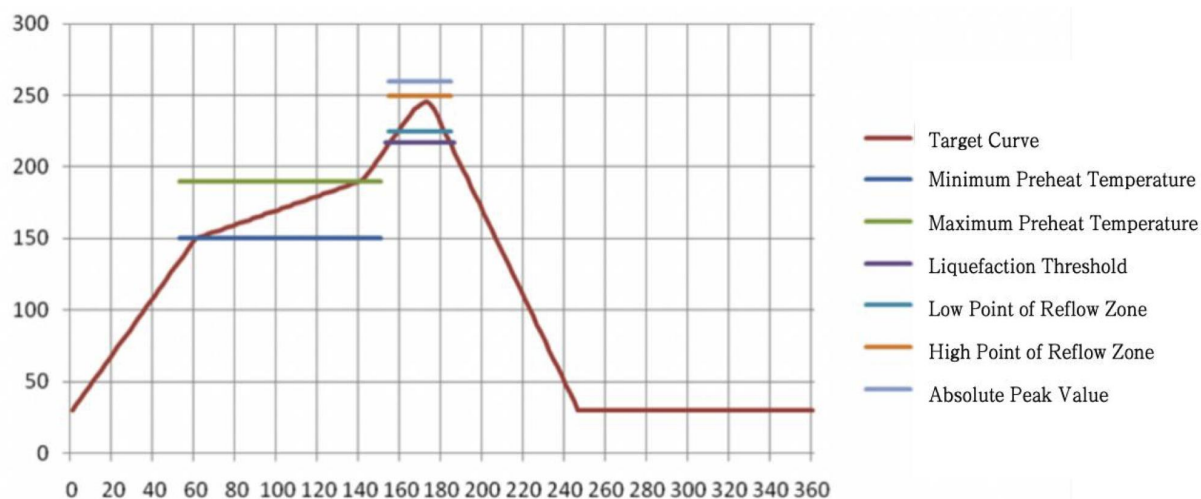


Figure 13 Soldering Profile

Item	Value	Unit
Heating Rate	1~3	°C/s
Cooling Rate	2~4	°C/s
Heating Rate of Preheating Zone	0.5~1	°C/s
Minimum Time of Preheating Zone	70	s
Maximum Time of Preheating Zone	120	s
Minimum Temperature of Preheating Zone	150	°C
Maximum Temperature of Preheating Zone	190	°C
Minimum Residence Time of Solder Paste (above liquefaction temperature)	50	s
Maximum Residence Time of Solder Paste (above liquefaction temperature)	70	s
Residence Time in Reflux Zone	30	s
Maximum Residence Time at Peak Temperature	5	s
Recommand Liquefaction Zone Threshold	218	°C
Low Point Temperature of Reflux Zone	240	°C
High Point Temperature of Reflux Zone	250	°C
Peak Temperature	260	°C

7. Version

V1.0	2026-07-25	First Release	David Du
------	------------	---------------	----------