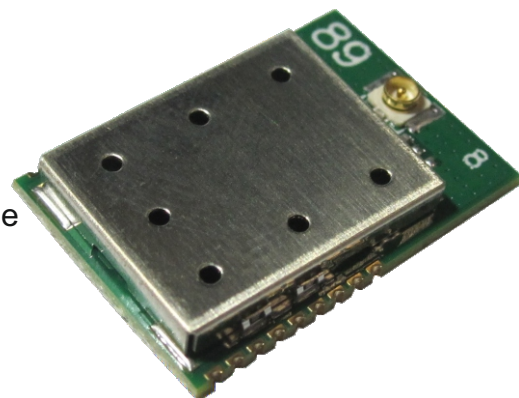


RC-SM1276-915

based on Semtech SX1276

It's a SX1276 LoRa module with SPI interface.

The RC-SM1276-915 module is designed based on SX1276. The SX1276 incorporates the LoRa™ spread spectrum modem which is capable of achieving significantly longer range than existing systems based on FSK or OOK modulation. At maximum data rates of LoRa™ the sensitivity is 8dB better than FSK, but using a low cost bill of materials with a 20ppm XTAL LoRa™ can improve receiver sensitivity by more than 20dB compared to FSK. LoRa™ also provides significant advances in selectivity and blocking performance, further improving communication reliability. For maximum flexibility the user may decide on the spread spectrum modulation bandwidth (BW), spreading factor (SF) and error correction rate (CR). Another benefit of the spread modulation is that each spreading factor is orthogonal - thus multiple transmitted signals can occupy the same channel without interfering. This also permits simple coexistence with existing FSK based systems. Standard GFSK, FSK, OOK, and GMSK modulation is also provided to allow compatibility with existing systems or standards such as wireless MBUS and IEEE 802.15.4g. For more information and details, please refer to the SX1276 Semtech datasheet.



Features

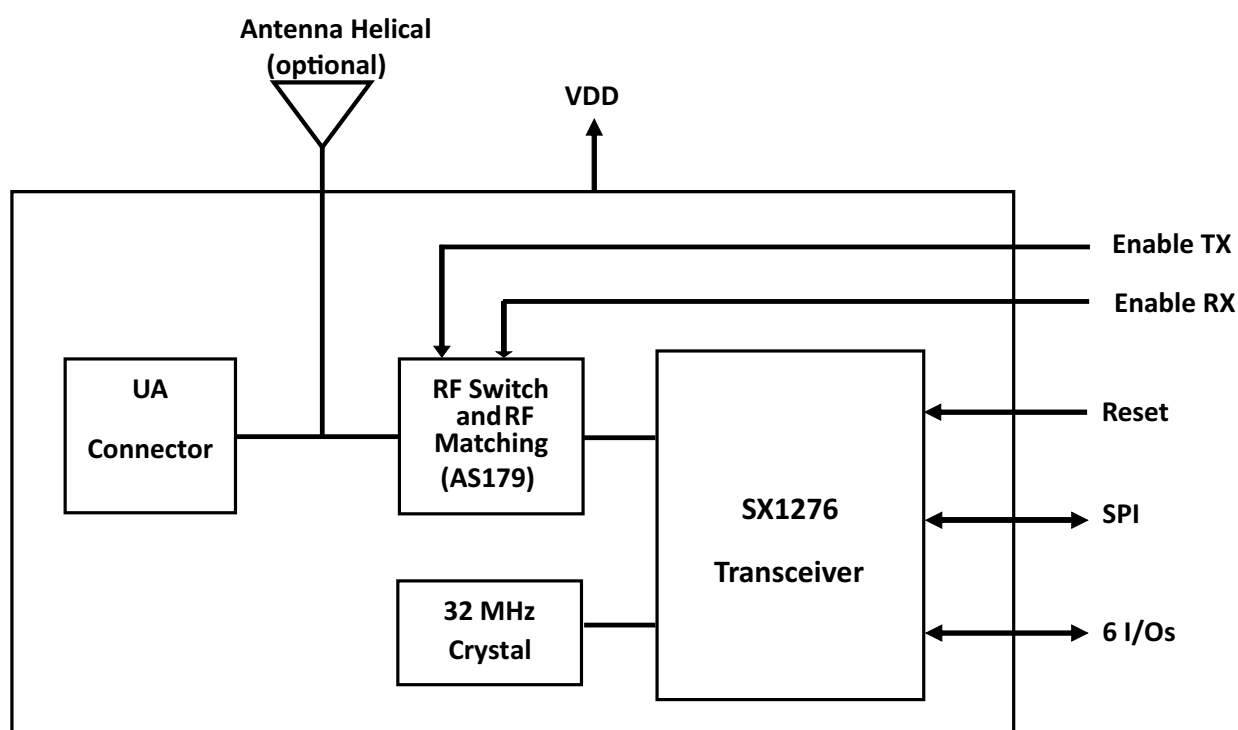
- LoRa™ Modem
- 168 dB maximum link budget
- +20 dBm - 100 mW constant RF output vs. V supply
- +14 dBm high efficiency PA
- Programmable bit rate up to 300 kbps
- High sensitivity: down to -148 dBm
- Bullet-proof front end: IIP3 = -11 dBm
- Excellent blocking immunity
- Low RX current of 9.9 mA, 200 nA register retention
- Fully integrated synthesizer with a resolution of 61 Hz
- FSK, GFSK, MSK, GMSK, LoRa™ and OOK modulation
- Built-in bit synchronizer for clock recovery

- Preamble detection
- 127 dB Dynamic Range RSSI
- Automatic RF Sense and CAD with ultra-fast AFC
- Packet engine up to 256 bytes with CRC
- Built-in temperature sensor and low battery indicator

Applications

- Automatic Measure Reading.
- Home and Building Automation.
- Wireless Security Systems.
- Home and Building Automation

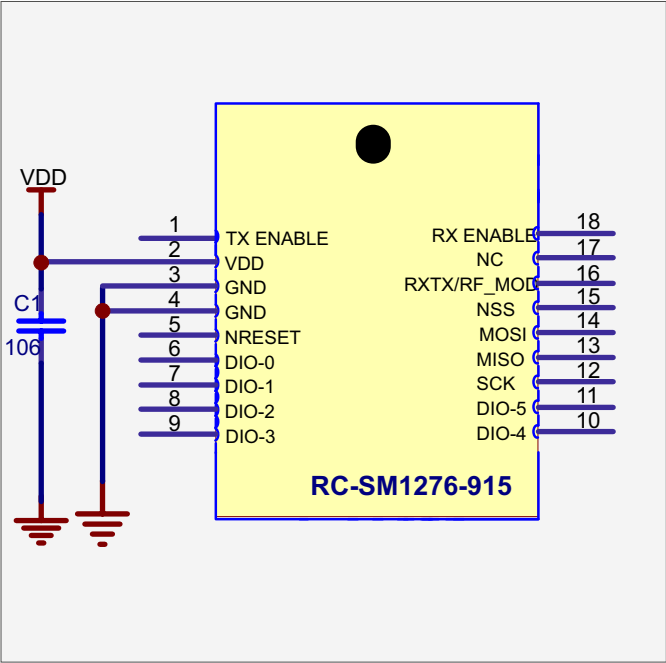
1.0 Block Diagram



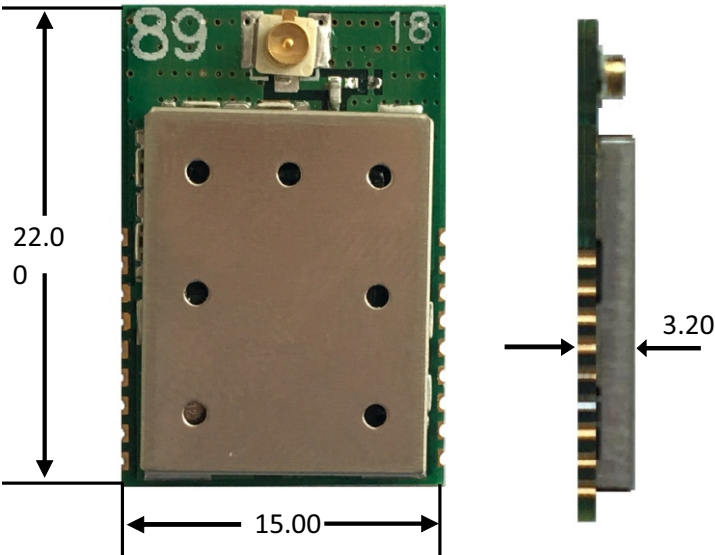
2.0 Technical Specifications

| Characteristics | MIN | TYP | MAX | UNIT |
|---|-----|-------|-----|------|
| Supply Voltage | 1.8 | | 3.7 | VDC |
| Supply Current RX mode LnaBoost OFF, band1 | | 10.8 | | mA |
| Supply Current RX mode LnaBoost ON, band1 | | 11.5 | | mA |
| Supply Current RX mode Bands 2&3 | | 12.0 | | mA |
| Supply Current Sleep Mode | | 0.2 | 1 | μA |
| Supply Current Idle Mode (RC Osc. enabled) | | 1.5 | | μA |
| Supply Current Standby Mode (Crystal enabled) | | 1.6 | | μA |
| Supply Current Transmit Mode RFOP=+20dBm | | 120 | | mA |
| RF Power Output(for LORA Modulation) | | | +19 | dBm |
| RF Sensitivity (for LORA Modulation) | | - 139 | | dBm |
| Operative Temperature | -20 | | +70 | °C |

Reference Schematics



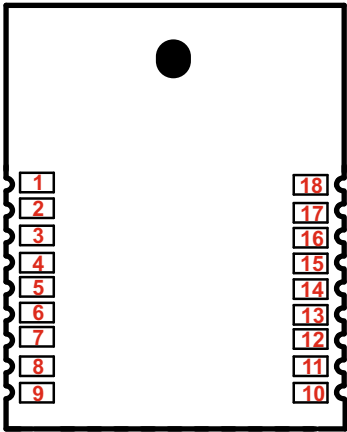
Mechanical dimensions



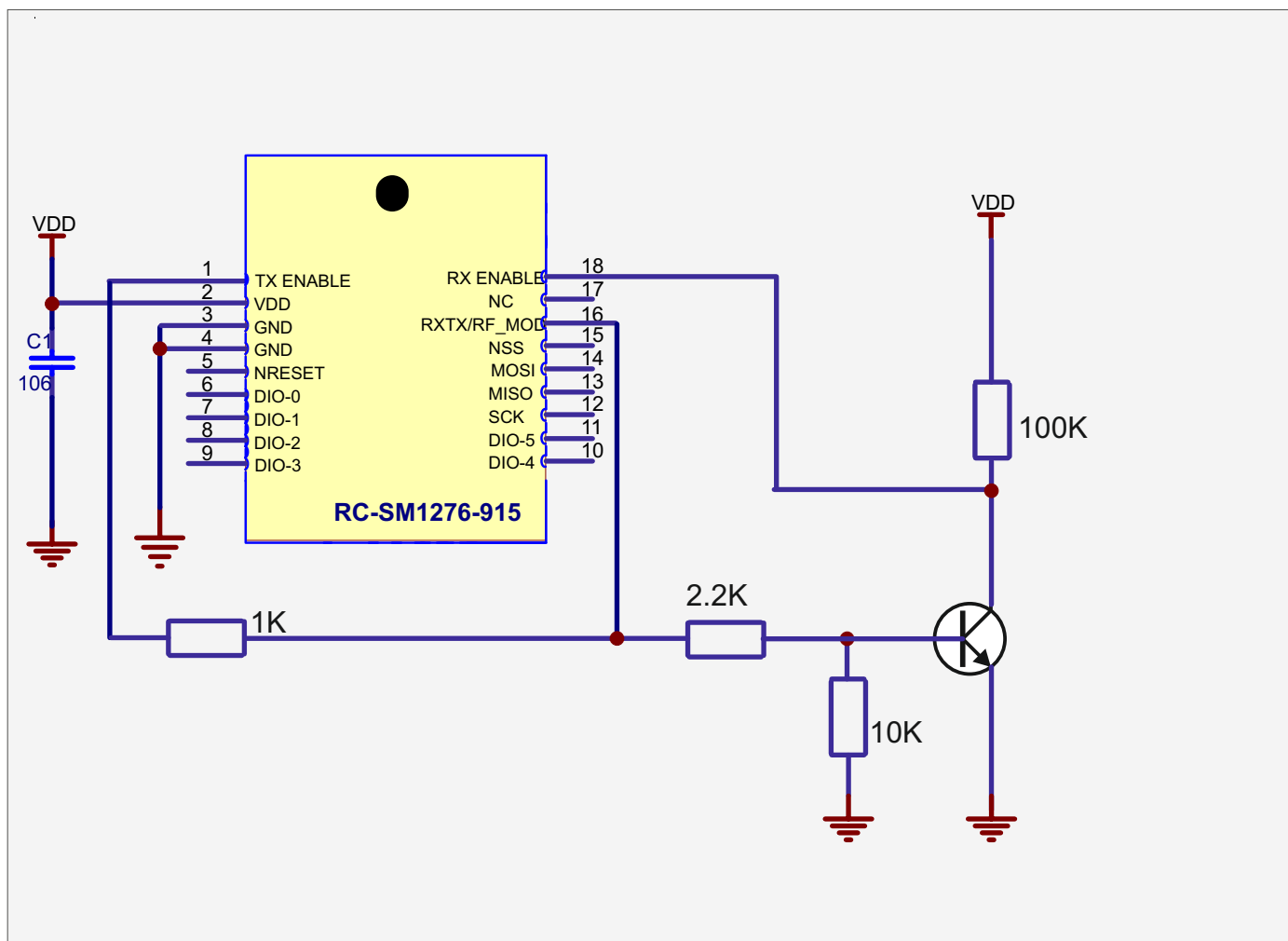
Unit: mm
Tolerance: 0.2mm

Pin out device

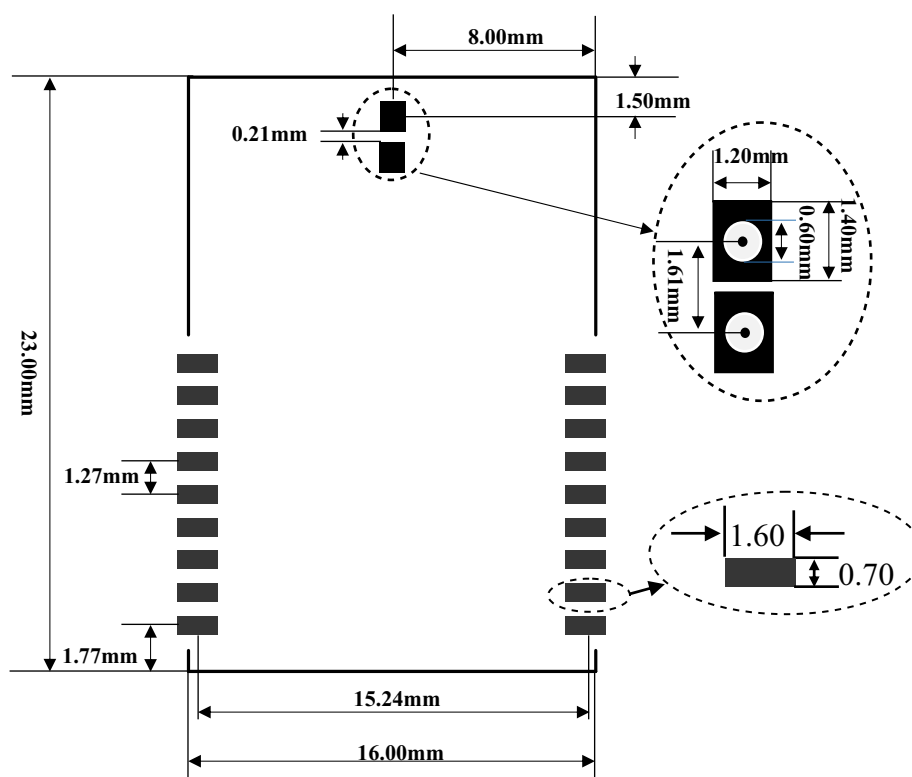
| Pads | Name | Description |
|------|-------------|---------------------------------------|
| 1 | TX_EN | RF Switch Control : High in Tx |
| 2 | VDD | Power 1.8 to 3.7 Volt |
| 3 | GND | Ground |
| 4 | GND | Ground |
| 5 | NRESET | Reset Trigger Input |
| 6 | DIO 0 | Digital I/O |
| 7 | DIO 1/DCLK | Digital I/O |
| 8 | DIO 2/Data | Digital I/O |
| 9 | DIO 3 | Digital I/O |
| 10 | DIO 4 | Digital I/O |
| 11 | DIO 5 | Digital I/O |
| 12 | SCK | SPI Clock Input |
| 13 | MISO | SPI Data Output |
| 14 | MOSI | SPI Data Input |
| 15 | NSS | SPI Chip Select Input |
| 16 | RXTX/RF_MOD | RX/TX Switch Control : High in TX |
| 17 | NC | Not connected |
| 18 | RX_EN | RF Switch Control : High in RX |



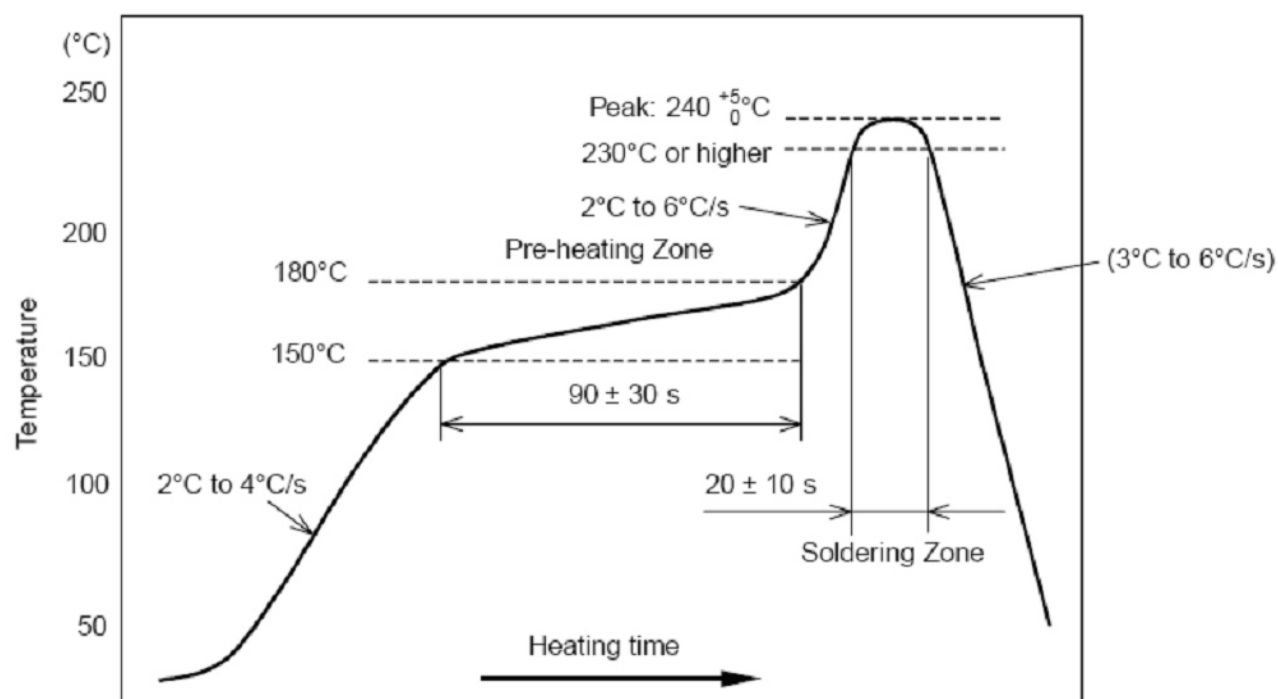
Rf Switch : How to make the connection



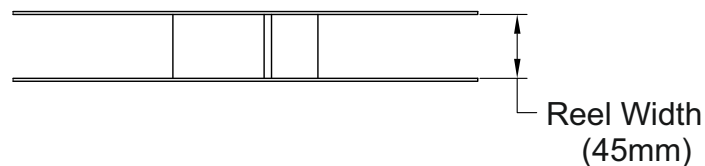
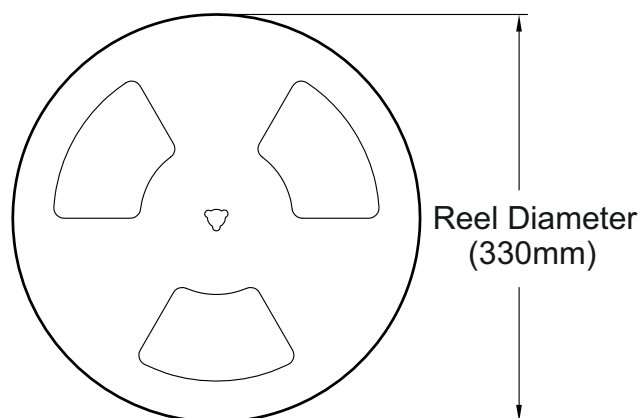
Reccomended PCB Layout



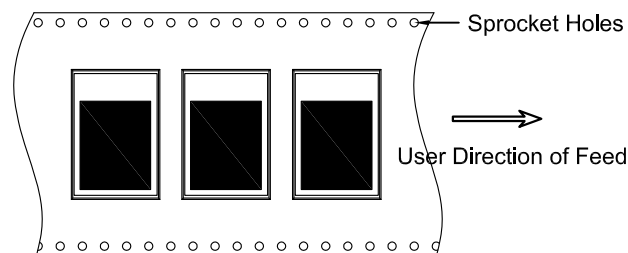
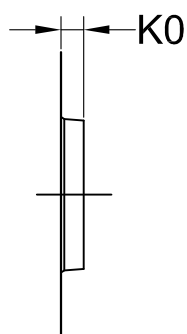
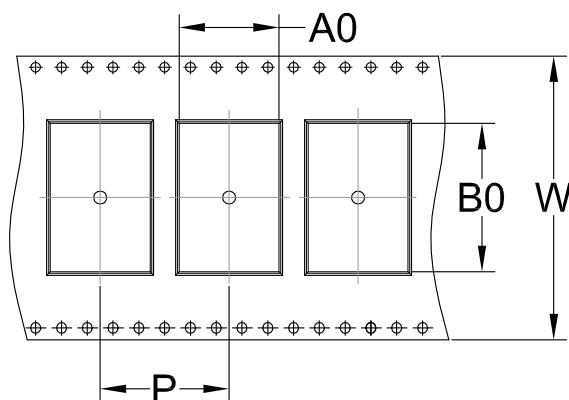
Reccomended Reflow Profile for Lead Free Solder



REEL DIMENSIONS



TAPE DIMENSIONS



| | | | |
|----|---|--------|----------|
| A0 | Dimension designed to accommodate the component width | 15.5mm | ± 0.10mm |
| B0 | Dimension designed to accommodate the component length | 23.0mm | ± 0.10mm |
| K0 | Dimension designed to accommodate the component thickness | 3.5mm | ± 0.10mm |
| W | Overall width of the carrier tape | 44.0mm | ± 0.30mm |
| P | Pitch between successive cavity centers | 20.0mm | ± 0.10mm |