



## **LRW32 Module Datasheet V2.0**

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## History

| Date     | Version | Description | Draft | Approval |
|----------|---------|-------------|-------|----------|
| 2021-2-3 | V2.0    | Release     | LYL   | Jessy    |
|          |         |             |       |          |

## Module Name Information

|              |   |                               |   |                                   |   |             |   |                                          |
|--------------|---|-------------------------------|---|-----------------------------------|---|-------------|---|------------------------------------------|
| LRW32        | - | A                             | - | NA                                | - | C           | - | 470                                      |
| ↓            |   | ↓                             |   | ↓                                 |   | ↓           |   | ↓                                        |
| Module Type: |   | A: TCXO Crystal<br>B: Crystal |   | Antenna Type:<br>NA: NO Connector |   | PCB Version |   | Frequency:<br>470MHz<br>868MHz<br>915MHz |

## Features

- LoRa™ spread spectrum modulation technology
- Receive sensitivity as low as -141 dBm
- Excellent resistance to blocking
- Supports preamble detection
- Supports half-duplex SPI communication
- Programmable bit rate up to 300Kbps
- Supports FSK, GFSK, MSK, GMSK, LoRa™ and OOK modulation modes
- Supports automatic RF signal detection, CAD mode and ultra high speed AFC
- Packets with CRC, up to 256 bytes
- Small package with double volume stamps

## Application

- Smart meters
- Supply chain and logistics
- Building automation
- Agricultural sensors
- Smart cities
- Retail store sensors
- Asset tracking
- Street lights
- Parking sensors
- Environmental sensors
- Healthcare
- Safety and security sensors
- Remote control applications

## Description

The LRW32 long-range wireless and ultra-low-power devices embed a powerful and ultra-low-power radio compliant LPWAN radio solution: LoRa® (only available in STM32WLE5xx), (G)FSK, (G)MSK, and BPSK.

The devices embed high-speed memories (Flash memory up to 256 Kbytes, SRAM up to 64 Kbytes), and an extensive range of enhanced I/Os and peripherals.

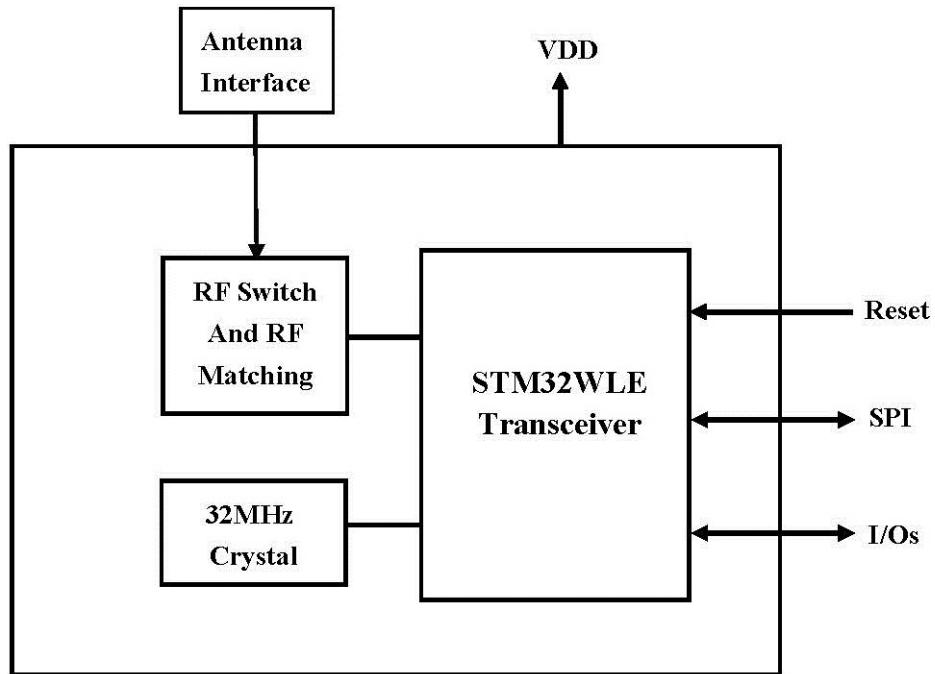
The devices also embed several protection mechanisms for embedded Flash memory and SRAM: readout protection, write protection and proprietary code readout protection.

These devices offer a 12-bit ADC, a 12-bit DAC low-power sample-and-hold, two ultra-low-power comparators associated with a high-accuracy reference voltage generator.

The devices embed a low-power RTC with a 32-bit sub-second wakeup counter, one 16-bit single-channel timer, two 16-bit four-channel timers (supporting motor control), one 32-bit four-channel timer and three 16-bit ultra-low-power timers.

These devices also embed two DMA controllers (7 channels each) allowing any transfer combination between memory (Flash memory, SRAM1 and SRAM2) and peripheral, using the DMAMUX1 for flexible DMA channel mapping.

## Block Diagram

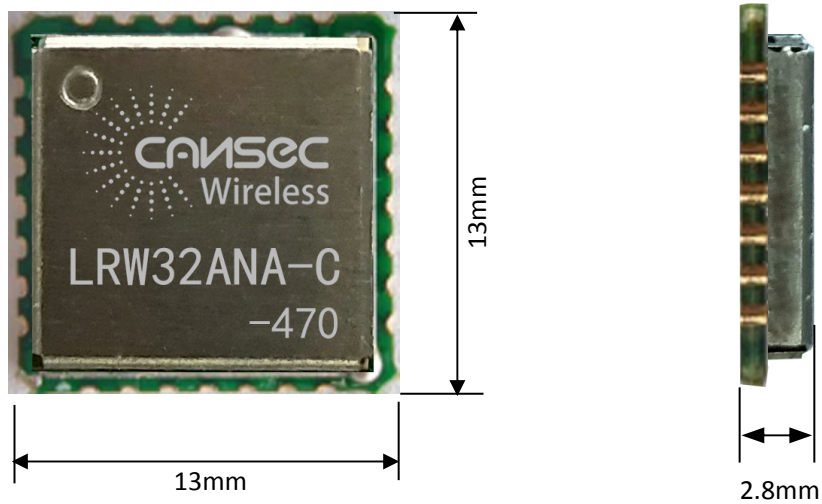


## Specifications

| Parameter             |               | Min | Typ  | Max | Unit |
|-----------------------|---------------|-----|------|-----|------|
| Operating Voltage     |               | 2.5 | 3.3  | 3.7 | V    |
| Operating Temperature |               | -20 | -    | +70 | ℃    |
| Current Consumption   | Sleep Mode    | -   | 2    |     | uA   |
|                       | Receive mode  | -   | 12.5 |     | mA   |
|                       | Transmit Mode | -   | 120  |     | mA   |
| TX Power              |               | -   |      | 20  | dBm  |
| RX Sensitivity        |               |     | -140 |     | dBm  |

## Mechanical Drawing

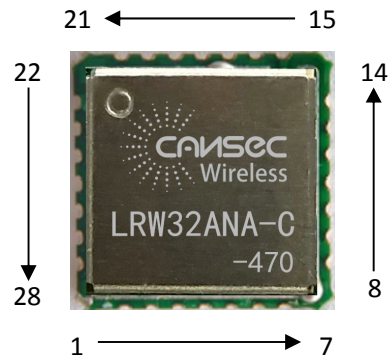
### LRW32ANA-C-470:



## RF Switch Control

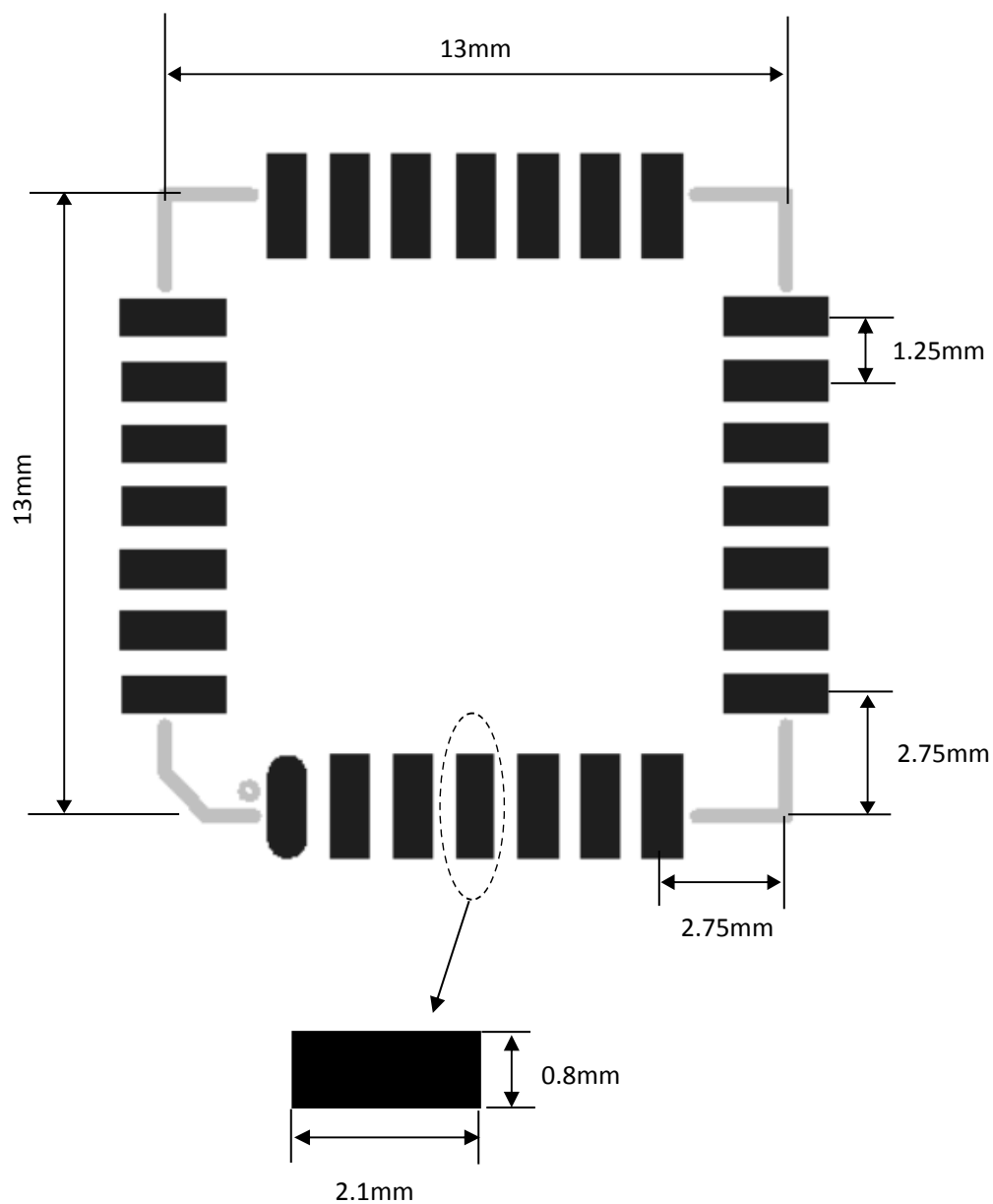
| RF Switch Control | PC3 | PC4 | RF Mode |
|-------------------|-----|-----|---------|
|                   | 1   | 0   | TX      |
|                   | 0   | 1   | RX      |

## Terminal Description

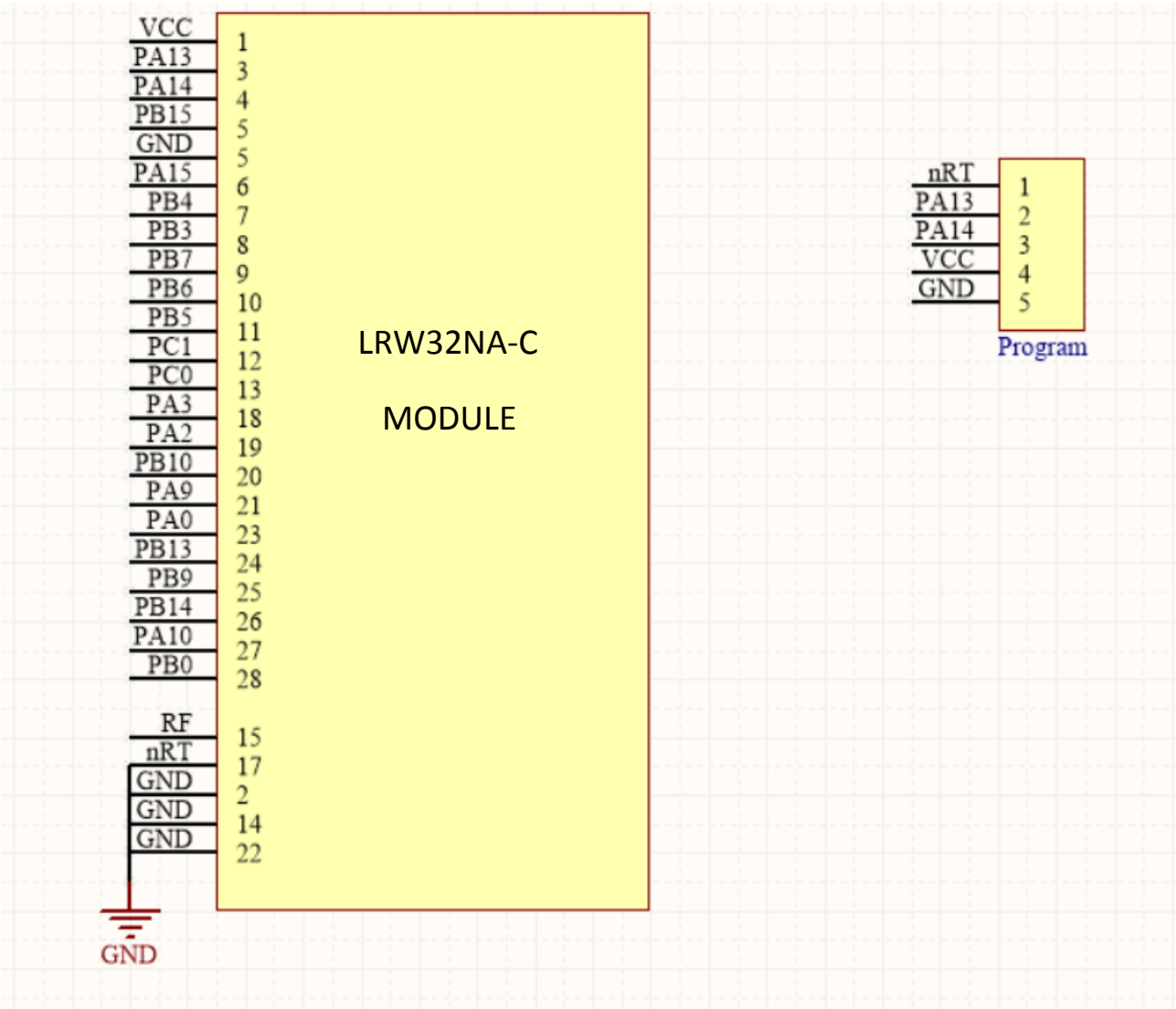


| Pad Number | Name | Pin Type | Description                                 |
|------------|------|----------|---------------------------------------------|
| 1          | +3V3 | POWER    | 2.5V to 3.7V main chip supply, Typical 3.3V |
| 2          | GND  | Ground   | The ground                                  |
| 3          | PA13 | I/O      | Input / output pin                          |
| 4          | PA14 | I/O      | Input / output pin                          |
| 5          | PB15 | I/O      | Input / output pin                          |
| 6          | PA15 | I/O      | Input / output pin                          |
| 7          | PB4  | I/O      | Input / output pin                          |
| 8          | PB3  | I/O      | Input / output pin                          |
| 9          | PB7  | I/O      | Input / output pin                          |
| 10         | PB6  | I/O      | Input / output pin                          |
| 11         | PB5  | I/O      | Input / output pin                          |
| 12         | PC1  | I/O      | Input / output pin                          |
| 13         | PC0  | I/O      | Input / output pin                          |
| 14         | GND  | Ground   | The ground                                  |
| 15         | RF   | Antenna  | Antenna                                     |
| 16         | GND  | Ground   | The ground                                  |
| 17         | nRT  | Reset    | Reset trigger input                         |
| 18         | PA3  | I/O      | Input / output pin                          |
| 19         | PA2  | I/O      | Input / output pin                          |
| 20         | PB10 | I/O      | Input / output pin                          |
| 21         | PA9  | I/O      | Input / output pin                          |
| 22         | GND  | Ground   | The ground                                  |
| 23         | PA0  | I/O      | Input / output pin                          |
| 24         | PB13 | I/O      | Input / output pin                          |
| 25         | PB9  | I/O      | Input / output pin                          |
| 26         | PB14 | I/O      | Input / output pin                          |
| 27         | PA10 | I/O      | Input / output pin                          |
| 28         | PB0  | I/O      | Input / output pin                          |

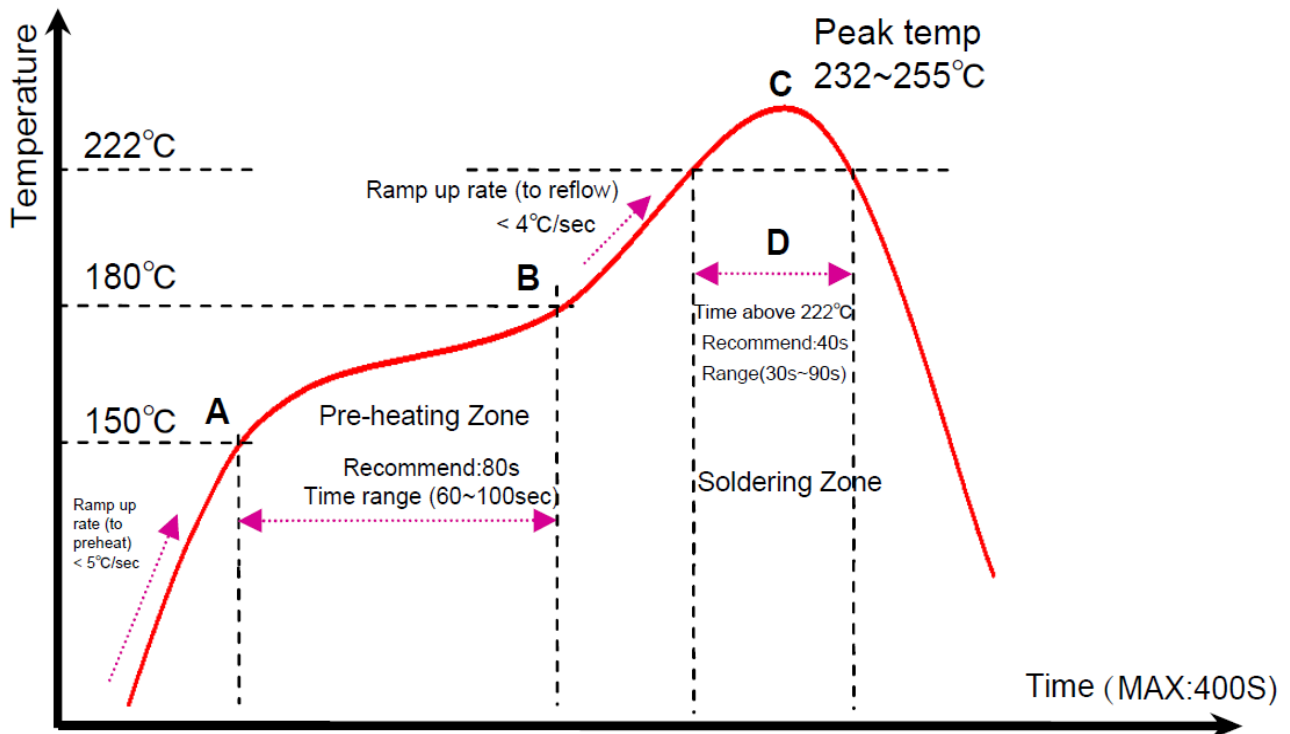
## Recommended PCB Layout for Package



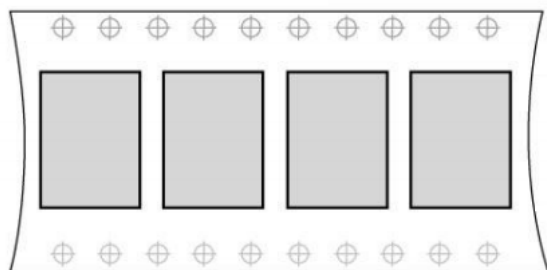
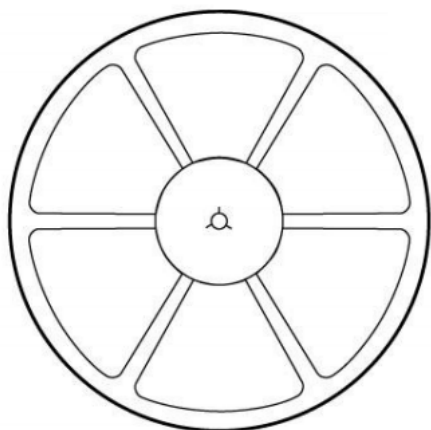
# Reference Schematics



## Recommended Reflow Profile for Lead Free Solder



## Package



- Tape and Reel
- Helical antenna version Module exception
- Note: For package, we have three package types: Reel, Tray, Simple way for choosing, depend on customer's request or quantity request

## Contact Details



CANSEC Catalog



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