



## **BLE52810SA-A Module Datasheet V2.1**

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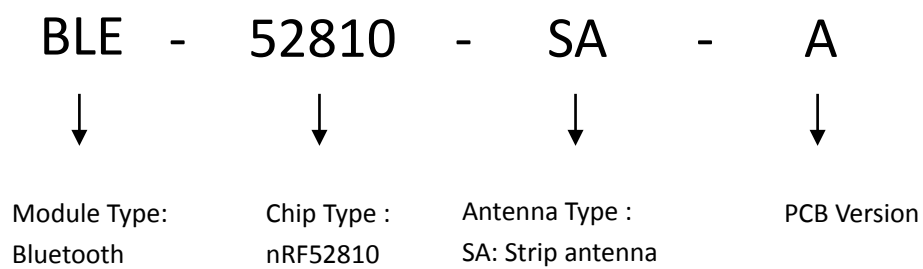
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# History

| Date      | Version | Description            | Draft        | Approval |
|-----------|---------|------------------------|--------------|----------|
| 2020.5.27 | V2.0    |                        | Zhangxiangyu | Amy      |
| 2025.7.22 | V2.1    | Update Contact Details | Keystone     | Jessy    |

## Module Name Information



## Features

- Single chip, highly flexible, 2.4 GHz multi-protocol SoC
- 32-bit ARM Cortex-M4 Processor
- 1.7v to 3.6v operation
- 192kB flash + 24kB RAM
- Supports concurrent Bluetooth low energy/ANT protocol operation
- On-chip NFC tag for Out-of-Band (OOB) Pairing
- Up to +3dBm output power
- -96dBm sensitivity, Bluetooth Low Energy
- Thread safe and run-time protected
- Event driven API
- 2 data rates (2Mbps/1Mbps)
- PPI - maximum flexibility for power-efficient applications and code simplification
- Automated power management system with automatic power management of each peripheral
- Configurable I/O mapping for analog and digital I/O
- 3 x Master/Slave SPI
- 2 x Two-wire interface (I<sup>2</sup>C)
- UART (RTS/CTS)
- 3 x PWM
- AES HW encryption
- 12-bit ADC
- Real Time Counter (RTC)
- Digital microphone interface (PDM)
- Size:15 X 22.8 X 2.8mm

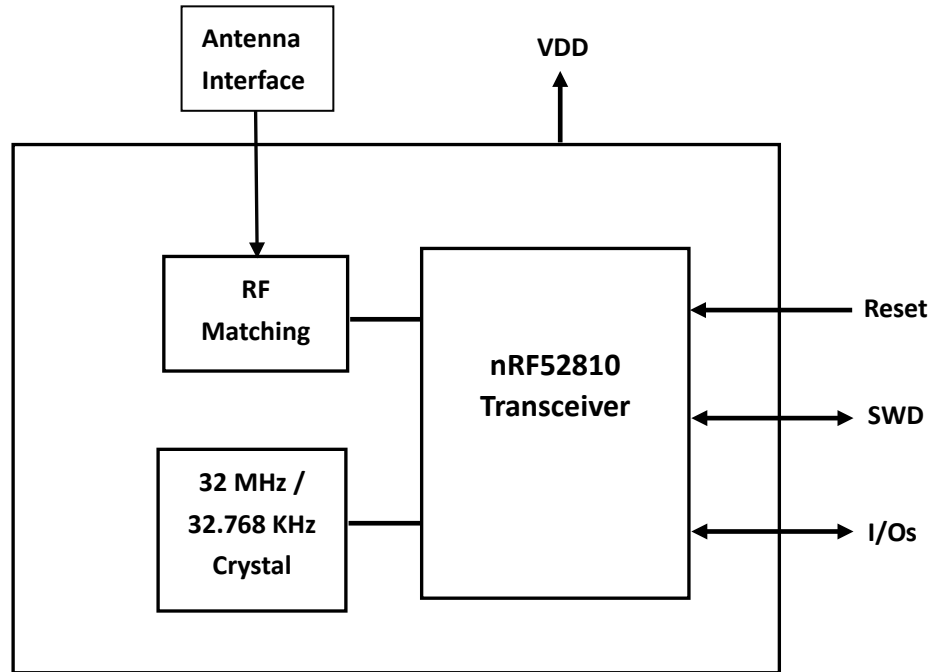
## Applications

- Internet of Things (IoT)
- Wearables
- SmartHome sensors
- Voice-command smart remotes
- A4WP 'Rezence' wireless charging
- Beacons
- Sports and fitness sensors and hubs
- Connected health products
- Connected white goods
- Computer peripherals
- Smart watches
- RC Toys
- Interactive games
- Building automation and sensor networks

## Description

The BLE52810 module is based on nRF52810 SoC which is a powerful, highly flexible ultra-low power multiprotocol SoC ideally suited for Bluetooth® Low Energy, ANT and 2.4GHz ultra low-power wireless applications. The nRF52810 SoC is built around a 32-bit ARM® Cortex™-M4F CPU with 192kB + 24kB RAM. The embedded 2.4GHz transceiver supports Bluetooth Low Energy, ANT and proprietary 2.4 GHz protocol stack. It is on air compatible with the nRF51 Series, nRF24L and nRF24AP Series products from Nordic Semiconductor.

## Block Diagram

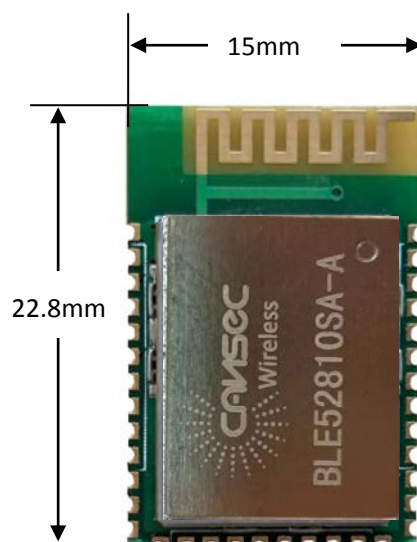


## Specifications

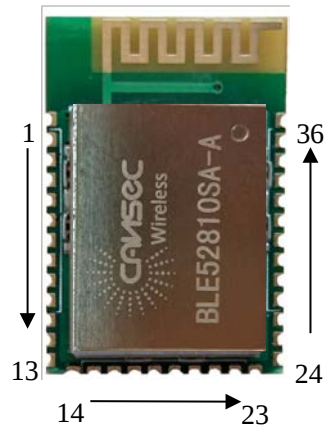
| Parameter                            |               | Min | Typ | Max | Unit |
|--------------------------------------|---------------|-----|-----|-----|------|
| Operating Voltage                    |               | 1.7 | -   | 3.6 | V    |
| Operating Temperature                |               | -20 | -   | +70 | °C   |
| Current Consumption                  | Sleep Mode    | -   | 0.5 | -   | uA   |
|                                      | Receive mode  | -   | 15  | -   | mA   |
|                                      | Transmit Mode | -   | 22  | -   | mA   |
| TX Power (For Carrier)               |               | -   | 3   | -   | dBm  |
| RX Sensitivity (For Lora Modulation) |               | -   | -   | -96 | dBm  |
| Distance                             |               | 160 |     |     | m    |

## Mechanical Drawing

H=2.8mm



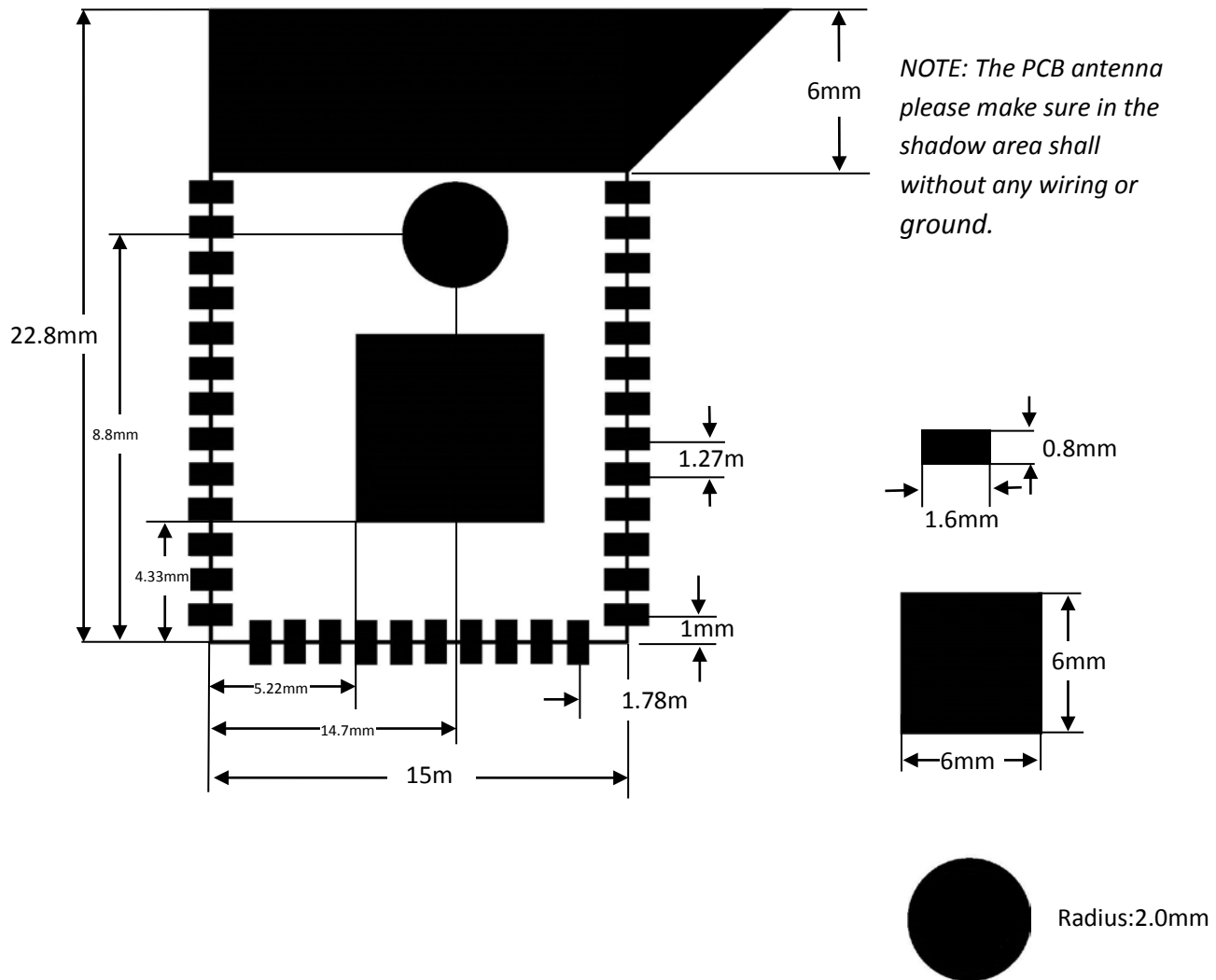
## Terminal Description



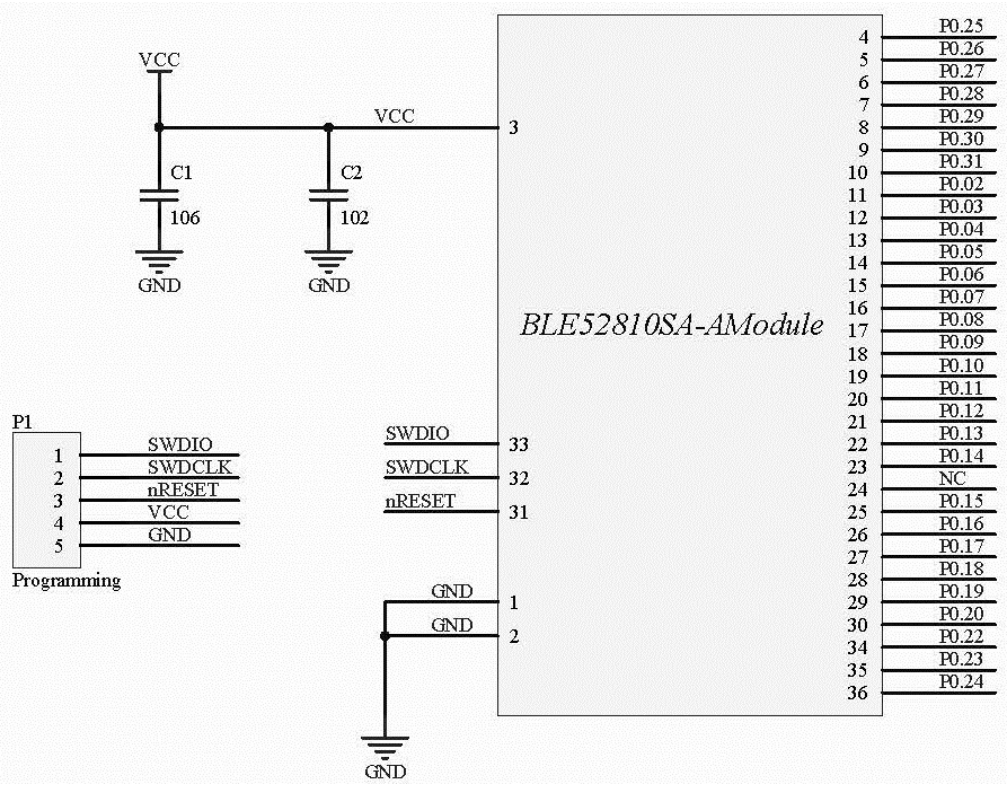
| Pad Number | Name           | Pin Type                    | Description                                         |
|------------|----------------|-----------------------------|-----------------------------------------------------|
| 1          | GND            | Power                       | Ground                                              |
| 2          | GND            | Power                       | Ground                                              |
| 3          | VCC            | Power                       | 1.7 V–3.6 V Power supply                            |
| 4          | P0.25          | Digital I/O                 | General purpose I/O2                                |
| 5          | P0.26          | Digital I/O                 | General purpose I/O2                                |
| 6          | P0.27          | Digital I/O                 | General purpose I/O2                                |
| 7          | P0.28/<br>AIN4 | Digital I/O<br>Analog input | General purpose I/O2<br>SAADC/COMP/LPCOMP input     |
| 8          | P0.29/<br>AIN5 | Digital I/O<br>Analog input | General purpose I/O2<br>SAADC/COMP/LPCOMP input     |
| 9          | P0.30/<br>AIN6 | Digital I/O<br>Analog input | General purpose I/O2<br>SAADC/COMP/LPCOMP input     |
| 10         | P0.31/<br>AIN7 | Digital I/O<br>Analog input | General purpose I/O pin2<br>SAADC/COMP/LPCOMP input |
| 11         | P0.02/<br>AIN0 | Digital I/O<br>Analog input | General purpose I/O<br>SAADC/COMP/LPCOMP input      |
| 12         | P0.03/<br>AIN1 | Digital I/O<br>Analog input | General purpose I/O<br>SAADC/COMP/LPCOMP input      |
| 13         | P0.04/<br>AIN2 | Digital I/O<br>Analog input | General purpose I/O<br>SAADC/COMP/LPCOMP input      |
| 14         | P0.05/<br>AIN3 | Digital I/O<br>Analog input | General purpose I/O<br>SAADC/COMP/LPCOMP input      |
| 15         | P0.06          | Digital I/O                 | General purpose I/O                                 |
| 16         | P0.07          | Digital I/O                 | General purpose I/O                                 |
| 17         | P0.08          | Digital I/O                 | General purpose I/O                                 |

|    |                                     |                          |                                                                |
|----|-------------------------------------|--------------------------|----------------------------------------------------------------|
| 18 | NFC1/<br>P0.09                      | NFC input<br>Digital I/O | NFC antenna connection<br>General purpose I/O1                 |
| 19 | NFC2/<br>P0.10                      | NFC input<br>Digital I/O | NFC antenna connection<br>General purpose I/O1                 |
| 20 | P0.11                               | Digital I/O              | General purpose I/O                                            |
| 21 | P0.12                               | Digital I/O              | General purpose I/O                                            |
| 22 | P0.13                               | Digital I/O              | General purpose I/O                                            |
| 23 | P0.14/<br>TRACEDATA[3]              | Digital I/O              | General purpose I/O<br>Trace port output                       |
| 24 | NC                                  |                          |                                                                |
| 25 | P0.15/<br>TRACEDATA[2]              | Digital I/O              | General purpose I/O<br>Trace port output                       |
| 26 | P0.16/<br>TRACEDATA[1]              | Digital I/O              | General purpose I/O<br>Trace port output                       |
| 27 | P0.17                               | Digital I/O              | General purpose I/O                                            |
| 28 | P0.18/<br>TRACEDATA[0]<br><br>/ SWO | Digital I/O              | General purpose I/O<br>Single wire output<br>Trace port output |
| 29 | P0.19                               | Digital I/O              | General purpose I/O                                            |
| 30 | P0.20/<br>TRACECLK                  | Digital I/O              | General purpose I/O<br>Trace port clock output                 |
| 31 | P0.21/<br>nRESET                    | Digital I/O              | General purpose I/O<br>Configurable as pin reset               |
| 32 | SWDCLK                              | Digital input            | Serial wire debug clock input for debug<br>and programming     |
| 33 | SWDIO                               | Digital I/O              | Serial wire debug I/O for debug and<br>programming             |
| 34 | P0.22                               | Digital I/O              | General purpose I/O2                                           |
| 35 | P0.23                               | Digital I/O              | General purpose I/O2                                           |
| 36 | P0.24                               | Digital I/O              | General purpose I/O2                                           |

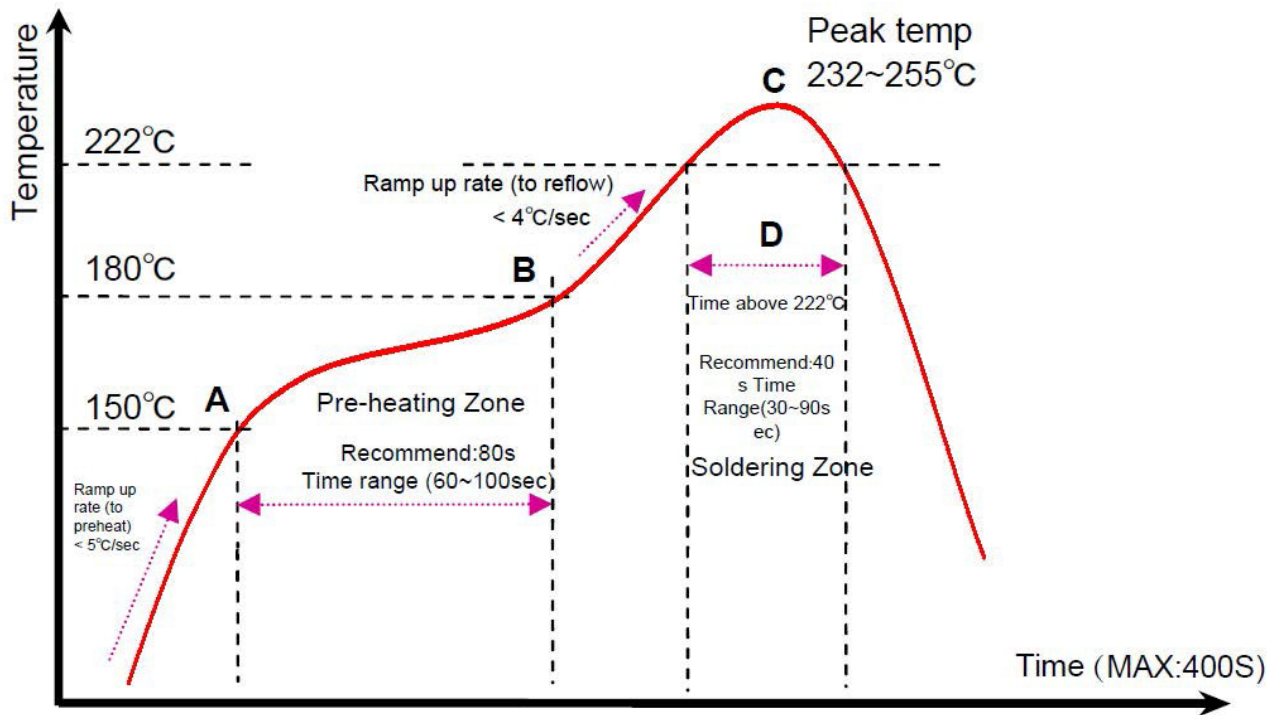
## Recommended PCB Layout for Package



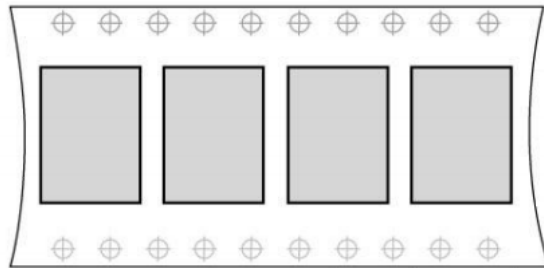
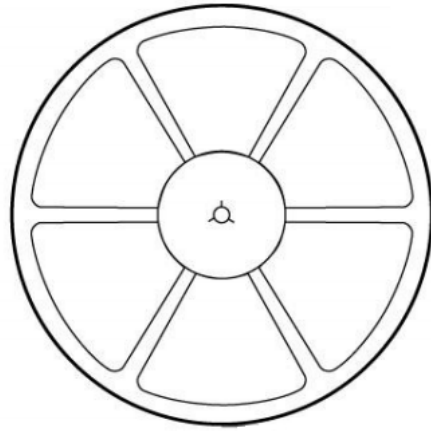
# Reference Schematics



## 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

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