NDB-M2658A Bluetooth Low Energy Module

1 Device Overview

1.1 Description

Necdaz's single-mode Bluetooth module is a high-performance and low-power RF SOC module that incorporates the RS02A1 transceiver chip with super low power consumption (BLE TX with LDO: 10.6 mA @ 0 dBm, BLE RX with LDO: 8.8 mA @ 1.0 Mbps), good noise reduction and sensitivity.

1.2 Key Features

- Supply voltage: 1.8 V ~ 3.6 V
- Recommended voltage: 3.3 V
- Frequency: 2400.0 MHz ~ 2483.5 MHz
- Tx power: +7.0 dBm (@0 dBm)
- Sensitivity: -95.0 dBm
- Frequency error: ±20.0 kHz
- Supply temperature range: -20.0 ℃ ~ +85.0 ℃
- Storage temperature range: -50.0 ℃ ~ +125.0 ℃
- ROM: 64.0 KB
- SRAM: 32.0 KB
- FLASH: 256.0 KB
- Outline dimension: 15.1 x 11.2 x (1.65 ± 0.2) mm^3

1.3 Application

- Smart toys
- Fitness equipment
- Environmental sensor nodes
- Passive key-less entry (PKE)
- Smart door locks
- Phone accessories
- Health-care equipment
- Smart lighting
- Energy harvesting
- Thermometer
- Human input devices
- Sports equipment
- Wearable

1.4 Block Diagram

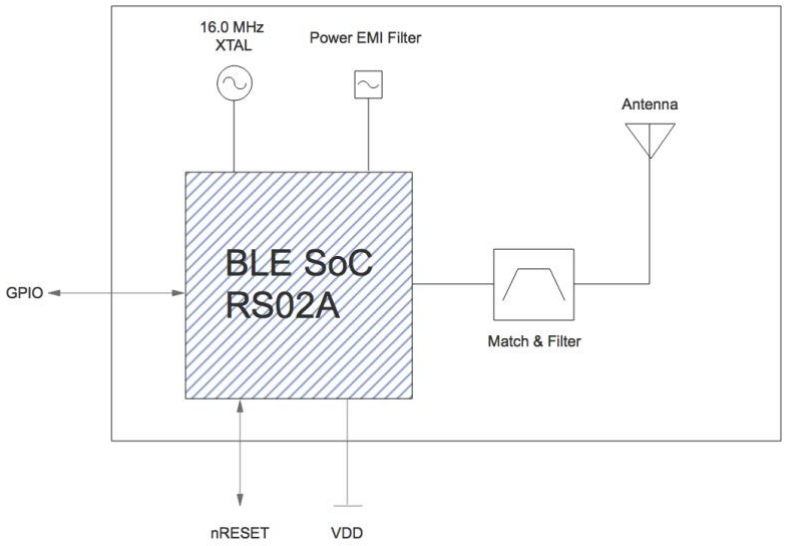

Figure 1. Block Diagram of NDB-M2658A

1.5 Part Number Conventions

The part numbers are of the form of NDB-M2658A where the fields are defined as follows.

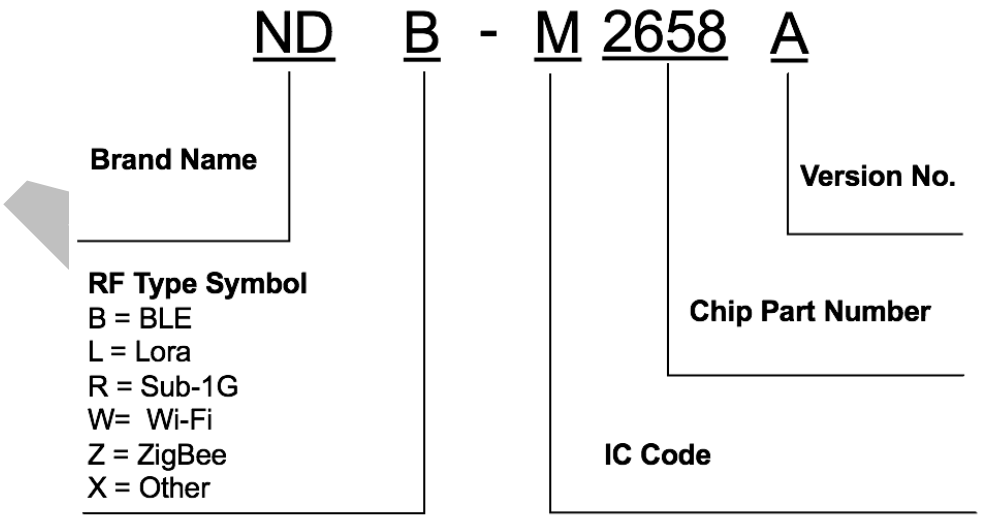

Figure 2. Part Number Conventions

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2 Revision History

NOTE: Pages number may be different from the former ones.

Version No.:	Page
• Changed Xx	Xx
• Added Xx	Xx

3 Terminal Configuration and Functions

3.1 Pin Diagram

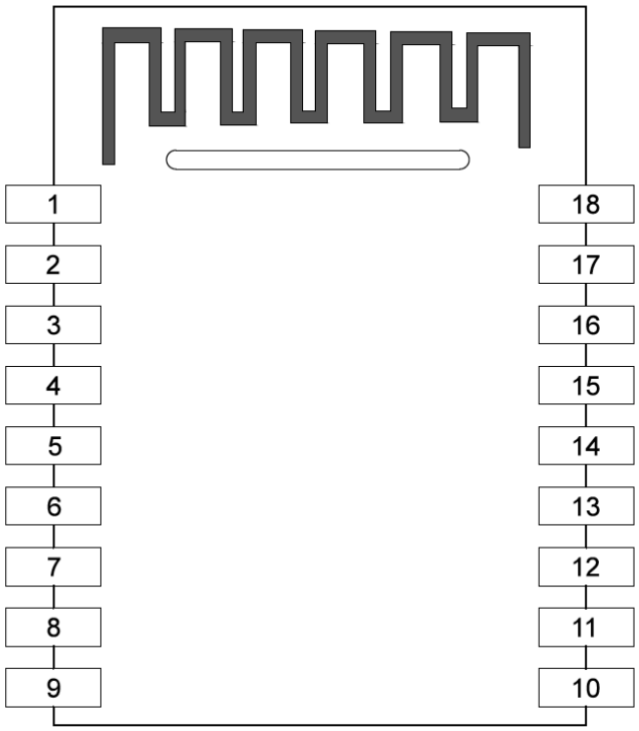

Figure 3. Pin Diagram of NDB-M2685A (Top View)

3.2 Pin Attributes

Table 1. Pin Attributes of NDB-M2685A

Pin	Name	Pin Type	Remarks
1	GND	Ground	Grounding
2	VCC	VCC	Power supply: 1.8 V ~ 3.6 V; Recommended: 3.3 V
3	P15	I/O	
4	P24	I/O	
5	RESET	RESTORE	Active when set low level
6	P06	I/O	
7	SWC	SWCLK	Connect the J-Link simulator SWCLK
8	SWD	SWDIO	Connect the J-Link simulator SWDIO
9	P21	I/O	
10	P10	I/O	
11	P11	I/O	
12	P12	I/O	
13	P14	I/O	
14	P16	I/O	
15	P17	I/O	
16	P27	I/O	
17	P28	I/O	
18	P03	I/O	

4 Mechanical and Packaging Information

4.1 Mechanical Drawing

Figure 4. Mechanical Drawing of NDB-M2658A

4.2 Recommended PCB Layout for Package

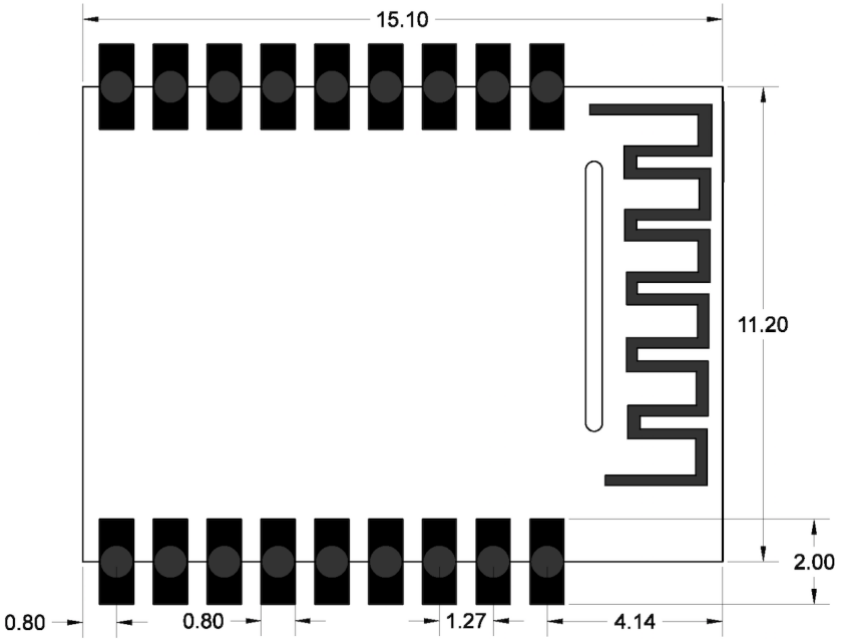

Figure 5. Recommended PCB Layout of NDB-2658A (mm)

5 Applications, Implementation, and Layout

5.1 Reference Schematics

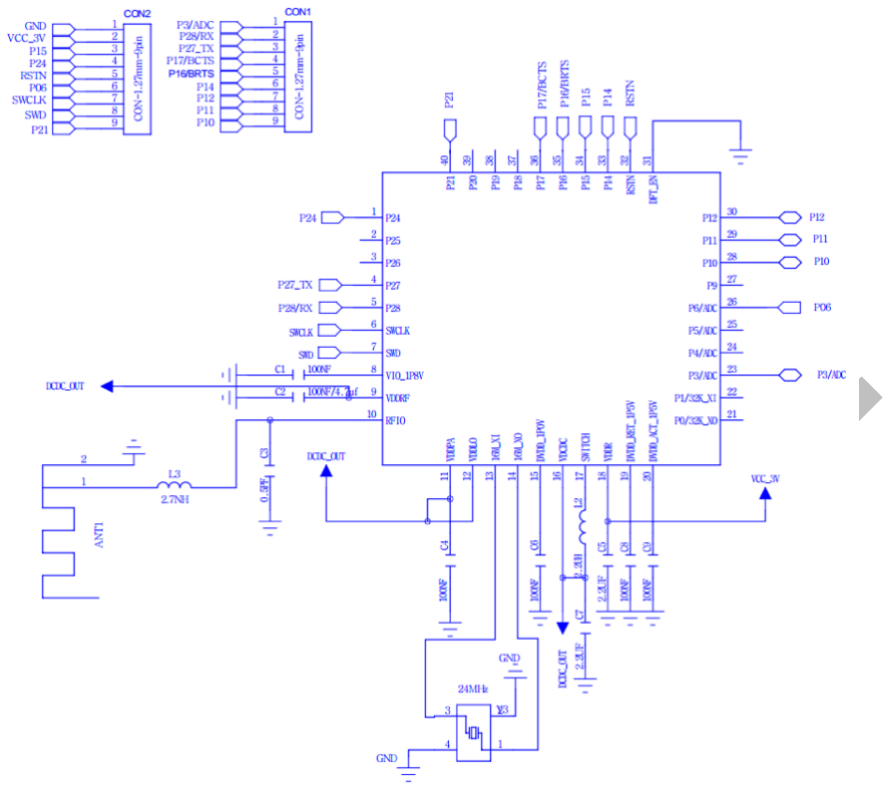

Figure 6. Reference Schematics

5.2 Soldering Recommendation

Recommended Reflow Profile for Lead Free Solder

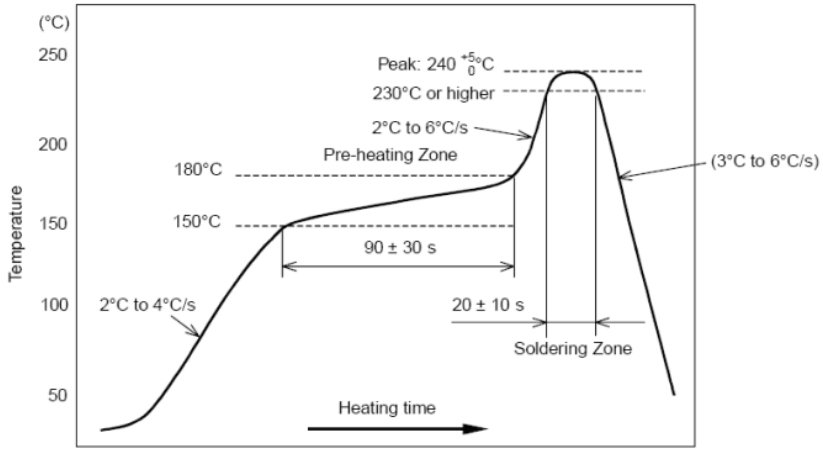

Figure 7. Recommended Reflow Profile for Lead Free Solder

6 Recommended Operating Conditions

6.1 Recommended Operation conditions

Notes :

(1) The operating temperature is limited to the change of crystal's frequency;

(2) To ensure the RF performance, the ripple wave on the source must be less than ±300 mV

Identification	Condition	Min.	Typ.	Max.	Unit
Source & IO	Battery mode	1.6	3.3	3.6	V
Operating Temperature	/	-40	25	85	℃
Environmental Hot Pendulum		-20		20	℃ / Min

6.2 Electrostatic Discharge Warnings

Module will be damaged for the discharge of static. Necdaz suggest that all modules should follow the 3 precautions below:

1. According to the anti-static measures, bare hands are not allowed to touch modules.
2. Modules must be placed in anti- static areas.
3. Take the anti-static circuitry (when inputting HV or VHF) into consideration in product design.

Static may result in the degradation in performance of module, even causing the failure.

7 Order Information

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