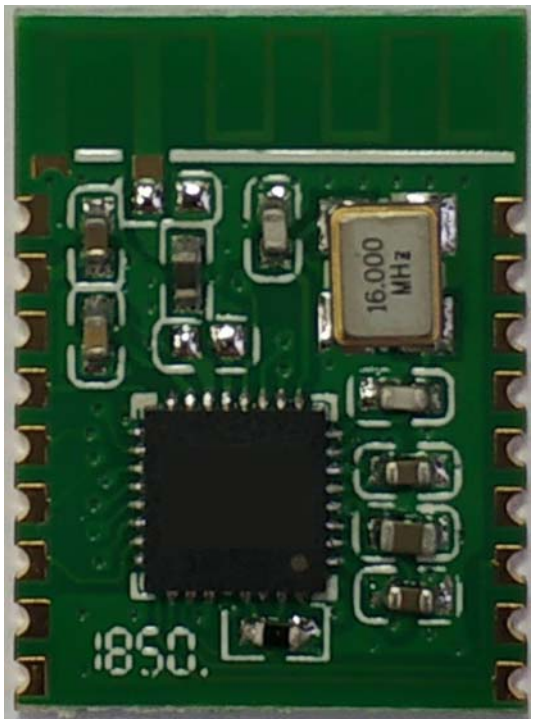
Bluetooth Module

NDB1793S02 Datasheet V1.0



CONTENTS

KEY FEATURES

Core and system
- ARM®Cortex-M0 CPU
- Maximum operating frequency up to 48MHz

Memories
- 128K Bytes of Flash memory
- 8K Bytes of SRAM
- Boot loader support chip Flash and ISP（In-System Programming）

BLE transceiver
- Bluetooth smart 4.1
- GFSK encoding and decoding
- Single end antenna
- Programmable RF output：-28 ~ +3 dBm
- Receive sensitivity：-85 dBm

Clock, reset and power management
– 2.0V ~ 3.6V application supply
– Power-on/Power-down reset (POR/PDR), Programmable voltage detector (PVD)
– Embedded factory-tuned 48MHz high speed oscillator
– Embedded 40KHz low speed oscillator
– PLL supports CPU running at 48MHz

Low-power
– Sleep, Stop and Standby modes

1 12-bit ADC, 1μS transform time (up to 10 channels)
– Conversion range: 0 ~ VDDA
– Support sampling time and resolution configuration
– On-chip temperature sensor

2 Comparators

5 DMA controller
– Supported peripherals: Timer、UART、I2C、SPI、ADC and USB

Up to 39 fast I/Os:
– All mappable on 16 external interrupt vectors

Debug mode
– Serial wire debug (SWD)

Up to 9 timers

– 1 16-bit 4-channel advanced-control timer for 4 channels PWM output, with deadtime generation and emergency stop

– 1 16-bit timer and 1 32-bit timer, with up to 4 IC/OC, usable for IR control decoding

– 2 16-bit timer, with 1 IC/OC, 1 OCN, deadtime generation and emergency stop and modulator gate for IR control

– 1 16-bit timer, with 1 IC/OC

– 2 watchdog timers (independent and window type)

–SysTick timer: 24-bit downcounter

Up to 4 Communication interfaces

– 2 UARTs

– 1 I2C

– 1 SPIs

APPLICATIONS

- Network connectivity processor
- Smart RF remote controls
- PC peripherals
- Medical sensors
- Fitness sensors
- Toys
- Smart home sensors and actuators
- Logistics and tagging
- Airfuel wireless charging

SPECIFICATIONS

Absolute Maximum Ratings	Min	Max	Unit
Powersupply Voltage	–0.3	+3.6	V
Voltage ofI/O pins	–0.3	+3.6	V
Storage Temperature	–40	+125	°C

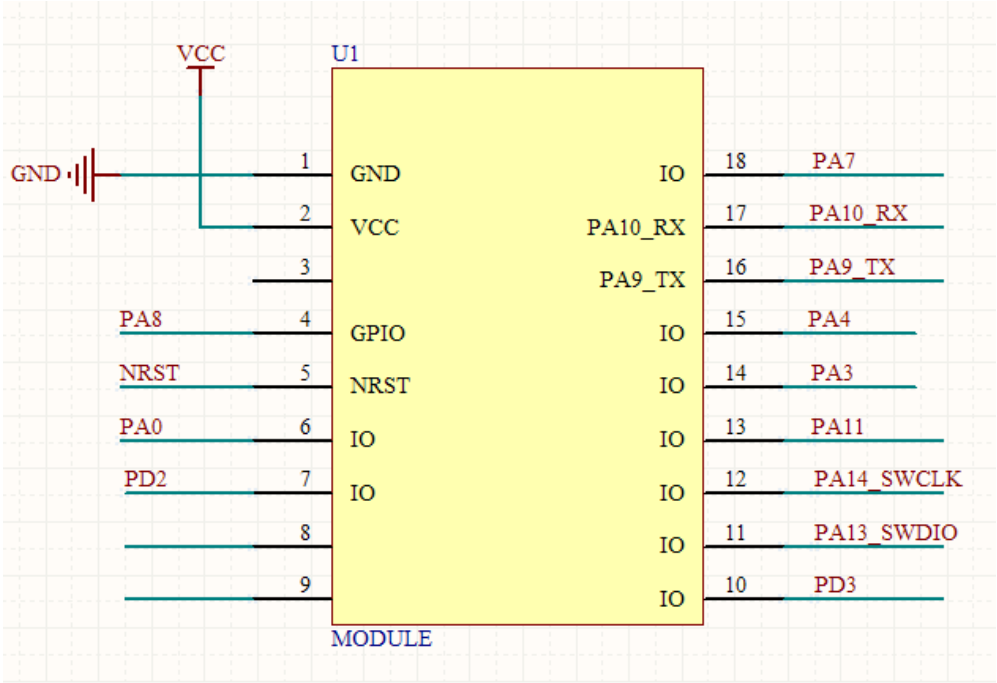
Absolute Maximum Ratings

Recommended Operating Conditions	Min	TYP	Max	Unit
Powersupply Voltage (VDD)	1.7	3.0	3.6	V
Voltage of I/O pins	0	3.0	3.6	V
T_{R_VDD}（Supply rise time 0V to 1.7V）			60	ms
Operating Temperature	-40	25	85	°C

Recommended Operating Conditions

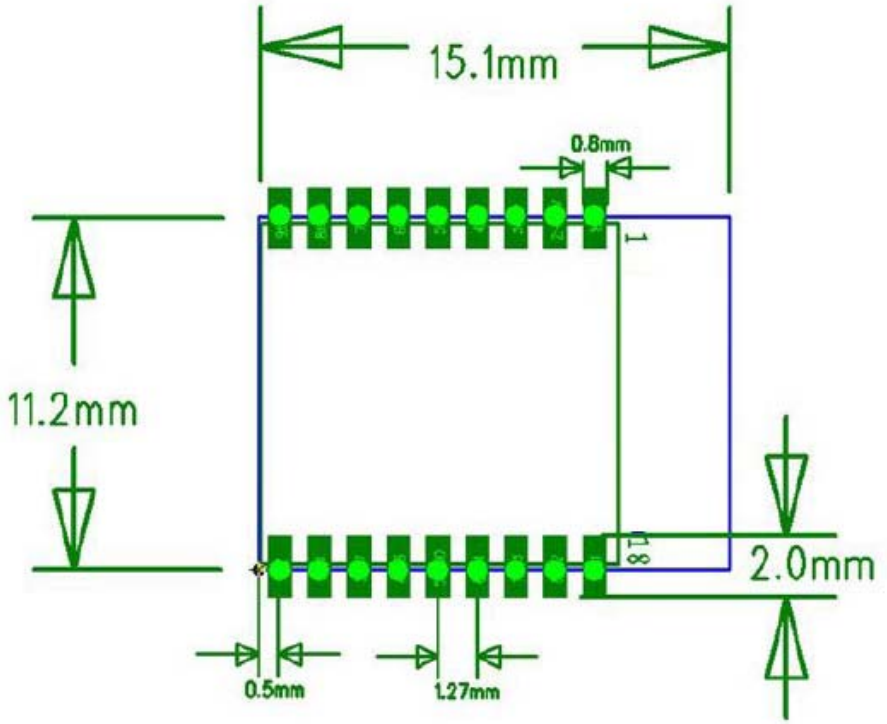
Externally 3.3V DC voltage					
		Min	Type	Max	Unit
RESET			0.005		mA
SLEEP			4.8	5.3	
STOP			0.195	0.200	
STANDBY			0.019	0.022	
RX				38.39	
TX	+3 dBm		36		
	0dBm		30		
	-3 dBm		28		

PIN ASSIGNMENTS



PinNo	Symbol	I/O	Function Description	Optional function
1	GND	Power	Ground	
2	VCC	Power	Power Supply	
3	NC			
4	PA8	DIO		TIM1_CH1/MCO
5	NRST	Reset		
6	PA0	DIO		UART2_CTS/ADC_IN0
7	PD2	DIO		
8	NC			
9	NC			
10	PD3	DIO		
11	PA13_SWDIO	DIO		SWDIO
12	PA14_SWDCLK	DIO		SWCLK/UART2_TX
13	PA11	DIO		UART1_CTS/TIM1_CH4/I2C_SCL
14	PA3	DIO		ADC_IN3/TIM2_CH4
15	PA4	DIO		ADC_IN4/TIM14_CH1
16	PA9_TX	DIO		UART1_TX/TIM1_CH2/UART1_RX/I2C_SCL/MCO
17	PA10_RX	DIO		UART1_RX/TIM1_CH3/UART1_TX/I2C_SDA
18	PA7	DIO		ADC_IN7/TIM17_CH1

PHYSICAL DIMENSIONS（unit:mm）



FCC statement

FCC Label: The FCC ID is on the front of the device. It is easily visible.

The device FCC ID is 2ATO2-NDB1793S.

A label with the following statements must be attached to the host end product:

This device contains FCC ID: 2ATO2-NDB1793S.

The manual provides guidance to the host manufacturer will be included in the documentation that will be provided to the OEM.

The module is limited to installation in mobile or fixed applications.

The separate approval is required for all other operating configurations, including portable configurations and different antenna configurations.

The OEM integrators are responsible for ensuring that the end-user has no manual or instructions to remove or install module.

Module grantee (the party responsible for the module grant) shall provide guidance to the host manufacturer for ensuring compliance with the Part 15 Subpart B requirements.

The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with the Part 15 Subpart B requirements, the host manufacturer is required to show compliance with the Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions) with the Radio essential requirements. The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in the Part 15 Subpart B or emissions are complaint with the Radio aspects.

FCC RF Exposure Requirements

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter and must be installed to provide a separation distance of at least 20cm from all persons.

FCC Regulations

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference

received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.