Model: DD6600-RF-Bluetooth Module

Version: Ver1.0

Version History

Document Release	Date	Modification
Version Ver1.0	July 20, 2024	

1. Introduction

The DD6600 is a near-field communication module designed by Dooya based on the nRF52840 chip, supporting Thread, BLE communication and the standards and industry alliance specifications of the Matter application layer.

1.1 Features

Operating voltage: 1.8V - 3.6V

The main frequency supports 64 MHz.

8MBFLASH

Supports Bluetooth 5.4

Peripheral resources:

Up to 11 GPIOs
1 high-speed UART
Support external clock connection

1.2 Application fields

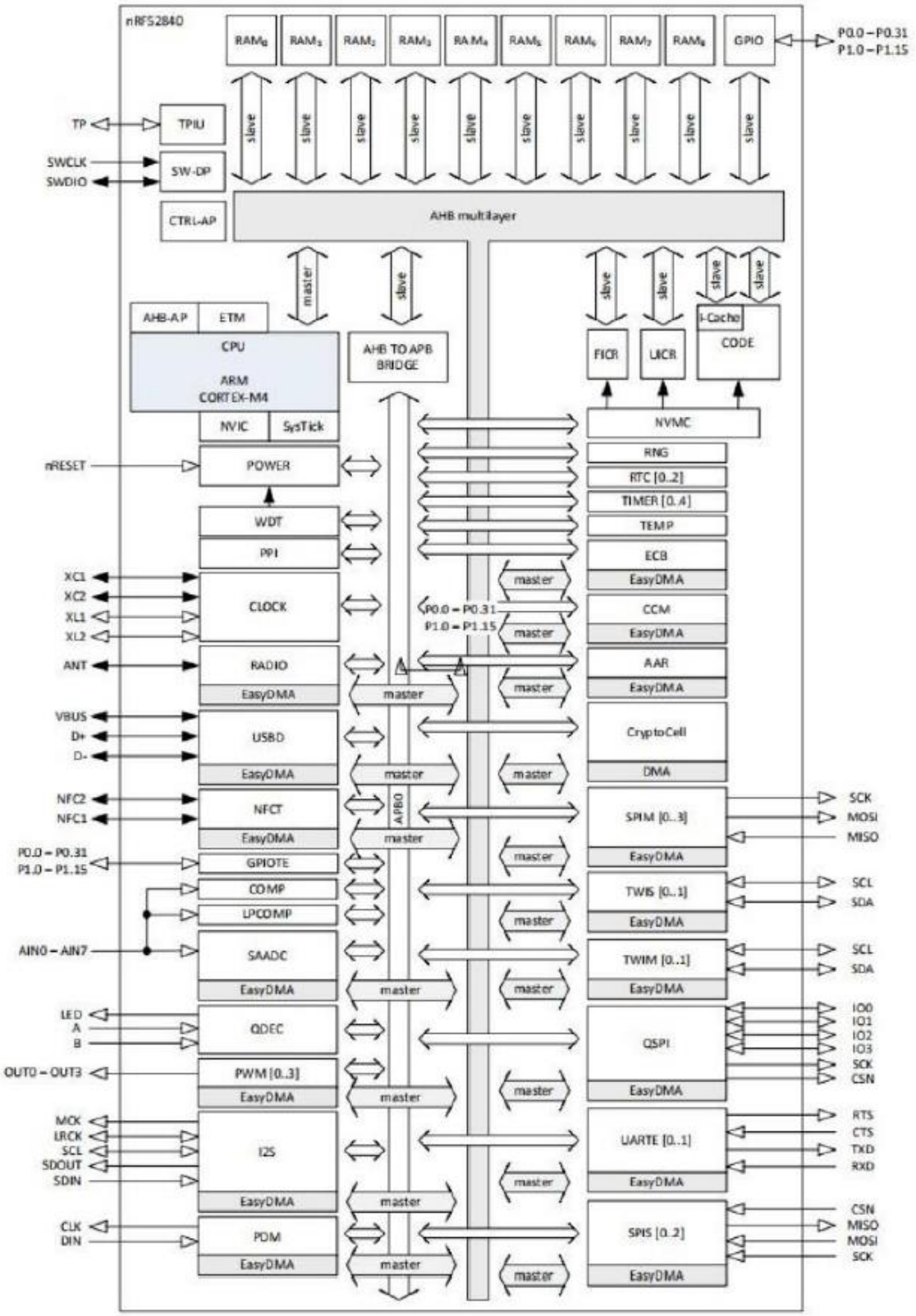
Smart building
Smart home / smart appliances Smart socket
Industrial wireless control

1.3 Module Specifications

Chip model	nRF52840
Support standards	Thread, BLE,Matter
Antenna interface	Antenna pad
Module size	External antenna (antenna pad): L*W*H: 20*14*3.1mm
Working temperature	-40°C to 85°C
Storage temperature	-40°C to 125°C

1.4 Scheme block diagram

This block diagram illustrates the entire system of the nRF52840. Arrows with white heads indicate signals that share physical pins with other signals. Any GPIO can be configured as peripheral pins for SPI, I2C, UART, PWM, etc.



2. Electrical characteristics

2.1 DC Characteristics

Item	Sym	Min	Typ	Max	Unit
VBAT		1.7		3.6	V
Input high voltage	VIH	0.7 VDD		VDD	V
Input low voltage	VIL	VSS		0.3 VDD	V
Output high voltage	VOH	0.9VDD		VDD	V
Output low voltage	VOL	VSS		0.1 VDD	V
Operating Temperature	TOpr	-40		85	°C

2.2 AC Characteristics

Working frequency	2.400 GHz - 2.4835 GHz
Wireless transmission rate	Bluetooth® 5 –2 Mbps, 1 Mbps, 500 kbps, and 125 bps IEEE 802.15.4-2006 - 250 kbps Proprietary 2.4 GHz - 2 Mbps, 1 Mbps
transmission power	TYP:-20 to +8 dBm TX power, configurable in 4 dB steps
Receiving sensitivity	125kpbs: -102dbm; 1 Mbps: -94 dBm

2.3 Driving Characteristics

Item	Description	Min	Typ	Max	Unit
IOL,HDH	At VSS + 0.4 V current, output set low, high drive, VDD = 3.3 V	6	10	15	mA
IOH,HDH	At VDD - 0.4 V, output set high, high drive, VDD = 3.3 V	6	9	14	mA

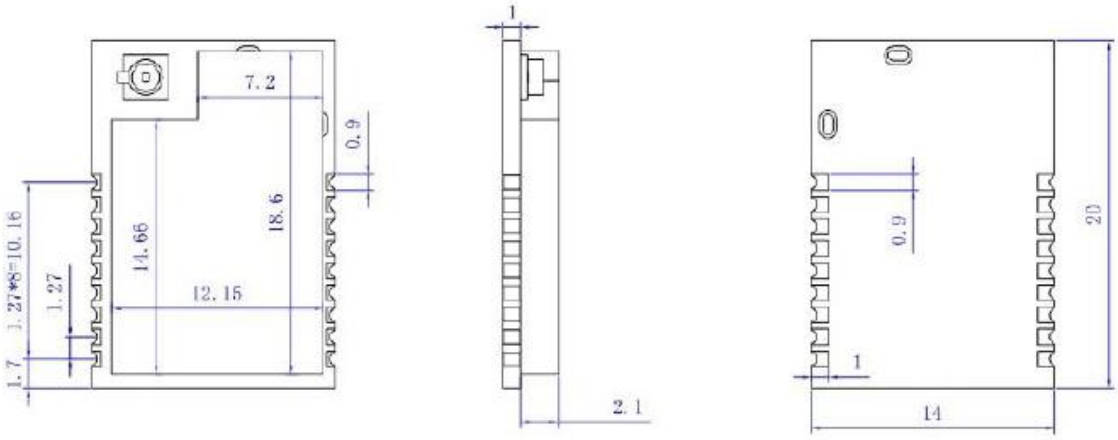
2.4 Antenna Information

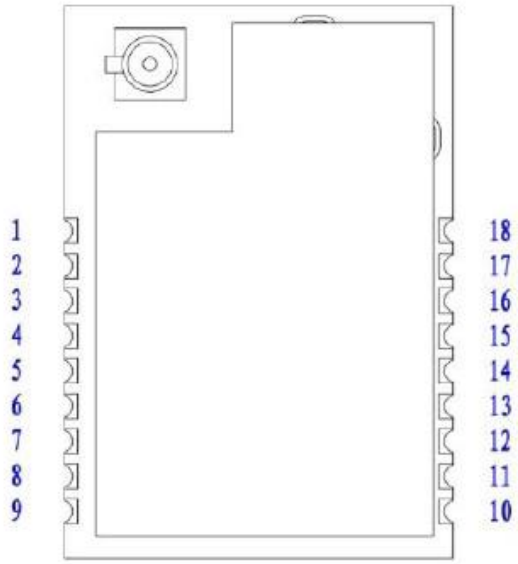
Antenna Type	Brand	Model No.	Max. Antenna Gain
External Antenna	Dooya	SHZD2400-1U-K3-1	1 dBi

3. Module en

3.1 Module Dimensions (Unit: mm)

3.1.1 External antenna version (antenna pad)





3.2 Module P

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Pin designation	Type	Pin functions	Note
1	Digital I/O Analog input P0.03	General purpose I/O Analog input	Standard drive, low frequency I/O only
2	Digital I/O Analog input P0.02	General purpose I/O Analog input	Standard drive, low frequency I/O only
3	Digital I/O Analog input P0.28	General purpose I/O Analog input	Standard drive, low frequency I/O only
4	Digital I/O P0.08	General purpose I/O	
5	Digital I/O Page 1.08	General purpose I/O	
6	Digital I/O Analog input P0.31	General purpose I/O Analog input	Standard drive, low frequency I/O only
7	Digital I/O Analog input P0.00	General purpose I/O 32.768 kHz The crystal oscillator is connected to the circuit	
8	Digital I/O Analog input P0.01	General purpose I/O 32.768 kHz The crystal oscillator is connected to the circuit	
9	GND	Negative power supply for module	
10	VDD	Typ. 3.3V, ripple < 30mV, current > 250mA	
11	Digital I/O P0.13	General purpose I/O	
12	Digital I/O P0.14	General purpose I/O	
13	Digital I/O Trace data P0.12	General purpose I/O Trace buffer TRACEDATA[1]	
14	Digital I/O Trace data P0.1	General purpose I/O Trace buffer TRACEDATA[2]	
15	Digital I/O Trace data P1.09	General purpose I/O Trace buffer TRACEDATA[3]	
16	Digital I/O Reset P0.18	General purpose I/O Configurable as pin RESET	
17	SWDIO Debug	Serial wire debug I/O for debug and programming	
18	SWDCLK Debug	Serial wire debug clock input for debug and programming	

4. Application Solutions

4.1 AT Application

Pin number	Function	Function Introduction	Explanation
4	RX_EN	The RX receive enable pin of the UART	When the signal is at a high level, the RX of the UART is enabled to receive data from the MCU; when it is at a low level, the UART_RX is disabled.
5	TX_NTF	UART message notification pin	When the module has data to send to the MCU, this pin will trigger a high-level output. After the transmission is completed, this pin will return to a low level.
6	KEY	Key-controlled foot	The external 10K resistor is pulled up, and the key is triggered by a low level.
7	XL1	External 32.768KHz crystal oscillator pin	
8	XL2		
9	GND	Negative terminal of the power supply	Power ground
10	VDD	Positive terminal of the power supply	Typ. 3.3V, ripple < 30mV, current > 250mA
11	RART_RX	UART serial communication	UART communication for modules and MCU
12	RART_TX		
13	LED_R	External 3.3V / 20mA / Red, blue and green three colors lamp	Shared LED, the LED lights up when the voltage is low.
14	LED_G		
15	LED_B		
16	RESET	Reset foot	Suspended, on standby
17	SWDIO	Program burning port	
18	SWDCLK		

5. Notice to Host

Any deviation(s) from the defined parameters of the antenna trace, as described by this instruction, host product manufacturer must notify us that you wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

5.1 Labelling Instruction for Host Product Integrator

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. For FCC, this exterior label should follow "Contains FCC ID: VYYDD6600"
In accordance with FCC KDB guidance 784748 Labeling Guidelines.

5.2 Installation Notice to Host Product Manufacturer

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module. The module is limited to installation in mobile application, a separate approval is required for all other operating configurations, including portable configurations with respect to §2.1091 and difference antenna configurations.

5.3 Antenna Change Notice to Host Product manufacturer

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

5.4 FCC Compliance Requirements for Host product manufacturer

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements. Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in *§15.105 Information to the user* or such similar statement and place it in a prominent location in the text of host product manual. Original texts as following:

For Class B

Note: 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.

For Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

6. FCC Statement

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.
NOTE: 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 form that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.
Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
FCC RF Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.