

WFBLE. DTU. Module-102 Product Specifications

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1. Product Overview

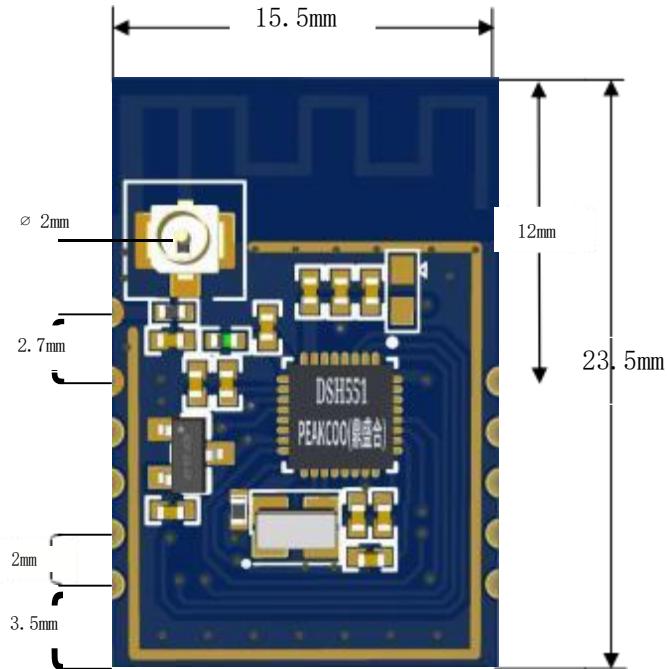
The product is a Wi-Fi+BLE combination module. The antenna form is onboard antenna generation. It is used to expand the Wi-Fi network data transmission channel of the device. The product has the characteristics of fast speed and free application. It communicates with the device through the serial port. The data processing board is connected, has strong anti-interference ability, and supports remote control, remote debugging, remote upgrade and other functions of the equipment. At the same time, local monitoring, real-time monitoring and other functions can be realized through BLE.

2. Product features

- (1) Common standards: Support Wi-Fi@2.4GHz 802.11b/g/n;
- (2) Various modes: support AP/STA/AP+STA working mode;
- (3) Safe and reliable: supports WPS/WEP/WPA/WPA2 Personal/WPA2 Enterprise/WPA3 security mode;
- (4) Easy to use: serial port (2400–115200bps, default 9600, NONE/ODD/EVEN) ;
- (5) Device selection: industrial grade components, can work for a long time within -40°C~+85°C ;
- (6) Convenient configuration: supports AT command configuration such as network, serial port and Bluetooth;
- (7) Protection measures: Software watchdog feeding signal;
- (8) Data security: private protocol, data verification;
- (9) Simple maintenance: supports remote firmware upgrade and Bluetooth debugging;
- (10) High integration: ultra-small size, can integrate smaller embedded products..

3. Product size

3.1 Structural dimensions (module PCB and shielding cover)



3.2 Product actual picture



4. Product interface



PIN	Name	Type	Describe	DC Characteristic	Remark
1	ANT	I/O	RF antenna interface	50 Ω Characteristic impedance	For stamp hole version
2	GND	GND	GND		
3	WDI	I/O	Output 1Hz square wave signal	0/3.3V	Watchdog feeding dog output pin, backplane circuit The design recommends adding a hard watchdog circuit to improve High overall product reliability
4	BUZZER	I/O	Buzzer output	0/3.3V	When powered on, it will output a high level and then turn low after 2 seconds. If not in use, it will be left floating.
5	SRV	I/O	SRV indicator light	0/3.3V	When the module is powered on, the low level turns high after 2 seconds. When the module is connected to the cloud server, it remains low.
6	NET	I/O	NET indicator light	0/3.3V	The output low level turns high after 2 seconds after power-on. When the module is successfully connected to the network, it remains low. It jumps high/low during Bluetooth configuration.
7	COM	I/O	COM indicator light	0/3.3V	The output low level turns high after power-on for 2 seconds, and remains low when communication with subordinate devices is successful.
8	RXD	I	The main serial port receives data	0/3.3V	

9	TXD	0	The main serial port sends data	0/3.3V	
10	RST	I	Module reset pin	0 efficient	Internal pull-up, active at low level, if not used hanging in the air
11	VDD33	Power	Power supply 3.3V	Vmax=3.45V Vmin=3.15V Vnorm=3.3V	The external power supply needs to provide a current carrying capacity of more than 500mA, and the ripple is recommended to be less than 100mV

5. Product specifications

Category	Entry	Parameter
Product structure	PCBA Dimensions (length/width/height)	23.5*15.5*3.3 (Shielding cover height 2.3mm) mm
	PCB color	green
	Shielding cover size (length/width/height)	13.4*16*2.3mm (Notch on upper left side 4.7*3.3mm)
	weight	TBD
	working temperature	-40°C ~ +85°C
	Storage temperature	-40°C ~ +90°C
Hardware interface	Power	3.3V/500mA
	Communication interface type	TTL
	baud rate	2400bps~115200bps (default 9600bps)
	Check digit	NONE/ODD/EVEN
	data bits	8
	Stop bit	1
Wireless parameters	wireless standards	802.11b/g/n
	frequency band	Wi-Fi@2.4GHz
	Transmit power	802.11b: +17 +/-2dBm(@11Mbps, CCK) 802.11g: +16 +/-2dBm(@54Mbps, OFDM) 802.11n: +15 +/-2dBm(@HT20, MCS7)
	Receive sensitivity	802.11b: -85 dBm(@11Mbps, CCK) 802.11g: -70 dBm(@54Mbps, OFDM) 802.11n: -68 dBm(@HT20, MCS7)
	Transmission distance	50~100M
Antenna parameters	Antenna form	Onboard antenna
	Onboard antenna gain	1.7dBm
	data rate	1Mbps
Bluetooth parameters	bluetooth standard	BLE 5.0
	Bluetooth distance	20M
	Bluetooth local monitoring refresh rate	s
	Bluetooth local monitoring and issuing command cycle	2s
	Connect Bluetooth local monitoring	Produce the first piece of data within 5 seconds
Software parameters	Wireless working mode	STA/AP/AP+STA
	security mechanism	WEP/WPA-PSK/WPA2-PSK
	working mode	Transparent Transmission
	Parameter configuration method	AT instruction
	Support cloud platform	ValueClouds, Customer customized platform
Other parameters	Warranty	1 year
	Certification	CE, RoHS

FCC warning statements:

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.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

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.

The device has been evaluated to meet general RF exposure requirement. 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 & your body.

instructions will not be made available to the end user.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

FCC Part 15 Subpart C 15.247 & 15.207 & 15.209 & 15.205

2.3 Specific operational use conditions

When installed in smart terminal products, the host manufacturer must negotiate with the module manufacturer on the final installation method in the system. The host manufacturer installing this module into their product must ensure that the final compost product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

The module should be installed and operated with minimum distance 20cm between the radiator & your body. and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization. When the host is a portable device, it is necessary to take a SAR test with your set mounting this module. Class II permissive change application is necessary using the SAR report. Please contact kevin (mengxiangti@eybond.com). And an application for a Class II permissive change from a Mobile equipment to a Portable equipment is also required.

Note) Portable equipment : Equipment for which the spaces between human body and antenna are used within 20cm. Mobile equipment : Equipment used at position in which the spaces between human body and antenna exceeded 20cm.

1. According to the following requirements of the power supply DC3.3V, power up, about 3 seconds to to complete the initial.
2. iphone/Android mobile phone BT/WIFI function to open, search to the corresponding Wireless network adapter name (name can be changed according to customer production requirements), click the name of the BT/WIFI and select the connection.
3. open application software (need to install the company's specific application software development, application software interface can be customized according to customer's product requirements).

2.4 Limited module procedures

The module is a Single module.

Requirement per 15.212 and KDB 996369 D01	Explanation from Grantee (do not write yes/no, but explain why product complies/how it is achieved)
The radio elements must have the radio frequency circuitry shielded. Physical components and tuning capacitor(s) may be located external to the shield, but must be on the module assembly.	Has Shielding cover
The module must have buffered modulation/data inputs to ensure that the device will comply with Part 15 requirements with any type of input signal.	The modular have buffered modulation/data inputs.
The module must contain power supply regulation on the module.	The modular transmitter have its own power supply regulation.(DC 3.3V) See Page 6
The module must contain a permanently attached antenna, or contain a unique antenna connector, and be marketed and operated only with specific antenna(s), per §§ 15.203, 15.204(b), 15.204(c), 15.212(a), 2.929(b).	Antenna restrictions are added in the manual.The antenna needs to be professionally installed.
The module must demonstrate compliance in a stand-alone configuration.	The module was tested in a stand-alone configuration, please refer to the Setup Photo for the detail
The module must be labeled with its permanently affixed FCC ID label, or use an electronic display (see KDB Publication 784748).	Please refer to Label sample
The module must comply with all specific rules applicable to the transmitter, including all the conditions provided in the integration instructions by the grantee.	The required FCC rule has been fulfilled and all the instructions for the maintaining compliance have been clearly stated in the User Manual.
The module must comply with RF exposure requirements	The MPE evaluation with 20cm distance restriction is submitted for the compliance of RF Exposure requirement.

2.5 RF exposure considerations

The module complies with FCC radiation exposure limits set forth for an uncontrolled environment. The module should be installed and operated with minimum distance 20cm between the radiator & your body.

2.6 Antennas

This module has been approved to operate with the antenna types listed below, with the maximum permissible gain indicated. The module antenna requires professional installation, and the antenna type cannot be changed. The gain cannot exceed 1.55dBi.

Frequency band	Antenna Type	Max Gain
2400-2500MHz	PCB Antenna	1.55(dBi)

This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna; The module shall be only used with the External antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a 'unique' antenna coupler.

As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating

"Contains FCC ID: 2ASAF-MODULE-102 With their finished product.

2.9 Information on test modes and additional testing requirements

BT function:

Operation Frequency: 2402~2480MHz

Number of Channel: 40 Channels

Modulation Type: GFSK

Antenna Type: PCB antenna

Antenna Gain(Peak): 1.55 dBi (Provided by customer)

2.4G WIFI function:

Operation Frequency: 2412~2462MHz

Number of Channel:

802.11b/802.11g/802.11n(HT20): 11CH

802.11(HT40): 7CH

Modulation Type:

IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK)

IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)

IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK)

Antenna Type: PCB antenna

Antenna Gain(Peak): 1.55 dBi (Provided by customer)

Host manufacturer must perform test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 & 15.209 & 15.205 and that the 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. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

2.11 The user manual of the end product should include:

- a) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- b) The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.
- c) 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.
- d) This device is restricted to indoor use.
- e) The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.