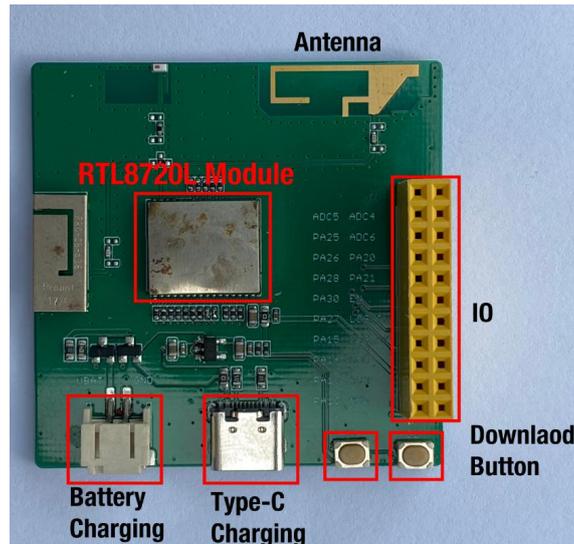


Model: RTL8720DN



**Description:**

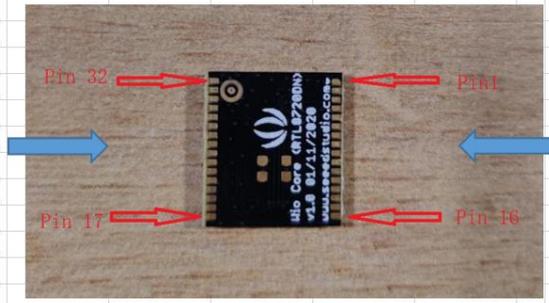
Realtek RTL8720DN is a WiFi and Bluetooth module that has dual bands for WiFi communication. It is worth saying that this little module can support WiFi 5G and Bluetooth Low Energy 5.0 as well. This WiFi and Bluetooth module is a highly integrated WiFi and Bluetooth module with the main chip RTL8720DN, it can be regarded as an SoC for the WiFi and Bluetooth application with typical SBCs.

**Specification:**

MCU	Dual core:20MHz Cortex M0; 200MHz Cortex M4F
Major Chipset	RTL8720DN
Flash	Serial SPI Flash;104MHz
WiFi Wireless Standards	802.11 a/b/g/n 2.4GHz & 5GHz;
Bluetooth Wireless Standards	Bluetooth5.0 BLE
Charging Interface	USB-Type C
Battery	N/A.
Charging Current	600mA
Firmware Upgrade	UART

RTL8720DN Pinout:

Pin32	GND
Pin31	RF_ANT
Pin30	GND
Pin29	NC
Pin28	NC
Pin27	NC
Pin26	UART_LOG_RXD
Pin25	UART_LOG_TXD
Pin24	CHIP_EN
Pin23	PB21
Pin22	PB20
Pin21	GND
Pin20	PB17
Pin19	PB16
Pin18	PB13
Pin17	PB14



Pin1	GND
Pin2	PA12
Pin3	PA13
Pin4	PA14
Pin5	PA15
Pin6	PA27
Pin7	PA30
Pin8	PA28
Pin9	PA26
Pin10	PA25
Pin11	NC
Pin12	ADC5
Pin13	ADC4
Pin14	ADC6
Pin15	GND
Pin16	VDD1V8/3V3

## **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

### **2.3 Specific operational use conditions**

The module is a module with BLE and WIFI 2.4G and WIFI 5.1G and WIFI 5.8G functions.

Operation Frequency: WiFi 2.4G: 802.11b/ g/ n(HT20) 2412-2462MHz

802.11n(HT40) 2422-2452MHz

BLE: 2402-2480MHz

WiFi 5.1G: 5180MHz~5240MHz

WiFi 5.8G: 5745MHz~5825MHz

Number of Channel: WiFi 2.4G: 11 Channels for 802.11b/ g/ n(HT20)

7 Channels for 802.11n(HT40)

BLE: 40 Channels

WiFi 5.1G: 4 Channels for 802.11a

WiFi 5.8G: 5 Channels for 802.11a

Modulation: WiFi 2.4G: 802.11b CCK; 802.11g/n OFDM

BLE: GFSK

WiFi 5.1G: OFDM with BPSK/QPSK/16QAM/64QAM/256QAM

WiFi 5.8G: OFDM with BPSK/QPSK/16QAM/64QAM/256QAM

Type: ANT A: PCB Antenna

ANT B: Chip Antenna

Gain: WiFi 2.4G: 4.1 dBi (PCB ANTA) , 1 dBi (Chip ANTB)

BLE: 4.1 dBi (PCB ANTA) , 1 dBi (Chip ANTB)

WiFi 5.1G: 3.6 dBi (PCB ANT) , 4 dBi (Chip ANT)

WiFi 5.8G: 2.1 dBi (PCB ANT) , 4 dBi (Chip ANT)

The module can be used for mobile or portable applications with a maximum 4.1dBi antenna. The host manufacturer installing this module into their product must ensure that the final composite 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.

### **2.4 Limited module procedures**

Not applicable. The module is a Single module and complies with the requirement of FCC Part 15.212.

### **2.5 Trace antenna designs**

Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.

### **2.6 RF exposure considerations**

The module must be installed in the host equipment such that at least 5mm is maintained between the antenna and users' 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.

## **2.7 Antennas**

Antenna Specification are as follows:

Type: ANT A: PCB Antenna

ANT B: Chip Antenna

Gain: WiFi 2.4G: 4.1 dBi (PCB ANTA) , 1 dBi (Chip ANTB)

BLE: 4.1 dBi (PCB ANTA) , 1 dBi (Chip ANTB)

WiFi 5.1G: 3.6 dBi (PCB ANT) , 4 dBi (Chip ANT)

WiFi 5.8G: 2.1 dBi (PCB ANT) , 4 dBi (Chip ANT)

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 internal 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: Z4TSEED8720DN" with their finished product.

## **2.9 Information on test modes and additional testing requirements**

Operation Frequency: WiFi 2.4G: 802.11b/ g/ n(HT20) 2412-2462MHz

802.11n(HT40) 2422-2452MHz

BLE: 2402-2480MHz

WiFi 5.1G: 5180MHz~5240MHz

WiFi 5.8G: 5745MHz~5825MHz

Number of Channel: WiFi 2.4G: 11 Channels for 802.11b/ g/ n(HT20)

7 Channels for 802.11n(HT40)

BLE: 40 Channels

WiFi 5.1G: 4 Channels for 802.11a

WiFi 5.8G: 5 Channels for 802.11a

Modulation: WiFi 2.4G: 802.11b CCK; 802.11g/n OFDM

BLE: GFSK

WiFi 5.1G: OFDM with BPSK/QPSK/16QAM/64QAM/256QAM

## WiFi 5.8G: OFDM with BPSK/QPSK/16QAM/64QAM/256QAM

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 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. Federal Communication Commission Statement (FCC, U.S.)

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 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.

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.

#### FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

#### IMPORTANT NOTES

##### Co-location warning:

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

##### OEM integration instructions:

This device is intended only for OEM integrators 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.

As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator 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.).

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:

The final end product must be labeled in a visible area with the following: "Contains Transmitter Module FCC ID: Z4TSEED8720DN".

Information that must be placed in the end user manual:

The OEM integrator 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.