



HEWRQU1 Module Datasheet

Version: 20220214

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Developed by Tuya, HEWRQU1 is a Wi-Fi module that is suitable for serial communication in which the level is changed from 5V TTL to 3.3V TTL. It consists of a highly integrated wireless RF chip (RTL 8710BN), an extension chip, and a DC-DC chip. Besides, it has a Wi-Fi network protocol stack and rich library functions inside. It further contains a low-power ARM CM4FCPU, a 2-MB flash memory, and a 256-KB SRAM.

1 Product overview

HEWRQU1 is an RTOS platform that integrates all function libraries of the Wi-Fi MAC and TCP/IP. On the basis of serial communication, you can develop embedded Wi-Fi products as required.

1.1 Features

- Low-power CPU, which can also function as an application processor
- The maximum clock rate: 125 MHz
- Operating voltage: 4.5 to 5.5V
- Peripheral: 1 UART
- Wi-Fi connectivity
 - 802.11 b/g/ n_HT20 HT40
 - Channels 1 to 14@2.4 GHz
 - Support WPA, WPA2, WEP, and TKIP security modes
 - Up to +18 dBm output power in 802.11b mode
 - Support STA, AP, and STA+AP working modes
 - Support SmartConfig and AP network configuration manners for Android and iOS devices
 - Onboard PCB antenna
 - Operating temperature: -20°C to 85°C

1.2 Applications

- Intelligent buildings
- Smart household and home appliances
- Smart socket and light
- Industrial wireless control

- Baby monitor
- Network camera
- Intelligent bus

1.3 Change history

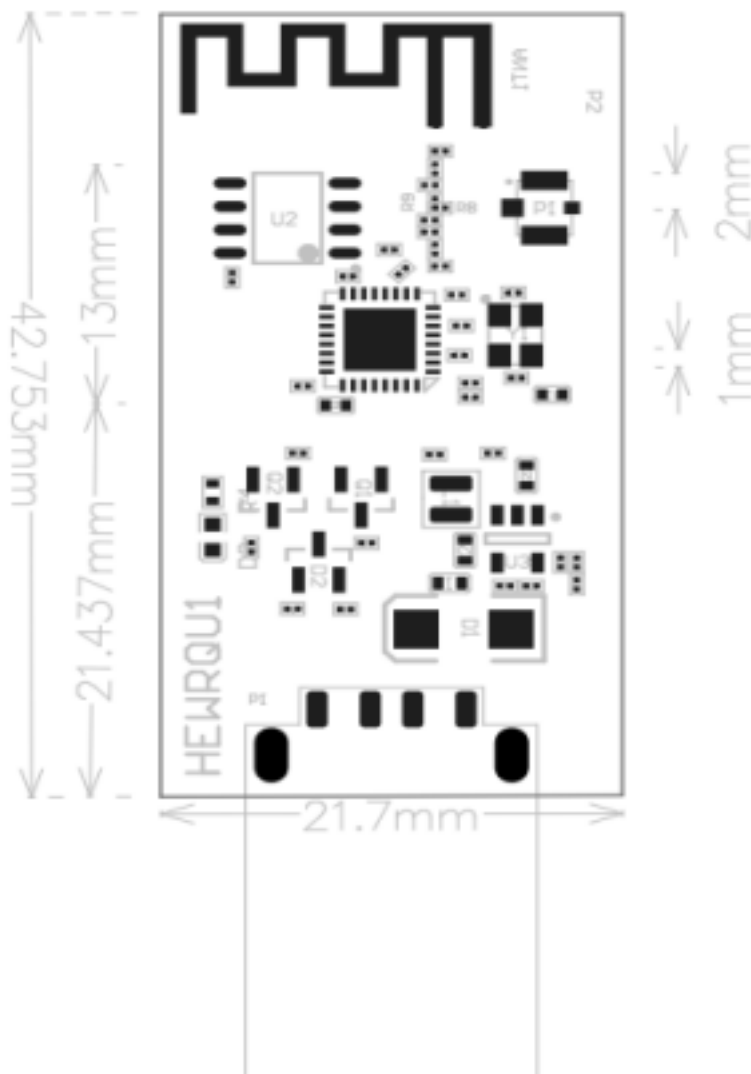
Update date	Updated content	Version after update
Sep. 29, 2021	This is the first release.	V1.0.0

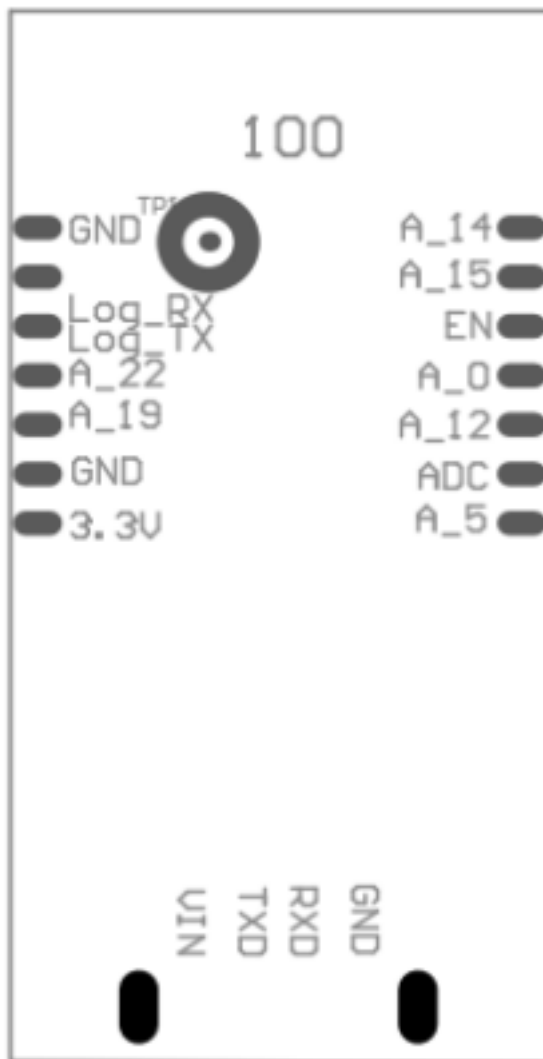
2 Module interfaces

2.1 Dimensions and footprint

The dimensions of HEWRQU1 are 42.75 ± 0.35 mm (L) $\times$ 21.7 ± 0.35 mm (W) $\times$ 4.5 ± 0.15 mm (H).

The dimensions of HEWRQU1 are shown below:





2.2 Pin definition

Pin number	Symbol	Type	Function
1	A_14	I/O	GPIO_14
2	A_15	I/O	GPIO_15
3	EN	P	Enabling pin (low active)

Pin number	Symbol	Type	Function
4	A_0	I/O	GPIO_0. It cannot be pulled up during powering on.
5	A_12	I/O	GPIO_12
6	ADC	AI	ADC port, the max input voltage 5V
7	A_5	I/O	GPIO_5
8	3.3V	P	Power supply pin (3.3V)
9	GND	P	Power supply reference ground
10	A_19	I/O	GPIO_19
11	A_22	I/O	GPIO_22
12	Log_TX	I/O	UART_Log_TXD (used to display the internal information of the module)
13	Log_RX	I/O	UART_Log_RXD (used to display the internal information of the module)
14	GND	P	Power supply reference ground
15	VIN	I/O	External input voltage (5V)
16	TXD	I/O	UART0_TXD (user-side serial port)

Pin number	Symbol	Type	Function
17	RXD	I/O	UART0_RXD (user-side serial port)
18	GND	P	Power supply reference ground

:::info

- P indicates power supply pins, I/O indicates input/output pins and AI indicates analog input pins.
- RST is only a reset pin and cannot be used for clearing network configuration information. :::

2.3 Definitions on test pins

Pin Number	Symbol	I/O Type	Function
-		I	Used for production tests of the module

Test pins are not recommended.

3 Electrical parameters

3.1 Absolute electrical parameters

Parameter	Description	Minimum value	Maximum value	Unit
Ts	Storage temperature	-40	125	°C
V _{BAT}	Power supply voltage	-	5.5	V
ESD voltage (human body model)	TAMB-25°C	-	2	KV
ESD voltage (machine model)	TAMB-25°C	-	0.5	KV

3.2 Normal working conditions

Parameter	Description	Minimum value	Typical value	Maximum value	Unit
Ta	Operating temperature	-20	-	85	°C
V _{BAT}	Power supply voltage	4.5	5	5.5	V
VIL	Low voltage input	-0.3	-	VCC*0.25	V
VIH	High voltage input	VCC*0.75	-	VCC	V

Parameter	Description	Minimum value	Typical value	Maximum value	Unit
VOL	Low voltage output	-	-	VCC*0.1	V
VOH	High voltage output	VCC*0.8	-	VCC	V
I _{max}	IO drive current	-	-	16	mA

3.3 TX and RX power consumption

Working Status	Mode	Rate	Transmit Power/Receive	Typical Value	Unit
Transmit	11 b	11Mbps	+17dBm	285	mA
Transmit	11g	54Mbps	+14.5dBm	255	mA
Transmit	11n-HT20	MCS7	+13.5dBm	235	mA
Transmit	11n-HT40	MCS7	+13.5dBm	235	mA
Receive	11b	11Mbps	Constantly receive	90	mA
Receive	11g	54Mbps	Constantly receive	90	mA
Receive	11n-HT20	MCS7	Constantly receive	90	mA
Receive	11n-HT40	MCS7	Constantly receive	90	mA

3.4 Operating current

Operating mode	Operating status, Ta = 25°C	Average value	Maximum value (Typical value)	Unit
Quick pairing	The module is in fast pairing state	88	150	mA
Hotspot	The module is in pairing state through the hotspot and the Wi-Fi indicator always flashes slowly	95	245	mA
Connected	The module is connected to the network and the Wi-Fi indicator is always on	55	220	mA

The above parameters may vary with firmware functions.

4 RF parameters

4.1 Basic RF features

Parameter	Description
Operating frequency	2.412 to 2.483.5 GHz
Wi-Fi standard	IEEE 802.11 b/g/n (channels 1 to 14)
Data transmission rate	11b: 1, 2, 5.5, and 11 (Mbps); 11g: 6, 9, 12, 18, 24, 36, 48, and 54 (Mbps); 11n: HT20 MCS 0 to 7; HT40 MCS 0 to 7
Antenna type	PCB antenna

4.2 TX performance

TX performance

Parameter	Minimum value	Typical value	Maximum value	Unit
Average RF output power, 802.11b CCK Mode 11M	-	17	-	dBm
Average RF output power, 802.11g OFDM Mode 54M	-	14.5	-	dBm
Average RF output power, 802.11n HT20 Mode MCS7	-	13.5	-	dBm
Average RF output power, 802.11n HT40 Mode MCS7	-	13.5	-	dBm

Parameter	Minimum value	Typical value	Maximum value	Unit
Frequency error	-20	-	20	ppm

4.3 RX performance

RX sensitivity

Parameter	Minimum value	Typical value	Maximum value	Unit
PER<8%, RX sensitivity, 802.11b DSSS Mode 11M	-	-90	-	dBm
PER<10%, RX sensitivity, 802.11a OFDM Mode 54M	-	-73	-	dBm
PER<10%, RX sensitivity, 802.11n OFDM Mode HT20-MCS7	-	-70	-	dBm

5 Antenna

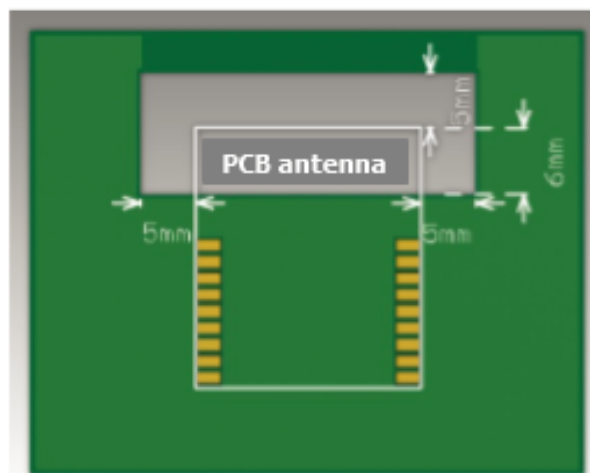
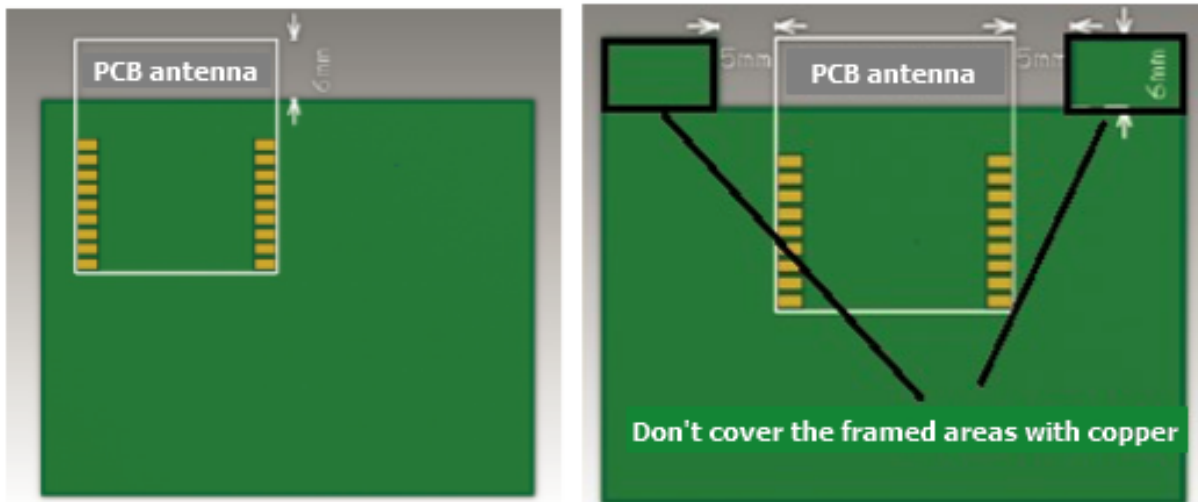
5.1 Antenna type

HEWRQU1 supports two types of antennas: Onboard PCB antenna and external antenna. By default, the onboard PCB antenna is preferred.

5.2 Interference reduction

To ensure optimal Wi-Fi performance when the Wi-Fi module uses a PCB antenna, it is recommended that the antenna be at least 15 mm away from other metal parts.

To prevent adverse impact on the radiation performance, avoid copper or traces within the antenna area of the PCB. During layout, you should note: 1. Make sure that there is no substrate medium on or under the printed antenna. 2. Make sure that the area around the printed antenna is far away from copper, to ensure the radiation effect of the antenna to the greatest extent.

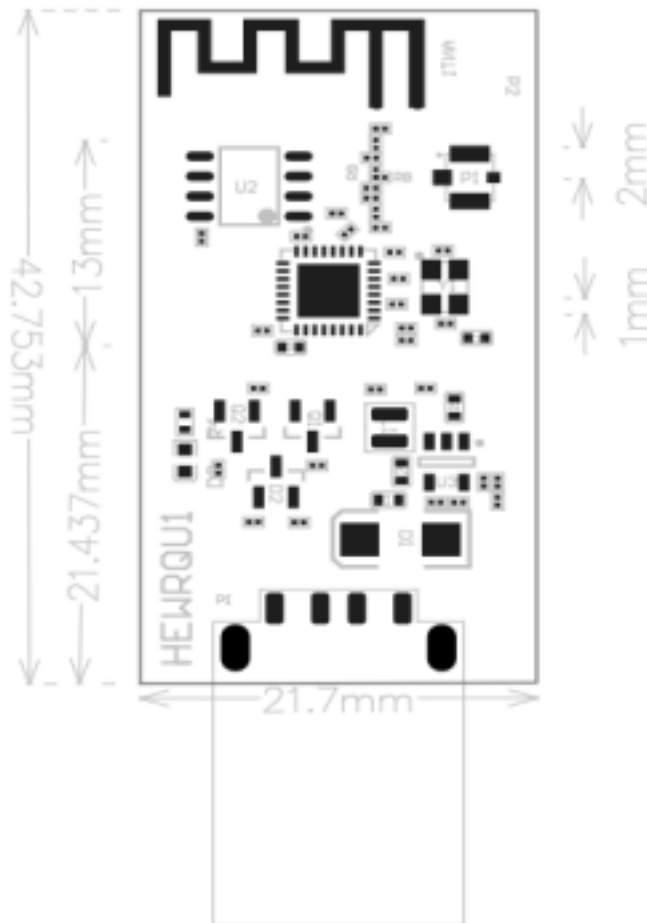


5.3 Specifications of antenna connector

There is no connector for the antenna currently.

6 Packaging information and production instructions

6.1 Mechanical dimensions



6.2 Production instructions

Storage conditions for a delivered module are as follows:

- The moisture-proof bag must be placed in an environment where the temperature is below 30°C and the relative humidity is lower than 70%.
- The shelf life of a dry-packaged product is 6 months from the date when the product is packaged and sealed.

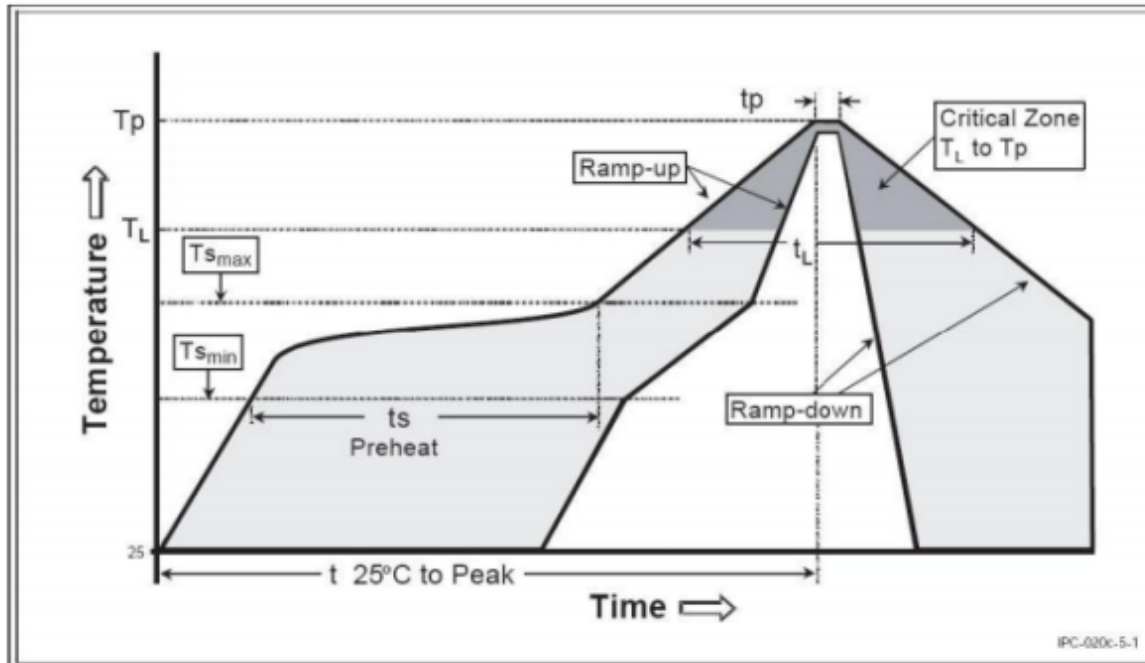
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- In the production process, all operators must wear electrostatic rings.
- During operation, strictly prevent the module from getting wet or dirty. :::

6.3 Recommended oven temperature curve

We mount the PCB with the SMT according to the following temperature curve. The peak temperature is 245°C.

Refer to IPC/JEDEC standard. Peak Temperature: <245°C. Number of Times: ≤2.

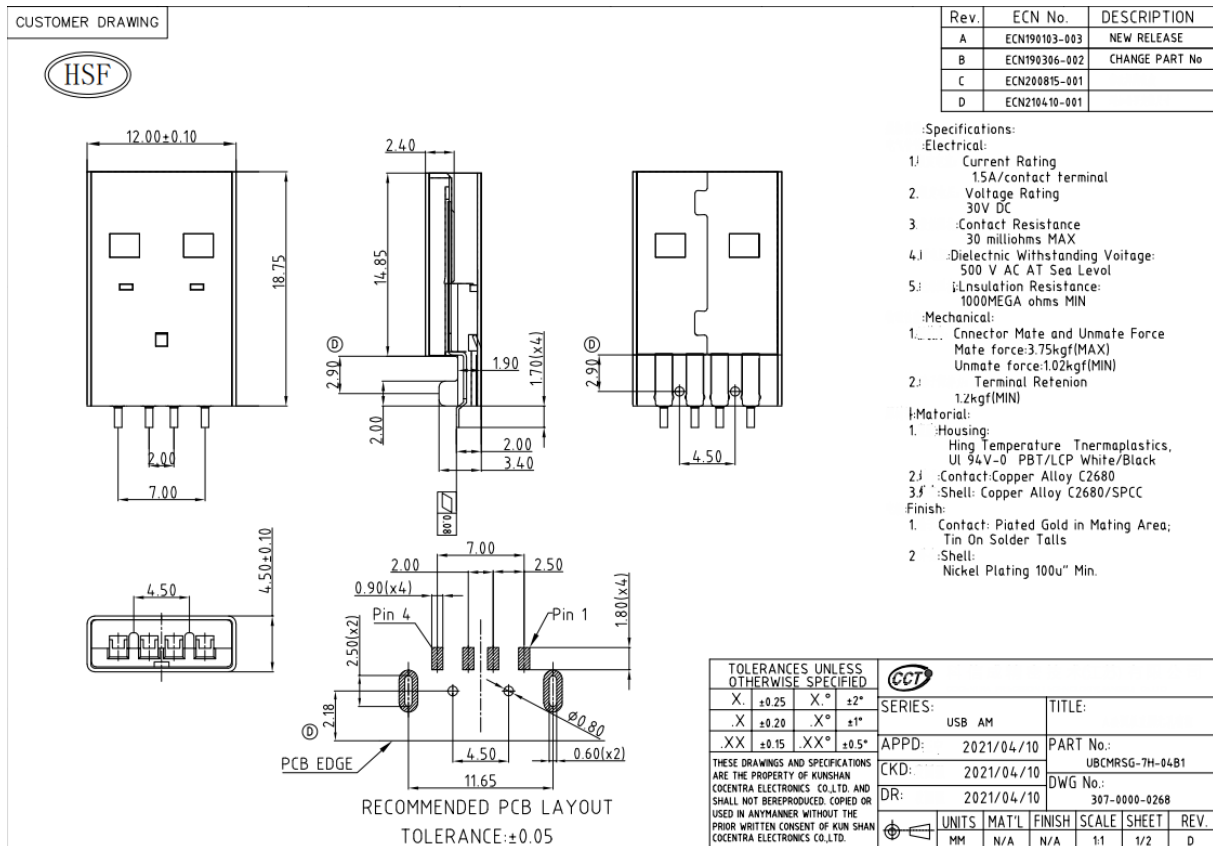


6.4 Storage conditions

	Caution This bag contains MOISTURE-SENSITIVE DEVICES	LEVEL 3 If blank, see adjacent bar code label
1. Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)		
2. Peak package body temperature: <u>260</u> °C If blank, see adjacent bar code label		
3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be		
a) Mounted within: <u>168</u> hours of factory conditions If blank, see adjacent bar code label ≤30°C/60% RH, or		
b) Stored per J-STD-033		
4. Devices require bake, before mounting, if:		
a) Humidity Indicator Card reads >10% for level 2a - 5a devices or >60% for level 2 devices when read at 23 ± 5°C		
b) 3a or 3b are not met		
5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure		
See Production Date Bag Seal Date: _____ If blank, see adjacent bar code label		
Note: Level and body temperature defined by IPC/JEDEC J-STD-020		

Specifications of terminal

This module adopts the USB2.0 180° sinking-plate straight-leg plug connector. Its specifications are as follows:



Product model	MOQ (pcs)	Packing method	The number of modules per reel	The number of reels per carton
HEWRQU1	400	Honeycomb carton	200	2

7 Appendix: Statement

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

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, according 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 by 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.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Important Note

This radio module must not be installed to co-locate and operating simultaneously with other radios in the host system except in accordance with FCC multi-transmitter product procedures. Additional testing and equipment authorization may be required to operate simultaneously with other radios.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end-user.

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. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed. The separate approval is required for all other operating configurations including portable configurations with respect to Part 2.1093 and different antenna configuration.

The end-user manual shall include all required regulatory information/warning as shown in this manual, including This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

This device has got an FCC ID: 2ANDL-HEWRQU1. The final end product must be labeled in a visible area with the following: "Contains Transmitter Module FCC ID: 2ANDL- HEWRQU1" .

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as the 2 conditions above are met, further transmitter tests 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.

Industry Canada Statement

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Radiation Exposure Statement

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

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This device is intended only for OEM integrators under the following conditions:
(For module device use)

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 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.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et

2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or colocation with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not 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 Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dansces

circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC:23243-HEWRQU1".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante:

"Contient des IC: 23243-HEWRQU1".

Manual Information To the End User

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 shown in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

Declaration of Conformity European Notice

Hereby, Hangzhou Tuya Information Technology Co., Ltd declares that this WIFI module product is in compliance with essential requirements and other relevant provisions of Directive 2014/53/EC. A copy of the Declaration of conformity can be found at <http://www.tuya.com>.

EN 300 328 V2.1.1

- EN 301 489-1 V2.1.1;
- EN 301 489-17 V3.1.1
- EN 62311: 2008
- EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013