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RF Exposure Evaluation Report

Report No.: CQASZ20251202911E-05
Applicant: WIRELESS-TAG TECHNOLOGY CO., LIMITED
Address of Applicant: 801, Block A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Community, Xili Street, Nanshan District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: WiFi + BLE Module
Model No.: WT0132C5-S5, WT0132C5-S5U
Test Model No.: WT0132C5-S5, WT0132C5-S5U
Brand Name: Wireless-tag
FCC ID: 2AFOS-WT0132C5-S5
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2025-12-12
Date of Test: 2025-12-12 to 2025-12-30
Date of Issue: 2026-01-27
Test Result: **PASS***

*In the configuration tested, the EUT complied with the standards specified above

Tested By: Lewis Zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack Ai
(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20251202911E-05	Rev.01	Initial report	2026-01-27

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3 General Information

3.1 Client Information

Applicant:	WIRELESS-TAG TECHNOLOGY CO., LIMITED
Address of Applicant:	801, Block A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Community, Xili Street, Nanshan District, Shenzhen, China
Manufacturer:	WIRELESS-TAG TECHNOLOGY CO., LIMITED
Address of Manufacturer:	801, Block A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Community, Xili Street, Nanshan District, Shenzhen, China
Factory:	WIRELESS-TAG TECHNOLOGY CO., LIMITED
Address of Factory:	801, Block A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Community, Xili Street, Nanshan District, Shenzhen, China

3.2 General Description of EUT

Product Name:	WiFi + BLE Module
Model No.:	WT0132C5-S5, WT0132C5-S5U
Test Model No.:	WT0132C5-S5, WT0132C5-S5U
Trade Mark:	Wireless-tag
Software Version:	V1.0
Hardware Version:	V1.0
EUT Power Supply:	Power supply DC 5V

3.3 General Description of Zigbee/Thread

Operation Frequency:	2405MHz~2480MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	O-QPSK
Number of Channel:	16
Transfer Rate:	250 kbps
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	FPC antenna/PCB antenna
Antenna Gain:	FPC antenna:3.27dBi PCB antenna:1.74dBi

3.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.0
Modulation Type:	GFSK
Number of Channel:	40
Transfer Rate:	1Mbps/2Mbps
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	FPC antenna/PCB antenna
Antenna Gain:	FPC antenna:3.27dBi PCB antenna:1.74dBi

3.5 General Description of 2.4G WIFI Classic

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Type of Modulation:	802.11b: DSSS(CCK/QPSK/BPSK) 802.11g: OFDM(BPSK/QPSK/16QAM/64QAM) 802.11n : OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Transfer Rate:	802.11b: 1M/2M/5.5M/11M bps 802.11g: 6M/9M/12M/18M/24M/36M/48M/54M bps 802.11n: 7.2M/14.4M/21.7M/28.9M/43.3M/57.8M/65M/72.2M bps
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	FPC antenna/PCB antenna
Antenna Gain:	FPC antenna:3.27dBi PCB antenna:1.74dBi

3.6 General Description of 5G WIFI Classic

Operation Frequency:	IEEE 802.11a/n/ax(20M): 5150MHz ~5250 MHz IEEE802.11n(40M): 5150MHz ~5250 MHz IEEE 802.11a/n/ax(20M): 5725MHz ~5850 MHz IEEE802.11n(40M): 5725MHz ~5850 MHz
Channel Numbers:	IEEE 802.11a/n/ax(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11a/n/ax(20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n(40M): 5725MHz ~5850MHz/ 2 channel
Type of Modulation:	IEEE for 802.11a/n: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11ax: OFDMA(1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	FPC antenna/PCB antenna

Antenna gain:	FPC antenna:4.48dBi PCB antenna:2.71dBi
Cable loss:	1.0 dB

Note:

The above parameters will directly affect the test results. The information is provided by the applicant.

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.1.3 EUT RF Exposure

1) For BLE

Antenna Gain: 3.27dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.12 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	5.69	6.0±1	7	5.01
Middle(2440MHz)	5.68	6.0±1	7	5.01
Highest(2480MHz)	1.68	2.0±1	3	2.00

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
5.01	3.27	0.00211704031827794	1.0	PASS

Note: 1) Refer to report No. CQASZ20251202911E-01 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (5.01 * 2.12) / (4 * 3.1416 * 20^2) = 0.00211704031827794$

2) For 2.4G WIFI

Antenna Gain: 3.27dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.12 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11G mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	14.21	14.5±1	15.5	35.48
Middle(2437MHz)	13.56	14.0±1	15	31.62
Highest(2462MHz)	13.69	14.0±1	15	31.62

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
35.48	3.27	0.0149874976869612	1.0	PASS

Note: 1) Refer to report No. CQASZ20251202911E-02 for EUT test Max Conducted AV Output Power value.

2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (35.48 \cdot 2.12) / (4 \cdot 3.1416 \cdot 20^2) = 0.0149874976869612$

3) For 5G WIFI Classic

Antenna Gain: 4.48dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.81 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11A mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5260MHz)	13.54	14.0±1	15	31.62
Middle(5280MHz)	13.21	13.5±1	14.5	28.18
Highest(5320MHz)	11.83	12.0±1	13	19.95

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
31.62	4.48	0.0198029152611632	1.0	PASS

Note: 1) Refer to report No. CQASZ20251202911E-03 for EUT test Max Conducted AV Output Power value.

2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (31.62 \cdot 2.81) / (4 \cdot 3.1416 \cdot 20^2) = 0.0198029152611632$

4) For Zigbee/Thread

Antenna Gain: 3.27dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.12 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

O-QPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2405MHz)	16.73	17.0±1	18	63.10
Middle(2445MHz)	16.88	17.0±1	18	63.10
Highest(2480MHz)	16.08	16.5±1	17.5	56.23

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
63.1	3.27	0.0266519585447291	1.0	PASS

Note: 1) Refer to report No. CQASZ20251202911E-04 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (63.1 * 2.12) / (4 * 3.1416 * 20^2) = 0.0266519585447291$

*** END OF REPORT ***