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RF Exposure Evaluation Report

Report No.: CQASZ20250300547E-02
Applicant: Winstars Technology Limited
Address of Applicant: 1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: Wireless AP/Repeater
Model No.: WS-WN573HX3, WL-WN573HX3, WS-WN573HX1, WL-WN573HX1, AERIAL HD6, AERIAL HD9
Test Model No.: WS-WN573HX3
Brand Name: N/A
FCC ID: NZ3-WN0007
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2025-03-17
Date of Test: 2025-03-17 to 2025-05-26
Date of Issue: 2025-05-30
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
CQASZ20250300547E-02	Rev.01	Initial report	2025-05-30

2 Contents

	Page
1 VERSION	2
2 CONTENTS	3
.....	3
3 GENERAL INFORMATION	4
3.1 CLIENT INFORMATION	4
3.2 GENERAL DESCRIPTION OF EUT	4
3.3 GENERAL DESCRIPTION OF 5G WIFI CLASSIC	5
3.4 GENERAL DESCRIPTION OF 2.4G WIFI CLASSIC	6
4 MPE EVALUATION	7
4.1 RF EXPOSURE COMPLIANCE REQUIREMENT	7
4.1.1 Limits	7
4.1.2 Test Procedure	7
4.1.3 EUT RF Exposure	8

3 General Information

3.1 Client Information

Applicant:	Winstars Technology Limited
Address of Applicant:	1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen, China
Manufacturer:	Winstars Technology Limited
Address of Manufacturer:	1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen, China
Factory:	Winstars Technology Limited
Address of Factory:	1-5F, NO.5, Taisong Industrial Zone, Dalang Community, Dalang Street, Longhua District, Shenzhen, China

3.2 General Description of EUT

Product Name:	Wireless AP/Repeater
Model No.:	WS-WN573HX3, WL-WN573HX3, WS-WN573HX1, WL-WN573HX1, AERIAL HD6, AERIAL HD9
Test Model No.:	WS-WN573HX3
Trade Mark:	N/A
Software Version:	M73HX3_V240229
Hardware Version:	WS-WN573HX3-A
EUT Power Supply:	Power supply POE

3.3 General Description of 5G WIFI Classic

Operation Frequency:	IEEE 802.11a/n/ac/ax(20M): 5150MHz ~5250 MHz IEEE802.11n/ac/ax(40M): 5150MHz ~5250 MHz IEEE802.11ac/ax(80M): 5150MHz ~5250 MHz IEEE 802.11a/n/ac/ax(20M): 5250MHz ~5350 MHz IEEE802.11n/ac/ax(40M): 5250MHz ~5350 MHz IEEE802.11ac/ax(80M): 5250MHz ~5350 MHz IEEE 802.11a/n/ac/ax(20M): 5470MHz ~5725 MHz IEEE802.11n/ac/ax(40M): 5470MHz ~5725 MHz IEEE802.11ac/ax(80M): 5470MHz ~5725 MHz IEEE 802.11a/n/ac/ax(20M): 5725MHz ~5850 MHz IEEE802.11n/ac/ax(40M): 5725MHz ~5850 MHz IEEE802.11ac/ax(80M): 5725MHz ~5850 MHz
Type of Modulation:	IEEE for 802.11ax: OFDMA(1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11a/n/ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11a/n/ac/ax(20M): 5250MHz ~5350MHz/ 4 channel IEEE 802.11n/ac/ax(40M): 5250MHz ~5350MHzHz/ 2 channel IEEE 802.11ac/ax(80M): 5250MHz ~5350MHzHz/ 1 channel IEEE 802.11a/n/ac/ax(20M): 5470MHz ~5725MHz/ 9 channel IEEE 802.11n/ac/ax(40M): 5470MHz ~5725MHz/ 4 channel IEEE 802.11ac/ax(80M): 5470MHz ~5725MHz/ 2 channel
Channel Separation:	5MHz
Channel Numbers:	IEEE 802.11a/n/ac/ax(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac/ax(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11ac/ax(80M): 5150MHz ~5250MHz/ 1 channel IEEE 802.11a/n/ac/ax(20M): 5250MHz ~5350MHz/ 4 channel IEEE 802.11n/ac/ax(40M): 5250MHz ~5350MHzHz/ 2 channel IEEE 802.11ac/ax(80M): 5250MHz ~5350MHzHz/ 1 channel IEEE 802.11a/n/ac/ax(20M): 5470MHz ~5725MHz/ 8 channel IEEE 802.11n/ac/ax(40M): 5470MHz ~5725MHz/ 3 channel IEEE 802.11ac/ax(80M): 5470MHz ~5725MHz/ 1 channel IEEE 802.11a/n/ac/ax(20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n/ac/ax(40M): 5725MHz ~5850MHz/ 2 channel IEEE 802.11ac/ax(80M): 5725MHz ~5850MHz/ 1 channel
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	External antenna

Antenna Gain:	Ant1: 6.7dBi@5GHz: Wi-Fi: U-NII-1 6.83dBi@5GHz: Wi-Fi: U-NII-2A 7.61dBi@5GHz: Wi-Fi: U-NII-2C 6.71dBi@5GHz: Wi-Fi: U-NII-3 Ant2: 6.7dBi@5GHz: Wi-Fi: U-NII-1 6.83dBi@5GHz: Wi-Fi: U-NII-2A 7.61dBi@5GHz: Wi-Fi: U-NII-2C 6.71dBi@5GHz: Wi-Fi: U-NII-3 Ant1+Ant2: 9.71dBi@5GHz: Wi-Fi: U-NII-1 9.84dBi@5GHz: Wi-Fi: U-NII-2A 10.62dBi@5GHz: Wi-Fi: U-NII-2C 9.72dBi@5GHz: Wi-Fi: U-NII-3
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3.4 General Description of 2.4G WIFI Classic

Operation Frequency:	2412MHz~2462MHz
Type of Modulation:	802.11b: DSSS(CCK/QPSK/BPSK) 802.11g: OFDM(BPSK/QPSK/16QAM/64QAM) 802.11n (HT20)(HT40): OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11ax(HT20)(HT40) :OFDMA(1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	2.4GHz: Wi-Fi: 802.11b/g/n(HT20)/ax(HE20): 2412MHz~2462MHz; 802.11n(HT40)/ax(HE40): 2422MHz~2452MHz
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(HT20)(HT40): 7.2M/14.4M/21.7M/28.9M/43.3M/57.8M/65M/72.2M bps 802.11ax(HT20)(HT40): 8.6M/17.2M/25.8M/34.4M/51.6M/68.8M/77.4M/86M/103.2M/114.7M/129M/143.4Mbps
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	External antenna
Antenna Gain:	Ant1:8.05dBi Ant2:8.05dBi Ant1+Ant2:11.06dBi

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 5G WIFI Classic

ANT1:

Antenna Gain: 6.83dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.82 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11AX mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5260MHz)	10.75	11.0±1	12.0	15.85

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
15.85	6.83	0.0151959945	1.0	PASS

Note: 1) Refer to report No. CQASZ20250300547E-01 for EUT test Max Conducted AV Output Power value.

$$2) P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (15.85 \cdot 4.82) / (4 \cdot 3.1416 \cdot 20^2) = 0.0151959945$$

ANT2:

Antenna Gain: 6.83dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.82 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11AX mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5260MHz)	9.15	9.5±1	10.5	11.22

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm²)	Limit	Result
11.22	6.83	0.0107579403	1.0	PASS

Note: 1) Refer to report No. CQASZ20250300547E-01 for EUT test Max Conducted AV Output Power value.

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (11.22 * 4.82) / (4 * 3.1416 * 20^2) = 0.0107579403$$

ANT1+ANT2:

Antenna Gain: 9.84dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 9.64 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11AX mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5260MHz)	13.03	13.5±1	14.5	28.18

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
28.18	9.84	0.0540417158	1.0	PASS

Note: 1) Refer to report No. CQASZ20250300547E-01 for EUT test Max Conducted AV Output Power value.

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (28.18 * 9.64) / (4 * 3.1416 * 20^2) = 0.0540417158$$

2) For 2.4G WIFI

ANT1:

Antenna Gain: 8.05dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 6.38 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11B mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	6.7	7.0±1	8.0	6.31

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
6.31	8.05	0.0080117821	1.0	PASS

Note: 1) Refer to report No. CQASZ20240400712E-01 for EUT test Max Conducted AV Output Power value.

$$2) P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (6.31 \cdot 6.38) / (4 \cdot 3.1416 \cdot 20^2) = 0.0080117821$$

ANT2:

Antenna Gain: 8.05dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 6.38 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11B mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	7.4	7.5±1	8.5	7.08

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
7.08	8.05	0.0089893674	1.0	PASS

Note: 1) Refer to report No. CQASZ20240400712E-01 for EUT test Max Conducted AV Output Power value.

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (7.08 * 6.38) / (4 * 3.1416 * 20^2) = 0.0089893674$$

ANT1+ANT2:

Antenna Gain: 11.06dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 12.76 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11N mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	8.59	9.0±1	10.0	10.0

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm²)	Limit	Result
10.0	11.06	0.0253938839	1.0	PASS

Note: 1) Refer to report No. CQASZ20240400712E-01 for EUT test Max Conducted AV Output Power value.

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (10.0 * 12.76) / (4 * 3.1416 * 20^2) = 0.0253938839$$

Simultaneous transmission:

MPE ratios(2.4G WIFI)+MPE ratios(5G WIFI)

=0.0253938839/1+0.0540417158 /1

=0.0794356≤1

*** END OF REPORT ***