



RADIO EXPOSURE TEST REPORT

FCC ID : 2AU6R04285

Equipment : 802.11be (WiFi 7) Dual-Radio PoE Access Point

Brand Name : ZYXEL

Model Name : NWA50BE PRO, NWA90BE PRO, NWA50BE, NWA90BE

Applicant : Zyxel Networks Corporation
No.2 Industry East RD. IX, Hsinchu Science Park,
Hsinchu 30075, Taiwan, R.O.C

Manufacturer : Zyxel Networks Corporation
No.2 Industry East RD. IX, Hsinchu Science Park,
Hsinchu 30075, Taiwan, R.O.C

Standard : 47 CFR Part 2.1091

The product was received on Apr. 24, 2025, and testing was started from May 08, 2025 and completed on Jul. 21, 2025. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

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Photographs of EUT v01



History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A1_1 Ver1.1

Page Number : 3 of 10
Issued Date : Aug. 27, 2025
Report Version : 01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: **Sam Chen**

Report Producer: **Muse Chan**



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5250 5250-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM) EHT240: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
6GHz WLAN	5925-7125	5955-7115	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)



1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ARISTOTLE ENTERPRISES INC.	13103-27-P1	PIFA Antenna	I-PEX	Note 1
2	ARISTOTLE ENTERPRISES INC.	13103-27-P2	PIFA Antenna	I-PEX	

Note 1:

Ant.	Port		Antenna Gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz	WLAN 2.4GHz	WLAN 5GHz			
				UNII 1	UNII 2A	UNII 2C	UNII 3
1	2	1	2.163173	4.49291	3.94728	4.695129	4.864368
2	1	2	3.041951	2.536596	2.929424	2.183749	3.330918

Ant.	Port		Antenna Gain (dBi)			
	WLAN 6GHz		WLAN 6GHz			
			UNII 5	UNII 6	UNII 7	UNII 8
1	1		4.384437	3.733008	3.545851	3.055706
2	2		3.872025	3.363481	4.012242	4.507121

Note 2: The above information was declared by manufacturer.

Note 3: **For 2.4GHz function:****For IEEE 802.11 b/g/n/VHT/ax/be (2TX/2RX):**

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:**For IEEE 802.11 a/n/ac/ax/be (2TX/2RX):**

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 6GHz function:**For IEEE 802.11 ax/be (2TX/2RX):**

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

Note 4: Directional gain information

Type	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for N ANT ≤ 4	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{dB}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$
BF	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{dB}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{dB}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$

Ex.

Directional Gain (NSS1) formula :

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{dB}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$$

$$NSS1(g1,1) = 10^{G1/20} ; NSS1(g1,2) = 10^{G2/20} ; NSS1(g1,2) = 10^{G3/20} ; NSS1(g1,2) = 10^{G4/20}$$

$$g_{j,k} = (NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2$$

$$DG = 10 \log[(NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2 / N_{ANT}] \Rightarrow 10$$

$$\log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / N_{ANT}]$$

Where ;

2T1S

$$2.4G \ G1 = 2.163173 \text{ dBi} ; G2 = 3.041951 \text{ dBi} ; DG = 5.623970 \text{ dBi}$$

$$5G \ UNII-1 \ G1 = 4.492910 \text{ dBi} ; G2 = 2.536596 \text{ dBi} ; DG = 6.580010 \text{ dBi}$$

$$5G \ UNII-2A \ G1 = 3.947280 \text{ dBi} ; G2 = 2.929424 \text{ dBi} ; DG = 6.463550 \text{ dBi}$$

$$5G \ UNII-2C \ G1 = 4.695129 \text{ dBi} ; G2 = 2.183749 \text{ dBi} ; DG = 6.540190 \text{ dBi}$$

$$5G \ UNII-3 \ G1 = 4.864368 \text{ dBi} ; G2 = 3.330918 \text{ dBi} ; DG = 7.141740 \text{ dBi}$$

2T2S

$$2.4G \ DG = 2.624750 \text{ dBi}$$

$$5G \ UNII-1 \ DG = 3.623990 \text{ dBi}$$

$$5G \ UNII-2A \ DG = 3.468100 \text{ dBi}$$

$$5G \ UNII-2C \ DG = 3.618500 \text{ dBi}$$

$$5G \ UNII-3 \ DG = 4.164980 \text{ dBi}$$

$$6G \ UNII-5 \ DG = 4.135780 \text{ dBi}$$

$$6G \ UNII-6 \ DG = 3.552170 \text{ dBi}$$

$$6G \ UNII-7 \ DG = 3.785300 \text{ dBi}$$

$$6G \ UNII-8 \ DG = 3.841770 \text{ dBi}$$



1.3 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	6GHz function	Description
NWA50BE PRO	V	For Small business
NWA90BE PRO	V	For e-commerce
NWA50BE	X	For Small business
NWA90BE	X	For e-commerce

Note 1: From the above models, model: NWA50BE PRO was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	DVE	DSA-18PFCA-09	INPUT: 100-240V~50/60Hz, 0.6A OUTPUT: +12.0V, 1.5A, 18.0W
Others			
Plug*1			

1.5 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
Test site Designation No. TW3787 with FCC.	
Conformity Assessment Body Identifier (CABID) TW3787 with ISED.	



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;G1D	3.041951	27.18	30.22	0.50	30.72	1.18085	20	0.23492	1.00000	0.23492
5.2G;D1D	4.492910	26.02	30.51	0.50	31.01	1.26267	20	0.25119	1.00000	0.25119
5.3G;D1D	3.468100	23.82	27.29	0.50	27.79	0.60091	20	0.11954	1.00000	0.11954
5.6G;D1D	3.618500	23.95	27.57	0.50	28.07	0.64099	20	0.12752	1.00000	0.12752
5.8G;D1D	4.864368	26.50	31.36	0.50	31.86	1.53616	20	0.30560	1.00000	0.30560
6.2G;D1D	4.135780	22.75	26.89	0.50	27.39	0.54774	20	0.10897	1.00000	0.10897
6.4G;D1D	3.552170	24.34	27.89	0.50	28.39	0.69058	20	0.13738	1.00000	0.13738
6.7G;D1D	3.785300	24.94	28.73	0.50	29.23	0.83662	20	0.16644	1.00000	0.16644
7.0G;D1D	3.841770	22.19	26.03	0.50	26.53	0.44996	20	0.08952	1.00000	0.08952

Simultaneous Transmission Analysis:

Mode 1: EUT + WLAN 2.4GHz + WLAN 5GHz

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;G1D	3.041951	27.18	30.22	0.50	30.72	1.18085	20	0.23492	1.00000	0.23492
5.8G;D1D	4.864368	26.50	31.36	0.50	31.86	1.53616	20	0.30560	1.00000	0.30560
									Sum Ratio	0.54052
									Ratio Limit	1

Mode 2: EUT + WLAN 2.4GHz + WLAN 6GHz

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;G1D	3.041951	27.18	30.22	0.50	30.72	1.18085	20	0.23492	1.00000	0.23492
6.7G;D1D	3.785300	24.94	28.73	0.50	29.23	0.83662	20	0.16644	1.00000	0.16644
									Sum Ratio	0.40136
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—————THE END—————