



# RADIO EXPOSURE TEST REPORT

**FCC ID** : I8811AXAP22A

**Equipment** : 802.11ax (WiFi 6) Dual-Radio PoE Access Point

**Brand Name** : ZYXEL

**Model Name** : NWA50AX

**Applicant** : ZyXEL Communications Corporation  
No.2 Industry East RD. IX, Hsinchu Science Park,  
Hsinchu 30075, Taiwan, R.O.C

**Manufacturer** : ZyXEL Communications 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 Feb. 19, 2021, and testing was started from Mar. 15, 2021 and completed on Apr. 10, 2021. 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**

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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## 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 8  
Issued Date : Apr. 29, 2021  
Report Version : 01



## Summary of Test Result

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

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Sam Chen**

**Report Producer: Wendy Pan**



# 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)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5240<br>5260-5320<br>5500-5720<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)                                 |

## 1.2 Antenna Information

| Ant. | Port | Brand   | Model Name      | Antenna Type | Connector | Gain (dBi) |      |
|------|------|---------|-----------------|--------------|-----------|------------|------|
|      |      |         |                 |              |           | 2.4GHz     | 5GHz |
| 1    | 1    | LYNwave | MLX21M-221AA0-A | PIFA         | I-PEX     | 3.4        | 4.5  |
| 2    | 2    | LYNwave | MLX21M-221AA0-A | PIFA         | I-PEX     | 3.1        | 4.2  |

Note: The above information was declared by manufacturer.

**For WLAN 2.4GHz function:**

**For IEEE 802.11b/g/n/VHT/ax mode (2TX/2RX):**

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

Port 1 and Port 2 could transmit/receive simultaneously.

**For WLAN 5GHz function:**

**For IEEE 802.11a/n/ac/ax mode (2TX/2RX):**

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

Port 1 and Port 2 could transmit/receive simultaneously.



### 1.3 Accessories

| Accessories    |       |                         |                                                               |
|----------------|-------|-------------------------|---------------------------------------------------------------|
| Equipment Name | Brand | Model Name              | Rating                                                        |
| Adapter        | DVE   | DSA-18PFCA-12<br>120150 | INPUT: 100-240V ~ 50/60Hz, 0.6A<br>OUTPUT: 12.0V, 1.5A, 18.0W |
| Other          |       |                         |                                                               |
| Plug*1         |       |                         |                                                               |

### 1.4 Testing Location

| Testing Location Information                              |                                                                                                                                                                                                                                                |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Lab. : Sporton International Inc. Hsinchu Laboratory |                                                                                                                                                                                                                                                |
| Hsinchu<br>(TAF: 3787)                                    | ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)<br>TEL: 886-3-656-9065      FAX: 886-3-656-9085<br>Test site Designation No. TW3787 with FCC.<br>Test site registered number IC 4086D with Industry Canada. |



## 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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | *(100)                                   | <6                                                               |
| 3.0-30                | 1842/f                            | 4.89/f                            | *(900/f <sup>2</sup> )                   | <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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | *(100)                                   | <30                                                              |
| 1.34-30               | 824/f                             | 2.19/f                            | *(180/f <sup>2</sup> )                   | <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 21 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 <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;D1D | 6.26     | 25.12       | 31.38      | 0.50           | 31.88              | 1.54170          | 21            | 0.27820                 | 1.00000                       |
| 5.2G;D1D | 7.36     | 26.79       | 34.15      | 0.50           | 34.65              | 2.91743          | 21            | 0.52644                 | 1.00000                       |
| 5.3G;D1D | 7.36     | 22.43       | 29.79      | 0.20           | 29.99              | 0.99770          | 21            | 0.18003                 | 1.00000                       |
| 5.6G;D1D | 7.36     | 22.60       | 29.96      | 0.03           | 29.99              | 0.99770          | 21            | 0.18003                 | 1.00000                       |
| 5.8G;D1D | 7.36     | 27.83       | 35.19      | 0.50           | 35.69              | 3.70681          | 21            | 0.66889                 | 1.00000                       |

### Simultaneous Transmission Analysis Mode: 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 <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 2.4G;D1D | 6.26     | 25.12       | 31.38      | 0.50           | 31.88              | 1.54170          | 21            | 0.2782                  | 1.00000                       | 0.2782          |
| 5.8G;D1D | 7.36     | 27.83       | 35.19      | 0.50           | 35.69              | 3.70681          | 21            | 0.66889                 | 1.00000                       | 0.66889         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.94709         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

Note: The above antenna gain was declared by manufacturer.

————THE END————