



FCC RADIO EXPOSURE TEST REPORT

FCC ID : PPQ-WP8333V5
Equipment : 802.11ac Tri Band PoE Access Point
Brand Name : LITE-ON, WatchGuard
Model Name : WP8333V5, C-110, AP325
Applicant : LITE-ON Technology Corp.
Bldg. C, 90, Chien 1 Rd., Chung-Ho, New Taipei
City, 23585 Taiwan
Manufacturer (1) : Lite-On Network Communication (Dongguan)
Limited
30#Keji Rd., Yin Hu Industrial Area, Qingxi
Town, DongGuan City, Guangdong, China
Manufacturer (2) : LITE-ON Technology Corp. Networking Plant
No. 101, Neihuan N. Rd., Nanzi Processing Export,
Nanzi Dist., Kaohsiung City 811, Taiwan
Standard : 47 CFR Part 2.1091

The product was received on Nov. 11, 2019, and testing was started from Nov. 11, 2019 and completed on Dec. 26, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

| | |
|---|----------|
| History of this test report..... | 3 |
| Summary of Test Result..... | 4 |
| 1 General Description | 5 |
| 1.1 EUT General Information | 5 |
| 1.2 Table for Multiple Listing | 5 |
| 1.3 Table for Explanation of Flash..... | 5 |
| 1.4 Testing Location | 6 |
| 2 Maximum Permissible Exposure | 7 |
| 2.1 Limit of Maximum Permissible Exposure | 7 |
| 2.2 MPE Calculation Method..... | 7 |
| 2.3 Calculated Result and Limit..... | 8 |
| Photographs of EUT v01 | |



History of this test report

| Report No. | Version | Description | Issued Date |
|-------------|---------|-------------------------|---------------|
| FA741722-10 | 01 | Initial issue of report | Jan. 02, 2020 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



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) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT20/VHT40: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |
| 5GHz WLAN | 5150-5250 5725-5850 | 5180-5240 5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |
| Bluetooth | 2400-2483.5 | 2402-2480 | BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: GFSK |

Note: The EUT contain Radio 3 (2.4G)/(5G) RF module (Model Name: WM862FEMD, FCC ID: PPQ-WM862FEMD).

1.2 Table for Multiple Listing

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

| Brand Name | Model Name | Description |
|------------|--------------|---|
| LITE-ON | WP8333V5 | All the models are identical, the difference model for difference brand served as marketing strategy. |
| WatchGuard | C-110, AP325 | |

From the above models, model: AP325 was selected as representative model for the test and its data was recorded in this report.

1.3 Table for Explanation of Flash

| Brand name | Model name | Flash |
|------------|------------|---------|
| winbond | 25Q256JVFQ | 32M+32M |



1.4 Testing Location

| Testing Location | | |
|-------------------------------------|--------|--|
| <input type="checkbox"/> | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973 |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

Test site Designation No. TW0006 with FCC.

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 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)* | 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)* | 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 22 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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

For EUT:

| 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) |
|----------------------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;D1D (Radio 1) | 6.50 | 24.12 | 30.62 | 0.50 | 31.12 | 1.29420 | 22 | 0.21279 | 1.00000 |
| 5.2G;D1D (Radio 2) | 5.60 | 25.72 | 31.32 | 0.50 | 31.82 | 1.52055 | 22 | 0.25000 | 1.00000 |
| 5.8G;D1D (Radio 2) | 5.90 | 27.92 | 33.82 | 0.50 | 34.32 | 2.70396 | 22 | 0.44457 | 1.00000 |
| 2.4G;BT-BR (Radio 4) | 2.10 | 6.91 | 9.01 | 0.50 | 9.51 | 0.00893 | 22 | 0.00147 | 1.00000 |
| 2.4G;BT-LE (Radio 4) | 2.10 | 8.35 | 10.45 | 0.50 | 10.95 | 0.01245 | 22 | 0.00205 | 1.00000 |

For RF module (Model Name: WM862FEMD, FCC ID: PPQ-WM862FEMD):

| 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) |
|--------------------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;G1D (Radio 3) | 6.50 | 24.89 | 31.39 | 0.50 | 31.89 | 1.54525 | 22 | 0.25406 | 1.00000 |
| 5.2G;D1D (Radio 3) | 4.80 | 22.01 | 26.81 | 0.50 | 27.31 | 0.53827 | 22 | 0.08850 | 1.00000 |
| 5.8G;D1D (Radio 3) | 6.00 | 22.23 | 28.23 | 0.50 | 28.73 | 0.74645 | 22 | 0.12273 | 1.00000 |



Simultaneous Transmission Analysis Mode: Radio 1 + Radio 2 + Radio 3 (WLAN 2.4GHz) + Radio 4

| 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;D1D (Radio 1) | 6.50 | 24.12 | 30.62 | 0.50 | 31.12 | 1.29420 | 22 | 0.21278 | 1.00000 | 0.21278 |
| 5.8G;D1D (Radio 2) | 5.90 | 27.92 | 33.82 | 0.50 | 34.32 | 2.70396 | 22 | 0.44456 | 1.00000 | 0.44456 |
| 2.4G;G1D (Radio 3) | 6.50 | 24.89 | 31.39 | 0.50 | 31.89 | 1.54525 | 22 | 0.25406 | 1.00000 | 0.25406 |
| 2.4G;BT-LE (Radio 4) | 2.10 | 8.35 | 10.45 | 0.50 | 10.95 | 0.01245 | 22 | 0.00205 | 1.00000 | 0.00205 |
| | | | | | | | | | Sum Ratio | 0.91345 |
| | | | | | | | | | Ratio Limit | 1 |

Simultaneous Transmission Analysis Mode: Radio 1 + Radio 2 + Radio 3 (WLAN 5GHz) + Radio 4

| 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;D1D (Radio 1) | 6.50 | 24.12 | 30.62 | 0.50 | 31.12 | 1.29420 | 22 | 0.21278 | 1.00000 | 0.21278 |
| 5.8G;D1D (Radio 2) | 5.90 | 27.92 | 33.82 | 0.50 | 34.32 | 2.70396 | 22 | 0.44456 | 1.00000 | 0.44456 |
| 5.8G;D1D (Radio 3) | 6.00 | 22.23 | 28.23 | 0.50 | 28.73 | 0.74645 | 22 | 0.12273 | 1.00000 | 0.12273 |
| 2.4G;BT-LE (Radio 4) | 2.10 | 8.35 | 10.45 | 0.50 | 10.95 | 0.01245 | 22 | 0.00205 | 1.00000 | 0.00205 |
| | | | | | | | | | Sum Ratio | 0.78212 |
| | | | | | | | | | Ratio Limit | 1 |

Note: The above antenna gain was declared by manufacturer.

————THE END————