

# RF Exposure Evaluation Report

**Equipment** : Dual-Band 802.11ac 4x4 MIMO PCI Express Mini Card Wireless Network Adapter

**Brand Name** : LITE-ON

**Model No.** : WM6687

**FCC ID** : PPQ-WM6687

**Standard** : 47 CFR Part 2.1091

**Applicant** : Lite-On Technology Corp.  
Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C

**Manufacturer** : Lite-On Network Communication (Dongguan) Limited  
30#Keji Rd.,Yin Hu Industrial Area,Qingxi Town,DongGuan City,Guangdong,China

The product sample received on May 02, 2017 and completely tested on Jun. 15, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with 47 CFR Part 2.1091 and pass the limit.

Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

  
Sam Chen  
SPORTON INTERNATIONAL INC.





## **TABLE OF CONTENTS**

|          |                                             |          |
|----------|---------------------------------------------|----------|
| <b>1</b> | <b>GENERAL DESCRIPTION .....</b>            | <b>4</b> |
| 1.1      | EUT General Information .....               | 4        |
| 1.2      | Testing Location .....                      | 4        |
| <b>2</b> | <b>MAXIMUM PERMISSIBLE EXPOSURE .....</b>   | <b>5</b> |
| 2.1      | Limit of Maximum Permissible Exposure ..... | 5        |
| 2.2      | MPE Calculation Method .....                | 5        |
| 2.3      | Calculated Result and Limit.....            | 6        |

### **PHOTOGRAPHS OF EUT V01**

## REVISION HISTORY

[illegible]

# 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>802.11ac: OFDM (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, 1024QAM)                                      |

## 1.2 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.<br>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.<br>TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

## 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)*                               | 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)*                                 | 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 25 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**

**For Mode 1 (Antenna Set 1):**

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|----------|----------|-------------|------------|----------|---------------|-------------------------|-------------------------------|
| 2.4G;G1D | 3.53     | 27.25       | 30.78      | 1.19674  | 25            | 0.15237                 | 1.00000                       |
| 2.4G;D1D | 9.55     | 26.43       | 35.98      | 3.96278  | 25            | 0.50456                 | 1.00000                       |
| 5.2G;D1D | 10.92    | 18.91       | 29.83      | 0.96161  | 25            | 0.12244                 | 1.00000                       |
| 5.3G;D1D | 10.92    | 19.02       | 29.94      | 0.98628  | 25            | 0.12558                 | 1.00000                       |
| 5.6G;D1D | 10.92    | 18.95       | 29.87      | 0.97051  | 25            | 0.12357                 | 1.00000                       |
| 5.8G;D1D | 10.92    | 25.06       | 35.98      | 3.96278  | 25            | 0.50456                 | 1.00000                       |

**For Mode 2 (Antenna Set 2 with Gray Cable):**

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|----------|----------|-------------|------------|----------|---------------|-------------------------|-------------------------------|
| 2.4G;G1D | 0.60     | 27.80       | 28.40      | 0.69183  | 25            | 0.08809                 | 1.00000                       |
| 2.4G;D1D | 6.62     | 26.43       | 33.05      | 2.01837  | 25            | 0.25699                 | 1.00000                       |
| 5.2G;D1D | 8.32     | 21.64       | 29.97      | 0.99312  | 25            | 0.12645                 | 1.00000                       |
| 5.3G;D1D | 8.32     | 21.63       | 29.95      | 0.98855  | 25            | 0.12587                 | 1.00000                       |
| 5.6G;D1D | 8.32     | 21.64       | 29.96      | 0.99083  | 25            | 0.12616                 | 1.00000                       |
| 5.8G;D1D | 8.32     | 27.55       | 35.87      | 3.86367  | 25            | 0.49194                 | 1.00000                       |