**IEEE C95.1**
**KDB 447498 D03**
**47 C.F.R. Part 1, Subpart I, Section 1.1310**
**47 C.F.R. Part 2, Subpart J, Section 2.1091**

# RF EXPOSURE REPORT

## For

## 802.11n, 2.4G 1T1R Wireless LAN USB Module

## Model: WN4639R

## Trade Name: LITE-ON

*Issued to*

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

*Issued by*

**Compliance Certification Services Inc.**
**No.11, Wugong 6th Rd., Wugu Dist.,**
**New Taipei City 24891, Taiwan. (R.O.C.)**
**http://www.ccsrf.com**
**service@ccsrf.com**
**Issued Date: January 19, 2016**

Testing Laboratory
1309

# Revision History

| Rev. | Issue Date | Revisions | Effect Page | Revised By |
|---|---|---|---|---|
| 00 | 2016/1/19 | Initial Issue | ALL | Kelly Cheng |

# TABLE OF CONTENTS

1. LIMIT ..... 4
2. EUT SPECIFICATION ..... 4
3. TEST RESULTS ..... 5
4. MAXIMUM PERMISSIBLE EXPOSURE ..... 6

# 1. LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

# 2. EUT SPECIFICATION

| | |
|---|---|
| **EUT** | 802.11n, 2.4G 1T1R Wireless LAN USB Module |
| **Model** | WN4639R |
| **Frequency band (Operating)** | ☒ 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz<br>802.11n HT40: 2.422GHz ~ 2.452GHz<br>☐ Others |
| **Device category** | ☐ Portable (<20cm separation)<br>☒ Mobile (>20cm separation)<br>☐ Others |
| **Exposure classification** | ☐ Occupational/Controlled exposure (S = 5mW/cm$^2$)<br>☒ General Population/Uncontrolled exposure (S=1mW/cm$^2$) |
| **Antenna Specification** | For TX<br>PIFA Antenna：Walsin / RFMTA400530IMAB701<br>Antenna Gain : 3.11 dBi (Numeric gain: 2.05)<br>For RX<br>PIFA Antenna：HONGLIN / 290-20031<br>Antenna Gain : 2.20 dBi (Numeric gain: 1.66) |
| **Maximum Average output power** | IEEE 802.11b Mode: 24.94 dBm (311.889 mW)<br>IEEE 802.11g Mode: 21.11 dBm (129.122 mW)<br>IEEE 802.11n HT 20 Mode: 24.75 dBm (298.538 mW)<br>IEEE 802.11n HT 40 Mode: 24.14 dBm (259.418 mW) |
| **Maximum Tune up Power** | IEEE 802.11b Mode: 26.50 dBm (446.684 mW)<br>IEEE 802.11g Mode: 23.00 dBm (199.526 mW)<br>IEEE 802.11n HT 20 Mode: 26.50 dBm (446.684 mW)<br>IEEE 802.11n HT 40 Mode: 26.00 dBm (398.107 mW) |
| **Evaluation applied** | ☒ MPE Evaluation*<br>☐ SAR Evaluation<br>☐ N/A |

# 3. TEST RESULTS

## No non-compliance noted.

**Calculation**

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

*Where E = Field strength in Volts / meter*
*P = Power in Watts*
*G = Numeric antenna gain*
*d = Distance in meters*
*S = Power density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

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

Changing to units of mW and cm, using:

*P (mW) = P (W) / 1000 and*

*d (cm) = d(m) / 100*

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

*Where d = Distance in cm*
*P = Power in mW*
*G = Numeric antenna gain*
*S = Power density in mW / $cm^2$*

# 4. MAXIMUM PERMISSIBLE EXPOSURE

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

*Where P = Power in mW*

*G = Numeric antenna gain*

*S = Power density in mW / cm²*

**IEEE 802.11b mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm² | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 6 | 2437 | 466.684 | 2.05 | 20 | 0.1904 | 1 |

**IEEE 802.11g mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm² | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 6 | 2437 | 199.526 | 2.05 | 20 | 0.0814 | 1 |

**IEEE 802.11n HT20 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm² | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 6 | 2437 | 466.684 | 2.05 | 20 | 0.1904 | 1 |

**IEEE 802.11n HT40 mode:**

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm² | Limit (mW/cm2) |
|---|---|---|---|---|---|---|
| 6 | 2437 | 398.107 | 2.05 | 20 | 0.1624 | 1 |