# **RF Exposure Evaluation Report**

**APPLICANT**: D-Link Corporation

**EQUIPMENT**: 4G LTE Router

**BRAND NAME**: D-Link

MODEL NAME: DWR-922

FCC ID : KA2WR922C2

STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC., would like to declare that the device 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.

Reviewed by: Eric Huang / Manager

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Approved by: Jones Tsai / Manager

lac-MRA



**Report No. : FA720930** 

#### SPORTON INTERNATIONAL INC.

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)

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## SPORTON LAB. RF Exposure Evaluation Report

### **Revision History**

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FA720930   | Rev. 01 | Initial issue of report | Apr. 19, 2017 |
|            |         |                         |               |
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### 1. Administration Data

#### 1.1. <u>Testing Laboratory</u>

| Testing Laboratory |  |  |  |  |  |
|--------------------|--|--|--|--|--|
| Test Site          | SPORTON INTERNATIONAL INC.   |  |  |  |  |
| Test Site Location | No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978 |  |  |  |  |

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| Applicant Applicant |   |  |  |
|---------------------|---|--|--|
| Company Name        | D-Link Corporation  |  |  |
| Address             | No.289, Sinhu 3rd Rd, Neihu District Taipei City 114 Taiwan |  |  |

| Manufacturer   |  |  |  |  |  |
|--|--|--|--|--|--|
| Company Name Advance Multimedia Internet Technology Inc. |  |  |  |  |  |
| Address  | No.28, Lane 31, Sec. 1, Huandong Rd., Sinshih District, Tainan City 74146, Taiwan (R.O.C.) |  |  |  |  |

### 2. <u>Description of Equipment Under Test (EUT)</u>

| Product Feature & Specification            |                                       |  |  |  |
|--|---------------------------------------|--|--|--|
| EUT Type                                   | 4G LTE Router                         |  |  |  |
| Brand Name                                 | D-Link                                |  |  |  |
| Model Name                                 | DWR-922                               |  |  |  |
| FCC ID                                     | KA2WR922C2                            |  |  |  |
| Wireless Technology and<br>Frequency Range | WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz |  |  |  |
| Mode                                       | 802.11b/g/n HT20/HT40                 |  |  |  |
| HW Version                                 | C2                                    |  |  |  |
| EUT Stage                                  | Production Unit                       |  |  |  |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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### 3. Maximum RF average output power among production units

| Band /      | Channel / Frequency | / (MHz) |      | Average Po | 802.11<br>ower (dBm)<br>nt 1 |      |
|-------------|---------------------|---------|------|------------|------------------------------|------|
|             |                     |         |      | 11g        | HT20                         | HT40 |
|             | Ch 1                | 2412    | 20.5 | 17.5       | 17                           |      |
|             | Ch 3                | 2422    |      |            |                              | 13.5 |
| 2.4GHz WLAN | Ch 6                | 2437    | 14.5 | 16         | 18                           | 15   |
|             | Ch 9                | 2452    |      |            |                              | 12   |
|             | Ch 11               | 2462    | 15   | 15.5       | 14.5                         |      |

| Band /      | IEEE 802.11<br>Average Power (dBm)<br>Ant 1 + 2 |      |      |      |  |
|-------------|---|------|------|------|--|
|             |   |      |      |      |  |
|             | Ch 1  | 2412 | 18.5 |      |  |
|             | Ch 3  | 2422 |      | 17   |  |
| 2.4GHz WLAN | Ch 6  | 2437 | 18.5 | 18.5 |  |
|             | Ch 9  | 2452 |      | 17   |  |
|             | Ch 11   | 2462 | 17.5 |      |  |

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### 4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

| Frequency range<br>(MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density<br>(mW/cm <sup>2</sup> ) | Averaging time<br>(minutes) |
|--------------------------|-------------------------------|-------------------------------|--|-----------------------------|
| (A) (S)                  | (A) Limits for O              | ccupational/Controlled Expos  | sures                                  | 80 H2                       |
| 0.3-3.0                  | 614                           | 1.63                          | *(100)                                 | 6                           |
| 3.0-30                   | 1842/                         | f 4.89/1                      | *(900/f2)                              | 6                           |
| 30-300                   | 61.4                          | 0.163                         | 1.0                                    | 6                           |
| 300-1500                 |                               |                               | f/300                                  | 6                           |
| 1500-100,000             |                               |                               | 5                                      | 6                           |
|                          | (B) Limits for Gene           | ral Population/Uncontrolled I | Exposure                               |                             |
| 0.3-1.34                 | 614                           | 1.63                          | *(100)                                 | 30                          |
| 1.34-30                  | 824/                          | f 2.19/1                      | *(180/f2)                              | 30                          |
| 30-300                   | 27.5                          | 0.073                         | 0.2                                    | 30                          |
| 300-1500                 |                               |                               | f/1500                                 | 30                          |
| 1500-100,000             |                               |                               | 1.0                                    | 30                          |

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:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

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#### 5. Radio Frequency Radiation Exposure Evaluation

#### 5.1. Standalone Power Density Calculation

| Band        | Antenna<br>Gain<br>(dBi) | Maximum<br>Power<br>(dBm) | Maximum<br>EIRP<br>(dBm) | Maximum<br>EIRP<br>(W) | Average<br>EIRP<br>(mW) | Density at | Limit<br>(mW/cm^2) | Power<br>Density<br>/ Limit |
|-------------|--------------------------|---------------------------|--------------------------|------------------------|-------------------------|------------|--------------------|-----------------------------|
| 2.4GHz WLAN | 3.80                     | 20.50                     | 24.300                   | 0.269                  | 269.153                 | 0.054      | 1.000              | 0.054                       |

#### 5.2. Collocated Power Density Calculation

| WWAN<br>Power Density / Limit | WLAN<br>Power Density / Limit | ∑(Power Density / Limit)<br>of<br>WWAN+WLAN |
|-------------------------------|-------------------------------|---|
| 0.220                         | 0.054                         | 0.274                                       |

#### Note:

- 1. The WWAN operation is also into this host, and collocated power density calculation in above table, for the power density of WWAN detail information please refer to original report (FCC ID : SRQ-ZM8620).
- 2.  $\Sigma$  (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN.
- 3. Considering the WWAN module collocation with the WLAN transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

#### **Conclusion:**

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

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