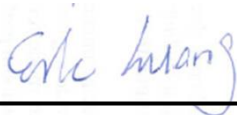


# RF Exposure Evaluation Report

APPLICANT : D-Link Co.  
EQUIPMENT : 4G LTE VPN Router  
BRAND NAME : D-Link  
MODEL NAME : DWR-925  
FCC ID : KA2WR925A2  
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 / Deputy Manager



Approved by: Jones Tsai / Manager



**SPORTON INTERNATIONAL INC.**

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



## Table of Contents

<b>1. ADMINISTRATION DATA .....</b>	<b>4</b>
1.1. Testing Laboratory .....	4
<b>2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) .....</b>	<b>5</b>
<b>3. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS .....</b>	<b>6</b>
<b>4. RF EXPOSURE LIMIT INTRODUCTION .....</b>	<b>7</b>
<b>5. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION .....</b>	<b>8</b>
5.1. Power Density Calculation.....	8



**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA492416	Rev. 01	Initial issue of report	Dec. 18, 2014



**1. Administration Data**

**1.1. Testing Laboratory**

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	D-Link Co.
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. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	4G LTE VPN Router
Brand Name	D-Link
Model Name	DWR-925
FCC ID	KA2WR925A2
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz
Mode	<ul style="list-style-type: none"><li>• GPRS/EGPRS</li><li>• RMC 12.2Kbps Rel 99</li><li>• HSDPA Rel 7, Cat14</li><li>• HSUPA Rel 6, Cat6</li><li>• DC-HSDPA Rel 8 Cat24</li><li>• LTE: QPSK, 16QAM</li><li>• 802.11b/g/n HT20/HT40</li></ul>
Antenna Type	WWAN: Dipole Antenna WLAN: Dipole Antenna
HW Version	A2
SW Version	V1.05
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.



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

Mode	GSM 850	GSM 1900
	Average power(dBm)	
GPRS/EDGE (GMSK, 1 Tx slot)	32.50	30.00
GPRS/EDGE (GMSK, 2 Tx slots)	-	30.00
GPRS/EDGE (GMSK, 3 Tx slots)	-	30.00
GPRS/EDGE (GMSK, 4 Tx slots)	-	30.00
EDGE (8PSK, 1 Tx slot)	26.50	26.00
EDGE (8PSK, 2 Tx slots)	26.50	26.00
EDGE (8PSK, 3 Tx slots)	26.50	26.00
EDGE (8PSK, 4 Tx slots)	26.50	26.00

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
	Average power(dBm)		
RMC 12.2Kbps	24.00	24.50	24.50
HSDPA Subtest-1	24.00	24.50	24.50
DC-HSDPA Subtest-1	24.00	24.50	24.50
HSUPA Subtest-5	24.00	23.50	23.50

Band / Mode		Average power(dBm)
LTE	Band 17	23.00
	Band 5	23.00
	Band 4	23.00
	Band 2	23.00

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)			
		Ant 0		Ant 0+1	
		11b	11g	HT20	HT40
2.4GHz Band	2412	17.00	15.00	15.00	
	2422				11.00
	2437	17.00	17.50	15.00	15.00
	2452				11.00
	2462	17.00	15.00	15.00	



### 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 (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
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>(B) Limits for General Population/Uncontrolled Exposure</b>				
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

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



## **5. Radio Frequency Radiation Exposure Evaluation**

### **5.1. Power Density Calculation**

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Power Density / Limit
GPRS 850 (1 Tx slot)	824.2	2.31	32.50	34.810	3.027	381.066	0.076	0.549	0.138
EGPRS 850 (1 Tx slot)	824.2	2.31	26.50	28.810	0.760	95.719	0.019	0.549	0.035
EGPRS 850 (2 Tx slots)	824.2	2.31	26.50	28.810	0.760	190.985	0.038	0.549	0.069
EGPRS 850 (3 Tx slots)	824.2	2.31	26.50	28.810	0.760	285.102	0.057	0.549	0.103
EGPRS 850 (4 Tx slots)	824.2	2.31	26.50	28.810	0.760	381.066	0.076	0.549	0.138
GPRS 1900 (1 Tx slot)	1850.2	3.51	30.00	33.510	2.244	282.488	0.056	1.000	0.056
GPRS 1900 (2 Tx slots)	1850.2	3.51	30.00	33.510	2.244	563.638	0.112	1.000	0.112
GPRS 1900 (3 Tx slots)	1850.2	3.51	30.00	33.510	2.244	841.395	0.167	1.000	0.167
GPRS 1900 (4 Tx slots)	1850.2	3.51	30.00	33.510	2.244	1124.605	0.224	1.000	<b>0.224</b>
EGPRS 1900 (1 Tx slot)	1850.2	3.51	26.00	29.510	0.893	112.460	0.022	1.000	0.022
EGPRS 1900 (2 Tx slots)	1850.2	3.51	26.00	29.510	0.893	224.388	0.045	1.000	0.045
EGPRS 1900 (3 Tx slots)	1850.2	3.51	26.00	29.510	0.893	334.965	0.067	1.000	0.067
EGPRS 1900 (4 Tx slots)	1850.2	3.51	26.00	29.510	0.893	447.713	0.089	1.000	0.089
WCDMA Band 5	826.4	2.31	24.00	26.310	0.428	427.563	0.085	0.551	0.154
WCDMA Band 4	1712.4	3.41	24.50	27.910	0.618	618.016	0.123	1.000	0.123
WCDMA Band 2	1852.4	3.51	24.50	28.010	0.632	632.412	0.126	1.000	0.126
LTE Band 17	706.5	1.27	23.00	24.270	0.267	267.301	0.053	0.471	0.113
LTE Band 5	824.7	2.31	23.00	25.310	0.340	339.625	0.068	0.550	0.123
LTE Band 4	1710.7	3.41	23.00	26.410	0.438	437.522	0.087	1.000	0.087
LTE Band 2	1850.7	3.51	23.00	26.510	0.448	447.713	0.089	1.000	0.089
2.4GHz WLAN	2412.0	1.73	17.50	19.230	0.084	83.753	0.017	1.000	<b>0.017</b>

**Note:** For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band

WLAN Power Density / Limit	WWAN Power Density / Limit	$\Sigma$ (Power Density / Limit) of WWAN+WLAN
0.224	0.017	0.241

**Note:**

- For colocation analysis, GPRS1900 (4TX slot) is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
- $\Sigma$  (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
- 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.