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

(1) AX1500 Wi-Fi 6 AI Range Extender
(2) AX1500 Mesh Range Extender

Model: E15

Trade Name: D-Link

Issued to

D-Link Corporation
14420 Myford Road Suite 100, Irvine, California 92606, United States

Issued by

Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan. (R.O.C.)
Issue Date: August 10, 2021

Note: This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF, NIST or any government agencies. The test results in the report only apply to the tested sample.

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 10, 2021	Initial Issue	ALL	Allison Chen

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1. TEST RESULT CERTIFICATION

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
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	No non-compliance noted
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

Approved by:

Kevin Tsai
Deputy Manager
Compliance Certification Services Inc.

2. 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.

§1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of FCC part 2.1093 of the chapter.

TABLE 1 - LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	* 100	6
3.0-30	1842/f	4.89/f	* $900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* 100	30
1.34-30	824/f	2.19/f	* $180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Note 1 to Table 1: Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2 to Table 2: General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

3. EUT SPECIFICATION

EUT	(1) AX1500 Wi-Fi 6 AI Range Extender (2) AX1500 Mesh Range Extender
Model	E15
Model Discrepancy	N/A
Frequency band (Operating)	☐ Bluetooth: 2402MHz-2480MHz ☒ 802.11b/g/n HT20: 2412MHz ~ 2462 MHz ☒ 802.11n HT40: 2422MHz ~ 2452MHz ☒ 802.11a/n HT20: 5180MHz ~ 5240MHz / 5745MHz ~ 5825MHz ☒ 802.11ax 20: 5180MHz ~ 5240MHz / 5745MHz ~ 5825MHz ☒ 802.11n HT40: 5190MHz ~ 5230MHz / 5755MHz ~ 5795MHz ☒ 802.11ax 40: 5190MHz ~ 5230MHz / 5755MHz ~ 5795MHz ☒ 802.11ac VHT80: 5210MHz / 5775MHz ☒ 802.11ax 80: 5210MHz / 5775MHz ☐ Others
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna Specification	**embedded Antenna** WIFI 2.4GHz: Chain 0: 3.1 dBi Chain 1: 3.1 dBi Power direction gain: 6.11 dBi WIFI 5GHz: Chain 0: 3.1 dBi Chain 1: 3.3 dBi Power direction gain: 6.21 dBi 2.4GHz: Direction Gain: 6.11 dBi (Numeric gain: 4.08) Worst 5GHz: Direction Gain: 6.21 dBi (Numeric gain: 4.18) Worst

<table>
<tr><td>Maximum Measurement Average Power</td><td>
<table>
<tr><td>2.4GHz</td><td></td><td></td></tr>
<tr><td>IEEE 802.11b Mode:</td><td>25.43 dBm</td><td>(349.140 mW)</td></tr>
<tr><td>IEEE 802.11g Mode:</td><td>24.73 dBm</td><td>(297.167 mW)</td></tr>
<tr><td>IEEE 802.11n HT 20 Mode:</td><td>24.44 dBm</td><td>(277.971 mW)</td></tr>
<tr><td>IEEE 802.11n HT 40 Mode:</td><td>24.72 dBm</td><td>(296.483 mW)</td></tr>
<tr><td>5GHz</td><td></td><td></td></tr>
<tr><td>IEEE 802.11a Mode:</td><td>25.26 dBm</td><td>(335.401 mW)</td></tr>
<tr><td>IEEE 802.11n HT 20 Mode:</td><td>24.53 dBm</td><td>(283.846 mW)</td></tr>
<tr><td>IEEE 802.11n HT 40 Mode:</td><td>23.72 dBm</td><td>(235.573 mW)</td></tr>
<tr><td>IEEE 802.11ac VHT 80 Mode:</td><td>22.09 dBm</td><td>(161.880 mW)</td></tr>
<tr><td>IEEE 802.11ax 20 Mode:</td><td>24.45 dBm</td><td>(278.916 mW)</td></tr>
<tr><td>IEEE 802.11ax 40 Mode:</td><td>24.51 dBm</td><td>(282.370 mW)</td></tr>
<tr><td>IEEE 802.11ax 80 Mode:</td><td>25.26 dBm</td><td>(335.883 mW)</td></tr>
</table>
</td></tr>
<tr><td>Maximum tune up power</td><td>
<table>
<tr><td>2.4GHz</td><td></td><td></td></tr>
<tr><td>IEEE 802.11b Mode:</td><td>26.00 dBm</td><td>(398.107 mW)</td></tr>
<tr><td>IEEE 802.11g Mode:</td><td>25.50 dBm</td><td>(354.813 mW)</td></tr>
<tr><td>IEEE 802.11n HT 20 Mode:</td><td>25.00 dBm</td><td>(316.228 mW)</td></tr>
<tr><td>IEEE 802.11n HT 40 Mode:</td><td>25.50 dBm</td><td>(354.813 mW)</td></tr>
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<tr><td>IEEE 802.11n HT 40 Mode:</td><td>24.50 dBm</td><td>(281.838 mW)</td></tr>
<tr><td>IEEE 802.11ac VHT 80 Mode:</td><td>23.00 dBm</td><td>(199.526 mW)</td></tr>
<tr><td>IEEE 802.11ax 20 Mode:</td><td>25.00 dBm</td><td>(316.228 mW)</td></tr>
<tr><td>IEEE 802.11ax 40 Mode:</td><td>25.50 dBm</td><td>(354.813 mW)</td></tr>
<tr><td>IEEE 802.11ax 80 Mode:</td><td>26.00 dBm</td><td>(398.107 mW)</td></tr>
</table>
</td></tr>
<tr><td>Evaluation applied</td><td>☒ MPE Evaluation*
☐ SAR Evaluation
☐ N/A</td></tr>
</table>

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. The tune up power referred the AVG power of the test report T210319W02-RP1, T210319W02-RP2 for RF Exposure assessment purpose.

4. 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

5. 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 / cm^2

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
1	2412	398.107	4.08	20	0.3232	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	354.813	4.08	20	0.2881	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	316.228	4.08	20	0.2568	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	354.813	4.08	20	0.2881	1

IEEE 802.11a mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
44	5220	398.108	4.18	20	0.3312	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
44	5220	354.813	4.18	20	0.2951	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
46	5230	281.838	4.18	20	0.2344	1

IEEE 802.11ac VHT80 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
155	5775	199.526	4.18	20	0.1660	1

IEEE 802.11ax 20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
36	5180	316.228	4.18	20	0.2630	1

IEEE 802.11ax 40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
38	5190	354.813	4.18	20	0.2951	1

IEEE 802.11ax 80 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
42	5210	398.107	4.18	20	0.3312	1

6. SIMULTANEOUS TRANSMISSION SAR ANALYSIS

Both of the WiFi 2.4GHz and WiFi 5GHz can transmit simultaneously, the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WiFi 2.4GHz + WiFi 5GHz

Therefore, the worst-case situation is 0.3232 / 1 + 0.3312 / 1 = 0.6544, which is less than “1”.

--End of Report--