

# FCC RF EXPOSURE REPORT

## FCC ID: KA2AP1610B1

**Project No.** : 2006H024  
**Equipment** : 1) AC1200 Mesh Wi-Fi Range Extender  
2) AC750 Mesh Wi-Fi Range Extender  
**Brand Name** : D-Link  
**Test Model** : 1) DAP-1610  
**Series Model** : 2) DAP-1530  
**Applicant** : D-Link Corporation  
**Address** : 17595 Mt. Herrmann, Fountain Valley, California, UnitedStates, 92708  
**Manufacturer** : D-Link Corporation  
**Address** : No.289, Xinhua 3rd Rd., Neihu District, Taipei City 11494, Taiwan,  
**Factory** : Edimax Technology Co., Ltd.& Intelligent Technology INC.  
**Address** : No. 278, Xinhua 1st Rd., Neihu Dist., Taipei City, Taiwan & Yuanhe 3  
Street, Tongsha Industrial Zone, Dongcheng Area, Dongguan,  
Guangdong, China  
**Date of Receipt** : Aug. 04, 2020  
**Date of Test** : Aug. 18, 2020 ~ Sep. 04, 2020  
**Issued Date** : Dec. 11, 2020  
**Report Version** : R02  
**Test Sample** : Engineering Sample No.: DG202008055  
**Standard(s)** : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091  
FCC Title 47 Part 2.1091, OET Bulletin 65 Supplement C

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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Certificate #5123.02

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**REPORT ISSUED HISTORY**

Report Version	Description	Issued Date
R00	Original Issue	Oct. 09, 2020
R01	Updated the power.	Nov. 10, 2020
R02	Modified the comments of CETECOM.	Dec. 11, 2020

## 1. TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

## 2. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

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

where:

S = power density



P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Table for Filed Antenna:

For WLAN 2.4GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain(dBi)
1		RF21C05288A	PCB	Cable	2.5
2		RF21C05288A	PCB	Cable	2.5

Note: This EUT supports CDD, and all antennas have the same gain, so,

(1) For Non Beamforming: Directional gain= $G_{ANT} + \text{Array Gain}$ .

For output power measurements, Array Gain=0 ( $N_{ANT} \leq 4$ ), so the Directional gain=2.5.

For power spectral density measurements, Array Gain= $10\log(N_{ANT}/N_{SS})$  dB,  
so the Directional gain= $2.5 + 10\log(2/1) = 5.51$ .

(2) For Beamforming: Beamforming Gain: 2.5dB. So the Directional gain= $2.5 + 2.5 = 5$ .

Table for Antenna Configuration:



For Non Beamforming:

Operating Mode	TX Mode	
	1TX	2TX
802.11b	V (Ant. 1)	
802.11g	V (Ant. 1)	
802.11n(20 MHz)		V (Ant. 1 + Ant. 2)
802.11n(40 MHz)		V (Ant. 1 + Ant. 2)

For Beamforming:

Operating Mode	TX Mode	
	2TX	
802.11n(20 MHz)	V (Ant. 1 + Ant. 2)	
802.11n(40 MHz)	V (Ant. 1 + Ant. 2)	

For WLAN 5GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1		RF21C05288A	PCB	Cable	3
2		RF21C05288A	PCB	Cable	3

Note: This EUT supports CDD, and all antennas have the same gain, so,

 (1) For Non Beamforming: Directional gain= $G_{ANT} + \text{Array Gain}$ .

 For output power measurements, Array Gain=0 ( $N_{ANT} \leq 4$ ), so the Directional gain=3.

 For power spectral density measurements, Array Gain= $10\log(N_{ANT}/N_{SS})$  dB, so the Directional gain= $3 + 10\log(2/1) = 6.01$ . So, the UNII-1 power spectral density limit is  $17 - (6.01 - 6) = 16.99$ , the UNII-3 power spectral density limit is  $30 - (6.01 - 6) = 29.99$ .

(2) For Beamforming:

 Beamforming Gain: 3dB. So the Directional gain= $3 + 3 = 6$ . So the output power limit is  $30 - (6 - 6) = 30$ .

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode	TX Mode	
	1TX	2TX
IEEE 802.11a	V (Ant.1)	-
IEEE 802.11n (HT20)	-	V (Ant. 1 + Ant. 2)
IEEE 802.11n (HT40)	-	V (Ant. 1 + Ant. 2)
IEEE 802.11ac (VHT20)	-	V (Ant. 1 + Ant. 2)
IEEE 802.11ac (VHT40)	-	V (Ant. 1 + Ant. 2)
IEEE 802.11ac (VHT80)	-	V (Ant. 1 + Ant. 2)

For Beamforming:

Operating Mode	TX Mode	
	2TX	
IEEE 802.11n (HT20)	V (Ant. 1 + Ant. 2)	
IEEE 802.11n (HT40)	V (Ant. 1 + Ant. 2)	
IEEE 802.11ac (VHT20)	V (Ant. 1 + Ant. 2)	
IEEE 802.11ac (VHT40)	V (Ant. 1 + Ant. 2)	
IEEE 802.11ac (VHT80)	V (Ant. 1 + Ant. 2)	

### 3. TEST RESULTS

For 2.4GHz Non Beamforming:

Directional Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2.5	1.7783	26.18	414.9540	0.14688	1	Complies

For 2.4GHz Beamforming:

Directional Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5	3.1623	24.86	306.1963	0.19273	1	Complies

For 5GHz UNII-1 Non Beamforming:

Directional Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
3	1.9953	22.83	191.8669	0.07620	1	Complies

For 5GHz UNII-3 Non Beamforming:

Directional Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
3	1.9953	23.55	226.4644	0.08994	1	Complies

For 5GHz UNII-1 Beamforming:

Directional Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
6	3.9811	22.67	184.9269	0.14654	1	Complies

For 5GHz UNII-3 Beamforming:

Directional Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
6	3.9811	23.52	224.9055	0.17822	1	Complies

**For the max simultaneous transmission MPE:**

Power Density (S) (mW/cm <sup>2</sup> )	Power Density (S) (mW/cm <sup>2</sup> )	Total	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2.4GHz	5GHz			
0.19273	0.17822	0.37095	1	Complies

Note: The calculated distance is 20 cm.

**End of Test Report**