



RF Exposure Report

Report No.: SA130207E02H

FCC ID: KA2AP1650A1

Test Model: DAP-1650

Received Date: Dec. 31, 2015

Test Date: Jan. 06, 2016

Issued Date: Jan. 13, 2016

Applicant: D-Link Corporation

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A D T

Release Control Record

Issue No.	Description	Date Issued
SA130207E02H	Original release.	Jan. 13, 2016



A D T

1 Certificate of Conformity

Product: Wireless AC1200 Dual Band Gigabit Range Extender

Brand: D-Link

Test Model: DAP-1650

Sample Status: R&D SAMPLE

Applicant: D-Link Corporation

Test Date: Jan. 06, 2016

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 GENERAL RF EXPOSURE GUIDANCE V06

IEEE STD C95.1-2005

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____

Date: _____

Jan. 13, 2016

Elsie Hsu / Specialist

Approved by : _____

Date: _____

Jan. 13, 2016

May Chen / Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

For 2.4GHz

Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain (dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connector Type	Cable Loss (dB)	Cable Length (cm)
Chain (1)	MAG.LAY ERS	PCA-5010-2G 4C1-A1	PCB Dipole	2.67	2400~2500	NA	NA	6.5
Chain (0)	Alpha	NA	Printed	2.94	2400~2500	NA	NA	5

For 5GHz

Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain (dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connector Type	Cable Loss (dB)	Cable Length (cm)
Chain (1)	MAG.LAY ERS	PCA-2010-5 G0C1-A4	PCB Dipole	2.25	4900~5825	IPEX	NA	11
Chain (0)	MAG.LAY ERS	PCA-2010-5G 0C1-A4	PCB Dipole	2.25	4900~5825	IPEX	NA	11

2.5 Calculation Result of Maximum Conducted Power

For 2.4GHz data was copied from the original test report (Report No.: RF130207E02D)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	372.812	5.95	20	0.29189	1
5180-5240	189.981	5.26	20	0.12689	1
5745-5825	192.515	5.26	20	0.12859	1

NOTE:

2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.95\text{dBi}$

5GHz: Directional gain = $2.25\text{dBi} + 10\log(2) = 5.26\text{dBi}$

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots\text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz = $0.29189 + 0.12859 = 0.42048$

Therefore the maximum calculations of above situations are less than the "1" limit.

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