

RF Exposure Evaluation declaration

Product Name : Access Point
Model No. : VigorAP820, VigorAP810, VigorAP710, VigorFly215
FCC ID. : VGYVAP810

Applicant : DrayTek Corp.

Address : No.26 Fu Shing Rd., HuKou County, Hsin-Chu Industrial Park,
Hsin-Chu, Taiwan 303 R.O.C.

Date of Receipt : 2013/12/13
Date of Declaration : 2014/01/22
Report No. : 13C0398R-RF-US-Exp
Report Version : V1.0



The declaration results relate only to the samples calculated.

The declaration shall not be reproduced except in full without the written approval of QuieTek Corporation.

1. RF Exposure Evaluation

1.1. Limits

According to FCC 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)

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)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product	Access Point
Test Mode	Transmit
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.2dBi or 1.66 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11b ANT 0+1			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412	284.4461	0.09394
6	2437	238.7811	0.07886
11	2462	242.1029	0.07995

IEEE 802.11g ANT 0+1			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412	226.9865	0.07496
6	2437	797.9947	0.26353
11	2462	119.6741	0.03952

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

Product	Access Point
Test Mode	Transmit
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.2dBi or 1.66 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (20MHz) ANT 0+1			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412	267.3006	0.08827
6	2437	922.5714	0.30468
11	2462	104.4720	0.03450

IEEE 802.11n (40MHz) ANT 0+1			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
3	2422	201.3724	0.06650
6	2437	170.6082	0.05634
9	2452	82.2243	0.02715

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².