

RF Exposure Evaluation declaration

Product Name : Powerline Wireless N Extender
Model No. : PWQ-5101
FCC ID : YG7-PWQ51N00

Applicant : ZINWELL CORPORATION

Address : 7F., No.512, Yuanshan Rd., Zhonghe Dist., New Taipei
City 235, Taiwan (R.O.C.)

Date of Receipt : Aug. 17, 2012

Date of Declaration : Sep. 11, 2012

Report No. : 128380R-RFUSP42V01

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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: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

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 : Powerline Wireless N Extender
 Test Item : RF Exposure Evaluation
 Test Site : No.3 OATS

802.11b (1Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (4.58dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412.00	112.2018	0.064081
6	2437.00	93.3254	0.053300
11	2462.00	103.2761	0.058983

Power density in column 4 is much lower than the limit (1 mW/cm²).

802.11g (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (4.58dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
1	2412.00	136.4583	0.077935
6	2437.00	182.8100	0.104407
11	2462.00	133.0454	0.075985

Power density in column 4 is much lower than the limit (1 mW/cm²).

802.11n-20MHz

Output Power Into Antenna & RF Exposure Evaluation Distance (4.58dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
01	2412.00	138.0384	0.078837
06	2437.00	179.4734	0.102502
11	2462.00	135.2073	0.077220

Power density in column 4 is much lower than the limit (1 mW/cm²).

802.11n-40MHz

Output Power Into Antenna & RF Exposure Evaluation Distance (4.58dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)
03	2422.00	103.5142	0.059119
06	2437.00	101.6249	0.058040
09	2452.00	103.9920	0.059392

Power density in column 4 is much lower than the limit (1 mW/cm²).