RF Exposure Evaluation Declaration

Product: 802.11n Wireless VDSL2 4-Port Gateway with HPNA3.1

Test Item: RF Exposure Evaluation Declaration

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/cm2)	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: Pd = (Pout*G)/(4*pi*r2)

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

Pd id 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℃and 78％ RH.

1.3. EUT Operation condition

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

1.4. Test Result of RF Exposure Evaluation

Antenna Gain:

Ant0:
antenna type: Dipole antenna
antenna gain:2.0dBi
Ant1:
antenna type: Dipole antenna
antenna gain: 3.0dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

1) 802.11b

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	60.8135	0.0241396
06	2437.00	53.7032	0.0213176
11	2462.00	76.7361	0.0304599

2) 802.11g

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	121.6186	0.0482758
06	2437.00	93.1108	0.0369598
11	2462.00	90.5733	0.0359525

3) 802.11n(20MHz) (An0)

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	196.3360	0.0779344
06	2437.00	174.5822	0.0692993
11	2462.00	153.4617	0.0609157

4) 802.11n(20MHz) (An1)

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	194.5360	0.0772199
06	2437.00	207.9697	0.0825523
11	2462.00	194.0886	0.0770423

5) 802.11n(20MHz) (An0 and An1)

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	390.8409	0.1551419
06	2437.00	382.8247	0.1519599
11	2462.00	347.5362	0.1379524

6) 802.11n(40MHz) (An0)

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
03	2422.00	149.6236	0.0593922
06	2437.00	144.8772	0.0575081
09	2452.00	140.9289	0.0559409

7) 802.11n(40MHz) (An1)

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
03	2422.00	124.4515	0.0484003
06	2437.00	121.8990	0.0483871
09	2452.00	113.2400	0.0449499

8) 802.11n(40MHz) (An0 and An1)

Test date:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
03	2422.00	274.1574	0.1088251
06	2437.00	266.6859	0.1058593
09	2452.00	254.0973	0.1008624