RF Exposure Evaluation Declaration

Product: 802.11n Wireless ADSL2+ 4-port Security Gateway

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: 2.0dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

1) 802.11b (can transmit on An0 only)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
01	2412.00	92.8966	0.0292907
06	2437.00	55.0808	0.0173672
11	2462.00	60.3949	0.0194274

2) 802.11g (can transmit on An0 only)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
01	2412.00	113.7627	0.0358698
06	2437.00	77.6247	0.0244754
11	2462.00	84.7227	0.0267134

3) 802.11n(20MHz) (An0)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
01	2412.00	51.5229	0.0162454
06	2437.00	43.9542	0.0138589
11	2462.00	49.6592	0.0156577

4) 802.11n(20MHz) (An1)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
01	2412.00	40.2717	0.0126978
06	2437.00	46.8813	0.0147819
11	2462.00	40.0867	0.0126395

3) 802.11n(20MHz) (An1 and An0)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
01	2412.00	91.8333	0.0289554
06	2437.00	90.7821	0.0286239
11	2462.00	89.7429	0.0282963

5) 802.11n(40MHz) (An0)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
03	2422.00	51.9996	0.0163957
06	2437.00	54.7016	0.0172476
09	2452.00	49.3174	0.0155500

6) 802.11n(40MHz) (An1)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
03	2422.00	46.4515	0.0146463
06	2437.00	46.1318	0.0145455
09	2452.00	43.4510	0.0137003

7) 802.11n(40MHz) (An1 and An0)

Test date:

Channel	Channel Frequency (MHz)	Peak Output Power to Antenna (mW)	Power Density at R = 20 cm to Antenna (mW/cm2)
03	2422.00	98.4011	0.0310262
06	2437.00	100.9253	0.0318221
09	2452.00	92.6830	0.0292233

Note:

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.