RF Exposure Evaluation declaration

Product Name	802.11n, 2.4G 1T1R Wireless LAN USB Module
Model No.	WN4608R
FCC ID	MDZLTRT5370-WL

Applicant	Amtran Technology Co Ltd
Address	17F, No. 268, Lien Chen Rd. Chung Ho City, Taipei County, Taiwan 235

Date of Receipt	Nov. 03, 2011
Date of Declaration	Nov. 14, 2011
Report No.	11B163R-RFUSP32V01

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

Where

Pd = power density in mW/cm^2

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/cm^2. 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. Test Result of RF Exposure Evaluation

Product : 802.11n, 2.4G 1T1R Wireless LAN USB Module
Test Item : RF Exposure Evaluation
Test Site : No.3 OATS

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.37 dBi in logarithm scale.

802.11b (1Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (2.37 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
1	2412.00	83.7529	0.028756
6	2437.00	85.1138	0.029223
11	2462.00	84.1395	0.028889

The RF exposure at 20 cm is below limit.

802.11g (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (2.37 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
1	2412.00	305.4921	0.104889
6	2437.00	329.6097	0.113170
11	2462.00	314.7748	0.108076

The RF exposure at 20 cm is below limit.

802.11n-20MHz_7.2Mbps - 2.4G Band

Output Power Into Antenna & RF Exposure Evaluation Distance (2.37 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	273.5269	0.093914
06	2437.00	259.4179	0.089070
11	2462.00	273.5269	0.093914

The RF exposure at 20 cm is below limit.

802.11n-40MHz_15Mbps - 2.4G Band

Output Power Into Antenna & RF Exposure Evaluation Distance (2.37 dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2422.00	174.1807	0.059804
04	2437.00	177.0109	0.060776
07	2452.00	188.7991	0.064823

The RF exposure at 20 cm is below limit.