

## RF Exposure Evaluation declaration

Product Name	802.11b/g/n 1T1R Wireless Lan USB Module
Model No.	WN4617R (M)
FCC ID	MDZ-WN4517R-M

Applicant	Amtran Technology Co., Ltd
Address	17F., No.268, Liancheng Rd., Jhonghe, New Taipei City, Taiwan, R.O.C.

Date of Receipt	Oct. 01, 2012
Date of Declaration	Oct, 17, 2012
Report No.	12A055R-RFUSP42V01

The declaration results relate only to the samples calculated.

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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 <sup>2</sup> )	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/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. 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 : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : RF Exposure Evaluation  
 Test Site : No.3 OATS

#### 802.11b (1Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (4.72dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412.00	100.4616	0.059256
6	2437.00	89.5365	0.052812
11	2462.00	88.1049	0.051967

Power density in column 4 is much lower than the limit (1 mW/cm<sup>2</sup>).

#### 802.11g (6Mbps) Output Power Into Antenna & RF Exposure Evaluation Distance (4.72dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412.00	239.8833	0.141492
6	2437.00	255.8586	0.150914
11	2462.00	237.1374	0.139872

Power density in column 4 is much lower than the limit (1 mW/cm<sup>2</sup>).

#### 802.11n-20MHz\_7.2Mbps - 2.4G Band

##### Output Power Into Antenna & RF Exposure Evaluation Distance (4.72dBi):

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412.00	208.4491	0.122951
6	2437.00	216.2719	0.127565
11	2462.00	195.4339	0.115274

Power density in column 4 is much lower than the limit (1 mW/cm<sup>2</sup>).

**802.11n-40MHz\_15Mbps - 2.4G Band****Output Power Into Antenna & RF Exposure Evaluation Distance (4.72dBi):**

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
3	2422.00	121.3389	0.071570
6	2437.00	157.0363	0.092625
9	2452.00	149.9685	0.088457

Power density in column 4 is much lower than the limit (1 mW/cm<sup>2</sup>).