RF Exposure Evaluation declaration

Product Name ： ASUS Wireless SuperSpeedN Router

Model No. ： RT-N12

FCC ID. ： MSQ-RTN12

Applicant : ASUSTeK COMPUTER INC.

Address ： No. 15, Li-Te Rd., Peitou, Taipei 112,Taiwan

Date of Receipt ： 2009/06/19

Date of Declaration : 2009/07/14

Report No. ： 096316R-RF-US-Exp

Report Version ： V1.0

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	ASUS Wireless SuperSpeedN Router
Test Mode	Mode 1: Transmit
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.5dBi or 1.78 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11b			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	109.3956	0.3874
6	2437	126.4736	0.4479
11	2462	112.7197	0.3992

IEEE 802.11g			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	179.4734	0.6355
6	2437	176.1976	0.6239
11	2462	142.5608	0.5048

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/cm^2.

Product	ASUS Wireless SuperSpeedN Router
Test Mode	Mode 1: Transmit
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.5dBi or 1.78 in linear
scale. IEEE 802.11n (ANT A (20M) / ANT A (40M))
scale. IEEE 802.11n (ANT B (20M) / ANT B (40M))

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (ANT A (20MHz) / ANT B (20MHz))

WLAN Function

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	272.2701	0.9642
6	2437	267.9168	0.9487
11	2462	254.6830	0.9019

IEEE 802.11n (ANT A (40MHz) / ANT B (40MHz))

WLAN Function

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
3	2422	210.8628	0.7467
6	2437	207.4914	0.7348
9	2452	204.1738	0.7230

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/cm^2.