

RF Exposure Evaluation declaration

Product Name : ASUS SuperSpeedN Wireless Router
Model No. : RT-N13
FCC ID. : MSQ-RTN13

Applicant : ASUSTeK COMPUTER INC.

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

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Report No. : 088123R-RF-US-Exp
Version : V1.0

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

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 is 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°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

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

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.7dBi or 2.951 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	56.4937	0.03317
6	2437	61.2350	0.03595
11	2462	53.3335	0.03131

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	56.6239	0.03325
6	2437	59.2925	0.03481
11	2462	51.0505	0.02997

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.

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

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.7dBi or 2.951 in linear scale. IEEE 802.11n (ANT A (20M) / ANT A (40M))

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.3dBi or 2.692 in linear 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	67.4124	0.03957
6	2437	78.3952	0.04603
11	2462	86.6575	0.05088

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)
1	2412	81.3105	0.04353
6	2437	81.6874	0.04374
11	2462	86.9030	0.04653

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.