RF Exposure Evaluation declaration

Product Name ： RT-N18U 2.4GHz 600Mbps High Power Router
Model No. ： RT-N18U
FCC ID. ： MSQ-RTN18U

Applicant : ASUSTeK COMPUTER INC.
Address ： 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt : 2014/03/24
Date of Declaration : 2014/05/02
Report No. : 1430470R-RF-US-Exp
Report Version : V1.0

Testing Laboratory
1313

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	RT-N18U 2.4GHz 600Mbps High Power Router
Test Mode	Mode 1: Transmit (CDD mode)
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11b(ANT 0+1+2)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	130.4057	0.04099
6	2437	584.3359	0.18367
11	2462	124.6889	0.03919

IEEE 802.11g(ANT 0+1+2)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	203.2277	0.06388
6	2437	826.7991	0.25989
11	2462	235.0190	0.07387

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	RT-N18U 2.4GHZ 600MBPS HIGH POWER ROUTER
Test Mode	Mode 1: Transmit (CDD mode)
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (20MHz) (ANT 0+1+2)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	173.8840	0.05466
6	2437	633.8697	0.19924
11	2462	160.0512	0.05031

IEEE 802.11n (40MHz) (ANT 0+1+2)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
3	2422	122.3576	0.03846
6	2437	230.0401	0.07231
9	2452	138.9798	0.04369

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	RT-N18U 2.4GHZ 600MBPS HIGH POWER ROUTER
Test Mode	Mode 2: Transmit (Beamforming mode)
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11g(ANT 0+1+2)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	135.3696	0.04255
6	2437	623.2591	0.19591
11	2462	138.8668	0.04365

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	RT-N18U 2.4GHZ 600MBPS HIGH POWER ROUTER
Test Mode	Mode 2: Transmit (Beamforming mode)
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (20MHz) (ANT 0+1+2)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	130.6171	0.0412
6	2437	575.4399	0.1814
11	2462	166.7247	0.0526

IEEE 802.11n (40MHz) (ANT 0+1+2)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
3	2422	89.1251	0.0281
6	2437	198.1527	0.0625
9	2452	147.9108	0.0466

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.