RF Exposure Evaluation declaration

Product Name	:	Wireless-AC2600 Dual Band Gigabit Router
Trade Name	:	ASUS
Model No.	:	BLUE CAVE
FCC ID.	:	MSQ-RTHK00

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

Date of Receipt	:	Apr. 06, 2017
Date of Declaration	:	Jun. 02, 2017
Report No.	:	1720225R-RF-US-Exp
Report Version	:	V1.0

Testing Laboratory
3024

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

WiFi

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ CDD mode
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.76 dBi or 1.19 dBi in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11b (ANT 0)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
1	2412	358.9219	0.08497
6	2437	829.8508	0.19646
11	2462	580.7644	0.13749

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	293.5067	0.06949
6	2437	906.9223	0.21471
11	2462	330.4300	0.07823

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ MIMO Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.76 dBi or 1.19 dBi 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	190.9029	0.04519
6	2437	929.1293	0.21996
11	2462	289.9425	0.06864

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	131.3139	0.03109
6	2437	239.3656	0.05667
9	2452	124.9000	0.02957

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.

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Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ Beamforming Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.76 dBi or 1.19 dBi 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	115.9624	0.02745
6	2437	687.9709	0.16287
11	2462	184.5273	0.04369

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	60.0225	0.01421
6	2437	139.2555	0.03297
9	2452	99.6118	0.02358

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ CDD Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

5.2Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.47 dBi or 1.40 dBi in linear scale.

5.8Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.22 dBi or 1.32 dBi in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11a (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
36	5180	414.3048	0.11539
40	5220	405.3426	0.11290
44	5240	421.3278	0.11735

IEEE 802.11a (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
149	5745	944.7480	0.24810
157	5785	947.4750	0.24881
165	5825	952.3950	0.25010

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ MIMO Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

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5.8Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.22 dBi or 1.32 dBi in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (20MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
36	5180	404.4061	0.11264
40	5220	433.5748	0.12076
44	5240	431.8280	0.12027

IEEE 802.11n (20MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
149	5745	910.5803	0.23912
157	5785	943.6559	0.24781
165	5825	965.0758	0.25343

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ MIMO Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

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Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (40MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
38	5190	338.0648	0.09416
46	5230	462.4529	0.12880

IEEE 802.11n (40MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
151	5755	823.7857	0.21633
159	5795	841.0331	0.22086

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ MIMO Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

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Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11ac (80MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
42	5210	452.5848	0.12605

IEEE 802.11ac (80MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
155	5775	851.7586	0.22368

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ Beamforming Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

5.2Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.47 dBi or 1.40 dBi in linear scale.

5.8Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.22 dBi or 1.32 dBi in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (20MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
36	5180	329.2857	0.09171
40	5220	433.5748	0.12076
44	5240	431.8280	0.12027

IEEE 802.11n (20MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
149	5745	681.6788	0.17901
157	5785	690.3461	0.18129
165	5825	684.4067	0.17973

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ Beamforming Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

5.2Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.47 dBi or 1.40 dBi in linear scale.

5.8Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.22 dBi or 1.32 dBi in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11n (40MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
38	5190	180.3298	0.05023
46	5230	623.8251	0.17375

IEEE 802.11n (40MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
151	5755	538.9746	0.14154
159	5795	686.3822	0.18025

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit_ Beamforming Mode
Test Condition	RF Exposure Evaluation

Antenna Gain

5.2Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.47 dBi or 1.40 dBi in linear scale.

5.8Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.22 dBi or 1.32 dBi in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

IEEE 802.11ac (80MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
42	5210	136.3991	0.03799

IEEE 802.11ac (80MHz) (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
155	5775	304.2286	0.08473

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.

The results are evaluated using the maximum power.

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	Transmit
Test Condition	RF Exposure Evaluation

Power Density (2.4GHz) (mW/cm2)	Power Density (5GHz) (mW/cm2)	Total Power Density (2.4GHz+5GHz) (mW/cm2)	Limit (mW/cm2)
0.214	0.253	0.467	1

BT 2.0

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	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:

GFSK			
Bluetooth Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
00	2402	7.9983	0.00251
39	2441	7.6913	0.00242
78	2480	5.9156	0.00186

π /4 DQPSK			
Bluetooth Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
00	2402	12.8825	0.00405
39	2441	12.1619	0.00382
78	2480	9.8175	0.00309

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	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	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:

8DQPSK			
Bluetooth Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
00	2402	13.9959	0.00440
39	2441	13.0918	0.00412
78	2480	4.3551	0.00137

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.

BT 4.0

Product	Wireless-AC2600 Dual Band Gigabit Router
Test Mode	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:

GFSK			
Bluetooth Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)
00	2402	2.1627	0.00068
19	2440	2.2646	0.00071
39	2480	1.7219	0.00054

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.