

# RF Exposure Evaluation Declaration

Product Name : Wireless-AC2600 Dual WAN VPN Wireless Router  
Trade Name : ASUS  
Model No. : BRT-AC828/M2  
FCC ID. : MSQ-RT0V00

Applicant : ASUSTeK COMPUTER INC.

Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt : Nov. 10, 2015  
Issued Date : Nov. 23, 2015  
Report No. : 15B0233R-RF-US-Exp  
Report 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 <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:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

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/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	Wireless-AC2600 Dual WAN VPN Wireless 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 are 2.18dBi or 1.65 in linear scale.

**Output Power into Antenna & RF Exposure Evaluation Distance:**

IEEE 802.11b (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412	796.1594	0.26134
6	2437	946.2372	0.31061
11	2462	663.7431	0.21788

IEEE 802.11g (ANT 0+1+2+3)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
1	2412	264.8500	0.08694
6	2437	810.9611	0.26620
11	2462	261.8183	0.08594

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<sup>2</sup>.

Product	Wireless-AC2600 Dual WAN VPN Wireless 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 are 2.18dBi or 1.65 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 <sup>2</sup> )
1	2412	255.8586	0.08399
6	2437	794.3282	0.26074
11	2462	277.9713	0.09125

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 <sup>2</sup> )
3	2422	145.2112	0.04767
6	2437	273.5269	0.08979
9	2452	109.6478	0.03599

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<sup>2</sup>.

Product	Wireless-AC2600 Dual WAN VPN Wireless 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 3.19dBi or 2.08 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 <sup>2</sup> )
36	5180	294.4422	0.12184
40	5220	297.8516	0.12325
44	5240	289.7344	0.11989

IEEE 802.11 n(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 <sup>2</sup> )
36	5180	309.7419	0.12817
40	5220	308.3188	0.12758
44	5240	306.9022	0.12700

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<sup>2</sup>.

Product	Wireless-AC2600 Dual WAN VPN Wireless 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 3.19dBi or 2.08 in linear scale.

**Output Power into Antenna & RF Exposure Evaluation Distance:**

IEEE 802.11 n(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 <sup>2</sup> )
38	5190	374.9730	0.15516
46	5230	635.3309	0.26290

IEEE 802.11 ac(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 <sup>2</sup> )
42	5210	287.0781	0.11879

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<sup>2</sup>.

Product	Wireless-AC2600 Dual WAN VPN Wireless 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 3.19dBi or 2.08 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 <sup>2</sup> )
149	5745	851.1380	0.35220
153	5785	859.0135	0.35546
165	5825	870.9636	0.36041

IEEE 802.11 n(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 <sup>2</sup> )
149	5745	885.1156	0.36626
153	5785	853.1001	0.35301
165	5825	855.0667	0.35383

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<sup>2</sup>.

Product	Wireless-AC2600 Dual WAN VPN Wireless 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 3.19dBi or 2.08 in linear scale.

**Output Power into Antenna & RF Exposure Evaluation Distance:**

IEEE 802.11 n(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 <sup>2</sup> )
151	5755	835.6030	0.34577
159	5795	887.1560	0.36711

IEEE 802.11 ac(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 <sup>2</sup> )
155	5775	685.4882	0.28366

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<sup>2</sup>.



Product	Wireless-AC2600 Dual WAN VPN Wireless 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 are 2.18dBi or 1.65 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 <sup>2</sup> )
1	2412	130.3167	0.04278
6	2437	526.0173	0.17267
11	2462	101.1579	0.03321

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 <sup>2</sup> )
3	2422	66.5273	0.02184
6	2437	168.2674	0.05523
9	2452	98.1748	0.03223

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<sup>2</sup>.

Product	Wireless-AC2600 Dual WAN VPN Wireless 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 3.19dBi or 2.08 in linear scale.

**Output Power into Antenna & RF Exposure Evaluation Distance:**

IEEE 802.11 n(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 <sup>2</sup> )
149	5745	449.7799	0.18612
153	5785	448.7454	0.18569
165	5825	458.1419	0.18958

IEEE 802.11 n(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 <sup>2</sup> )
151	5755	462.3810	0.19133
159	5795	459.1980	0.19002

IEEE 802.11 ac(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 <sup>2</sup> )
155	5775	459.1980	0.19002

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<sup>2</sup>.