

# RF Exposure Evaluation Declaration

Product Name : ASUS SRT-AC1900 Wireless Smart Router  
Trade Name : ASUS  
Model No. : SRT-AC1900  
FCC ID. : MSQ-SRTAC1900

Applicant : ASUSTeK COMPUTER INC.

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

Date of Receipt : Jun. 11, 2015  
Issued Date : Aug. 20, 2015  
Report No. : 1560358R-RF-US-Exp-C  
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:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 1: Tx- Horizontal Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

#### Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 3.27dBi or 3.55 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 <sup>2</sup> )
1	2412	362.2430	0.15278
6	2437	879.0225	0.37074
11	2462	368.1290	0.15526

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 <sup>2</sup> )
1	2412	114.2878	0.04820
6	2437	866.9619	0.36565
11	2462	197.2423	0.08319

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 1: Tx- Horizontal Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 3.27dBi or 3.55 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 <sup>2</sup> )
1	2412	73.1139	0.03084
6	2437	889.2011	0.37503
11	2462	174.9847	0.07380

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>.

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 <sup>2</sup> )
3	2422	35.9749	0.01517
6	2437	172.9816	0.07296
9	2452	33.8844	0.01429

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 1: Tx- Horizontal Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 5.37dBi or 3.44 in linear scale.

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

IEEE 802.11a			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
36	5180	249.4595	0.17072
40	5220	255.8586	0.17510
44	5240	246.0368	0.16838

IEEE 802.11 n(20MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
36	5180	254.6830	0.17430
40	5220	255.2701	0.17470
44	5240	257.0396	0.17591

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	ASUS SRT-AC1900 Wireless Smart Router
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Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 5.37 dBi or 3.44 in linear scale.

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

IEEE 802.11 n(40MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
38	5190	132.7394	0.09084
46	5230	548.2770	0.37522

IEEE 802.11 ac(80MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
42	5210	84.3335	0.05771

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 1: Tx- Horizontal Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 5.55dBi or 3.59 in linear scale.

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

IEEE 802.11a			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
149	5745	595.6621	0.42543
153	5785	615.1769	0.43936
165	5825	579.4287	0.41383

IEEE 802.11 n(20MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
149	5745	583.4451	0.41670
153	5785	601.1737	0.42936
165	5825	566.2393	0.40441

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>.

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Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 5.55dBi or 3.59 in linear scale.

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

IEEE 802.11 n(40MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
151	5755	404.5759	0.28895
159	5795	568.8529	0.40628

IEEE 802.11 ac(80MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
155	5775	434.5102	0.31033

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 2: Tx- Vertical Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 3.9dBi or 2.45 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 <sup>2</sup> )
1	2412	449.7799	0.21923
6	2437	926.8298	0.45175
11	2462	285.7591	0.13928

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 <sup>2</sup> )
1	2412	195.8845	0.09548
6	2437	916.2205	0.44658
11	2462	196.7886	0.09592

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 2: Tx- Vertical Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 3.9dBi or 2.45 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 <sup>2</sup> )
1	2412	108.1434	0.05271
6	2437	883.0799	0.43042
11	2462	118.8502	0.05793

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>.

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 <sup>2</sup> )
3	2422	33.8065	0.01648
6	2437	217.2701	0.10590
9	2452	31.6957	0.01545

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 2: Tx- Vertical Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.87 dBi or 3.07 in linear scale.

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

IEEE 802.11a			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
36	5180	263.0268	0.16065
40	5220	271.6439	0.16591
44	5240	288.4032	0.17614

IEEE 802.11 n(20MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
36	5180	242.6610	0.14821
40	5220	294.4422	0.17983
44	5240	306.9022	0.18744

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>.

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Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.87 dBi or 3.07 in linear scale.

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

IEEE 802.11 n(40MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
38	5190	88.9201	0.05431
46	5230	492.0395	0.30052

IEEE 802.11 ac(80MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
42	5210	60.6736	0.03706

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 2: Tx- Vertical Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 5.07dBi or 3.21 in linear scale.

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

IEEE 802.11a			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
149	5745	628.0584	0.40108
153	5785	642.6877	0.41043
165	5825	628.0584	0.40108

IEEE 802.11 n(20MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
149	5745	544.5027	0.34772
153	5785	575.4399	0.36748
165	5825	523.6004	0.33438

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	ASUS SRT-AC1900 Wireless Smart Router
Test Mode	Mode 2: Tx- Vertical Antenna (AD891M21)
Test Condition	RF Exposure Evaluation

**Antenna Gain**

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 5.07dBi or 3.21 in linear scale.

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

IEEE 802.11 n(40MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
151	5755	380.1894	0.24279
159	5795	522.3962	0.33361

IEEE 802.11 ac(80MHz)			
WLAN Function			
Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )
155	5775	278.6121	0.17792

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>.