



# FCC RADIO EXPOSURE TEST REPORT

**FCC ID** : MSQ-RTGZ00

**Equipment** : Wireless-AC5300 Tri-band Gigabit Router, ROG Rapture Tri-band Gaming Router, Extreme Gaming Router

**Brand Name** : ASUS

**Model Name** : RT-AC5300, RT-AC5300R, RT-AC5300W, RT-AC5300P, RT-AC95U, RT-AC96U, GT-AC5300, ROG Rapture GT-AC5300

**Applicant** : ASUSTeK COMPUTER INC.  
4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan

**Manufacturer (1)** : ASKEY TECHNOLOGY (JIANG SU) LTD  
NO1388, Jiao Tong Road, Wujiang Economic Technological Development Area Jiangsu Province 215200 China

**Manufacturer (2)** : Compal Networking (KunShan) Co., LTD.  
No. 520, Nabbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China

**Manufacturer (3)** : Arcadyan Technology (Vietnam) Co., Ltd.  
Ba Thien Industrial Park, Ba Hien commune, Binh Xuyen district, Vinh Phuc Province, Viet Nam

**Standard** : 47 CFR Part 2.1091

The product was received on Sep. 25, 2019, and testing was started from Sep. 25, 2019 and completed on Jan. 16, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



## Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
<b>1 General Description .....</b>	<b>5</b>
1.1 EUT General Information .....	5
1.2 Table for Multiple Listing .....	5
1.3 Table for Class II Change.....	7
1.4 Testing Location .....	7
<b>2 Maximum Permissible Exposure .....</b>	<b>8</b>
2.1 Limit of Maximum Permissible Exposure .....	8
2.2 MPE Calculation Method.....	8
2.3 Calculated Result and Limit.....	9
<b>Photographs of EUT v01</b>	





### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: **Sam Chen**

Report Producer: **Cindy Peng**



# 1 General Description

## 1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

## 1.2 Table for Multiple Listing

1. The equipment names/model names in the following table are all refer to the identical product.

Equipment Name	Model Name	Description
Wireless-AC5300 Tri-band Gigabit Router, ROG Rapture Tri-band Gaming Router, Extreme Gaming Router	RT-AC5300	All the equipment names/model names are identical, the difference equipment names/model names served as marketing strategy.
	RT-AC5300R	
	RT-AC5300W	
	RT-AC5300P	
	RT-AC95U	
	RT-AC96U	
	GT-AC5300	
ROG Rapture GT-AC5300		

Note: Model: RT-AC5300 was selected as representative model for the test and its data was recorded in this report.

2. The EUT has three types, which are identical to each other in all aspects except for the following table:

EUT	LAN Port	EUT Version	Transformer	Resistance (Size)	Thickness of Heat sink (mm)	Pad (mm)	Fan
EUT 1	4	Version 2 (Rev 1.33)	SKU B	0402/0201	2mm	5mm	X
EUT 2	8	Version 2 (Rev 1.311)	SKU A	0402/0201	2mm	5mm	X
EUT 3	8	Version 2 (Rev1.411)	SKU A	0402/0201	2mm	5mm	X

Note1: The above information was declared by manufacturer.

Note2: V : With X :Without



3. The EUT Version 2 information as below:

Ant. Connector	Port		
	2.4GHz	5GHz Band 1	5GHz Band 4
1	4	1	-
2	3	2	-
3	2	3	-
4	1	4	-
5	-	-	4
6	-	-	3
7	-	-	2
8	-	-	1

4. The transformer information as below:

Transformer	Brand	LAN	LAN	WAN
SKU A	Mingtek	HN8011VG	HN8011VG	HN18101CG
SKU B	Mingtek	HN8014VG	HN8015VG	HN18101CG

5. The Version information as below:

Version		Rev 1.33	Rev 1.311	Rev 1.411	
RF	2G	Mainchip	BCM4366	BCM4366	
		TX	PA SE2623L	PA SE2623L	
		RX	RX FEM SKY85201	RX FEM SKY85201	Discrete RX BFP842 + RTC6619
	5G Low/ High Band	Mainchip	BCM4366	BCM4366	BCM4366
		TX	PA RFPA5542	PA RFPA5542	PA RFPA5542
		RX	RX FEM SKY85605	RX FEM SKY85614	RX FEM SKY85614
BB	CPU	BCM4709C0	BCM4908	BCM4908	
	DDR	512MBx1	512MBx2	512MBx1	
	Gigabit switch	RTL8365MB (Reserved)	BCM53134S	BCM53134S	
	LAN port	4 (Reserved extra 4)	8	8	
	Flash	128MB	256MB	256MB	
	EMI Filter for low voltage	none	none	none	
	Power IC	RT8290A	RT8290A+RT6220+RT621 7E	RT8290A+RT6220+RT621 7E	
	USB	2.0x1/3.0x1	3.0x2	3.0x2	



### 1.3 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA532637-11

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Updating the test rule of 5GHz band 4 to "15.407 (b)(4)(i)" from "15.407 (b)(4)(ii)" for EUT version 2.	Maximum Permissible Exposure.
2. Adding one adapter "model name: ADP-65GD D". 3. Adding one power cable. 4. Adding one manufacturer "Arcadyan Technology (Vietnam) Co., Ltd." and "Ba Thien Industrial Park, Ba Hien commune, Binh Xuyen district, Vinh Phuc Province, Viet Nam".	It does not affect the Maximum Permissible Exposure test result.

Note: Maximum Permissible Exposure of 2.4GHz and 5GHz band 1 are based on original test report

### 1.4 Testing Location

Testing Location		
<input type="checkbox"/>	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
<input checked="" type="checkbox"/>	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.



## 2 Maximum Permissible Exposure

### 2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Method

The MPE was calculated at 31 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P** = RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



### 2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm <sup>2</sup> )	S Limit (mW/cm <sup>2</sup> )
2.4G;D1D	8.34	27.56	35.90	0.09	35.99	3.97192	31	0.32889	1
5.2;D1D	9.49	26.47	35.96	0.03	35.99	3.97192	31	0.32889	1
5.8;D1D	9.49	26.46	35.95	0.04	35.99	3.97192	31	0.32889	1

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz Band 1 + WLAN 5GHz Band 4

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm <sup>2</sup> )	S Limit (mW/cm <sup>2</sup> )	Ratio (S/Limit)
2.4G;D1D	8.34	27.56	35.90	0.09	35.99	3.97192	31	0.32889	1	0.32889
5.2;D1D	9.49	26.47	35.96	0.03	35.99	3.97192	31	0.32889	1	0.32889
5.8;D1D	9.49	26.46	35.95	0.04	35.99	3.97192	31	0.32889	1	0.32889
									Sum Ratio	0.98667
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—THE END—