



# FCC RADIO EXPOSURE TEST REPORT

**FCC ID** : MSQ-RTAXJ300  
**Equipment** : AX3000 Dual Band Wi-Fi Router, AX5400 Dual Band Wi-Fi Router  
**Brand Name** : ASUS  
**Model Name** : RT-AX58U, RT-AX82U  
**Applicant** : ASUSTeK COMPUTER INC.  
4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan  
**Manufacturer (1)** : Datamax Electronics (DongGuan) Co., Ltd.  
Niu Shan Foreign Economic Industrial Park, Dong Cheng District, Dong Guan City, Guang Dong, 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  
**Standard** : 47 CFR Part 2.1091

The product was received on Jul. 12, 2019, and testing was started from Jul. 12, 2019 and completed on Aug. 02, 2019. 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 SKU information .....	5
1.4 Table for Class II Change.....	6
1.5 Testing Location .....	6
<b>2 Maximum Permissible Exposure .....</b>	<b>7</b>
2.1 Limit of Maximum Permissible Exposure .....	7
2.2 MPE Calculation Method.....	7
2.3 Calculated Result and Limit.....	8
<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: **Viola Huang**



# 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) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5725-5850	5180-5250 5250-5320 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

## 1.2 Table for Multiple Listing

The Equipment and model names in the following table are all refer to the identical product.

Equipment	Model Name	Description
AX3000 Dual Band Wi-Fi Router, AX5400 Dual Band Wi-Fi Router	RT-AX82U, RT-AX58U	All the equipments and models are identical, the different equipment and model names served as marketing strategy.

From the above models, equipment: AX3000 Dual Band Wi-Fi Router and model: RT-AX82U was selected as representative model for the test and its data was recorded in this report.

## 1.3 Table for SKU information

SKU	Material	Housing	Brand	P/N
SKU 1	PJ-45 port was covered by plastic.	There are two different housings.	LAN port : ETSWAP / Mingtek	LAN port : NS773602 / HN36201CG
SKU 2	PJ-45 port was covered by metal.		WAN port : ETSWAP / Mingtek	WAN port: NS771802 / HN18101CG



### 1.4 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA952922

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

Modifications	Performance Checking
1. Adding Band 2 (5250~5350 MHz) for this device. 2. Adding 160MHz for this device.	Maximum Permissible Exposure

Note: RF Exposure Evaluation of 5GHz Band 1, 4 and 2.4GHz Band are based on original test report.

### 1.5 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 4086B 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 24 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 2T1S	4.68	29.95	34.63	0.50	35.13	3.25837	24	0.45016	1.00000
2.4G;D1D 2T2S	1.71	29.92	31.63	0.50	32.13	1.63305	24	0.22561	1.00000
5.2G;D1D 2T1S	4.85	29.90	34.75	0.50	35.25	3.34965	24	0.46277	1.00000
5.2G;D1D 2T2S	1.84	29.95	31.79	0.50	32.29	1.69434	24	0.23408	1.00000
5.2G;D1D 4T1S	7.86	28.12	35.98	0.01	35.99	3.97192	24	0.54874	1.00000
5.2G;D1D 4T2S	4.85	29.98	34.83	0.50	35.33	3.41193	24	0.47138	1.00000
5.3G;D1D 2T1S	4.90	23.97	28.87	0.50	29.37	0.86497	24	0.11950	1.00000
5.3G;D1D 2T2S	1.84	21.87	23.71	0.50	24.21	0.26363	24	0.03642	1.00000
5.3G;D1D 4T1S	7.91	22.05	29.96	0.03	29.99	0.99770	24	0.13784	1.00000
5.3G;D1D 4T2S	4.90	23.93	28.83	0.50	29.33	0.85704	24	0.11840	1.00000
5.8G;D1D 2T1S	4.93	29.91	34.84	0.50	35.34	3.41979	24	0.47246	1.00000
5.8G;D1D 2T2S	1.92	29.96	31.88	0.50	32.38	1.72982	24	0.23898	1.00000
5.8G;D1D 4T1S	7.87	28.06	35.93	0.06	35.99	3.97192	24	0.54874	1.00000
5.8G;D1D 4T2S	4.86	29.92	34.78	0.50	35.28	3.37287	24	0.46598	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz

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 2T1S	4.68	29.95	34.63	0.50	35.13	3.25837	24	0.45016	1.00000	0.45016
5.2G;D1D 4T1S	7.86	28.12	35.98	0.01	35.99	3.97192	24	0.54874	1.00000	0.54874
									Sum Ratio	0.99890
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—————THE END—————