



FCC RADIO EXPOSURE TEST REPORT

FCC ID : MSQ-RTAXJ300

Equipment : AX3000 Dual Band Wi-Fi Router, AX5400 Dual Band Wi-Fi Router, Dual Band Wi-Fi Router

Brand Name : ASUS

Model Name : RT-AX58U, RT-AX82U, RT-AX3000, RT-AX5400, TUF-AX3000

Applicant : ASUSTeK COMPUTER INC.
1F., No. 15, Lide Rd., Beitou, 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

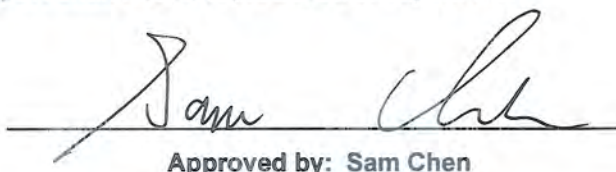
Manufacturer (3) : ARCADYAN TECHNOLOGY (VIETNAM) CO., LTD.
Ba Thien Industrial Park, Ba Hien commune, Binh Xuyen district, Vinh Phuc Province

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 May 30, 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.)



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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) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5250 5250-5320 5500-5720 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, Dual Band Wi-Fi Router	RT-AX58U, RT-AX82U, RT-AX3000, RT-AX5400, TUF-AX3000	All the equipment and model names 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	5G PA	Housing Size	Brand	P/N
SKU 1	RJ-45 port was covered by plastic.	SKY85743	223.62mm x 129.48mm x 32.9mm	LAN port : NETSWAP / Mingtek WAN port : NETSWAP / Mingtek	LAN port : NS773602 / HN36201CG WAN port: NS771802 / HN18101CG
SKU 2	RJ-45 port was covered by metal.	SKY85743	264.82mm x 156.11mm x 54.97mm		
SKU 3	RJ-45 port was covered by metal.	SKY85743	265.00mm x 158.39mm x 54.99mm		
SKU 4	RJ-45 port was covered by metal.	SKY85743	275.50mm x 170.40mm x 65.00mm		
SKU 5	RJ-45 port was covered by plastic.	QPF4516B	223.62mm x 129.48mm x 32.9mm		

Note1: The SKU 3 is same as SKU 2 except for the logo of housing size and antenna appearance.

Note2: The SKU 4 is same as SKU 2 except for the logo of housing size, antenna appearance and design of light board.

Note3: The EUT 5 is same as SKU 1 except for 5G PA.

1.4 Table for EUT supports functions

Function	Support Type
AP Router	Master
Bridge	Slave without radar detection
Repeater	Master
Mesh	Master



1.5 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA952922-01

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

Modifications	Performance Checking
1. Adding 5GHz band 3 (5470~5725 MHz) for this device.	Maximum Permissible Exposure
2. Adding Dynamic In-Service Monitoring Test (Zero-Wait CAC) of 160MHz.	It is not necessary to re-test.
3. Adding three adapters (adapter 3~adapter 5).	
4. Adding the SKU 3, SKU 4 and SKU 5 (Refer to section 1.3 for detail information)	
5. Adding Mesh function.	
6. Adding model name: RT-AX3000, RT-AX5400, TUF-AX3000 (Refer to section 1.2 for detail information)	
7. Adding equipment name: Dual Band Wi-Fi Router (Refer to section 1.2 for detail information)	
8. Changing the applicant address to "1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan" from "4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan".	

Note: Other test results were based on original test report.

1.6 Testing Location

Testing Location		
☐	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
☒	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 ²)	Averaging Time E ² , H ² 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 ²)	Averaging Time E ² , H ² 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:

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

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

<SKU 1>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	4.68	29.95	34.63	0.50	35.13	3.25837	24	0.45016	1.00000
5.2G;D1D	7.86	28.12	35.98	0.01	35.99	3.97192	24	0.54874	1.00000
5.3G;D1D	7.91	22.05	29.96	0.03	29.99	0.99770	24	0.13784	1.00000
5.6G;D1D	7.90	22.07	29.97	0.02	29.99	0.99770	24	0.13783	1.00000
5.8G;D1D	7.87	28.06	35.93	0.06	35.99	3.97192	24	0.54874	1.00000

<SKU 5>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
5.2G;D1D	7.86	28.06	35.92	0.07	35.99	3.97192	24	0.54874	1.00000
5.3G;D1D	7.91	21.96	29.87	0.12	29.99	0.99770	24	0.13784	1.00000
5.6G;D1D	7.90	22.05	29.95	0.04	29.99	0.99770	24	0.13784	1.00000
5.8G;D1D	7.87	28.12	35.99	-0.00	35.99	3.97192	24	0.54874	1.00000

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

<SKU 1>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	4.68	29.95	34.63	0.50	35.13	3.25837	24	0.45016	1.00000	0.45016
5.2G;D1D	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

<SKU 5>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	4.68	29.95	34.63	0.50	35.13	3.25837	24	0.45016	1.00000	0.45016
5.8G;D1D	7.87	28.12	35.99	0.00	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—