



# RADIO EXPOSURE TEST REPORT

**FCC ID** : MSQ-RTBE6G00  
**Equipment** : BE19000 Tri-band WiFi Router  
**Brand Name** : ASUS  
**Model Name** : RT-BE96U  
**Applicant** : ASUSTeK COMPUTER INC.  
1F., No. 15, Lide Rd., Beitou, Taipei City 112, Taiwan  
**Standard** : 47 CFR Part 2.1091

The product was received on Dec. 26, 2022, and testing was started from Dec. 26, 2022 and completed on Jun. 01, 2023. We, Sporton International Inc. Hsinchu 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 test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

**Sporton International Inc. Hsinchu Laboratory**

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<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	-

**Conformity Assessment Condition:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Sam Chen**

**Report Producer: Sandy Chuang**



# 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) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
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) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
6GHz WLAN	5925-7125	5955-7095	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)



## 1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 6GHz	WLAN 2.4GHz	WLAN 5GHz					
1	1	-	-	WHA Yu	C660-510587-A	Dipole Antenna	I-PEX	Note 1
2	2	-	-	WHA Yu	C660-510588-A	Dipole Antenna	I-PEX	
3	3	-	-	WHA Yu	C660-510589-A	Dipole Antenna	I-PEX	
4	4	-	-	WHA Yu	C660-510590-A	Dipole Antenna	I-PEX	
5	-	1	1	WHA Yu	C660-510591-A	Dipole Antenna	I-PEX	
6	-	4	4	WHA Yu	C660-510592-A	Dipole Antenna	I-PEX	
7	-	3	3	WHA Yu	C660-510593-A	Dipole Antenna	I-PEX	
8	-	2	2	WHA Yu	C660-510594-A	Dipole Antenna	I-PEX	

Note 1

Ant.	Antenna Gain (dBi)					
	WLAN 2.4GHz	WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3	WLAN 6GHz
1	-	-	-	-	-	2.44
2	-	-	-	-	-	2.39
3	-	-	-	-	-	2.44
4	-	-	-	-	-	2.43
5	2.09	1.52	1.17	1.98	1.08	-
6	1.84	2.29	2.9	3.09	2.51	-
7	2.91	2.7	3.04	2.48	3.39	-
8	2.14	1.21	1.19	3.23	1.87	-

Item	Directional gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz			
		WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3
4T1S	5.99	4.72	5.97	5.72	5.64
4T2S	2.99	2.7	3.04	3.23	3.39
4T4S	2.91	2.7	3.04	3.23	3.39

Note 2: The above information (except antenna 5~8 gain and directional gain) was declared by manufacturer.

Note 3: For 2.4GHz/5GHz, the antenna gain and directional gain are measured which follow the procedure of KDB 662911 D03.



**Note 4: For 2.4GHz function:**

**For IEEE 802.11 b/g/n/VHT/ax/be (4TX/4RX):**

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

**For 5GHz function:**

**For IEEE 802.11a/n/ac/ax/be (4TX/4RX):**

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

**For 6GHz function:**

**For IEEE 802.11ax/be mode (4TX/4RX):**

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

### 1.3 Accessories

Power	Brand	Model	Rating	Remark
Adapter 1	DELTA	ADP-65DE B	INPUT: 100-240V~1.5A, 50-60Hz OUTPUT: 19.0V, 3.42A, 65.0W	With the DC cable: Non-shielded, 1.5m
Adapter 2	DELTA	ADP-65DE B	INPUT: 100-240V~1.5A, 50-60Hz OUTPUT: 19.0V, 3.42A, 65.0W	With the DC cable: Non-shielded, 1.5m
Adapter 3	AcBel	ADD011	INPUT: 100-240V~ 1.7A, 50-60Hz OUTPUT: +19.5V, 3.33A, 65.0W MAX.	With the DC cable: Non-shielded, 1.5m
Adapter 4	AcBel	ADD011	INPUT: 100-240V~ 1.7A, 50-60Hz OUTPUT: +19.5V, 3.33A, 65.0W MAX.	With the DC cable: Non-shielded, 1.5m
<b>Others</b>				
RJ-45 cable 1*1: Shielded, 1.5m				
RJ-45 cable 2*1: Shielded, 1.5m				
Power cord*1: Non-shielded, 0.9m				

Note: Refer to photographs of EUT for the detail information of difference between Adapter 1 & Adapter 2 and Adapter 3 & Adapter 4.

### 1.4 Table for EUT supports functions

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

Note: The above information was declared by manufacturer.



1.5 Table for Radio function

Table with 3 columns: Radio 1 (WLAN 2.4GHz), Radio 2 (WLAN 5GHz UNII 1~3), Radio 3 (WLAN 6GHz UNII 5~8)

Note: The above information was declared by manufacturer.

1.6 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA262427-01.

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

Table with 2 columns: Modifications, Performance Checking. Contains 4 rows of modification details and their corresponding performance checking results.

Note: All the test results were based on original report.

1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2.1091
KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- 47 CFR Part 1.1307
47 CFR Part 1.1310

1.8 Testing Location

Table titled 'Testing Location Information' containing details about the test lab (Sporton International Inc. Hsinchu Laboratory), address, contact info, and test site designation.





## 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 <sup>2</sup> )	<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 <sup>2</sup> )	<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 53 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 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= Pth.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

*d* = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance

R between the person and the antenna / radiating structure, where  $R > \lambda / 2 \pi$ .

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R <sup>2</sup> .
1.34-30	3,450 R <sup>2</sup> /f <sup>2</sup> .
30-300	3.83 R <sup>2</sup> .
300-1,500	0.0128 R <sup>2</sup> f.
1,500-100,000	19.2R <sup>2</sup> .

Note: R is in meters, f is in MHz.



### 2.4 Calculated Result and Limit

#### Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm2)	S Limit (mW/cm2)	Option	TL EIRP (dBm)	TL Ratio
2.4G;D1D	5.99	28.72	34.71	0.50	35.21	53	0.09402	1.00000	C	39.467	0.3752
5.2G;D1D	4.72	29.98	34.70	0.50	35.20	53	0.09381	1.00000	C	39.467	0.3744
5.3G;D1D	5.97	23.95	29.92	0.07	29.99	53	0.02826	1.00000	C	39.467	0.1128
5.6G;D1D	5.72	23.93	29.65	0.34	29.99	53	0.02826	1.00000	C	39.467	0.1128
5.8G;D1D	5.64	29.97	35.61	0.38	35.99	53	0.11252	1.00000	C	39.467	0.4491
6.2G;D1D	8.45	-	27.32	0.50	27.82	53	0.01715	1.00000	C	39.467	0.0684
6.4G;D1D	8.45	-	26.85	0.50	27.35	53	0.01539	1.00000	C	39.467	0.0614
6.7G;D1D	5.44	-	26.80	0.50	27.30	53	0.01521	1.00000	C	39.467	0.0607
7.0G;D1D	5.44	-	25.37	0.50	25.87	53	0.01095	1.00000	C	39.467	0.0437

#### Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm2)	Limit (mW/cm2)	Option	TL EIRP (dBm)	TL Ratio
2.4G;D1D	5.99	28.72	34.71	0.50	35.21	53	0.09402	1.00000	C	39.467	0.3752
5.8G;D1D	5.64	29.97	35.61	0.38	35.99	53	0.11252	1.00000	C	39.467	0.4491
6.2G;D1D	8.45	-	27.32	0.50	27.82	53	0.01715	1.00000	C	39.467	0.0684
Sum TL Ratio_C	0.8927										
Ratio Limit	1										

Note: The above antenna gain was declared by manufacturer.

————THE END————