



RADIO EXPOSURE TEST REPORT

FCC ID : MSQ-RTBE7L00
Equipment : ASUS RT-BE92U BE9700 Tri-band WiFi7 Router
Brand Name : ASUS
Model Name : RT-BE92U,RT-BE9700
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 Apr. 22, 2024, and testing was started from Apr. 22, 2024 and completed on Jul. 04, 2024. 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 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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Photographs of EUT v01



History of this test report

Report No.	Version	Description	Issued Date
FA442307	01	Initial issue of report	Jul. 11, 2024



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:

1. 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.
2. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.

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 5260-5320 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	802.11a: use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation. 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)
	2.4GHz	5GHz	6GHz					
1	3	1	-	WHA Yu	C660-510630-A	Dipole Antenna	I-PEX	Note1
2	2	2	-	WHA Yu	C660-510631-A	Dipole Antenna	I-PEX	
3	1	-	-	WHA Yu	C660-510634-A	Dipole Antenna	I-PEX	
4	-	-	1	WHA Yu	C660-510632-A	Dipole Antenna	I-PEX	
5	-	-	2	WHA Yu	C660-510633-A	Dipole Antenna	I-PEX	

Note 1:

Antenna Configuration 1 for 2.4GHz/5GHz: External antenna vertical, internal antenna fixed (hor.)

Freq(Hz)	2.4G	2.45G	2.4835G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	1.72	2.46	2.64	2.41	2.6	3.29	3.78
Ant. 2 Max Gain (dBi)	1.23	1.94	2.33	3.22	2.75	3.82	4.45
Ant. 3 Max Gain (dBi)	3.78	2.99	3.12	-	-	-	-
DG [1SS] (dBi)	4.34	5.07	5.05	4.64	5.15	6.08	6.46
DG [2SS] (dBi)	3.78	2.99	3.12	3.22	2.75	3.82	4.45
DG [3SS] (dBi)	3.78	2.99	3.12	-	-	-	-

Antenna Configuration 2 for 2.4GHz/5GHz: External antenna horizontal, internal antenna fixed (hor.)

Freq(Hz)	2.4G	2.45G	2.4835G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.03	1.52	1.93	1.97	1.6	1.89	1.9
Ant. 2 Max Gain (dBi)	-0.27	0.76	0.49	2.99	3.18	3.61	4.04
Ant. 3 Max Gain (dBi)	3.78	2.99	3.12	-	-	-	-
DG [1SS] (dBi)	3.78	4	4.08	2.99	3.18	3.88	4.04
DG [2SS] (dBi)	3.78	2.99	3.12	2.99	3.18	3.61	4.04
DG [3SS] (dBi)	3.78	2.99	3.12	-	-	-	-

For RF conducted test: Selected the highest gain to test from each band of antenna configuration.

Ant.	Port	Antenna Gain (dBi)
	WLAN 6GHz	WLAN 6GHz
4	1	3.0
5	2	3.2

Note 2: The above information (excepting antenna 1~3 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 6GHz Directional gain information

Type	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for N ANT ≤ 4	$Directional\ IGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$
BF	$Directional\ IGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$	$Directional\ IGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

Ex.

Directional Gain (NSS1) fomula :

$$Directional\ IGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

$$NSS1(g1,1) = 10^{G1/20} ; NSS1(g1,2)= 10^{G2/20} ; NSS1(g1,2)= 10^{G3/20}; NSS1(g1,2)= 10^{G4/20}$$

$$g_{j,k} = (Nss1(g1,1) + Nss1(g1,2) + Nss1(g1,3) + Nss1(g1,4))^2$$

$$DG = 10 \log[(Nss1(g1,1) + Nss1(g1,2) + Nss1(g1,3) + Nss1(g1,4))^2 / N_{ANT}] => 10$$

$$\log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / N_{ANT}]$$

Where ;

6E UNII-5 G1 = 3.00 dBi; G2 = 3.20 dBi;

6E UNII-6 G1 = 3.00 dBi; G2 = 3.20 dBi;

6E UNII-7 G1 = 3.00 dBi; G2 = 3.20 dBi;

6E UNII-8 G1 = 3.00 dBi; G2 = 3.20 dBi;

6E UNII-5 DG = 6.11 dBi

6E UNII-6C DG = 6.11 dBi

6E UNII-7 DG = 6.11 dBi

6E UNII-8 DG = 6.11 dBi



Note 5:

For 2.4GHz function:

For IEEE 802.11b/g/n/VHT/ax/be (3TX/3RX):

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

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

For 5GHz function:

For IEEE 802.11a/n/ac/ax/be (2TX/2RX):

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

Port 1 and Port 2 could transmit/receive simultaneously.

For 6GHz function:

For IEEE 802.11a/ax/be (2TX/2RX):

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

Port 1 and Port 2 could transmit/receive simultaneously.

1.3 Table for Multiple Listing

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

Model Name	Description
RT-BE92U	All the models are identical, the different models served as a marketing strategy.
RT-BE9700	

Note 1: From the above models, model: RT-BE92U was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.4 Table for EUT Supports Functions

Function	Support Type	Support Band
AP Router	Master	2.4GHz/5GHz/6GHz
Bridge	Slave without Radar	2.4GHz/5GHz
Extender	Master	2.4GHz/5GHz/6GHz
Mesh	Master	2.4GHz/5GHz/6GHz

Note 1: The USB port on this device supports both storage and WWAN functionality.

Note 2: The above information was declared by manufacturer.



1.5 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	LEI	MU36D1120300-A1	Input: 100-240V ~ 50/60Hz, 1.0A Output: 12V, 3A
Other			
RJ-45 cable*1, Shielded, 1.5m			

1.6 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

1.7 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
Test site Designation No. TW3787 with FCC.	
Conformity Assessment Body Identifier (CABID) TW3787 with ISED.	



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 ²)	<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 ²)	<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 ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .

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



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode 1: EUT + WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	5.07	29.57	32.49	0.50	1990.673	53	C	5393.3	0.3692
5.2G;D1D	4.64	29.32	31.81	0.50	1702.159	53	C	5393.3	0.3157
5.3G;D1D	5.15	23.94	26.94	0.50	554.626	53	C	5393.3	0.1029
5.6G;D1D	6.08	23.88	27.81	0.03	608.135	53	C	5393.3	0.1128
5.8G;D1D	6.46	29.26	33.57	0.27	2421.029	53	C	5393.3	0.4491
6.2G;D1D	6.11	23.22	27.18	0.50	586.138	53	C	5393.3	0.1087
6.4G;D1D	6.11	23.21	27.17	0.50	584.790	53	C	5393.3	0.1085
6.7G;D1D	6.11	23.30	27.26	0.50	597.035	53	C	5393.3	0.1107
7.0G;D1D	6.11	21.74	25.70	0.50	416.869	53	C	5393.3	0.0773

Simultaneous Transmission Analysis

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	5.07	29.57	32.49	0.50	1990.673	53	C	5393.3	0.3692
5.8G;D1D	6.46	29.26	33.57	0.27	2421.029	53	C	5393.3	0.4491
6.7G;D1D	6.11	23.30	27.26	0.50	597.035	53	C	5393.3	0.1107
Sum TL Ratio_C	0.929								
Ratio Limit	1								



Mode 2: EUT + WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + WWAN

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	5.07	29.57	32.49	0.50	1990.673	53	C	5393.3	0.3692
5.2G;D1D	4.64	29.32	31.81	0.50	1702.159	53	C	5393.3	0.3157
5.3G;D1D	5.15	23.94	26.94	0.50	554.626	53	C	5393.3	0.1029
5.6G;D1D	6.08	23.88	27.81	0.03	608.135	53	C	5393.3	0.1128
5.8G;D1D	6.46	29.26	33.57	0.27	2421.029	53	C	5393.3	0.4491
6.2G;D1D	6.11	23.22	27.18	0.50	586.138	53	C	5393.3	0.1087
6.4G;D1D	6.11	23.21	27.17	0.50	584.790	53	C	5393.3	0.1085
6.7G;D1D	6.11	23.30	27.26	0.50	597.035	53	C	5393.3	0.1107
7.0G;D1D	6.11	21.74	25.70	0.50	416.869	53	C	5393.3	0.0773
Band12;G7D	0.00	24.00	21.85	0.50	171.791	53	C	2513.3	0.0684

Simultaneous Transmission Analysis

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	5.07	29.57	32.49	0.50	1990.673	53	C	5393.3	0.3692
5.8G;D1D	6.46	29.26	33.57	0.27	2421.029	53	C	5393.3	0.4491
6.7G;D1D	6.11	23.30	27.26	0.50	597.035	53	C	5393.3	0.1107
Band12;G7D	0.00	24.00	21.85	0.50	171.791	53	C	2513.3	0.0684
Sum TL Ratio_C	0.9974								
Ratio Limit	1								

—THE END—