



RADIO EXPOSURE TEST REPORT

FCC ID : MSQ-RTBE7800
Equipment : BE18000 Tri Band WiFi Router
Brand Name : ASUS
Model Name : BT10, BE18000
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 Feb. 22, 2024, and testing was started from Mar. 04, 2024 and completed on May 11, 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

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
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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/manufacturee 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: Wendy Pan**



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	802.11a: 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	2	2	-	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	Note1
2	1	1	-	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	
3	-	4	-	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	
4	-	3	-	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	
5	-	-	1	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	
6	-	-	4	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	
7	-	-	3	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	
8	-	-	2	PSA	RFDPA230512IMAB903	Dipole Antenna	I-PEX	

Note1:

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.39	3.69	3.93	3.99	3.59
Ant. 2 Max Gain (dBi)	2.55	2.22	2.55	3.84	3.38
Ant. 3 Max Gain (dBi)	N/A	3.16	2.79	3.72	2.47
Ant. 4 Max Gain (dBi)	N/A	2.53	2.56	2.33	3.71
DG [1SS] (dBi)	4.86	5.7	6.12	7.72	7.52
DG [2SS] (dBi)	2.55	3.69	3.93	4.72	4.52
DG [4SS] (dBi)	N/A	3.69	3.93	3.99	3.71

Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 5 Max Gain (dBi)	3.42	2.5	2.46	2.81
Ant. 6 Max Gain (dBi)	3.07	2.65	2.57	2.83
Ant. 7 Max Gain (dBi)	3.47	3.58	2.44	3.53
Ant. 8 Max Gain (dBi)	3.85	3.26	3.95	3.38
DG [1SS] (dBi)	5.33	4.88	5.77	5.89
DG [2SS] (dBi)	3.85	3.58	3.95	3.53
DG [4SS] (dBi)	3.85	3.58	3.95	3.53



Note 2: The above information (excepting antenna gain and directional gain) was declared by manufacturer.

For 2.4GHz function:

For IEEE 802.11b/g/n/VHT/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 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 802.11a/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.

1.3 Table for Multiple Listing

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

Brand Name	Model Name	Description
ASUS	BT10	All the models are identical, the different models served as a marketing strategy.
	BE18000	

Note 1: From the above models, model: BT10 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
AP Router
Mesh

Note 1: The USB port on this device supports both storage and WWAN functionality and EUT in WWAN mode, 10G WNA/LAN 2 ports will be fixed in WAN function.

Note 2: The above information was declared by manufacturer.

1.4.1 Table for EUT Information

EUT	Integrated circuit packaging (Location: UP1/BUP7)
1	FCFBGA Package
2	FCBGA Package

Note 1: From the above, EUT 2 was selected to test all items.

Note 2: The above information was declared by manufacturer.



1.5 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter 1	LEI	MU36D1120300-A1	Input: 100-240V~50/60Hz, 1.0A Output: 12V, 3A
Adapter 2	APD	WA-36N12FU	Input: 100-240V~, 50-60Hz, 0.9A Max Output: 12.0V, 3.0A
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 ISCED.



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 50 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 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	$19.2 R^2$.
Note: R is in meters, f is in MHz.	



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode 1: 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	4.86	27.82	30.53	0.50	1267.652	50	C	4800.0	0.2642
5.2G;D1D	5.70	29.89	33.44	0.40	2421.029	50	C	4800.0	0.5046
5.3G;D1D	6.12	23.83	27.80	0.04	608.135	50	C	4800.0	0.1267
5.6G;D1D	7.72	22.24	27.81	0.03	608.135	50	C	4800.0	0.1267
5.8G;D1D	7.52	28.46	33.83	0.01	2421.029	50	C	4800.0	0.5046
6.2G;D1D	5.33	24.65	27.83	0.01	608.135	50	C	4800.0	0.1267
6.4G;D1D	4.88	22.58	25.31	0.50	381.066	50	C	4800.0	0.0794
6.7G;D1D	3.95	25.98	27.78	0.06	608.135	50	C	4800.0	0.1267
7.0G;D1D	5.89	21.68	25.42	0.50	390.841	50	C	4800.0	0.0815

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	4.86	27.82	30.53	0.50	1267.652	50	C	4800.0	0.2642
5.8G;D1D	7.52	28.46	33.83	0.01	2421.029	50	C	4800.0	0.5046
6.2G;D1D	5.33	24.65	27.83	0.01	608.135	50	C	4800.0	0.1267
Sum TL Ratio_C	0.8955								
Ratio Limit	1								

**Mode 2: 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	4.86	27.82	30.53	0.50	1267.652	50	C	4800.0	0.2642
5.2G;D1D	5.70	29.89	33.44	0.40	2421.029	50	C	4800.0	0.5046
5.3G;D1D	6.12	23.83	27.80	0.04	608.135	50	C	4800.0	0.1267
5.6G;D1D	7.72	22.24	27.81	0.03	608.135	50	C	4800.0	0.1267
5.8G;D1D	7.52	28.46	33.83	0.01	2421.029	50	C	4800.0	0.5046
6.2G;D1D	5.33	24.65	27.83	0.01	608.135	50	C	4800.0	0.1267
6.4G;D1D	4.88	22.58	25.31	0.50	381.066	50	C	4800.0	0.0794
6.7G;D1D	3.95	25.98	27.78	0.06	608.135	50	C	4800.0	0.1267
7.0G;D1D	5.89	21.68	25.42	0.50	390.841	50	C	4800.0	0.0815
Band26;G7D	0.00	24.00	21.85	0.50	171.791	50	C	2236.8	0.0768

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	4.86	27.82	30.53	0.50	1267.652	50	C	4800.0	0.2642
5.8G;D1D	7.52	28.46	33.83	0.01	2421.029	50	C	4800.0	0.5046
6.2G;D1D	5.33	24.65	27.83	0.01	608.135	50	C	4800.0	0.1267
Band12;G7D	0.00	24.00	21.85	0.50	171.791	50	C	2236.8	0.0768
Sum TL Ratio_C	0.9723								
Ratio Limit	1								

————THE END————