



# 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**

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## History of this test report

[illegible]



## 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: 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)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)<br>802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM) |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5250<br>5250-5320<br>5500-5720<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)<br>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.<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)<br>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<br>(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<br>Output: 12V, 3A           |
| Adapter 2                     | APD        | WA-36N12FU      | Input: 100-240V~, 50-60Hz, 0.9A Max<br>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 <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 50 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**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   |
| Band12;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————