# FCC RADIO EXPOSURE TEST REPORT

| | | |
|---|---|---|
| FCC ID | : | MSQ-RTAXHP00 |
| Equipment | : | Wireless-AX6000 Dual Band Gigabit Router |
| Brand Name | : | ASUS |
| Model Name | : | RT-AX88U, RT-AX6000, RT-AX88P, RT-AX88R, RT-AX88A |
| Applicant | : | ASUSTeK COMPUTER INC.<br>4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan |
| Manufacturer (1) | : | Compal Networking (KunShan) Co., LTD.<br>No. 520, Nanbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China |
| Manufacturer (2) | : | ASKEY TECHNOLOGY (JIANG SU) LTD<br>NO1388, Jiao Tong Road, Wujiang Economic Technological Development Area Jiangsu Province 215200 China |
| Standard | : | 47 CFR Part 2.1091 |

The product was received on Dec. 18, 2017, and testing was started from Feb. 21, 2018 and completed on Jun. 11, 2018. 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*
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# History of this test report

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| FA780707-03 | 01 | Initial issue of report | Aug. 08, 2018 |
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# Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---|---|---|---|---|
| 2 | - | Exposure evaluation | PASS | - |

**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)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac/ax: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |
| 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/ax: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |

## 1.2 Table for Multiple Listing

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

| Model Name | Description |
|---|---|
| RT-AX88U | All the models are identical, the different model names served as marketing strategy. |
| RT-AX6000 | |
| RT-AX88P | |
| RT-AX88R | |
| RT-AX88A | |

From the above models, model: RT-AX88U was selected as representative model for the test and its data was recorded in this report.

## 1.3 Table for SKU information

| EUT No. | SKU No. / Brand Name | P/N |
|---|---|---|
| 1 | SKU 1 / SWAPnet | NS604804 |
| 2 | SKU 2 / Mingtek | HN4821CG |

## 1.4 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA780707-01

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

| Modifications | Description |
|---|---|
| 1. Updating some power settings of 160MHz in ac mode.<br>2. Adding the bandwidth 160MHz for 5GHz ax mode (Thus change the firmware version). | Re-evaluated Maximum Permissible Exposure of 160MHz in ac Mode and in ax Mode |
| 3. Adding the function of Zero Wait for bandwidth 20/40/80 in DFS band.<br>4. Adding the bridge mode.<br>5. Adding the extender mode.<br>6. Adding the home mesh mode. | It's no need to re-test. |

Note: Other test mode of test results are based on original report.

## 1.5 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/ cm²) | 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/ cm²) | 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 26 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

**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**

| 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;G1D | 1.94 | 29.92 | 31.86 | 0.50 | 32.36 | 1.72187 | 26 | 0.20270 | 1.00000 |
| 2.4G;D1D (BF Mode) | 7.96 | 28.00 | 35.96 | 0.04 | 36.00 | 3.98107 | 26 | 0.46888 | 1.00000 |
| 5.2G;D1D | 8.35 | 27.63 | 35.98 | 0.02 | 36.00 | 3.98107 | 26 | 0.46888 | 1.00000 |
| 5.3G;D1D | 8.35 | 21.61 | 29.96 | 0.04 | 30.00 | 1.00000 | 26 | 0.11772 | 1.00000 |
| 5.6G;D1D | 8.37 | 21.59 | 29.96 | 0.04 | 30.00 | 1.00000 | 26 | 0.11772 | 1.00000 |
| 5.8G;D1D | 7.96 | 28.01 | 35.97 | 0.03 | 36.00 | 3.98107 | 26 | 0.46888 | 1.00000 |
| 5.2G;D1D (AX 160 Mode) | 8.35 | 21.29 | 29.64 | 0.50 | 30.14 | 1.03276 | 20 | 0.20546 | 1.00000 |
| 5.3G;D1D (AX 160 Mode) | 8.35 | 20.71 | 29.06 | 0.50 | 29.56 | 0.90365 | 20 | 0.17978 | 1.00000 |
| 5.6G;D1D (AX 160 Mode) | 8.37 | 21.60 | 29.97 | 0.02 | 29.99 | 0.99770 | 20 | 0.19849 | 1.00000 |

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

| 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;G1D | 7.96 | 28.00 | 35.96 | 0.04 | 36.00 | 3.98107 | 26 | 0.46888 | 1.00000 | 0.46888 |
| 5.2G;D1D | 8.35 | 27.63 | 35.98 | 0.02 | 36.00 | 3.98107 | 26 | 0.46888 | 1.00000 | 0.46888 |
| | | | | | | | | | Sum Ratio | 0.93776 |
| | | | | | | | | | Ratio Limit | 1 |

———THE END———