# FCC Test Report

| | |
|---|---|
| Product Name | TUF Gaming H3 Wireless dongle |
| Model No. | TUF GAMING H3 WIRELESS DONGLE |
| FCC ID | BJM-TUFH3WLD |

| | |
|---|---|
| Applicant | Tatung Company |
| Address | 22 Chungshan N Road Sec 3 ,Taipei 10451,Taiwan |

| | |
|---|---|
| Date of Receipt | Oct. 05, 2020 |
| Issued Date | Nov. 20, 2020 |
| Report No. | 20A0023R-E3032110120 |
| Report Version | V1.0 |

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
This report must not be used to claim product endorsement by TAF or any agency of the government.
The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

# Test Report

Issued Date: Nov. 20, 2020
Report No.: 20A0023R-E3032110120

| | |
|---|---|
| Product Name | TUF Gaming H3 Wireless dongle |
| Applicant | Tatung Company |
| Address | 22 Chungshan N Road Sec 3 ,Taipei 10451,Taiwan |
| Manufacturer | Tatung Company |
| Model No. | TUF GAMING H3 WIRELESS DONGLE |
| FCC ID | BJM-TUFH3WLD |
| EUT Rated Voltage | DC 5V (Power by USB) |
| EUT Test Voltage | DC 5V (Power by USB) |
| Trade Name | ASUS |
| Applicable Standard | FCC CFR Title 47 Part 15 Subpart C<br>ANSI C63.4: 2014, ANSI C63.10: 2013 |
| Test Result | Complied |

Documented By : Ida Tung
( Adm. Specialist / Ida Tung )

Tested By : Ivan Chuang
( Senior Engineer / Ivan Chuang )

Approved By :
( Director / Vincent Lin )

# TABLE OF CONTENTS

# Revision History

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| 20A0023R-E3032110120 | V1.0 | Initial issue of report. | 2020-11-20 |

# 1. GENERAL INFORMATION

## 1.1. EUT Description

| | |
|---|---|
| Product Name | TUF Gaming H3 Wireless dongle |
| Trade Name | ASUS |
| Model No. | TUF GAMING H3 WIRELESS DONGLE |
| FCC ID | BJM-TUFH3WLD |
| Frequency Range | 2405.35-2477.35MHz |
| Channel Number | 37CH |
| Type of Modulation | Pi/4 DQPSK |
| Antenna Type | Chip Antenna |
| Antenna Gain | Refer to the table “Antenna List” |
| Channel Control | Auto |
| USB to Type-C Cable | MFR: ASUS, M/N: TUF GAMING H3 WIRELESS, Shielded, 1m |
| Connecter | MFR: ASUS, M/N: TUF GAMING H3 WIRELESS |

**Antenna List**

| No. | Manufacturer | Part No. | Antenna Type | Peak Gain |
|---|---|---|---|---|
| 1 | Advanced Ceramic X Corp. | AT3216-B2R7HAA_ | Chip Antenna | 0.5dBi for 2.4GHz |

Note: The antenna of EUT is conform to FCC 15.203

**Center Frequency of Each Channel:**

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| Channel 01: | 2405.35 MHz | Channel 21: | 2445.35 MHz |
| Channel 02: | 2407.35 MHz | Channel 22: | 2447.35 MHz |
| Channel 03: | 2409.35 MHz | Channel 23: | 2449.35 MHz |
| Channel 04: | 2411.35 MHz | Channel 24: | 2451.35 MHz |
| Channel 05: | 2413.35 MHz | Channel 25: | 2453.35 MHz |
| Channel 06: | 2415.35 MHz | Channel 26: | 2455.35 MHz |
| Channel 07: | 2417.35 MHz | Channel 27: | 2457.35 MHz |
| Channel 08: | 2419.35 MHz | Channel 28: | 2459.35 MHz |
| Channel 09: | 2421.35 MHz | Channel 29: | 2461.35 MHz |
| Channel 10: | 2423.35 MHz | Channel 30: | 2463.35 MHz |
| Channel 11: | 2425.35 MHz | Channel 31: | 2465.35 MHz |
| Channel 12: | 2427.35 MHz | Channel 32: | 2467.35 MHz |
| Channel 13: | 2429.35 MHz | Channel 33: | 2469.35 MHz |
| Channel 14: | 2431.35 MHz | Channel 34: | 2471.35 MHz |
| Channel 15: | 2433.35 MHz | Channel 35: | 2473.35 MHz |
| Channel 16: | 2435.35 MHz | Channel 36: | 2475.35 MHz |
| Channel 17: | 2437.35 MHz | Channel 37: | 2477.35 MHz |
| Channel 18: | 2439.35 MHz | | |
| Channel 19: | 2441.35 MHz | | |
| Channel 20: | 2443.35 MHz | | |

Note:

1. The EUT is a TUF Gaming H3 Wireless dongle with a built-in 2.4GHz wireless transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance of transmitter with Part 15 Subpart C Paragraph 15.249 for spread spectrum devices.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

| | |
|---|---|
| Test Mode | Mode 1: Transmit<br>Mode 2: Normal mode |

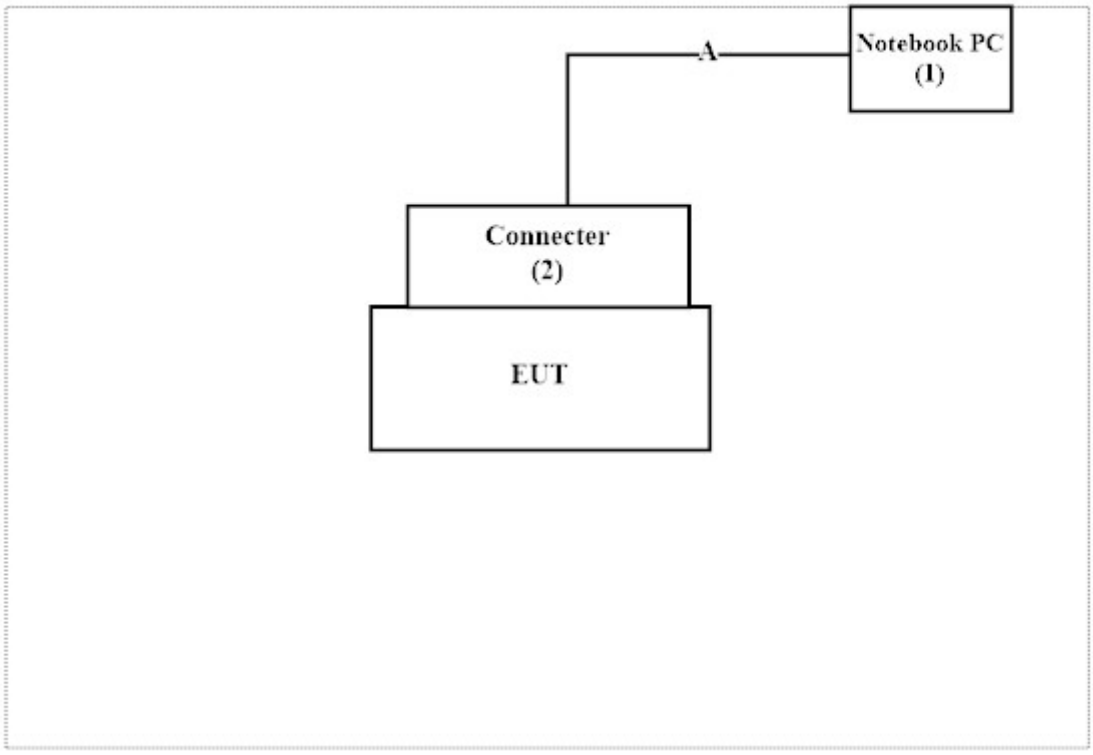
## 1.2. Tested System Datails

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

| Product | | Manufacturer | Model No. | Serial No. | Power Cord |
|---|---|---|---|---|---|
| 1 | Notebook PC | DELL | Inspiron 15 3000 | 4V5JPJ2 | N/A |
| 2 | Connecter | ASUS | TUF GAMING H3 WIRELESS | N/A | N/A |

| Signal Cable Type | | Signal cable Description |
|---|---|---|
| A | USB Cable | Shielded, 1.8m |

## 1.3. Configuration of Test System




## 1.4. EUT Exercise Software

(1) Setup the EUT as shown in Section 1.3.

(2) Execute “RF Power V2018.5.18.1” program on the Notebook PC.

(3) Configure the test mode and the test channel

(4) Start the continuous transmit.

(5) Verify that the EUT works properly.

## 1.5. Test Facility

Ambient conditions in the laboratory:

| Performed Item | Items | Required | Actual |
|---|---|---|---|
| Conducted Emission | Temperature (°C) | 10~40 °C | 23.4 °C |
| | Humidity (%RH) | 10~90 % | 56.9 % |
| Radiated Emission | Temperature (°C) | 10~40 °C | 23.5 °C |
| | Humidity (%RH) | 10~90 % | 65.5 % |
| Conductive | Temperature (°C) | 10~40 °C | 23.2 °C |
| | Humidity (%RH) | 10~90 % | 56.0 % |

**USA : FCC Registration Number: TW0023**

**Canada : IC Registration Number: 25880**

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No.159, Sec. 2, Wenhua 1st Rd., Linkou Dist.,
New Taipei City 24457, Taiwan, R.O.C.
Phone number : 886-2-2602-7968
Fax number : 866-2-2602-3286
Email address : info.tw@dekra.com
Website : http://www.dekra.com.tw

## 1.6. List of Test Equipment

**For Conduction measurements /ASR1**

| | Equipment | Manufacturer | Model No. | Serial No. | Cali. Data | Due. Data |
|---|---|---|---|---|---|---|
| X | EMI Test Receiver | R&S | ESR7 | 101601 | 2020.05.28 | 2021.05.27 |
| X | Two-Line V-Network | R&S | ENV216 | 101306 | 2020.03.25 | 2021.03.24 |
| X | Two-Line V-Network | R&S | ENV216 | 101307 | 2020.04.17 | 2021.04.16 |
| X | Coaxial Cable | DEKRA | RG400_BNC | RF001 | 2020.05.24 | 2021.05.23 |

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0

**For Conducted measurements /ASR2**

| | Equipment | Manufacturer | Model No. | Serial No. | Cali. Data | Due. Data |
|---|---|---|---|---|---|---|
| X | Spectrum Analyzer | R&S | FSV30 | 103466 | 2019.12.16 | 2020.12.15 |
| | Peak Power Analyzer | KEYSIGHT | 8900B | MY51000539 | 2020.05.13 | 2021.05.12 |
| | Power Sensor | KEYSIGHT | N1923A | MY59240002 | 2020.05.22 | 2021.05.21 |
| | Power Sensor | KEYSIGHT | N1923A | MY59240003 | 2020.05.22 | 2021.05.21 |

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test System V9.0.5

**For Radiated measurements /ACB1**

| | Equipment | Manufacturer | Model No. | Serial No. | Cali. Data | Due. Data |
|---|---|---|---|---|---|---|
| X | Loop Antenna | AMETEK | HLA6121 | 49611 | 2020.03.16 | 2021.03.15 |
| X | Bi-Log Antenna | SCHWARZBECK | VULB9168 | 9168-953 | 2020.01.03 | 2021.01.02 |
| X | Horn Antenna | ETS-Lindgren | 3117 | 00203800 | 2019.12.12 | 2020.12.11 |
| X | Horn Antenna | Com-Power | AH-840 | 101087 | 2020.06.08 | 2021.06.07 |
| X | Pre-Amplifier | EMCI | EMC001330 | 980316 | 2020.06.23 | 2021.06.22 |
| X | Pre-Amplifier | EMCI | EMC051835SE | 980311 | 2020.06.23 | 2021.06.22 |
| X | Pre-Amplifier | EMCI | EMC05820SE | 980310 | 2020.06.24 | 2021.06.23 |
| X | Pre-Amplifier | EMCI | EMC184045SE | 980314 | 2020.06.10 | 2021.06.09 |
| X | Filter | MICRO TRONICS | BRM50702 | G251 | 2020.09.17 | 2021.09.16 |
| | Filter | MICRO TRONICS | BRM50716 | G188 | 2020.09.17 | 2021.09.16 |
| X | EMI Test Receiver | R&S | ESR7 | 101602 | 2019.12.16 | 2020.12.15 |
| X | Spectrum Analyzer | R&S | FSV40 | 101148 | 2020.03.16 | 2021.03.15 |
| X | Coaxial Cable | SUHNER | SUCOFLEX 106 | RF002 | 2020.07.03 | 2021.07.02 |
| X | Mircoflex Cable | HUBER SUHNER | SUCOFLEX 102 | MY3381/2 | 2020.06.10 | 2021.06.09 |

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0

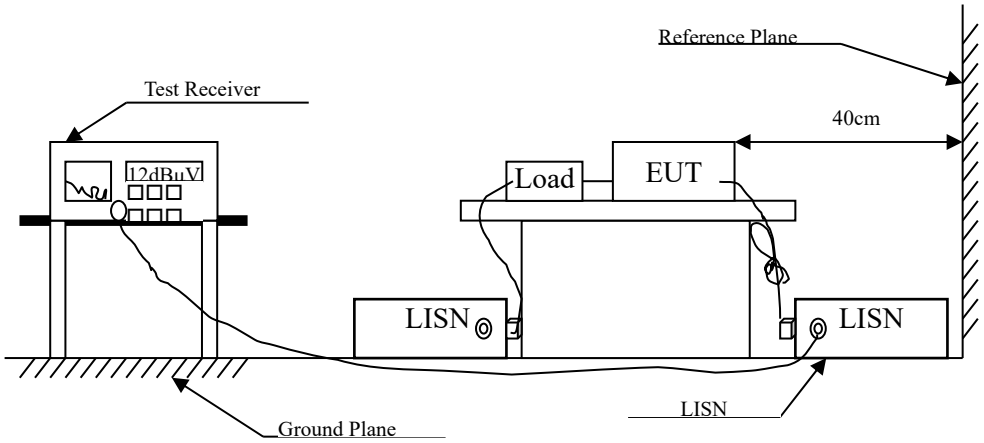
## 1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

| Test item | Uncertainty | |
|---|---|---|
| Conducted Emission | ±3.42 dB | |
| Radiated Emission | Under 1GHz<br>±4.06 dB | Above 1GHz<br>±3.73 dB |
| Band Edge | Under 1GHz<br>±4.06 dB | Above 1GHz<br>±3.73 dB |
| Duty Cycle | ±2.31 ms | |

## 2. Conducted Emission

### 2.1. Test Setup




### 2.2. Limits

| FCC Part 15 Subpart C Paragraph 15.207 (dBµV ) Limit | | |
|---|---|---|
| Frequency MHz | Limits | |
| | QP | AV |
| 0.15 - 0.50 | 66-56 | 56-46 |
| 0.50-5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |

Remarks: In the above table, the tighter limit applies at the band edges.

## 2.3. Test Procedure

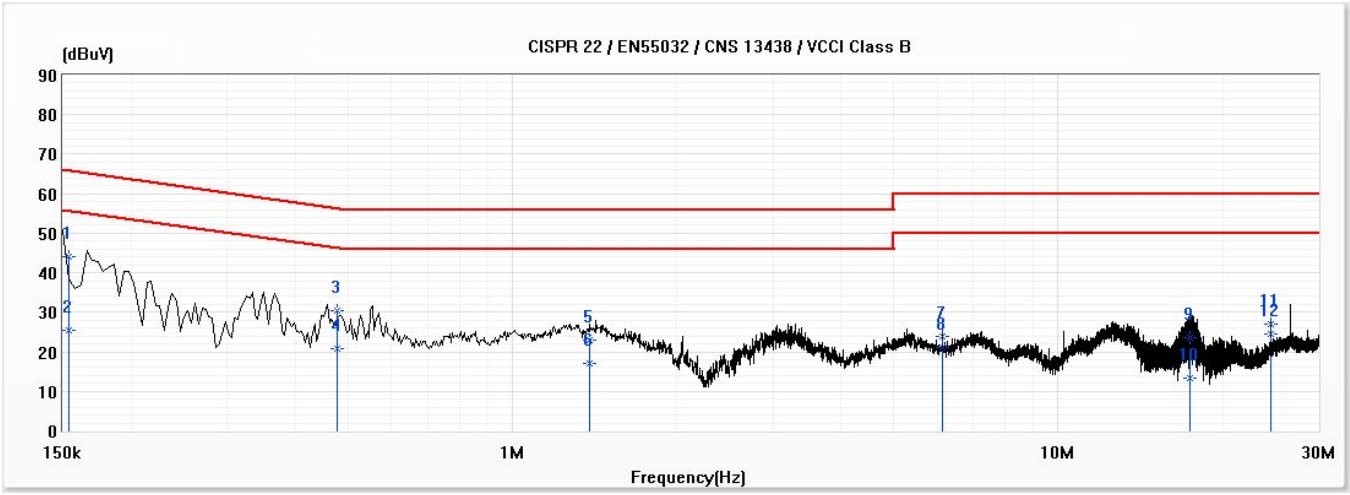
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

## 2.4. Test Result of Conducted Emission

Product : TUF Gaming H3 Wireless dongle
Test Item : Conducted Emission Test
Power Line : L1
Test Date : 2020/11/10
Test Mode : Mode 1: Transmit (2441.35MHz)

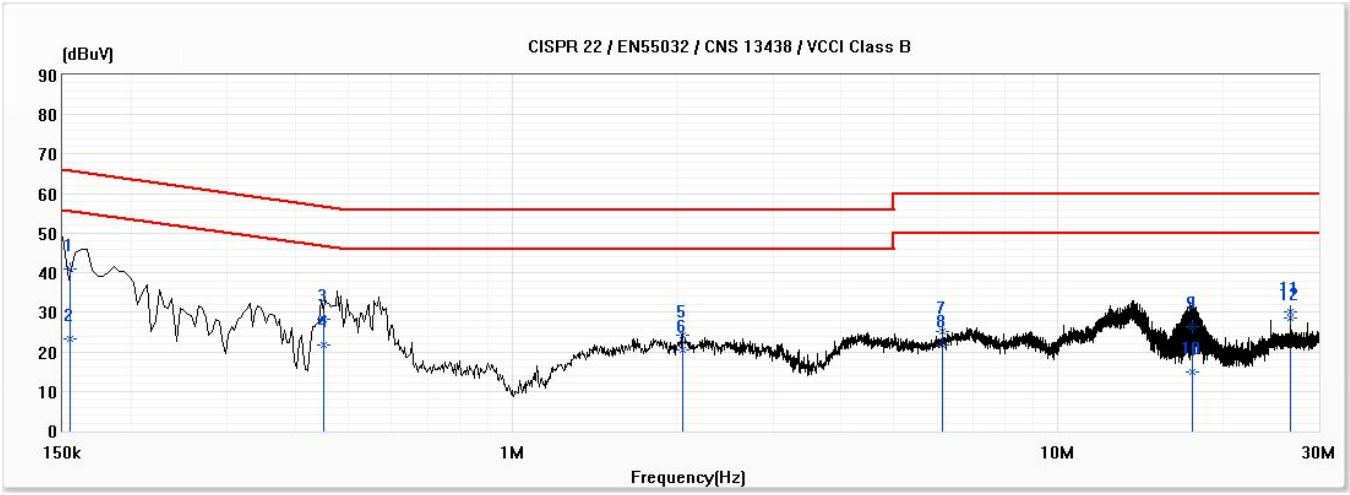



| No | Frequency (MHz) | Emission Level (dBuV) | Limit (dBuV) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| *1 | 0.154 | 44.08 | 65.80 | -21.72 | 34.42 | 9.66 | QP |
| 2 | 0.154 | 25.36 | 55.80 | -30.44 | 15.70 | 9.66 | AV |
| 3 | 0.478 | 30.28 | 56.38 | -26.10 | 20.62 | 9.66 | QP |
| 4 | 0.478 | 20.85 | 46.38 | -25.53 | 11.19 | 9.66 | AV |
| 5 | 1.382 | 22.87 | 56.00 | -33.13 | 13.16 | 9.70 | QP |
| 6 | 1.382 | 17.09 | 46.00 | -28.91 | 7.39 | 9.70 | AV |
| 7 | 6.144 | 23.89 | 60.00 | -36.11 | 14.07 | 9.82 | QP |
| 8 | 6.144 | 21.11 | 50.00 | -28.89 | 11.29 | 9.82 | AV |
| 9 | 17.453 | 23.72 | 60.00 | -36.28 | 13.76 | 9.95 | QP |
| 10 | 17.453 | 13.27 | 50.00 | -36.73 | 3.31 | 9.95 | AV |
| 11 | 24.577 | 26.91 | 60.00 | -33.09 | 16.95 | 9.96 | QP |
| 12 | 24.577 | 24.55 | 50.00 | -25.45 | 14.59 | 9.96 | AV |

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Conducted Emission Test |
| Power Line | : | N |
| Test Date | : | 2020/11/10 |
| Test Mode | : | Mode 1: Transmit (2441.35MHz) |




| No | Frequency (MHz) | Emission Level (dBuV) | Limit (dBuV) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 0.154 | 40.86 | 65.76 | -24.90 | 31.19 | 9.67 | QP |
| 2 | 0.154 | 23.40 | 55.76 | -32.35 | 13.73 | 9.67 | AV |
| 3 | 0.451 | 28.36 | 56.86 | -28.49 | 18.69 | 9.67 | QP |
| 4 | 0.451 | 21.72 | 46.86 | -25.13 | 12.05 | 9.67 | AV |
| 5 | 2.048 | 24.30 | 56.00 | -31.70 | 14.57 | 9.73 | QP |
| 6 | 2.048 | 20.38 | 46.00 | -25.62 | 10.65 | 9.73 | AV |
| 7 | 6.144 | 25.10 | 60.00 | -34.90 | 15.27 | 9.83 | QP |
| 8 | 6.144 | 21.86 | 50.00 | -28.14 | 12.02 | 9.83 | AV |
| 9 | 17.630 | 26.29 | 60.00 | -33.71 | 16.26 | 10.03 | QP |
| 10 | 17.630 | 14.88 | 50.00 | -35.12 | 4.86 | 10.03 | AV |
| 11 | 26.624 | 30.01 | 60.00 | -29.99 | 19.93 | 10.08 | QP |
| *12 | 26.624 | 28.41 | 50.00 | -21.59 | 18.33 | 10.08 | AV |

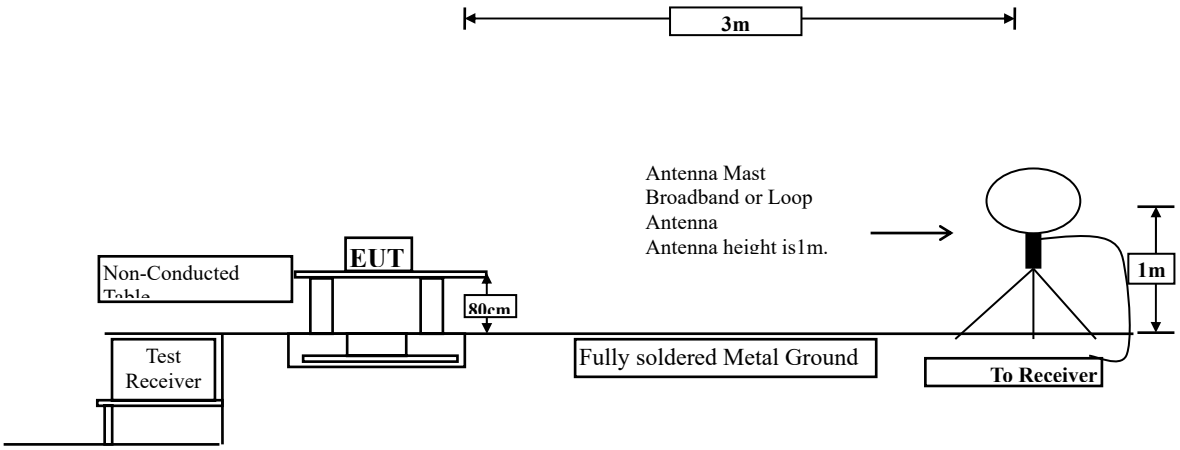
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

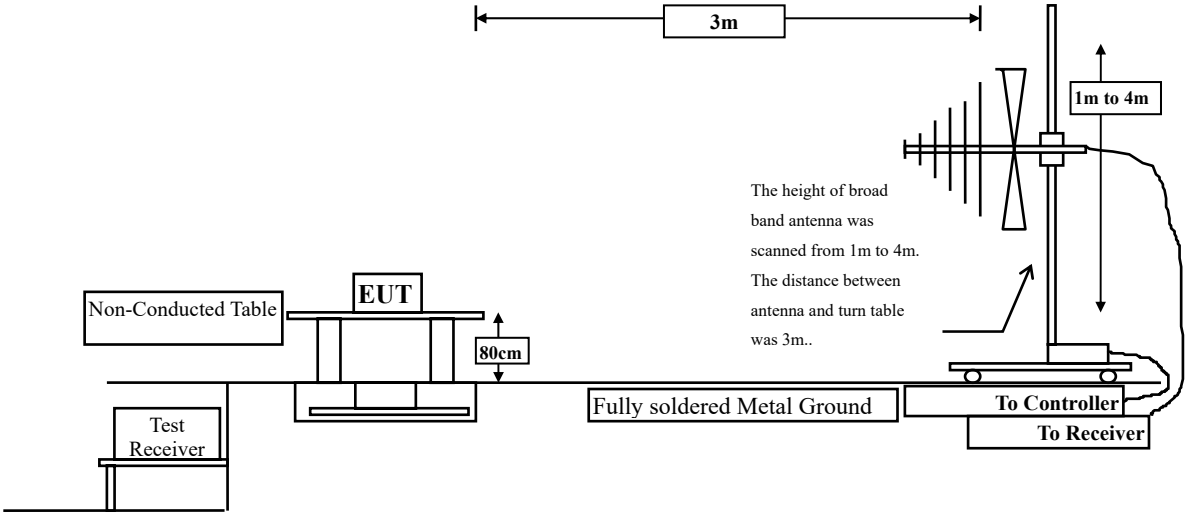
# 3. Radiated Emission

## 3.1. Test Setup

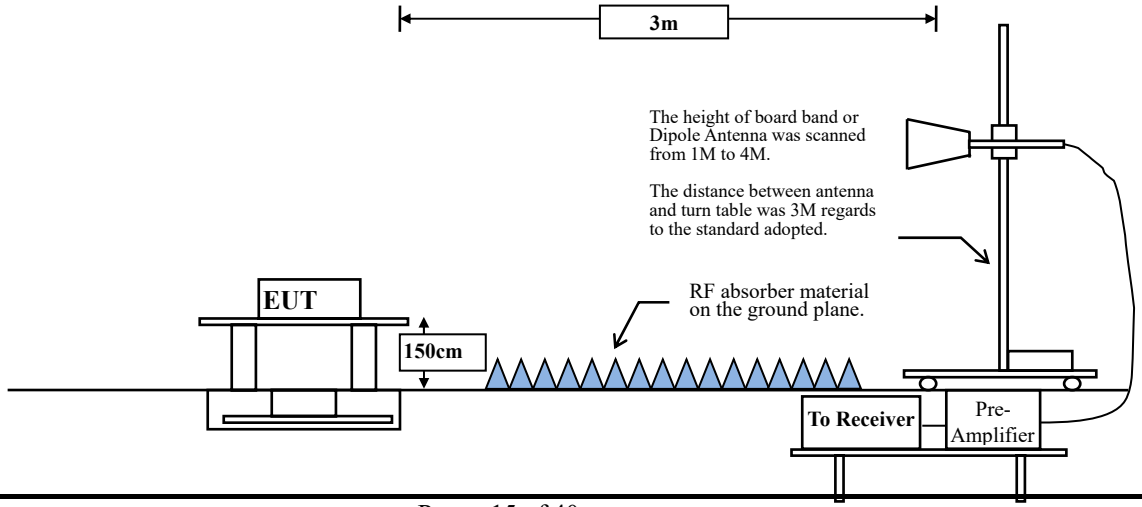
Radiated Emission Under 30MHz




Radiated Emission Below 1GHz




Radiated Emission Above 1GHz



## 3.2. Limits

➢ **Fundamental and Harmonics Emission Limits**

| FCC Part 15 Subpart C Paragraph 15.249 Limits | | | | |
|---|---|---|---|---|
| Frequency MHz | Field Strength of Fundamental | | Field Strength of Harmonics | |
| | (mV/m @3m) | (dBμV /m @3m) | (uV/m @3m) | (dBμV /m @3m) |
| 902-928 | 50 | 94 | 500 | 54 |
| 2400-2483.5 | 50 | 94 | 500 | 54 |
| 5725-5875 | 50 | 94 | 500 | 54 |
| 24000-24250 | 250 | 108 | 2500 | 68 |

Remarks : 1. RF Voltage (dBμV /m) = 20 log RF Voltage (uV/m)

2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➢ **General Radiated Emission Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

| FCC Part 15 Subpart C Paragraph 15.209(a) Limits | | |
|---|---|---|
| Frequency MHz | Field strength (microvolts/meter) | Measurement distance (meter) |
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Remarks: E field strength (dBμV /m) = 20 log E field strength (uV/m)

## 3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.249 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

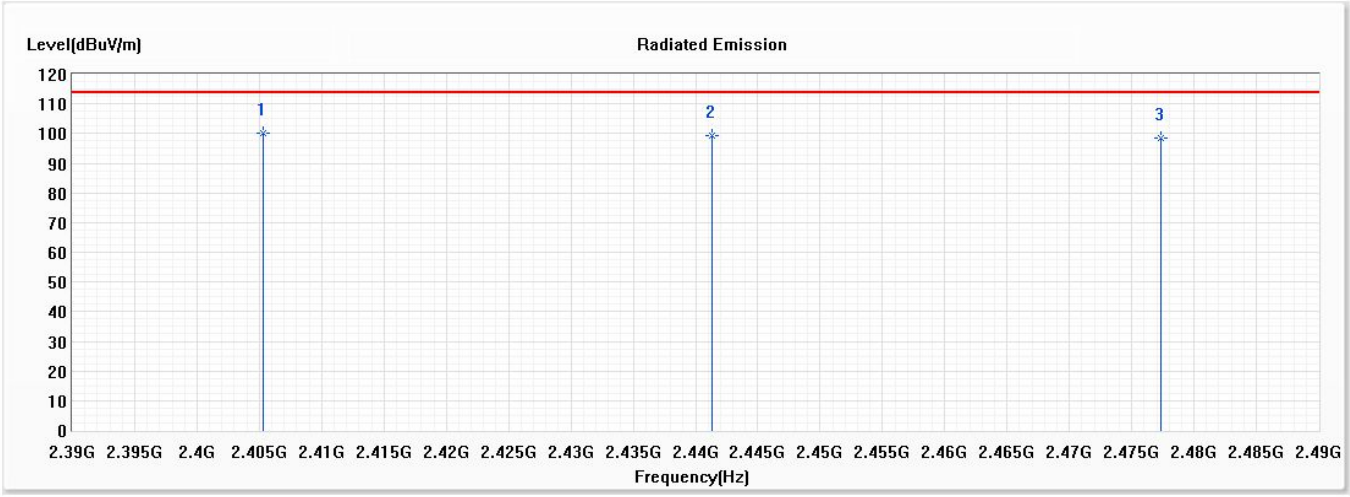
The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

## 3.4. Test Result of Radiated Emission

Product : TUF Gaming H3 Wireless dongle
Test Item : Fundamental Radiated Emission
Test Date : 2020/11/06
Test Mode : Mode 1: Transmit

**Horizontal_X-Axis**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 2405.350 | 102.15 | 114.00 | -11.85 | 90.46 | 11.69 | PK |
| 2 | 2441.350 | 99.36 | 114.00 | -14.64 | 87.53 | 11.83 | PK |
| 3 | 2477.350 | 98.58 | 114.00 | -15.42 | 86.60 | 11.98 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.

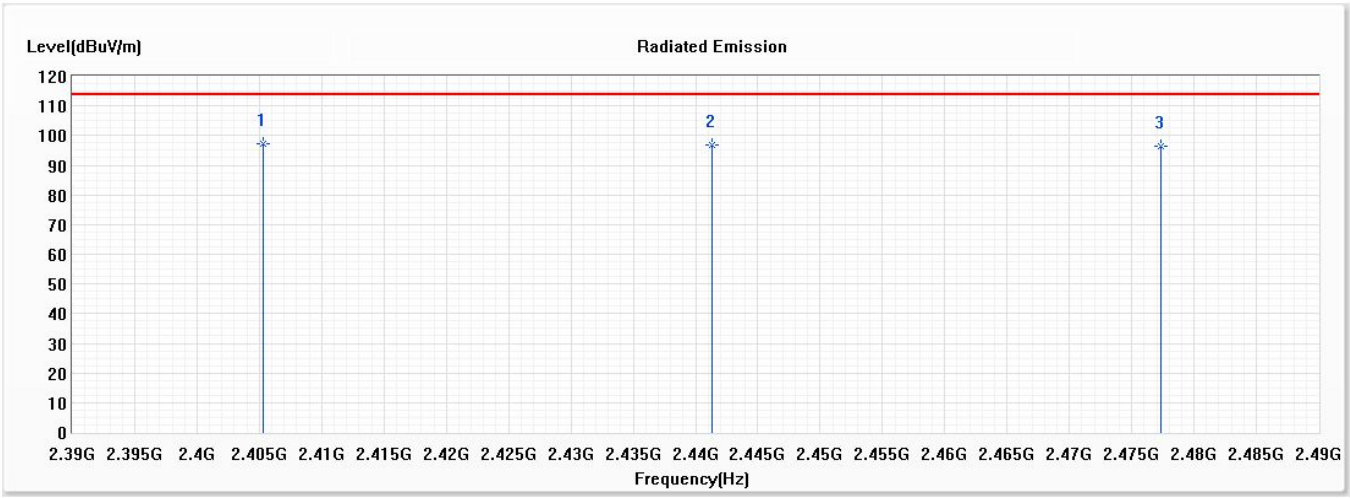
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) |
|---|---|---|---|---|---|
| 2405.350 | 102.150 | -33.971 | 68.179 | -25.821 | 94.000 |
| 2441.350 | 99.360 | -33.971 | 65.389 | -28.611 | 94.000 |
| 2477.350 | 98.580 | -33.971 | 64.609 | -29.391 | 94.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Fundamental Radiated Emission |
| Test Date | : | 2020/11/06 |
| Test Mode | : | Mode 1: Transmit |

**Vertical_X-Axis**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 2405.350 | 97.22 | 114.00 | -16.78 | 85.53 | 11.69 | PK |
| 2 | 2441.350 | 96.93 | 114.00 | -17.07 | 85.10 | 11.83 | PK |
| 3 | 2477.350 | 96.35 | 114.00 | -17.65 | 84.37 | 11.98 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.

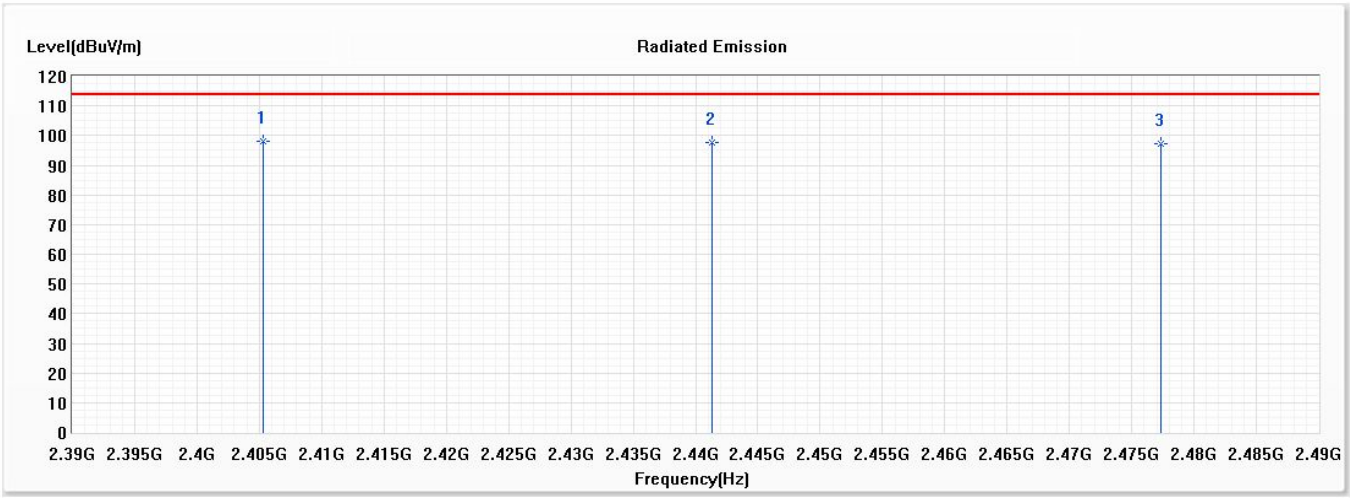
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) |
|---|---|---|---|---|---|
| 2405.350 | 97.220 | -33.971 | 63.249 | -30.751 | 94.000 |
| 2441.350 | 96.930 | -33.971 | 62.959 | -31.041 | 94.000 |
| 2477.350 | 96.350 | -33.971 | 62.379 | -31.621 | 94.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Fundamental Radiated Emission |
| Test Date | : | 2020/11/06 |
| Test Mode | : | Mode 1: Transmit |

**Horizontal_Y-Axis**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 2405.350 | 97.87 | 114.00 | -16.13 | 86.18 | 11.69 | PK |
| 2 | 2441.350 | 97.55 | 114.00 | -16.45 | 85.72 | 11.83 | PK |
| 3 | 2477.350 | 97.08 | 114.00 | -16.92 | 85.10 | 11.98 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.

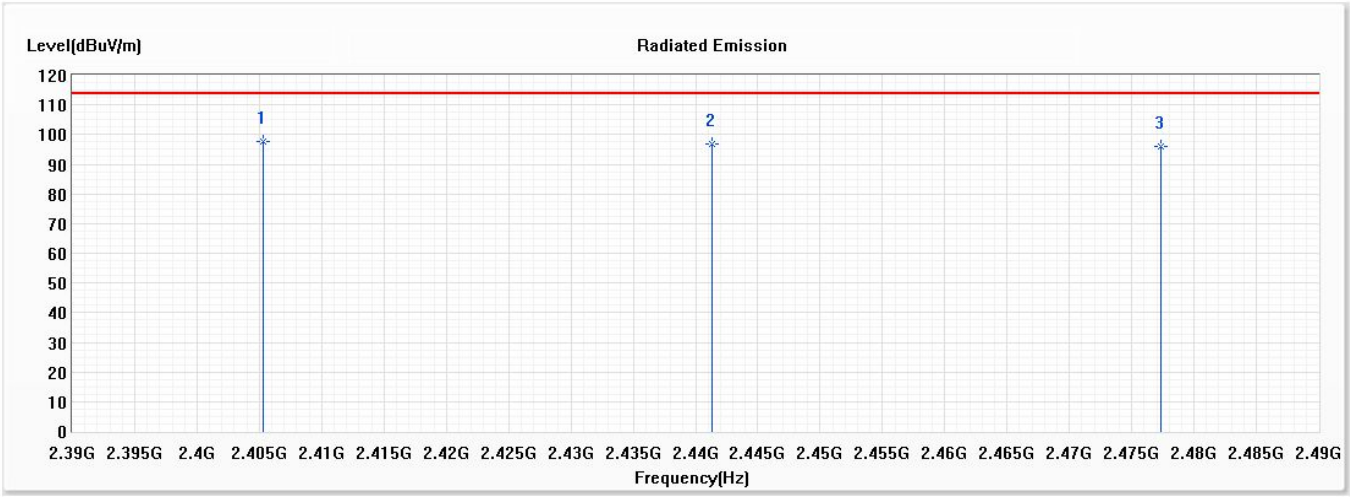
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) |
|---|---|---|---|---|---|
| 2405.350 | 97.870 | -33.971 | 63.899 | -30.101 | 94.000 |
| 2441.350 | 97.550 | -33.971 | 63.579 | -30.421 | 94.000 |
| 2477.350 | 97.080 | -33.971 | 63.109 | -30.891 | 94.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Fundamental Radiated Emission |
| Test Date | : | 2020/11/06 |
| Test Mode | : | Mode 1: Transmit |

**Vertical_Y-Axis**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 2405.350 | 97.56 | 114.00 | -16.44 | 85.87 | 11.69 | PK |
| 2 | 2441.350 | 96.97 | 114.00 | -17.03 | 85.14 | 11.83 | PK |
| 3 | 2477.350 | 95.85 | 114.00 | -18.15 | 83.87 | 11.98 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.

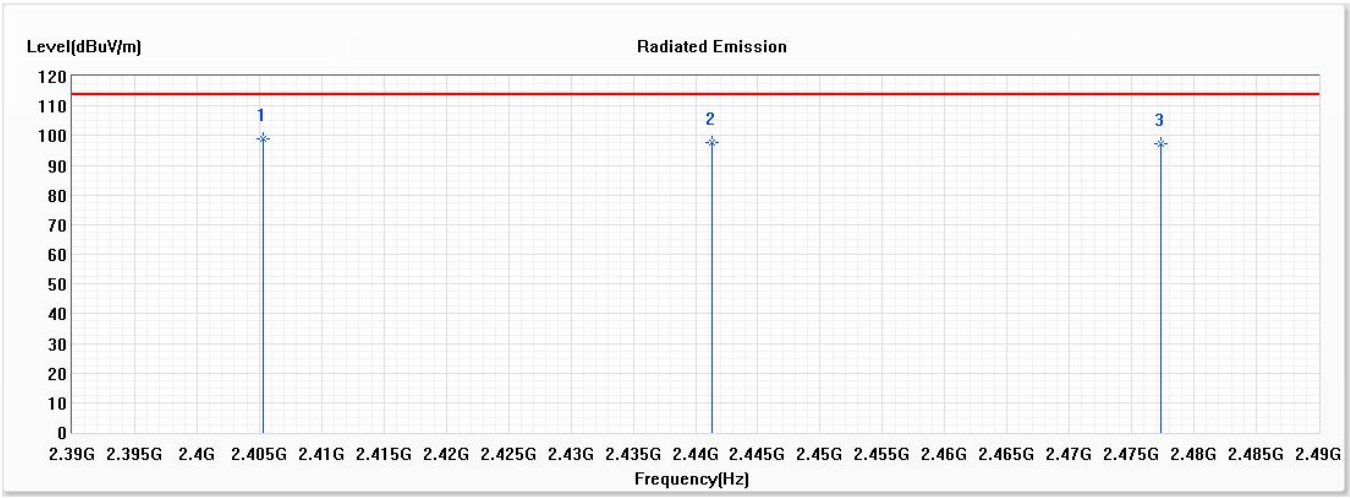
| Frequency (MHz) | Peak Measurement (dBμV/m) | Duty Cycle Factor (dB) | Average Measurement (dBμV/m) | Margin (dB) | Average Limit (dBμV/m) |
|---|---|---|---|---|---|
| 2405.350 | 97.560 | -33.971 | 63.589 | -30.411 | 94.000 |
| 2441.350 | 96.970 | -33.971 | 62.999 | -31.001 | 94.000 |
| 2477.350 | 95.850 | -33.971 | 61.879 | -32.121 | 94.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Fundamental Radiated Emission |
| Test Date | : | 2020/11/06 |
| Test Mode | : | Mode 1: Transmit |

**Horizontal_Z-Axis**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 2405.350 | 98.72 | 114.00 | -15.28 | 87.03 | 11.69 | PK |
| 2 | 2441.350 | 97.84 | 114.00 | -16.16 | 86.01 | 11.83 | PK |
| 3 | 2477.350 | 97.23 | 114.00 | -16.77 | 85.25 | 11.98 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.

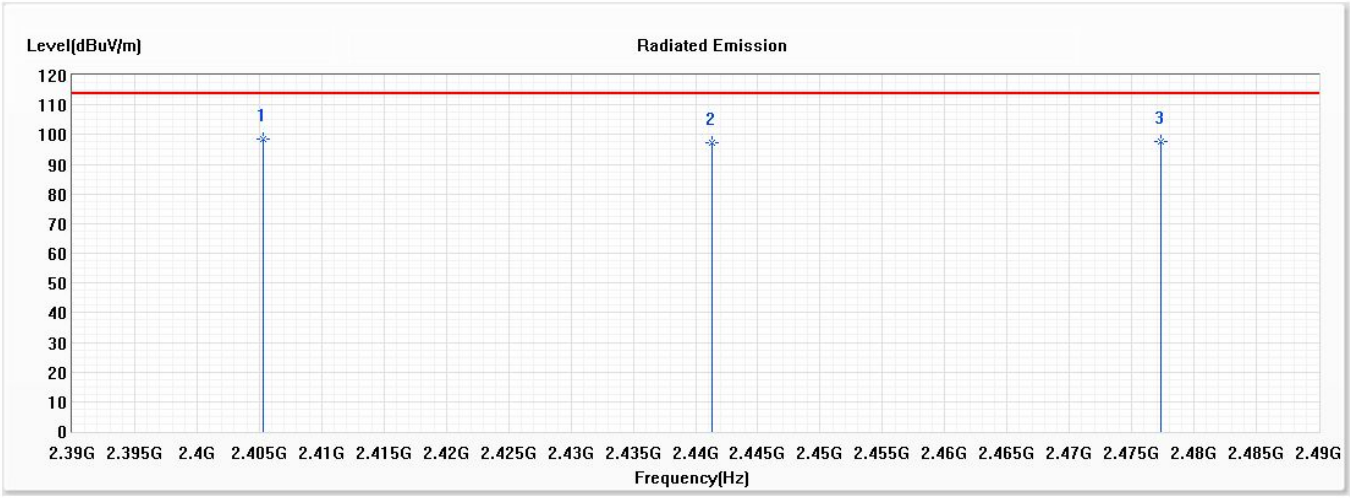
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) |
|---|---|---|---|---|---|
| 2405.350 | 98.720 | -33.971 | 64.749 | -29.251 | 94.000 |
| 2441.350 | 97.840 | -33.971 | 63.869 | -30.131 | 94.000 |
| 2477.350 | 97.230 | -33.971 | 63.259 | -30.741 | 94.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Fundamental Radiated Emission |
| Test Date | : | 2020/11/06 |
| Test Mode | : | Mode 1: Transmit |

**Vertical_Z-Axis**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 2405.350 | 98.40 | 114.00 | -15.60 | 86.71 | 11.69 | PK |
| 2 | 2441.350 | 97.04 | 114.00 | -16.96 | 85.21 | 11.83 | PK |
| 3 | 2477.350 | 97.75 | 114.00 | -16.25 | 85.77 | 11.98 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.

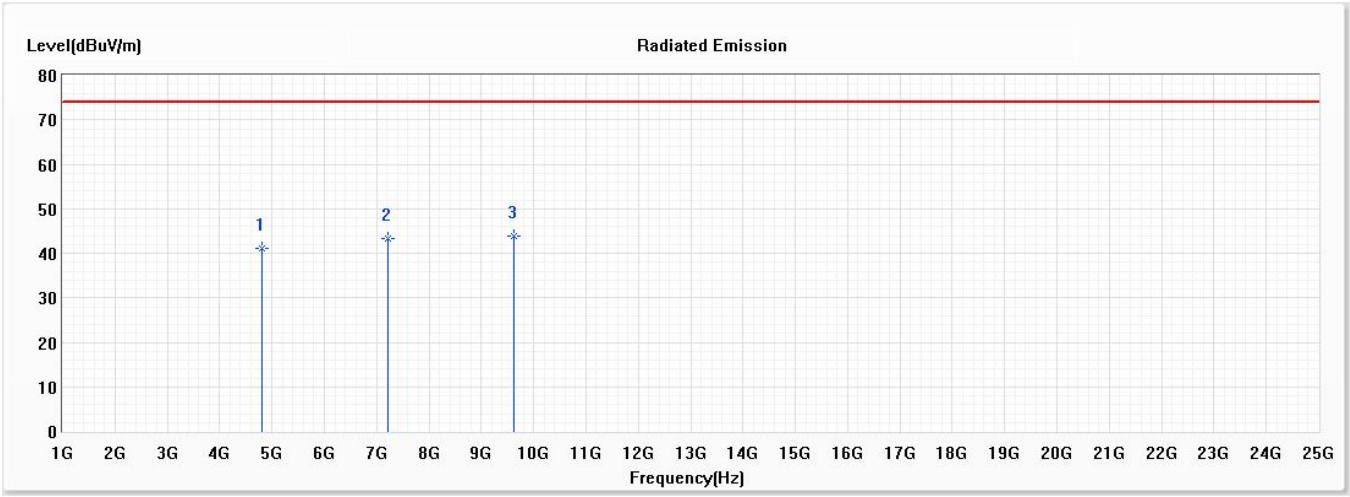
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) |
|---|---|---|---|---|---|
| 2405.350 | 98.400 | -33.971 | 64.429 | -29.571 | 94.000 |
| 2441.350 | 97.040 | -33.971 | 63.069 | -30.931 | 94.000 |
| 2477.350 | 97.750 | -33.971 | 63.779 | -30.221 | 94.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Harmonic Radiated Emission Data |
| Test Date | : | 2020/11/06 |
| Test Mode | : | Mode 1: Transmit (2405.35MHz) |

**Horizontal**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 4810.700 | 40.97 | 74.00 | -33.03 | 45.70 | -4.73 | PK |
| 2 | 7216.050 | 43.43 | 74.00 | -30.57 | 44.63 | -1.20 | PK |
| * 3 | 9621.400 | 43.94 | 74.00 | -30.06 | 43.08 | 0.86 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

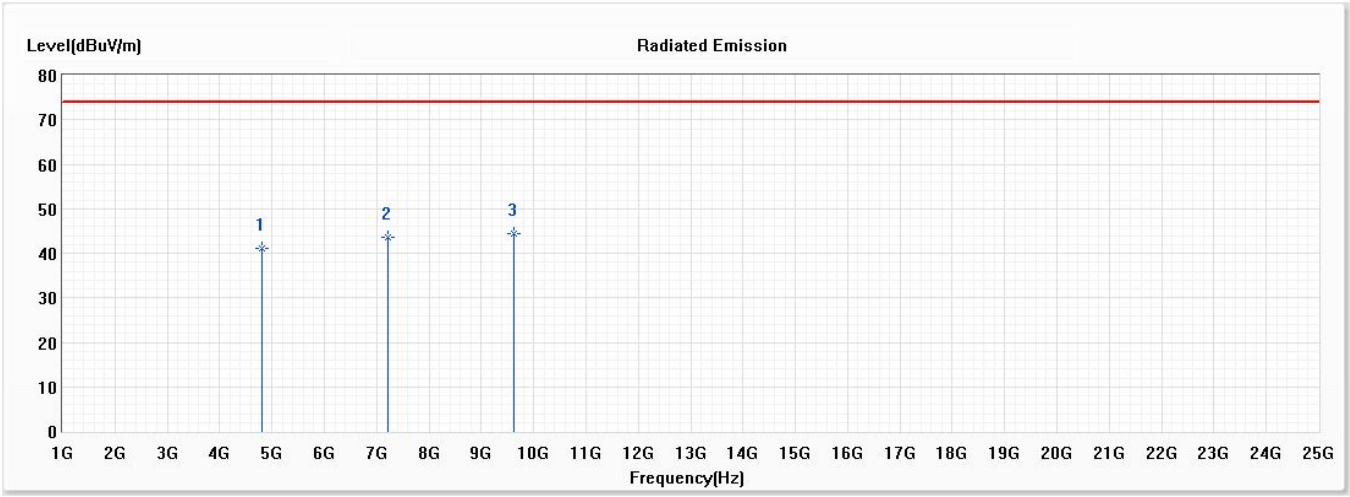
| Frequency MHz | Peak Measurement dBµV/m | Duty Cycle Factor dB | Average Measurement dBµV/m | Margin dB | Peak Limit dBµV/m | Average Limit dBµV/m |
|---|---|---|---|---|---|---|
| **Average Detector:** | | | | | | |
| -- | -- | -- | -- | -- | 74.000 | 54.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : TUF Gaming H3 Wireless dongle
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/11/06
Test Mode : Mode 1: Transmit (2405.35MHz)

**Vertical**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 4810.700 | 41.03 | 74.00 | -32.97 | 45.76 | -4.73 | PK |
| 2 | 7216.050 | 43.54 | 74.00 | -30.46 | 44.74 | -1.20 | PK |
| * 3 | 9621.400 | 44.28 | 74.00 | -29.72 | 43.42 | 0.86 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

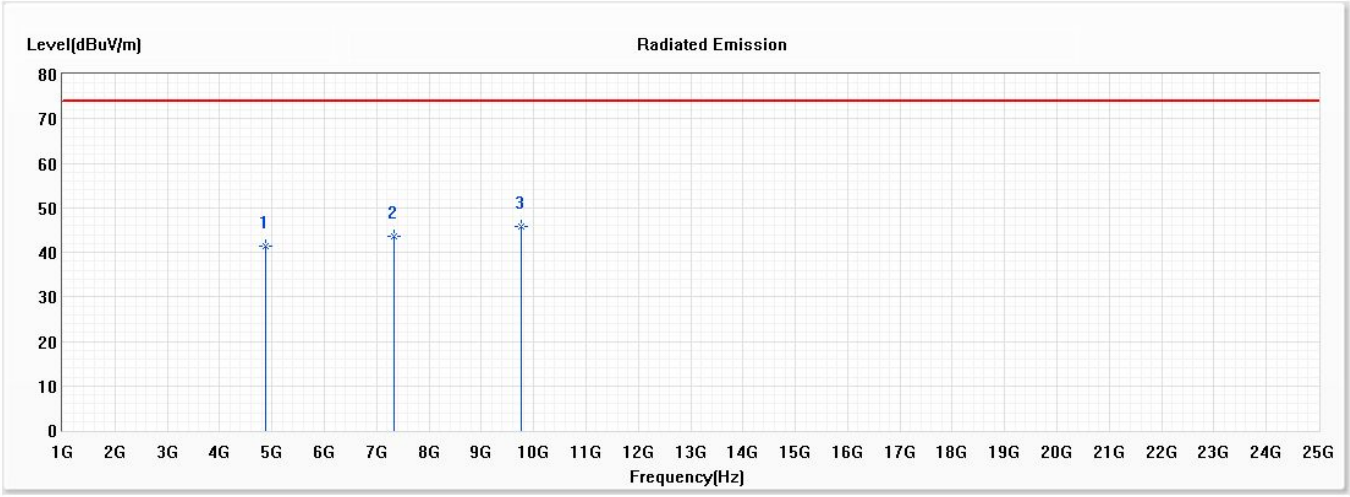
| Frequency MHz | Peak Measurement dBµV/m | Duty Cycle Factor dB | Average Measurement dBµV/m | Margin dB | Peak Limit dBµV/m | Average Limit dBµV/m |
|---|---|---|---|---|---|---|
| **Average Detector:** | | | | | | |
| -- | -- | -- | -- | -- | 74.000 | 54.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Harmonic Radiated Emission Data |
| Test Date | : | 2020/11/06 |
| Test Mode | : | Mode 1: Transmit (2441.35MHz) |

**Horizontal**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 4882.700 | 41.30 | 74.00 | -32.70 | 45.97 | -4.67 | PK |
| 2 | 7324.050 | 43.66 | 74.00 | -30.34 | 44.89 | -1.23 | PK |
| * 3 | 9765.400 | 45.69 | 74.00 | -28.31 | 44.60 | 1.09 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

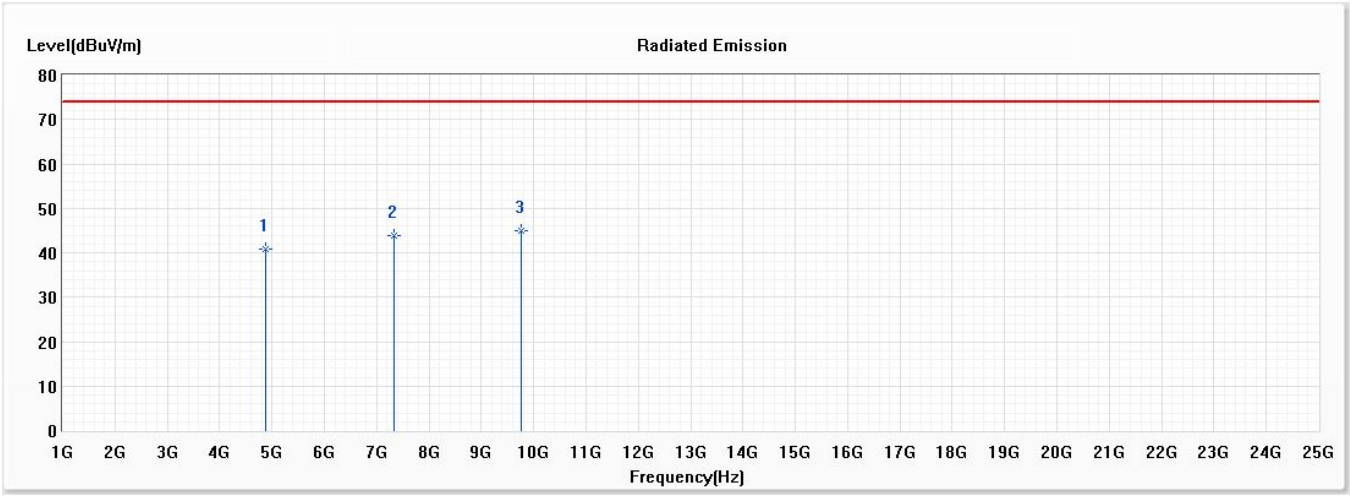
| Frequency | Peak Measurement | Duty Cycle Factor | Average Measurement | Margin | Peak Limit | Average Limit |
|---|---|---|---|---|---|---|
| MHz | dBµV/m | dB | dBµV/m | dB | dBµV/m | dBµV/m |
| **Average Detector:** | | | | | | |
| -- | -- | -- | -- | -- | 74.000 | 54.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : TUF Gaming H3 Wireless dongle
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/11/06
Test Mode : Mode 1: Transmit (2441.35MHz)

**Vertical**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 4882.700 | 40.89 | 74.00 | -33.11 | 45.56 | -4.67 | PK |
| 2 | 7324.050 | 43.83 | 74.00 | -30.17 | 45.06 | -1.23 | PK |
| * 3 | 9765.400 | 45.09 | 74.00 | -28.91 | 44.00 | 1.09 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

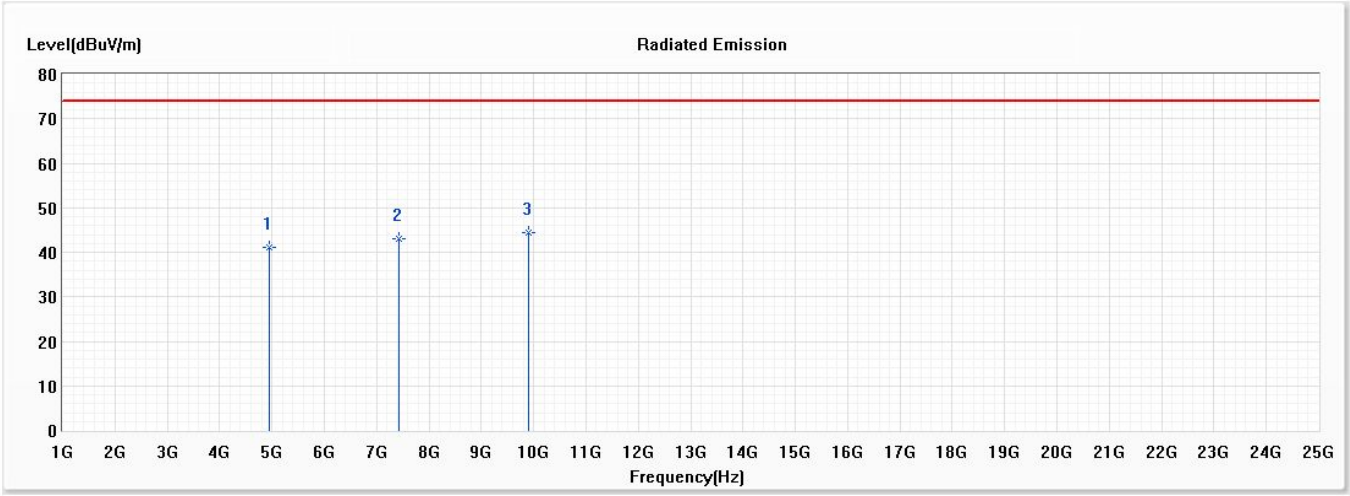
| Frequency MHz | Peak Measurement dBµV/m | Duty Cycle Factor dB | Average Measurement dBµV/m | Margin dB | Peak Limit dBµV/m | Average Limit dBµV/m |
|---|---|---|---|---|---|---|
| **Average Detector:** | | | | | | |
| -- | -- | -- | -- | -- | 74.000 | 54.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : TUF Gaming H3 Wireless dongle
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/11/06
Test Mode : Mode 1: Transmit (2477.35MHz)

**Horizontal**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 4954.700 | 41.05 | 74.00 | -32.95 | 45.59 | -4.54 | PK |
| 2 | 7432.050 | 43.04 | 74.00 | -30.96 | 44.19 | -1.15 | PK |
| * 3 | 9909.400 | 44.45 | 74.00 | -29.55 | 43.13 | 1.32 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

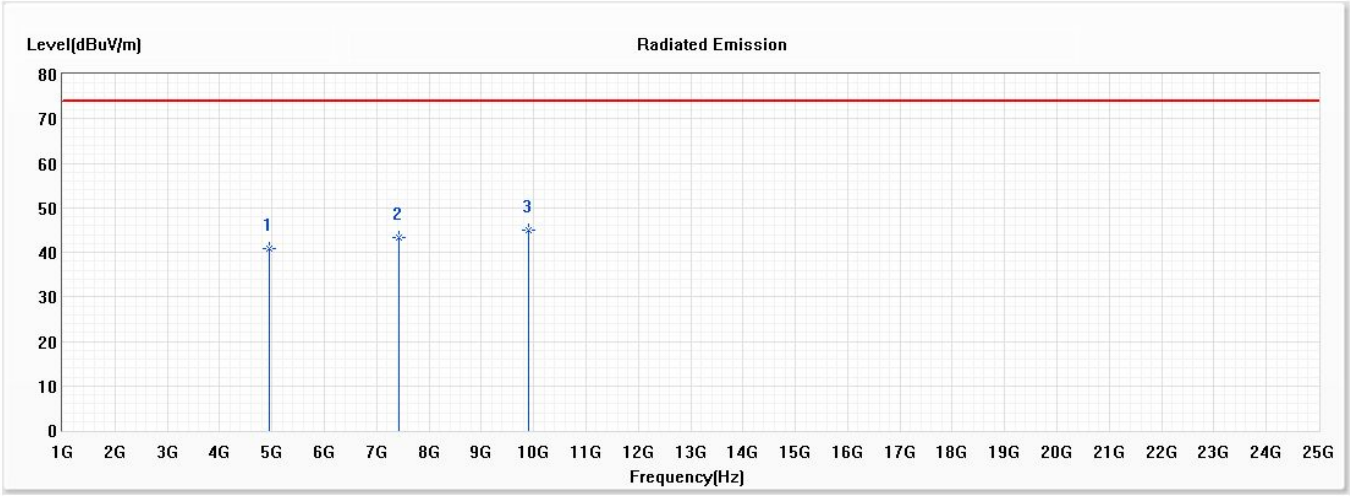
| Frequency MHz | Peak Measurement dBµV/m | Duty Cycle Factor dB | Average Measurement dBµV/m | Margin dB | Peak Limit dBµV/m | Average Limit dBµV/m |
|---|---|---|---|---|---|---|
| **Average Detector:** | | | | | | |
| -- | -- | -- | -- | -- | 74.000 | 54.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : TUF Gaming H3 Wireless dongle
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/11/06
Test Mode : Mode 1: Transmit (2477.35MHz)

**Vertical**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 4954.700 | 40.73 | 74.00 | -33.27 | 45.27 | -4.54 | PK |
| 2 | 7432.050 | 43.36 | 74.00 | -30.64 | 44.51 | -1.15 | PK |
| * 3 | 9909.400 | 44.85 | 74.00 | -29.15 | 43.53 | 1.32 | PK |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

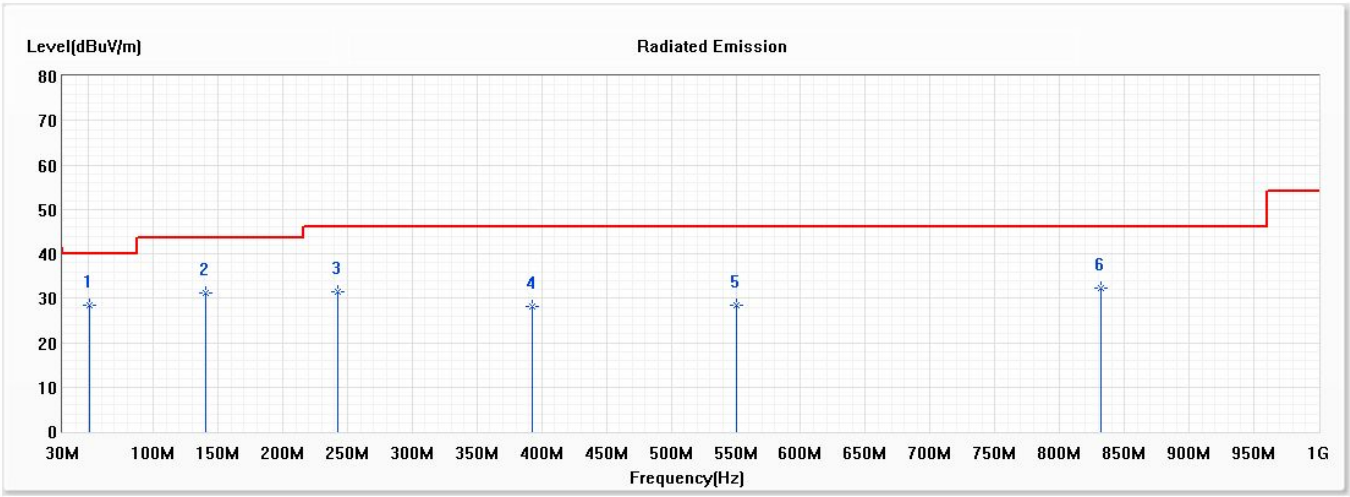
| Frequency MHz | Peak Measurement dBµV/m | Duty Cycle Factor dB | Average Measurement dBµV/m | Margin dB | Peak Limit dBµV/m | Average Limit dBµV/m |
|---|---|---|---|---|---|---|
| **Average Detector:** | | | | | | |
| -- | -- | -- | -- | -- | 74.000 | 54.000 |

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : TUF Gaming H3 Wireless dongle
Test Item : General Radiated Emission Data
Test Date : 2020/11/03
Test Mode : Mode 1: Transmit (2441.35MHz)

**Horizontal**



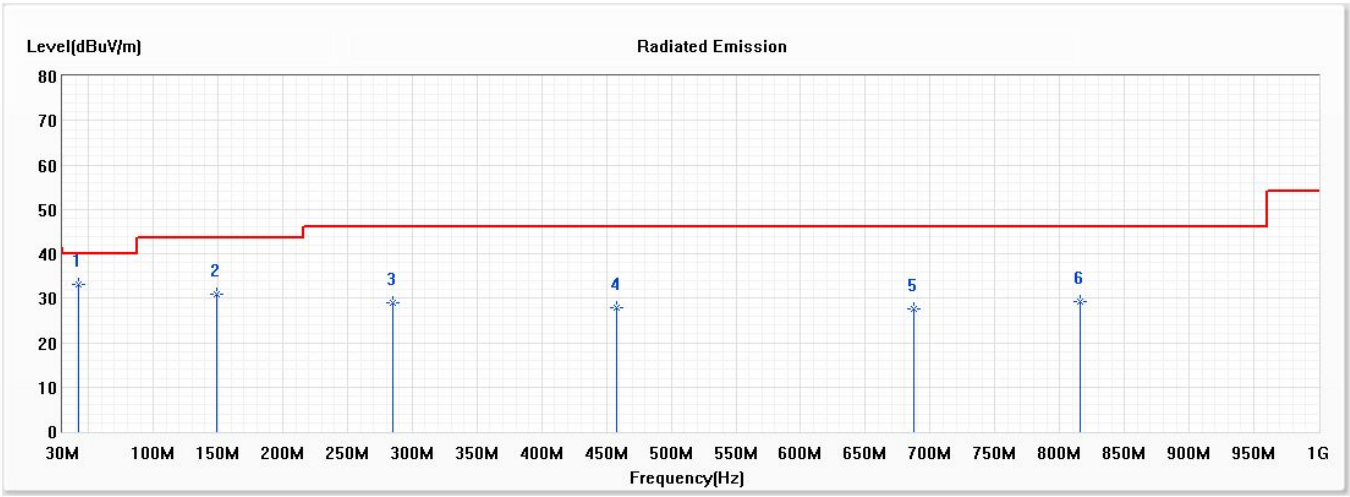

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 50.370 | 28.33 | 40.00 | -11.67 | 38.61 | -10.28 | QP |
| 2 | 140.580 | 31.27 | 43.50 | -12.23 | 42.39 | -11.12 | QP |
| 3 | 242.430 | 31.34 | 46.00 | -14.66 | 42.80 | -11.46 | QP |
| 4 | 392.780 | 28.25 | 46.00 | -17.75 | 35.49 | -7.24 | QP |
| 5 | 550.890 | 28.37 | 46.00 | -17.63 | 32.57 | -4.20 | QP |
| 6 | 832.190 | 32.30 | 46.00 | -13.70 | 32.35 | -0.05 | QP |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : TUF Gaming H3 Wireless dongle
Test Item : General Radiated Emission Data
Test Date : 2020/11/03
Test Mode : Mode 1: Transmit (2441.35MHz)

**Vertical**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| * 1 | 42.610 | 32.97 | 40.00 | -7.03 | 43.64 | -10.67 | QP |
| 2 | 149.310 | 30.81 | 43.50 | -12.69 | 41.57 | -10.76 | QP |
| 3 | 285.110 | 28.84 | 46.00 | -17.16 | 38.62 | -9.78 | QP |
| 4 | 457.770 | 27.80 | 46.00 | -18.20 | 33.49 | -5.69 | QP |
| 5 | 687.660 | 27.57 | 46.00 | -18.43 | 29.51 | -1.94 | QP |
| 6 | 815.700 | 29.17 | 46.00 | -16.83 | 29.39 | -0.22 | QP |

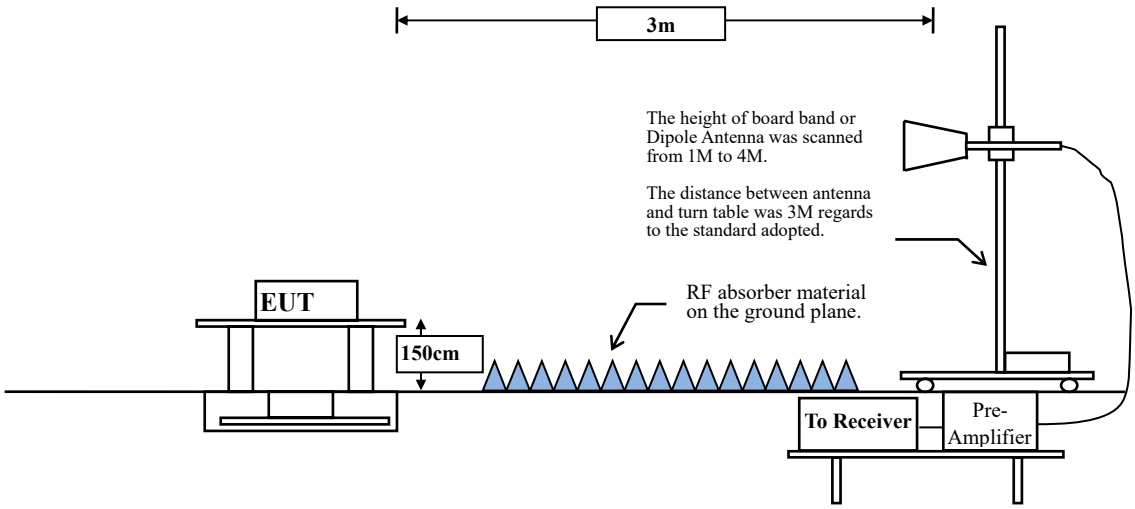
Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

# 4. Band Edge

## 4.1. Test Setup

**RF Radiated Measurement:**




## 4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

| FCC Part 15 Subpart C Paragraph 15.209(a) Limits | | |
|---|---|---|
| Frequency MHz | Field strength (microvolts/meter) | Measurement distance (meter) |
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Remarks: E field strength (dBμV /m) = 20 log E field strength (uV/m)

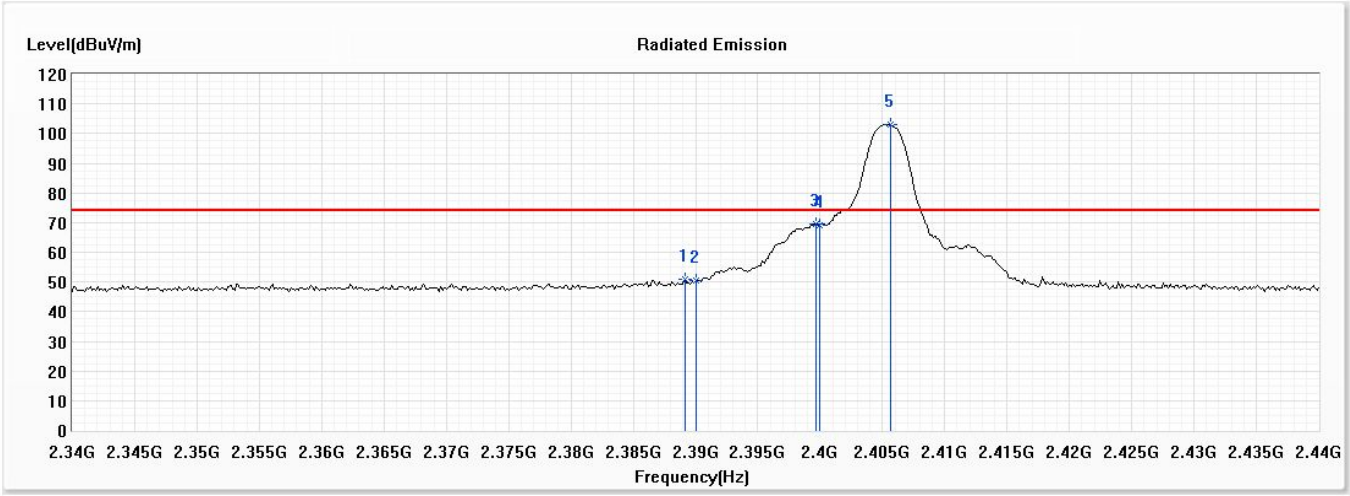
## 4.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.
The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

## 4.4. Test Result of Band Edge

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Band Edge Data |
| Test Date | : | 2020/10/19 |
| Test Mode | : | Mode 1: Transmit (2405.35MHz) |

**Horizontal**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 2389.130 | 50.96 | 74.00 | -23.04 | 37.50 | 13.46 | PK |
| 2 | 2390.000 | 50.67 | 74.00 | -23.33 | 37.21 | 13.46 | PK |
| 3 | 2399.710 | 69.67 | 74.00 | -4.33 | 56.18 | 13.49 | PK |
| 4 | 2400.000 | 69.10 | 74.00 | -4.90 | 55.61 | 13.49 | PK |
| 5 | 2405.652 | 102.96 | -- | -- | 89.45 | 13.51 | PK |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

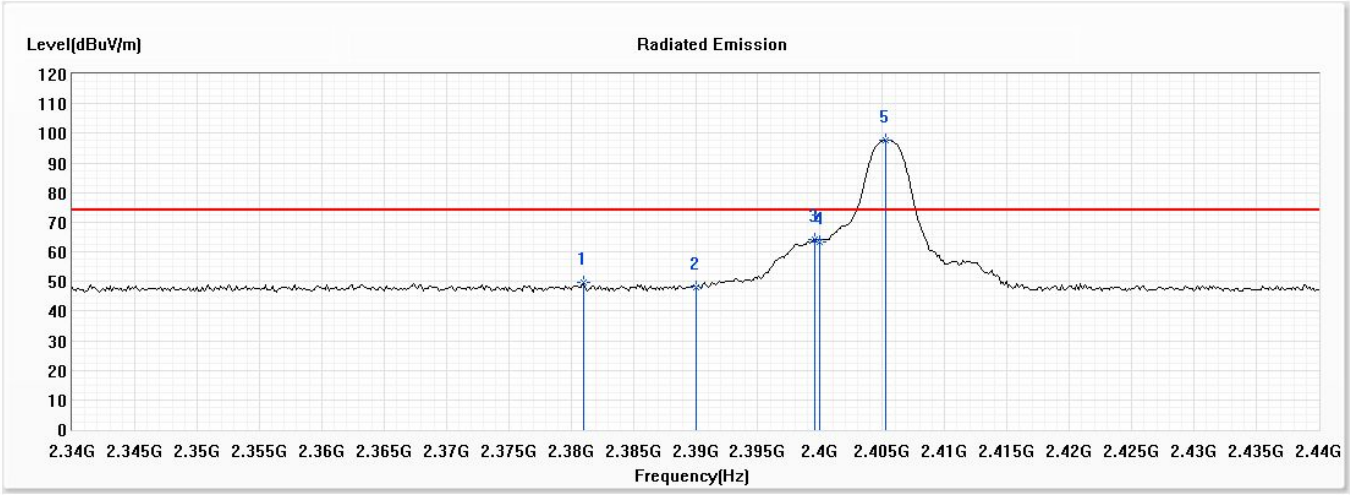
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) | Result |
|---|---|---|---|---|---|---|
| 2389.130 | 50.960 | -33.971 | 16.989 | -37.011 | 54.000 | Pass |
| 2390.000 | 50.670 | -33.971 | 16.699 | -37.301 | 54.000 | Pass |
| 2399.710 | 69.670 | -33.971 | 35.699 | -18.301 | 54.000 | Pass |
| 2400.000 | 69.100 | -33.971 | 35.129 | -18.871 | 54.000 | Pass |
| 2405.652 | 102.960 | -33.971 | 68.989 | -- | -- | Pass |

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

Product : TUF Gaming H3 Wireless dongle
Test Item : Band Edge Data
Test Date : 2020/10/19
Test Mode : Mode 1: Transmit (2405.35MHz)

**Vertical**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 2381.014 | 49.67 | 74.00 | -24.33 | 36.23 | 13.44 | PK |
| 2 | 2390.000 | 48.09 | 74.00 | -25.91 | 34.63 | 13.46 | PK |
| 3 | 2399.565 | 64.14 | 74.00 | -9.86 | 50.65 | 13.49 | PK |
| 4 | 2400.000 | 63.47 | 74.00 | -10.53 | 49.98 | 13.49 | PK |
| 5 | 2405.217 | 97.57 | -- | -- | 84.06 | 13.51 | PK |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

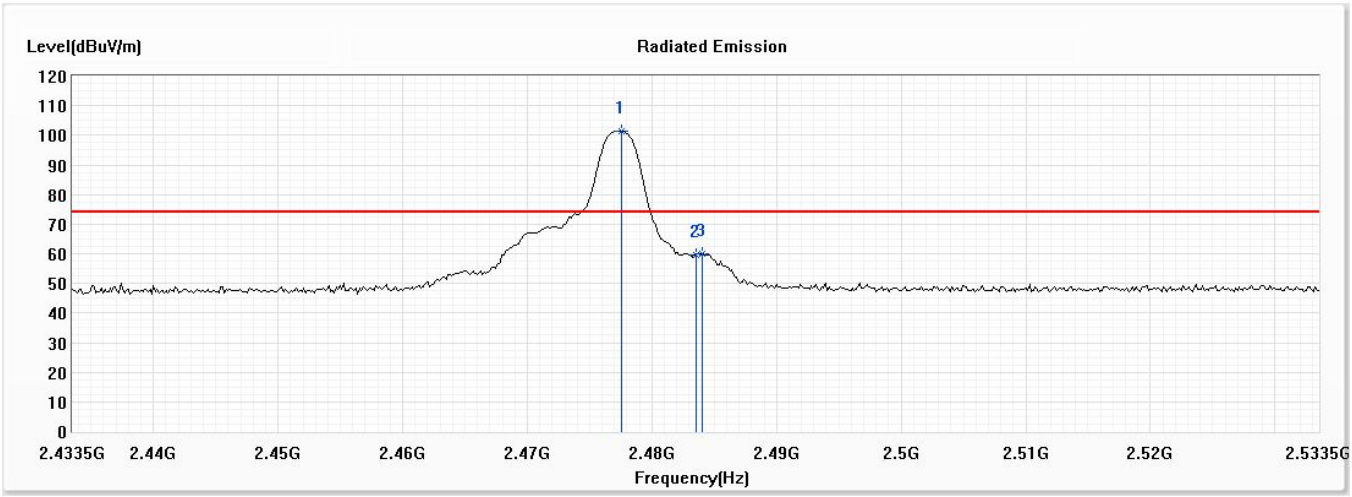
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) | Result |
|---|---|---|---|---|---|---|
| 2381.014 | 49.670 | -33.971 | 15.699 | -38.301 | 54.000 | Pass |
| 2390.000 | 48.090 | -33.971 | 14.119 | -39.881 | 54.000 | Pass |
| 2399.565 | 64.140 | -33.971 | 30.169 | -23.831 | 54.000 | Pass |
| 2400.000 | 63.470 | -33.971 | 29.499 | -24.501 | 54.000 | Pass |
| 2405.217 | 97.570 | -33.971 | 63.599 | -- | -- | Pass |

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

Product : TUF Gaming H3 Wireless dongle
Test Item : Band Edge Data
Test Date : 2020/10/19
Test Mode : Mode 1: Transmit (2477.35MHz)

**Horizontal**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 2477.558 | 101.56 | -- | -- | 87.67 | 13.89 | PK |
| 2 | 2483.500 | 59.44 | 74.00 | -14.56 | 45.52 | 13.92 | PK |
| 3 | 2484.080 | 59.97 | 74.00 | -14.03 | 46.04 | 13.93 | PK |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

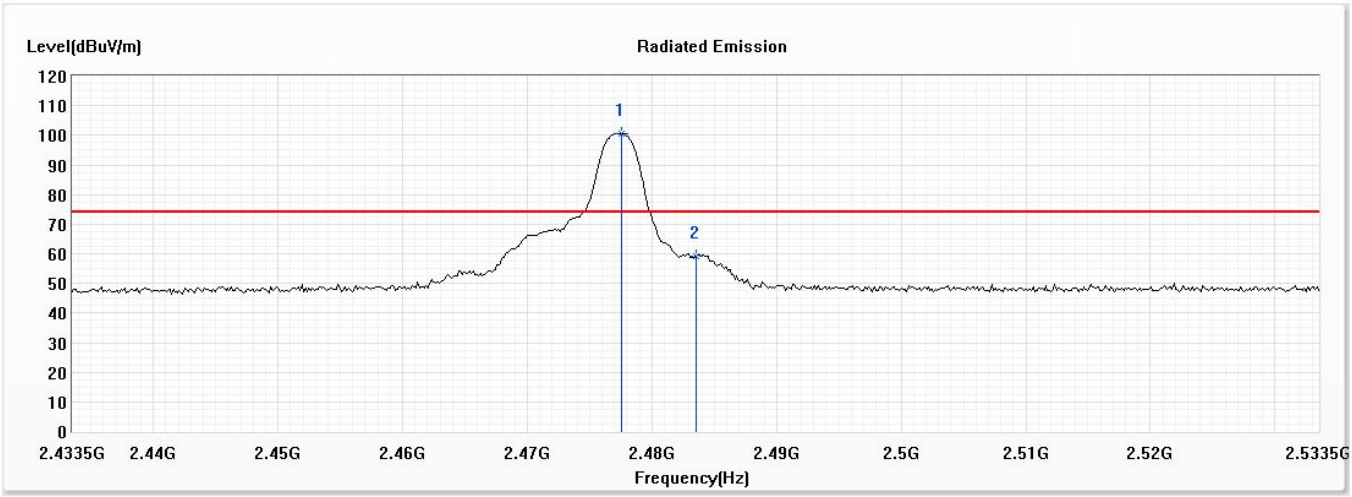
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) | Result |
|---|---|---|---|---|---|---|
| 2477.558 | 101.560 | -33.971 | 67.589 | -- | -- | Pass |
| 2483.500 | 59.440 | -33.971 | 25.469 | -28.531 | 54.000 | Pass |
| 2484.080 | 59.970 | -33.971 | 25.999 | -28.001 | 54.000 | Pass |

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

| | | |
|---|---|---|
| Product | : | TUF Gaming H3 Wireless dongle |
| Test Item | : | Band Edge Data |
| Test Date | : | 2020/10/19 |
| Test Mode | : | Mode 1: Transmit (2477.35MHz) |

**Vertical**




| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Reading Level (dBuV) | Correct Factor (dB) | Detector Type |
|---|---|---|---|---|---|---|---|
| 1 | 2477.558 | 100.75 | -- | -- | 86.86 | 13.89 | PK |
| 2 | 2483.500 | 59.26 | 74.00 | -14.74 | 45.34 | 13.92 | PK |

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

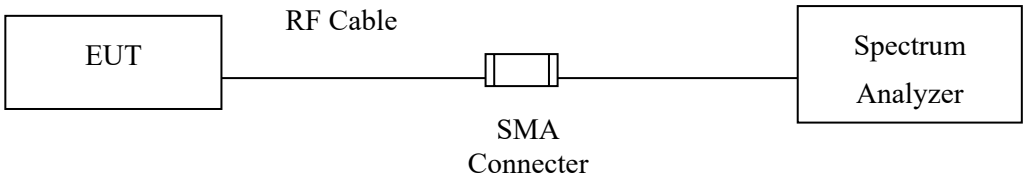
| Frequency (MHz) | Peak Measurement (dBµV/m) | Duty Cycle Factor (dB) | Average Measurement (dBµV/m) | Margin (dB) | Average Limit (dBµV/m) | Result |
|---|---|---|---|---|---|---|
| 2477.558 | 100.750 | -33.971 | 66.779 | -- | -- | Pass |
| 2483.500 | 59.260 | -33.971 | 25.289 | -28.711 | 54.000 | Pass |

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

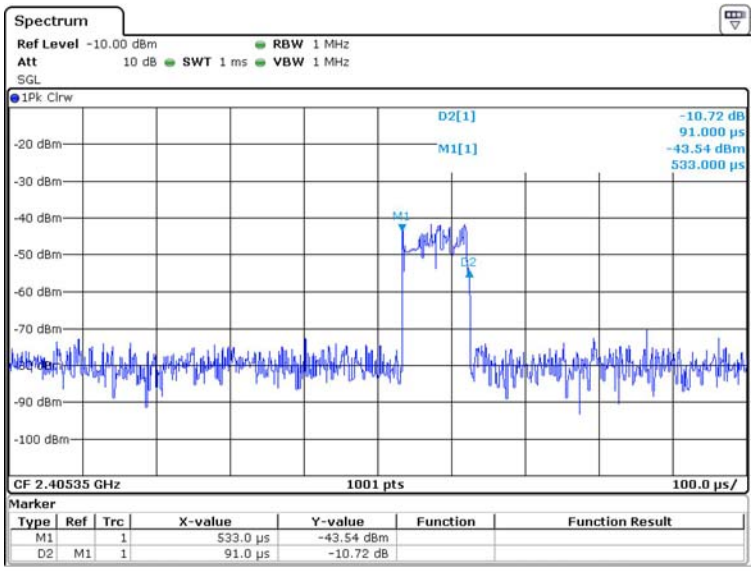
# 5. Duty Cycle

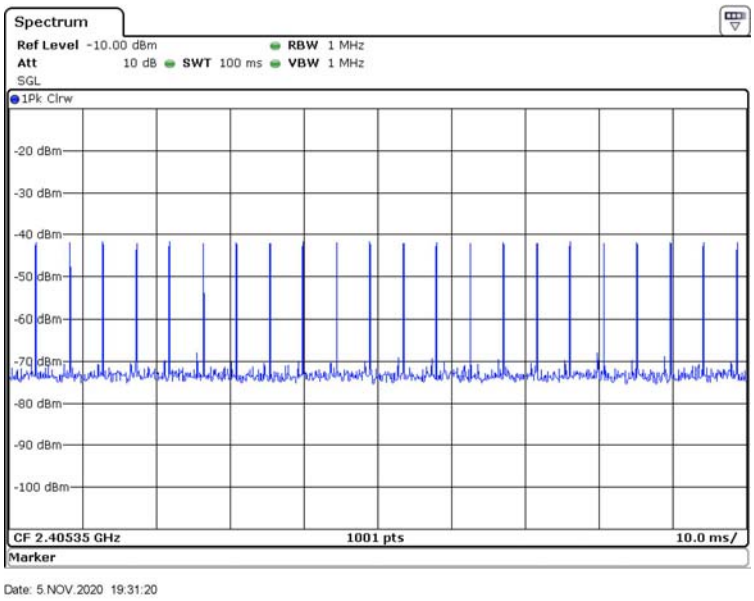
## 5.1. Test Setup



## 5.2. Test Result of Duty Cycle

Product : TUF Gaming H3 Wireless dongle
Test Item : Duty Cycle Data
Test Mode : Mode 2: Normal mode




Time on of 100ms= 91us*22= 2.002ms

Duty Cycle=2.002ms / 100ms= 0.02002

Duty Cycle correction factor= 20 LOG 0.02002= -33.971 dB

| **Duty Cycle correction factor** | **-33.971 dB** |
|---|---|

## 6. EMI Reduction Method During Compliance Testing

No modification was made during testing.