# TEST REPORT

| | |
|---|---|
| **Applicant:** | Shantou Hongxing Toys Industry Co., Ltd |
| **Address of Applicant:** | Yangdong Industrial Zone, Dongwan Village, Lianxia Town, Chenghai District, Shantou City, China |
| **Manufacturer/Factory:** | Shantou Hongxing Toys Industry Co., Ltd |
| **Address of Manufacturer/Factory:** | Yangdong Industrial Zone, Dongwan Village, Lianxia Town, Chenghai District, Shantou City, China |
| **Equipment Under Test (EUT)** | |
| Product Name: | Remote control car |
| Model No.: | See section 5.1 |
| **FCC ID:** | 2BLCP93310 |
| **Applicable standards:** | FCC CFR Title 47 Part 15 Subpart C Section 15.249 |
| **Date of sample receipt:** | September 23, 2024 |
| **Date of Test:** | September 24, 2024-October 09, 2024 |
| **Date of report issued:** | October 09, 2024 |
| **Test Result :** | PASS * |

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

**Robinson Luo**
**Laboratory Manager**

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## 2 Version

| Version No. | Date | Description |
|---|---|---|
| *00* | *October 09, 2024* | *Original* |
| | | |
| | | |
| | | |
| | | |

***Prepared By:*** ***Date:*** *October 09, 2024*

***Project Engineer***

***Check By:*** ***Date:*** *October 09, 2024*

***Reviewer***

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# 4 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Antenna requirement | 15.203 | Pass |
| AC Power Line Conducted Emission | 15.207 | N/A |
| Field strength of the fundamental signal | 15.249 (a) | Pass |
| Spurious emissions | 15.249 (a) (d)/15.209 | Pass |
| Band edge | 15.249 (d)/15.205 | Pass |
| 20dB Occupied Bandwidth | 15.215 (c) | Pass |

*Remarks:*

1. *Test according to ANSI C63.10:2013.*
2. *Pass: The EUT complies with the essential requirements in the standard.*

## 4.1 Measurement Uncertainty

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Radio Frequency | $\pm 7.25\times10^{-8}$ |
| 2 | Duty cycle | ±0.37% |
| 3 | Occupied Bandwidth | ±3% |
| 4 | RF conducted power | ±0.75dB |
| 5 | RF power density | ±3dB |
| 6 | Conducted Spurious emissions | ±2.58dB |
| 7 | AC Power Line Conducted Emission | ±3.44dB (0.15MHz ~ 30MHz) |
| 8 | Radiated Spurious emission test | ±3.1dB (9kHz-30MHz) |
| | | ±3.8039dB (30MHz-200MHz) |
| | | ±3.9679dB (200MHz-1GHz) |
| | | ±4.29dB (1GHz-18GHz) |
| | | ±3.30dB (18GHz-40GHz) |
| 9 | Temperature test | ±1°C |
| 10 | Humidity test | ±3% |
| 11 | Time | ±3% |

# 5 General Information

## 5.1 General Description of EUT

| | |
|---|---|
| Product Name: | Remote control car |
| Model No.: | 93300, 93301, 93302, 93303, 93304, 93305, 93306, 93307, 93308, 93309, 93310, 93311, 93312, 93313, 93314, 93315, 93316, 93317, 93318, 93319, 93320, 93210, 93211, 93212, 93213, 93214, 93215, 93216, 93217, 93218, 93219, 93220, 93221, 93222, 93223, 93224, 93225, 93226, 93227, 93228, 93229, 93110, 93111, 93112, 93113, 93114, 93115, 93116, 93117, 93118, 93119, 93120, D93300, D93301, D93302, D93303, D93304, D93305, D93306, D93307, D93308, D93309, D93310, D93311, D93312, D93313, D93314, D93315, D93316, D93317, D93318, D93319, 93200, 93201, 93202, 93203, 93204, 93205, 93206, 93207, 93208, 93209, D93225, D93226, 93227, 93228, 93229, D93217, D93218, D93219, D93227, D93228, D93229, 93114S, 93210S, 93205S, 93208S, 93230-1, 93230-2, 93230-3, 93230-4, 93230-5, 93230-6, 93230-7, 93230-8, 93230-9, 93230-10, 93230-11, 93231 |
| Test Model No.: | 93310 |
| Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance, color and model name for commercial purpose. | |
| Serial No.: | N/A |
| Test sample(s) ID: | GTS2024090194-1 |
| Sample(s) Status | Engineered sample |
| Operation Frequency: | 2405MHz~2475MHz |
| Channel Numbers: | 71 |
| Modulation Type: | GFSK |
| Antenna Type: | Wire Antenna |
| Antenna gain: | 0dBi(declare by applicant) |
| Power supply: | DC 3V(2*1.5V Size“AA” Battery) |

Remark:
1. Antenna gain information provided by the customer
2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

| Operation Frequency each of channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 1 | 2405 | 19 | 2423 | 37 | 2441 | 55 | 2459 |
| 2 | 2406 | 20 | 2424 | 38 | 2442 | 56 | 2460 |
| 3 | 2407 | 21 | 2425 | 39 | 2443 | 57 | 2461 |
| 4 | 2408 | 22 | 2426 | 40 | 2444 | 58 | 2462 |
| 5 | 2409 | 23 | 2427 | 41 | 2445 | 59 | 2463 |
| 6 | 2410 | 24 | 2428 | 42 | 2446 | 60 | 2464 |
| 7 | 2411 | 25 | 2429 | 43 | 2447 | 61 | 2465 |
| 8 | 2412 | 26 | 2430 | 44 | 2448 | 62 | 2466 |
| 9 | 2413 | 27 | 2431 | 45 | 2449 | 63 | 2467 |
| 10 | 2414 | 28 | 2432 | 46 | 2450 | 64 | 2468 |
| 11 | 2415 | 29 | 2433 | 47 | 2451 | 65 | 2469 |
| 12 | 2416 | 30 | 2434 | 48 | 2452 | 66 | 2470 |
| 13 | 2417 | 31 | 2435 | 49 | 2453 | 67 | 2471 |
| 14 | 2418 | 32 | 2436 | 50 | 2454 | 68 | 2472 |
| 15 | 2419 | 33 | 2437 | 51 | 2455 | 69 | 2473 |
| 16 | 2420 | 34 | 2438 | 52 | 2456 | 70 | 2474 |
| 17 | 2421 | 35 | 2439 | 53 | 2457 | 71 | 2475 |
| 18 | 2422 | 36 | 2440 | 54 | 2458 | | |

The test frequencies are below:

| Channel | Frequency |
|---|---|
| The lowest channel | 2405MHz |
| The middle channel | 2440MHz |
| The Highest channel | 2475MHz |

## 5.2 Test mode

| | |
|---|---|
| Transmitting mode | Keep the EUT in continuously transmitting mode. |
| Remark: New battery is used during all test. | |

**Per-test mode.**

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report (Only show the worst case:Y axis) and defined as follows:

| Axis | X | Y | Z |
|---|---|---|---|
| Field Strength(dBuV/m) | 89.56 | 90.90 | 88.11 |

## 5.3 Description of Support Units

None.

## 5.4 Deviation from Standards

None.

## 5.5 Abnormalities from Standard Conditions

None.

## 5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

● **ISED—Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

## 5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123- 128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

## 5.8 Additional Instructions

| | |
|---|---|
| Test Software | Special test command provided by manufacturer |
| Power level setup | Default |

# 6 Test Instruments list

| Radiated Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS250 | Jun. 22, 2024 | Jun. 21, 2027 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | Apr. 11, 2024 | Apr. 10, 2025 |
| 4 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9168 | GTS640 | Mar. 19, 2023 | Mar. 18, 2025 |
| 5 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9120 D | GTS208 | Apr. 17, 2023 | Apr. 16, 2025 |
| 6 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 7 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | GTS575 | Apr. 11, 2024 | Apr. 10, 2025 |
| 8 | Loop Antenna | ZHINAN | ZN30900A | GTS534 | Nov. 13, 2023 | Nov.12, 2024 |
| 9 | Broadband Preamplifier | SCHWARZBECK | BBV9718 | GTS535 | Apr. 11, 2024 | Apr. 10, 2025 |
| 10 | Amplifier(1GHz-26.5GHz) | HP | 8449B | GTS601 | Apr. 11, 2024 | Apr. 10, 2025 |
| 11 | Horn Antenna (18-26.5GHz) | / | UG-598A/U | GTS664 | Oct. 29, 2023 | Oct. 28, 2024 |
| 12 | Horn Antenna (26.5-40GHz) | A.H Systems | SAS-573 | GTS665 | Oct. 29, 2023 | Oct. 28, 2024 |
| 13 | FSV·Signal Analyzer (10Hz-40GHz) | Keysight | FSV-40-N | GTS666 | Mar. 12, 2024 | Mar. 11, 2025 |
| 14 | Amplifier | / | LNA-1000-30S | GTS650 | Apr. 11, 2024 | Apr. 10, 2025 |
| 15 | CDNE M2+M3-16A | HCT | 30MHz-300MHz | GTS692 | Nov. 08, 2023 | Nov. 07, 2024 |
| 16 | Wideband Amplifier | / | WDA-01004000-15P35 | GTS602 | Apr. 11, 2024 | Apr. 10, 2025 |
| 17 | Thermo meter | JINCHUANG | GSP-8A | GTS643 | Apr. 18, 2024 | Apr. 17, 2025 |
| 18 | RE cable 1 | GTS | N/A | GTS675 | Jul. 02, 2024 | Jul. 01, 2025 |
| 19 | RE cable 2 | GTS | N/A | GTS676 | Jul. 02, 2024 | Jul. 01, 2025 |
| 20 | RE cable 3 | GTS | N/A | GTS677 | Jul. 02, 2024 | Jul. 01, 2025 |
| 21 | RE cable 4 | GTS | N/A | GTS678 | Jul. 02, 2024 | Jul. 01, 2025 |
| 22 | RE cable 5 | GTS | N/A | GTS679 | Jul. 02, 2024 | Jul. 01, 2025 |
| 23 | RE cable 6 | GTS | N/A | GTS680 | Jul. 02, 2024 | Jul. 01, 2025 |
| 24 | RE cable 7 | GTS | N/A | GTS681 | Jul. 05, 2024 | Jul. 04, 2025 |
| 25 | RE cable 8 | GTS | N/A | GTS682 | Jul. 05, 2024 | Jul. 04, 2025 |

| RF Conducted Test: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | MXA Signal Analyzer | Agilent | N9020A | GTS566 | Apr. 13, 2024 | Apr. 12, 2025 |
| 2 | EMI Test Receiver | R&S | ESCI 7 | GTS552 | Apr. 13, 2024 | Apr. 12, 2025 |
| 3 | PSA Series Spectrum Analyzer | Agilent | E4440A | GTS536 | Apr. 13, 2024 | Apr. 12, 2025 |
| 4 | MXG vector Signal Generator | Agilent | N5182A | GTS567 | Apr. 13, 2024 | Apr. 12, 2025 |
| 5 | ESG Analog Signal Generator | Agilent | E4428C | GTS568 | Apr. 13, 2024 | Apr. 12, 2025 |
| 6 | USB RF Power Sensor | DARE | RPR3006W | GTS569 | Apr. 13, 2024 | Apr. 12, 2025 |
| 7 | RF Switch Box | Shongyi | RFSW3003328 | GTS571 | Apr. 13, 2024 | Apr. 12, 2025 |
| 8 | Programmable Constant Temp & Humi Test Chamber | WEWON | WHTH-150L-40-880 | GTS572 | Apr. 13, 2024 | Apr. 12, 2025 |
| 9 | Thermo meter | JINCHUANG | GSP-8A | GTS641 | Apr. 18, 2024 | Apr. 17, 2025 |

| General used equipment: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Barometer | KUMAO | SF132 | GTS647 | Apr. 18, 2024 | Apr. 17, 2025 |

# 7 Test results and Measurement Data

## 7.1 Antenna requirement

| **Standard requirement:** | FCC Part15 C Section 15.203 |
|---|---|
| **15.203 requirement:**<br>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.<br>**15.247(c) (1)(i) requirement:**<br>(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi. | |
| **EUT Antenna:** | |
| The antenna is wire antenna, reference to the appendix II for details. | |

## 7.2 Radiated Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.209 |
| Test Method: | ANSI C63.10:2013 |
| Test Frequency Range: | 9kHz to 25GHz |
| Test site: | Measurement Distance: 3m |

**Receiver setup:**

| Frequency | Detector | RBW | VBW | Remark |
|---|---|---|---|---|
| 9kHz-150kHz | Quasi-peak | 200Hz | 300Hz | Quasi-peak Value |
| 150kHz-30MHz | Quasi-peak | 9kHz | 10kHz | Quasi-peak Value |
| 30MHz-1GHz | Quasi-peak | 120KHz | 300KHz | Quasi-peak Value |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak Value |
| | Peak | 1MHz | 10Hz | Average Value |

**Limit: (Field strength of the fundamental signal)**

| Frequency | Limit (dBuV/m @3m) | Remark |
|---|---|---|
| 2400MHz-2483.5MHz | 94.00 | Average Value |
| | 114.00 | Peak Value |

**Limit: (Spurious Emissions)**

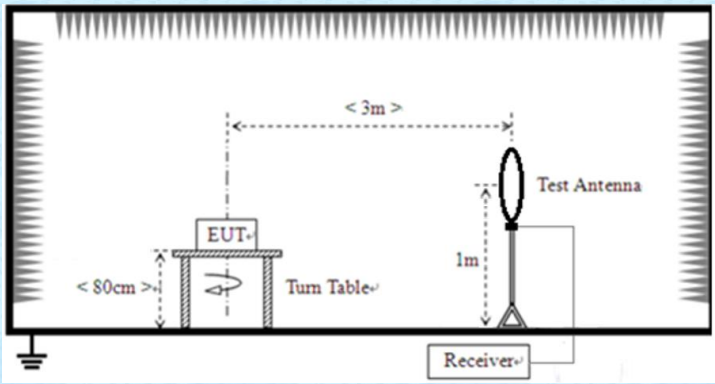
| Frequency | Limit (uV/m) | Remark |
|---|---|---|
| 0.009MHz-0.490MHz | 2400/F(kHz) @300m | Quasi-peak Value |
| 0.490MHz-1.705MHz | 24000/F(kHz) @30m | Quasi-peak Value |
| 1.705MHz-30.0MHz | 30 @30m | Quasi-peak Value |
| 30MHz-88MHz | 100 @3m | Quasi-peak Value |
| 88MHz-216MHz | 150 @3m | Quasi-peak Value |
| 216MHz-960MHz | 200 @3m | Quasi-peak Value |
| 960MHz-1GHz | 500 @3m | Quasi-peak Value |
| Above 1GHz | 500 @3m | Average Value |
| | 5000 @3m | Peak Value |

**Limit: (band edge)**

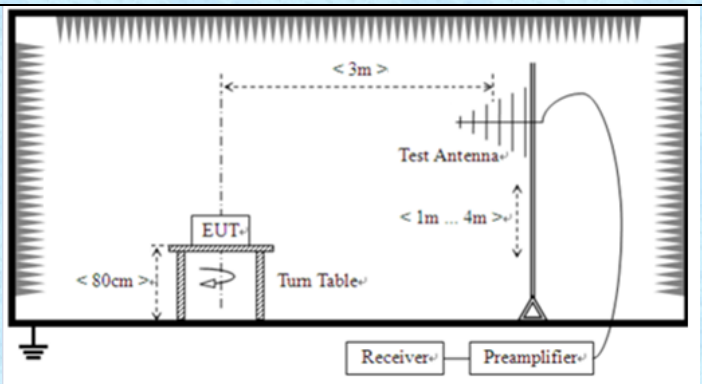
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

**Test setup:**

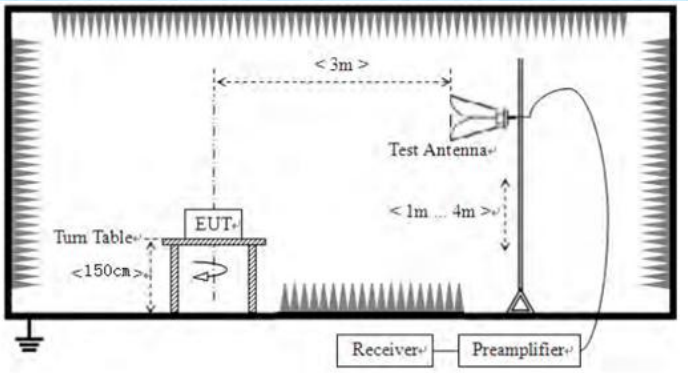
For radiated emissions from 9kHz to 30MHz




For radiated emissions from 30MHz to1GHz




For radiated emissions above 1GHz




| | | | | | | |
|---|---|---|---|---|---|---|
| Test Procedure: | 1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.<br>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.<br>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. | | | | | |
| Test Instruments: | Refer to section 6.0 for details | | | | | |
| Test mode: | Refer to section 5.2 for details | | | | | |
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
| Test voltage: | DC 3V | | | | | |
| Test results: | Pass | | | | | |

**Measurement data:**

### 7.2.1 Field Strength of The Fundamental Signal

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 2405.00 | 97.24 | 27.43 | 4.57 | 38.56 | 90.68 | 114.00 | -23.32 | Vertical |
| 2405.00 | 94.32 | 27.43 | 4.57 | 38.56 | 87.76 | 114.00 | -26.24 | Horizontal |
| 2440.00 | 97.36 | 27.55 | 4.56 | 38.57 | 90.90 | 114.00 | -23.10 | Vertical |
| 2440.00 | 94.55 | 27.55 | 4.56 | 38.57 | 88.09 | 114.00 | -25.91 | Horizontal |
| 2475.00 | 95.67 | 27.64 | 4.55 | 38.58 | 89.28 | 114.00 | -24.72 | Vertical |
| 2475.00 | 86.53 | 27.64 | 4.55 | 38.58 | 80.14 | 114.00 | -33.86 | Horizontal |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 2405.00 | 85.92 | 27.43 | 4.57 | 38.56 | 79.36 | 94.00 | -14.64 | Vertical |
| 2405.00 | 83.00 | 27.43 | 4.57 | 38.56 | 76.44 | 94.00 | -17.56 | Horizontal |
| 2440.00 | 86.04 | 27.55 | 4.56 | 38.57 | 79.58 | 94.00 | -14.42 | Vertical |
| 2440.00 | 83.23 | 27.55 | 4.56 | 38.57 | 76.77 | 94.00 | -17.23 | Horizontal |
| 2475.00 | 84.35 | 27.64 | 4.55 | 38.58 | 77.96 | 94.00 | -16.04 | Vertical |
| 2475.00 | 75.21 | 27.64 | 4.55 | 38.58 | 68.82 | 94.00 | -25.18 | Horizontal |

Note: For fundamental frequency , RBW>20dB BW, VBW>=RBW, PK detector for PK value, RMS detector for AV value

### 7.2.2 Spurious emissions

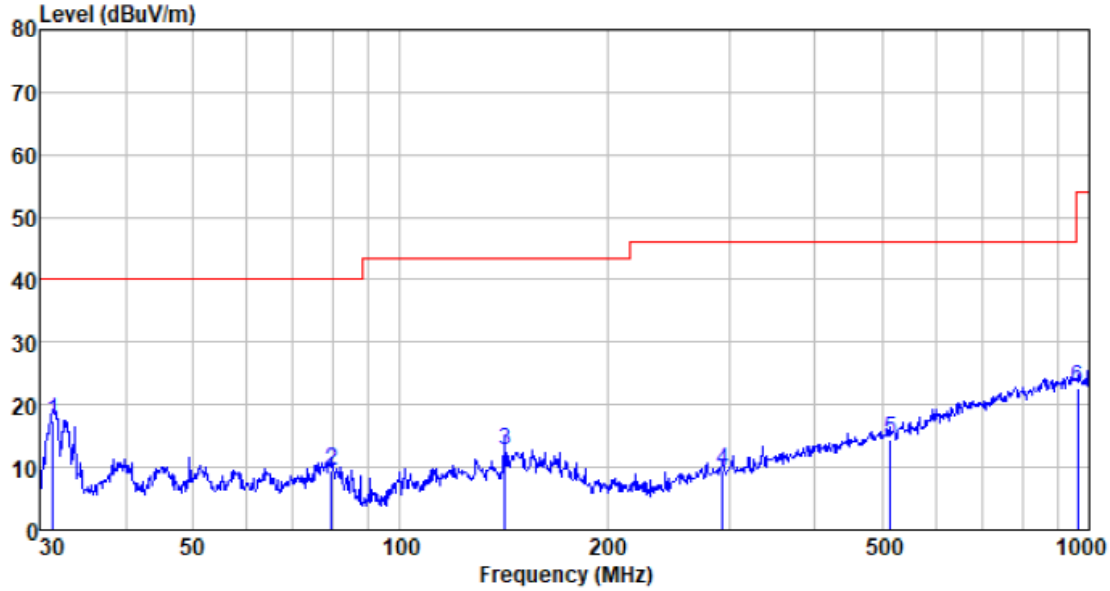
■ **Below 30MHz**

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

■ **Below 1GHz**

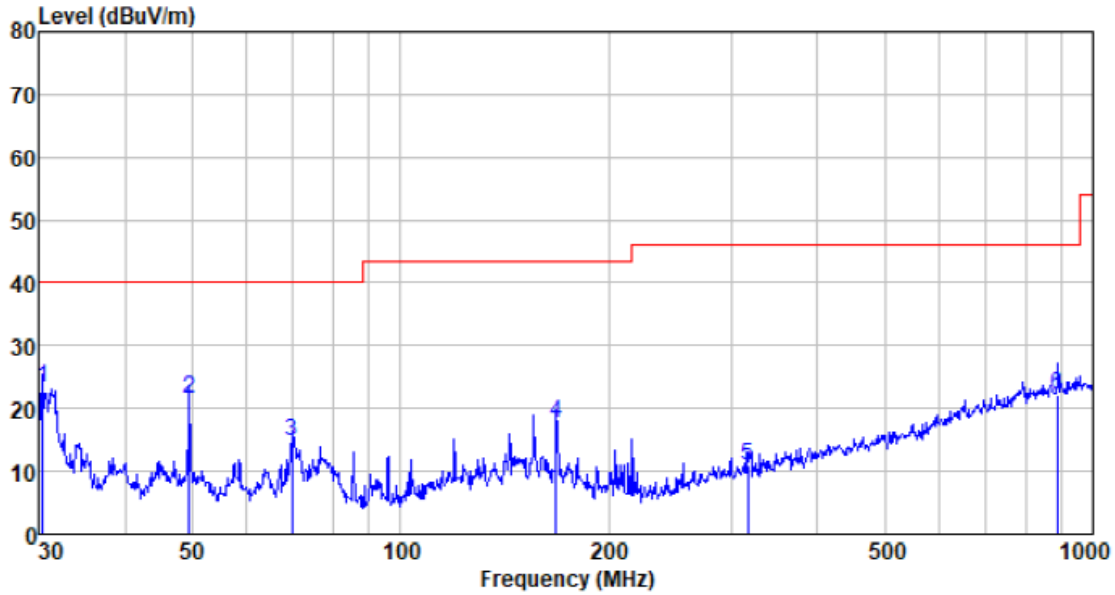
Pre-scan all test modes, found worst case at 2405MHz, and so only show the test result of it

Horizontal




| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 31.399 | 35.96 | 12.50 | 1.13 | 32.30 | 17.29 | 40.00 | -22.71 | QP |
| 79.521 | 30.49 | 9.85 | 1.65 | 32.42 | 9.57 | 40.00 | -30.43 | QP |
| 141.826 | 28.91 | 13.88 | 2.39 | 32.46 | 12.72 | 43.50 | -30.78 | QP |
| 294.114 | 25.96 | 12.26 | 3.39 | 32.31 | 9.30 | 46.00 | -36.70 | QP |
| 515.437 | 25.44 | 17.01 | 4.26 | 32.14 | 14.57 | 46.00 | -31.43 | QP |
| 962.162 | 24.17 | 23.70 | 5.91 | 31.10 | 22.68 | 54.00 | -31.32 | QP |

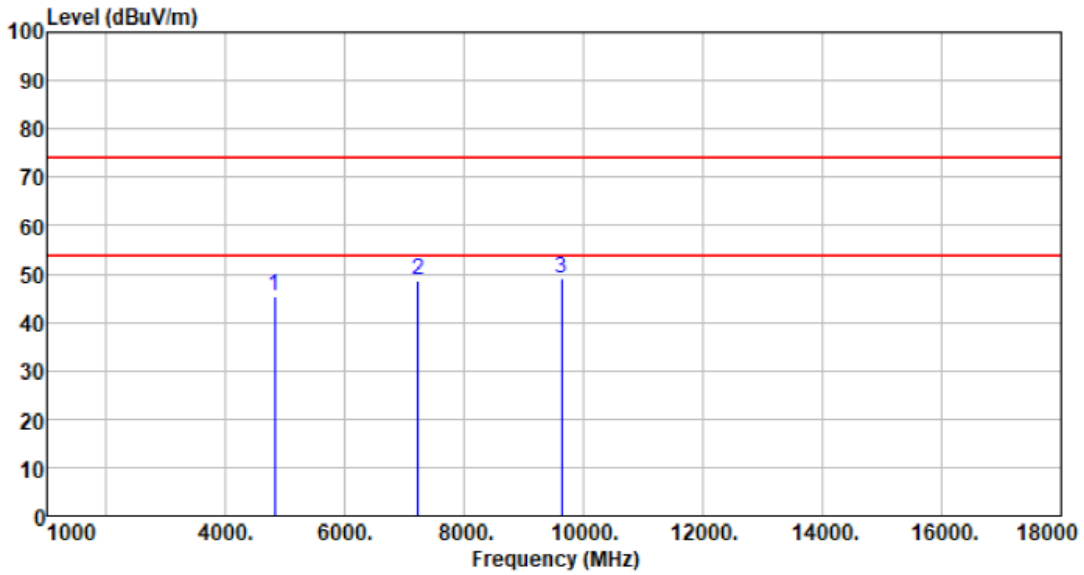
Vertical




| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 30.424 | 42.01 | 12.44 | 1.11 | 32.30 | 23.26 | 40.00 | -16.74 | QP |
| 49.533 | 39.80 | 12.69 | 1.38 | 32.30 | 21.57 | 40.00 | -18.43 | QP |
| 69.600 | 34.56 | 10.84 | 1.64 | 32.38 | 14.66 | 40.00 | -25.34 | QP |
| 167.824 | 33.88 | 13.62 | 2.62 | 32.43 | 17.69 | 43.50 | -25.81 | QP |
| 317.701 | 27.01 | 12.81 | 3.51 | 32.29 | 11.04 | 46.00 | -34.96 | QP |
| 887.610 | 24.66 | 22.95 | 5.70 | 31.10 | 22.21 | 46.00 | -23.79 | QP |

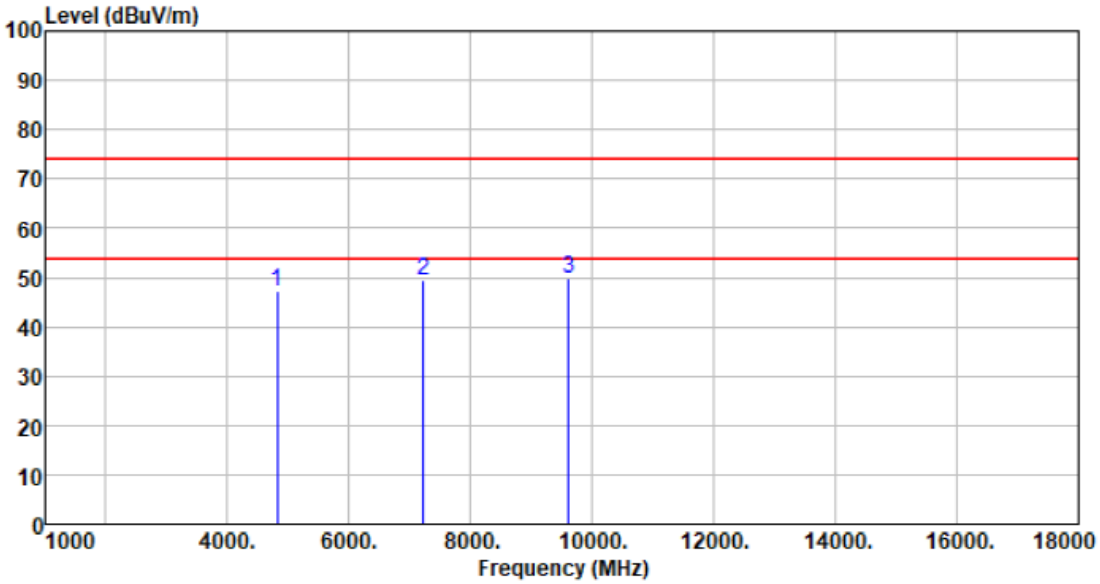
■ **Above 1GHz**

| Test channel: | Lowest | Polarization: | Horizontal |
|---|---|---|---|



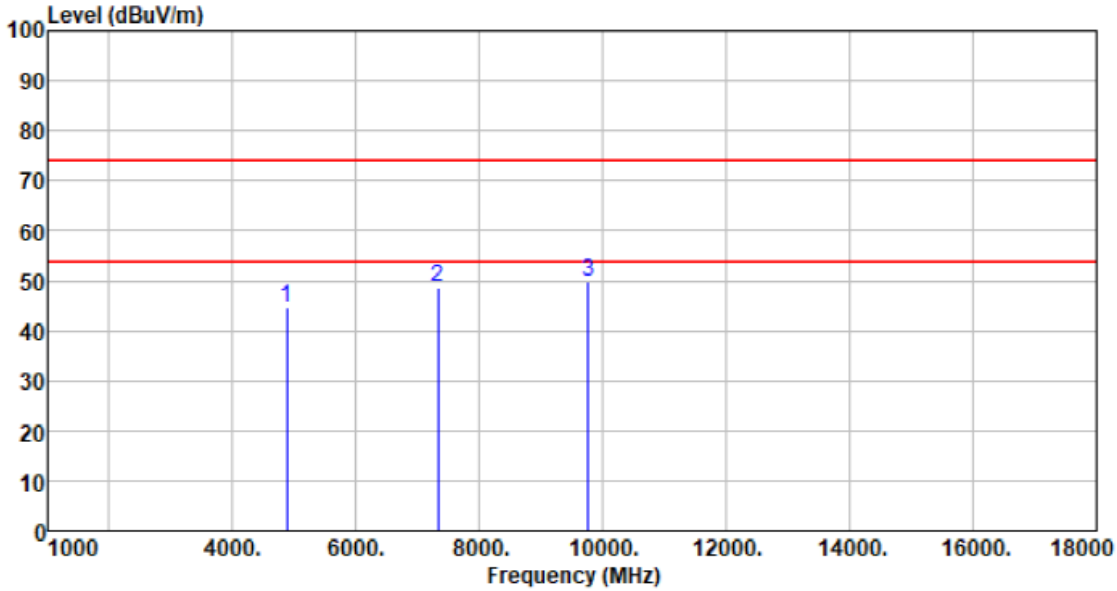

| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 4810.000 | 45.80 | 32.02 | 6.01 | 38.54 | 45.29 | 74.00 | -28.71 | Peak |
| 7215.000 | 43.56 | 36.23 | 7.93 | 39.15 | 48.57 | 74.00 | -25.43 | Peak |
| 9620.000 | 36.61 | 38.20 | 14.60 | 40.22 | 49.19 | 74.00 | -24.81 | Peak |

| Test channel: | Lowest | Polarization: | Vertical |
|---|---|---|---|



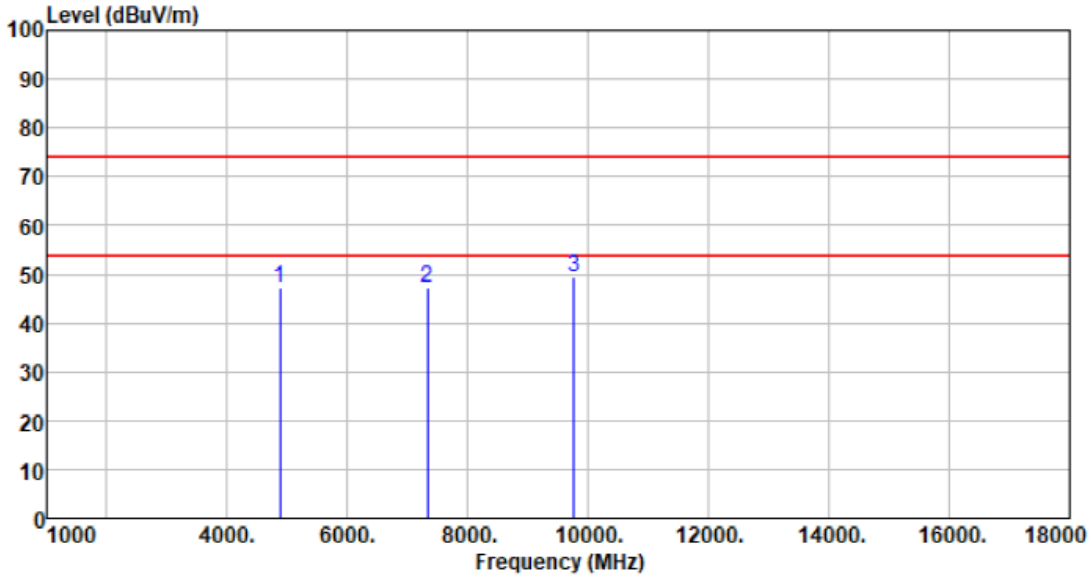

| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 4810.000 | 47.75 | 32.02 | 6.01 | 38.54 | 47.24 | 74.00 | -26.76 | Peak |
| 7215.000 | 44.39 | 36.23 | 7.93 | 39.15 | 49.40 | 74.00 | -24.60 | Peak |
| 9619.000 | 37.12 | 38.20 | 14.62 | 40.22 | 49.72 | 74.00 | -24.28 | Peak |

| Test channel: | Middle | Polarization: | Horizontal |
|---|---|---|---|



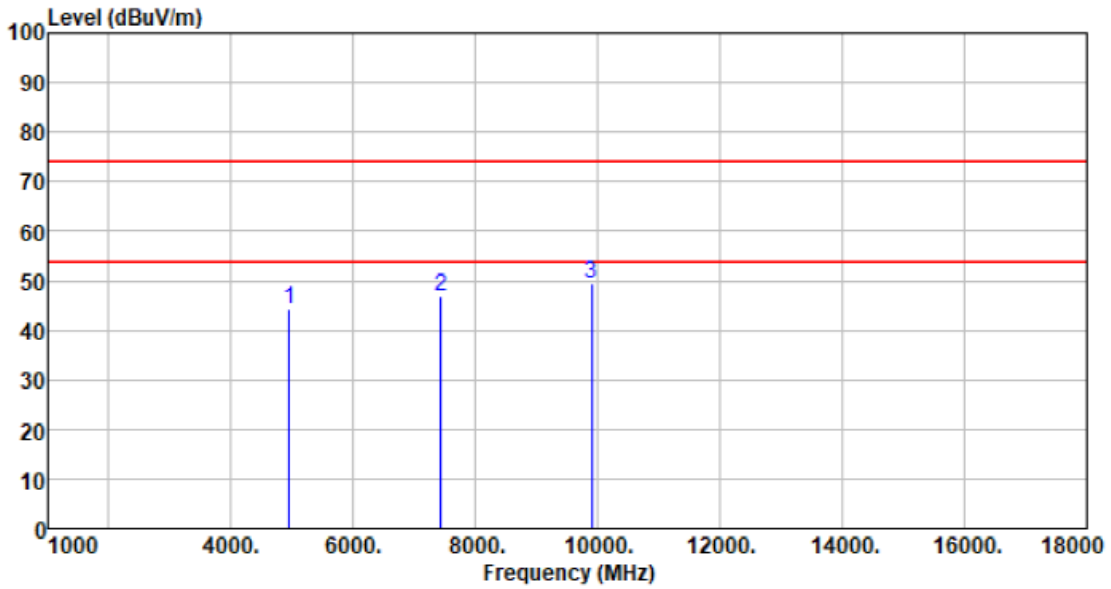

| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 4880.000 | 44.86 | 32.10 | 6.03 | 38.52 | 44.47 | 74.00 | -29.53 | Peak |
| 7320.000 | 43.43 | 36.30 | 8.04 | 39.22 | 48.55 | 74.00 | -25.45 | Peak |
| 9760.000 | 40.51 | 38.20 | 11.35 | 40.25 | 49.81 | 74.00 | -24.19 | Peak |

| Test channel: | Middle | Polarization: | Vertical |
|---|---|---|---|



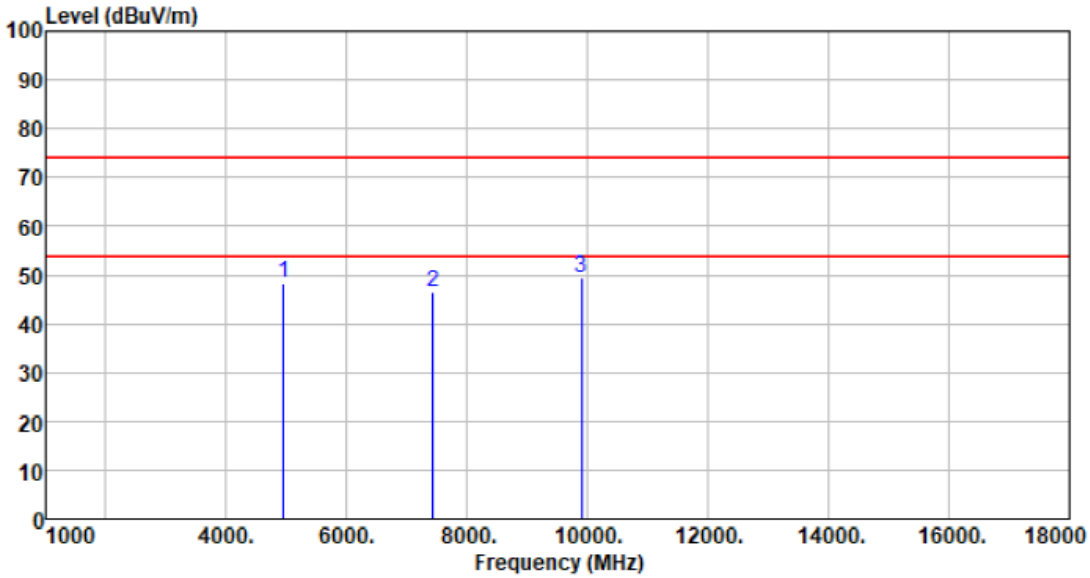

| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 4880.000 | 47.76 | 32.10 | 6.03 | 38.52 | 47.37 | 74.00 | -26.63 | Peak |
| 7320.000 | 42.19 | 36.30 | 8.04 | 39.22 | 47.31 | 74.00 | -26.69 | Peak |
| 9760.000 | 40.15 | 38.20 | 11.35 | 40.25 | 49.45 | 74.00 | -24.55 | Peak |

| Test channel: | Highest | Polarization: | Horizontal |
|---|---|---|---|




| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 4950.000 | 44.48 | 32.20 | 6.05 | 38.51 | 44.22 | 74.00 | -29.78 | Peak |
| 7425.000 | 41.76 | 36.30 | 8.14 | 39.30 | 46.90 | 74.00 | -27.10 | Peak |
| 9900.000 | 40.75 | 38.20 | 10.70 | 40.28 | 49.37 | 74.00 | -24.63 | Peak |

| Test channel: | Highest | Polarization: | Vertical |
|---|---|---|---|




| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 4950.000 | 48.62 | 32.20 | 6.05 | 38.51 | 48.36 | 74.00 | -25.64 | Peak |
| 7425.000 | 41.38 | 36.30 | 8.14 | 39.30 | 46.52 | 74.00 | -27.48 | Peak |
| 9900.000 | 40.75 | 38.20 | 10.70 | 40.28 | 49.37 | 74.00 | -24.63 | Peak |

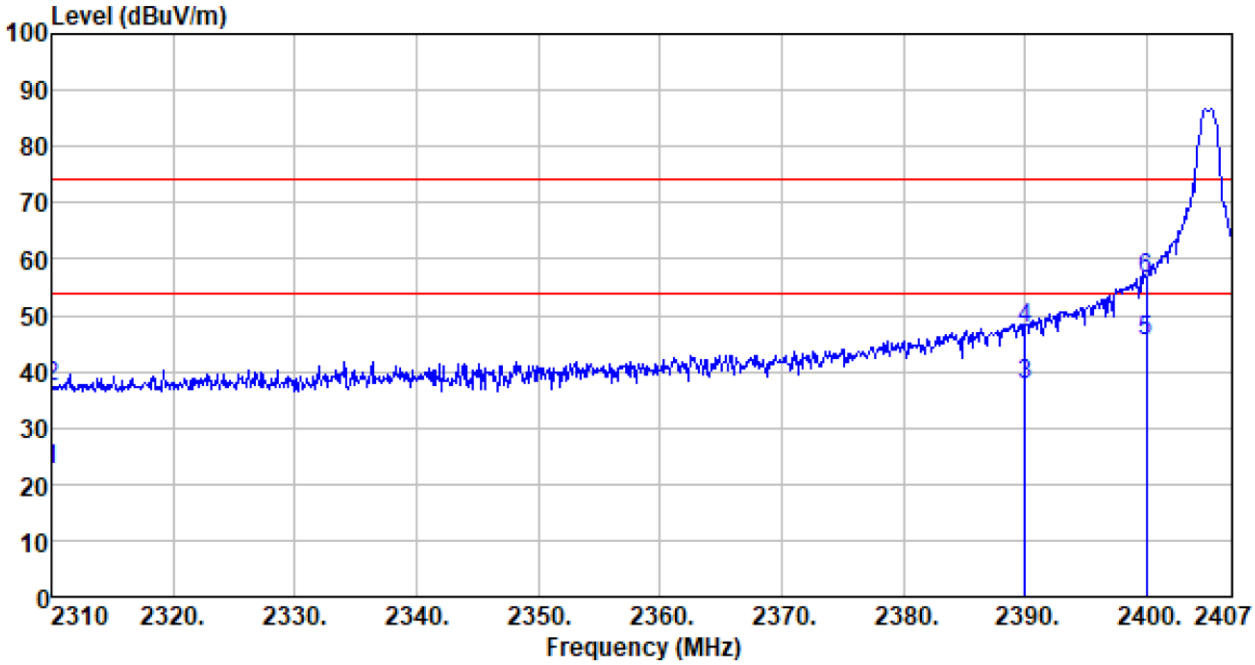
*Remarks:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *For above 18GHz, no emission found.*
4. *If the average limit is met when using a Peak detector, the EUT shall be deemed to meet both peak and average limits. And measurement with the average detector is unnecessary.*

### 7.2.3 Bandedge emissions

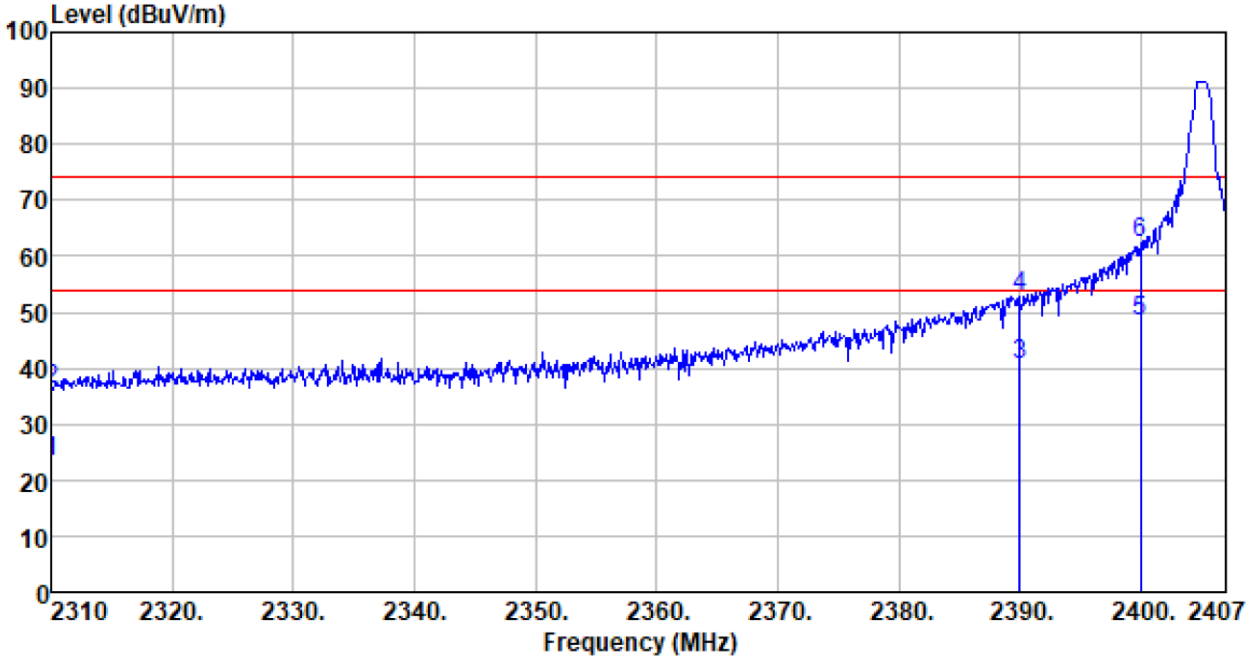
*All of the restriction bands were tested, and only the data of worst case was exhibited.*

| Test channel: | Lowest | Polarization: | Horizontal |
|---|---|---|---|



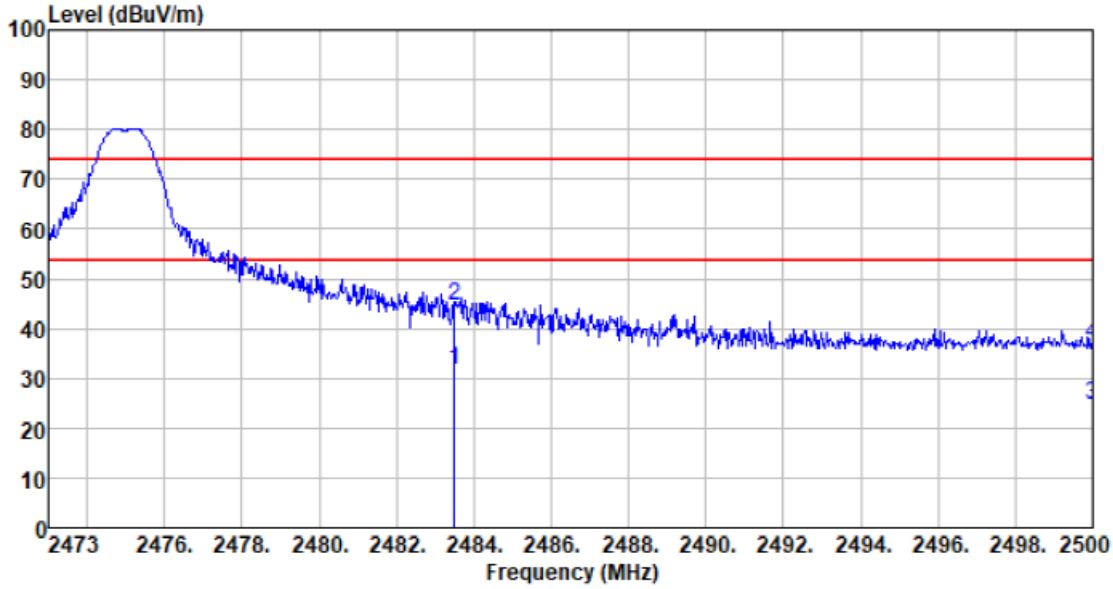

| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2310.000 | 30.41 | 27.00 | 4.13 | 39.14 | 22.40 | 54.00 | -31.60 | Average |
| 2310.000 | 45.39 | 27.00 | 4.13 | 39.14 | 37.38 | 74.00 | -36.62 | Peak |
| 2390.000 | 45.91 | 27.08 | 4.17 | 39.34 | 37.82 | 54.00 | -16.18 | Average |
| 2390.000 | 55.77 | 27.08 | 4.17 | 39.34 | 47.68 | 74.00 | -26.32 | Peak |
| 2400.000 | 53.61 | 27.10 | 4.18 | 39.36 | 45.53 | 54.00 | -8.47 | Average |
| 2400.000 | 64.48 | 27.10 | 4.18 | 39.36 | 56.40 | 74.00 | -17.60 | Peak |

| Test channel: | Lowest | Polarization: | Vertical |
|---|---|---|---|



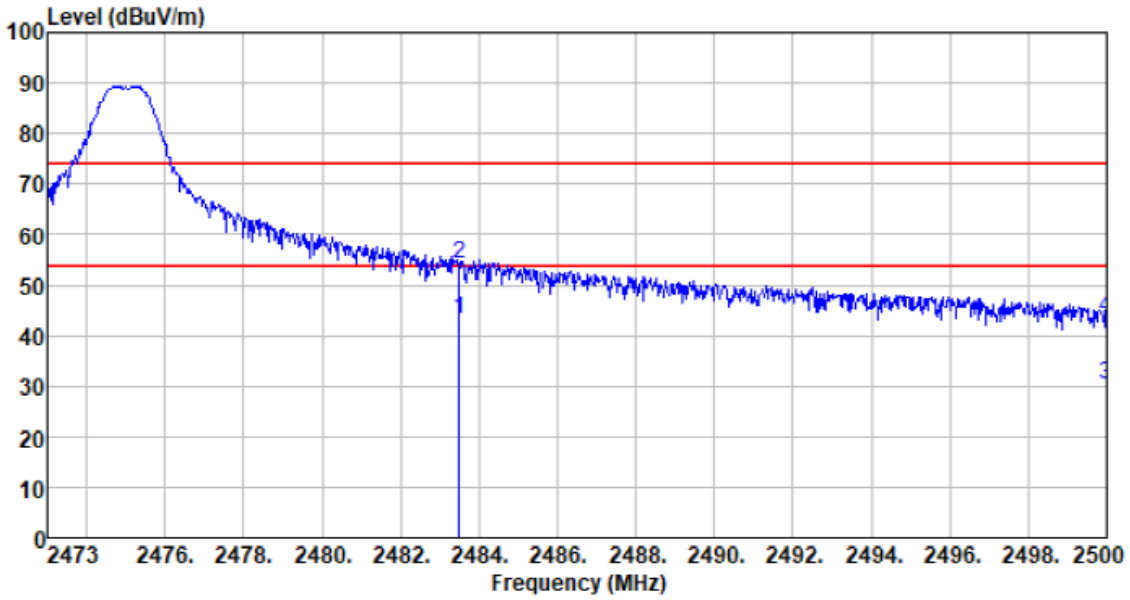

| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2310.000 | 31.16 | 27.00 | 4.13 | 39.14 | 23.15 | 54.00 | -30.85 | Average |
| 2310.000 | 44.06 | 27.00 | 4.13 | 39.14 | 36.05 | 74.00 | -37.95 | Peak |
| 2390.000 | 48.83 | 27.08 | 4.17 | 39.34 | 40.74 | 54.00 | -13.26 | Average |
| 2390.000 | 60.94 | 27.08 | 4.17 | 39.34 | 52.85 | 74.00 | -21.15 | Peak |
| 2400.000 | 56.57 | 27.10 | 4.18 | 39.36 | 48.49 | 54.00 | -5.51 | Average |
| 2400.000 | 70.32 | 27.10 | 4.18 | 39.36 | 62.24 | 74.00 | -11.76 | Peak |

| Test channel: | Highest | Polarization: | Horizontal |
|---|---|---|---|




| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 39.82 | 27.27 | 4.08 | 39.56 | 31.61 | 54.00 | -22.39 | Average |
| 2483.500 | 52.95 | 27.27 | 4.08 | 39.56 | 44.74 | 74.00 | -29.26 | Peak |
| 2500.000 | 33.14 | 27.30 | 4.06 | 39.60 | 24.90 | 54.00 | -29.10 | Average |
| 2500.000 | 45.10 | 27.30 | 4.06 | 39.60 | 36.86 | 74.00 | -37.14 | Peak |

| Test channel: | Highest | Polarization: | Vertical |
|---|---|---|---|

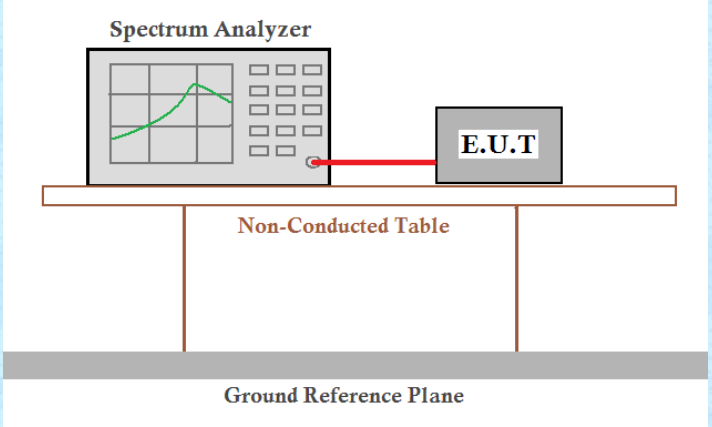



| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 51.28 | 27.27 | 4.08 | 39.56 | 43.07 | 54.00 | -10.93 | Average |
| 2483.500 | 62.42 | 27.27 | 4.08 | 39.56 | 54.21 | 74.00 | -19.79 | Peak |
| 2500.000 | 38.61 | 27.30 | 4.06 | 39.60 | 30.37 | 54.00 | -23.63 | Average |
| 2500.000 | 51.85 | 27.30 | 4.06 | 39.60 | 43.61 | 74.00 | -30.39 | Peak |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *For above 18GHz, no emission found*

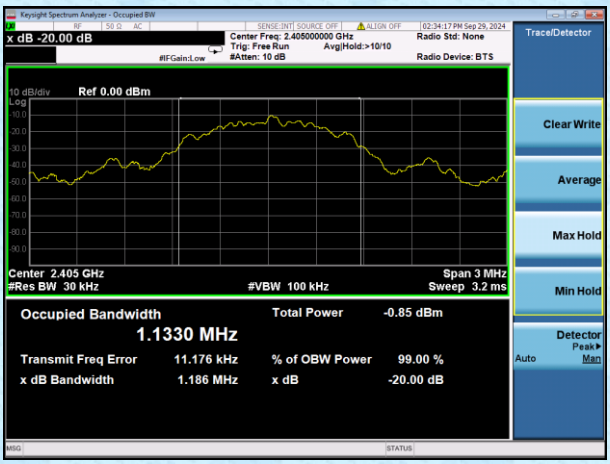
## 7.3 20dB Occupy Bandwidth

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.249/15.215 |
| Test Method: | ANSI C63.10:2013 |
| Limit: | Operation Frequency range 2400MHz~2483.5MHz |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data**

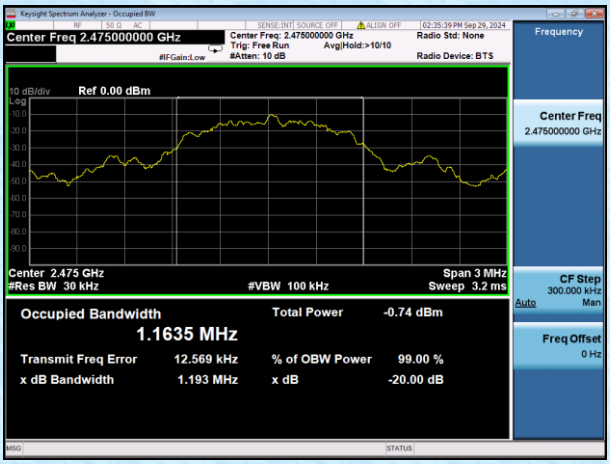
| Test channel | 20dB bandwidth(MHz) | Result |
|---|---|---|
| Lowest | 1.186 | Pass |
| Middle | 1.192 | Pass |
| Highest | 1.193 | Pass |

Test plot as follows:




Lowest channel

Middle channel




Highest channel

# 8 Test Setup Photo

Reference to the **appendix I** for details.

# 9 EUT Constructional Details

Reference to the **appendix II** for details.

------End------