# FCC Test Report

| | |
|---|---|
| **Report No.:** | 2405Y99385EC |
| **Applicant:** | Shenzhen VanTop Technology & Innovation Co., Ltd. |
| **Address:** | 506, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, China |
| **Product Name:** | R/C QUADCOPTER |
| **Product Model:** | DR-STP31G |
| **Multiple Models:** | DR-UHG30G |
| **Trade Mark:** | N/A |
| **FCC ID:** | 2AQ3A-STP31GT2424 |
| **Standards:** | FCC CFR Title 47 Part 15E (§15.407) |
| **Test Date:** | 2024-10-23 to 2024-11-18 |
| **Test Result:** | Complied |
| **Issue Date:** | 2024-11-18 |

**Reviewed by:** Abel Chen — Abel Chen, Project Engineer

**Approved by:** Jacob Gong — Jacob Kong, Manager

**Prepared by:**

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

NVLAP TESTING NVLAP LAB CODE 600335-0

This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★"

# Announcement

1. This test report shall not be reproduced except in full, without the written approval of World Alliance Testing & Certification (Shenzhen) Co., Ltd

2. The results in this report apply only to the sample tested.

3. This sample tested is in compliance with the limits of the above regulation.

4. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

5. The information marked "#" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

# Revision History

| Version No. | Issued Date | Description |
|---|---|---|
| *00* | *2024-11-18* | *Original* |

# Contents

# 1 General Information

## 1.1 Client Information

| | |
|---|---|
| Applicant: | Shenzhen VanTop Technology & Innovation Co., Ltd. |
| Address: | 506, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, China |
| Manufacturer: | Shenzhen VanTop Technology & Innovation Co., Ltd. |
| Address: | 506, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, China |

## 1.2 Product Description of EUT

The EUT is R/C QUADCOPTER that contains 5G WLAN radio, this report covers the full testing of the 5G WLAN radio.

| | |
|---|---|
| Sample Serial number | 2SWX-2 for RE test, 2SWX-3 for RF conducted test(assigned by WATC) |
| Sample Received Date | 2024-10-16 |
| Sample Status | Good Condition |
| Frequency Range | 5725 MHz - 5850MHz |
| Maximum Conducted Output Power | 5725 MHz - 5850MHz: 26.37dBm |
| Modulation Technology | OFDM |
| Spatial Streams | MIMO (2TX, 2RX) |
| Antenna Gain# | 1.88dBi |
| Power Supply | DC 7.4V from battery |
| Adapter Information | N/A |
| Modification | Sample No Modification by the test lab |

## 1.3 Antenna information

**15.203 requirement:**

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.

| **Device Antenna information:** | |
|---|---|

The Wi-Fi antenna is an internal antenna which cannot replace by end-user. Please see the product internal photos for details.

## 1.4 Related Submittal(s)/Grant(s)

No related submittal(s)/Grant(s)

## 1.5 Measurement Uncertainty

| Parameter | | Expanded Uncertainty (Confidence of 95%(U = 2Uc(y))) |
|---|---|---|
| AC Power Lines Conducted Emissions | | ±3.14dB |
| Emissions, Radiated | Below 30MHz | ±2.78dB |
| | Below 1GHz | ±4.84dB |
| | Above 1GHz | ±5.44dB |
| Emissions, Conducted | | 1.75dB |
| Conducted Power | | 0.74dB |
| Frequency Error | | 150Hz |
| Bandwidth | | 0.34% |
| Power Spectral Density | | 0.74dB |

***Note:*** *The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.*

## 1.6 Laboratory Location

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

## 1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

# 2 Description of Measurement

## 2.1 Test Configuration

| Operating channels: (5725-5850MHz) | | | | | |
|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
| 149 | 5745 | 153 | 5765 | 157 | 5785 |
| 161 | 5805 | 165 | 5825 | / | / |
| According to ANSI C63.10-2013 chapter 5.6.1 Table 11 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows: | | | | | |
| **802.11a, 802.11n-HT20, 802.11ac-VHT20** | | | | | |
| Lowest channel | | Middle channel | | Highest channel | |
| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
| 149 | 5745 | 157 | 5785 | 165 | 5825 |

| Test Mode: | | | | | |
|---|---|---|---|---|---|
| Transmitting mode: | Keep the EUT in continuous transmitting with modulation | | | | |
| Exercise software#: | SecureCRT | | | | |
| **Band** | **Mode** | **Data rate** | **Power Level Setting#** | | |
| | | | **Low Channel** | **Middle Channel** | **High Channel** |
| 5725-5850MHz | 802.11a | 6Mbps | 95 | 95 | 95 |
| | 802.11ac-VHT20 | MCS0 | 95 | 95 | 95 |
| The exercise software and the maximum power setting that provided by manufacturer. | | | | | |

| Worst-Case Configuration: |
|---|
| For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was photo and recorded in report<br><br>For radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.<br><br>For radiated emissions below 30MHz, three antenna orientations (parallel, perpendicular, gound-parallel) were tested, only record the worse case test data in report.<br><br>According to manufacturer, the device support SISO/MIMO for all mode, all modes share the same power level setting under the same modulation. So the worst mode MIMO was selected to test<br><br>The n-ht20 was reduced test since the identical parameters with ac vht20. |

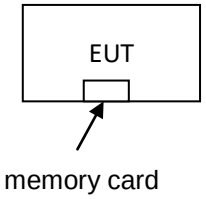
## 2.2 Test Auxiliary Equipment

| Manufacturer | Description | Model | Serial Number |
|---|---|---|---|
| Samsung | memory card | unknown | unknown |

## 2.3 Interconnecting Cables

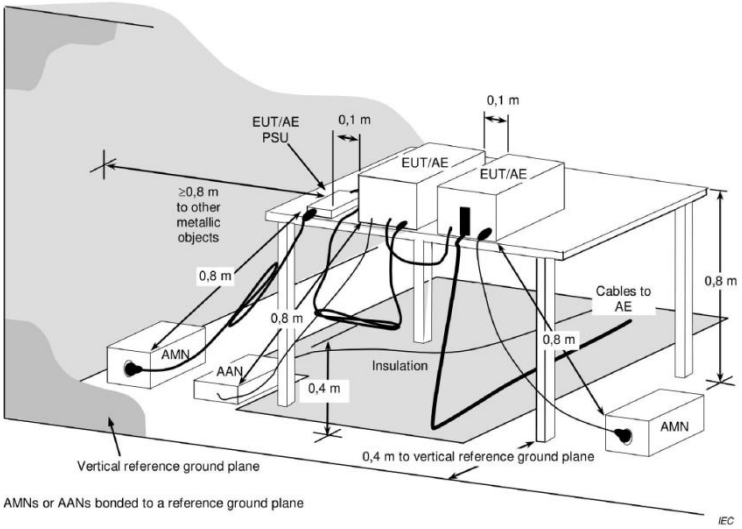
| Manufacturer | Description | Length(m) | From | To |
|---|---|---|---|---|
| / | / | / | / | / |

## 2.4 Block Diagram of Connection between EUT and AE



## 2.5 Test Setup

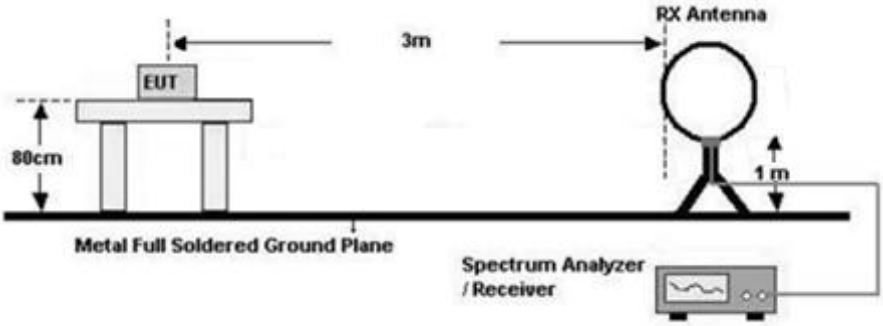
**1) Conducted emission measurement:**



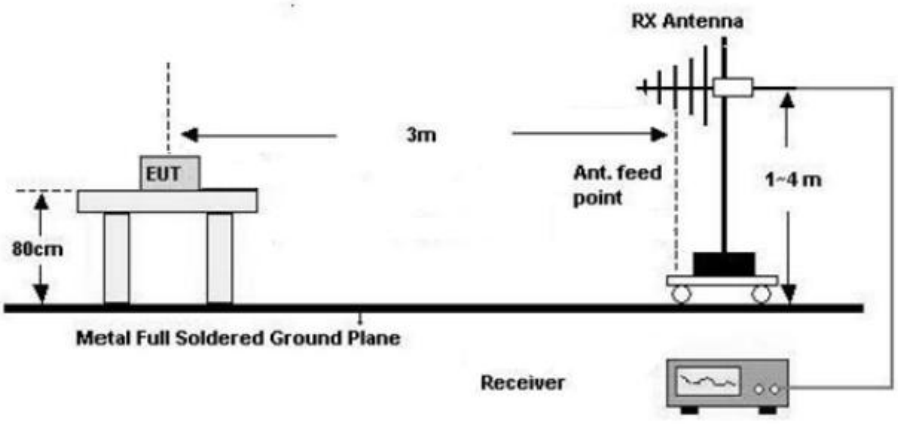

**Note:** The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

**2) Radiated emission measurement:**

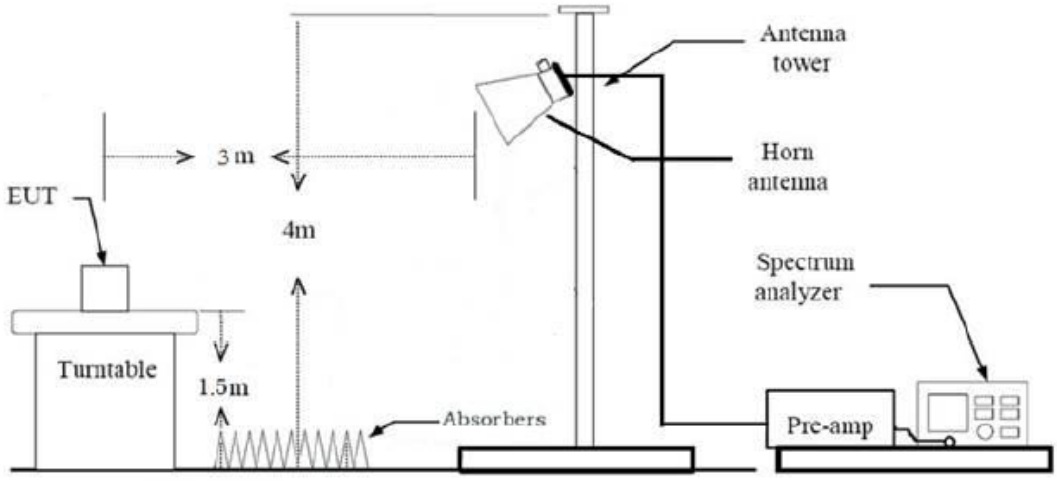
Below 30MHz (3m SAC)



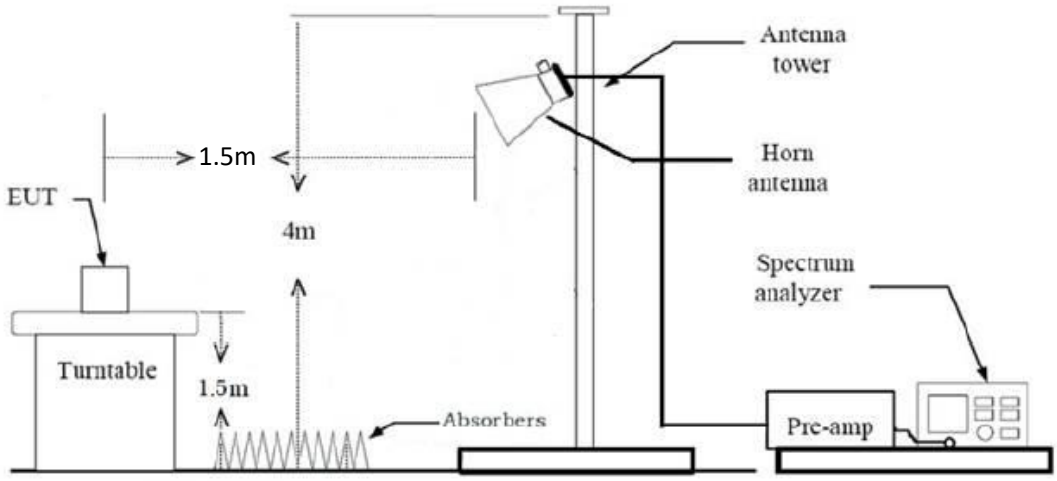

0MHz-1GHz (3m SAC)



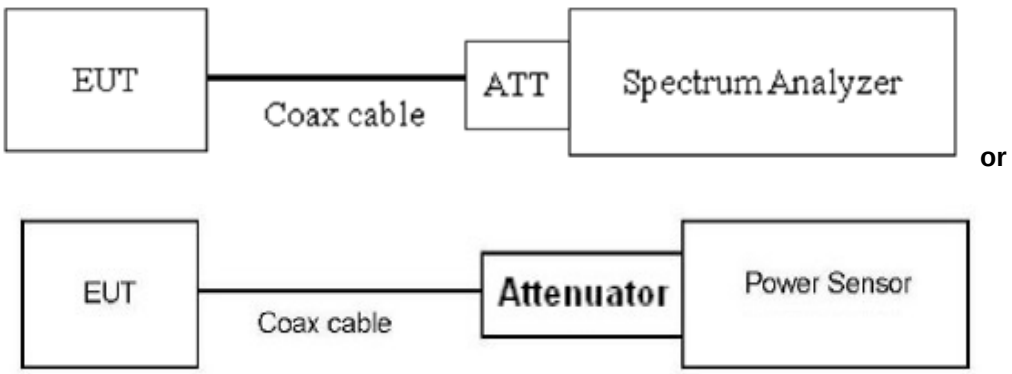
1GHz-18GHz




Above 18GHz




**3) RF Conducted Test**




**or**

## 2.6 Test Procedure

**Conducted emission:**

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. 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 C63.10 on conducted measurement.
3. Line conducted data is recorded for both Line and Neutral

**Radiated Emission Procedure:**

**a) For below 30MHz**

- All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).
- Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, gound-parallel)
- The RBW/VBW of receiver is set to 200Hz/1kHz for 9kHz to 150kHz range, to 10kHz/30kHz for 150kHz to 30MHz range for scan Peak emission, 200Hz/9kHz IF BW was used for final measurement in the Quasi-peak or average detection mode for frequency range 9~150kHz/150kHz~30MHz respectively.
- If the Peak emission complies with the QP limit, then perform final measurement is optional.

**b) For 30MHz-1GHz:**

- The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
- EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
- The RBW/VBW of receiver is set to 100kHz/300kHz for scan Peak emission, 120kHz IF BW was used for final measurement in the Quasi-peak detection mode.
- If the Peak emission complies with the QP limit, then perform final measurement is optional.

**c) For above 1GHz:**

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m (1-18GHz) and 1.5 m (above 18GHz).
2. EUT works in each mode of operation that needs to be tested，and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

3. The RBW/VBW of spectrum analyzer is set to 1MHz/3MHz for scan Peak emission, for measured average emission, reduce the VBW to 10Hz(for duty cycle≥98%), or ≥1/T(for duty cycle<98%). T is minimum transmission duration. (Note: a high VBW (for example 1kHz, not less than 1/T) may used to scan average emissions to avoid long sweep time.)
4. If the Peak emission complies with the Average limit, then perform average measurement is optional.
5. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
6. Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

**RF Conducted Test:**

1. The antenna port of EUT was connected to the RF port of the test equipment (Power Meter or Spectrum analyzer) through Attenuator and RF cable.
2. The cable assembly insertion loss of 14.0dB (including Attenuator and cable loss) was entered as an offset in the power meter. Note: Actual cable loss was unavailable at the time of testing, therefore the cable loss was assumed as worst case. This was later verified to be true by laboratory. ( if the RF cable provided by client, the cable loss declared by client)
3. The EUT is keeping in continuous transmission mode and tested in all modulation modes.

## 2.7 Measurement Method

| Description of Test | Measurement Method |
|---|---|
| AC Line Conducted Emissions | ANSI C63.10-2013 Section 6.2 |
| Maximum Conducted Output Power | KDB 789033 D02 v02r01 section E.3. b) |
| Power Spectral Density | KDB 789033 D02 v02r01 section F |
| 26 dB Emission Bandwidth | KDB 789033 D02 v02r01 section C.1 |
| 6 dB Emission Bandwidth | KDB 789033 D02 v02r01 section C.2 |
| 99% Occupied Bandwidth | KDB 789033 D02 v02r01 section D. |
| Unwanted Emissions | KDB 789033 D02 v02r01 section G. |
| Duty Cycle | KDB 789033 D02 v02r01 section B. |

## 2.8 Measurement Equipment

| Manufacturer | Description | Model | Management No. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| Radiated Emission Test | | | | | |
| R&S | EMI test receiver | ESR3 | 102758 | 2024/6/4 | 2025/6/3 |
| ROHDE& SCHWARZ | SPECTRUM ANALYZER | FSV40-N | 101608 | 2024/6/4 | 2025/6/3 |
| SONOMA INSTRUMENT | Low frequency amplifier | 310 | 186014 | 2024/6/4 | 2025/6/3 |
| A.H. Systems | PREAMPLIFIER | PAM-0118P | 531 | 2024/6/4 | 2025/6/3 |
| COM-POWER | Amplifier | PAM-840A | 461306 | 2023/8/8 | 2024/8/7 |
| BACL | Loop Antenna | 1313-1A | 4010611 | 2024/2/7 | 2027/2/6 |
| SCHWARZBECK | Log - periodic wideband antenna | VULB 9163 | 9163-872 | 2023/7/7 | 2026/7/6 |
| Astro Antenna Ltd | Horn antenna | AHA-118S | 3015 | 2023/7/6 | 2026/7/5 |
| Ducommun technologies | Horn Antenna | ARH-4223-02 | 1007726-03 | 2023/7/10 | 2026/7/9 |
| Ducommun technologies | Horn Antenna | ARH-2823-02 | 1007726-03 | 2023/7/10 | 2026/7/9 |
| Oulitong | Band Reject Filter | OBSF-5150-5850-S | OE02104371 | 2024/6/4 | 2025/6/3 |
| Unknown | 6.7G High Pass Filter | Unknown | 6.7G | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.9 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.13 | N/A | 2024/8/7 | 2025/8/6 |
| N/A | Coaxial Cable | NO.15 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.16 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.17 | N/A | 2024/6/4 | 2025/6/3 |
| Audix | Test Software | E3 | 191218 V9 | / | / |
| RF Conducted Test | | | | | |
| ROHDE& SCHWARZ | SPECTRUM ANALYZER | FSU-26 | 200680/026 | 2024/6/4 | 2025/6/3 |
| ANRITSU | USB Power Sensor | MA24418A | 12620 | 2024/6/4 | 2025/6/3 |
| Unknown | 10dB attenuator | 10dB | 10-1 | 2024/6/4 | 2025/6/3 |

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

# 3 Test Results

## 3.1 Test Summary

| FCC Rules | Description of Test | Result |
|---|---|---|
| §15.203 | Antenna Requirement | Compliance |
| §15.207 (a)<br>§15.407 (b)(9) | AC Line Conducted Emissions | N/A |
| §15.407 (a)(3)(i) | Conducted Output Power<br>Power Spectral Density | Compliance |
| §15.407 (a) | 99% Occupied Bandwidth | Compliance |
| §15.407 (e) | 6 dB Emission Bandwidth | Compliance |
| §15.205, §15.209,<br>§15.407 (b) (4), (9), (10) | Unwanted Emissions | Compliance |
| / | Duty Cycle | Report only |

## 3.2 Limit

| Test items | Limit |
|---|---|
| AC Power Line Conducted Emission | See details §15.207 (a) |
| Conducted Output Power<br><br>Power Spectral Density | **For the band 5.725-5.850 GHz:**<br><br>For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas ofdirectional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, Fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi withoutany corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipointsystems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. Theoperator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. |
| 26dB Emission Bandwidth<br>99% Occupied Bandwidth | N/A |
| 6dB Emission Bandwidth | Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz. |
| Unwanted Emissions | For transmitters operating solely in the 5.725–5.850 GHz band:<br><br>All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.<br><br>Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.<br><br>The provisions of § 15.205 apply to intentional radiators operating under this section. |

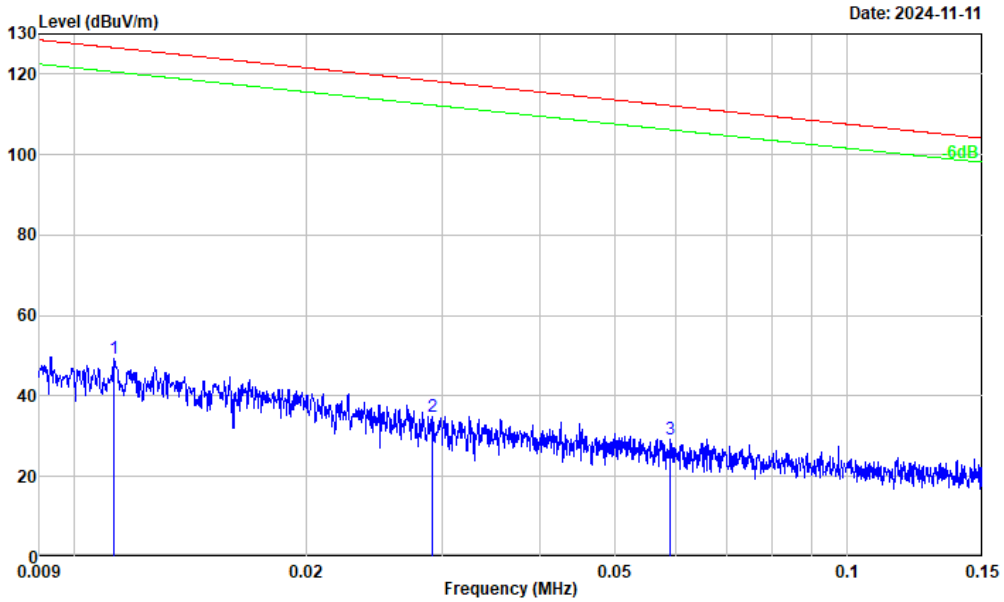
## 3.3 AC Line Conducted Emissions Test Data

*Not Applicable, the device only powered by battery*

# 3.4 Radiated emission Test Data

**9 kHz-30MHz:**

| **Test Date:** | 2024-11-11 | **Test By:** | Luke Li |
|---|---|---|---|
| **Environment condition:** | Temperature: 24.0°C; Relative Humidity:47%; ATM Pressure: 100.9kPa | | |

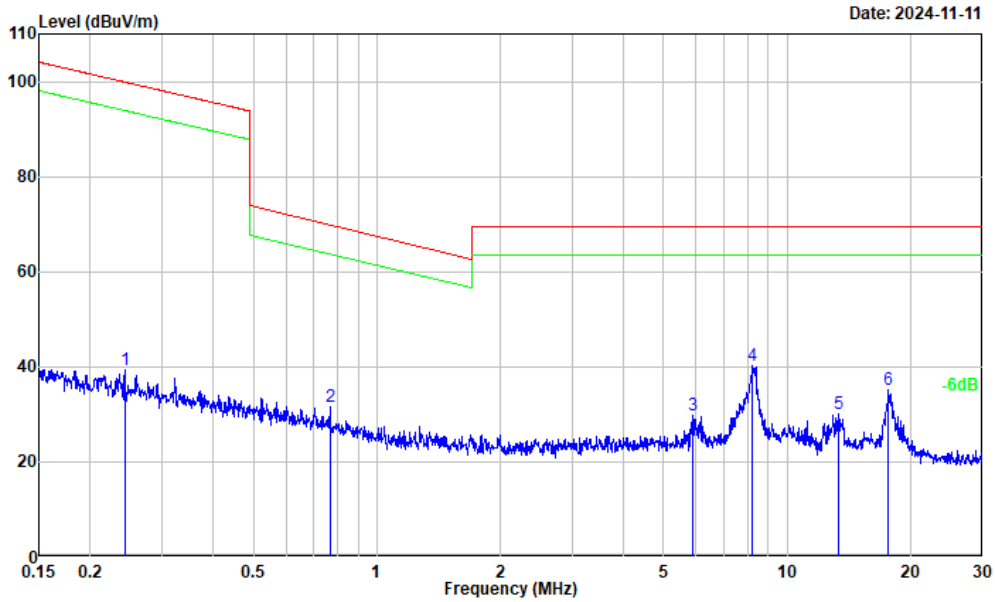



Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 24.0℃/47%R.H./100.9kPa
Tested by : Luke Li
Polarization : PARALLEL
Remark : 5GWiFi B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.011 | 12.77 | 36.41 | 49.18 | 126.58 | -77.40 | Peak |
| 2 | 0.029 | 9.69 | 25.10 | 34.79 | 118.34 | -83.55 | Peak |
| 3 | 0.059 | 10.19 | 19.14 | 29.33 | 112.16 | -82.83 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: RBW/VBW: 200Hz/1kHz, DET: PK




Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 24.0℃/47%R.H./100.9kPa
Tested by : Luke Li
Polarization : PARALLEL
Remark : 5GWiFi B4 802.11a low channel

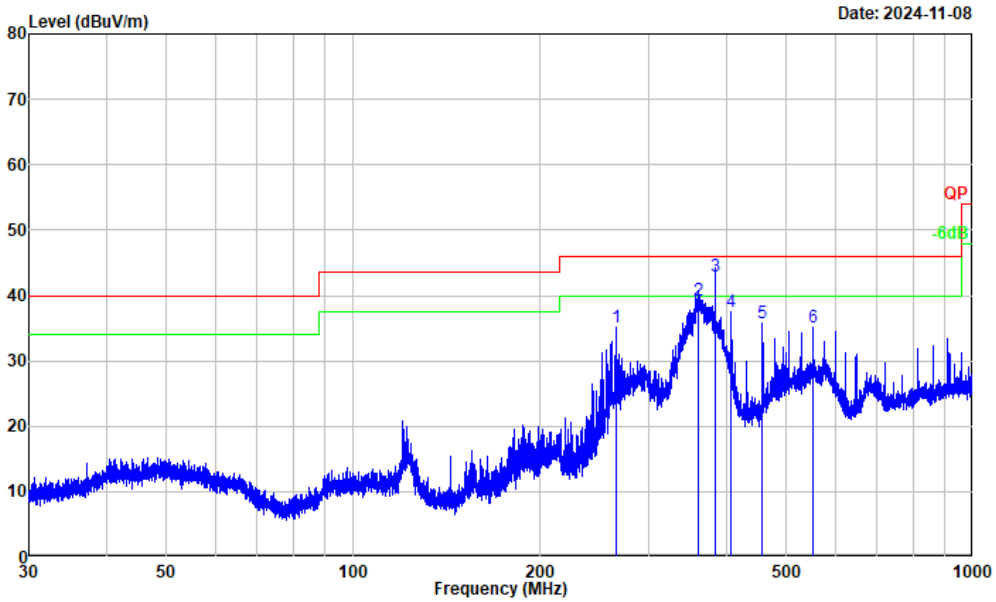
| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.243 | 28.28 | 10.93 | 39.21 | 99.89 | -60.68 | Peak |
| 2 | 0.770 | 28.94 | 2.68 | 31.62 | 69.79 | -38.17 | Peak |
| 3 | 5.893 | 34.03 | -4.14 | 29.89 | 69.54 | -39.65 | Peak |
| 4 | 8.230 | 44.15 | -3.89 | 40.26 | 69.54 | -29.28 | Peak |
| 5 | 13.332 | 33.72 | -3.56 | 30.16 | 69.54 | -39.38 | Peak |
| 6 | 17.656 | 38.58 | -3.27 | 35.31 | 69.54 | -34.23 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: RBW/VBW: 10kHz/30kHz, DET: PK

**30MHz-1GHz:**

| Test Date: | 2024-11-08 | Test By: | Luke Li |
|---|---|---|---|
| Environment condition: | Temperature: 23.6°C; Relative Humidity:41%; ATM Pressure: 101.1kPa | | |

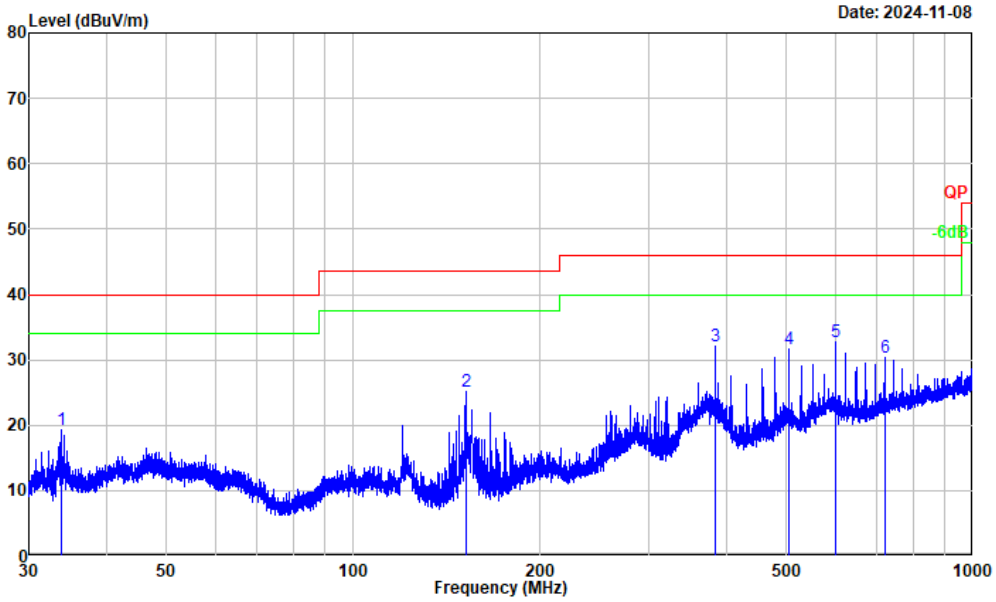



Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.6℃/41%R.H./101.1kPa
Tested by : Luke Li
Polarization : horizontal
Remark : 5GWiFi B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 265.559 | 47.20 | -12.15 | 35.05 | 46.00 | -10.95 | Peak |
| 2 | 359.974 | 48.90 | -9.67 | 39.23 | 46.00 | -6.77 | QP |
| 3 | 384.100 | 52.11 | -9.21 | 42.90 | 46.00 | -3.10 | QP |
| 4 | 408.051 | 46.06 | -8.58 | 37.48 | 46.00 | -8.52 | Peak |
| 5 | 456.106 | 44.23 | -8.37 | 35.86 | 46.00 | -10.14 | Peak |
| 6 | 552.157 | 41.70 | -6.56 | 35.14 | 46.00 | -10.86 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK
Final measurement: RBW: 120kHz, DET: QP




Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.6℃/41%R.H./101.1kPa
Tested by : Luke Li
Polarization : vertical
Remark : 5GWiFi B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 33.784 | 34.30 | -15.05 | 19.25 | 40.00 | -20.75 | Peak |
| 2 | 151.996 | 42.45 | -17.32 | 25.13 | 43.50 | -18.37 | Peak |
| 3 | 383.932 | 41.22 | -9.21 | 32.01 | 46.00 | -13.99 | Peak |
| 4 | 504.043 | 39.12 | -7.38 | 31.74 | 46.00 | -14.26 | Peak |
| 5 | 600.110 | 38.01 | -5.30 | 32.71 | 46.00 | -13.29 | Peak |
| 6 | 720.146 | 34.20 | -3.74 | 30.46 | 46.00 | -15.54 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK
Final measurement: RBW: 120kHz, DET: QP

**Above 1GHz:**

| **Test Date:** | 2024-10-23~2024-11-01 | **Test By:** | Bard Huang |
|---|---|---|---|
| **Environment condition:** | Temperature: 23.9~25°C; Relative Humidity: 57~59%; ATM Pressure: 100.6kPa | | |

| Frequency (MHz) | Reading level (dBμV) | Polar (H/V) | Corrected Factor (dB/m) | Corrected Amplitude (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 5725-5850MHz Band | | | | | | | |
| 802.11a | | | | | | | |
| Low Channel | | | | | | | |
| 11490.000 | 45.38 | horizontal | 4.54 | 49.92 | 54.00 | -4.08 | Average |
| 11490.000 | 53.18 | horizontal | 4.54 | 57.72 | 74.00 | -16.28 | Peak |
| 11490.000 | 46.08 | vertical | 4.54 | 50.62 | 74.00 | -23.38 | Peak |
| 17235.000 | 53.73 | horizontal | 4.46 | 58.19 | 68.20 | -10.01 | Peak |
| 17235.000 | 53.15 | vertical | 4.46 | 57.61 | 68.20 | -10.59 | Peak |
| Middle Channel | | | | | | | |
| 11550.000 | 43.88 | horizontal | 4.12 | 48.00 | 54.00 | -6.00 | Average |
| 11550.000 | 51.32 | horizontal | 4.12 | 55.44 | 74.00 | -18.56 | Peak |
| 11550.000 | 46.27 | vertical | 4.12 | 50.39 | 74.00 | -23.61 | Peak |
| 17355.000 | 49.97 | horizontal | 4.62 | 54.59 | 68.20 | -13.61 | Peak |
| 17355.000 | 45.45 | vertical | 4.62 | 50.07 | 68.20 | -18.13 | Peak |
| High Channel | | | | | | | |
| 11650.000 | 47.34 | horizontal | 3.64 | 50.98 | 54.00 | -3.02 | Average |
| 11650.000 | 57.68 | horizontal | 3.64 | 61.32 | 74.00 | -12.68 | Peak |
| 11650.000 | 49.53 | vertical | 3.64 | 53.17 | 74.00 | -20.83 | Peak |
| 17475.000 | 60.17 | horizontal | 5.29 | 65.46 | 68.20 | -2.74 | Peak |
| 17475.000 | 56.08 | vertical | 5.29 | 61.37 | 68.20 | -6.83 | Peak |
| 802.11ac-VHT20 | | | | | | | |
| Low Channel | | | | | | | |
| 11490.000 | 45.09 | horizontal | 4.54 | 49.63 | 54.00 | -4.37 | Average |
| 11490.000 | 56.17 | horizontal | 4.54 | 60.71 | 74.00 | -13.29 | Peak |
| 11490.000 | 45.97 | vertical | 4.54 | 50.51 | 74.00 | -23.49 | Peak |
| 17235.000 | 55.73 | horizontal | 4.46 | 60.19 | 68.20 | -8.01 | Peak |
| 17235.000 | 51.63 | vertical | 4.46 | 56.09 | 68.20 | -12.11 | Peak |
| Middle Channel | | | | | | | |
| 11570.000 | 46.30 | horizontal | 3.96 | 50.26 | 54.00 | -3.74 | Average |
| 11570.000 | 54.59 | horizontal | 3.96 | 58.55 | 74.00 | -15.45 | Peak |
| 11570.000 | 43.67 | vertical | 3.96 | 47.63 | 54.00 | -6.37 | Average |
| 11570.000 | 51.25 | vertical | 3.96 | 55.21 | 74.00 | -18.79 | Peak |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17355.000 | 55.38 | horizontal | 4.62 | 60.00 | 68.20 | -8.20 | Peak |
| 17355.000 | 53.72 | vertical | 4.62 | 58.34 | 68.20 | -9.86 | Peak |
| High Channel | | | | | | | |
| 11650.000 | 47.17 | horizontal | 3.64 | 50.81 | 54.00 | -3.19 | Average |
| 11650.000 | 56.43 | horizontal | 3.64 | 60.07 | 74.00 | -13.93 | Peak |
| 11650.000 | 45.46 | vertical | 3.64 | 49.10 | 54.00 | -4.90 | Average |
| 11650.000 | 53.37 | vertical | 3.64 | 57.01 | 74.00 | -16.99 | Peak |
| 17474.000 | 55.66 | horizontal | 5.28 | 60.94 | 68.20 | -7.26 | Peak |
| 17475.000 | 54.43 | vertical | 5.29 | 59.72 | 68.20 | -8.48 | Peak |

Remark:

Corrected Amplitude= Reading level + corrected Factor

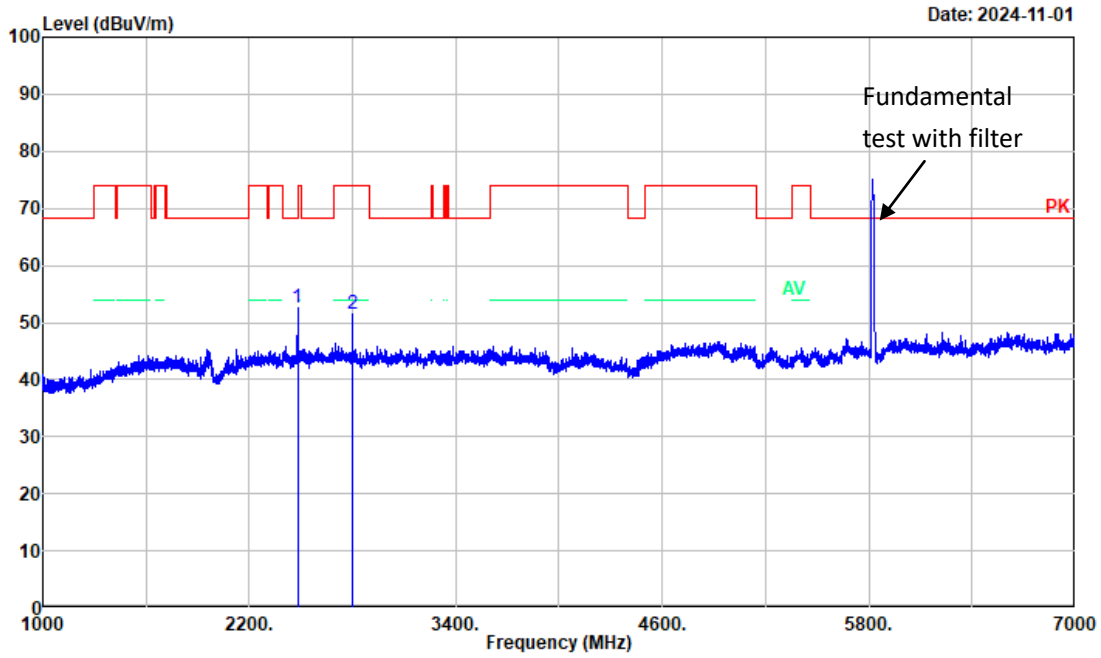
Corrected Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Corrected Amplitude – Limit

For the test result of Peak below the Peak limit more than 20dB, which can compliance with the average limit, just the Peak level was recorded.

**Test plot for example as below:**

| Mode: | 802.11 a | Channel: | 5825MHz |
|---|---|---|---|



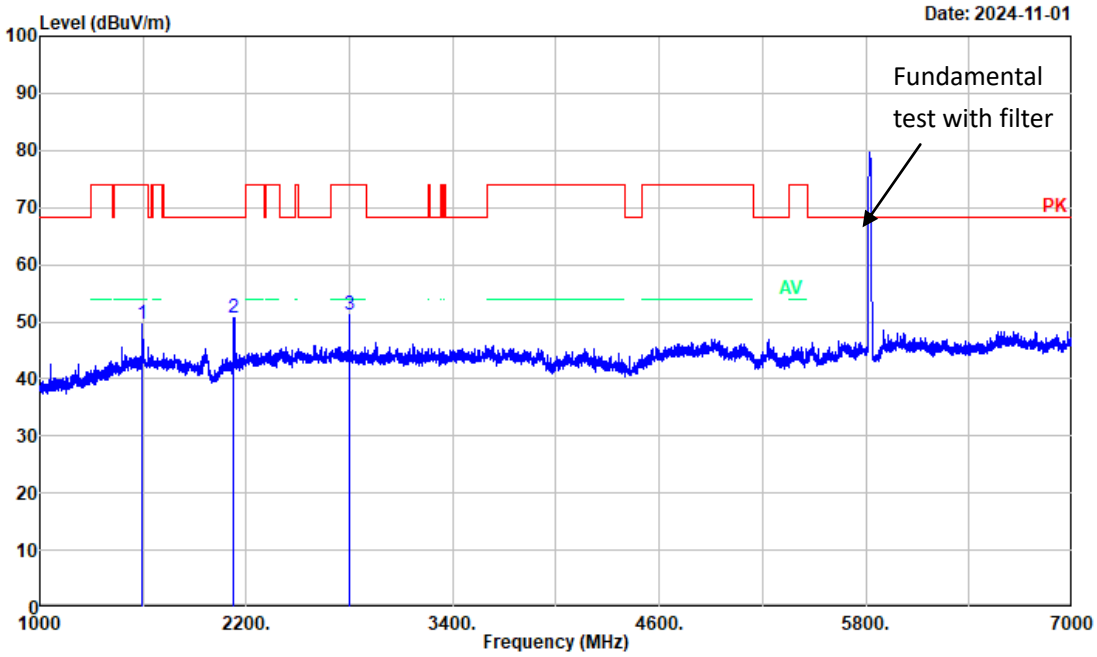

```
Project No.   : 2405Y99385E
Test Mode     : Transmitting
Test Voltage  : Power by battery
Environment   : 23.9℃/57%R.H./100.6kPa
Tested by     : Bard Huang
Polarization  : horizontal
Remark        : B4 802.11a high channel
```

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2480.000 | 55.57 | -2.99 | 52.58 | 68.20 | -15.62 | Peak |
| 2 | 2796.000 | 54.04 | -2.64 | 51.40 | 74.00 | -22.60 | Peak |

```
Remarks:  Factor = Antenna factor + Cable loss - Preamp gain
          Result = Reading + Factor
          Over Limit = Result - Limit
```

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11 a | Channel: | 5825MHz |
|---|---|---|---|



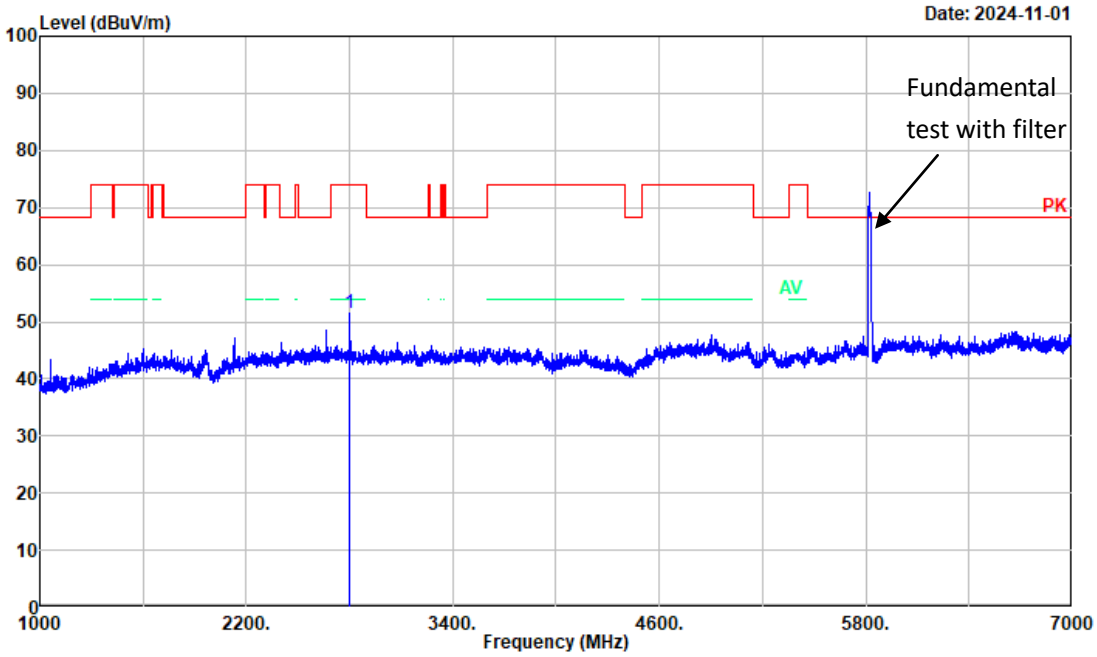

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.9℃/57%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11a high channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 1595.000 | 54.01 | -4.49 | 49.52 | 74.00 | -24.48 | Peak |
| 2 | 2127.000 | 54.95 | -4.24 | 50.71 | 68.20 | -17.49 | Peak |
| 3 | 2797.000 | 53.76 | -2.64 | 51.12 | 74.00 | -22.88 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5825MHz |
|---|---|---|---|



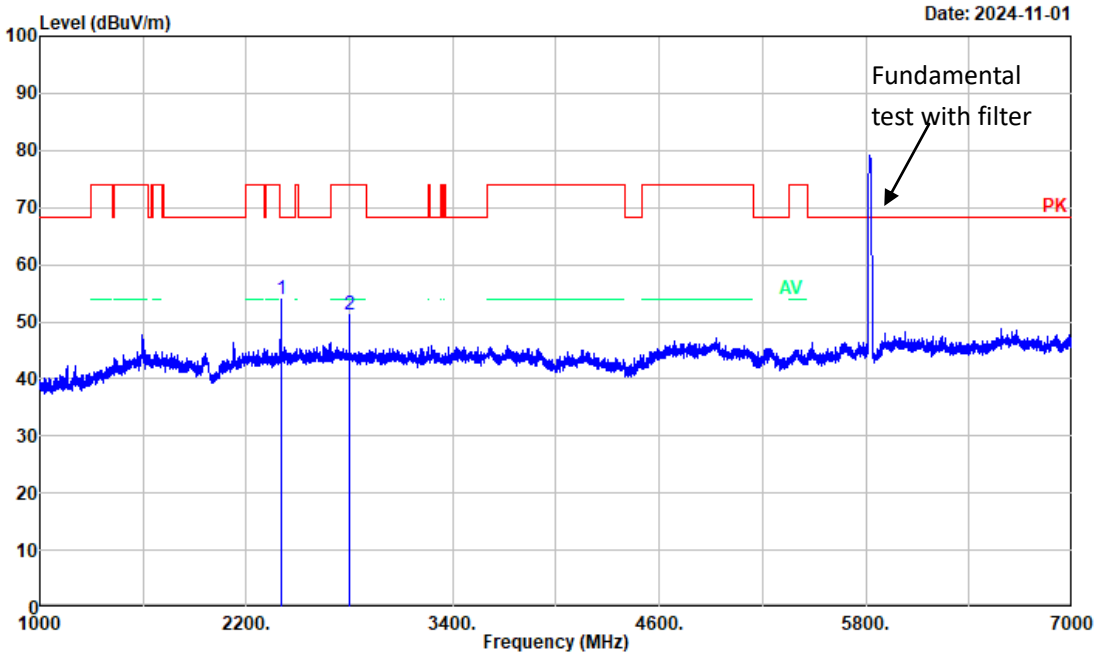

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.9℃/57%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : B4 802.11ac20 high channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2796.000 | 54.19 | -2.64 | 51.55 | 74.00 | -22.45 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5825MHz |
|---|---|---|---|



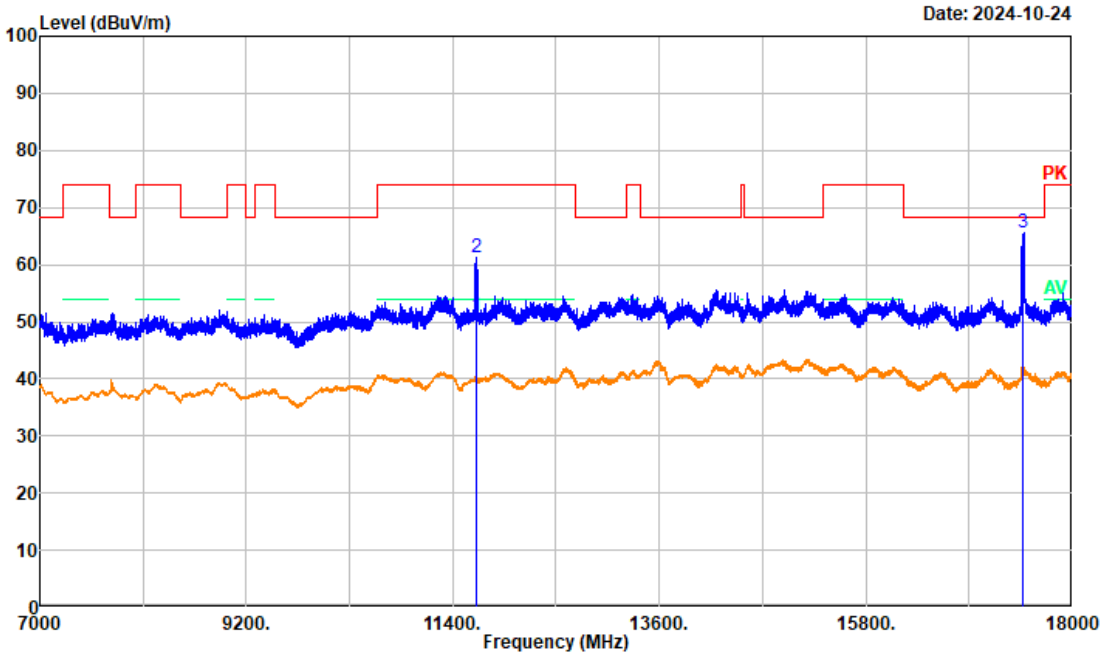

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.9℃/57%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11ac20 high channel

| --No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2402.000 | 57.07 | -3.16 | 53.91 | 68.20 | -14.29 | Peak |
| 2 | 2796.000 | 53.87 | -2.64 | 51.23 | 74.00 | -22.77 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11 a | Channel: | 5825MHz |
|---|---|---|---|



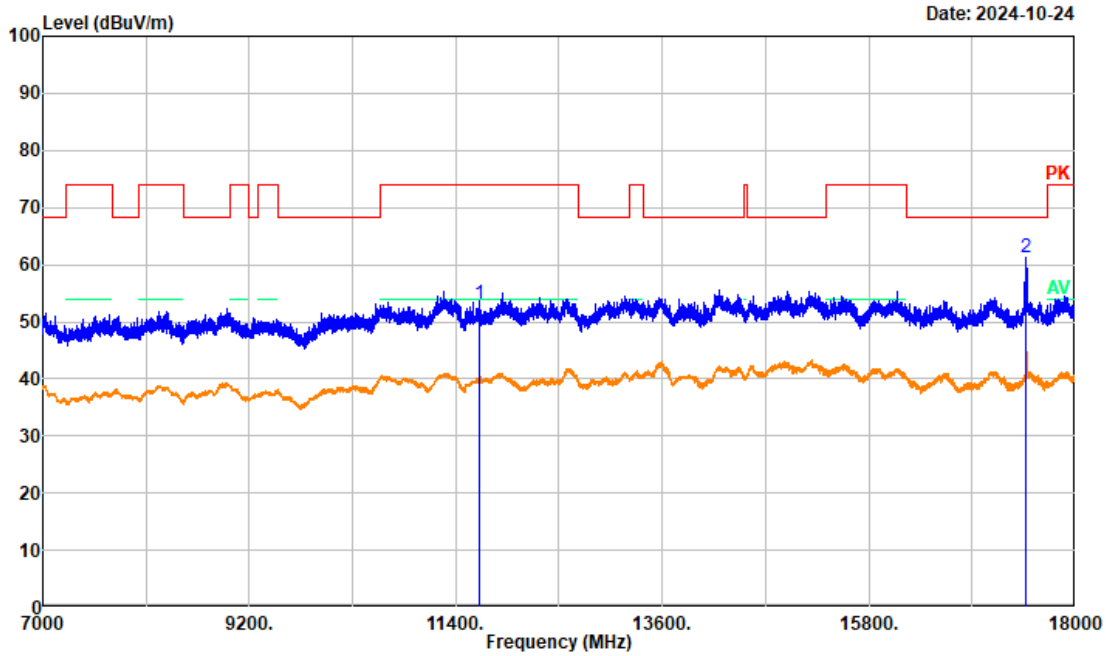

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : B4 802.11a high channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 11650.000 | 47.34 | 3.64 | 50.98 | 54.00 | -3.02 | Average |
| 2 | 11650.000 | 57.68 | 3.64 | 61.32 | 74.00 | -12.68 | Peak |
| 3 | 17475.000 | 60.17 | 5.29 | 65.46 | 68.20 | -2.74 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK
Average: RBW/VBW: 1MHz/1kHz, DET: PK

| Mode: | 802.11 a | Channel: | 5825MHz |
|---|---|---|---|




Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11a high channel

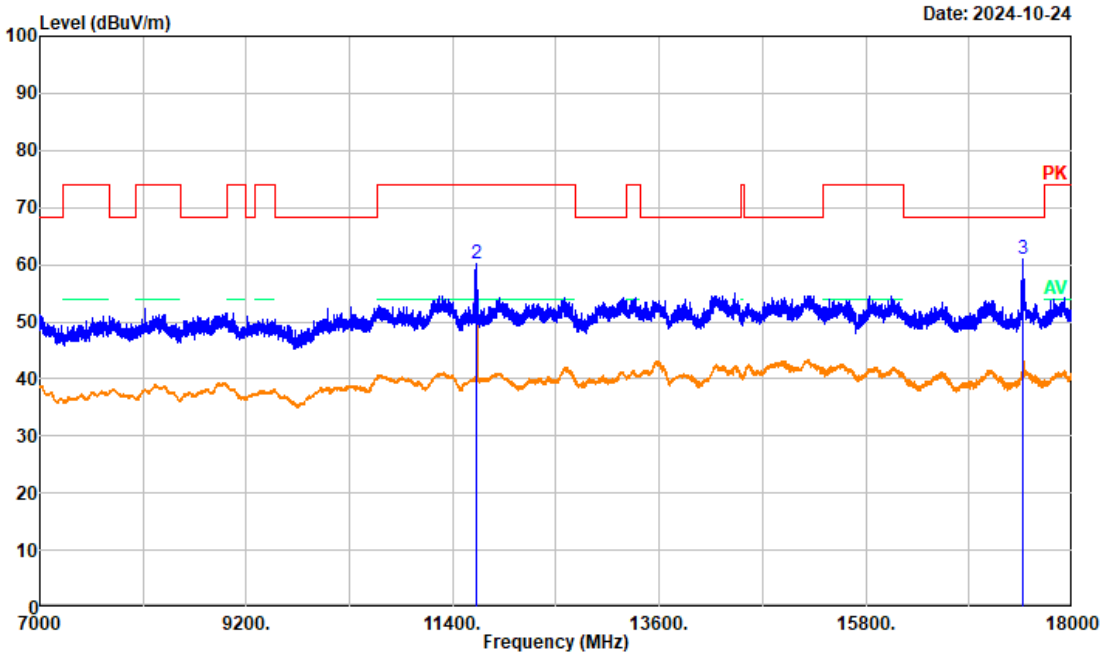
| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 11650.000 | 49.53 | 3.64 | 53.17 | 74.00 | -20.83 | Peak |
| 2 | 17475.000 | 56.08 | 5.29 | 61.37 | 68.20 | -6.83 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

Average: RBW/VBW: 1MHz/1kHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5825MHz |
|---|---|---|---|



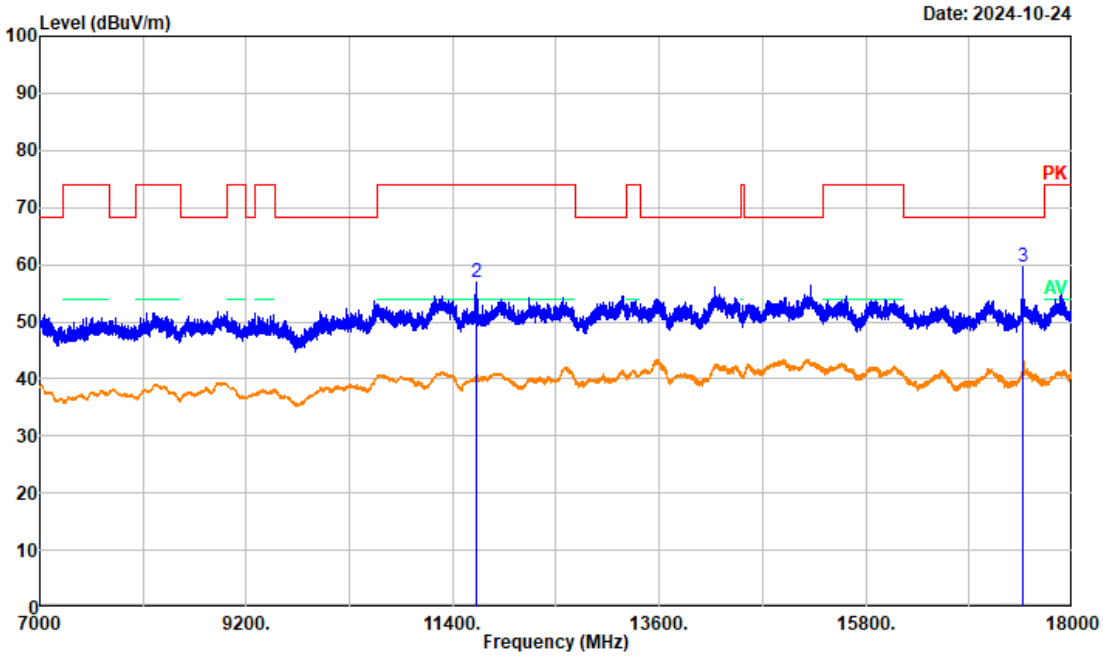

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : B4 802.11ac20 high channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 11650.000 | 47.17 | 3.64 | 50.81 | 54.00 | -3.19 | Average |
| 2 | 11650.000 | 56.43 | 3.64 | 60.07 | 74.00 | -13.93 | Peak |
| 3 | 17474.000 | 55.66 | 5.28 | 60.94 | 68.20 | -7.26 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK
Average: RBW/VBW: 1MHz/1kHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5825MHz |
|---|---|---|---|



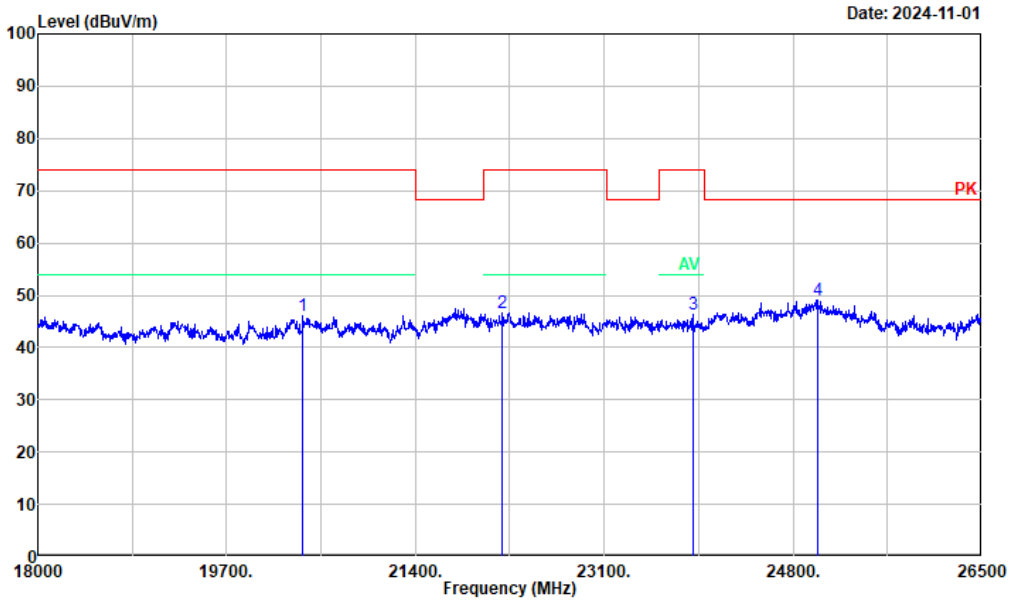

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11ac20 high channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 11650.000 | 45.46 | 3.64 | 49.10 | 54.00 | -4.90 | Average |
| 2 | 11650.000 | 53.37 | 3.64 | 57.01 | 74.00 | -16.99 | Peak |
| 3 | 17475.000 | 54.43 | 5.29 | 59.72 | 68.20 | -8.48 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK
Average: RBW/VBW: 1MHz/1kHz, DET: PK

| Mode: | 802.11a | Channel: | 5745MHz |
|---|---|---|---|



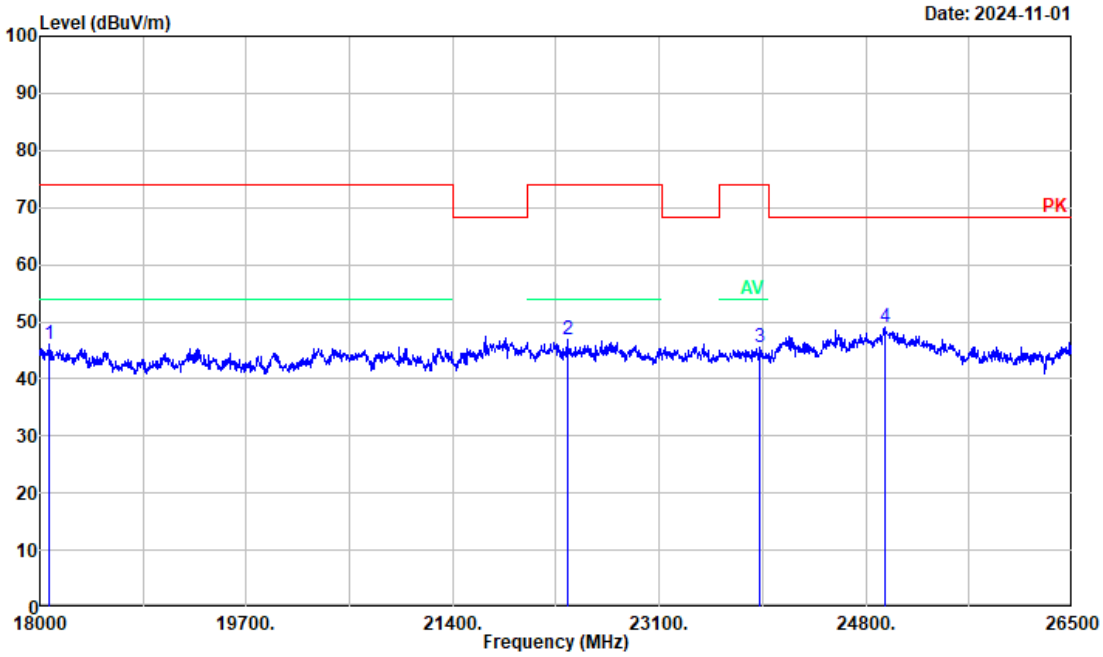

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.9℃/57%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 5GWiFi B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 20381.190 | 53.65 | -7.47 | 46.18 | 74.00 | -27.82 | Peak |
| 2 | 22184.090 | 53.42 | -6.87 | 46.55 | 74.00 | -27.45 | Peak |
| 3 | 23897.700 | 52.51 | -6.26 | 46.25 | 74.00 | -27.75 | Peak |
| 4 | 25020.260 | 51.99 | -2.98 | 49.01 | 68.20 | -19.19 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11a | Channel: | 5745MHz |
|---|---|---|---|



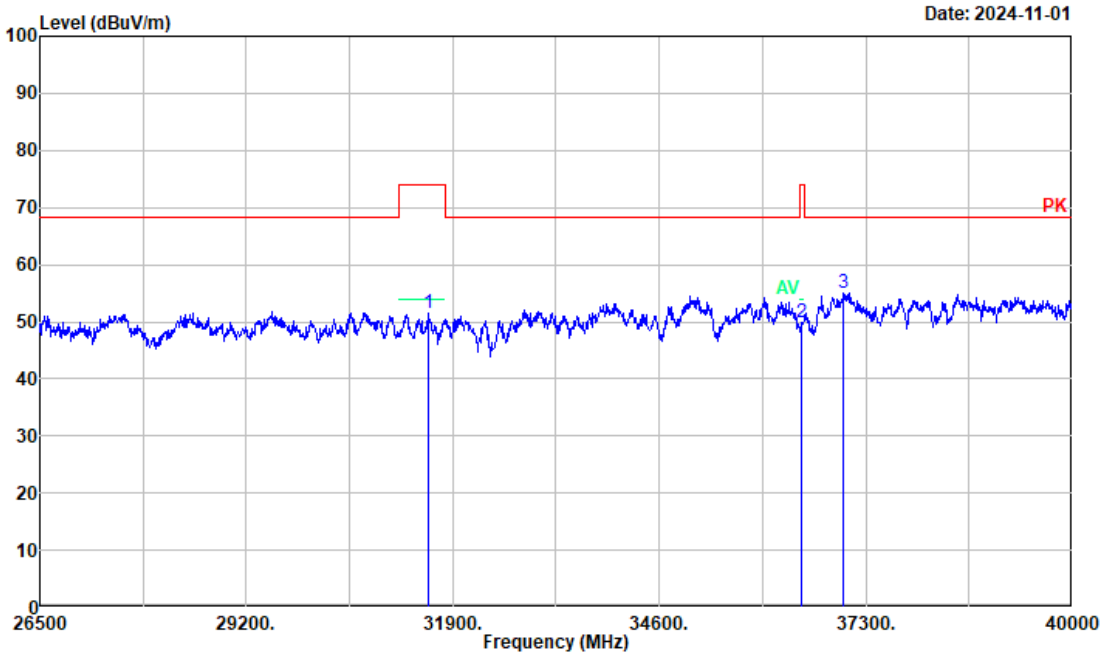

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.9℃/57%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 5GWiFi B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 18080.790 | 51.68 | -5.53 | 46.15 | 74.00 | -27.85 | Peak |
| 2 | 22341.420 | 53.89 | -7.05 | 46.84 | 74.00 | -27.16 | Peak |
| 3 | 23931.720 | 51.71 | -6.22 | 45.49 | 74.00 | -28.51 | Peak |
| 4 | 24952.230 | 52.10 | -3.17 | 48.93 | 68.20 | -19.27 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11a | Channel: | 5745MHz |
|---|---|---|---|



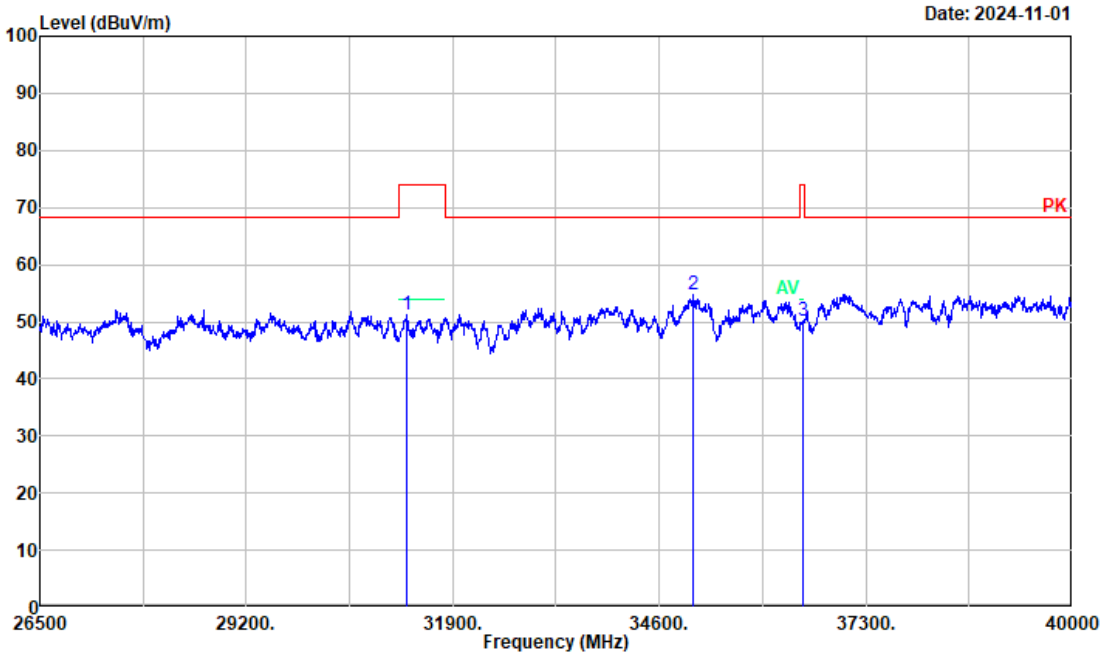

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.9℃/57%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 5GWiFi B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 31585.290 | 48.98 | 2.40 | 51.38 | 74.00 | -22.62 | Peak |
| 2 | 36454.480 | 44.65 | 5.33 | 49.98 | 74.00 | -24.02 | Peak |
| 3 | 37008.250 | 47.59 | 7.46 | 55.05 | 68.20 | -13.15 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11a | Channel: | 5745MHz |
|---|---|---|---|




Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 23.9℃/57%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 5GWiFi B4 802.11a low channel

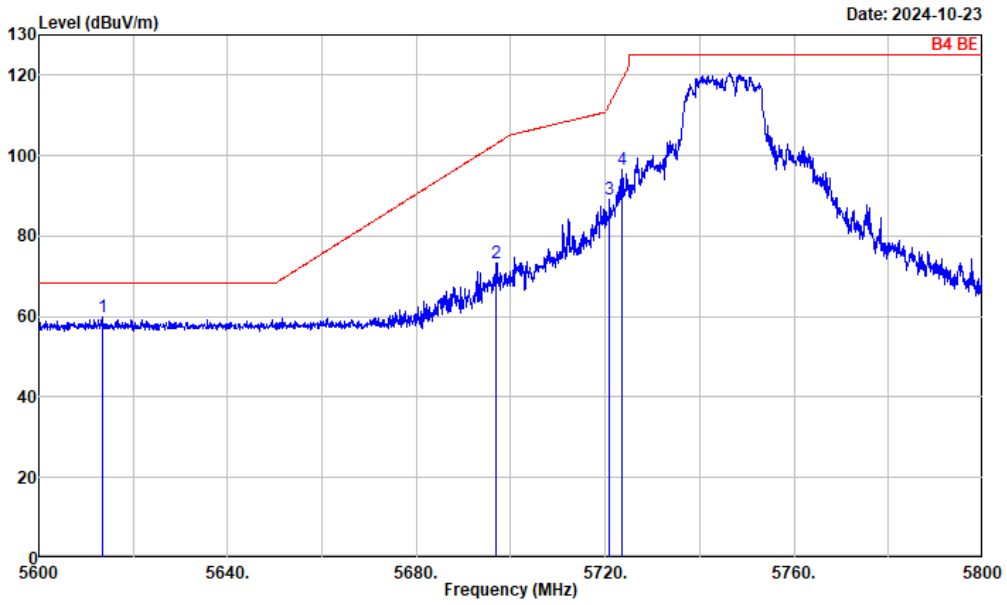
| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 31294.900 | 48.92 | 2.42 | 51.34 | 74.00 | -22.66 | Peak |
| 2 | 35043.020 | 50.22 | 4.59 | 54.81 | 68.20 | -13.39 | Peak |
| 3 | 36488.240 | 44.86 | 5.40 | 50.26 | 74.00 | -23.74 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

**Test plot for Band edge:**

| Mode: | 802.11 a | Channel: | 5725MHz |
|---|---|---|---|



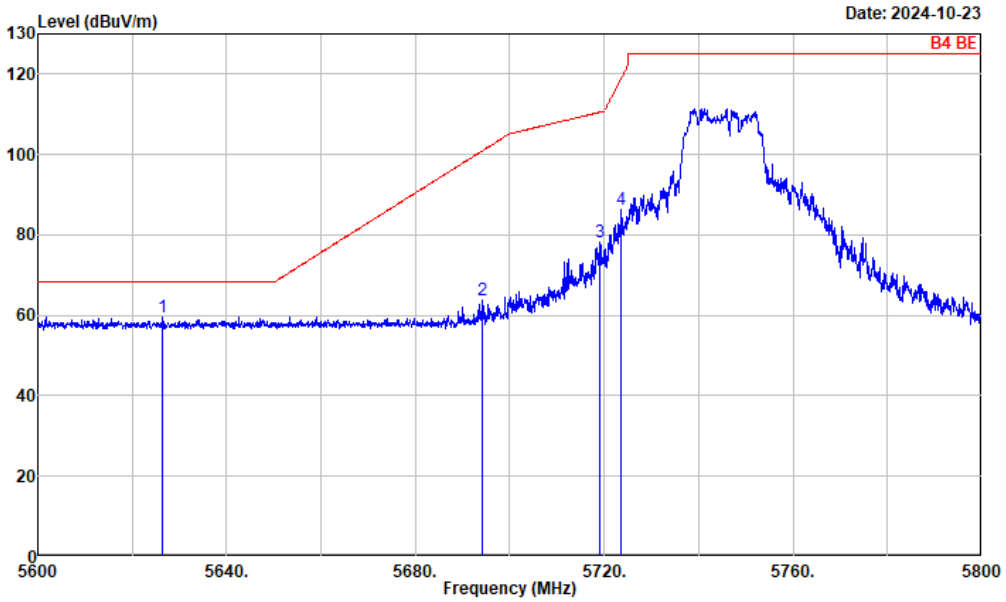

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5613.400 | 51.74 | 8.09 | 59.83 | 68.20 | -8.37 | Peak |
| 2 | 5697.000 | 65.11 | 8.31 | 73.42 | 102.99 | -29.57 | Peak |
| 3 | 5720.900 | 80.84 | 8.27 | 89.11 | 112.85 | -23.74 | Peak |
| 4 | 5723.500 | 88.11 | 8.27 | 96.38 | 118.78 | -22.40 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11 a | Channel: | 5745MHz |
|---|---|---|---|



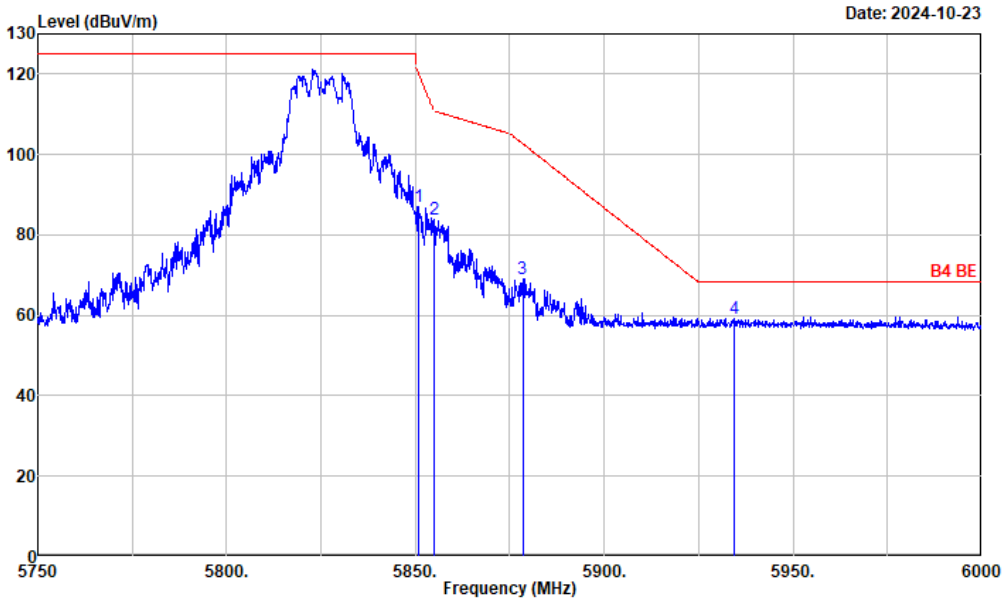

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11a low channel

| --No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5626.500 | 51.50 | 8.12 | 59.62 | 68.20 | -8.58 | Peak |
| 2 | 5694.300 | 55.49 | 8.31 | 63.80 | 101.00 | -37.20 | Peak |
| 3 | 5719.000 | 69.99 | 8.28 | 78.27 | 110.52 | -32.25 | Peak |
| 4 | 5723.600 | 78.12 | 8.27 | 86.39 | 119.01 | -32.62 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11 a | Channel: | 5825MHz |
|---|---|---|---|



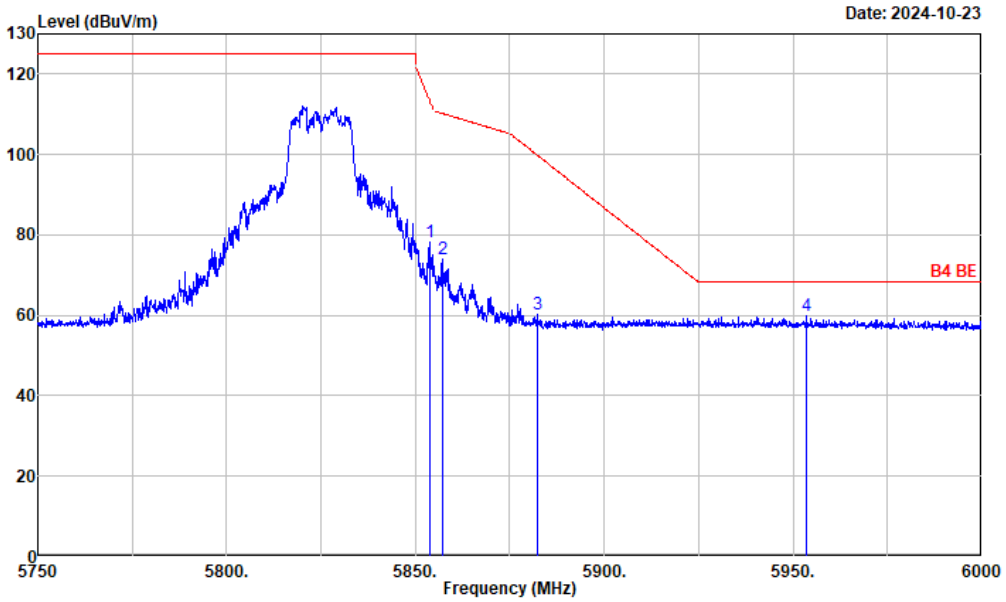

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : B4 802.11a high channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5850.875 | 79.09 | 7.87 | 86.96 | 120.20 | -33.24 | Peak |
| 2 | 5855.125 | 75.93 | 7.85 | 83.78 | 110.76 | -26.98 | Peak |
| 3 | 5878.375 | 61.38 | 7.75 | 69.13 | 102.69 | -33.56 | Peak |
| 4 | 5934.250 | 51.58 | 7.69 | 59.27 | 68.20 | -8.93 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11 a | Channel: | 5825MHz |
|---|---|---|---|



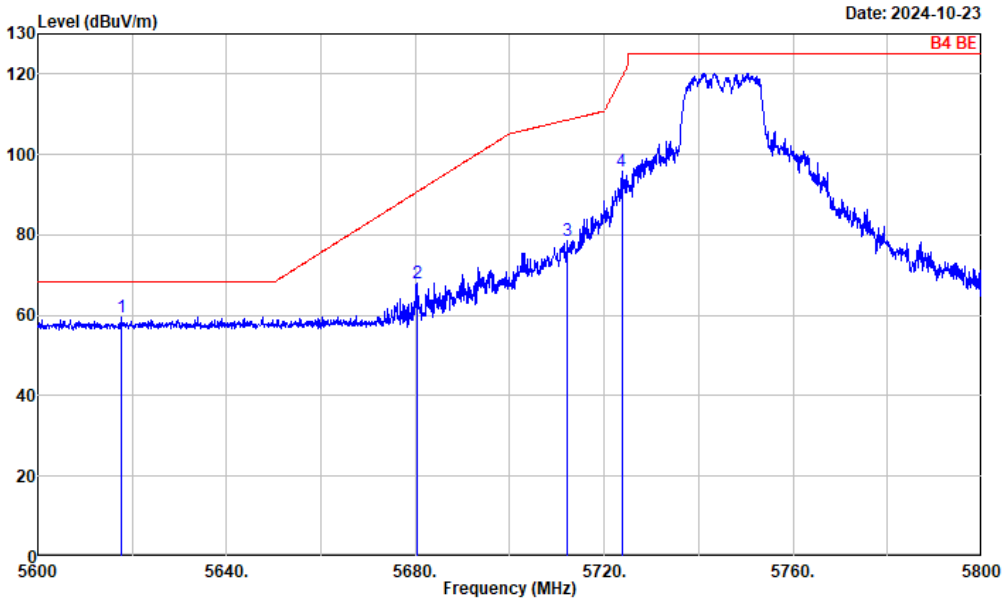

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11a high channel

| --No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5853.750 | 70.18 | 7.86 | 78.04 | 113.65 | -35.61 | Peak |
| 2 | 5857.125 | 66.16 | 7.85 | 74.01 | 110.20 | -36.19 | Peak |
| 3 | 5882.250 | 52.55 | 7.75 | 60.30 | 99.82 | -39.52 | Peak |
| 4 | 5953.625 | 52.16 | 7.68 | 59.84 | 68.20 | -8.36 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5745MHz |
|---|---|---|---|



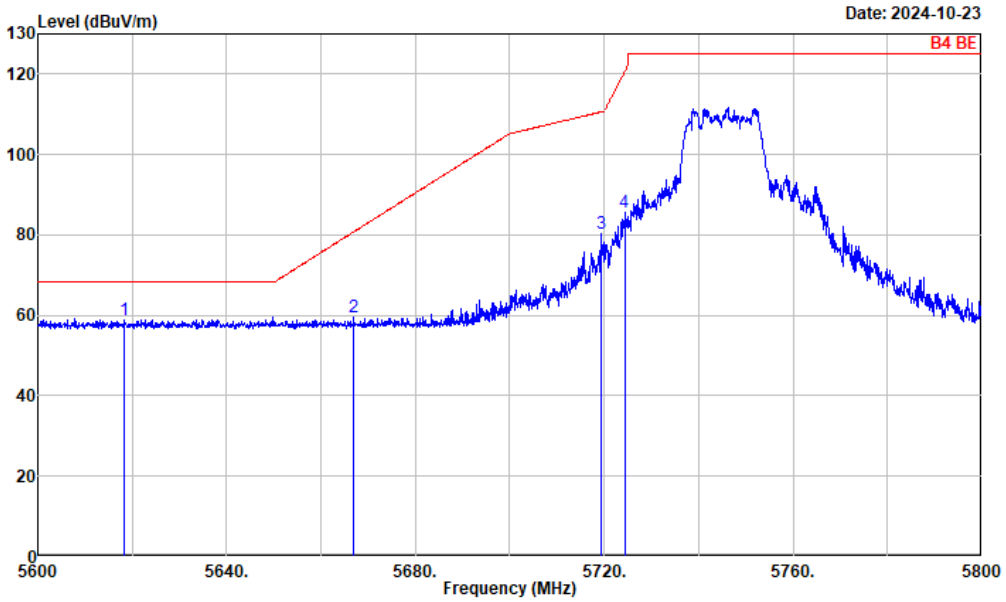

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : B4 802.11ac20 low channel

| --No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5617.800 | 51.40 | 8.10 | 59.50 | 68.20 | -8.70 | Peak |
| 2 | 5680.300 | 59.73 | 8.26 | 67.99 | 90.66 | -22.67 | Peak |
| 3 | 5712.200 | 70.27 | 8.30 | 78.57 | 108.62 | -30.05 | Peak |
| 4 | 5723.700 | 87.66 | 8.27 | 95.93 | 119.24 | -23.31 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5745MHz |
|---|---|---|---|



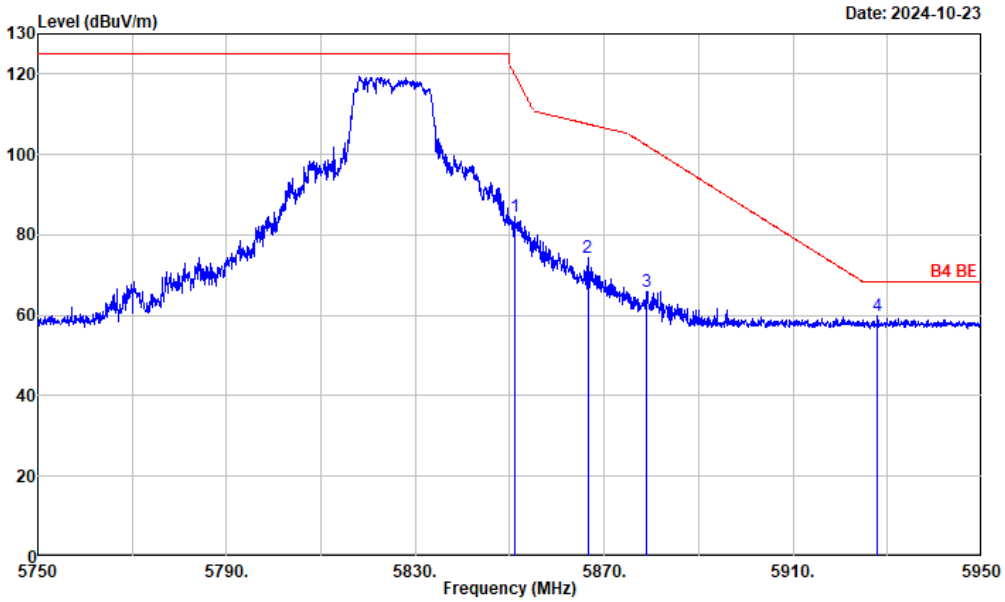

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11ac20 low channel

| --No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5618.300 | 50.83 | 8.10 | 58.93 | 68.20 | -9.27 | Peak |
| 2 | 5667.000 | 51.24 | 8.20 | 59.44 | 80.82 | -21.38 | Peak |
| 3 | 5719.300 | 71.95 | 8.28 | 80.23 | 110.60 | -30.37 | Peak |
| 4 | 5724.300 | 77.40 | 8.27 | 85.67 | 120.60 | -34.93 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5825MHz |
|---|---|---|---|



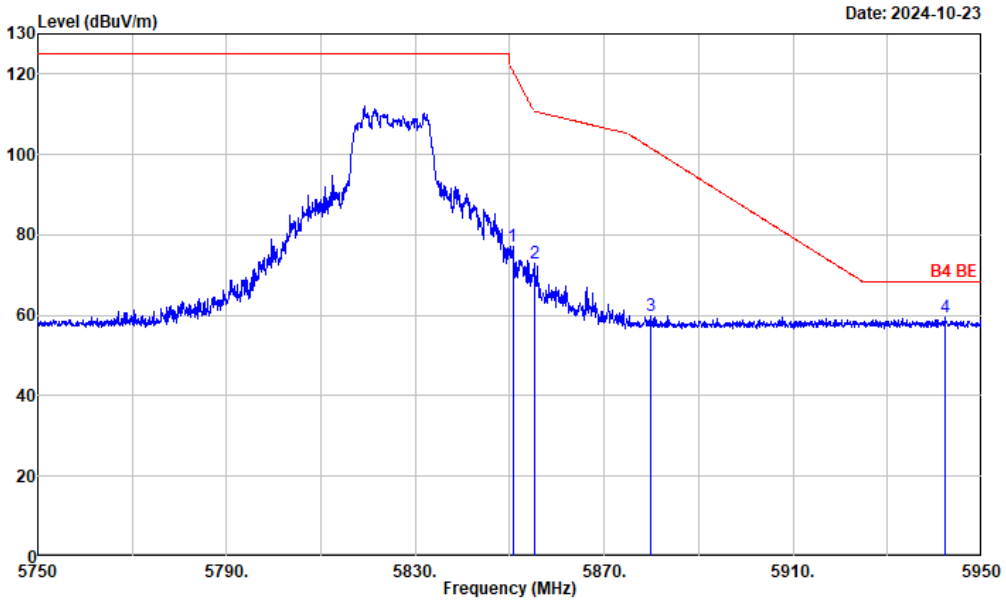

Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : B4 802.11ac20 high channel

| --No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5851.100 | 76.81 | 7.87 | 84.68 | 119.69 | -35.01 | Peak |
| 2 | 5866.500 | 66.61 | 7.81 | 74.42 | 107.58 | -33.16 | Peak |
| 3 | 5879.000 | 58.17 | 7.75 | 65.92 | 102.23 | -36.31 | Peak |
| 4 | 5927.900 | 52.09 | 7.69 | 59.78 | 68.20 | -8.42 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

| Mode: | 802.11ac-VHT20 | Channel: | 5825MHz |
|---|---|---|---|




Project No. : 2405Y99385E
Test Mode : Transmitting
Test Voltage : Power by battery
Environment : 25.0℃/59%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : B4 802.11ac20 high channel

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 5850.600 | 69.12 | 7.87 | 76.99 | 120.83 | -43.84 | Peak |
| 2 | 5855.300 | 65.19 | 7.85 | 73.04 | 110.72 | -37.68 | Peak |
| 3 | 5879.900 | 52.07 | 7.76 | 59.83 | 101.56 | -41.73 | Peak |
| 4 | 5942.100 | 51.71 | 7.70 | 59.41 | 68.20 | -8.79 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK

# 3.5 RF Conducted Test Data

| Test Date: | 2024-10-29~2024-11-18 | Test By: | Ryan Zhang |
|---|---|---|---|
| Environment condition: | Temperature: 23.8~24.5°C;RelativeHumidity:54~60%; ATM Pressure: 100.0~100.5kPa | | |

## 3.5.1 Emission Bandwidth

**5725-5850MHz**

| Mode | Antenna | Test Frequency (MHz) | 6dB BW (MHz) | Limit (MHz) | Verdict |
|---|---|---|---|---|---|
| 802.11a | Chain 0 | 5745 | 16.400 | 0.5 | Pass |
| | | 5785 | 16.400 | 0.5 | Pass |
| | | 5825 | 16.400 | 0.5 | Pass |
| 802.11ac20 | Chain 0 | 5745 | 16.800 | 0.5 | Pass |
| | | 5785 | 17.300 | 0.5 | Pass |
| | | 5825 | 17.300 | 0.5 | Pass |

## 3.5.2 99% Occupied Bandwidth

**5725-5850MHz**

| Mode | Antenna | Test Frequency (MHz) | 99% OBW (MHz) |
|---|---|---|---|
| 802.11a | Chain 0 | 5745 | 16.450 |
| | | 5785 | 16.500 |
| | | 5825 | 16.500 |
| 802.11ac20 | Chain 0 | 5745 | 17.600 |
| | | 5785 | 17.700 |
| | | 5825 | 17.600 |

**Note:**

**The 99% Occupied Bandwidth have not fall into the band 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.**

## 3.5.3 Maximum conducted output power

**5725-5850MHz**

| Mode | Antenna | Test Frequency (MHz) | Average Output Power(dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|
| 802.11a | Chain 0 | 5745 | 22.97 | 30 | Pass |
| | | 5785 | 22.46 | 30 | Pass |
| | | 5825 | 21.56 | 30 | Pass |
| | Chain 1 | 5745 | 23.71 | 30 | Pass |
| | | 5785 | 23.09 | 30 | Pass |
| | | 5825 | 22.26 | 30 | Pass |
| | Chain 0+Chain 1 | 5745 | 26.37 | 30 | Pass |
| | | 5785 | 25.80 | 30 | Pass |
| | | 5825 | 24.93 | 30 | Pass |
| 802.11ac20 | Chain 0 | 5745 | 22.50 | 30 | Pass |
| | | 5785 | 22.19 | 30 | Pass |
| | | 5825 | 21.39 | 30 | Pass |
| | Chain 1 | 5745 | 23.59 | 30 | Pass |
| | | 5785 | 23.00 | 30 | Pass |
| | | 5825 | 22.20 | 30 | Pass |
| | Chain 0+Chain 1 | 5745 | 26.09 | 30 | Pass |
| | | 5785 | 25.62 | 30 | Pass |
| | | 5825 | 24.82 | 30 | Pass |

Note:

The device employ CDD for MIMO mode, according to KDB 662911 D01 Multiple Transmitter Output v02r01, Directional gain = $G_{ANT}$ + Array Gain

For power measurements on IEEE 802.11 devices:

*Array Gain = 0 dB, for* $N_{ANT} \leqslant 4$;

$G_{ANT}$ =*2.16dBi*, Directional gain=2.16+0=2.16dBi<6dBi

## 3.5.4 Power Spectral Density

**5725-5850MHz**

| Mode | Antenna | Test Frequency (MHz) | Reading(dBm /500kHz) | Duty Cycle Factor(dB) | Result(dBm /500kHz) | Limit(dBm /500kHz) | Verdict |
|---|---|---|---|---|---|---|---|
| 802.11a | Chain 0 | 5745 | 2.77 | 6.98 | 9.75 | 30 | Pass |
| | | 5785 | 2.67 | 6.98 | 9.65 | 30 | Pass |
| | | 5825 | 1.49 | 6.98 | 8.47 | 30 | Pass |
| | Chain 1 | 5745 | 4.15 | 6.98 | 11.13 | 30 | Pass |
| | | 5785 | 3.66 | 6.98 | 10.64 | 30 | Pass |
| | | 5825 | 2.70 | 6.98 | 9.68 | 30 | Pass |
| | Chain 0+Chain 1 | 5745 | 6.52 | 6.98 | 13.50 | 30 | Pass |
| | | 5785 | 6.20 | 6.98 | 13.18 | 30 | Pass |
| | | 5825 | 5.15 | 6.98 | 12.13 | 30 | Pass |
| 802.11ac20 | Chain 0 | 5745 | 2.07 | 7.35 | 9.42 | 30 | Pass |
| | | 5785 | 2.28 | 7.35 | 9.63 | 30 | Pass |
| | | 5825 | 1.14 | 7.35 | 8.49 | 30 | Pass |
| | Chain 1 | 5745 | 3.75 | 7.35 | 11.10 | 30 | Pass |
| | | 5785 | 3.44 | 7.35 | 10.79 | 30 | Pass |
| | | 5825 | 1.96 | 7.35 | 9.31 | 30 | Pass |
| | Chain 0+Chain 1 | 5745 | 6.00 | 7.35 | 13.35 | 30 | Pass |
| | | 5785 | 5.91 | 7.35 | 13.26 | 30 | Pass |
| | | 5825 | 4.58 | 7.35 | 11.93 | 30 | Pass |

Note:

The device employ CDD for MIMO mode, according to KDB 662911 D01 Multiple Transmitter Output v02r01, Directional gain = $G_{ANT}$ + Array Gain

For power spectral density (PSD) measurements:

*Array Gain = 10 log($N_{ANT}/N_{SS}$) dB;*

$G_{ANT\,1}$*=2.16dBi,* Directional gain=2.16+10*log(2)=5.16dBi<6dBi

## 3.5.5 Duty Cycle

**5725-5850MHz**

| Mode | Antenna | Test Frequency (MHz) | Ton (ms) | Ton+Toff (ms) | Duty Cycle (%) | Duty Cycle Factor(dB) | 1/Ton (Hz) | VBW Setting (kHz) |
|---|---|---|---|---|---|---|---|---|
| 802.11a | Chain 0 | 5785 | 2.005 | 10.010 | 20.03 | 6.98 | 499 | 0.500 |
| 802.11ac20 | Chain 0 | 5785 | 1.850 | 10.040 | 18.43 | 7.35 | 541 | 1 |

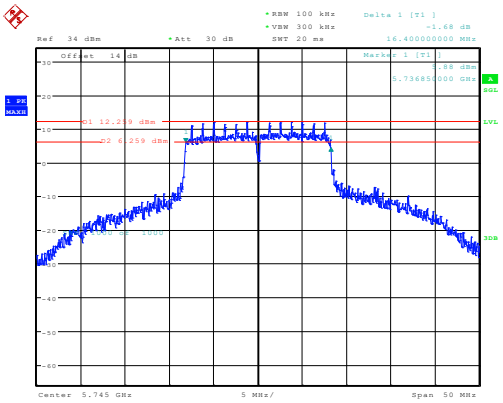
**Duty Cycle = Ton/(Ton+Toff)*100%**

## Test Plots:

### 6dB Emission Bandwidth

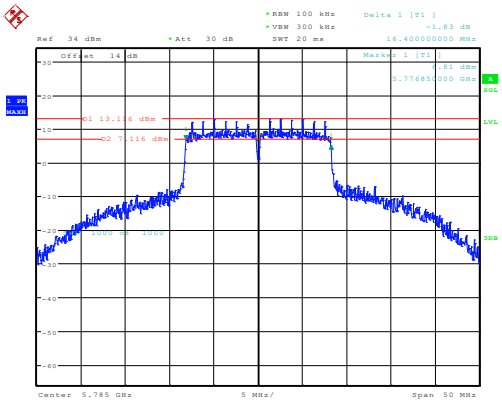
## 5725-5850MHz

802.11a_5745MHz_Chain 0 16.400MHz



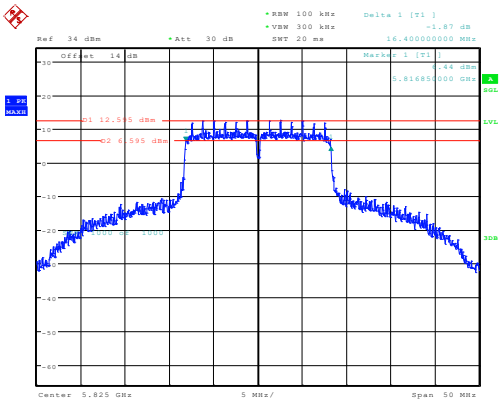
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:04:58

802.11a_5785MHz_Chain 0 16.400MHz



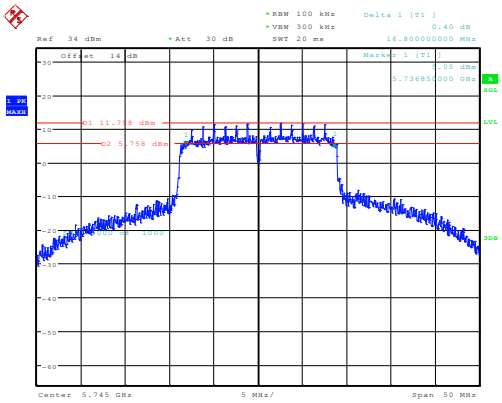
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:06:08

802.11a_5825MHz_Chain 0 16.400MHz



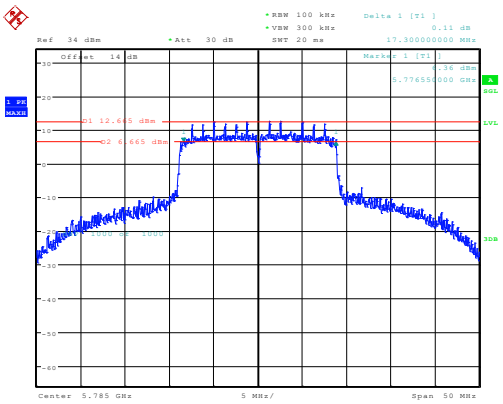
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:07:17

802.11ac20_5745MHz_Chain 0 17.400MHz



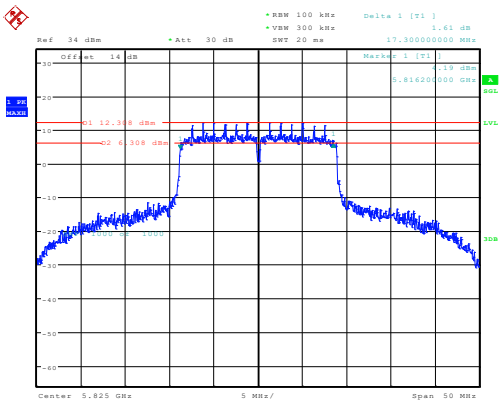
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:08:49

802.11ac20_5785MHz_Chain 0 17.650MHz



ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:09:59

802.11ac20_5825MHz_Chain 0 17.400MHz

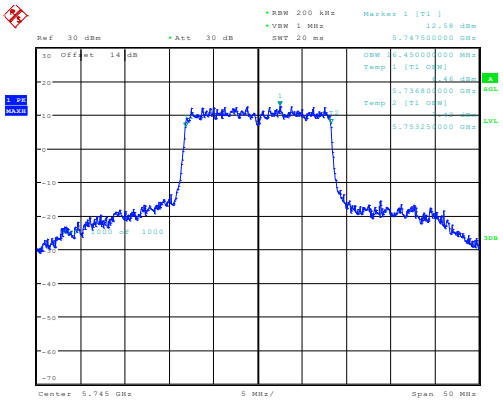


ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:11:10

**99% Occupied Bandwidth**

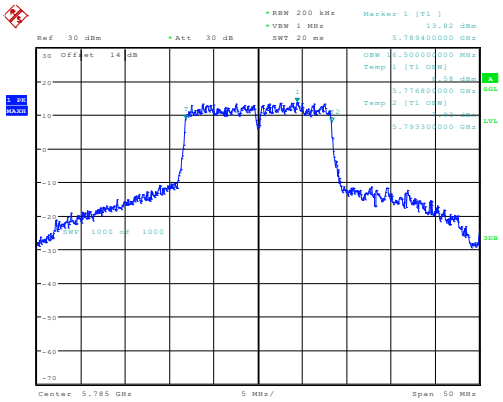
## 5725-5850MHz

802.11a_5745MHz_Chain 0 16.550MHz



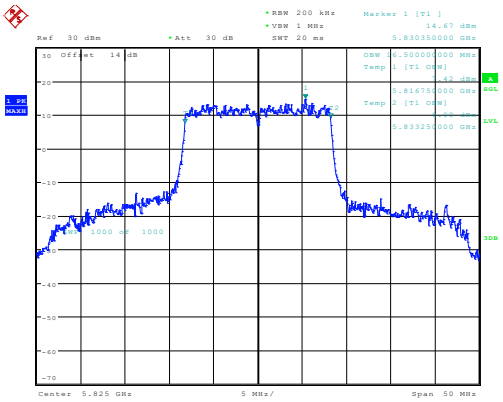

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:48:38

802.11a_5785MHz_Chain 0 16.500MHz



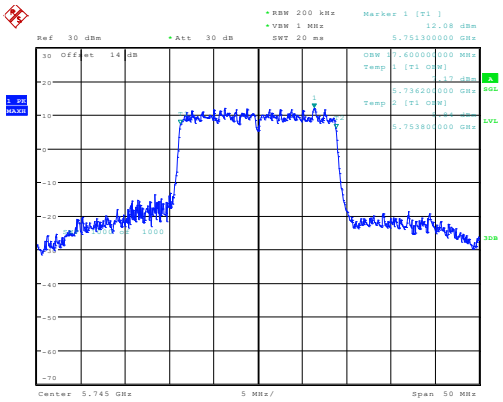

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:50:28

802.11a_5825MHz_Chain 0 16.400MHz



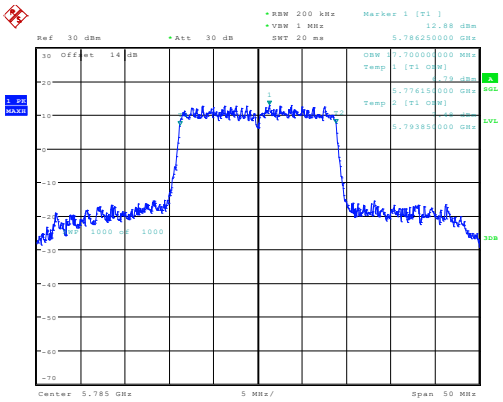

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:52:21

802.11ac20_5745MHz_Chain 0 17.700MHz



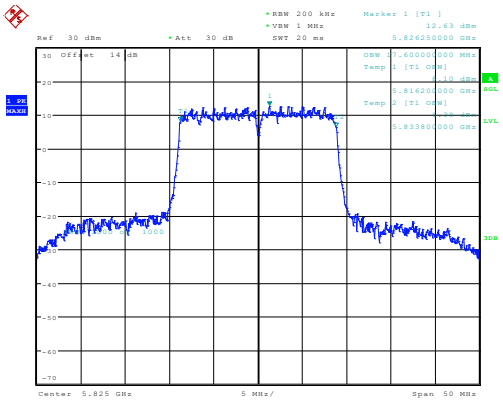

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:54:23

802.11ac20_5785MHz_Chain 0 17.650MHz




ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:59:09

802.11ac20_5825MHz_Chain 0 17.600MHz

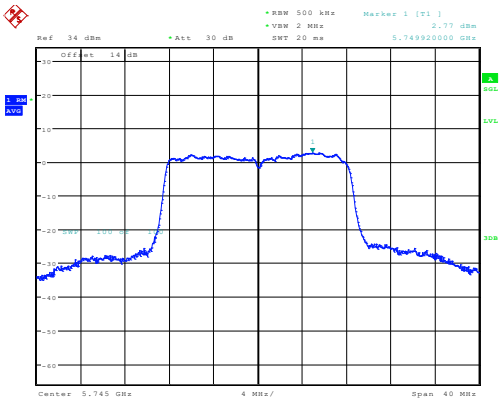



ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:57:25

## Power Spectral Density

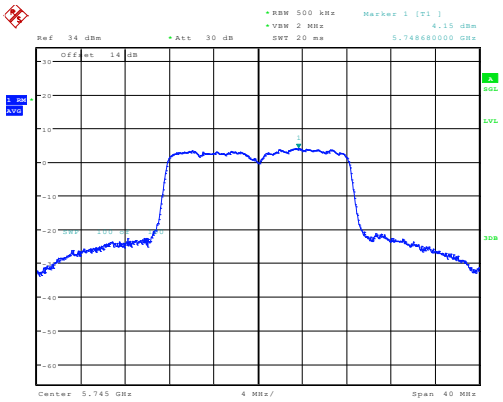
### 5725-5850MHz

802.11a_5745MHz_Chain 0



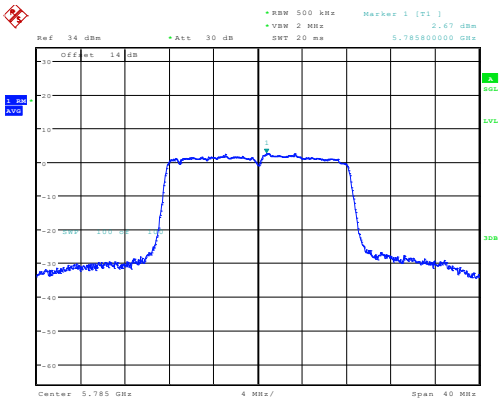

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:10:22

802.11a_5745MHz_Chain 1



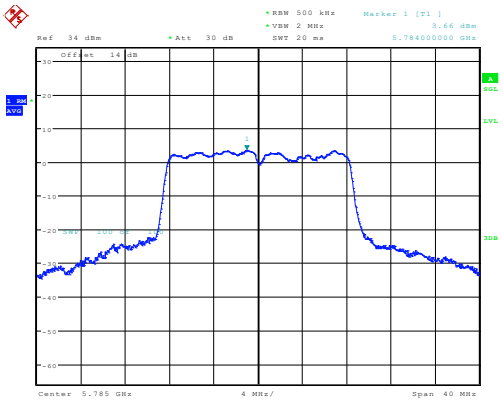

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:00:02

802.11a_5785MHz_Chain 0



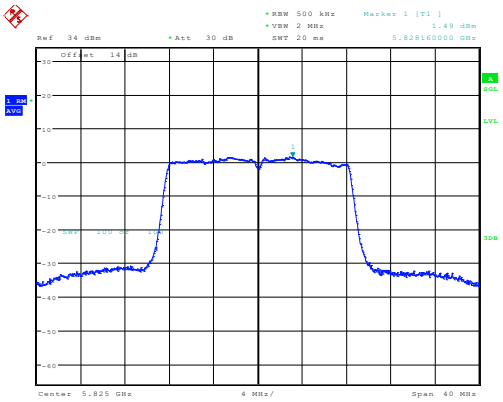

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:12:51

802.11a_5785MHz_Chain 1



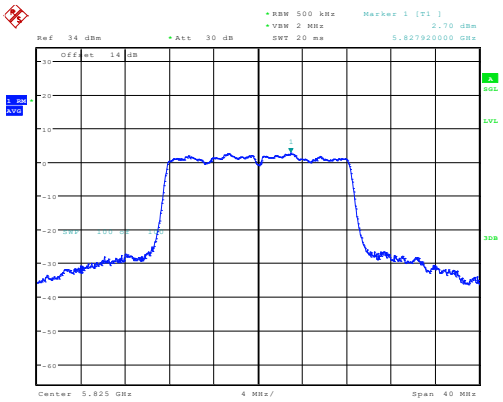

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:00:49

802.11a_5825MHz_Chain 0



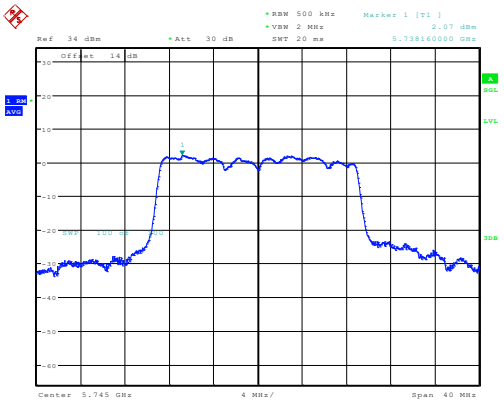

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:15:18

802.11a_5825MHz_Chain 1



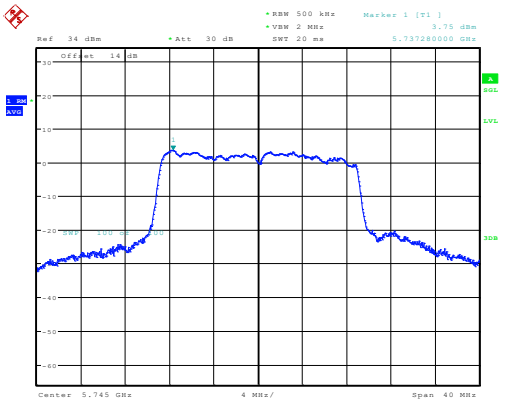

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:02:06

802.11ac20_5745MHz_Chain 0



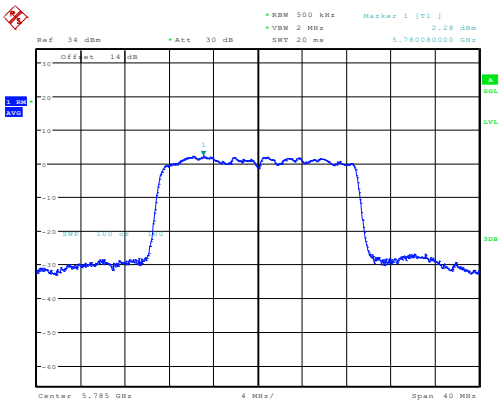

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:17:46

802.11ac20_5745MHz_Chain 1



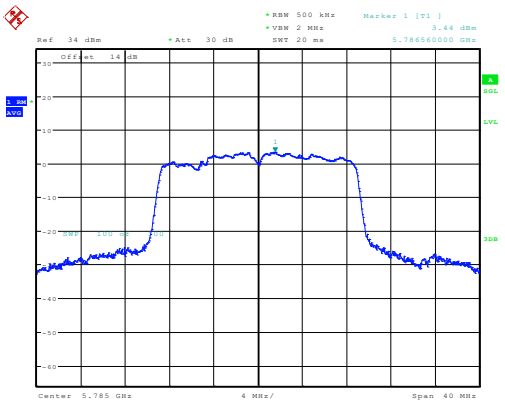

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:02:44

802.11ac20_5785MHz_Chain 0



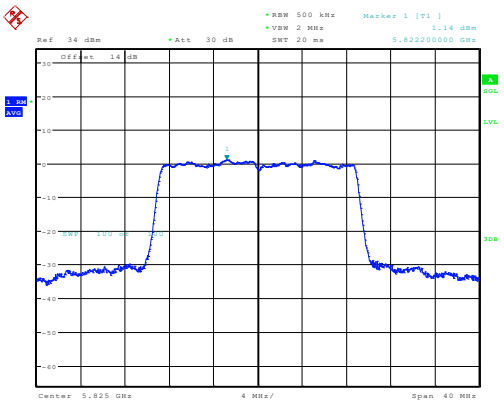

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:26:37

802.11ac20_5785MHz_Chain 1



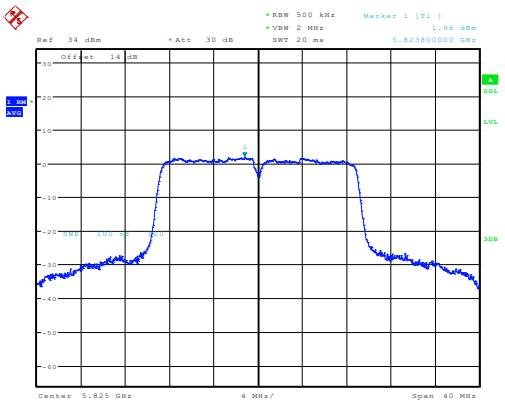

ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:03:19

802.11ac20_5825MHz_Chain 0




ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:34:36

802.11ac20_5825MHz_Chain 1

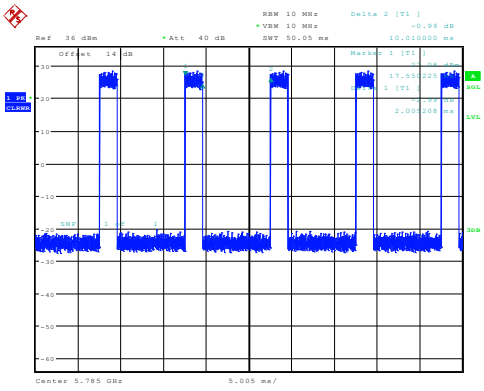



ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:03:57

## Duty Cycle

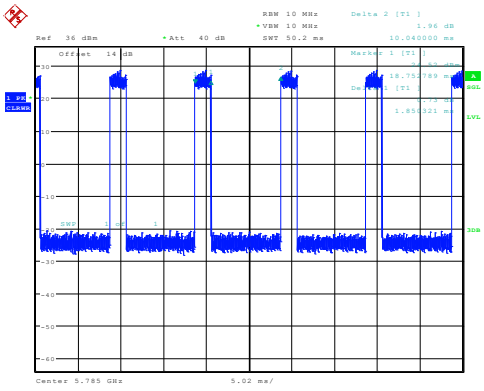
### 5725-5850MHz

802.11a_5785MHz_Chain 0
2.005ms,10.010ms




ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:06:07

802.11ac20_5785MHz_Chain 0
1.850ms,10.040ms




ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:07:25

# 4 Test Setup Photo

Please refer to the attachment 2405Y99385E Test Setup photo.

# 5 E.U.T Photo

Please refer to the attachment 2405Y99385E External photo and 2405Y99385E Internal photo.

**---End of Report---**