# TEST REPORT

**FCC ID: 2AHYJ-TVE1070M**

**Product: Tablet**

**Model No.: LincPlus T3**

**Trade Mark: LincPlus**

**Report No.: WSCT-A2LA-R&E230300006A-Wi-Fi2**

**Issued Date: 10 April 2023**

**Issued for:**

**Techvision Intelligent Technology Co.,Ltd.**

**5F, No.2 Building, District D,TCL international E City, Nanshan, ShenZhen, China**

**Issued By:**

**World Standardization Certification & Testing Group(Shenzhen) Co., Ltd.**

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***Note:*** *The results contained in this report pertain only to the tested sample. This report shall not be reproduced, except in full, without written approval of World Standardization Certification & Testing Group(Shenzhen) Co., Ltd. This report must not be used by the client to claim product certification, approval, or any agency of the U.S. Government.*

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# 1 Test Certification

| | |
|---|---|
| **Product:** | Tablet |
| **Model No.:** | LincPlus T3 |
| **Trade Mark:** | LincPlus |
| **Applicant:** | **Techvision Intelligent Technology Co.,Ltd.** |
| **Address:** | 5F, No.2 Building, District D,TCL international E City, Nanshan, ShenZhen, China |
| **Manufacturer:** | **Techvision Intelligent Technology Co.,Ltd.** |
| **Address:** | 5F, No.2 Building, District D,TCL international E City, Nanshan, ShenZhen, China |
| **Date of Test:** | 10 March 2023 ~ 09 April 2023 |
| **Applicable Standards:** | FCC CFR Title 47 FCC Part 15 Subpart E |

*The above equipment has been tested by World Standardization Certification & Testing Group(Shenzhen)Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.*

**Tested By:** Wang Xiang **(Wang Xiang)**

**Checked By:** Li Huaibi **(Li Huaibi)**

**Approved By:** Liu Fuxin **(Liu Fuxin)**

**Date:** 10 April 2023

# 2 EUT Description

| | |
|---|---|
| **Product:** | Tablet |
| **Model No.:** | LincPlus T3 |
| **Trade Mark:** | LincPlus |
| **Operation Frequency:** | Band 1: 5180-5240 MHz<br>Band 2: 5260-5320 MHz<br>Band 3: 5500-5700 MHz<br>Band 4: 5745-5825 MHz |
| **Modulation type:** | IEEE 802.11a/n/ac: OFDM<br>(BPSK/QPSK/16QAM/64QAM/256QAM) |
| **Antenna Type:** | Integral Antenna |
| **Antenna Gain** | 0.20dBi |
| **Rechargeable Li-Polymer Battery:** | Li-ion Battery: U3158123PV<br>Rated Voltage: 3.8V<br>Rated Capacity: 7000mAh |
| **Adapter:** | Adapter: MX21PD-U<br>Input: 100-240V~50/60Hz 0.5A<br>Output: 5V⎓3A/9V⎓2.22A/12V⎓1.67A |
| **Remark:** | N/A. |

# 3 TEST DESCRIPTION

## 3.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

| No. | Item | Uncertainty |
|---|---|---|
| 1 | Conducted Emission Test | ±3.2dB |
| 2 | RF power, conducted | ±0.16dB |
| 3 | Spurious emissions, conducted | ±0.21dB |
| 4 | All emissions, radiated(<1GHz) | ±4.7dB |
| 5 | All emissions, radiated(>1GHz) | ±4.7dB |
| 6 | Temperature | ±0.5°C |
| 7 | Humidity | ±2% |

## 3.2 TEST ENVIRONMENT AND MODE

| | |
|---|---|
| **Operating Environment:** | |
| Temperature: | 25.0 °C |
| Humidity: | 56 % RH |
| Atmospheric Pressure: | 1010 mbar |
| **Test Mode:** | |
| Engineering mode: | Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%) |

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Test Mode | Description |
|---|---|
| Mode 1 | 802.11a |
| Mode 2 | 802.11n20 |
| Mode 3 | 802.11n40 |
| Mode 4 | 802.11ac20 |
| Mode 5 | 802.11ac40 |
| Mode 6 | 802.11ac80 |

Note:

*(1) The measurements are performed at the highest, lowest available channels.*

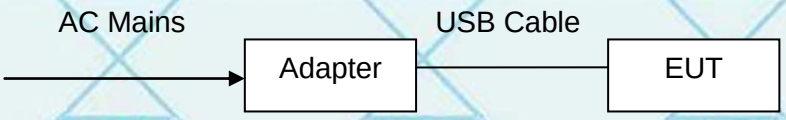
*(2) The EUT use new battery.*

*(3) Record the worst case of each test item in this report.*

### 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

| Test program | *#*#3646633#*#* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mode | Test Frequency (MHz) | | | | | | | | | | | |
| | NCB: 20MHz | | | | | | | | | | | |
| 802.11a | 5180 MHz | 5240 MHz | 5260 MHz | 5320 MHz | 5500 MHz | 5700 MHz | 5745 MHz | 5825 MHz | | | | |
| 802.11n | 5180 MHz | 5240 MHz | 5260 MHz | 5320 MHz | 5500 MHz | 5700 MHz | 5745 MHz | 5825 MHz | | | | |
| 802.11ac | 5180 MHz | 5240 MHz | 5260 MHz | 5320 MHz | 5500 MHz | 5700 MHz | 5745 MHz | 5825 MHz | | | | |
| | NCB: 40MHz | | | | | | | | | | | |
| 802.11n | 5190 MHz | 5230 MHz | 5270 MHz | 5310 MHz | 5510 MHz | 5670 MHz | 5755 MHz | 5795 MHz | | | | |
| 802.11ac | 5190 MHz | 5230 MHz | 5270 MHz | 5310 MHz | 5510 MHz | 5670 MHz | 5755 MHz | 5795 MHz | | | | |
| | NCB: 80MHz | | | | | | | | | | | |
| 802.11ac | 5210 MHz | 5290 MHz | 5530 MHz | 5610 MHz | 5775 MHz | | | | | | | |
| During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product. | | | | | | | | | | | | |

### 3.4 CONFIGURATION OF SYSTEM UNDER TEST




(EUT: Tablet)

### 3.5 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|---|---|---|---|---|---|
| 1 | Adapter | / | MX21PD-U | / | / |
| 2 | Earphone | / | N/A | / | / |

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.
(4) The adapter supply by the applicant.

# 4 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 Subpart C&E | | | |
|---|---|---|---|
| Standard Section | Test Item | Judgment | Remark |
| 2.1049<br>15.403(i) | 26dB & 99% Bandwidth | PASS | Complies |
| 15.407(e) | 6dB Spectrum Bandwidth | PASS | Complies |
| 15.407(a) | Maximum Conducted Output Power | PASS | Complies |
| 15.407(a) | Power Spectral Density | PASS | Complies |
| 15.407(b) | Unwanted Emissions | PASS | Complies |
| 15.207 | AC Conducted Emission | PASS | Complies |
| 15.407(g) | Frequency Stability | PASS | Complies |
| 15.407(c) | Automatically Discontinue Transmission | PASS | Complies |
| 15.203 &<br>15.407(a) | Antenna Requirement | PASS | Complies |
| 15.407(h) | Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS) | PASS | Complies |

NOTE:

(1)" N/A" denotes test is not applicable in this test report.

# 5 MEASUREMENT INSTRUMENTS

| NAME OF EQUIPMENT | MANUFACTURER | MODEL | SERIAL NUMBER | Calibration Date | Calibration Due. |
|---|---|---|---|---|---|
| Test software | -- | EZ-EMC | CON-03A | - | - |
| Test software | -- | MTS8310 | - | - | - |
| EMI Test Receiver | R&S | ESCI | 100005 | 11/05/2022 | 11/04/2023 |
| LISN | AFJ | LS16 | 16010222119 | 11/05/2022 | 11/04/2023 |
| LISN(EUT) | Mestec | AN3016 | 04/10040 | 11/05/2022 | 11/04/2023 |
| Universal Radio Communication Tester | R&S | CMU 200 | 1100.0008.02 | 11/05/2022 | 11/04/2023 |
| Coaxial cable | Megalon | LMR400 | N/A | 11/05/2022 | 11/04/2023 |
| GPIB cable | Megalon | GPIB | N/A | 11/05/2022 | 11/04/2023 |
| Spectrum Analyzer | R&S | FSU | 100114 | 11/05/2022 | 11/04/2023 |
| Pre Amplifier | H.P. | HP8447E | 2945A02715 | 11/05/2022 | 11/04/2023 |
| Pre-Amplifier | CDSI | PAP-1G18-38 | -- | 11/05/2022 | 11/04/2023 |
| Bi-log Antenna | SUNOL Sciences | JB3 | A021907 | 11/05/2022 | 11/04/2023 |
| 9*6*6 Anechoic | -- | -- | -- | 11/05/2022 | 11/04/2023 |
| Horn Antenna | COMPLIANCE ENGINEERING | CE18000 | -- | 11/05/2022 | 11/04/2023 |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-631 | 11/05/2022 | 11/04/2023 |
| Cable | TIME MICROWAVE | LMR-400 | N-TYPE04 | 11/05/2022 | 11/04/2023 |
| System-Controller | CCS | N/A | N/A | N.C.R | N.C.R |
| Turn Table | CCS | N/A | N/A | N.C.R | N.C.R |
| Antenna Tower | CCS | N/A | N/A | N.C.R | N.C.R |
| RF cable | Murata | MXHQ87WA3000 | - | 11/05/2022 | 11/04/2023 |
| Loop Antenna | EMCO | 6502 | 00042960 | 11/05/2022 | 11/04/2023 |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | 1123 | 11/05/2022 | 11/04/2023 |
| Power meter | Anritsu | ML2487A | 6K00003613 | 11/05/2022 | 11/04/2023 |
| Power sensor | Anritsu | MX248XD | -- | 11/05/2022 | 11/04/2023 |
| Spectrum Analyzer | Keysight | N9010B | MY60241089 | 11/05/2022 | 11/04/2023 |

# 6 Facilities and Accreditations

## 6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the World Standardization Certification & Testing Group(Shenzhen) CO., LTD**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

## 6.2 ACCREDITATIONS

**CNAS - Registration Number: L3732**

China National Accreditation Service for Conformity Assessment, The test firm Registration Number: L3732

**FCC - Designation Number: CN1303**

World Standardization Certification & Testing Group(Shenzhen) CO., LTD. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Designation Number: CN1303.

**A2LA - Certificate Number: 5768.01**

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA).Certification Number: 5768.01

# 7 Test Results and Measurement Data

## 7.1CONDUCTED EMISSION MEASUREMENT

**POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)**

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | | Standard |
|---|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average | |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * | FCC |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 | FCC |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 | FCC |

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

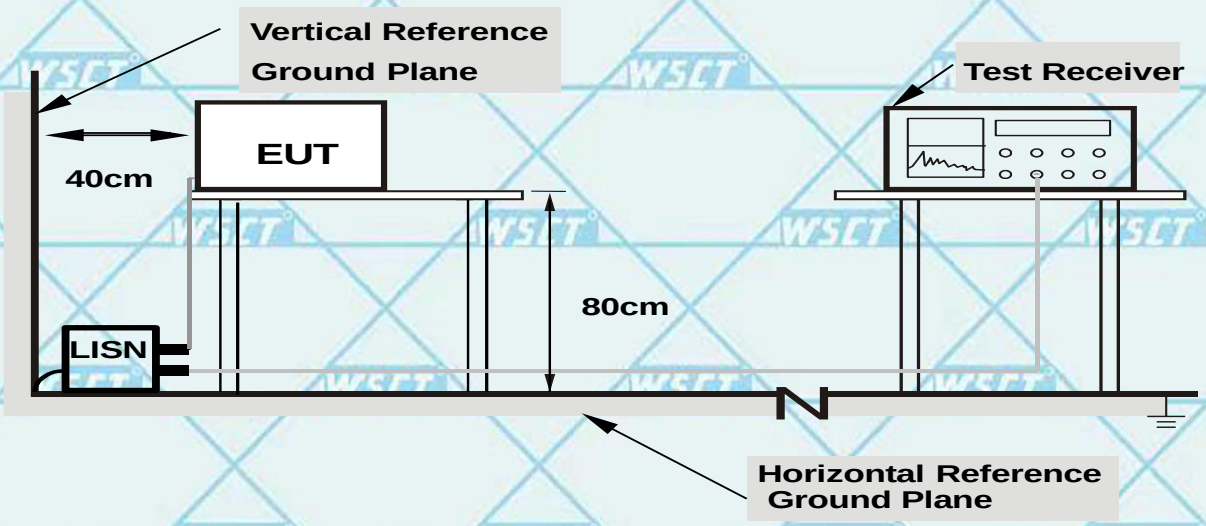
### 7.1.1 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 7.1.2 DEVIATION FROM TEST STANDARD

No deviation

### TEST SETUP



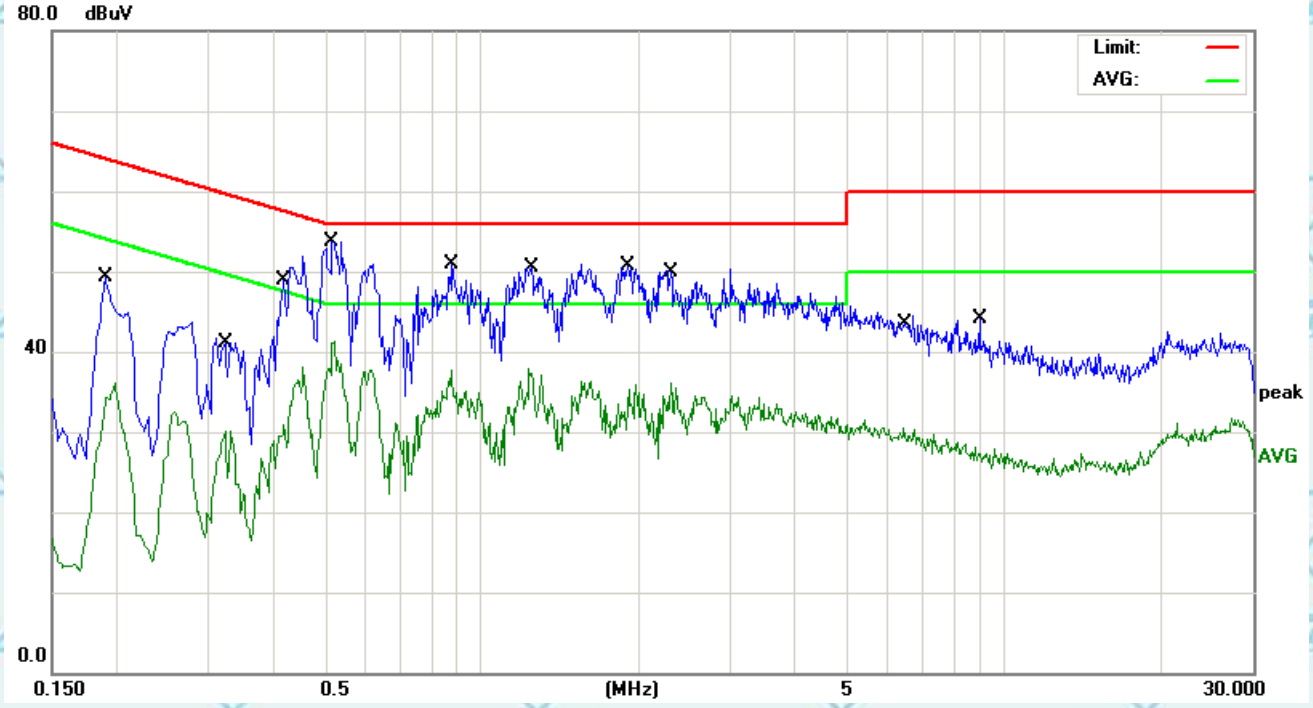

**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 7.1.3 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

### 7.1.4 TEST RESULTS

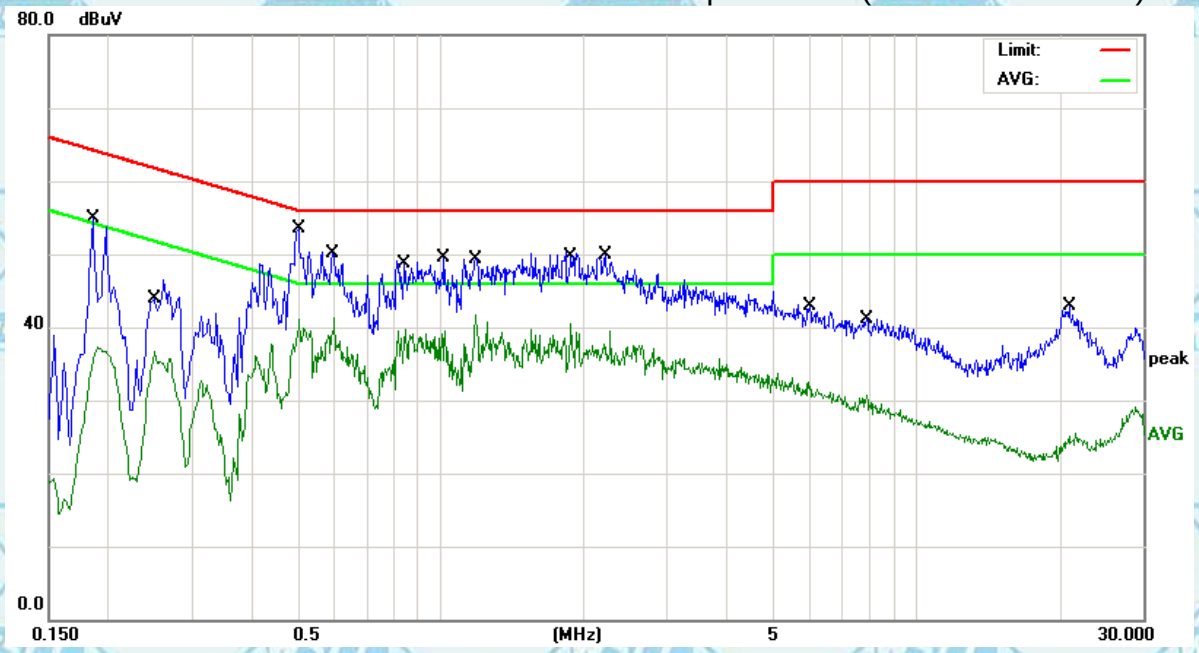
Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)-worst




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.1900 | 38.90 | 10.45 | 49.35 | 64.03 | -14.68 | QP |
| 2 | | 0.3220 | 19.72 | 10.48 | 30.20 | 49.65 | -19.45 | AVG |
| 3 | | 0.4180 | 38.40 | 10.50 | 48.90 | 57.49 | -8.59 | QP |
| 4 | | 0.5180 | 38.51 | 10.52 | 49.03 | 56.00 | -6.97 | QP |
| 5 | * | 0.5220 | 30.78 | 10.52 | 41.30 | 46.00 | -4.70 | AVG |
| 6 | | 0.8740 | 27.13 | 10.54 | 37.67 | 46.00 | -8.33 | AVG |
| 7 | | 0.8780 | 40.29 | 10.54 | 50.83 | 56.00 | -5.17 | QP |
| 8 | | 1.2300 | 27.24 | 10.59 | 37.83 | 46.00 | -8.17 | AVG |
| 9 | | 1.8980 | 39.93 | 10.69 | 50.62 | 56.00 | -5.38 | QP |
| 10 | | 2.2980 | 25.44 | 10.71 | 36.15 | 46.00 | -9.85 | AVG |
| 11 | | 6.4340 | 19.77 | 10.77 | 30.54 | 50.00 | -19.46 | AVG |
| 12 | | 8.9940 | 33.24 | 10.81 | 44.05 | 60.00 | -15.95 | QP |

Remark: All the modes have been investigated, and only worst mode is presented in this report.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.1860 | 44.39 | 10.45 | 54.84 | 64.21 | -9.37 | QP |
| 2 | | 0.2500 | 26.26 | 10.46 | 36.72 | 51.75 | -15.03 | AVG |
| 3 | | 0.5020 | 38.90 | 10.52 | 49.42 | 56.00 | -6.58 | QP |
| 4 | | 0.5980 | 30.77 | 10.53 | 41.30 | 46.00 | -4.70 | AVG |
| 5 | | 0.8460 | 29.11 | 10.54 | 39.65 | 46.00 | -6.35 | AVG |
| 6 | | 1.0180 | 39.04 | 10.55 | 49.59 | 56.00 | -6.41 | QP |
| 7 | * | 1.1860 | 31.04 | 10.58 | 41.62 | 46.00 | -4.38 | AVG |
| 8 | | 1.8860 | 29.88 | 10.69 | 40.57 | 46.00 | -5.43 | AVG |
| 9 | | 2.2139 | 39.12 | 10.71 | 49.83 | 56.00 | -6.17 | QP |
| 10 | | 5.9860 | 32.16 | 10.76 | 42.92 | 60.00 | -17.08 | QP |
| 11 | | 7.8900 | 19.92 | 10.79 | 30.71 | 50.00 | -19.29 | AVG |
| 12 | | 20.9300 | 31.75 | 11.06 | 42.81 | 60.00 | -17.19 | QP |

***Note:***

*Freq. = Emission frequency in MHz*
*Reading level (dBμV) = Receiver reading*
*Corr. Factor (dB) = Antenna factor + Cable loss*
*Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)*
*Limit (dBμV) = Limit stated in standard*
*Margin (dB) = Measurement (dBμV) – Limits (dBμV)*
*Q.P. =Quasi-Peak AVG =average*
** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

## 7.2 RADIATED EMISSION MEASUREMENT

**Radiated Emission Limits(Frequency Range 9kHz-1000MHz)**

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009~0.490 | 2400/F(KHz) | 300 |
| 0.490~1.705 | 24000/F(KHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) | |
|---|---|---|
| | PEAK | AVERAGE |
| Above 1000 | 74 | 54 |

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 1Hz for Average |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

### 7.2.1 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

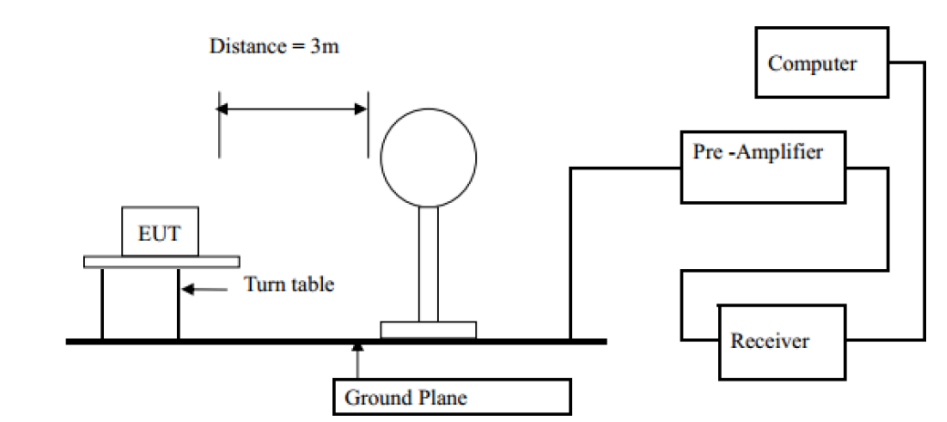
***Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported***

### 7.2.2 DEVIATION FROM TEST STANDARD

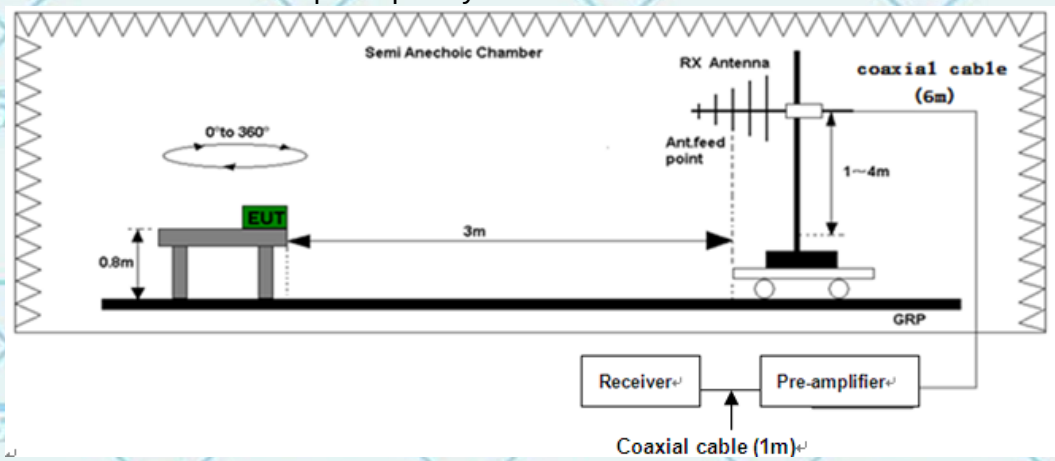
No deviation

### 7.2.3 TEST SETUP

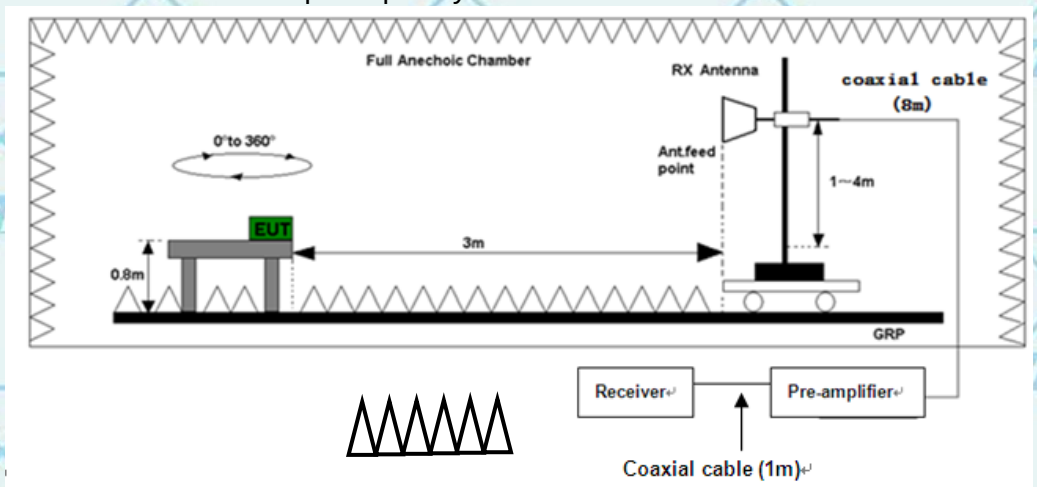
（A）Radiated Emission Test-Up Frequency Below 30MHz




（B）Radiated Emission Test-Up Frequency 30MHz~1GHz




（C）Radiated Emission Test-Up Frequency Above 1GHz



### 7.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 7.2.5 RESULTS (BELOW 30 MHZ)

| Freq. | Reading | Limit | Margin | State |
|---|---|---|---|---|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB) | P/F |
| -- | -- | -- | -- | P |
| -- | -- | -- | -- | P |

Note:

No result in this part for margin above 20dB.

Distance extrapolation factor =20 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.

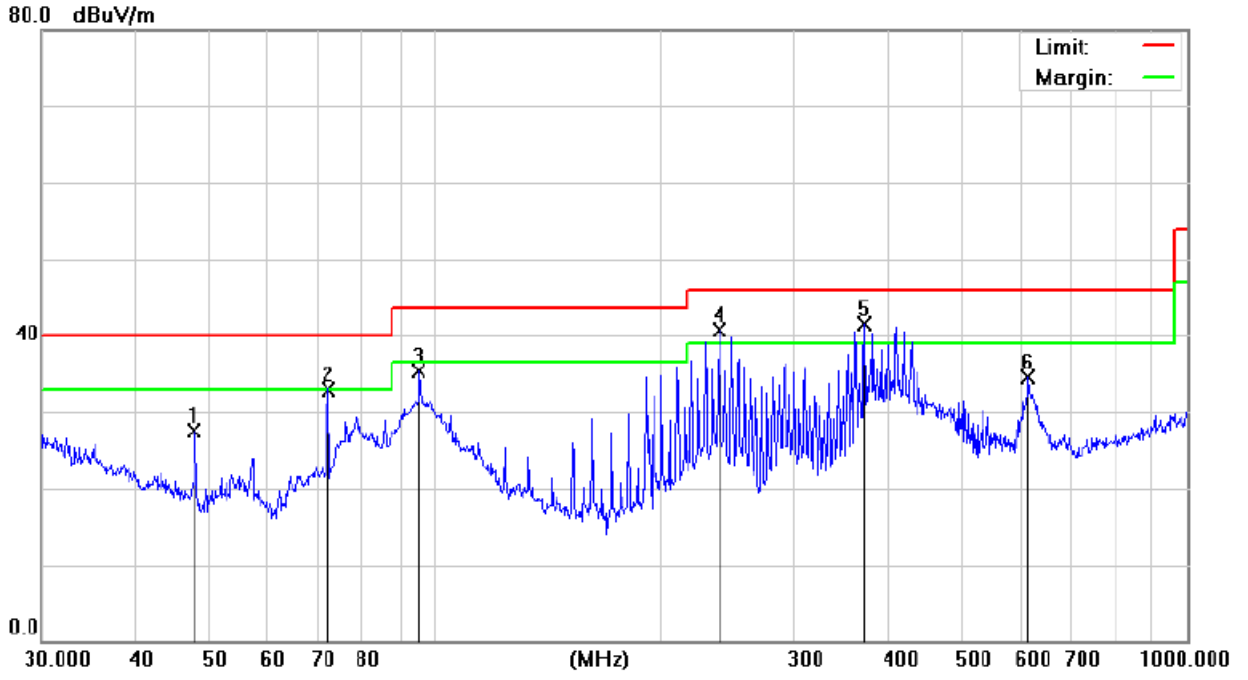
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

### 7.2.6 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

**Please refer to following diagram for individual**

**Below 1GHz**

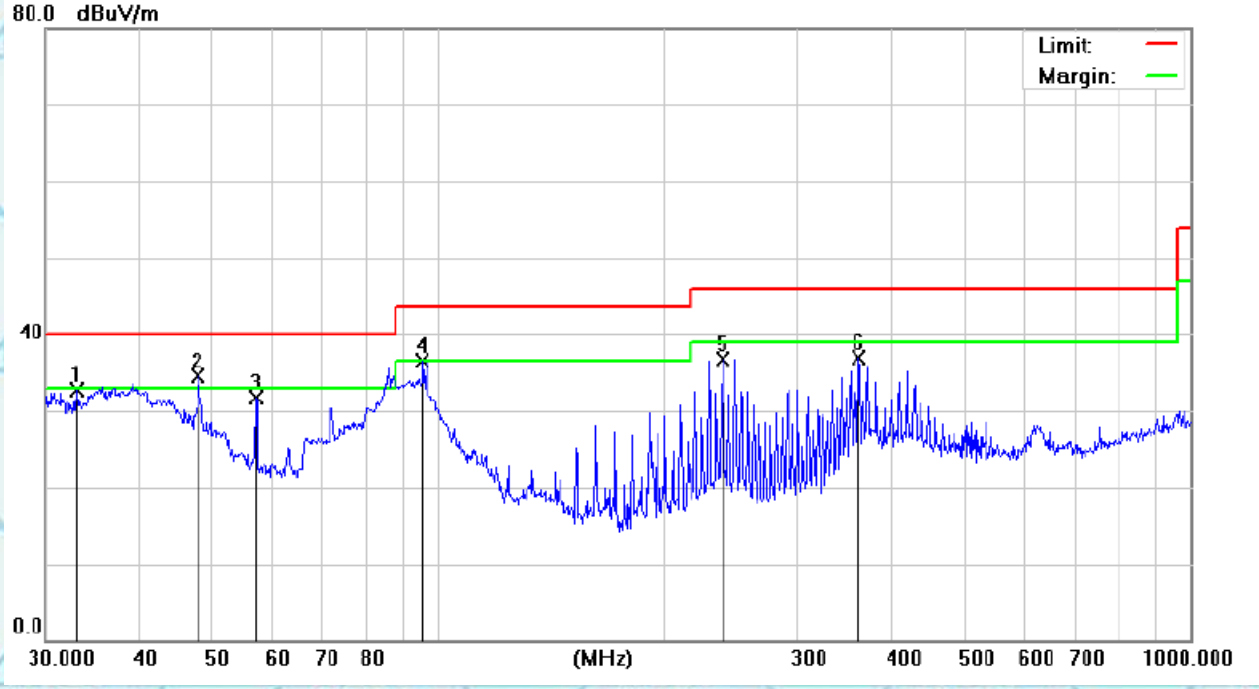
Horizontal:




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 47.8260 | 31.28 | -3.72 | 27.56 | 40.00 | -12.44 | QP |
| 2 | | 72.0843 | 40.04 | -7.04 | 33.00 | 40.00 | -7.00 | QP |
| 3 | | 95.0930 | 40.09 | -4.84 | 35.25 | 43.50 | -8.25 | QP |
| 4 | ! | 238.3102 | 45.93 | -5.25 | 40.68 | 46.00 | -5.32 | QP |
| 5 | * | 372.0045 | 42.82 | -1.28 | 41.54 | 46.00 | -4.46 | QP |
| 6 | | 614.2142 | 33.01 | 1.54 | 34.55 | 46.00 | -11.45 | QP |

Remark: All the modes have been investigated, and only worst mode is presented in this report.

Vertical:




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 32.9791 | 28.99 | 3.65 | 32.64 | 40.00 | -7.36 | QP |
| 2 | * | 47.8260 | 38.13 | -3.72 | 34.41 | 40.00 | -5.59 | QP |
| 3 | | 56.9912 | 37.63 | -5.85 | 31.78 | 40.00 | -8.22 | QP |
| 4 | ! | 95.0930 | 41.40 | -4.84 | 36.56 | 43.50 | -6.94 | QP |
| 5 | | 238.3102 | 42.01 | -5.25 | 36.76 | 46.00 | -9.24 | QP |
| 6 | | 361.7139 | 38.27 | -1.42 | 36.85 | 46.00 | -9.15 | QP |

Remark: All the modes have been investigated, and only worst mode is presented in this report.

Note:
Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = Antenna factor + Cable loss - Amplifier factor.
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
Limit (dBμV) = Limit stated in standard
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

## TEST RESULTS (ABOVE 1GHZ)

**Above 1GHz**

| Freq. (MHz) | Low channel: 5180MHz | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant.Pol | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Over(dB) | |
| | H/V | PK | AV | PK | AV | PK | AV |
| 10360 | V | 60.77 | 40.59 | 74 | 54 | -13.23 | -13.41 |
| 15540 | V | 58.23 | 40.95 | 74 | 54 | -15.77 | -13.05 |
| 10360 | H | 58.81 | 39.10 | 74 | 54 | -15.19 | -14.90 |
| 15540 | H | 58.09 | 39.09 | 74 | 54 | -15.91 | -14.91 |

| Freq. (MHz) | Low channel: 5180MHz | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant.Pol | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Over(dB) | |
| | H/V | PK | AV | PK | AV | PK | AV |
| 10360 | V | 58.58 | 39.72 | 74 | 54 | -15.42 | -14.28 |
| 15540 | V | 58.79 | 39.38 | 74 | 54 | -15.21 | -14.62 |
| 10360 | H | 58.76 | 39.74 | 74 | 54 | -15.24 | -14.26 |
| 15540 | H | 58.12 | 39.12 | 74 | 54 | -15.88 | -14.88 |

| Freq. (MHz) | Low channel: 5180MHz | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant.Pol | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Over(dB) | |
| | H/V | PK | AV | PK | AV | PK | AV |
| 10360 | V | 58.12 | 39.96 | 74 | 54 | -15.88 | -14.04 |
| 15540 | V | 59.66 | 40.75 | 74 | 54 | -14.34 | -13.25 |
| 10360 | H | 58.63 | 39.54 | 74 | 54 | -15.37 | -14.46 |
| 15540 | H | 58.23 | 39.23 | 74 | 54 | -15.77 | -14.77 |

| Freq. (MHz) | Low channel: 5180MHz | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant.Pol | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Over(dB) | |
| | H/V | PK | AV | PK | AV | PK | AV |
| 10360 | V | 59.30 | 40.00 | 74 | 54 | -14.70 | -14.00 |
| 15540 | V | 58.36 | 40.22 | 74 | 54 | -15.64 | -13.78 |
| 10360 | H | 58.06 | 40.88 | 74 | 54 | -15.94 | -13.12 |
| 15540 | H | 59.24 | 40.24 | 74 | 54 | -14.76 | -13.76 |

Note:
1. All emissions not reported were more than 20dB below the specified limit or in the noise floor.
2. Freq. = Emission frequency in MHz
   Reading level (dBμV) = Receiver reading
   Corr. Factor (dB) = Attenuation factor + Cable loss
   Level (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
   Limit (dBμV) = Limit stated in standard
   Margin (dB) = Level (dBμV) – Limits (dBμV)
3. Data of measurement within this frequency range shown “--” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

## 7.3 ANTENNA REQUIREMENT

| | |
|---|---|
| **Standard requirement:** | The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and FCC part 15C section 15.407. |
| FCC part 15C section 15.203 and FCC part 15C section 15.407 requirements: Systems operating in the 5150~5850MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi. | |
| **E.U.T Antenna:** | |
| The Wi-Fi antenna is a Integral Antenna. it meets the standards, and the best case gain of the antenna is 0.20dBi. | |

# 7.4 EMISSION BANDWIDTH

## 7.4.1 TEST EQUIPMENT

Please refer to Section 5 this report.

## 7.4.2 TEST PROCEDURE

| | |
|---|---|
| **-26dB Bandwidth and 99% Occupied Bandwidth:** | |
| Test Method: | a)The transmitter was radiated to the spectrum analyzer in peak hold mode.<br>b)Measure the maximum width of the emission that is 26 dB down from the peak of the emission Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%. |
| Test Equipment Setting – 26dB Bandwidth: | Test Equipment Setting – 99%% Bandwidth: |
| a)Attenuation: Auto<br>b)Span Frequency: > 26dB Bandwidth<br>c)RBW: Approximately 1% of the emission bandwidth<br>d)VBW: VBW > RBW<br>e)Detector: Peak<br>f)Trace: Max Hold<br>g)Sweep Time: Auto | a)Span: 1.5 times to 5.0 times the OBW<br>b)RBW: 1 % to 5 % of the OBW<br>c)VBW: ≥ 3 x RBW<br>d)Detector: Peak<br>e)Trace: Max Hold |
| **6 dB Bandwidth:** | |
| Test Method: | a)The transmitter was radiated to the spectrum analyzer in peak hold mode.<br>b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.<br>c)Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions<br>Testing of Transmitters with Multiple Outputs in the Same Band.<br>d)Measured the spectrum width with power higher than 6dB below carrier. |
| Test Equipment Setting: | |
| a)Attenuation: Auto<br>b)Span Frequency: > 6dB Bandwidth<br>c)RBW: 100kHz<br>d)VBW: ≥ 3 x RBW | e)Detector: Peak<br>f)Trace: Max Hold<br>g)Sweep Time: Auto |
| **Maximum Conducted Output Power Measurement:** | |
| Test Method: | a)The transmitter output (antenna port) was connected to the power meter.<br>b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).<br>c)Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions<br>Testing of Transmitters with Multiple Outputs in the Same Band.<br>d)When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula. |
| Test Equipment Setting: Detector - Average | |
| **Power Spectral Density:** | |
| Test Method: | a)The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.<br>b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).<br>c)Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power<br>Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.<br>d)When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for<br>the first frequency bin of the summed spectrum. The summed spectrum value for each of the other<br>frequency bins is computed in the same way.<br>e)For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) |

| | |
|---|---|
| | and the final result should ≤ 30 dBm. |

| Test Equipment Setting: | |
|---|---|
| a)Attenuation: Auto<br>b)Span Frequency: Encompass the entire emissions bandwidth (EBW) of the signal<br>c)RBW: 1000 kHz<br>d)VBW: 3000 kHz | e)Detector: RMS<br>f)Trace: AVERAGE<br>g)Sweep Time: Auto<br>h)Trace Average: 100 times |
| Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement. | |

| **Frequency Stability Measurement:** | |
|---|---|
| Test Method: | a)The transmitter output (antenna port) was connected to the spectrum analyzer.<br>b)EUT have transmitted absence of modulation signal and fixed channelize.<br>c)Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.<br>d)Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.<br>e)fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and<br>the limit is less than ±20ppm (IEEE 802.11nspecification).<br>f)The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the<br>nominal value<br>g)Extreme temperature is 0°C~40°C |
| Test Equipment Setting: | |
| a)Attenuation: Auto<br>b)Span Frequency: Entire absence of modulation emissions bandwidth<br>c)RBW: 10 kHz<br>d)VBW: 10 kHz | e)Sweep Time: Auto |

### 7.4.3 CONFIGURATION OF THE EUT

Same as section 3.4 of this report

### 7.4.4 EUT OPERATING CONDITION

Same as section 3.5 of this report.

### 7.4.5 LIMIT

| | |
|---|---|
| **-26dB Bandwidth and 99% Occupied Bandwidth:** | |
| Limit: | No restriction limits. |
| **-6 dB Bandwidth:** | |
| Limit: | For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz. |
| Test Equipment Setting: | |
| a)Attenuation: Auto<br>b)Span Frequency: > 6dB Bandwidth<br>c)RBW: 100kHz<br>d)VBW: ≥ 3 x RBW | e)Detector: Peak<br>f)Trace: Max Hold<br>g)Sweep Time: Auto |
| **Maximum Conducted Output Power Measurement:** | |
| ☒5.15~5.25 GHz | |
| ☐Limit of Outdoor access point: | ☐Limit of Indoor access point: |
| The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm). | The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional 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. |
| ☐Limit of Fixed point-to-point access points: | ☒Limit of Mobile and portable client devices: |
| The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. | The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional 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. |
| ☒5.25-5.35 GHz & ☒5.470-5.725 GHz | |
| The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional 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. | |
| ☒5.725~5.85 GHz | |
| The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional 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 without any corresponding reduction in transmitter conducted power. | |
| **Power Spectral Density** | |
| ☒5.15~5.25 GHz | |
| ☐Limit of Outdoor access point: 17 dBm/MHz | ☐Limit of Indoor access point: 17 dBm/MHz |
| ☐Limit of Fixed point-to-point access points: 17 dBm/MHz | ☒Limit of Mobile and portable client devices: 11 dBm/MHz |
| ☐5.25-5.35 GHz | 11 dBm/MHz |
| ☐5.470-5.725 GHz | 11 dBm/MHz |
| ☒5.725~5.85 GHz | 30 dBm/500kHz |
| **Frequency Stability Measurement:** | |
| Limit: | In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.<br>The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE802.11n specification). |

## 7.4.6 TEST RESULT

### -26dB Bandwidth and 99% Occupied Bandwidth

| | | | |
|---|---|---|---|
| **Product** | : EUT-Sample | Test Mode | : See section 3.4 |
| **Test Item** | : -26dB Bandwidth/-6dB Bandwidth and 99% Occupied Bandwidth | Temperature | : 25 ℃ |
| **Test Voltage** | : DC 3.8V | Humidity | : 56%RH |
| **Test Result** | : PASS | | |

### -26dB Bandwidth

| Band | Channel | Frequency (MHz) | -26 dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Limit -26 dB Bandwidth (MHz) | Verdict |
|---|---|---|---|---|---|---|
| **20MHz(IEEE 802.11a/n/ac)** | | | | | | |
| 1 | Low | 5180 | 23.6 | 20.211 | 0.5 | Pass |
| | High | 5240 | 23.018 | 20.019 | 0.5 | Pass |
| 2 | Low | 5260 | 23.632 | 19.979 | 0.5 | Pass |
| | High | 5320 | 23.258 | 19.972 | 0.5 | Pass |
| 3 | Low | 5500 | 22.303 | 19.845 | 0.5 | Pass |
| | High | 5700 | 23.137 | 20.092 | 0.5 | Pass |
| **40MHz(IEEE 802.11n/ac)** | | | | | | |
| 1 | Low | 5190 | 41.809 | 39.61 | 0.5 | Pass |
| | High | 5230 | 44.075 | 39.673 | 0.5 | Pass |
| 2 | Low | 5270 | 41.097 | 39.507 | 0.5 | Pass |
| | High | 5310 | 42.49 | 39.965 | 0.5 | Pass |
| 3 | Low | 5510 | 42.188 | 39.501 | 0.5 | Pass |
| | High | 5670 | 41.98 | 39.939 | 0.5 | Pass |
| **80MHz(IEEE 802.11ac)** | | | | | | |
| 1 | Low | 5210 | 83.522 | 79.389 | 0.5 | Pass |
| 2 | High | 5290 | 83.069 | 79.228 | 0.5 | Pass |
| 3 | Low | 5530 | 82.27 | 79.045 | 0.5 | Pass |
| | High | 5610 | 83.925 | 79.452 | 0.5 | Pass |

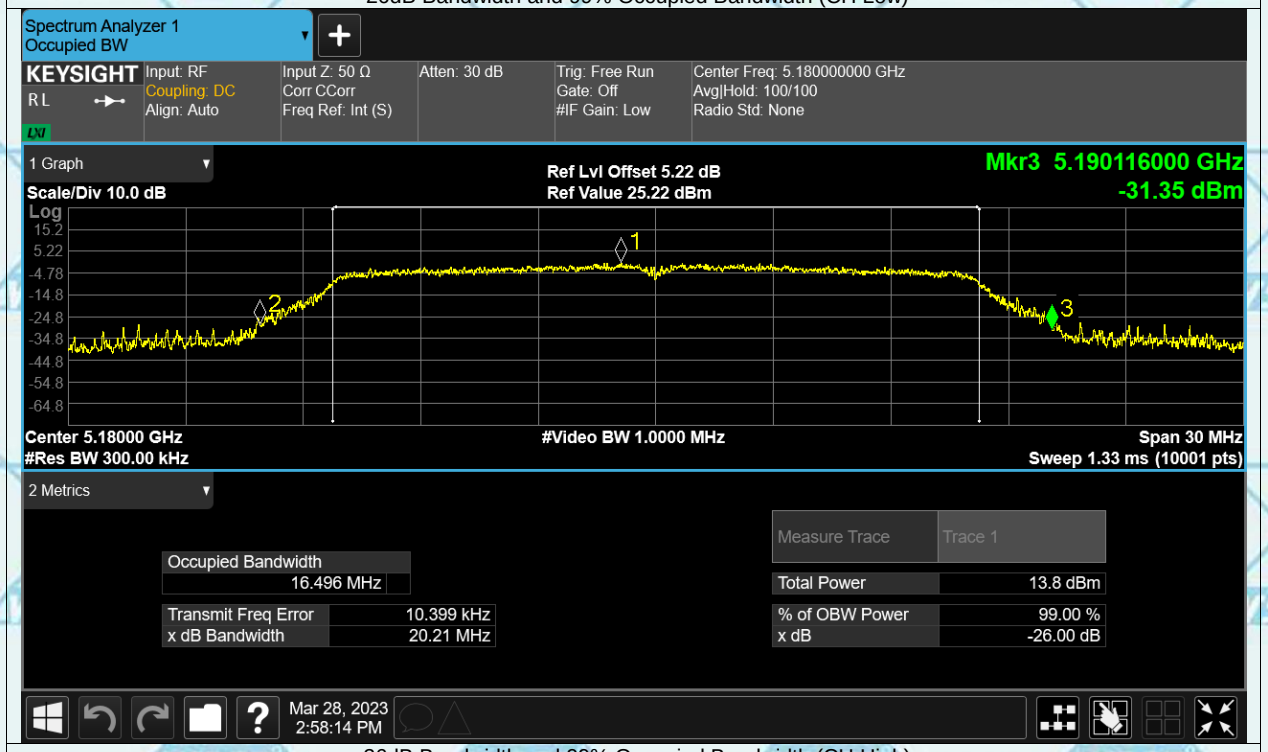
### -6dB Bandwidth

| Band | Channel | Frequency (MHz) | -6 dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|---|---|---|---|---|---|---|
| **20MHz(IEEE 802.11a/n/ac)** | | | | | | |
| 4 | Low | 5745 | 17.53 | 17.527 | > 0.5 | Pass |
| | High | 5825 | 17.509 | 17.536 | > 0.5 | Pass |
| **40MHz(IEEE 802.11n/ac)** | | | | | | |
| 4 | Low | 5755 | 35.929 | 35.825 | > 0.5 | Pass |
| | High | 5795 | 36.294 | 35.809 | > 0.5 | Pass |
| **80MHz(IEEE 802.11ac)** | | | | | | |
| 4 | Low | 5775 | 75.066 | 75.178 | > 0.5 | Pass |

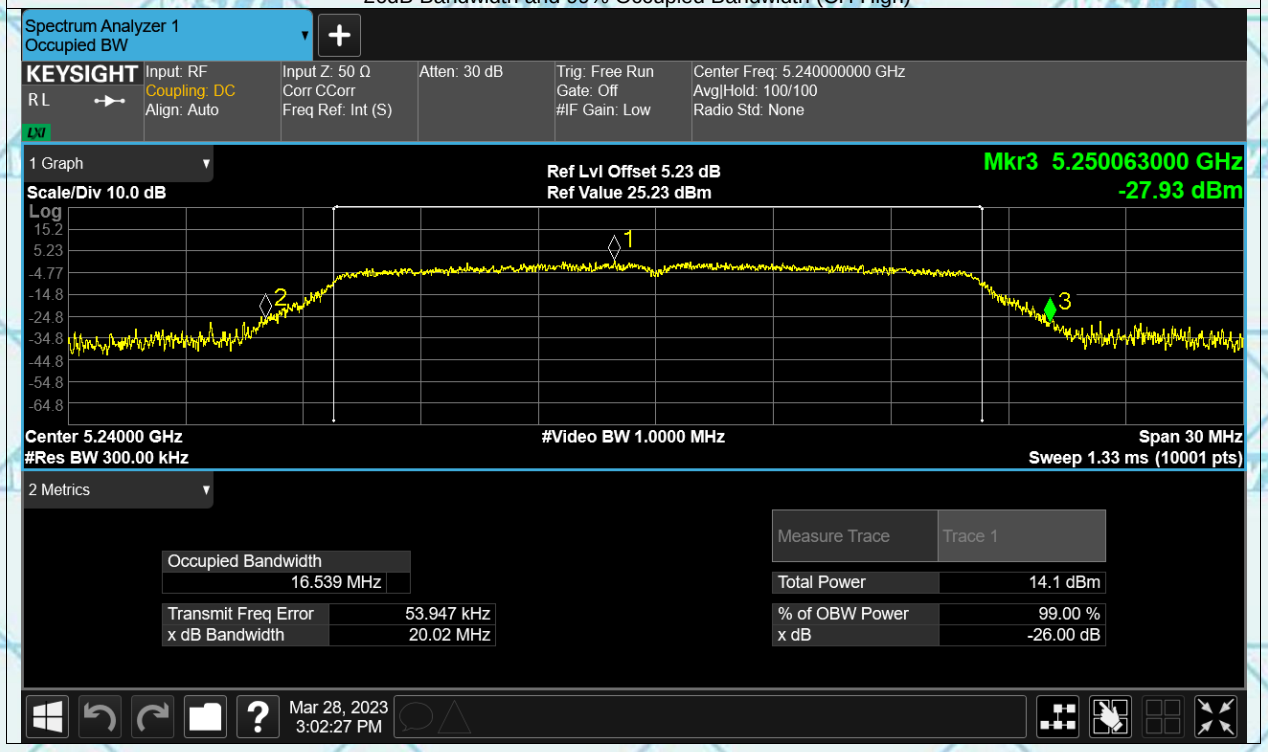
**20MHz(IEEE 802.11a/n/ac)**
**Band1**

Test Graphs

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

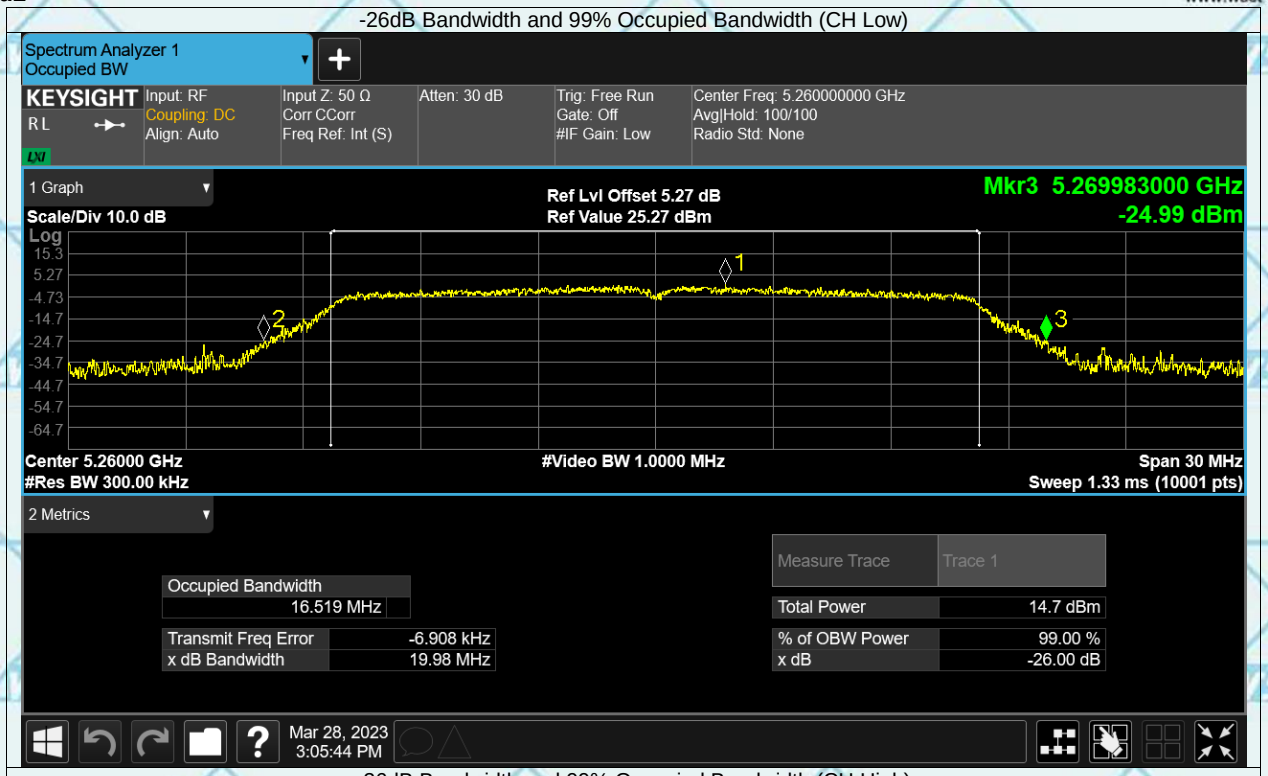



-26dB Bandwidth and 99% Occupied Bandwidth (CH High)

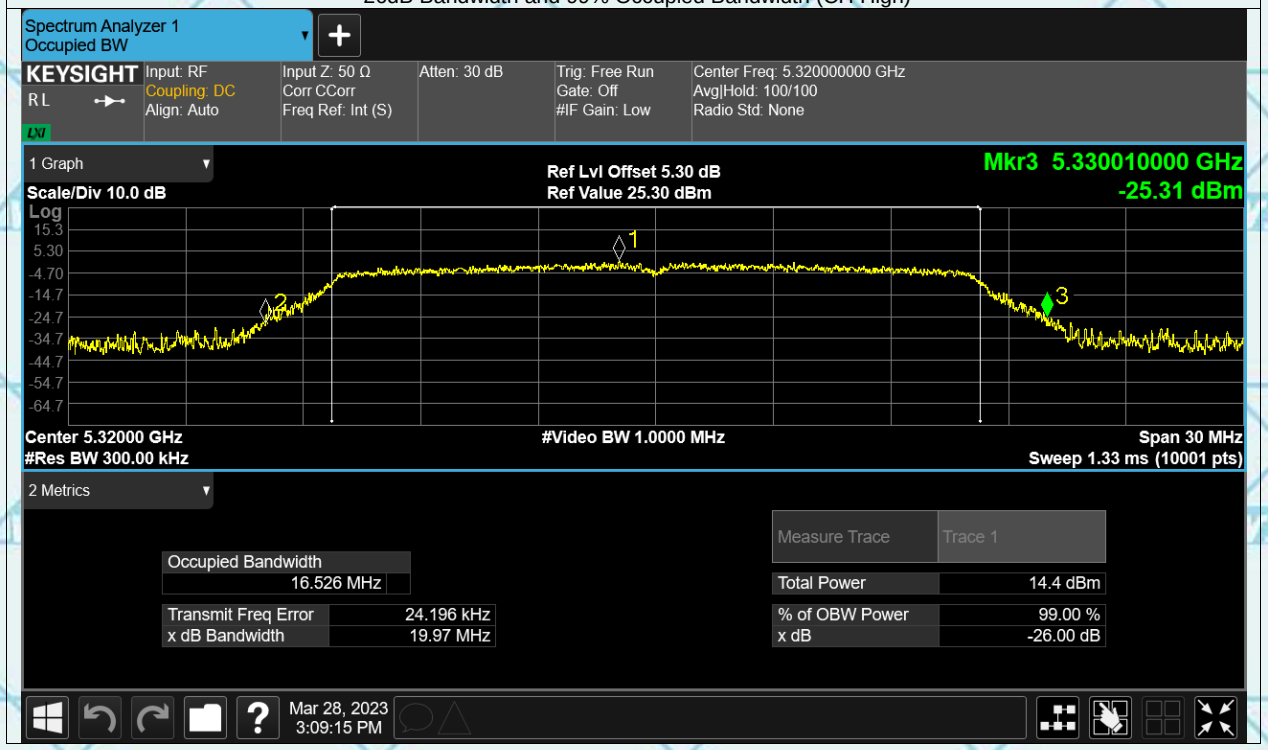


**Band2**

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

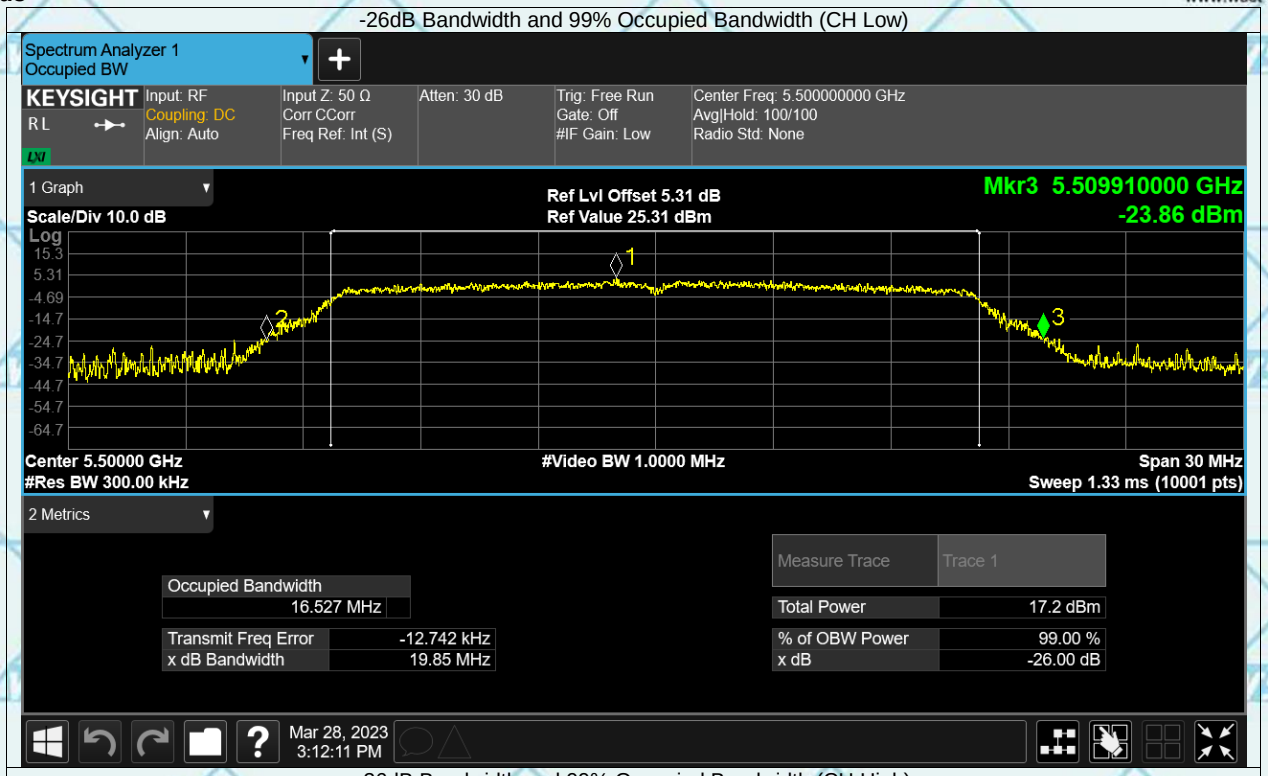



-26dB Bandwidth and 99% Occupied Bandwidth (CH High)



**Band3**

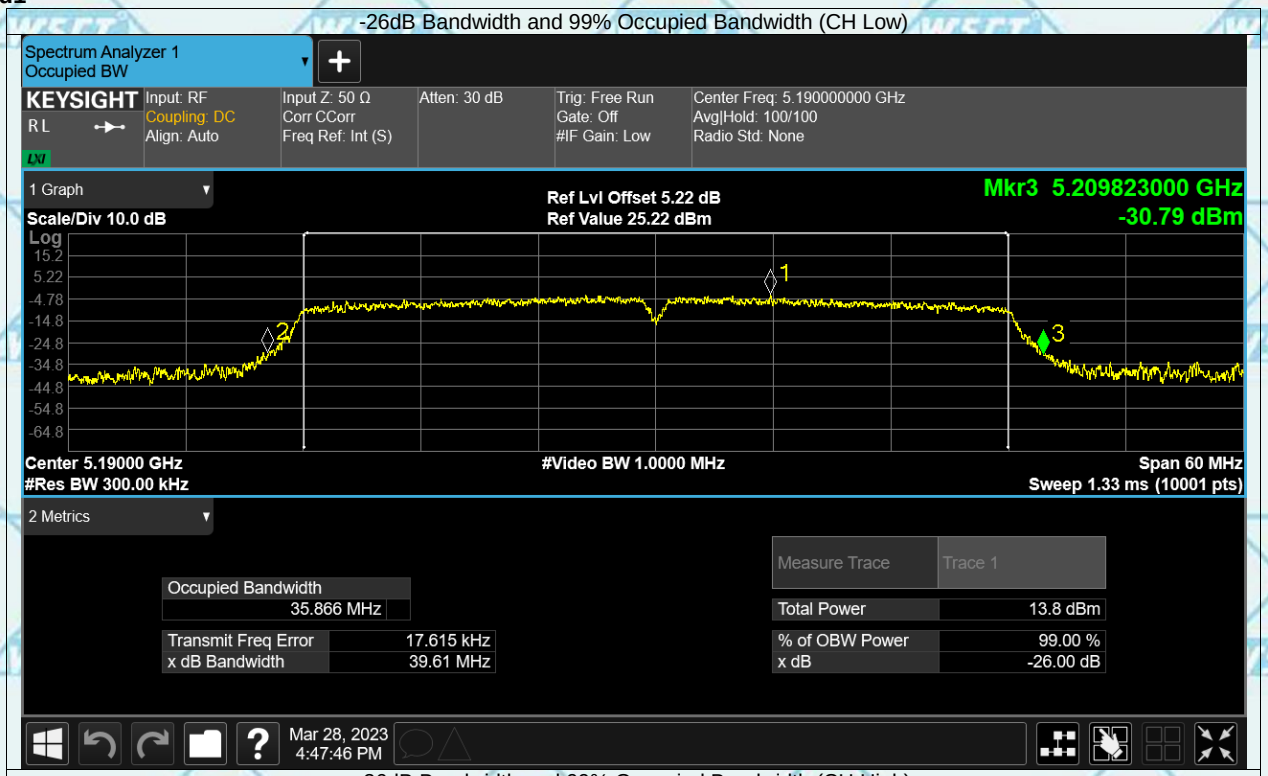
-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



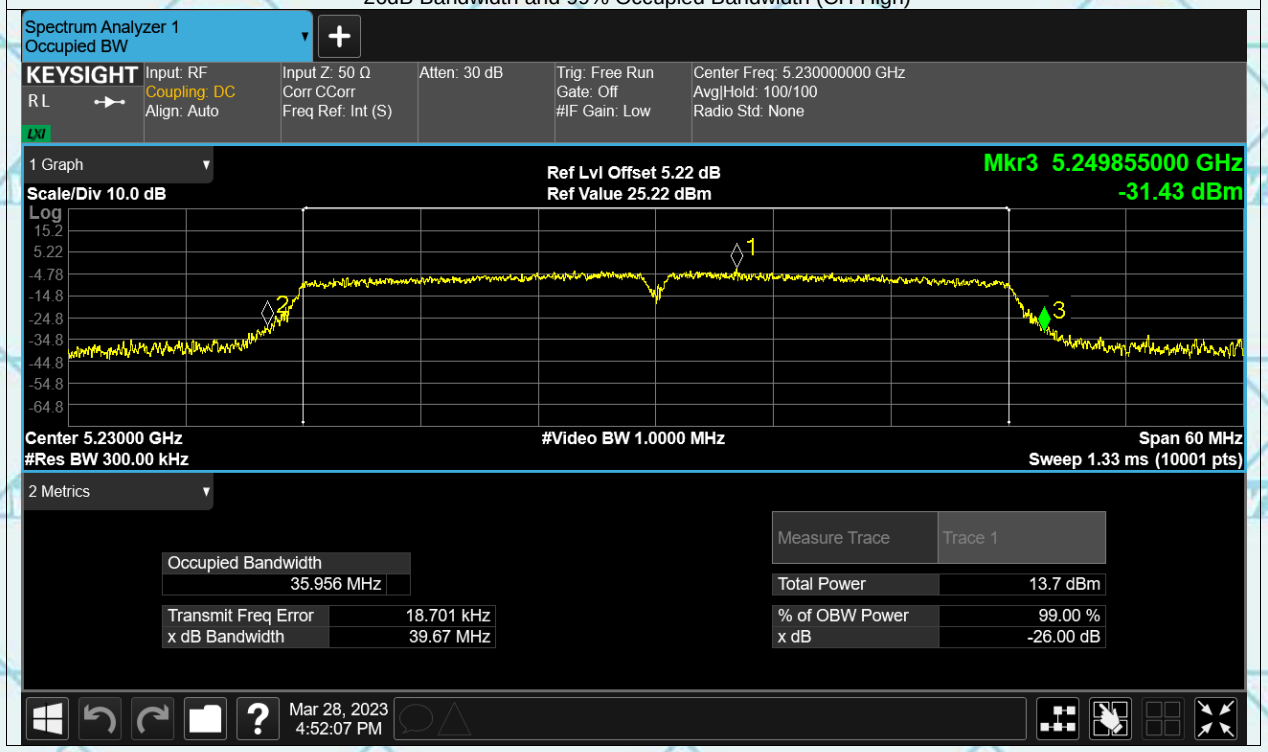

-26dB Bandwidth and 99% Occupied Bandwidth (CH High)

**40MHz(IEEE 802.11n/ac)**
**Band1**

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

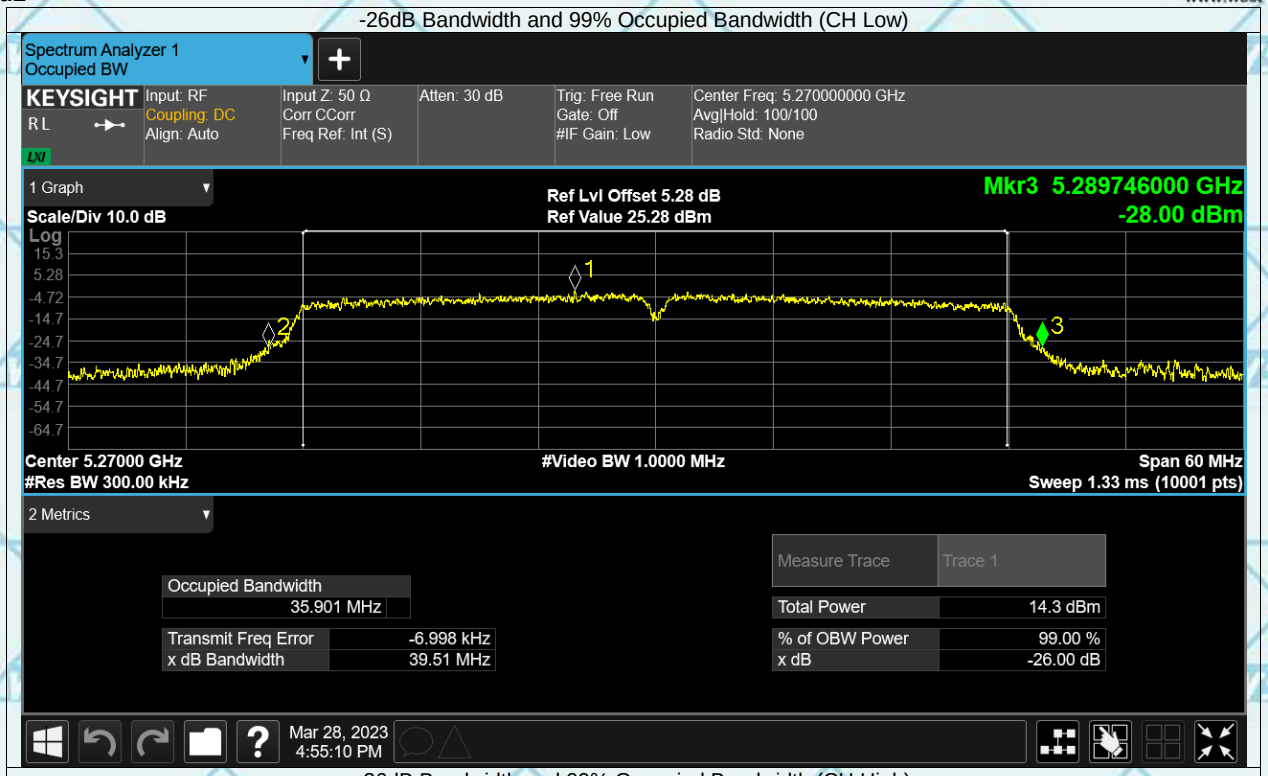



-26dB Bandwidth and 99% Occupied Bandwidth (CH High)

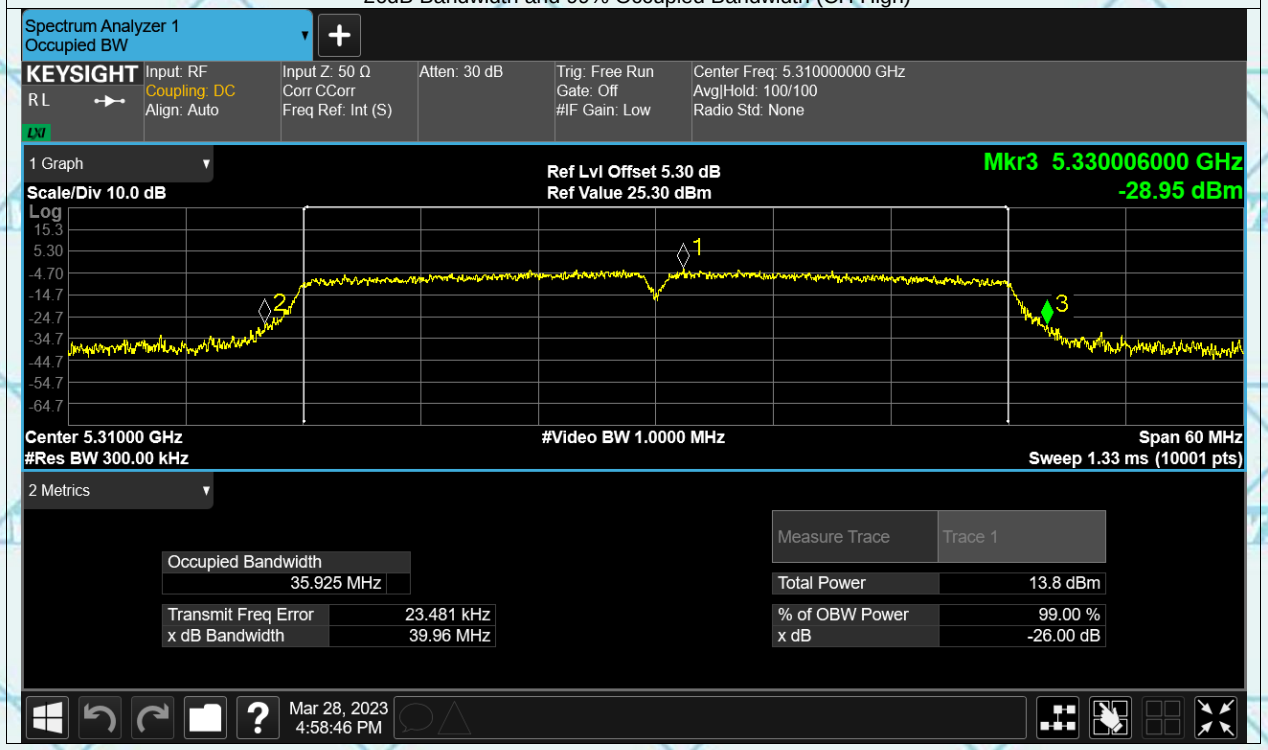


**Band2**

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

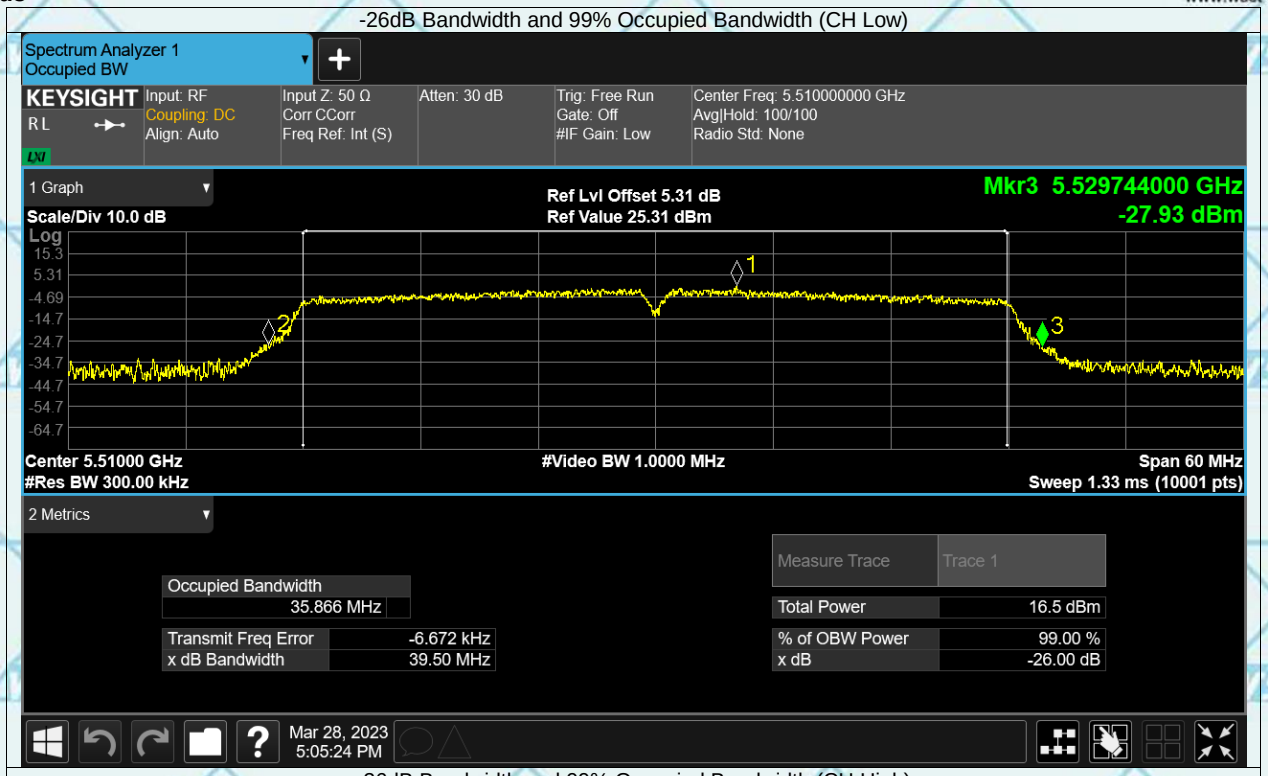



-26dB Bandwidth and 99% Occupied Bandwidth (CH High)

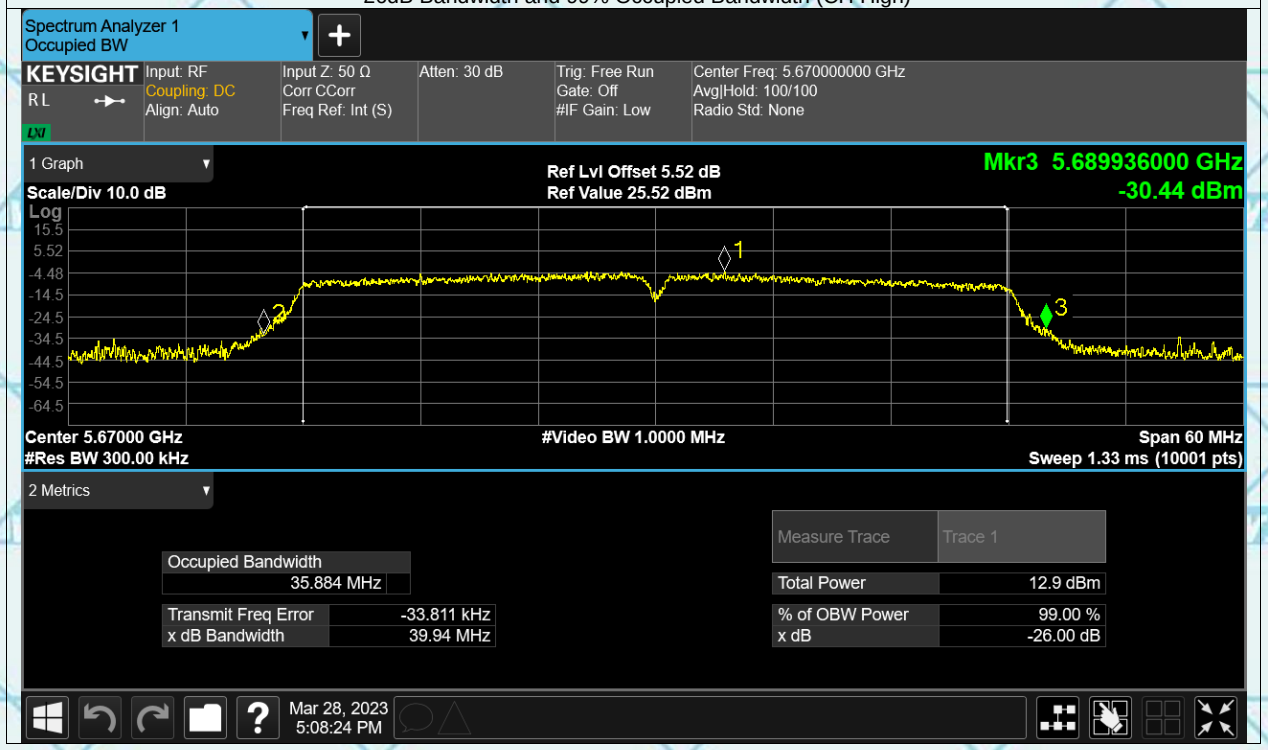


**Band3**

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

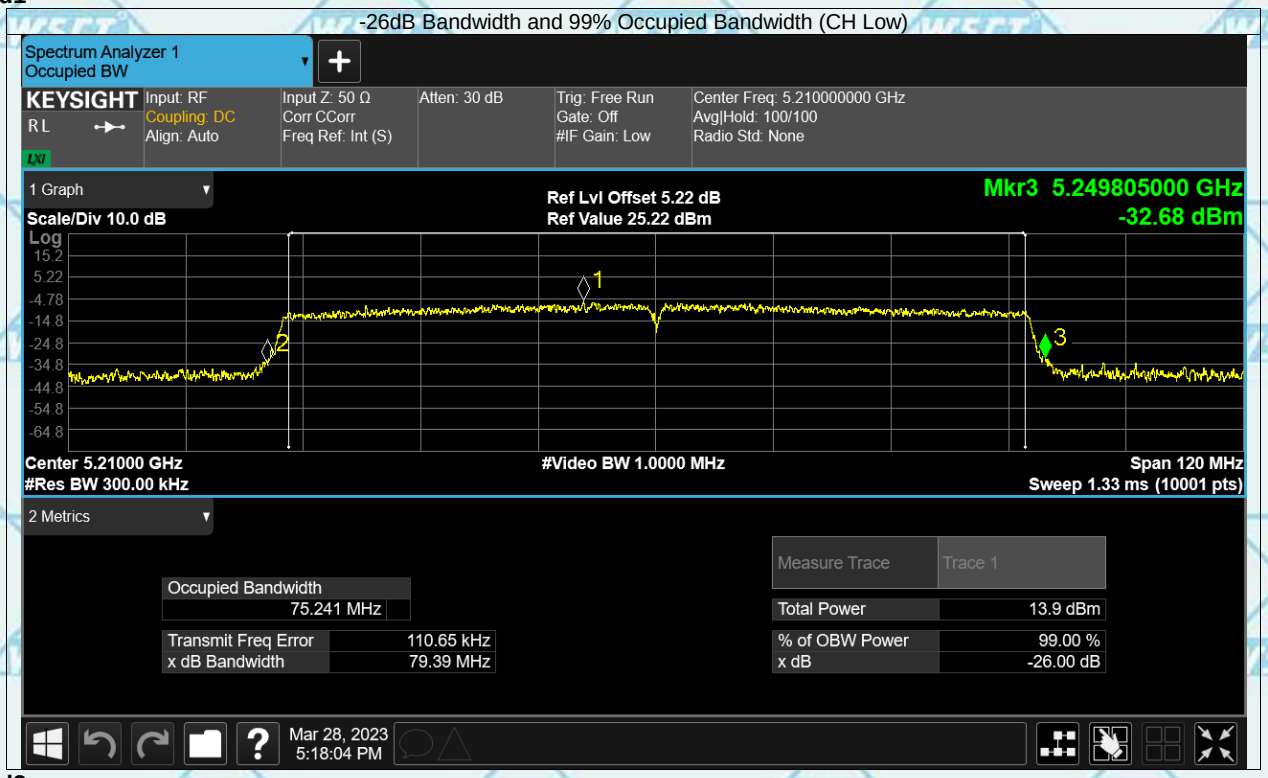



-26dB Bandwidth and 99% Occupied Bandwidth (CH High)



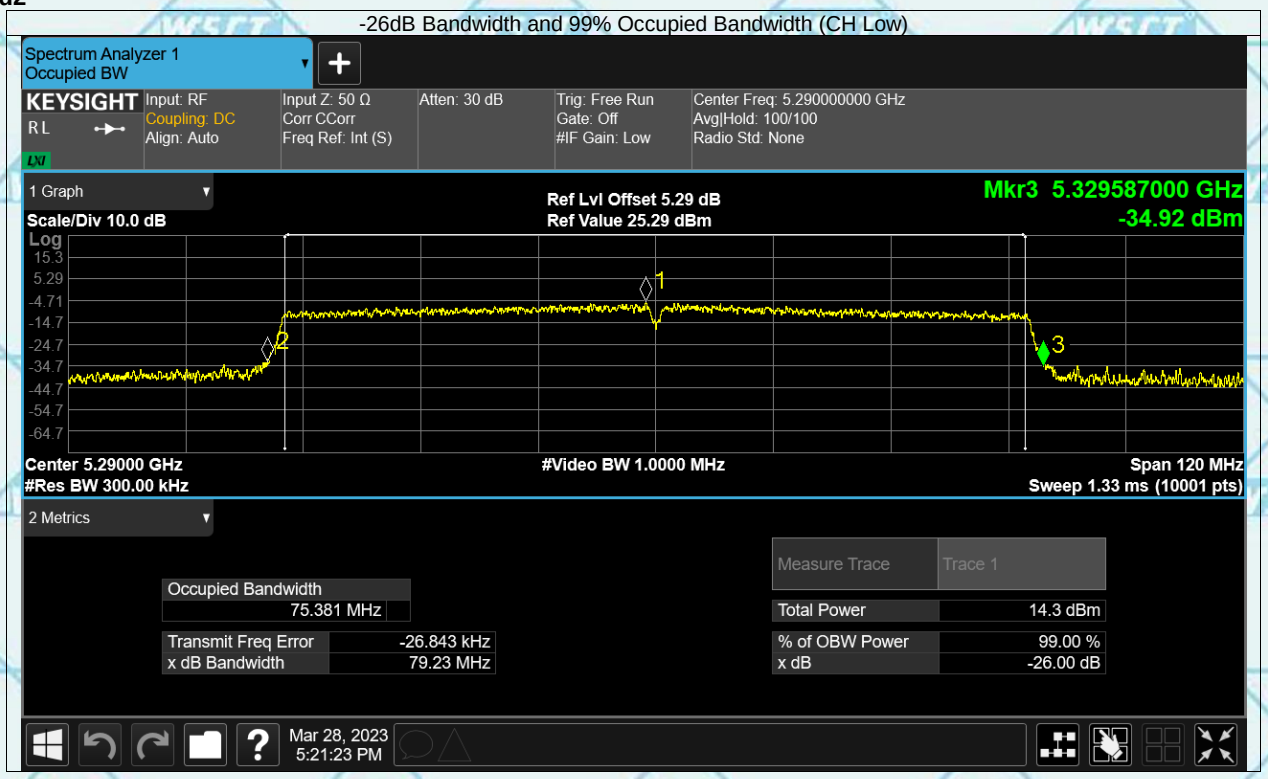
**80MHz(IEEE 802.11ac)**
**Band1**

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



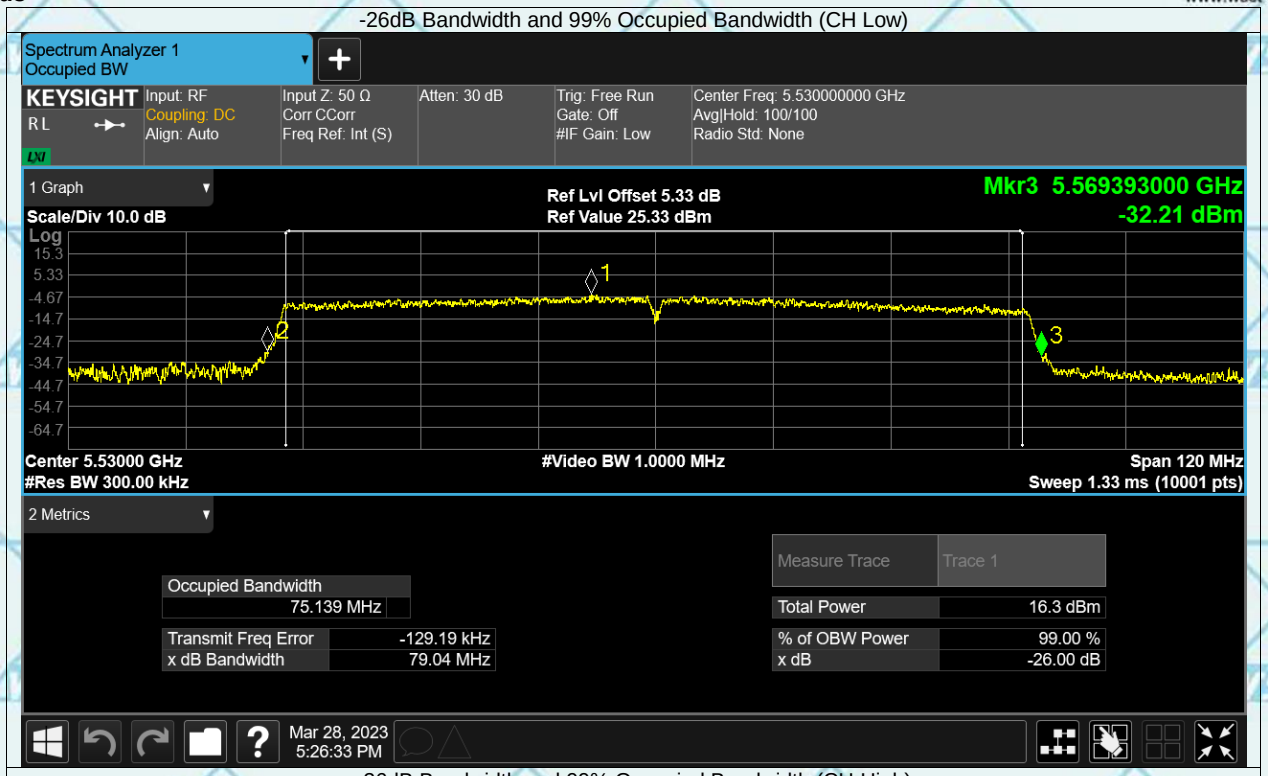

**Band2**

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

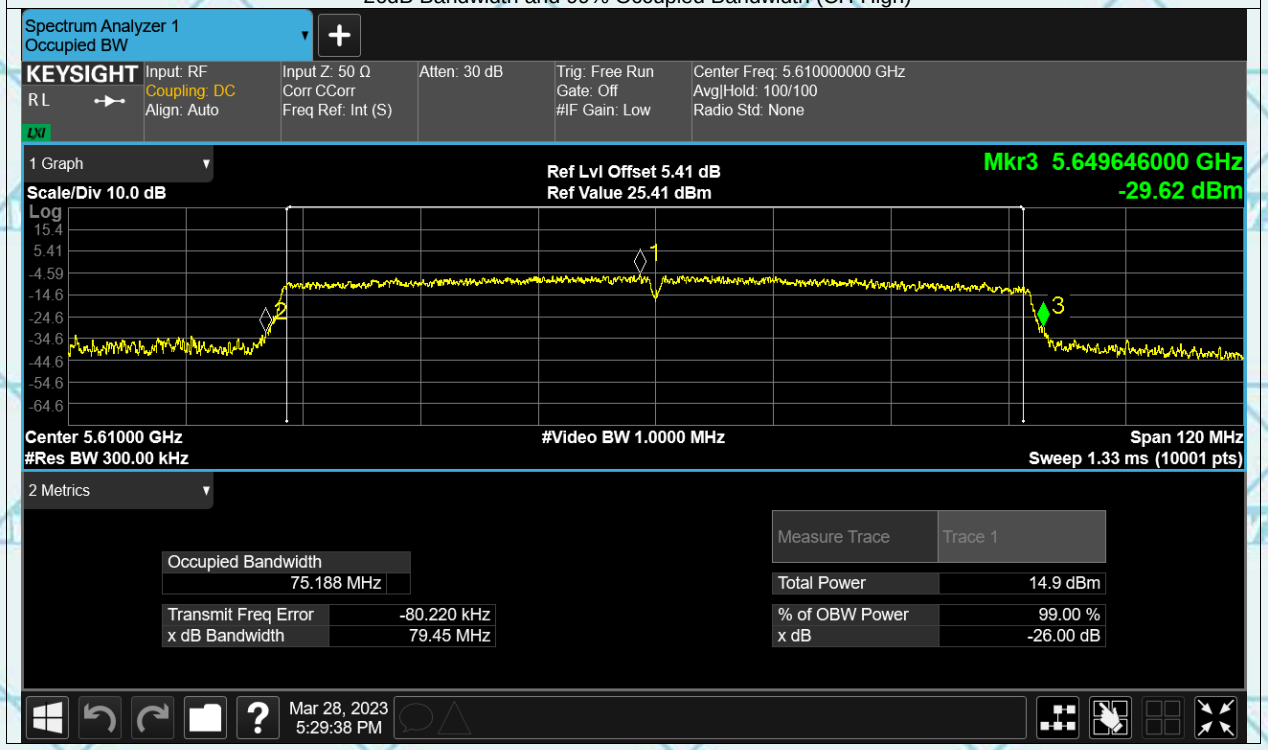


**Band3**

-26dB Bandwidth and 99% Occupied Bandwidth (CH Low)




-26dB Bandwidth and 99% Occupied Bandwidth (CH High)

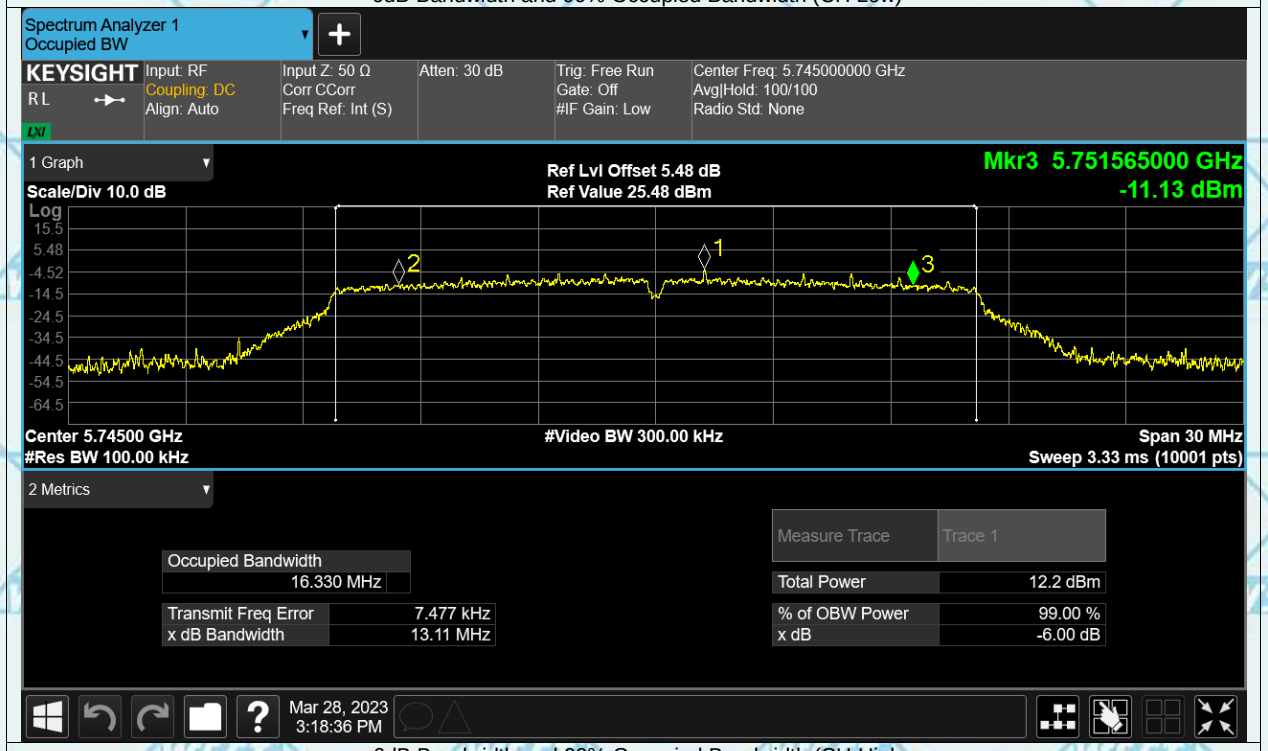


## -6dB Bandwidth

**20MHz(IEEE 802.11a/n/ac)**

**Band4**

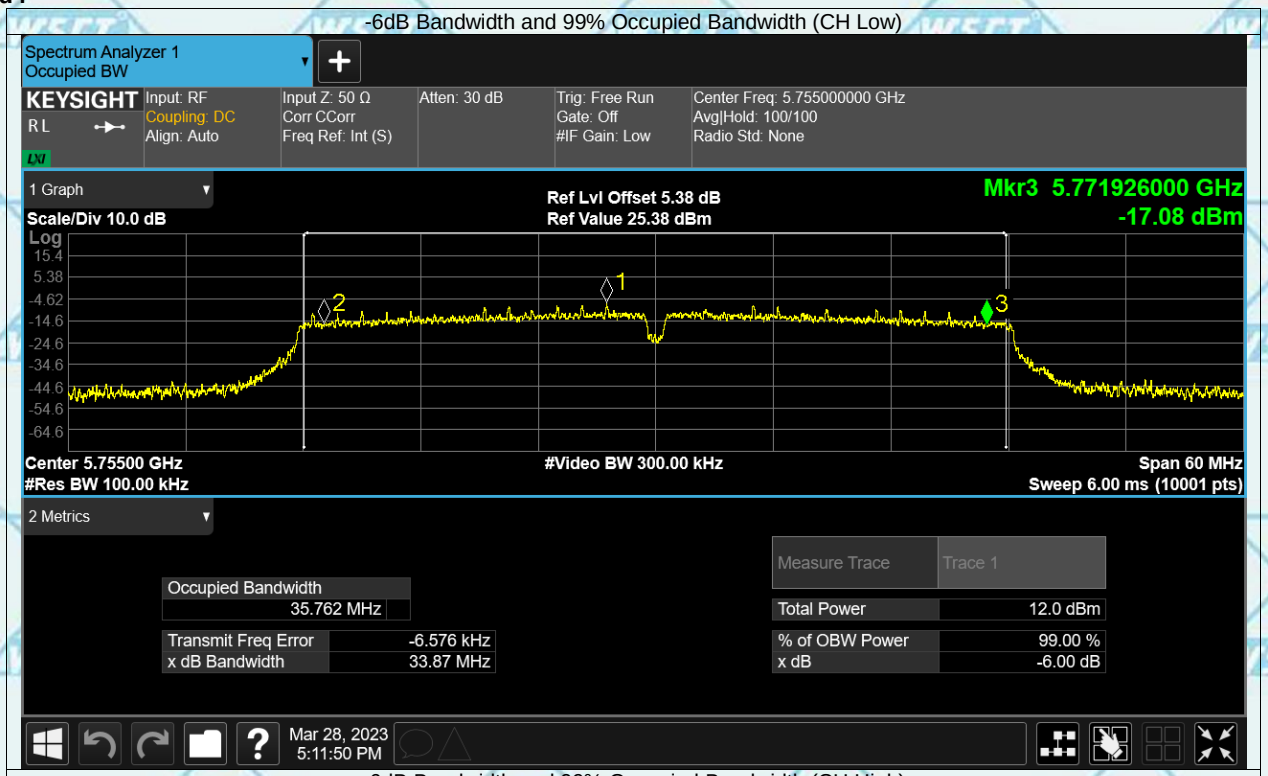
-6dB Bandwidth and 99% Occupied Bandwidth (CH Low)



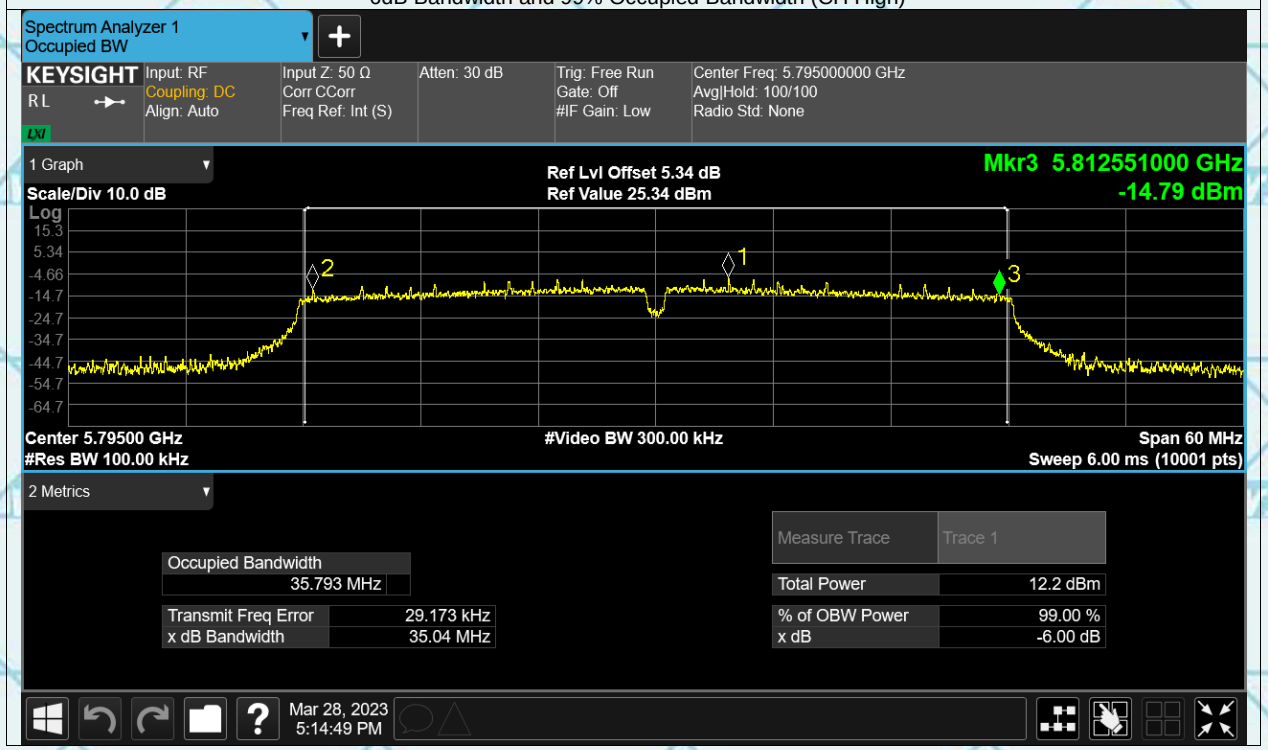

-6dB Bandwidth and 99% Occupied Bandwidth (CH High)

**40MHz(IEEE 802.11n/ac)**
**Band4**

-6dB Bandwidth and 99% Occupied Bandwidth (CH Low)




-6dB Bandwidth and 99% Occupied Bandwidth (CH High)



**80MHz(IEEE 802.11ac)**
**Band4**

-6dB Bandwidth and 99% Occupied Bandwidth (CH Low)