

TEST REPORT

FCC/ISED UNII Test for WOC-0430
FCC: Class II Permissive Change
ISED: Class IV Permissive Change

APPLICANT
JVCKENWOOD Corporation

REPORT NO.
HCT-RF-2406-FI012-R2

DATE OF ISSUE
July 18, 2024

Tested by
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TEST REPORT

REPORT NO.
HCT-RF-2406-FI012-R2

DATE OF ISSUE
July 10, 2024

Applicant **JVCKENWOOD Corporation**
1-16-2, Hakusan, Midori-ku, Yokohama-shi, Kanagawa, 226-8525 JAPAN

Product Name Communication Module
Model Name W0C-0430

FCC ID K44515050
IC 282F-515050

Modulation type OFDM

Date of Test May 01, 2024 ~ June 14, 2024

FCC Classification Unlicensed National Information Infrastructure(NII)

Test Standard Used FCC Rule Part(s): Part 15 subpart E
ISED Rule Part(s):
RSS-247 Issue 3 (August 2023)
RSS-Gen Issue 5_Amendment 2 (February 2021)

Test Results PASS

Location of Test Permanent Testing Lab On Site Testing
(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	June 20, 2024	Initial Release
1	July 10, 2024	- Added the note for all simultaneous transmission scenarios (page.31)
2	July 18, 2024	- Added the test software information (page.5)

Notice

Content

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC/ISED Rules under normal use and maintenance.

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

Test results provided by external providers are marked ***.

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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1. EUT DESCRIPTION

EUT Type	Communication Module	
FCC Model Name	W0C-0430	
ISED Model Name	W0C-0430	
Power Supply Voltage	DC 13.6V \pm 15%	
Modulation Type	802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20 MHz BW : 5180 - 5240 40 MHz BW : 5190 - 5230 80 MHz BW : 5210
	U-NII-2A	20 MHz BW : 5260 - 5320 40 MHz BW : 5270 - 5310 80 MHz BW : 5290
	U-NII-2C	20 MHz BW : 5500 - 5720 40 MHz BW : 5510 - 5710 80 MHz BW : 5530 - 5690
	U-NII-3	20 MHz BW : 5745 - 5825 40 MHz BW : 5755 - 5795 80 MHz BW : 5775
Antenna Specification	Type: Dipole Peak Gain: 2.74 dBi	
Straddle channel	Supported	
TDWR Band	FCC : Supported, ISED : Not Supported	
Dynamic Frequency Selection	Slave without radar detection	
Serial number	Conducted, Radiated : FES20066	
PMN (Product Marketing Number)	W0C-0430	
HVIN (Hardware Version Identification Number)	W0C-0430	
FVIN (Firmware Version Identification Number)	N/A	
HMN (Host Marketing Name)	VM8000-F	
Test software(EUT for test)	Armada (S/W version : 1.42.0.200)	
Host EUT description	This transmitter module has tested in the specific host devices , VM8000-F as non-stand-alone configuration.	

2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Band	Mode	Maximum output power	
		(dBm)	(W)
UNII1	802.11a	8.92	0.008
	802.11n (HT20)	8.61	0.007
	802.11n (HT40)	8.42	0.007
	802.11ac (VHT20)	8.55	0.007
	802.11ac (VHT40)	8.36	0.007
	802.11ac (VHT80)	3.75	0.002
UNII2A	802.11a	9.02	0.008
	802.11n (HT20)	8.61	0.007
	802.11n (HT40)	8.61	0.007
	802.11ac (VHT20)	8.64	0.007
	802.11ac (VHT40)	8.74	0.007
	802.11ac (VHT80)	4.37	0.003
UNII2C	802.11a	9.27	0.008
	802.11n (HT20)	8.99	0.008
	802.11n (HT40)	8.88	0.008
	802.11ac (VHT20)	8.90	0.008
	802.11ac (VHT40)	8.93	0.008
	802.11ac (VHT80)	4.91	0.003
UNII3	802.11a	9.75	0.009
	802.11n (HT20)	9.44	0.009
	802.11n (HT40)	5.25	0.003
	802.11ac (VHT20)	9.39	0.009
	802.11ac (VHT40)	5.21	0.003
	802.11ac (VHT80)	5.08	0.003

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’ were used in the measurement.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the RSS-Gen issue 5, RSS-247 issue 3.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated March 11, 2024 (Registration Number: KR0032).

For ISED, test facility was accepted dated March 13, 2024 (CAB identifier: KR0032).

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203, § 15.407:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section.”

- (1) The antennas of this E.U.T are permanently attached.
- (2) The E.U.T Complies with the requirement of § 15.203, § 15.407

According to RSS-Gen(Issue 5) Section 6.8:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested..

7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of

ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95 % level of confidence.

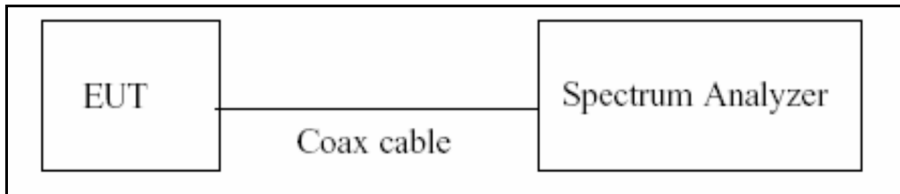
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, $k=2$)

8. DESCRIPTION OF TESTS

8.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure B.2 in KDB 789033 D02 v02r01.

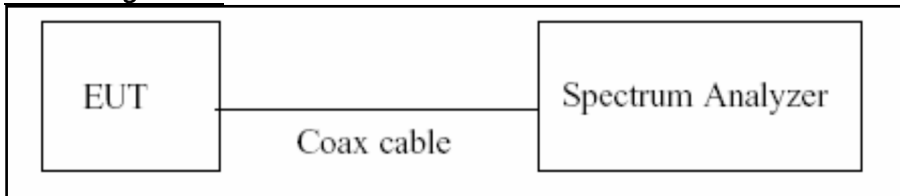
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (\geq RBW)
3. SPAN = 0 Hz
4. Measurement Type or = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10\log(1/\text{Duty Cycle})$

8.2. 6 dB Bandwidth & 26 dB Bandwidth & 99 % Bandwidth(ISED)

Limit

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Configuration



Test Procedure(26 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure C.1 in KDB 789033 D02 v02r01.

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Measurement Typeor = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum 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 Procedure (6 dB Bandwidth) (FCC)

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure C.2 in KDB 789033 D02 v02r01.

1. RBW = 100 kHz
2. VBW \geq 3 x RBW
3. Measurement Typeor = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum lever measured in the fundamental emission.

Test Procedure (6dB Bandwidth) (ISED)

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure RSS-GEN, 6.7

1. RBW = 1% ~ 5% of the occupied bandwidth
2. VBW \geq 3 x RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum lever measured in the fundamental emission.

Test Procedure (99 % Bandwidth measurement) (ISED)

The 99 % bandwidth is used to determine the conducted power limits.

The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. The sweep time is coupled. The spectrum analyzer internal 99 % bandwidth function is utilized. (6.9.3 in ANSI 63.10-2013)

1. RBW = 1 % ~ 5 % of the occupied bandwidth
2. VBW \geq 3 x RBW
3. Detector = Peak
4. Trace mode = max hold
5. Sweep = auto couple
6. Allow the trace to stabilize

Note:

1. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.
2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.
3. The 99 % Bandwidth is used to determine the conducted power limits.

8.3. Output Power Measurement

Limit(FCC)

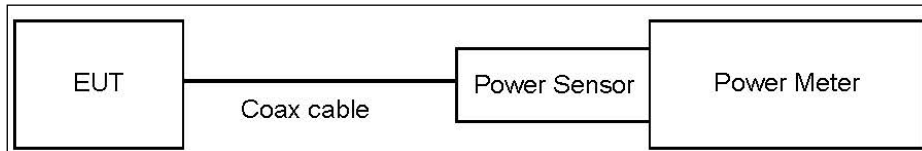
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30 dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

Limit(ISED)

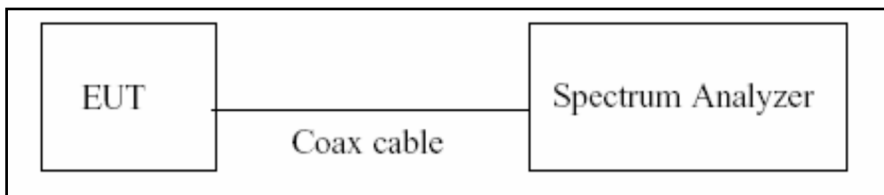
Band	Limit
UNII 1, 2A(EIRP)	30 mW (14.77dBm) or 1.76 + 10 log B, dBm, whichever power is less
UNII 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 99% bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

We tested according to Procedure E.3.a in KDB 789033 D02 v02r01.

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

3. Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Test Procedure(Spectrum Analyzer)

The transmitter output is connected to the Spectrum Analyzer.

We use the spectrum analyzer's integrated band power measurement function.

We tested according to Procedure E.2.d) in KDB 789033 D02 v02r01.

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW \geq 3 MHz.
5. Number of points in sweep \geq 2 x span/RBW.
6. Sweep time = auto.
7. Measurement Type or = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

Total Power(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels are not plot data.

The power results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	10.80
UNII 2A	10.80
UNII 2C	10.80
UNII 3	10.80

(Actual value of loss for the attenuator and cable combination)

8.4. Power Spectral Density

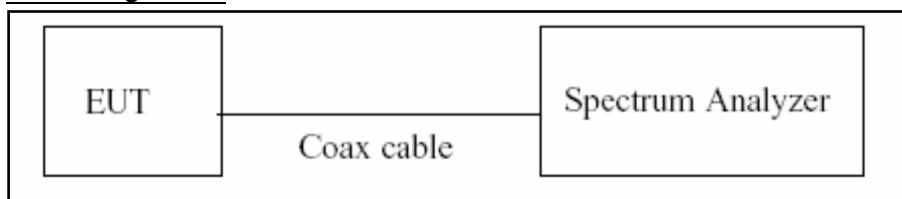
Limit(FCC)

Band	Limit
UNII 1	11 dBm/MHz
UNII 2A, 2C	11 dBm/MHz
UNII 3	30 dBm/500 kHz

Limit(ISED)

Band	Limit
UNII 1 (EIRP)	10 dBm/MHz
UNII 2A, 2C	11 dBm/MHz
UNII 3	30 dBm/500 kHz

Test Configuration



Test Procedure

We tested according to Procedure F in KDB 789033 D02 v02r01.

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
 →For portion within the NII-3 be used RBW 510kHz
3. VBW \geq 3 MHz
4. Number of points in sweep \geq 2 x span/RBW.
5. Sweep time = auto.
6. Measurement Typeor = RMS(i.e., power averaging), if available. Otherwise, use sample Measurement Typeor mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.

Sample Calculation

Total PSD(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels are not plot data.

The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	10.80
UNII 2A	10.80
UNII 2C	10.80
UNII 3	10.80

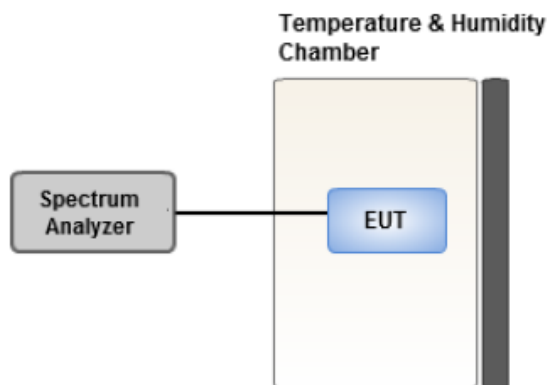
(Actual value of loss for the attenuator and cable combination)

8.5. Frequency Stability

Limit

Maintained within the band

Test Configuration



Test Procedure

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 °C and 50 °C.
2. The temperature was incremented by 10 °C intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.
3. The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.
4. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

8.6. AC Power line Conducted Emissions

Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56 ^(a)	56 to 46 ^(a)
0.50 to 5	56	46
5 to 30	60	50

^(a)Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Measurement Typeors : Quasi Peak and Average Measurement Typeor.

Sample Calculation

Quasi-peak(Final Result) = Measured Value + Correction Factor

8.7. Radiated Test

Limit

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
3. UNII 3: 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.
4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

FCC

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30

ISED

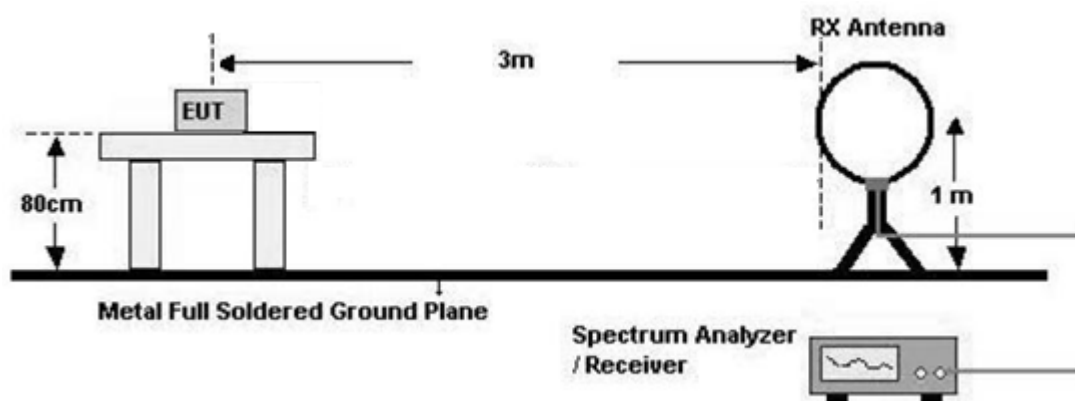
Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	$6.37/F(\text{kHz})$	300
0.490 – 1.705	$63.7/F(\text{kHz})$	30
1.705 – 30	0.08	30

FCC&ISED

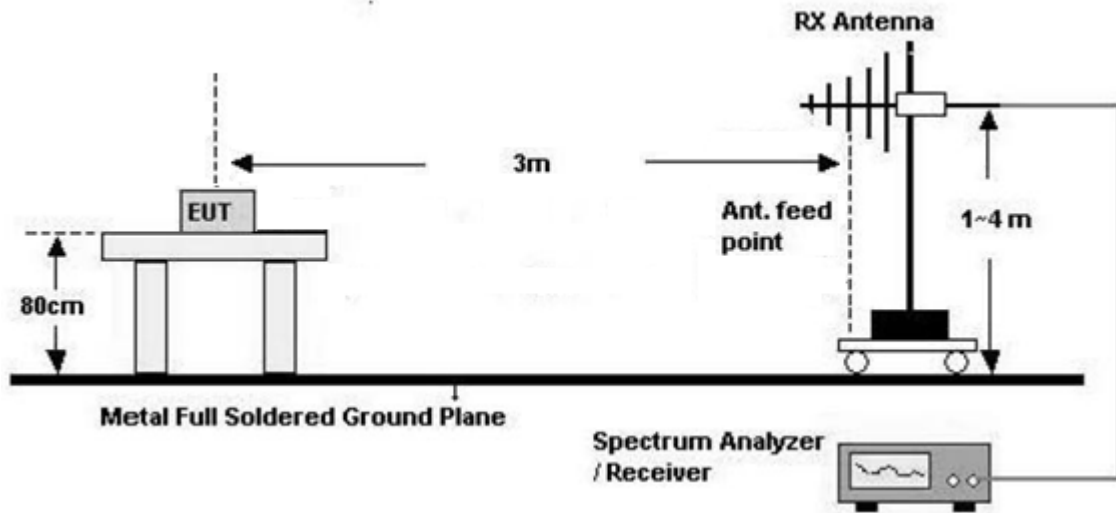
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

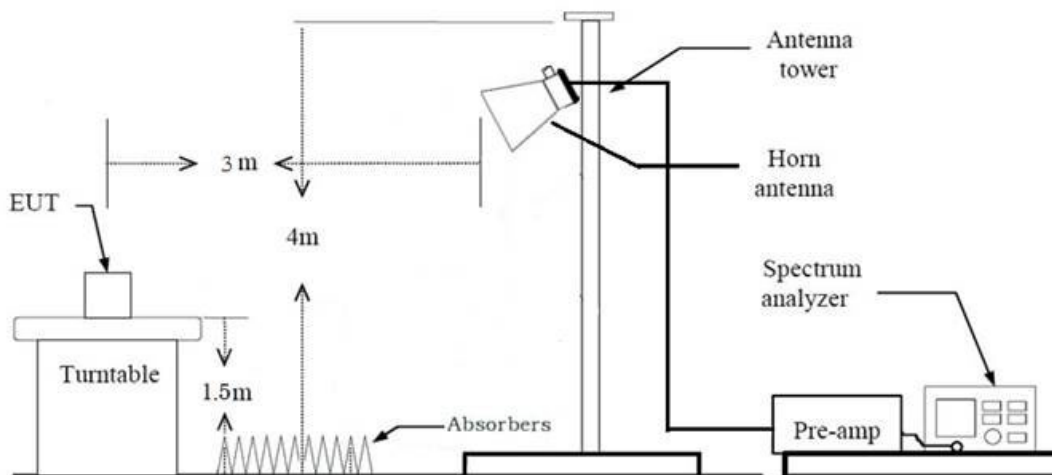
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in Measurement Typing antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = $40\log(3\text{ m}/300\text{ m}) = - 80\text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3\text{ m}/30\text{ m}) = - 40\text{ dB}$

Measurement Distance : 3 m

8. Spectrum Setting

- Frequency Range = 9 kHz ~ 30 MHz
- Measurement Type or = Peak
- Trace = Max Hold
- RBW = 9 kHz
- VBW $\geq 3 \times$ RBW

9. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

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.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in Measurement Typeing antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

6. Spectrum Setting

(1) Measurement Type(Peak):

- Measured Frequency Range : 30 MHz – 1 GHz
- Measurement Type or = Peak
- Trace = Max Hold
- RBW = 100 kHz
- VBW $\geq 3 \times$ RBW

(2) Measurement Type(Quasi-peak):

- Measured Frequency Range : 30 MHz – 1 GHz
- Measurement Type or = Quasi-Peak
- RBW = 120 kHz

※In general, (1) is used mainly

7.Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)

8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in Measurement Typeing antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting

(1) Measurement Type (Peak, G.5 in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW \geq 3 MHz
- Measurement Typeor = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

(2) Measurement Type (Average, G.6.d in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW(Duty cycle \geq 98 percent) = VBW \leq RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW \geq 1/T, where T is the minimum transmission duration.
- The analyzer is set to linear Measurement Typeor mode.
- Measurement Typeor = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least

98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor
10. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
11. Distance extrapolation factor = $20\log(\text{test distance} / \text{specific distance})$ (dB)
12. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G)
+ Distance Factor(D.F)

Test Procedure of Radiated Restricted Band Edge

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in Measurement Typeing antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting

(1) Measurement Type(Peak, G.5 in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW \geq 3 MHz
- Measurement Typeor = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle.

(2) Measurement Type(Average, G.6.d in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW(Duty cycle \geq 98 percent) = VBW \leq RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW \geq $1/T$, where T is the minimum transmission duration.
- The analyzer is set to linear Measurement Typeor mode.
- Measurement Typeor = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a

factor of $1/x$, where x is the duty cycle.

9. Measured Frequency Range :

- 4 500 MHz ~ 5 150 MHz
- 5 350 MHz ~ 5 460 MHz
- 5 460 MHz ~ 5 470 MHz
- (75 MHz or more below the 5 725 MHz) ~ 5 725 MHz
- 5 850 MHz ~ (75 MHz or more above the 5 850 MHz)

10. Distance extrapolation factor = $20\log$ (test distance / specific distance) (dB)

11. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Attenuator(ATT)
+ Distance Factor(D.F)

8.8. Receiver Spurious Emissions

Limit

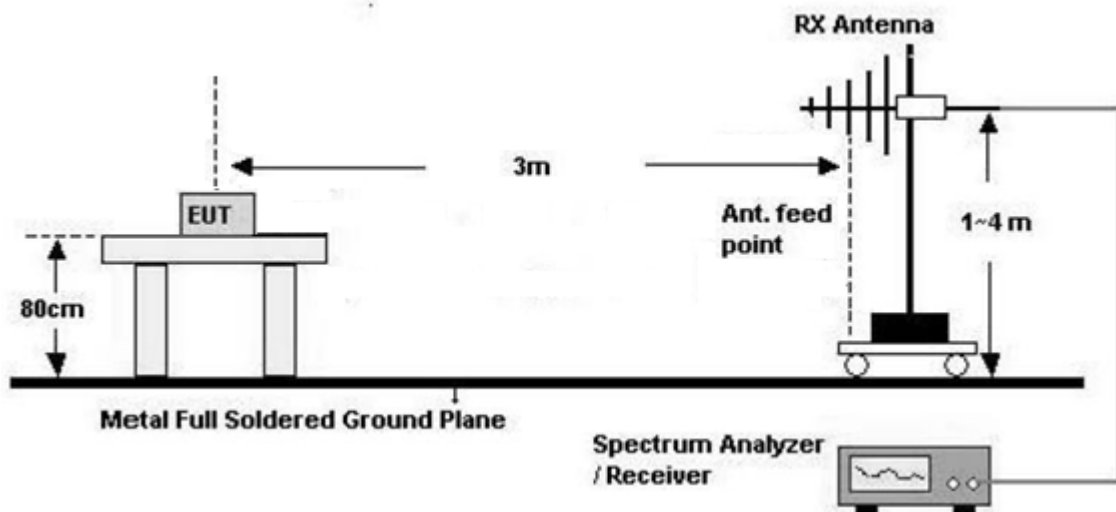
Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

Measurements for compliance with the limits in table may be performed at distances other than 3 metres.

Test Configuration

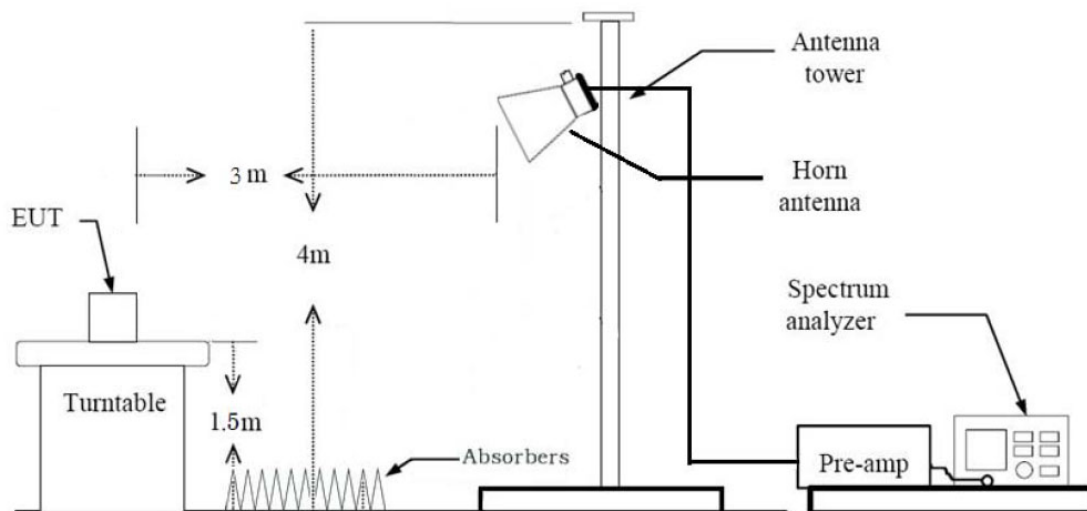
30 MHz - 1 GHz



Test Procedure of Receiver Spurious Emissions (Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz – 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 3 x RBW
7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) – Amp Gain(A.G)

Above 1 GHz



Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission

level.

4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting
 - (1) Measurement Type(Average):
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Average(RMS)
 - Trace = Average
 - Trace was allowed to stabilize
9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
10. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

8.9. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories (Microphone, Speaker, etc)
 - Worstcase : Stand alone + External accessories (Microphone, Speaker, etc)
2. EUT Axis
 - Radiated Spurious Emissions : X
 - Radiated Restricted Band Edge : Z, X
3. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
 - Position : Horizontal, Vertical, Parallel to the ground plane
4. All modulation of operation were investigated and the worst case modulation results are reported.
 - 802.11a : 6 Mbps
 - 802.11n(20M, 40M) : MCS 0
 - 802.11ac(20M, 40M, 80M) : MCS 0
5. All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed. Therefore, only the worst case(Stand alone + External accessories) results were reported.

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.
2. All modulation of operation were investigated and the worst case modulation results are reported.
 - 802.11a : 6 Mbps
 - 802.11n(20M, 40M) : MCS 0
 - 802.11ac(20M, 40M, 80M) : MCS 0

AC Power line Conducted Emissions

1. Not Tested

9. SUMMARY OF TEST RESULTS

FCC

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result	Status
26 dB Bandwidth	§ 15.407 (for Power Measurement)	N/A	Conducted	PASS	NT ^{Note2}
6 dB Bandwidth	§ 15.407(e)	>500 kHz (5725-5850 MHz)(UNII-3)		PASS	NT ^{Note2}
Maximum Conducted Output Power	§ 15.407(a)(1),(2),(3)	< 250 mW(5150-5250 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5470-5725 MHz) <1 W (5725-5850 MHz)		PASS	C ^{Note4}
Maximum Power Spectral Density	§ 15.407(a)(1),(2),(3)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS	NT ^{Note2}
Frequency Stability	§ 15.407(g) § 2.1055	Maintained within the band		PASS	NT ^{Note2}
AC Conducted Emissions 150 kHz-30 MHz	15.207 15.407(b)(8)	<FCC 15.207 limits		PASS	NT ^{Note2}
Undesirable Emissions	§ 15.407(b) (1),(2),(3),(4) § 15.407(b)(5)(ii),(iii) § 15.35(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.6 (UNII 3)		PASS	C ^{Note3}
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(9),(10)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		Radiated	PASS

Note:

1. C = Comply, NT = Not Tested, NA = Not Applicable, NC = Not Comply
2. C2PC model is electrically identical to the Original model.
3. The data from that application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the test result of section 9
4. Output power was verified to be within the expected tune up tolerances prior to performing the spot checks for radiated spurious emissions and band edge to confirm that the proposed changes to the digital circuitry had not adversely affected the previously reported values in the original filing.

ISED

Test Description	ISED Part Section(s)	Test Limit	Test Condition	Test Result	Status
99% Bandwidth	RSS-GEN, 6.7	N/A	Conducted	PASS	NT ^{Note2}
6 dB Bandwidth	RSS-247,6.2.4.2	> 500 kHz NII-3(5725~5850 MHz)		PASS	NT ^{Note2}
Maximum Conducted Output Power,	RSS-247,6.2	<250 mW or 11+10 log ₁₀ (BW) dBm (5250-5350 MHz, 5470-5600 MHz and 5650-5725 MHz) Whichever power is less		PASS	C ^{Note4}
	RSS-247,6.2.4.2	<1 W (5725-5850 MHz)		PASS	
Maximum e.i.r.p	RSS-247,6.2 RSS-247,6.2.5.2	<200 mW or 10+10 log ₁₀ (BW) dBm NII-1(5150-5250 MHz) <1 W or 17+10 log ₁₀ (BW) dBm NII-2A(5250-5350 MHz) <1 W or 17+10 log ₁₀ (BW) dBm NII-2C,3(5470-5600 MHz & 5650-5725 MHz)		PASS	NT ^{Note2}
	Power Spectral Density	RSS-247, 6.2		<10 dBm/ MHz(e.i.r.p.) (5150-5250 MHz) <11 dBm/MHz(Conducted) (5250-5350 MHz, 5470-5600 MHz and 5650-5725 MHz)	PASS
RSS-247,6.2.4.2		<30 dBm/500 kHz(Conducted) NII-3(5725-5850 MHz)		PASS	
Frequency Stability	RSS-GEN 8.11	should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation.		PASS	NT ^{Note2}
AC Conducted Emissions 150 kHz-30 MHz	RSS-GEN, 8.8	RSS-GEN section 8.8 table 4		PASS	NT ^{Note2}
Undesirable Emissions	RSS-247, 6.2.1.2	26 dBc at 5250~5350 MHz (5150~5350 MHz)		PASS	NT ^{Note2}
	RSS-247, 6.2	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)		PASS	NT ^{Note2}
	RSS-247, 6.2.4.3	cf. Section 8.7(NII-3) e.i.r.p spectral Density		PASS	
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	RSS-GEN, 8.9 RSS-GEN, 8.10	RSS-Gen section 8.9 table 5, 6 section 8.10 table 7		Radiated	PASS
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3	PASS		C ^{Note3}

Note:

1. C = Comply, NT = Not Tested, NA = Not Applicable, NC = Not Comply
2. C4PC model is electrically identical to the Original model.
3. The data from that application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the test result of section 9
4. Output power was verified to be within the expected tune up tolerances prior to performing the spot checks for radiated spurious emissions and band edge to confirm that the proposed changes to the digital circuitry had not adversely affected the previously reported values in the original filing.

10. TEST RESULT

10.1 Output Power

Limit (FCC)

(UNII 1) : 23.98 dBm

(UNII 2A, 2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)

(UNII 3) : 30.00 dBm

Limit (ISED)

(UNII 1, 2A) : EIRP: 30 mW (14.77dBm) or 1.76 + 10 log B, (where B is the 99% bandwidth in megahertz.)

(UNII 2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 99% Bandwidth in megahertz.)

(UNII 3) : 30.00 dBm

Band	Freq. [MHz]	CH.	Data Rate	Measured Power [dBm]	D.C.F [dB]	Total Power [dBm]	Antenna gain [dB]	EIRP [dBm]	FCC Limit [dBm]	ISED Limit [dBm]
UNII1 (802.11a)	5180	36	6M	5.44	0.30	5.73	2.74	8.47	23.98	13.98 EIRP
	5200	40	6M	5.50	0.30	5.80	2.74	8.54	23.98	13.98 EIRP
	5240	48	6M	8.62	0.30	8.92	2.74	11.66	23.98	13.98 EIRP
UNII2A (802.11a)	5260	52	6M	8.72	0.30	9.02	2.74	11.76	23.98	13.98 EIRP
	5300	60	6M	6.45	0.30	6.74	2.74	9.48	23.98	13.97 EIRP
	5320	64	6M	6.49	0.30	6.79	2.74	9.53	23.98	13.97 EIRP
UNII2C (802.11a)	5500	100	6M	6.01	0.30	6.30	-	-	23.98	23.98
	5600	120	6M	8.98	0.30	9.27	-	-	23.98	23.98
	5720	144	6M	6.76	0.30	7.06	-	-	23.98	23.98
UNII3 (802.11a)	5745	149	6M	6.77	0.30	7.07	-	-	30.00	30.00
	5785	157	6M	9.45	0.30	9.75	-	-	30.00	30.00
	5825	165	6M	6.83	0.30	7.13	-	-	30.00	30.00
UNII1 (802.11n20)	5180	36	MCS0	5.01	0.32	5.32	2.74	8.06	23.98	14.26 EIRP
	5200	40	MCS0	5.32	0.32	5.64	2.74	8.38	23.98	14.26 EIRP
	5240	48	MCS0	8.30	0.32	8.61	2.74	11.35	23.98	14.25 EIRP
UNII2A (802.11n20)	5260	52	MCS0	8.29	0.32	8.61	2.74	11.35	23.98	14.26 EIRP
	5300	60	MCS0	6.07	0.32	6.39	2.74	9.13	23.98	14.26 EIRP
	5320	64	MCS0	6.25	0.32	6.56	2.74	9.30	23.98	14.26 EIRP
UNII2C (802.11n20)	5500	100	MCS0	5.66	0.32	5.98	-	-	23.98	23.98
	5600	120	MCS0	8.67	0.32	8.99	-	-	23.98	23.98
	5720	144	MCS0	6.53	0.32	6.85	-	-	23.98	23.98
UNII3 (802.11n20)	5745	149	MCS0	6.30	0.32	6.62	-	-	30.00	30.00
	5785	157	MCS0	9.13	0.32	9.44	-	-	30.00	30.00
	5825	165	MCS0	6.54	0.32	6.85	-	-	30.00	30.00
UNII1 (802.11ac20)	5180	36	MCS0	4.88	0.32	5.20	2.74	7.94	23.98	14.25 EIRP
	5200	40	MCS0	5.27	0.32	5.59	2.74	8.33	23.98	14.25 EIRP
	5240	48	MCS0	8.23	0.32	8.55	2.74	11.29	23.98	14.26 EIRP
UNII2A (802.11ac20)	5260	52	MCS0	8.32	0.32	8.64	2.74	11.38	23.98	14.26 EIRP
	5300	60	MCS0	6.03	0.32	6.35	2.74	9.09	23.98	14.26 EIRP
	5320	64	MCS0	6.16	0.32	6.48	2.74	9.22	23.98	14.26 EIRP
UNII2C (802.11ac20)	5500	100	MCS0	5.59	0.32	5.91	-	-	23.98	23.98
	5600	120	MCS0	8.58	0.32	8.90	-	-	23.98	23.98
	5720	144	MCS0	6.45	0.32	6.77	-	-	23.98	23.98
UNII3 (802.11ac20)	5745	149	MCS0	6.37	0.32	6.69	-	-	30.00	30.00
	5785	157	MCS0	9.07	0.32	9.39	-	-	30.00	30.00
	5825	165	MCS0	6.43	0.32	6.75	-	-	30.00	30.00

Band	Freq. [MHz]	CH.	Data Rate	Measured Power [dBm]	D.C.F [dB]	Total Power [dBm]	Antenna gain [dB]	EIRP [dBm]	FCC Limit [dBm]	ISED Limit [dBm]
UNII1 (802.11n40)	5190	38	MCS0	2.83	0.61	3.44	2.74	6.18	23.98	14.77 EIRP
	5230	46	MCS0	7.81	0.61	8.42	2.74	11.16	23.98	14.77 EIRP
UNII2A (802.11n40)	5270	54	MCS0	8.00	0.61	8.61	2.74	11.35	23.98	14.77 EIRP
	5310	62	MCS0	3.95	0.61	4.56	2.74	7.30	23.98	14.77 EIRP
UNII2C (802.11n40)	5510	102	MCS0	3.65	0.61	4.26	-	-	23.98	23.98
	5590	118	MCS0	8.27	0.61	8.88	-	-	23.98	23.98
	5710	142	MCS0	4.61	0.61	5.21	-	-	23.98	23.98
UNII3 (802.11n40)	5755	151	MCS0	4.64	0.61	5.25	-	-	30.00	30.00
	5795	159	MCS0	4.59	0.61	5.19	-	-	30.00	30.00
UNII1 (802.11ac40)	5190	38	MCS0	2.87	0.61	3.48	2.74	6.22	23.98	14.77 EIRP
	5230	46	MCS0	7.76	0.61	8.36	2.74	11.10	23.98	14.77 EIRP
UNII2A (802.11ac40)	5270	54	MCS0	8.13	0.61	8.74	2.74	11.48	23.98	14.77 EIRP
	5310	62	MCS0	3.96	0.61	4.56	2.74	7.30	23.98	14.77 EIRP
UNII2C (802.11ac40)	5510	102	MCS0	3.66	0.61	4.26	-	-	23.98	23.98
	5590	118	MCS0	8.33	0.61	8.93	-	-	23.98	23.98
	5710	142	MCS0	4.58	0.61	5.19	-	-	23.98	23.98
UNII3 (802.11ac40)	5755	151	MCS0	4.53	0.61	5.14	-	-	30.00	30.00
	5795	159	MCS0	4.60	0.61	5.21	-	-	30.00	30.00
UNII1 (802.11ac80)	5210	42	MCS0	2.61	1.14	3.75	2.74	6.49	23.98	14.77 EIRP
UNII2A (802.11ac80)	5290	58	MCS0	3.23	1.14	4.37	2.74	7.11	23.98	14.77 EIRP
UNII2C (802.11ac80)	5530	106	MCS0	3.10	1.14	4.24	-	-	23.98	23.98
	5610	122	MCS0	3.45	1.14	4.59	-	-	23.98	23.98
	5690	138	MCS0	3.77	1.14	4.91	-	-	23.98	23.98
UNII3 (802.11ac80)	5775	155	MCS0	3.94	1.14	5.08	-	-	30.00	30.00

10.2 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin
[MHz]	[dB μ V]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]

No Critical peaks found

Note:

1. The Measured Value of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB)
3. Limit line = specific Limits (dB μ V) + Distance extrapolation factor

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	ANT. POL	Total	Limit	Margin
[MHz]	[dB μ V]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]

No Critical peaks found

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak Measurement Type or mode

Frequency Range : Above 1 GHz

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5745MHz
Channel No.	149 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11490	50.72	0.53	V	51.25	73.98	22.73	PK
11490	38.04	0.53	V	38.57	53.98	15.41	AV
17235	49.07	1.66	V	50.73	68.20	17.47	PK
11490	51.11	0.53	H	51.64	73.98	22.34	PK
11490	38.14	0.53	H	38.67	53.98	15.31	AV
17235	49.99	1.66	H	51.65	68.20	16.55	PK

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11570	50.80	0.88	V	51.68	73.98	22.30	PK
11570	38.04	0.88	V	38.92	53.98	15.06	AV
17355	48.74	1.78	V	50.52	68.20	17.68	PK
11570	51.36	0.88	H	52.24	73.98	21.74	PK
11570	38.13	0.88	H	39.01	53.98	14.97	AV
17355	50.49	1.78	H	52.27	68.20	15.93	PK

Band : UNII 3
 Operation Mode: 802.11 a
 Transfer Rate: 6 Mbps
 Operating Frequency 5825 MHz
 Channel No. 165 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
11650	50.94	1.34	V	52.28	73.98	21.70	PK
11650	38.02	1.34	V	39.36	53.98	14.62	AV
17475	48.13	2.82	V	50.95	68.20	17.25	PK
11650	51.74	1.34	H	53.08	73.98	20.90	PK
11650	38.26	1.34	H	39.60	53.98	14.38	AV
17475	49.76	2.82	H	52.58	68.20	15.62	PK

Band : UNII 3
 Operation Mode: 802.11n_HT20
 Transfer MCS Index: 0
 Operating Frequency 5745MHz
 Channel No. 149 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11490	50.81	0.53	V	51.34	73.98	22.64	PK
11490	38.06	0.53	V	38.59	53.98	15.39	AV
17235	49.69	1.66	V	51.35	68.20	16.85	PK
11490	49.91	0.53	H	50.44	73.98	23.54	PK
11490	37.88	0.53	H	38.41	53.98	15.57	AV
17235	48.76	1.66	H	50.42	68.20	17.78	PK

Band : UNII 3
 Operation Mode: 802.11n_HT20
 Transfer MCS Index: 0
 Operating Frequency 5785 MHz
 Channel No. 157 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11570	51.75	0.88	V	52.63	73.98	21.35	PK
11570	38.15	0.88	V	39.03	53.98	14.95	AV
17355	49.55	1.78	V	51.33	68.20	16.87	PK
11570	50.91	0.88	H	51.79	73.98	22.19	PK
11570	38.00	0.88	H	38.88	53.98	15.10	AV
17355	48.78	1.78	H	50.56	68.20	17.64	PK

Band : UNII 3
Operation Mode: 802.11n_HT20
Transfer MCS Index: 0
Operating Frequency 5825 MHz
Channel No. 165 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11650	51.67	1.34	V	53.01	73.98	20.97	PK
11650	38.05	1.34	V	39.39	53.98	14.59	AV
17475	49.18	2.82	V	52.00	68.20	16.20	PK
11650	50.58	1.34	H	51.92	73.98	22.06	PK
11650	37.86	1.34	H	39.20	53.98	14.78	AV
17475	48.62	2.82	H	51.44	68.20	16.76	PK

Band :	UNII 1
Operation Mode:	802.11n_HT40
Transfer MCS Index:	0
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
10380	52.98	0.92	V	53.90	68.20	14.30	PK
15570	47.98	2.27	V	50.25	73.98	23.73	PK
15570	36.62	2.27	V	38.89	53.98	15.09	AV
10380	53.11	0.92	H	54.03	68.20	14.17	PK
15570	48.55	2.27	H	50.82	73.98	23.16	PK
15570	36.70	2.27	H	38.97	53.98	15.01	AV

Band :	UNII 1
Operation Mode:	802.11n_HT40
Transfer MCS Index:	0
Operating Frequency	5230 MHz
Channel No.	46 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
10460	51.35	-0.50	V	50.85	68.20	17.35	PK
15690	49.22	1.77	V	50.99	73.98	22.99	PK
15690	37.38	1.77	V	39.15	53.98	14.83	AV
10460	51.93	-0.50	H	51.43	68.20	16.77	PK
15690	50.21	1.77	H	51.98	73.98	22.00	PK
15690	37.61	1.77	H	39.38	53.98	14.60	AV

Band :	<u>UNII 1</u>
Operation Mode:	<u>802.11ac_VHT20</u>
Transfer MCS Index:	<u>0</u>
Operating Frequency	<u>5180 MHz</u>
Channel No.	<u>36 Ch</u>

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
10360	51.83	-0.49	V	51.34	68.20	16.86	PK
15540	48.78	2.02	V	50.80	73.98	23.18	PK
15540	35.74	2.02	V	37.76	53.98	16.22	AV
10360	53.17	-0.49	H	52.68	68.20	15.52	PK
15540	49.32	2.02	H	51.34	73.98	22.64	PK
15540	35.87	2.02	H	37.89	53.98	16.09	AV

Band :	<u>UNII 1</u>
Operation Mode:	<u>802.11ac_VHT20</u>
Transfer MCS Index:	<u>0</u>
Operating Frequency	<u>5200 MHz</u>
Channel No.	<u>40 Ch</u>

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
10400	51.22	0.32	V	51.54	68.20	16.66	PK
15600	49.85	2.33	V	52.18	73.98	21.80	PK
15600	36.44	2.33	V	38.77	53.98	15.21	AV
10400	53.46	0.32	H	53.78	68.20	14.42	PK
15600	50.26	2.33	H	52.59	73.98	21.39	PK
15600	36.71	2.33	H	39.04	53.98	14.94	AV

Band : UNII 1
 Operation Mode: 802.11ac_VHT20
 Transfer MCS Index: 0
 Operating Frequency 5240 MHz
 Channel No. 48 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
10480	51.37	-0.46	V	50.91	68.20	17.29	PK
15720	49.90	1.28	V	51.18	73.98	22.80	PK
15720	36.72	1.28	V	38.00	53.98	15.98	AV
10480	51.99	-0.46	H	51.53	68.20	16.67	PK
15720	50.06	1.28	H	51.34	73.98	22.64	PK
15720	36.85	1.28	H	38.13	53.98	15.85	AV

Band :	UNII 2C
Operation Mode:	802.11ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11020	50.38	0.50	V	50.88	73.98	23.10	PK
11020	38.70	0.50	V	39.20	53.98	14.78	AV
16530	48.37	1.22	V	49.59	68.20	18.61	PK
11020	51.38	0.50	H	51.88	73.98	22.10	PK
11020	38.81	0.50	H	39.31	53.98	14.67	AV
16530	50.56	1.22	H	51.78	68.20	16.42	PK

Band :	UNII 2C
Operation Mode:	802.11ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5590 MHz
Channel No.	118 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11180	49.68	0.58	V	50.26	73.98	23.72	PK
11180	36.85	0.58	V	37.43	53.98	16.55	AV
16770	48.57	0.66	V	49.23	68.20	18.97	PK
11180	50.31	0.58	H	50.89	73.98	23.09	PK
11180	36.92	0.58	H	37.50	53.98	16.48	AV
16770	49.70	0.66	H	50.36	68.20	17.84	PK

Band : UNII 2C
Operation Mode: 802.11ac_VHT40
Transfer MCS Index: 0
Operating Frequency 5710 MHz
Channel No. 142 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11420	51.13	0.13	V	51.26	73.98	22.72	PK
11420	39.16	0.13	V	39.29	53.98	14.69	AV
17130	49.18	1.66	V	50.84	68.20	17.36	PK
11420	51.61	0.13	H	51.74	73.98	22.24	PK
11420	39.34	0.13	H	39.47	53.98	14.51	AV
17130	49.88	1.66	H	51.54	68.20	16.66	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5210 MHz
Channel No.	42 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
10420	50.56	-0.07	V	50.49	68.20	17.71	PK
15630	49.37	1.64	V	51.01	73.98	22.97	PK
15630	37.66	1.64	V	39.30	53.98	14.68	AV
10420	51.88	-0.07	H	51.81	68.20	16.39	PK
15630	50.22	1.64	H	51.86	73.98	22.12	PK
15630	38.26	1.64	H	39.90	53.98	14.08	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5290 MHz
Channel No.	58 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
10580	51.25	-0.07	V	51.18	68.20	17.02	PK
15870	48.91	1.02	V	49.93	73.98	24.05	PK
15870	38.04	1.02	V	39.06	53.98	14.92	AV
10580	52.45	-0.07	H	52.38	68.20	15.82	PK
15870	49.46	1.02	H	50.48	73.98	23.50	PK
15870	38.17	1.02	H	39.19	53.98	14.79	AV

Band : UNII 2C
 Operation Mode: 802.11 ac_VHT80
 Transfer MCS Index: 0
 Operating Frequency 5530 MHz
 Channel No. 106 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
11060	49.49	-0.25	V	49.24	73.98	24.74	PK
11060	38.45	-0.25	V	38.20	53.98	15.78	AV
16590	49.16	1.14	V	50.30	68.20	17.90	PK
11060	51.31	-0.25	H	51.06	73.98	22.92	PK
11060	38.98	-0.25	H	38.73	53.98	15.25	AV
16590	49.93	1.14	H	51.07	68.20	17.13	PK

Band : UNII 2C
 Operation Mode: 802.11 ac_VHT80
 Transfer MCS Index: 0
 Operating Frequency 5610 MHz
 Channel No. 122 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
11220	49.52	-0.18	V	49.34	73.98	24.64	PK
11220	37.65	-0.18	V	37.47	53.98	16.51	AV
16830	49.62	0.94	V	50.56	68.20	17.64	PK
11220	50.05	-0.18	H	49.87	73.98	24.11	PK
11220	37.90	-0.18	H	37.72	53.98	16.26	AV
16830	51.00	0.94	H	51.94	68.20	16.26	PK

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5690 MHz
Channel No.	138 Ch

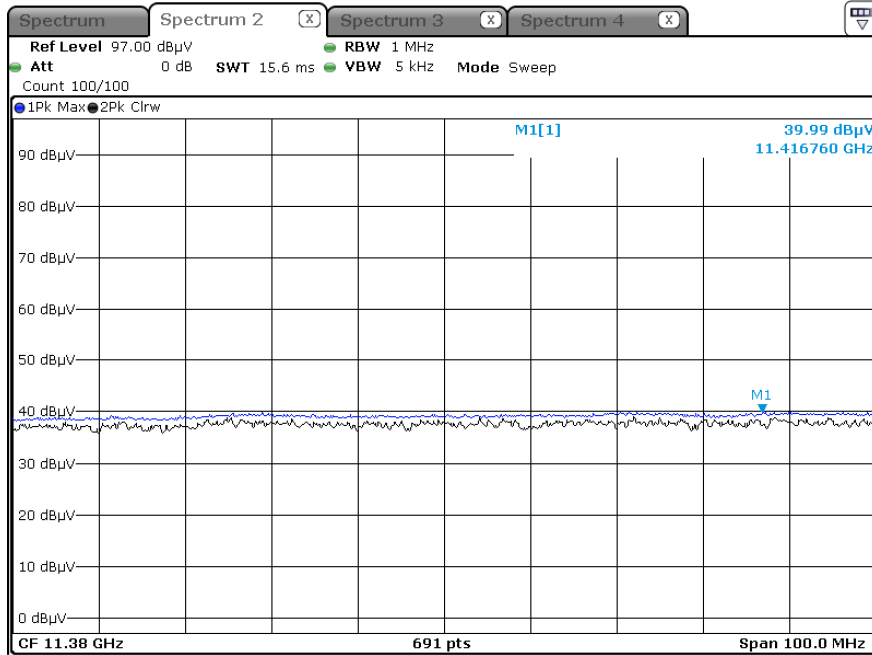
Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11380	50.29	0.39	V	50.68	73.98	23.30	PK
11380	39.59	0.39	V	39.98	53.98	14.00	AV
17070	49.08	1.45	V	50.53	68.20	17.67	PK
11380	51.45	0.39	H	51.84	73.98	22.14	PK
11380	39.99	0.39	H	40.38	53.98	13.60	AV
17070	49.69	1.45	H	51.14	68.20	17.06	PK

Band :	UNII 3
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5775 MHz
Channel No.	155 Ch

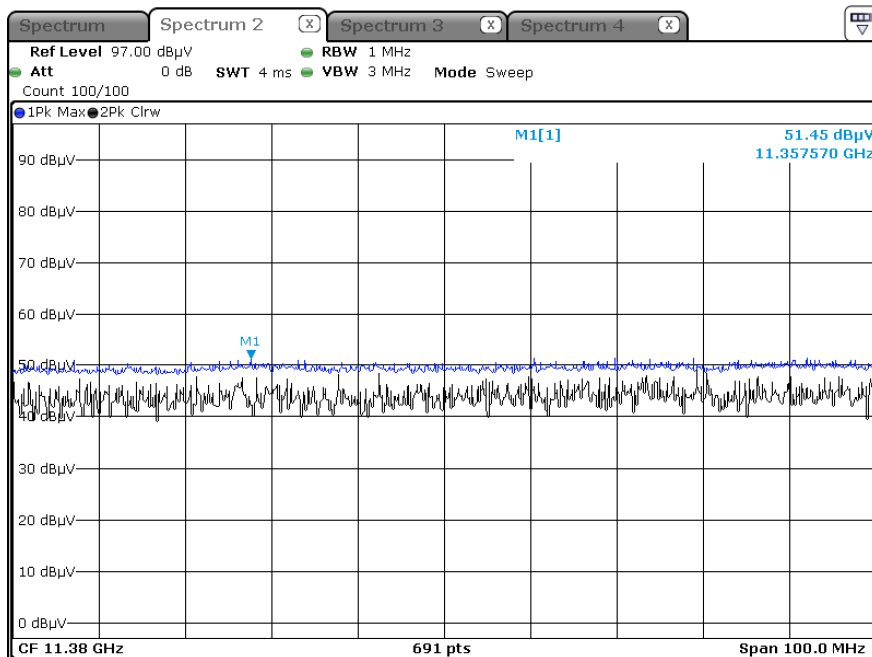
Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
11550	51.07	0.41	V	51.48	73.98	22.50	PK
11550	39.12	0.41	V	39.53	53.98	14.45	AV
17325	48.72	1.65	V	50.37	68.20	17.83	PK
11550	52.44	0.41	H	52.85	73.98	21.13	PK
11550	39.54	0.41	H	39.95	53.98	14.03	AV
17325	49.70	1.65	H	51.35	68.20	16.85	PK

Test Plots

Average Reading (802.11 ac_VHT80, Ch.138 2nd Harmonic, X-H)



Peak Reading (802.11 ac_VHT80, Ch.138 2nd Harmonic, X-H)



Note:

Only the worst case plots for Radiated Spurious Emissions.

10.3 RADIATED RESTRICTED BAND EDGE

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5150	49.09	7.17	H	56.26	73.98	17.72	PK
5150	32.37	7.17	H	39.54	53.98	14.44	AV
5150	47.84	7.17	V	55.01	73.98	18.97	PK
5150	31.98	7.17	V	39.15	53.98	14.83	AV

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5350	44.24	7.73	H	51.97	73.98	22.01	PK
5350	31.71	7.73	H	39.44	53.98	14.54	AV
5350	46.88	7.73	V	54.61	73.98	19.37	PK
5350	31.85	7.73	V	39.58	53.98	14.40	AV

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5460	45.38	8.31	H	53.69	73.98	20.29	PK
5460	31.48	8.31	H	39.79	53.98	14.19	AV
5470	48.22	8.61	H	56.83	68.20	11.37	PK
5460	44.77	8.31	V	53.08	73.98	20.90	PK
5460	31.22	8.31	V	39.53	53.98	14.45	AV
5470	45.41	8.61	V	54.02	68.20	14.18	PK

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5150	47.43	7.17	H	54.60	73.98	19.38	PK
5150	32.35	7.17	H	39.52	53.98	14.46	AV
5150	46.08	7.17	V	53.25	73.98	20.73	PK
5150	31.98	7.17	V	39.15	53.98	14.83	AV

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5350	43.41	7.73	H	51.14	73.98	22.84	PK
5350	31.64	7.73	H	39.37	53.98	14.61	AV
5350	44.32	7.73	V	52.05	73.98	21.93	PK
5350	31.87	7.73	V	39.60	53.98	14.38	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5460	45.13	8.31	H	53.44	73.98	20.54	PK
5460	31.49	8.31	H	39.80	53.98	14.18	AV
5470	45.25	8.61	H	53.86	68.20	14.34	PK
5460	44.92	8.31	V	53.23	73.98	20.75	PK
5460	31.23	8.31	V	39.54	53.98	14.44	AV
5470	44.68	8.61	V	53.29	68.20	14.91	PK

Band : UNII 1
 Operation Mode: 802.11 ac_VHT20
 Transfer MCS Index: 0
 Operating Frequency 5180 MHz
 Channel No. 36 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5150	45.76	7.17	H	52.93	73.98	21.05	PK
5150	32.20	7.17	H	39.37	53.98	14.61	AV
5150	44.97	7.17	V	52.14	73.98	21.84	PK
5150	31.87	7.17	V	39.04	53.98	14.94	AV

Band : UNII 2A
 Operation Mode: 802.11 ac_VHT20
 Transfer MCS Index: 0
 Operating Frequency 5320 MHz
 Channel No. 64 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5350	43.44	7.73	H	51.17	73.98	22.81	PK
5350	31.85	7.73	H	39.58	53.98	14.40	AV
5350	44.44	7.73	V	52.17	73.98	21.81	PK
5350	31.92	7.73	V	39.65	53.98	14.33	AV

Band : UNII 2C
 Operation Mode: 802.11 ac_VHT20
 Transfer MCS Index: 0
 Operating Frequency 5500 MHz
 Channel No. 100 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5460	44.77	8.31	H	53.08	73.98	20.90	PK
5460	31.41	8.31	H	39.72	53.98	14.26	AV
5470	44.64	8.61	H	53.25	68.20	14.95	PK
5460	43.66	8.31	V	51.97	73.98	22.01	PK
5460	31.29	8.31	V	39.60	53.98	14.38	AV
5470	43.31	8.61	V	51.92	68.20	16.28	PK

Band : UNII 1
 Operation Mode: 802.11 n_HT40
 Transfer MCS Index: 0
 Operating Frequency 5190 MHz
 Channel No. 38 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5150	45.78	7.17	H	52.95	73.98	21.03	PK
5150	33.29	7.17	H	40.46	53.98	13.52	AV
5150	44.50	7.17	V	51.67	73.98	22.31	PK
5150	31.97	7.17	V	39.14	53.98	14.84	AV

Band : UNII 1
 Operation Mode: 802.11 n_HT40
 Transfer MCS Index: 0
 Operating Frequency 5310 MHz
 Channel No. 62 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5350	43.89	7.73	H	51.62	73.98	22.36	PK
5350	32.32	7.73	H	40.05	53.98	13.93	AV
5350	45.17	7.73	V	52.90	73.98	21.08	PK
5350	32.73	7.73	V	40.46	53.98	13.52	AV

Band :	<u>UNII 2C</u>
Operation Mode:	<u>802.11 n_HT40</u>
Transfer MCS Index:	<u>0</u>
Operating Frequency	<u>5510 MHz</u>
Channel No.	<u>102 Ch</u>

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5460	44.97	8.31	H	53.28	73.98	20.70	PK
5460	32.25	8.31	H	40.56	53.98	13.42	AV
5470	48.26	8.61	H	56.87	68.20	11.33	PK
5460	44.46	8.31	V	52.77	73.98	21.21	PK
5460	32.03	8.31	V	40.34	53.98	13.64	AV
5470	45.65	8.61	V	54.26	68.20	13.94	PK

Band : UNII 1
 Operation Mode: 802.11 ac_VHT40
 Transfer MCS Index: 0
 Operating Frequency 5190 MHz
 Channel No. 38 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5150	45.53	7.17	H	52.70	73.98	21.28	PK
5150	33.16	7.17	H	40.33	53.98	13.65	AV
5150	44.85	7.17	V	52.02	73.98	21.96	PK
5150	32.75	7.17	V	39.92	53.98	14.06	AV

Band : UNII 1
 Operation Mode: 802.11 ac_VHT40
 Transfer MCS Index: 0
 Operating Frequency 5310 MHz
 Channel No. 62 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5350	43.98	7.73	H	51.71	73.98	22.27	PK
5350	32.42	7.73	H	40.15	53.98	13.83	AV
5350	45.64	7.73	V	53.37	73.98	20.61	PK
5350	32.73	7.73	V	40.46	53.98	13.52	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dB μ V/m]	[dB]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]	
5460	45.09	8.31	H	53.40	73.98	20.58	PK
5460	32.20	8.31	H	40.51	53.98	13.47	AV
5470	47.75	8.61	H	56.36	68.20	11.84	PK
5460	44.71	8.31	V	53.02	73.98	20.96	PK
5460	32.08	8.31	V	40.39	53.98	13.59	AV
5470	46.01	8.61	V	54.62	68.20	13.58	PK

Band : UNII 1
 Operation Mode: 802.11 ac_VHT80
 Transfer MCS Index: 0
 Operating Frequency 5210 MHz
 Channel No. 42 Ch

Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5150	47.05	7.17	H	54.22	73.98	19.76	PK
5150	34.89	7.17	H	42.06	53.98	11.92	AV
5150	45.93	7.17	V	53.10	73.98	20.88	PK
5150	33.96	7.17	V	41.13	53.98	12.85	AV

Band : UNII 2A
 Operation Mode: 802.11 ac_VHT80
 Transfer MCS Index: 0
 Operating Frequency 5290 MHz
 Channel No. 58 Ch

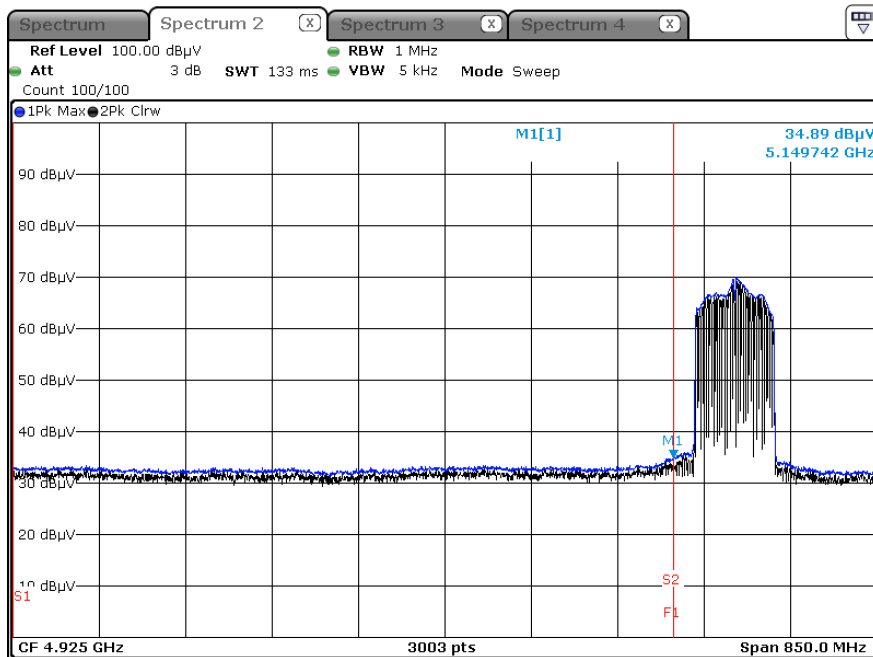
Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5350	44.17	7.73	H	51.90	73.98	22.08	PK
5350	33.26	7.73	H	40.99	53.98	12.99	AV
5350	45.79	7.73	V	53.52	73.98	20.46	PK
5350	34.29	7.73	V	42.02	53.98	11.96	AV

Band : UNII 2C
 Operation Mode: 802.11 ac_VHT80
 Transfer MCS Index: 0
 Operating Frequency 5530 MHz
 Channel No. 106 Ch

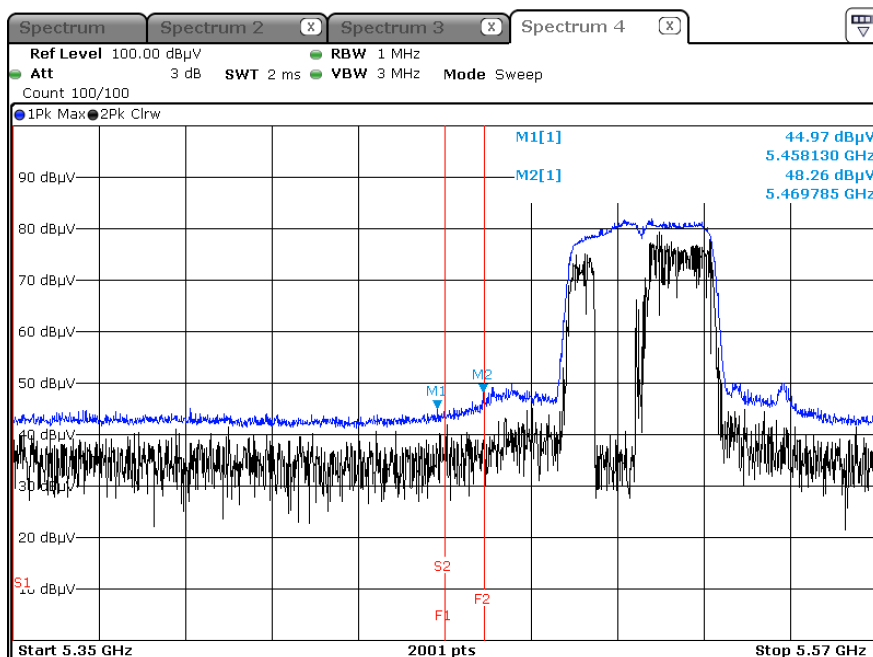
Frequency	Measured Value	CL+AF+DF-AG+ATT	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5460	47.72	8.31	H	56.03	73.98	17.95	PK
5460	34.04	8.31	H	42.35	53.98	11.63	AV
5470	47.91	8.61	H	56.52	68.20	11.68	PK
5460	45.85	8.31	V	54.16	73.98	19.82	PK
5460	32.27	8.31	V	40.58	53.98	13.40	AV
5470	46.15	8.61	V	54.76	68.20	13.44	PK

▣ Test Plots(UNII 1, 2A, 2C)

Average Reading (802.11ac(80M), Ch.42, Z-H)



Peak Reading (802.11n(HT40), Ch.102, X-H)

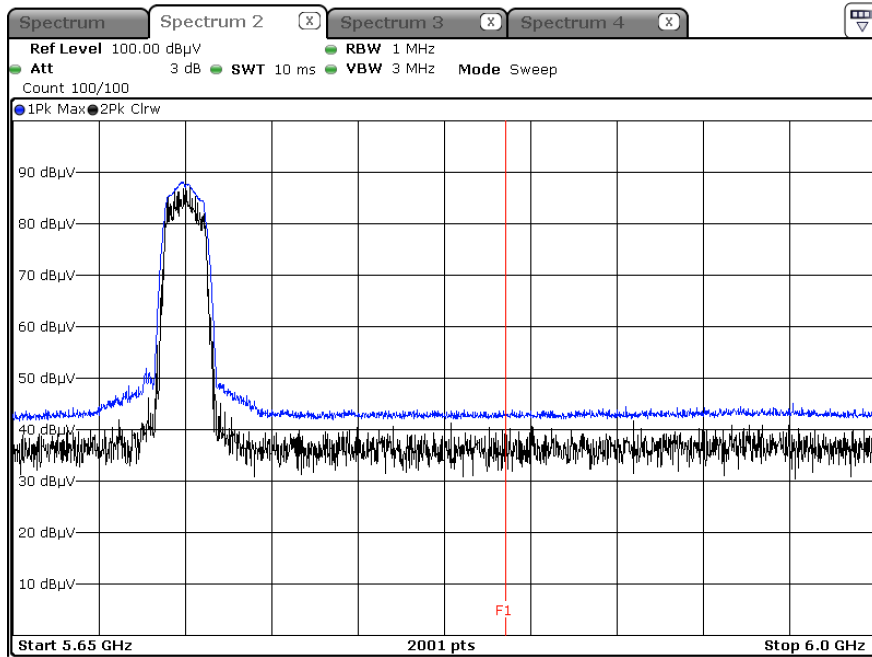


Note:

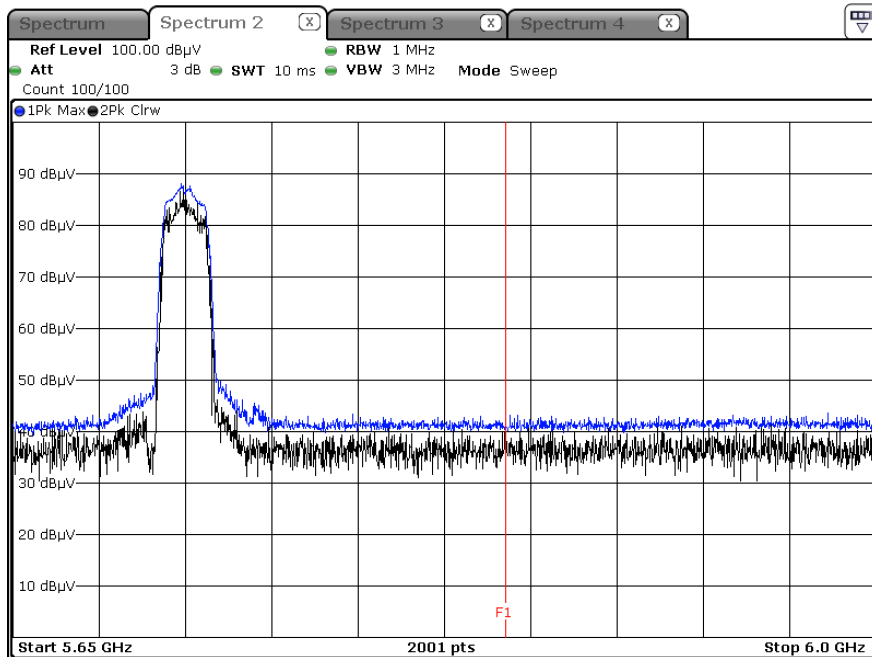
Only the worst case plots for Radiated Restricted Band Edge.

Test Plots(Straddle Channel)

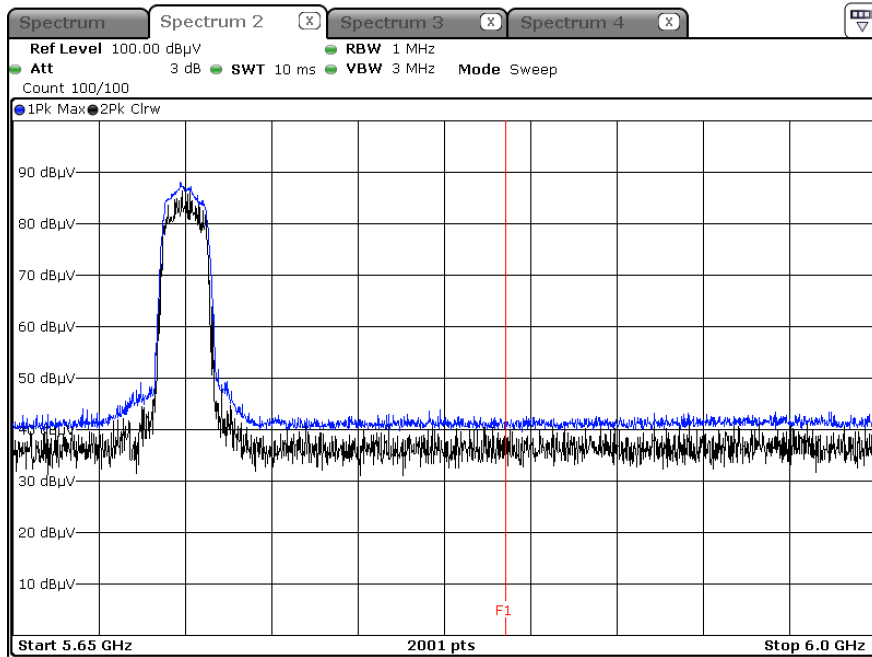
Peak Result (802.11a, Ch.144, X-H)



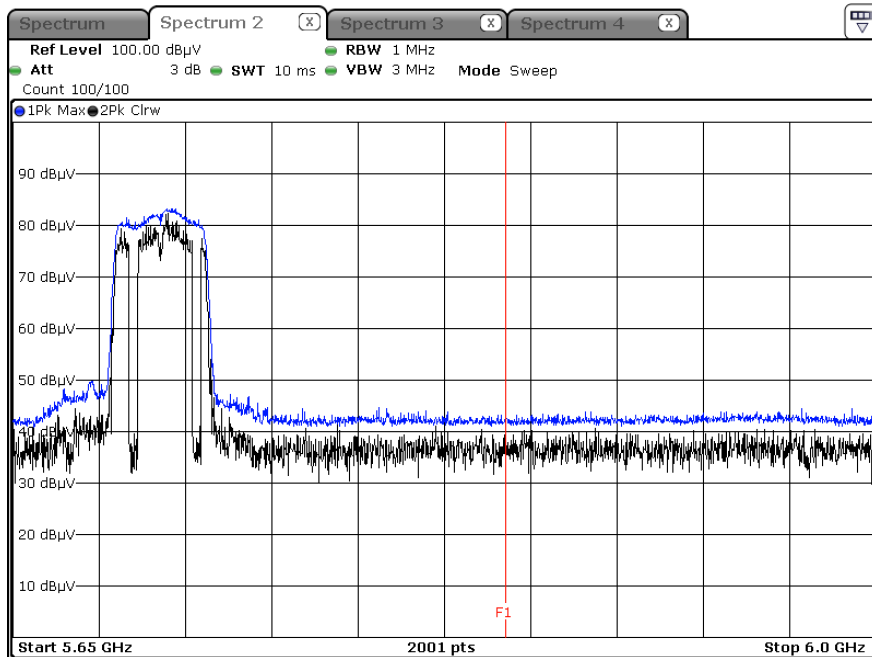
Peak Result (802.11n_HT20, Ch.144, X-H)



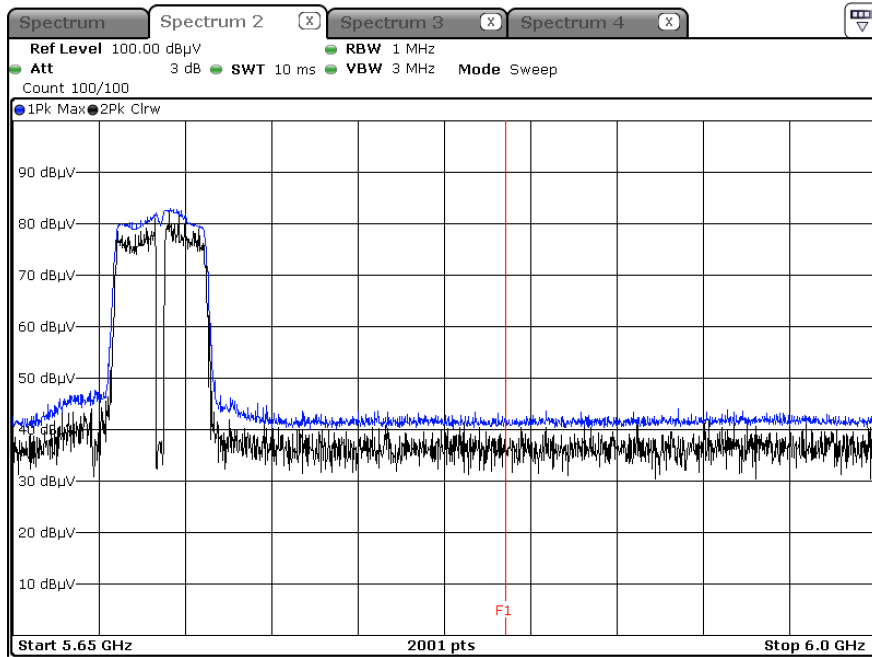
Peak Result (802.11ac_VHT20, Ch.144, X-H)



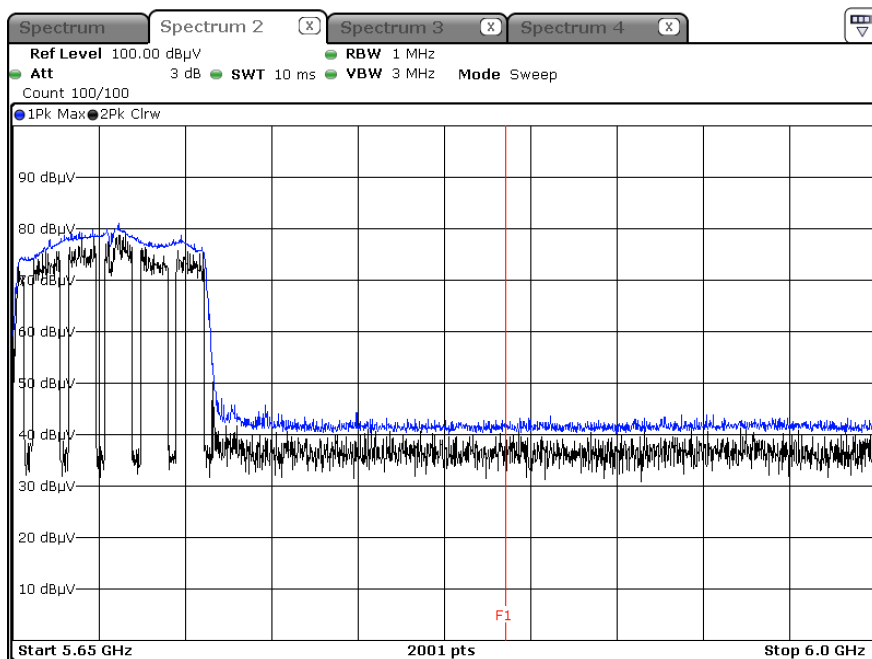
Peak Result (802.11n_HT40, Ch.142, X-H)



Peak Result (802.11ac_VHT40, Ch.142, X-H)



Peak Result (802.11ac_VHT80, Ch.138, X-H)

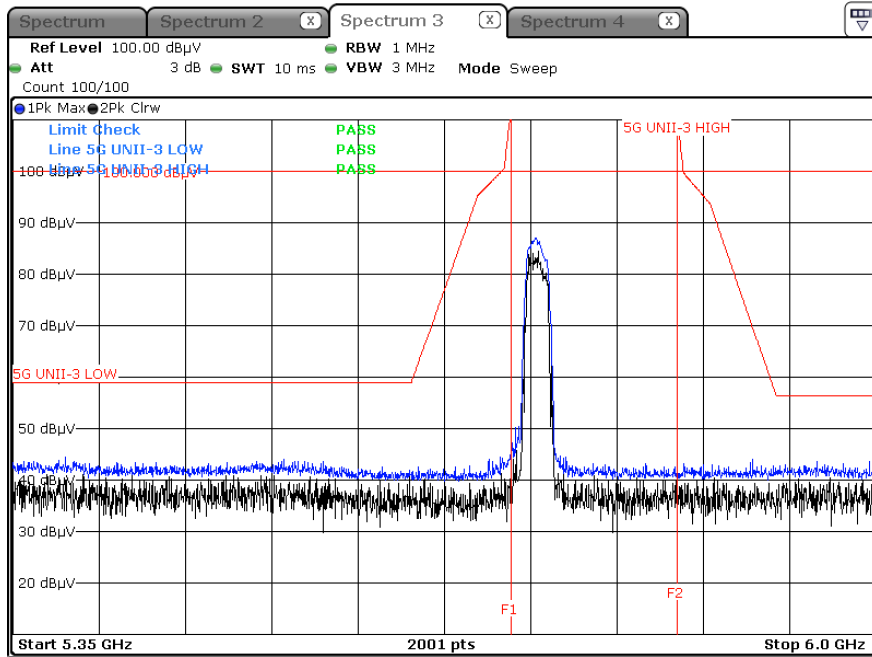


Note :

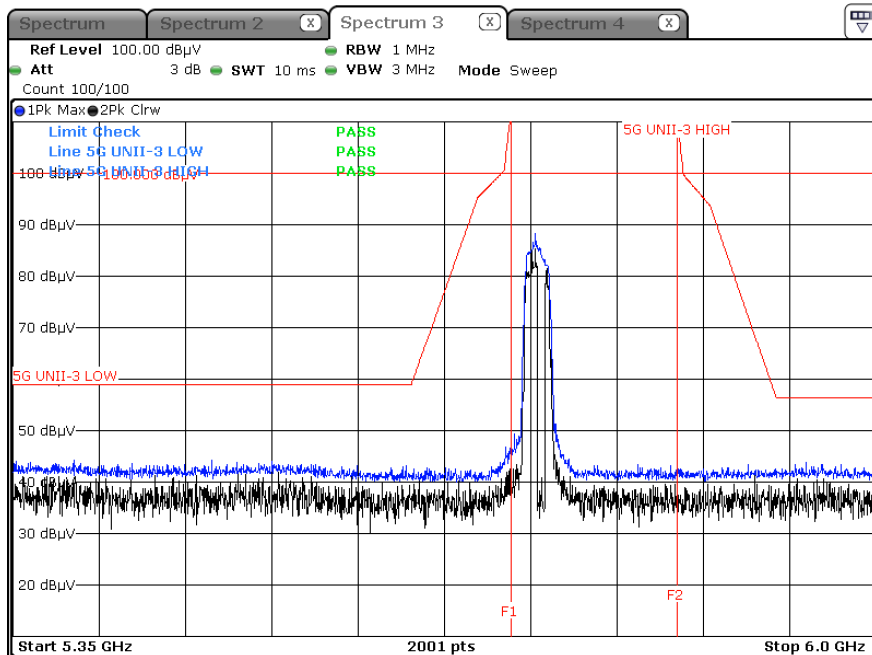
1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5 850 MHz
3. Ambient Noise (Because of ambient noise, We attached only the worst plot without a data table)

▣ Test Plots(UNII 3)

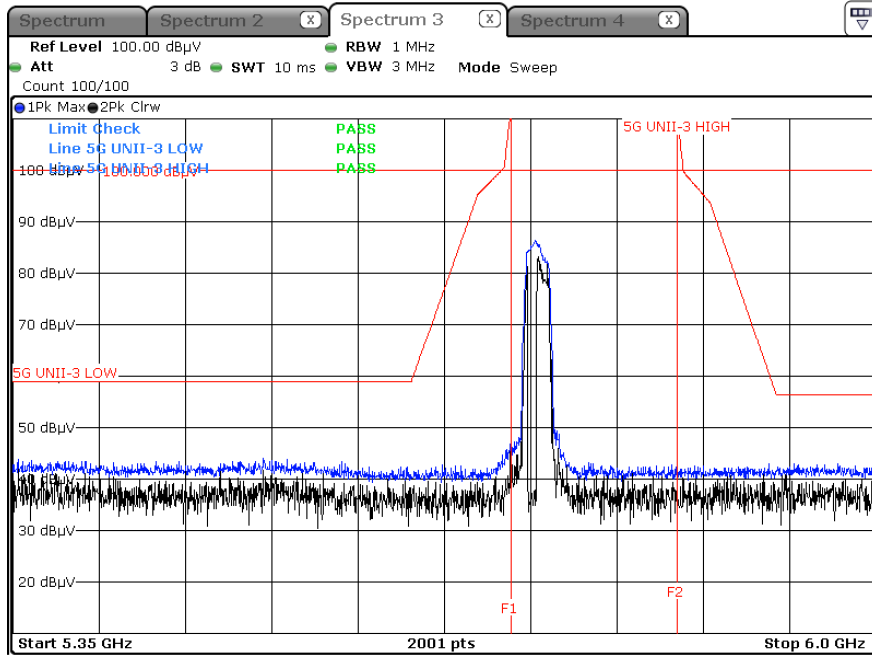
Peak Result (802.11a, Ch.149, X-H)



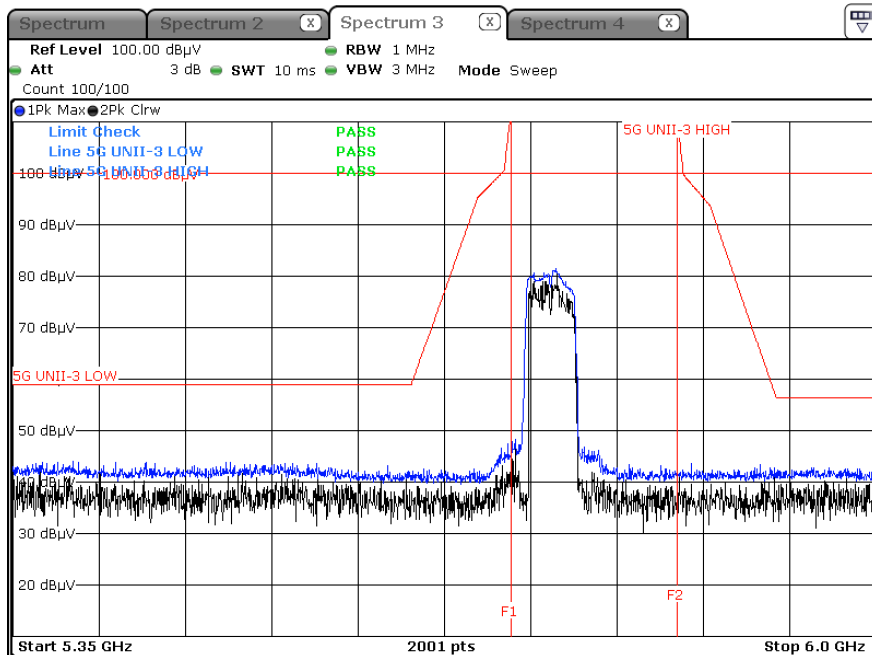
Peak Result (802.11n_HT20, Ch.149, X-H)



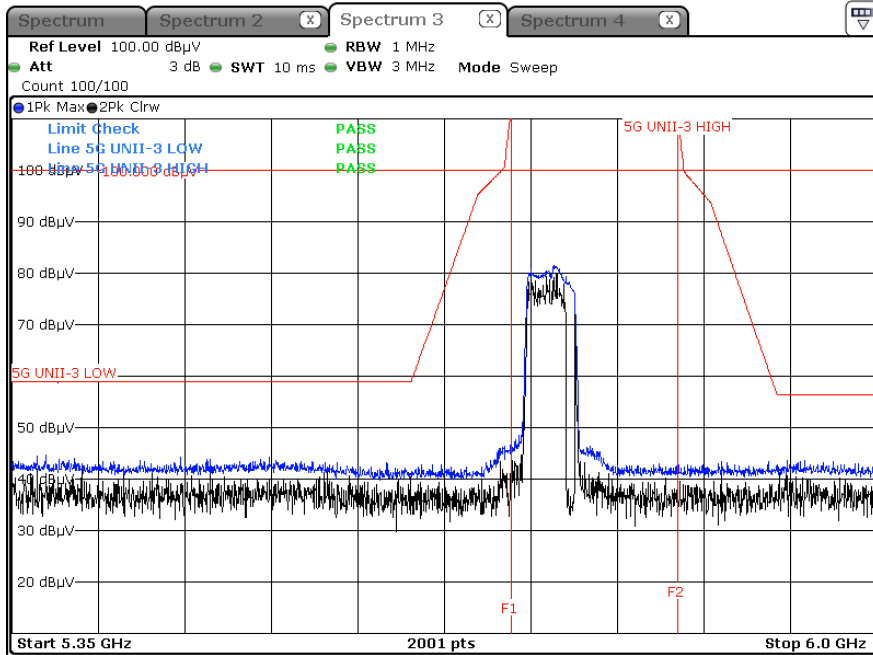
Peak Result (802.11ac_VHT20, Ch.149, X-H)



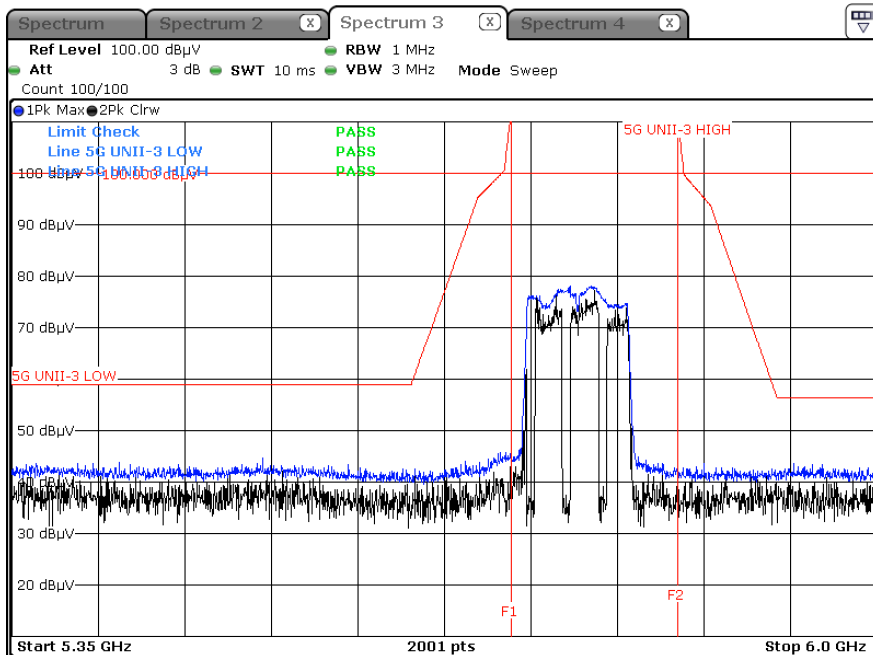
Peak Result (802.11n_HT40, Ch.151, X-H)



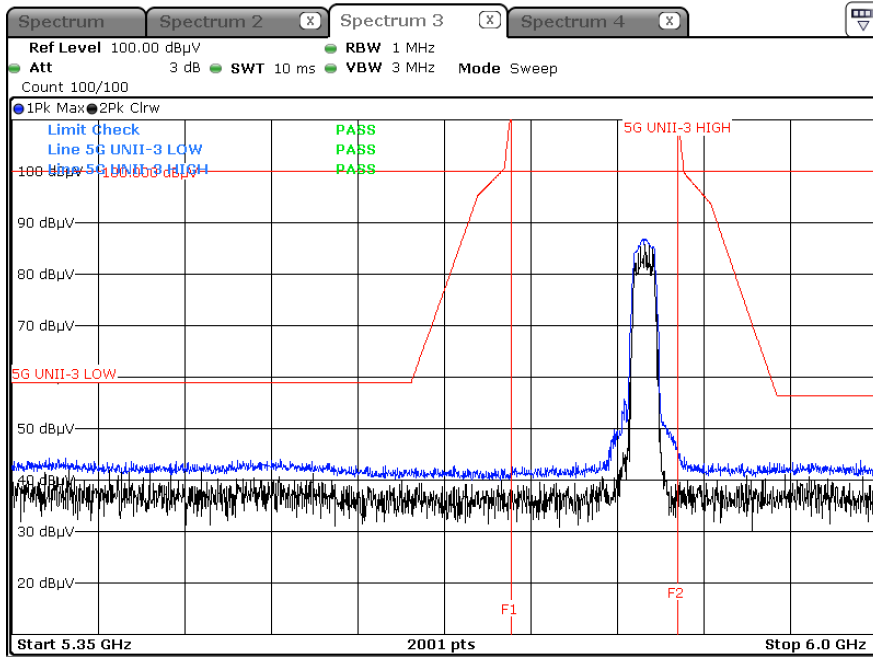
Peak Result (802.11ac_VHT40, Ch.151, X-H)



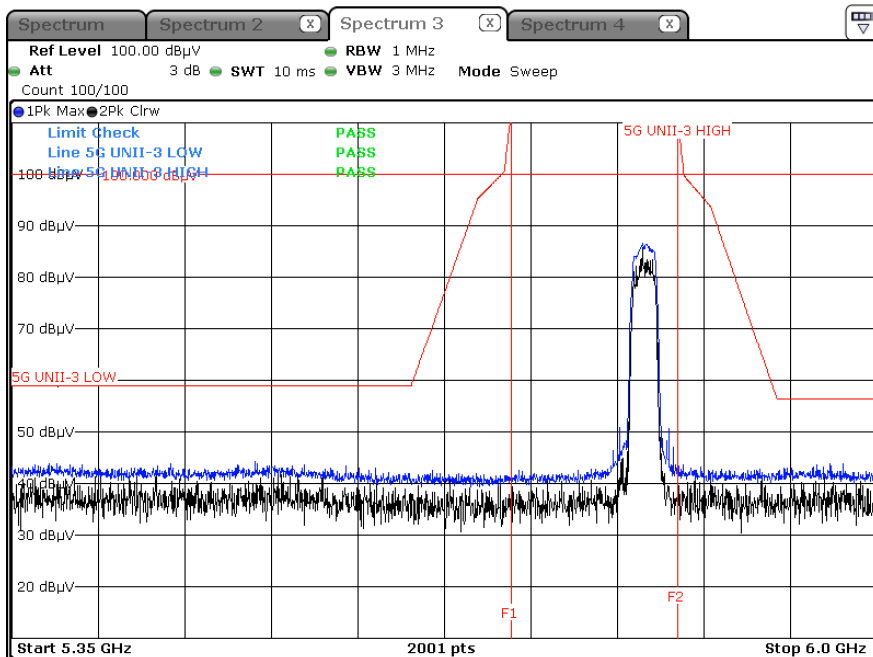
Peak Result (802.11ac_VHT80, Ch.155, X-H)



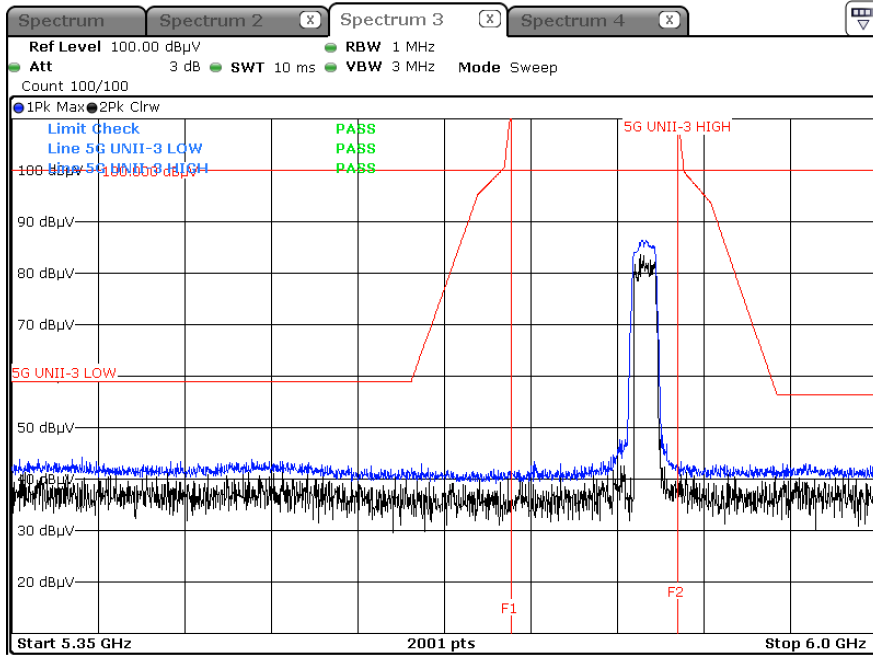
Peak Result (802.11a, Ch.165, X-H)



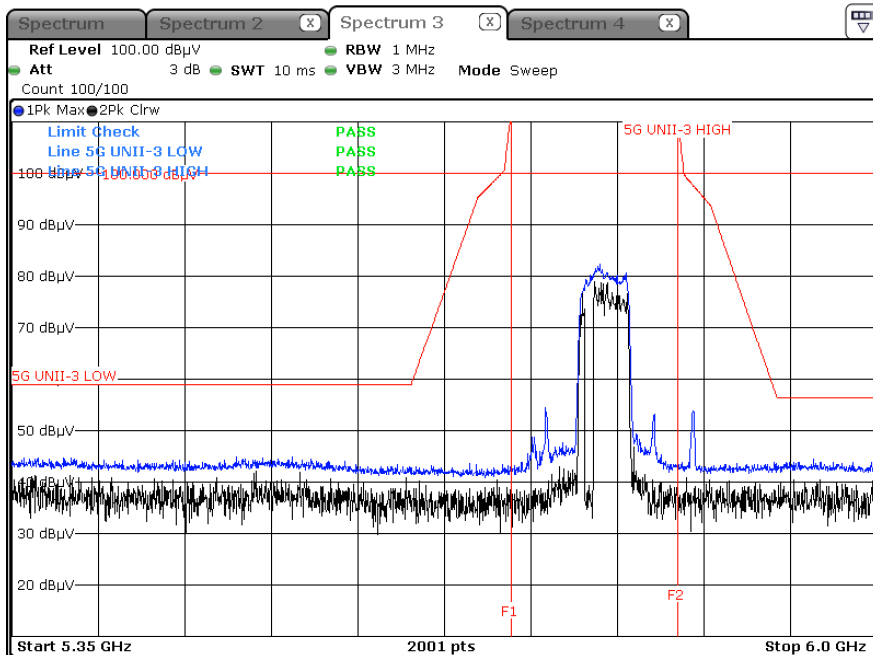
Peak Result (802.11n_HT20, Ch.165, X-H)



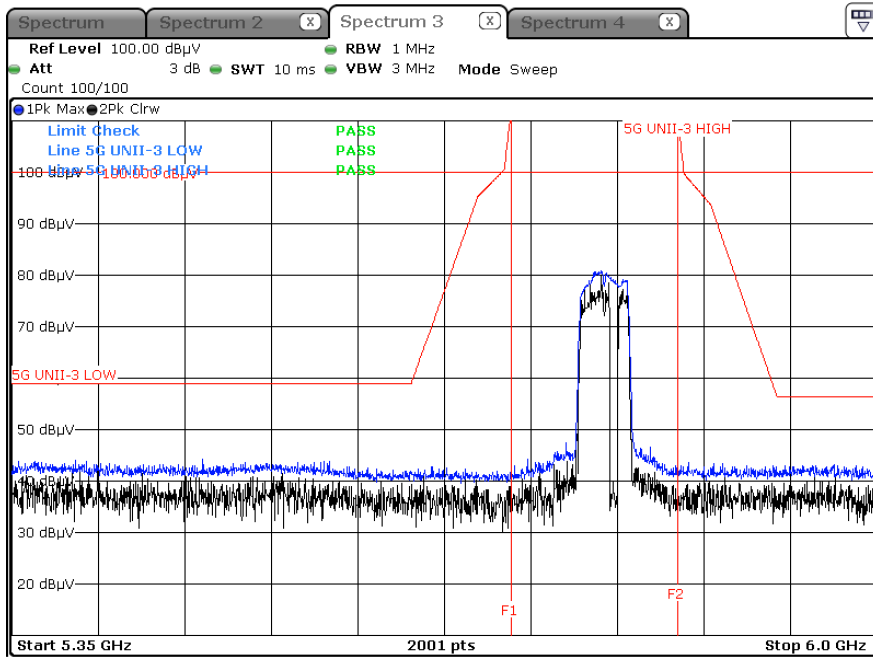
Peak Result (802.11ac_VHT20, Ch.165, X-H)



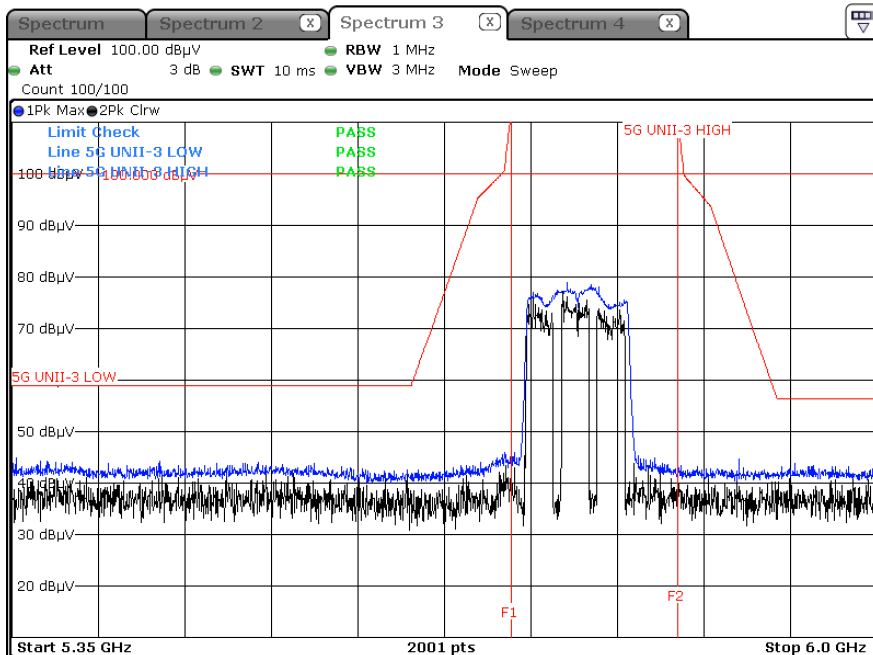
Peak Result (802.11n_HT40, Ch.159, X-H)



Peak Result (802.11ac_VHT40, Ch.159, X-H)



Peak Result (802.11ac_VHT80, Ch.155, X-H)



Note :

1. Only the worst case plots for U-NII-3 Out of Band e.i.r.p Emission.
2. U-NII-3 Low & High Band Edge RedLine is Final Test Limit about factor value compensation.

10.4 RECEIVER SPURIOUS EMISSIONS

Frequency Range : Below 1 GHz

Frequency	Measured Value	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	[dB μ V/m]	dBm/m	dBm	(H/V)	[dB μ V/m]	[dB μ V/m]	dB
No Critical peaks found							

Note:

1. Radiated emissions measured in frequency range from 30 MHz o 1000 MHz were made with an instrument using Quasi peak detector mode.

Frequency Range : Above 1 GHz

Frequency	Measured Value	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	[dB μ V/m]	dBm/m	dBm	(H/V)	[dB μ V/m]	[dB μ V/m]	dB
No Critical peaks found							

11. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/02/2024	Annual
EMI Test Receiver	ESCI	Rohde & Schwarz	100584	05/08/2025	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	02/19/2025	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	12/19/2024	Annual
Power Meter	N1911A	Agilent	MY45100523	02/28/2025	Annual
Power Sensor	N1921A	Agilent	MY57820067	02/22/2025	Annual
Directional Coupler	87300B	Agilent	3116A03621	10/30/2024	Annual
Power Splitter	11667B	Hewlett Packard	10545	02/06/2025	Annual
DC Power Supply	E3632A	Agilent	KR75305528	01/02/2025	Annual
Attenuator(10 dB)	8493C	Hewlett Packard	07560	06/05/2025	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A
Bluetooth Tester	CBT	Rohde & Schwarz	100808	02/15/2025	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	S2AM	08/03/2025	Biennial
Controller	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/07/2026	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	760	02/24/2025	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02299	01/29/2026	Biennial
Horn Antenna (15GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Spectrum Analyzer	FSV40	Rohde & Schwarz	100901	02/22/2025	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/04/2025	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/04/2025	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/02/2025	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/14/2025	Annual
RF Switching System	FMSR-04B (3G HPF+LNA)	T&M SYSTEM	S2L1	12/27/2024	Annual
RF Switching System	FMSR-04B (10dB ATT+LNA)	T&M SYSTEM	S2L2	12/27/2024	Annual
RF Switching System	FMSR-04B (3dB ATT+LNA)	T&M SYSTEM	S2L3	12/27/2024	Annual
RF Switching System	FMSR-04B (LNA)	T&M SYSTEM	S2L4	12/27/2024	Annual
RF Switching System	FMSR-04B (7G HPF+LNA)	T&M SYSTEM	S2L5	12/27/2024	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

12. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2406-FI012-P