RF TEST REPORT

For

Shenzhen Huibai Trading Co., Ltd
Product Name: Dash cam
Test Model(s).: K2 PRO

Report Reference No.	:	**DACE241011001RF003**
FCC ID	:	**2BLQ8-HUIBAI**
Applicant's Name	:	Shenzhen Huibai Trading Co., Ltd
Address	:	29 Nanxin Road, Nanwan Street, Longgang District, Shenzhen, Guangdong Province, China
Testing Laboratory	:	Shenzhen DACE Testing Technology Co., Ltd.
Address	:	102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Test Specification Standard	:	**47 CFR Part 15E**
Date of Receipt	:	October 11, 2024
Date of Test	:	October 11, 2024 to October 23, 2024
Data of Issue	:	October 23, 2024
Result	:	**Pass**

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Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	DACE241011001RF003	October 23, 2024

NOTE1:

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

Compiled by:	Supervised by:	Approved by:
Keren Huang	Stone Yin	Tom Chen
Keren Huang/Test Engineer	Stone Yin/ projector Engineer	Tom Chen / Manager

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

47 CFR Part 15E: Unlicensed National Information Infrastructure Devices

1.2 Summary of Test Result

Item	Method	Requirement	Result
Antenna requirement	/	47 CFR 15.203	Pass
Emission bandwidth and occupied bandwidth	ANSI C63.10-2013, section 6.9 & 12.4	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.	Pass
Maximum conducted output power	ANSI C63.10-2013, section 12.3	47 CFR Part 15.407(a)(1)(iv)	Pass
Power spectral density	ANSI C63.10-2013, section 12.5	47 CFR Part 15.407(a)(1)(iv)	Pass
Band edge emissions (Conducted)	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass
Band edge emissions (Radiated)	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass
Undesirable emission limits (below 1GHz)	ANSI C63.10-2013, section 12.7.4, 12.7.5	47 CFR Part 15.407(b)(9)	Pass
Undesirable emission limits (above 1GHz)	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass

Note: 1.N/A -this device(EUT) is not applicable to this testing item
2. RF-conducted test results including cable loss.

2 GENERAL INFORMATION

2.1 Client Information

Applicant's Name : Shenzhen Huibai Trading Co., Ltd
Address : 29 Nanxin Road, Nanwan Street, Longgang District, Shenzhen, Guangdong Province, China

Manufacturer : Shenzhen Huibai Trading Co., Ltd
Address : 29 Nanxin Road, Nanwan Street, Longgang District, Shenzhen, Guangdong Province, China

2.2 Description of Device (EUT)*

Product Name:	Dash cam
Model/Type reference:	K2 PRO
Series Model:	A8, K1, K2, K4, K7, K8, K9, T20, T20 PRO, T30, T30 PRO, K40, K50, K60, K70, K80, K90, H330, D80, D90, H6, H8
Model Difference:	There are many models of the product, and the differences between the models are the appearance, screen size, and built-in Android software. The PCB and BOM of the product are the same, so the test model is K2 PRO.
Trade Mark:	N/A
Product Description:	Dash cam
Power Supply:	DC12.0V from car-battery
Operation Frequency:	802.11a/n(HT20)/ac(HT20): U-NII Band 1: 5180MHz to 5240MHz; 802.11n(HT40)/ac(HT40): U-NII Band 1: 5190MHz to 5230MHz;
Number of Channels:	802.11a/n(HT20)/ac(HT20): U-NII Band 1: 4; 802.11n(HT40)/ac(HT40): U-NII Band 1: 2;
Modulation Type:	802.11a: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM);
Antenna Type:	FPC ANTENNA
Antenna Gain:	2.1dBi
Hardware Version:	V1.2
Software Version:	SecureCRT

Operation Frequency each of channel

Band 1					
802.11a/802.11n20		802.11n40/802.11ac40		--	
Channel	Frequency	Channel	Frequency	--	
36	5180MHz	39	5190MHz	--	
40	5200MHz	45	5230MHz	--	
44	5220MHz	--	--	--	--
48	5240MHz	--	--	--	--

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

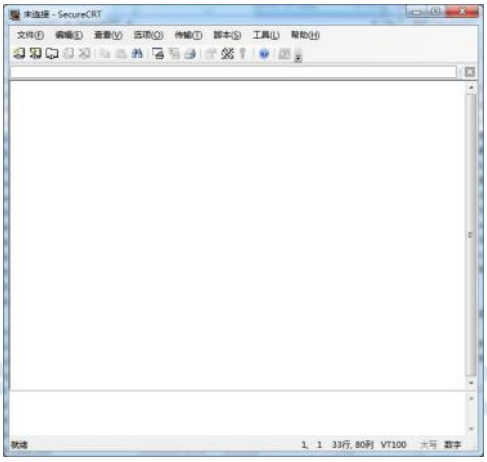
Band 1					
20MHz-BW		40MHz-BW		80MHz-BW	
Channel	Frequency	Channel	Frequency	Channel	Frequency
The lowest channel	5180MHz	The lowest channel	5190MHz	--	--
The middle channel	5200MHz	-	--	--	--
The highest channel	5240MHz	The highest channel	5230MHz	--	--

2.3 Description of Test Modes

No	Title	Description
TM1	802.11a mode	Keep the EUT in continuously transmitting mode with 802.11a modulation type at lowest, middle and highest channel. All data rates has been tested and found the data rate @ 6Mbps is the worst case. Only the data of worst case is recorded in the report.
TM2	802.11n mode	Keep the EUT in continuously transmitting mode with 802.11n modulation type at lowest, middle and highest channel. All bandwidth and data rates has been tested and found the data rate @ MCS0 is the worst case. Only the data of worst case is recorded in the report.
TM3	802.11ac mode	Keep the EUT in continuously transmitting mode with 802.11ac modulation type at lowest, middle and highest channel. All bandwidth and data rates has been tested and found the data rate @ MCS0 is the worst case. Only the data of worst case is recorded in the report.

☒ Special software is used.
☐ Through engineering command into the engineering mode.
engineering command: *#*#3646633#*#*
☐ Other method:

Special software:



2.4 Description of Support Units

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.

Title	Manufacturer	Model No.	Serial No.
12V Battery	CAMEL		/

2.5 Equipments Used During The Test

Power spectral density
Band edge emissions (Conducted)
Duty Cycle
Emission bandwidth and occupied bandwidth
Maximum conducted output power

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Test Software	Tachoy Information	RTS-01	V1.0.0	/	/
RF Sensor Unit	Tachoy Information	TR1029-2	000001	/	/
Signal Generator	Keysight	N5181A	MY48180415	2023-11-09	2024-11-08
Signal Generator	Keysight	N5182A	MY50143455	2023-11-09	2024-11-08
Spectrum Analyzer	Keysight	N9020A	MY53420323	2023-12-12	2024-12-11

Undesirable emission limits (above 1GHz)
Band edge emissions (Radiated)
Undesirable emission limits (below 1GHz)

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test software	Farad	EZ -EMC	V1.1.42	/	/
Positioning Controller	/	MF-7802	/	/	/
Amplifier(18-40G)	COM-POWER	AH-1840	10100008-1	2022-04-05	2025-04-04
Horn antenna	COM-POWER	AH-1840 (18-40G)	10100008	2023-04-05	2025-04-04
Loop antenna	ZHINAN	ZN30900C	ZN30900C	2024-06-14	2026-06-13
Cable(LF)#2	Schwarzbeck	/	/	2024-02-19	2025-02-18
Cable(LF)#1	Schwarzbeck	/	/	2024-02-19	2025-02-18
Cable(HF)#2	Schwarzbeck	AK9515E	96250	2024-03-20	2025-03-19
Cable(HF)#1	Schwarzbeck	SYV-50-3-1	/	2024-03-20	2025-03-19
Power amplifier(LF)	Schwarzbeck	BBV9743	9743-151	2024-06-12	2025-06-11
Power amplifier(HF)	Schwarzbeck	BBV9718	9718-282	2024-06-12	2025-06-11
Spectrum Analyzer	R&S	FSP30	1321.3008K40-101729-jR	2024-06-12	2025-06-11
Test Receiver	R&S	ESCI 3	1166.5950K03-101431-Jq	2024-06-13	2025-06-12
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023-05-13	2025-05-12
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2023-05-21	2025-05-20

2.6 Statement Of The Measurement Uncertainty

Test Item	Measurement Uncertainty
Duty cycle	±3.1%
Occupied Bandwidth	±3.63%
RF conducted power	±0.733dB
RF power density	±0.234%
Conducted Spurious emissions	±1.98dB
Radiated Emission (Above 1GHz)	±5.46dB
Radiated Emission (Below 1GHz)	±5.79dB
Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

2.7 Authorizations

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102, Building H1 & 1/F, Building H, Hongfa Science and Technology Park, Tangtou, Shiyan, Bao'An District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252

Identification of the Responsible Testing Location

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102, Building H1 & 1/F, Building H, Hongfa Science and Technology Park, Tangtou, Shiyan, Bao'An District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252
FCC Registration Number:	0032847402
Designation Number:	CN1342
Test Firm Registration No.:	778666
A2LA Certificate Number:	6270.01

2.8 Announcement

(1) The test report reference to the report template version v0.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) This document may not be altered or revised in any way unless done so by DACE and all revisions are duly noted in the revisions section.

(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

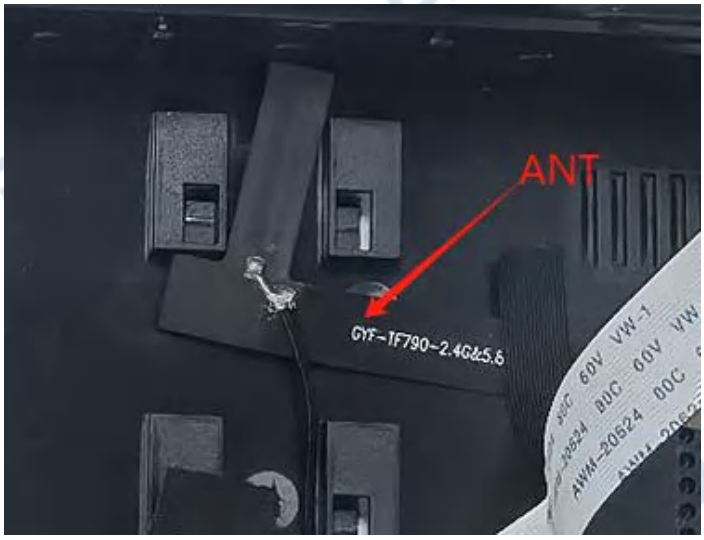
(6) We hereby declare that the laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant(information with "*" provided by applicant). the laboratory is not responsible for the accuracy of the information provided by the client. When the information provided by the customer may affect the effectiveness of the results, the responsibility lies with the customer, and the laboratory does not assume any responsibility.

3 Evaluation Results (Evaluation)

3.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.1.1 Conclusion:



4 Radio Spectrum Matter Test Results (RF)

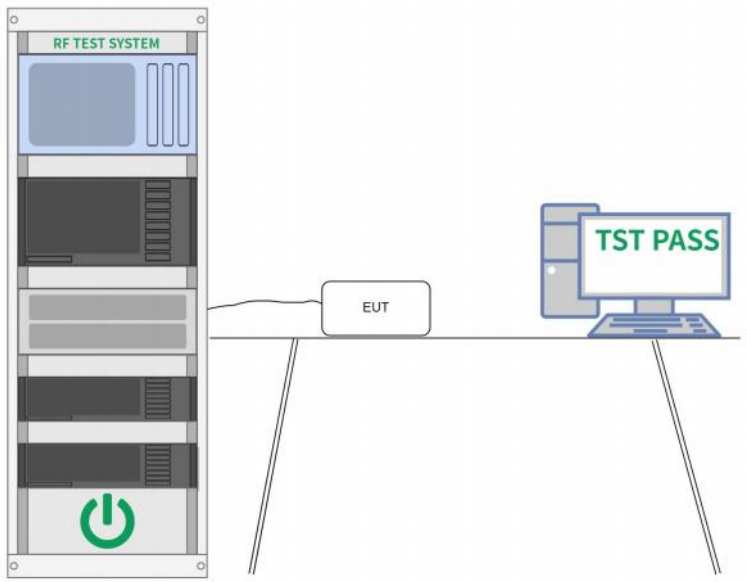
4.1 Duty Cycle

Test Requirement:	All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.
Test Limit:	No limits, only for report use.
Test Method:	ANSI C63.10-2013 section 12.2 (b)
Procedure:	i) Set the center frequency of the instrument to the center frequency of the transmission. ii) Set RBW >= EBW if possible; otherwise, set RBW to the largest available value. iii) Set VBW >= RBW. iv) Set detector = peak. v) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in item a1) of 12.2, and the number of sweep points across duration T exceeds 100.

4.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

4.1.2 Test Setup Diagram:



4.1.3 Test Data:

Please Refer to Appendix for Details.

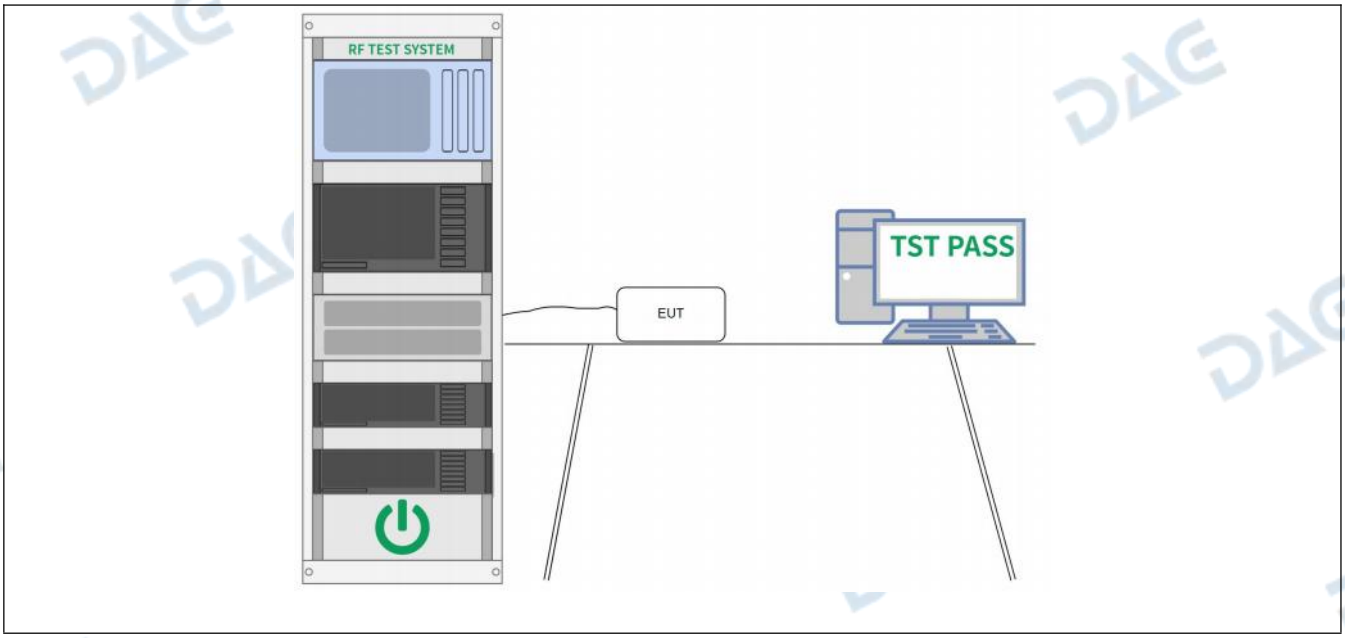
4.2 Emission bandwidth and occupied bandwidth

Test Requirement:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.
Test Limit:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.
Test Method:	ANSI C63.10-2013, section 6.9 & 12.4
Procedure:	Emission bandwidth: a) Set RBW = approximately 1% of the emission bandwidth. b) Set the VBW > RBW. c) Detector = peak. d) Trace mode = max hold. e) 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 instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%. Occupied bandwidth: a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Step a) through step c) might require iteration to adjust within the specified range. e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used. f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth. g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies. h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

4.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

4.2.2 Test Setup Diagram:



4.2.3 Test Data:

Please Refer to Appendix for Details.

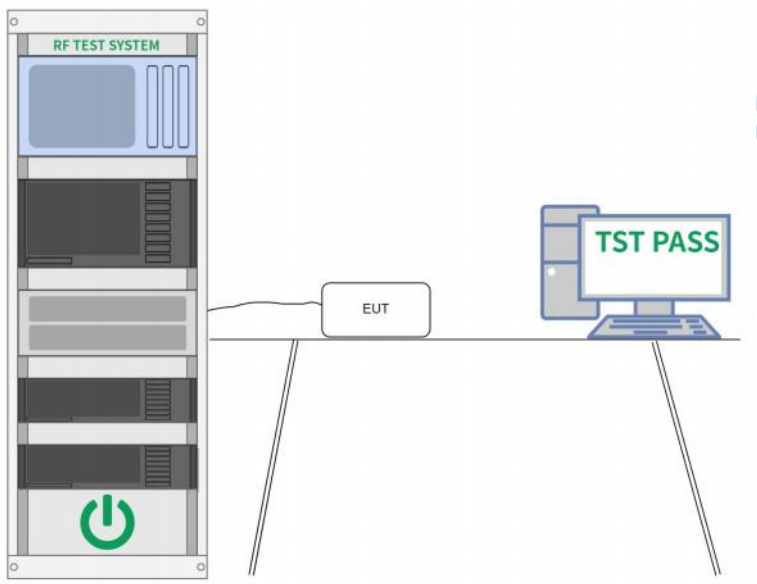
4.3 Maximum conducted output power

Test Requirement:	47 CFR Part 15.407(a)(1)(iv)
Test Limit:	For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
Test Method:	ANSI C63.10-2013, section 12.3
Procedure:	Refer to ANSI C63.10-2013 section 12.3

4.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

4.3.2 Test Setup Diagram:



4.3.3 Test Data:

Please Refer to Appendix for Details.

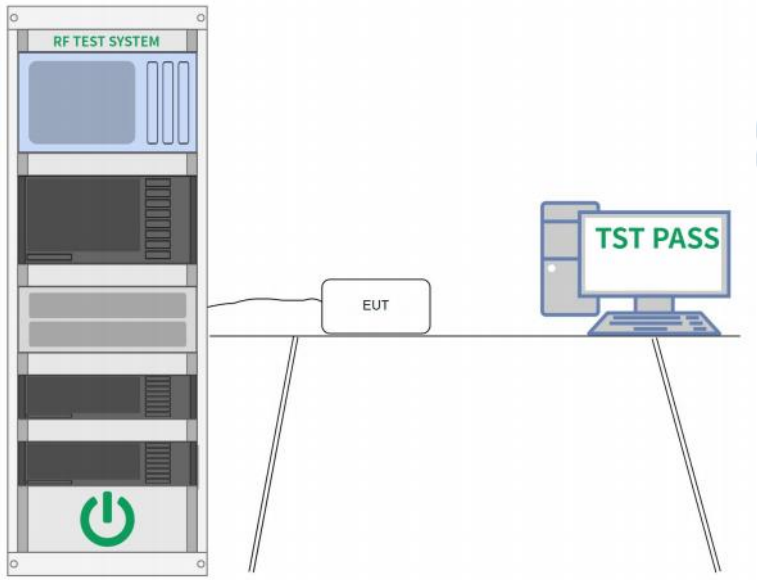
4.4 Power spectral density

Test Requirement:	47 CFR Part 15.407(a)(1)(iv)
Test Limit:	For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
Test Method:	ANSI C63.10-2013, section 12.5
Procedure:	Refer to ANSI C63.10-2013, section 12.5

4.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

4.4.2 Test Setup Diagram:



4.4.3 Test Data:

Please Refer to Appendix for Details.

4.5 Band edge emissions (Conducted)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

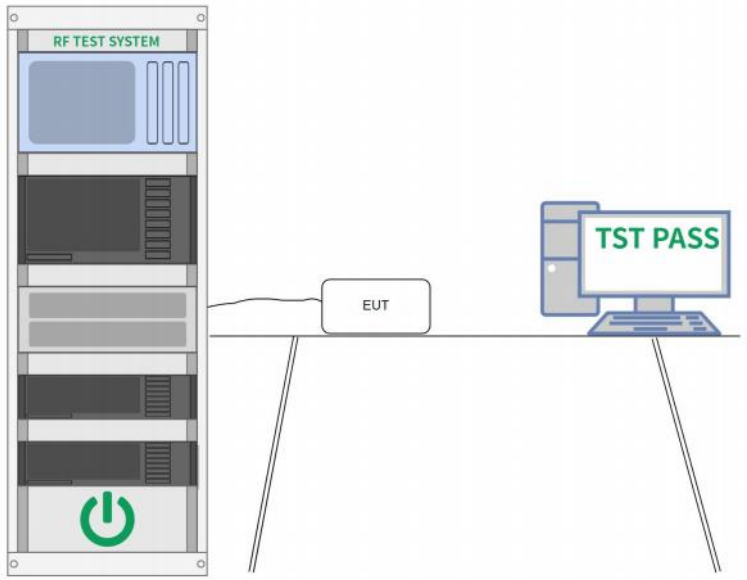
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa

Pretest mode:	TM1, TM2, TM3
Final test mode:	TM1, TM2, TM3

4.5.2 Test Setup Diagram:



4.5.3 Test Data:

Please Refer to Appendix for Details.

4.6 Band edge emissions (Radiated)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

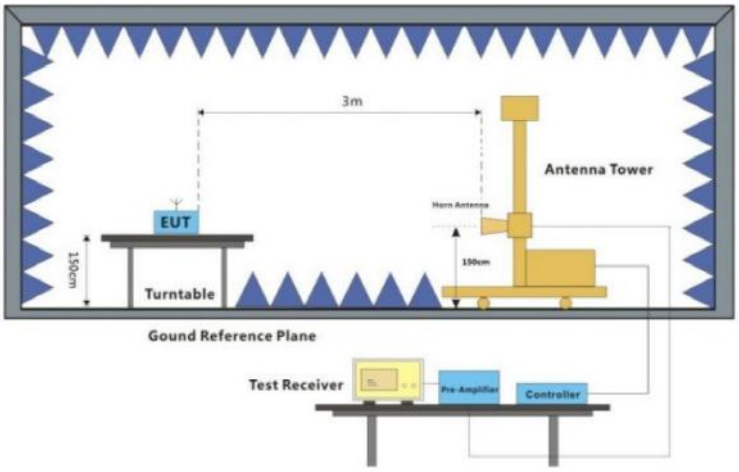
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4.6.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1, TM2, TM3				

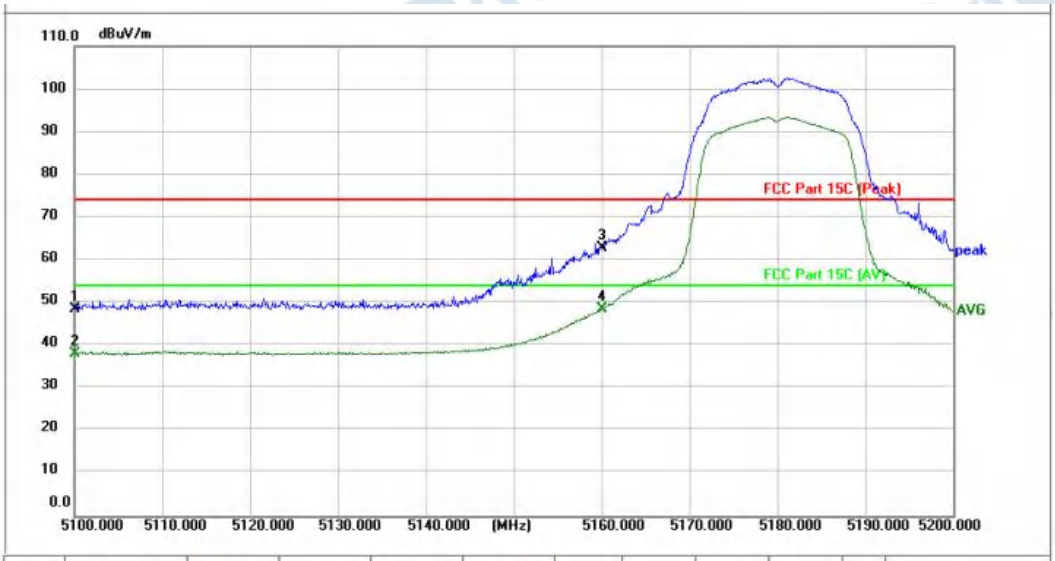
Final test mode:	TM1, TM3

4.6.2 Test Setup Diagram:



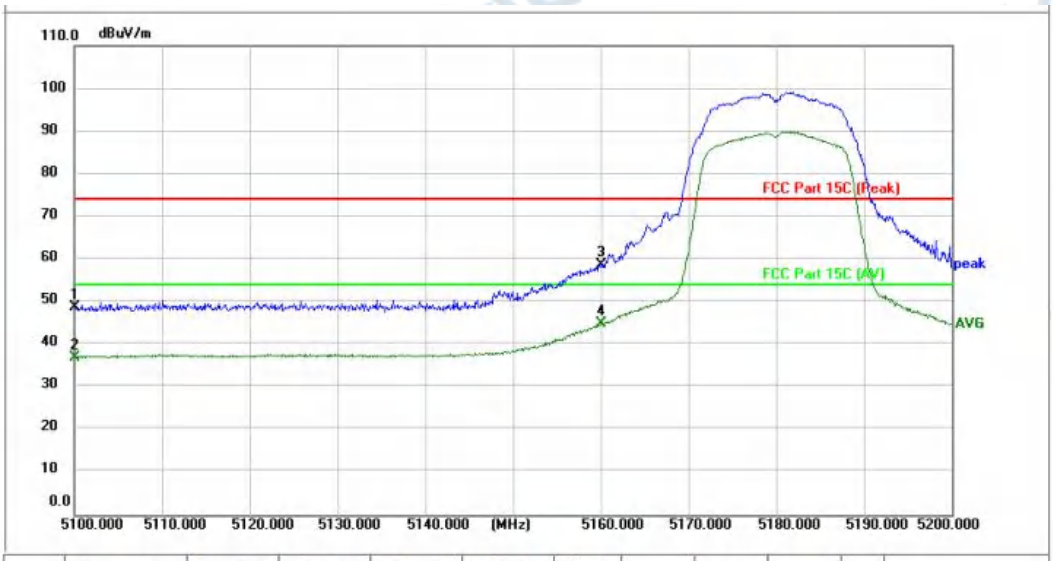
4.6.3 Test Data:

TM1 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 20 / CH: H



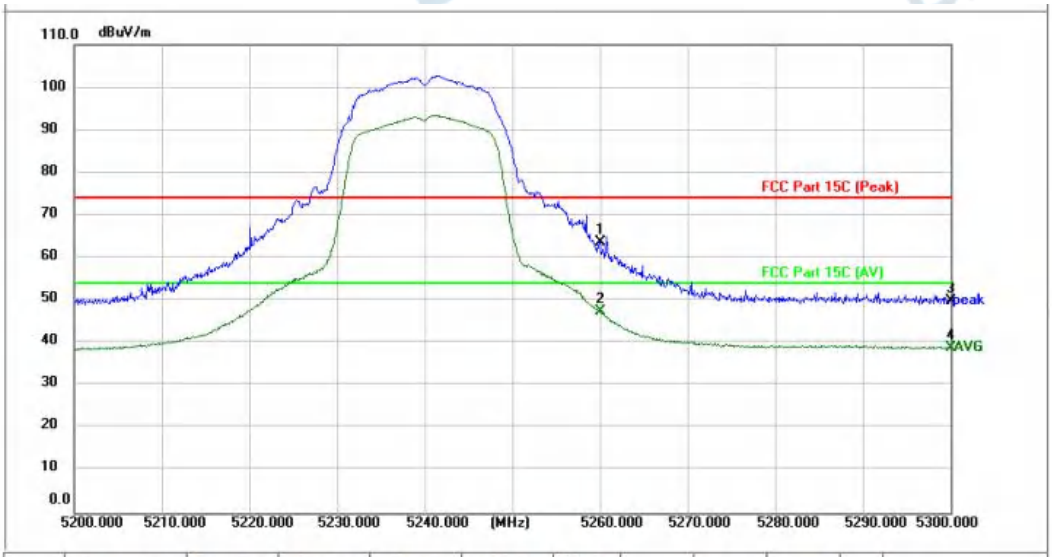
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5100.000	43.90	4.71	48.61	74.00	-25.39	peak	150		P	
2	5100.000	33.30	4.71	38.01	54.00	-15.99	AVG	150		P	
3	5160.000	58.01	4.87	62.88	74.00	-11.12	peak	150		P	
4 *	5160.000	43.62	4.87	48.49	54.00	-5.51	AVG	150		P	

TM1 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 20 / CH: L



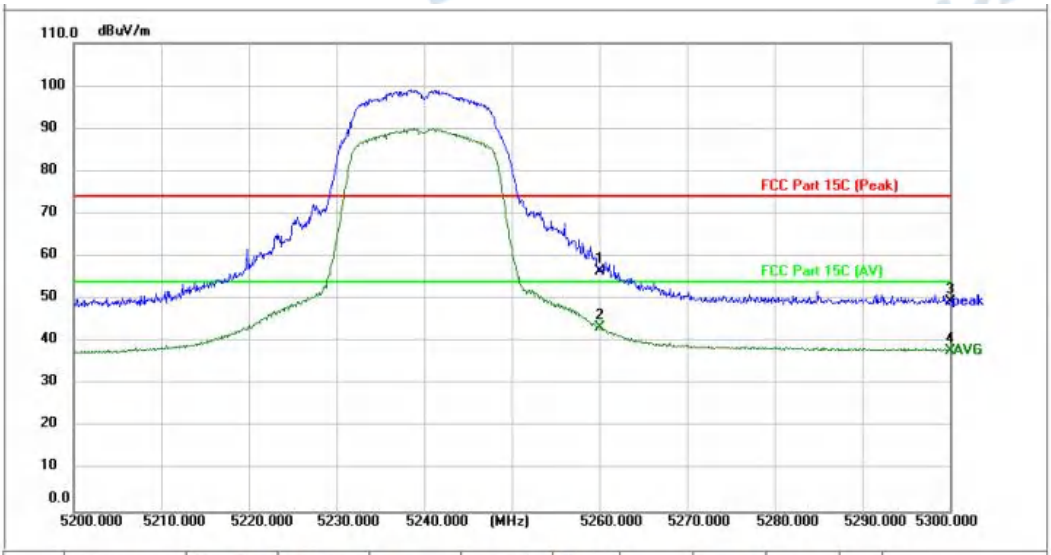
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5100.000	44.12	4.71	48.83	74.00	-25.17	peak	150		P	
2	5100.000	32.36	4.71	37.07	54.00	-16.93	AVG	150		P	
3	5160.000	53.87	4.87	58.74	74.00	-15.26	peak	150		P	
4 *	5160.000	40.09	4.87	44.96	54.00	-9.04	AVG	150		P	

TM1 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 20 / CH: L



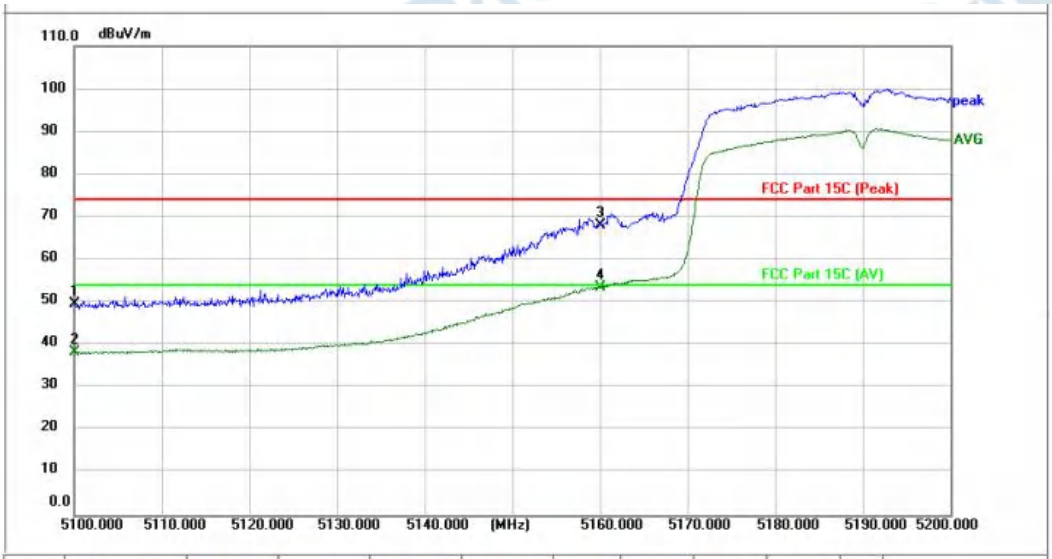
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5260.000	58.48	5.15	63.63	74.00	-10.37	peak	150		P	
2 *	5260.000	42.32	5.15	47.47	54.00	-6.53	AVG	150		P	
3	5300.000	44.63	5.26	49.89	74.00	-24.11	peak	150		P	
4	5300.000	33.65	5.26	38.91	54.00	-15.09	AVG	150		P	

TM1 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 20 / CH: L



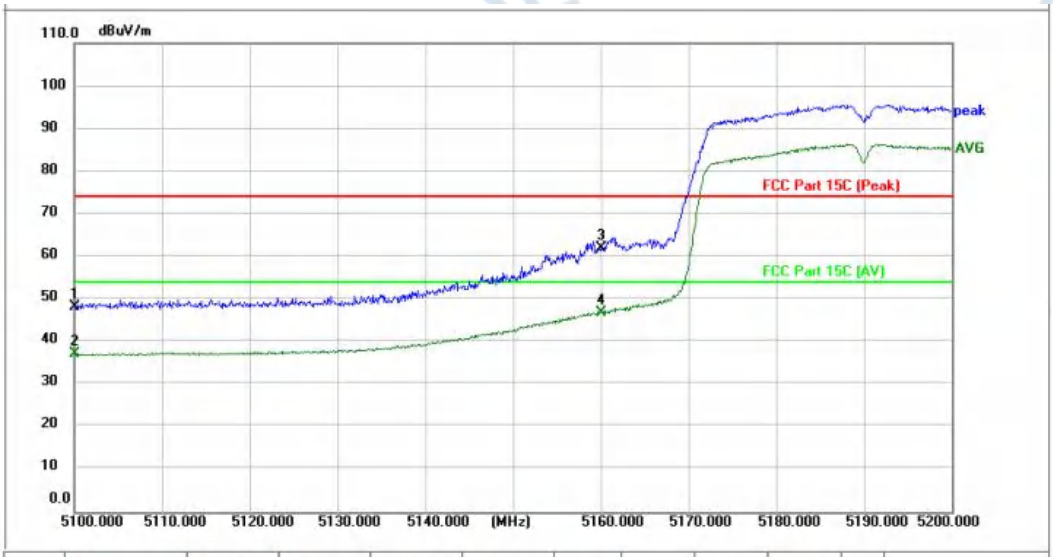
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5260.000	51.33	5.15	56.48	74.00	-17.52	peak	150		P	
2 *	5260.000	38.27	5.15	43.42	54.00	-10.58	AVG	150		P	
3	5300.000	44.06	5.26	49.32	74.00	-24.68	peak	150		P	
4	5300.000	32.63	5.26	37.89	54.00	-16.11	AVG	150		P	

TM3 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 40 / CH: L



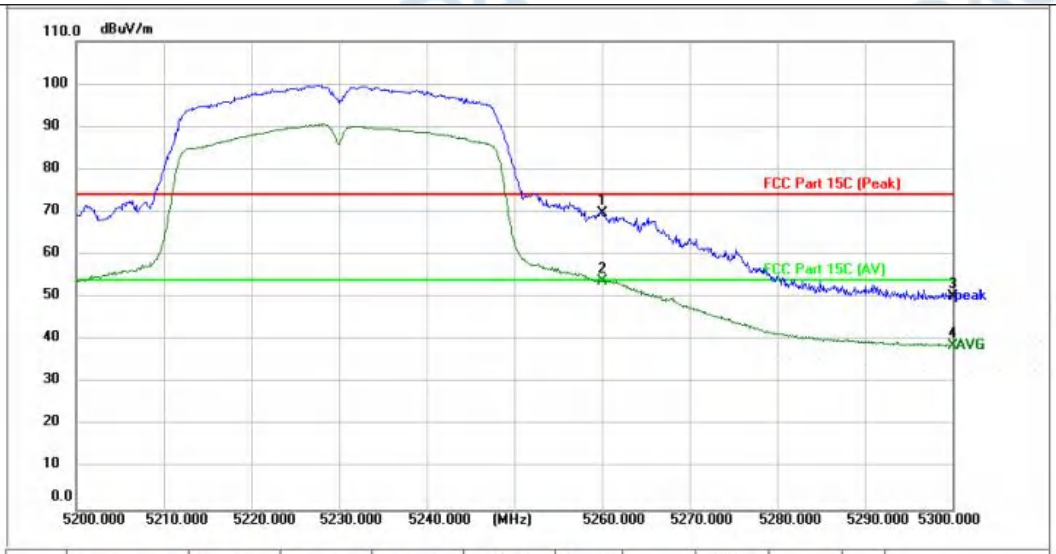
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5100.000	44.86	4.71	49.57	74.00	-24.43	peak	150		P	
2	5100.000	33.79	4.71	38.50	54.00	-15.50	AVG	150		P	
3	5160.000	63.06	4.87	67.93	74.00	-6.07	peak	150		P	
4 *	5160.000	48.65	4.87	53.52	54.00	-0.48	AVG	150		P	

TM3 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 40 / CH: L



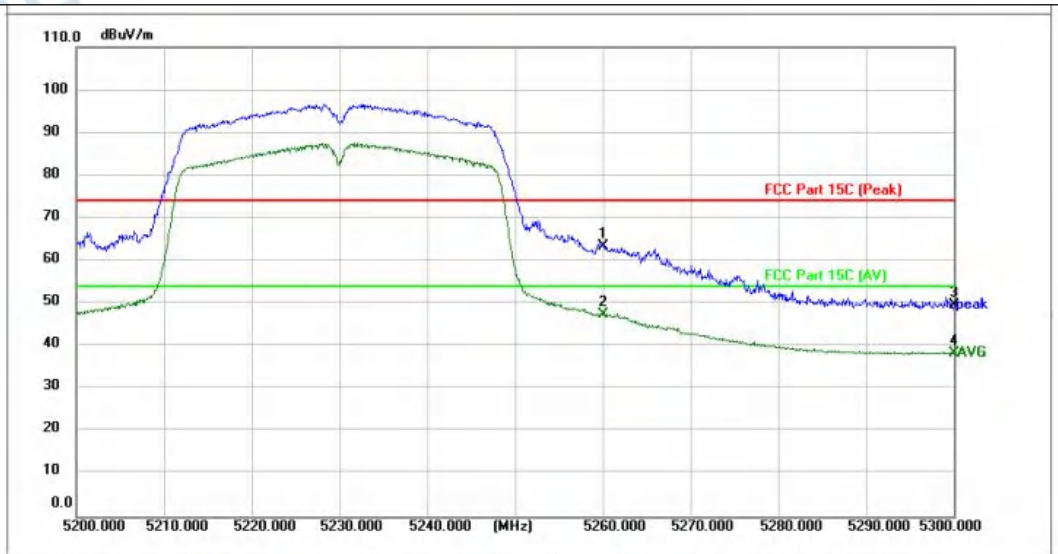
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5100.000	43.49	4.71	48.20	74.00	-25.80	peak	150		P	
2	5100.000	32.46	4.71	37.17	54.00	-16.83	AVG	150		P	
3	5160.000	57.11	4.87	61.98	74.00	-12.02	peak	150		P	
4 *	5160.000	42.13	4.87	47.00	54.00	-7.00	AVG	150		P	

TM3 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 40 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5260.000	64.53	5.15	69.68	74.00	-4.32	peak	150		P	
2 *	5260.000	48.67	5.15	53.82	54.00	-0.18	AVG	150		P	
3	5300.000	44.95	5.26	50.21	74.00	-23.79	peak	150		P	
4	5300.000	33.43	5.26	38.69	54.00	-15.31	AVG	150		P	

TM3 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 40 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5260.000	58.27	5.15	63.42	74.00	-10.58	peak	150		P	
2 *	5260.000	42.35	5.15	47.50	54.00	-6.50	AVG	150		P	
3	5300.000	44.40	5.26	49.66	74.00	-24.34	peak	150		P	
4	5300.000	33.12	5.26	38.38	54.00	-15.62	AVG	150		P	

NOTE:1.The test software will only record the worst test angle and height, and only the worst case will be recorded in the test report.

2. Margin = Measurement Level - Limit ;Measurement Level=Test receiver reading + correction factor

4.7 Undesirable emission limits (below 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(9)
Test Limit:	Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5
Procedure:	Below 1GHz: a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The

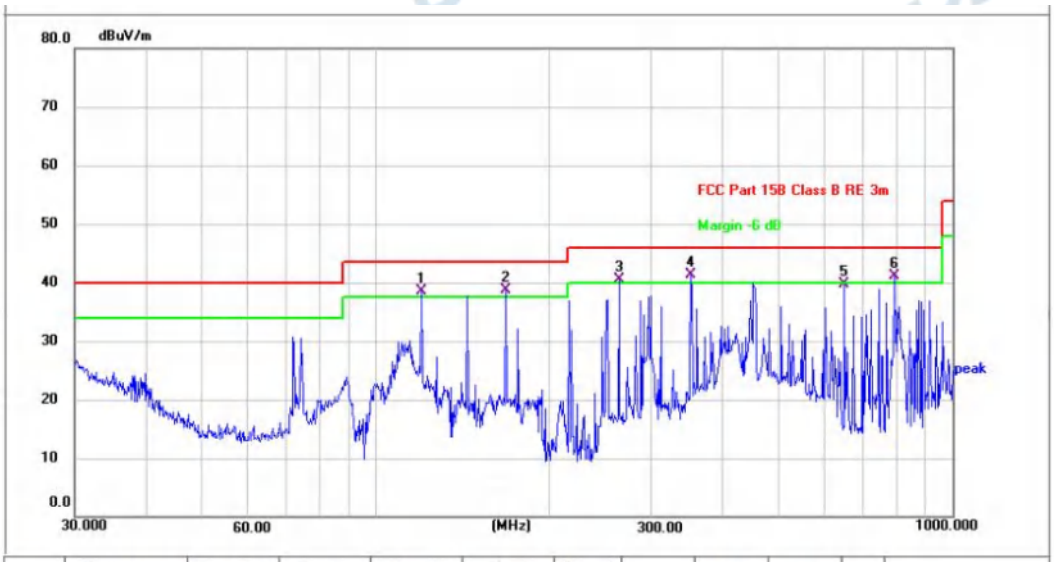
	points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4.7.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1				

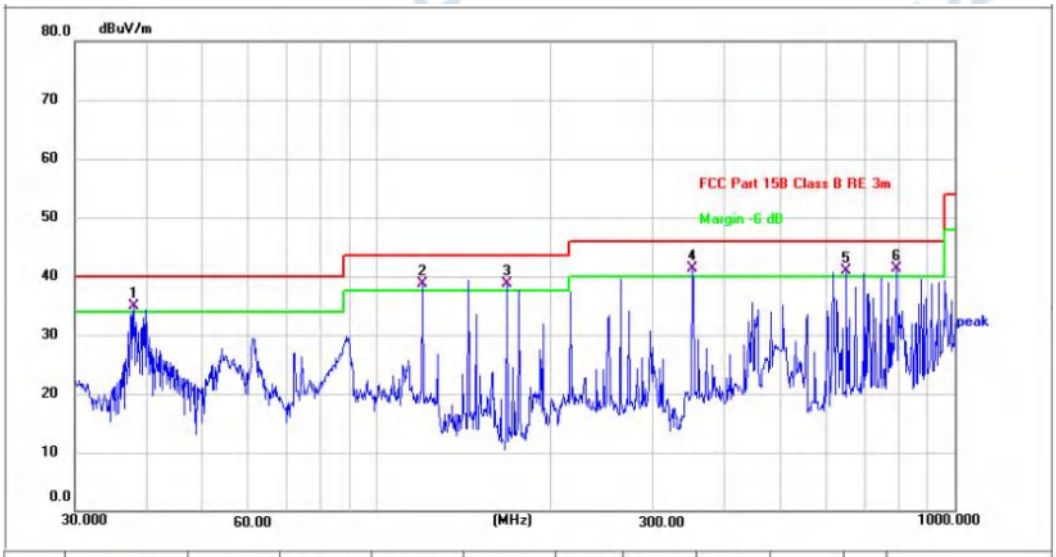
4.7.2 Test Data:

TM1 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	119.8556	43.86	-5.37	38.49	43.50	-5.01	QP			P	
2 !	167.8242	46.24	-7.49	38.75	43.50	-4.75	QP			P	
3 !	263.8190	47.38	-6.84	40.54	46.00	-5.46	QP			P	
4 *	351.7080	45.89	-4.55	41.34	46.00	-4.66	QP			P	
5	649.6596	38.74	0.87	39.61	46.00	-6.39	QP			P	
6 !	793.3960	37.16	3.87	41.03	46.00	-4.97	QP			P	

TM1 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	37.9450	39.70	-4.76	34.94	40.00	-5.06	QP			P	
2 !	119.8556	44.09	-5.37	38.72	43.50	-4.78	QP			P	
3 !	167.8242	46.22	-7.49	38.73	43.50	-4.77	QP			P	
4 *	351.7080	45.96	-4.57	41.39	46.00	-4.61	QP			P	
5 !	649.6596	40.10	0.88	40.98	46.00	-5.02	QP			P	
6 !	793.3960	37.52	3.82	41.34	46.00	-4.66	QP			P	

NOTE:1.The test software will only record the worst test angle and height, and only the worst case will be recorded in the test report.

2. Margin = Measurement Level - Limit ;Measurement Level=Test receiver reading + correction factor

4.8 Undesirable emission limits (above 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

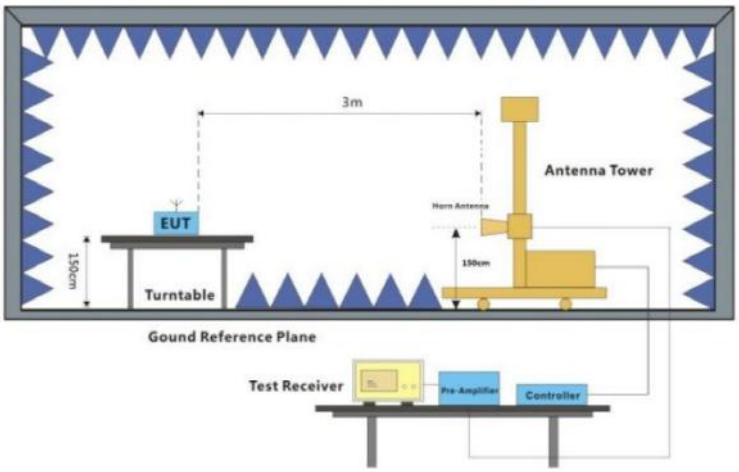
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4.8.1 E.U.T. Operation:

Operating Environment:					
Temperature:	22.8 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa

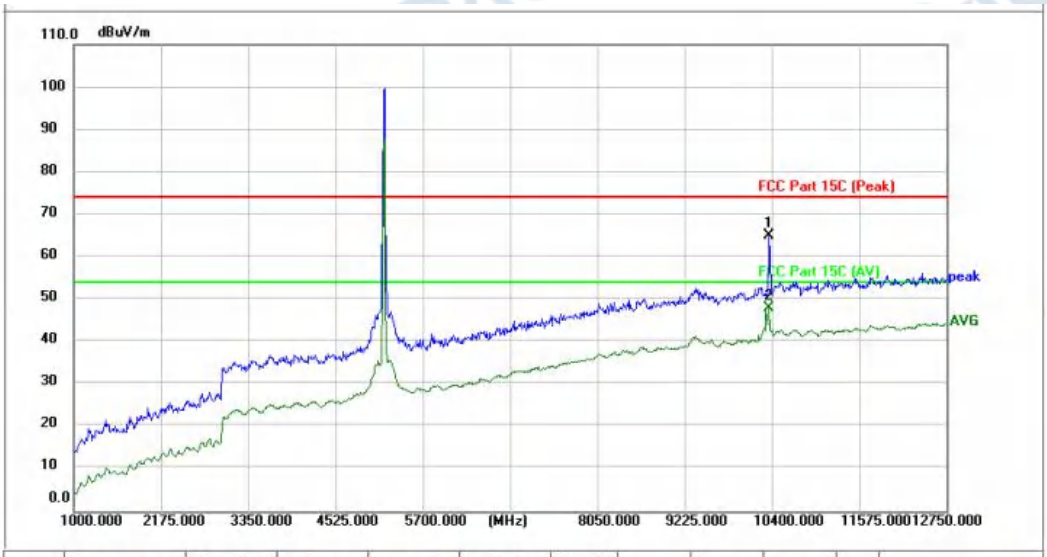
Pretest mode:	TM1, TM2, TM3
Final test mode:	TM1

4.8.2 Test Setup Diagram:



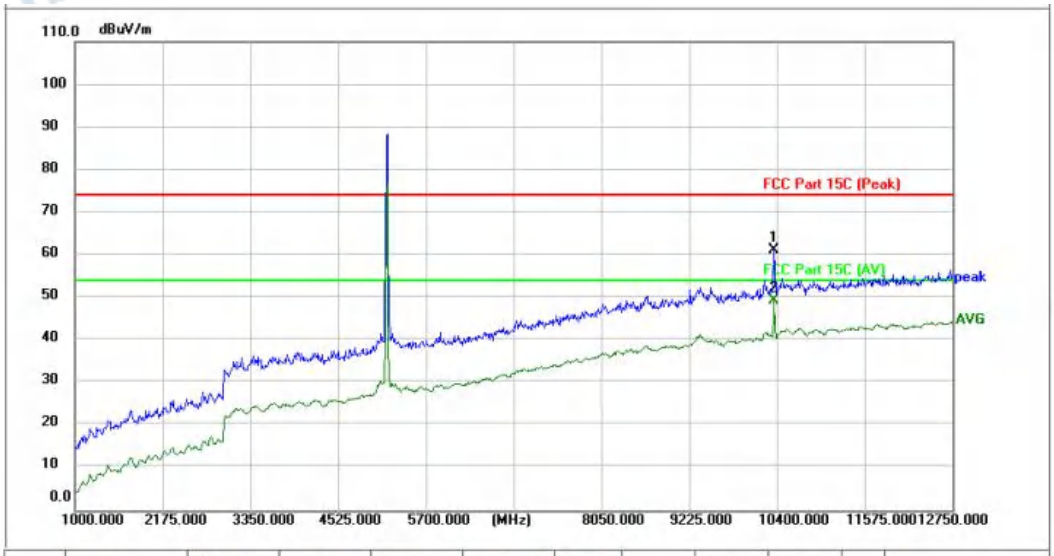
4.8.3 Test Data:

TM1 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 20 / CH: L



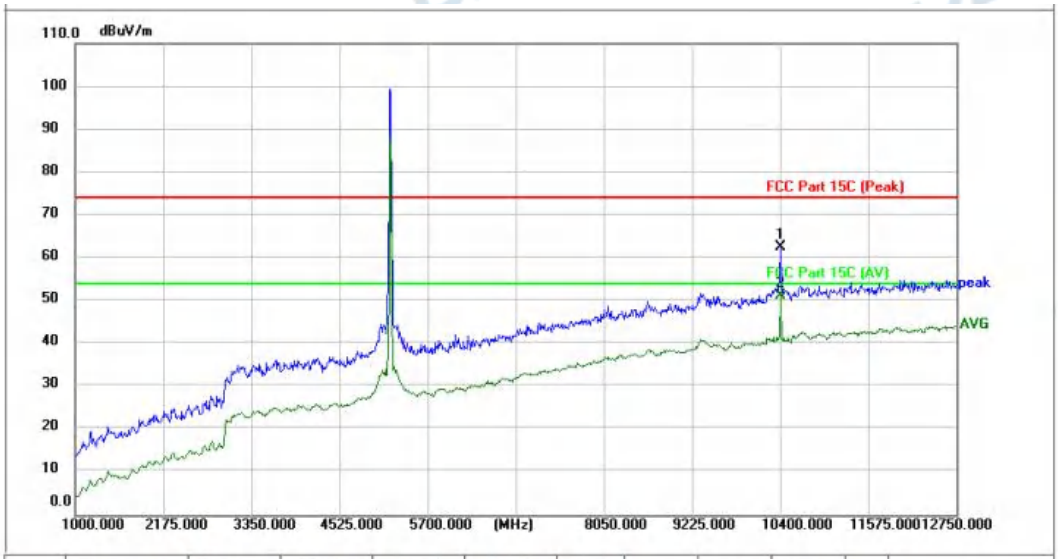
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	10364.750	48.16	16.89	65.05	74.00	-8.95	peak	150		P	
2 *	10364.750	31.09	16.89	47.98	54.00	-6.02	AVG	150		P	

TM1 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 20 / CH: L



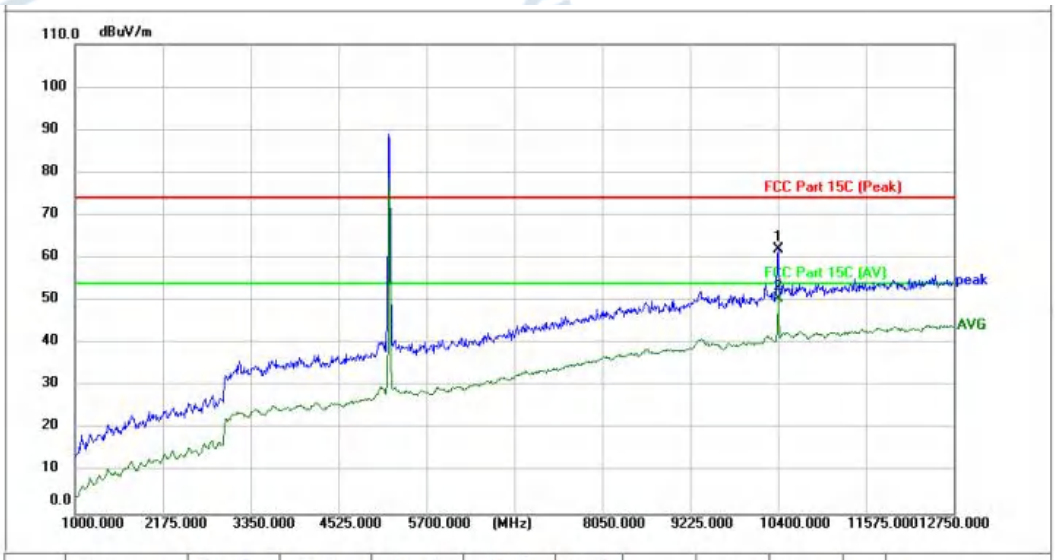
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	10364.750	44.18	16.89	61.07	74.00	-12.93	peak	150		P	
2 *	10364.750	32.56	16.89	49.45	54.00	-4.55	AVG	150		P	

TM1 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 20 / CH: M



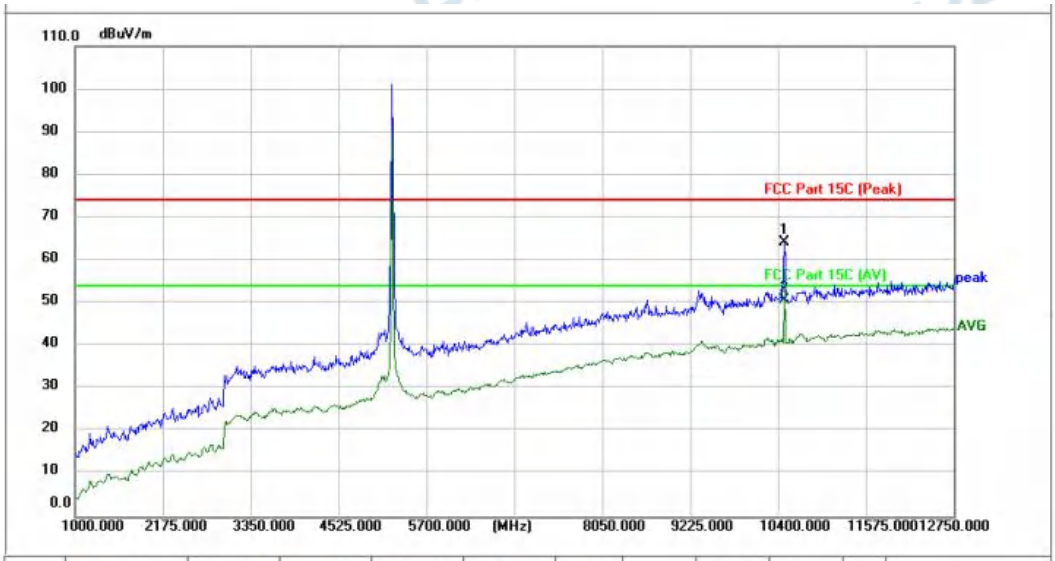
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	10400.000	45.60	16.97	62.57	74.00	-11.43	peak	150		P	
2 *	10400.000	34.37	16.97	51.34	54.00	-2.66	AVG	150		P	

TM1 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 20 / CH: M



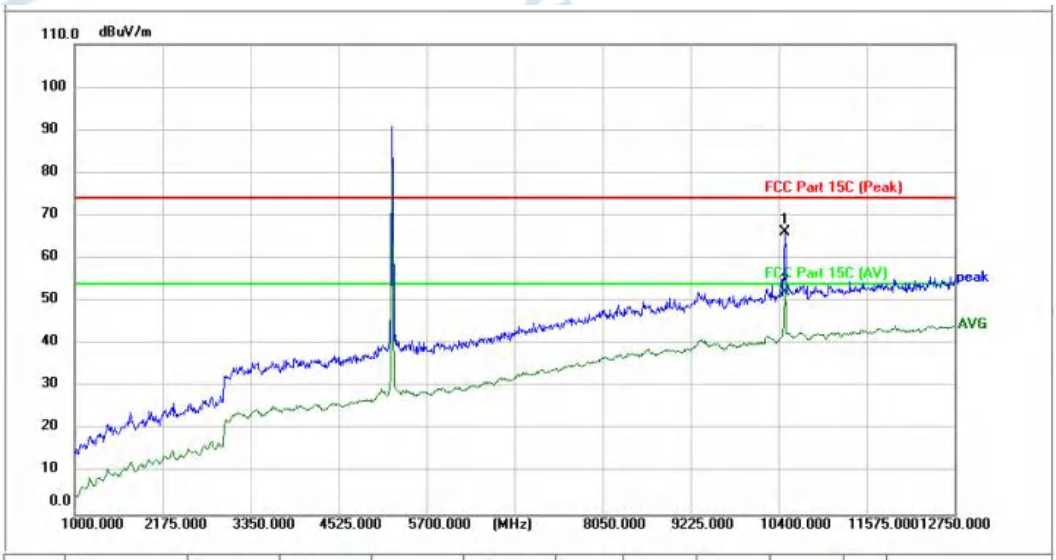
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	10400.000	45.13	16.97	62.10	74.00	-11.90	peak	150		P	
2 *	10400.000	33.52	16.97	50.49	54.00	-3.51	AVG	150		P	

TM1 / Polarization: Horizontal / Band: 5150-5250 MHz / BW: 20 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	10482.250	47.03	17.17	64.20	74.00	-9.80	peak	150		P	
2 *	10482.250	33.50	17.17	50.67	54.00	-3.33	AVG	150		P	

TM1 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 20 / CH: H



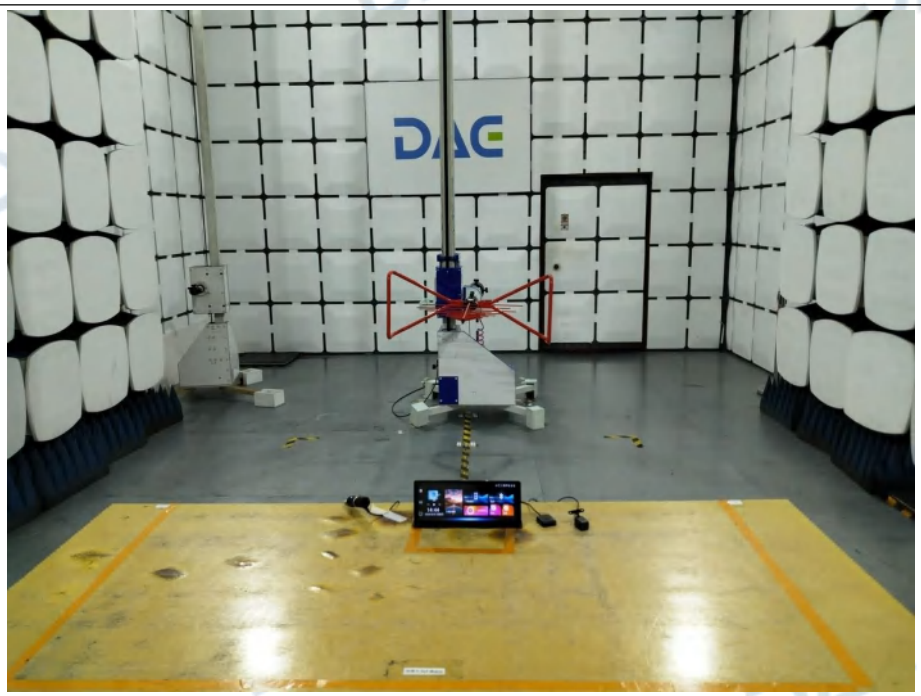
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	10482.250	49.10	17.17	66.27	74.00	-7.73	peak	150		P	
2 *	10482.250	34.94	17.17	52.11	54.00	-1.89	AVG	150		P	

NOTE:1.The test software will only record the worst test angle and height, and only the worst case will be recorded in the test report.

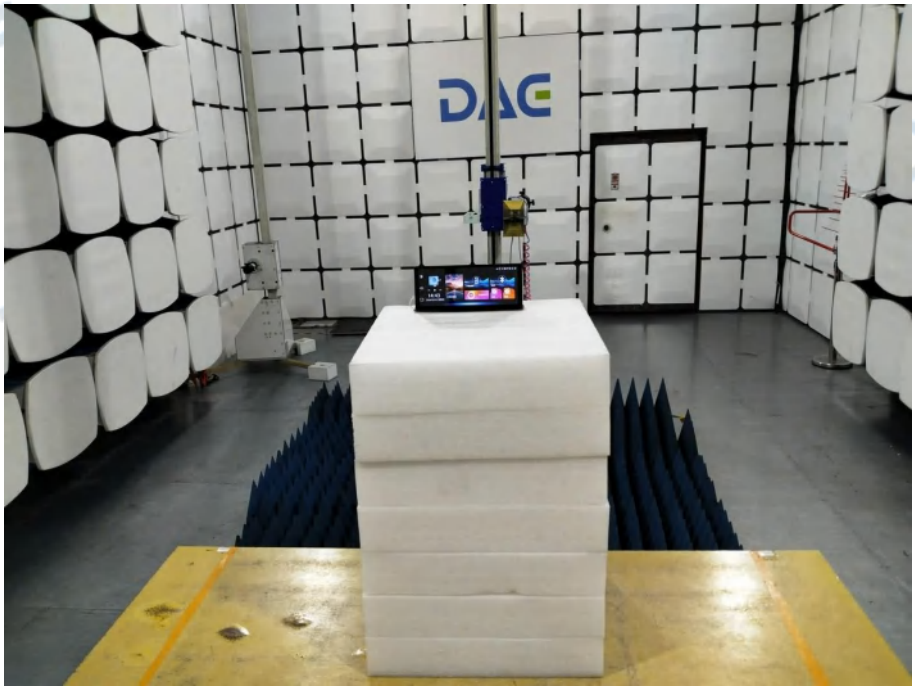
2. Margin = Measurement Level - Limit ;Measurement Level=Test receiver reading + correction factor

5 TEST SETUP PHOTOS

Emissions in frequency bands (below 1GHz)



Emissions in frequency bands (above 1GHz)



6 PHOTOS OF THE EUT

Please Refer to DACE241011001RF001 for Details.

Appendix

1. -26dB and 99% Emission Bandwidth

Condition	Antenna	Modulation	Frequency(MHz)	-26dB_Emission_Bandwidth (MHz)	Occupied Bandwidth(MHz)
NVNT	ANT1	802.11a	5180.00	19.26	16.24
NVNT	ANT1	802.11a	5200.00	19.29	16.25
NVNT	ANT1	802.11a	5240.00	19.32	16.24
NVNT	ANT1	802.11n(HT20)	5180.00	20.03	17.36
NVNT	ANT1	802.11n(HT20)	5200.00	20.10	17.37
NVNT	ANT1	802.11n(HT20)	5240.00	20.11	17.34
NVNT	ANT1	802.11ac(VHT20)	5180.00	20.08	17.36
NVNT	ANT1	802.11ac(VHT20)	5200.00	19.96	17.38
NVNT	ANT1	802.11ac(VHT20)	5240.00	19.93	17.38
NVNT	ANT1	802.11n(HT40)	5190.00	37.98	35.26
NVNT	ANT1	802.11n(HT40)	5230.00	38.01	35.30
NVNT	ANT1	802.11ac(VHT40)	5190.00	37.88	35.31
NVNT	ANT1	802.11ac(VHT40)	5230.00	37.99	35.29

99%_OCB_NVNT_ANT1_802_11a_5180

-26BW_NVNT_ANT1_802_11a_5180

99%_OCB_NVNT_ANT1_802_11a_5200

-26BW_NVNT_ANT1_802_11a_5200

99%_OCB_NVNT_ANT1_802_11a_5240

-26BW_NVNT_ANT1_802_11a_5240

99%_OCB_NVNT_ANT1_802_11n(HT20)_5180

-26BW_NVNT_ANT1_802_11n(HT20)_5180

99%_OCB_NVNT_ANT1_802_11n(HT20)_5200

-26BW_NVNT_ANT1_802_11n(HT20)_5200

99%_OCB_NVNT_ANT1_802_11n(HT20)_5240

-26BW_NVNT_ANT1_802_11n(HT20)_5240

99%_OCB_NVNT_ANT1_802_11ac(VHT20)_5180

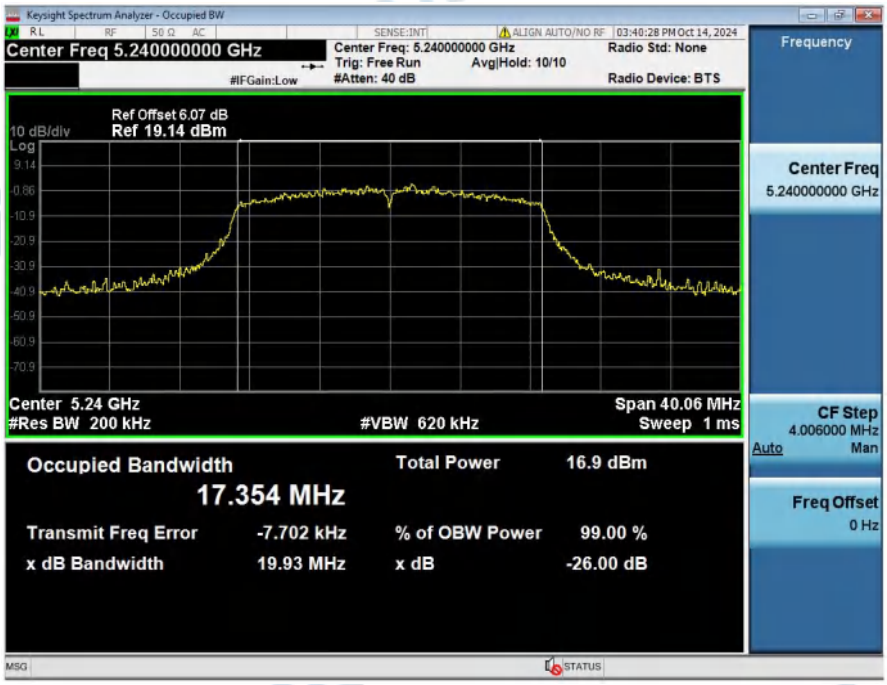
-26BW_NVNT_ANT1_802_11ac(VHT20)_5180

99%_OCB_NVNT_ANT1_802_11ac(VHT20)_5200

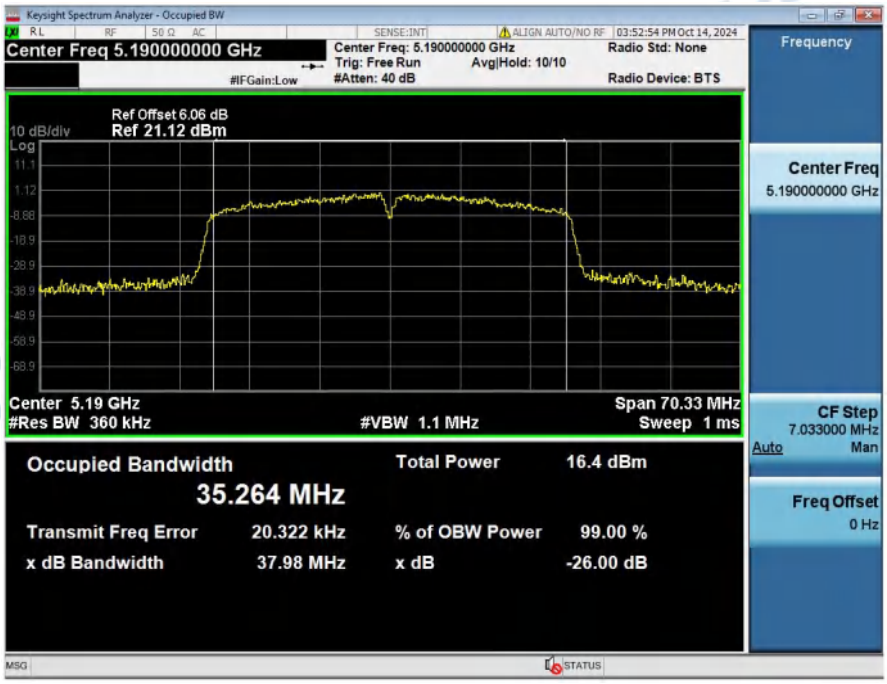
-26BW_NVNT_ANT1_802_11ac(VHT20)_5200

99%_OCB_NVNT_ANT1_802_11ac(VHT20)_5240

-26BW_NVNT_ANT1_802_11ac(VHT20)_5240

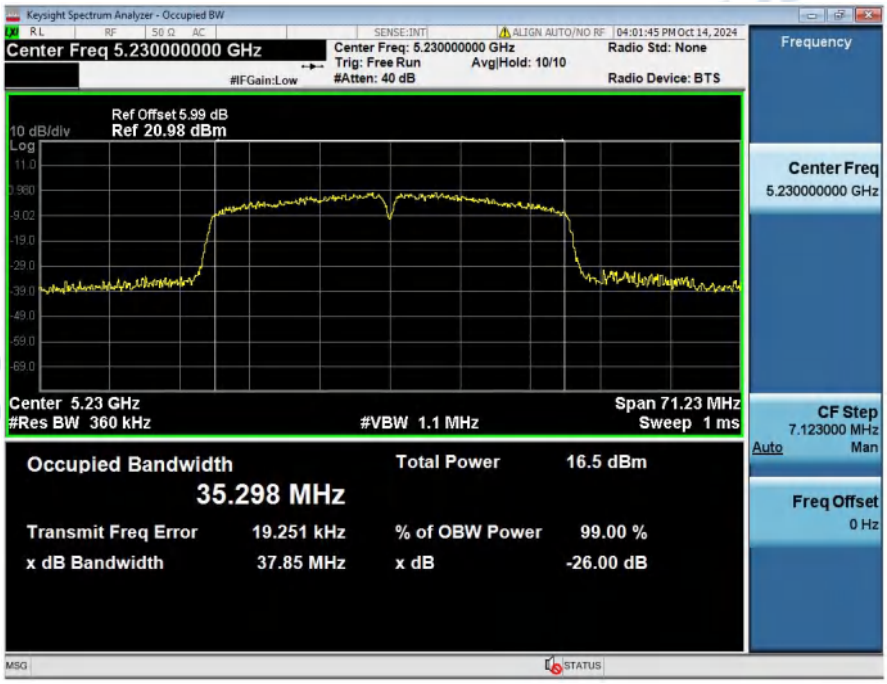


99%_OCB_NVNT_ANT1_802_11n(HT40)_5190



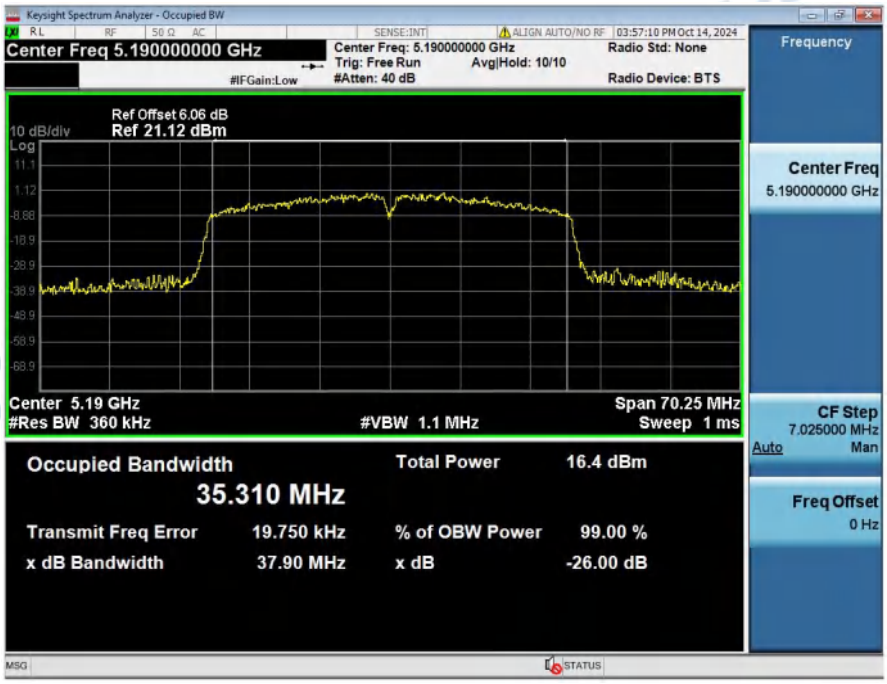
-26BW_NVNT_ANT1_802_11n(HT40)_5190

99%_OCB_NVNT_ANT1_802_11n(HT40)_5230

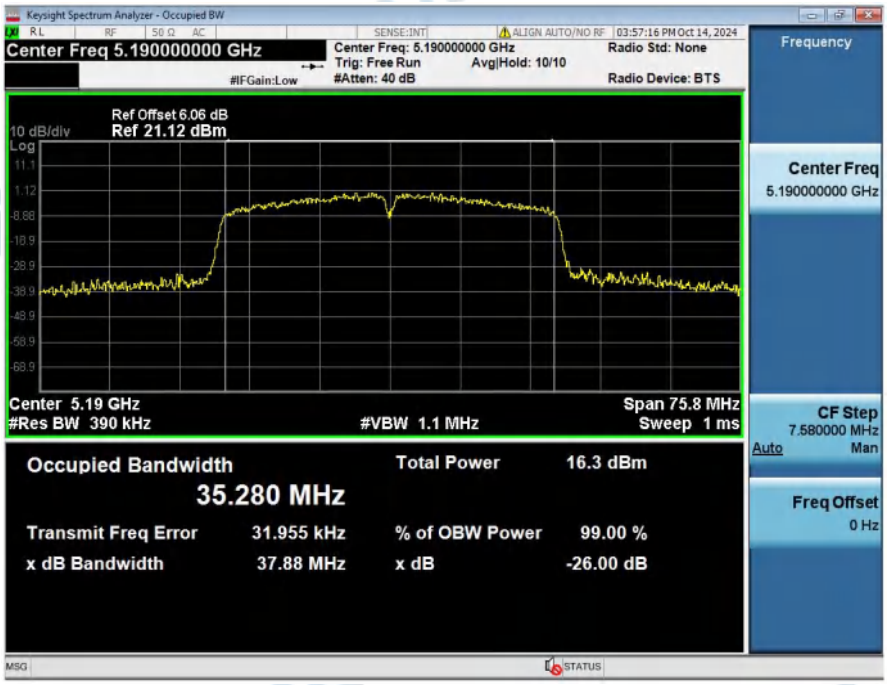


-26BW_NVNT_ANT1_802_11n(HT40)_5230

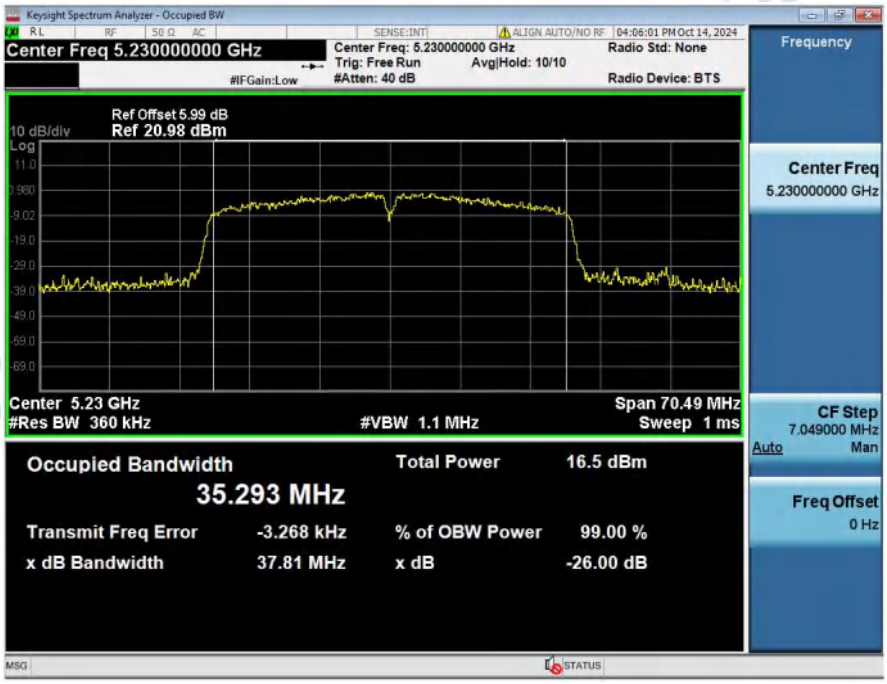
99%_OCB_NVNT_ANT1_802_11ac(VHT40)_5190



-26BW_NVNT_ANT1_802_11ac(VHT40)_5190



99%_OCB_NVNT_ANT1_802_11ac(VHT40)_5230

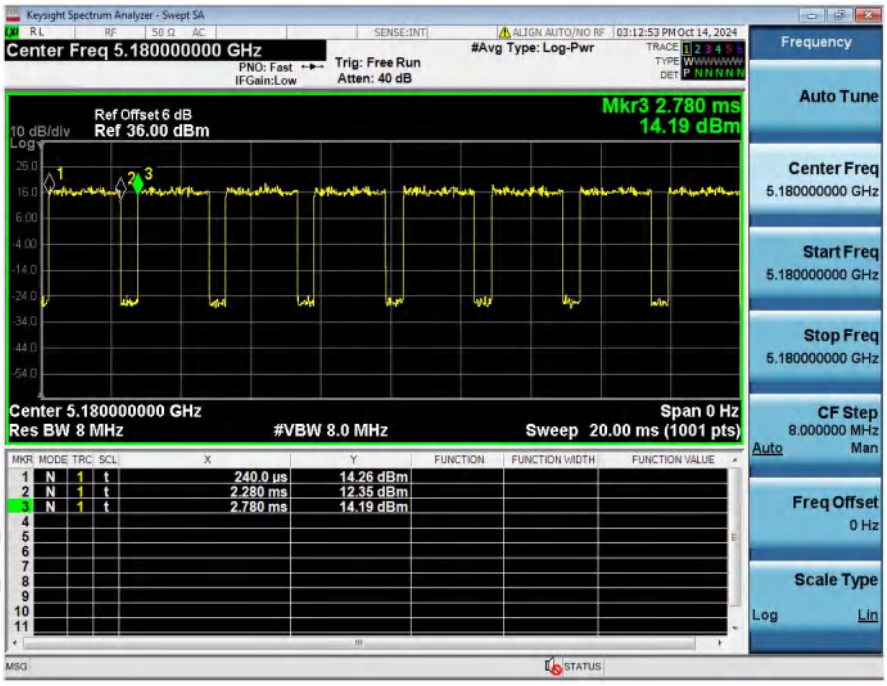


-26BW_NVNT_ANT1_802_11ac(VHT40)_5230

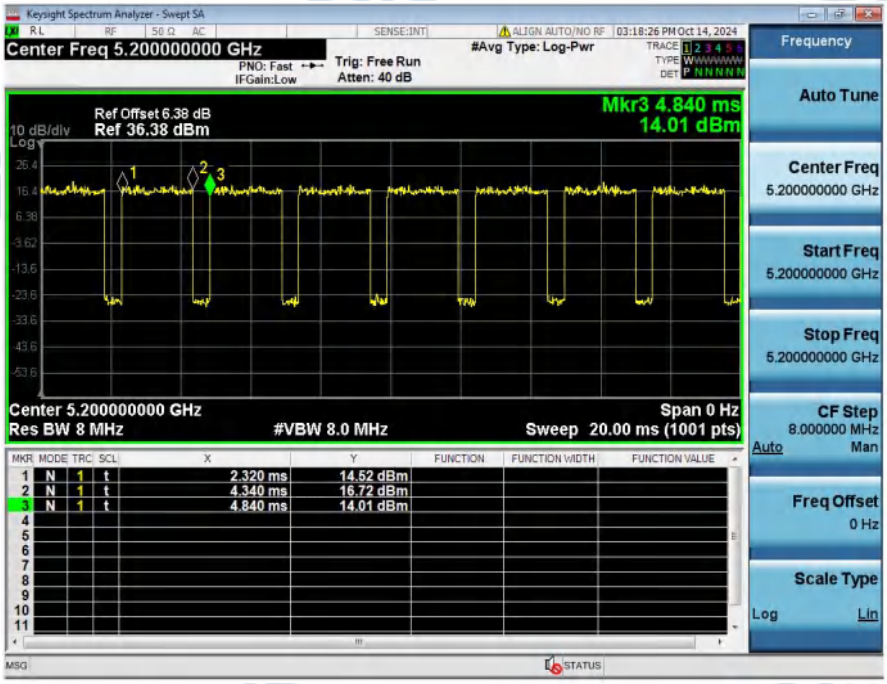
2. Duty Cycle

Condition	Antenna	Modulation	Frequency (MHz)	Duty cycle(%)	Duty_factor
NVNT	ANT1	802.11a	5180.00	80.31	0.95
NVNT	ANT1	802.11a	5200.00	80.16	0.96
NVNT	ANT1	802.11a	5240.00	79.53	0.99
NVNT	ANT1	802.11n(HT20)	5180.00	78.99	1.02
NVNT	ANT1	802.11n(HT20)	5200.00	79.17	1.01
NVNT	ANT1	802.11n(HT20)	5240.00	79.17	1.01
NVNT	ANT1	802.11ac(VHT20)	5180.00	78.99	1.02
NVNT	ANT1	802.11ac(VHT20)	5200.00	78.33	1.06
NVNT	ANT1	802.11ac(VHT20)	5240.00	78.99	1.02
NVNT	ANT1	802.11n(HT40)	5190.00	65.28	1.85
NVNT	ANT1	802.11n(HT40)	5230.00	64.79	1.89
NVNT	ANT1	802.11ac(VHT40)	5190.00	65.28	1.85
NVNT	ANT1	802.11ac(VHT40)	5230.00	64.79	1.89

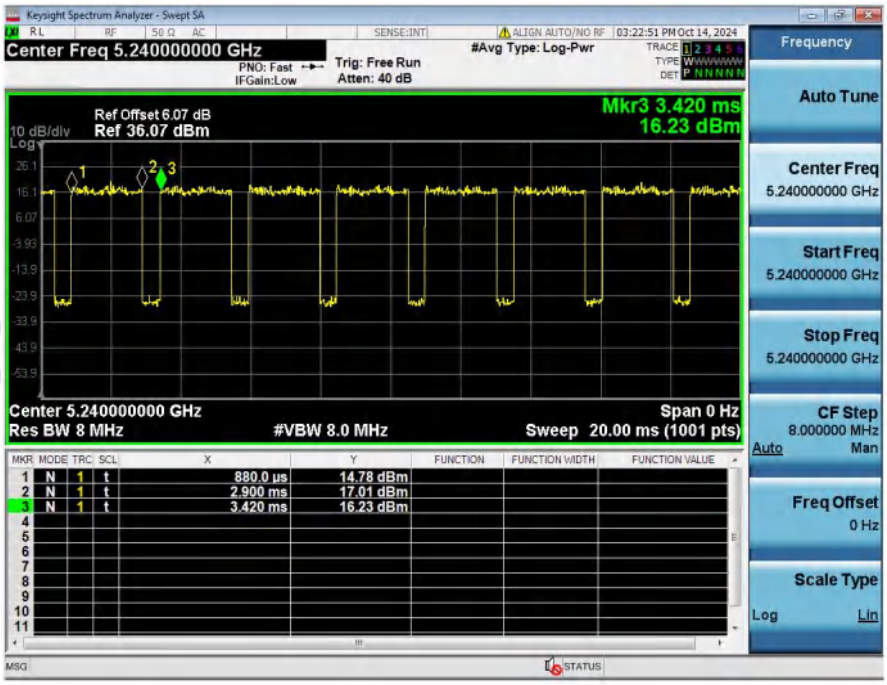
Duty_Cycle_NVNT_ANT1_802_11a_5180



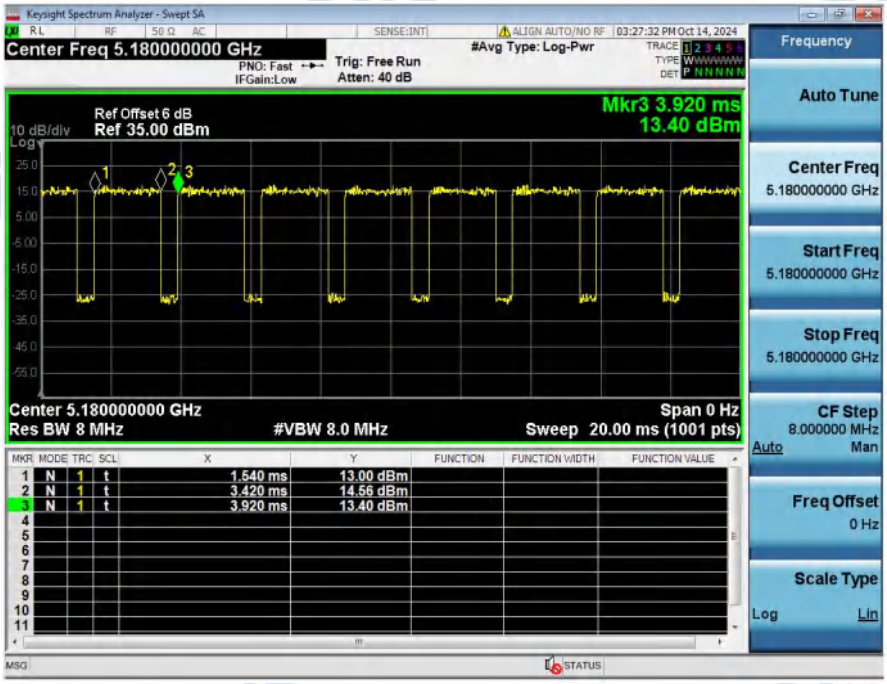
Duty_Cycle_NVNT_ANT1_802_11a_5200



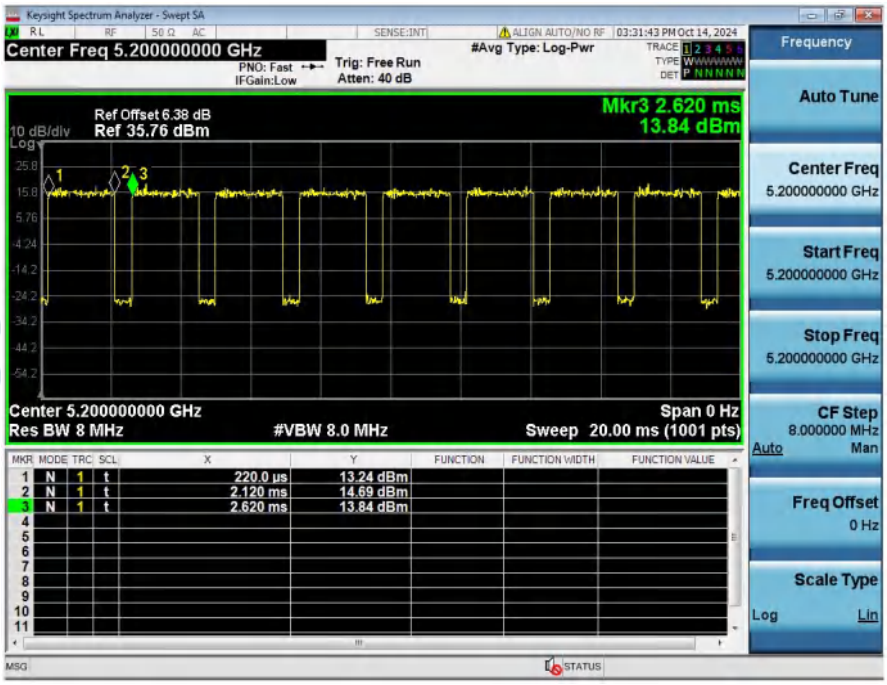
Duty_Cycle_NVNT_ANT1_802_11a_5240



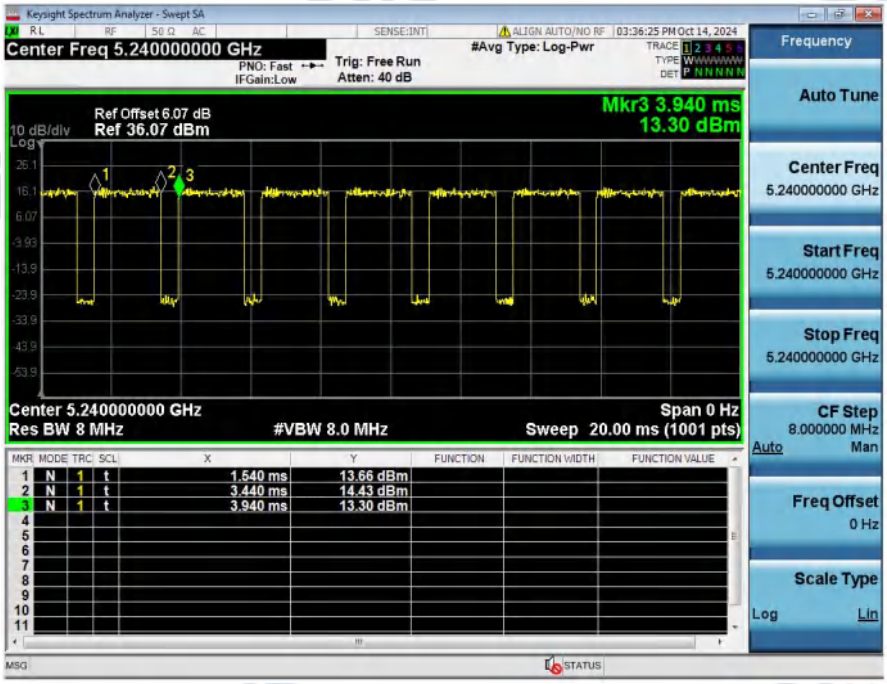
Duty_Cycle_NVNT_ANT1_802_11n(HT20)_5180



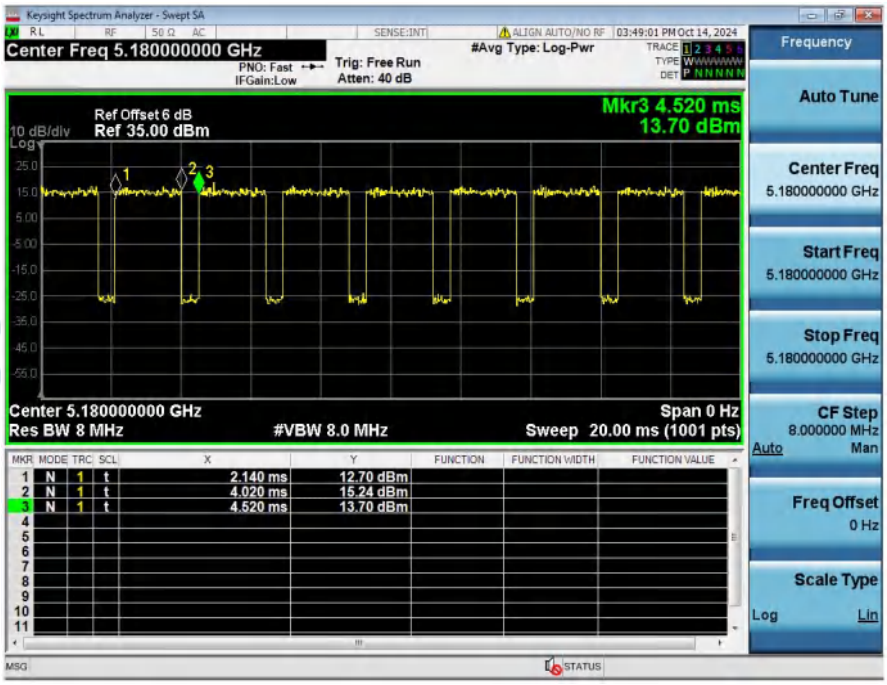
Duty_Cycle_NVNT_ANT1_802_11n(HT20)_5200



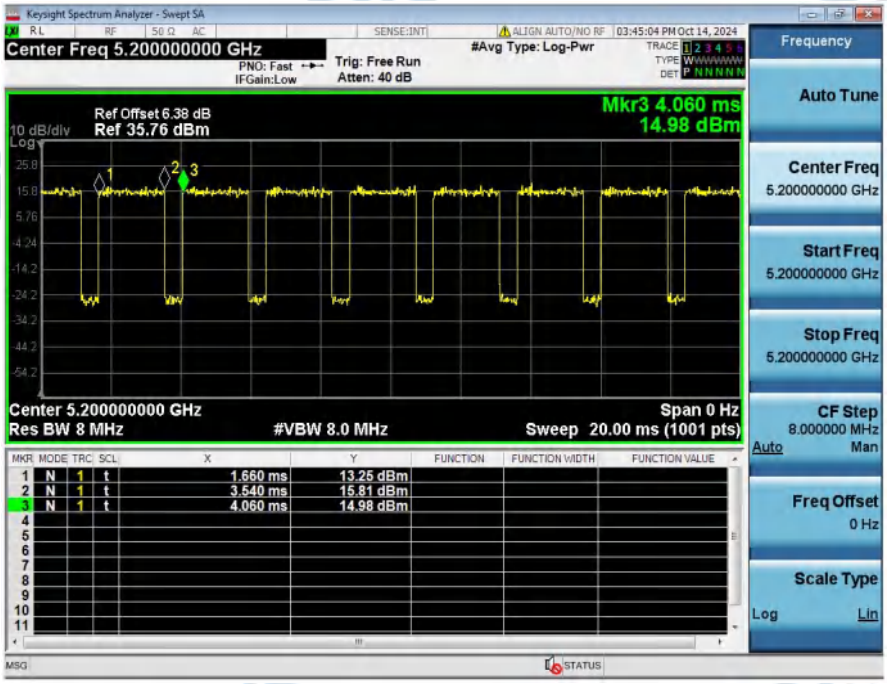
Duty_Cycle_NVNT_ANT1_802_11n(HT20)_5240



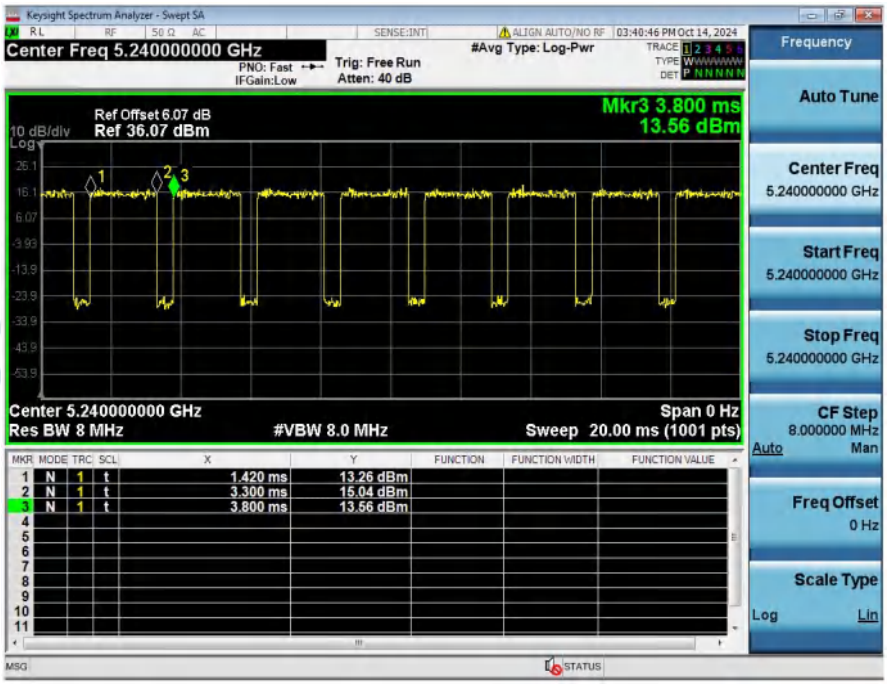
Duty_Cycle_NVNT_ANT1_802_11ac(VHT20)_5180



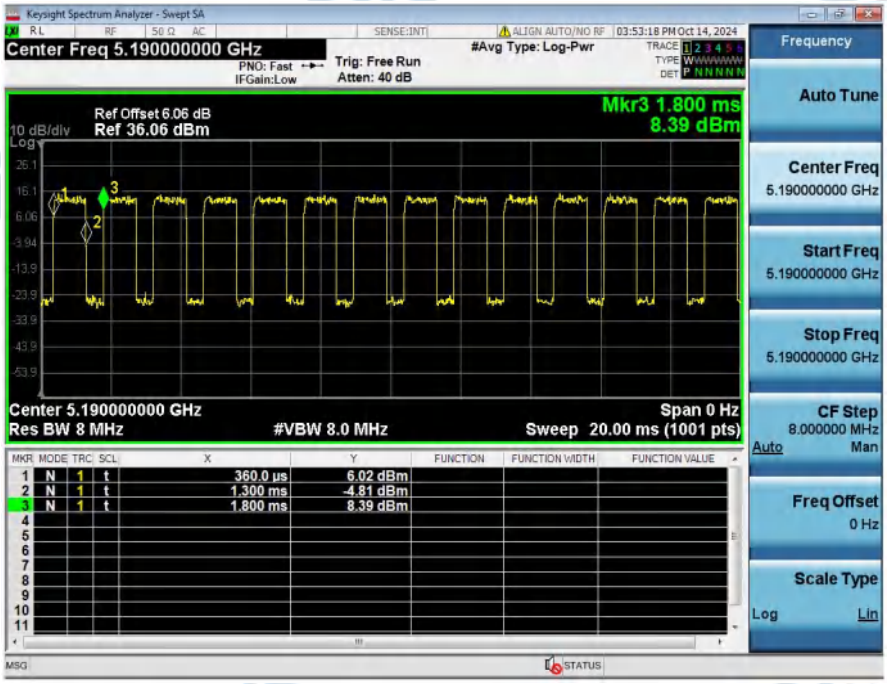
Duty_Cycle_NVNT_ANT1_802_11ac(VHT20)_5200



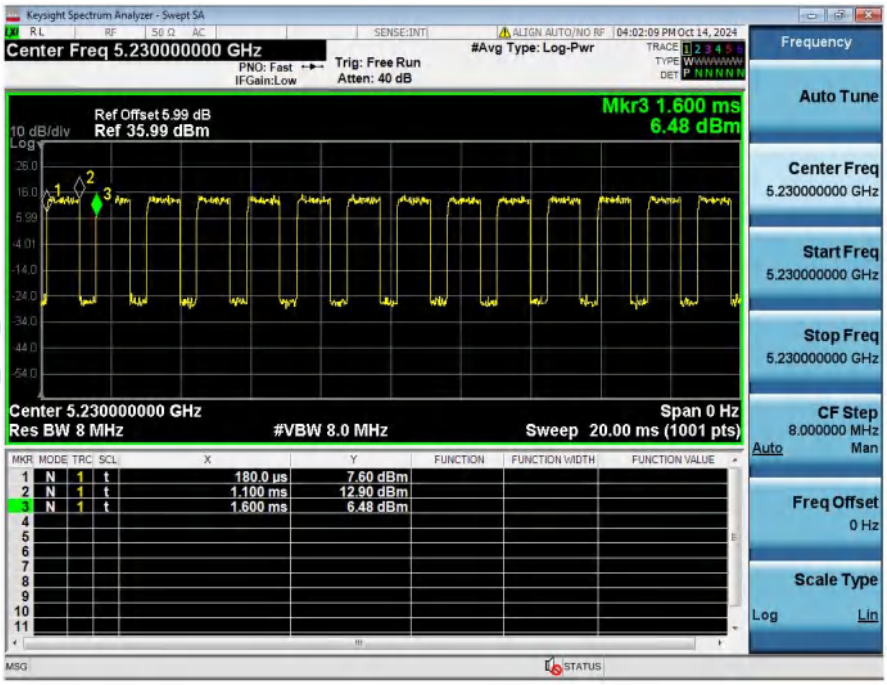
Duty_Cycle_NVNT_ANT1_802_11ac(VHT20)_5240



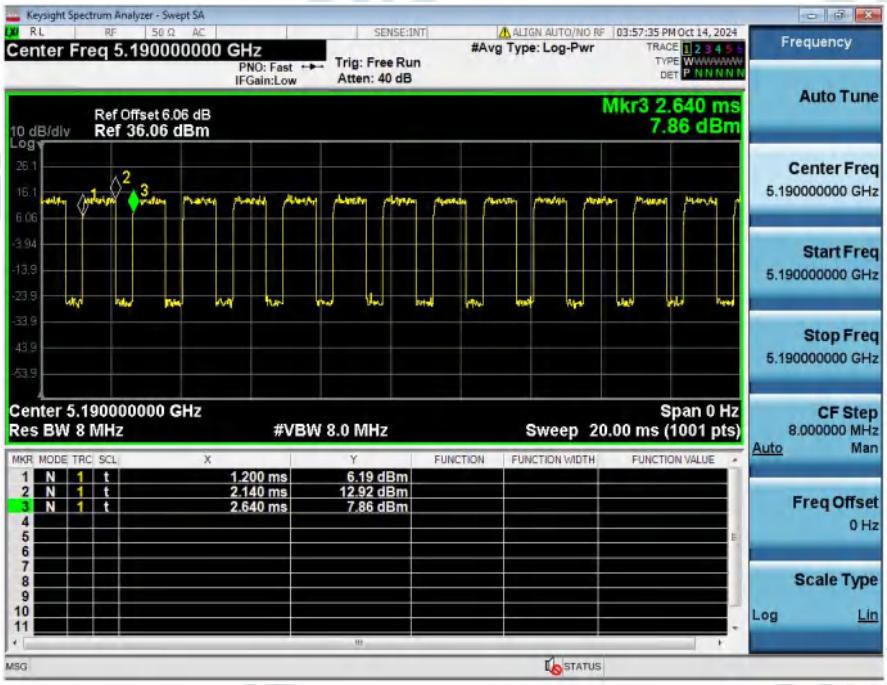
Duty_Cycle_NVNT_ANT1_802_11n(HT40)_5190



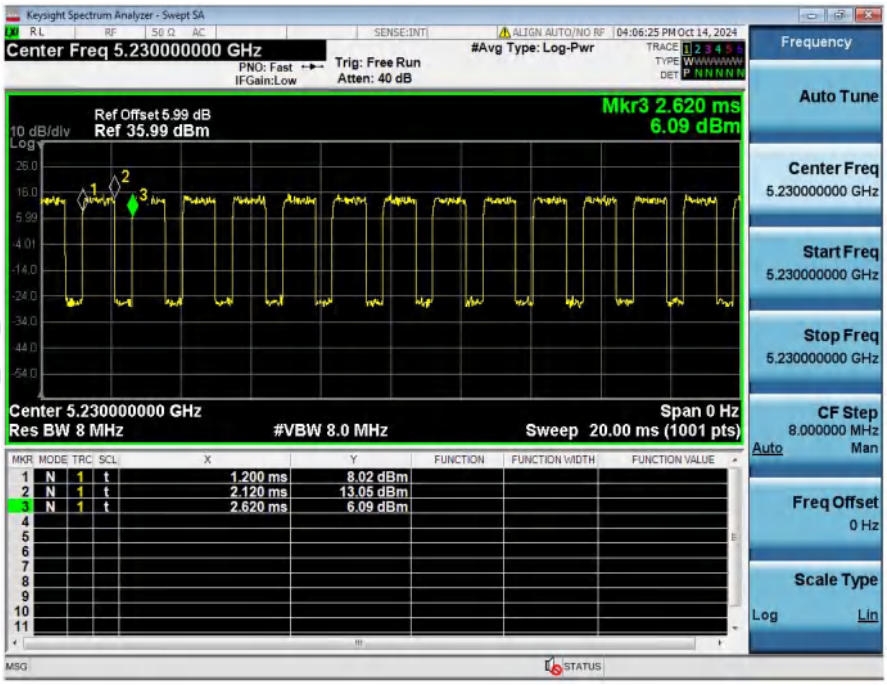
Duty_Cycle_NVNT_ANT1_802_11n(HT40)_5230



Duty_Cycle_NVNT_ANT1_802_11ac(VHT40)_5190



Duty_Cycle_NVNT_ANT1_802_11ac(VHT40)_5230



3. Maximum Conducted Output Power

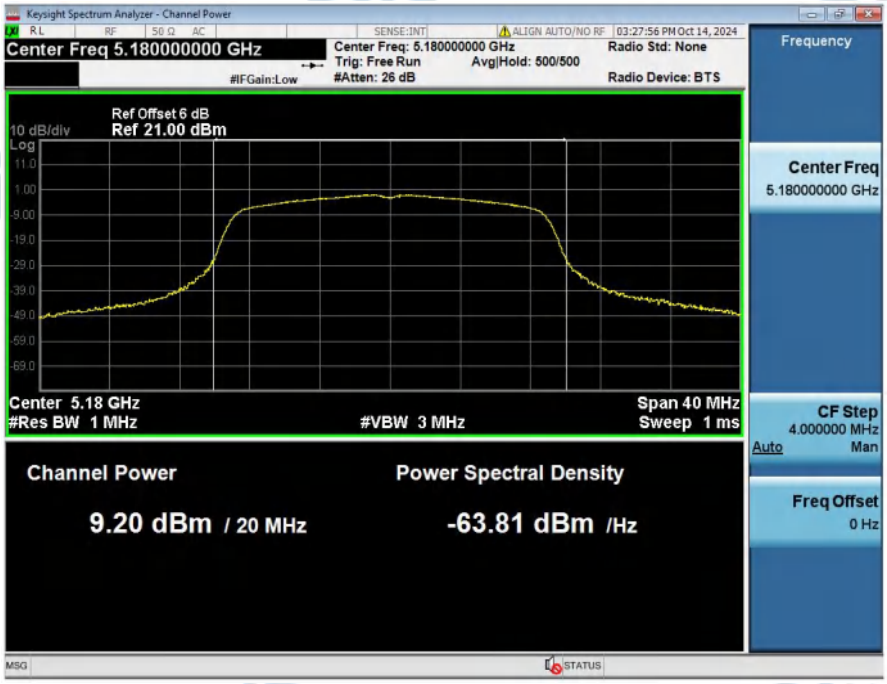
Condition	Antenna	Modulation	Frequency (MHz)	Conducted Power(dBm)	Duty factor(dB)	Total Power(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	10.28	0.95	11.23	24	Pass
NVNT	ANT1	802.11a	5200.00	10.65	0.96	11.61	24	Pass
NVNT	ANT1	802.11a	5240.00	10.46	0.99	11.45	24	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	9.20	1.02	10.22	24	Pass
NVNT	ANT1	802.11n(HT20)	5200.00	9.32	1.01	10.33	24	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	9.36	1.01	10.37	24	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	8.99	1.02	10.01	24	Pass
NVNT	ANT1	802.11ac(VHT20)	5200.00	9.48	1.06	10.54	24	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	9.31	1.02	10.33	24	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	8.12	1.85	9.97	24	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	8.27	1.89	10.16	24	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	8.24	1.85	10.09	24	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	8.34	1.89	10.23	24	Pass

Maximum_Conducted_Output_Power_NVNT_ANT1_802_11a_5180_20M

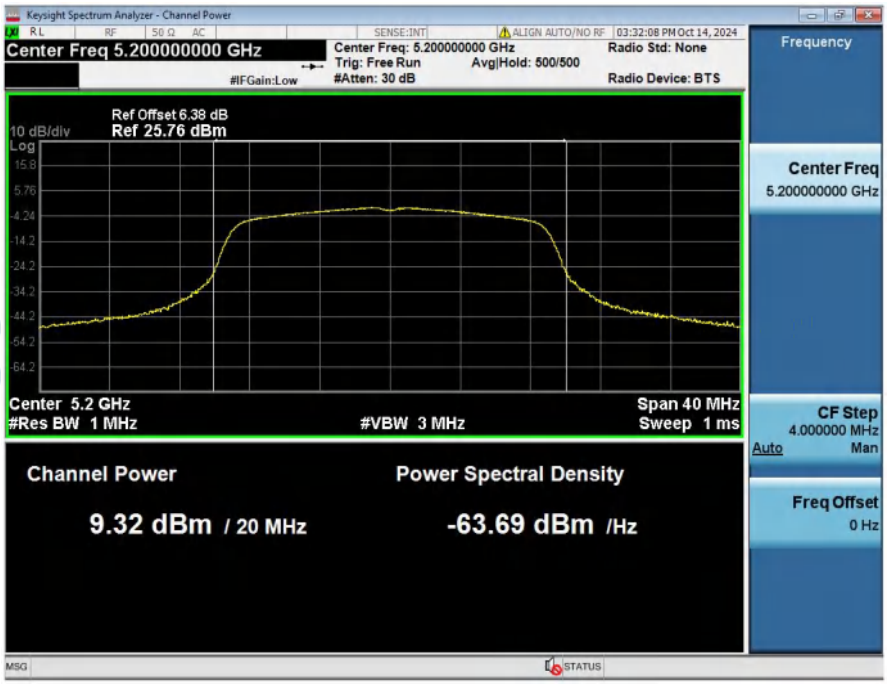
Maximum_Conducted_Output_Power_NVNT_ANT1_802_11a_5200_20M

Maximum_Conducted_Output_Power_NVNT_ANT1_802_11a_5240_20M

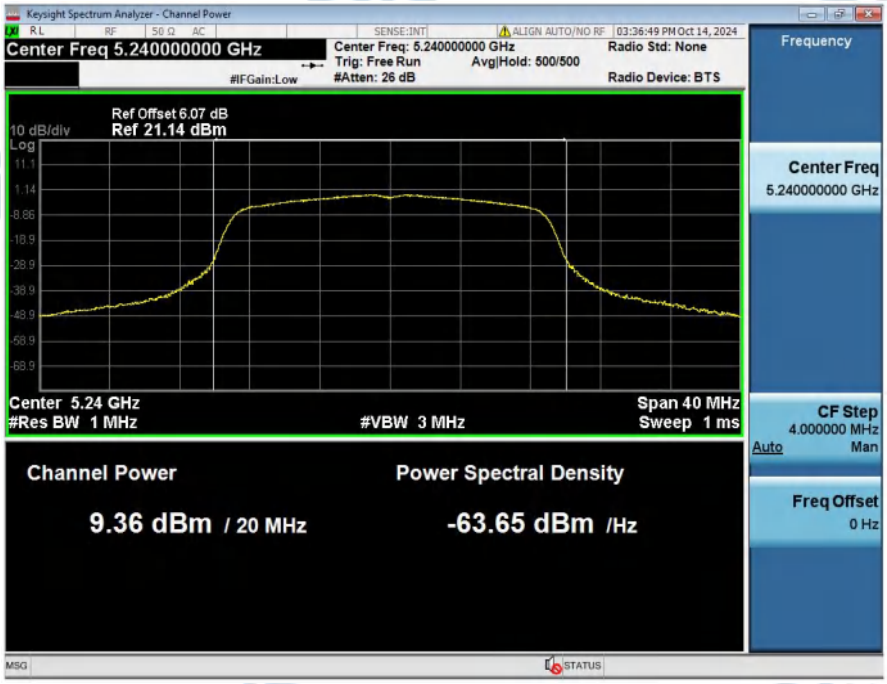
Maximum_Conducted_Output_Power_NVNT_ANT1_802_11n(HT20)_5180_20M



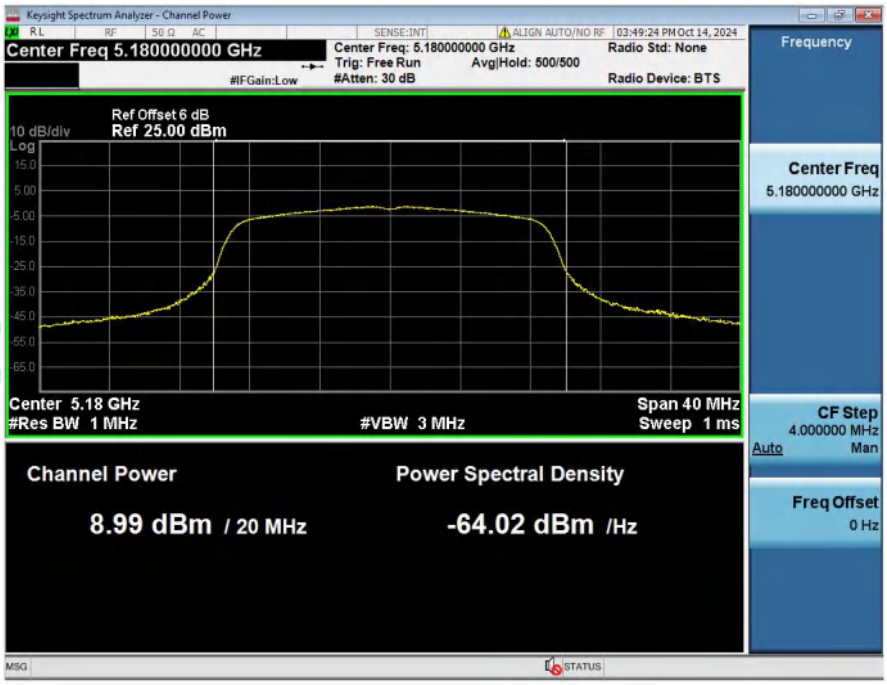
Maximum_Conducted_Output_Power_NVNT_ANT1_802_11n(HT20)_5200_20M



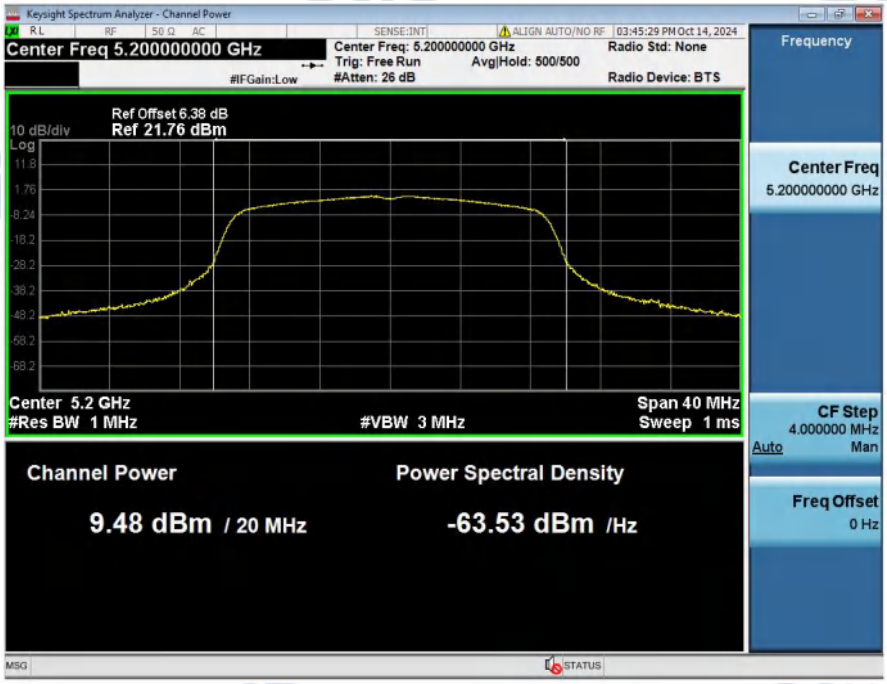
Maximum_Conducted_Output_Power_NVNT_ANT1_802_11n(HT20)_5240_20M



Maximum_Conducted_Output_Power_NVNT_ANT1_802_11ac(VHT20)_5180_20M



Maximum_Conducted_Output_Power_NVNT_ANT1_802_11ac(VHT20)_5200_20M



Maximum_Conducted_Output_Power_NVNT_ANT1_802_11ac(VHT20)_5240_20M

Maximum_Conducted_Output_Power_NVNT_ANT1_802_11n(HT40)_5190_40M

Maximum_Conducted_Output_Power_NVNT_ANT1_802_11n(HT40)_5230_40M

Maximum_Conducted_Output_Power_NVNT_ANT1_802_11ac(VHT40)_5190_40M

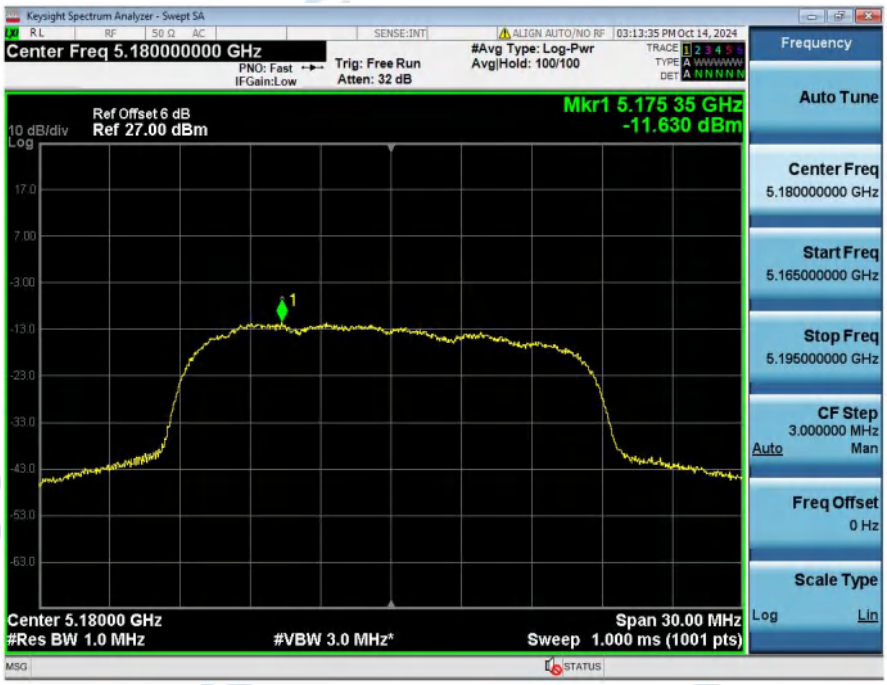
Maximum_Conducted_Output_Power_NVNT_ANT1_802_11ac(VHT40)_5230_40M

4. Power Spectral Density

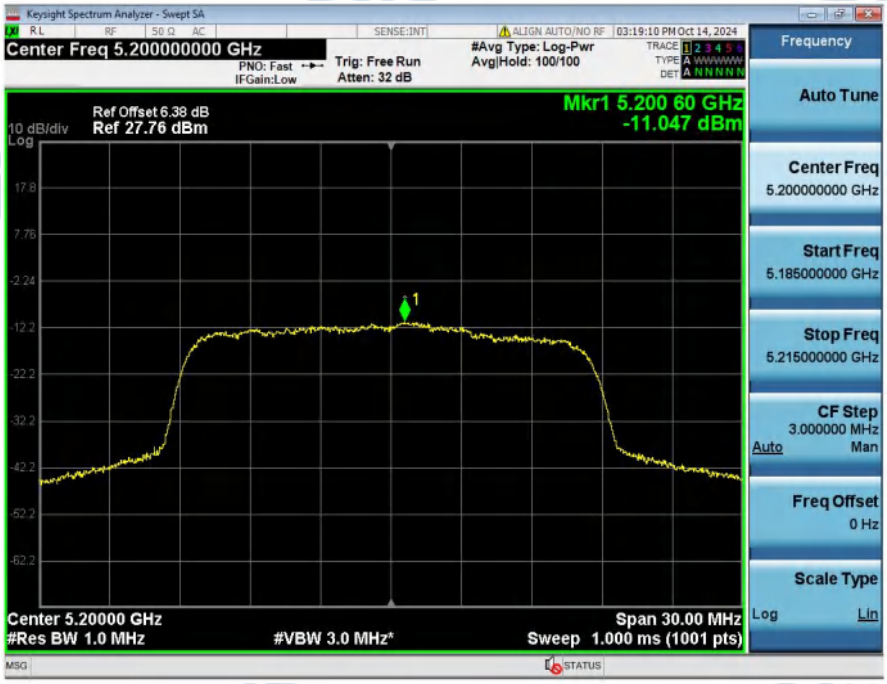
Condition	Antenna	Modulation	Frequency (MHz)	PSD(dBm/MHz)	Duty factor(dB)	Total PSD(dBm/MHz)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	-11.63	0.95	-10.68	11.00	Pass
NVNT	ANT1	802.11a	5200.00	-11.05	0.96	-10.09	11.00	Pass
NVNT	ANT1	802.11a	5240.00	-9.97	0.99	-8.98	11.00	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	-12.53	1.02	-11.51	11.00	Pass
NVNT	ANT1	802.11n(HT20)	5200.00	-12.09	1.01	-11.08	11.00	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	-11.24	1.01	-10.23	11.00	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	-13.11	1.02	-12.09	11.00	Pass
NVNT	ANT1	802.11ac(VHT20)	5200.00	-12.33	1.06	-11.27	11.00	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	-10.51	1.02	-9.49	11.00	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	-20.34	1.85	-18.49	11.00	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	-20.38	1.89	-18.49	11.00	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	-22.64	1.85	-20.79	11.00	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	-23.72	1.89	-21.83	11.00	Pass

Total PSD(dBm/MHz)=PSD(dBm/MHz)+Duty factor(dB)

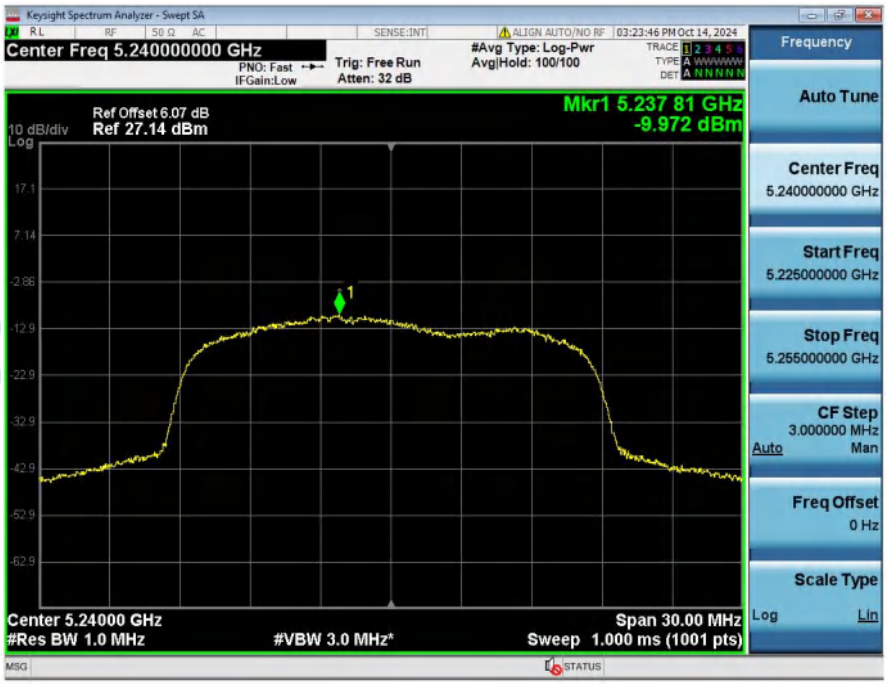
Power_Spectral_Density_NVNT_ANT1_802_11a_5180



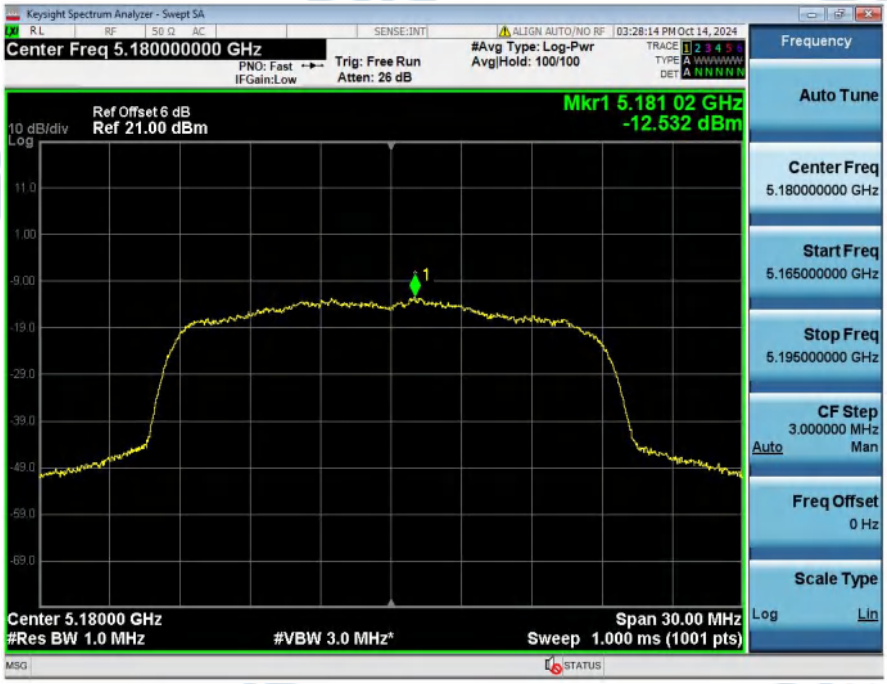
Power_Spectral_Density_NVNT_ANT1_802_11a_5200



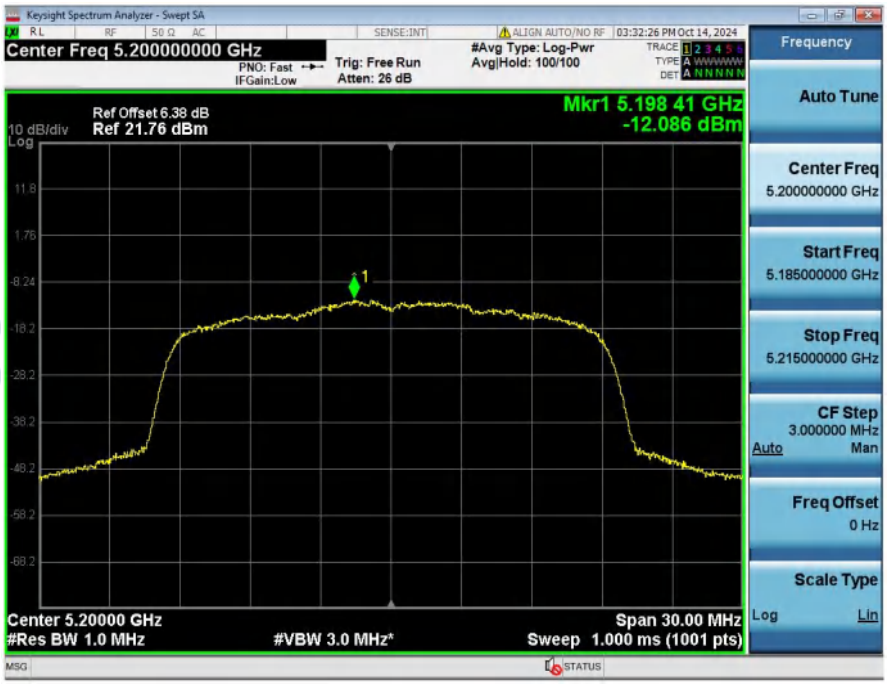
Power_Spectral_Density_NVNT_ANT1_802_11a_5240



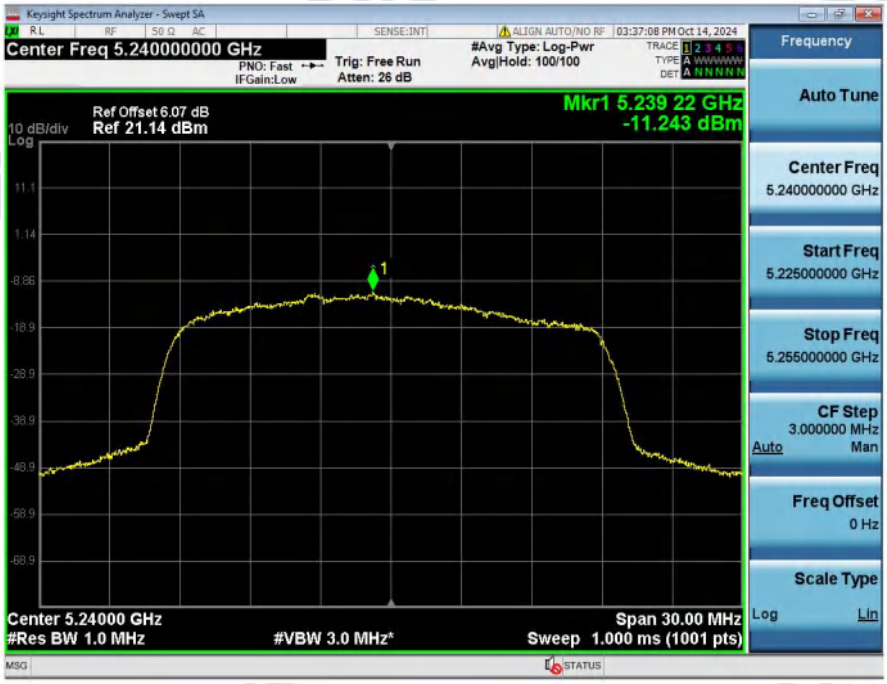
Power_Spectral_Density_NVNT_ANT1_802_11n(HT20)_5180



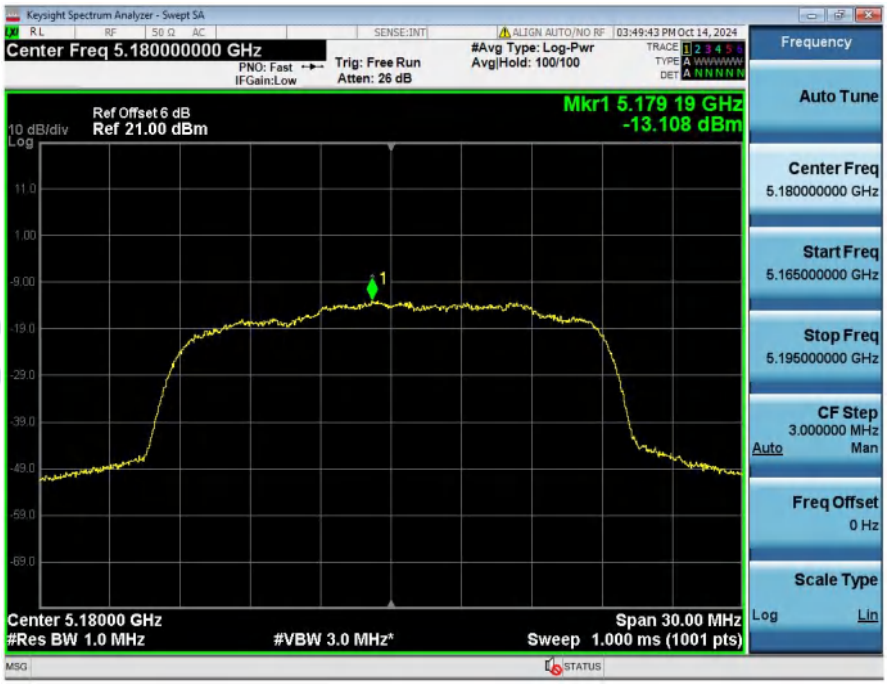
Power_Spectral_Density_NVNT_ANT1_802_11n(HT20)_5200



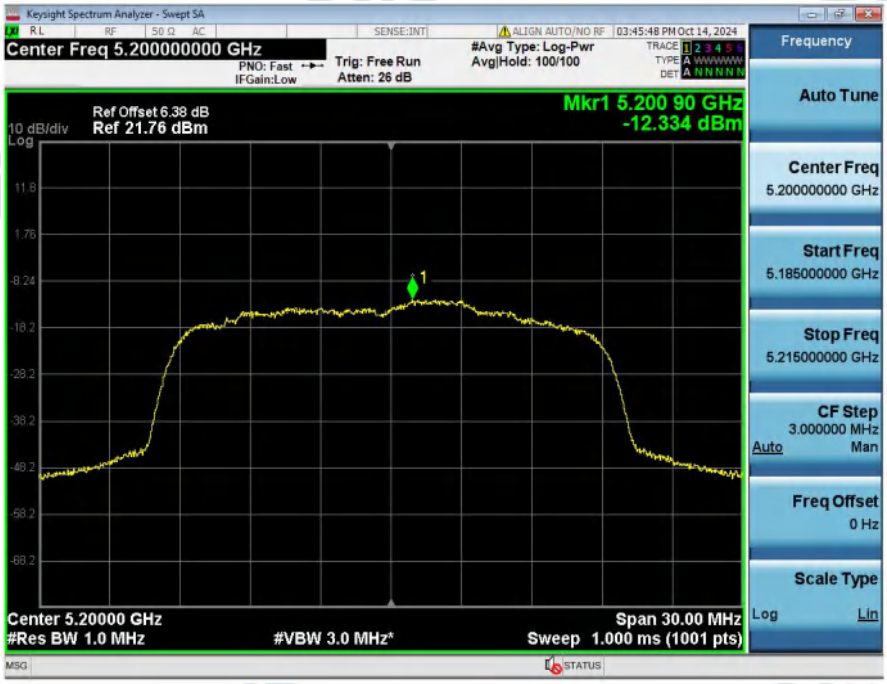
Power_Spectral_Density_NVNT_ANT1_802_11n(HT20)_5240



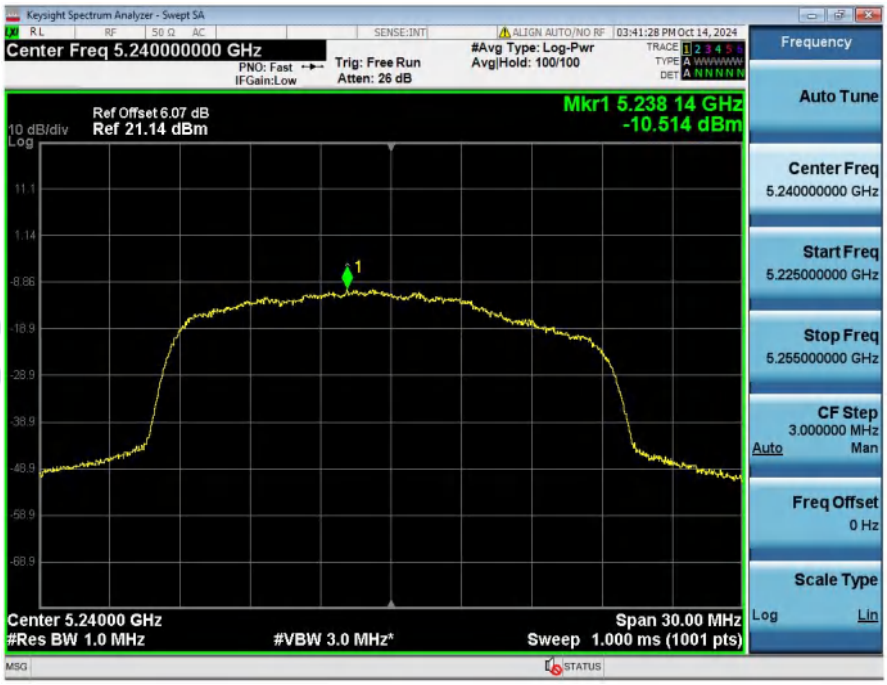
Power_Spectral_Density_NVNT_ANT1_802_11ac(VHT20)_5180



Power_Spectral_Density_NVNT_ANT1_802_11ac(VHT20)_5200



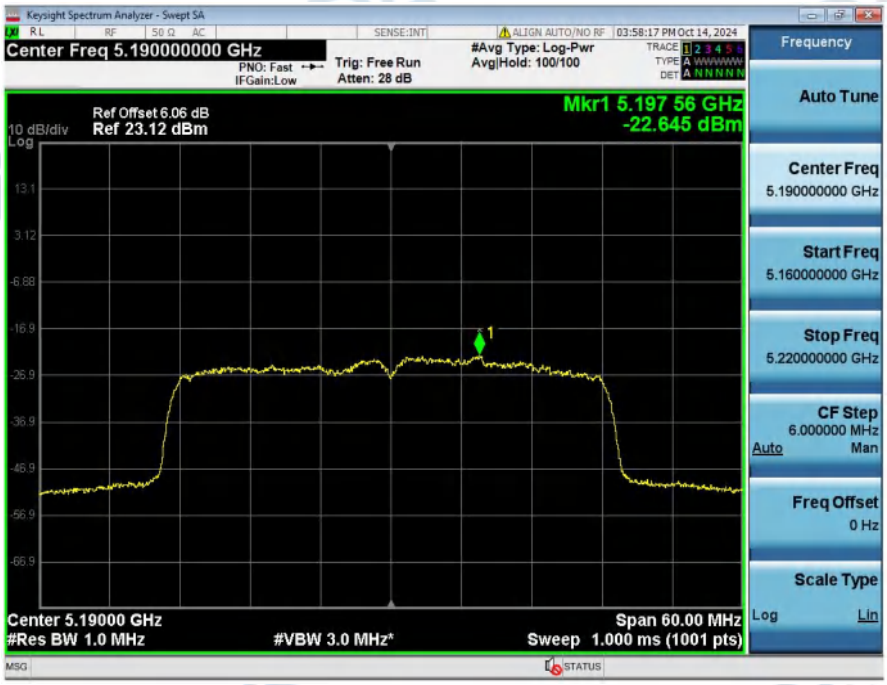
Power_Spectral_Density_NVNT_ANT1_802_11ac(VHT20)_5240



Power_Spectral_Density_NVNT_ANT1_802_11n(HT40)_5190

Power_Spectral_Density_NVNT_ANT1_802_11n(HT40)_5230

Power_Spectral_Density_NVNT_ANT1_802_11ac(VHT40)_5190



Power_Spectral_Density_NVNT_ANT1_802_11ac(VHT40)_5230

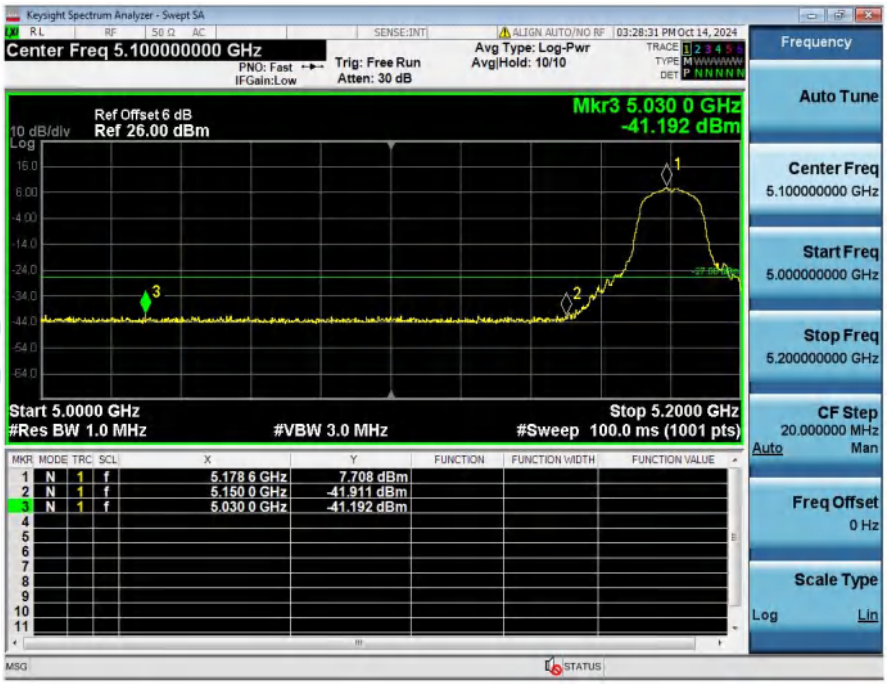
5. Bandedge

Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark Frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	5149.40	-39.26	-27	Pass
NVNT	ANT1	802.11a	5240.00	5351.40	-40.80	-27	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	5030.00	-41.19	-27	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	5391.40	-39.98	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	5148.40	-40.91	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	5358.80	-40.88	-27	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	5149.94	-36.59	-27	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	5358.68	-40.42	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	5148.89	-36.59	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	5406.98	-40.49	-27	Pass

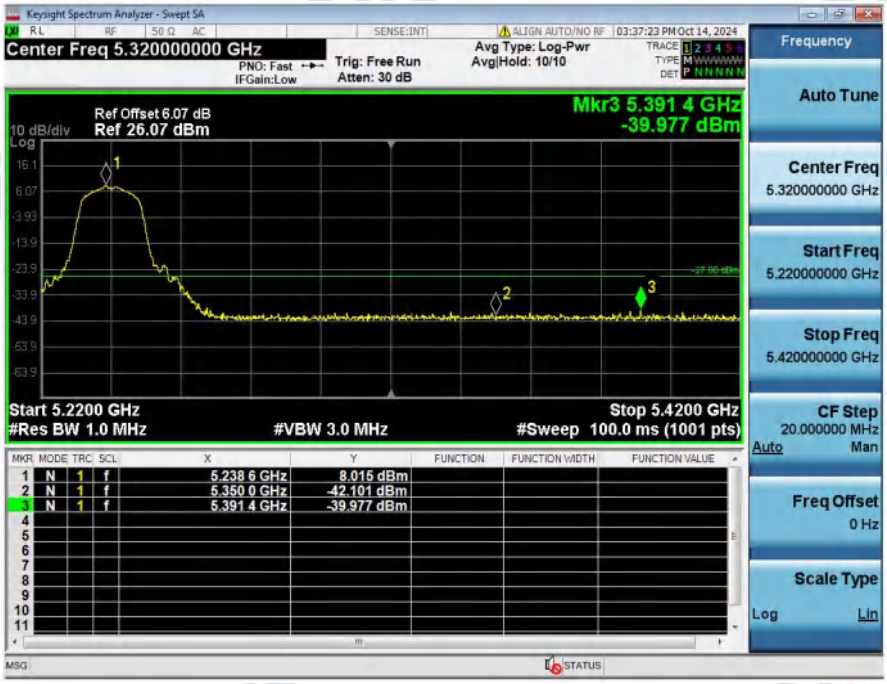
Bandedge_NVNT_ANT1_802_11a_5180

Bandedge_NVNT_ANT1_802_11a_5240

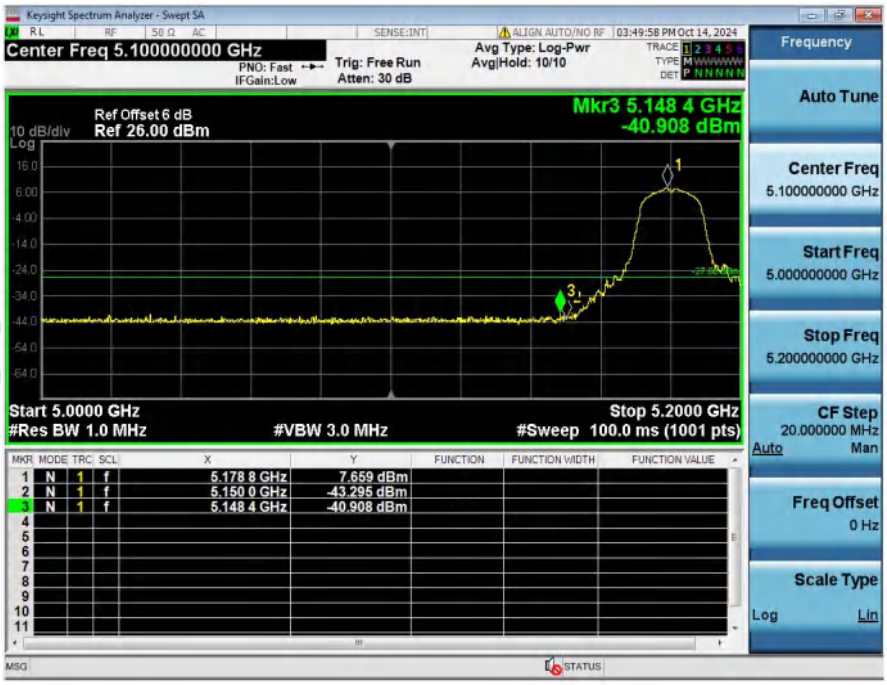
Bandedge_NVNT_ANT1_802_11n(HT20)_5180



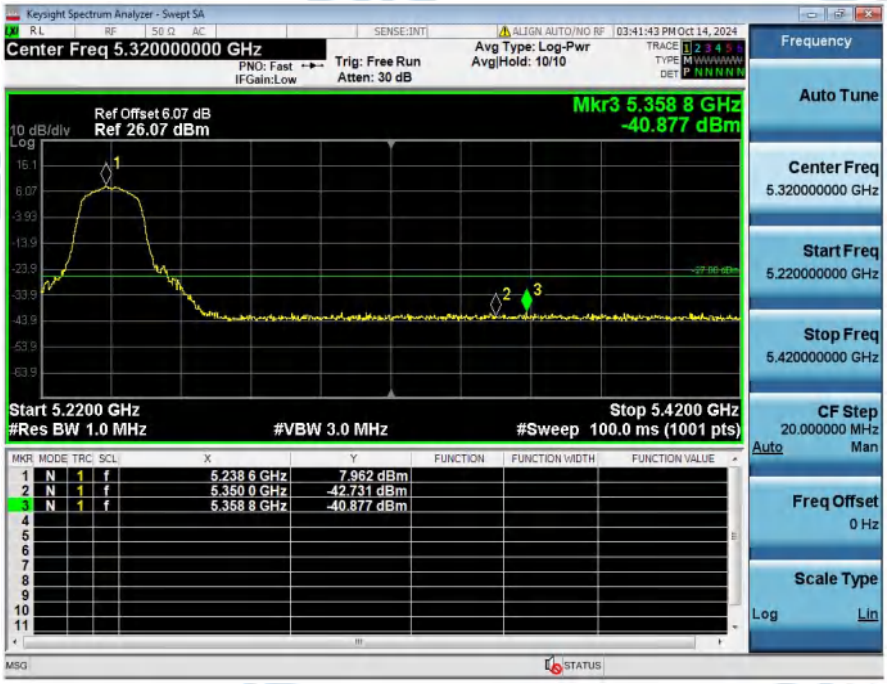
Bandedge_NVNT_ANT1_802_11n(HT20)_5240



Bandedge_NVNT_ANT1_802_11ac(VHT20)_5180



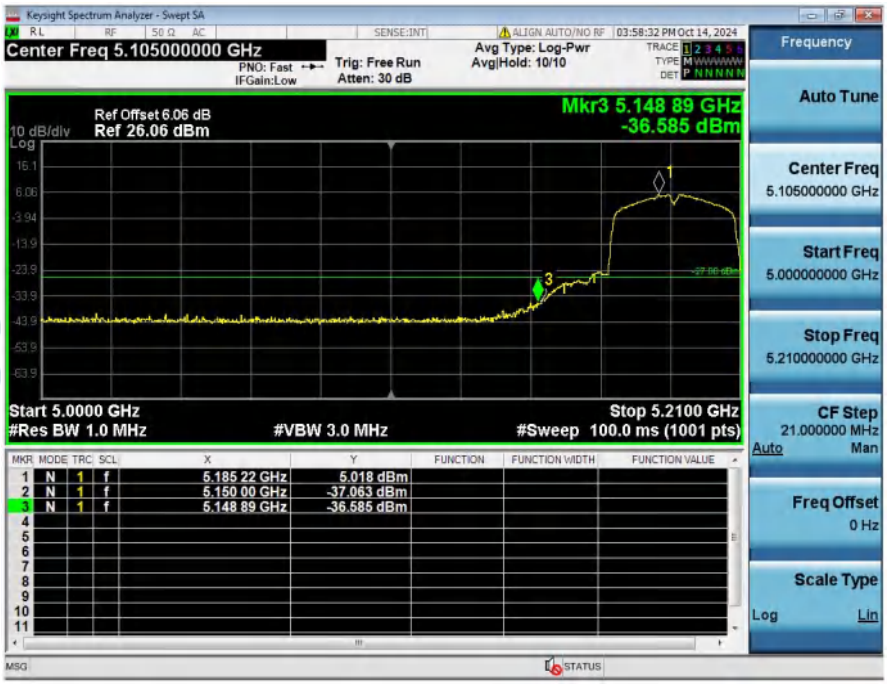
Bandedge_NVNT_ANT1_802_11ac(VHT20)_5240



Bandedge_NVNT_ANT1_802_11n(HT40)_5190

Bandedge_NVNT_ANT1_802_11n(HT40)_5230

Bandedge_NVNT_ANT1_802_11ac(VHT40)_5190



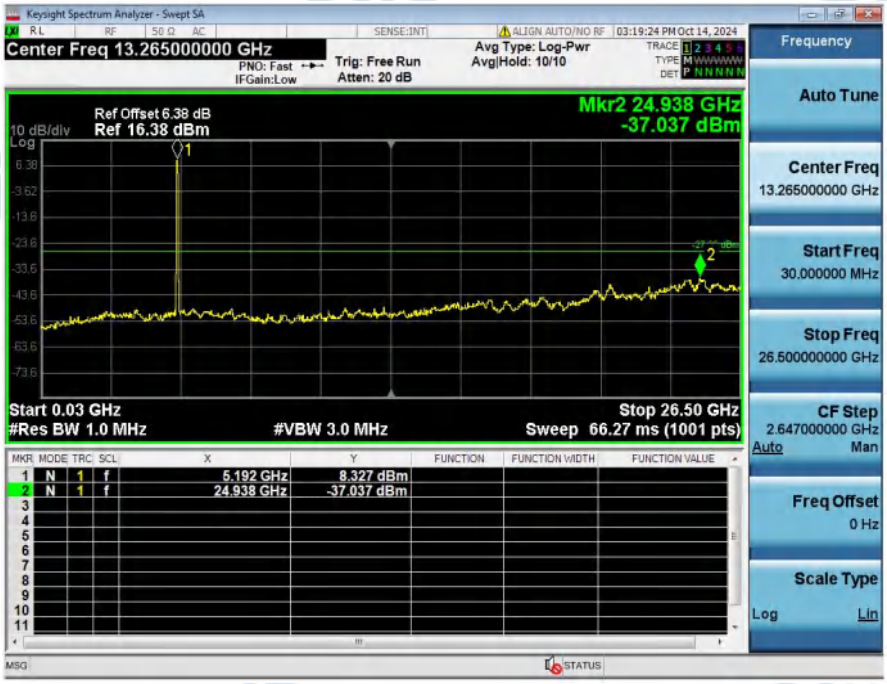
Bandedge_NVNT_ANT1_802_11ac(VHT40)_5230

6. Spurious Emission

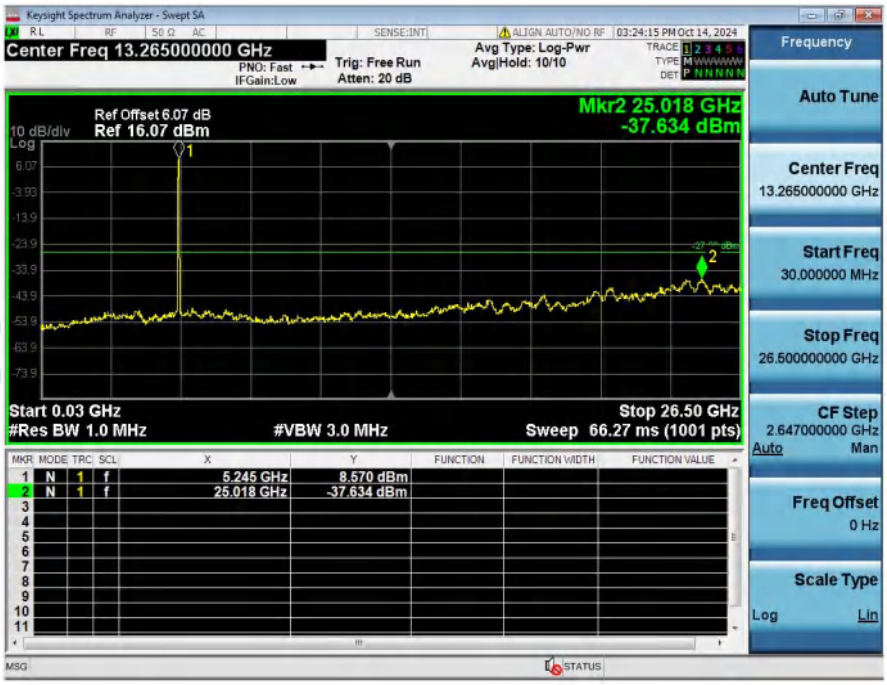
Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark Frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	24488.28	-37.62	-27	Pass
NVNT	ANT1	802.11a	5200.00	24938.27	-37.04	-27	Pass
NVNT	ANT1	802.11a	5240.00	25017.68	-37.63	-27	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	25070.62	-38.20	-27	Pass
NVNT	ANT1	802.11n(HT20)	5200.00	24991.21	-36.78	-27	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	25017.68	-37.39	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	25070.62	-37.01	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5200.00	24461.81	-36.81	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	25017.68	-37.28	-27	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	24964.74	-36.86	-27	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	24991.21	-36.57	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	24488.28	-36.77	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	24991.21	-36.87	-27	Pass

Spurious_Emission_NVNT_ANT1_802_11a_5180_20M

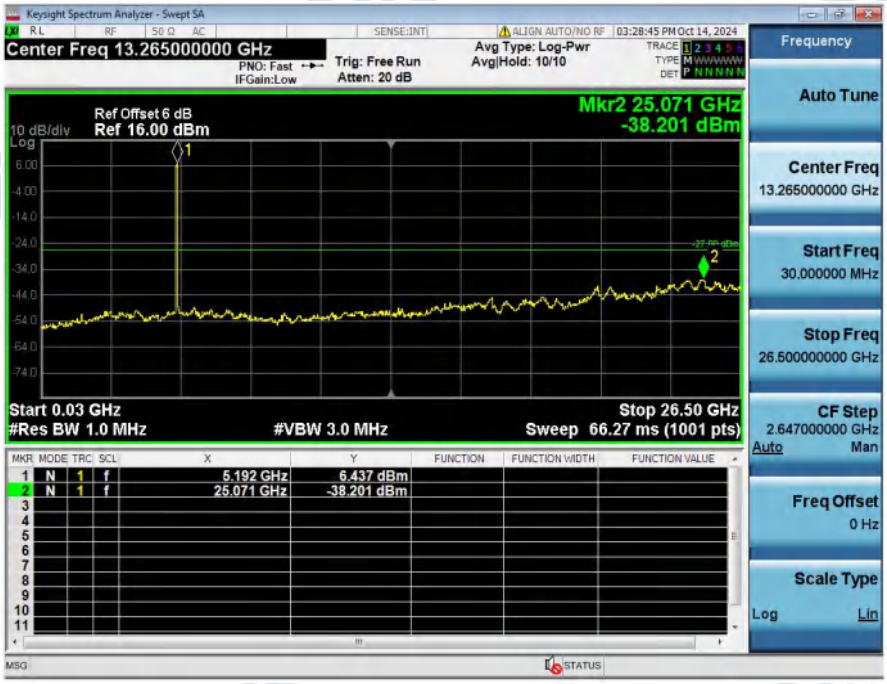
Spurious_Emission_NVNT_ANT1_802_11a_5200_20M



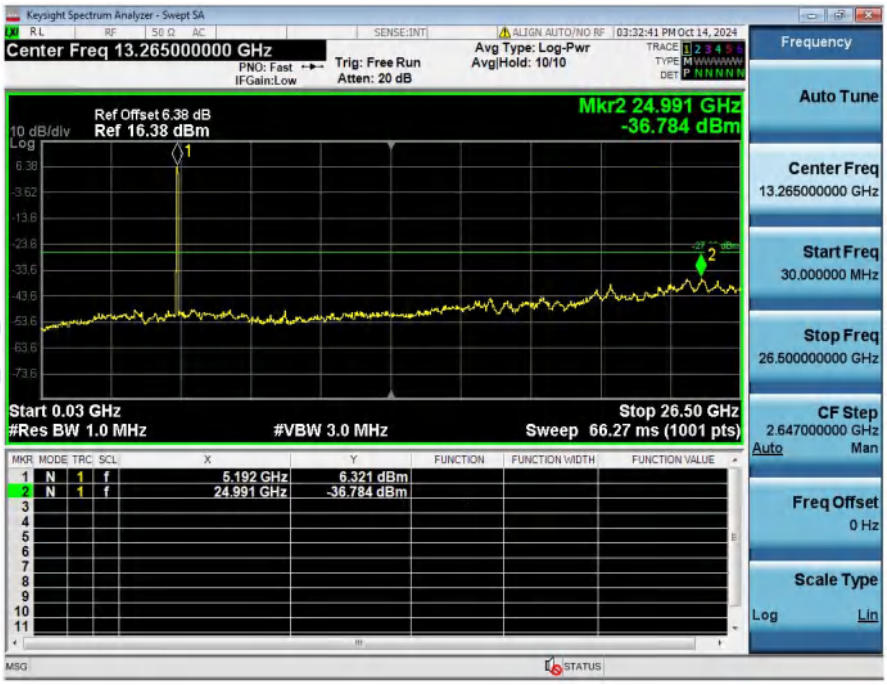
Spurious_Emission_NVNT_ANT1_802_11a_5240_20M



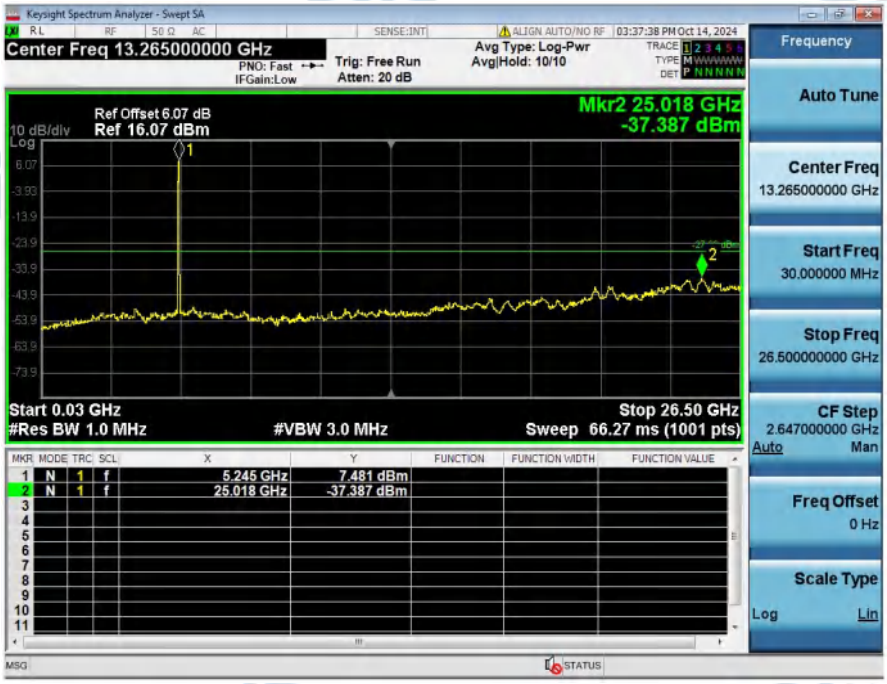
Spurious_Emission_NVNT_ANT1_802_11n(HT20)_5180_20M



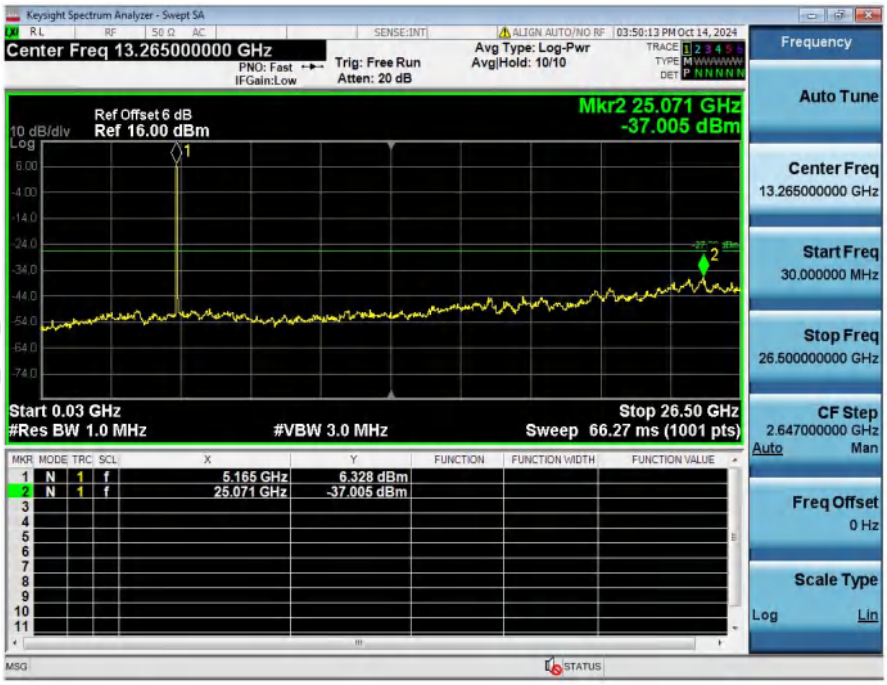
Spurious_Emission_NVNT_ANT1_802_11n(HT20)_5200_20M



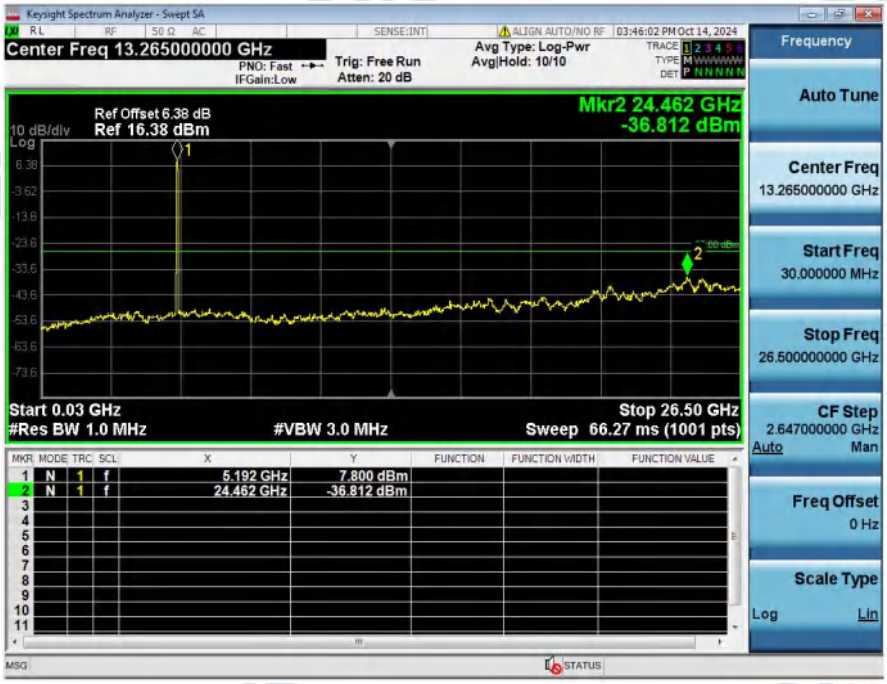
Spurious_Emission_NVNT_ANT1_802_11n(HT20)_5240_20M



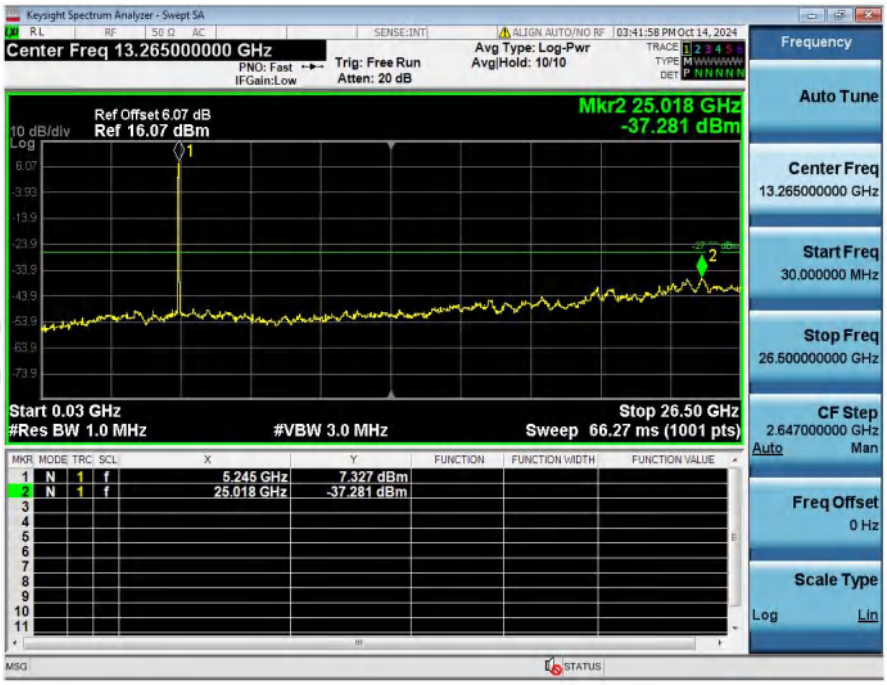
Spurious_Emission_NVNT_ANT1_802_11ac(VHT20)_5180_20M



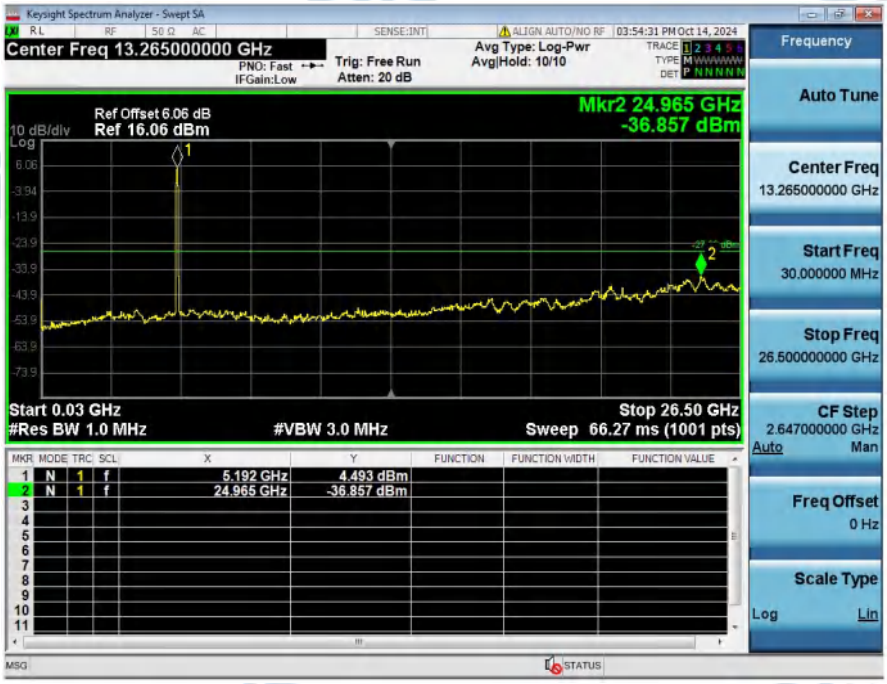
Spurious_Emission_NVNT_ANT1_802_11ac(VHT20)_5200_20M



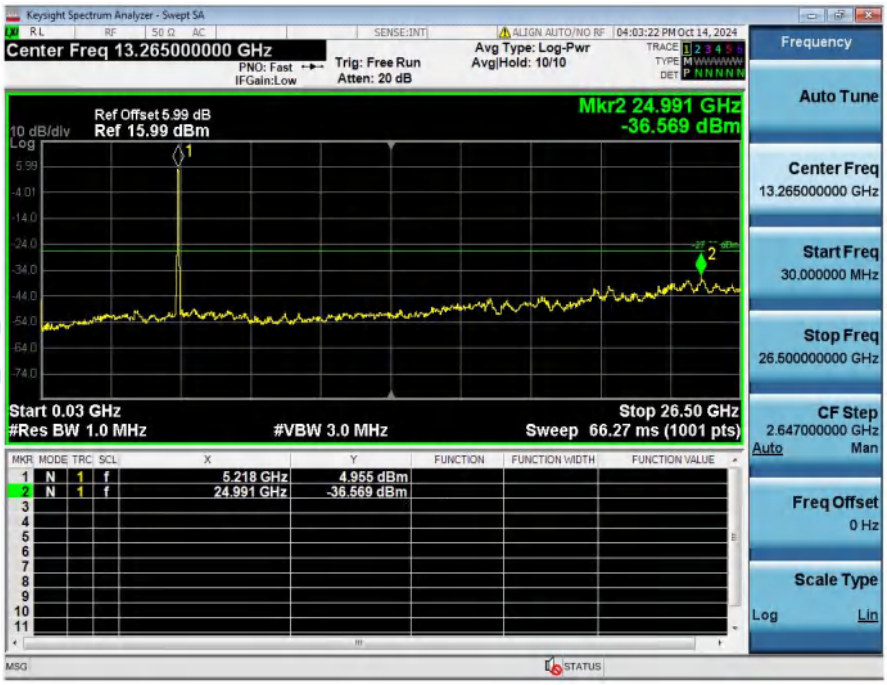
Spurious_Emission_NVNT_ANT1_802_11ac(VHT20)_5240_20M



Spurious_Emission_NVNT_ANT1_802_11n(HT40)_5190_40M

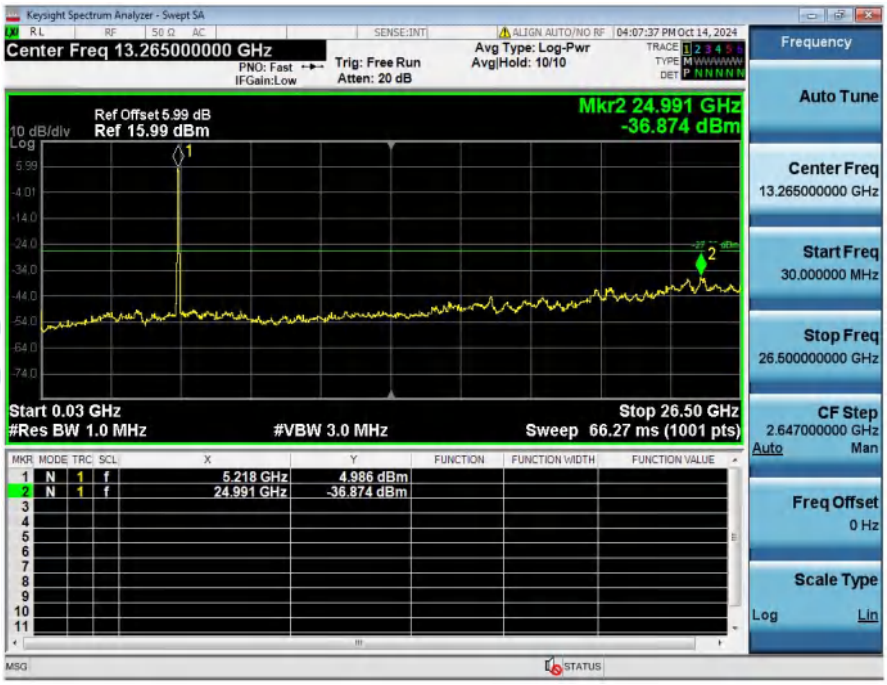


Spurious_Emission_NVNT_ANT1_802_11n(HT40)_5230_40M



Spurious_Emission_NVNT_ANT1_802_11ac(VHT40)_5190_40M

Spurious_Emission_NVNT_ANT1_802_11ac(VHT40)_5230_40M



7. Frequency Stability

Condition	Antenna	Modulation	Frequency (MHz)	Fc(MHz)	Fl(MHz)	Fh(MHz)	Limit(MHz)	Result
HTNV	ANT1	802.11a	5180.00	5180.020	5171.596	5188.444	5150~5250	Pass
NTNV	ANT1	802.11a	5180.00	5180.000	5172.060	5187.940	5150~5250	Pass
LTNV	ANT1	802.11a	5180.00	5180.002	5172.380	5187.624	5150~5250	Pass
NTHV	ANT1	802.11a	5180.00	5179.994	5172.456	5187.532	5150~5250	Pass
NTLV	ANT1	802.11a	5180.00	5179.996	5172.592	5187.400	5150~5250	Pass
HTNV	ANT1	802.11a	5200.00	5200.018	5191.584	5208.452	5150~5250	Pass
NTNV	ANT1	802.11a	5200.00	5200.000	5191.824	5208.176	5150~5250	Pass
LTNV	ANT1	802.11a	5200.00	5199.990	5191.948	5208.032	5150~5250	Pass
NTHV	ANT1	802.11a	5200.00	5199.990	5192.040	5207.940	5150~5250	Pass
NTLV	ANT1	802.11a	5200.00	5199.972	5192.132	5207.812	5150~5250	Pass
HTNV	ANT1	802.11a	5240.00	5240.024	5231.600	5248.448	5150~5250	Pass
NTNV	ANT1	802.11a	5240.00	5239.996	5231.828	5248.164	5150~5250	Pass
LTNV	ANT1	802.11a	5240.00	5239.998	5231.948	5248.048	5150~5250	Pass
NTHV	ANT1	802.11a	5240.00	5239.996	5232.044	5247.948	5150~5250	Pass
NTLV	ANT1	802.11a	5240.00	5239.976	5232.128	5247.824	5150~5250	Pass
HTNV	ANT1	802.11n(HT20)	5180.00	5179.980	5171.040	5188.920	5150~5250	Pass
NTNV	ANT1	802.11n(HT20)	5180.00	5179.976	5171.264	5188.688	5150~5250	Pass
LTNV	ANT1	802.11n(HT20)	5180.00	5179.992	5171.396	5188.588	5150~5250	Pass
NTHV	ANT1	802.11n(HT20)	5180.00	5179.986	5171.500	5188.472	5150~5250	Pass
NTLV	ANT1	802.11n(HT20)	5180.00	5179.998	5171.604	5188.392	5150~5250	Pass
HTNV	ANT1	802.11n(HT20)	5200.00	5199.964	5191.028	5208.900	5150~5250	Pass
NTNV	ANT1	802.11n(HT20)	5200.00	5199.986	5191.252	5208.720	5150~5250	Pass
LTNV	ANT1	802.11n(HT20)	5200.00	5199.976	5191.384	5208.568	5150~5250	Pass
NTHV	ANT1	802.11n(HT20)	5200.00	5199.988	5191.504	5208.472	5150~5250	Pass
NTLV	ANT1	802.11n(HT20)	5200.00	5200.000	5191.612	5208.388	5150~5250	Pass
HTNV	ANT1	802.11n(HT20)	5240.00	5239.992	5231.060	5248.924	5150~5250	Pass
NTNV	ANT1	802.11n(HT20)	5240.00	5239.986	5231.280	5248.692	5150~5250	Pass
LTNV	ANT1	802.11n(HT20)	5240.00	5239.984	5231.404	5248.564	5150~5250	Pass
NTHV	ANT1	802.11n(HT20)	5240.00	5239.980	5231.512	5248.448	5150~5250	Pass
NTLV	ANT1	802.11n(HT20)	5240.00	5239.990	5231.616	5248.364	5150~5250	Pass
HTNV	ANT1	802.11ac(VHT20)	5180.00	5180.000	5171.060	5188.940	5150~5250	Pass
NTNV	ANT1	802.11ac(VHT20)	5180.00	5180.000	5171.292	5188.708	5150~5250	Pass
LTNV	ANT1	802.11ac(VHT20)	5180.00	5179.996	5171.424	5188.568	5150~5250	Pass
NTHV	ANT1	802.11ac(VHT20)	5180.00	5180.010	5171.540	5188.480	5150~5250	Pass
NTLV	ANT1	802.11ac(VHT20)	5180.00	5180.026	5171.660	5188.392	5150~5250	Pass
HTNV	ANT1	802.11ac(VHT20)	5200.00	5199.992	5191.052	5208.932	5150~5250	Pass
NTNV	ANT1	802.11ac(VHT20)	5200.00	5199.988	5191.280	5208.696	5150~5250	Pass
LTNV	ANT1	802.11ac(VHT20)	5200.00	5199.998	5191.408	5208.588	5150~5250	Pass
NTHV	ANT1	802.11ac(VHT20)	5200.00	5199.990	5191.528	5208.452	5150~5250	Pass
NTLV	ANT1	802.11ac(VHT20)	5200.00	5200.004	5191.636	5208.372	5150~5250	Pass
HTNV	ANT1	802.11ac(VHT20)	5240.00	5239.986	5231.032	5248.940	5150~5250	Pass
NTNV	ANT1	802.11ac(VHT20)	5240.00	5239.980	5231.260	5248.700	5150~5250	Pass
LTNV	ANT1	802.11ac(VHT20)	5240.00	5239.990	5231.408	5248.572	5150~5250	Pass
NTHV	ANT1	802.11ac(VHT20)	5240.00	5239.980	5231.508	5248.452	5150~5250	Pass
NTLV	ANT1	802.11ac(VHT20)	5240.00	5240.000	5231.628	5248.372	5150~5250	Pass
HTNV	ANT1	802.11n(HT40)	5190.00	5189.988	5172.032	5207.944	5150~5250	Pass
NTNV	ANT1	802.11n(HT40)	5190.00	5190.020	5172.392	5207.648	5150~5250	Pass

LTNV	ANT1	802.11n(HT40)	5190.00	5190.024	5172.680	5207.368	5150~5250	Pass
NTHV	ANT1	802.11n(HT40)	5190.00	5190.040	5172.944	5207.136	5150~5250	Pass
NTLV	ANT1	802.11n(HT40)	5190.00	5190.052	5173.192	5206.912	5150~5250	Pass
HTNV	ANT1	802.11n(HT40)	5230.00	5229.992	5212.048	5247.936	5150~5250	Pass
NTNV	ANT1	802.11n(HT40)	5230.00	5230.012	5212.376	5247.648	5150~5250	Pass
LTNV	ANT1	802.11n(HT40)	5230.00	5230.004	5212.600	5247.408	5150~5250	Pass
NTHV	ANT1	802.11n(HT40)	5230.00	5229.992	5212.848	5247.136	5150~5250	Pass
NTLV	ANT1	802.11n(HT40)	5230.00	5230.012	5213.080	5246.944	5150~5250	Pass
HTNV	ANT1	802.11ac(VHT40)	5190.00	5189.984	5172.024	5207.944	5150~5250	Pass
NTNV	ANT1	802.11ac(VHT40)	5190.00	5189.972	5172.328	5207.616	5150~5250	Pass
LTNV	ANT1	802.11ac(VHT40)	5190.00	5189.976	5172.568	5207.384	5150~5250	Pass
NTHV	ANT1	802.11ac(VHT40)	5190.00	5189.988	5172.840	5207.136	5150~5250	Pass
NTLV	ANT1	802.11ac(VHT40)	5190.00	5189.960	5173.096	5206.824	5150~5250	Pass
HTNV	ANT1	802.11ac(VHT40)	5230.00	5229.996	5212.048	5247.944	5150~5250	Pass
NTNV	ANT1	802.11ac(VHT40)	5230.00	5230.016	5212.384	5247.648	5150~5250	Pass
LTNV	ANT1	802.11ac(VHT40)	5230.00	5229.992	5212.616	5247.368	5150~5250	Pass
NTHV	ANT1	802.11ac(VHT40)	5230.00	5230.024	5212.864	5247.184	5150~5250	Pass
NTLV	ANT1	802.11ac(VHT40)	5230.00	5230.012	5213.120	5246.904	5150~5250	Pass

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