FCC RADIO TEST REPORT
FCC ID: 2AONKFFRC10A

Product: Communication Station
Trade Mark: N/A
Model No.: FFRC10A
Family Model: N/A
Report No.: S20091801310001
Issue Date: 20 Oct. 2020

Prepared for

Shenzhen Qi Yuan Science and Technology Co., LTD.
1st Floor, Building #2 Galaxy Incubator #1 Yanan Road, Meiban Boulevard Longgang District, Shenzhen, Guangdong, China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.
1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District Shenzhen, Guangdong, China
Tel:400-800-6106 , 0755-3699-5508
Website:http://www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name ..... : Shenzhen Qi Yuan Science and Technology Co., LTD.

Address ..... : 1st Floor, Building #2 Galaxy Incubator #1 Yanan Road, Meiban Boulevard Longgang District, Shenzhen, Guangdong, China

Manufacturer's Name ..... : Shenzhen Qi Yuan Science and Technology Co., LTD.

Address ..... : 1st Floor, Building #2 Galaxy Incubator #1 Yanan Road, Meiban Boulevard Longgang District, Shenzhen, Guangdong, China

Product description

Product name..... : Communication Station

Model and/or type reference : FFRC10A

Family Model..... : N/A

Standards ..... : FCC Part15.407

Test procedure ..... ANSI C63.10-2013 and KDB 789033 D02 General UNII Test Procedures New Rules v02r01
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements/ the Industry Canada requirements.. And it is applicable only to the tested sample identified in the report.

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Date of Test .....

Date (s) of performance of tests..... 18 Sep. 2020 ~ 20 Oct. 2020

Date of Issue..... 20 Oct. 2020

Test Result..... **Pass**

Testing Engineer : Mary. Hu

(Mary Hu)

Technical Manager : Jasonchen

(Jason Chen)

Authorized Signatory : Alex

(Alex Li)

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Revision History

Report No.	Version	Description	Issued Date
S20091801310001	Rev.01	Initial issue of report	20 Oct, 2020

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.207	AC Power Line Conducted Emissions	PASS	
15.209(a), 15.407 (b)(1)	Spurious Radiated Emissions	PASS	
15.407 (a)	26 dB and 99% Emission Bandwidth	PASS	
15.407(e)	Minimum 6 dB bandwidth	N/A	
15.407 (a)	Maximum Conducted Output Power	PASS	
15.407 (b)(1)	Band Edge	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
15.407(g)	Frequency Stability Measurement	PASS	
15.407(h)	Dynamic Frequency Selection(DFS)	N/A	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) This device operates with a duty cycle greater than 99%

1.1 FACILITIES AND ACCREDITATIONS

FACILITIES

All measurement facilities used to collect the measurement data are located at
1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District
Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

CNAS-Lab.	:	The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005) The Certificate Registration Number is L5516.
IC-Registration		The Certificate Registration Number is 9270A. CAB identifier:CN0074
FCC- Accredited		Test Firm Registration Number: 463705. Designation Number: CN1184
A2LA-Lab.		The Certificate Registration Number is 4298.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).
Name of Firm	:	Shenzhen NTEK Testing Technology Co., Ltd.
Site Location	:	1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District Shenzhen, Guangdong, China

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	±2.80dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(30MHz~1GHz)	±2.64dB
5	All emissions, radiated(1GHz~6GHz)	±2.40dB
6	All emissions, radiated(＞6GHz)	±2.52dB
7	Temperature	±0.5°C
8	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Communication Station
Trade Mark	N/A
Model Name	FFRC10A
Family Model	N/A
Model Difference	N/A
FCC ID	2AONKFFRC10A
Product Description	

Mode Supported	☒802.11a ☒802.11n(HT20) ☒802.11n(HT40) ☒802.11ac(HT20) ☒802.11ac(HT40) ☒802.11ac(HT80)
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40/VHT80):NSS1, MCS0-MCS9
Modulation	OFDM with BPSK/QPSK/16QAM/64QAM
Operating Frequency Range	☒ U-NII-1: 5180 MHz ~5240MHz ☐ U-NII-2A: 5260MHz~5320MHz ☐ U-NII-2C: 5500MHz~5700MHz ☐ U-NII-3: 5745 MHz ~5825 MHz
Function:	☐Outdoor AP ☒Indoor AP ☐Fixed P2P ☐Client
Support TPC	☐YES ☒NO
Antenna Type	PCB printed antenna
Antenna Gain	Antenna 0: 3.22dBi; Antenna 1: 2.87dBi;
Smart system	☒SISO for 802.11a ☒MIMO for 802.11n/ac

Based on the application, features, or specification exhibited in User's Manual, More details of EUT technical specification, please refer to the User's Manual.

Ratings	☒DC supply: DC 3.6V from Battery DC 5V from Adapter
Adapter	☐Adapter supply:
Battery	DC 3.6V 6400mAh 23.04Wh
Connecting I/O Port(s)	Please refer to the User's Manual
HW Version	QYWM_SCH_2_0_V015
SW Version	1.0.7

Note:

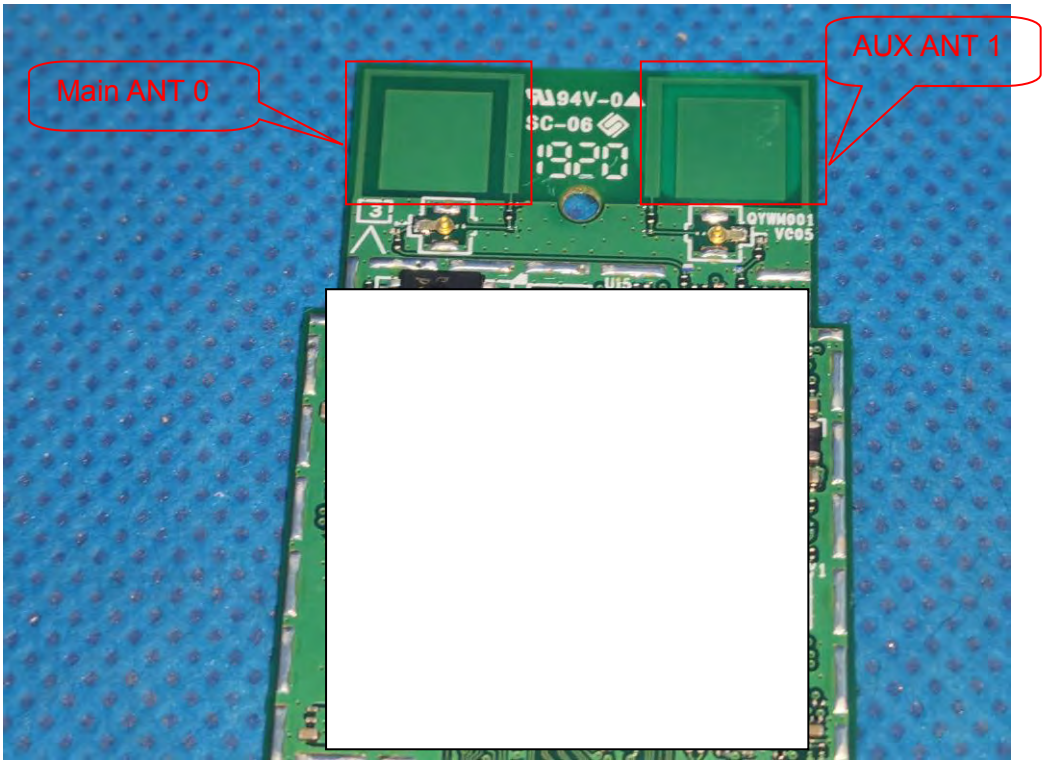
1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Frequency and Channel list:

Band	20MHz		40MHz		80MHz	
	Channel	Frequency	Channel	Frequency	Channel	Frequency
U-NII-1	36	5180 MHz	38	5190 MHz	42	5210 MHz
	40	5200 MHz	46	5230 MHz	-	-
	44	5220 MHz				
	48	5240 MHz				

The module for 5G WIFI has two antennas, and different modes support different transmit mode what describe as Following form:

Table for Filed Antenna

Antenna	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
0	N/A	N/A	PCB printed Antenna	IPEX	3.22	Wifi Antenna
1	N/A	N/A	PCB printed Antenna	IPEX	2.87	Wifi Antenna



The EUT has two antennas, and different modes support different transmit mode what describe as Following form:

Mode	Tx/Rx
802.11a/n/ac	1TX, 1RX
802.11n(20MHz,40MHz) ac(20MHz,40MHz, 80MHz)	2TX, 2RX

For 5GHz mode, Antenna 1,2 are transmitting, each with the same directional gain.
For MIMO mode, Directional gain=$[10\log(10^{G1/20}+10^{G2/20})^2/N_{ANT}]$dBi =6.06 dBi in 5GHz
the 802.11n(20/40) ac(20/40/80) 5GHz has MIMO mode.

Note: G1 means antenna gain for ANT 0 in 3.22dBi.
G2 means antenna gain for ANT 0 in 2.87dBi.
N_{ANT} means the number of Antennas.

2.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	Normal Link Mode
Mode 2	802.11a / n/ ac 20 CH36/ CH40/ CH 48
Mode 3	802.11n/ ac40 CH38/ CH 46
Mode 4	802.11 ac80 CH 42

For Radiated Emission	
Final Test Mode	Description
Mode 1	Normal Link Mode
Mode 2	802.11a / n/ ac 20 CH36/ CH40/ CH 48
Mode 3	802.11n/ ac40 CH38/ CH 46
Mode 4	802.11 ac80 CH 42

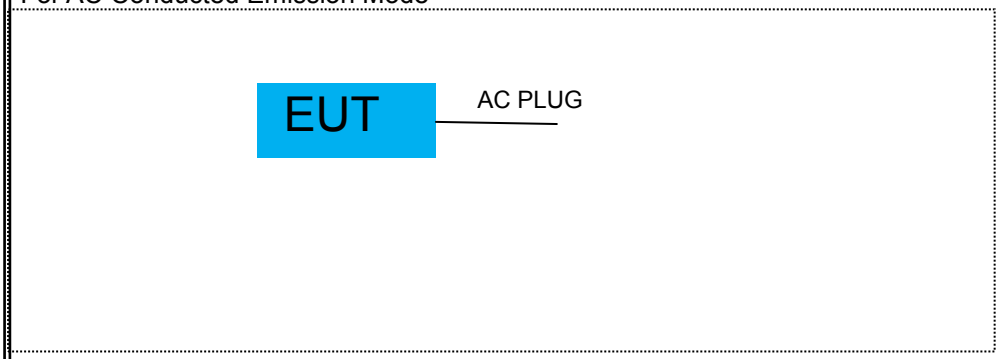
Note:

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

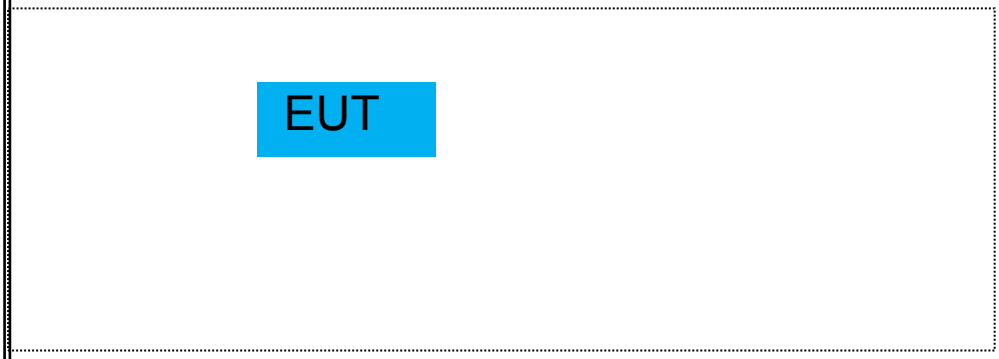
(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

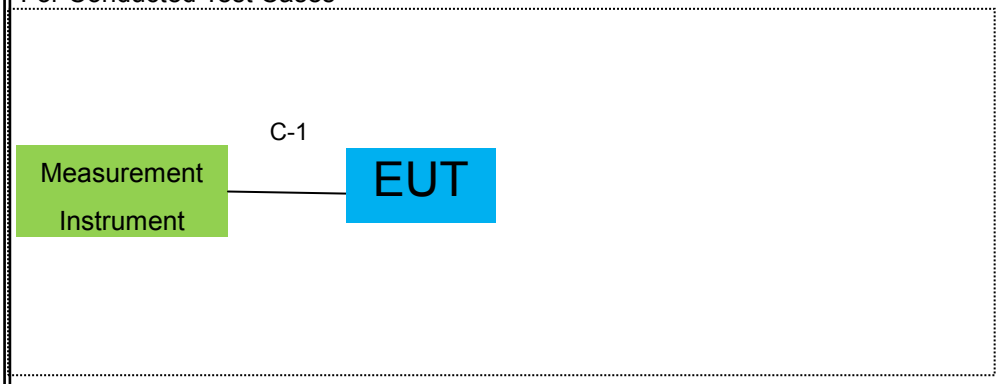
For AC Conducted Emission Mode



For Radiated Test Cases



For Conducted Test Cases



Note: 1. The temporary antenna connector is IPEX on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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

Item	Equipment	Brand	Model/Type No.	Series No.	Note

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	RF Cable	YES	NO	0.1m	

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation& Conducted Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Aglient	E4407B	MY45108040	2020.05.11	2021.05.10	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2020.05.11	2021.05.10	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2020.05.11	2021.05.10	1 year
4	Test Receiver	R&S	ESPI7	101318	2020.05.11	2021.05.10	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2020.05.11	2021.05.10	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.04.07	2023.04.06	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2020.04.11	2021.04.10	1 year
8	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2020.04.11	2021.04.10	1 year
9	Amplifier	EMC	EMC051835SE	980246	2020.05.11	2021.05.10	1 year
10	Active Loop Antenna	SCHWARZBECK	FMZB 1519 B	055	2020.04.11	2021.04.10	1 year
11	Power Meter	DARE	RPR3006W	15I00041SNO84	2020.05.11	2021.05.10	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2020.04.07	2023.04.06	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2020.04.07	2023.04.06	3 year
14	High Test Cable(1G-40GHz)	N/A	R-03	N/A	2020.04.07	2023.04.06	3 year
15	High Test Cable(1G-40GHz)	N/A	R-04	N/A	2020.04.07	2023.04.06	3 year
16	Filter	TRILTHIC	2400MHz	29	2020.04.07	2023.04.06	3 year
17	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A
18	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2020.05.11	2021.05.10	1 year

Note:
We will use the temporary antenna connector (soldered on the PCB board) When conducted test
And this temporary antenna connector is listed within the instrument list

AC Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2020.05.11	2021.05.10	1 year
2	LISN	R&S	ENV216	101313	2020.04.11	2021.04.10	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2020.05.11	2021.05.10	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2020.04.07	2023.04.06	3 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2020.04.07	2023.04.06	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2020.04.07	2023.04.06	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2020.04.07	2023.04.06	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& Aux Equipment which is scheduled for calibration every 3 years.

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

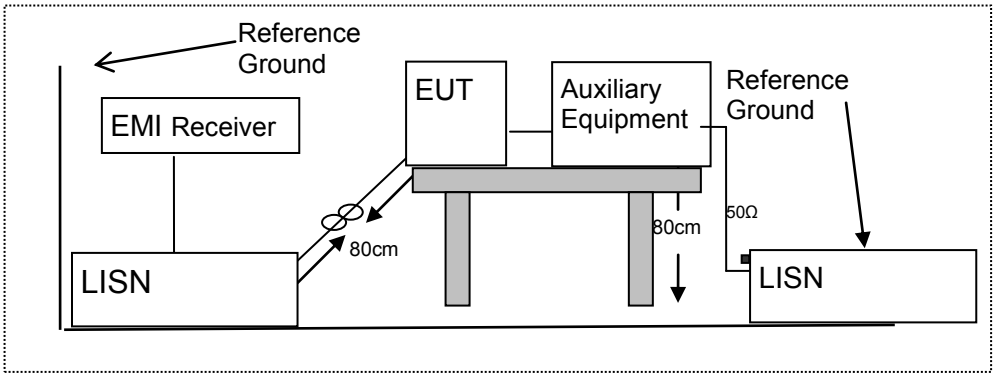
3.1.1 APPLICABLE STANDARD

According to FCC Part 15.207(a)

3.1.2 CONFORMANCE LIMIT

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56*	56-46*
0.5-5.0	56	46
5.0-30.0	60	50
Note: 1. *Decreases with the logarithm of the frequency 2. The lower limit shall apply at the transition frequencies 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

3.1.3 TEST CONFIGURATION



3.1.4 TEST PROCEDURE

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

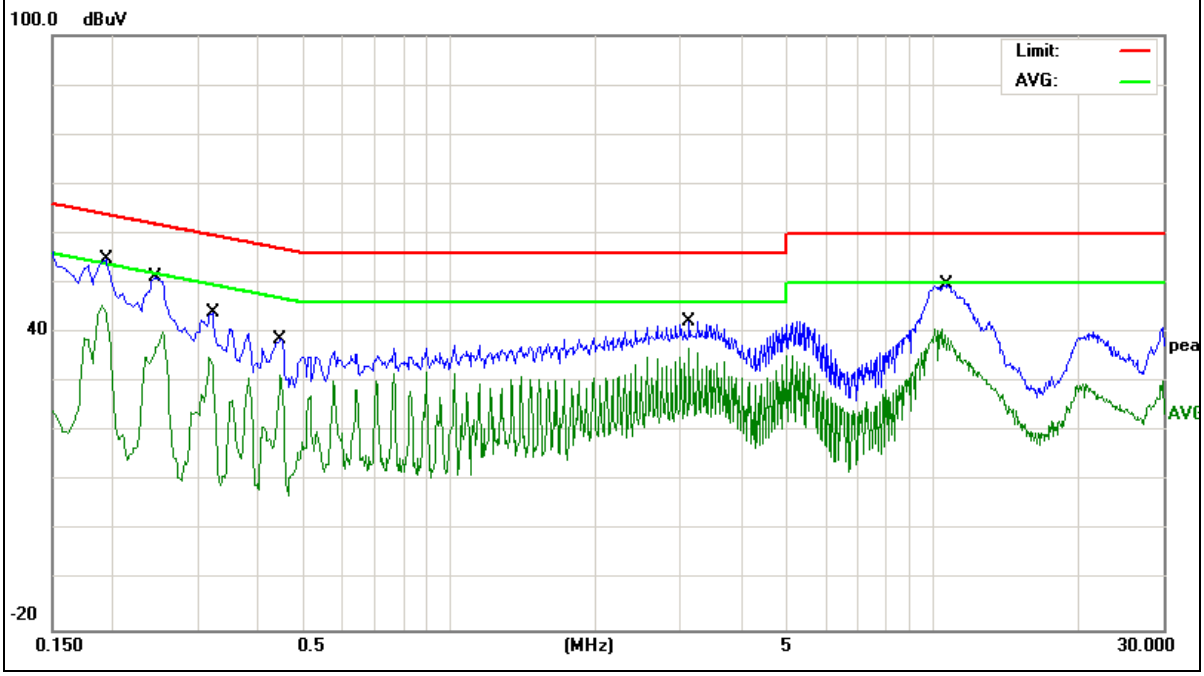
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	22 ℃	Relative Humidity：	59%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from Adapter AC 230V/50Hz	Test Mode：	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1940	45.05	9.76	54.81	63.86	-9.05	QP
0.1940	35.75	9.76	45.51	53.86	-8.35	AVG
0.2460	41.36	9.76	51.12	61.89	-10.77	QP
0.2460	30.26	9.76	40.02	51.89	-11.87	AVG
0.3220	34.25	9.74	43.99	59.65	-15.66	QP
0.3220	25.18	9.74	34.92	49.65	-14.73	AVG
0.4460	29.00	9.74	38.74	56.95	-18.21	QP
0.4460	21.80	9.74	31.54	46.95	-15.41	AVG
3.1340	32.50	9.83	42.33	56.00	-13.67	QP
3.1340	26.98	9.83	36.81	46.00	-9.19	AVG
10.6739	39.68	10.02	49.70	60.00	-10.30	QP
10.6739	30.64	10.02	40.66	50.00	-9.34	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

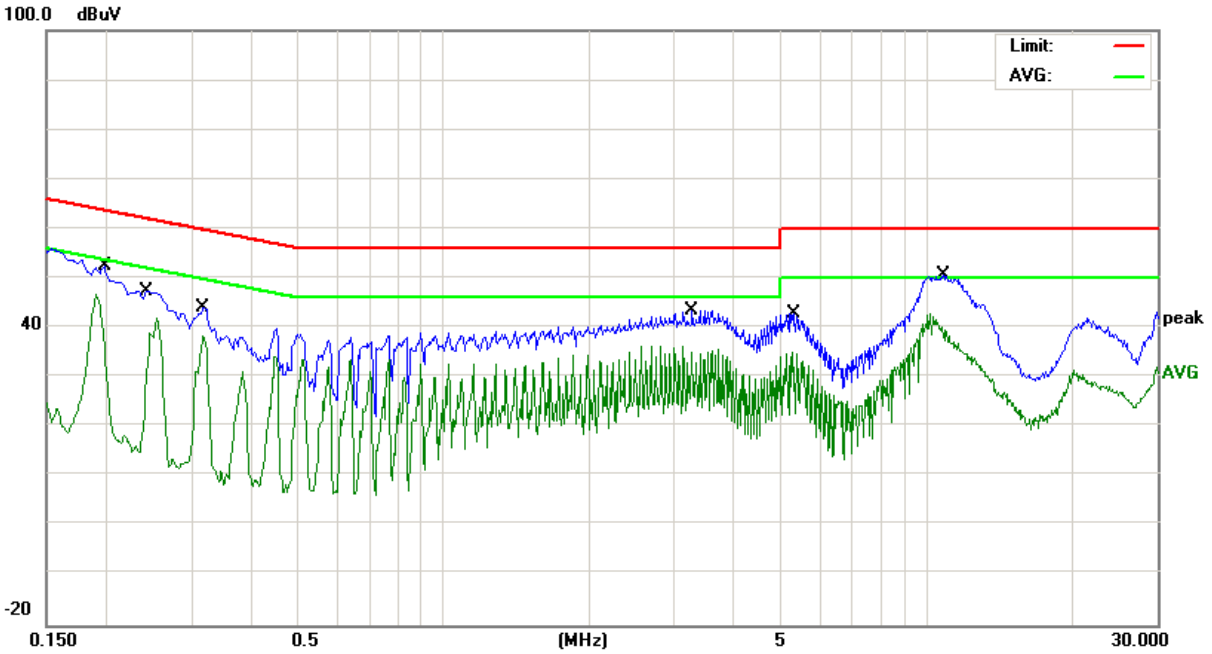


EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	22 ℃	Relative Humidity：	59%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from Adapter AC 230V/50Hz	Test Mode：	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1658	52.43	9.73	62.16	79	-16.84	QP
0.1658	38.43	9.73	48.16	66	-17.84	AVG
0.2139	49.64	9.73	59.37	79	-19.63	QP
0.2139	35.56	9.73	45.29	66	-20.71	AVG
0.2655	49.53	9.74	59.27	79	-19.73	QP
0.2655	36.26	9.74	46	66	-20	AVG
0.313	46.71	9.74	56.45	79	-22.55	QP
0.313	32.1	9.74	41.84	66	-24.16	AVG
0.3729	43.54	9.75	53.29	79	-25.71	QP
0.3729	31.28	9.75	41.03	66	-24.97	AVG
0.4889	38.87	9.75	48.62	79	-30.38	QP
0.4889	28.34	9.75	38.09	66	-27.91	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

3.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	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			

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

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	24000/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

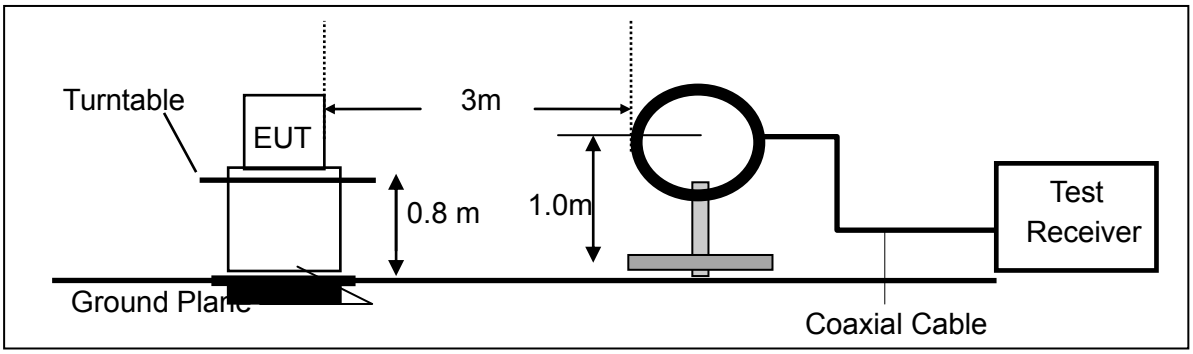
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. For Frequency 9kHz~30MHz:
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.
For Frequency above 30MHz:
Distance extrapolation factor =20log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

3.2.3 MEASURING INSTRUMENTS

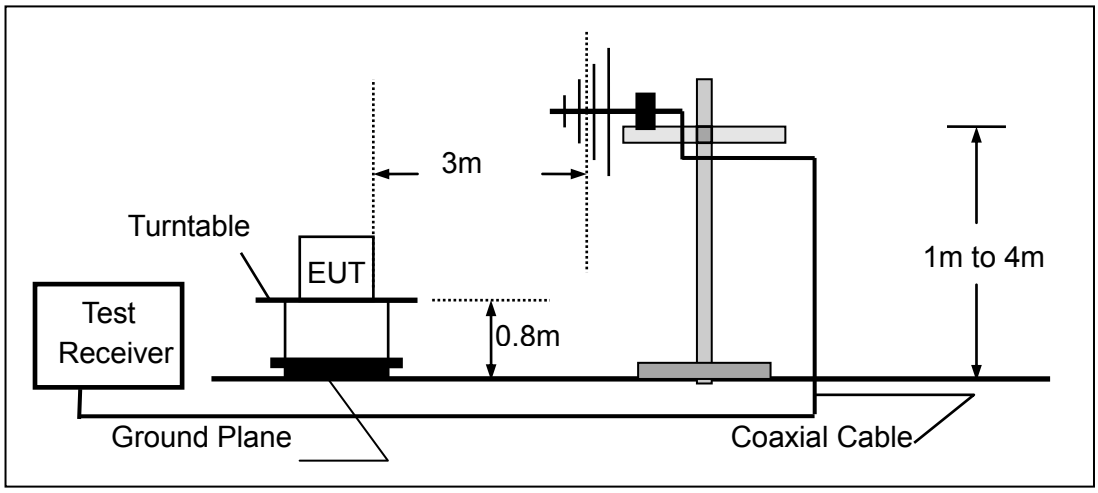
The Measuring equipment is listed in the section 6.3 of this test report.

3.2.4 TEST CONFIGURATION

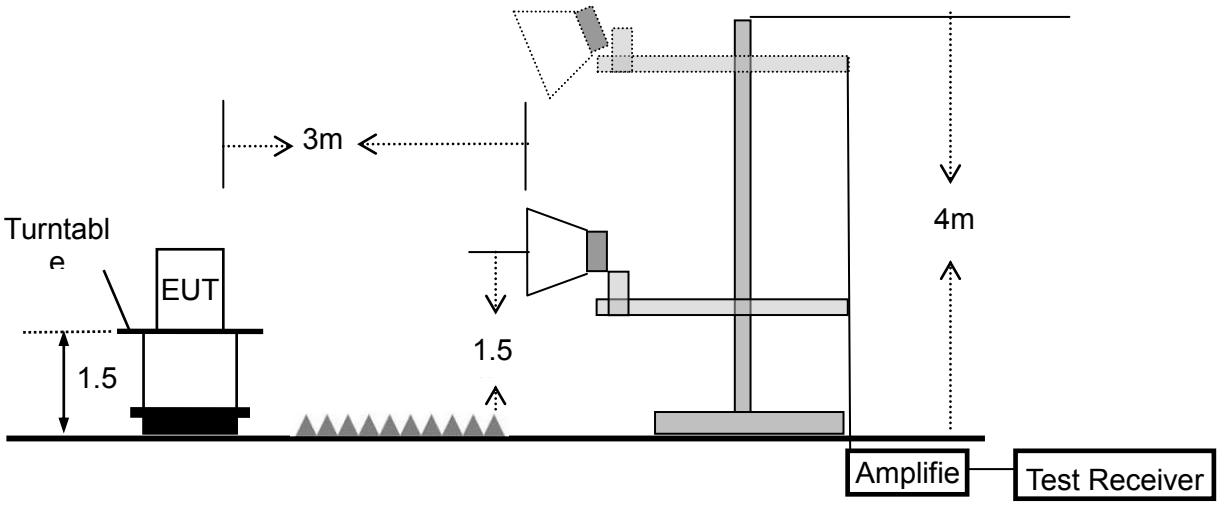
(a)For radiated emissions below 30MHz



(b)For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



3.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205.
It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

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

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

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

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

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

3.2.6 TEST RESULTS (9KHZ – 30 MHZ)

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure:	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX	Polarization :	--

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

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.2.7 TEST RESULTS (30MHZ – 1GHZ)

Note:

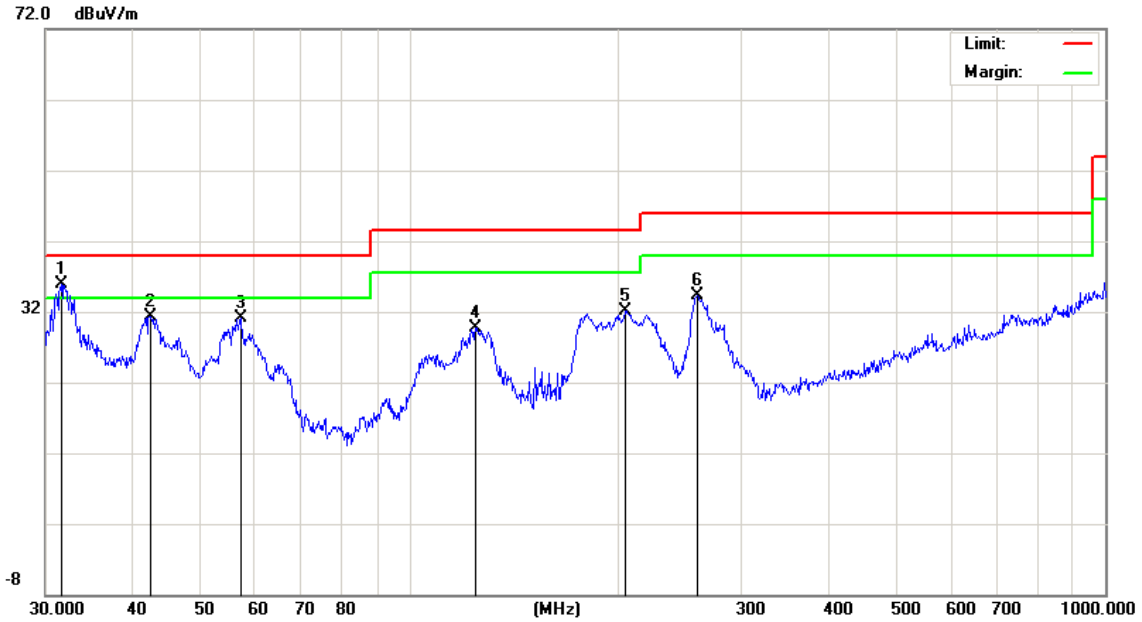
EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	25 ℃	Relative Humidity：	58%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX(5.2G)- 802.11a (High CH)		

Note: 1)All the modulation modes have been tested, and the worst result was report as below:
2) 0,1 Represent the value of antenna 0 and 1,The worst data is Antenna 0,only shown Antenna 0 data.

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	31.6202	18.00	17.98	35.98	40.00	-4.02	QP
V	42.4508	18.75	12.53	31.28	40.00	-8.72	QP
V	57.1914	24.68	6.35	31.03	40.00	-8.97	QP
V	124.5690	17.61	12.18	29.79	43.50	-13.71	QP
V	204.2377	22.48	9.70	32.18	43.50	-11.32	QP
V	259.2338	19.41	14.80	34.21	46.00	-11.79	QP

Remark:

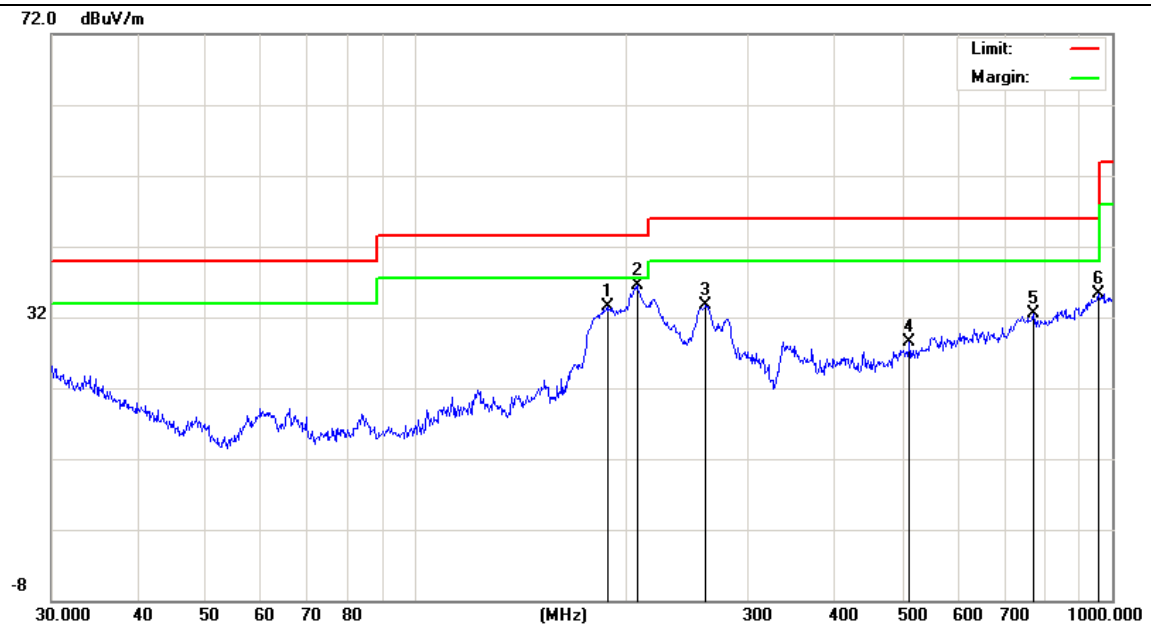
Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	188.4122	24.20	9.35	33.55	43.50	-9.95	QP
H	207.8501	26.65	9.89	36.54	43.50	-6.96	QP
H	261.0583	18.89	14.85	33.74	46.00	-12.26	QP
H	511.8352	7.99	20.60	28.59	46.00	-17.41	QP
H	771.4486	7.59	24.86	32.45	46.00	-13.55	QP
H	955.4379	6.83	28.41	35.24	46.00	-10.76	QP

Remark:

Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit



3.2.8 TEST RESULTS (1GHz-18GHz)

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX(5.2G) - 802.11n20 _5180~5240MHz		

Note: 0,1 Represent the value of antenna 0 and 1,The worst data is Antenna 0,only shown Antenna 0 data.

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G									
Vertical	3015	62.26	5.94	35.40	44.00	59.60	68.2	-8.60	Pk
Vertical	10360	60.52	8.46	39.75	44.50	64.23	68.2	-3.97	Pk
Vertical	10360	44.63	8.46	39.75	44.50	48.34	54	-5.66	AV
Vertical	15540	62.35	10.12	38.80	44.10	67.17	74	-6.83	Pk
Vertical	15540	43.01	10.12	38.80	42.70	49.23	54	-4.77	AV
Horizontal	2981	64.43	5.94	35.18	44.00	61.55	68.2	-6.65	Pk
Horizontal	10360	61.22	8.46	38.71	44.50	63.89	68.2	-4.31	Pk
Horizontal	10360	41.39	8.46	38.71	44.50	44.06	54	-9.94	AV
Horizontal	15540	60.77	10.12	38.38	44.10	65.17	74	-8.83	Pk
Horizontal	15540	41.43	10.12	38.38	44.10	45.83	54	-8.17	AV
Middle Channel (5200 MHz)-Above 1G									
Vertical	3561	67.16	6.48	36.35	44.05	65.94	68.2	-2.26	Pk
Vertical	10400	62.78	8.47	37.88	44.51	64.62	68.2	-3.58	Pk
Vertical	10400	46.03	8.47	37.88	44.51	47.87	54	-6.13	AV
Vertical	15600	61.81	10.12	38.8	44.1	66.63	74	-7.37	Pk
Vertical	15600	43.46	10.12	38.8	42.7	49.68	54	-4.32	AV
Horizontal	3363	64.02	6.48	36.37	44.05	62.82	68.2	-5.38	Pk
Horizontal	10400	61.77	8.47	38.64	44.5	64.38	68.2	-3.82	Pk
Horizontal	10400	44.69	8.47	38.64	44.5	47.30	54	-6.70	AV
Horizontal	15600	60.75	10.12	38.38	44.1	65.15	74	-8.85	Pk
Horizontal	15600	45.30	10.12	38.38	44.1	49.70	54	-4.30	AV
High Channel (5240 MHz)-Above 1G									
Vertical	3926	65.38	7.1	37.24	43.5	66.22	74	-7.78	Pk
Vertical	3926	46.66	7.1	37.24	43.5	47.50	54	-6.50	AV
Vertical	10480	62.09	8.46	37.68	44.5	63.73	68.2	-4.47	Pk
Vertical	15720	59.87	10.12	38.8	44.1	64.69	74	-9.31	Pk
Vertical	15720	37.46	10.12	38.8	42.7	43.68	54	-10.32	AV
Horizontal	3885	67.77	7.1	37.24	43.5	68.61	74	-5.39	Pk
Horizontal	3885	41.55	7.1	37.24	43.5	42.39	54	-11.61	AV
Horizontal	10480	60.93	8.46	38.57	44.5	63.46	68.2	-4.74	Pk
Horizontal	15720	60.94	10.12	38.38	44.1	65.34	74	-8.66	Pk
Horizontal	15720	42.80	10.12	38.38	44.1	47.20	54	-6.80	AV

Note:"802.11n20(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.2.9 TEST RESULTS (18GHz-40GHz)

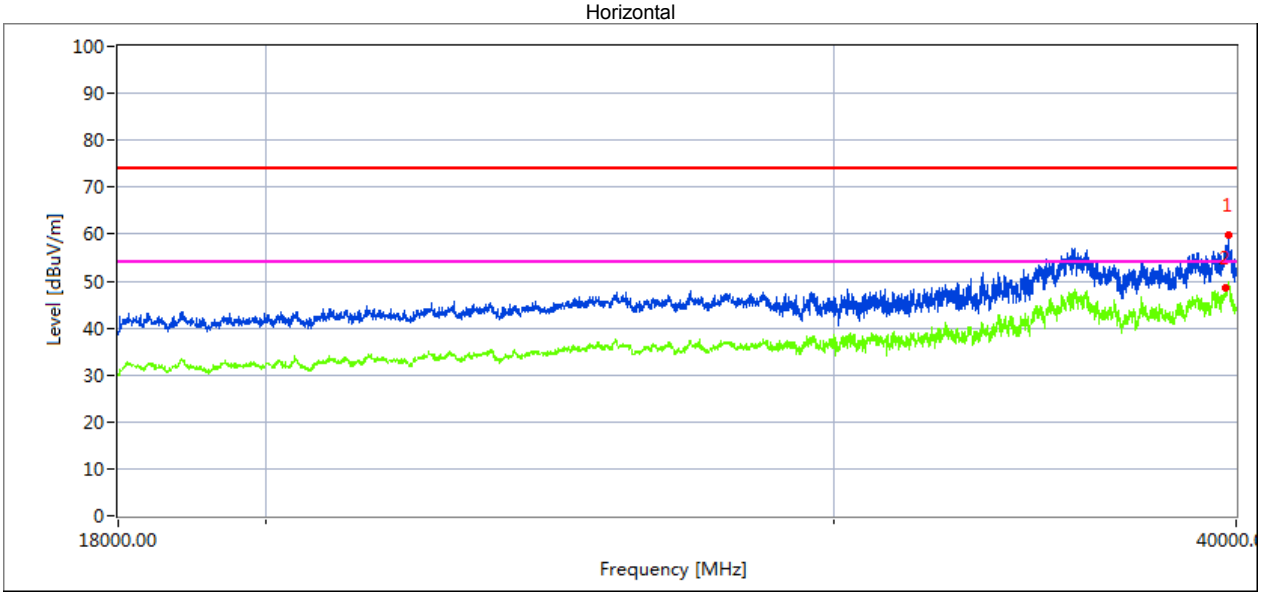
EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX (5.2G)-802.11a 5180MHz~5240MHz,		

Note: 0,1 Represent the value of antenna 0 and 1,The worst data is Antenna 0,only shown Antenna 0 data.

All the modulation modes have been tested, and the worst result was report as below:

Low Channel (5180 MHz)-Above 1G

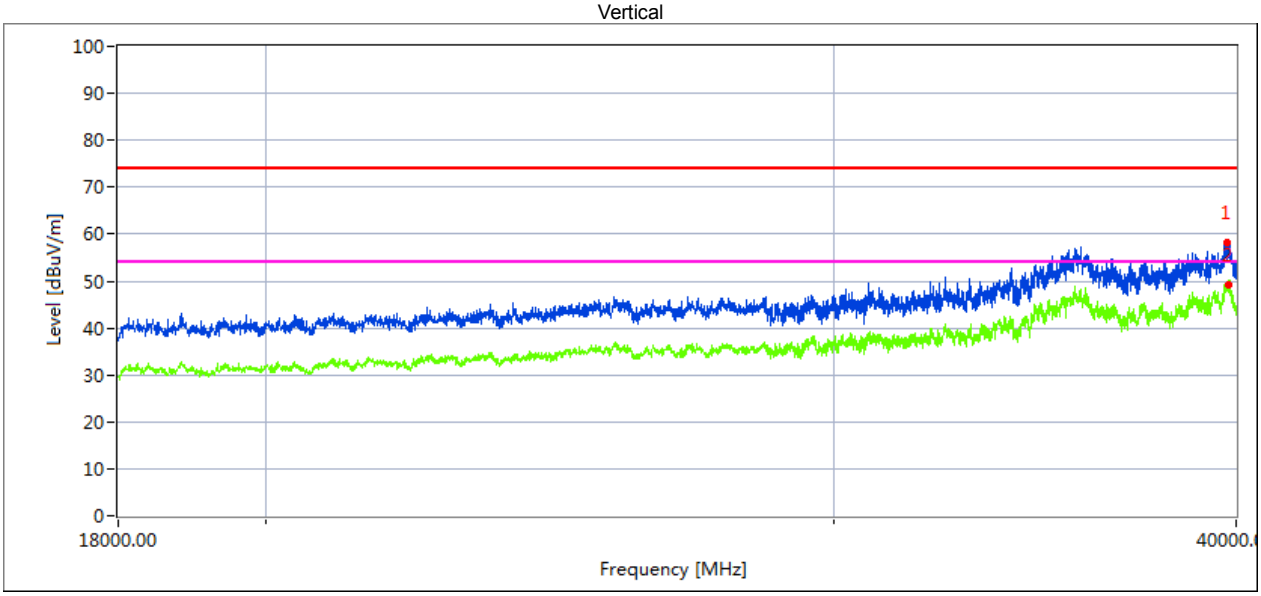
Horizontal



Measurement Result:

Frequency MHz	Meter Reading dBuV	Cable loss dB	Antenna Factor dB/m	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB
39765.004	38.03	20.09	44.1	43.22	59	68.2	-9.2

Vertical

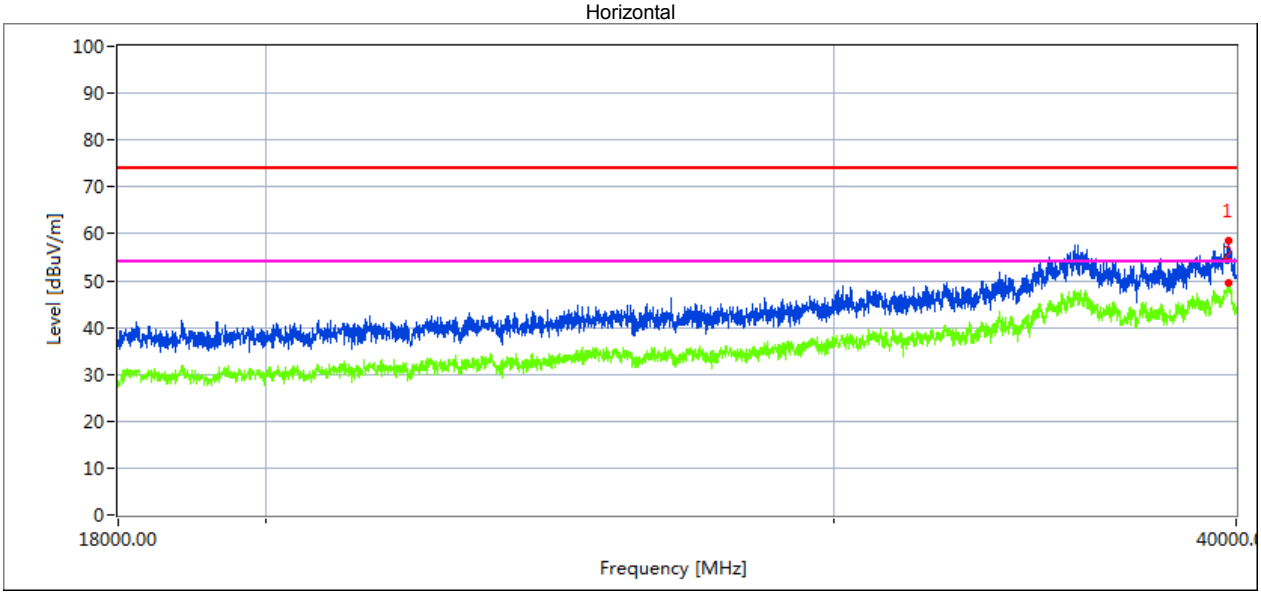


Measurement Result:

Frequency MHz	Meter Reading dBuV	Cable loss dB	Antenna Factor dB/m	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB
39787.004	32.23	20.09	44.1	43.22	53.2	68.2	-15.0

High Channel (5240 MHz)-Above 1G

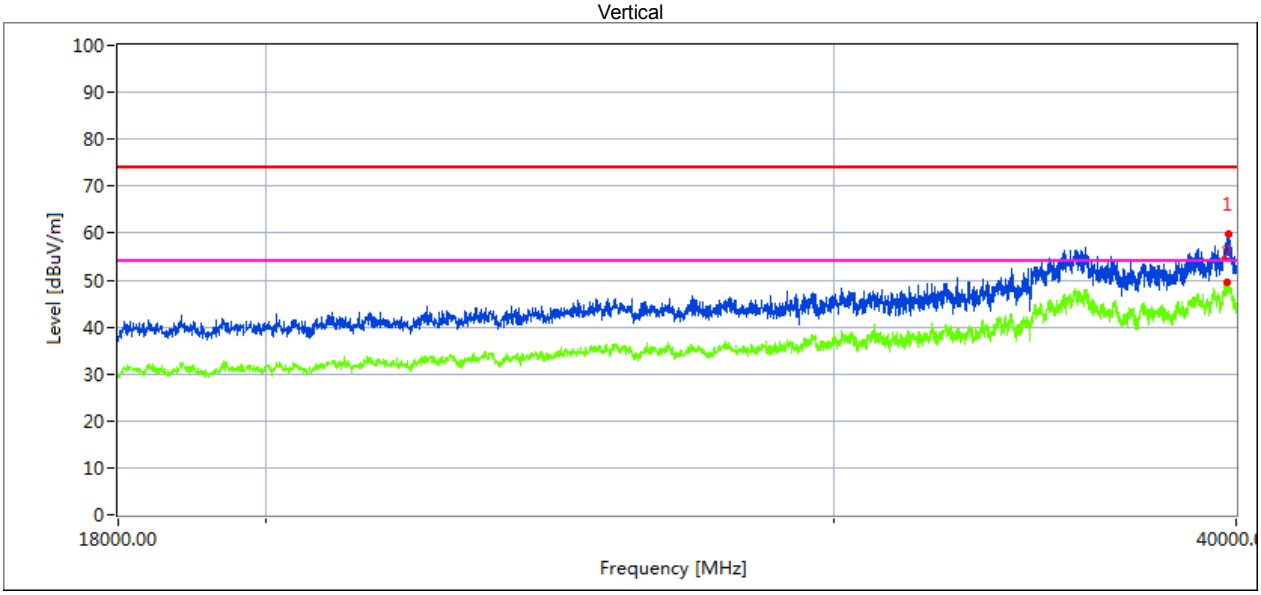
Horizontal



Measurement Result:

Frequency MHz	Meter Reading dBuV	Cable loss dB	Antenna Factor dB/m	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB
39769.114	38.23	20.09	44.1	43.22	59.2	68.2	-9.0

Vertical



Measurement Result:

Frequency MHz	Meter Reading dBuV	Cable loss dB	Antenna Factor dB/m	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB
39770.880	38.63	20.09	44.1	43.22	59.6	68.2	-8.6

3.2.10 Spurious Emission in Restricted Band 4.5GHz~5.150 GHz& 5.350GHz~5460GHz

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX(5.2G) - 802.11a _5180~5240MHz		

Note: 0,1 Represent the value of antenna 0 and 1,The worst data is Antenna 0,only shown Antenna 0 data

Frequency	Meter Reading	Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	dB/m	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
5.2G WIFI-802.11a Mode									
4500	64.23	5.2	35.6	44.2	60.83	74	-13.17	Pk	Horizontal
4500	46.05	5.2	35.6	44.2	42.65	54	-11.35	AV	Horizontal
4500	54.93	5.2	35.6	44.2	51.53	74	-22.47	Pk	Horizontal
4500	40.21	5.2	35.6	44.2	36.81	54	-17.19	AV	Horizontal
5150	70.01	5.36	35.66	44.22	66.81	74	-7.19	Pk	Horizontal
5150	51.21	5.36	35.66	44.22	48.01	54	-5.99	AV	Horizontal
5150	69.71	5.36	35.66	44.22	66.51	74	-7.49	Pk	Vertical
5150	51.66	5.36	35.66	44.22	48.46	54	-5.54	AV	Vertical
5350	62.38	5.68	35.68	44.22	59.52	74	-14.48	Pk	Vertical
5350	41.85	5.68	35.68	44.22	38.99	54	-15.01	AV	Vertical
5350	55.22	5.68	35.68	44.22	52.36	74	-21.64	Pk	Horizontal
5350	39.15	5.68	35.68	44.22	36.29	54	-17.71	AV	Horizontal

Note:"802.11a(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

(3)For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

,

4.2 TEST PROCEDURE

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

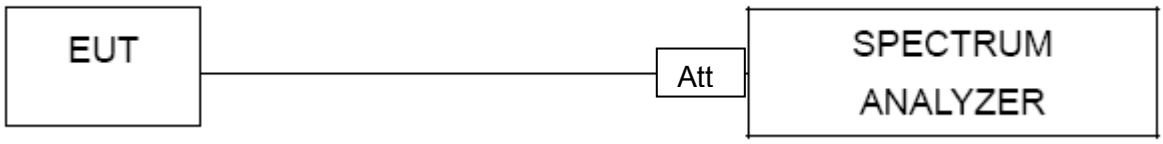
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX Frequency (5150-5250MHz)		

Note: Band1 For 802.11n/ac 5GHz has MIMO mode. Directional gain=6.06dbi
6.06dbi>6.0dbi so power density limit= 17-(6.06-6)=16.94 in dBm

Test data reference attachment.

5. 26DB & 99% EMISSION BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

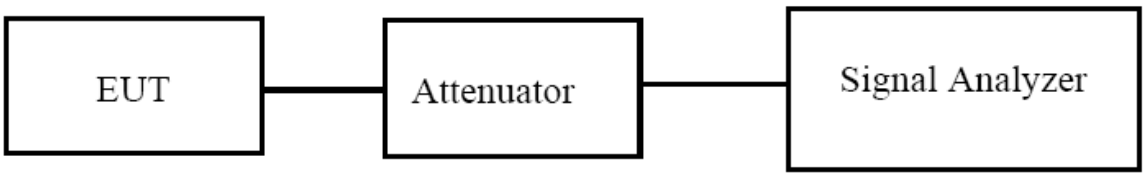
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

5.2 TEST PROCEDURE

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 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%.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. 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.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. 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% occupied bandwidth is the difference between these two frequencies.



5.3 EUT OPERATION CONDITIONS

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

5.4 TEST RESULTS

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX Frequency (5150-5250MHz)		

Test data reference attachment.

6. MINIMUM 6 DB BANDWIDTH

6.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(e)

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

6.2 TEST PROCEDURE

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

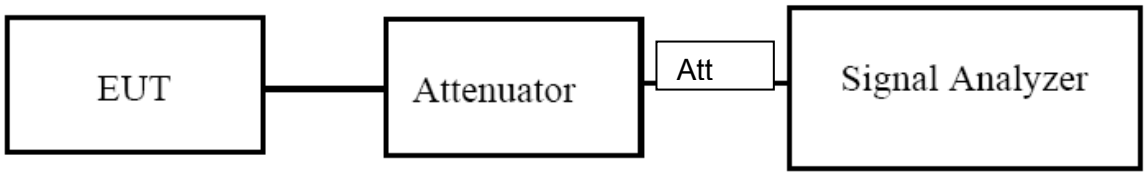
f) Allow the trace to stabilize.

g) 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 level measured in the fundamental emission.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

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

6.6 TEST RESULTS

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	N/A		

Note：Not applicable

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

The maximum conduced output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	1W
5250~5350	250mW
5470~5725	250mW
5725~5850	1W

6.2 TEST PROCEDURE

· Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

a) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:

1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle D of the transmitter output signal as described in 12.2.

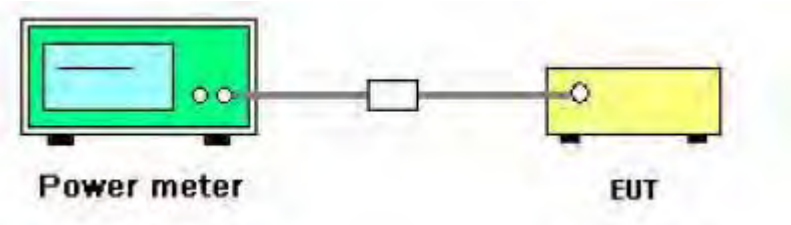
c) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.

d) Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle {e.g., [10 log (1 / 0.25)], if the duty cycle is 25%}.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

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

7.2 TEST RESULTS

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX Frequency (5150-5250MHz)		

Note: Band1&Band2A&Band2C For 802.11n/ac 5GHz has MIMO mode. Directional gain=6.06dbi
6.06dbi>6.0dbi so power limit= 30-(6.06-6)=29.94 in dBm

Test data reference attachment.

8. OUT OF BAND EMISSIONS

8.1 APPLICABLE STANDARD

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) 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.

(2) For transmitters operating in the 5.25-5.35 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.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

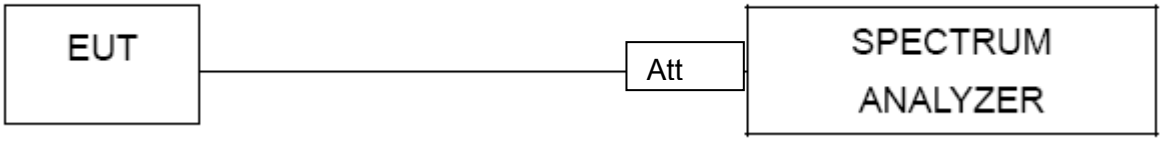
8.2 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

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

8.6 TEST RESULTS

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V

Test data reference attachment.

8. Frequency Stability Measurement

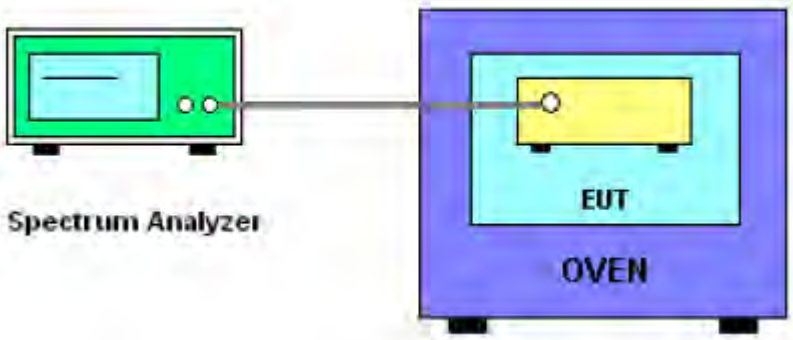
8.1 LIMIT

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

8.2 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency.
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is -10°C~40°C.

8.3 TEST SETUP LAYOUT



8.4 EUT OPERATION DURING TEST

1. The EUT was programmed to be in continuously un-modulation transmitting mode.
2. The module has two antennas, and the worst data is Antenna 0, only shown Antenna 0 Plot.

8.5 TEST RESULTS

EUT：	Communication Station	Model Name ：	FFRC10A
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX Frequency Band I (5150-5250MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	3.6	V nom (V)	3.6	5180.0242	5180	0.0242	4.6718
		V max (V)	4.14	5180.0161	5180	0.0161	3.1071
		V min (V)	3.06	5180.0163	5180	0.0163	3.1376
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
		T (°C)	-10	5180.0135	5180	0.0135	2.6005
		T (°C)	0	5180.0272	5180	0.0272	5.2537
		T (°C)	10	5180.0156	5180	0.0156	3.0034
		T (°C)	20	5180.0139	5180	0.0139	2.6851
		T (°C)	30	5180.0154	5180	0.0154	2.9787
		T (°C)	40	5180.0137	5180	0.0137	2.6440
Limits				Within 5150-5250MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	25	V nom (V)	3.6	5200.0113	5200	0.0113	2.1645
		V max (V)	4.14	5200.0131	5200	0.0131	2.5196
		V min (V)	3.06	5200.0130	5200	0.0130	2.5000
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
		T (°C)	-10	5200.0123	5200	0.0123	2.3635
		T (°C)	0	5200.0309	5200	0.0309	5.9493
		T (°C)	10	5200.0205	5200	0.0205	3.9414
		T (°C)	20	5200.0132	5200	0.0132	2.5469
		T (°C)	30	5200.0121	5200	0.0121	2.3244
		T (°C)	40	5200.0178	5200	0.0178	3.4322
Limits				Within 5150-5250MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	25	V nom (V)	3.6	5240.0114	5240	0.0114	2.1756
		V max (V)	4.14	5240.0171	5240	0.0171	3.2634
		V min (V)	3.06	5240.0154	5240	0.0154	2.9389
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
		T (°C)	-10	5240.0153	5240	0.0153	2.9224
		T (°C)	0	5240.0151	5240	0.0151	2.8906
		T (°C)	10	5240.0228	5240	0.0228	4.3433
		T (°C)	20	5240.0122	5240	0.0122	2.3376
		T (°C)	30	5240.0144	5240	0.0144	2.7492
		T (°C)	40	5240.0174	5240	0.0174	3.3286
Limits				Within 5150-5250MHz			
Result				Complies			

9. DYNAMIC FREQUENCY SELECTION(DFS)

9.1 APPLICABILITY OF DFS REQUIREMENTS

EUT is client and operates as client without radar detection function.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes
Client Beacon Test	N/A	Yes	Yes

Additional requirements for devices with multiple bandwidth modes	Operational Mode	
	Master or Client With Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note
Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

9.2 INTERFERENCE THRESHOLD VALUES, MASTER OR CLIENT INCORPORATING IN-SERVICE MONITORING

Maximum Transmit Power	Value (see notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.
Note 3: EIRP is based on the highest antenna gain.

9.3 DFS RESPONSE REQUIREMENT VALUES

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the 99% power bandwidth See Note 3.

Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:
• For the Short pulse radar Test Signals this instant is the end of the Burst.
• For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated.
• For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.
Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate Channel changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

9.4 SHORT PULSE RADAR TEST WAVEFORMS

As the EUT is a Client Device with no Radar Detection, only one type radar pulse is required for the testing. Radar Pulse type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	60%	30
1	1	Test A Test B	$\mathrm{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\mathrm{PRI}_{\mu sec}}\right)\right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a
Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms.
If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

9.5 CALIBRATION SETUP AND DFS TEST RESULTS

Radar Waveform Calibration Procedure

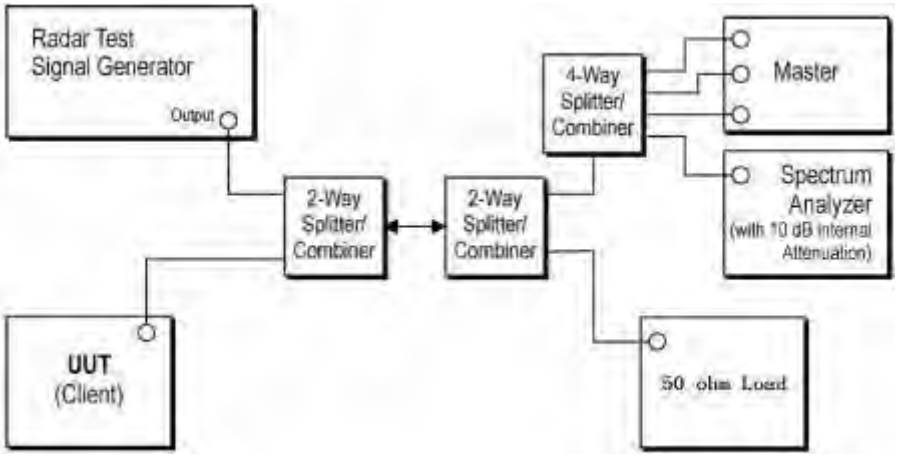
1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master

2) The interference Radar Detection Threshold Level is -62dBm + 0dBi +1dB = -61dBm that had been taken into account the output power range and antenna gain.

3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB.

4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was - -62dBm + 0dBi +1dB = -61dBm. Capture the spectrum analyzer plots on short pulse radar waveform.

9.6 CONDUCTED CALIBRATION SETUP



Wireless AP	Manufacturer	LINKSYS LLC
	Model NO.	WRT32X
	FCC ID	Q87-WRT3200ACM

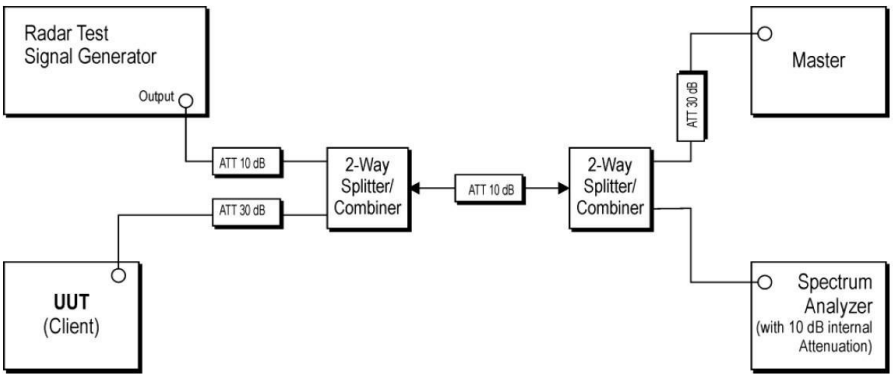
9.7 RADAR WAVEFORM CALIBRATION RESULT

Not applicable.

9.8 IN-SERVICE MONITORING: CHANNEL MOVE TIME, CHANNEL CLOSING TRANSMISSION TIME AND NON-OCCUPANCY PERIOD

TEST CONFIGURATION:

Setup for Client with injection at the Master



TEST PROCEDURE:

1. The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device
3. A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. EUT will associate with the master at channel. The file “iperf.exe” specified by the FCC is Streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
5. When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.
6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom In 600ms plot of the Short Pulse Radar Type
7. Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (0.3ms) =S (12000ms) / B (4000); where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: C (ms)= N X Dwell (0.3ms); where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
8. Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

TEST MODE:

Please refer to the clause 2.2

9.9 RESULT OF CHANNEL MOVE TIME, CHANNEL CLOSING TRANSMISSION TIME AND NON-OCCUPANCY PERIOD FOR CLIENT BEACON TEST

Not applicable.

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

10.2 EUT ANTENNA

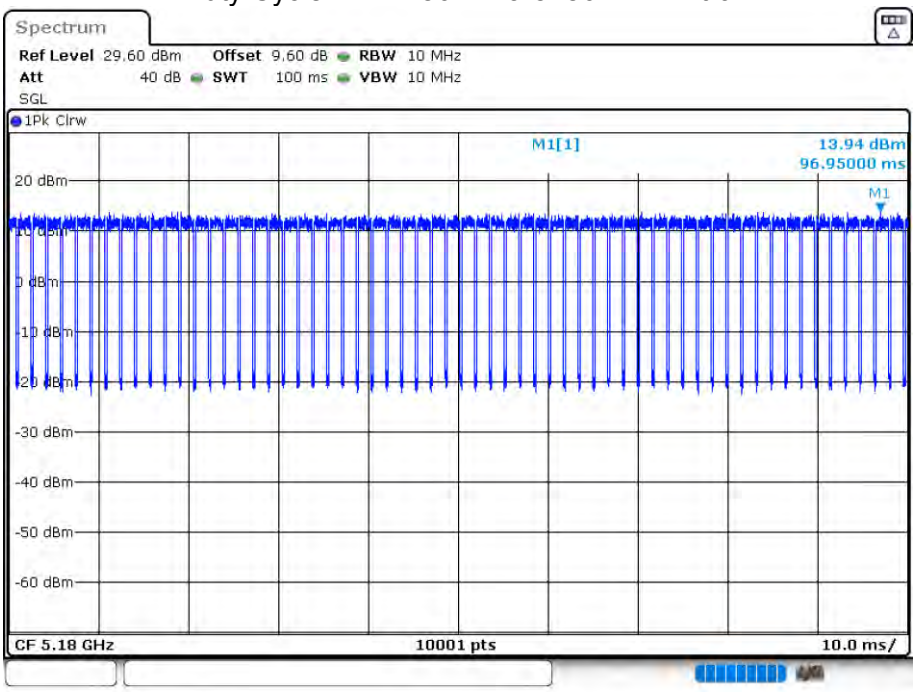
The EUT antenna is permanent attached PCB printed antenna (antenna gain: 3.22dBi (Antenna0); 2.87 dBi (Antenna1)). It comply with the standard requirement.

11. TEST RESULTS

11.1 DUTY CYCLE

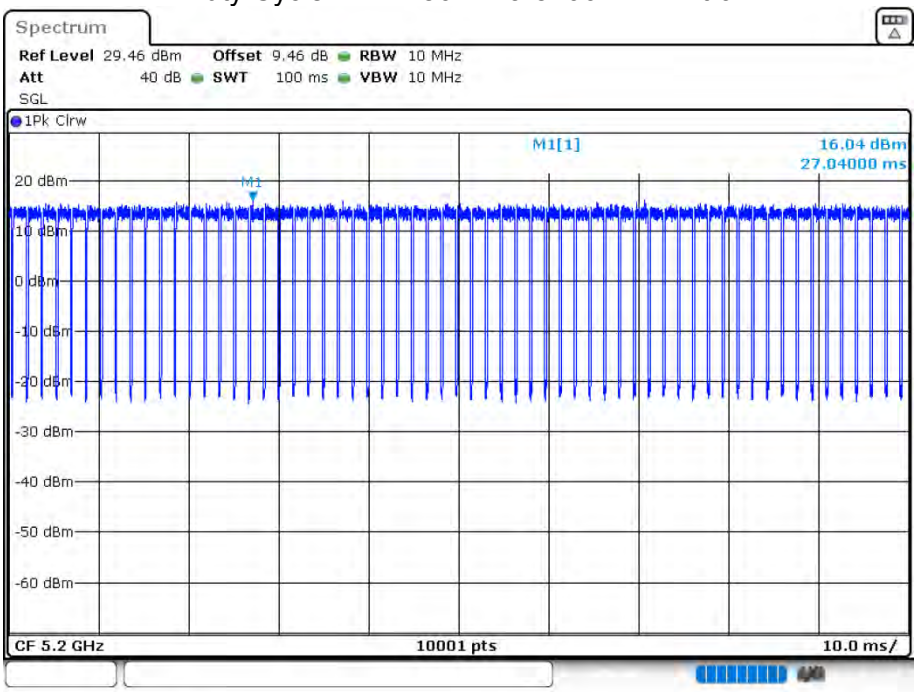
Antenna	Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
Ant 0	NVNT	802.11a	5180	100	0
Ant 0	NVNT	802.11a	5200	100	0
Ant 0	NVNT	802.11a	5240	100	0
Ant 1	NVNT	802.11a	5180	100	0
Ant 1	NVNT	802.11a	5200	100	0
Ant 1	NVNT	802.11a	5240	100	0
Ant 0	NVNT	802.11ac20	5180	100	0
Ant 0	NVNT	802.11ac20	5200	100	0
Ant 0	NVNT	802.11ac20	5240	100	0
Ant 1	NVNT	802.11ac20	5180	100	0
Ant 1	NVNT	802.11ac20	5200	100	0
Ant 1	NVNT	802.11ac20	5240	100	0
Ant 0	NVNT	802.11ac40	5190	100	0
Ant 0	NVNT	802.11ac40	5230	100	0
Ant 1	NVNT	802.11ac40	5190	100	0
Ant 1	NVNT	802.11ac40	5230	100	0
Ant 0	NVNT	802.11ac80	5210	100	0
Ant 1	NVNT	802.11ac80	5210	100	0
Ant 0	NVNT	802.11n(HT20)	5180	100	0
Ant 0	NVNT	802.11n(HT20)	5200	100	0
Ant 0	NVNT	802.11n(HT20)	5240	100	0
Ant 1	NVNT	802.11n(HT20)	5180	100	0
Ant 1	NVNT	802.11n(HT20)	5200	100	0
Ant 1	NVNT	802.11n(HT20)	5240	100	0
Ant 0	NVNT	802.11n(HT40)	5190	100	0
Ant 0	NVNT	802.11n(HT40)	5230	100	0
Ant 1	NVNT	802.11n(HT40)	5190	100	0
Ant 1	NVNT	802.11n(HT40)	5230	100	0

Duty Cycle NVNT 802.11a 5180MHz Ant 0



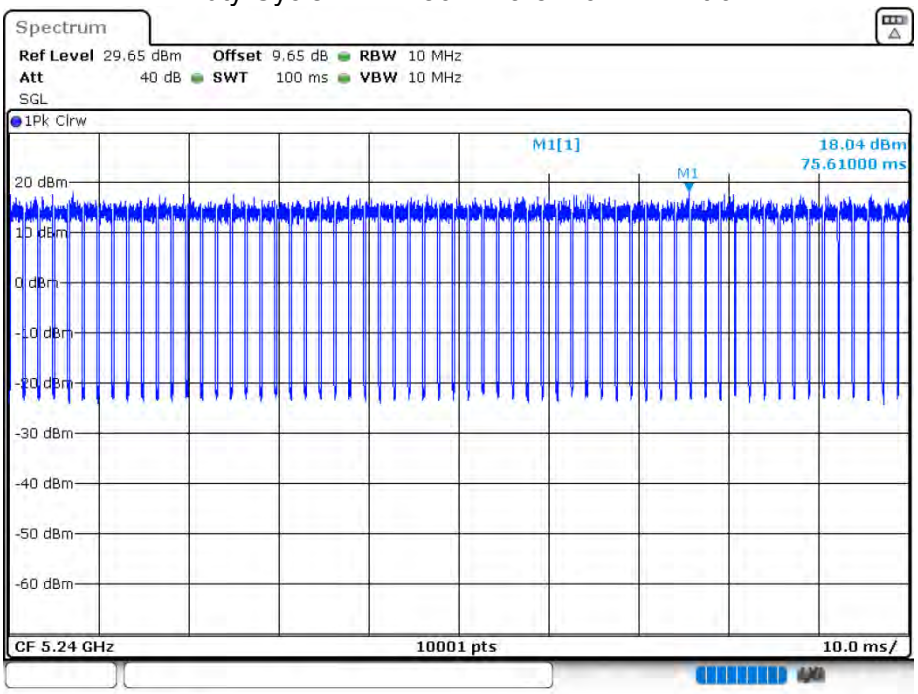
Date: 9.OCT.2020 11:44:15

Duty Cycle NVNT 802.11a 5200MHz Ant 0



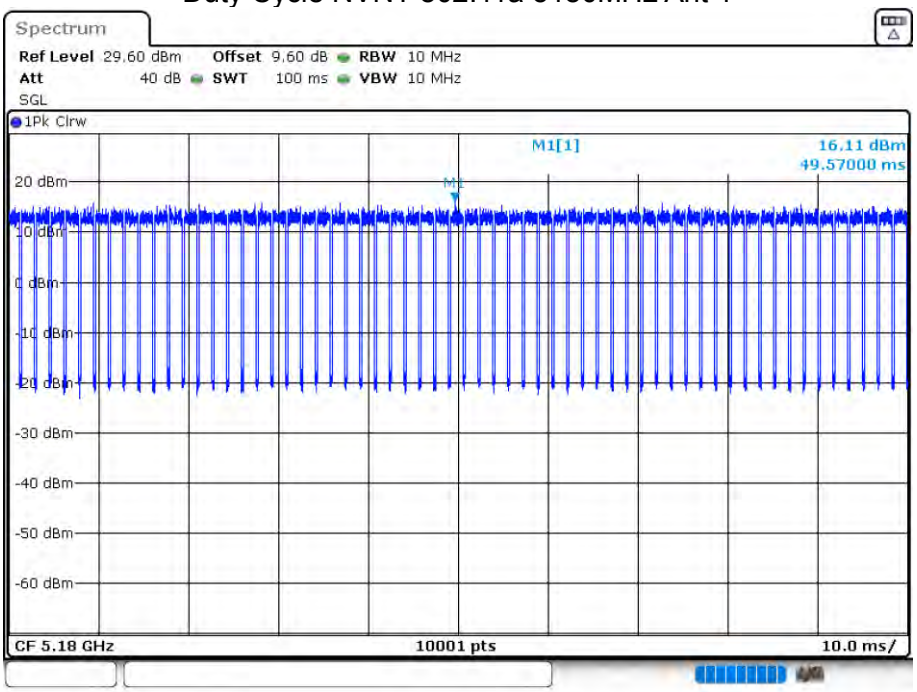
Date: 9.OCT.2020 11:45:05

Duty Cycle NVNT 802.11a 5240MHz Ant 0



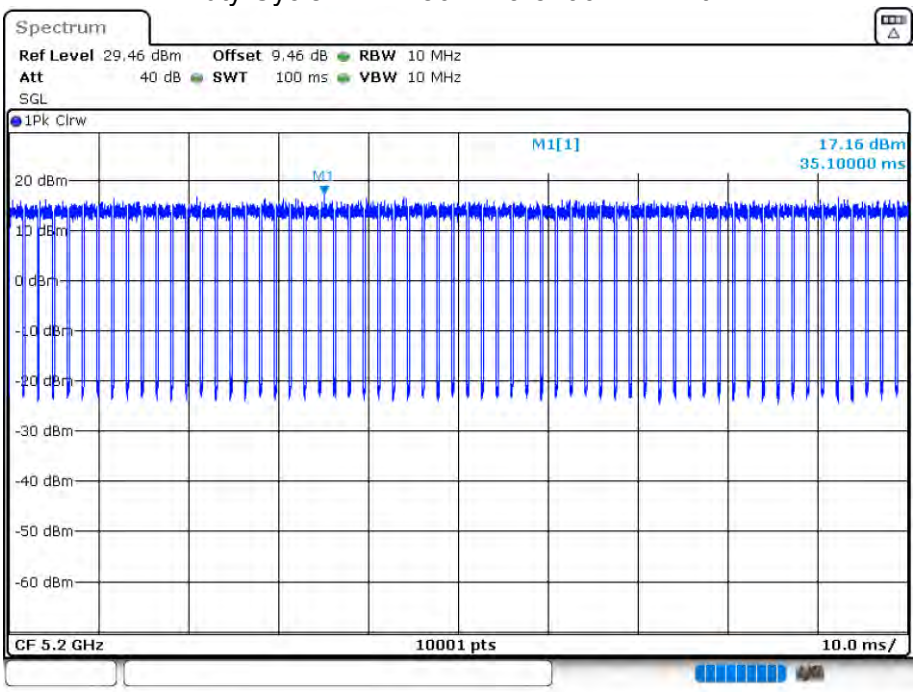
Date: 9.OCT.2020 11:49:34

Duty Cycle NVNT 802.11a 5180MHz Ant 1



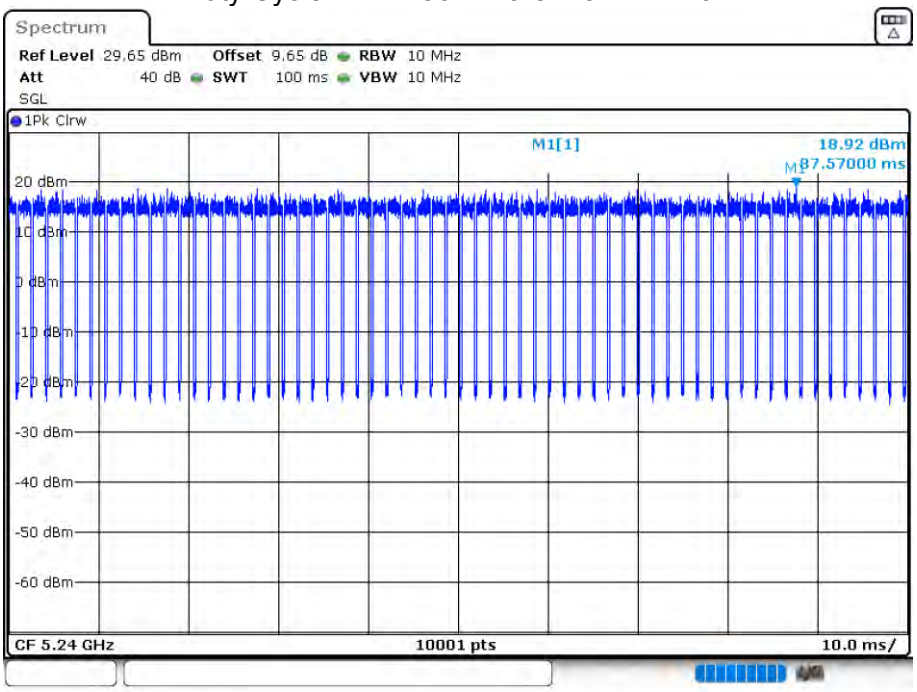
Date: 9.OCT.2020 11:04:24

Duty Cycle NVNT 802.11a 5200MHz Ant 1



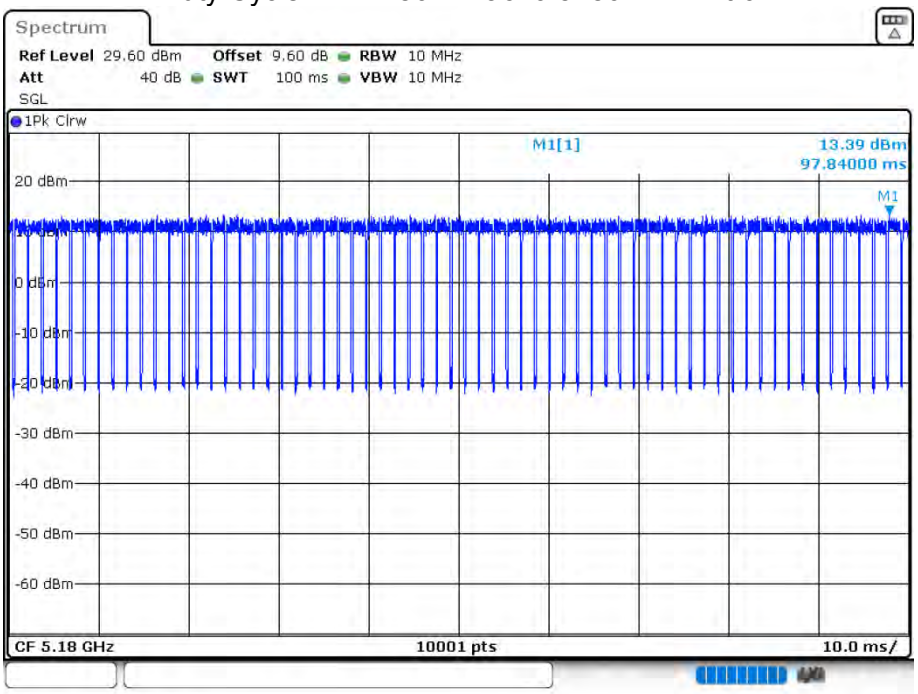
Date: 9.OCT.2020 11:06:02

Duty Cycle NVNT 802.11a 5240MHz Ant 1



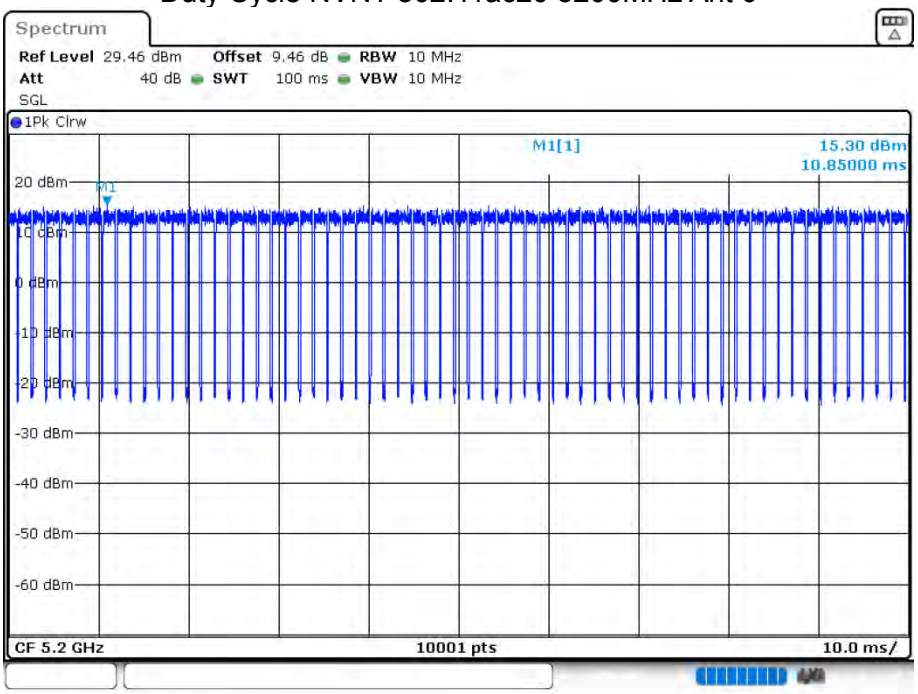
Date: 9.OCT.2020 11:08:16

Duty Cycle NVNT 802.11ac20 5180MHz Ant 0



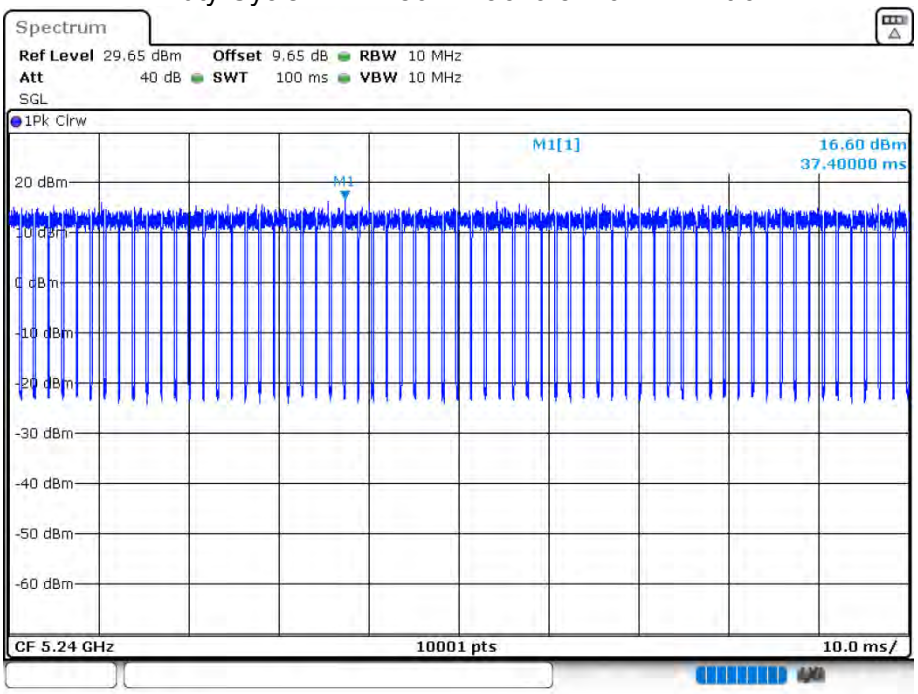
Date: 9.OCT.2020 12:01:09

Duty Cycle NVNT 802.11ac20 5200MHz Ant 0



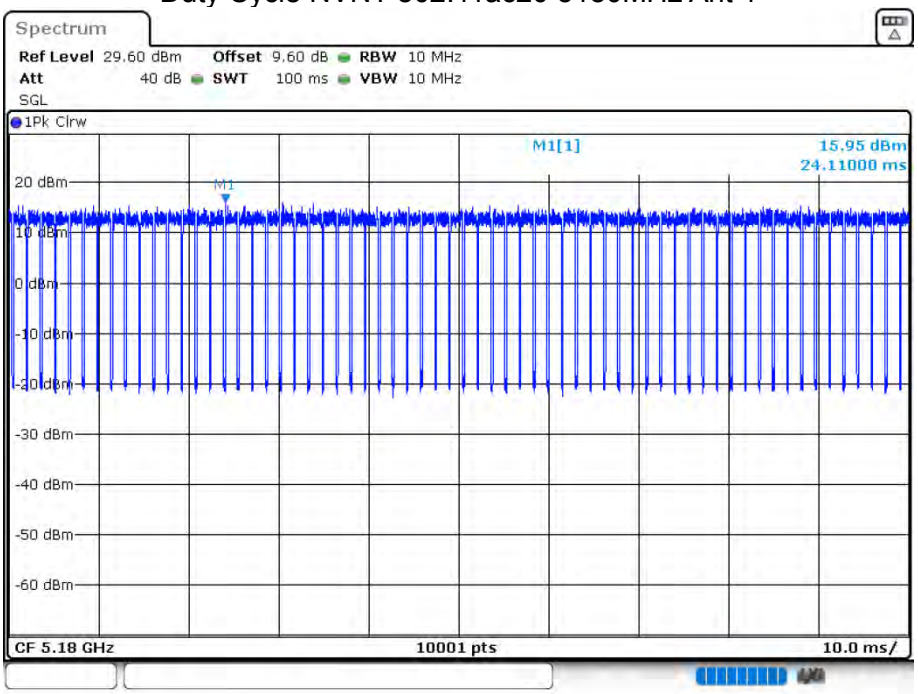
Date: 9.OCT.2020 12:02:28

Duty Cycle NVNT 802.11ac20 5240MHz Ant 0



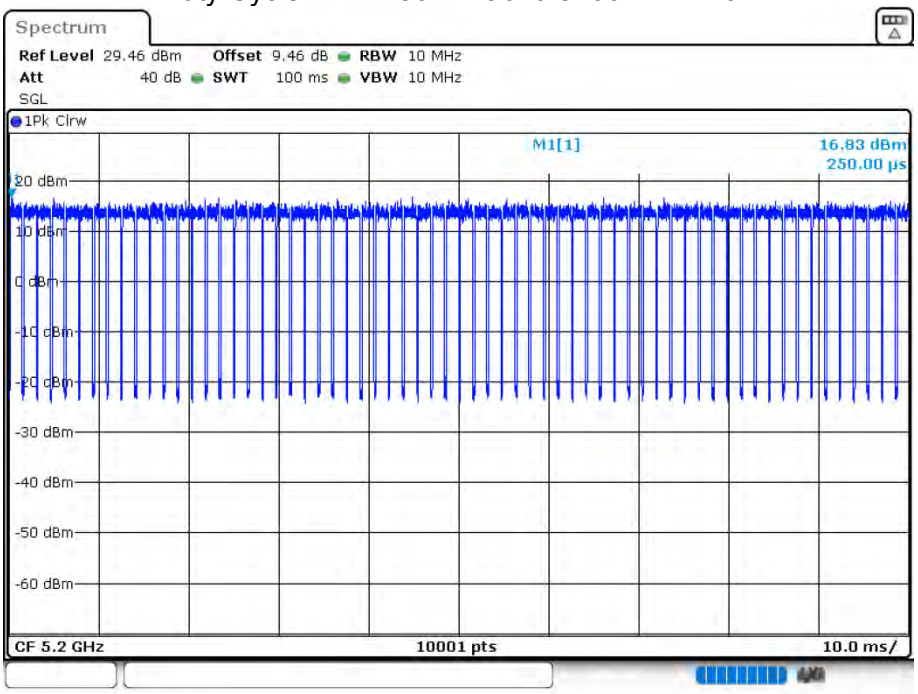
Date: 9.OCT.2020 12:03:39

Duty Cycle NVNT 802.11ac20 5180MHz Ant 1



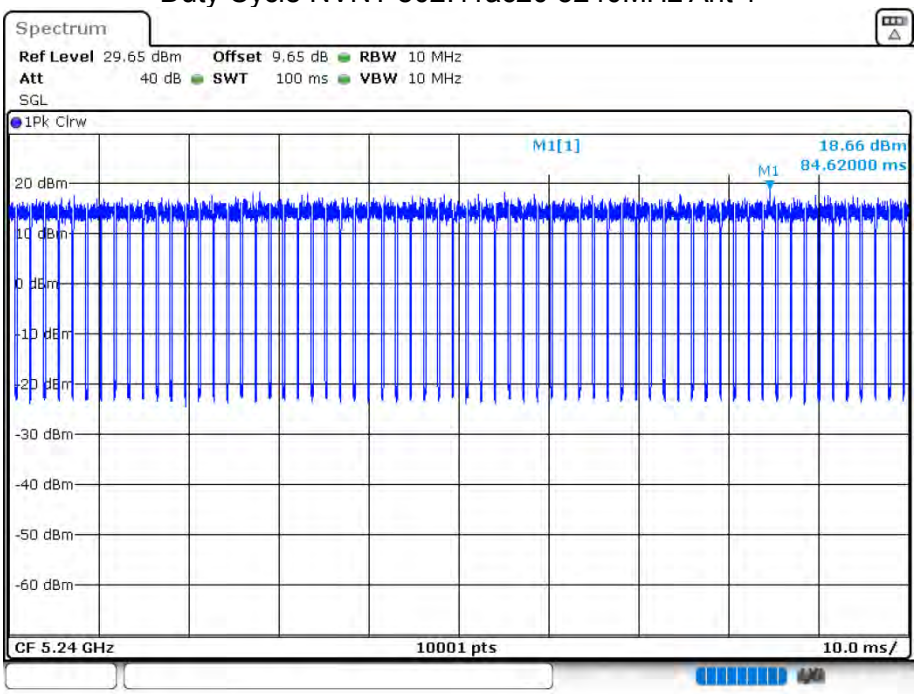
Date: 9.OCT.2020 11:15:53

Duty Cycle NVNT 802.11ac20 5200MHz Ant 1



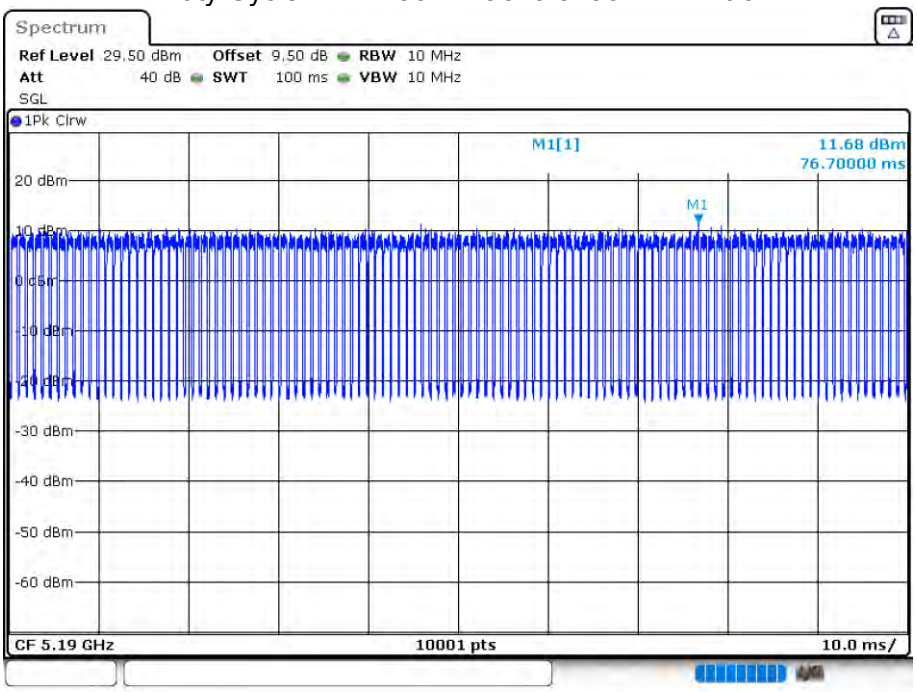
Date: 9.OCT.2020 11:16:58

Duty Cycle NVNT 802.11ac20 5240MHz Ant 1



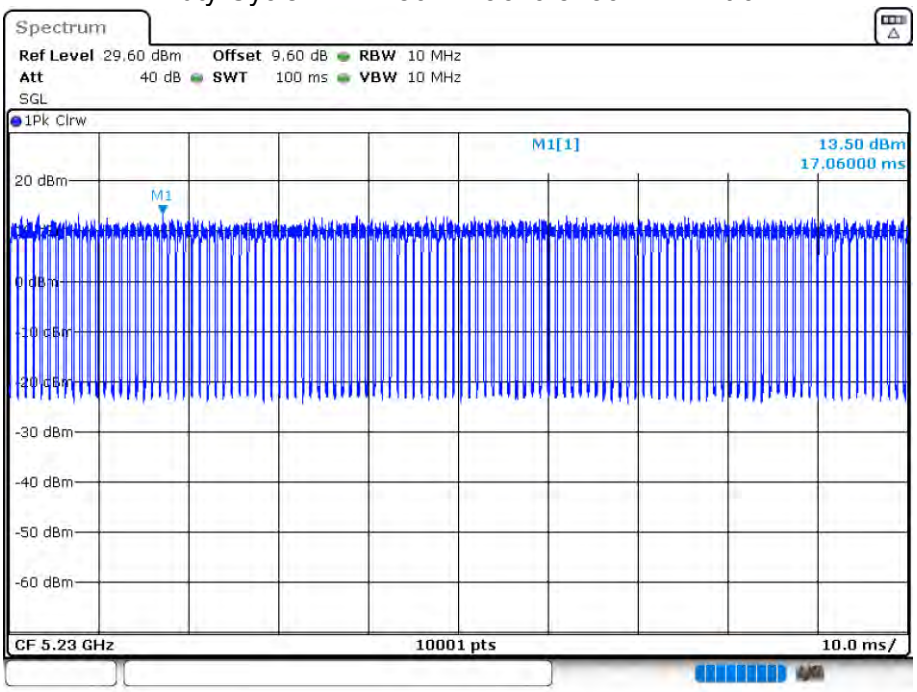
Date: 9.OCT.2020 11:18:12

Duty Cycle NVNT 802.11ac40 5190MHz Ant 0



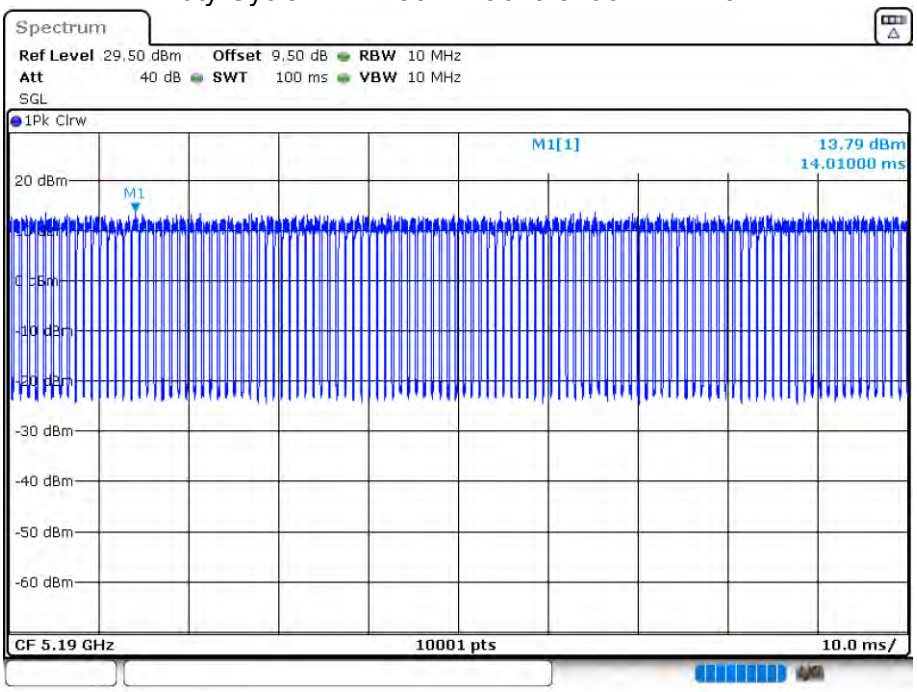
Date: 9.OCT.2020 12:11:33

Duty Cycle NVNT 802.11ac40 5230MHz Ant 0



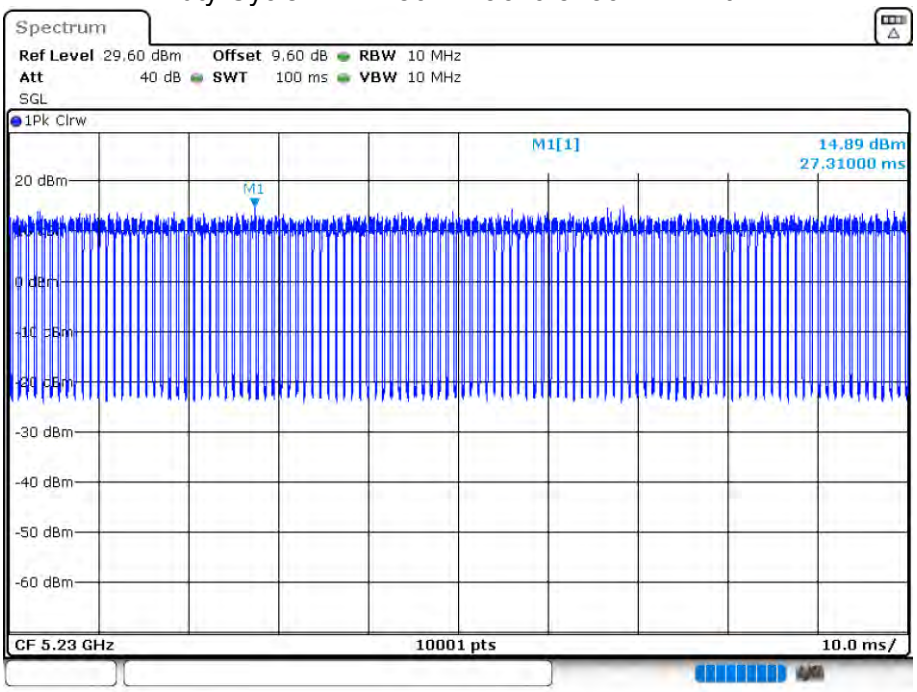
Date: 9.OCT.2020 12:13:22

Duty Cycle NVNT 802.11ac40 5190MHz Ant 1



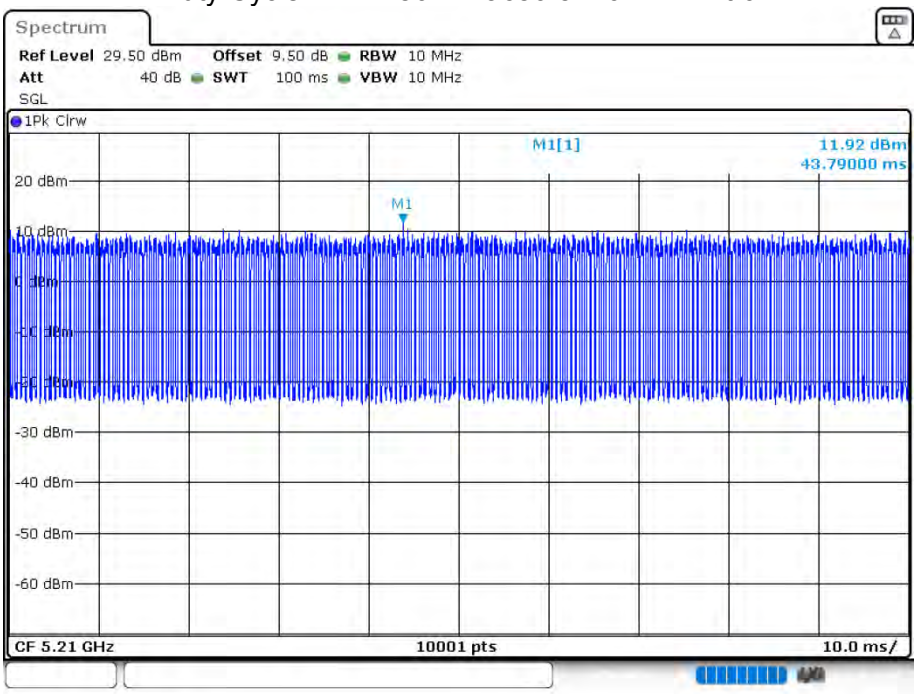
Date: 9.OCT.2020 11:25:39

Duty Cycle NVNT 802.11ac40 5230MHz Ant 1



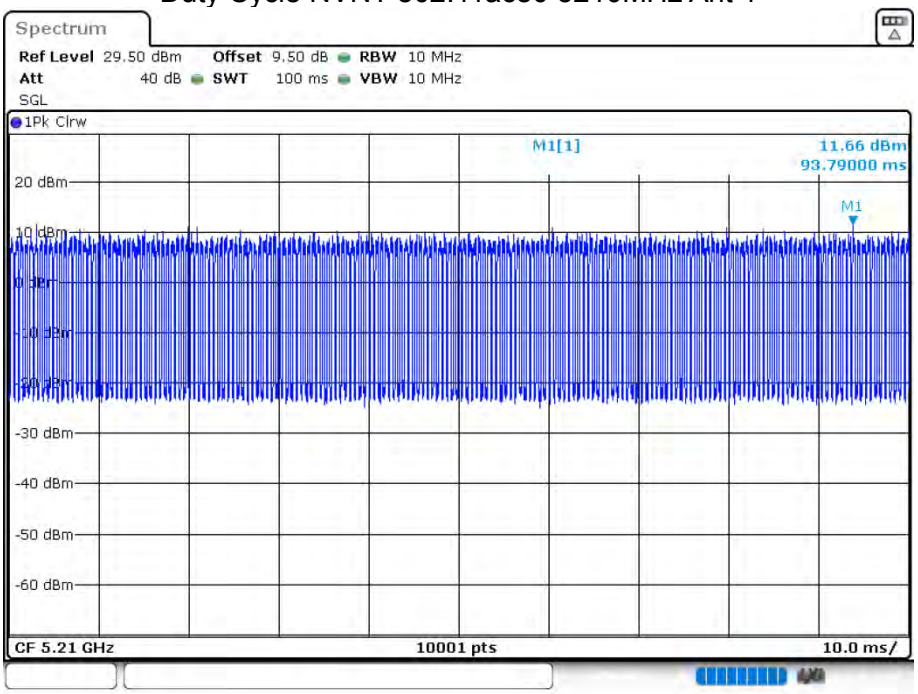
Date: 9.OCT.2020 11:32:23

Duty Cycle NVNT 802.11ac80 5210MHz Ant 0



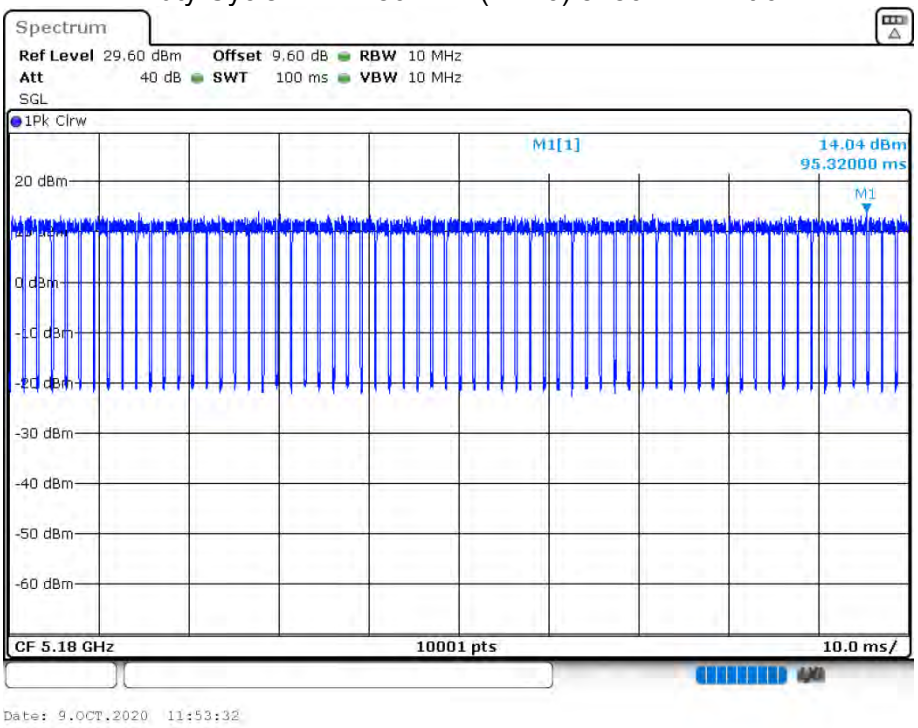
Date: 9.OCT.2020 11:41:24

Duty Cycle NVNT 802.11ac80 5210MHz Ant 1



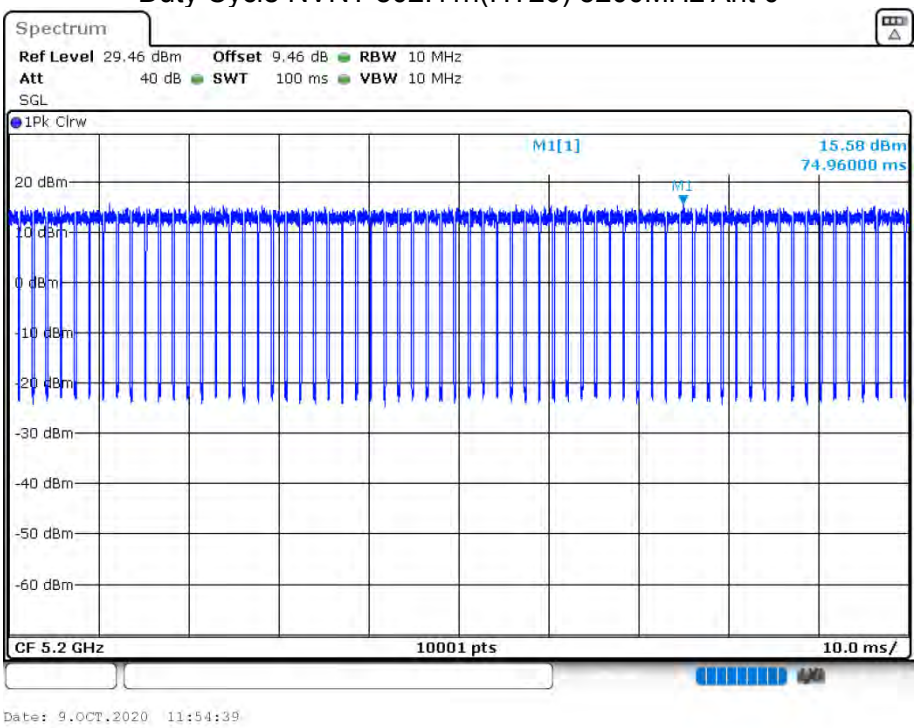
Date: 9.OCT.2020 11:34:31

Duty Cycle NVNT 802.11n(HT20) 5180MHz Ant 0



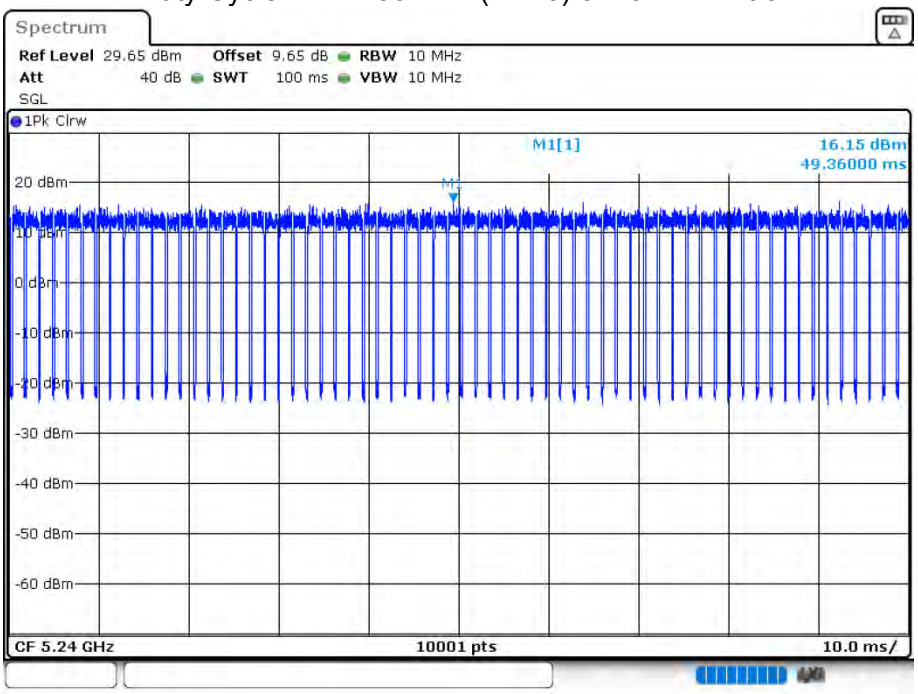
Date: 9.OCT.2020 11:53:32

Duty Cycle NVNT 802.11n(HT20) 5200MHz Ant 0



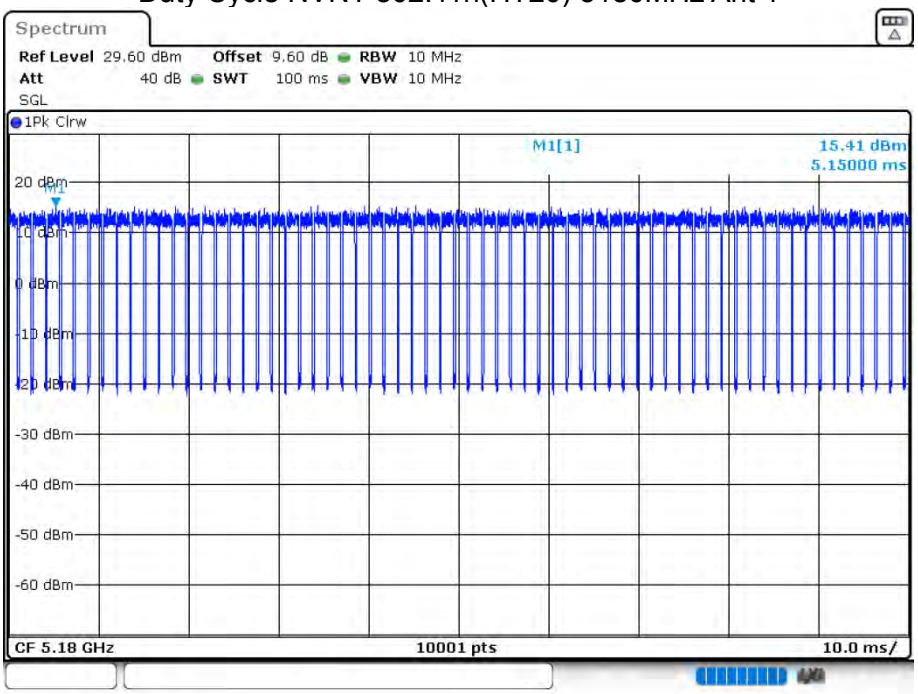
Date: 9.OCT.2020 11:54:39

Duty Cycle NVNT 802.11n(HT20) 5240MHz Ant 0



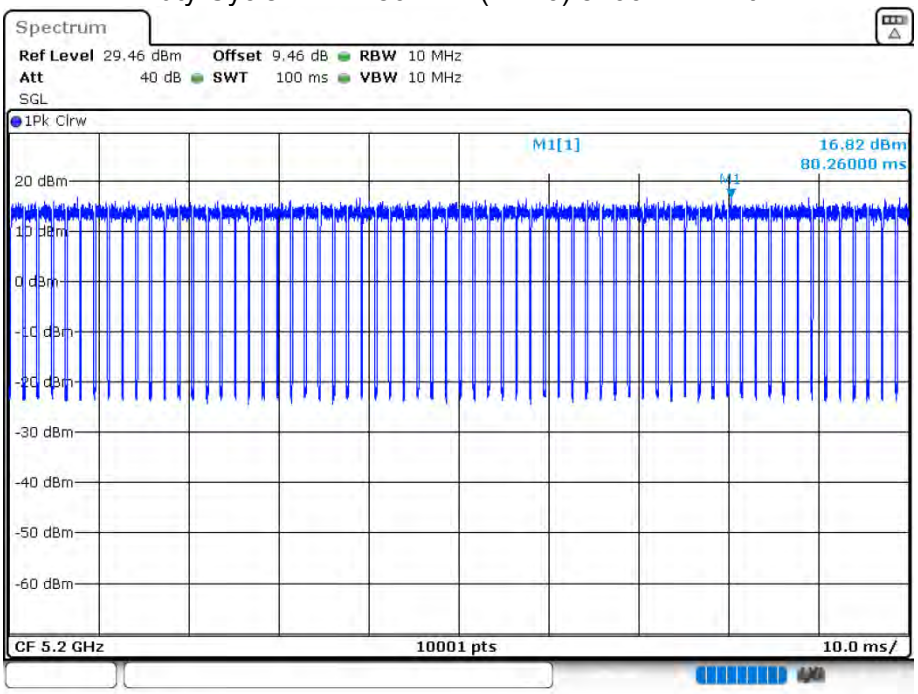
Date: 9.OCT.2020 11:59:27

Duty Cycle NVNT 802.11n(HT20) 5180MHz Ant 1



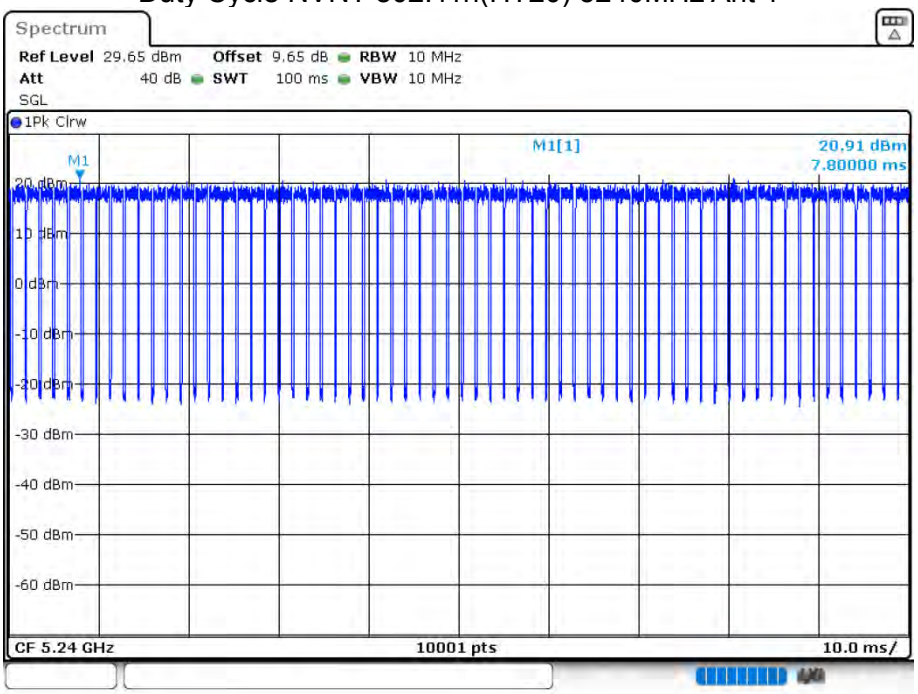
Date: 9.OCT.2020 11:11:59

Duty Cycle NVNT 802.11n(HT20) 5200MHz Ant 1



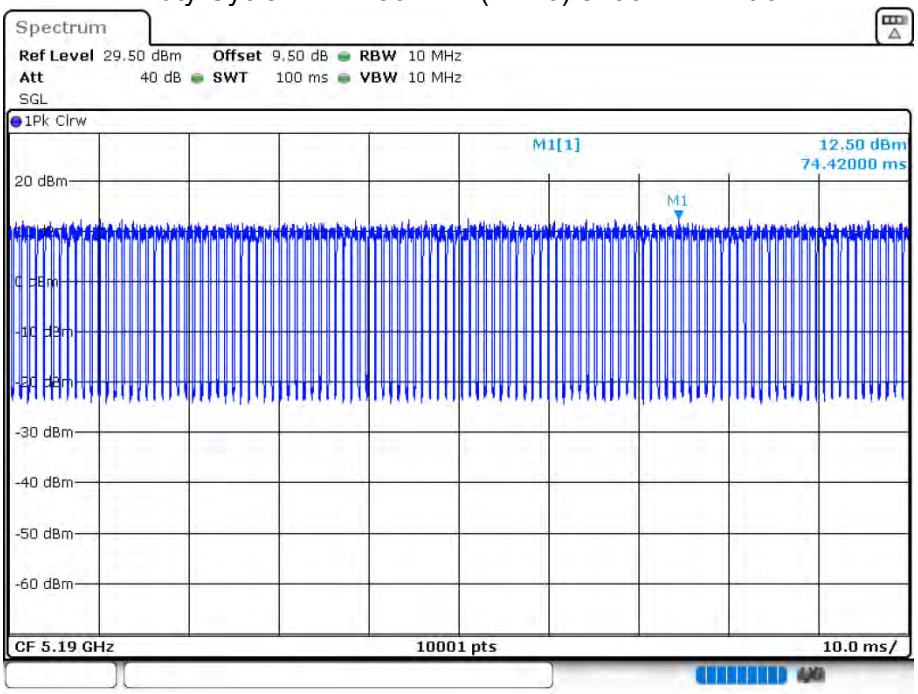
Date: 9.OCT.2020 11:13:05

Duty Cycle NVNT 802.11n(HT20) 5240MHz Ant 1



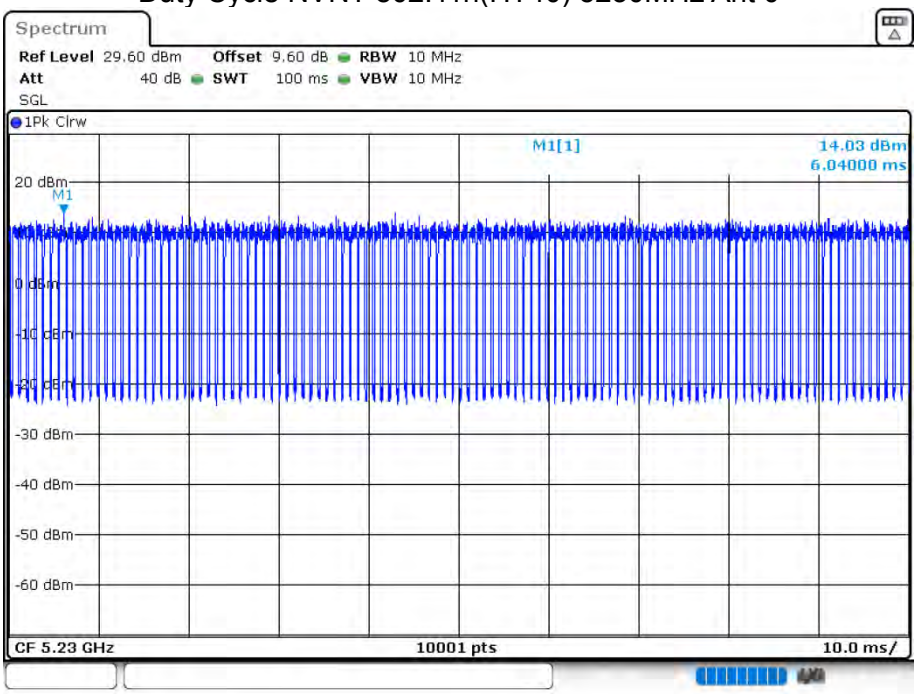
Date: 9.OCT.2020 11:14:12

Duty Cycle NVNT 802.11n(HT40) 5190MHz Ant 0



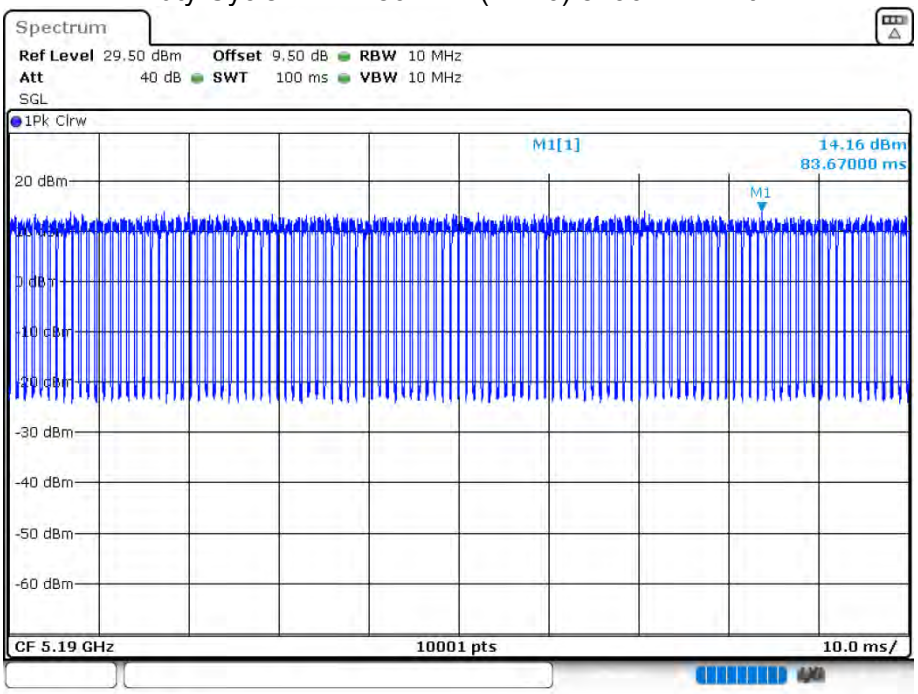
Date: 9.OCT.2020 12:06:13

Duty Cycle NVNT 802.11n(HT40) 5230MHz Ant 0



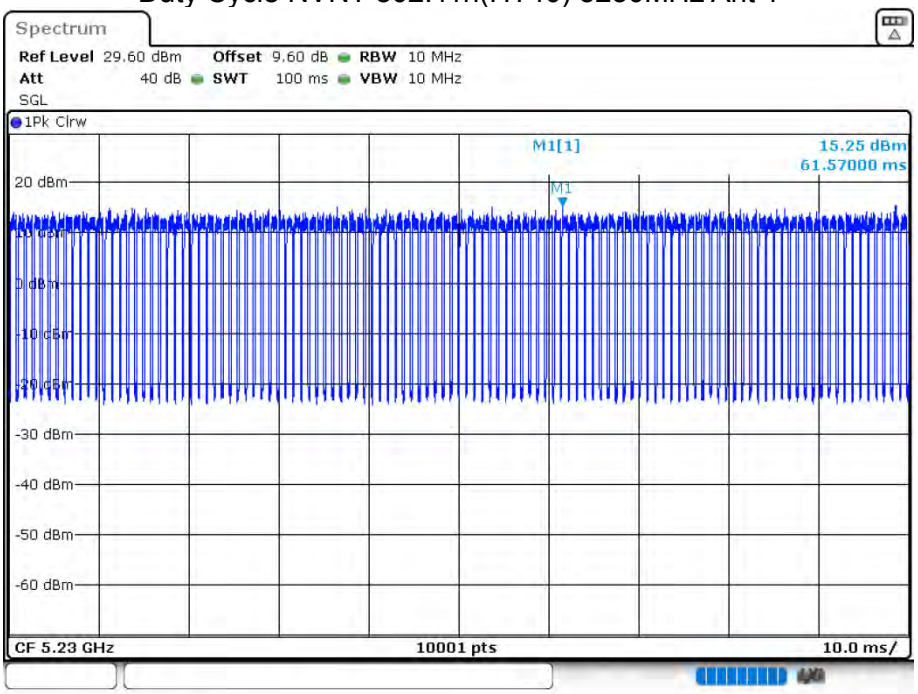
Date: 9.OCT.2020 12:10:16

Duty Cycle NVNT 802.11n(HT40) 5190MHz Ant 1



Date: 9.OCT.2020 11:23:20

Duty Cycle NVNT 802.11n(HT40) 5230MHz Ant 1



Date: 9.OCT.2020 11:21:22

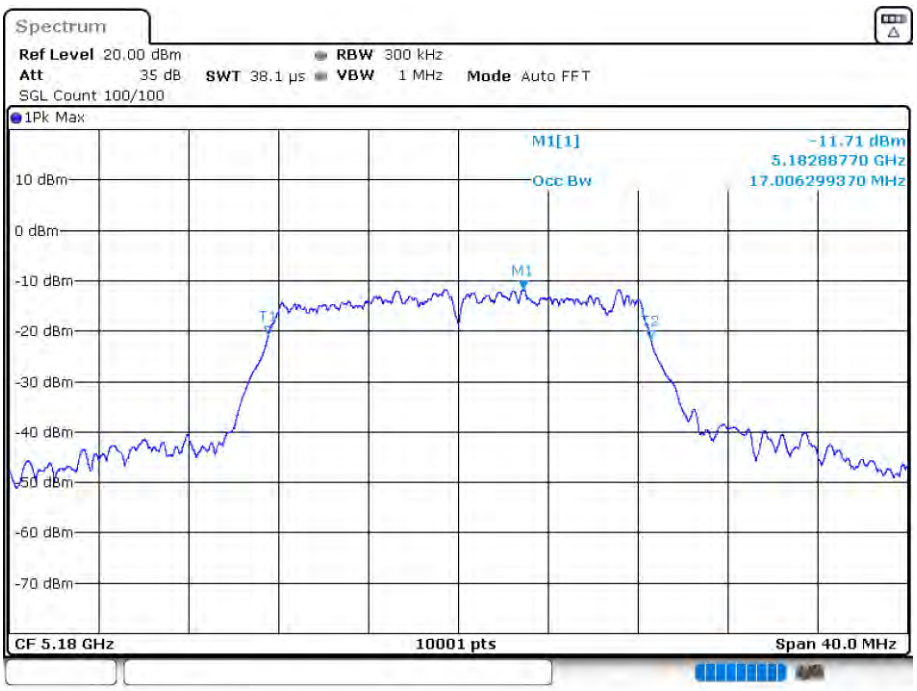
11.2 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Total Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant 0	6.19	0	6.19	N/A	30	Pass
NVNT	a	5200	Ant 0	8.04	0	8.04	N/A	30	Pass
NVNT	a	5240	Ant 0	7.94	0	7.94	N/A	30	Pass
NVNT	a	5180	Ant 1	7.47	0	7.47	N/A	30	Pass
NVNT	a	5200	Ant 1	8.22	0	8.22	N/A	30	Pass
NVNT	a	5240	Ant 1	8.84	0	8.84	N/A	30	Pass
NVNT	ac20	5180	Ant 0	5.63	0	5.63	9.61	29.94	Pass
NVNT	ac20	5180	Ant 1	7.4	0	7.4			Pass
NVNT	ac20	5200	Ant 0	7.42	0	7.42	10.89	29.94	Pass
NVNT	ac20	5200	Ant 1	8.29	0	8.29			Pass
NVNT	ac20	5240	Ant 0	6.53	0	6.53	10.87	29.94	Pass
NVNT	ac20	5240	Ant 1	8.88	0	8.88			Pass
NVNT	ac40	5190	Ant 0	4.42	0	4.42	8.33	29.94	Pass
NVNT	ac40	5190	Ant 1	6.07	0	6.07			Pass
NVNT	ac40	5230	Ant 0	6.26	0	6.26	10.10	29.94	Pass
NVNT	ac40	5230	Ant 1	7.78	0	7.78			Pass
NVNT	ac80	5210	Ant 0	7.08	0	7.08	10.39	29.94	Pass
NVNT	ac80	5210	Ant 1	7.66	0	7.66			Pass
NVNT	n20	5180	Ant 0	5.58	0	5.58	9.54	29.94	Pass
NVNT	n20	5180	Ant 1	7.31	0	7.31			Pass
NVNT	n20	5200	Ant 0	7.42	0	7.42	10.84	29.94	Pass
NVNT	n20	5200	Ant 1	8.21	0	8.21			Pass
NVNT	n20	5240	Ant 0	6.51	0	6.51	9.54	29.94	Pass
NVNT	n20	5240	Ant 1	6.55	0	6.55			Pass
NVNT	n40	5190	Ant 0	4.4	0	4.4	9.48	29.94	Pass
NVNT	n40	5190	Ant 1	7.86	0	7.86			Pass
NVNT	n40	5230	Ant 0	6.26	0	6.26	10.35	29.94	Pass
NVNT	n40	5230	Ant 1	8.21	0	8.21			Pass

11.3 OCCUPIED CHANNEL BANDWIDTH

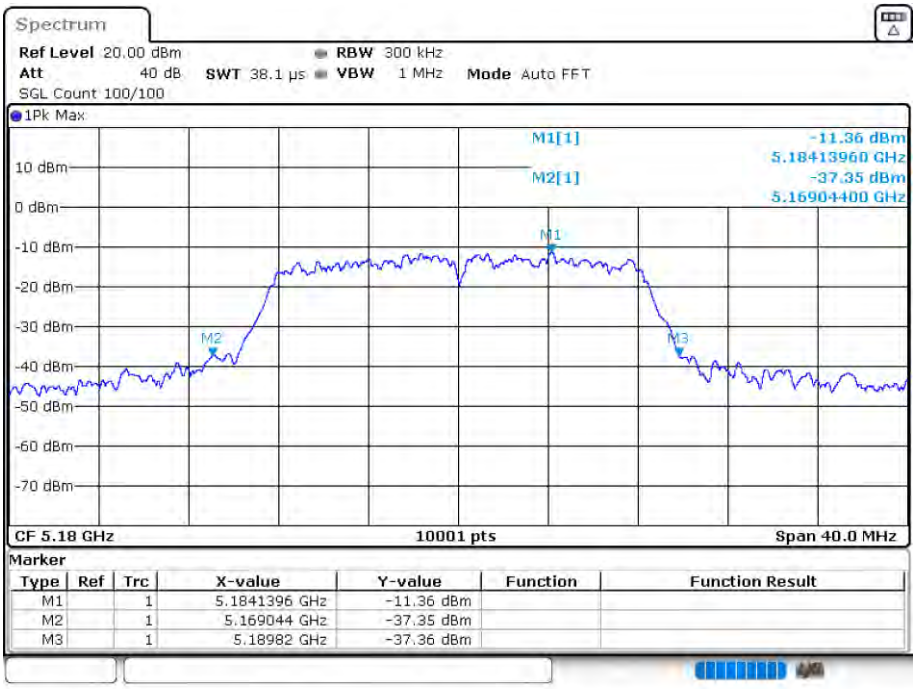
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)	-26 dB Bandwidth (MHz)
NVNT	802.11a	5180	Ant 0	17.0063	20.776
NVNT	802.11a	5200	Ant 0	16.7423	22.424
NVNT	802.11a	5240	Ant 0	16.4664	19.42
NVNT	802.11a	5180	Ant 1	16.7343	19.98
NVNT	802.11a	5200	Ant 1	16.6503	19.388
NVNT	802.11a	5240	Ant 1	16.5343	19.404
NVNT	802.11ac20	5180	Ant 0	17.9382	20.712
NVNT	802.11ac20	5200	Ant 0	17.7422	20.244
NVNT	802.11ac20	5240	Ant 0	17.6422	20.06
NVNT	802.11ac20	5180	Ant 1	17.6622	20.32
NVNT	802.11ac20	5200	Ant 1	17.7542	19.86
NVNT	802.11ac20	5240	Ant 1	17.6022	20.132
NVNT	802.11ac40	5190	Ant 0	36.1724	43.456
NVNT	802.11ac40	5230	Ant 0	35.8604	40.728
NVNT	802.11ac40	5190	Ant 1	36.2204	41.576
NVNT	802.11ac40	5230	Ant 1	35.9084	40.448
NVNT	802.11ac80	5210	Ant 0	74.2006	80.048
NVNT	802.11ac80	5210	Ant 1	74.6165	80.416
NVNT	802.11n(HT20)	5180	Ant 0	17.6542	20.348
NVNT	802.11n(HT20)	5200	Ant 0	17.6742	20.5
NVNT	802.11n(HT20)	5240	Ant 0	17.8062	20.416
NVNT	802.11n(HT20)	5180	Ant 1	17.7062	20.988
NVNT	802.11n(HT20)	5200	Ant 1	17.6942	20.532
NVNT	802.11n(HT20)	5240	Ant 1	17.6422	20.084
NVNT	802.11n(HT40)	5190	Ant 0	36.1884	41.552
NVNT	802.11n(HT40)	5230	Ant 0	35.8844	40.336
NVNT	802.11n(HT40)	5190	Ant 1	36.2124	42.016
NVNT	802.11n(HT40)	5230	Ant 1	35.8844	40.496

OBW NVNT 802.11a 5180MHz Ant 0



Date: 9.OCT.2020 11:43:55

-26 dB BW NVNT 802.11a 5180MHz Ant 0

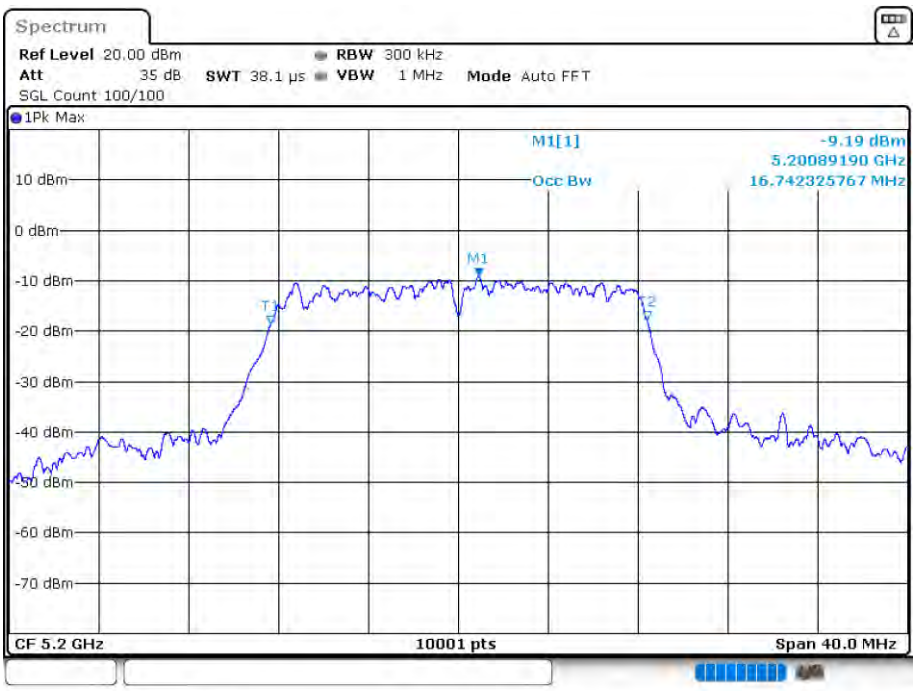


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1841396 GHz	-11.36 dBm		
M2		1	5.169044 GHz	-37.35 dBm		
M3		1	5.18982 GHz	-37.36 dBm		

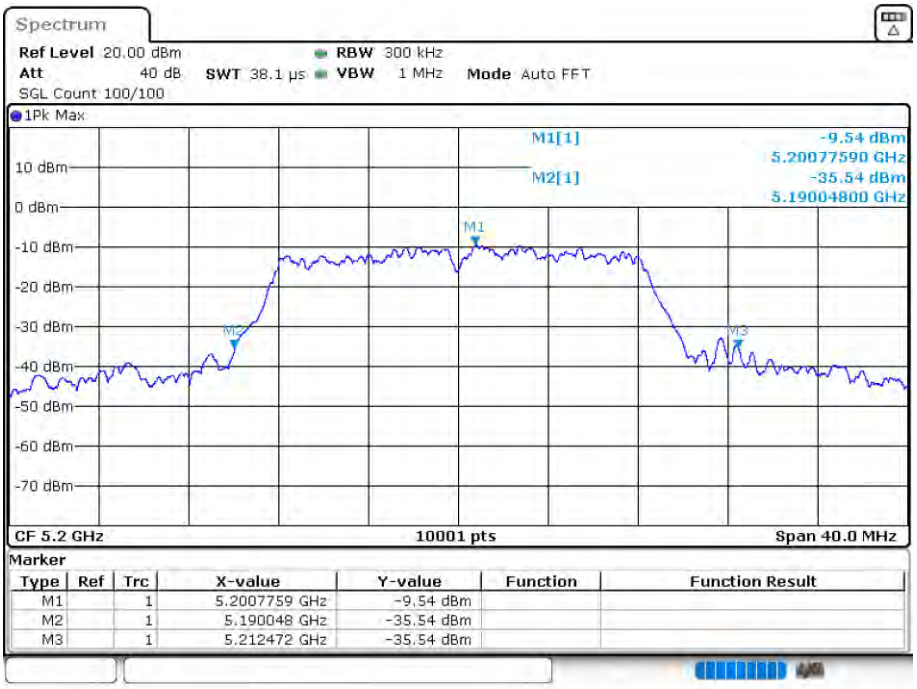
Date: 9.OCT.2020 11:43:57

OBW NVNT 802.11a 5200MHz Ant 0



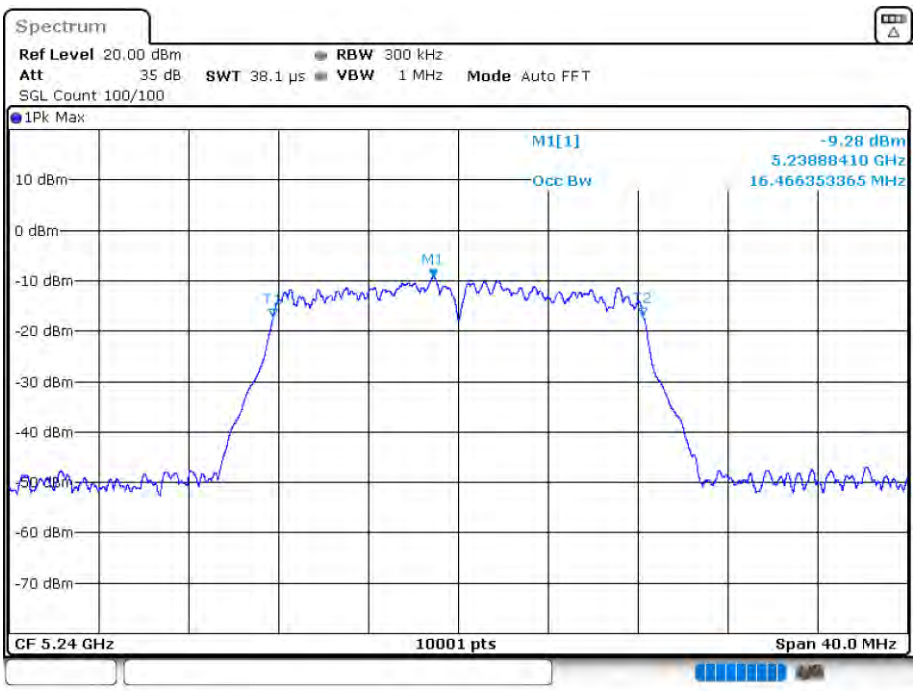
Date: 9.OCT.2020 11:45:19

-26 dB BW NVNT 802.11a 5200MHz Ant 0



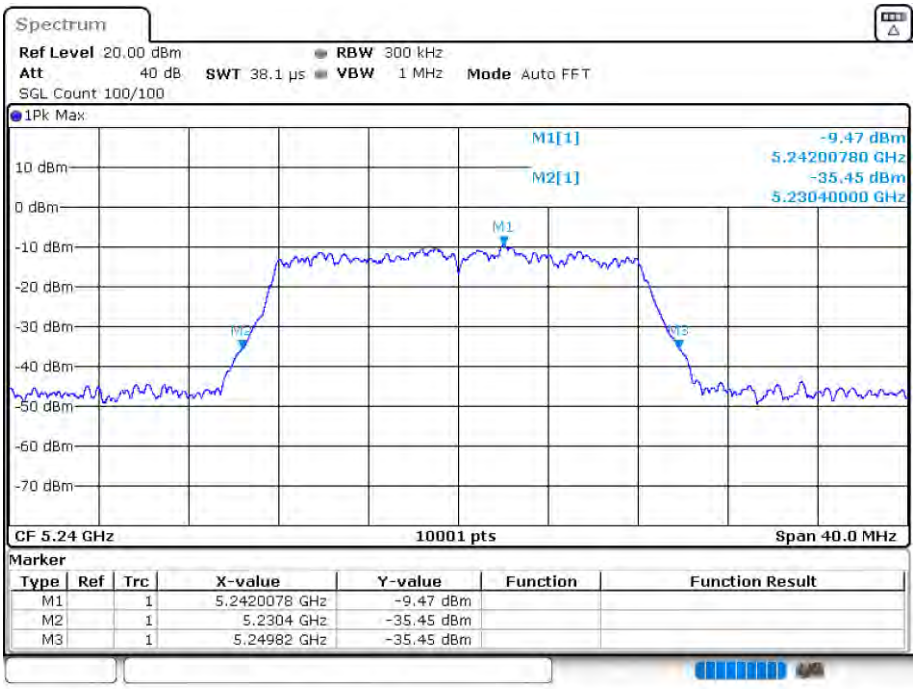
Date: 9.OCT.2020 11:45:21

OBW NVNT 802.11a 5240MHz Ant 0



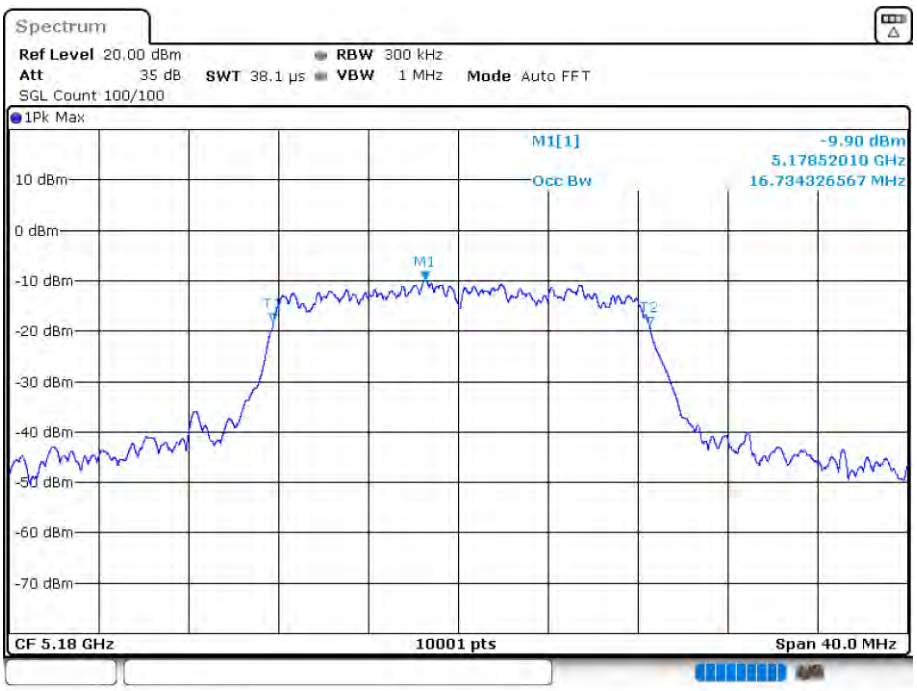
Date: 9.OCT.2020 11:48:51

-26 dB BW NVNT 802.11a 5240MHz Ant 0



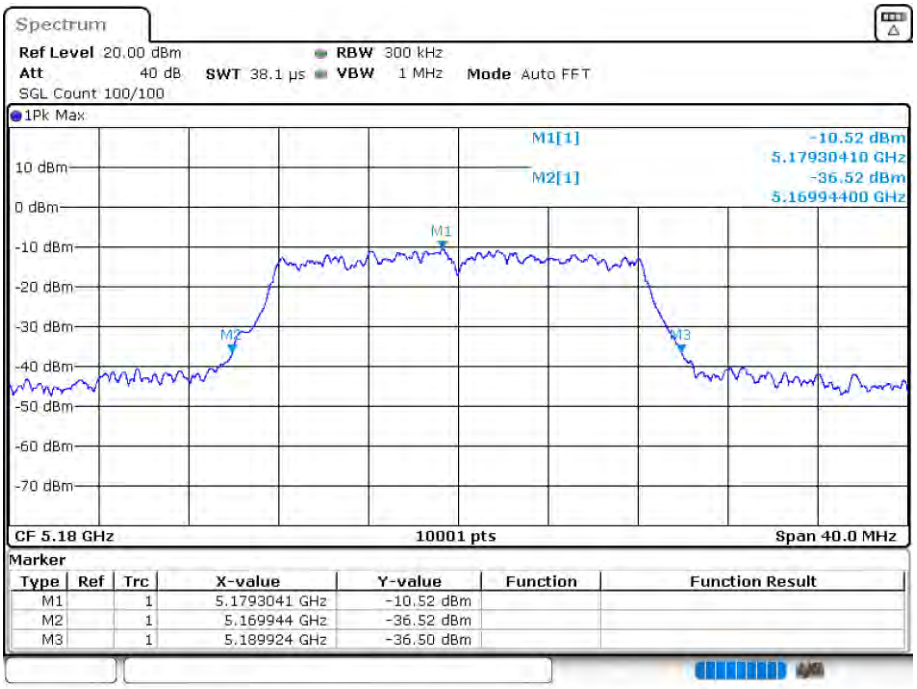
Date: 9.OCT.2020 11:48:54

OBW NVNT 802.11a 5180MHz Ant 1



Date: 9.OCT.2020 11:04:37

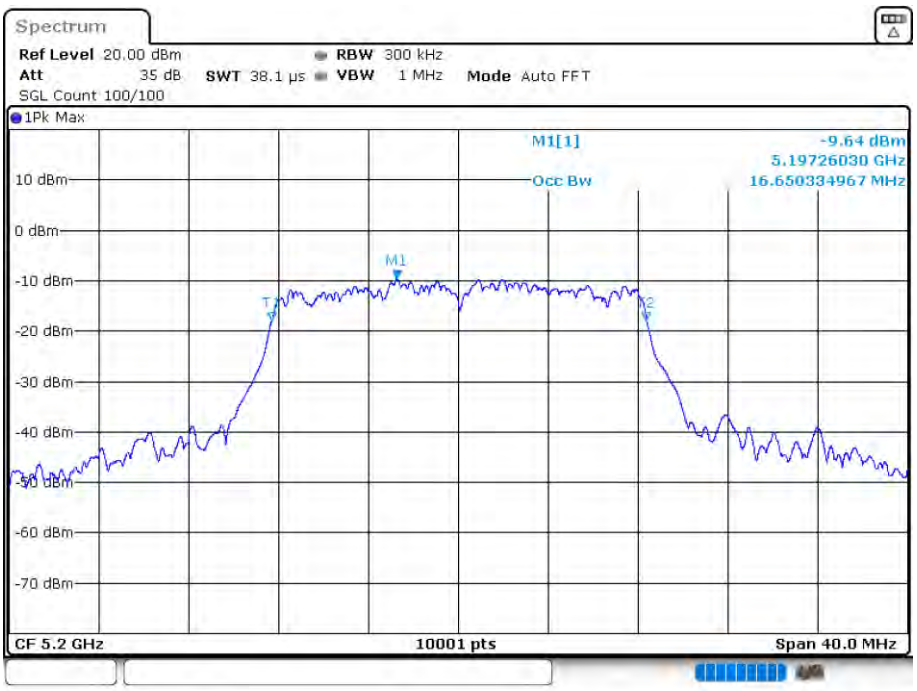
-26 dB BW NVNT 802.11a 5180MHz Ant 1



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1793041 GHz	-10.52 dBm		
M2		1	5.169944 GHz	-36.52 dBm		
M3		1	5.189924 GHz	-36.50 dBm		

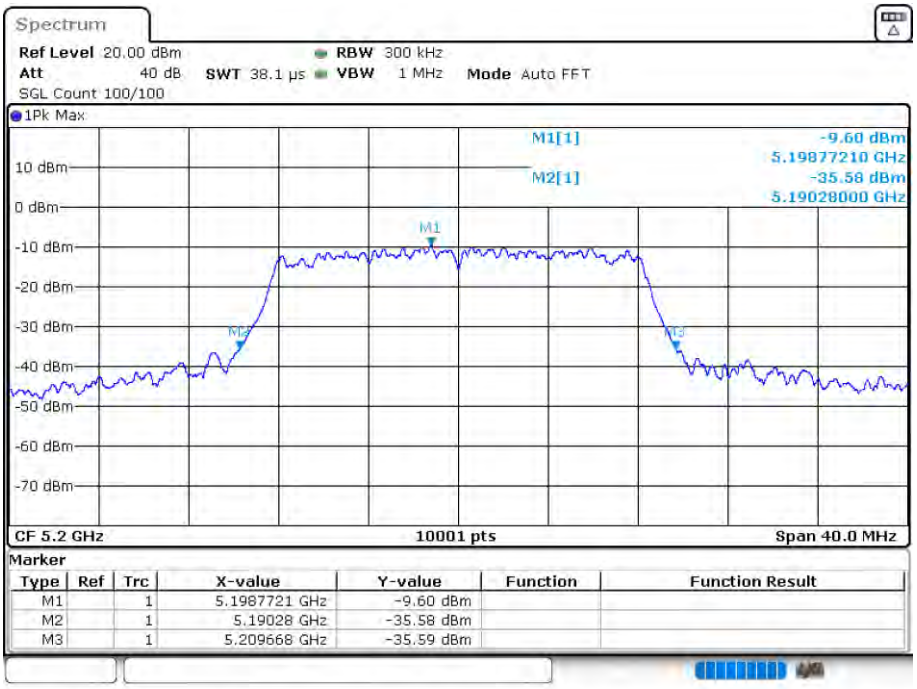
Date: 9.OCT.2020 11:04:39

OBW NVNT 802.11a 5200MHz Ant 1



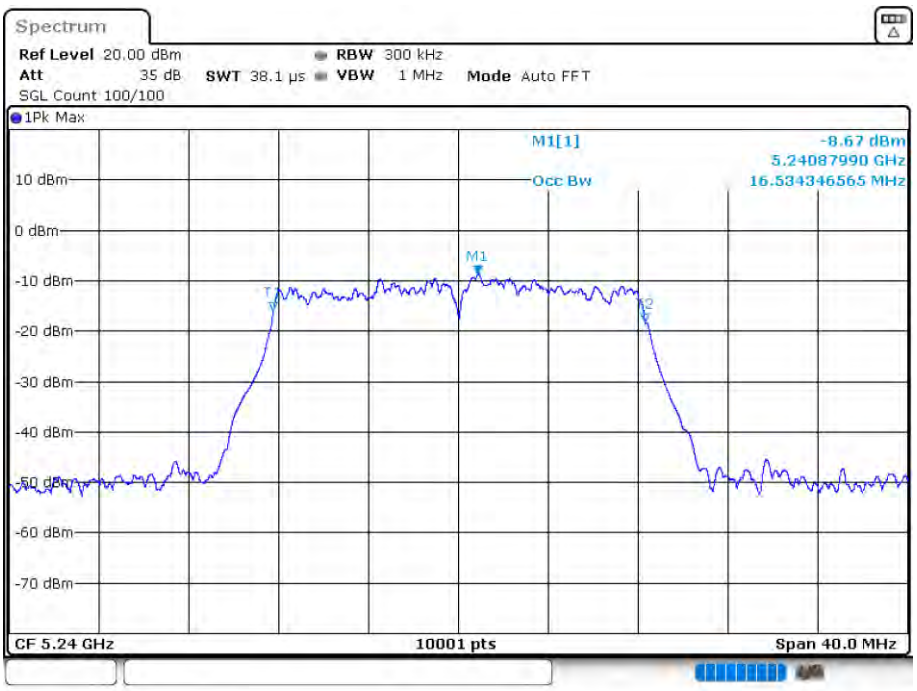
Date: 9.OCT.2020 11:05:42

-26 dB BW NVNT 802.11a 5200MHz Ant 1



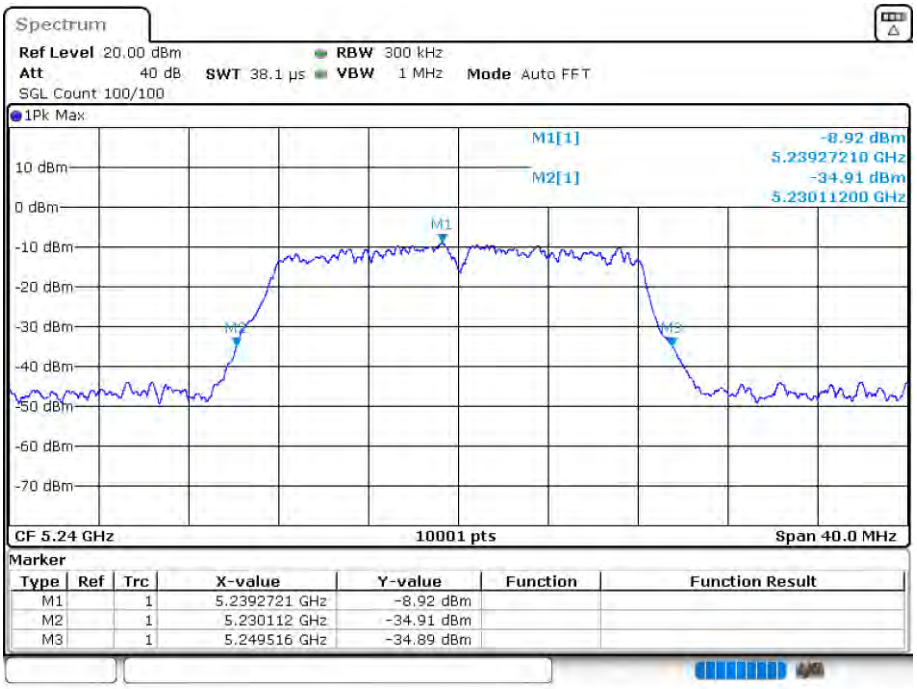
Date: 9.OCT.2020 11:05:44

OBW NVNT 802.11a 5240MHz Ant 1



Date: 9.OCT.2020 11:08:29

-26 dB BW NVNT 802.11a 5240MHz Ant 1



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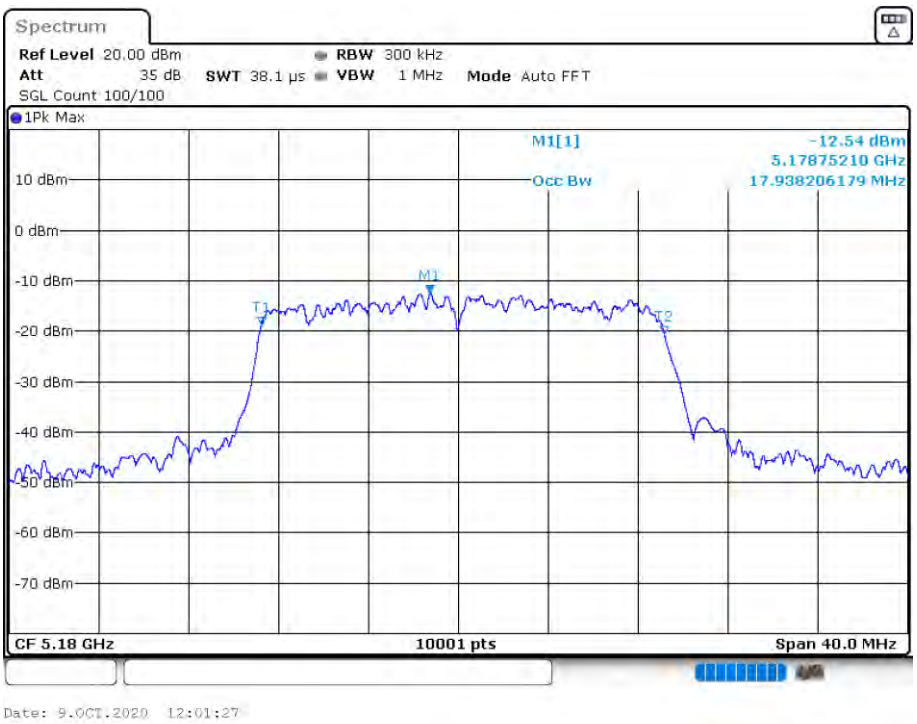
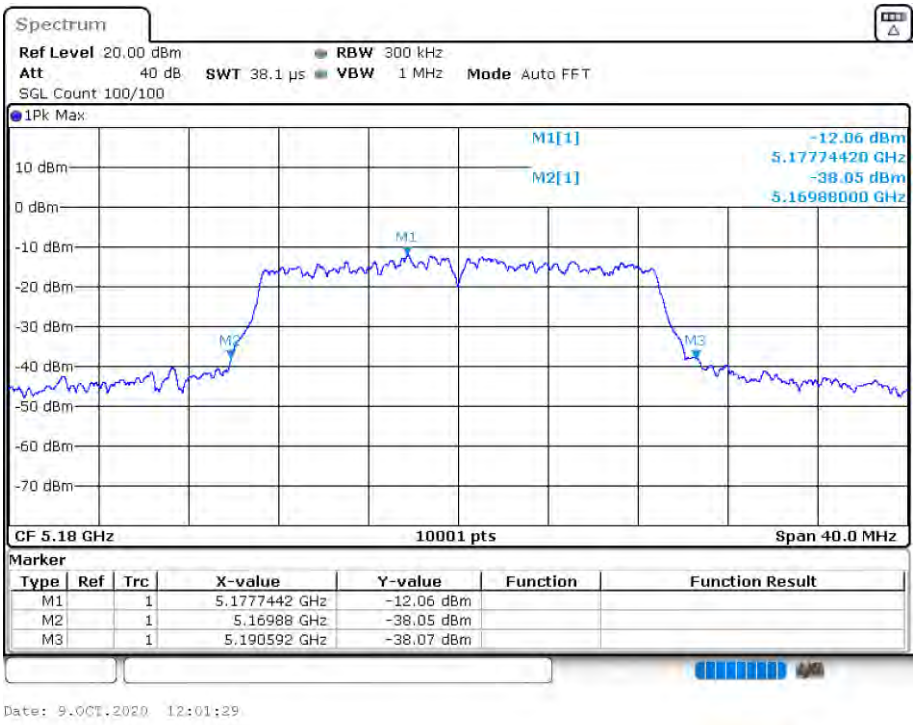
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2392721 GHz	-8.92 dBm		
M2		1	5.230112 GHz	-34.91 dBm		
M3		1	5.249516 GHz	-34.89 dBm		

Date: 9.OCT.2020 11:08:31

OBW NVNT 802.11ac20 5180MHz Ant 0



-26 dB BW NVNT 802.11ac20 5180MHz Ant 0



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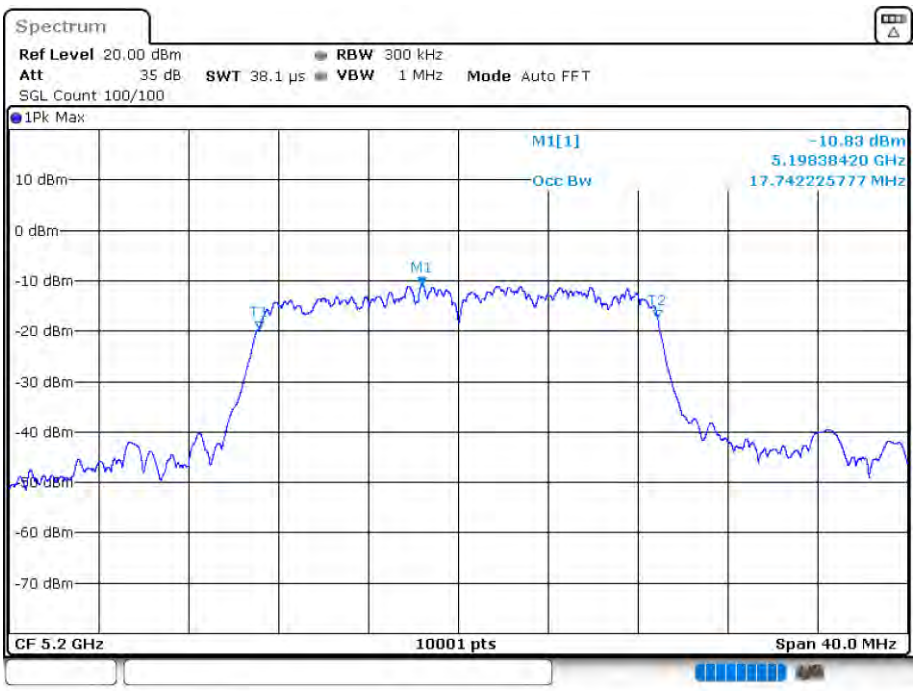
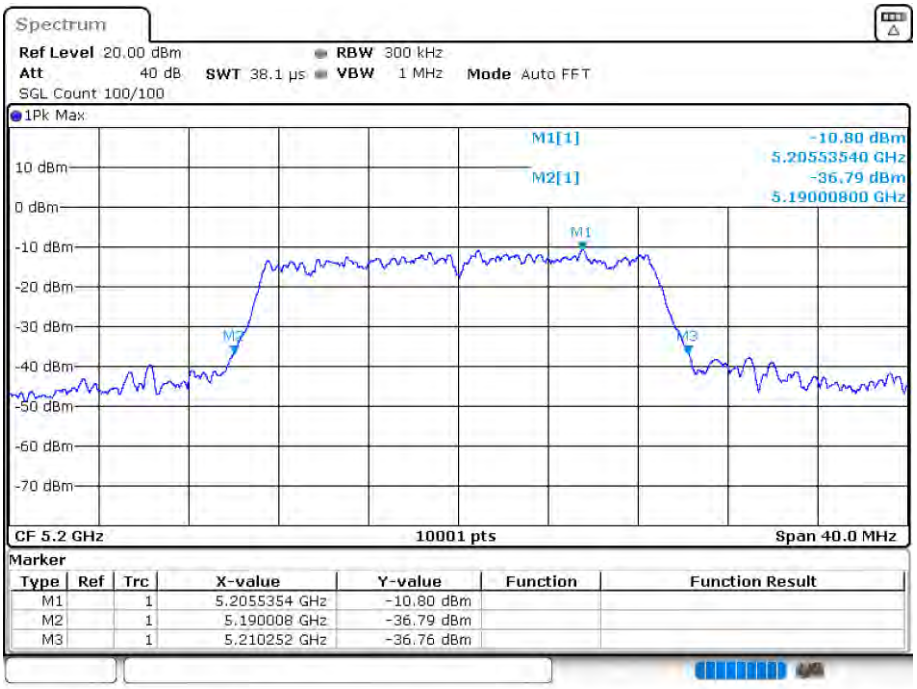
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1777442 GHz	-12.06 dBm		
M2		1	5.16988 GHz	-38.05 dBm		
M3		1	5.190592 GHz	-38.07 dBm		

OBW NVNT 802.11ac20 5200MHz Ant 0



Date: 9.OCT.2020 12:05:34

-26 dB BW NVNT 802.11ac20 5200MHz Ant 0

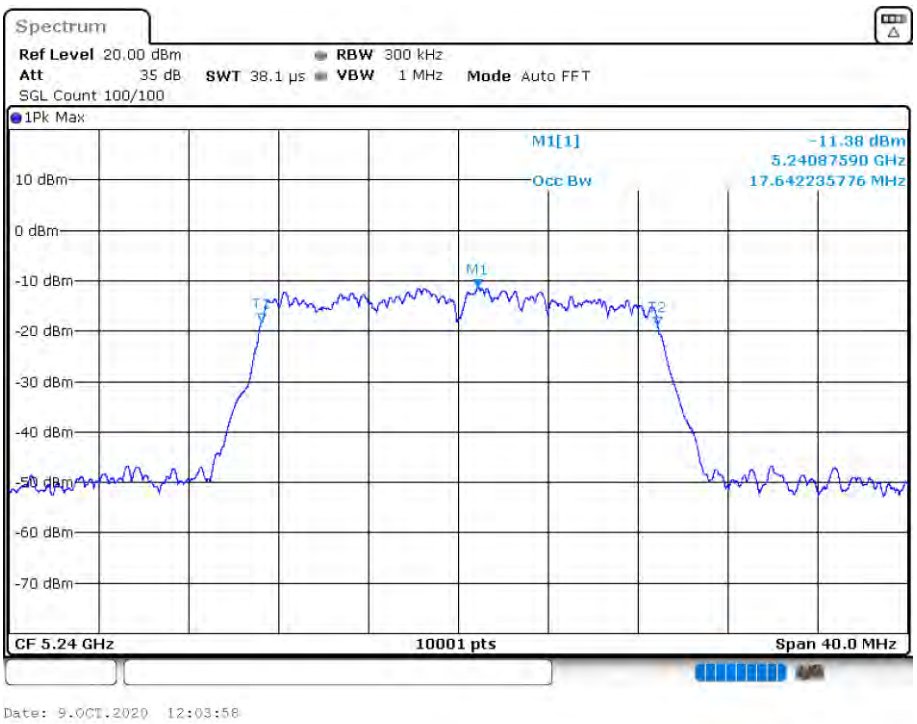


Marker

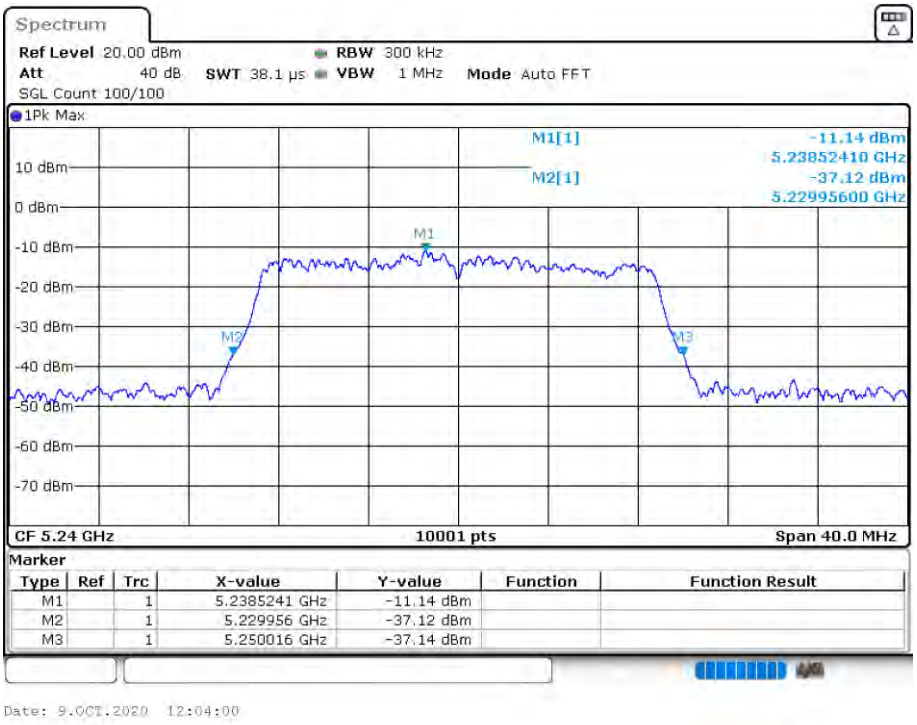
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2055354 GHz	-10.80 dBm		
M2		1	5.190008 GHz	-36.79 dBm		
M3		1	5.210252 GHz	-36.76 dBm		

Date: 9.OCT.2020 12:05:37

OBW NVNT 802.11ac20 5240MHz Ant 0



-26 dB BW NVNT 802.11ac20 5240MHz Ant 0



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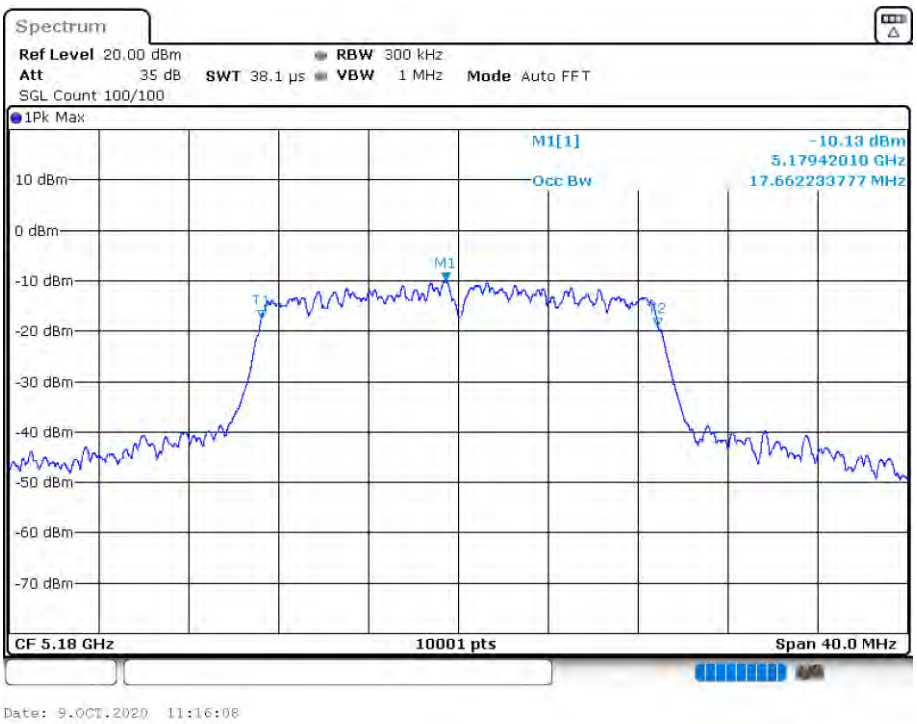
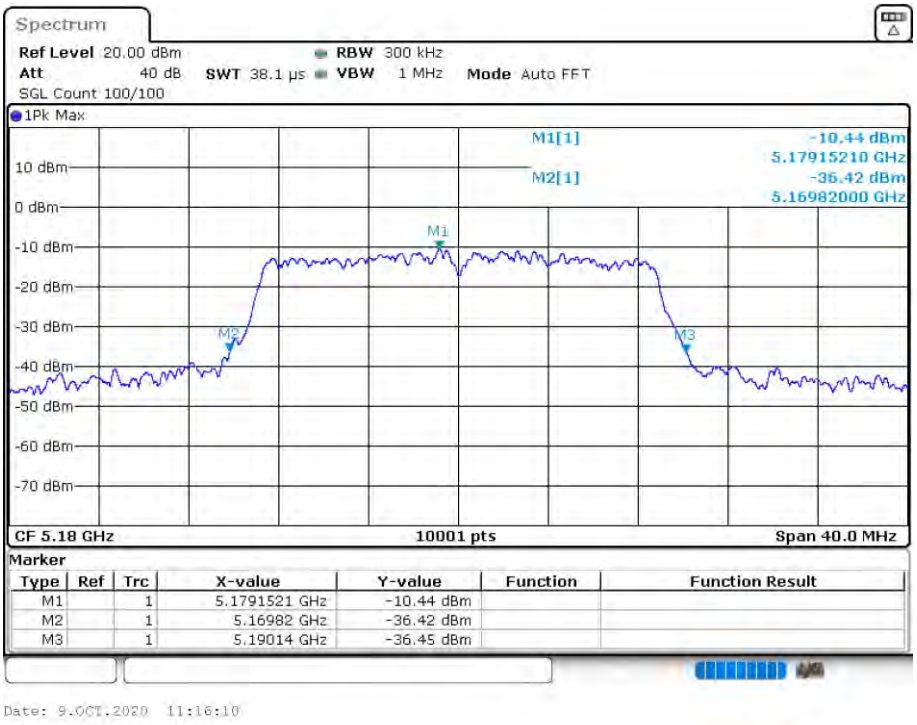
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2385241 GHz	-11.14 dBm		
M2		1	5.229956 GHz	-37.12 dBm		
M3		1	5.250016 GHz	-37.14 dBm		

OBW NVNT 802.11ac20 5180MHz Ant 1



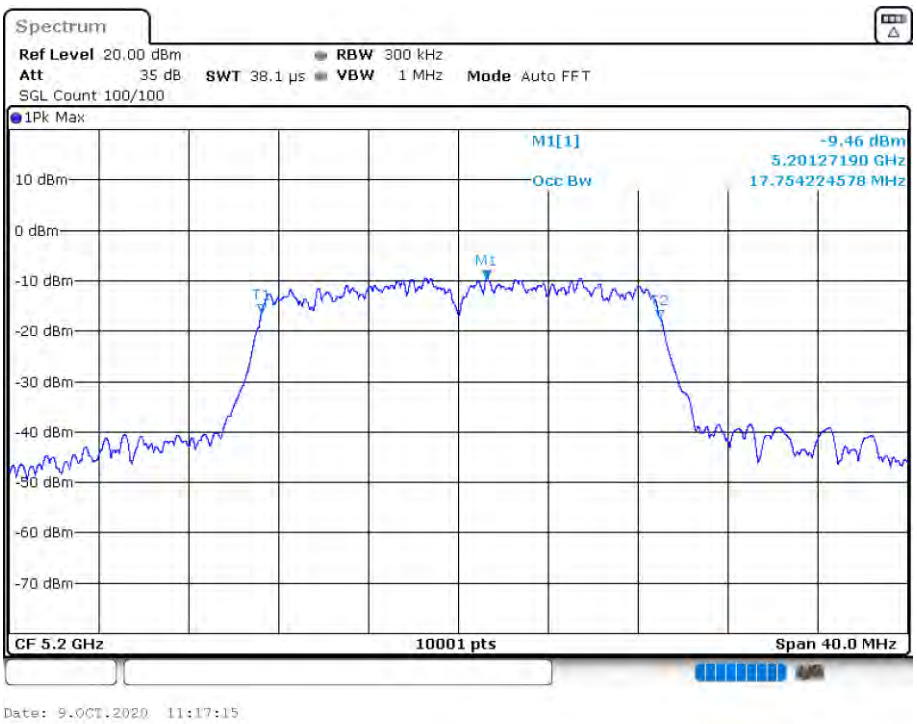
-26 dB BW NVNT 802.11ac20 5180MHz Ant 1



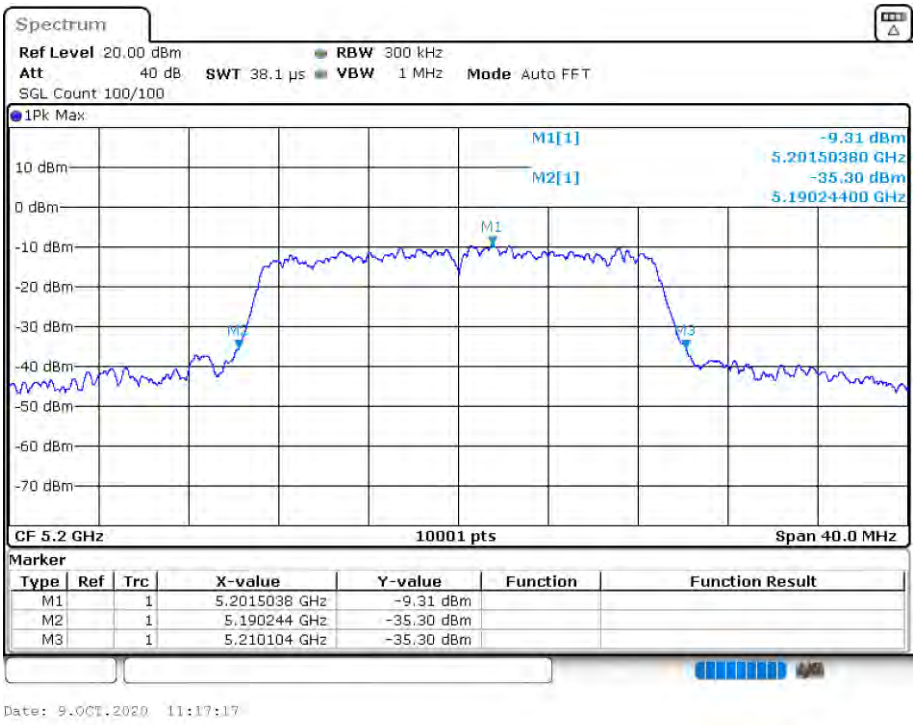
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1791521 GHz	-10.44 dBm		
M2		1	5.16982 GHz	-36.42 dBm		
M3		1	5.19014 GHz	-36.45 dBm		

OBW NVNT 802.11ac20 5200MHz Ant 1



-26 dB BW NVNT 802.11ac20 5200MHz Ant 1



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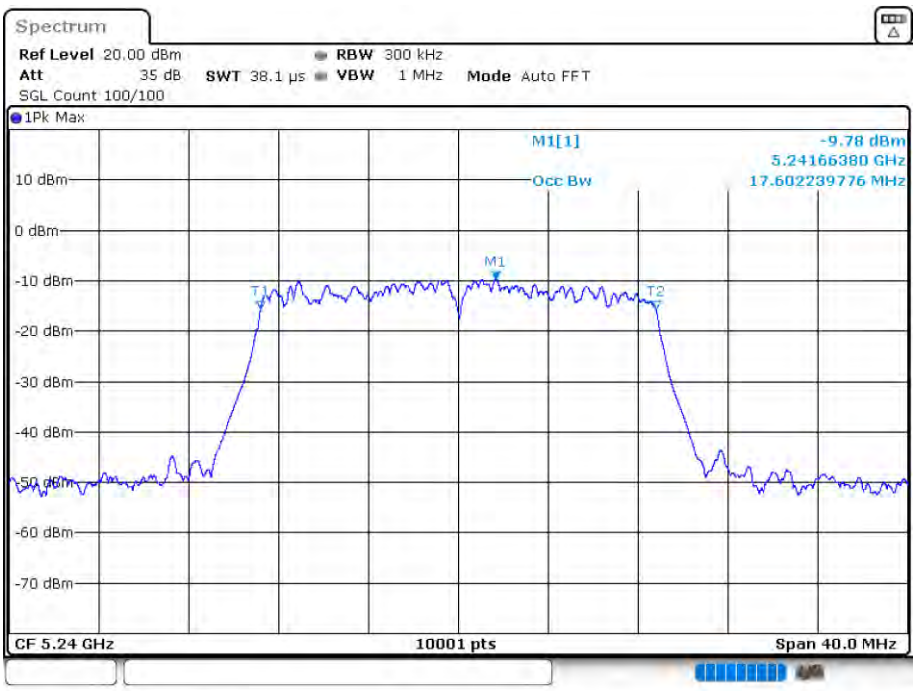
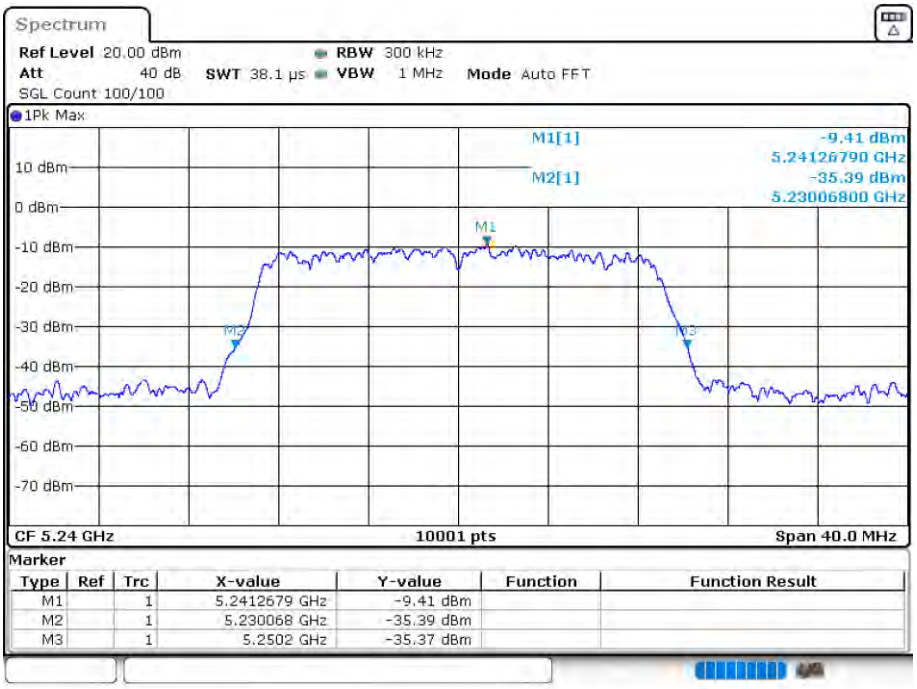
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2015038 GHz	-9.31 dBm		
M2		1	5.190244 GHz	-35.30 dBm		
M3		1	5.210104 GHz	-35.30 dBm		

OBW NVNT 802.11ac20 5240MHz Ant 1



Date: 9.OCT.2020 11:18:31

-26 dB BW NVNT 802.11ac20 5240MHz Ant 1



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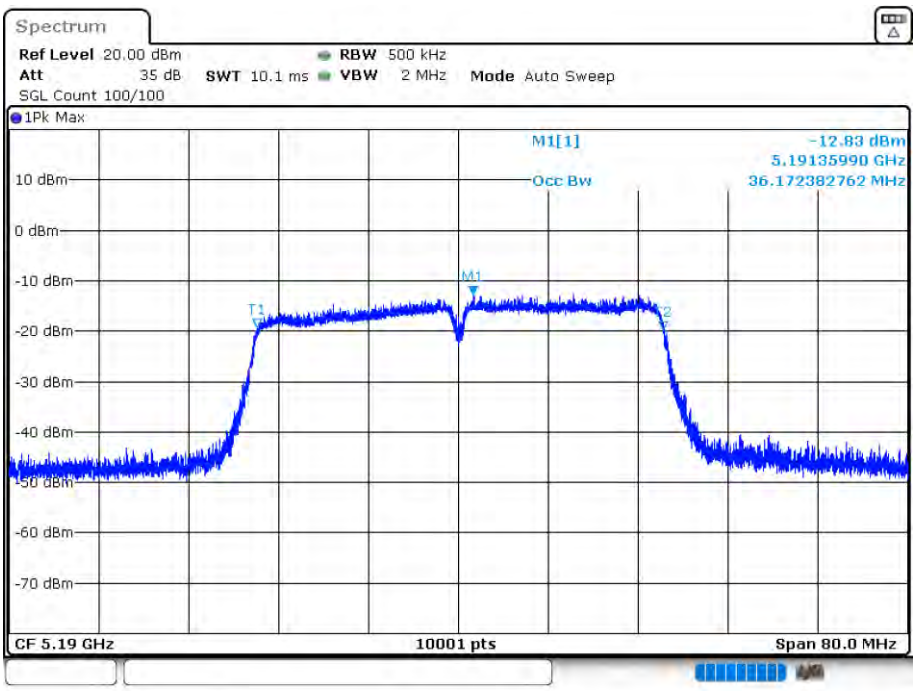
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2412679 GHz	-9.41 dBm		
M2		1	5.230068 GHz	-35.39 dBm		
M3		1	5.2502 GHz	-35.37 dBm		

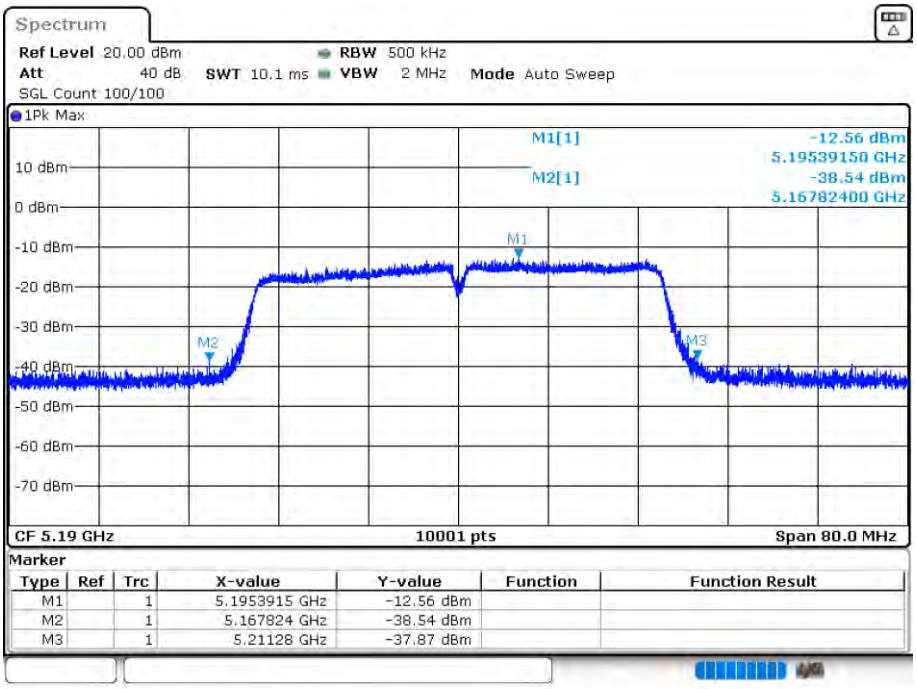
Date: 9.OCT.2020 11:18:33

OBW NVNT 802.11ac40 5190MHz Ant 0



Date: 9.OCT.2020 12:12:47

-26 dB BW NVNT 802.11ac40 5190MHz Ant 0



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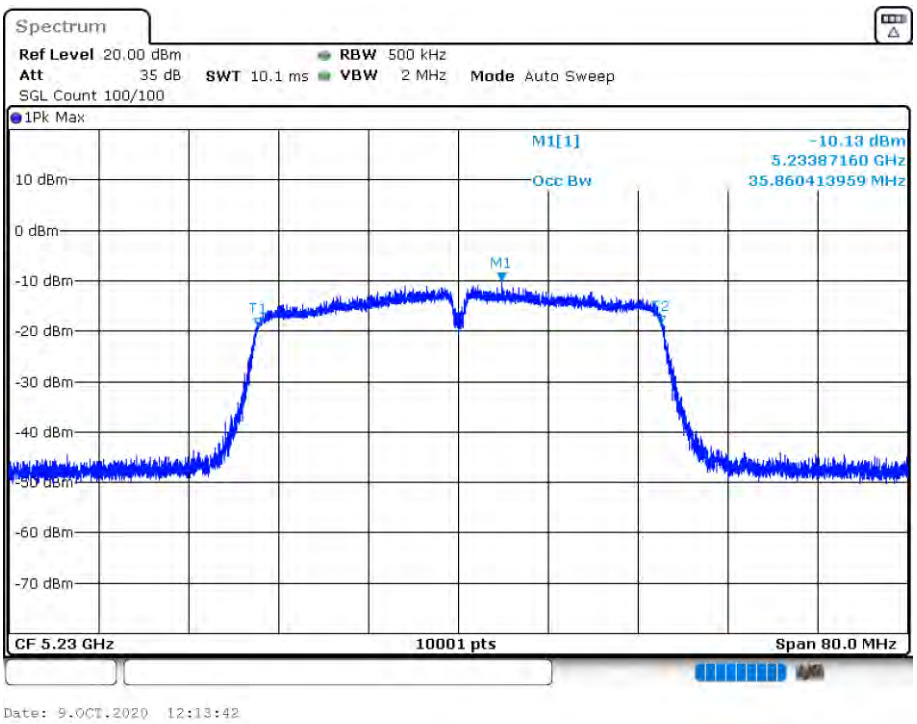
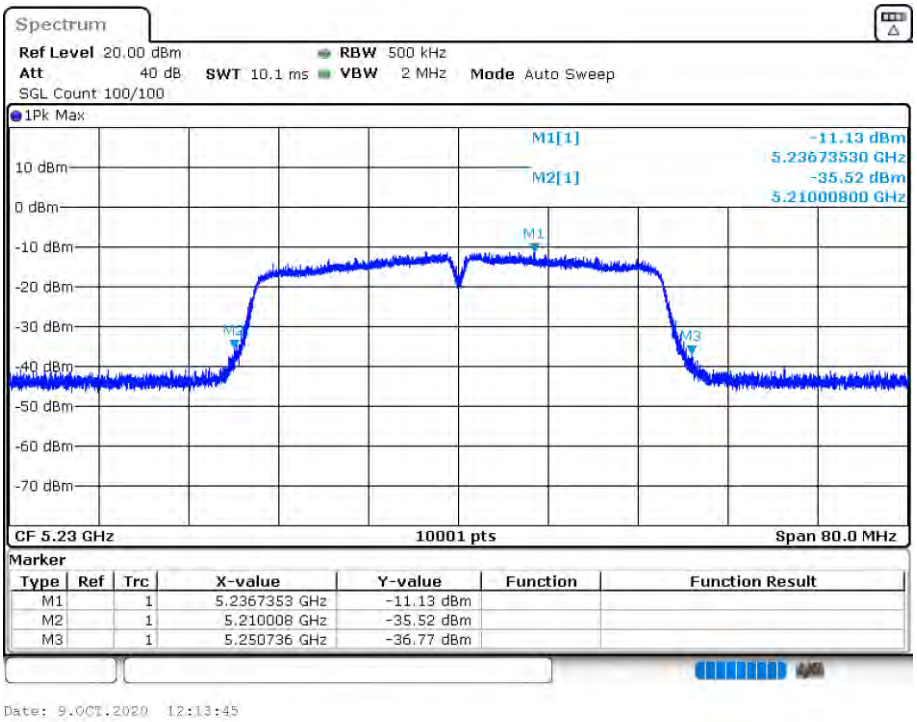
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1953915 GHz	-12.56 dBm		
M2		1	5.167824 GHz	-38.54 dBm		
M3		1	5.21128 GHz	-37.87 dBm		

Date: 9.OCT.2020 12:12:50

OBW NVNT 802.11ac40 5230MHz Ant 0



-26 dB BW NVNT 802.11ac40 5230MHz Ant 0



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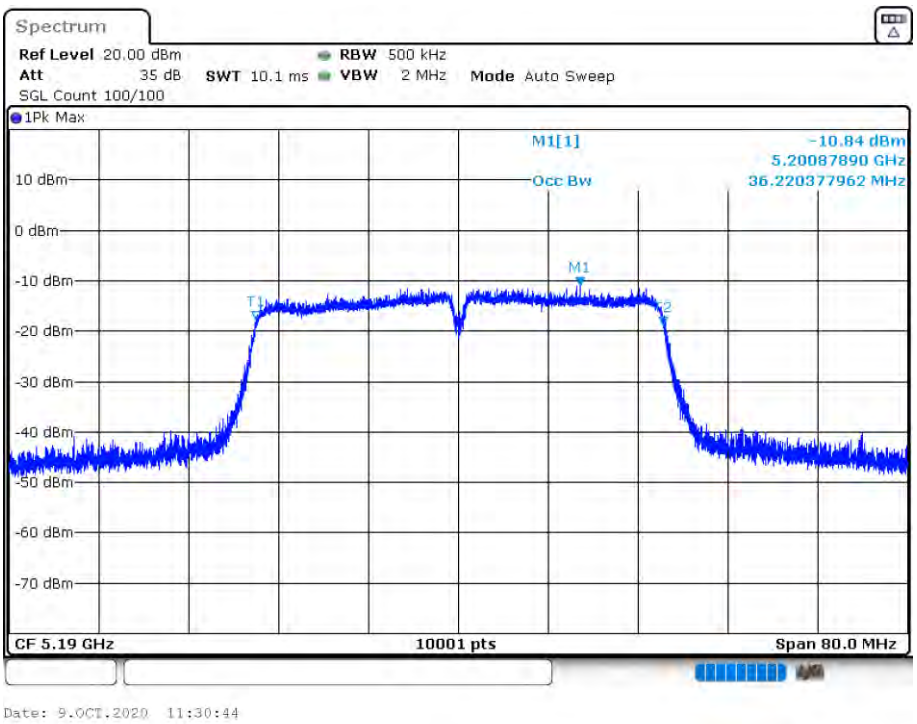
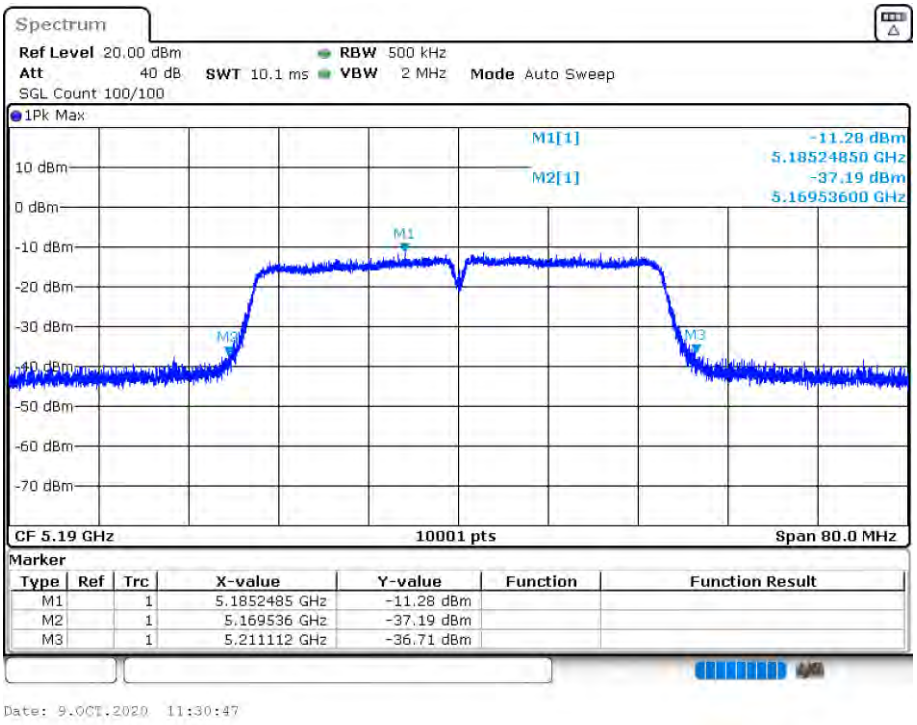
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2367353 GHz	-11.13 dBm		
M2		1	5.210008 GHz	-35.52 dBm		
M3		1	5.250736 GHz	-36.77 dBm		

OBW NVNT 802.11ac40 5190MHz Ant 1



-26 dB BW NVNT 802.11ac40 5190MHz Ant 1



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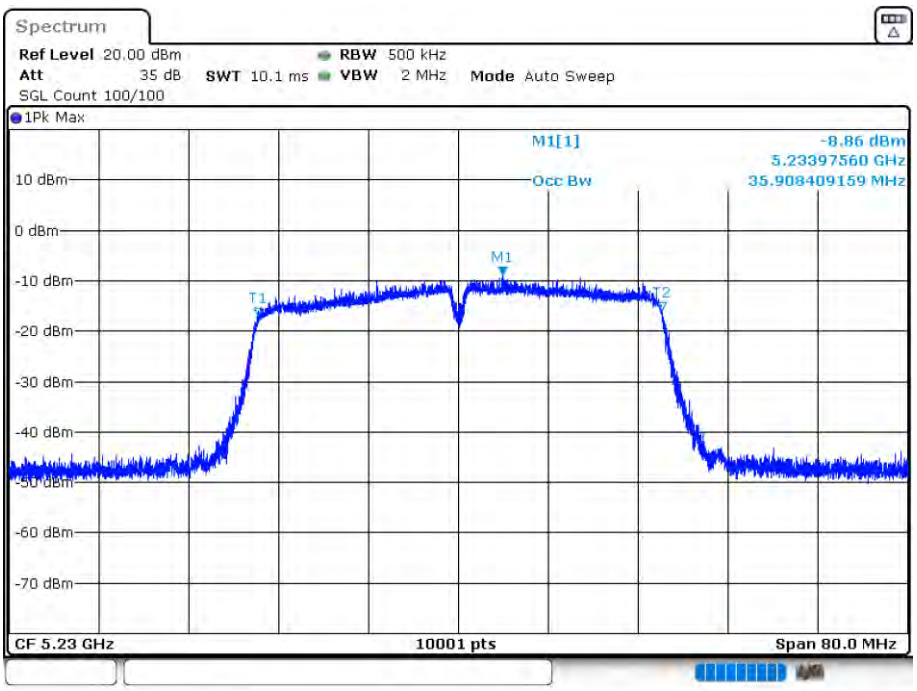
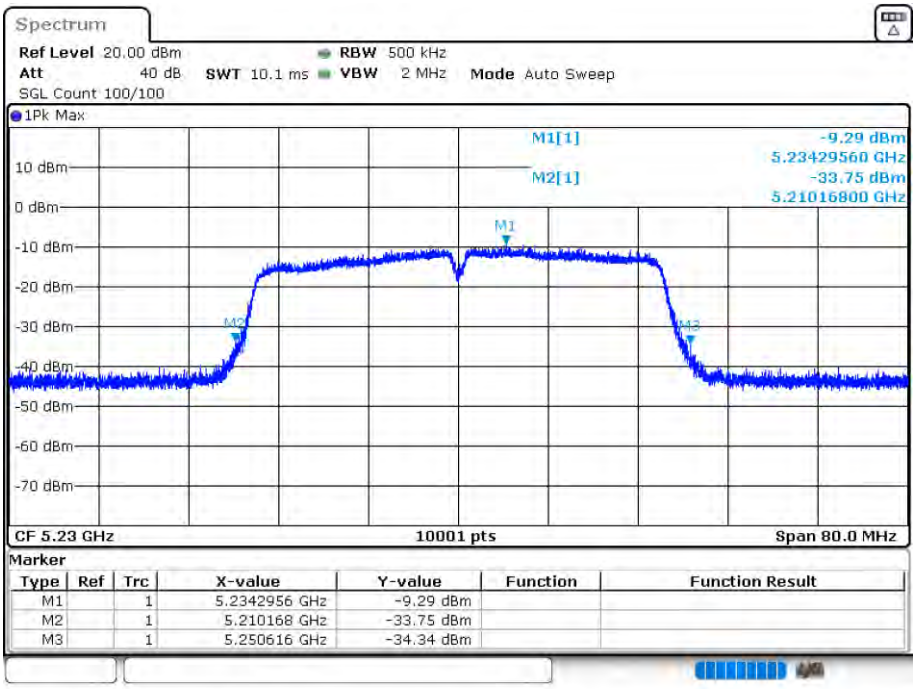
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1852485 GHz	-11.28 dBm		
M2		1	5.169536 GHz	-37.19 dBm		
M3		1	5.211112 GHz	-36.71 dBm		

OBW NVNT 802.11ac40 5230MHz Ant 1



Date: 9.OCT.2020 11:32:44

-26 dB BW NVNT 802.11ac40 5230MHz Ant 1



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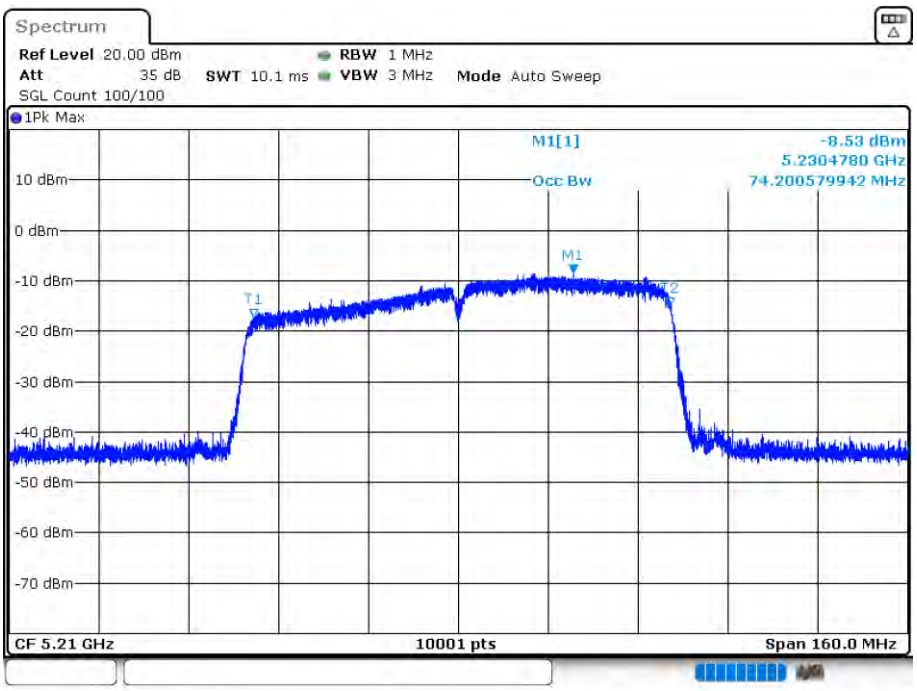
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2342956 GHz	-9.29 dBm		
M2		1	5.210168 GHz	-33.75 dBm		
M3		1	5.250616 GHz	-34.34 dBm		

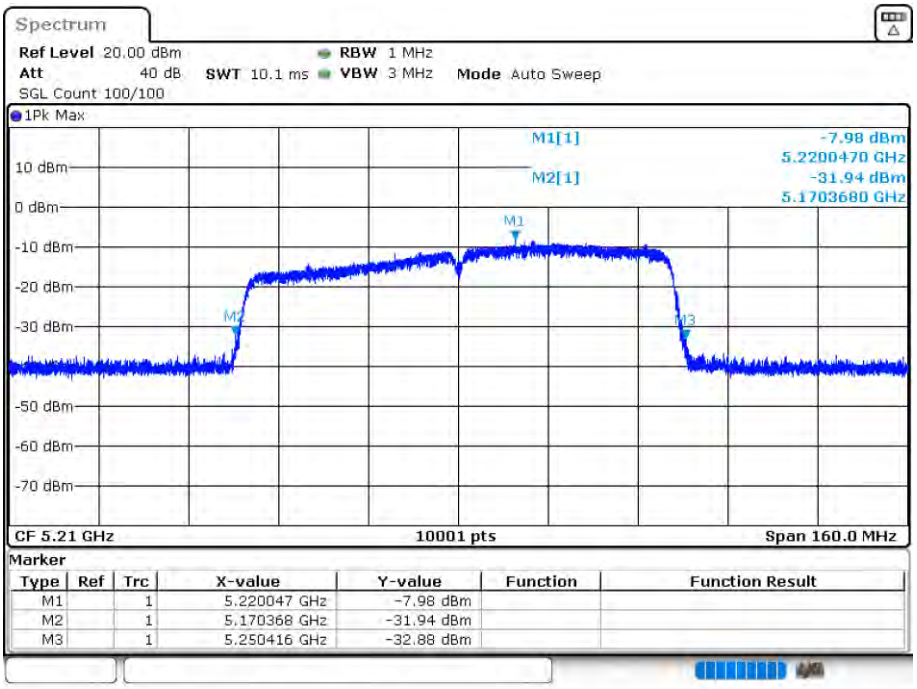
Date: 9.OCT.2020 11:32:47

OBW NVNT 802.11ac80 5210MHz Ant 0



Date: 9.OCT.2020 11:41:00

-26 dB BW NVNT 802.11ac80 5210MHz Ant 0

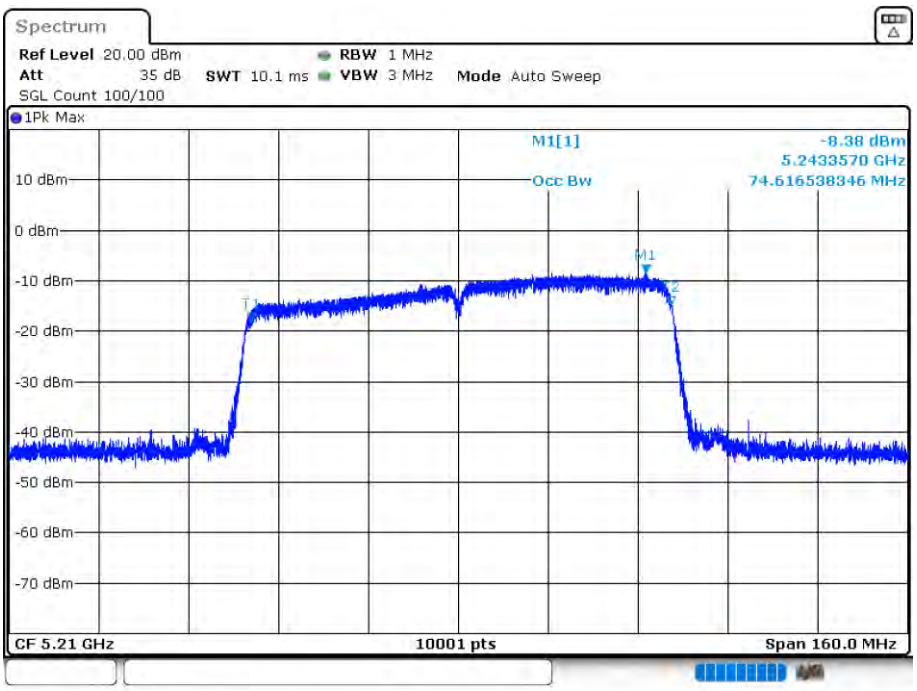


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.220047 GHz	-7.98 dBm		
M2		1	5.170368 GHz	-31.94 dBm		
M3		1	5.250416 GHz	-32.88 dBm		

Date: 9.OCT.2020 11:41:03

OBW NVNT 802.11ac80 5210MHz Ant 1



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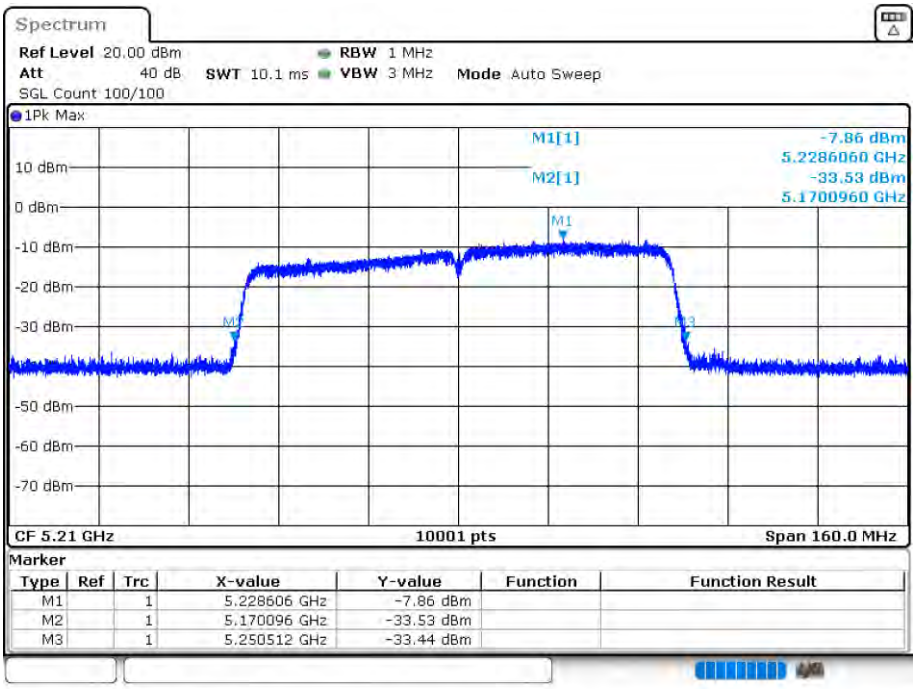
-26 dB BW NVNT 802.11ac80 5210MHz Ant 1



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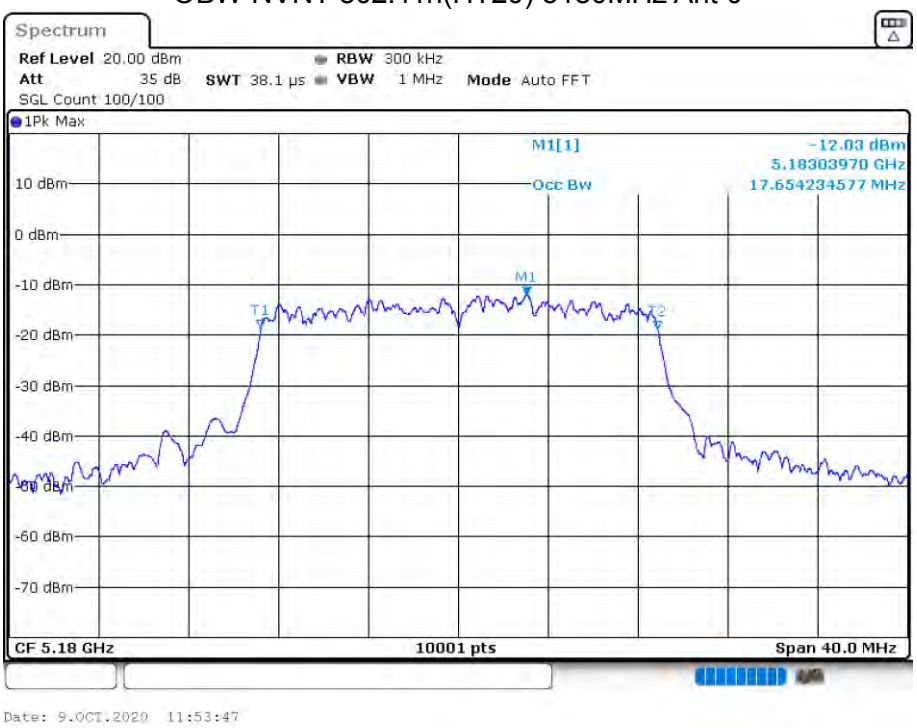
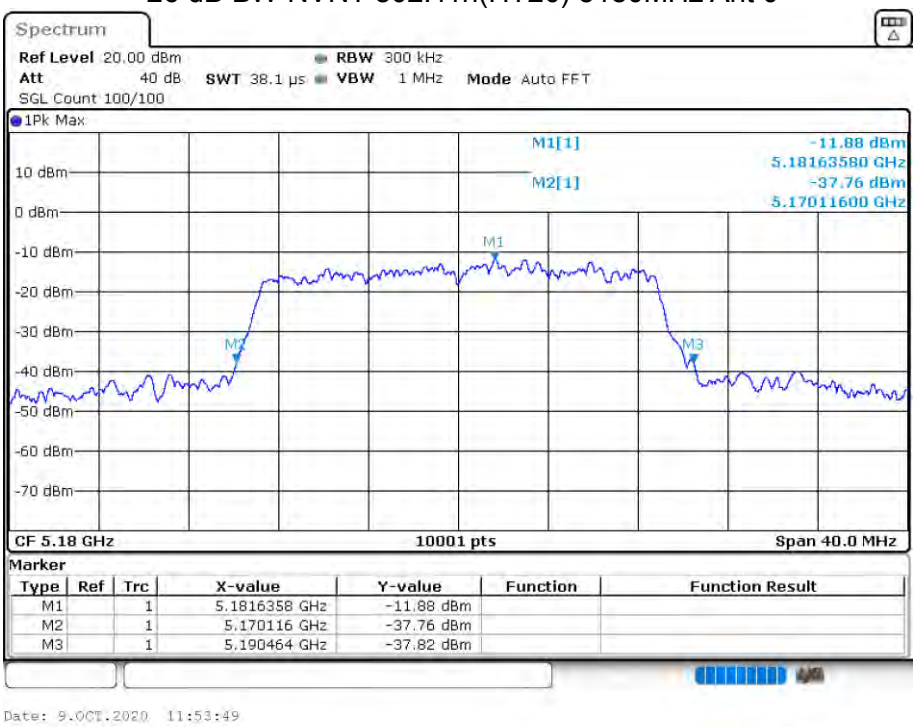
OBW NVNT 802.11n(HT20) 5180MHz Ant 0



-26 dB BW NVNT 802.11n(HT20) 5180MHz Ant 0



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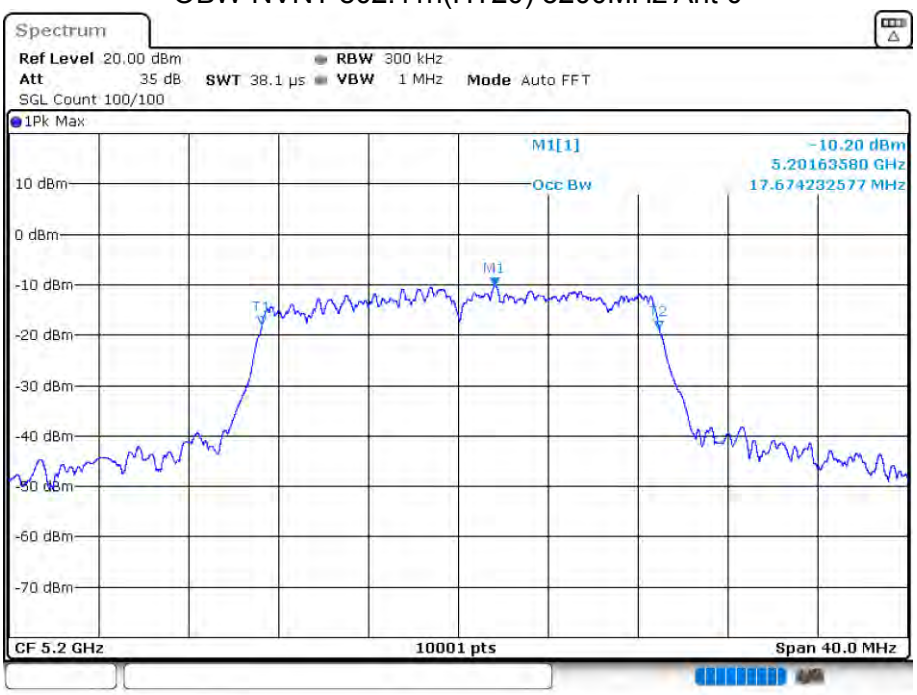
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1816358 GHz	-11.88 dBm		
M2		1	5.170116 GHz	-37.76 dBm		
M3		1	5.190464 GHz	-37.82 dBm		

OBW NVNT 802.11n(HT20) 5200MHz Ant 0



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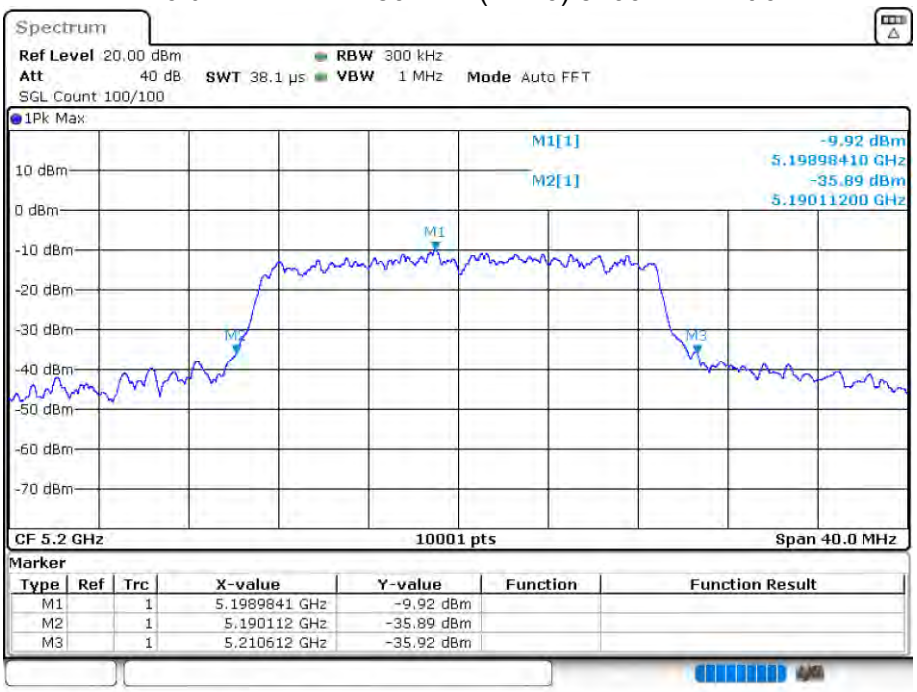
-26 dB BW NVNT 802.11n(HT20) 5200MHz Ant 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1989841 GHz	-9.92 dBm		
M2		1	5.190112 GHz	-35.89 dBm		
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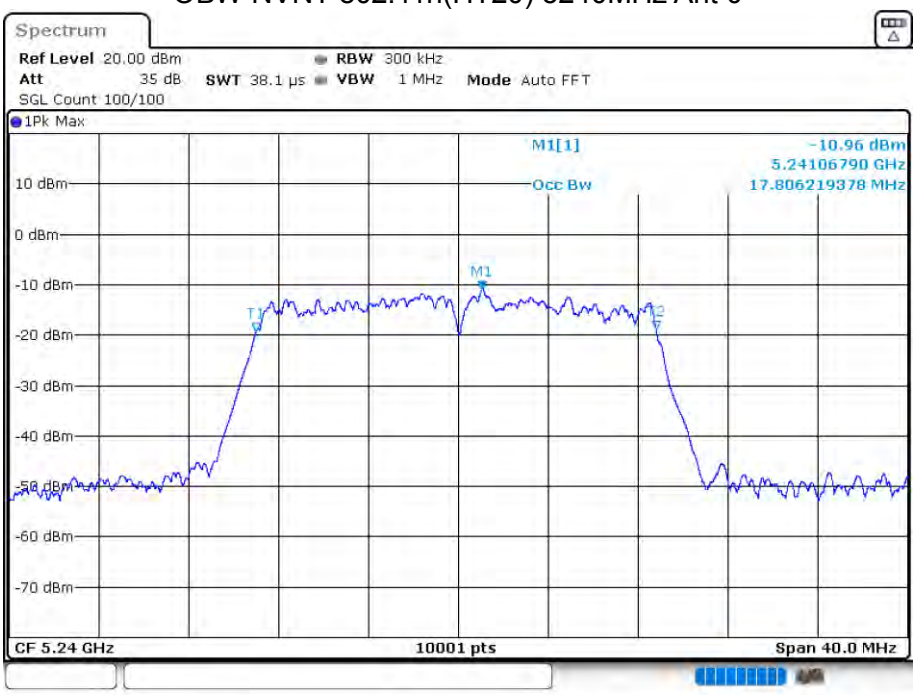
Date: 9.OCT.2020 11:54:56

OBW NVNT 802.11n(HT20) 5240MHz Ant 0



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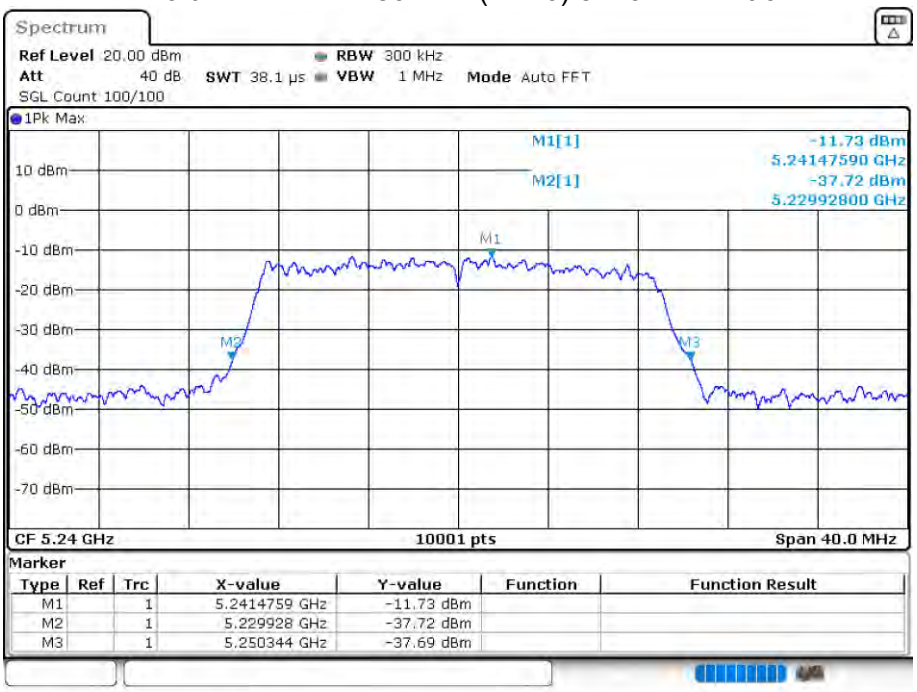
-26 dB BW NVNT 802.11n(HT20) 5240MHz Ant 0



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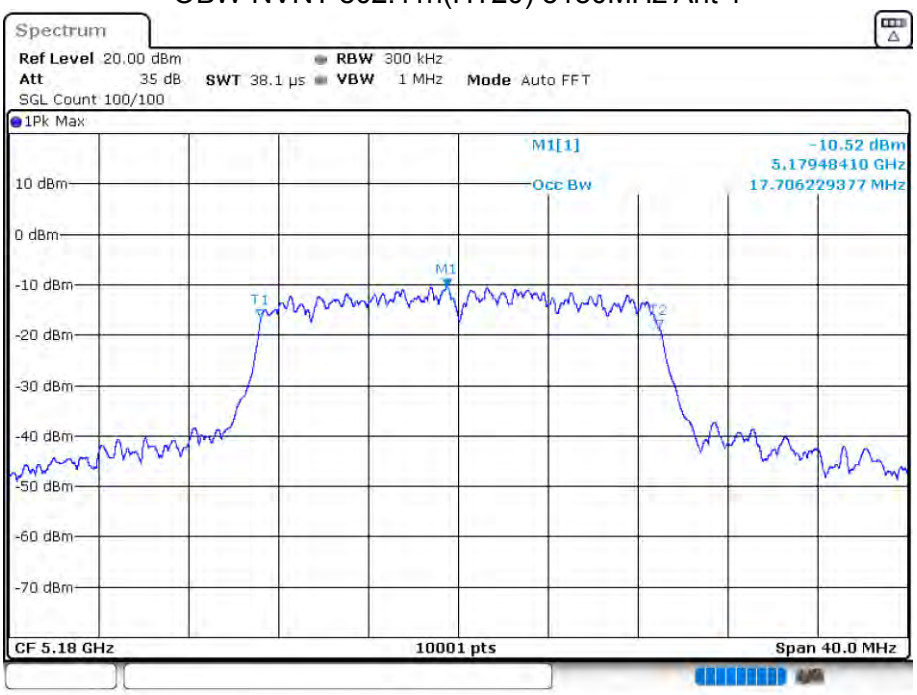
OBW NVNT 802.11n(HT20) 5180MHz Ant 1



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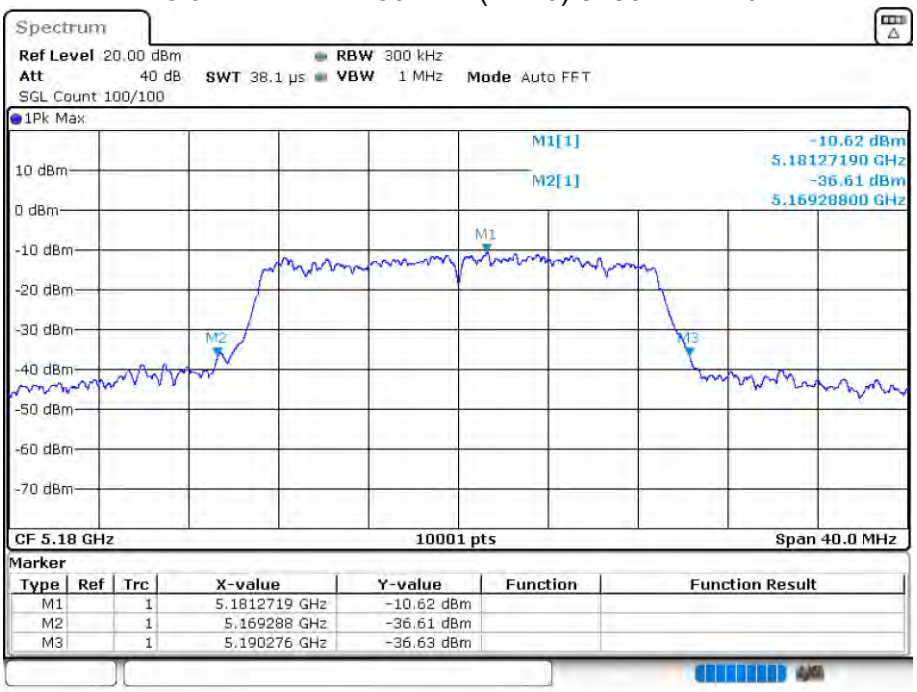
-26 dB BW NVNT 802.11n(HT20) 5180MHz Ant 1



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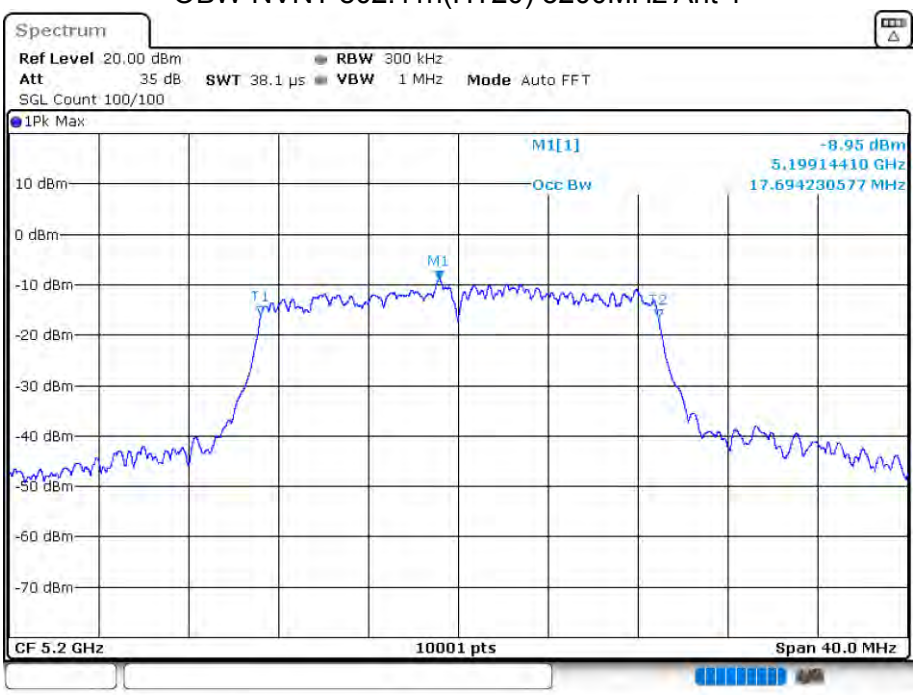
OBW NVNT 802.11n(HT20) 5200MHz Ant 1



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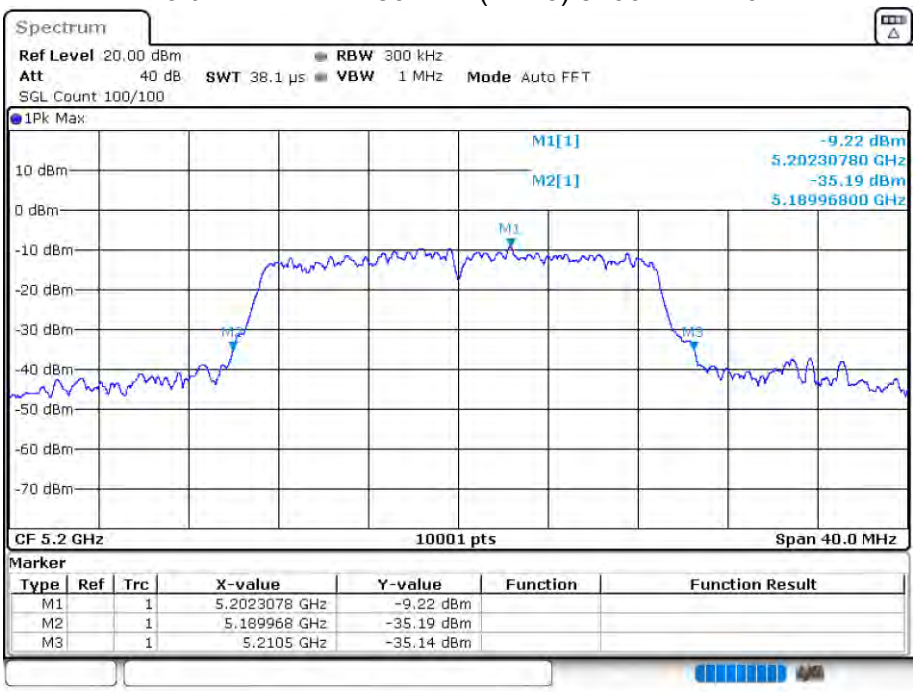
-26 dB BW NVNT 802.11n(HT20) 5200MHz Ant 1



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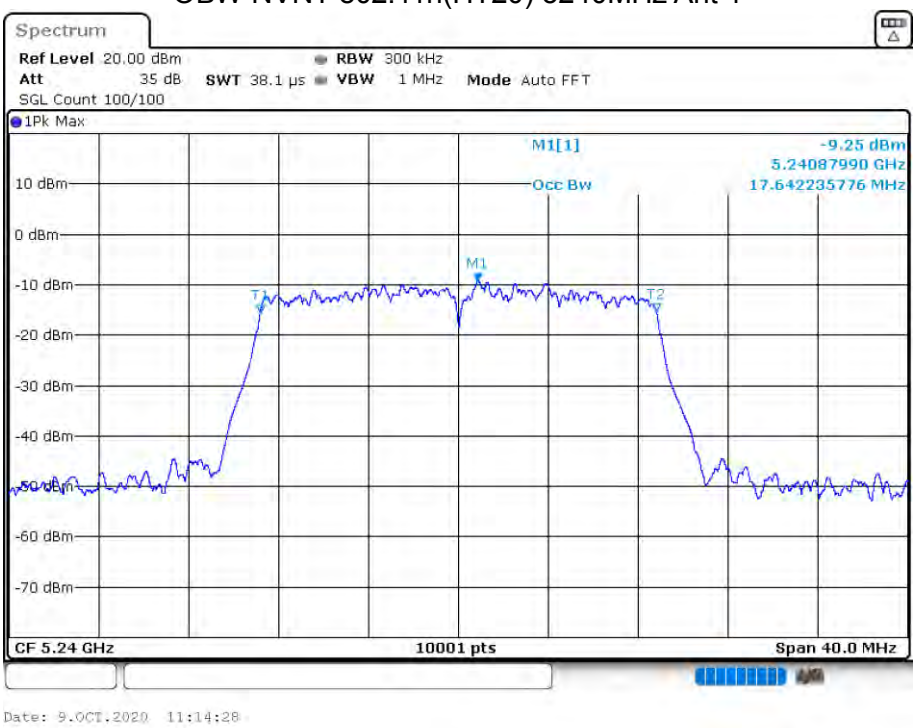
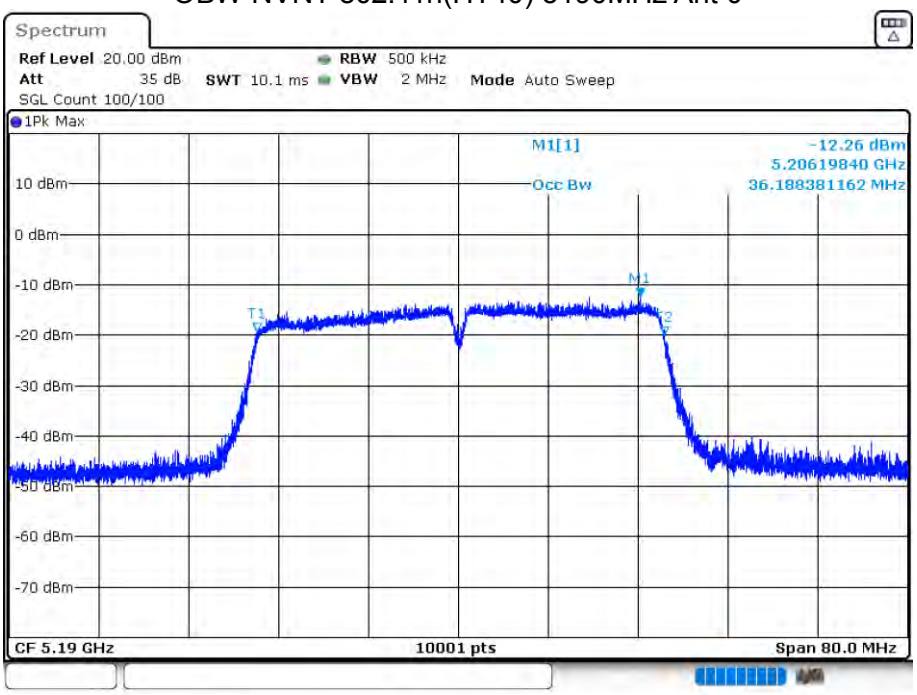
OBW NVNT 802.11n(HT20) 5240MHz Ant 1



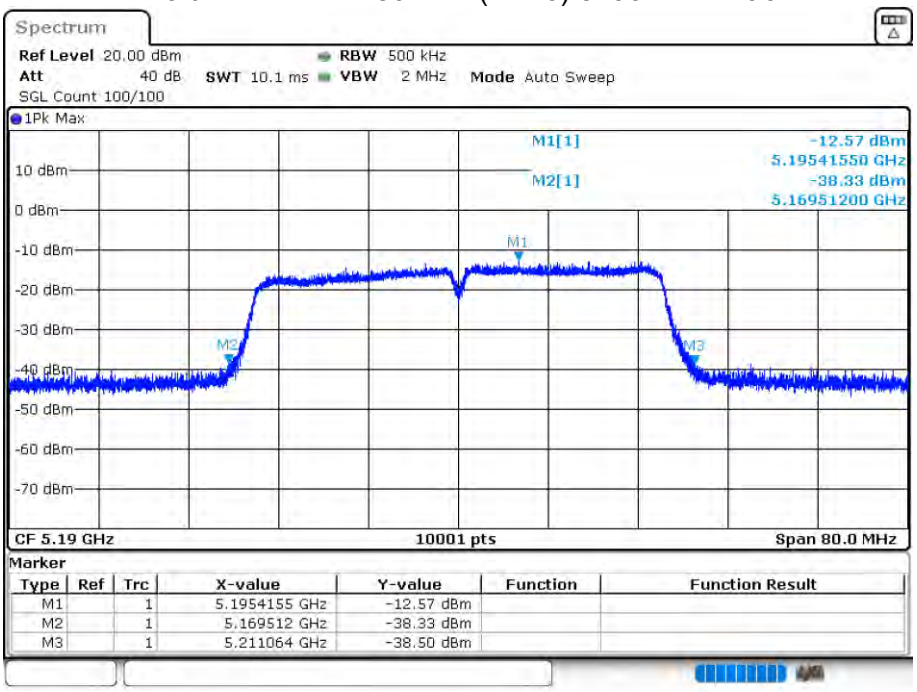
-26 dB BW NVNT 802.11n(HT20) 5240MHz Ant 1

OBW NVNT 802.11n(HT40) 5190MHz Ant 0



Date: 9.OCT.2020 12:08:29

-26 dB BW NVNT 802.11n(HT40) 5190MHz Ant 0

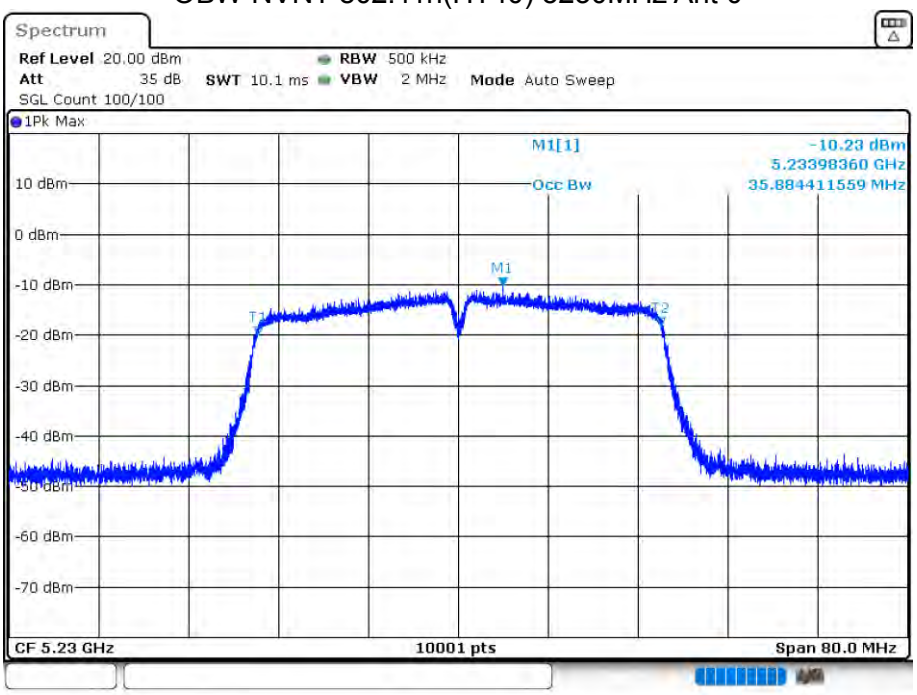


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.1954155 GHz	-12.57 dBm		
M2		1	5.169512 GHz	-38.33 dBm		
M3		1	5.211064 GHz	-38.50 dBm		

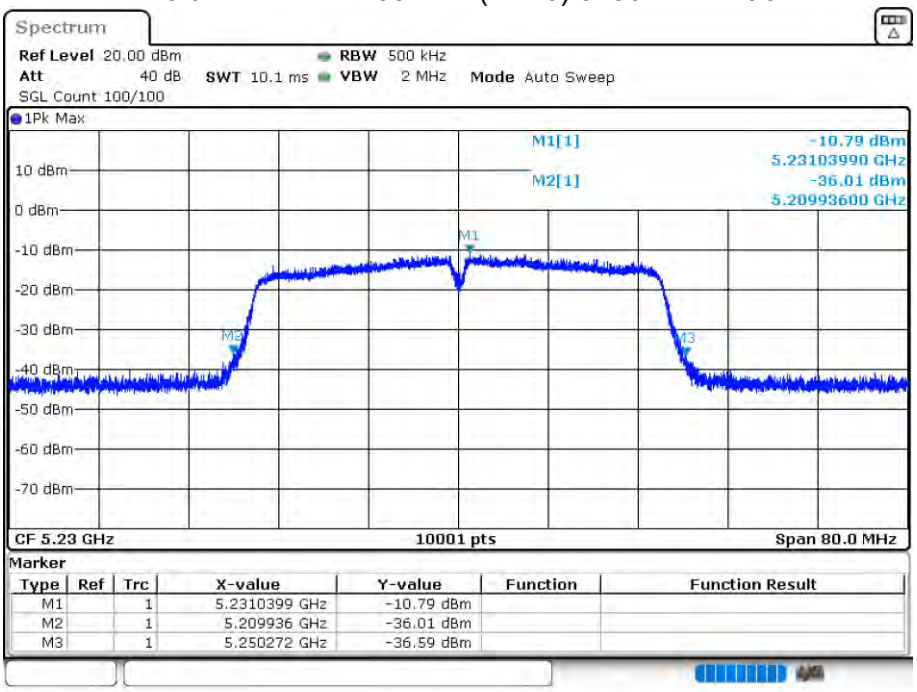
Date: 9.OCT.2020 12:08:32

OBW NVNT 802.11n(HT40) 5230MHz Ant 0



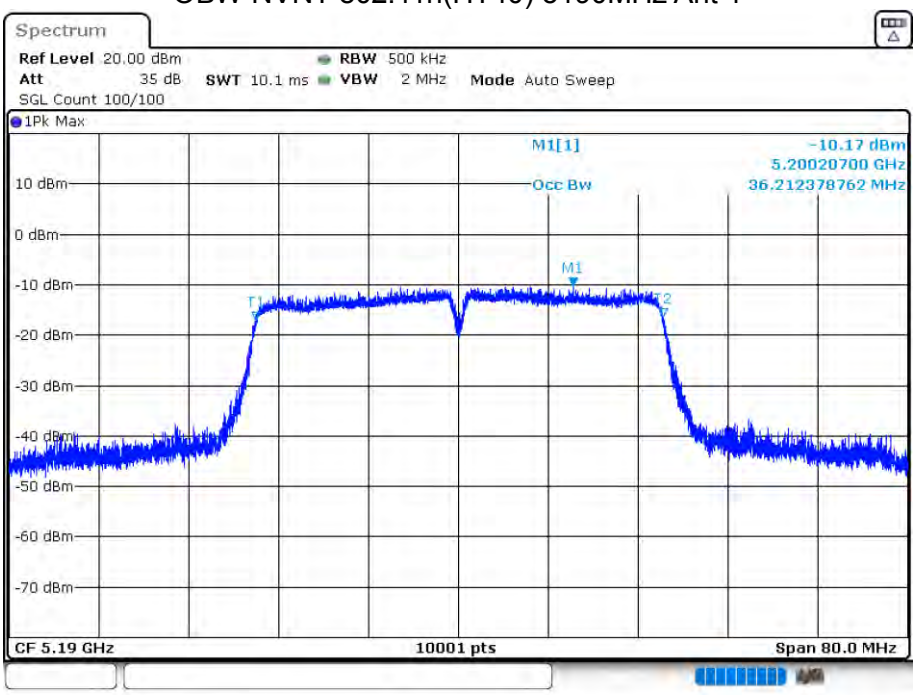
Date: 9.OCT.2020 12:09:55

-26 dB BW NVNT 802.11n(HT40) 5230MHz Ant 0



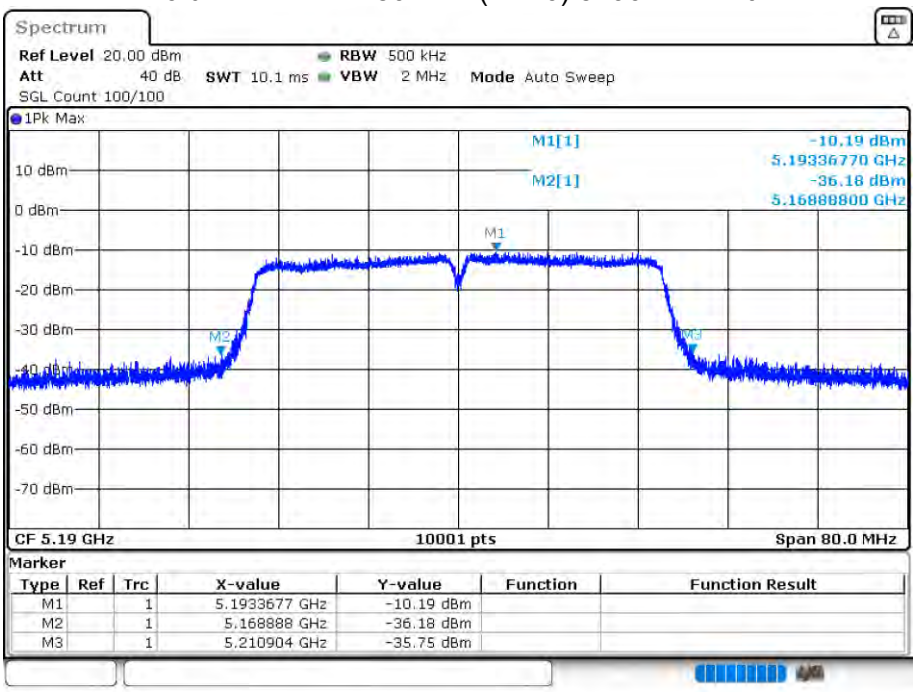
Date: 9.OCT.2020 12:09:58

OBW NVNT 802.11n(HT40) 5190MHz Ant 1



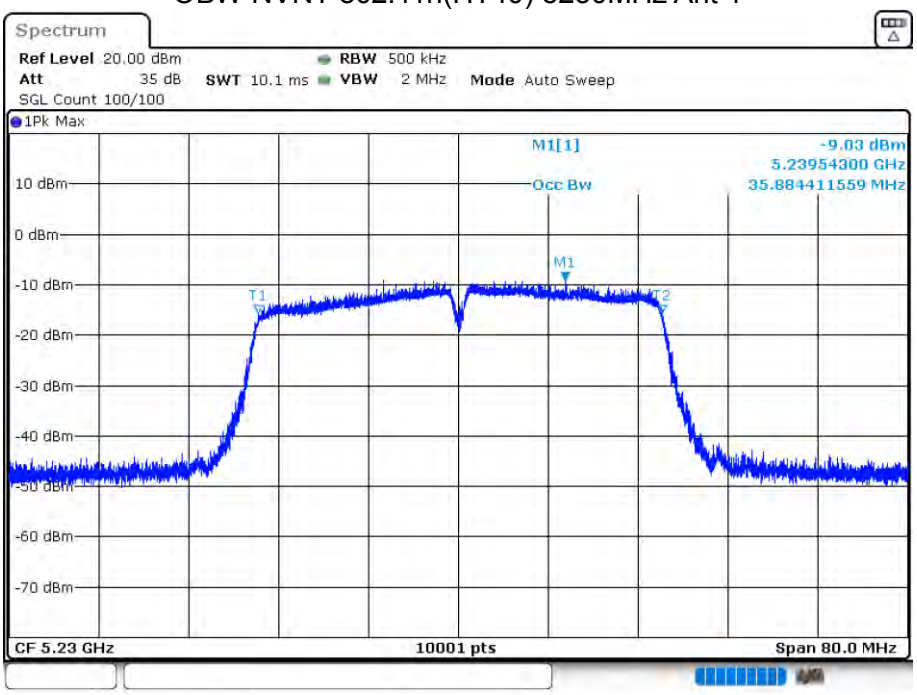
Date: 9.OCT.2020 14:45:51

-26 dB BW NVNT 802.11n(HT40) 5190MHz Ant 1



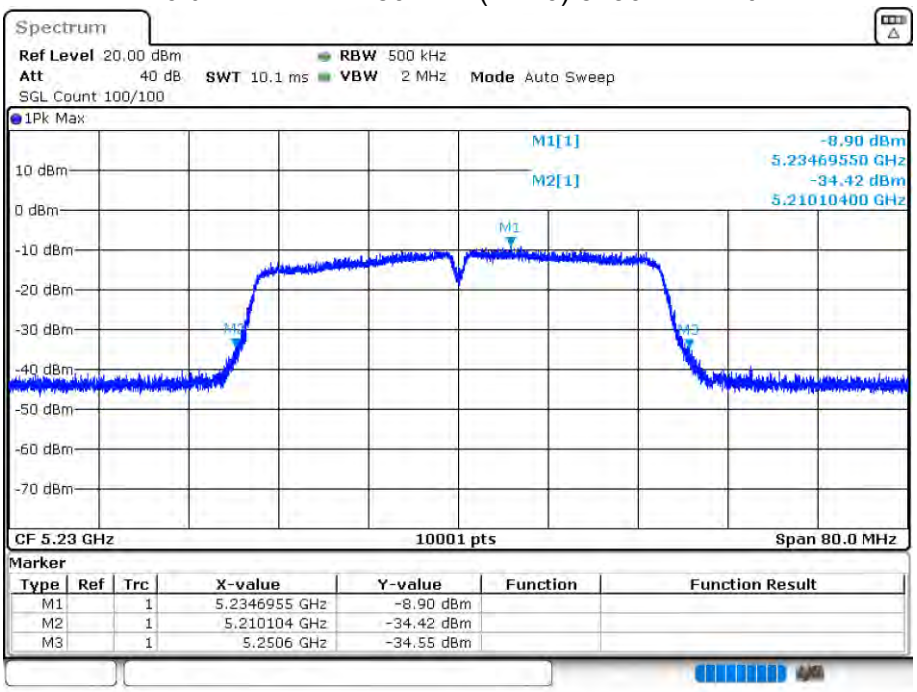
Date: 9.OCT.2020 14:45:53

OBW NVNT 802.11n(HT40) 5230MHz Ant 1



Date: 9.OCT.2020 11:21:42

-26 dB BW NVNT 802.11n(HT40) 5230MHz Ant 1



Marker

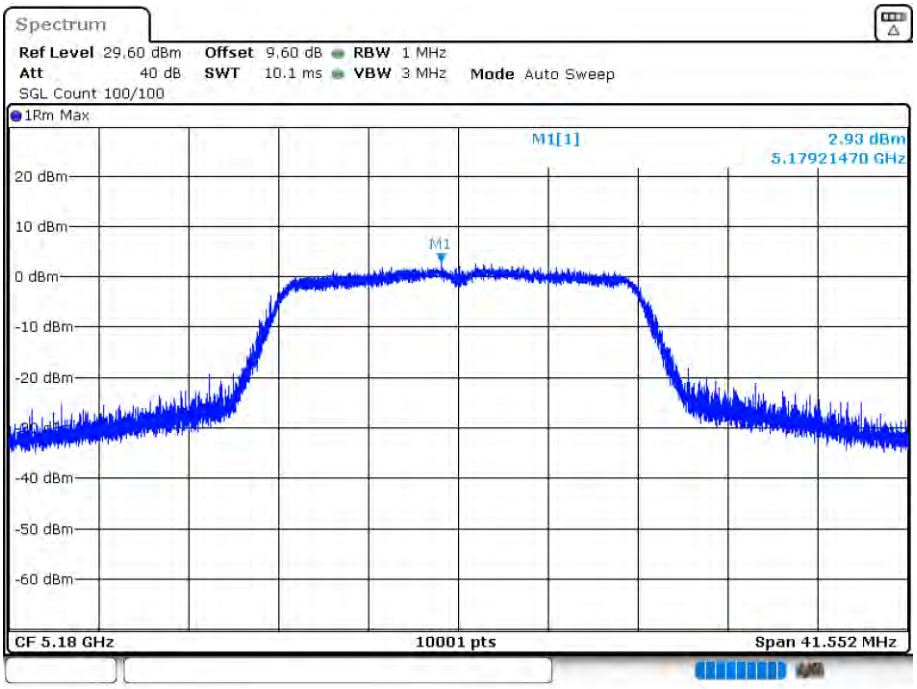
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2346955 GHz	-8.90 dBm		
M2		1	5.210104 GHz	-34.42 dBm		
M3		1	5.2506 GHz	-34.55 dBm		

Date: 9.OCT.2020 11:21:45

11.4 MAXIMUM POWER SPECTRAL DENSITY LEVEL

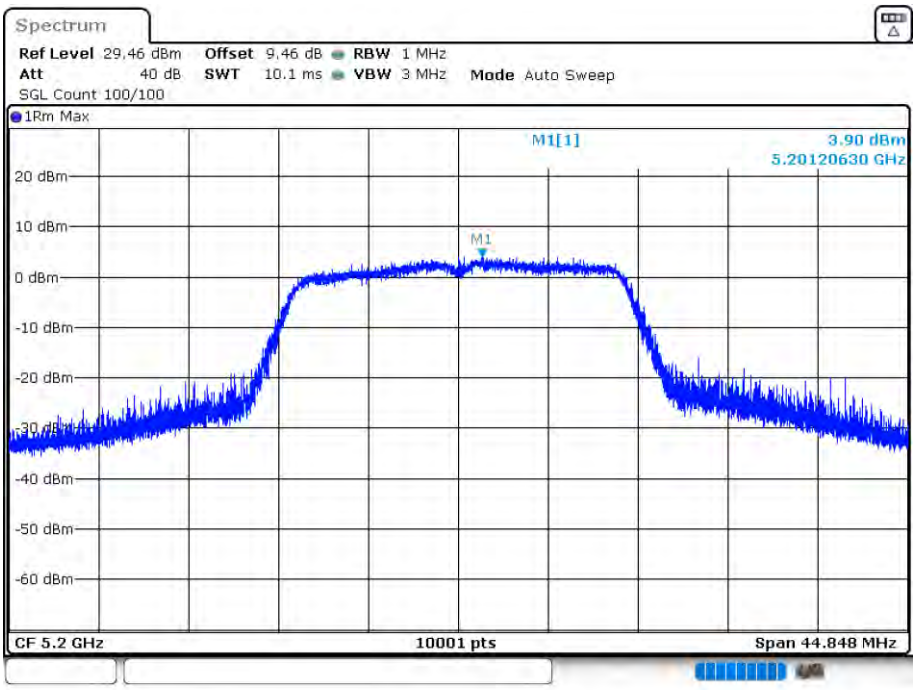
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant 0	2.93	N/A	17	Pass
NVNT	a	5200	Ant 0	3.9	N/A	17	Pass
NVNT	a	5240	Ant 0	4.31	N/A	17	Pass
NVNT	a	5180	Ant 1	4.19	N/A	17	Pass
NVNT	a	5200	Ant 1	4.37	N/A	17	Pass
NVNT	a	5240	Ant 1	4.98	N/A	17	Pass
NVNT	ac20	5180	Ant 0	1.91	5.88	16.94	Pass
NVNT	ac20	5180	Ant 1	3.66			Pass
NVNT	ac20	5200	Ant 0	3.79	7.10	16.94	Pass
NVNT	ac20	5200	Ant 1	4.37			Pass
NVNT	ac20	5240	Ant 0	2.15	6.57	16.94	Pass
NVNT	ac20	5240	Ant 1	4.63			Pass
NVNT	ac40	5190	Ant 0	-1.71	2.06	16.94	Pass
NVNT	ac40	5190	Ant 1	-0.31			Pass
NVNT	ac40	5230	Ant 0	-0.46	3.70	16.94	Pass
NVNT	ac40	5230	Ant 1	1.6			Pass
NVNT	ac80	5210	Ant 0	-0.95	1.90	16.94	Pass
NVNT	ac80	5210	Ant 1	-1.27			Pass
NVNT	n20	5180	Ant 0	1.61	5.68	16.94	Pass
NVNT	n20	5180	Ant 1	3.52			Pass
NVNT	n20	5200	Ant 0	4	7.08	16.94	Pass
NVNT	n20	5200	Ant 1	4.13			Pass
NVNT	n20	5240	Ant 0	2.7	7.23	16.94	Pass
NVNT	n20	5240	Ant 1	5.34			Pass
NVNT	n40	5190	Ant 0	-0.23	3.00	16.94	Pass
NVNT	n40	5190	Ant 1	0.2			Pass
NVNT	n40	5230	Ant 0	-0.35	3.85	16.94	Pass
NVNT	n40	5230	Ant 1	1.77			Pass

PSD NVNT 802.11a 5180MHz Ant 0



Date: 9.OCT.2020 11:44:20

PSD NVNT 802.11a 5200MHz Ant 0



Date: 9.OCT.2020 11:45:27