

# RF TEST REPORT

For

**SHENZHEN ZHUOYONGHANG ELECTRONICS CO.,LTD**  
**Product Name: Vehicle navigation**  
**Test Model(s).: TS18**

**Report Reference No.** : POCE231127015RL002

**FCC ID** : 2BECX-TS18

**Applicant's Name** : SHENZHEN ZHUOYONGHANG ELECTRONICS CO.,LTD

**Address** : 4th Floor, B1 Building, Libang Science Park, Xitian Third Industrial Zone, Gongming Street, Guangming New District, Shenzhen

**Testing Laboratory** : Shenzhen POCE Technology Co., Ltd.

**Address** : 102 Building H1 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao'an District, Shenzhen, Guangdong, China

**Test Specification Standard** : 47 CFR Part 15E

**Date of Receipt** : November 27, 2023

**Date of Test** : November 27, 2023 to December 19, 2023

**Date of Issue** : December 19, 2023

**Result** : Pass

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## Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	POCE231127015RL002	December 19, 2023

**NOTE1:**

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

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# 1 TEST SUMMARY

## 1.1 Test Standards

The tests were performed according to following standards:

**47 CFR Part 15E:** Unlicensed National Information Infrastructure Devices

## 1.2 Summary of Test Result

Item	Standard	Method	Requirement	Result
Antenna requirement	47 CFR Part 15E		Part 15.203	Pass
Duty Cycle	47 CFR Part 15E	ANSI C63.10-2013 section 12.2 (b)		Pass
Maximum conducted output power	47 CFR Part 15E	ANSI C63.10-2013, section 12.3	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv)	Pass
Power spectral density	47 CFR Part 15E	ANSI C63.10-2013, section 12.5	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv)	Pass
Emission bandwidth and occupied bandwidth	47 CFR Part 15E	ANSI C63.10-2013, section 6.9 & 12.4	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.	Pass
Band edge emissions (Radiated)	47 CFR Part 15E	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass
Undesirable emission limits (below 1GHz)	47 CFR Part 15E	ANSI C63.10-2013, section 12.7.4, 12.7.5	47 CFR Part 15.407(b)(9)	Pass
Undesirable emission limits (above 1GHz)	47 CFR Part 15E	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass

## 2 GENERAL INFORMATION

### 2.1 Client Information

**Applicant's Name** : SHENZHEN ZHUOYONGHANG ELECTRONICS CO.,LTD  
**Address** : 4th Floor, B1 Building, Libang Science Park, Xitian Third Industrial Zone, Gongming Street, Guangming New District, Shenzhen  
  
**Manufacturer** : SHENZHEN ZHUOYONGHANG ELECTRONICS CO.,LTD  
**Address** : 4th Floor, B1 Building, Libang Science Park, Xitian Third Industrial Zone, Gongming Street, Guangming New District, Shenzhen

### 2.2 Description of Device (EUT)

Product Name:	Vehicle navigation
Model/Type reference:	TS18
Series Model:	TS6,TS7,T3L,T100,T5,TS10,TQ919,T527,9213,9216,9210,9260L,7212,7216、7250,5716,9270,7260,5750,5760,9211,9212,5712,Y8,RK3326,RK3566,MK8163,MTK8321,MTK8227L,Y6 ,8581,7862
Model Difference:	The product has many models, only the model name is different, and the other parts such as the circuit principle, pcb and electrical structure are the same.
Trade Mark:	N/A
Power Supply:	DC12V
Operation Frequency:	802.11a/n(HT20)/ac(HT20): U-NII Band 1: 5180MHz to 5240MHz; 802.11n(HT40)/ac(HT40): U-NII Band 1: 5190MHz to 5230MHz; 802.11ac(HT80): U-NII Band 1: 5210MHz;
Number of Channels:	802.11a/n(HT20)/ac(HT20): U-NII Band 1: 4; 802.11n(HT40)/ac(HT40): U-NII Band 1: 2; 802.11ac(HT80): U-NII Band 1: 1;
Modulation Type:	802.11a: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM);
Antenna Type:	External Antenna
Antenna Gain:	0dBi
Hardware Version:	V1.0
Software Version:	V1.0

(Remark:The Antenna Gain is supplied by the customer.POCE is not responsible for This data and the related calculations associated with it)

#### Operation Frequency each of channel

802.11a/n(HT20)/ac(HT20)

Channel	U-NII Band 1
Channel	Frequency
1	5180 MHz
2	5200 MHz
3	5220 MHz
4	5240 MHz
5	/

802.11n(HT40)/ac(HT40)

Channel	U-NII Band 1
1	Frequency
	5190 MHz
2	5230 MHz

## 802.11ac(HT80)

Channel	U-NII Band 1
1	Frequency
	5210 MHz

## Note:

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

## 802.11a/n(HT20)/ac(HT20)

Test channel	Frequency (MHz)
Lowest channel	5180 MHz
Middle channel	5200 MHz
Highest channel	5240 MHz

## 802.11n(HT40)/ac(HT40)

Test channel	Frequency (MHz)
Lowest channel	5190 MHz
Highest channel	5230 MHz

## 802.11ac(HT80)

Test channel	Frequency (MHz)
Middle channel	5210 MHz

### 2.3 Description of Test Modes

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

Remark:Only the data of the worst mode would be recorded in this report.

### 2.4 Description of Support Units

The EUT was tested as an independent device.

## 2.5 Equipments Used During The Test

### Duty Cycle

### Maximum conducted output power

### Power spectral density

### Emission bandwidth and occupied bandwidth

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Test Software	TACHOY	RTS-01	V2.0.0.0	/	/
High Pass filter	ZHINAN	OQHPF1-M1.5-18G-224	6210075	/	/
Power divider	MIDEWEST	PWD-2533	SMA-79	2023-05-11	2026-05-10
DC power	HP	66311B	38444359	/	/
RF Sensor Unit	Tachoy Information Technology(she nzheng) Co.,Ltd.	TR1029-2	000001	/	/
Wideband radio communication tester	R&S	CMW500	113410	2023-06-13	2024-06-12
Vector signal generator	Keysight	N5181A	MY48180415	2023-11-09	2024-11-08
Signal generator	Keysight	N5182A	MY50143455	2023-12-28	2024-12-27
Spectrum Analyzer	Keysight	N9020A	MY53420323	2023-12-28	2024-12-27

### Band edge emissions (Radiated)

### Undesirable emission limits (below 1GHz)

### Undesirable emission limits (above 1GHz)

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test software	Farad	EZ -EMC	V1.1.42	/	/
Positioning Controller	/	MF-7802	/	/	/
High Pass filter	ZHINAN	OQHPF1-M1.5-18G-224	6210075	/	/
Amplifier(18-40G)	COM-POWER	AH-1840	10100008-1	2022-04-05	2025-04-04
Horn antenna	COM-POWER	AH-1840 (18-40G)	10100008	2023-04-05	2025-04-04
Loop antenna	ZHINAN	ZN30900C	ZN30900C	2021-07-05	2024-07-04
Cable(LF)#2	Schwarzbeck	/	/	2023-02-27	2024-02-26
Cable(LF)#1	Schwarzbeck	/	/	2023-02-27	2024-02-26
Cable(HF)#2	Schwarzbeck	AK9515E	96250	2023-02-28	2024-02-27
Cable(HF)#1	Schwarzbeck	SYV-50-3-1	/	2023-02-27	2024-02-26
Power amplifier(LF)	Schwarzbeck	BBV9743	9743-151	2023-06-13	2024-06-12
Power amplifier(HF)	Schwarzbeck	BBV9718	9718-282	2023-06-13	2024-06-12
Wideband radio communication tester	R&S	CMW500	113410	2023-06-13	2024-06-12
Spectrum Analyzer	R&S	FSP30	1321.3008K40-101729-jR	2023-06-14	2024-06-13
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023-05-13	2025-05-12
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2023-05-21	2025-05-20
Test Receiver	R&S	ESCI	102109	2023-06-13	2024-06-12

## 2.6 Statement Of The Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Disturbance (0.15~30MHz)	±3.41dB
Duty cycle	±3.1%
RF conducted power	±0.733dB
RF power density	±0.234%
Occupied Bandwidth	±3.63%
Radiated Emission (Above 1GHz)	±5.46dB
Radiated Emission (Below 1GHz)	±5.79dB

Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 2.7 Authorizations

Company Name:	Shenzhen POCE Technology Co., Ltd.
Address:	101-102 Building H5 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252

### Identification of the Responsible Testing Location

Company Name:	Shenzhen POCE Technology Co., Ltd.
Address:	101-102 Building H5 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252
FCC Registration Number:	0032847402
Designation Number:	CN1342
Test Firm Registration No.:	778666
A2LA Certificate Number:	6270.01

## 2.8 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by POCE and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) We hereby declare that the laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant. the laboratory is not responsible for the accuracy of the information provided by the client. When the information provided by the customer may affect the effectiveness of the results, the responsibility lies with the customer, and the laboratory does not assume any responsibility.

### 3 Evaluation Results (Evaluation)

#### 3.1 Antenna requirement

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



## 4 Radio Spectrum Matter Test Results (RF)

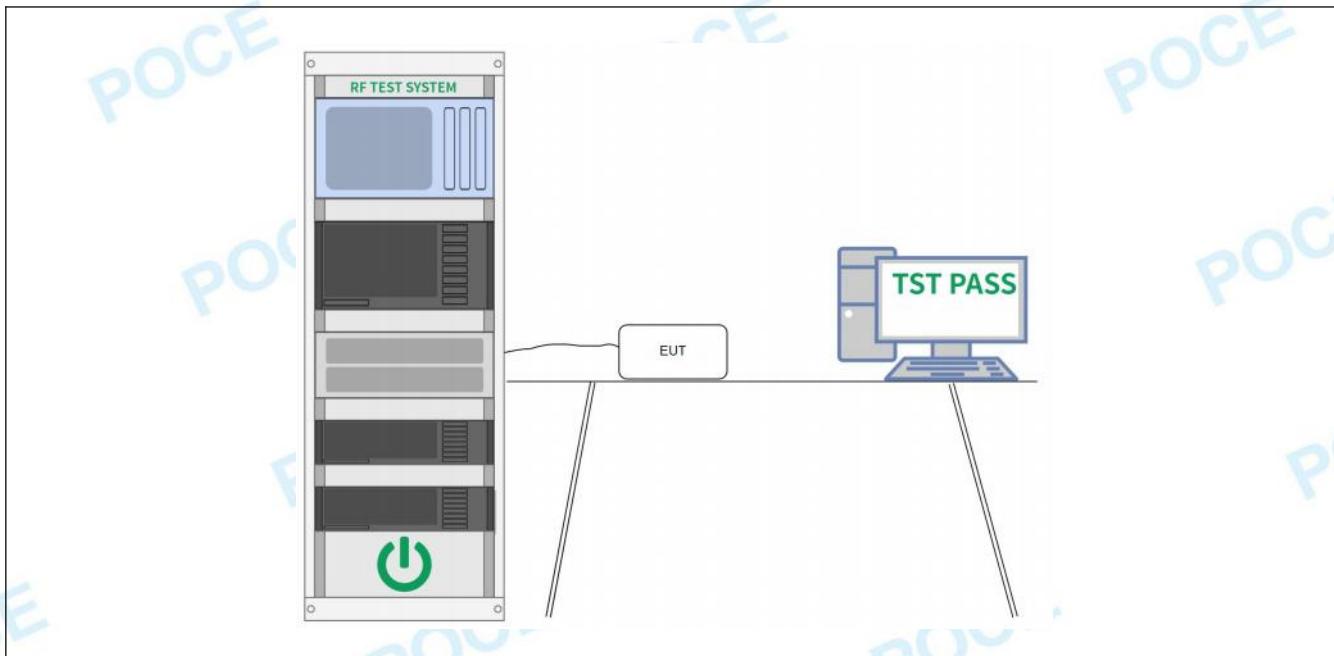
### 4.1 Duty Cycle

Test Requirement:	All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.
Test Limit:	No limits, only for report use.
Test Method:	ANSI C63.10-2013 section 12.2 (b)
Procedure:	<ul style="list-style-type: none"> <li>i) Set the center frequency of the instrument to the center frequency of the transmission.</li> <li>ii) Set RBW <math>\geq</math> EBW if possible; otherwise, set RBW to the largest available value.</li> <li>iii) Set VBW <math>\geq</math> RBW.</li> <li>iv) Set detector = peak.</li> <li>v) The zero-span measurement method shall not be used unless both RBW and VBW are <math>&gt; 50/T</math>, where T is defined in item a1) of 12.2, and the number of sweep points across duration T exceeds 100.</li> </ul>

#### 4.1.1 E.U.T. Operation:

Operating Environment:				
Temperature:	23.8 °C	Humidity:	55.8 %	Atmospheric Pressure: 102 kPa
Pre test mode:	TM1, TM2, TM3			
Final test mode:	TM1, TM2, TM3			

#### 4.1.2 Test Setup Diagram:



#### 4.1.3 Test Data:

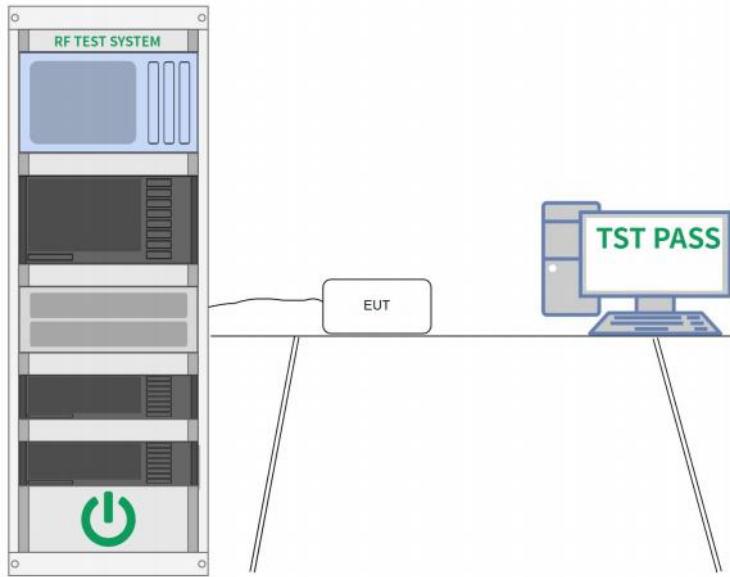
Please Refer to Appendix for Details.

## 4.2 Maximum conducted output power

Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv)
Test Limit:	<p>For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.</p> <p>If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. 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).</p> <p>For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.</p> <p>If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> <p>For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.</p> <p>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.</p> <p>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 is required for each 1 dB of antenna gain in excess of 23 dBi.</p> <p>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.</p> <p>For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.</p> <p>If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p>
Test Method:	ANSI C63.10-2013, section 12.3
Procedure:	Refer to ANSI C63.10-2013 section 12.3

### 4.2.1 E.U.T. Operation:

Operating Environment:				
Temperature:	23.8 °C	Humidity:	55.8 %	Atmospheric Pressure: 102 kPa
Pre test mode:	TM1, TM2, TM3			
Final test mode:	TM1, TM2, TM3			

**4.2.2 Test Setup Diagram:****4.2.3 Test Data:**

Please Refer to Appendix for Details.

### 4.3 Power spectral density

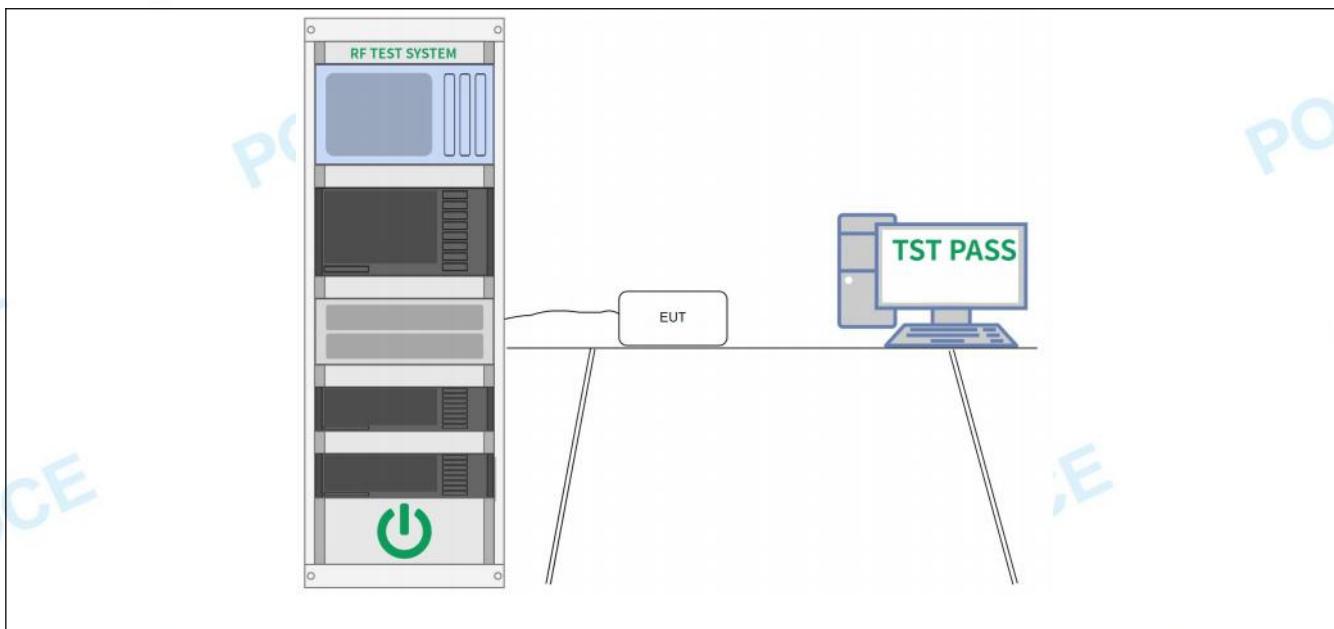
Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv)
Test Limit:	<p>For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> <p>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, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> <p>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 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 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.</p> <p>For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p>
Test Method:	ANSI C63.10-2013, section 12.5
Procedure:	Refer to ANSI C63.10-2013, section 12.5

#### 4.3.1 E.U.T. Operation:

Operating Environment:				
Temperature:	23.8 °C	Humidity:	55.8 %	Atmospheric Pressure: 102 kPa
Pre test mode:	TM1, TM2, TM3			
Final test mode:	TM1, TM2, TM3			

#### 4.3.2 Test Setup Diagram:

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#### 4.3.3 Test Data:

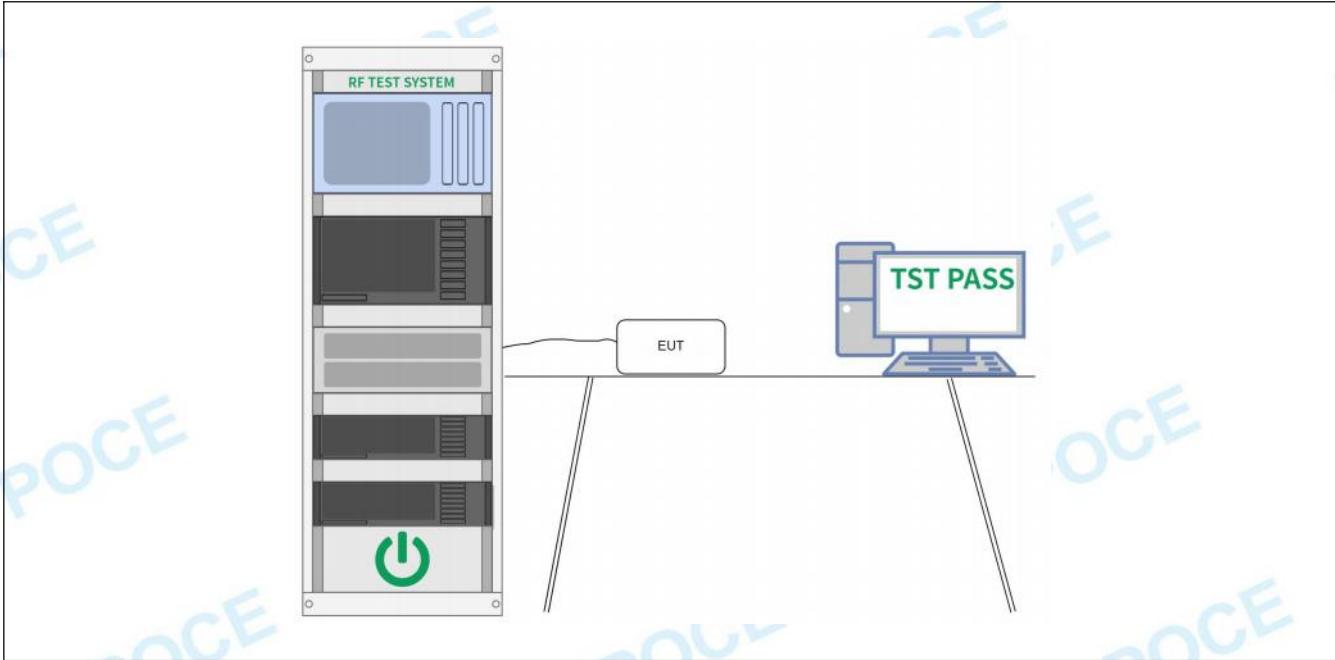
Please Refer to Appendix for Details.

#### 4.4 Emission bandwidth and occupied bandwidth

Test Requirement:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.
Test Limit:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.
Test Method:	ANSI C63.10-2013, section 6.9 & 12.4
Procedure:	<p>Emission bandwidth:</p> <ol style="list-style-type: none"> <li>Set RBW = approximately 1% of the emission bandwidth.</li> <li>Set the VBW &gt; RBW.</li> <li>Detector = peak.</li> <li>Trace mode = max hold.</li> <li>Measure the maximum width of the emission that is 26 dB down from the peak of the emission.</li> </ol> <p>Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.</p> <p>Occupied bandwidth:</p> <ol style="list-style-type: none"> <li>The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.</li> <li>The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.</li> <li>Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than <math>[10 \log (OBW/RBW)]</math> below the reference level. Specific guidance is given in 4.1.5.2.</li> <li>Step a) through step c) might require iteration to adjust within the specified range.</li> <li>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.</li> <li>Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.</li> <li>If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.</li> <li>The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).</li> </ol>

**4.4.1 E.U.T. Operation:**

Operating Environment:				
Temperature:	23.8 °C	Humidity:	55.8 %	Atmospheric Pressure: 102 kPa
Pre test mode:	TM1, TM2, TM3			
Final test mode:	TM1, TM2, TM3			

**4.4.2 Test Setup Diagram:****4.4.3 Test Data:**

Please Refer to Appendix for Details.

#### 4.5 Band edge emissions (Radiated)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)			
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.			
	MHz	MHz	MHz	GHz
	0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
	<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
	2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
	4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
	4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
	4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
	6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
	6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
	6.31175-6.31225	123-138	2200-2300	14.47-14.5
	8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
	8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
	8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
	8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
	12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
	12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
	12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
	13.36-13.41			

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup>Above 38.6

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

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

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

In the emission table above, the tighter limit applies at the band edges.

	<p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	<p>Above 1GHz:</p> <p>a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <ol style="list-style-type: none"> <li>1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</li> <li>2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.</li> <li>3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.</li> <li>4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.</li> </ol>

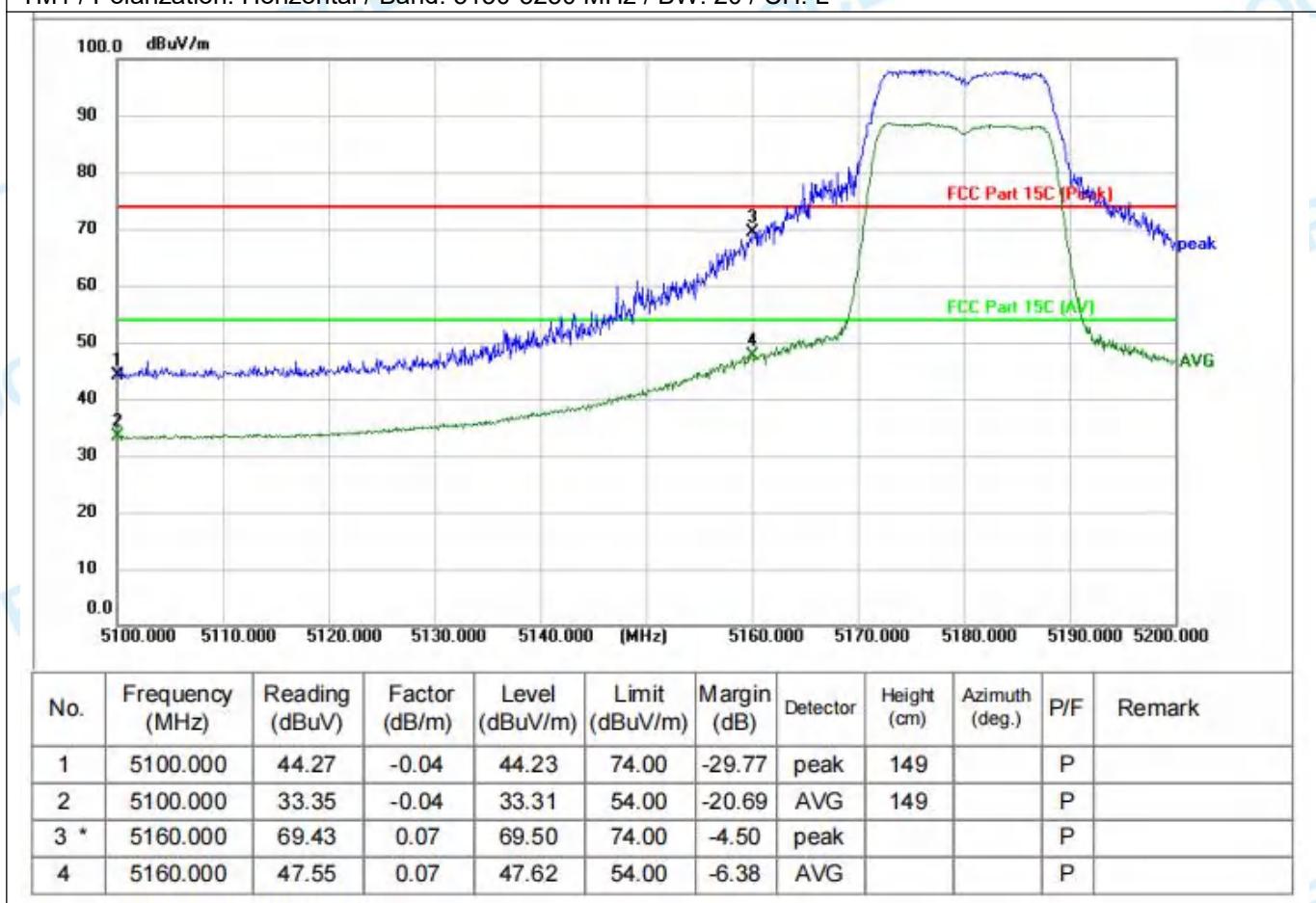
#### 4.5.1 E.U.T. Operation:

Operating Environment:				
Temperature:	23.8 °C	Humidity:	55.8 %	Atmospheric Pressure: 102 kPa
Pre test mode:	TM1, TM2, TM3			
Final test mode:	TM1			

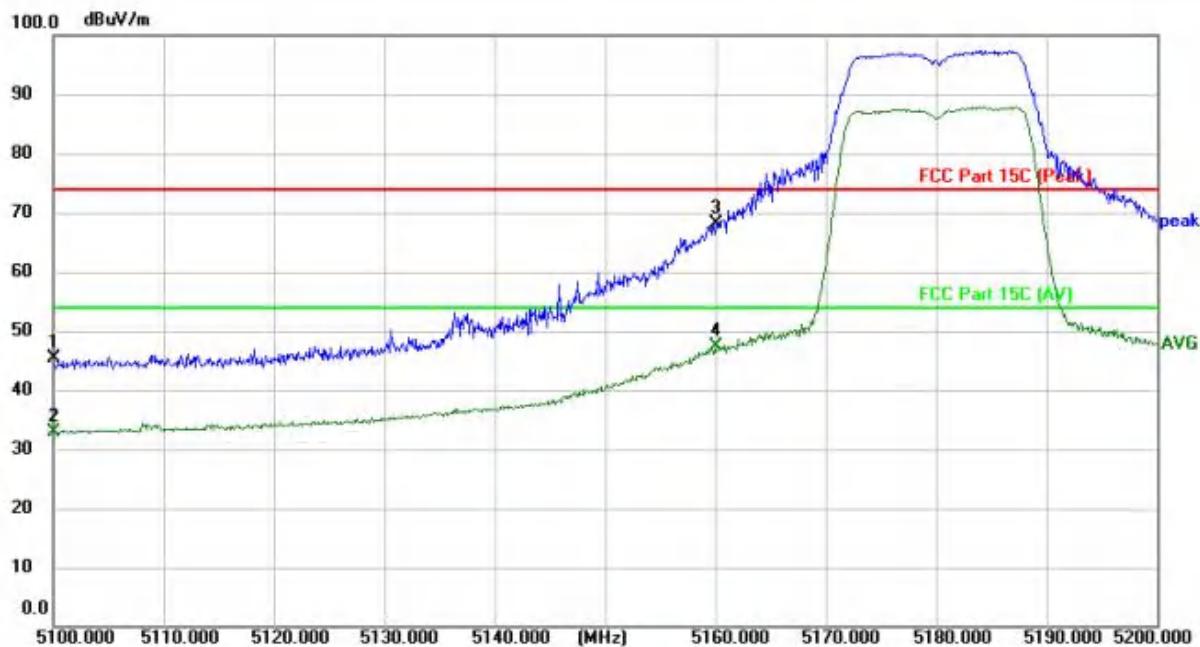
#### 4.5.2 Test Data:

TM1 is worse case and only reported

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

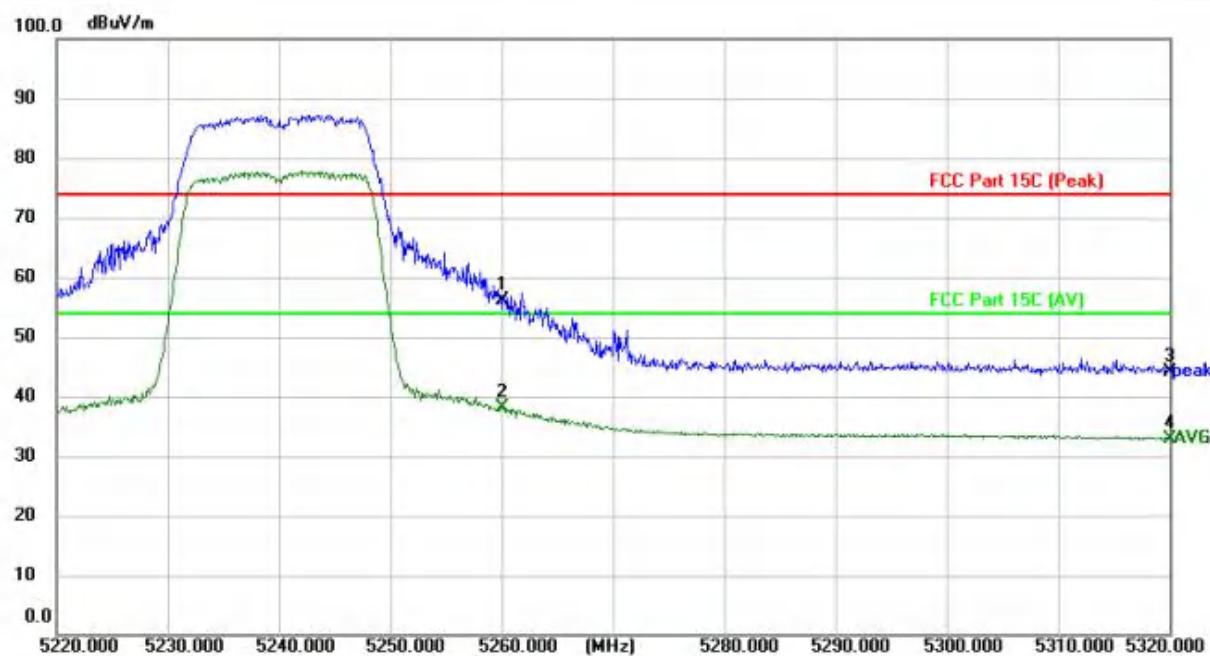


TM1 / Polarization: Vertical / Band: 5150-5250 MHz / BW: 20 / CH: L



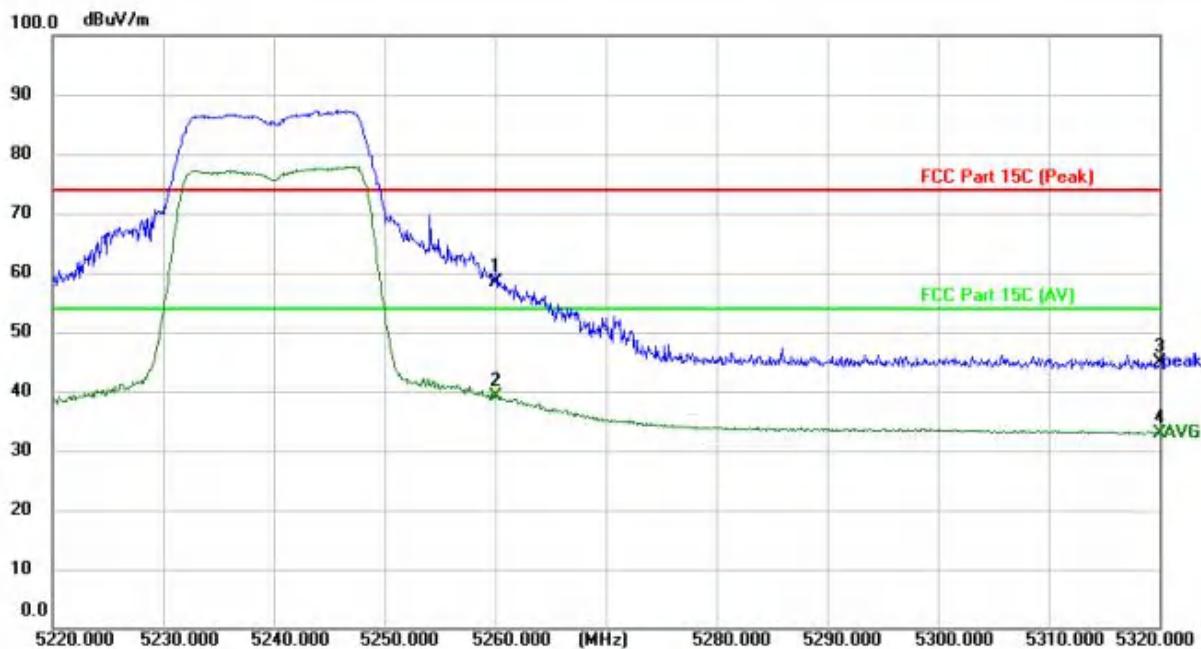
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5100.000	44.86	0.43	45.29	74.00	-28.71	peak	149		P	
2	5100.000	32.54	0.43	32.97	54.00	-21.03	AVG	149		P	
3 *	5160.000	67.67	0.46	68.13	74.00	-5.87	peak			P	
4	5160.000	47.00	0.46	47.46	54.00	-6.54	AVG			P	

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



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5260.000	55.83	0.27	56.10	74.00	-17.90	peak	149		P	
2 *	5260.000	37.83	0.27	38.10	54.00	-15.90	AVG	149		P	
3	5320.000	43.86	0.38	44.24	74.00	-29.76	peak	149		P	
4	5320.000	32.56	0.38	32.94	54.00	-21.06	AVG	149		P	

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



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5260.000	57.92	0.53	58.45	74.00	-15.55	peak	149		P	
2 *	5260.000	38.51	0.53	39.04	54.00	-14.96	AVG	149		P	
3	5320.000	44.34	0.57	44.91	74.00	-29.09	peak	149		P	
4	5320.000	32.33	0.57	32.90	54.00	-21.10	AVG	149		P	

#### 4.6 Undesirable emission limits (below 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(9)																										
Test Limit:	<p>Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.</p> <p>Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:</p>																										
	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr> </thead> <tbody> <tr> <td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr> <tr> <td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr> <tr> <td>1.705-30.0</td><td>30</td><td>30</td></tr> <tr> <td>30-88</td><td>100 **</td><td>3</td></tr> <tr> <td>88-216</td><td>150 **</td><td>3</td></tr> <tr> <td>216-960</td><td>200 **</td><td>3</td></tr> <tr> <td>Above 960</td><td>500</td><td>3</td></tr> </tbody> </table>			Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	0.009-0.490	2400/F(kHz)	300	0.490-1.705	24000/F(kHz)	30	1.705-30.0	30	30	30-88	100 **	3	88-216	150 **	3	216-960	200 **	3	Above 960	500	3
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)																									
0.009-0.490	2400/F(kHz)	300																									
0.490-1.705	24000/F(kHz)	30																									
1.705-30.0	30	30																									
30-88	100 **	3																									
88-216	150 **	3																									
216-960	200 **	3																									
Above 960	500	3																									
	<p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>																										
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5																										
Procedure:	<p>Below 1GHz:</p> <p>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <ol style="list-style-type: none"> <li>1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</li> <li>2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit</li> </ol>																										

need not be reported.

3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

Above 1GHz:

- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

Remark:

- Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
- The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

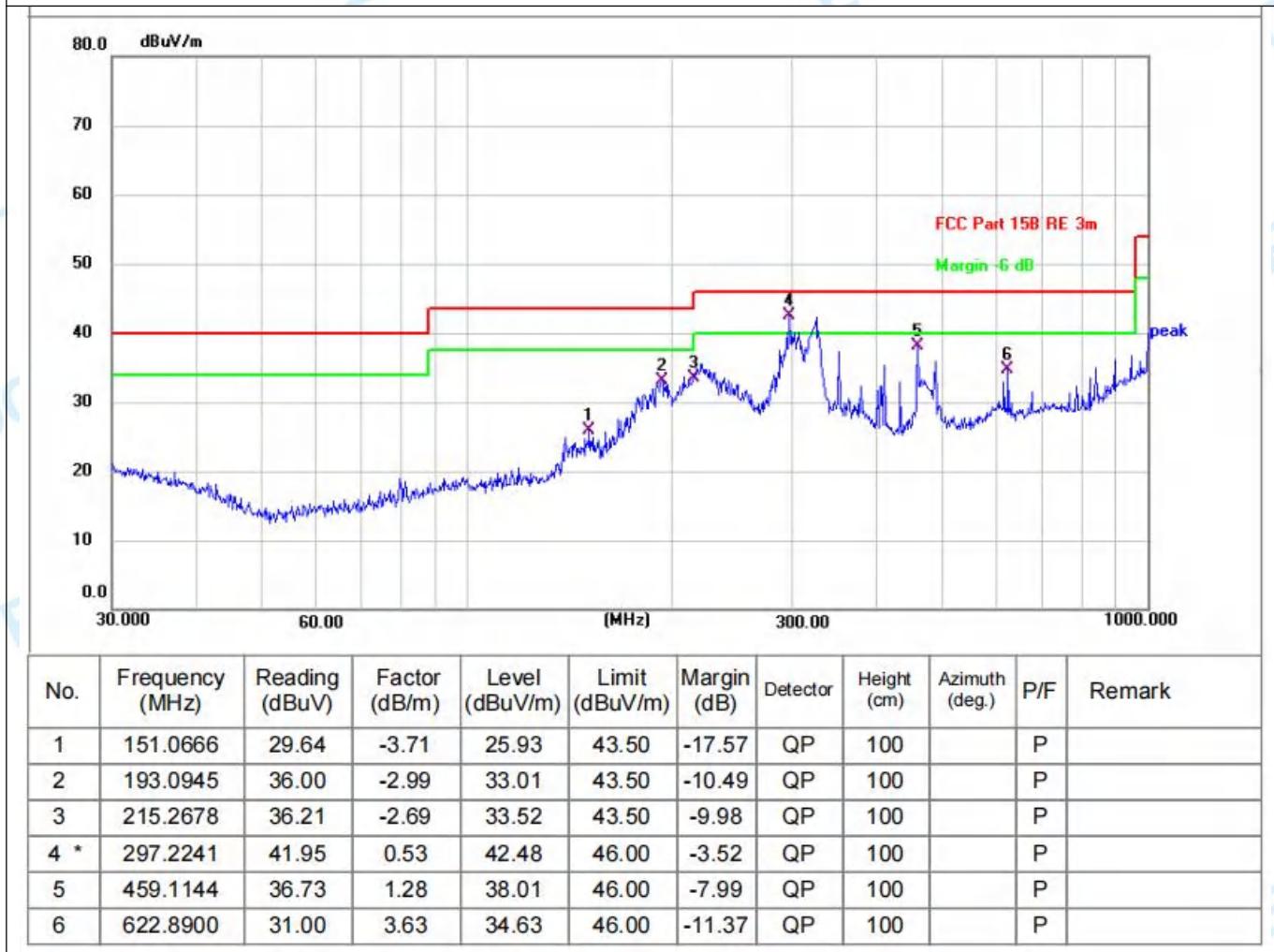
#### 4.6.1 E.U.T. Operation:

Operating Environment:

Temperature:	23.8 °C	Humidity:	55.8 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

#### 4.6.2 Test Data:

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



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



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	189.7385	36.31	-3.03	33.28	43.50	-10.22	QP	100		P	
2	222.1698	37.19	-2.58	34.61	46.00	-11.39	QP	100		P	
3 *	297.2241	40.66	0.53	41.19	46.00	-4.81	QP	100		P	
4	459.1144	37.53	1.28	38.81	46.00	-7.19	QP	100		P	
5	614.2142	30.49	3.41	33.90	46.00	-12.10	QP	100		P	
6	821.7103	31.06	6.34	37.40	46.00	-8.60	QP	100		P	

#### 4.7 Undesirable emission limits (above 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)			
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.			
MHz	MHz	MHz	GHz	
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15	
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46	
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75	
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5	
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2	
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5	
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7	
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4	
6.31175-6.31225	123-138	2200-2300	14.47-14.5	
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2	
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4	
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12	
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0	
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8	
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5	
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )	
13.36-13.41				

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup>Above 38.6

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

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

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

In the emission table above, the tighter limit applies at the band edges.

	<p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	<p>Above 1GHz:</p> <p>a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <ol style="list-style-type: none"> <li>1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</li> <li>2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.</li> <li>3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.</li> <li>4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.</li> </ol>

#### 4.7.1 E.U.T. Operation:

Operating Environment:				
Temperature:	23.8 °C	Humidity:	55.8 %	Atmospheric Pressure: 102 kPa
Pre test mode:	TM1, TM2, TM3			
Final test mode:	TM1			

#### 4.7.2 Test Data:

TM1 is worse case and only reported

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	8625.750	45.67	7.36	53.03	74.00	-20.97	peak	149		P	
2	8661.000	33.94	7.42	41.36	54.00	-12.64	AVG	149		P	
3	9366.000	34.95	8.07	43.02	54.00	-10.98	AVG	149		P	
4	9377.750	46.84	8.07	54.91	74.00	-19.09	peak	149		P	
5 *	10364.750	37.26	8.76	46.02	54.00	-7.98	AVG	149		P	
6	10376.500	47.76	8.78	56.54	74.00	-17.46	peak	149		P	
7	11915.750	47.57	9.96	57.53	74.00	-16.47	peak	149		P	
8	11951.000	35.09	9.97	45.06	54.00	-8.94	AVG	149		P	

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	8637.500	46.25	7.02	53.27	74.00	-20.73	peak	149		P	
2	8672.750	34.11	7.07	41.18	54.00	-12.82	AVG	149		P	
3	9366.000	47.47	7.85	55.32	74.00	-18.68	peak	149		P	
4	9366.000	35.15	7.85	43.00	54.00	-11.00	AVG	149		P	
5	11069.750	47.41	9.11	56.52	74.00	-17.48	peak	149		P	
6	11304.750	34.22	9.41	43.63	54.00	-10.37	AVG	149		P	
7	12456.250	46.15	11.10	57.25	74.00	-16.75	peak	149		P	
8 *	12573.750	34.13	11.31	45.44	54.00	-8.56	AVG	149		P	

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	8661.000	46.40	7.05	53.45	74.00	-20.55	peak	149		P	
2	8661.000	33.98	7.05	41.03	54.00	-12.97	AVG	149		P	
3	9354.250	46.94	7.84	54.78	74.00	-19.22	peak	149		P	
4	9366.000	35.07	7.85	42.92	54.00	-11.08	AVG	149		P	
5	10247.250	47.33	8.47	55.80	74.00	-18.20	peak	149		P	
6	10470.500	34.74	8.63	43.37	54.00	-10.63	AVG	149		P	
7	11833.500	47.58	10.09	57.67	74.00	-16.33	peak	149		P	
8 *	11962.750	34.68	10.26	44.94	54.00	-9.06	AVG	149		P	

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	8661.000	33.67	7.42	41.09	54.00	-12.91	AVG	149		P	
2	8672.750	46.36	7.44	53.80	74.00	-20.20	peak	149		P	
3	9354.250	34.77	8.06	42.83	54.00	-11.17	AVG	149		P	
4	9377.750	46.71	8.07	54.78	74.00	-19.22	peak	149		P	
5	10705.500	34.36	9.15	43.51	54.00	-10.49	AVG	149		P	
6	10717.250	46.73	9.17	55.90	74.00	-18.10	peak	149		P	
7 *	11927.500	34.86	9.96	44.82	54.00	-9.18	AVG	149		P	
8	11951.000	46.39	9.97	56.36	74.00	-17.64	peak	149		P	

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	8637.500	33.71	7.38	41.09	54.00	-12.91	AVG	149		P	
2	8649.250	45.40	7.40	52.80	74.00	-21.20	peak	149		P	
3	9366.000	34.91	8.07	42.98	54.00	-11.02	AVG	149		P	
4	9377.750	46.03	8.07	54.10	74.00	-19.90	peak	149		P	
5	10470.500	34.39	8.95	43.34	54.00	-10.66	AVG	149		P	
6	10482.250	47.45	8.97	56.42	74.00	-17.58	peak	149		P	
7 *	11939.250	34.99	9.97	44.96	54.00	-9.04	AVG	149		P	
8	11962.750	46.48	9.99	56.47	74.00	-17.53	peak	149		P	

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	8649.250	45.21	7.03	52.24	74.00	-21.76	peak	149		P	
2	8661.000	33.99	7.05	41.04	54.00	-12.96	AVG	149		P	
3	9342.500	46.71	7.84	54.55	74.00	-19.45	peak	149		P	
4	9366.000	35.08	7.85	42.93	54.00	-11.07	AVG	149		P	
5	10494.000	34.79	8.65	43.44	54.00	-10.56	AVG	149		P	
6	10529.250	46.40	8.68	55.08	74.00	-18.92	peak	149		P	
7	11692.500	46.70	9.91	56.61	74.00	-17.39	peak	149		P	
8 *	11974.500	34.61	10.27	44.88	54.00	-9.12	AVG	149		P	

## 5 TEST SETUP PHOTOS

Refer to Appendix - Test Setup Photos

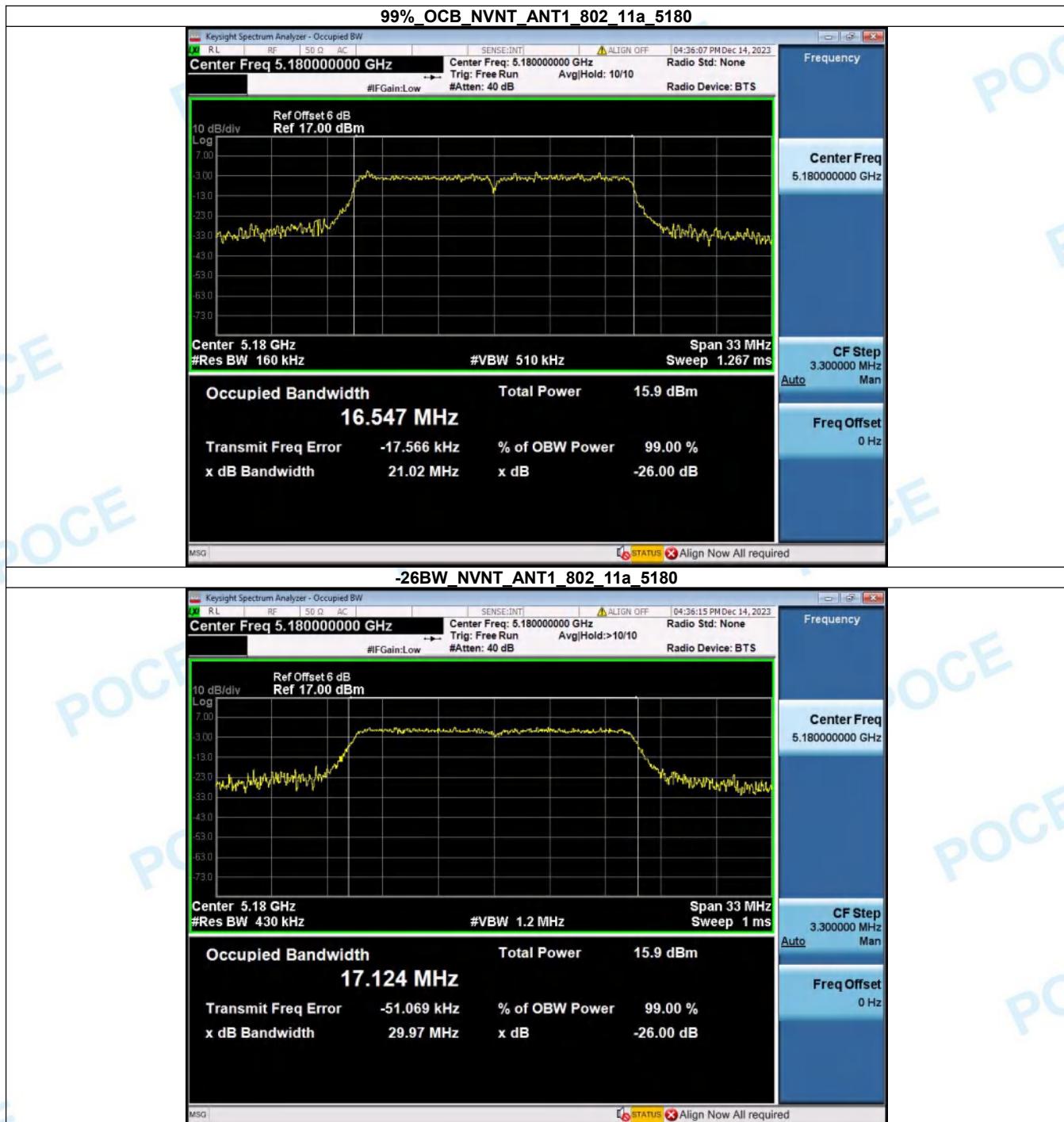
## 6 PHOTOS OF THE EUT

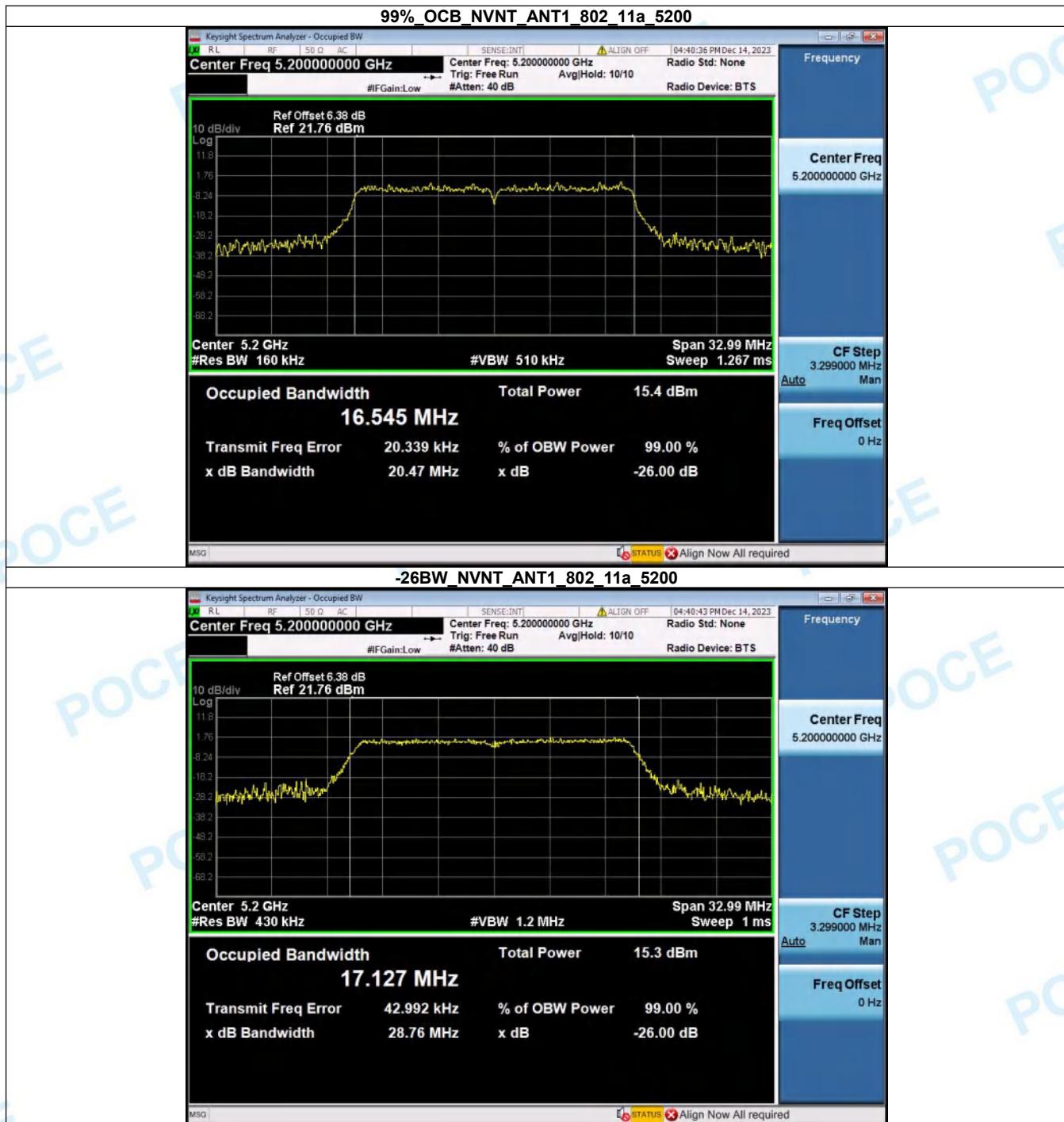
Refer to Appendix - EUT Photos

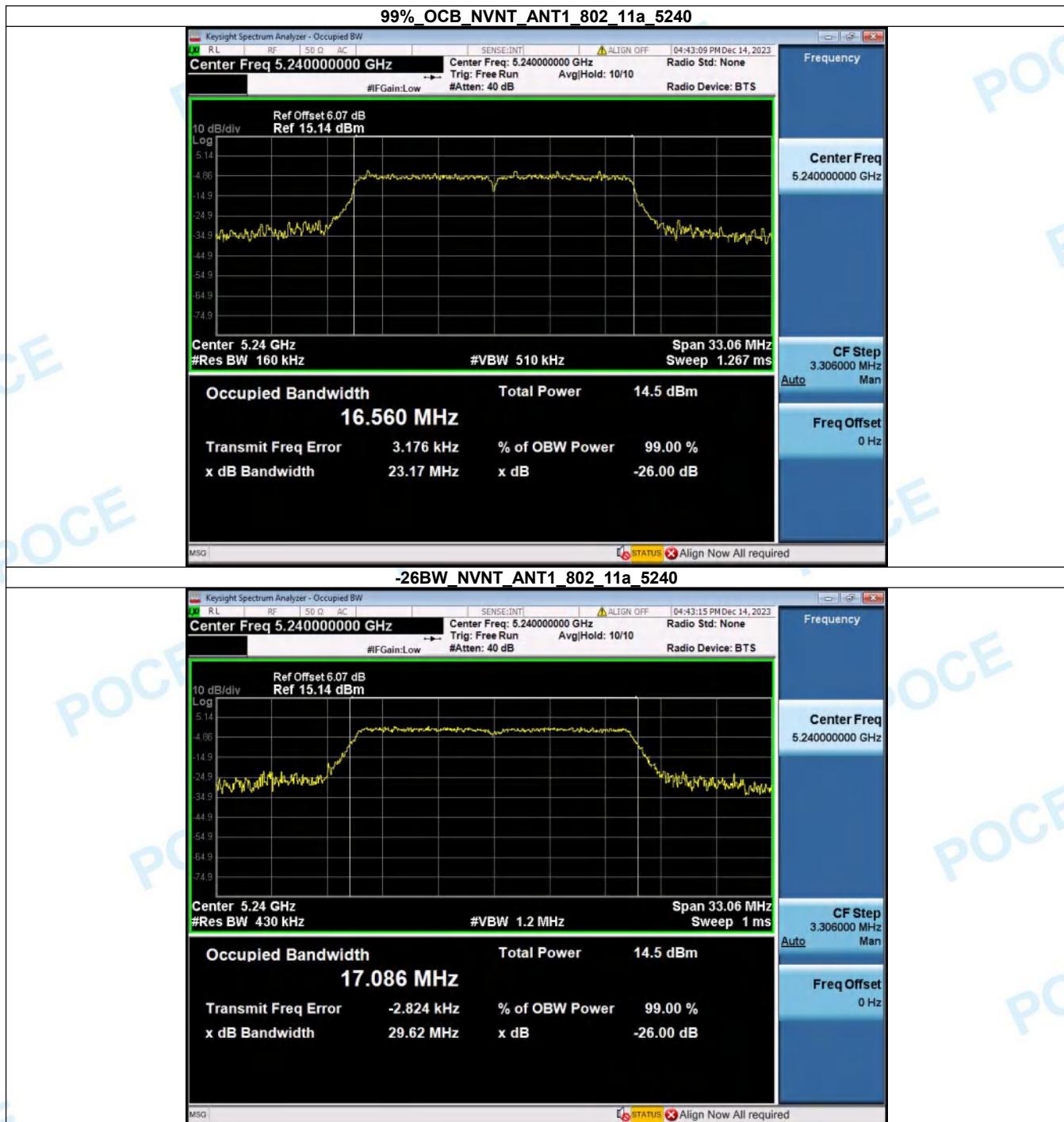
# Appendix

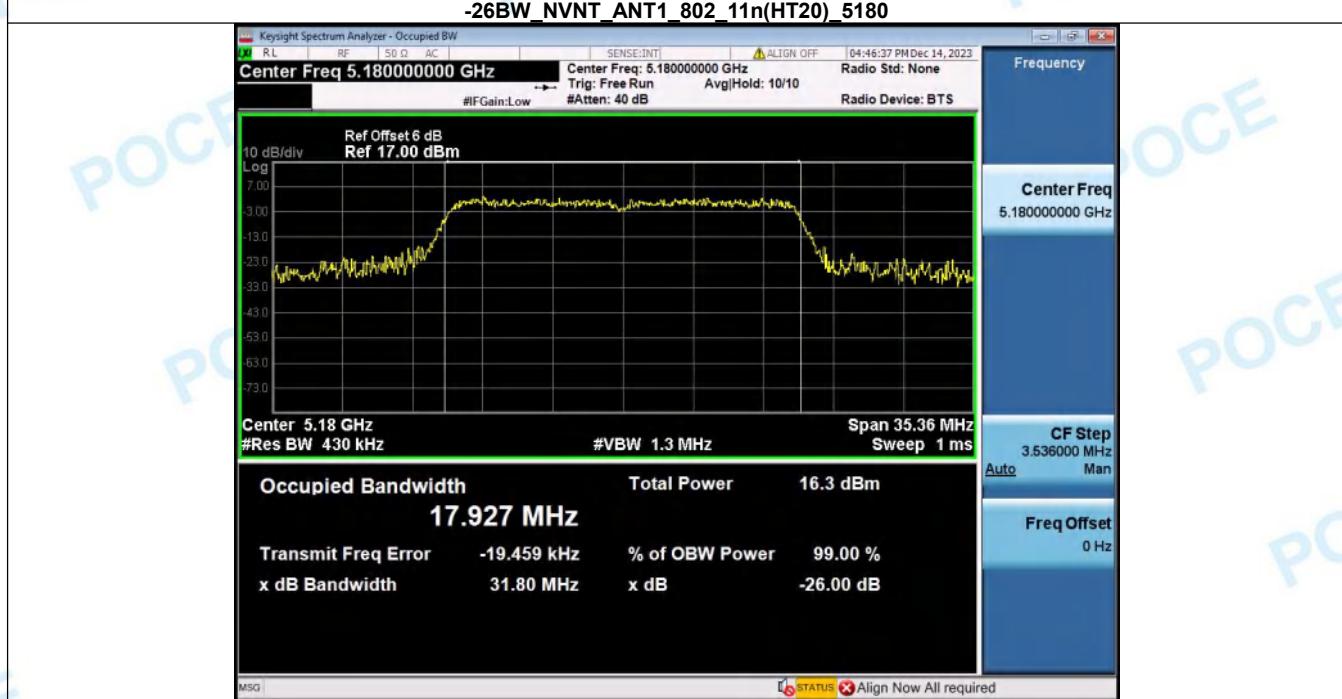
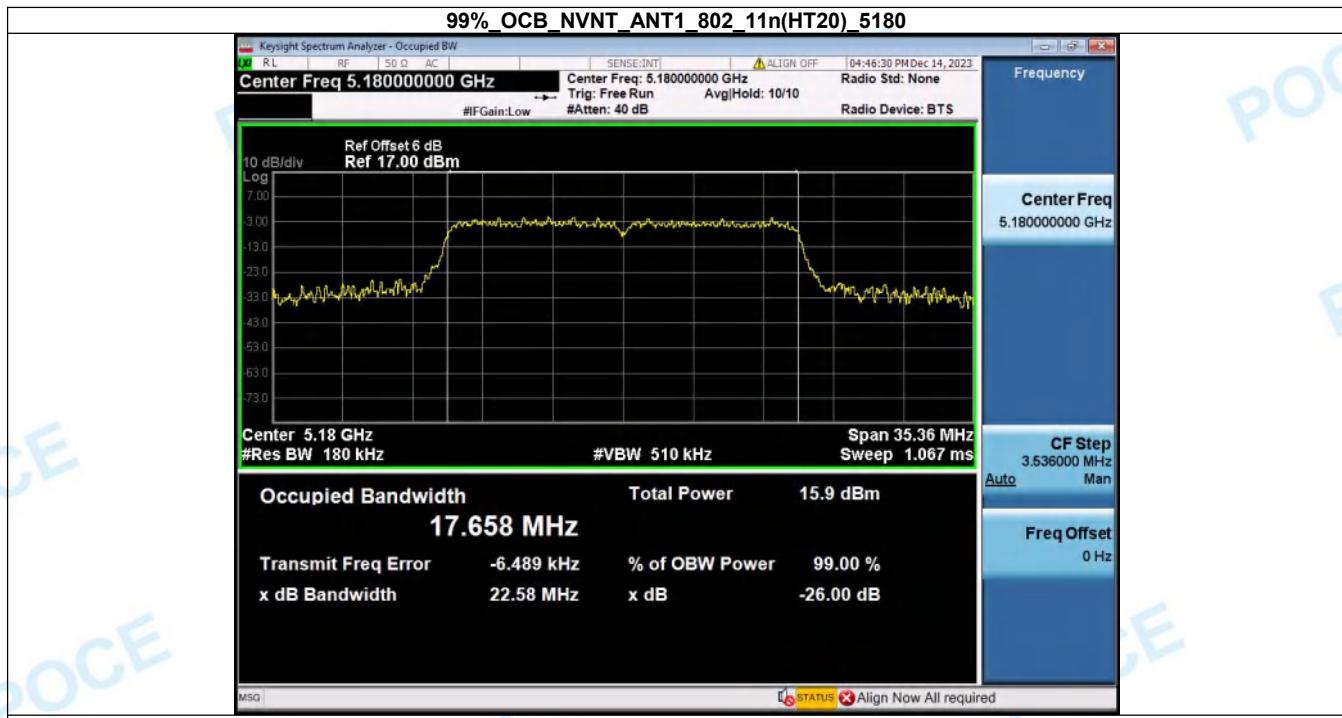
**1. -26dB and 99% Emission Bandwidth**

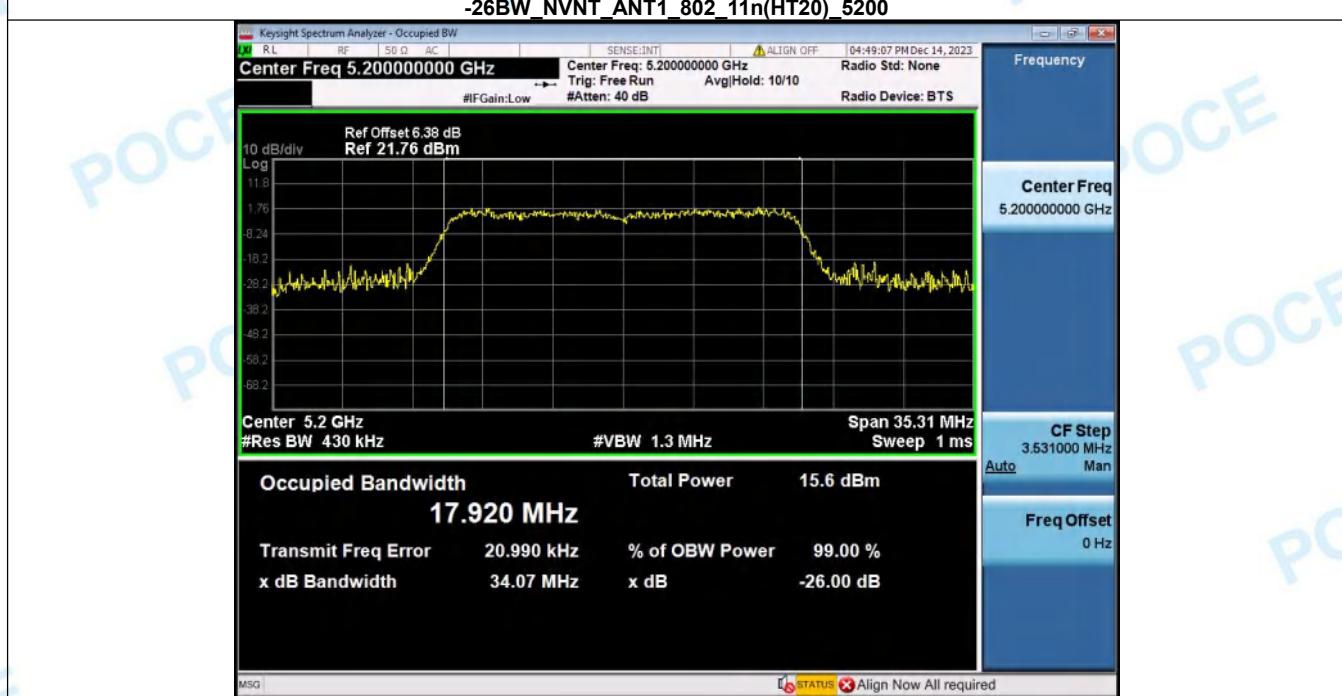
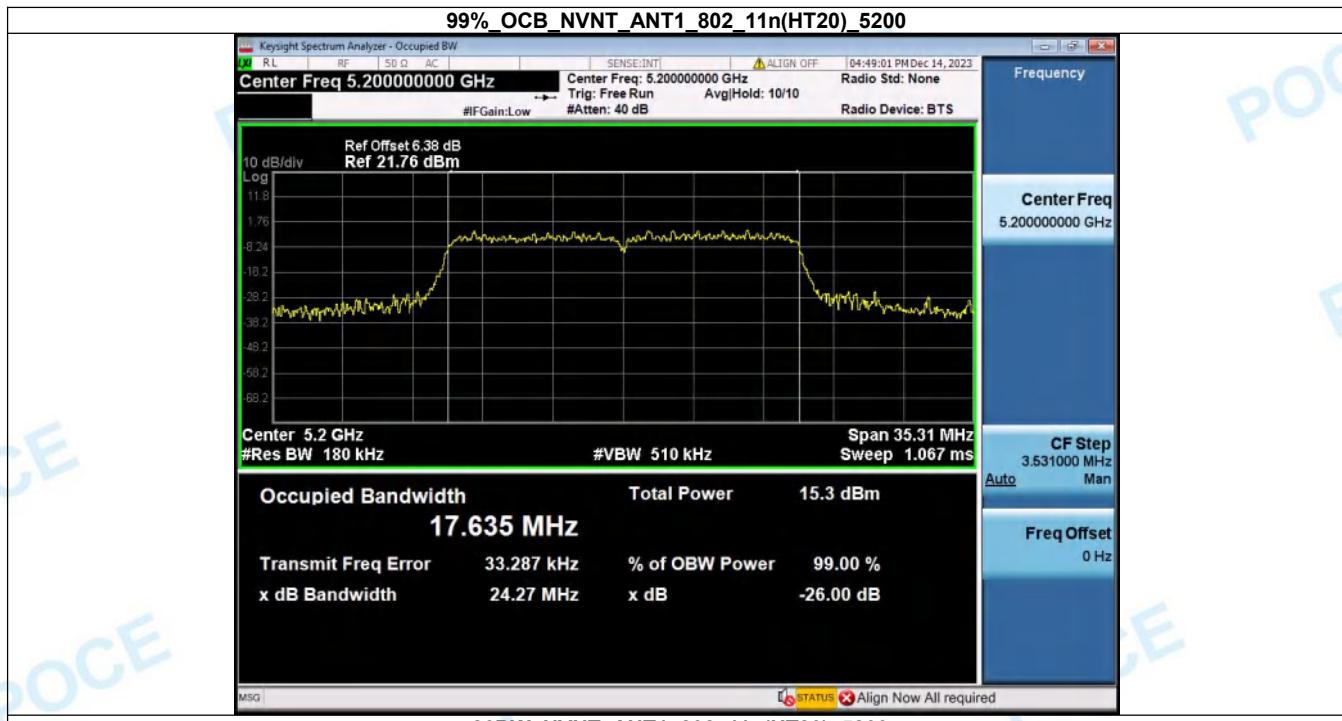
Condition	Antenna	Modulation	Frequency(MHz)	-26dB_Emission_Bandwidth(MHz)	Occupied Bandwidth(MHz)
NVNT	ANT1	802.11a	5180.00	29.97	16.55
NVNT	ANT1	802.11a	5200.00	28.76	16.54
NVNT	ANT1	802.11a	5240.00	29.62	16.56
NVNT	ANT1	802.11n(HT20)	5180.00	31.80	17.66
NVNT	ANT1	802.11n(HT20)	5200.00	34.07	17.63
NVNT	ANT1	802.11n(HT20)	5240.00	32.77	17.64
NVNT	ANT1	802.11ac(VHT20)	5180.00	33.68	17.68
NVNT	ANT1	802.11ac(VHT20)	5200.00	31.52	17.65
NVNT	ANT1	802.11ac(VHT20)	5240.00	30.07	17.64
NVNT	ANT1	802.11n(HT40)	5190.00	59.59	36.31
NVNT	ANT1	802.11n(HT40)	5230.00	58.30	36.24
NVNT	ANT1	802.11ac(VHT40)	5190.00	58.70	36.37
NVNT	ANT1	802.11ac(VHT40)	5230.00	50.86	36.25
NVNT	ANT1	802.11ac(VHT80)	5210.00	85.76	75.62

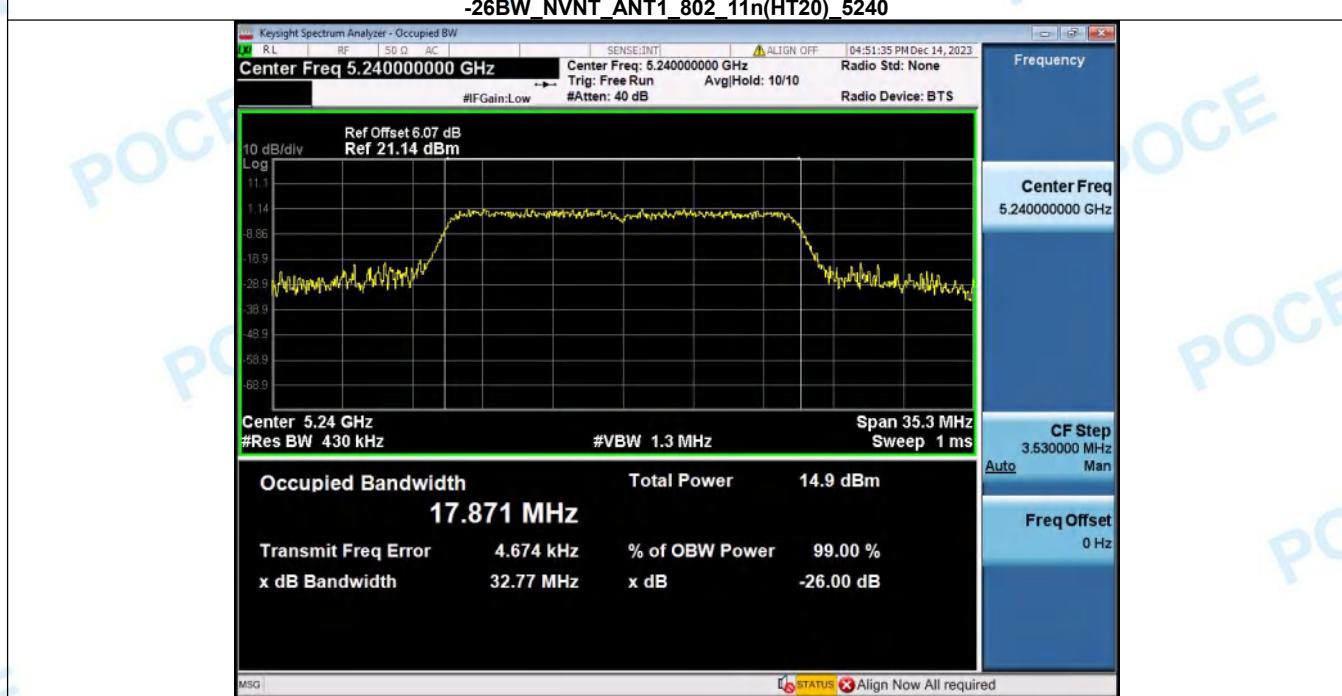
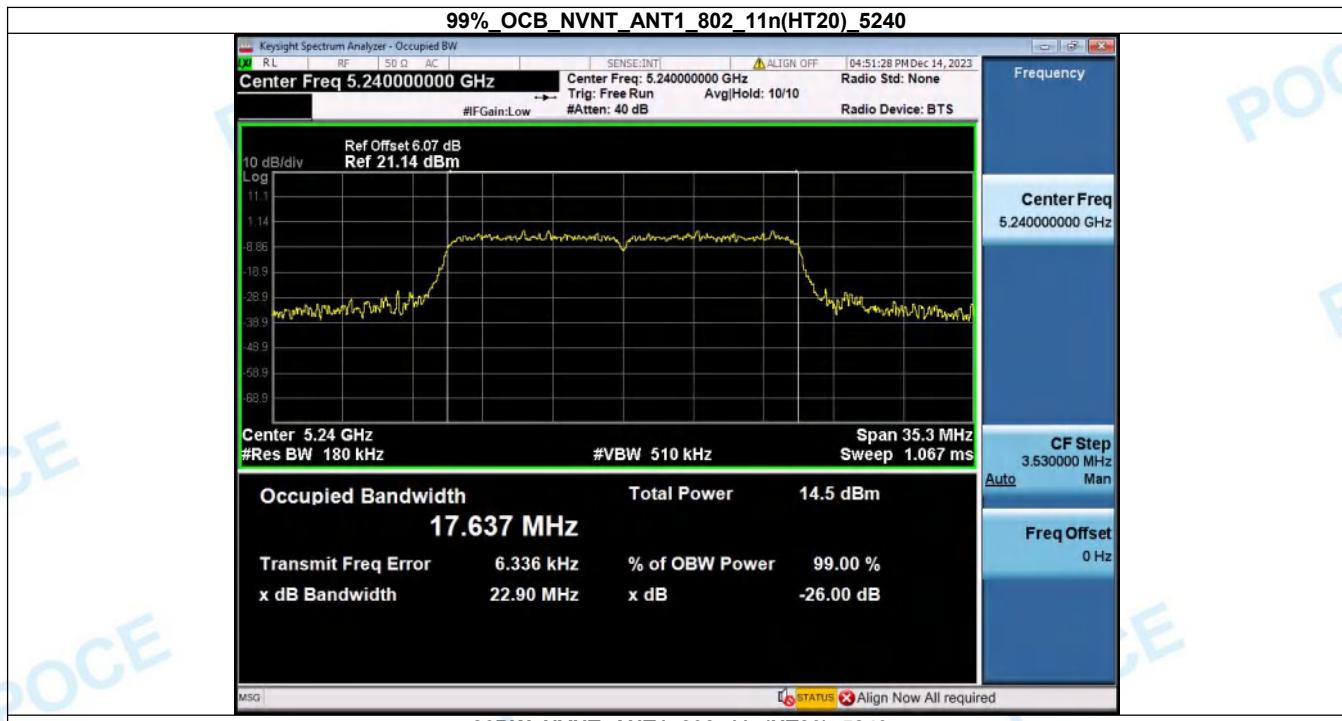


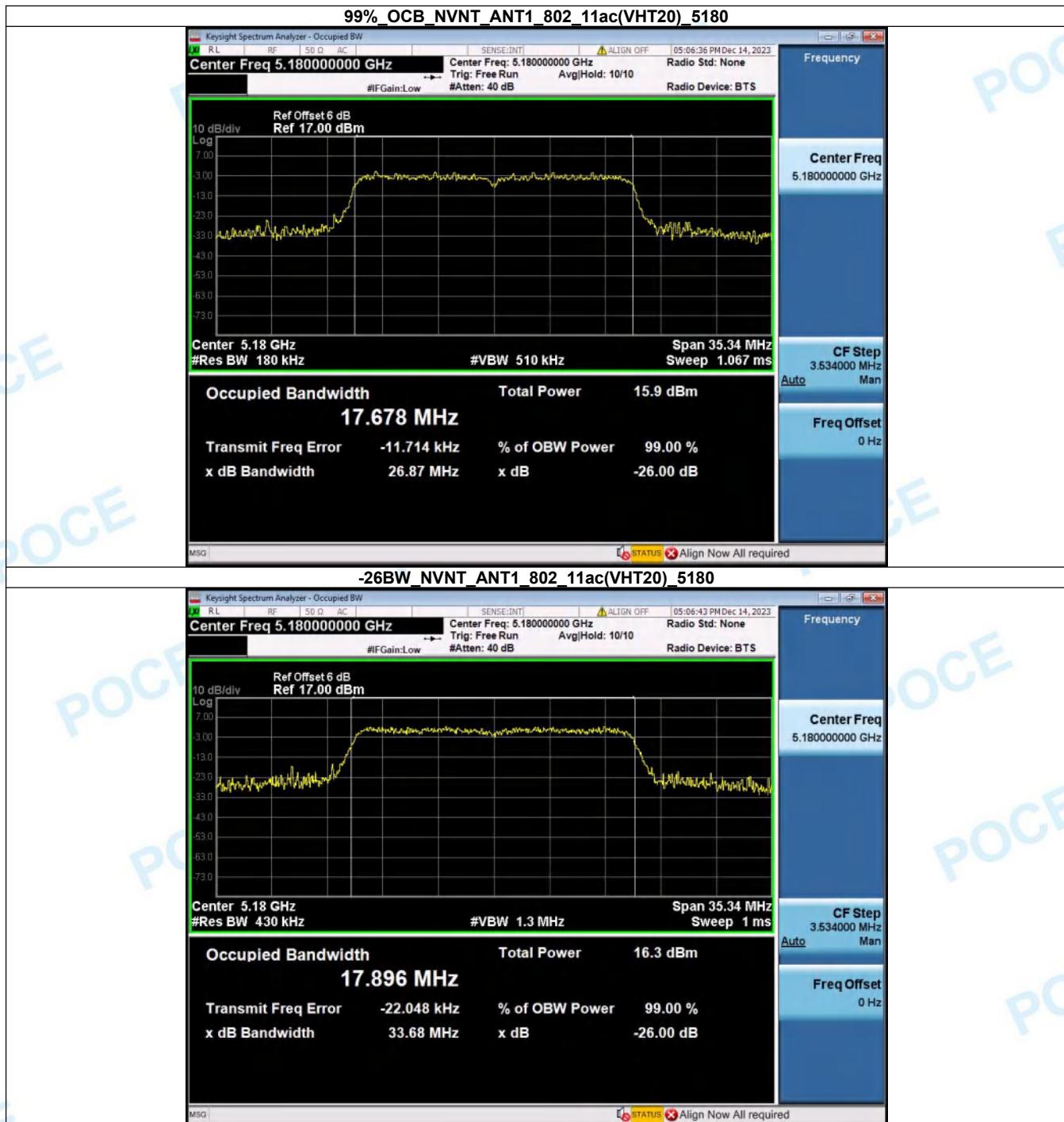


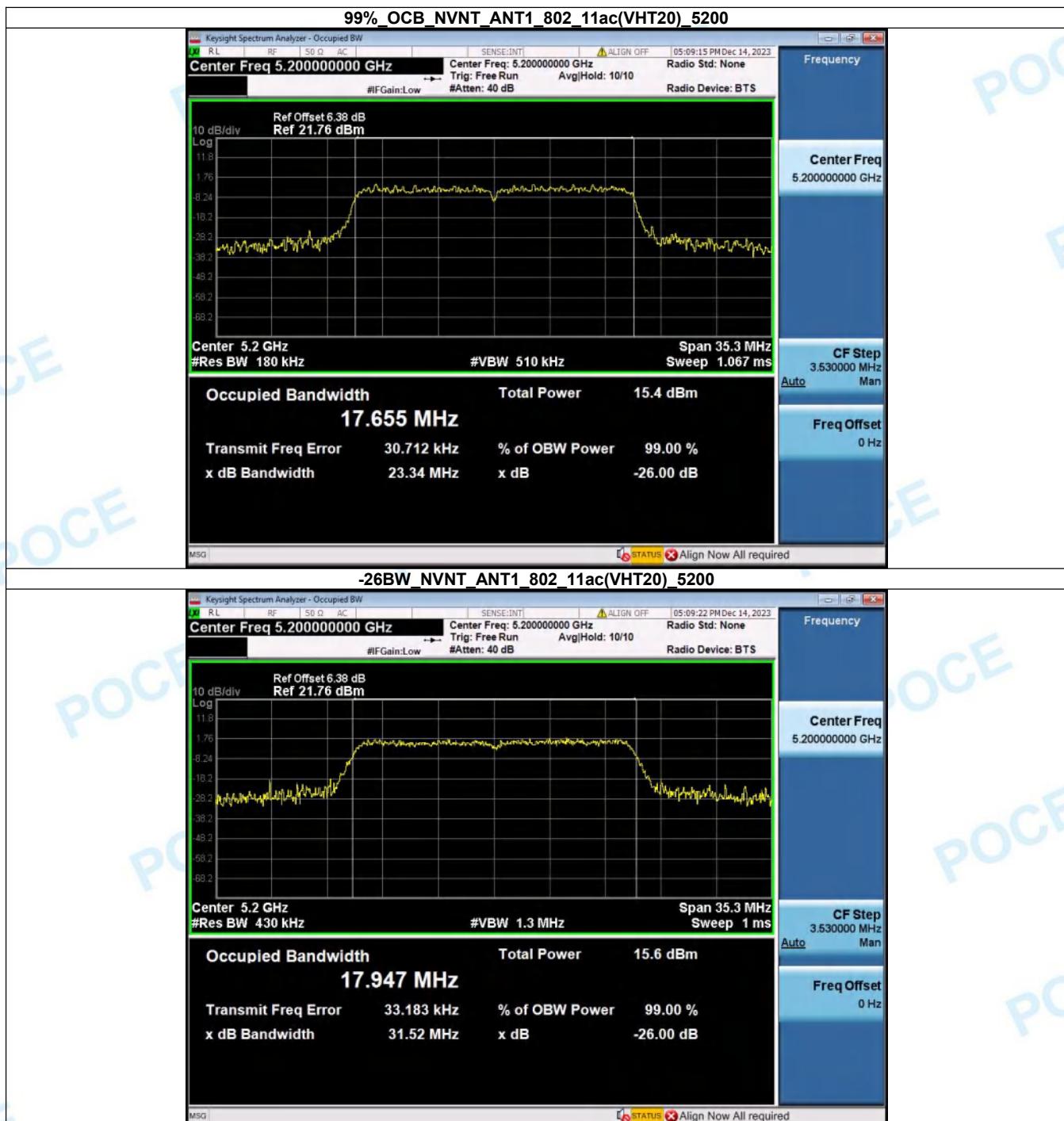


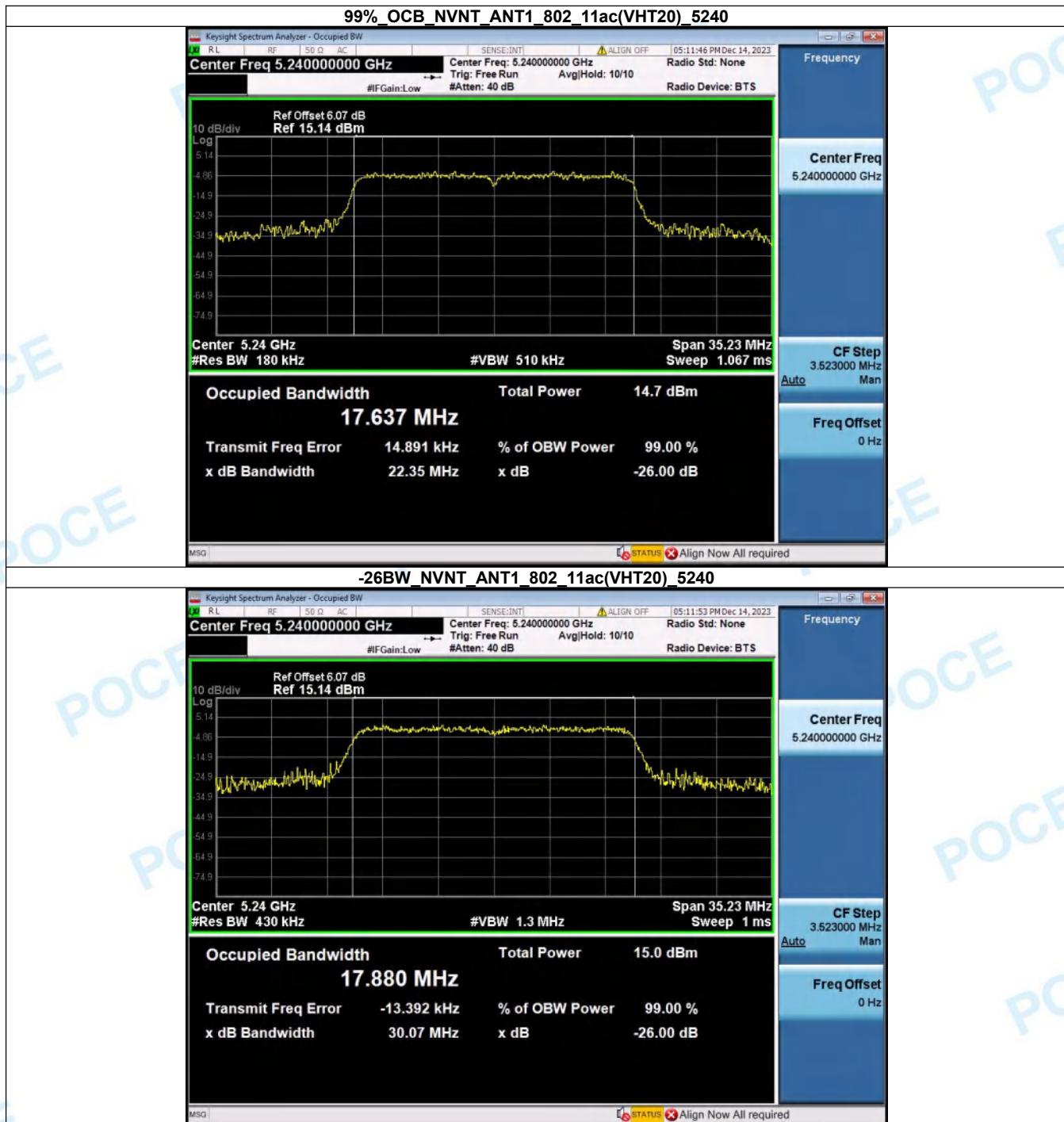


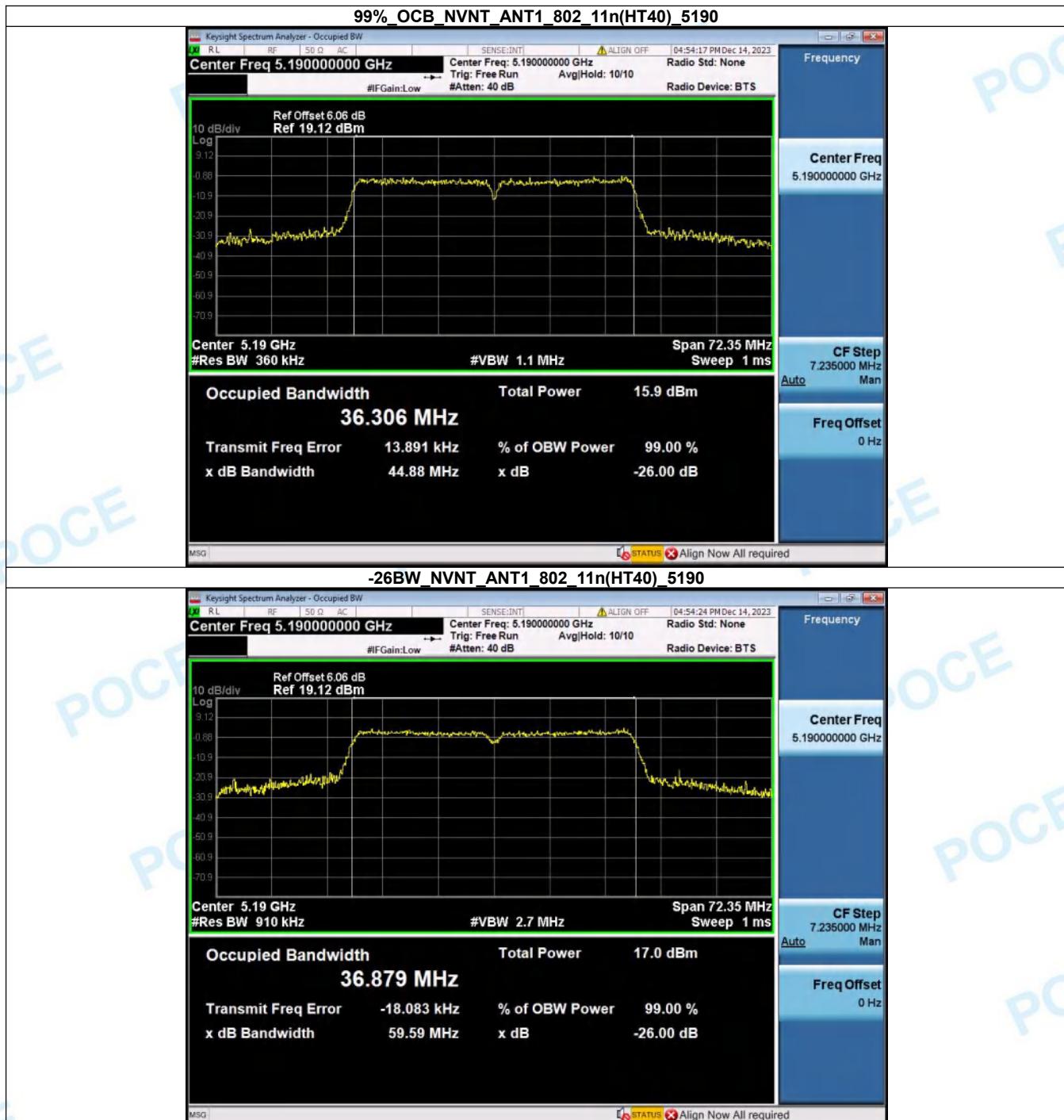


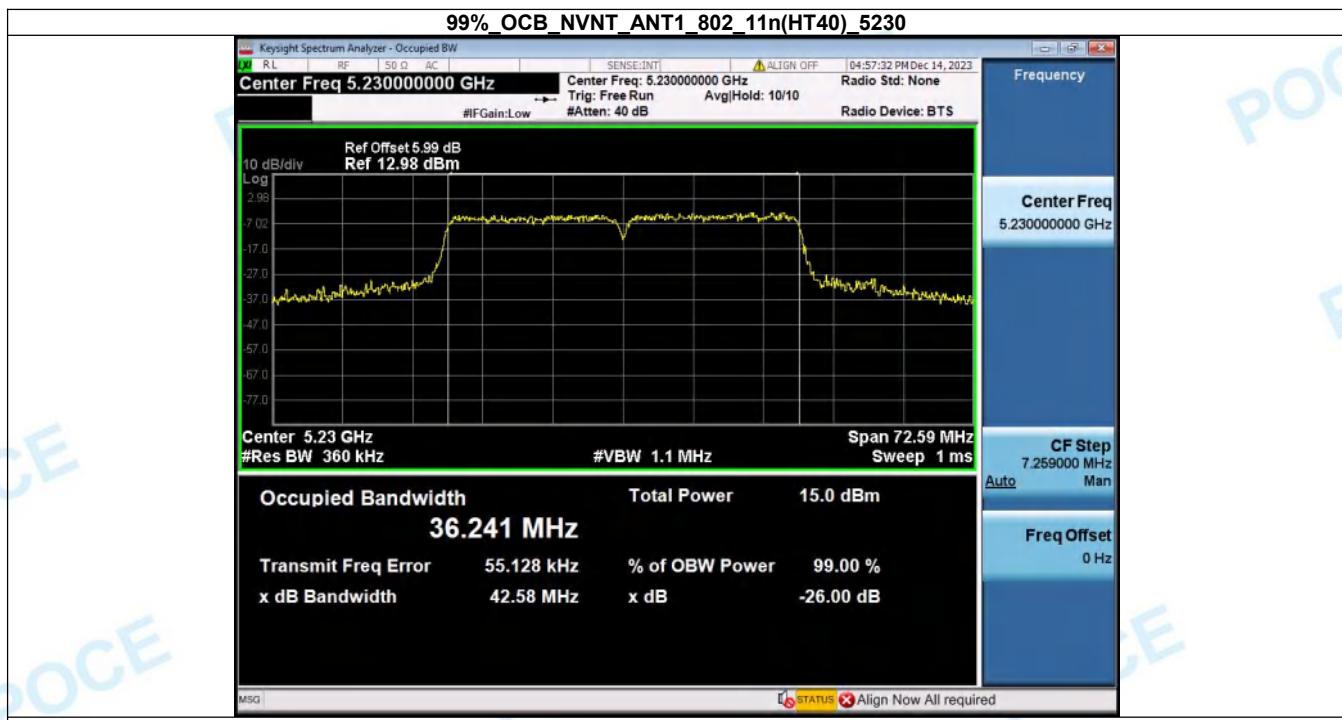




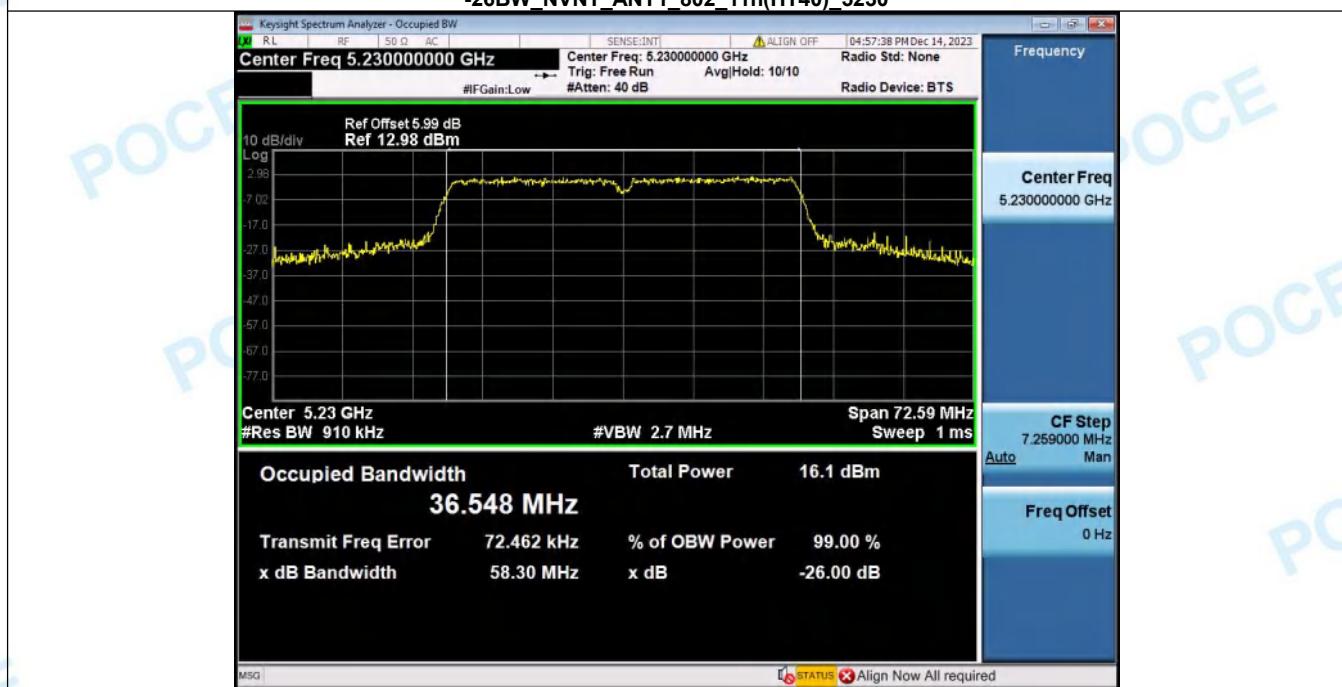


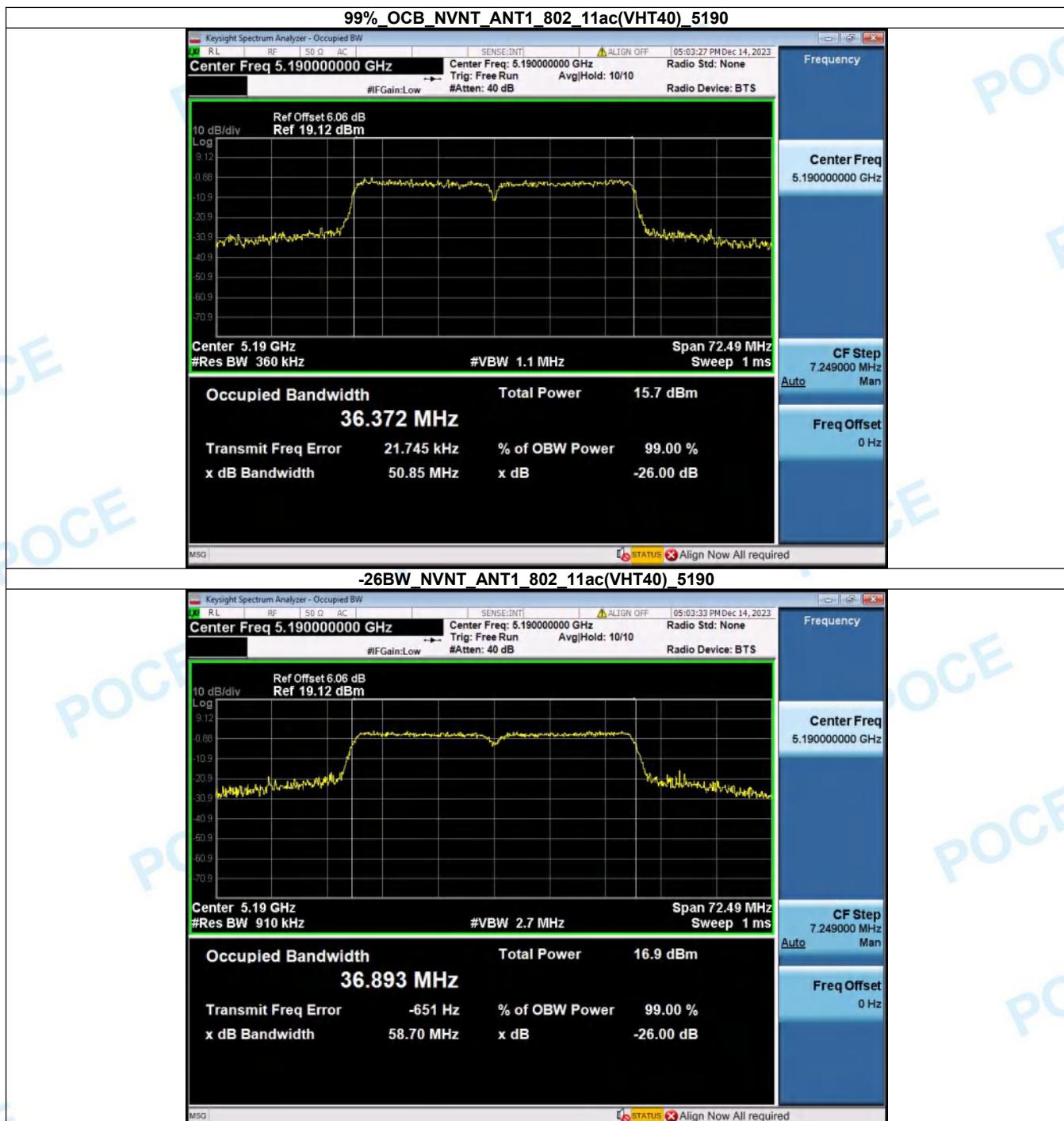


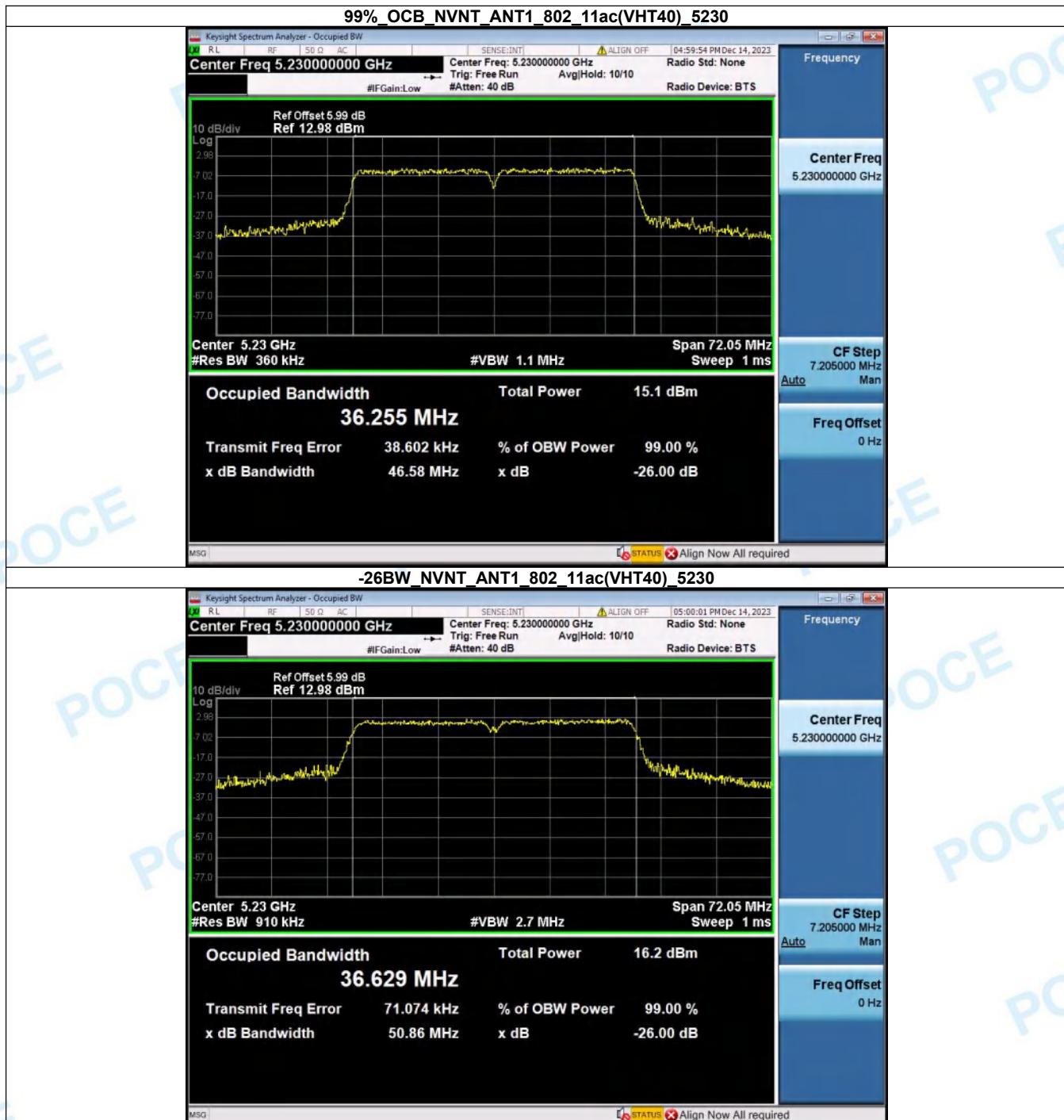


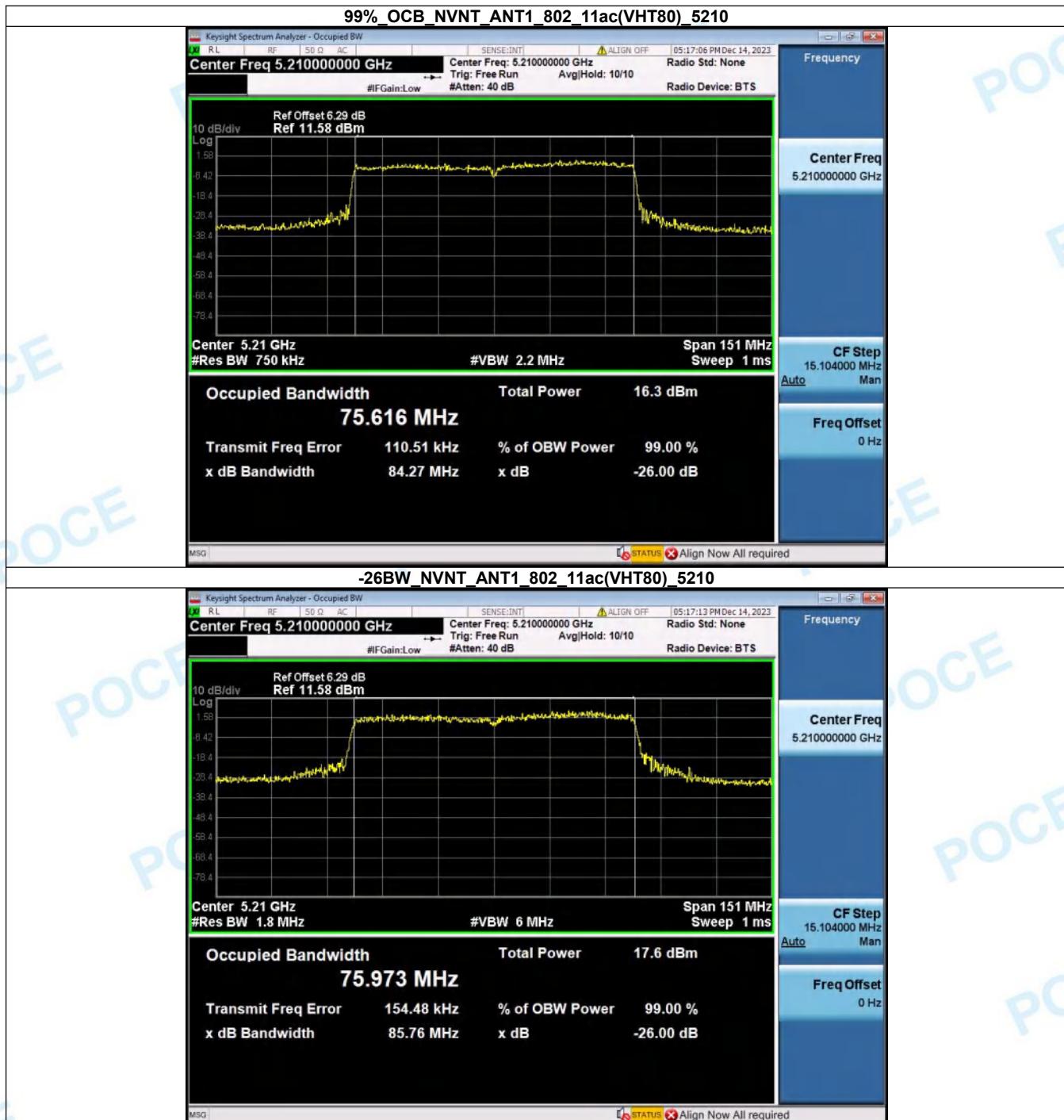


**-26BW\_NVNT\_ANT1\_802\_11n(HT40)\_5230**



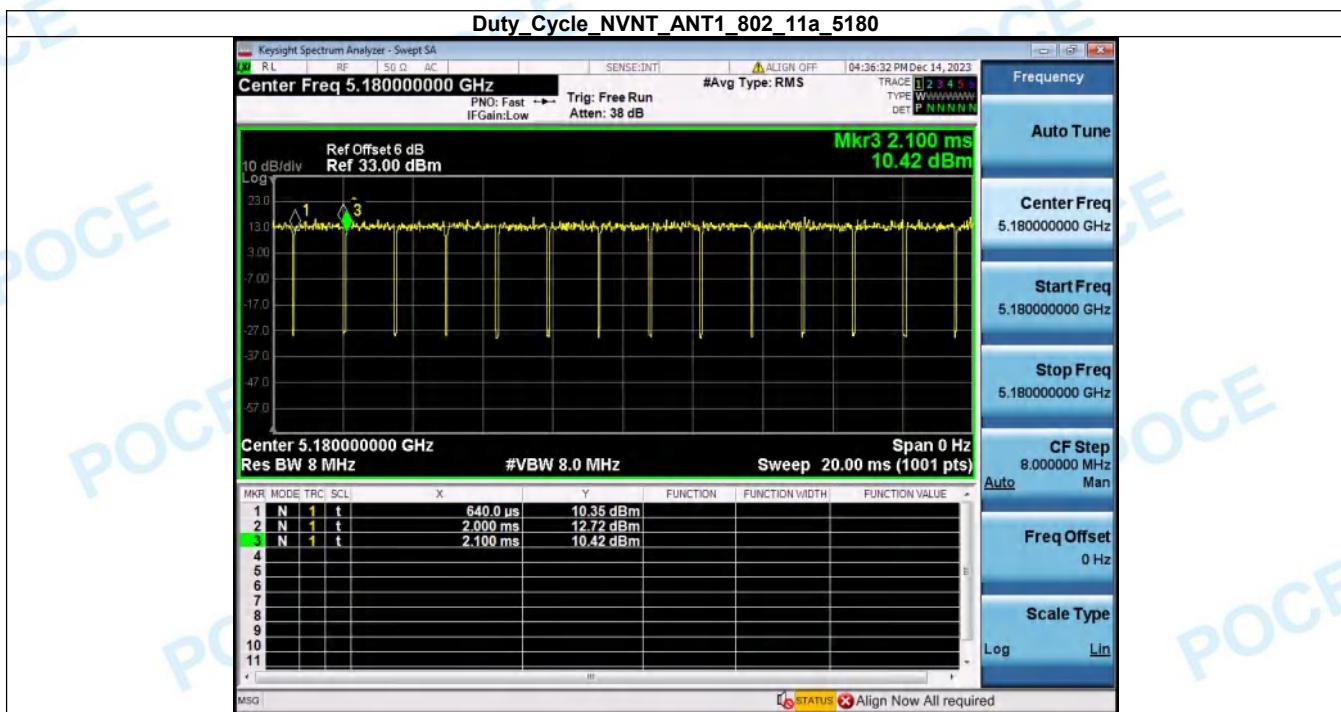


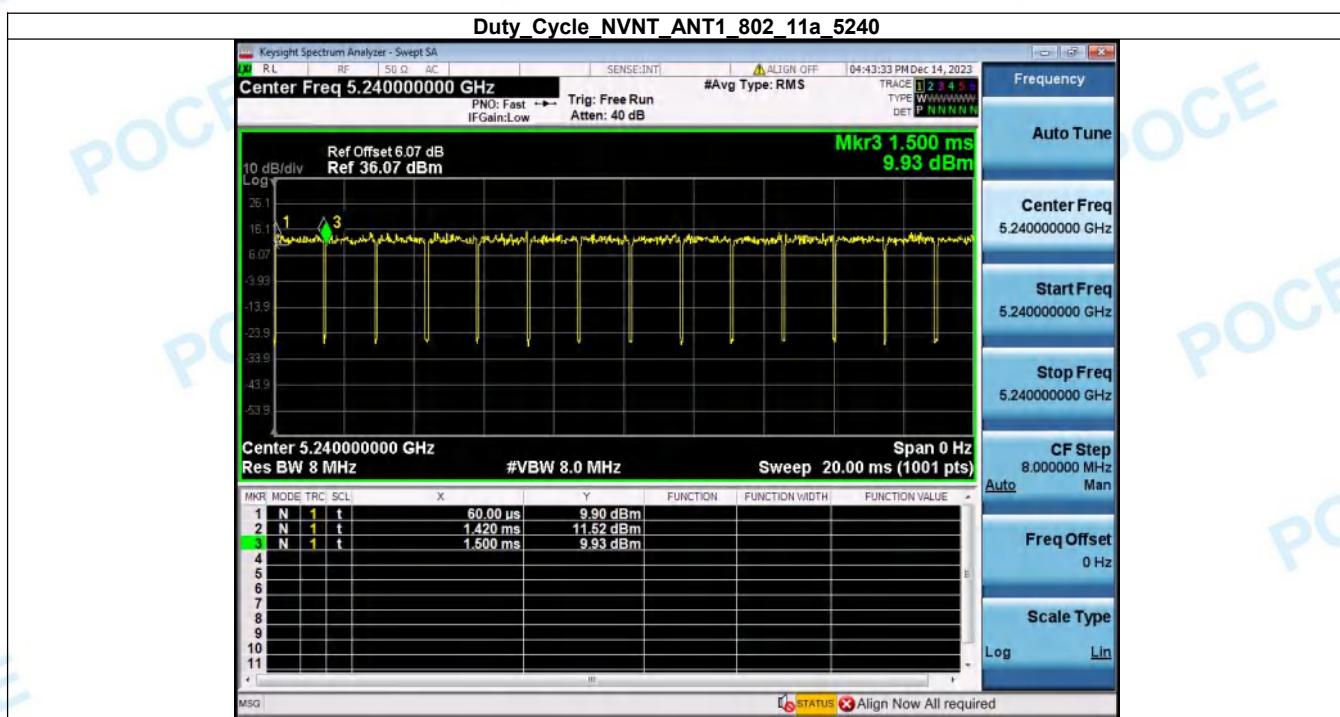
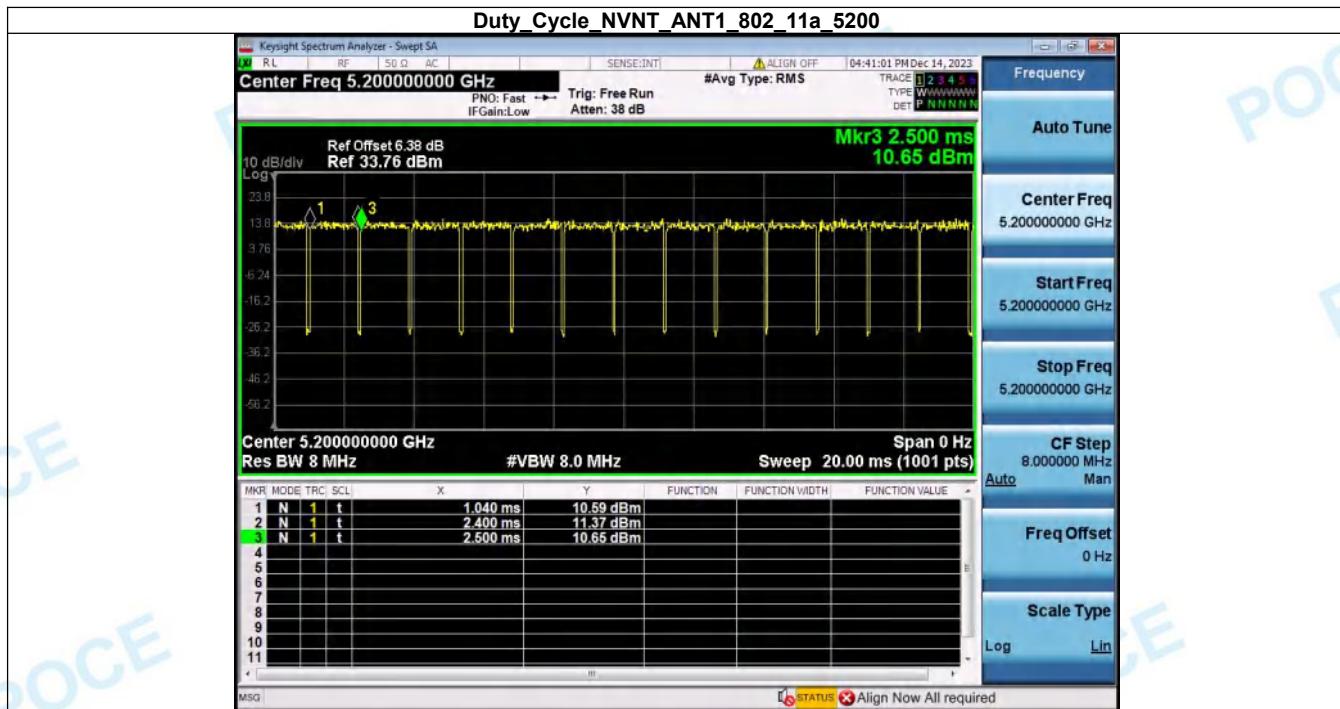


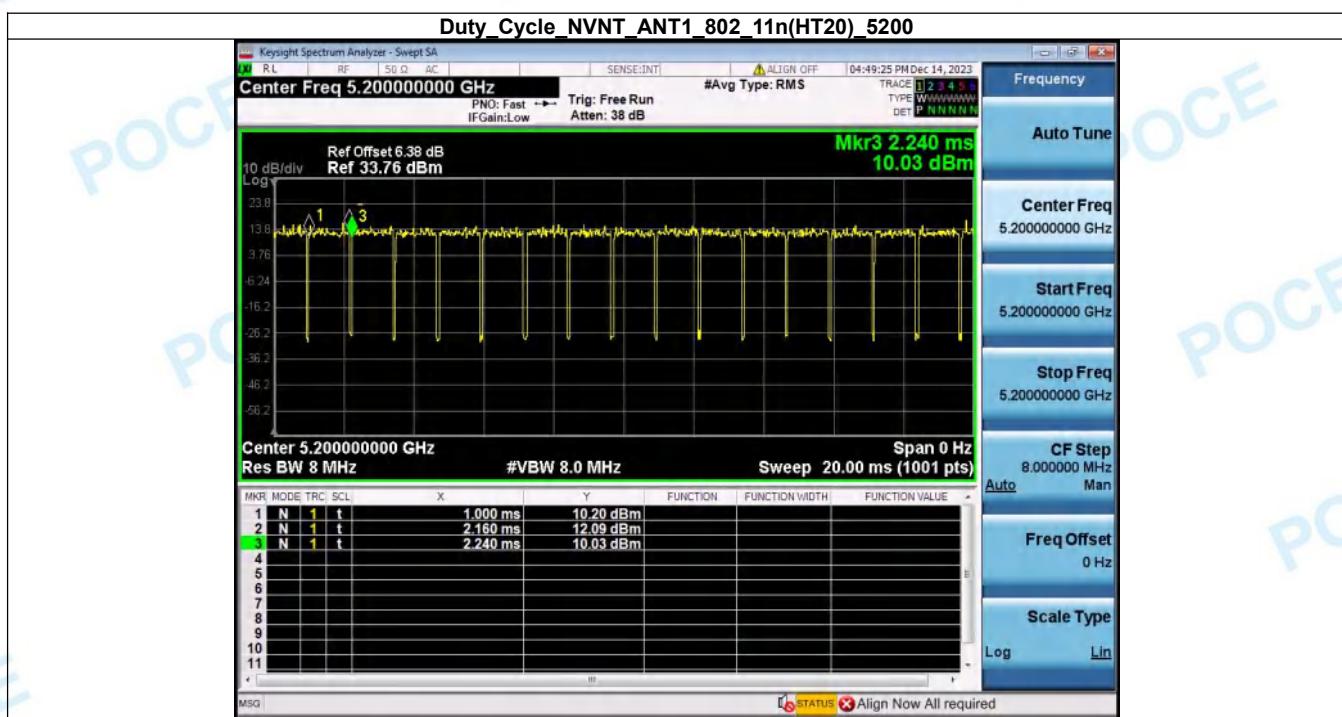
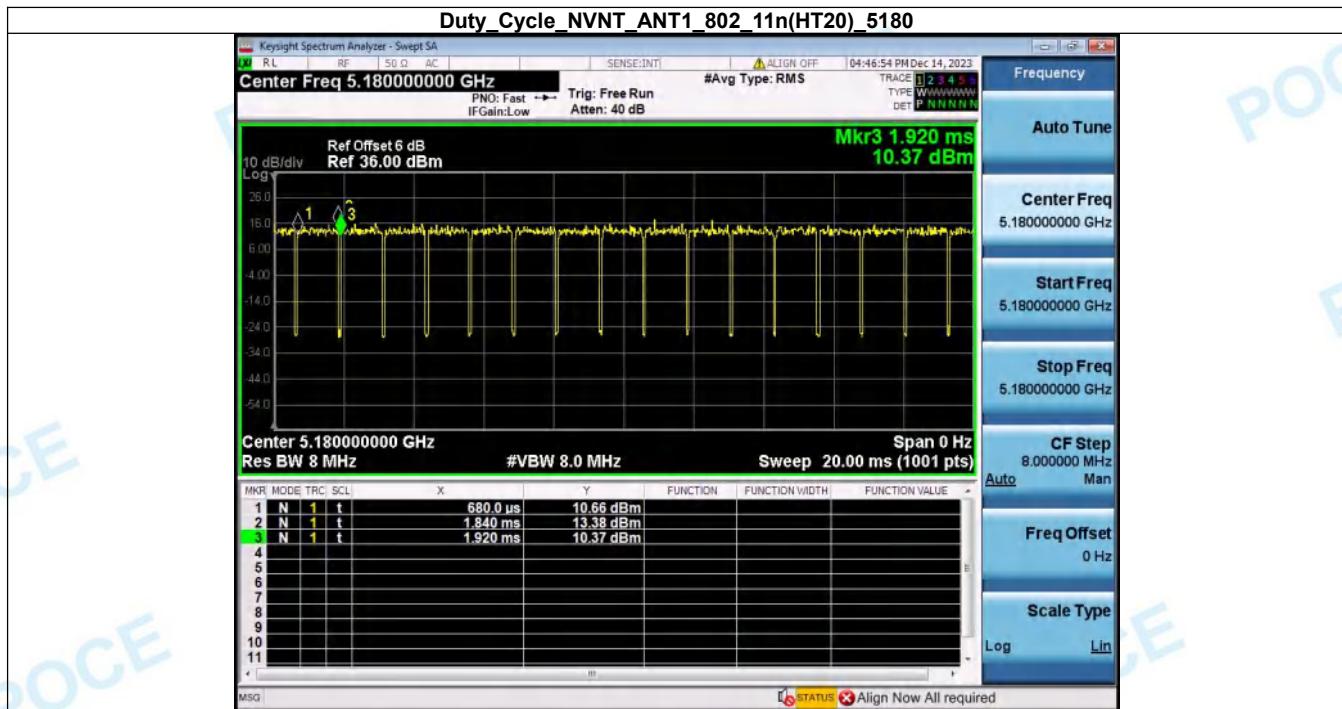


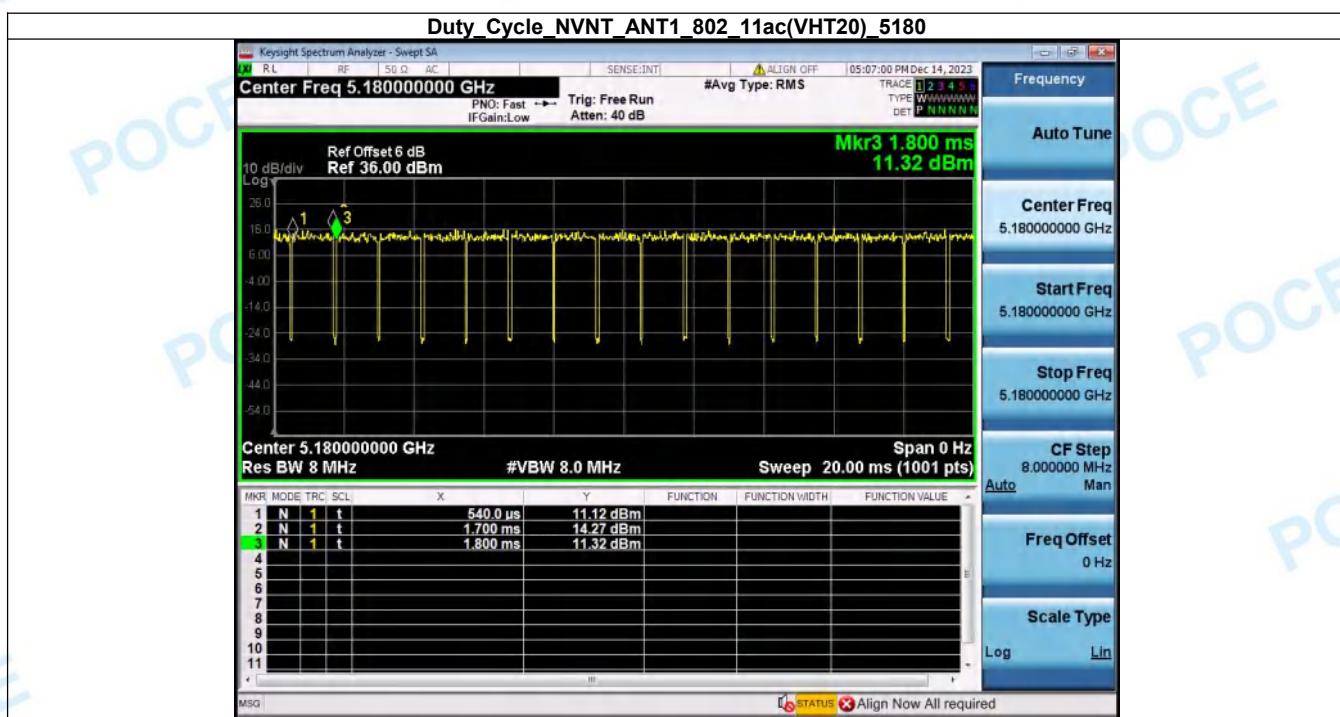
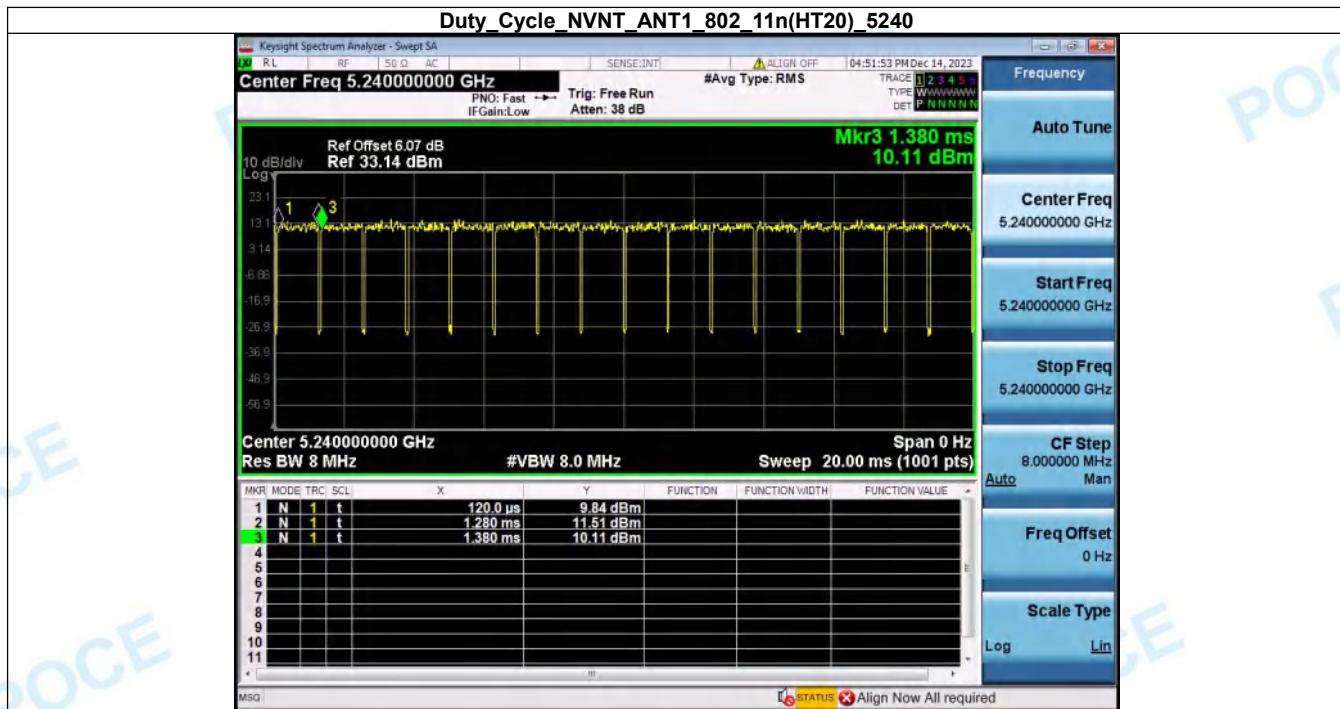
## 2. Duty Cycle

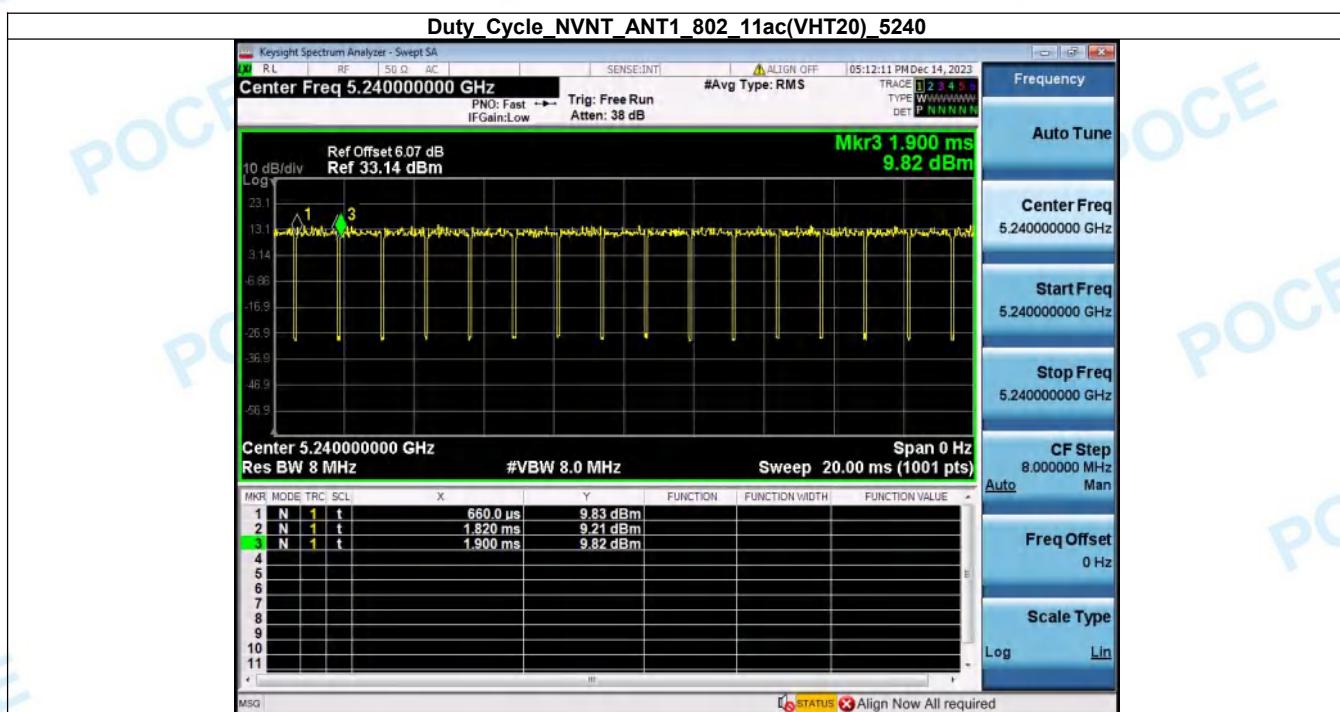
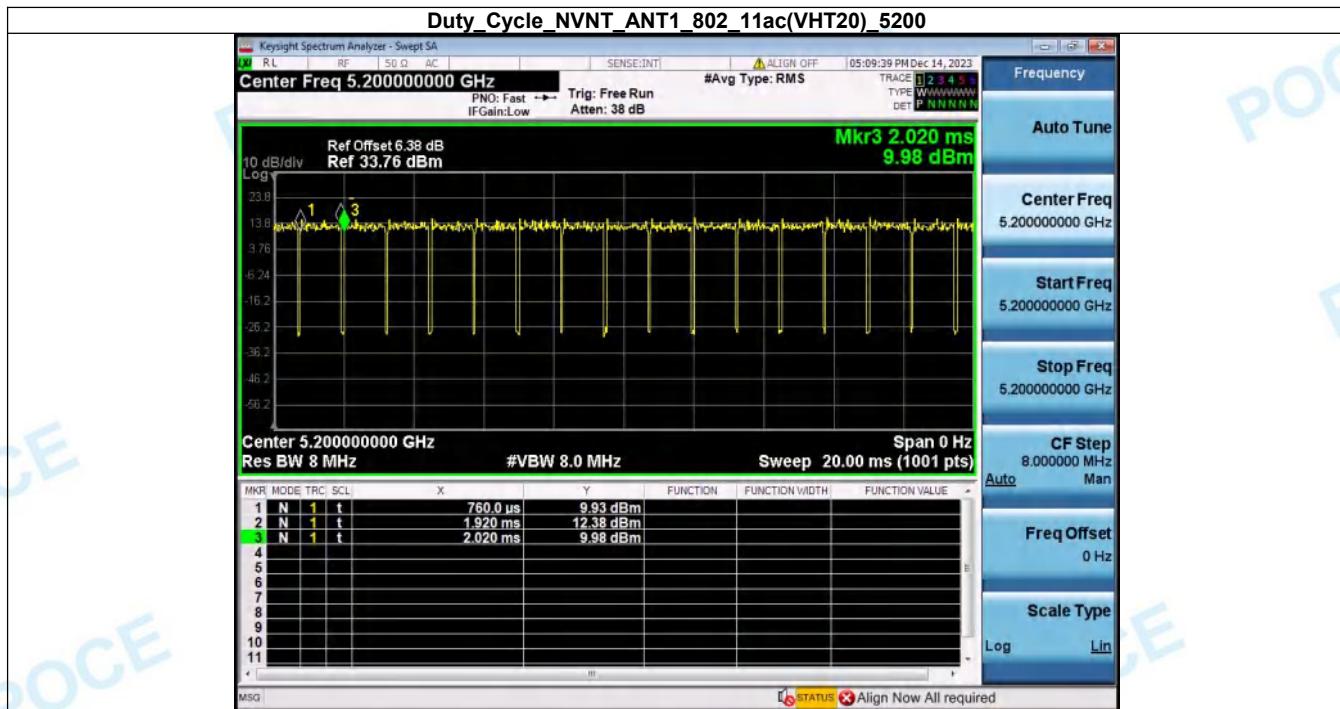
Condition	Antenna	Modulation	Frequency (MHz)	Duty cycle(%)	Duty_factor
NVNT	ANT1	802.11a	5180.00	93.15	0.31
NVNT	ANT1	802.11a	5200.00	93.15	0.31
NVNT	ANT1	802.11a	5240.00	94.44	0.25
NVNT	ANT1	802.11n(HT20)	5180.00	93.55	0.29
NVNT	ANT1	802.11n(HT20)	5200.00	93.55	0.29
NVNT	ANT1	802.11n(HT20)	5240.00	92.06	0.36
NVNT	ANT1	802.11ac(VHT20)	5180.00	92.06	0.36
NVNT	ANT1	802.11ac(VHT20)	5200.00	92.06	0.36
NVNT	ANT1	802.11ac(VHT20)	5240.00	93.55	0.29
NVNT	ANT1	802.11n(HT40)	5190.00	87.88	0.56
NVNT	ANT1	802.11n(HT40)	5230.00	85.29	0.69
NVNT	ANT1	802.11ac(VHT40)	5190.00	87.88	0.56
NVNT	ANT1	802.11ac(VHT40)	5230.00	85.29	0.69
NVNT	ANT1	802.11ac(VHT80)	5210.00	73.68	1.33

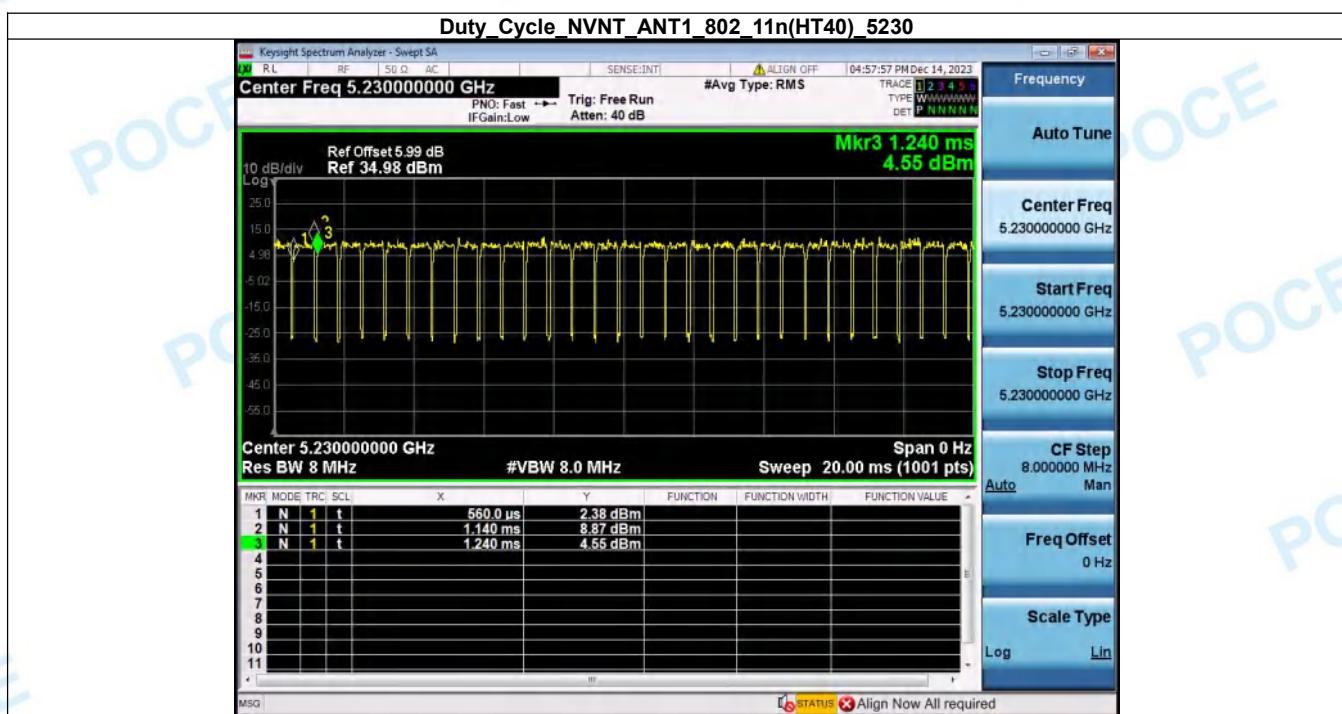
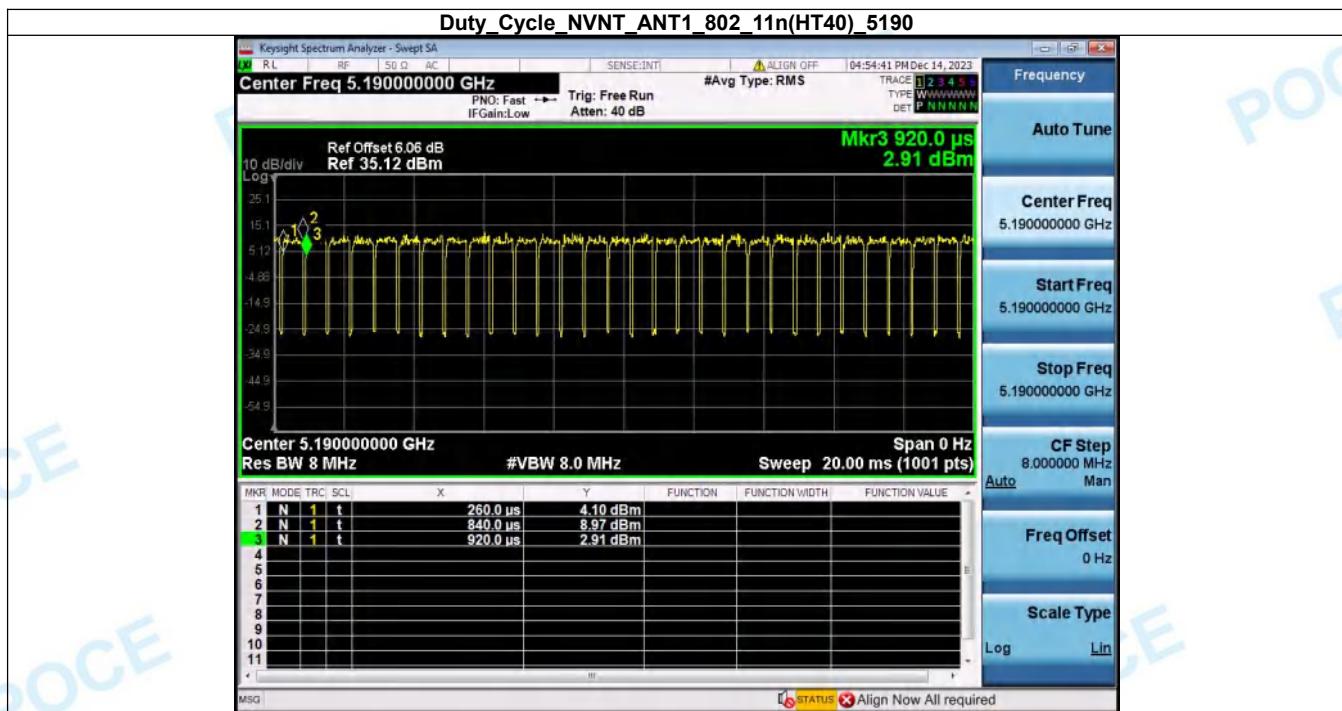


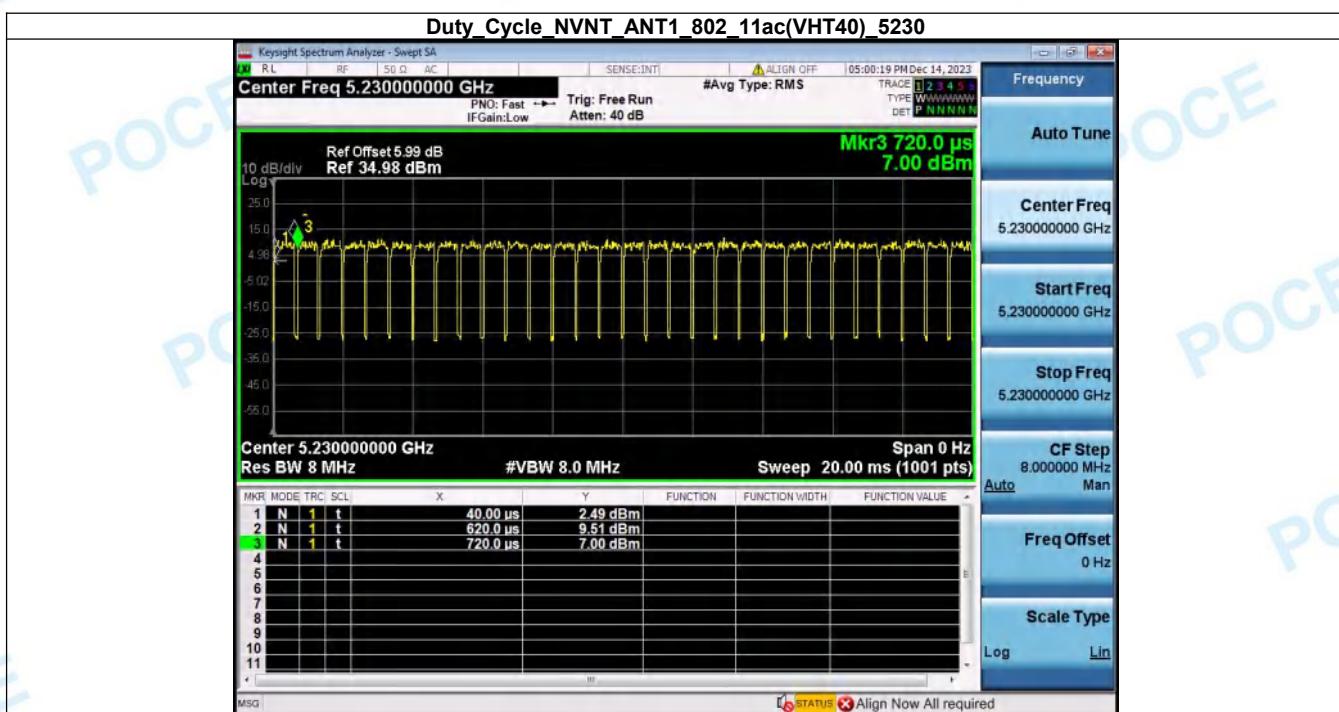
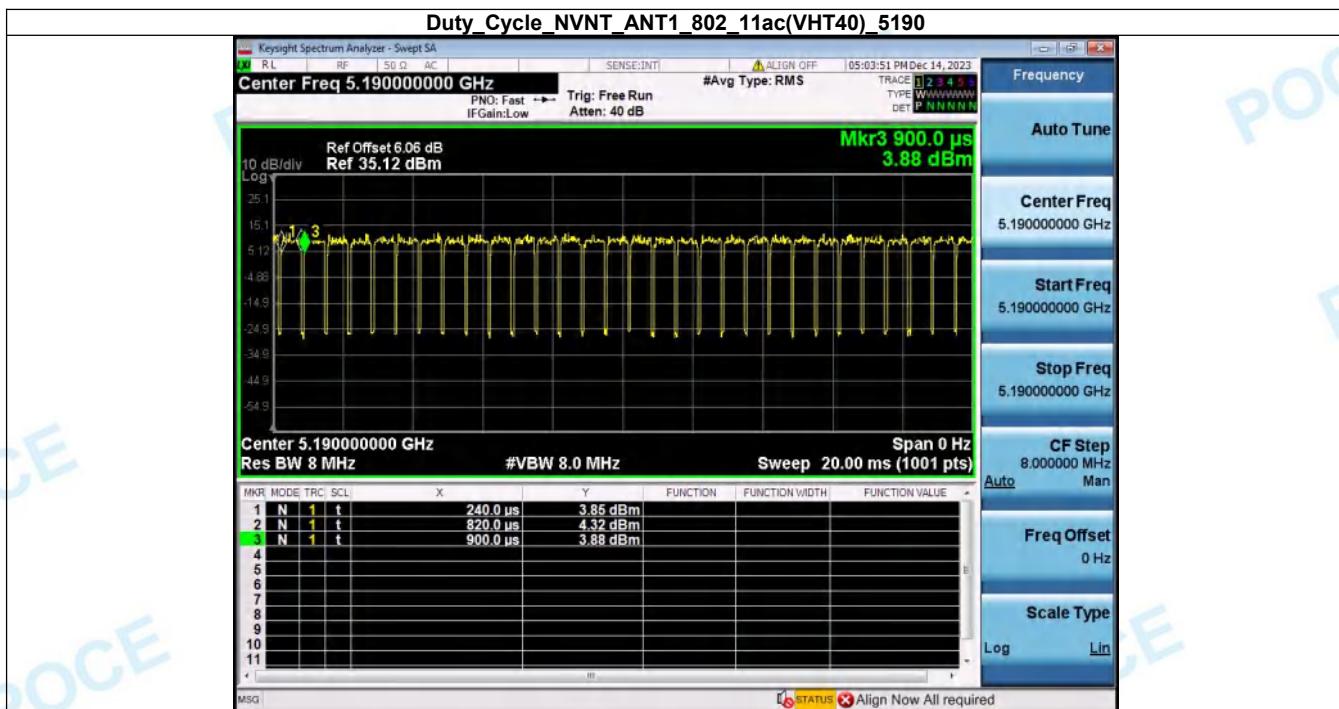


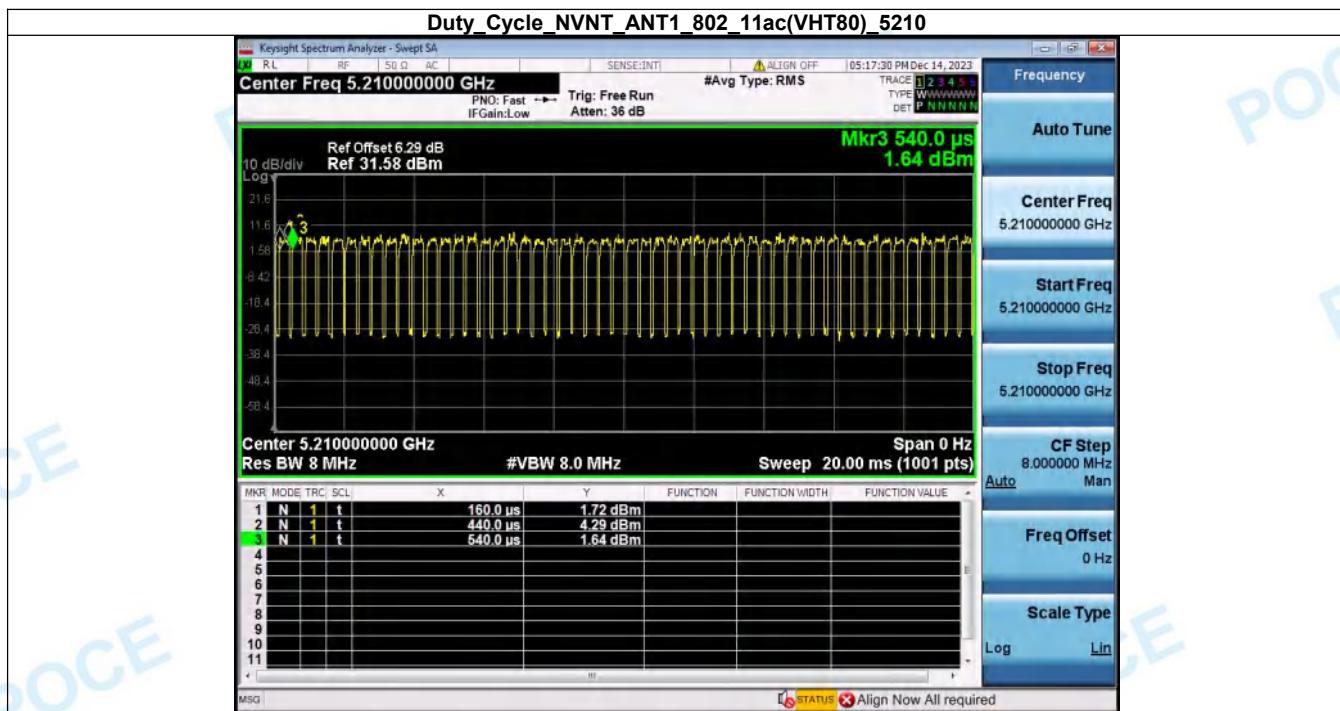










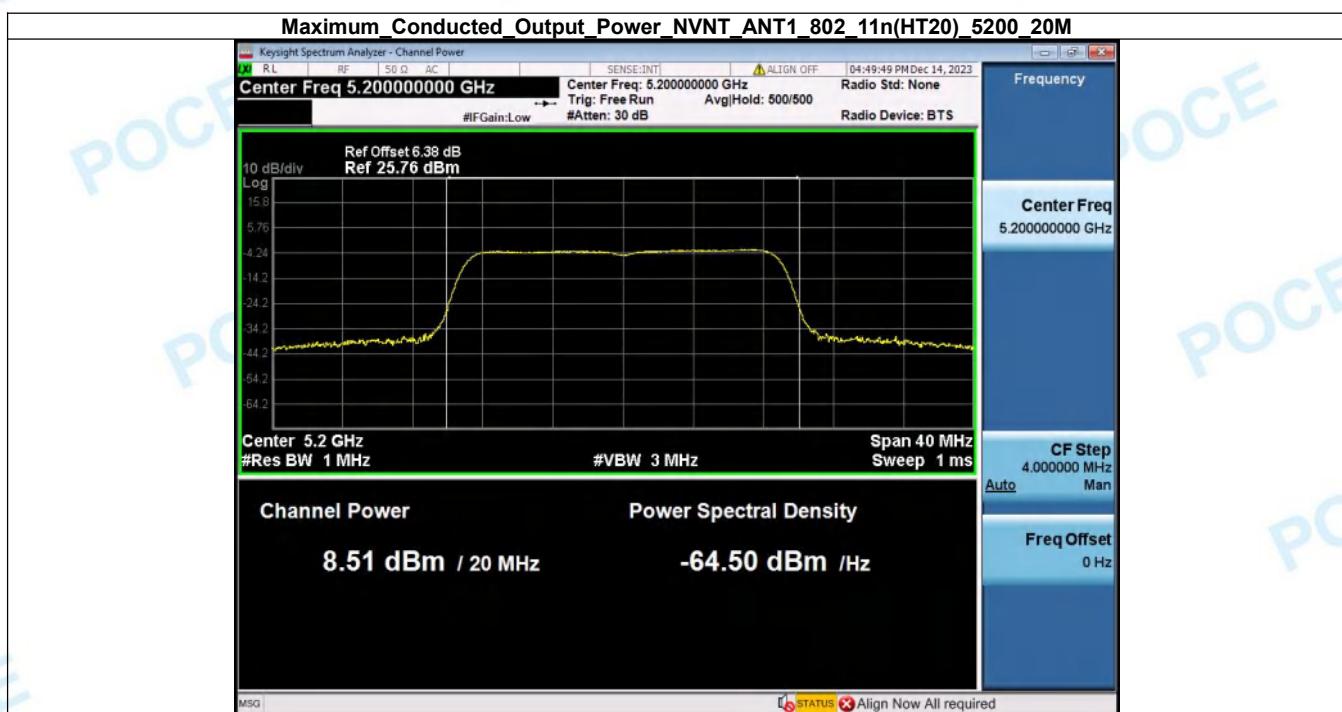
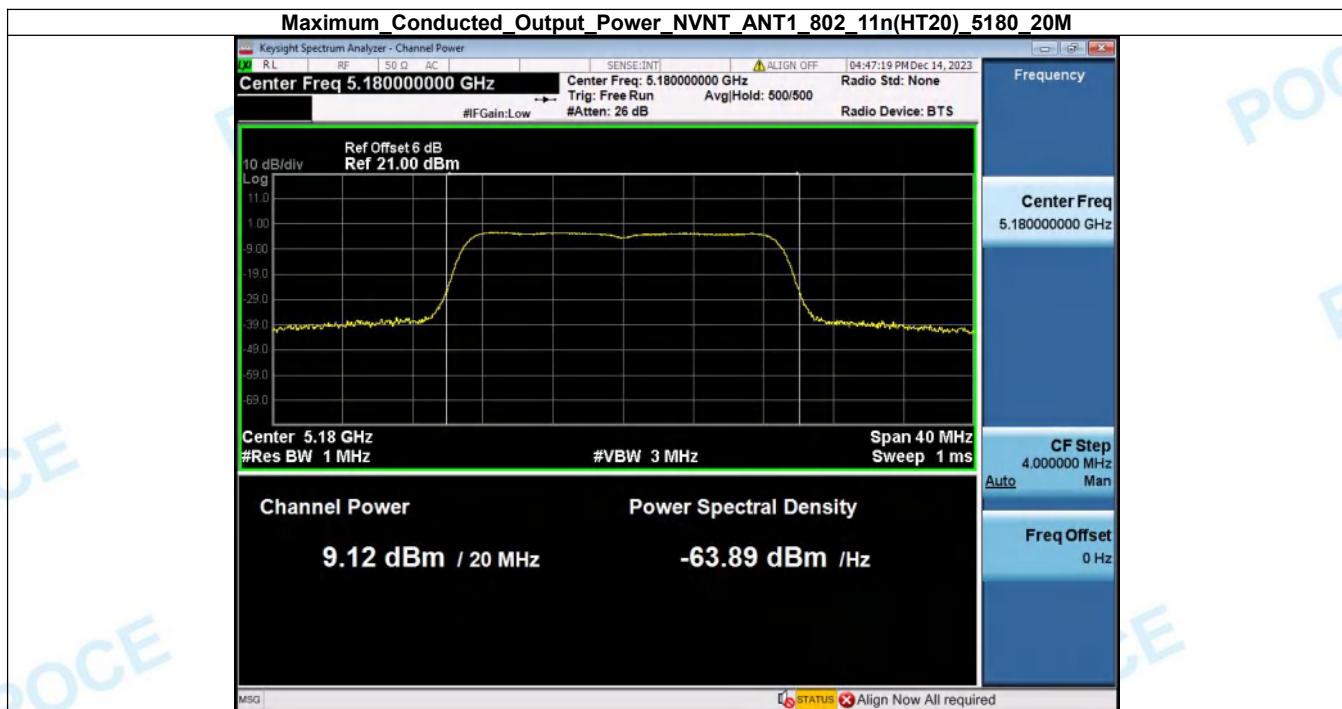


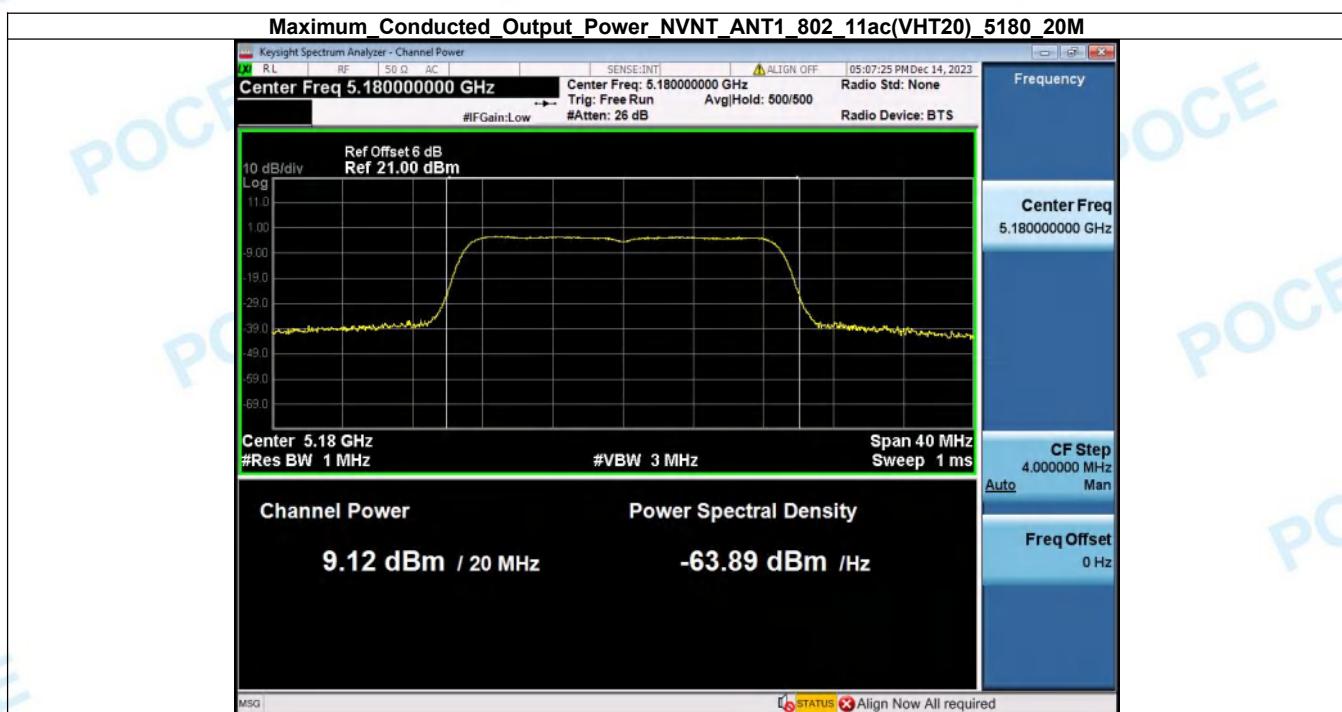
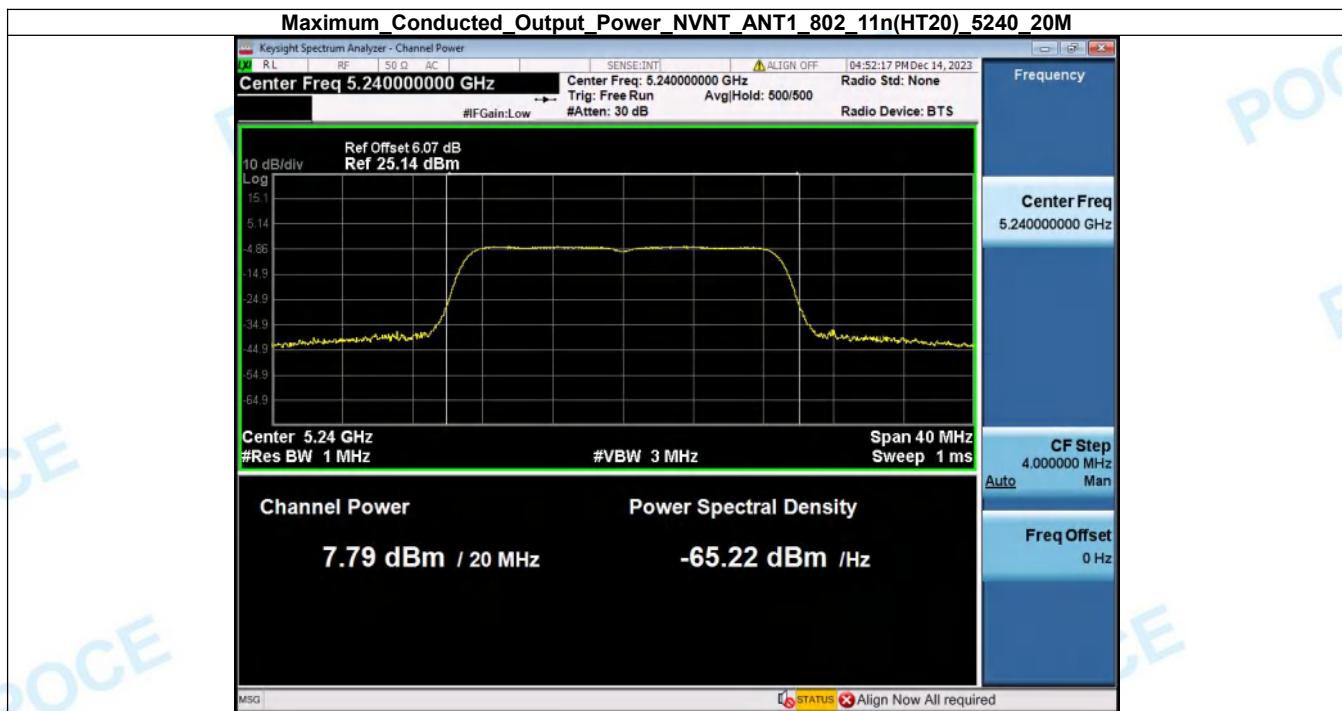
### 3. Maximum Conducted Output Power

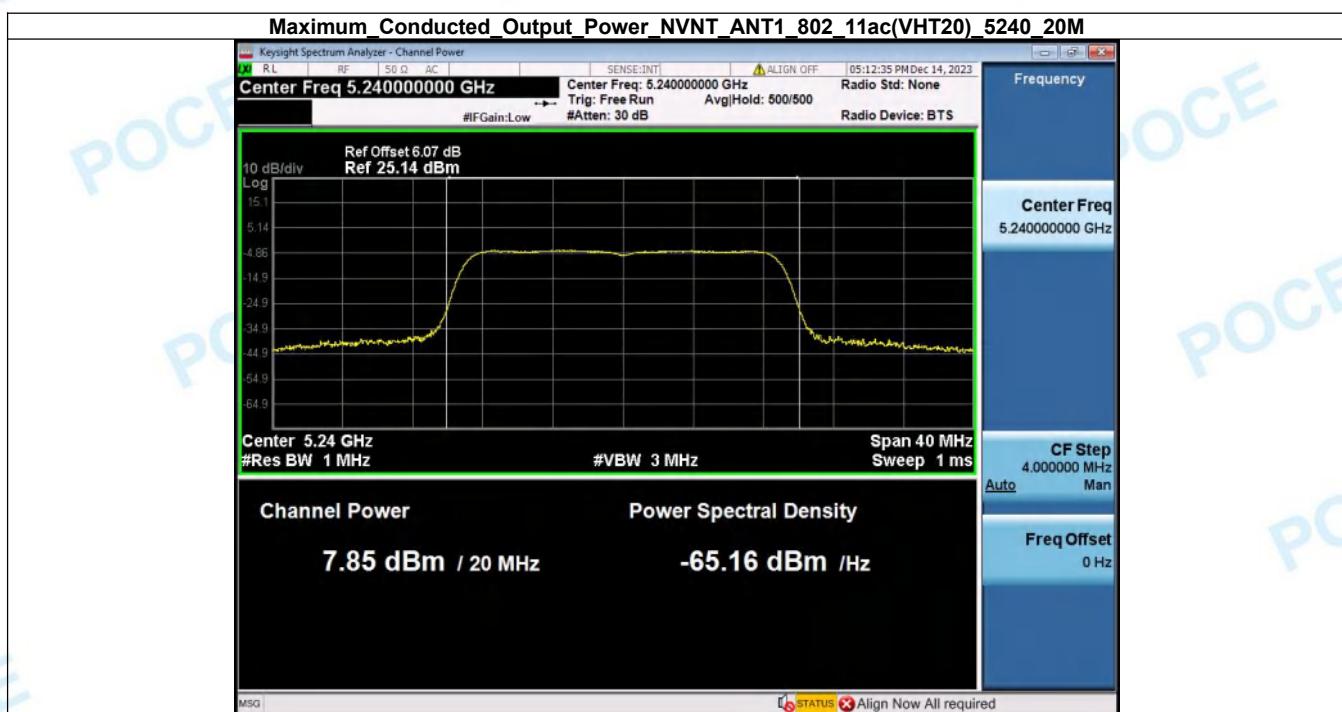
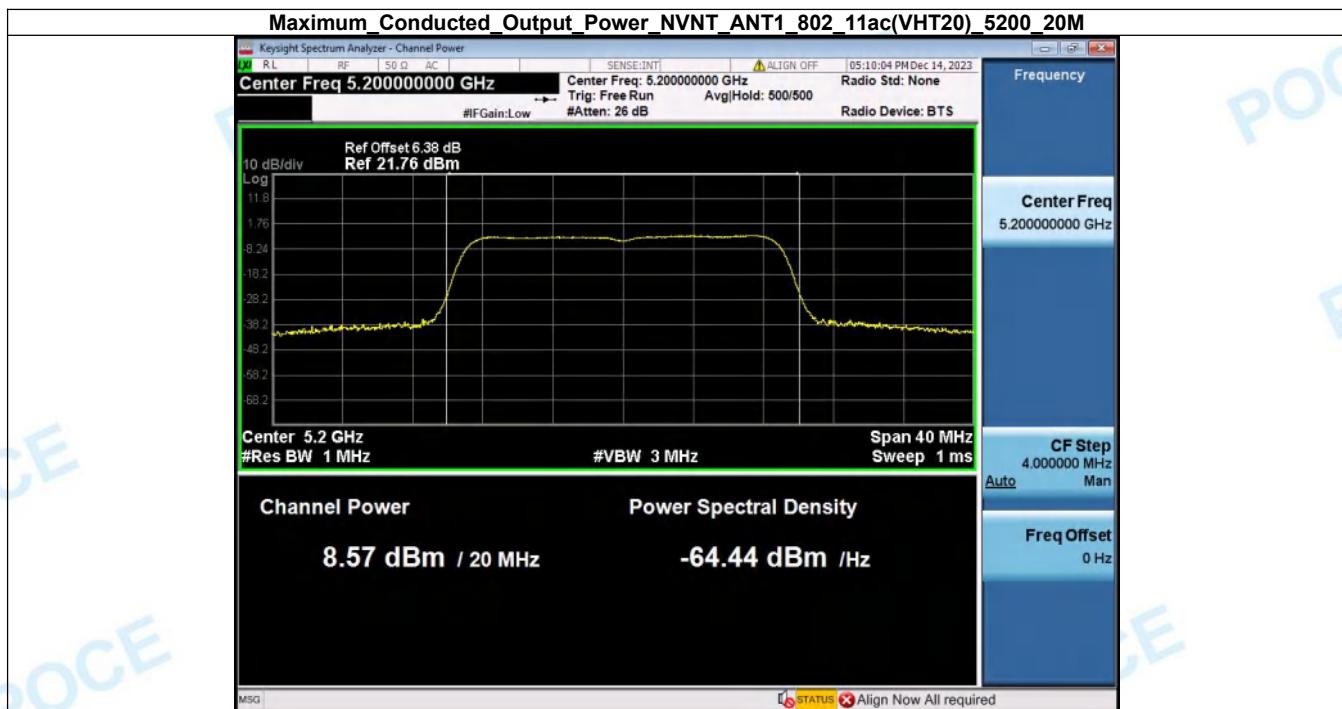
Condition	Antenna	Modulation	Frequency (MHz)	Conducted Power(dBm)	Duty factor(dB)	Total Power(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	9.24	0.31	9.55	24	Pass
NVNT	ANT1	802.11a	5200.00	8.58	0.31	8.89	24	Pass
NVNT	ANT1	802.11a	5240.00	7.77	0.25	8.02	24	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	9.12	0.29	9.41	24	Pass
NVNT	ANT1	802.11n(HT20)	5200.00	8.51	0.29	8.80	24	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	7.79	0.36	8.15	24	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	9.12	0.36	9.48	24	Pass
NVNT	ANT1	802.11ac(VHT20)	5200.00	8.57	0.36	8.93	24	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	7.85	0.29	8.14	24	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	8.57	0.56	9.13	24	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	7.88	0.69	8.57	24	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	8.64	0.56	9.20	24	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	7.88	0.69	8.57	24	Pass
NVNT	ANT1	802.11ac(VHT80)	5210.00	8.00	1.33	9.33	24	Pass

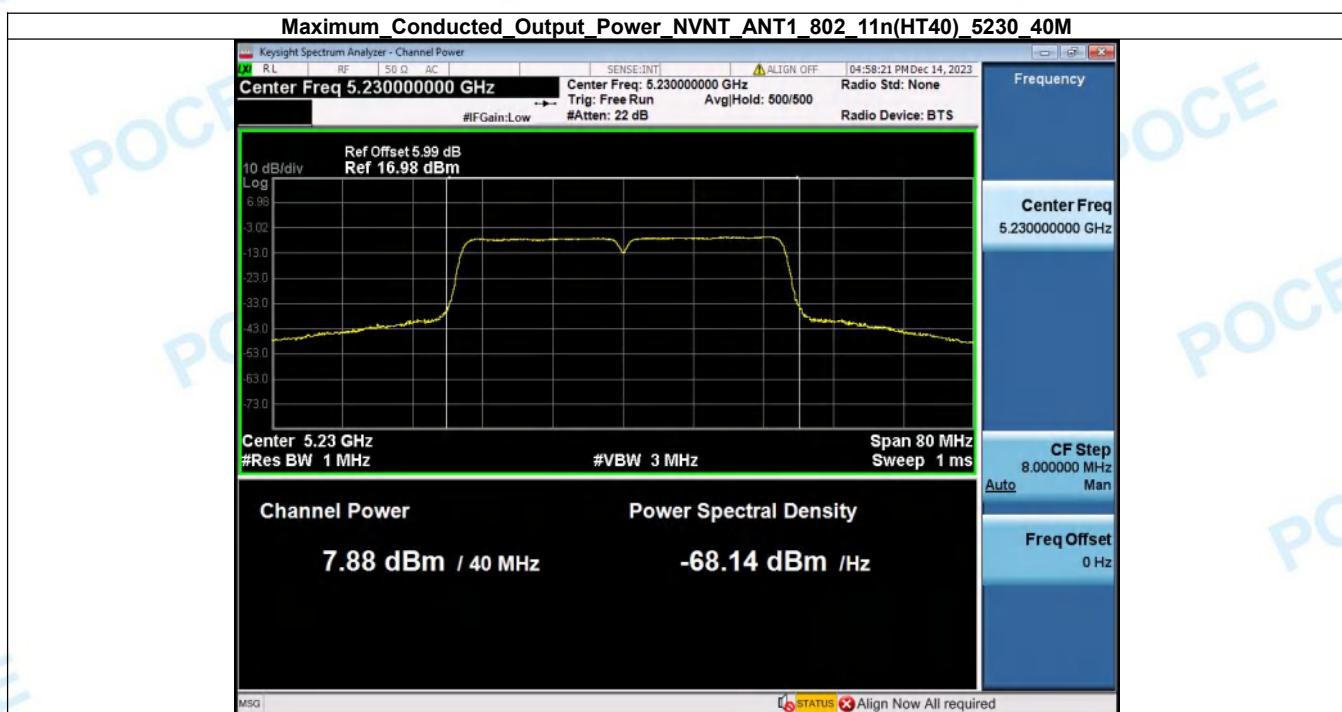


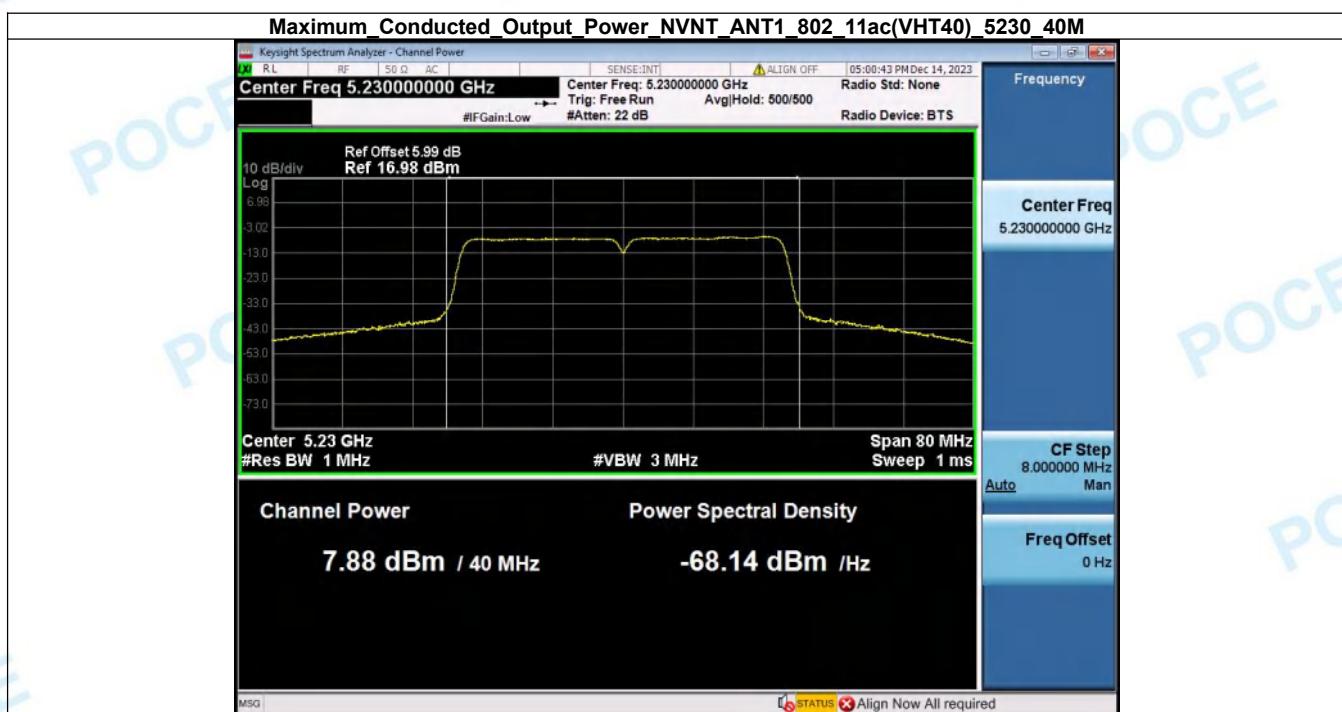
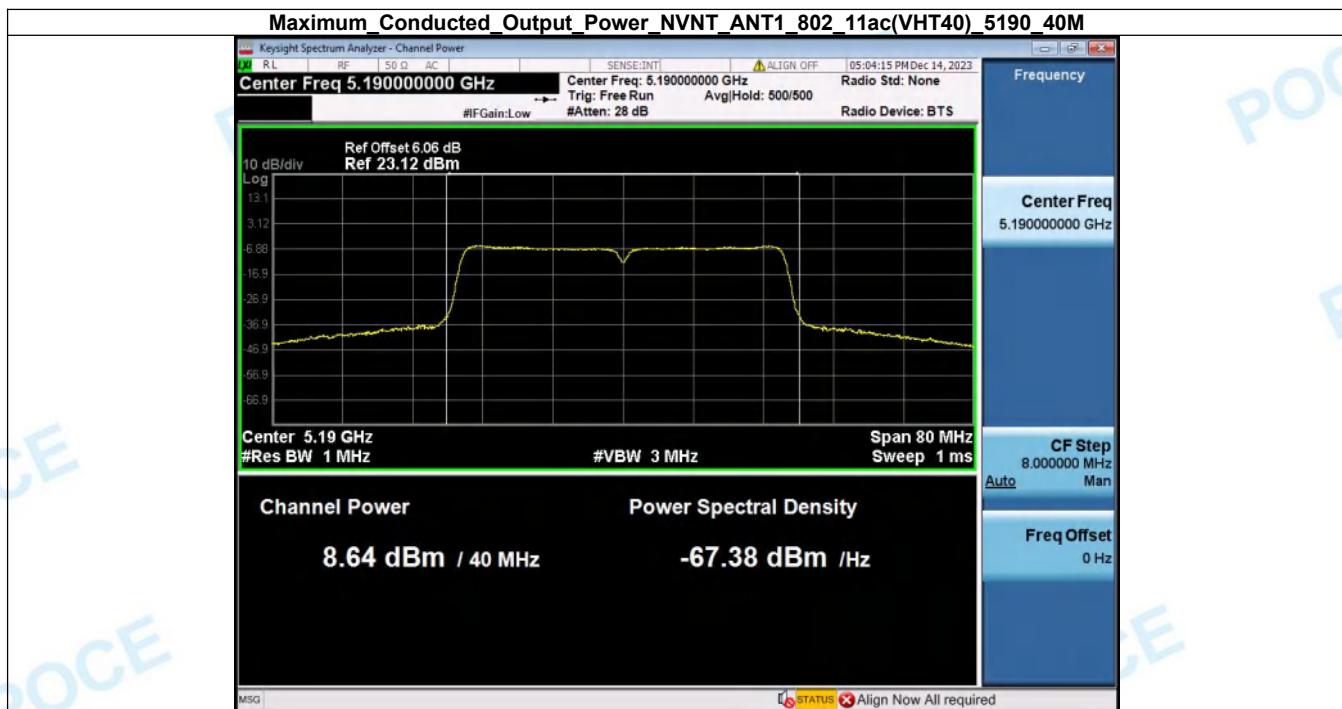


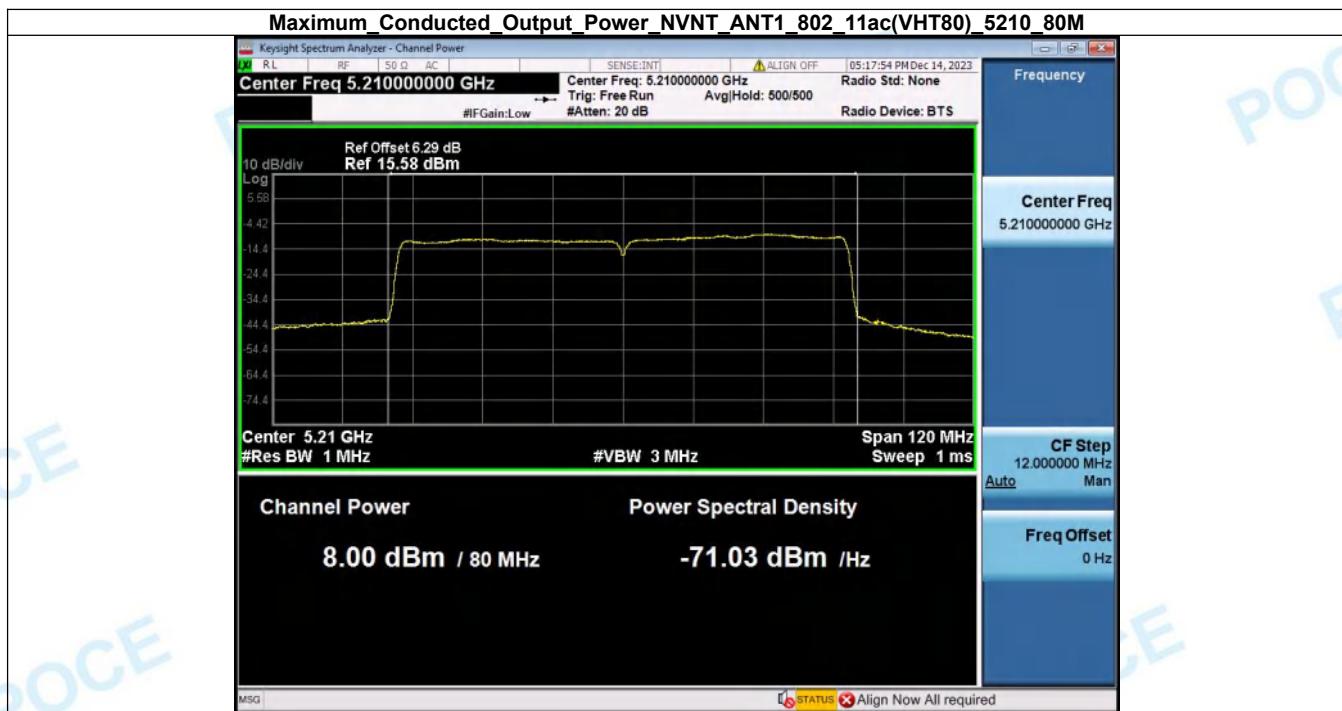






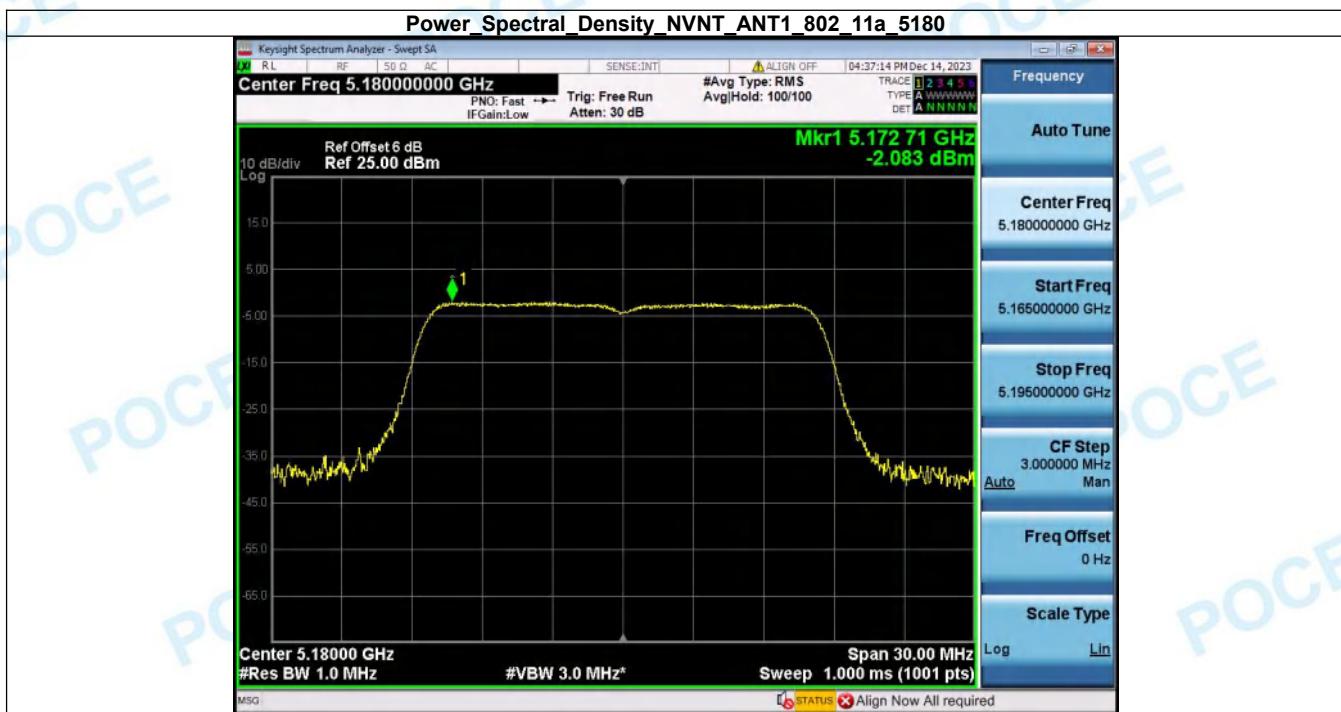


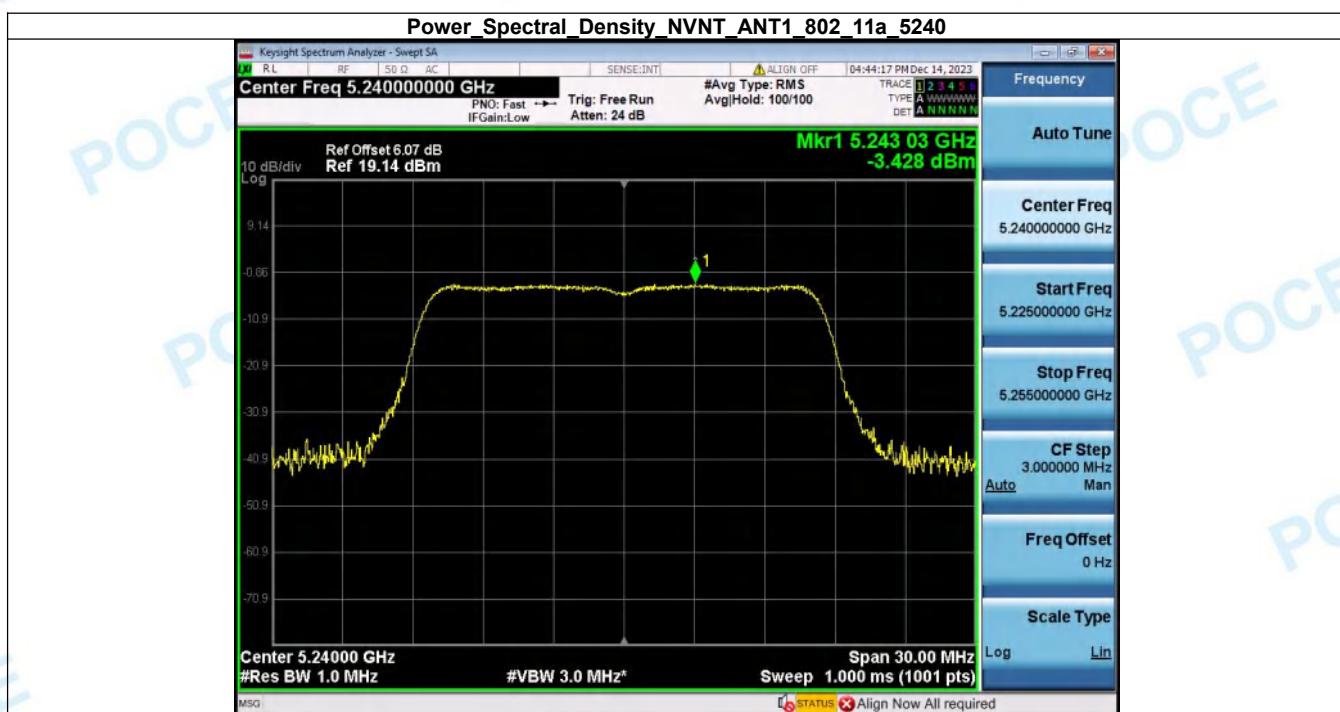




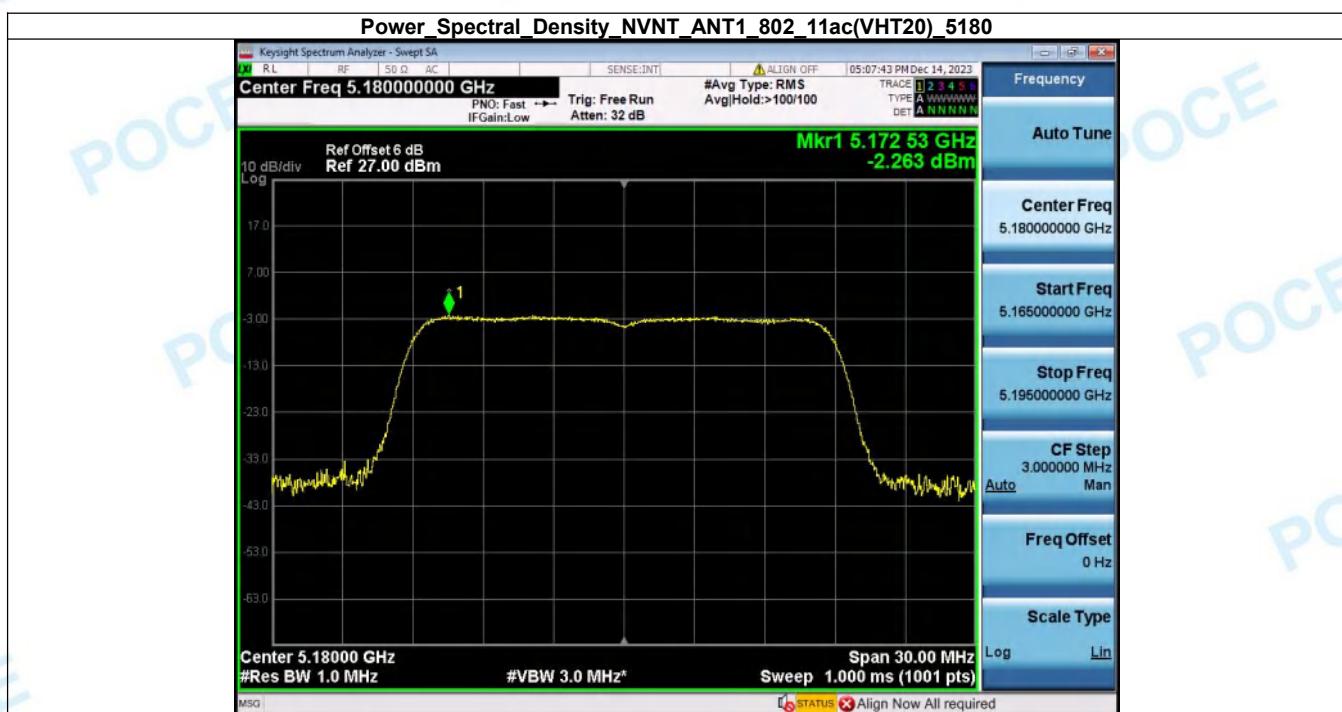
#### 4. Power Spectral Density

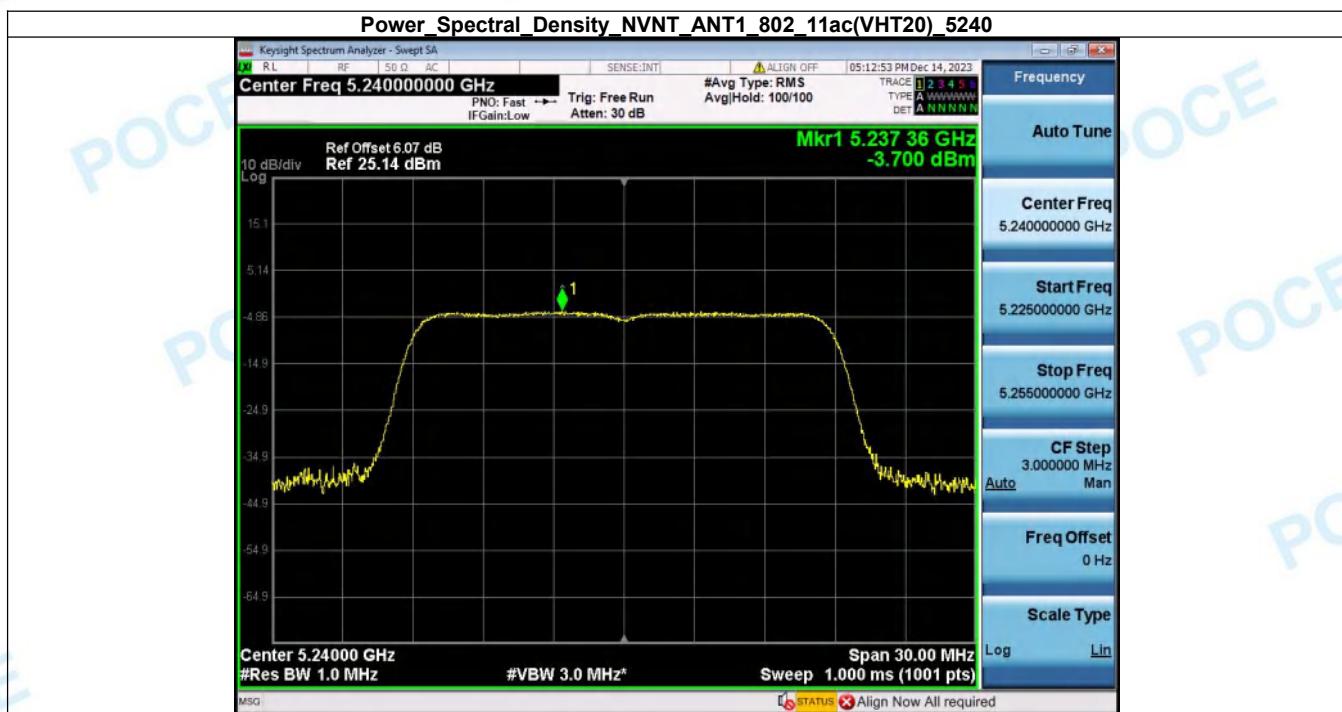
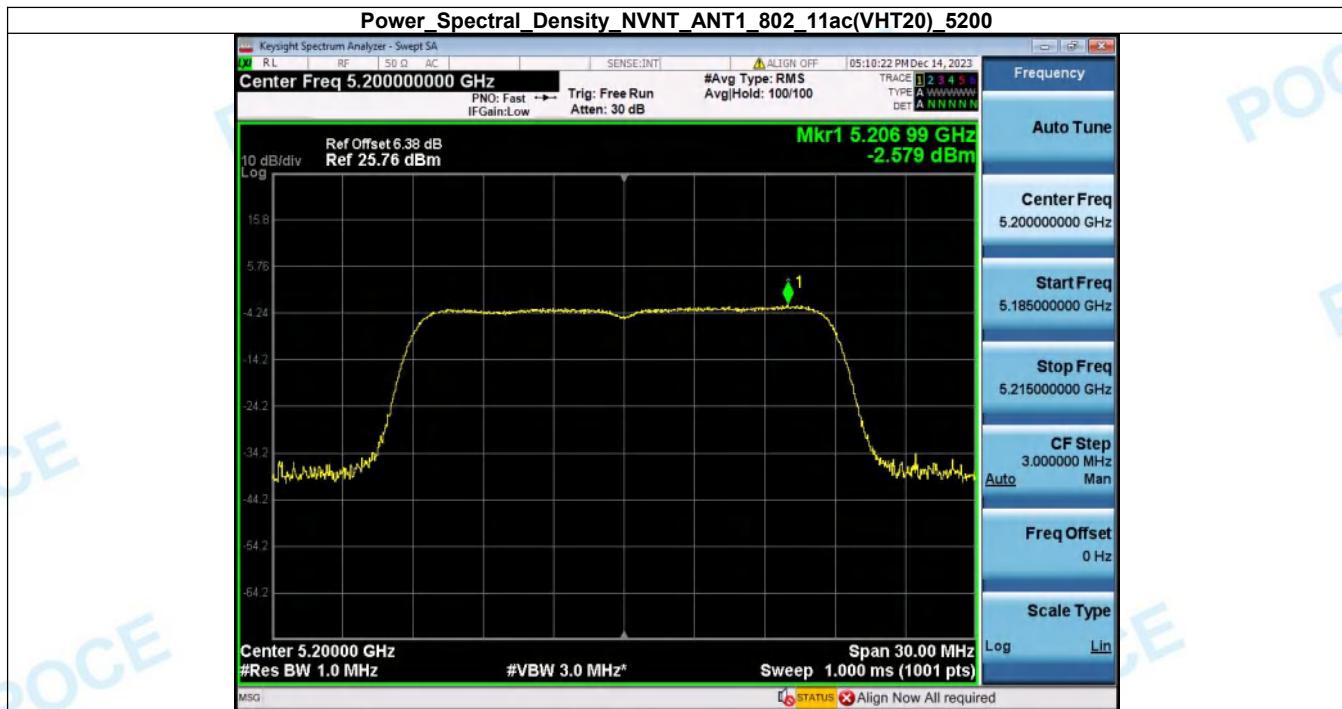
Condition	Antenna	Modulation	Frequency (MHz)	PSD(dBm/MHz)	Duty factor(dB)	Total PSD(dBm/MHz)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	-2.08	0.31	-1.77	11	Pass
NVNT	ANT1	802.11a	5200.00	-2.40	0.31	-2.09	11	Pass
NVNT	ANT1	802.11a	5240.00	-3.43	0.25	-3.18	11	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	-2.27	0.29	-1.98	11	Pass
NVNT	ANT1	802.11n(HT20)	5200.00	-2.94	0.29	-2.65	11	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	-3.65	0.36	-3.29	11	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	-2.26	0.36	-1.90	11	Pass
NVNT	ANT1	802.11ac(VHT20)	5200.00	-2.58	0.36	-2.22	11	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	-3.70	0.29	-3.41	11	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	-5.56	0.56	-5.00	11	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	-6.33	0.69	-5.64	11	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	-5.55	0.56	-4.99	11	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	-6.14	0.69	-5.45	11	Pass
NVNT	ANT1	802.11ac(VHT80)	5210.00	-8.15	1.33	-6.82	11	Pass

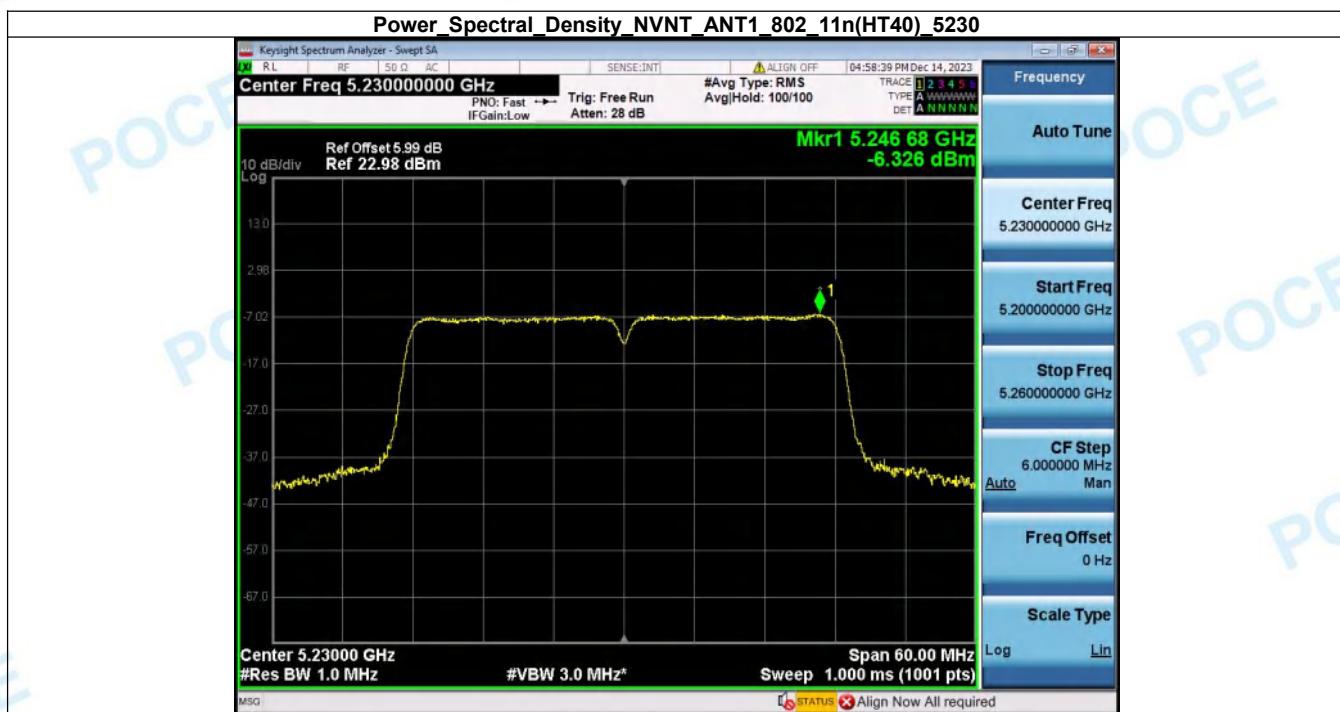


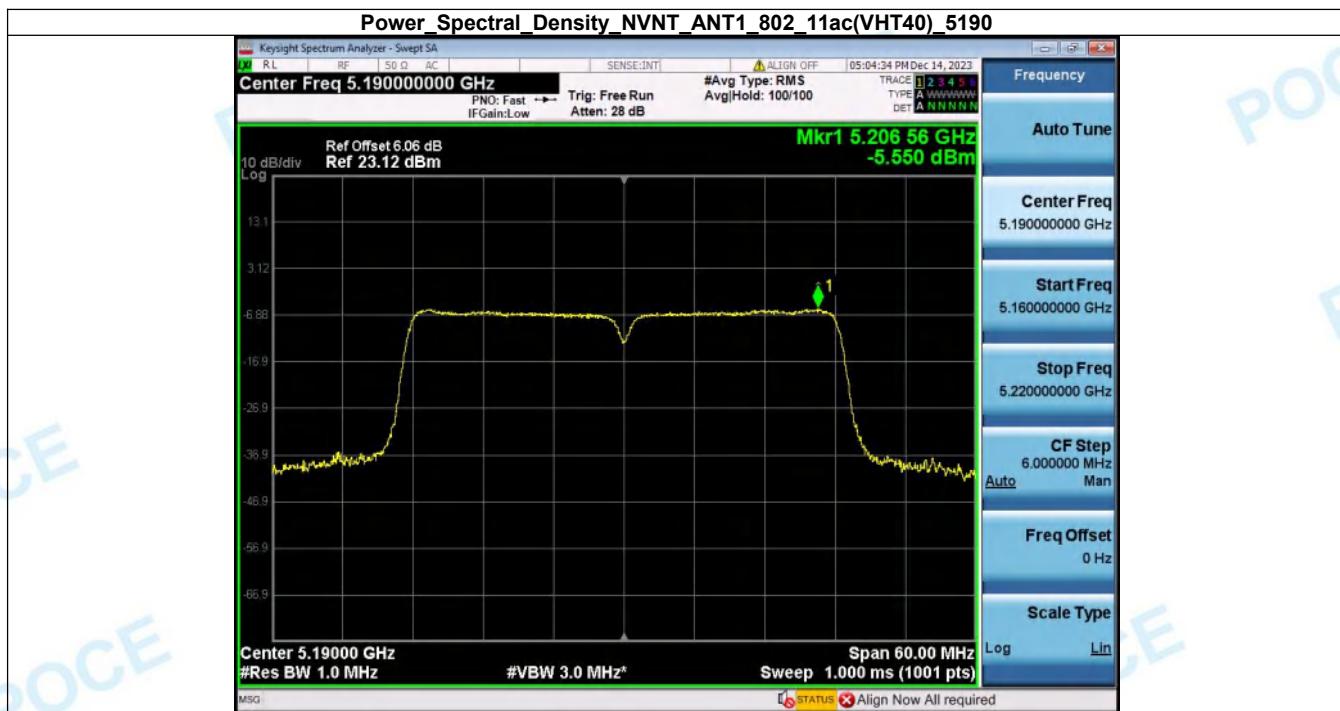


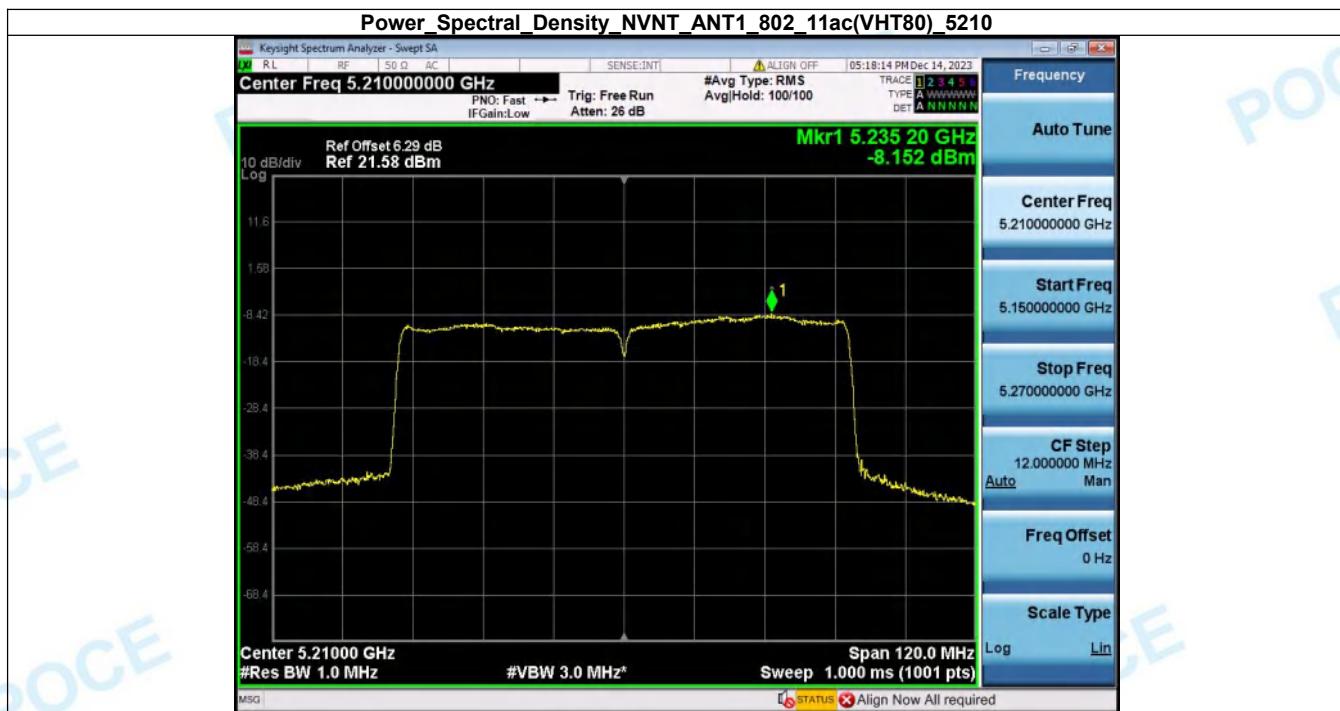








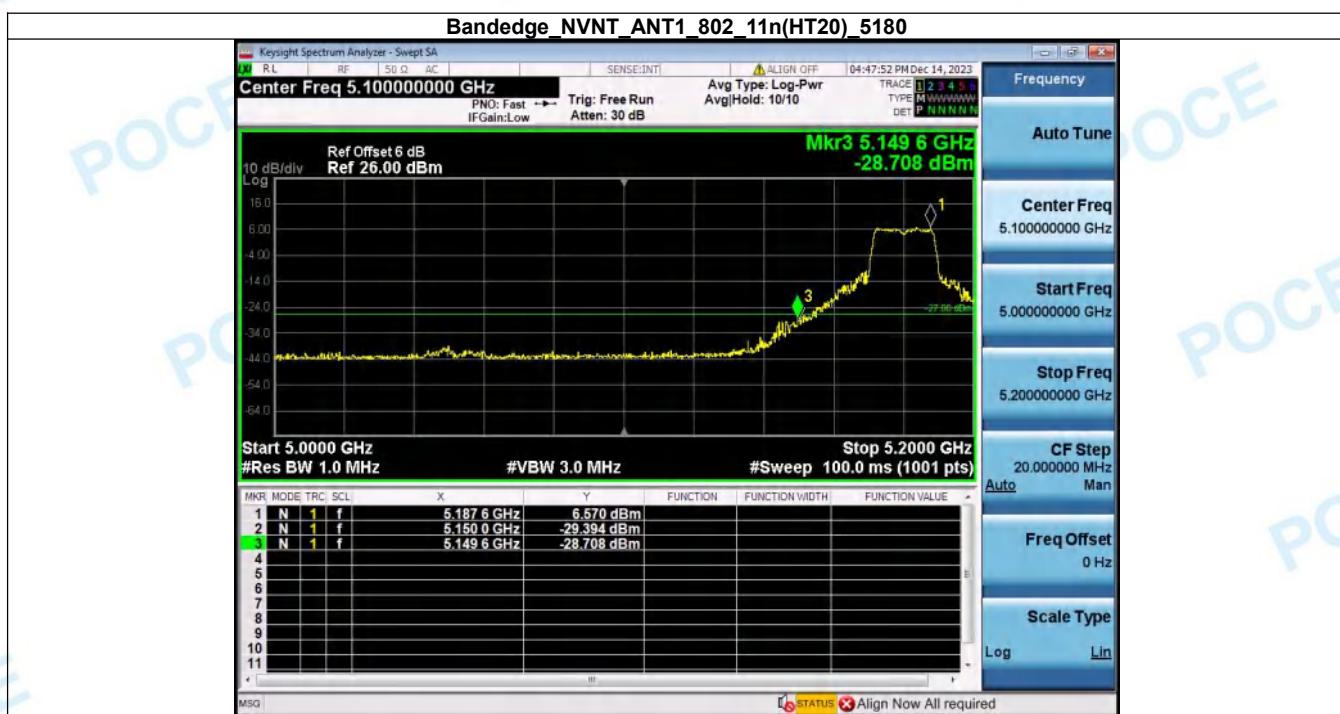


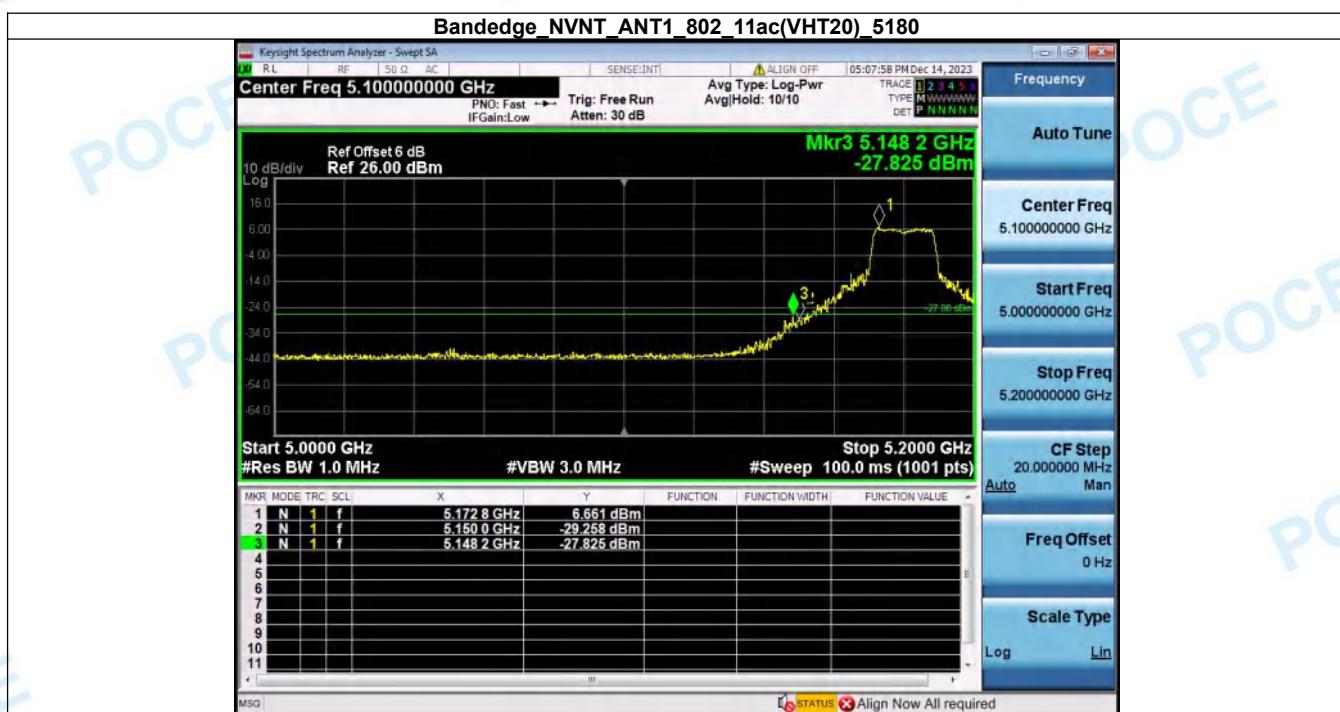
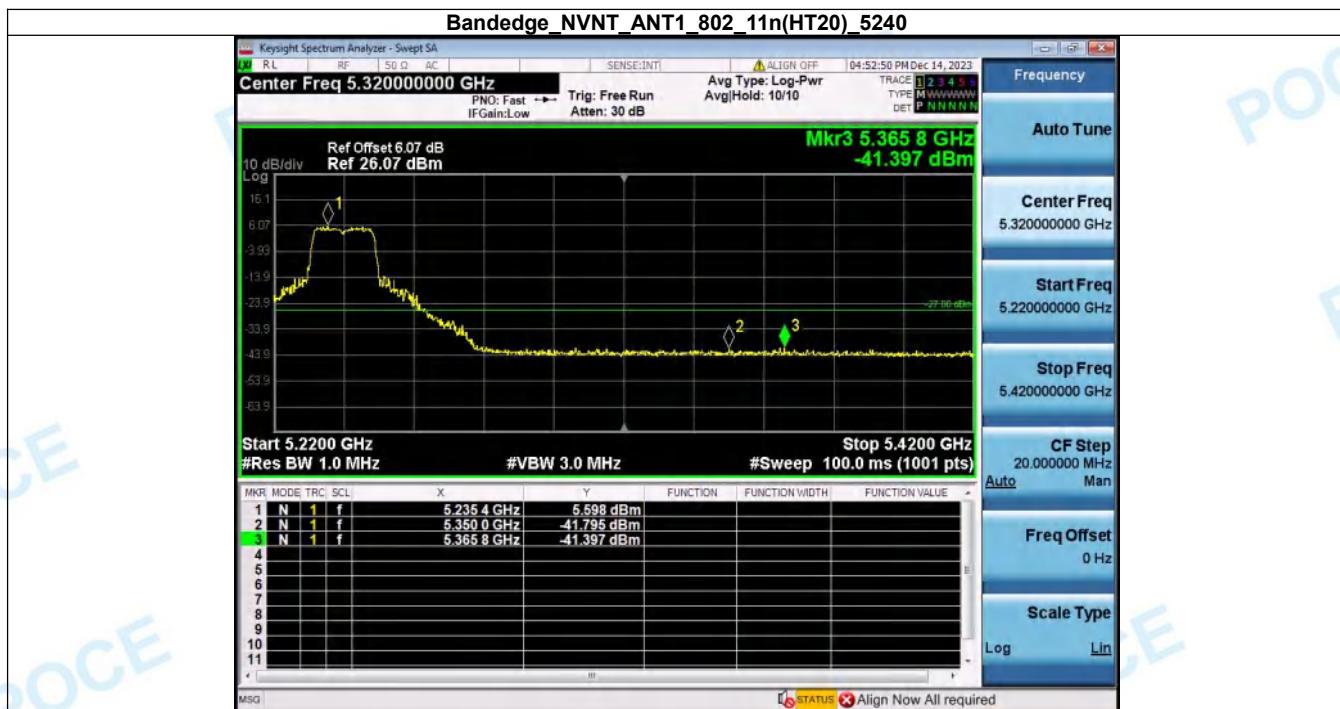


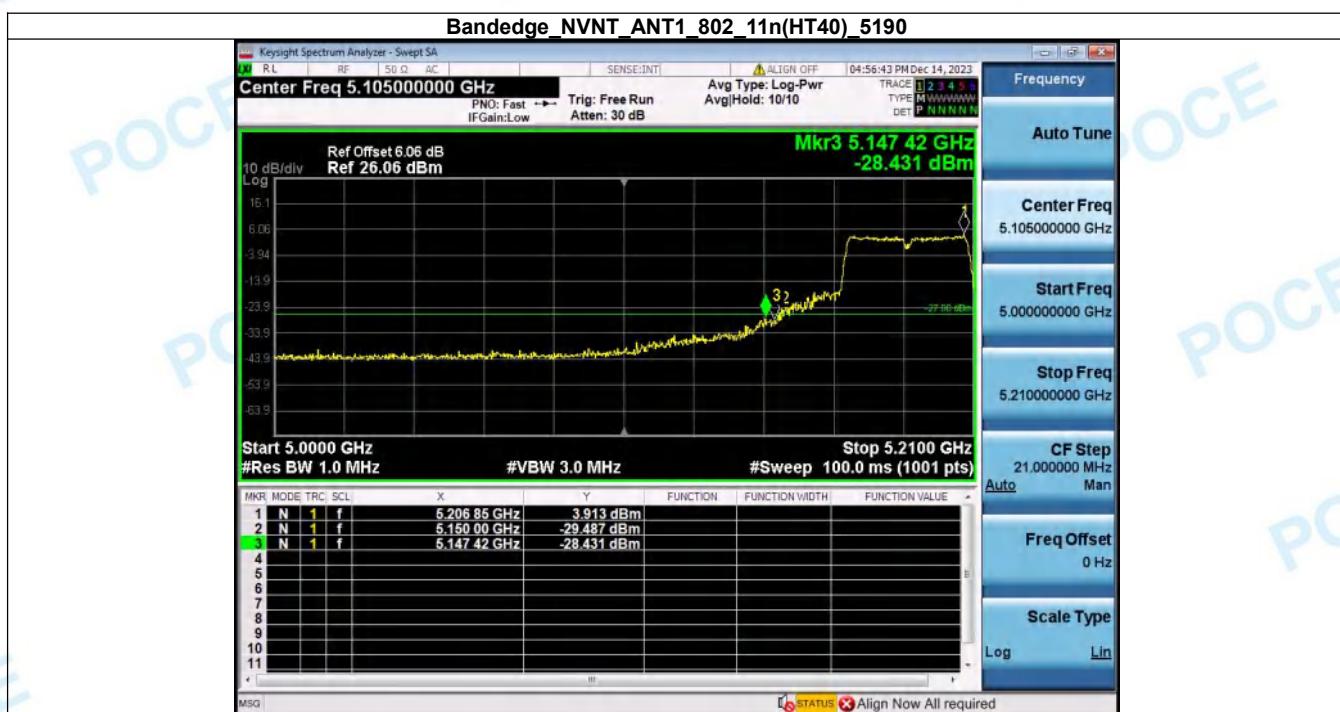
## 5. Bandedge

Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark Frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	5149.40	-30.59	-27	Pass
NVNT	ANT1	802.11a	5240.00	5362.20	-41.41	-27	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	5149.60	-28.71	-27	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	5365.80	-41.40	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	5148.20	-27.83	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	5376.80	-41.11	-27	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	5147.42	-28.43	-27	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	5364.98	-41.42	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	5149.94	-29.36	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	5376.11	-41.82	-27	Pass
NVNT	ANT1	802.11ac(VHT80)	5210.00	5139.44	-32.34	-27	Pass
NVNT	ANT1	802.11ac(VHT80)	5210.00	5359.94	-40.92	-27	Pass

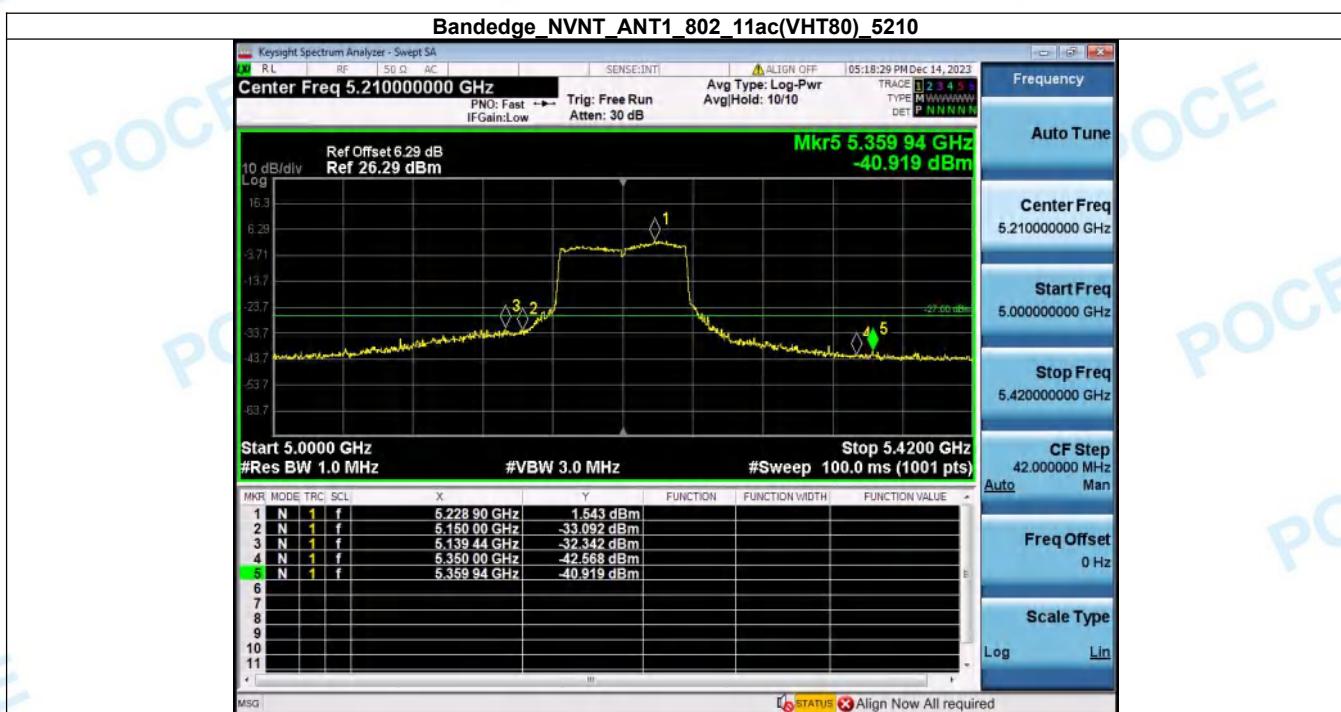






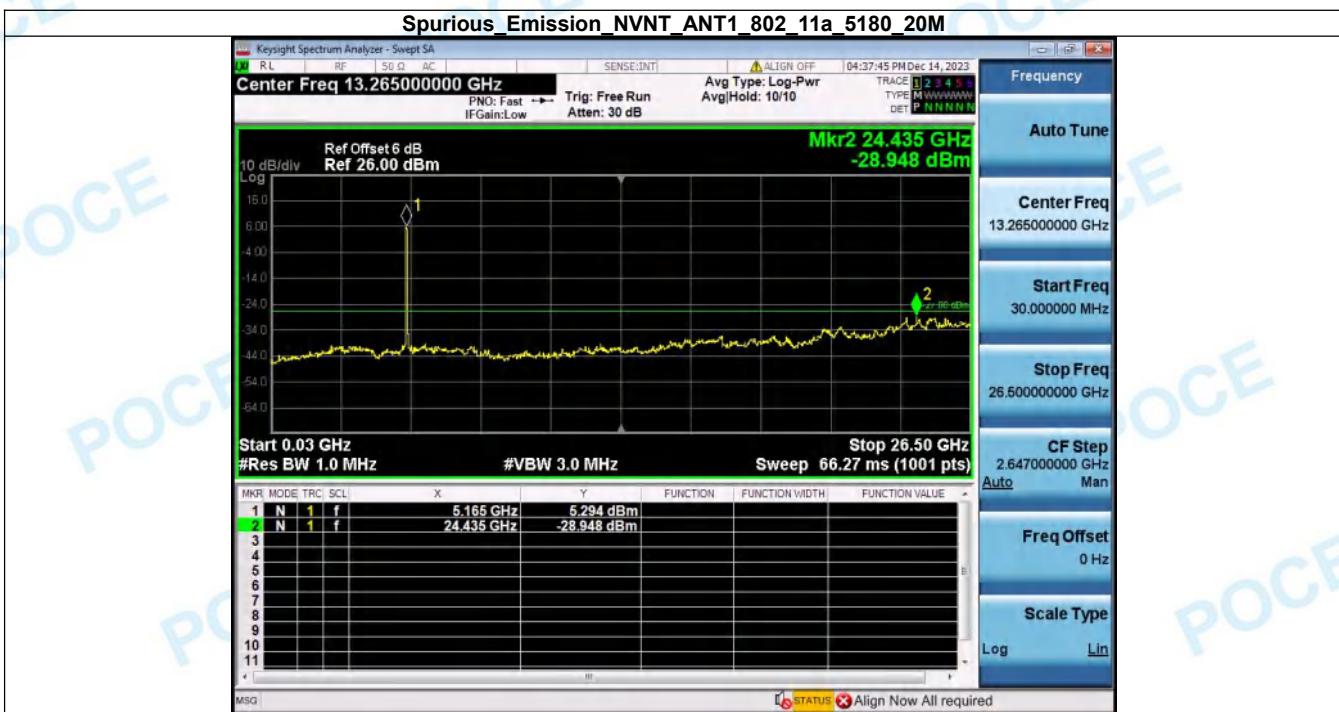


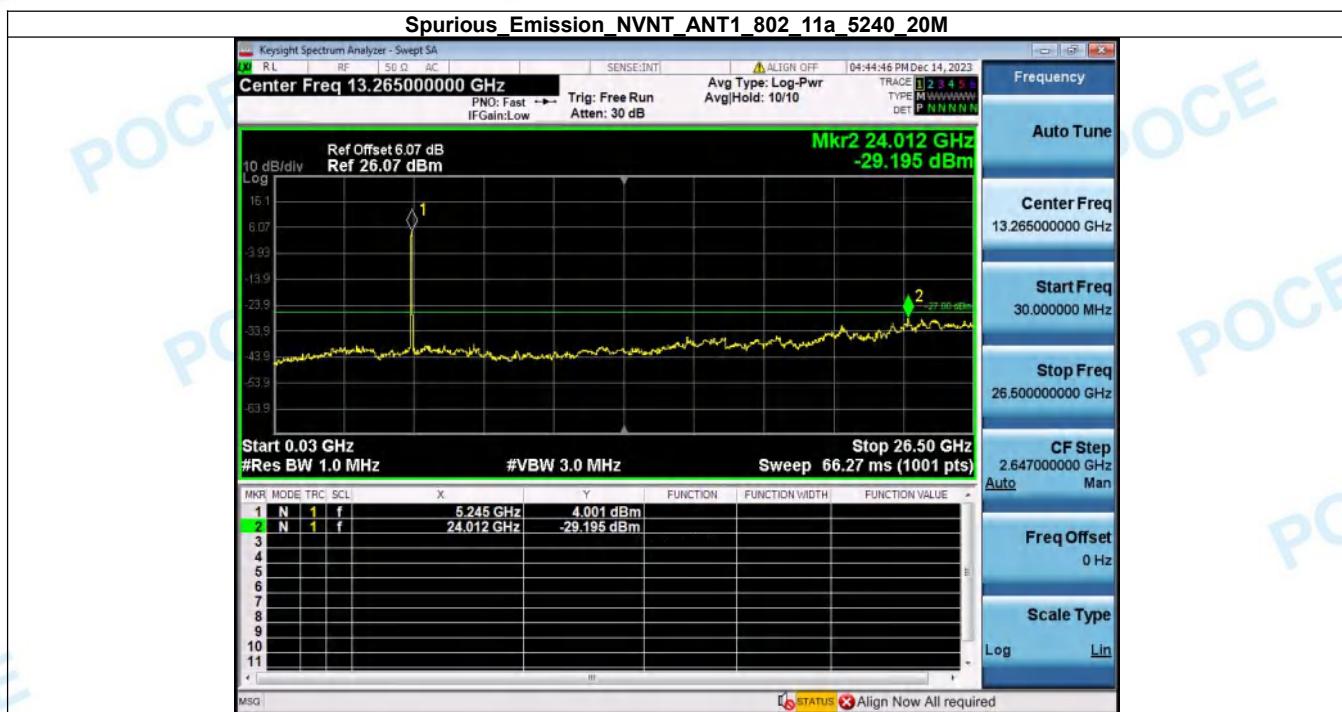
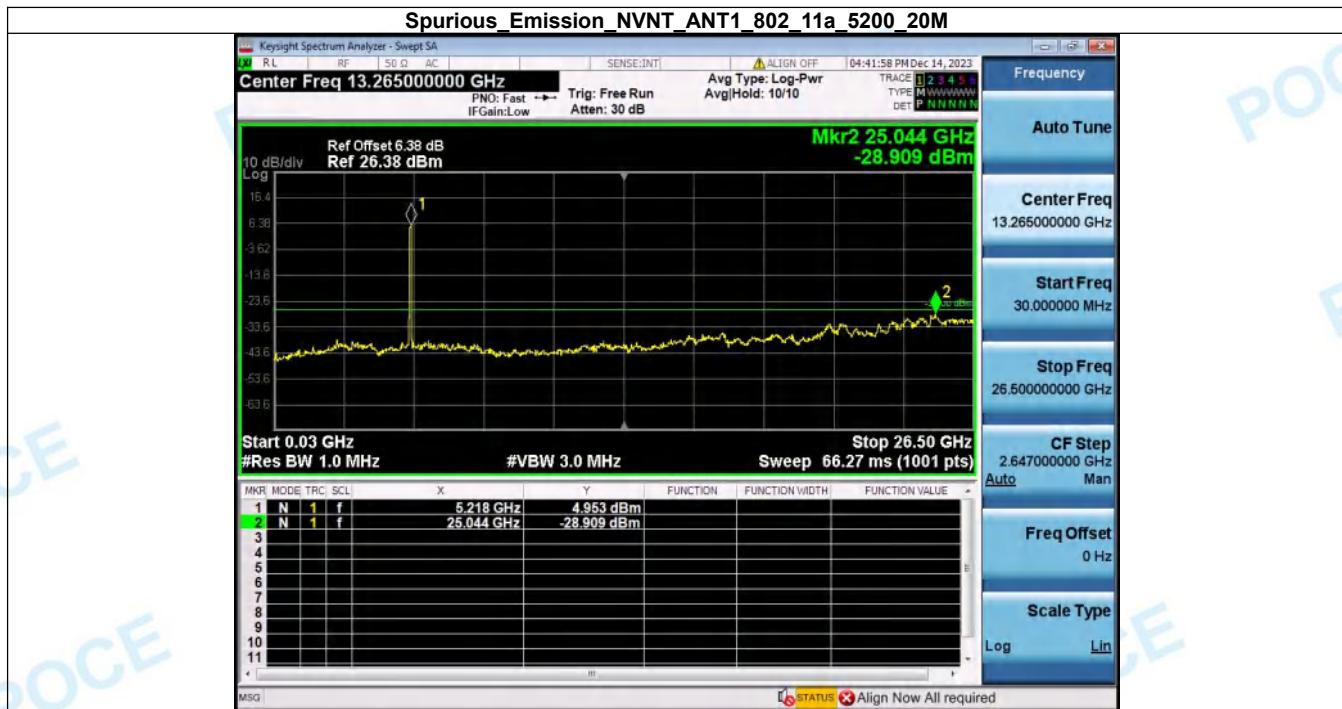


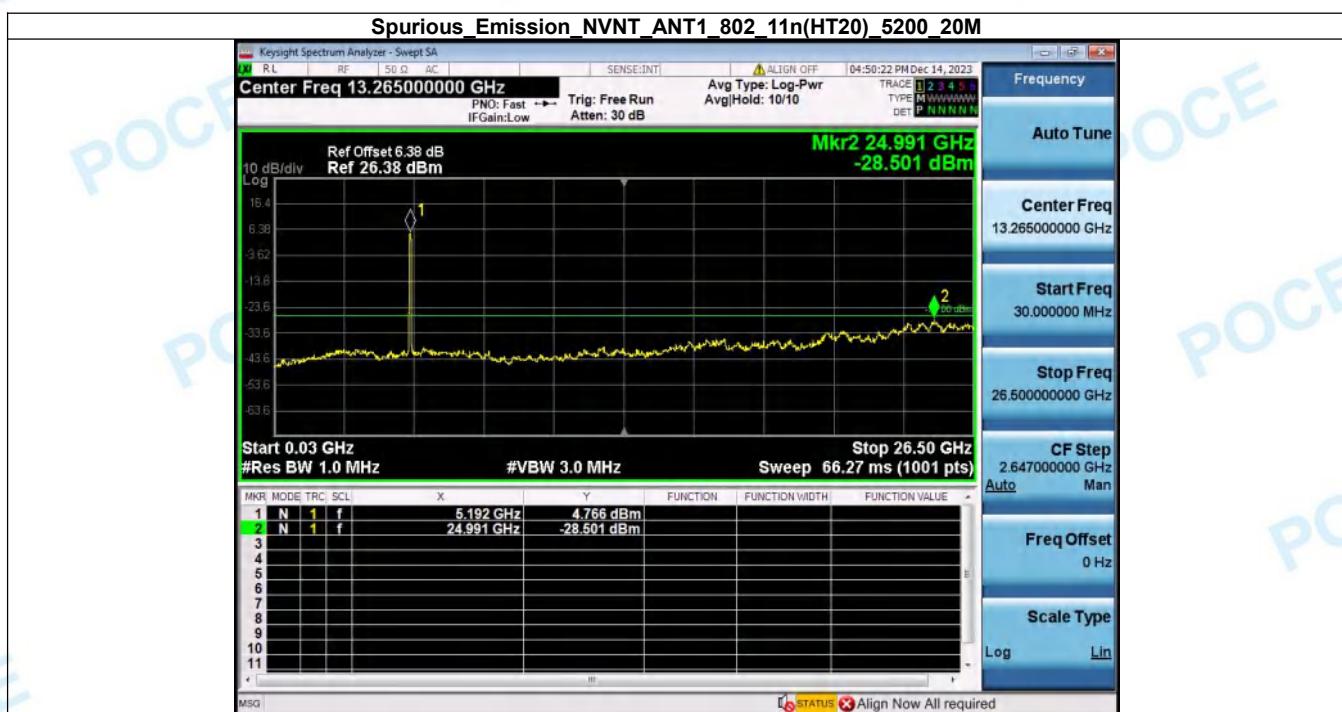
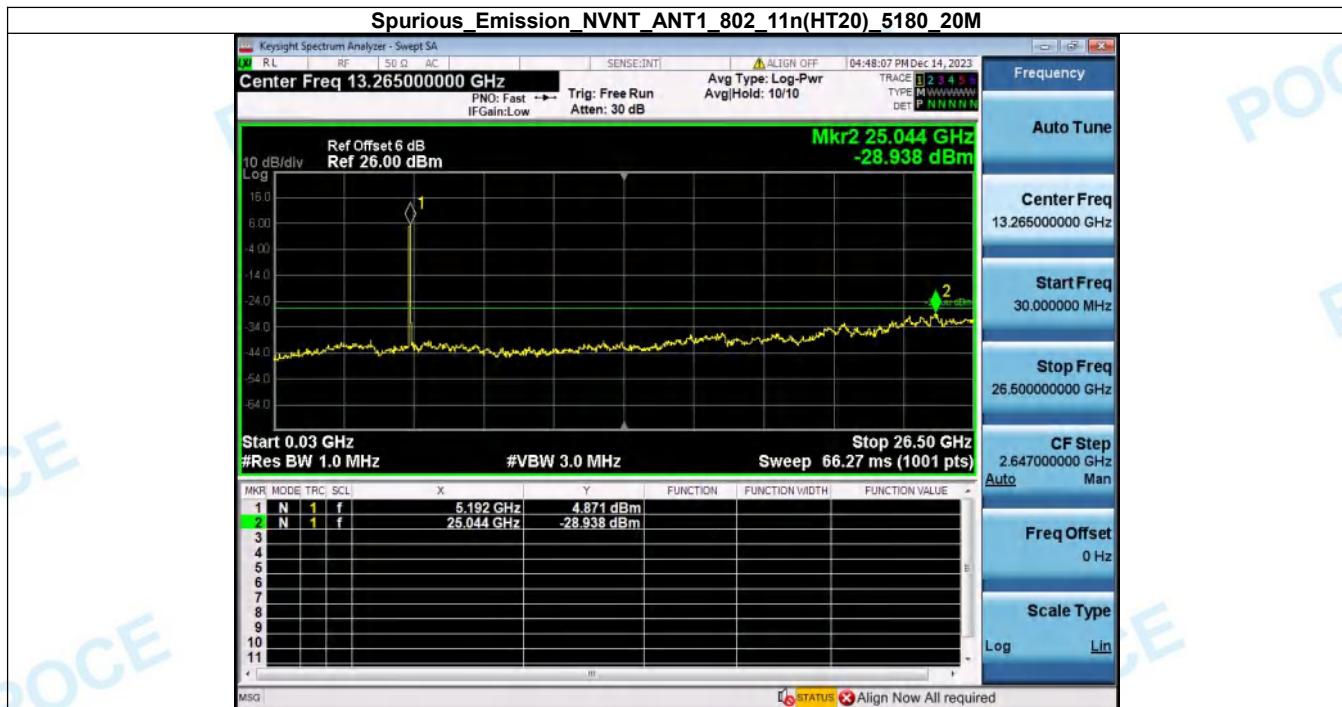


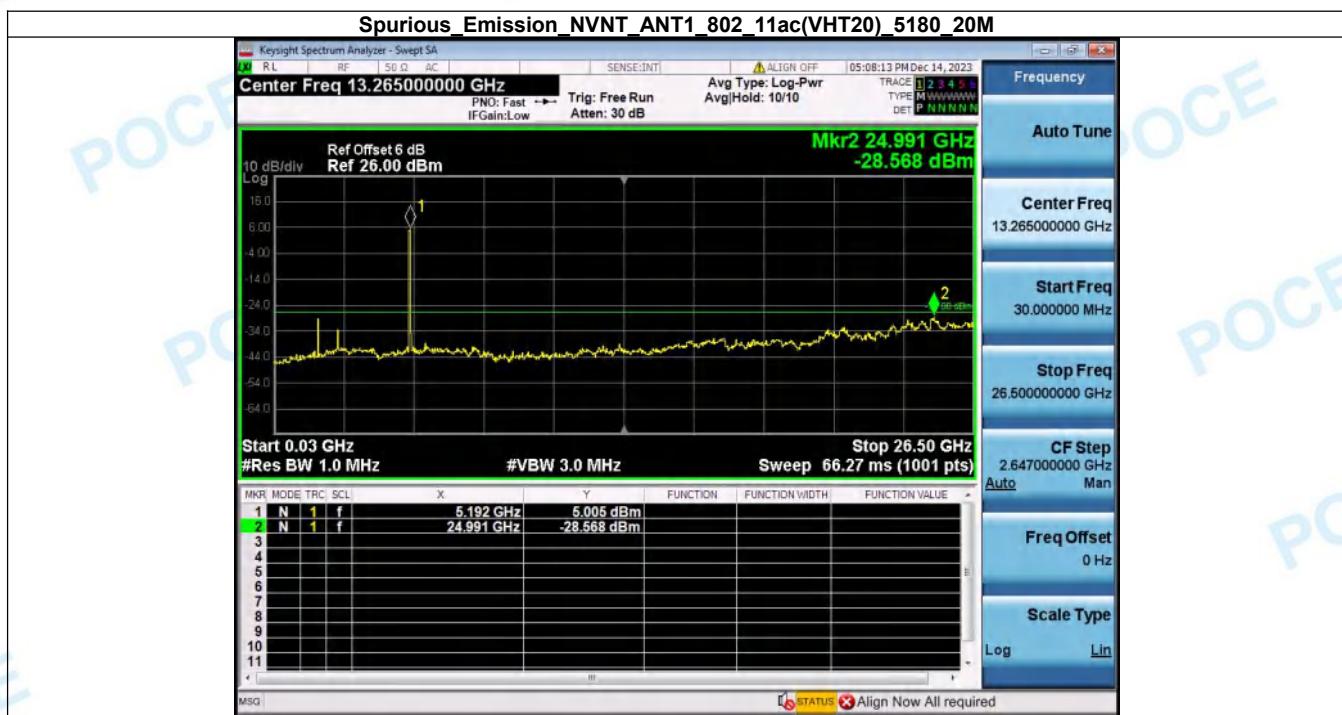
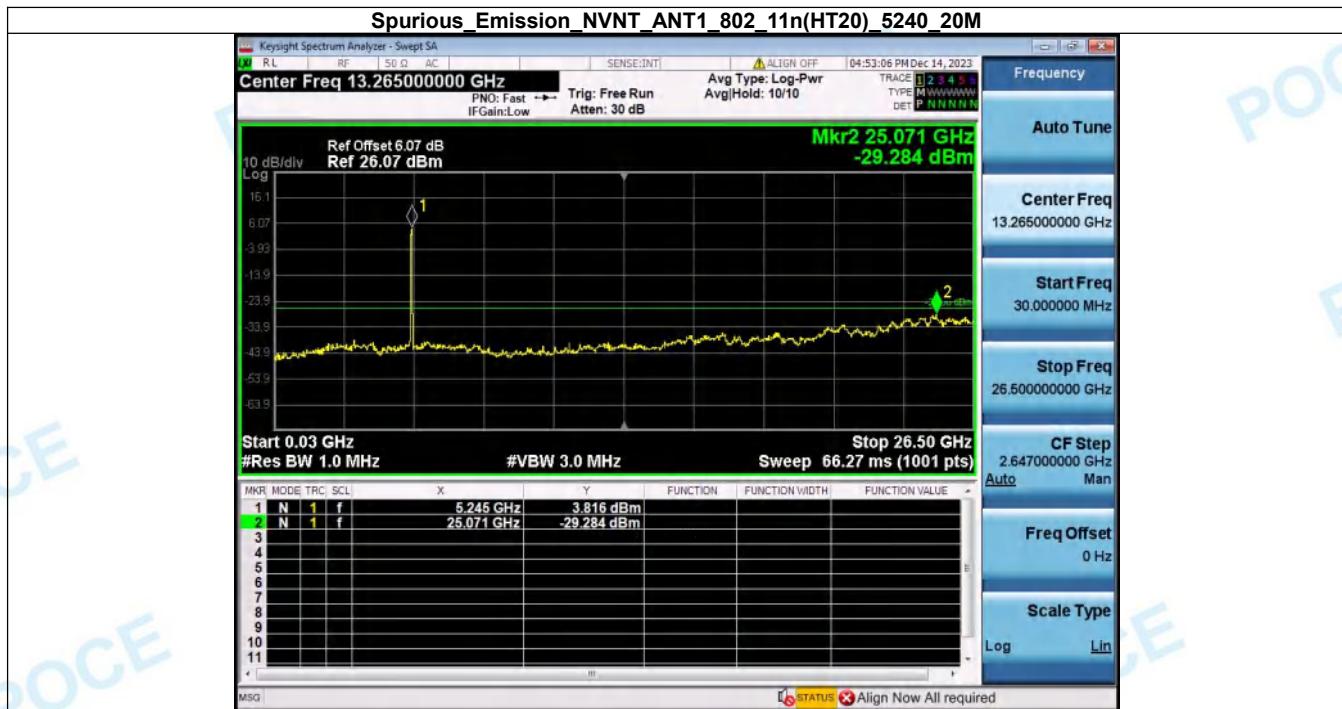
## 6. Spurious Emission

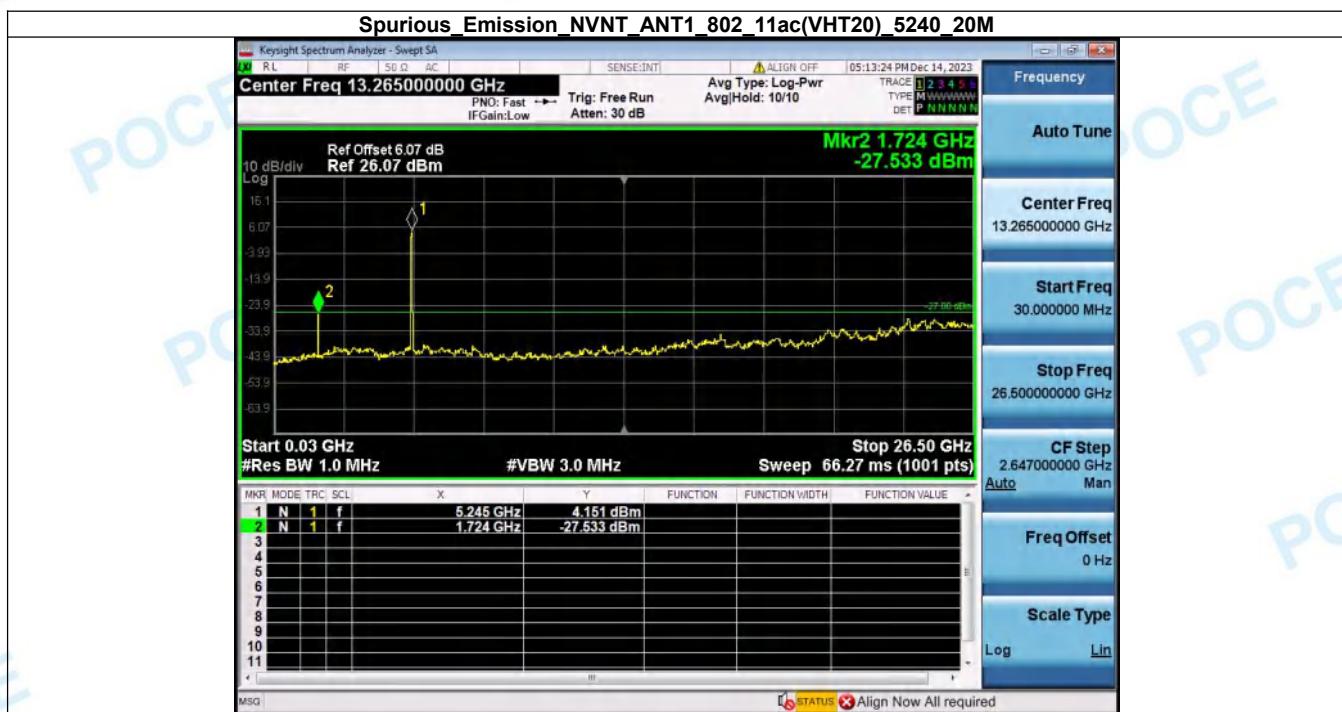
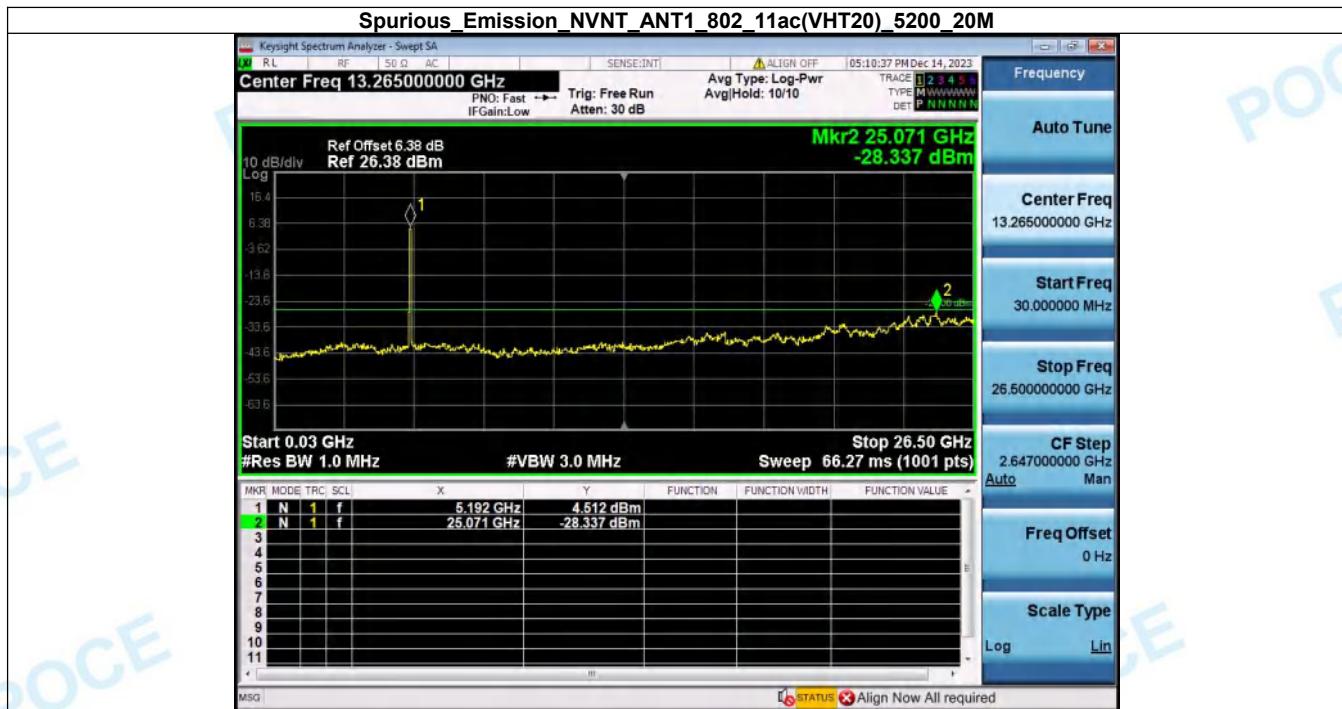
Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark Frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11a	5180.00	24435.34	-28.95	-27	Pass
NVNT	ANT1	802.11a	5200.00	25044.15	-28.91	-27	Pass
NVNT	ANT1	802.11a	5240.00	24011.82	-29.20	-27	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	25044.15	-28.94	-27	Pass
NVNT	ANT1	802.11n(HT20)	5200.00	24991.21	-28.50	-27	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	25070.62	-29.28	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	24991.21	-28.57	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5200.00	25070.62	-28.34	-27	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	1724.08	-27.53	-27	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	25017.68	-28.44	-27	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	24964.74	-28.78	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	25017.68	-28.64	-27	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	25017.68	-28.81	-27	Pass
NVNT	ANT1	802.11ac(VHT80)	5210.00	25070.62	-29.23	-27	Pass

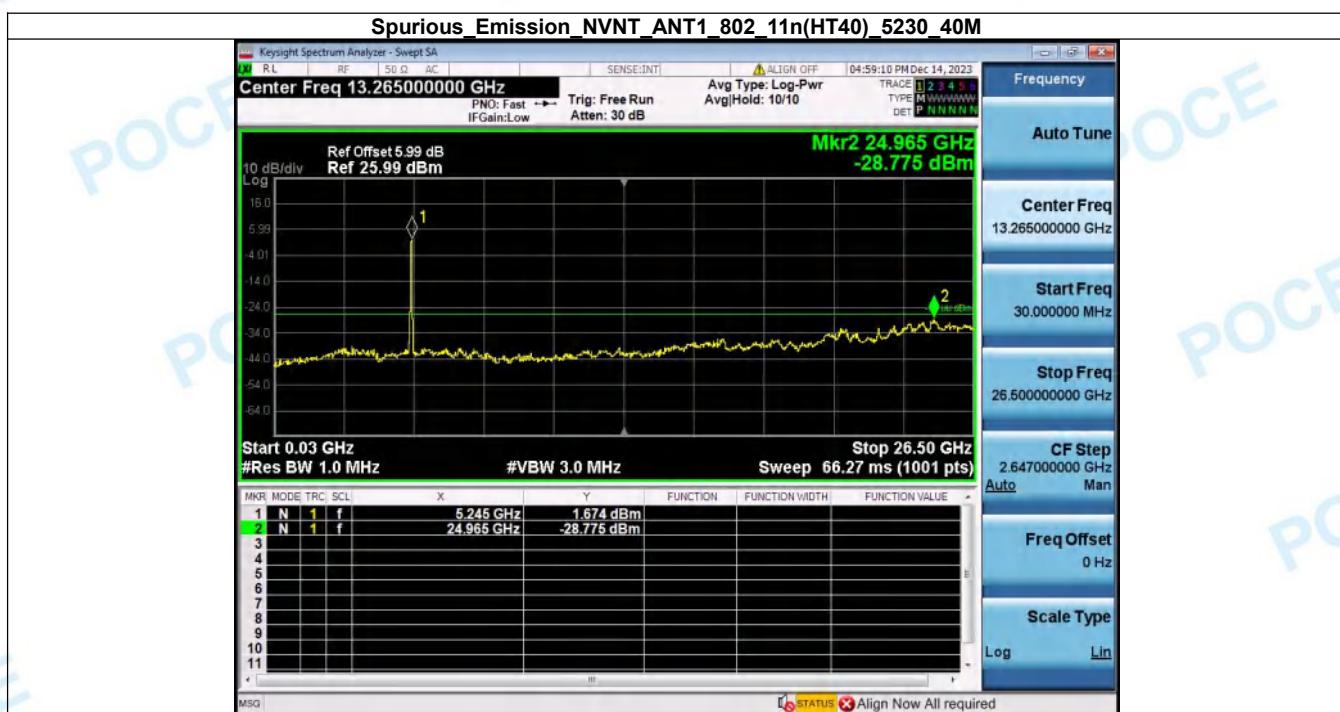
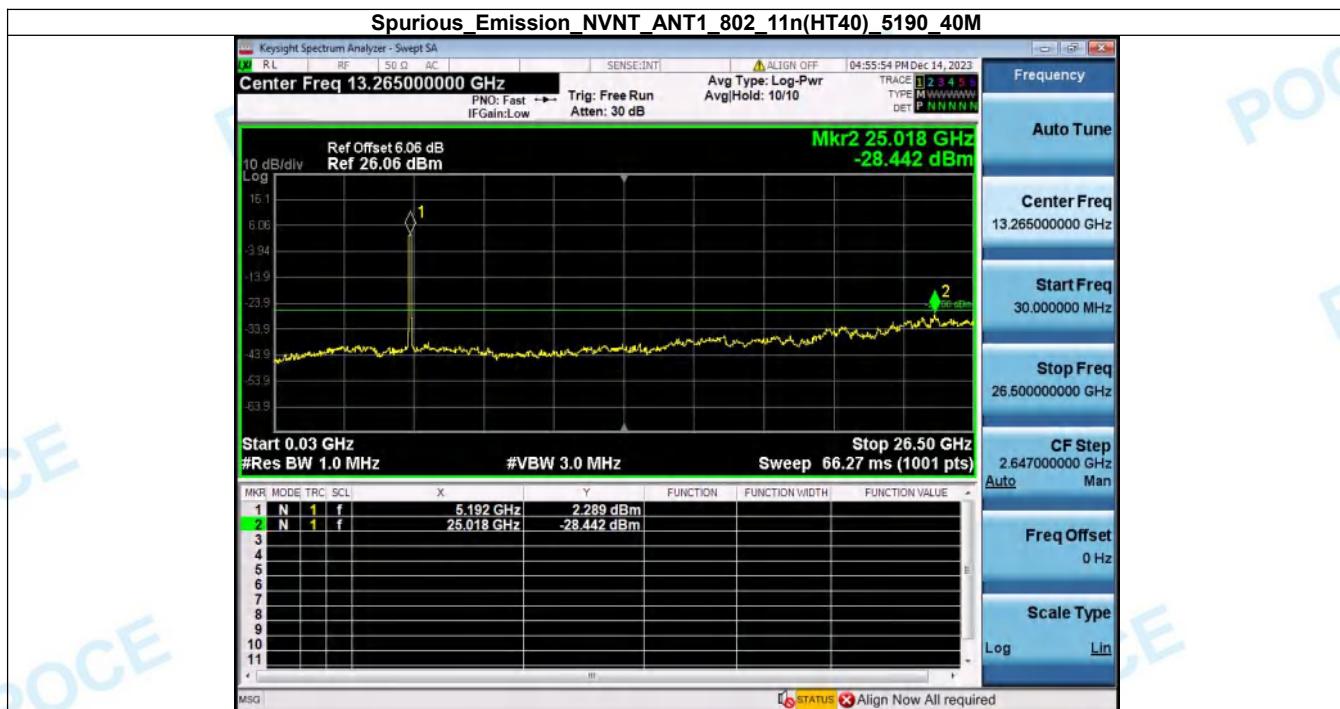


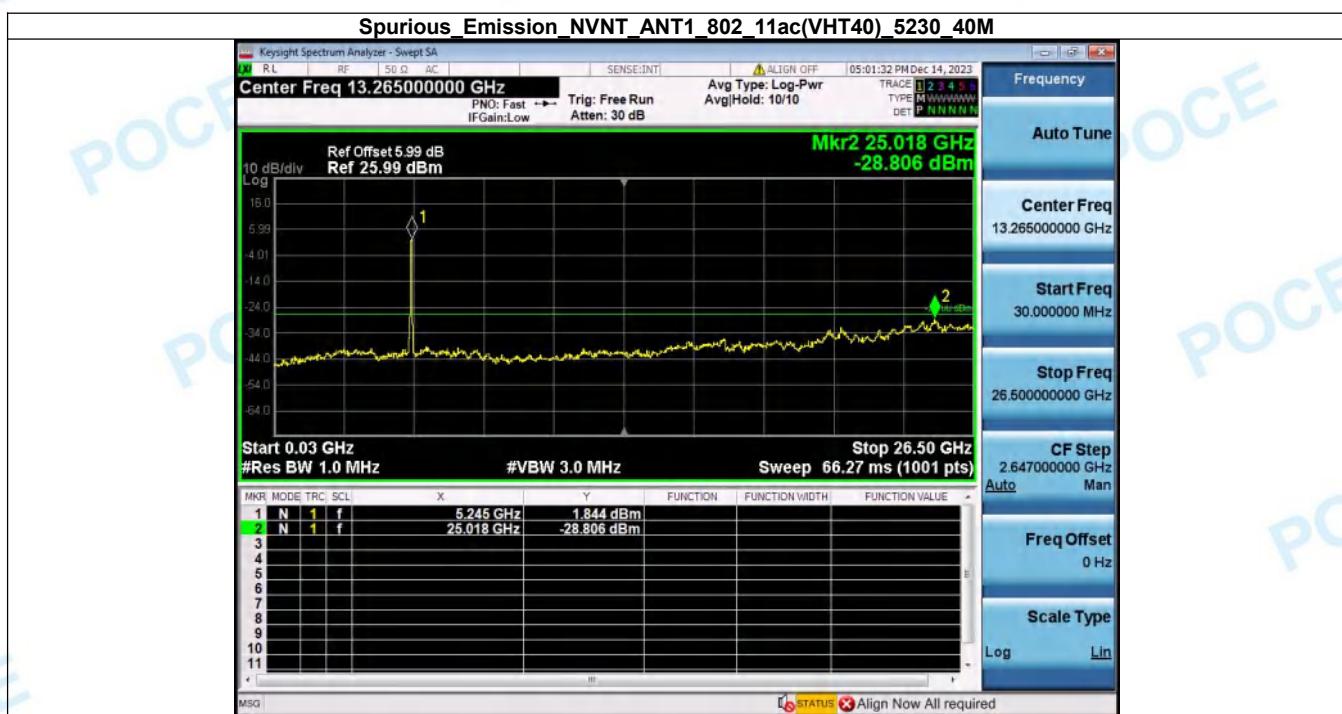
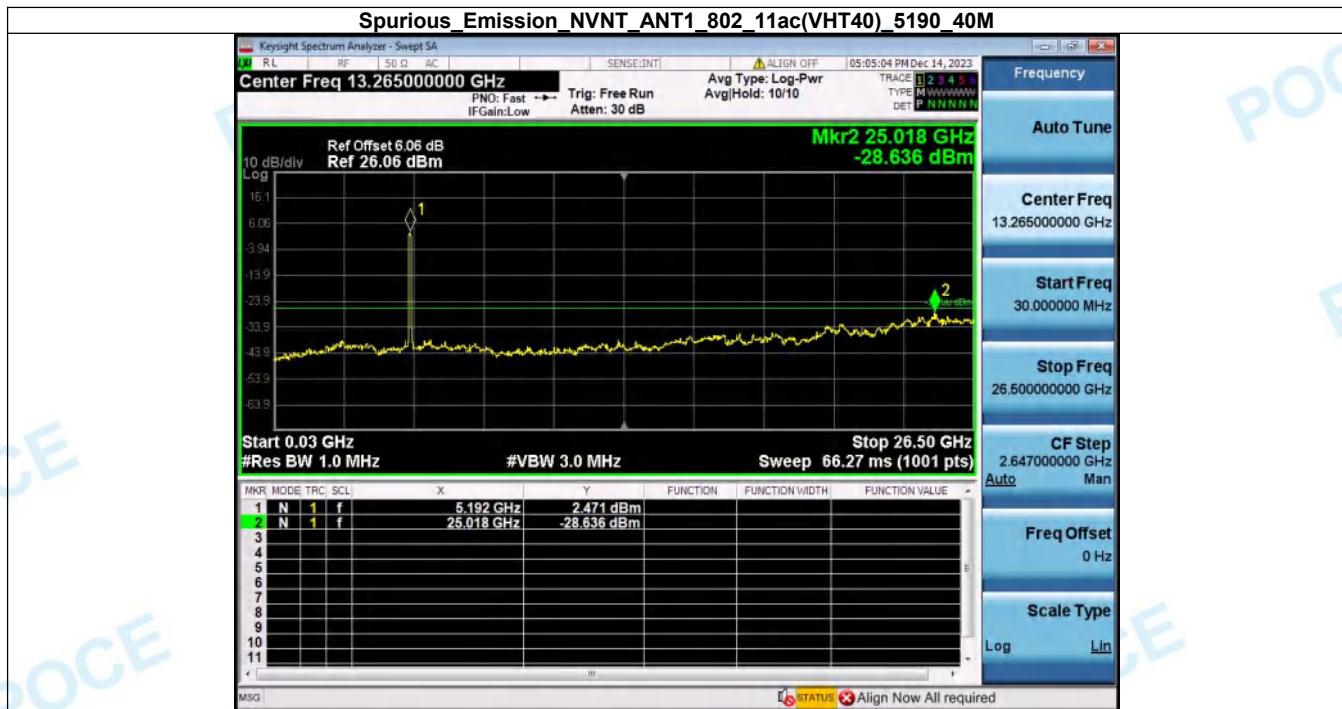


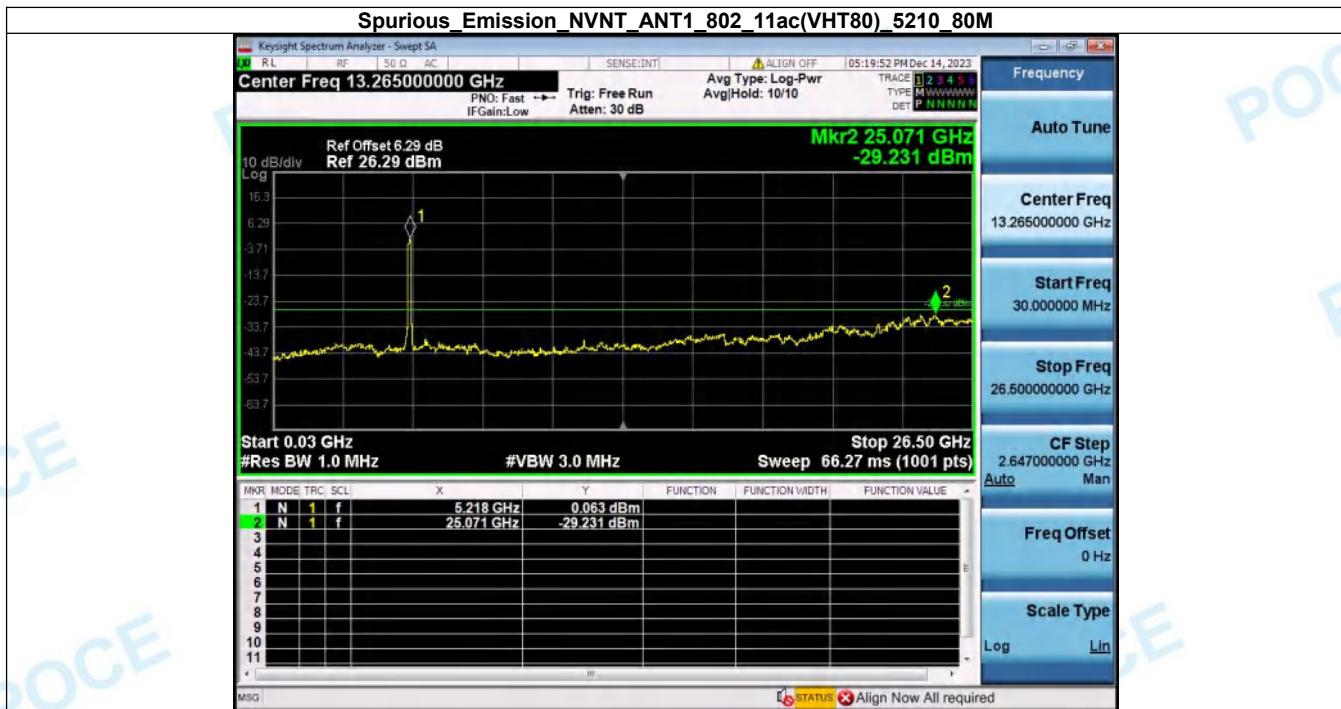






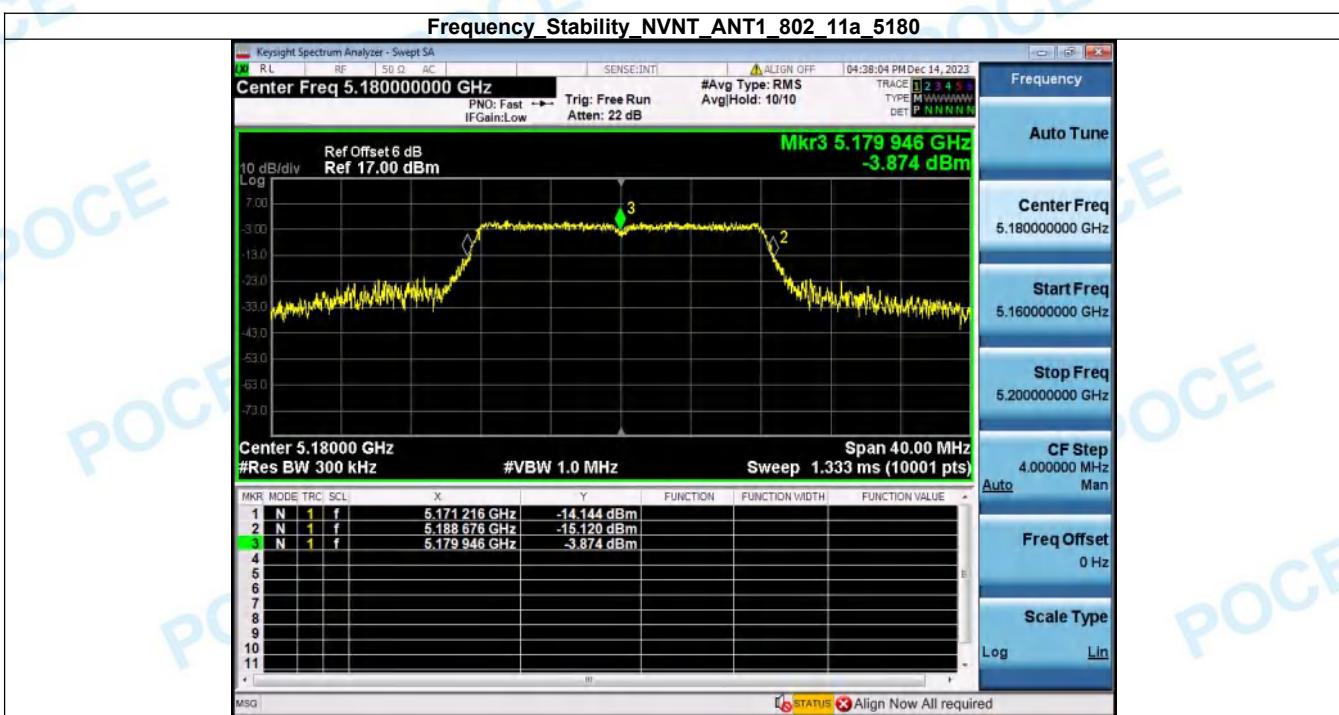


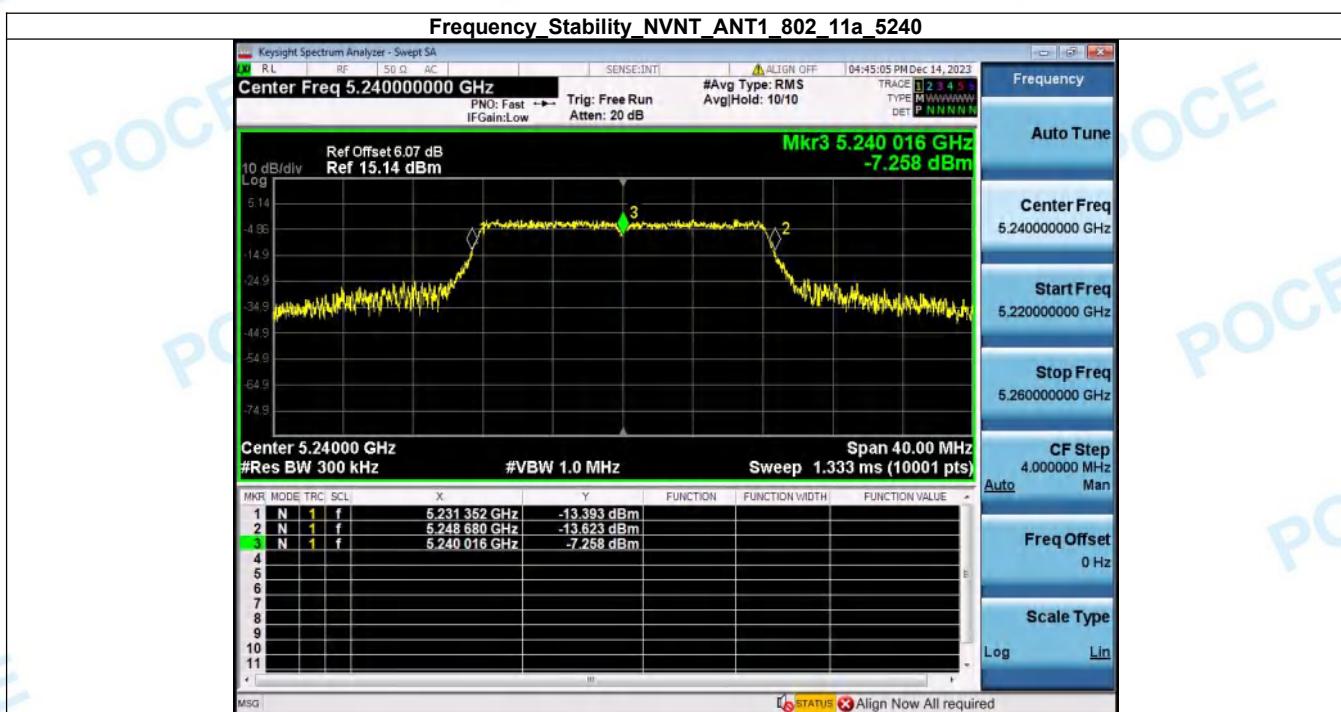
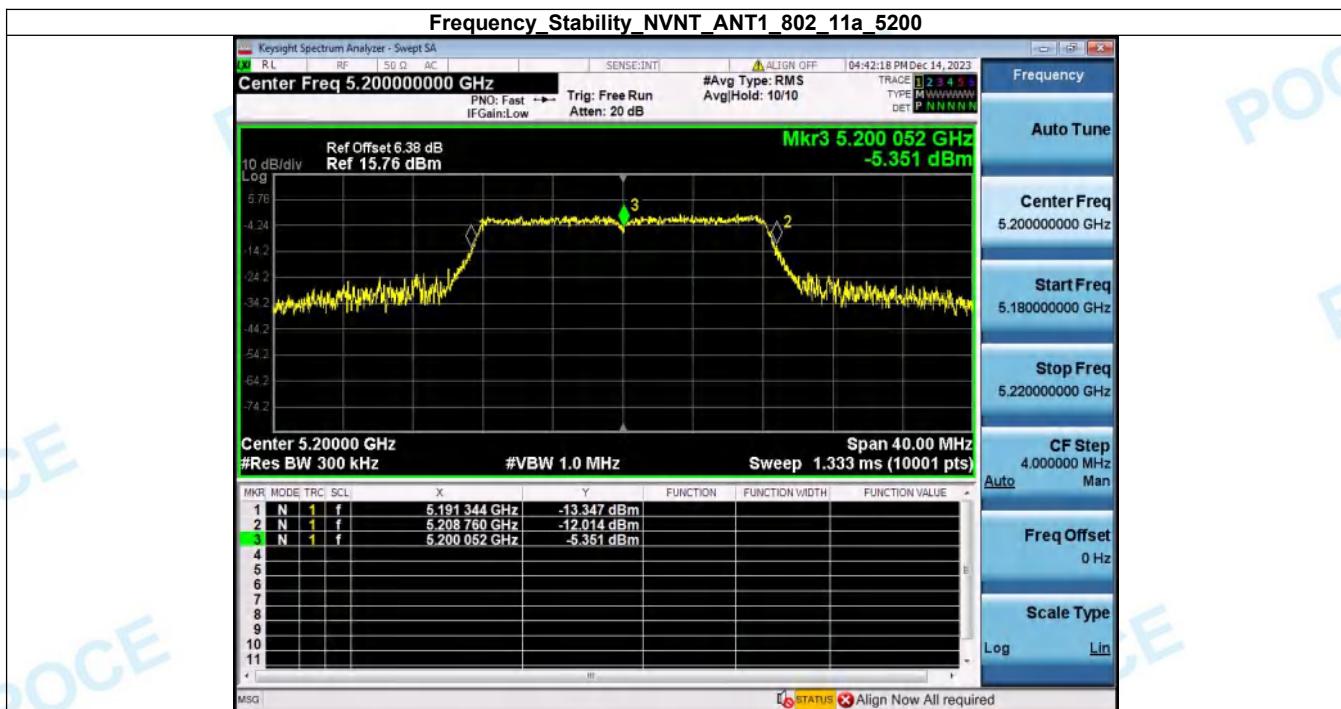


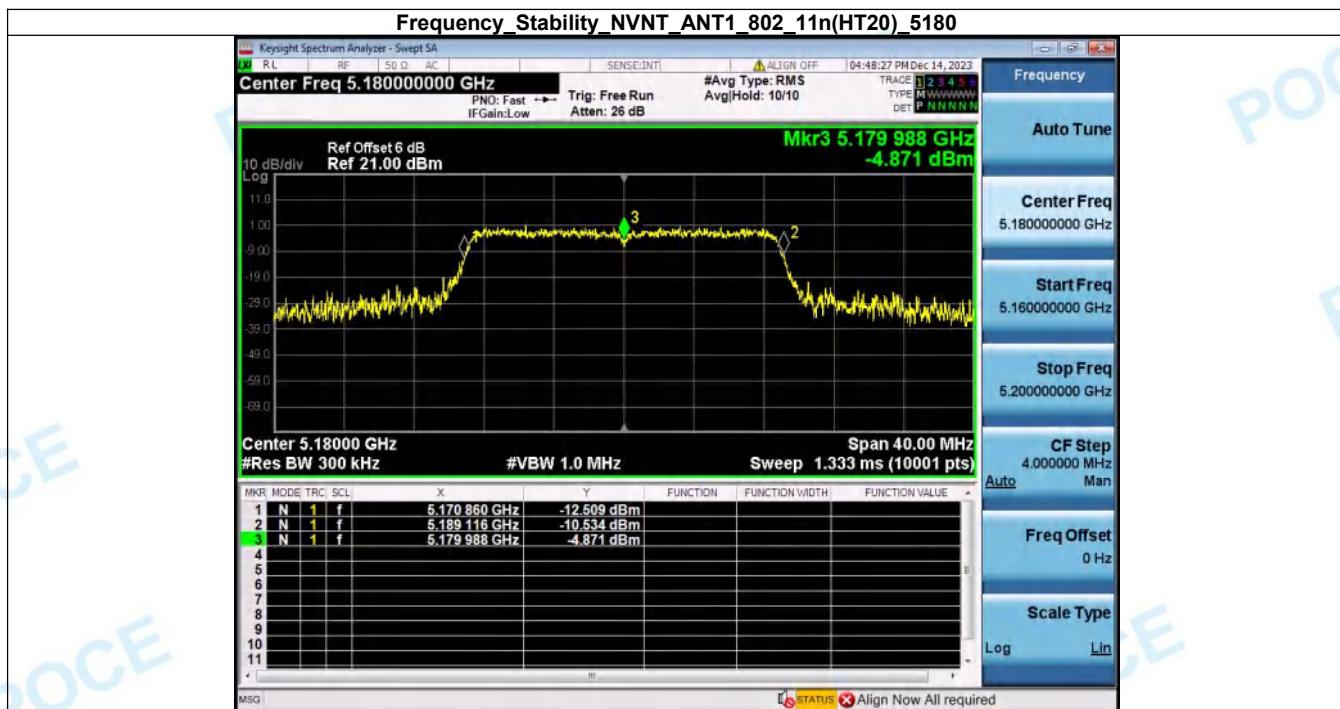


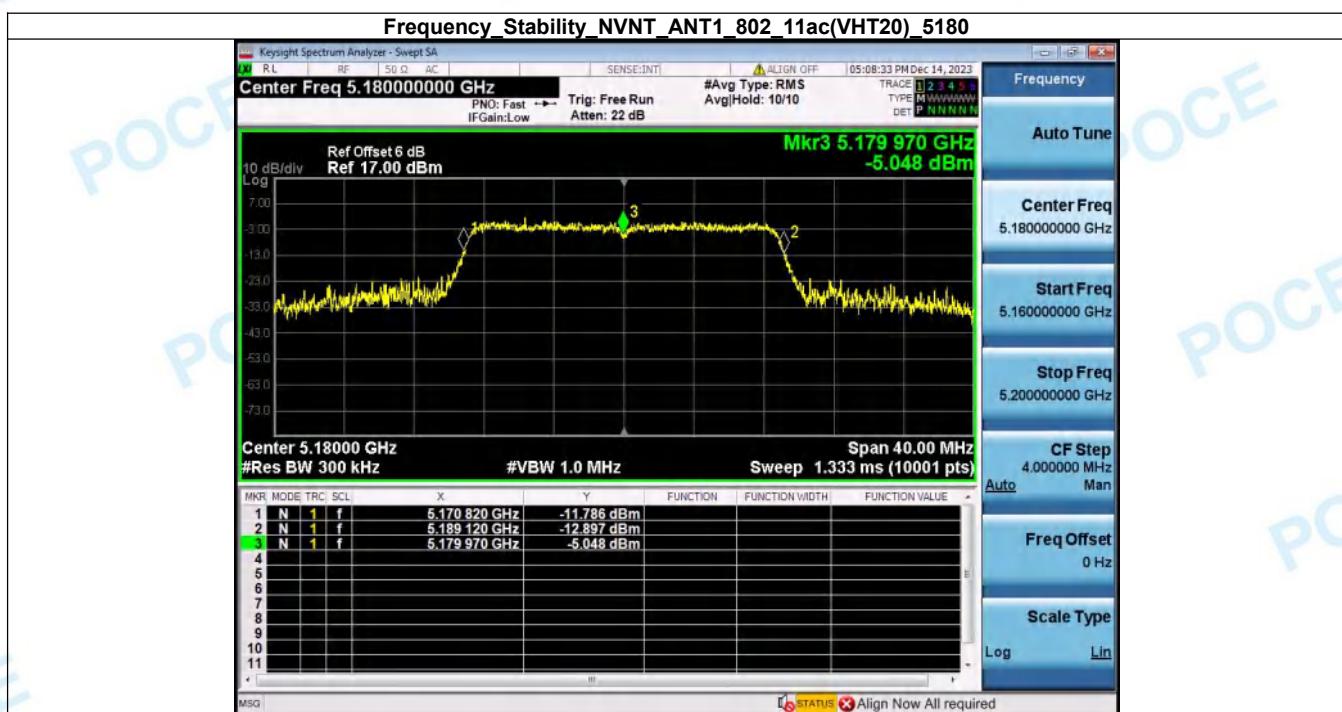
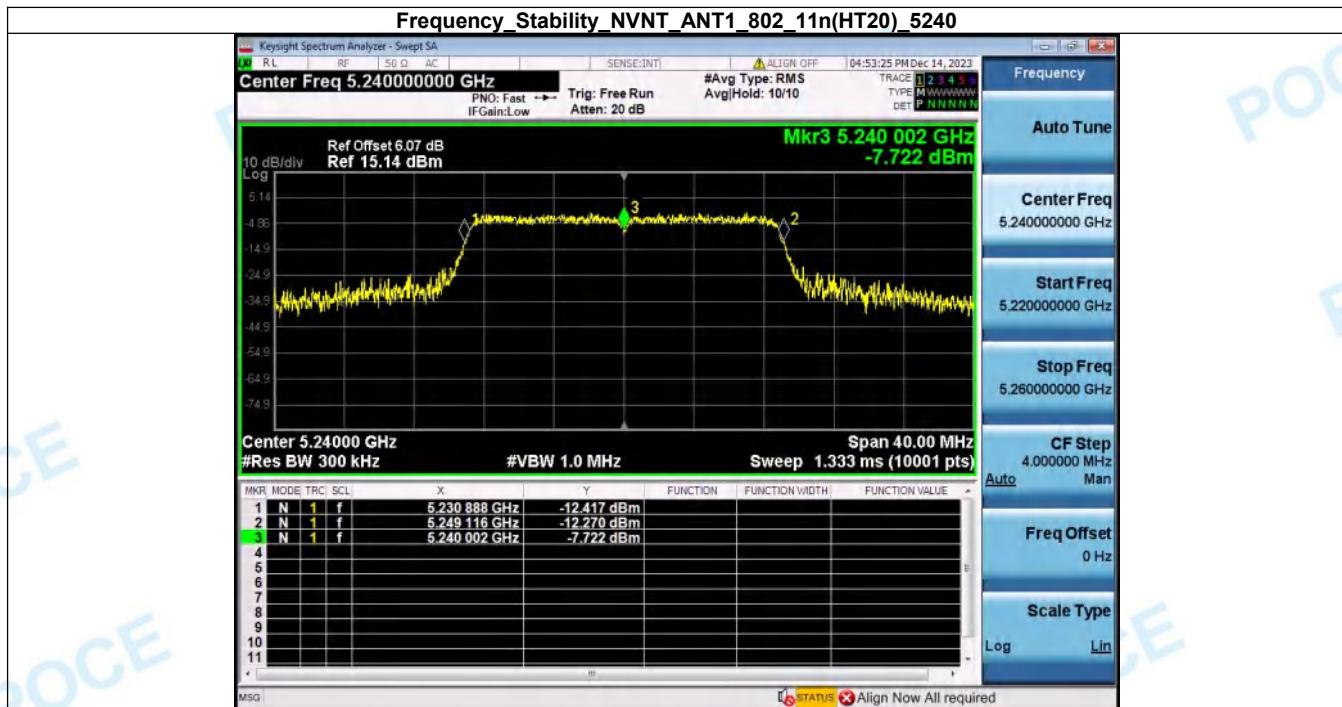
## 7. Frequency Stability

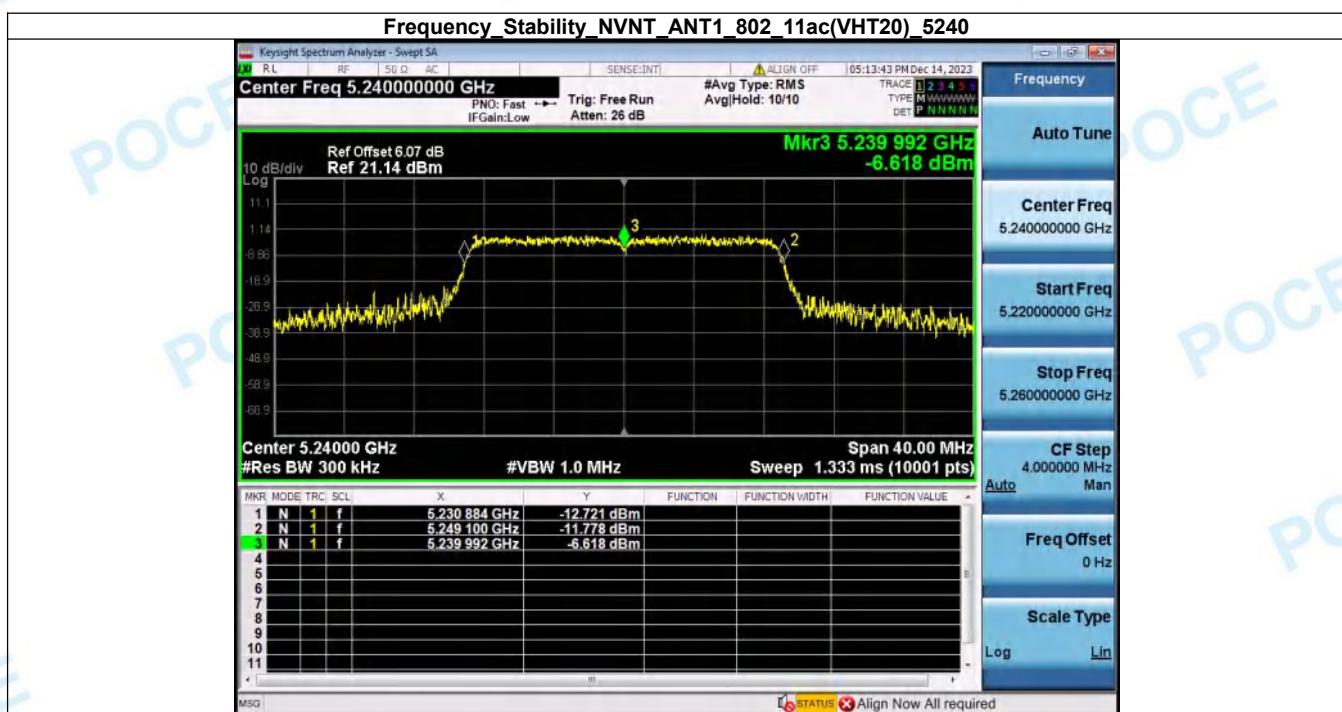
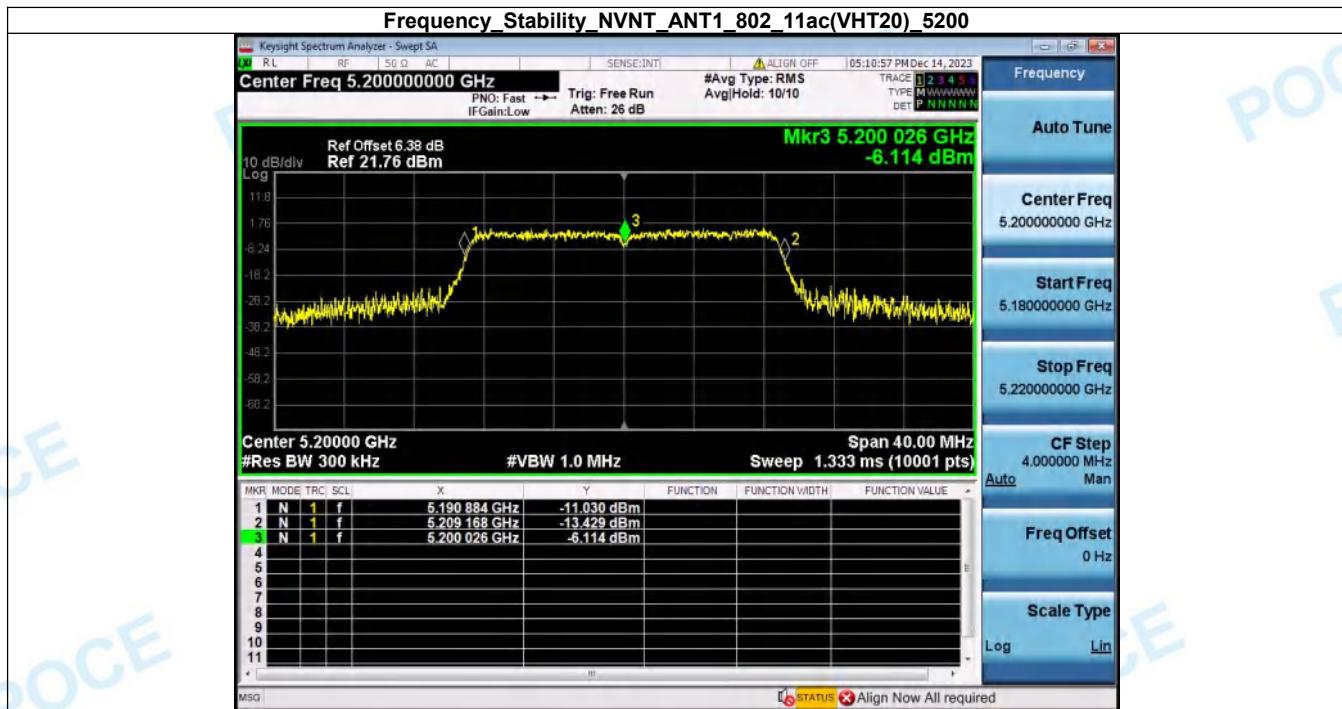
Condition	Antenna	Modulation	Frequency (MHz)	Fc(MHz)	Fl(MHz)	Fh(MHz)	Limit(MHz)	Result
NVNT	ANT1	802.11a	5180.00	5179.946	5171.216	5188.676	5150~5250	Pass
NVNT	ANT1	802.11a	5200.00	5200.052	5191.344	5208.760	5150~5250	Pass
NVNT	ANT1	802.11a	5240.00	5240.016	5231.352	5248.680	5150~5250	Pass
NVNT	ANT1	802.11n(HT20)	5180.00	5179.988	5170.860	5189.116	5150~5250	Pass
NVNT	ANT1	802.11n(HT20)	5200.00	5200.028	5190.880	5209.176	5150~5250	Pass
NVNT	ANT1	802.11n(HT20)	5240.00	5240.002	5230.888	5249.116	5150~5250	Pass
NVNT	ANT1	802.11ac(VHT20)	5180.00	5179.970	5170.820	5189.120	5150~5250	Pass
NVNT	ANT1	802.11ac(VHT20)	5200.00	5200.026	5190.884	5209.168	5150~5250	Pass
NVNT	ANT1	802.11ac(VHT20)	5240.00	5239.992	5230.884	5249.100	5150~5250	Pass
NVNT	ANT1	802.11n(HT40)	5190.00	5190.000	5171.648	5208.352	5150~5250	Pass
NVNT	ANT1	802.11n(HT40)	5230.00	5230.032	5211.728	5248.336	5150~5250	Pass
NVNT	ANT1	802.11ac(VHT40)	5190.00	5190.012	5171.640	5208.384	5150~5250	Pass
NVNT	ANT1	802.11ac(VHT40)	5230.00	5230.032	5211.744	5248.320	5150~5250	Pass
NVNT	ANT1	802.11ac(VHT80)	5210.00	5210.006	5171.972	5248.040	5150~5250	Pass

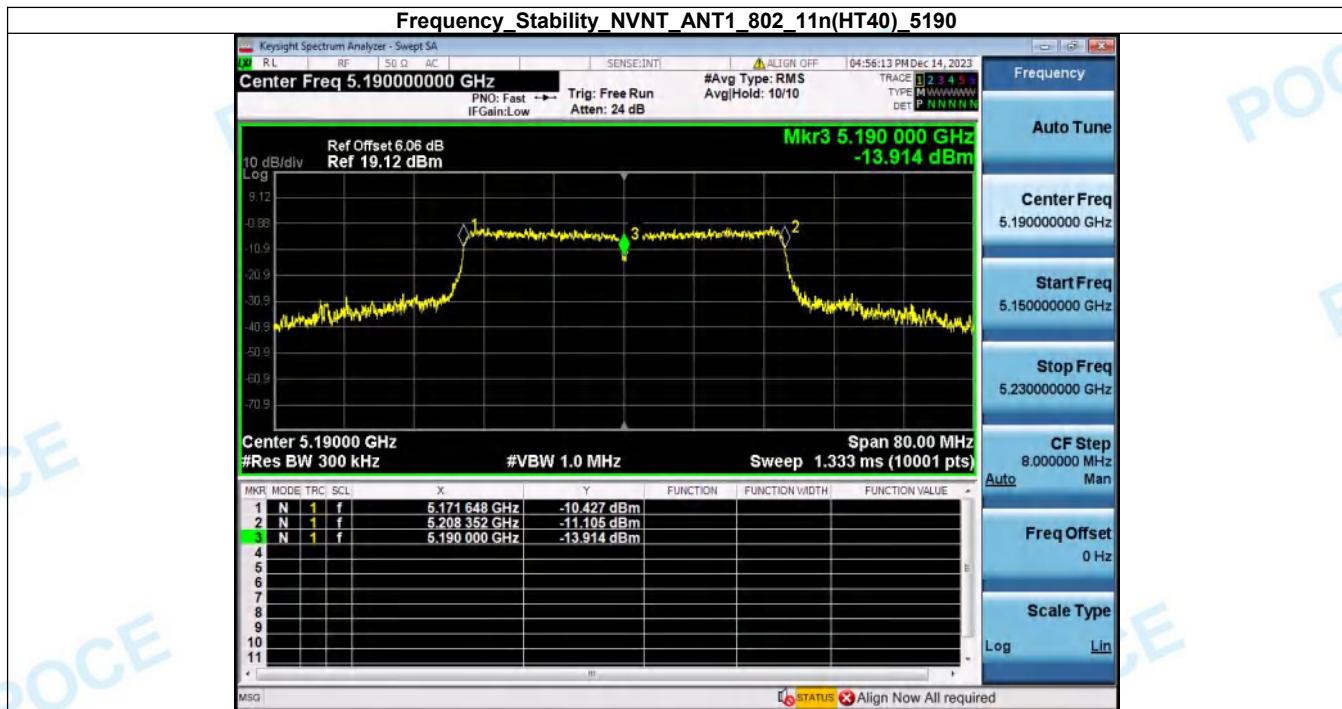


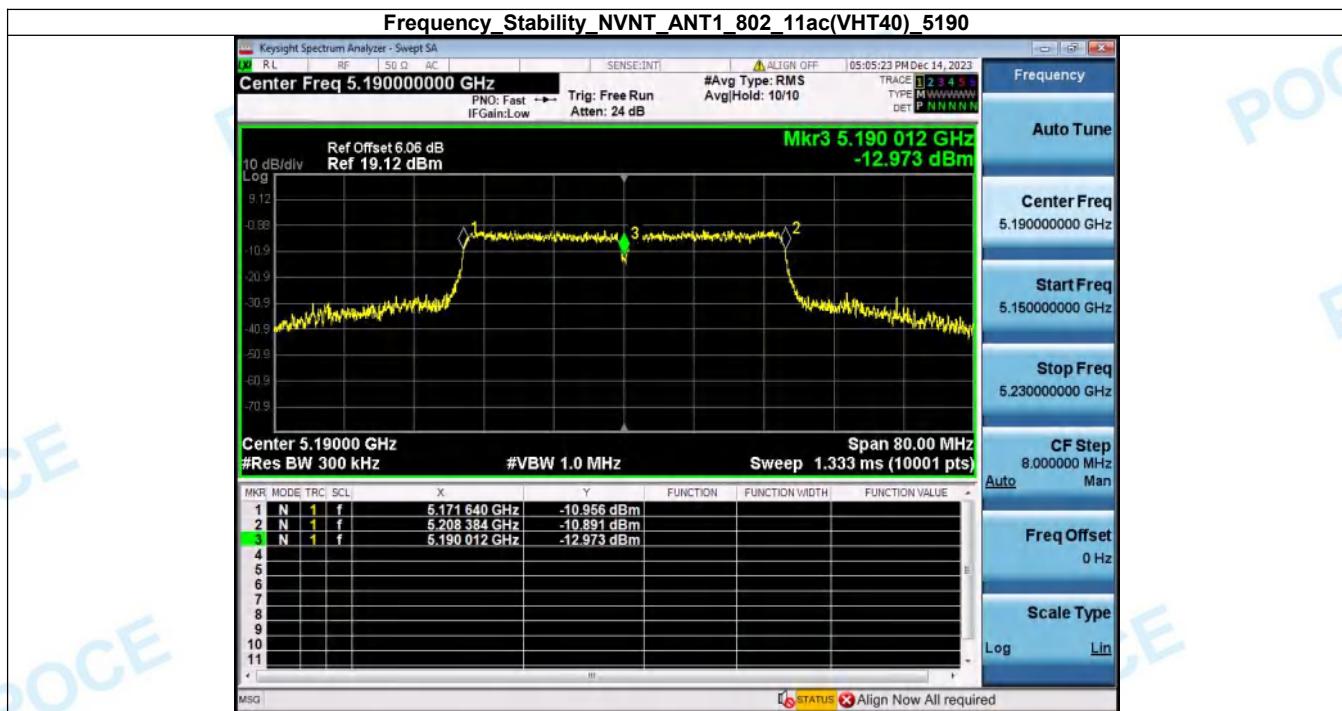


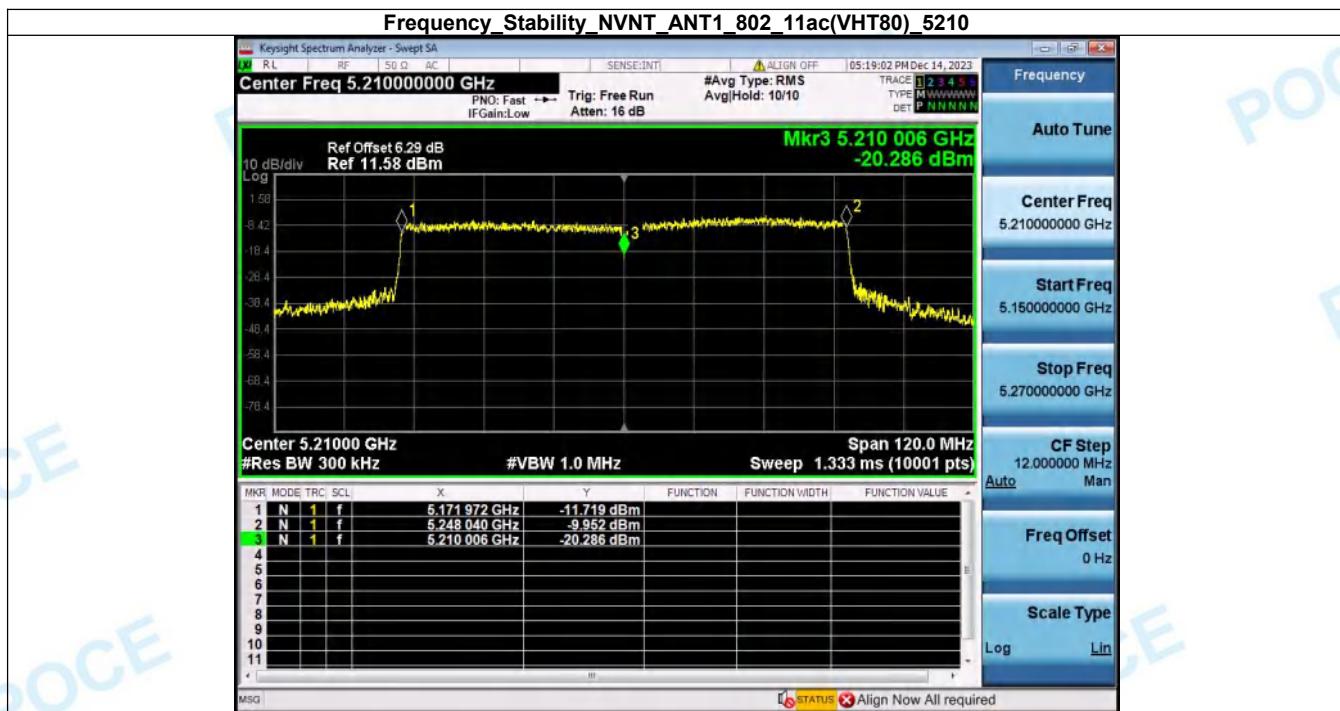












\*\*\*\*\* End of Report \*\*\*\*\*