FCC RADIO TEST REPORT
FCC ID: XUJCREHDV2

Product :	Professional Diagnostic Tool
Trade Mark :	LAUNCH
Model Name :	Millennium HD ProA
Family Model :	Creader Professional 123S HD, Creader Professional 129 HD V2, Creader Elite HD-CM V2, Creader Elite HD-IN V2, Creader Elite HD-CT V2, Creader Elite HD-V V2, Creader Elite HD-H V2, Creader Elite HD-IS V2, Creader Elite HD X V2
Report No. :	S25032803511004
Issue Date:	May 14, 2025

Prepared for

LAUNCH TECH CO., LTD.

No.4012, Launch Industrial Park, North Wuhe Rd, Bantian Street, Longgang District, Shenzhen, 518129, China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

No. 24 Xinfa East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China

Tel. 0755-2320 0050 Website: http://www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name.....:	LAUNCH TECH CO., LTD.
Address .....:	No.4012, Launch Industrial Park, North Wuhe Rd, Bantian Street, Longgang District, Shenzhen, 518129, China
Manufacturer's Name.....:	LAUNCH TECH CO., LTD.
Address .....:	No.4012, Launch Industrial Park, North Wuhe Rd, Bantian Street, Longgang District, Shenzhen, 518129, China
Product description	
Product name ..... :	Professional Diagnostic Tool
Trade Mark .....:	LAUNCH
Model and/or type reference :	Millennium HD ProA
Family Model .....:	Creader Professional 123S HD, Creader Professional 129 HD V2, Creader Elite HD-CM V2, Creader Elite HD-IN V2, Creader Elite HD-CT V2, Creader Elite HD-V V2, Creader Elite HD-H V2, Creader Elite HD-IS V2, Creader Elite HD X V2
Test Sample number.....:	S250328035005
Date of Test .....:	Apr. 01, 2025 ~ May 14, 2025
Standards.....:	FCC Part15.407
Test procedure.....	ANSI C63.10-2013 and KDB 789033 D02 General UNII Test Procedures New Rules 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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Prepared By :	Reviewed By :	Approved By :
Allen Liu	Aaron Cheng	Alex Li
(Project Engineer)	(Supervisor)	(Manager)

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Revision History

Report No.	Version	Description	Issued Date
S25032803511004	Rev.01	Initial issue of report	May 14, 2025

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) 15.407 (b)(4)	Spurious Radiated Emissions	PASS	
15.407 (a)(1) 15.407 (a)(3)	26 dB and 99% Emission Bandwidth	PASS	
15.407(e)	Minimum 6 dB bandwidth	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power	PASS	
15.407(b)(1) 15.407(b)(4)	Band Edge	PASS	
15.407 (a)(1) 15.407 (a)(3)	Power Spectral Density	PASS	
15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
15.203	Antenna Requirement	PASS	
15.407(c)	Automatically discontinue transmission	PASS	Note 2

NOTE:

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

(2) The product is a client device, and the data transmission is limited by the AP.
When the information to be sent is missing or the operation fails,
the device will automatically stop sending and directly connect to the AP correctly again.

1.1 FACILITIES AND ACCREDITATIONS

FACILITIES

All measurement facilities used to collect the measurement data are located at

No. 24 Xinfa East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of 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 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	:	No. 24 Xinfa East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of 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,PSD	±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%
9	All emissions, radiated(9KHz~30MHz)	±6dB
10	Occupied bandwidth	±4.7%
11	Dwell Time	±5.4%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Professional Diagnostic Tool	
Trade Mark	LAUNCH	
FCC ID	XUJCREHDV2	
Model Name	Millennium HD ProA	
Family Model	Creader Professional 123S HD, Creader Professional 129 HD V2, Creader Elite HD-CM V2, Creader Elite HD-IN V2, Creader Elite HD-CT V2, Creader Elite HD-V V2, Creader Elite HD-H V2, Creader Elite HD-IS V2, Creader Elite HD X V2	
Model Difference	All models are the same circuit and RF module, except for the color of the rubber sleeve and the Vehicle brand aredifferent.	
Product Description	IEEE 802.11 WLAN Mode Supported	☒802.11a/n/ac (20MHz channel bandwidth) ☒802.11n/ac (40MHz channel bandwidth) ☒802.11ac (80MHz channel bandwidth)
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
	Operating Frequency Range	☒5180-5240MHz for 802.11a/n(HT20)/ac(VHT20); 5190-5230MHz for 802.11n(HT40)/ac(VHT40); 5210MHz for 802.11ac(VHT80) ☒5745-5825 MHz for 802.11a/n(HT20)/ac(VHT20); 5755-5795 MHz for 802.11n(HT40)/ac(VHT40); 5775MHz for 802.11ac(VHT80)
	Number of Channels	☒4 channels for 802.11a/n20/ac20 in the 5180-5240MHz band ; 2 channels for 802.11 n40/ac40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ; ☒5 channels for 802.11a/n20/ac20 in the 5745-5825MHz band ; 2 channels for 802.11 n40/ac40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band ;
	Antenna Type	FPC Antenna
	Antenna Gain	4.51dBi
	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.	
Adapter	N/A	
Battery	DC 3.6V, 3000mAh, 10.8Wh	
Power supply	DC 3.6V from battery or DC 5V from adapter or DC 24V from the vehicle battery	
Connecting I/O Port(s)	Please refer to the User's Manual	

HW Version	N/A
SW Version	N/A

Note 1: Based on the application, features, or specification exhibited in User's Manual, the EUT is Professional Diagnostic Tool. More details of EUT technical specification, please refer to the User's Manual.

2: The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.

3: The product comes with different colored rubber sleeves.

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. The product comes with different colored rubber sleeves.

3. Frequency and Channel list for 802.11a/n/ac(20MHz) band I (5180-5240MHz):

802.11a/n/ac(20MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency z(MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220	-	-	-	-
40	5200	48	5240	-	-	-	-

Frequency and Channel list for 802.11n/ac(40MHz) band I (5190-5230MHz):

802.11n/ac(40MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	-	-	-	-	-	-
46	5230	-	-	-	-	-	-

Frequency and Channel list for 802.11ac(80MHz) band I (5210MHz):

802.11ac(80MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	-	-	-	-	-	-

Frequency and Channel list for 802.11a/n/ac(20 MHz) band IV (5745-5825MHz):

802.11a/n/ac(20 MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

Frequency and Channel list for 802.11n/ac(40MHz) band IV (5755-5795MHz):

802.11n/ac(40MHz) Carrier Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-

Frequency and Channel list for 802.11ac(80MHz) band IV (5775MHz):

802.11ac(80MHz) Carrier Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775			-	-

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 20 /ac 20 CH36/ CH40/ CH 48 802.11a / n 20 / ac 20 CH149/ CH157/ CH 165
Mode 3	802.11n40 / ac40 CH38/ CH 46 802.11n 40 / ac 40 CH 151 / CH 159
Mode 4	802.11ac80 CH 42 802.11ac 80 CH 155

For Radiated Emission	
Final Test Mode	Description
Mode 1	Normal Link Mode
Mode 2	802.11a / n 20 /ac 20 CH36/ CH40/ CH 48 802.11a / n 20 / ac 20 CH149/ CH157/ CH 165
Mode 3	802.11n40 / ac40 CH38/ CH 46 802.11n 40 / ac 40 CH 151 / CH 159
Mode 4	802.11ac80 CH 42 802.11ac 80 CH 155

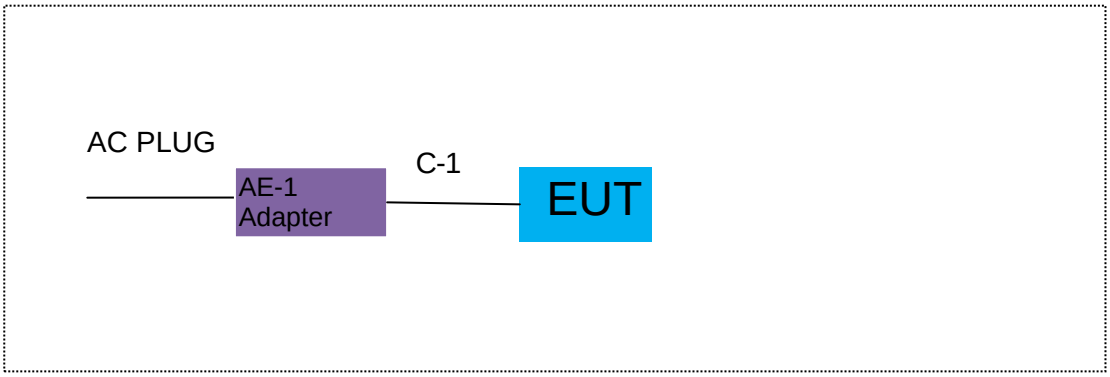
Note:

(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

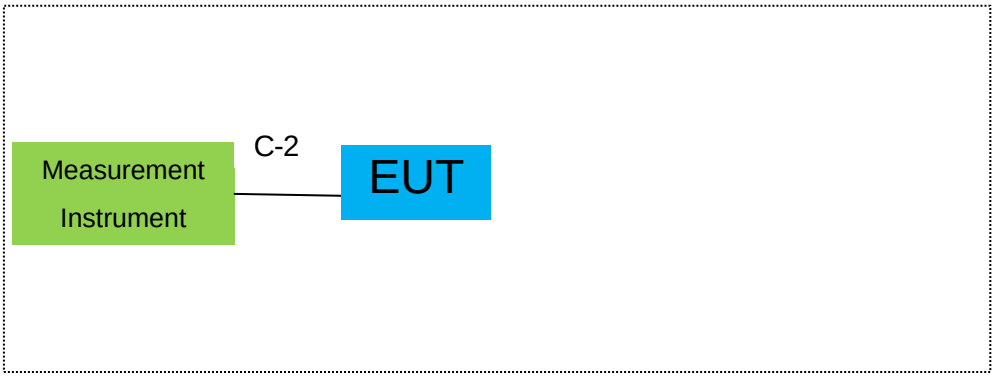
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

For AC Conducted Emission Mode



For Radiated Test Cases

For Conducted Test Cases



Note:1.The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.
2.EUT built-in battery-powered, the battery is fully-charged.

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	Model/Type No.	Manufacturer	Series No.	Note
AE-1	Adapter	KSAPK0110500200D5	Simplehuman LLC	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	USB Cable	YES	NO	0.8m
C-2	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	Agilent	E4440A	MY41000130	2024.04.26 2025.04.24	2025.04.25 2026.04.23	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024.04.25 2025.04.17	2025.04.24 2026.04.16	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2024.04.25 2025.04.17	2025.04.24 2026.04.16	1 year
4	Test Receiver	R&S	ESPI7	101318	2024.04.26 2025.04.17	2025.04.25 2026.04.16	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12 2025.05.11	2025.05.11 2026.05.10	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
8	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2024.05.12	2027.05.11	3 year
9	Amplifier	EMC	EMC051835SE	980246	2024.04.25 2025.04.17	2025.04.24 2026.04.16	1 year
10	Active Loop Antenna	SCHWARZBECK	FMZB 1519 B	055	2024.05.17	2027.05.16	3 year
11	Power Meter	DARE	RPR3006W	15I00041SNO84	2024.04.25 2025.04.17	2025.04.24 2026.04.16	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2023.05.06	2026.05.05	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2023.05.06	2026.05.05	3 year
14	High Test Cable(1G-40GHz)	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
15	Filter	TRILTHIC	2400MHz	29	2024.04.26	2027.04.25	3 year
16	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

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	2024.04.26 2025.04.17	2025.04.25 2026.04.16	1 year
2	LISN	R&S	ENV216	101313	2024.04.25 2025.04.16	2025.04.24 2026.04.15	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2024.04.25 2025.04.16	2025.04.24 2026.04.15	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2024.04.26	2027.04.25	3 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2023.05.06	2026.05.05	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.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFtest	MTS 8310 2.4GHz/5GHz	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	Farad	EZ-EMC_CE	AIT-03A	AC Conducted Test

3. TEST REQUIREMENTS

3.1CONDUCTED EMISSION MEASUREMENT

3.1.1 APPLICABLE STANDARD

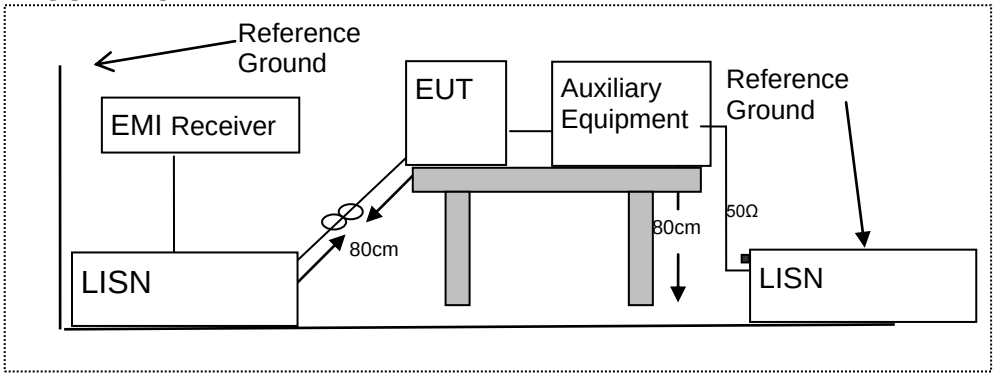
According to FCC Part 15.207(a)

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.

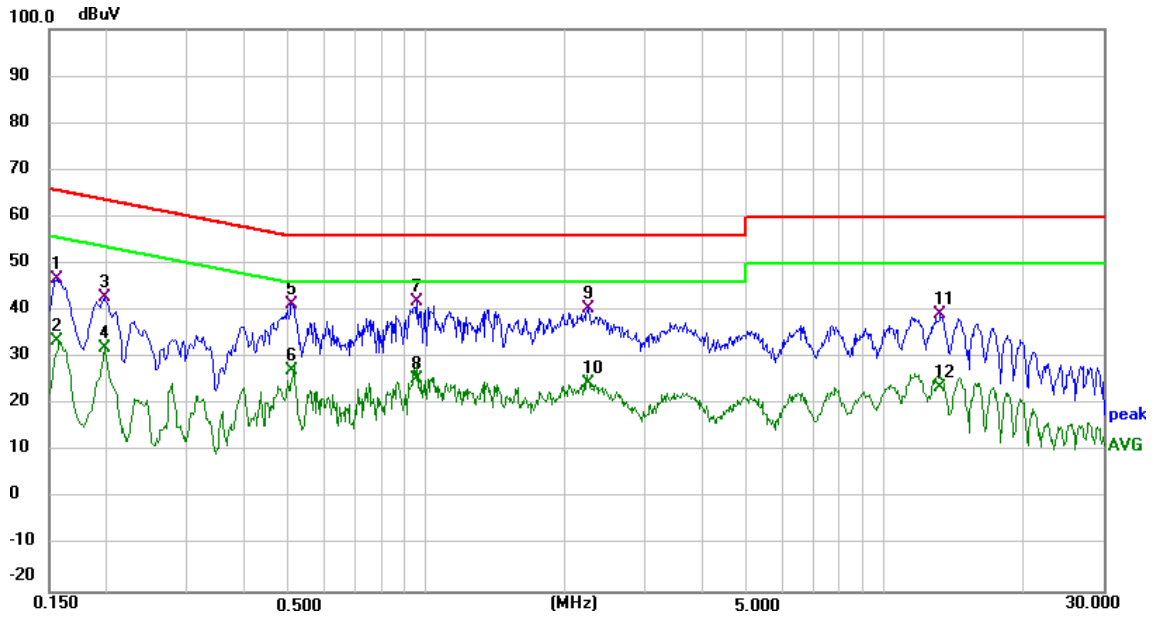
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The 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.

3.1.5 TEST RESULTS

EUT：	Professional Diagnostic Tool	Model Name ：	Millennium HD ProA
Temperature：	24℃	Relative Humidity：	49%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from Adapter AC 120V/60Hz	Test Mode：	Mode 1(5.2G)

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1554	36.64	10.02	46.66	65.71	-19.05	QP
0.1554	23.43	10.02	33.45	55.71	-22.26	AVG
0.1980	32.74	10.09	42.83	63.69	-20.86	QP
0.1980	21.93	10.09	32.02	53.69	-21.67	AVG
0.5100	30.74	10.70	41.44	56.00	-14.56	QP
0.5100	16.41	10.70	27.11	46.00	-18.89	AVG
0.9580	30.31	11.65	41.96	56.00	-14.04	QP
0.9580	13.71	11.65	25.36	46.00	-20.64	AVG
2.2540	30.58	9.83	40.41	56.00	-15.59	QP
2.2540	14.86	9.83	24.69	46.00	-21.31	AVG
13.2500	41.08	-1.75	39.33	60.00	-20.67	QP
13.2500	25.41	-1.75	23.66	50.00	-26.34	AVG

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

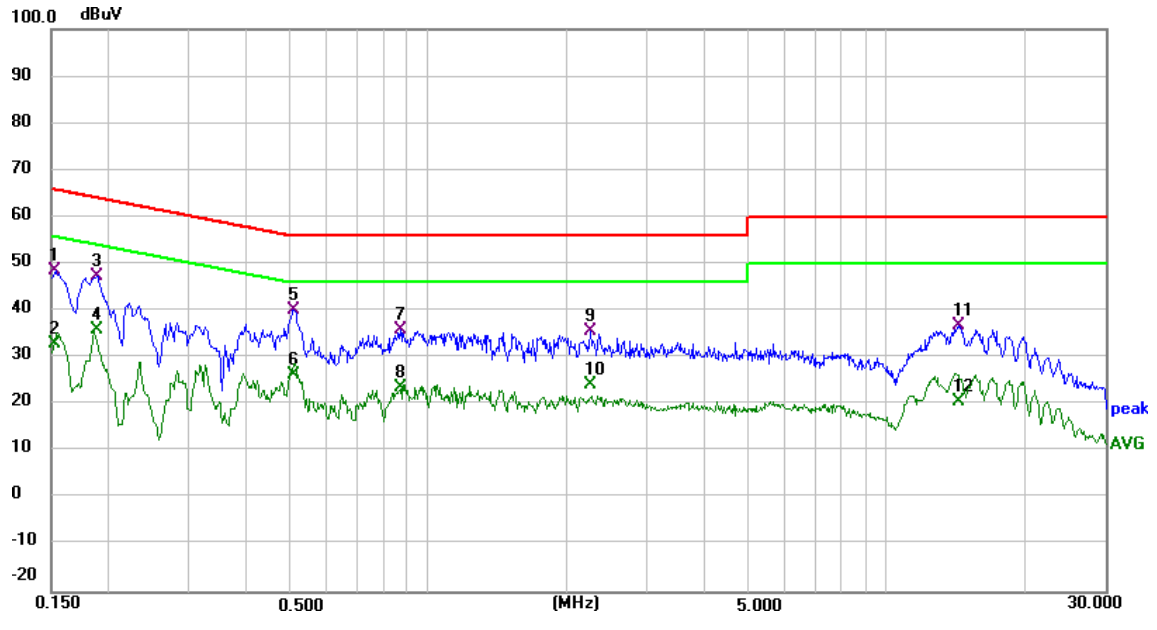


EUT：	Professional Diagnostic Tool	Model Name ：	Millennium HD ProA
Temperature：	24℃	Relative Humidity：	49%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from Adapter AC 120V/60Hz	Test Mode：	Mode 1(5.2G)

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1539	39.15	9.44	48.59	65.79	-17.20	QP
0.1539	23.58	9.44	33.02	55.79	-22.77	AVG
0.1882	37.84	9.50	47.34	64.12	-16.78	QP
0.1882	26.52	9.50	36.02	54.12	-18.10	AVG
0.5100	30.26	9.99	40.25	56.00	-15.75	QP
0.5100	16.37	9.99	26.36	46.00	-19.64	AVG
0.8700	25.23	10.74	35.97	56.00	-20.03	QP
0.8700	12.80	10.74	23.54	46.00	-22.46	AVG
2.2580	26.61	9.08	35.69	56.00	-20.31	QP
2.2580	15.04	9.08	24.12	46.00	-21.88	AVG
14.3900	25.88	10.92	36.80	60.00	-23.20	QP
14.3900	9.66	10.92	20.58	50.00	-29.42	AVG

Remark:

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

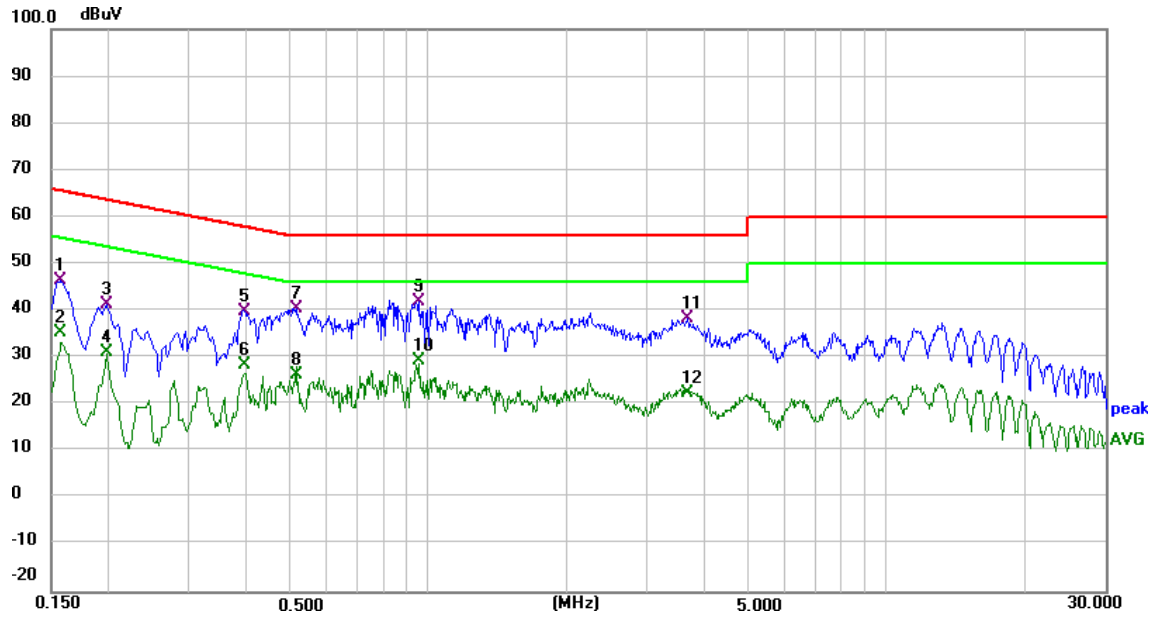


EUT：	Professional Diagnostic Tool	Model Name ：	Millennium HD ProA
Temperature：	24℃	Relative Humidity：	49%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from Adapter AC 120V/60Hz	Test Mode：	Mode 1(5.8G)

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1580	36.40	10.02	46.42	65.57	-19.15	QP
0.1580	25.20	10.02	35.22	55.57	-20.35	AVG
0.1980	31.24	10.09	41.33	63.69	-22.36	QP
0.1980	21.21	10.09	31.30	53.69	-22.39	AVG
0.3955	29.51	10.49	40.00	57.95	-17.95	QP
0.3955	17.96	10.49	28.45	47.95	-19.50	AVG
0.5140	29.77	10.70	40.47	56.00	-15.53	QP
0.5140	15.66	10.70	26.36	46.00	-19.64	AVG
0.9580	30.31	11.65	41.96	56.00	-14.04	QP
0.9580	17.68	11.65	29.33	46.00	-16.67	AVG
3.6620	28.43	9.95	38.38	56.00	-17.62	QP
3.6620	12.41	9.95	22.36	46.00	-23.64	AVG

Remark:

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

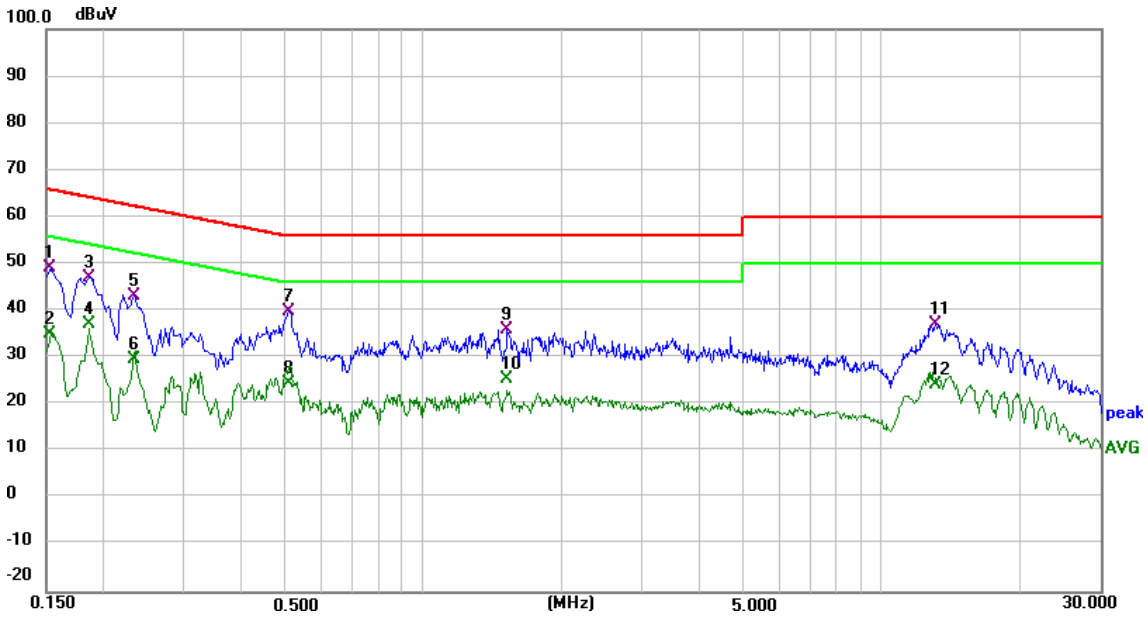


EUT：	Professional Diagnostic Tool	Model Name ：	Millennium HD ProA
Temperature：	24℃	Relative Humidity：	49%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from Adapter AC 120V/60Hz	Test Mode：	Mode 1(5.8G)

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1539	39.65	9.44	49.09	65.79	-16.70	QP
0.1539	25.58	9.44	35.02	55.79	-20.77	AVG
0.1860	37.66	9.50	47.16	64.21	-17.05	QP
0.1860	27.61	9.50	37.11	54.21	-17.10	AVG
0.2340	33.51	9.57	43.08	62.31	-19.23	QP
0.2340	20.08	9.57	29.65	52.31	-22.66	AVG
0.5100	29.76	9.99	39.75	56.00	-16.25	QP
0.5100	14.57	9.99	24.56	46.00	-21.44	AVG
1.5220	24.00	12.08	36.08	56.00	-19.92	QP
1.5220	13.25	12.08	25.33	46.00	-20.67	AVG
13.1100	26.36	10.68	37.04	60.00	-22.96	QP
13.1100	13.47	10.68	24.15	50.00	-25.85	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(b) and 15.209

3.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(1)(2)(3)(9)(10): 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			

(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.

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);

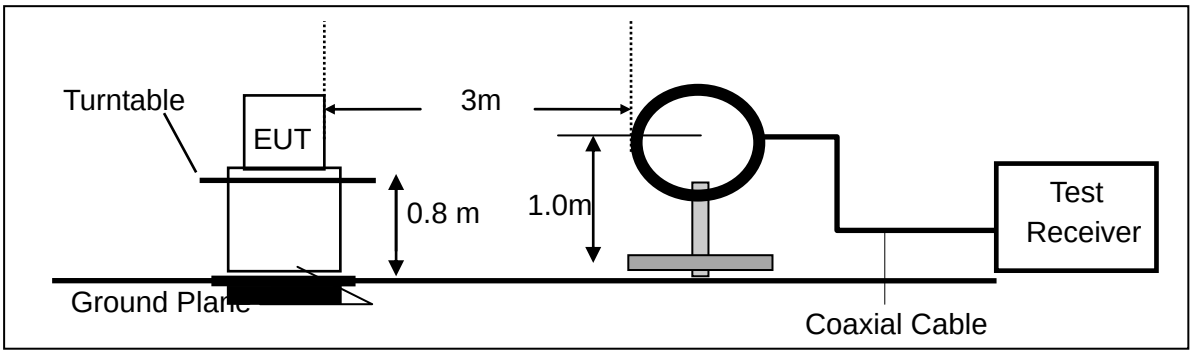
Limit line=Specific limits(dBuV) + distance extrapolation factor.

3.2.3 MEASURING INSTRUMENTS

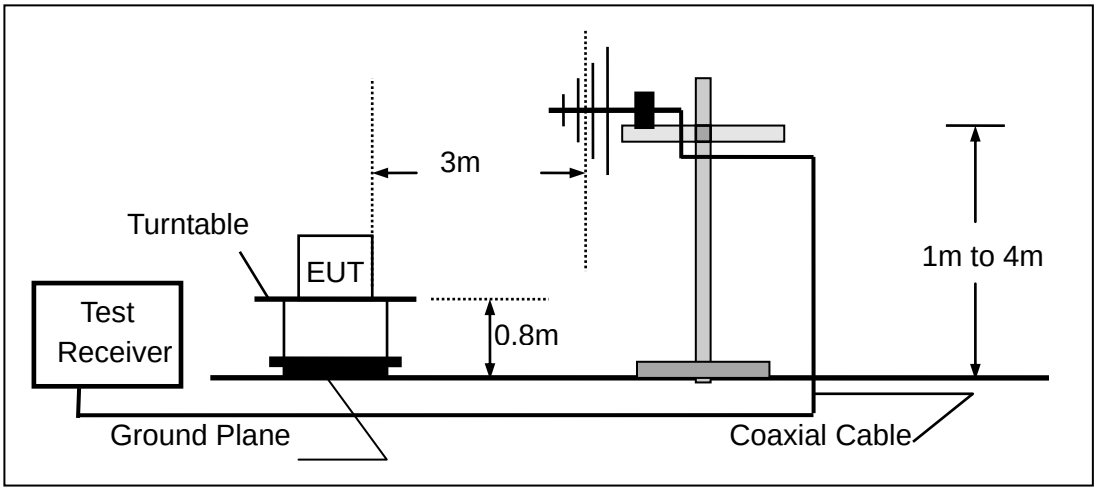
The Measuring equipment is listed in the section 6.3 of this test report.

3.2.4 TEST CONFIGURATION

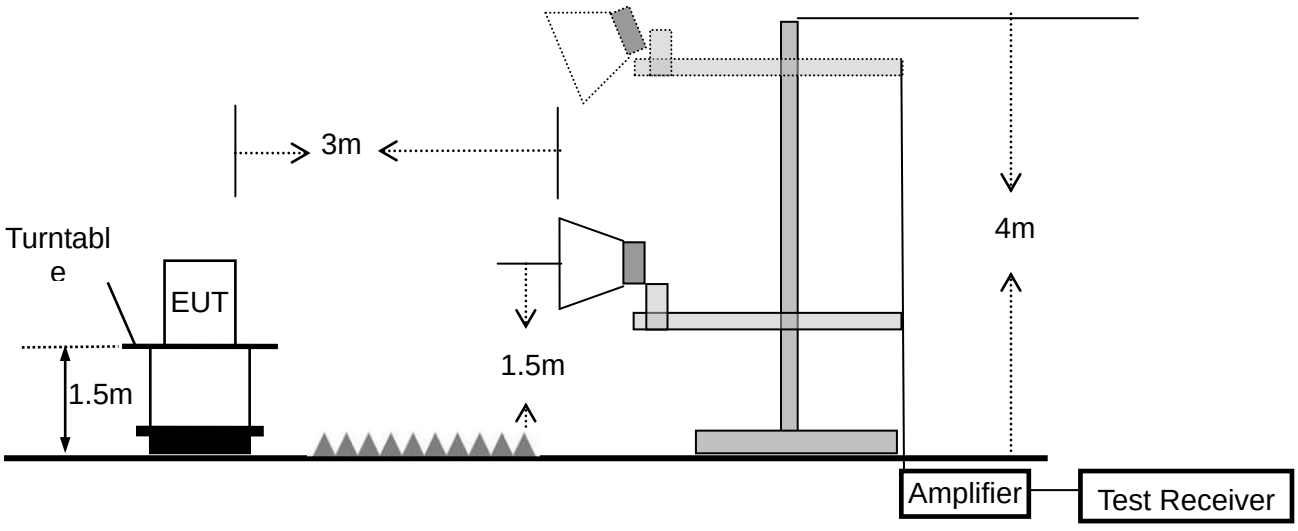
(a) For radiated emissions below 30MHz



(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 / 1MHz 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	1 MHz

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：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	20 ℃	Relative Humidtity：	48%
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.

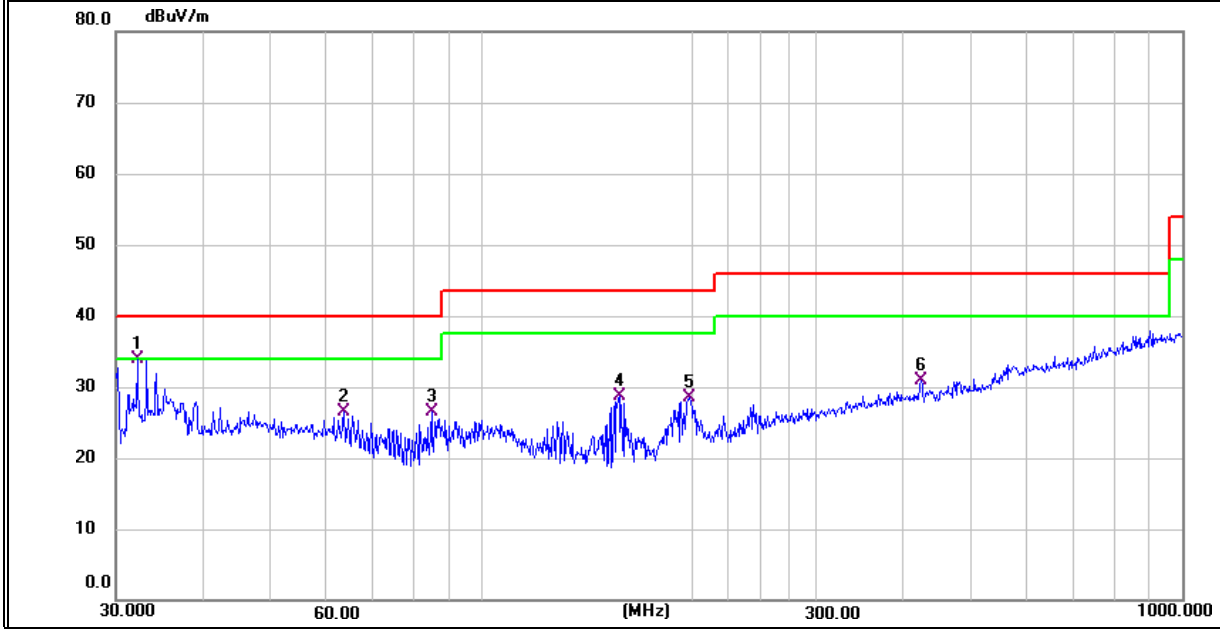
3.2.7 TEST RESULTS (30MHz – 1GHz)

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V from battery
Test Mode ：	TX(5.2G)- 802.11a (High CH)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	32.1794	16.93	16.91	33.84	40.00	-6.16	QP
V	63.5356	8.21	18.30	26.51	40.00	-13.49	QP
V	84.7020	12.08	14.40	26.48	40.00	-13.52	QP
V	157.0072	13.74	14.92	28.66	43.50	-14.84	QP
V	197.8925	10.42	18.00	28.42	43.50	-15.08	QP
V	423.5402	7.48	23.39	30.87	46.00	-15.13	QP

Remark:

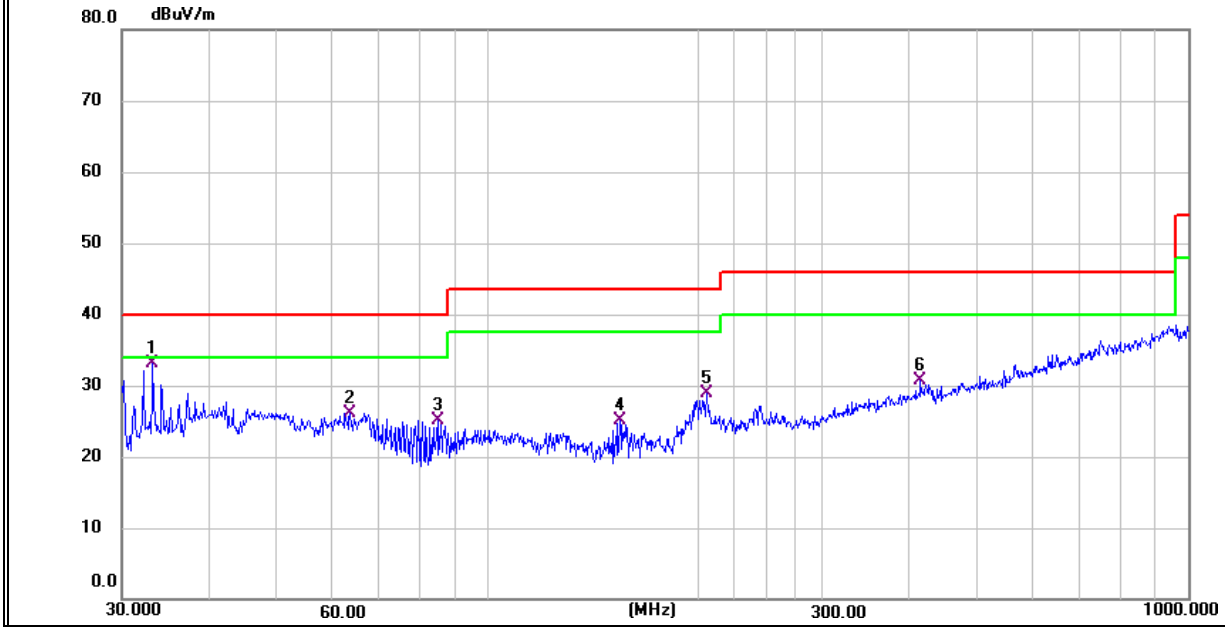
Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	33.2111	16.01	17.02	33.03	40.00	-6.97	QP
H	63.5356	7.77	18.30	26.07	40.00	-13.93	QP
H	84.7020	10.76	14.40	25.16	40.00	-14.84	QP
H	154.2785	10.49	14.71	25.20	43.50	-18.30	QP
H	204.9550	10.86	18.12	28.98	43.50	-14.52	QP
H	414.7223	7.52	23.19	30.71	46.00	-15.29	QP

Remark:

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



Note(1)“802.11a” mode is the worst mode.

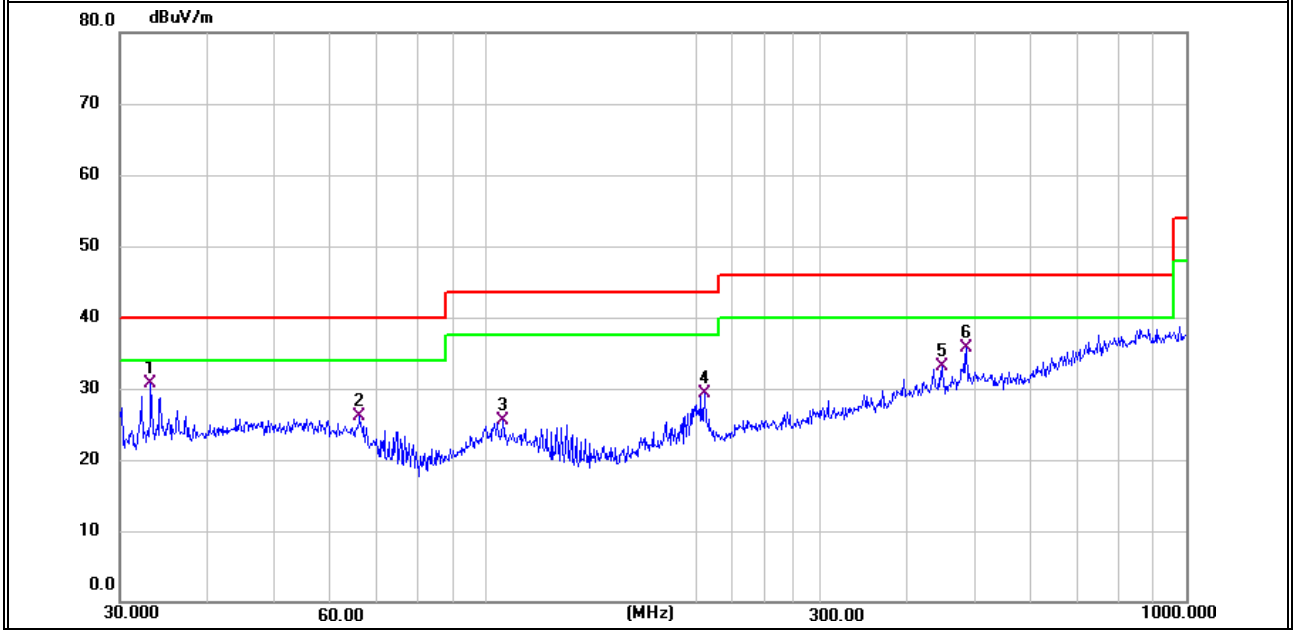
(2)Other emissions are attenuated more than 20dB below the permissible limits, so it does not recorded in the report.

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V from battery
Test Mode ：	TX(5.8G)- 802.11a (Mid CH)		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	33.2111	13.68	17.02	30.70	40.00	-9.30	QP
V	66.0340	8.58	17.47	26.05	40.00	-13.95	QP
V	105.6414	7.38	18.20	25.58	43.50	-17.92	QP
V	204.9550	11.13	18.12	29.25	43.50	-14.25	QP
V	447.9821	9.32	23.74	33.06	46.00	-12.94	QP
V	485.6091	11.39	24.36	35.75	46.00	-10.25	QP

Remark:

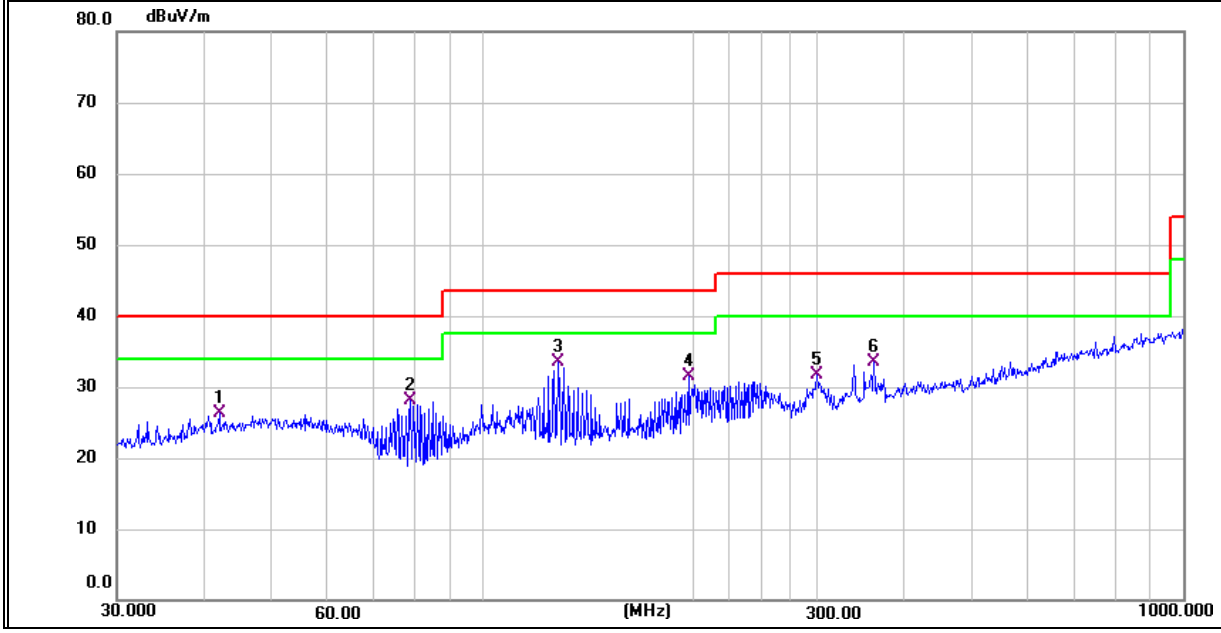
Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	42.0065	7.32	18.94	26.26	40.00	-13.74	QP
H	78.6885	14.22	13.92	28.14	40.00	-11.86	QP
H	128.1130	18.44	15.04	33.48	43.50	-10.02	QP
H	196.5098	13.66	17.85	31.51	43.50	-11.99	QP
H	299.3158	11.32	20.43	31.75	46.00	-14.25	QP
H	361.7137	11.45	22.11	33.56	46.00	-12.44	QP

Remark:

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



Note(1)“802.11a” mode is the worst mode.

(2)Other emissions are attenuated more than 20dB below the permissible limits, so it does not recorded in the report.

3.2.8 TEST RESULTS (1GHz-18GHz)

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage：	DC 3.6V
Test Mode ：	TX(5.2G) - 802.11a		

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	3694.10	59.26	5.94	35.40	44.00	56.60	74.00	-17.40	Pk
Vertical	3694.10	39.58	5.94	35.40	44.00	36.92	54.00	-17.08	AV
Vertical	10360.15	59.07	8.46	39.75	44.50	62.78	68.20	-5.42	Pk
Vertical	15540.22	60.75	10.12	38.80	44.10	65.57	74.00	-8.43	Pk
Vertical	15540.22	39.34	10.12	38.80	42.70	45.56	54.00	-8.44	AV
Horizontal	3713.00	59.28	5.94	35.18	44.00	56.40	74.00	-17.60	Pk
Horizontal	3713.00	39.72	5.94	35.18	44.00	36.84	54.00	-17.16	AV
Horizontal	10360.47	60.62	8.46	38.71	44.50	63.29	68.20	-4.91	Pk
Horizontal	15540.38	59.69	10.12	38.38	44.10	64.09	74.00	-9.91	Pk
Horizontal	15540.38	40.49	10.12	38.38	44.10	44.89	54.00	-9.11	AV
Low Channel (5200 MHz)-Above 1G									
Vertical	3624.13	60.60	6.48	36.35	44.05	59.38	74.00	-14.62	Pk
Vertical	3624.13	39.95	6.48	36.35	44.05	38.73	54.00	-15.27	AV
Vertical	10400.09	59.97	8.47	37.88	44.51	61.81	68.20	-6.39	Pk
Vertical	15600.15	60.25	10.12	38.80	44.10	65.07	74.00	-8.93	Pk
Vertical	15600.15	40.29	10.12	38.80	42.70	46.51	54.00	-7.49	AV
Horizontal	4202.14	59.59	6.48	36.37	44.05	58.39	74.00	-15.61	Pk
Horizontal	4202.14	39.92	6.48	36.37	44.05	38.72	54.00	-15.28	AV
Horizontal	10400.14	60.71	8.47	38.64	44.50	63.32	68.20	-4.88	Pk
Horizontal	15600.51	60.64	10.12	38.38	44.10	65.04	74.00	-8.96	Pk
Horizontal	15600.51	39.68	10.12	38.38	44.10	44.08	54.00	-9.92	AV
Low Channel (5240 MHz)-Above 1G									
Vertical	4597.70	60.06	7.10	37.24	43.50	60.90	74.00	-13.10	Pk
Vertical	4597.70	39.86	7.10	37.24	43.50	40.70	54.00	-13.30	AV
Vertical	10480.23	59.88	8.46	37.68	44.50	61.52	68.20	-6.68	Pk
Vertical	15720.15	60.76	10.12	38.80	44.10	65.58	74.00	-8.42	Pk
Vertical	15720.15	40.59	10.12	38.80	42.70	46.81	54.00	-7.19	AV
Horizontal	4589.26	60.24	7.10	37.24	43.50	61.08	74.00	-12.92	Pk
Horizontal	4589.26	39.78	7.10	37.24	43.50	40.62	54.00	-13.38	AV
Horizontal	10480.59	59.67	8.46	38.57	44.50	62.20	68.20	-6.00	Pk
Horizontal	15720.18	60.34	10.12	38.38	44.10	64.74	74.00	-9.26	Pk
Horizontal	15720.18	40.01	10.12	38.38	44.10	44.41	54.00	-9.59	AV

Note:"802.11a" mode is the worst mode.

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.

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX (5.8G) -- 802.11a		

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 (5745 MHz)- Above 1G									
Vertical	5122.51	59.48	5.94	35.40	44.00	56.82	74.00	-17.18	Pk
Vertical	5122.51	39.85	5.94	35.40	44.00	37.19	54.00	-16.81	AV
Vertical	11490.60	59.08	8.46	39.75	44.50	62.79	74.00	-11.21	Pk
Vertical	11490.60	40.50	8.46	39.75	44.50	44.21	54.00	-9.79	AV
Vertical	17235.65	40.17	10.12	38.80	44.10	44.99	68.20	-23.21	Pk
Horizontal	5166.60	59.43	5.94	35.18	44.00	56.55	68.20	-11.65	Pk
Horizontal	11490.47	50.56	8.46	38.71	44.50	53.23	74.00	-20.77	Pk
Horizontal	11490.47	40.95	8.46	38.71	44.50	43.62	54.00	-10.38	AV
Horizontal	17235.47	55.00	10.12	38.38	44.10	59.40	68.20	-8.80	Pk
Low Channel (5785 MHz)- Above 1G									
Vertical	5433.40	59.85	6.48	36.35	44.05	58.63	74.00	-15.37	Pk
Vertical	5433.40	39.30	6.48	36.35	44.05	38.08	54.00	-15.92	AV
Vertical	11570.41	59.38	8.47	37.88	44.51	61.22	74.00	-12.78	Pk
Vertical	11570.41	39.01	8.47	37.88	44.51	40.85	54.00	-13.15	AV
Vertical	17355.84	39.14	10.12	38.80	44.10	43.96	68.20	-24.24	Pk
Horizontal	4866.60	59.35	6.48	36.37	44.05	58.15	74.00	-15.85	Pk
Horizontal	4866.60	39.50	6.48	36.37	44.05	38.30	54.00	-15.70	AV
Horizontal	11570.28	59.72	8.47	38.64	44.50	62.33	74.00	-11.67	Pk
Horizontal	11570.28	40.68	8.47	38.64	44.50	43.29	54.00	-10.71	AV
Horizontal	17355.49	50.37	10.12	38.38	44.10	54.77	68.20	-13.43	Pk
Low Channel (5825 MHz)- Above 1G									
Vertical	5244.48	60.29	7.10	37.24	43.50	61.13	68.20	-7.07	Pk
Vertical	11652.42	59.61	8.46	37.68	44.50	61.25	74.00	-12.75	Pk
Vertical	11652.42	40.63	8.46	37.68	44.50	42.27	54.00	-11.73	AV
Vertical	17473.74	49.30	10.12	38.80	44.10	54.12	68.20	-14.08	Pk
Horizontal	5285.29	60.86	7.10	37.24	43.50	61.70	68.20	-6.50	Pk
Horizontal	11652.67	59.77	8.46	38.57	44.50	62.30	74.00	-11.70	Pk
Horizontal	11652.67	39.90	8.46	38.57	44.50	42.43	54.00	-11.57	AV
Horizontal	17474.68	50.43	10.12	38.38	44.10	54.83	68.20	-13.37	Pk

Note:"802.11a" mode is the worst mode.

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.

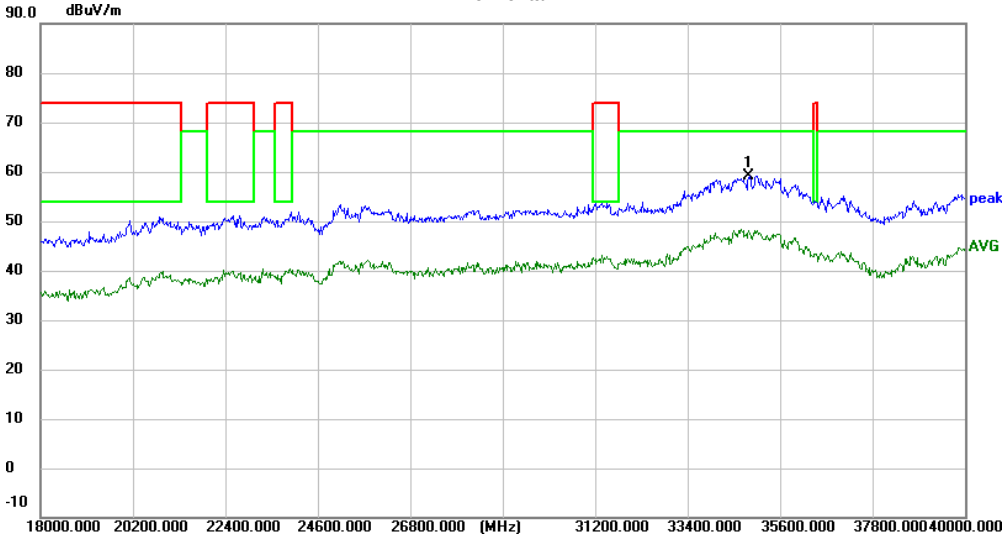
3.2.9 TEST RESULTS (18GHz-40GHz)

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX (5.2G)-802.11a TX (5.8G)-802.11a		

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

Low Channel (5180 MHz)-Above 1G

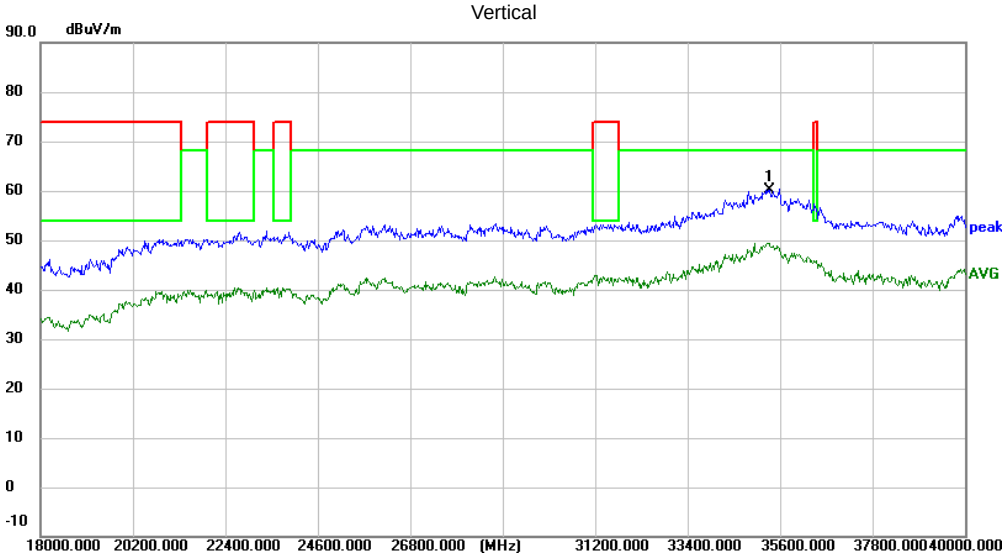
Horizontal



Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
34881.333	55.64	3.43	59.07	68.20	-9.13	peak

Vertical

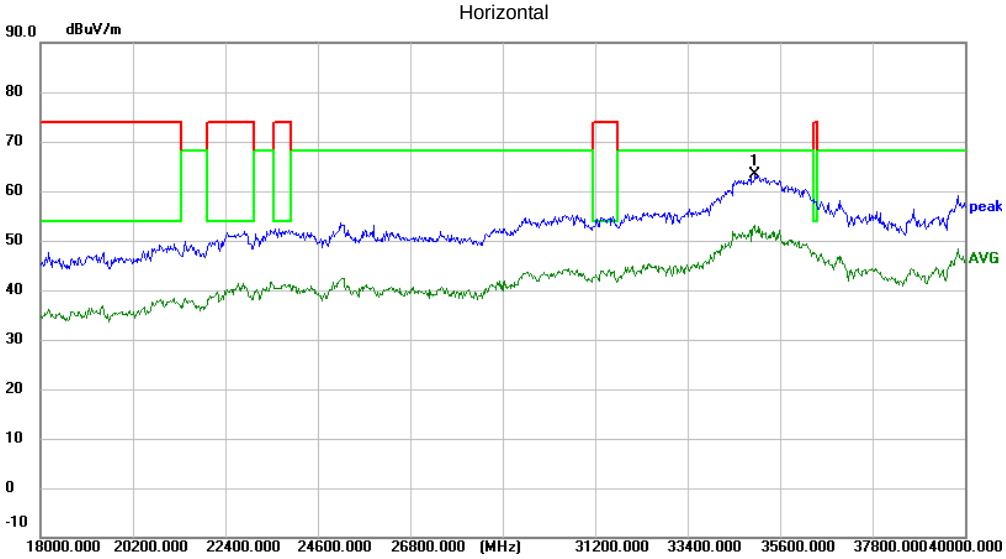


Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
35379.267	57.45	2.77	60.22	68.20	-7.98	peak

High Channel (5240 MHz)-Above 1G

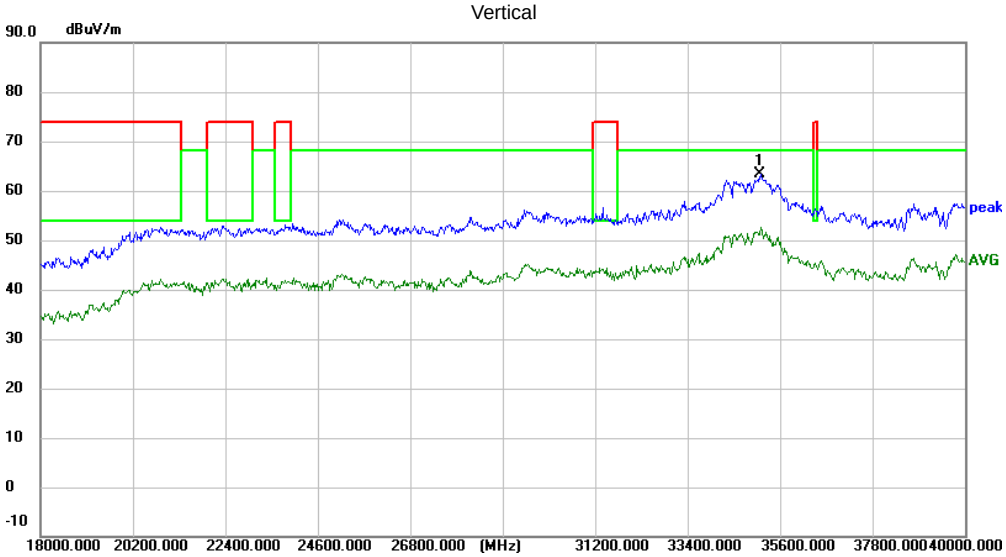
Horizontal



Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
35024.333	59.63	3.71	63.34	68.20	-4.86	peak

Vertical

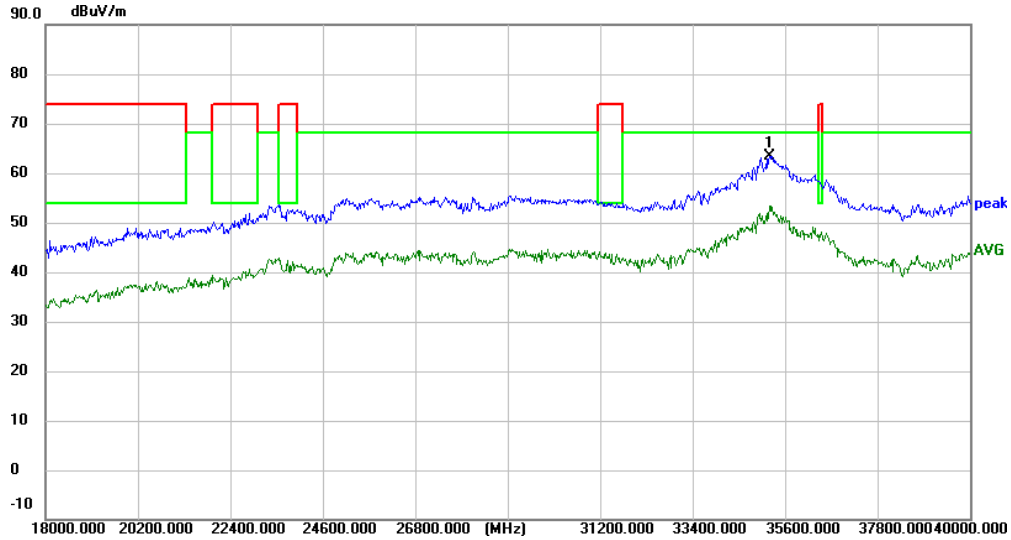


Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
35158.533	60.27	3.21	63.48	68.20	-4.72	peak

Low Channel (5745 MHz)-Above 1G

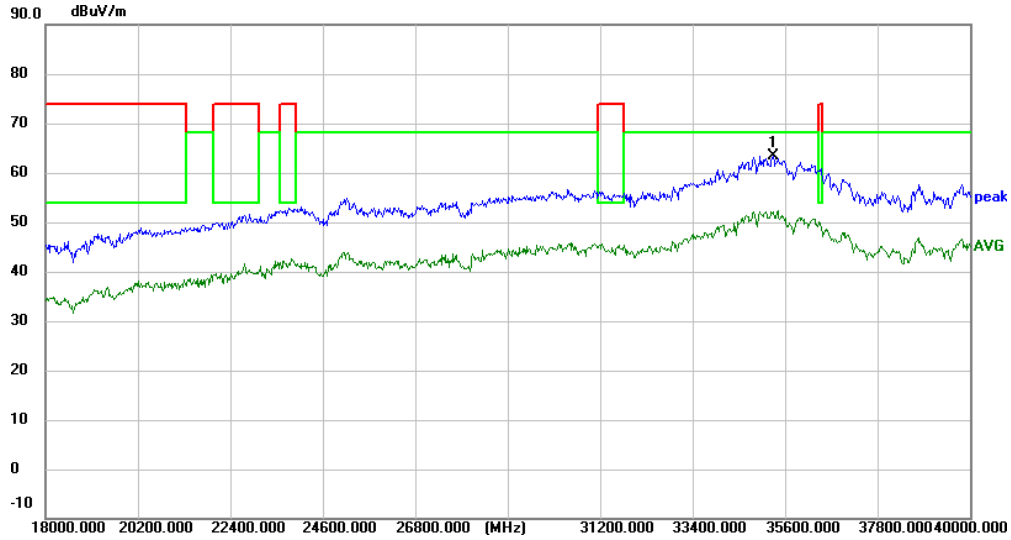
Horizontal



Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
35234.800	60.54	2.94	63.48	68.20	-4.72	peak

Vertical

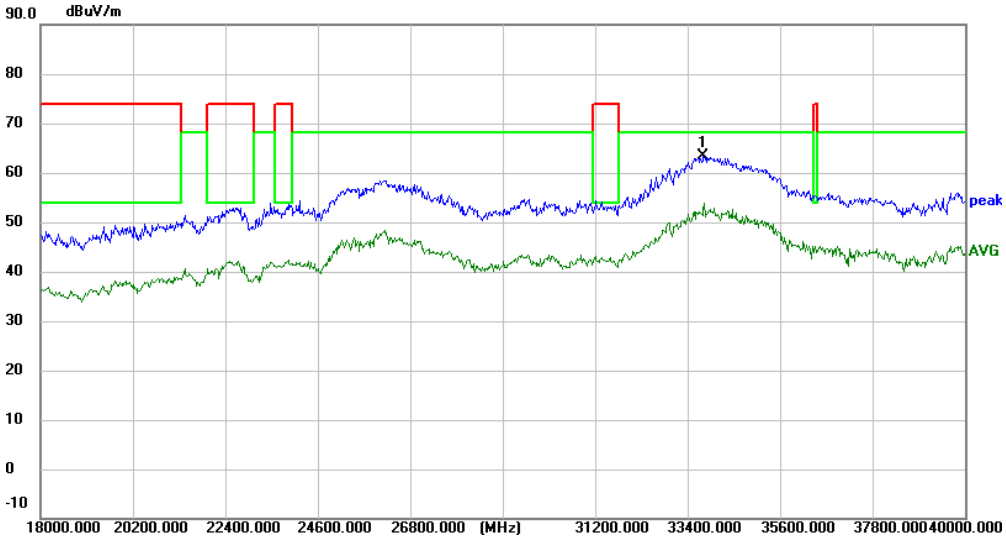


Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
35322.800	60.59	2.82	63.41	68.20	-4.79	peak

High Channel (5825 MHz)-Above 1G

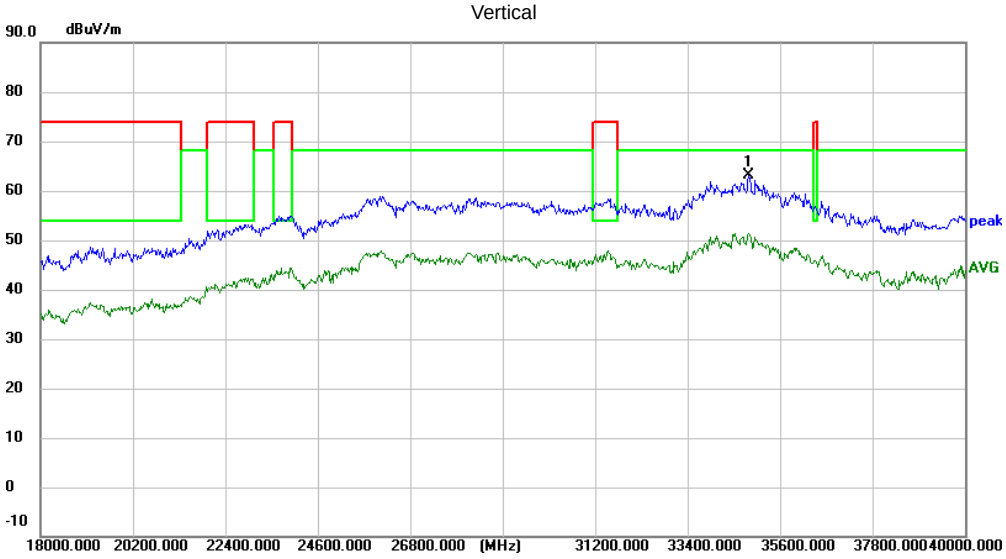
Horizontal



Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
33829.733	63.20	0.21	63.41	68.20	-4.79	peak

Vertical



Measurement Result:

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
34873.267	59.68	3.41	63.09	68.20	-5.11	peak

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

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX (5.2G)-802.11a		

All the modulation modes have been tested, The report just record the worst data mode.

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	
Low Channel (5180 MHz)									
4500	62.94	3.615	32.6	43.25	55.91	74	-18.09	Pk	Horizontal
4500	37.62	3.615	32.6	43.25	30.59	54	-23.41	AV	Horizontal
4500	62.62	3.615	32.6	43.25	55.58	74	-18.42	Pk	Vertical
4500	32.19	3.615	32.6	43.25	25.16	54	-28.84	AV	Vertical
5150	62.57	3.911	34.6	43.27	57.81	74	-16.19	Pk	Horizontal
5150	32.34	3.911	34.6	43.27	27.58	54	-26.42	AV	Horizontal
5150	62.86	3.911	34.6	43.27	58.10	74	-15.90	Pk	Vertical
5150	42.64	3.911	34.6	43.27	37.88	54	-16.12	AV	Vertical
High Channel (5240 MHz)									
5350	63.02	3.939	33.7	43.23	57.43	74	-16.57	Pk	Vertical
5350	34.00	3.939	33.7	43.23	28.41	54	-25.59	AV	Vertical
5350	62.31	3.939	33.7	43.23	56.72	74	-17.28	Pk	Horizontal
5350	38.22	3.939	33.7	43.23	32.63	54	-21.37	AV	Horizontal

Note: (1) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor

(2) “802.11a” mode is the worst mode. When PK value is lower than the Average value limit, average don't record.

3.3 POWER SPECTRAL DENSITY TEST

3.3.1 Applied procedures / limit

According to FCC §15.407(a)(3)

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 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.

,

3.3.2 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) Measure the duty cycle D of the transmitter output signal as described in 12.2.

b) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.

c) Set RBW = 1 MHz.

d) Set VBW $\geqslant$ 3 MHz.

e) Number of points in sweep $\geqslant$ [2 × span / RBW]. (This gives bin-to-bin spacing $\leqslant$ RBW / 2, so that narrowband signals are not lost between frequency bins.)

f) Sweep time = auto.

g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

h) Do not use sweep triggering. Allow the sweep to “free run.”

i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.

j) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

k) Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add [10 log (1 / 0.25)] = 6 dB if the duty cycle is 25%.

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.

3.3.3 DEVIATION FROM STANDARD

No deviation.

3.3.4 TEST SETUP

3.3.5 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.

3.3.6 **TEST RESULTS**

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1015 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX Frequency Band I (5150-5250MHz), Band IV (5725-5850MHz)		

Test data reference attachment.

3.4 26DB & 99% EMISSION BANDWIDTH

3.4.1 Applied procedures / limit

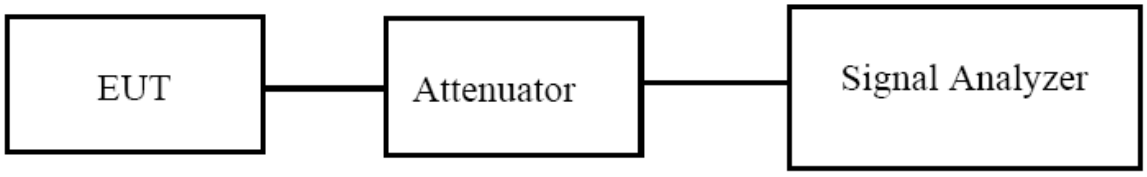
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band 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.

3.4.2 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.



3.4.3 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.

3.4.4 TEST RESULTS

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX Frequency Band I (5150-5250MHz), Band IV (5725-5850MHz)		

Test data reference attachment.

3.5 MINIMUM 6 DB BANDWIDTH

3.5.1 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.

3.5.2 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.

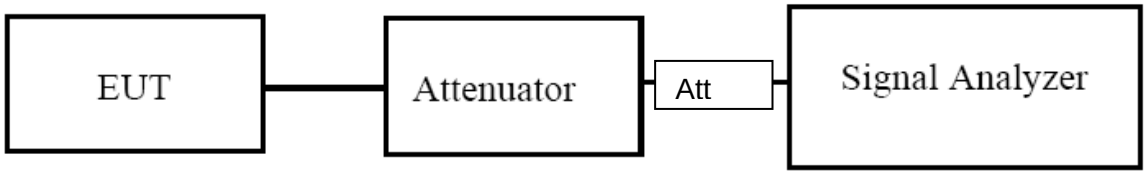
f) Allow the trace to stabilize.

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.

3.5.3 DEVIATION FROM STANDARD

No deviation.

3.5.4 TEST SETUP



3.5.5 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.

3.5.6 TEST RESULTS

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX (5G) Mode Frequency Band IV (5725-5850MHz)		

Test data reference attachment.

3.6 MAXIMUM CONDUCTED OUTPUT POWER

3.6.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

The maximum conduced output power should not exceed:

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

3.6.2 TEST PROCEDURE

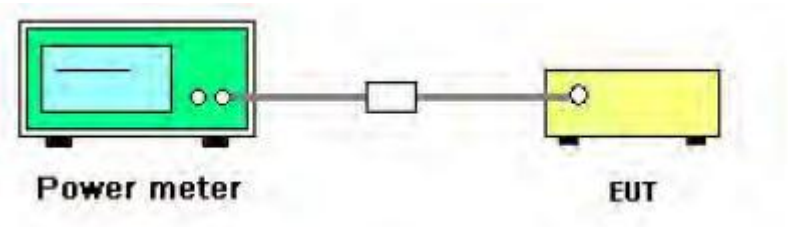
· Method PM-G is measurement using a gated RF average power meter.

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.6.3 DEVIATION FROM STANDARD

No deviation.

3.6.4 TEST SETUP



3.6.5 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.

3.6.6 TEST RESULTS

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX (5G) Mode Frequency Band I (5150-5250MHz), Band IV (5725-5850MHz)		

Test data reference attachment.

3.7 OUT OF BAND EMISSIONS

3.7.1 Applicable Standard

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(10) 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:
(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

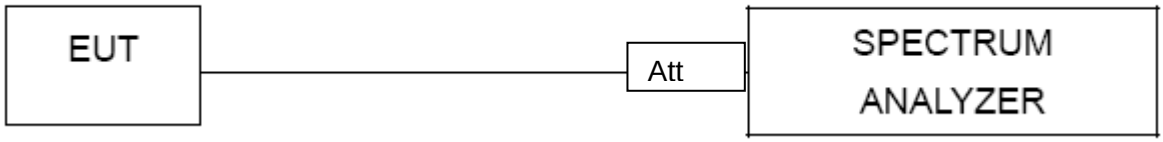
3.7.2 Test Procedure

The testing per ANSI C63.10 Section 12.7.4.2

3.7.3 DEVIATION FROM STANDARD

No deviation.

3.7.4 TEST SETUP



3.7.5 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.

3.7.6 TEST RESULTS

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 3.6V

The product has passed radiated emission testing per ANSI C63.10 Section 12.7.4.2 using a 50Ω termination cabinet, achieving a compliance margin >20dB, with conducted spurious emission data documented in the attached report.

3.8 FREQUENCY STABILITY MEASUREMENT

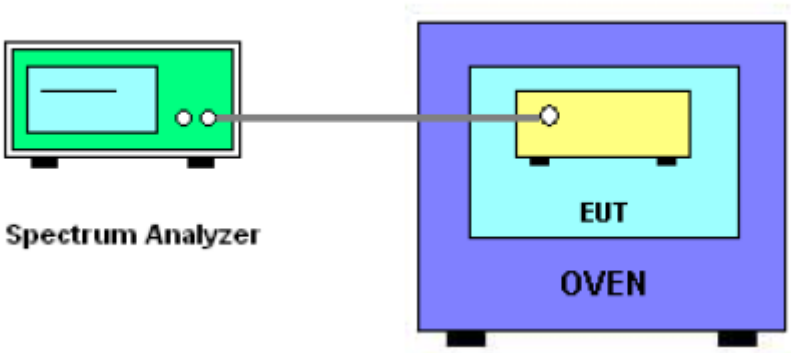
3.8.1 LIMIT

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.

3.8.2 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. Then the frequency error formula is (fc-f)/fc × 10_6 ppm .
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 -20°C~70°C.

3.8.3 TEST SETUP LAYOUT



3.9.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

3.9.5 TEST RESULTS

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 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)	20	V nom (V)	3.60	5180.0072	5180	0.0072	1.3862
		V max (V)	4.14	5180.0097	5180	0.0097	1.8657
		V min (V)	3.06	5180.0067	5180	0.0067	1.2894
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.6	T (°C)	-20	5180.0065	5180	0.0065	1.2623
		T (°C)	-10	5180.0065	5180	0.0065	1.2562
		T (°C)	0	5180.0097	5180	0.0097	1.8739
		T (°C)	10	5180.0056	5180	0.0056	1.0801
		T (°C)	20	5180.0056	5180	0.0056	1.0856
		T (°C)	30	5180.0099	5180	0.0099	1.9124
		T (°C)	40	5180.0017	5180	0.0017	0.3207
		T (°C)	50	5180.0010	5180	0.0010	0.1912
		T (°C)	60	5180.0077	5180	0.0077	1.4916
		T (°C)	70	5180.0034	5180	0.0034	0.6487
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)	20	V nom (V)	3.60	5200.0037	5200	0.0037	0.7182
		V max (V)	4.14	5200.0073	5200	0.0073	1.4100
		V min (V)	3.06	5200.0089	5200	0.0089	1.7144
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.6	T (°C)	-20	5200.0007	5200	0.0007	0.1346
		T (°C)	-10	5200.0001	5200	0.0001	0.0281
		T (°C)	0	5200.0043	5200	0.0043	0.8247
		T (°C)	10	5200.0095	5200	0.0095	1.8195
		T (°C)	20	5200.0018	5200	0.0018	0.3382
		T (°C)	30	5200.0033	5200	0.0033	0.6305
		T (°C)	40	5200.0090	5200	0.0090	1.7263
		T (°C)	50	5200.0077	5200	0.0077	1.4743
		T (°C)	60	5200.0014	5200	0.0014	0.2619
		T (°C)	70	5200.0045	5200	0.0045	0.8708
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)	20	V nom (V)	3.60	5240.0043	5240	0.0043	0.8182
		V max (V)	4.14	5240.0089	5240	0.0089	1.6906
		V min (V)	3.06	5240.0024	5240	0.0024	0.4589
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.6	T (°C)	-20	5240.0037	5240	0.0037	0.7024
		T (°C)	-10	5240.0053	5240	0.0053	1.0085
		T (°C)	0	5240.0016	5240	0.0016	0.3100
		T (°C)	10	5240.0021	5240	0.0021	0.4071
		T (°C)	20	5240.0044	5240	0.0044	0.8357
		T (°C)	30	5240.0045	5240	0.0045	0.8666
		T (°C)	40	5240.0036	5240	0.0036	0.6838
		T (°C)	50	5240.0023	5240	0.0023	0.4382
		T (°C)	60	5240.0048	5240	0.0048	0.9216
		T (°C)	70	5240.0007	5240	0.0007	0.1366
Limits				Within 5150-5250MHz			
Result				Complies			

EUT：	Professional Diagnostic Tool	Model Name. ：	Millennium HD ProA
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 3.6V
Test Mode ：	TX Frequency(5745-5825MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.60	5745.0023	5745	0.00233	0.4064
		V max (V)	4.14	5745.0074	5745	0.00737	1.2834
		V min (V)	3.06	5745.0018	5745	0.00176	0.3061
Limits				Within 5745-5850MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.6	T (°C)	-20	5745.0029	5745	0.00288	0.5020
		T (°C)	-10	5745.0095	5745	0.00948	1.6506
		T (°C)	0	5745.0028	5745	0.00276	0.4798
		T (°C)	10	5745.0009	5745	0.00095	0.1648
		T (°C)	20	5745.0023	5745	0.00230	0.3995
		T (°C)	30	5745.0056	5745	0.00561	0.9765
		T (°C)	40	5745.0039	5745	0.00385	0.6704
		T (°C)	50	5745.0068	5745	0.00675	1.1755
		T (°C)	60	5745.0045	5745	0.00451	0.7850
		T (°C)	70	5745.0098	5745	0.00976	1.6983
Limits				Within 5745-5850MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.60	5785.0013	5785	0.00133	0.2298
		V max (V)	4.14	5785.0008	5785	0.00083	0.1437
		V min (V)	3.06	5785.0024	5785	0.00242	0.4176
Limits				Within 5745-5850MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.6	T (°C)	-20	5785.0077	5785	0.00768	1.3267
		T (°C)	-10	5785.0076	5785	0.00762	1.3164
		T (°C)	0	5785.0086	5785	0.00859	1.4857
		T (°C)	10	5785.0082	5785	0.00822	1.4211
		T (°C)	20	5785.0007	5785	0.00071	0.1224
		T (°C)	30	5785.0084	5785	0.00844	1.4592
		T (°C)	40	5785.0020	5785	0.00204	0.3524
		T (°C)	50	5785.0015	5785	0.00149	0.2568
		T (°C)	60	5785.0031	5785	0.00310	0.5356
		T (°C)	70	5785.0038	5785	0.00382	0.6605
Limits				Within 5745-5850MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.60	5825.0066	5825	0.00656	1.1264
		V max (V)	4.14	5825.0006	5825	0.00062	0.1060
		V min (V)	3.06	5825.0041	5825	0.00411	0.7059
Limits				Within 5745-5850MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.6	T (°C)	-20	5825.0067	5825	0.00668	1.1465
		T (°C)	-10	5825.0058	5825	0.00584	1.0025
		T (°C)	0	5825.0092	5825	0.00922	1.5831
		T (°C)	10	5825.0014	5825	0.00136	0.2342
		T (°C)	20	5825.0048	5825	0.00479	0.8223
		T (°C)	30	5825.0052	5825	0.00518	0.8890
		T (°C)	40	5825.0065	5825	0.00647	1.1110
		T (°C)	50	5825.0014	5825	0.00143	0.2455
		T (°C)	60	5825.0063	5825	0.00626	1.0744
		T (°C)	70	5825.0086	5825	0.00857	1.4708
Limits				Within 5745-5850MHz			
Result				Complies			

4. ANTENNA REQUIREMENT

4.1 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.

4.2 EUT ANTENNA

The EUT antenna is permanent attached FPC antenna (4.51dBi).
It comply with the standard requirement.

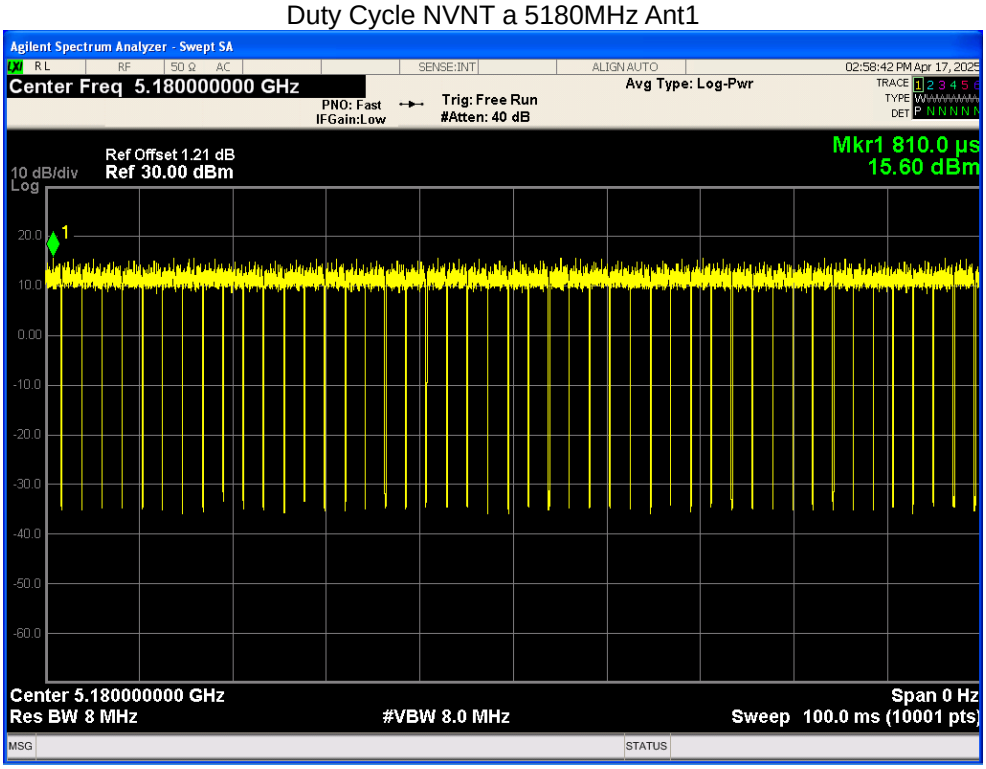
5. TEST RESULTS

5.1 5.2G WIFI

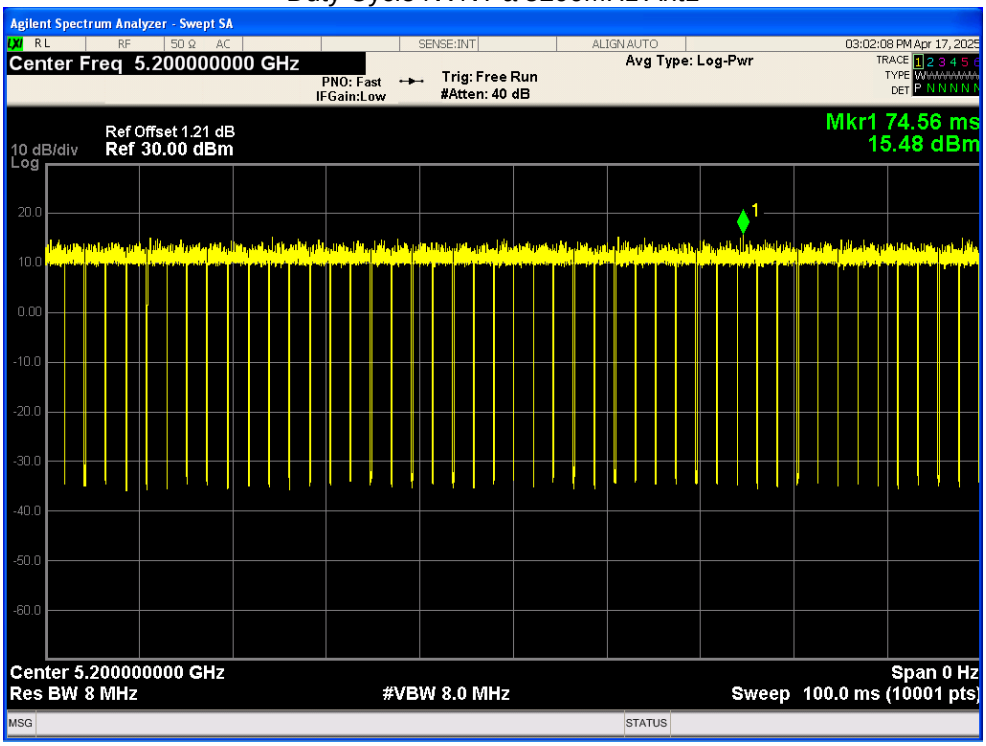
5.1.1 DUTY CYCLE

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5180	Ant1	95.63	0.19
NVNT	a	5200	Ant1	95.57	0.2
NVNT	a	5240	Ant1	95.83	0.18
NVNT	ac20	5180	Ant1	95.57	0.2
NVNT	ac20	5200	Ant1	95.68	0.19
NVNT	ac20	5240	Ant1	95.86	0.18
NVNT	ac40	5190	Ant1	91.52	0.38
NVNT	ac40	5230	Ant1	90.78	0.42
NVNT	ac80	5210	Ant1	83.82	0.77
NVNT	n20	5180	Ant1	95.13	0.22
NVNT	n20	5200	Ant1	95.04	0.22
NVNT	n20	5240	Ant1	95.23	0.21
NVNT	n40	5190	Ant1	91.29	0.4
NVNT	n40	5230	Ant1	91.26	0.4

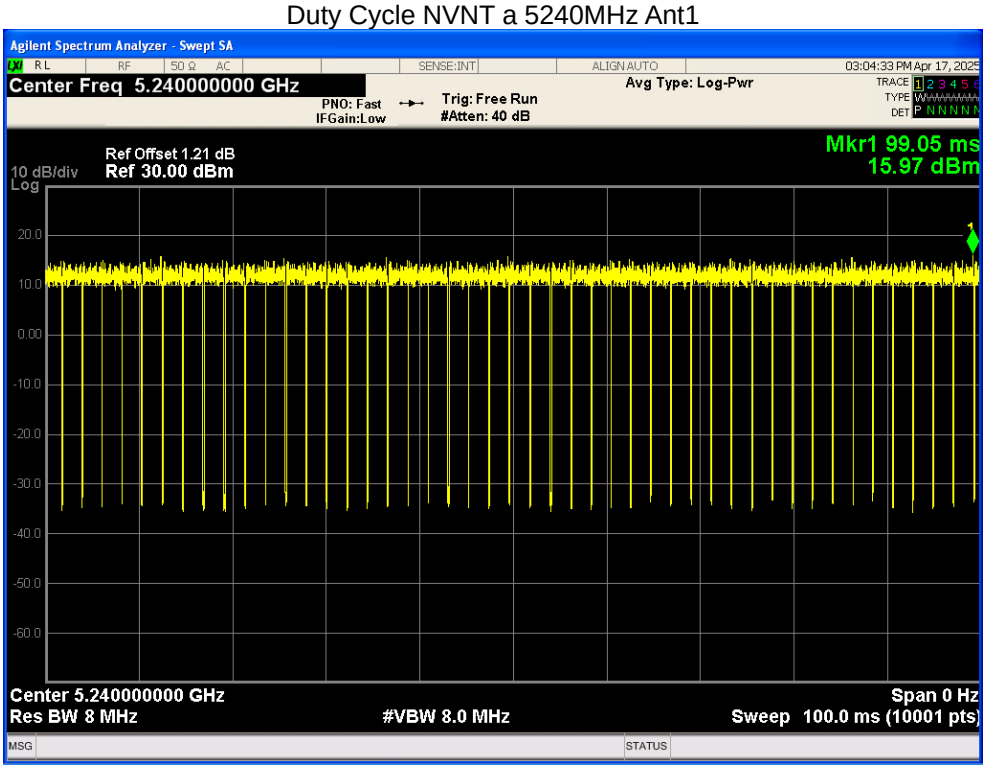
Duty Cycle NVNT a 5180MHz Ant1



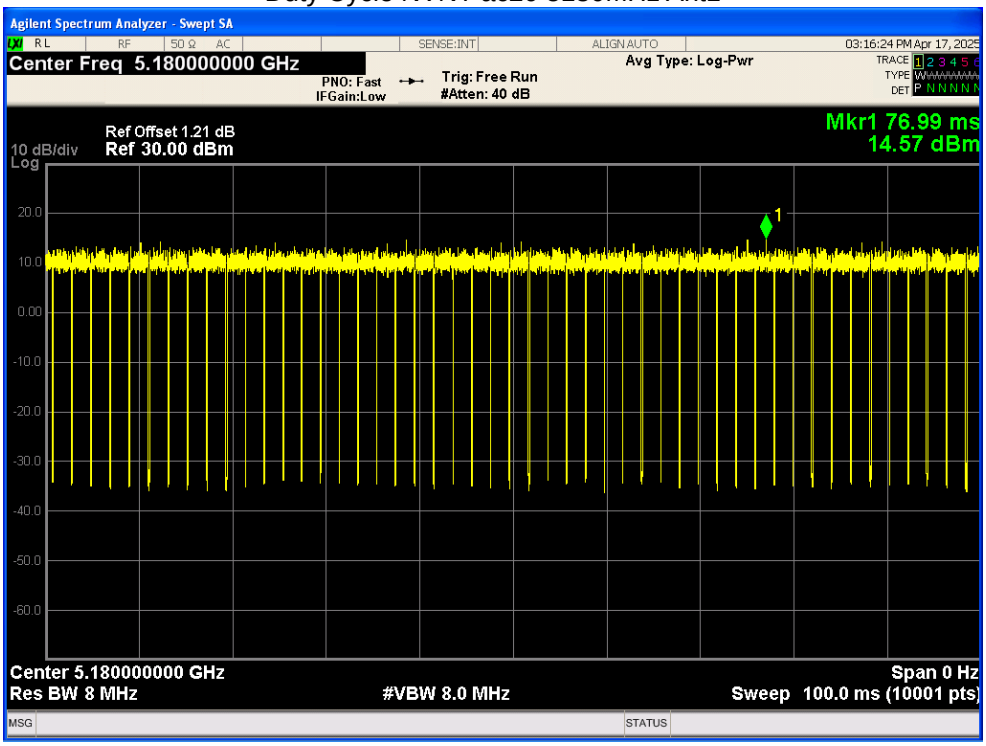
Duty Cycle NVNT a 5200MHz Ant1



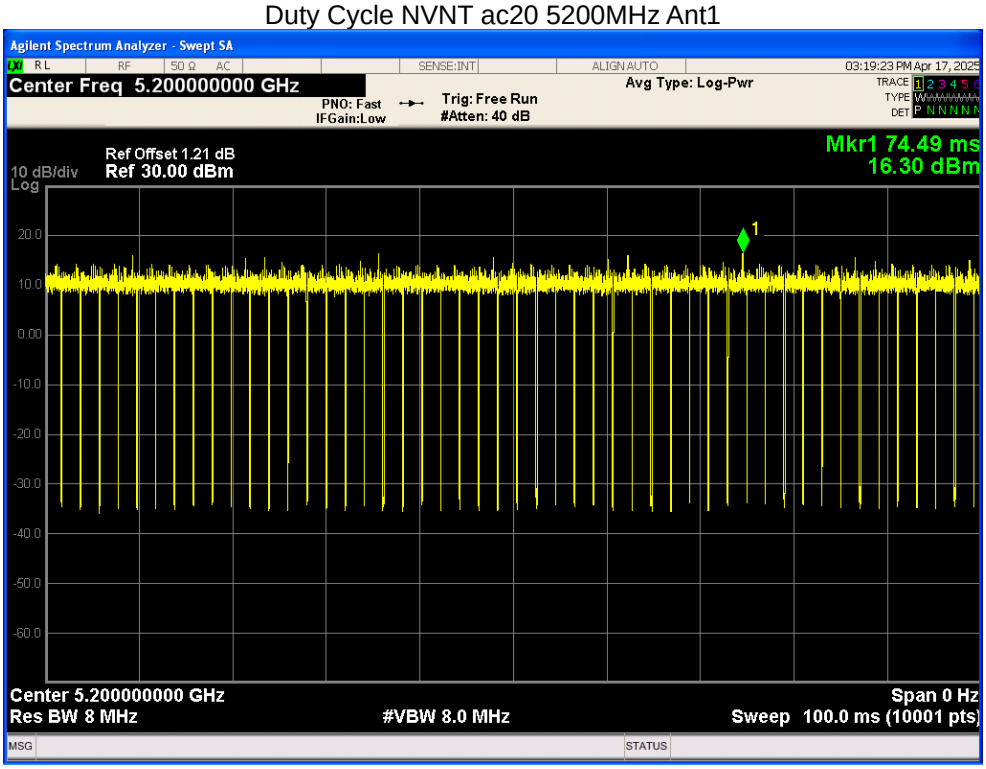
Duty Cycle NVNT a 5240MHz Ant1



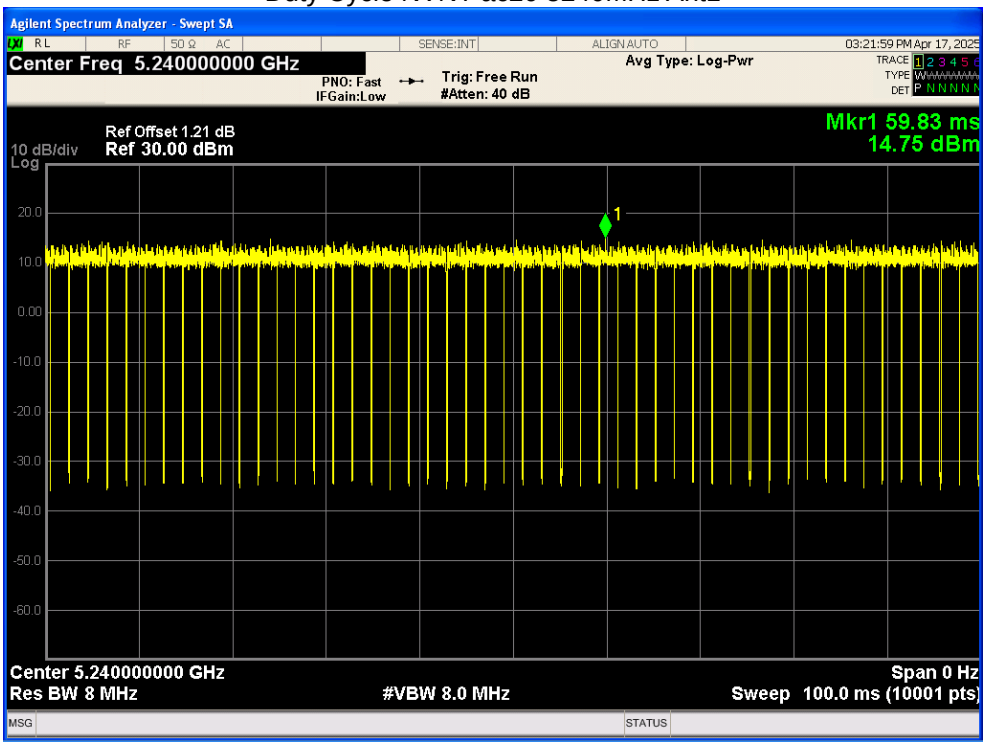
Duty Cycle NVNT ac20 5180MHz Ant1



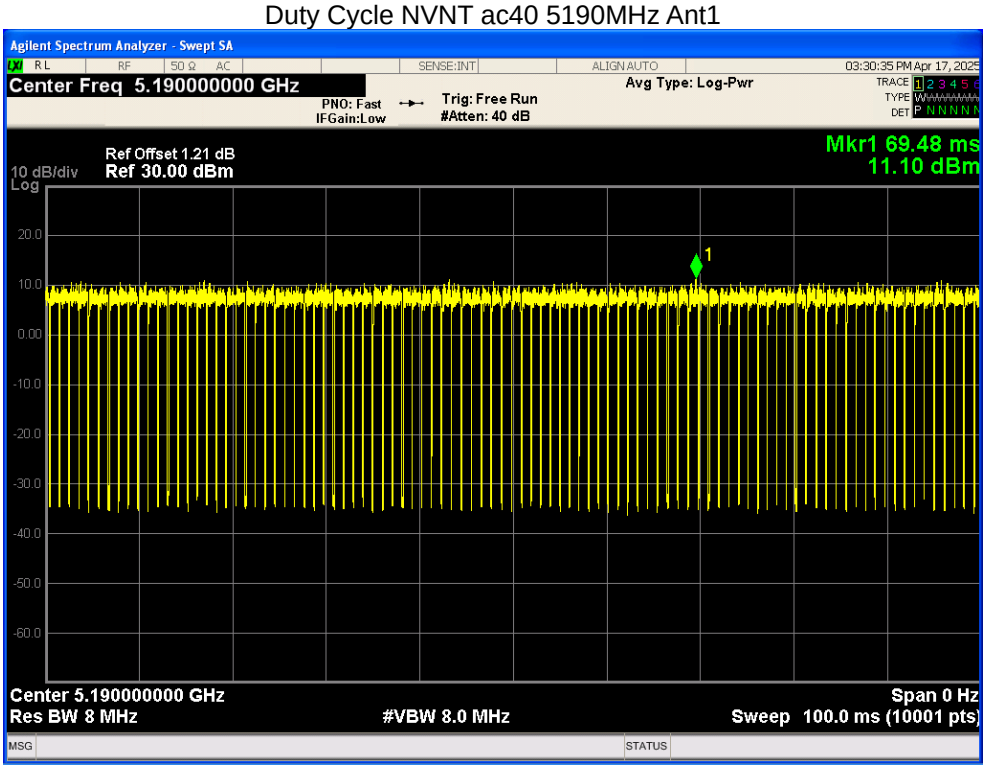
Duty Cycle NVNT ac20 5200MHz Ant1



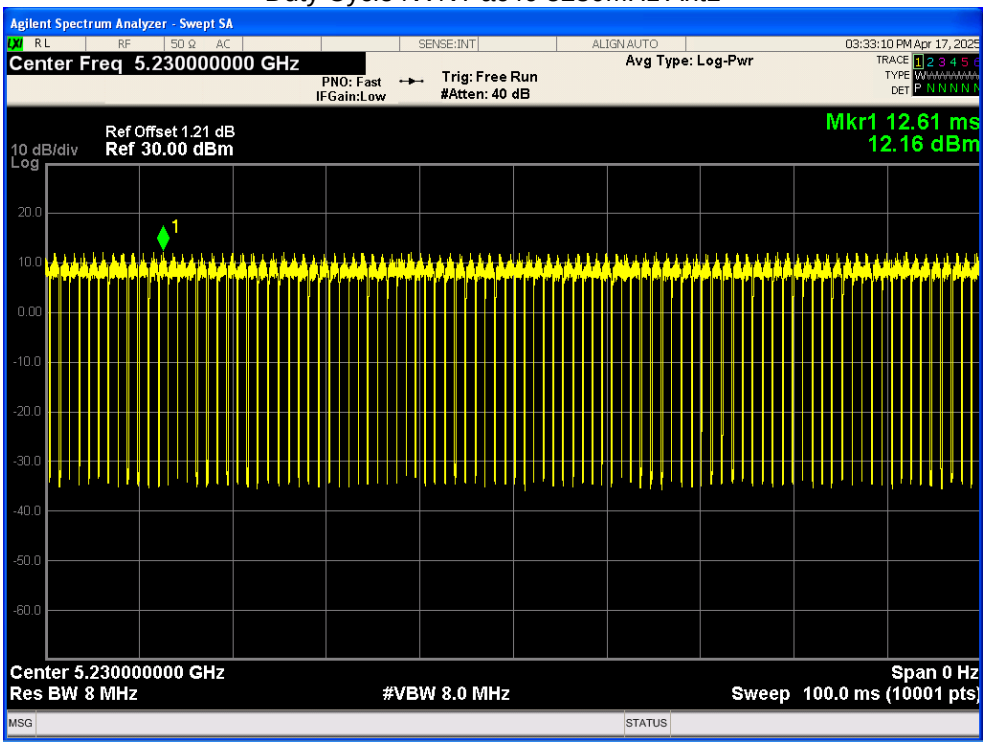
Duty Cycle NVNT ac20 5240MHz Ant1



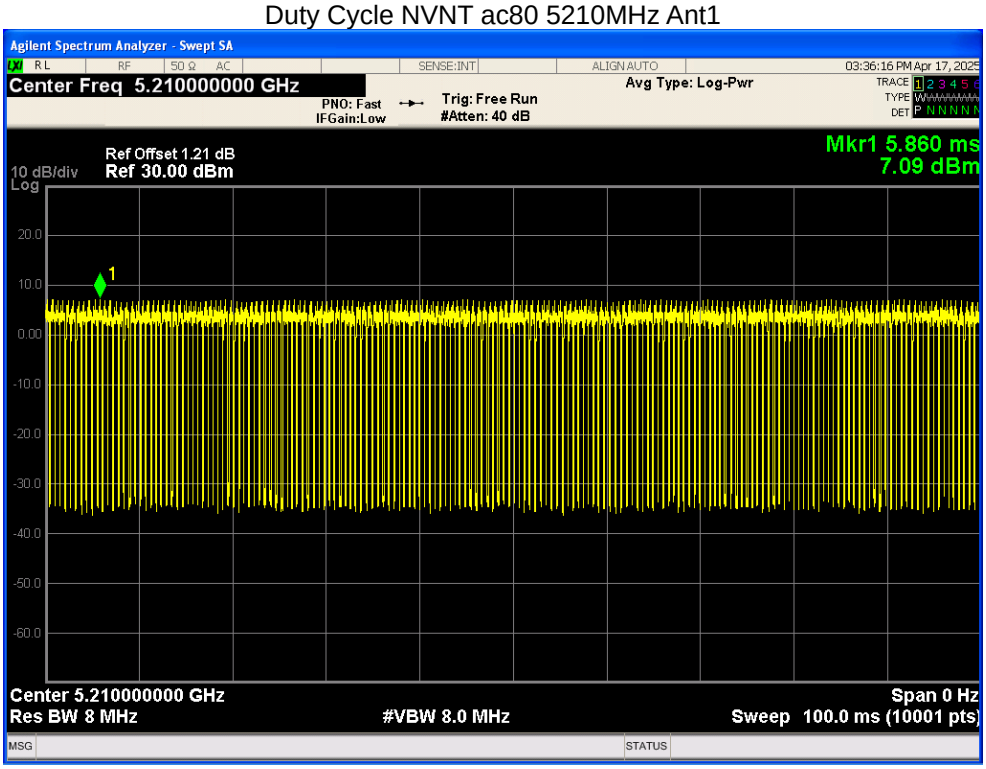
Duty Cycle NVNT ac40 5190MHz Ant1



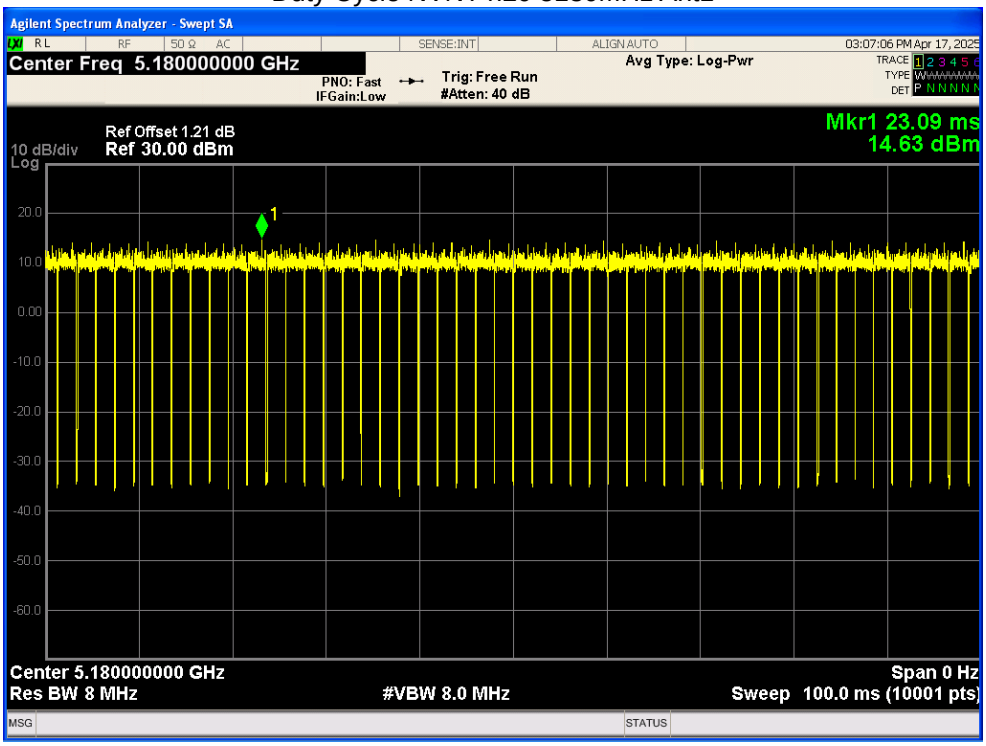
Duty Cycle NVNT ac40 5230MHz Ant1



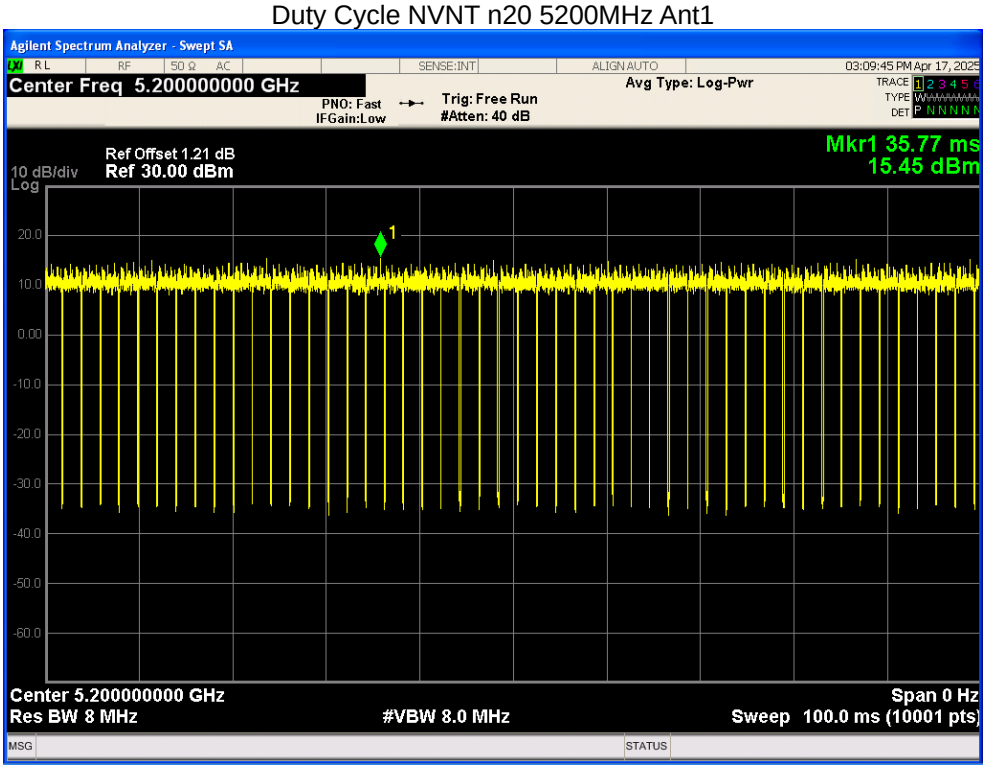
Duty Cycle NVNT ac80 5210MHz Ant1



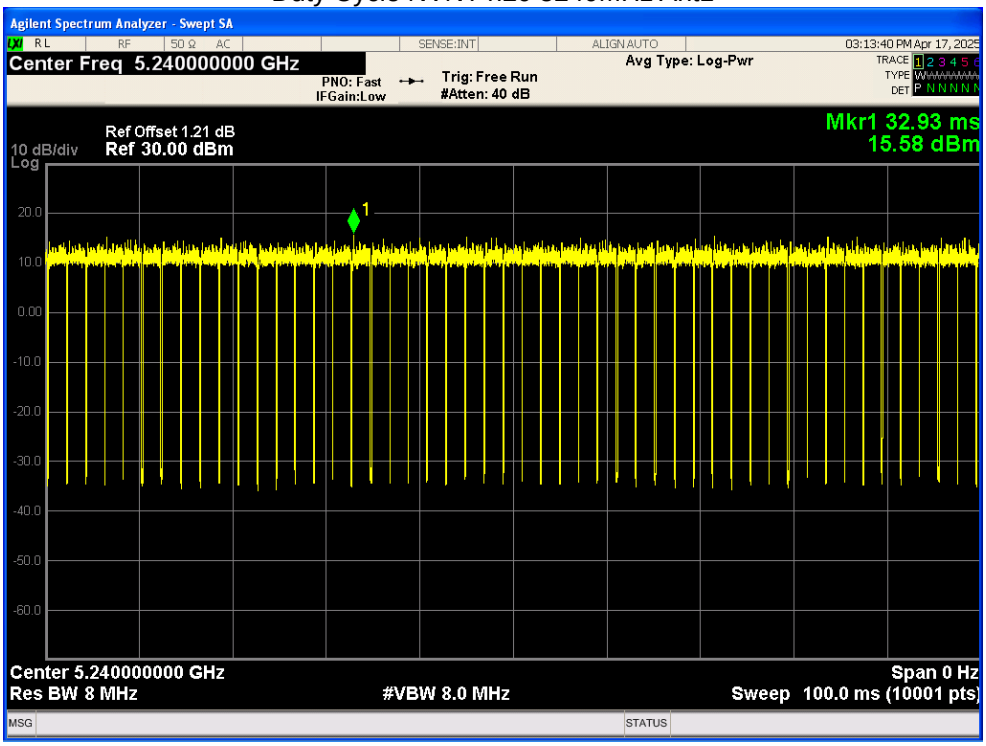
Duty Cycle NVNT n20 5180MHz Ant1



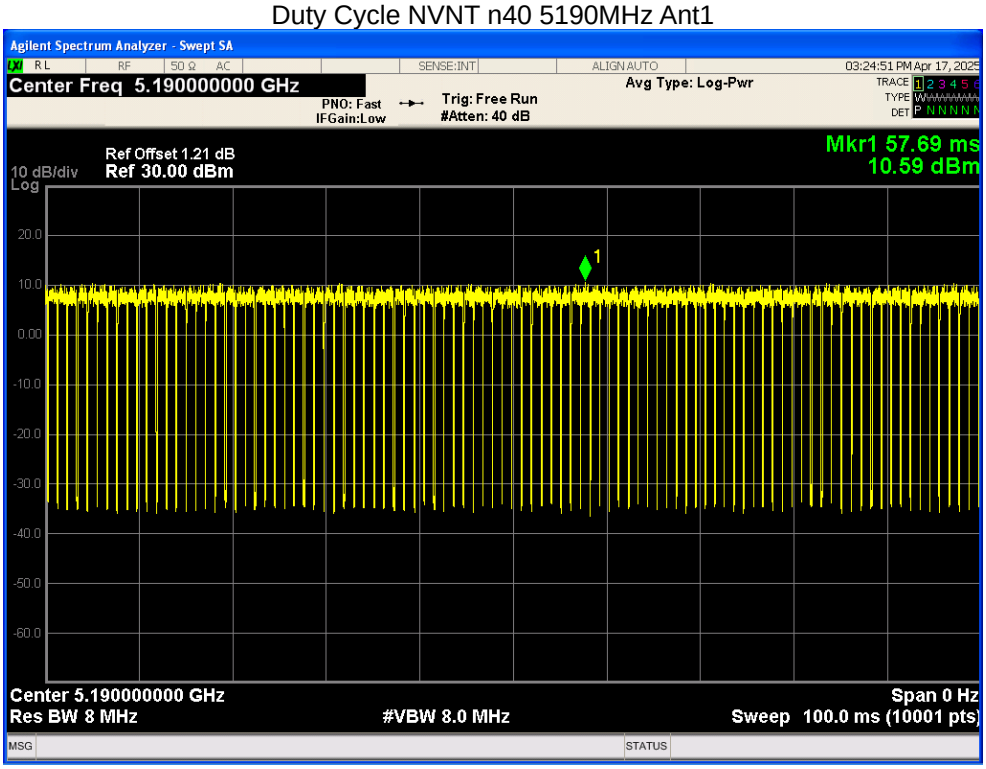
Duty Cycle NVNT n20 5200MHz Ant1



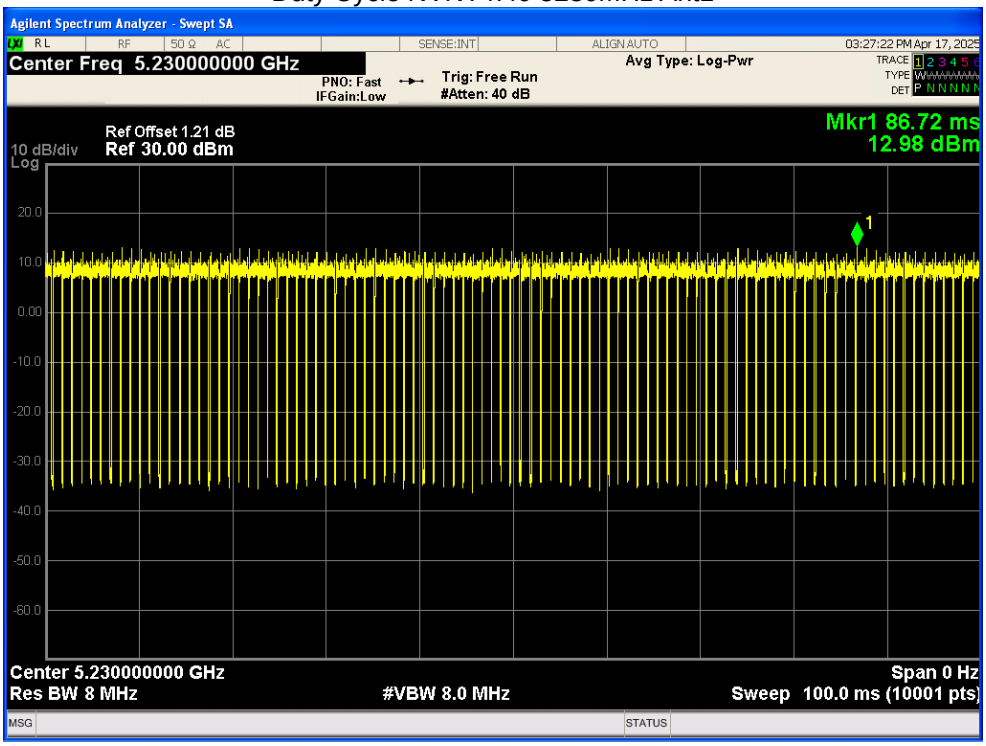
Duty Cycle NVNT n20 5240MHz Ant1



Duty Cycle NVNT n40 5190MHz Ant1



Duty Cycle NVNT n40 5230MHz Ant1



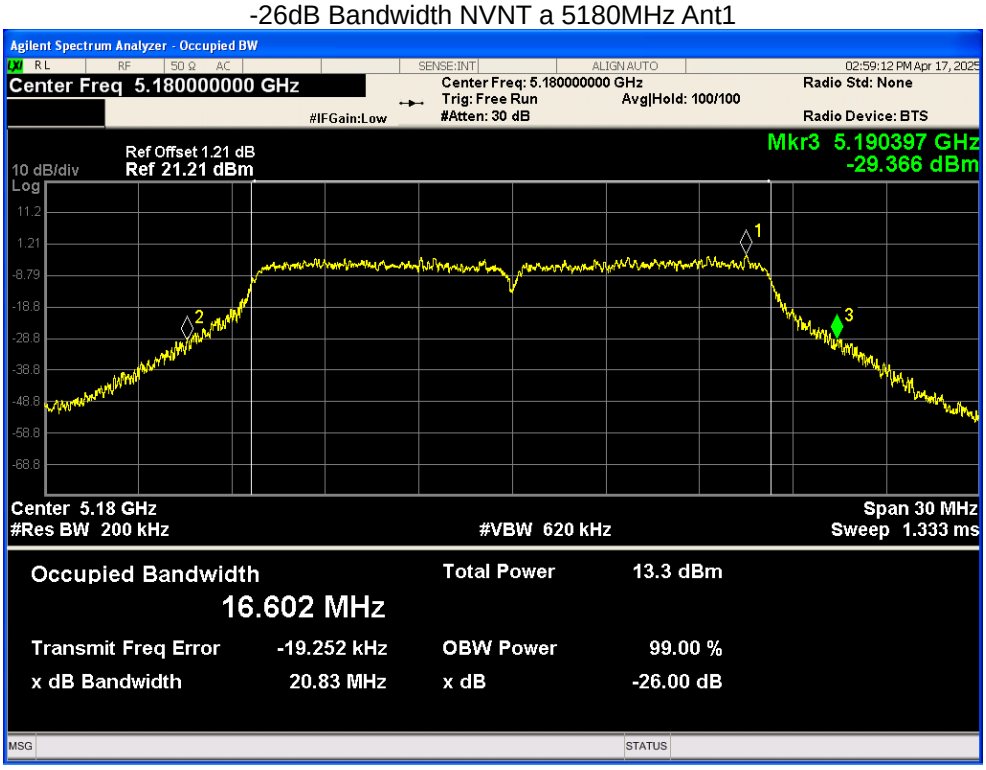
5.1.2 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	7.704	24	Pass
NVNT	a	5200	Ant1	7.719	24	Pass
NVNT	a	5240	Ant1	8.058	24	Pass
NVNT	ac20	5180	Ant1	6.613	24	Pass
NVNT	ac20	5200	Ant1	7.035	24	Pass
NVNT	ac20	5240	Ant1	7.615	24	Pass
NVNT	ac40	5190	Ant1	7.032	24	Pass
NVNT	ac40	5230	Ant1	7.705	24	Pass
NVNT	ac80	5210	Ant1	7.063	24	Pass
NVNT	n20	5180	Ant1	6.803	24	Pass
NVNT	n20	5200	Ant1	7.192	24	Pass
NVNT	n20	5240	Ant1	7.812	24	Pass
NVNT	n40	5190	Ant1	7.076	24	Pass
NVNT	n40	5230	Ant1	7.731	24	Pass

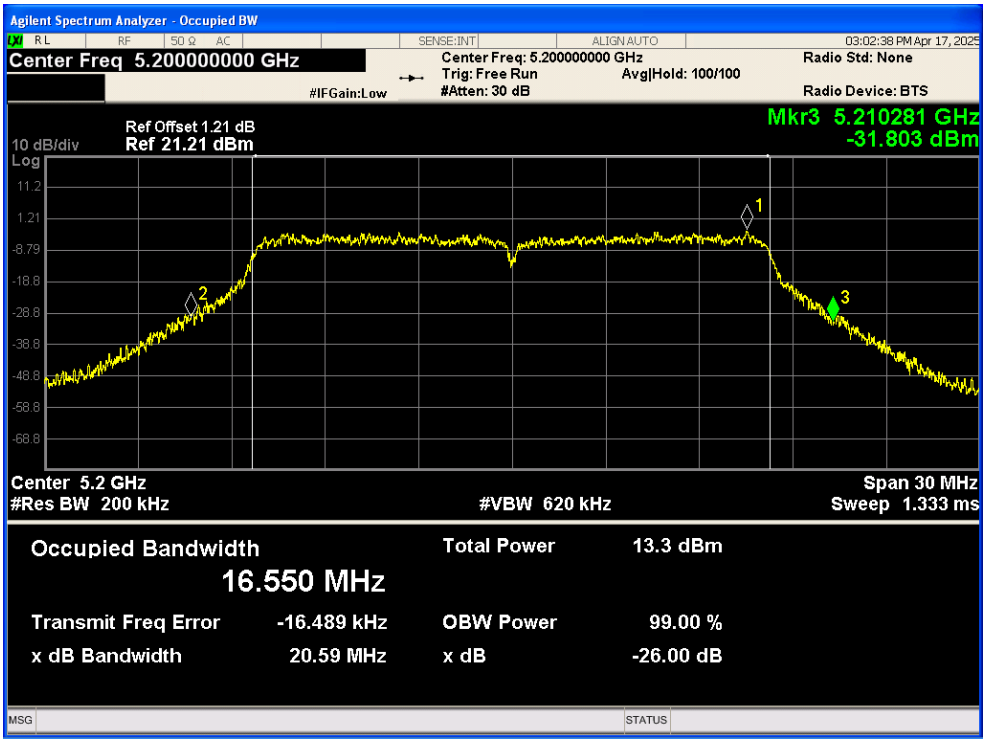
5.1.3 -26DB BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	Ant1	20.832	Pass
NVNT	a	5200	Ant1	20.595	Pass
NVNT	a	5240	Ant1	20.552	Pass
NVNT	ac20	5180	Ant1	20.976	Pass
NVNT	ac20	5200	Ant1	21.339	Pass
NVNT	ac20	5240	Ant1	21.193	Pass
NVNT	ac40	5190	Ant1	42.454	Pass
NVNT	ac40	5230	Ant1	41.87	Pass
NVNT	ac80	5210	Ant1	81.667	Pass
NVNT	n20	5180	Ant1	20.779	Pass
NVNT	n20	5200	Ant1	21.551	Pass
NVNT	n20	5240	Ant1	20.684	Pass
NVNT	n40	5190	Ant1	41.699	Pass
NVNT	n40	5230	Ant1	41.449	Pass

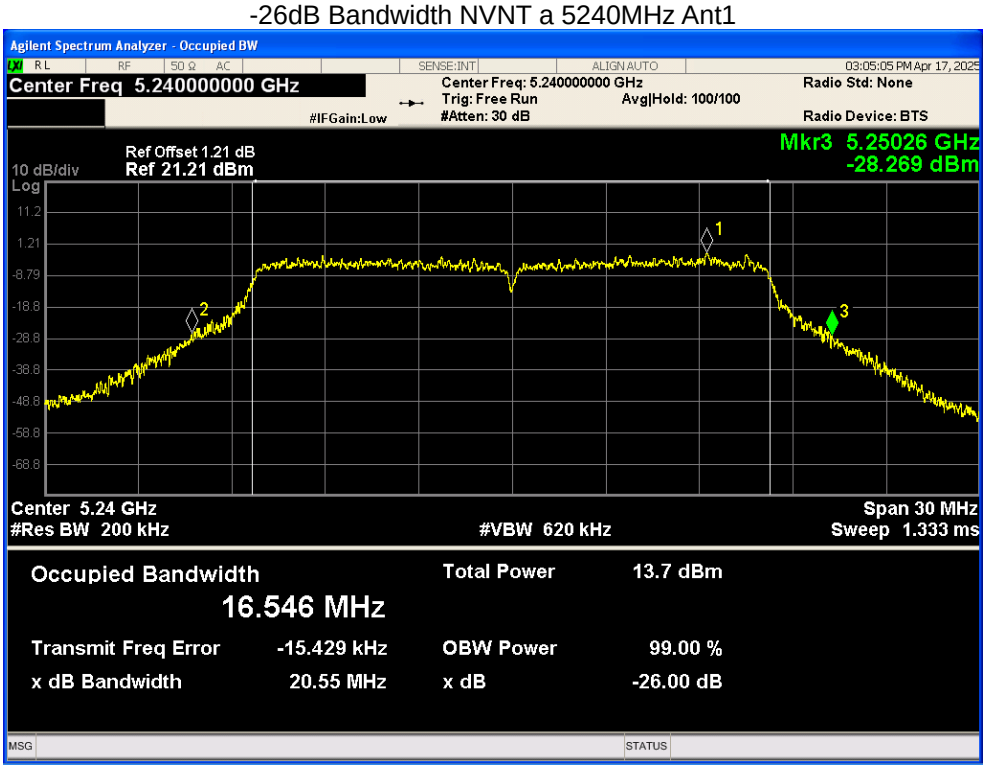
-26dB Bandwidth NVNT a 5180MHz Ant1



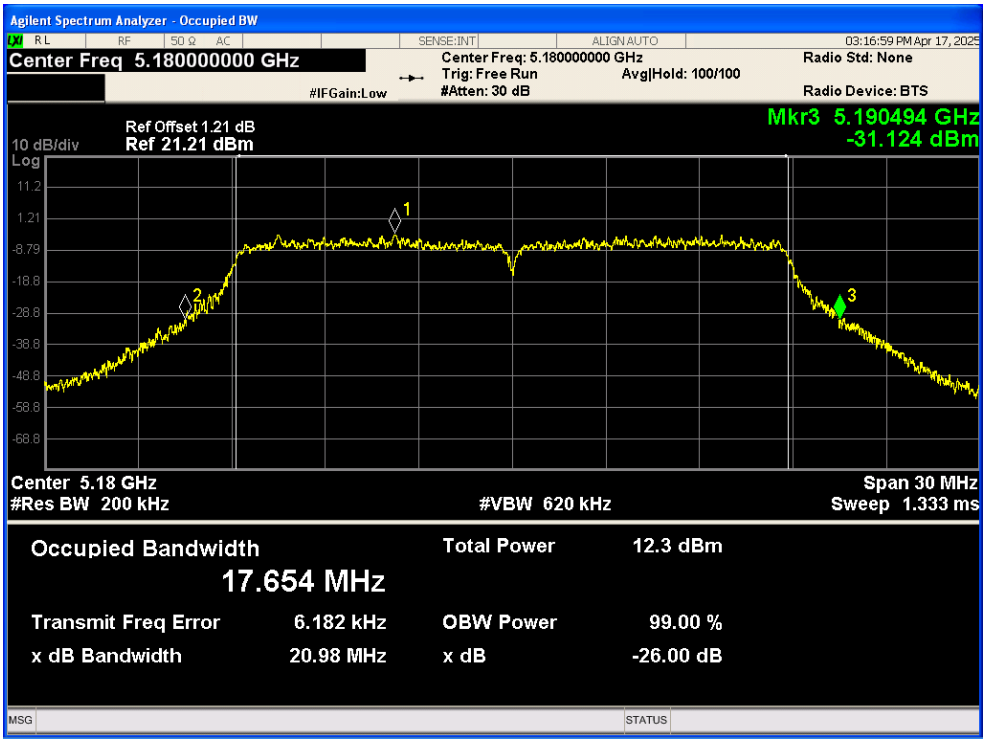
-26dB Bandwidth NVNT a 5200MHz Ant1



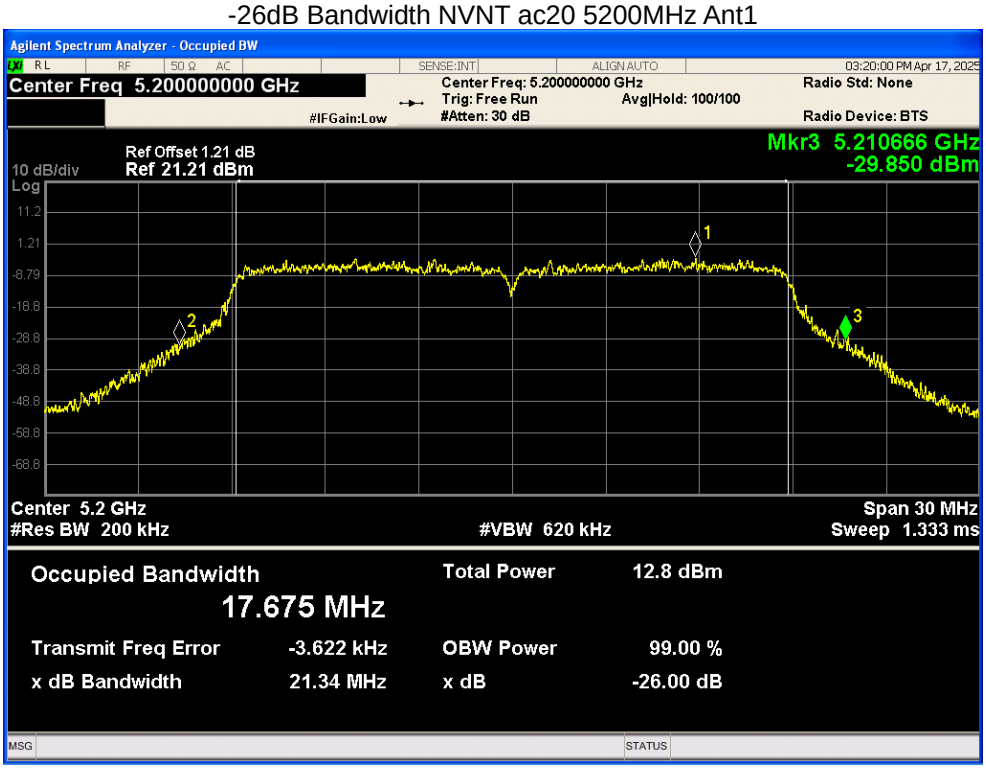
-26dB Bandwidth NVNT a 5240MHz Ant1



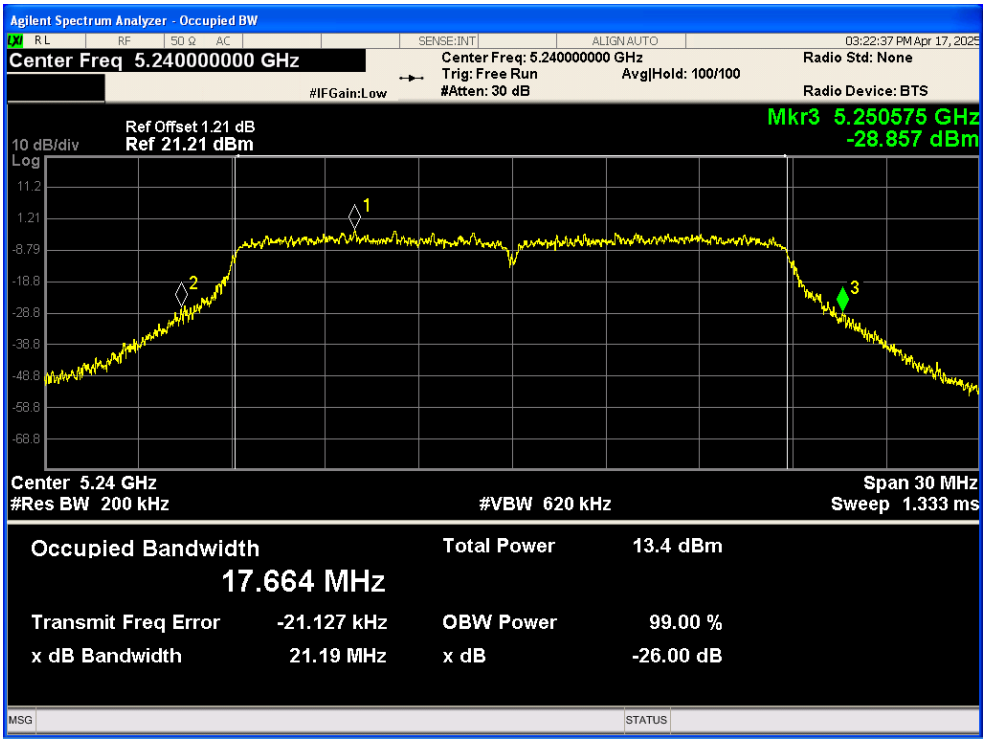
-26dB Bandwidth NVNT ac20 5180MHz Ant1



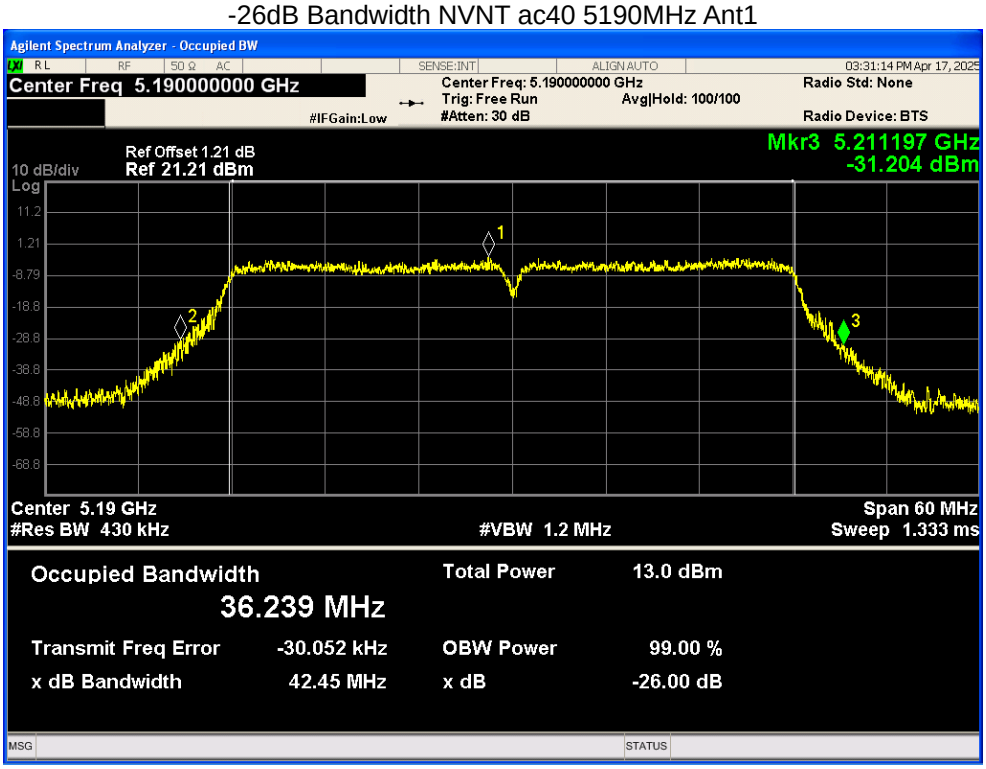
-26dB Bandwidth NVNT ac20 5200MHz Ant1



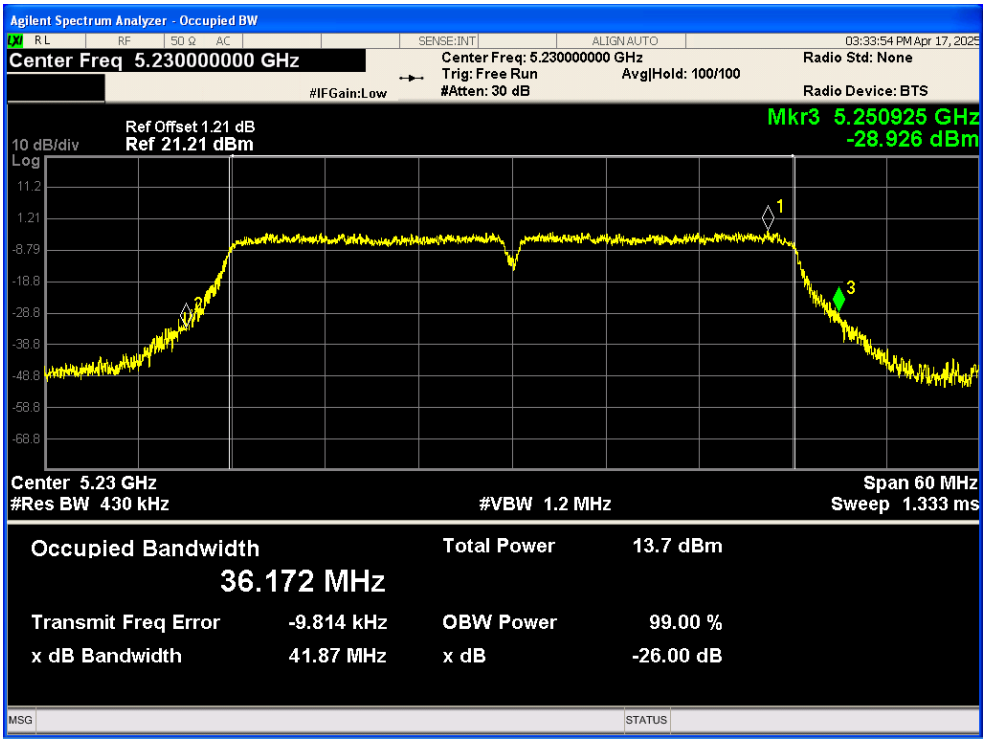
-26dB Bandwidth NVNT ac20 5240MHz Ant1



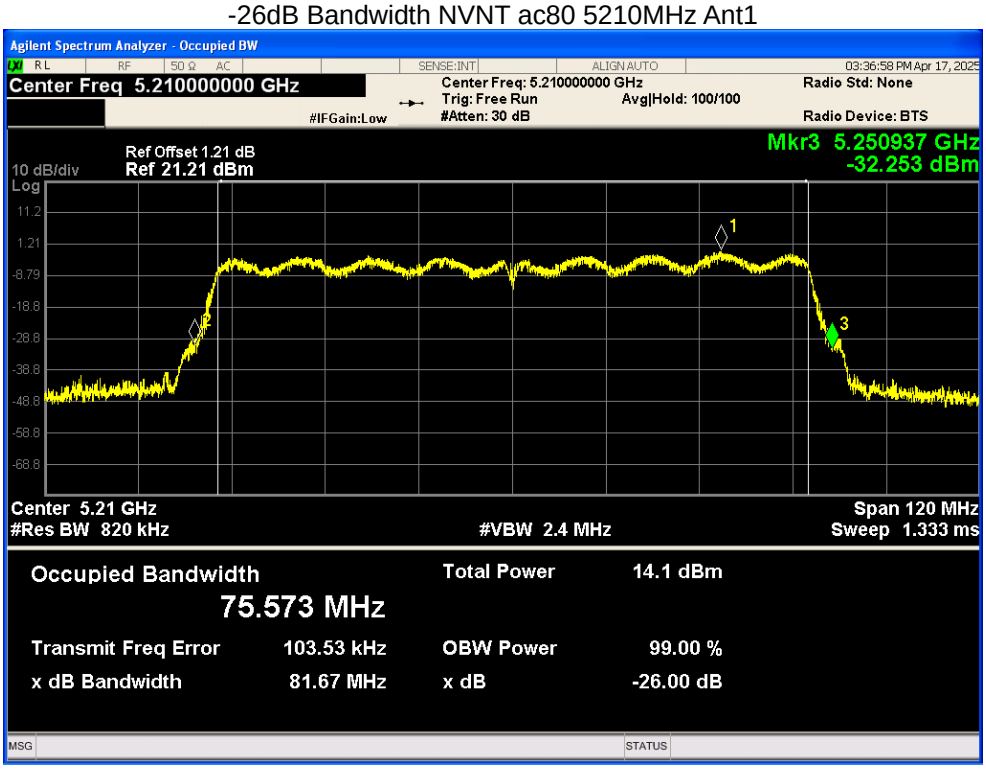
-26dB Bandwidth NVNT ac40 5190MHz Ant1



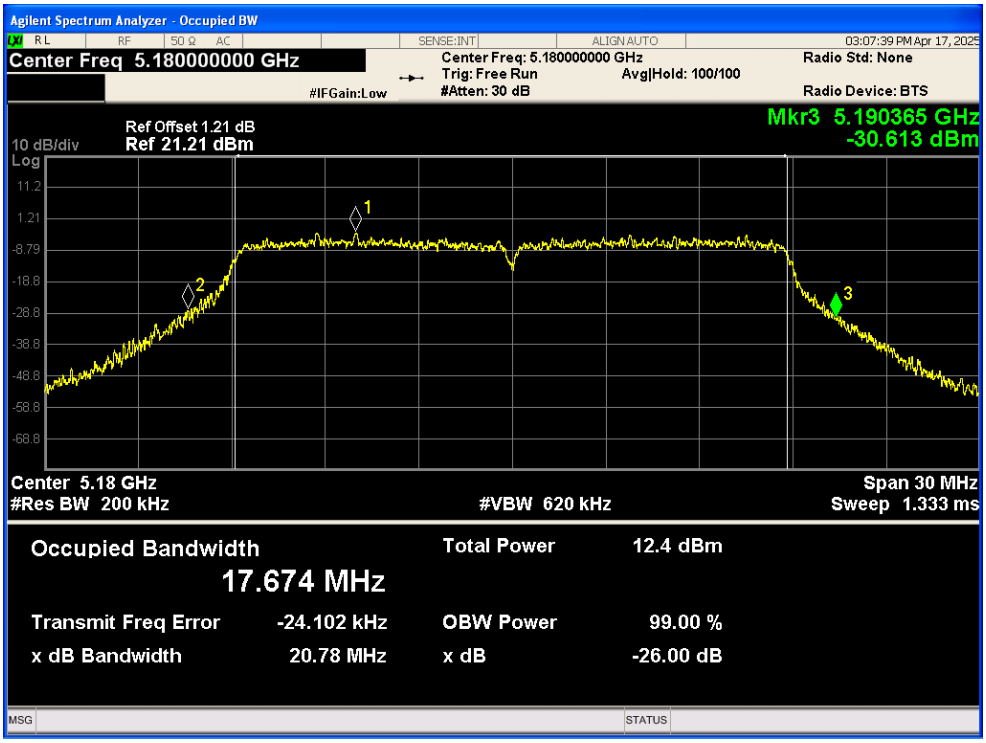
-26dB Bandwidth NVNT ac40 5230MHz Ant1



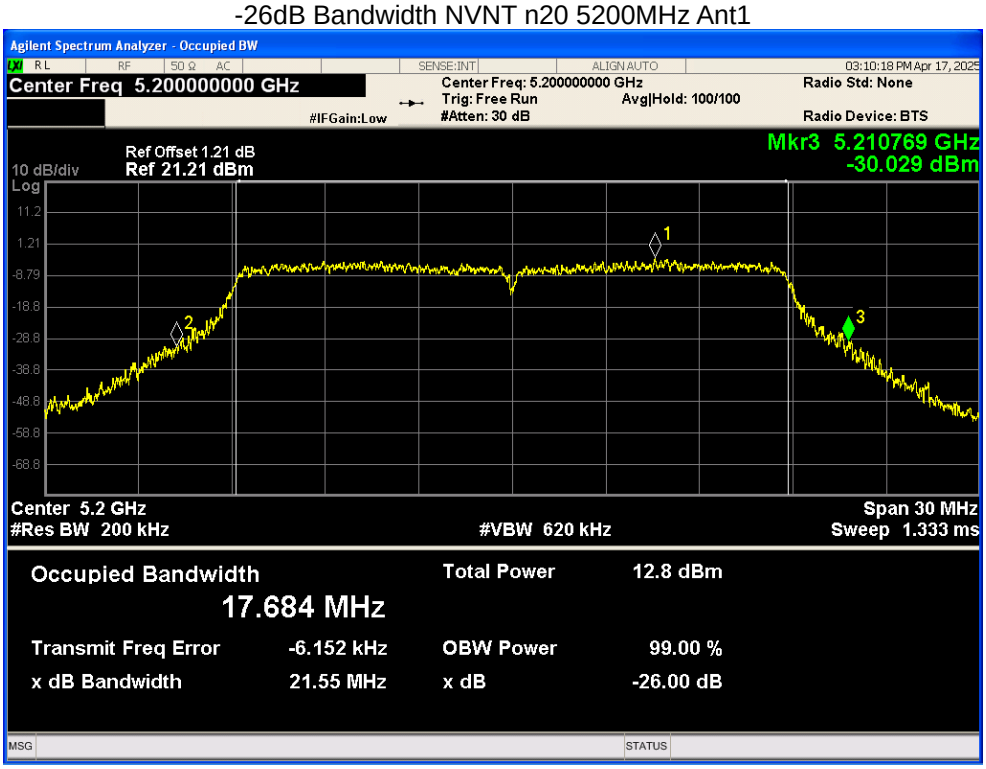
-26dB Bandwidth NVNT ac80 5210MHz Ant1



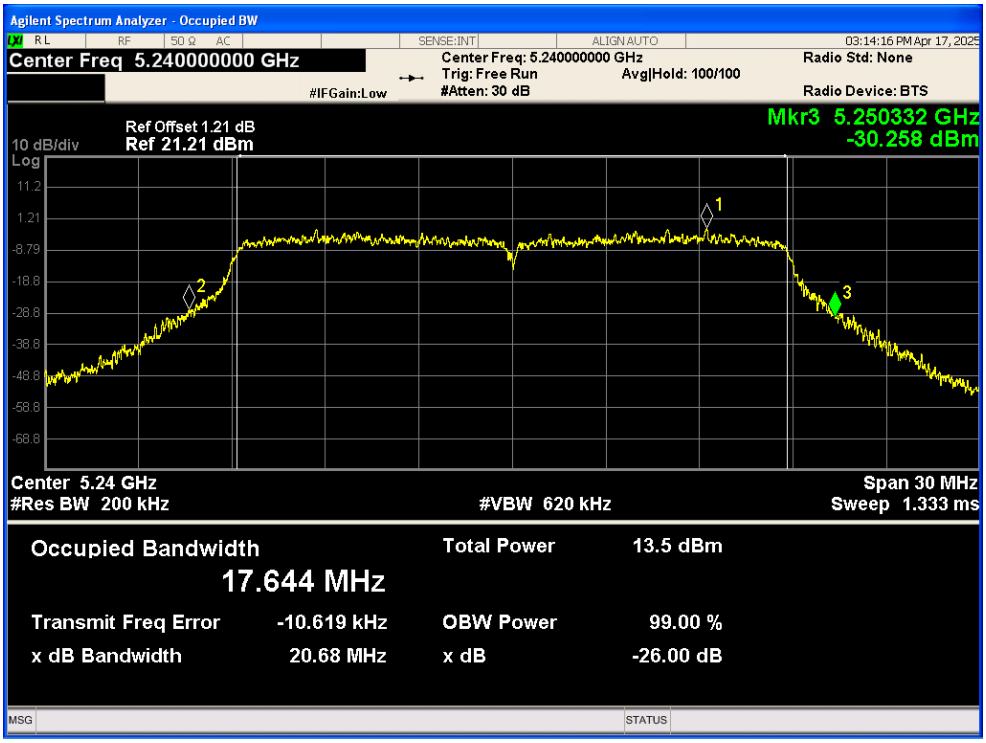
-26dB Bandwidth NVNT n20 5180MHz Ant1



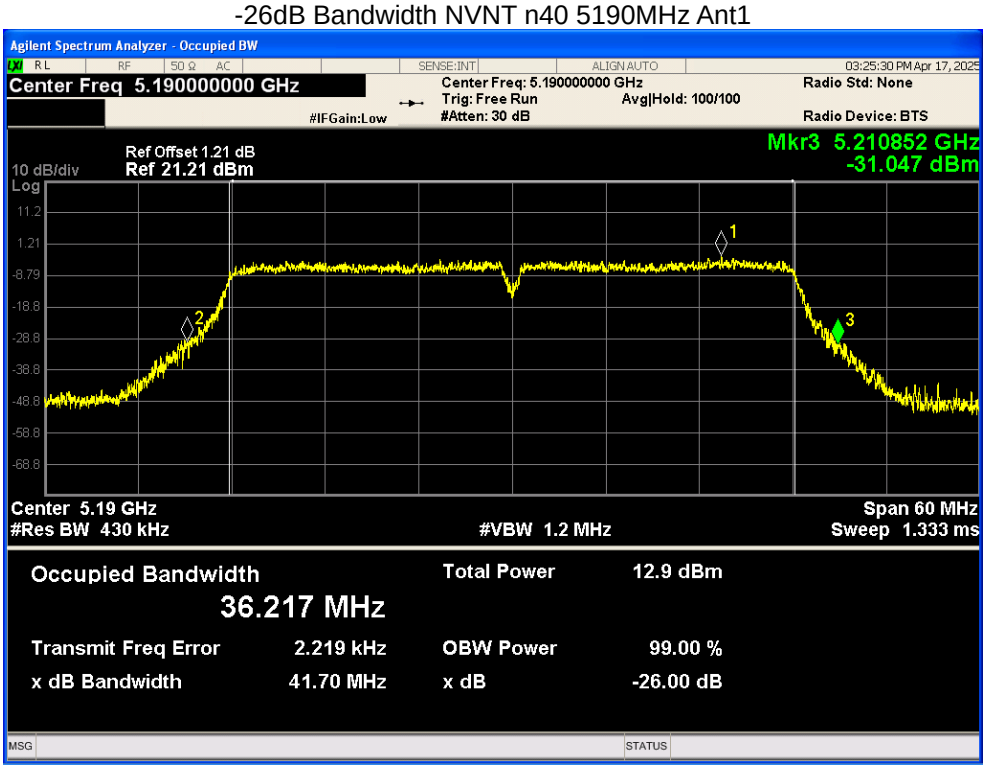
-26dB Bandwidth NVNT n20 5200MHz Ant1



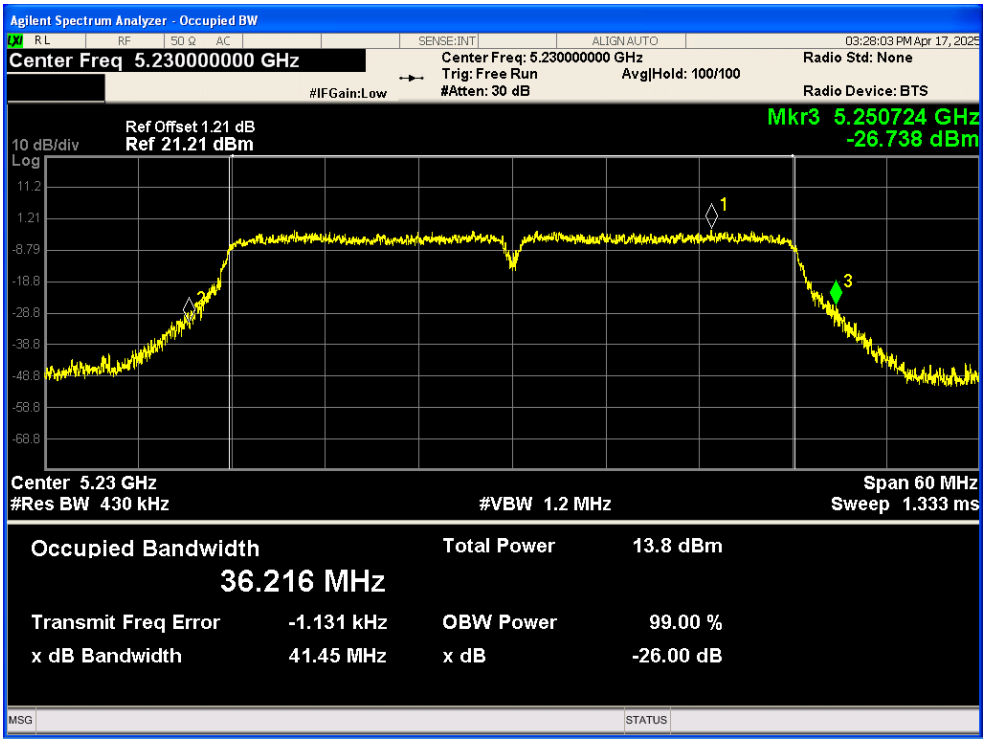
-26dB Bandwidth NVNT n20 5240MHz Ant1



-26dB Bandwidth NVNT n40 5190MHz Ant1



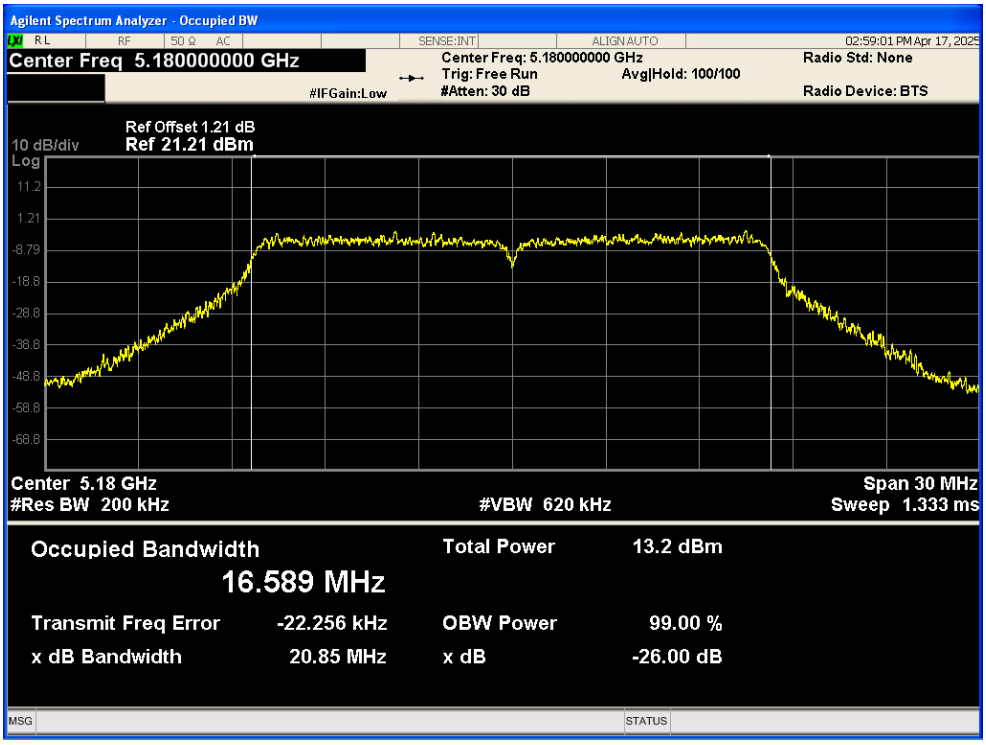
-26dB Bandwidth NVNT n40 5230MHz Ant1



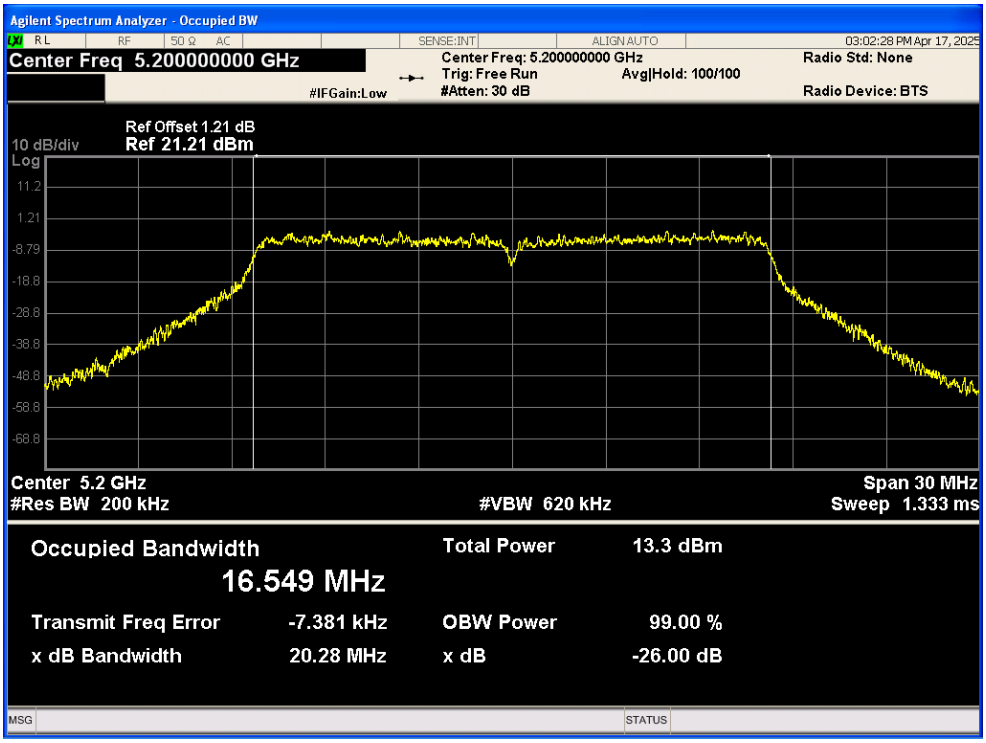
5.1.4 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	a	5180	Ant1	16.589
NVNT	a	5200	Ant1	16.549
NVNT	a	5240	Ant1	16.533
NVNT	ac20	5180	Ant1	17.642
NVNT	ac20	5200	Ant1	17.666
NVNT	ac20	5240	Ant1	17.681
NVNT	ac40	5190	Ant1	36.242
NVNT	ac40	5230	Ant1	36.177
NVNT	ac80	5210	Ant1	75.617
NVNT	n20	5180	Ant1	17.662
NVNT	n20	5200	Ant1	17.664
NVNT	n20	5240	Ant1	17.643
NVNT	n40	5190	Ant1	36.139
NVNT	n40	5230	Ant1	36.194

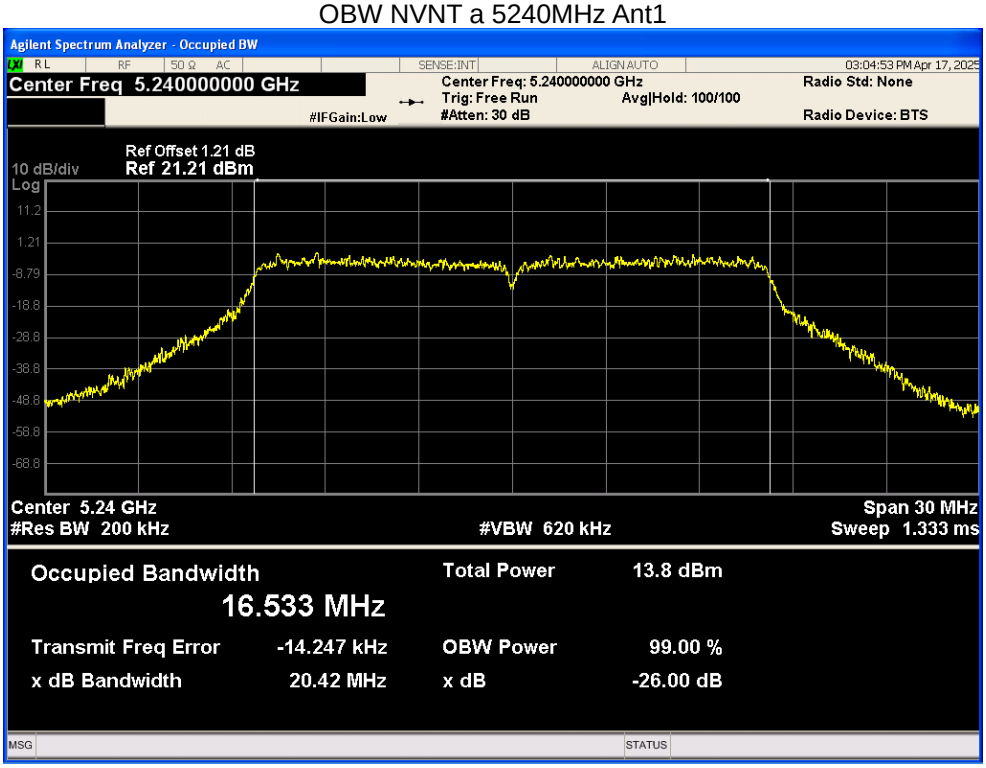
OBW NVNT a 5180MHz Ant1



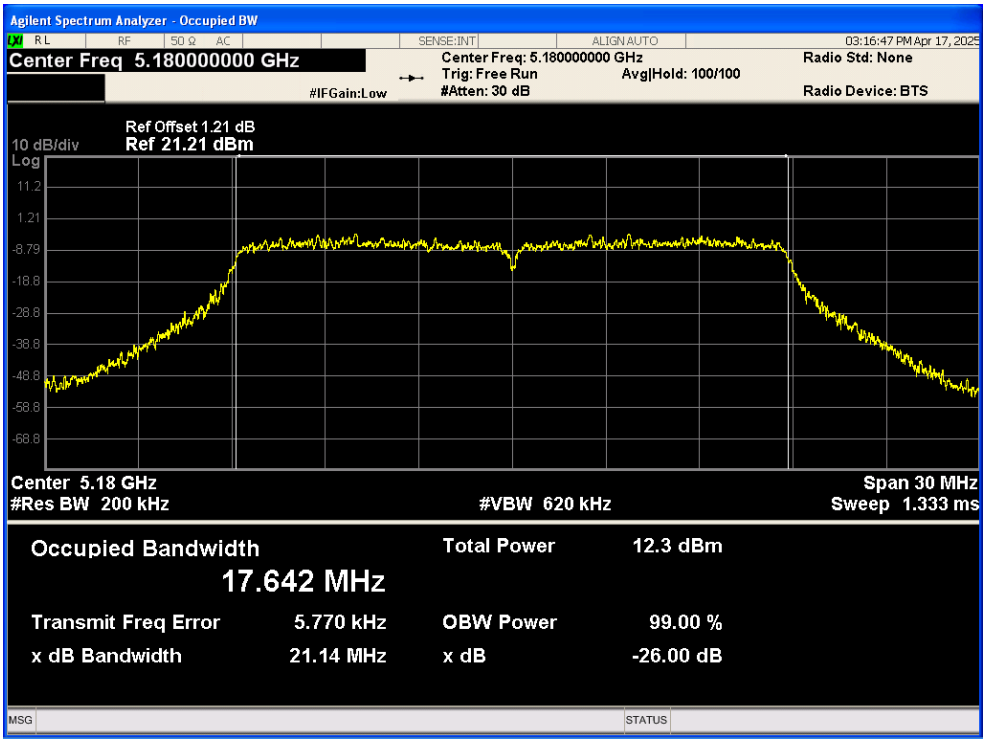
OBW NVNT a 5200MHz Ant1



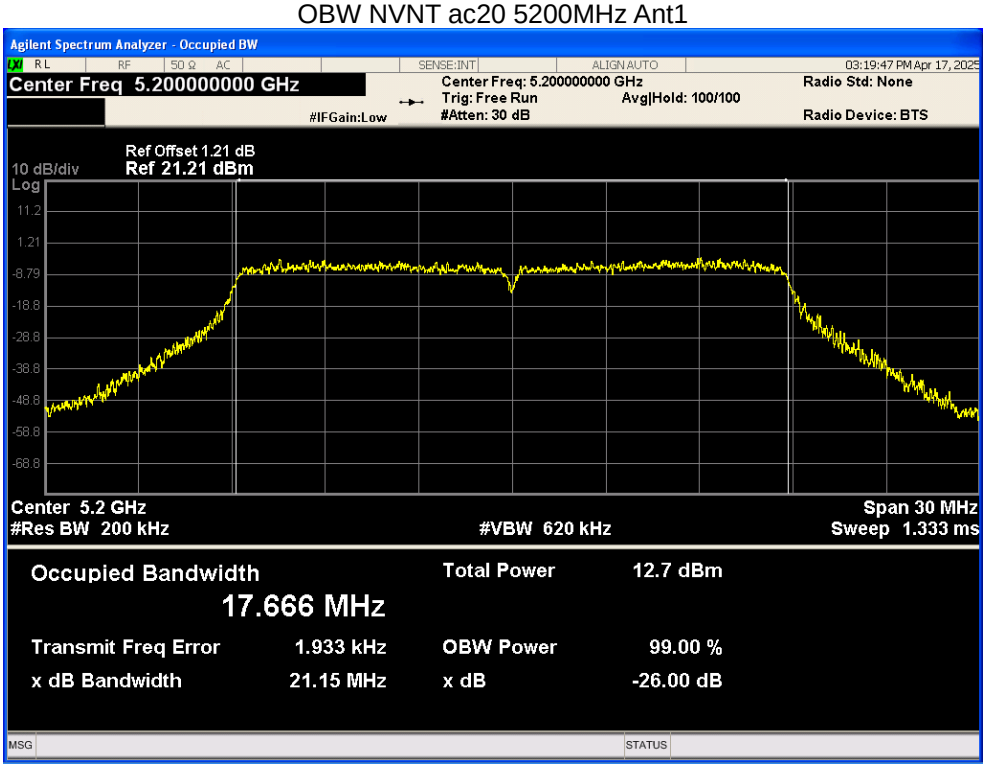
OBW NVNT a 5240MHz Ant1



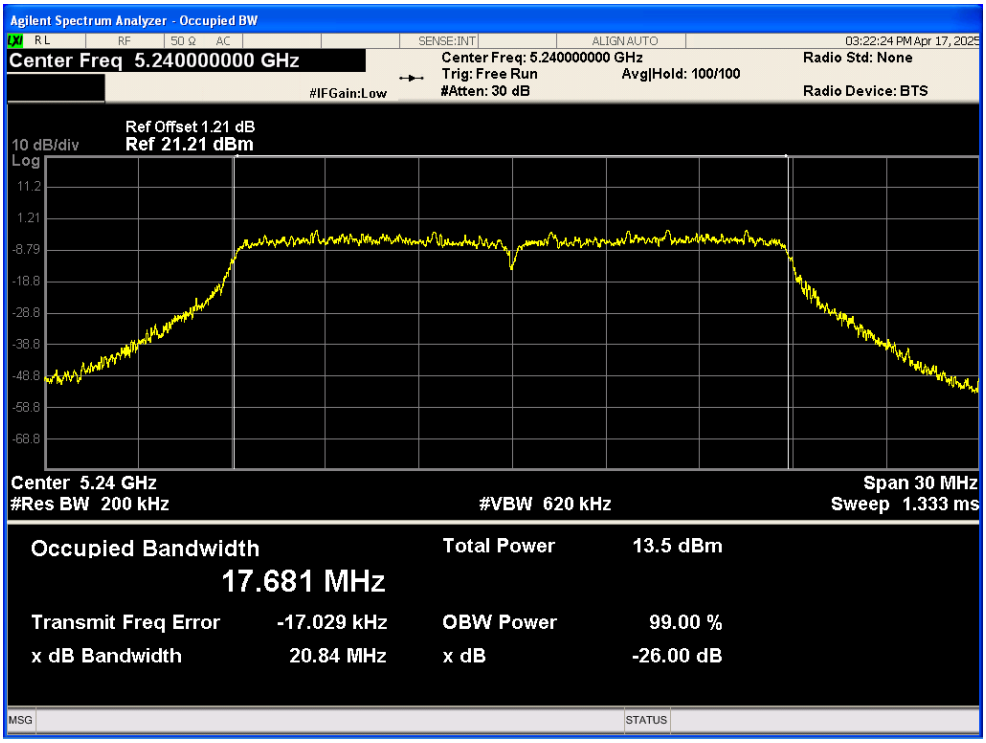
OBW NVNT ac20 5180MHz Ant1



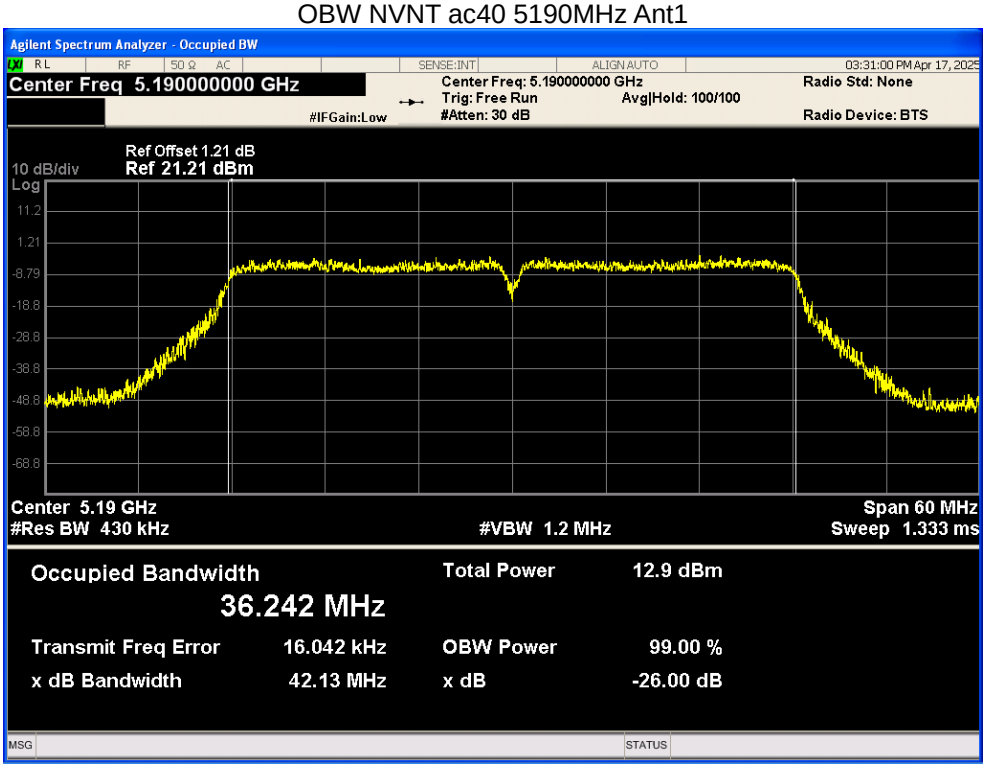
OBW NVNT ac20 5200MHz Ant1



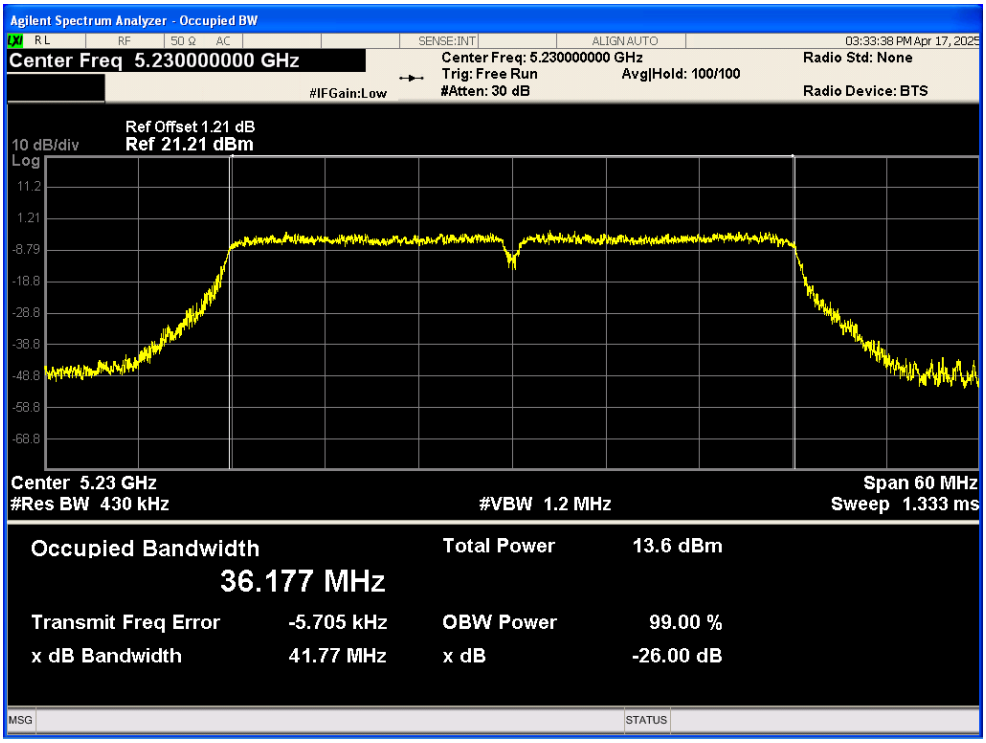
OBW NVNT ac20 5240MHz Ant1



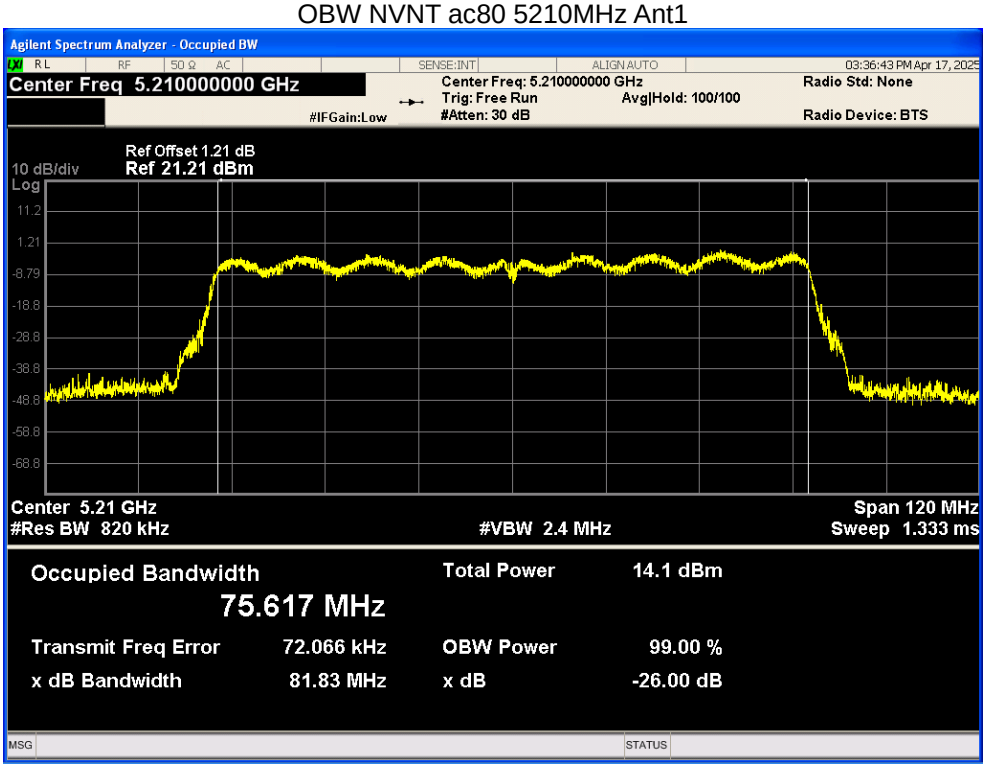
OBW NVNT ac40 5190MHz Ant1



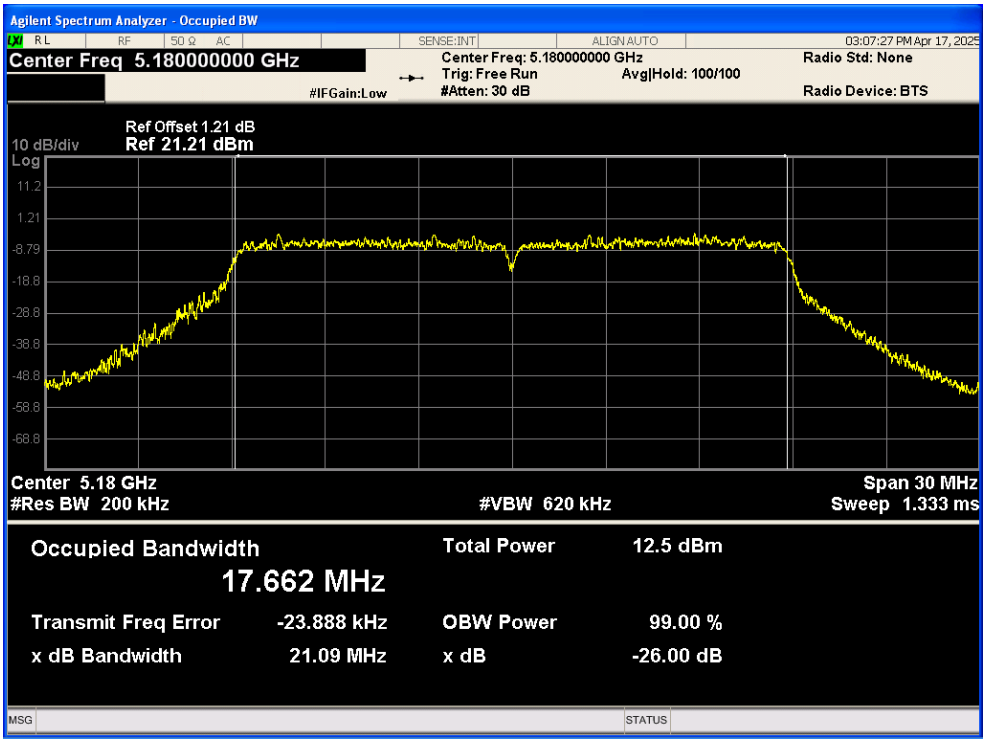
OBW NVNT ac40 5230MHz Ant1



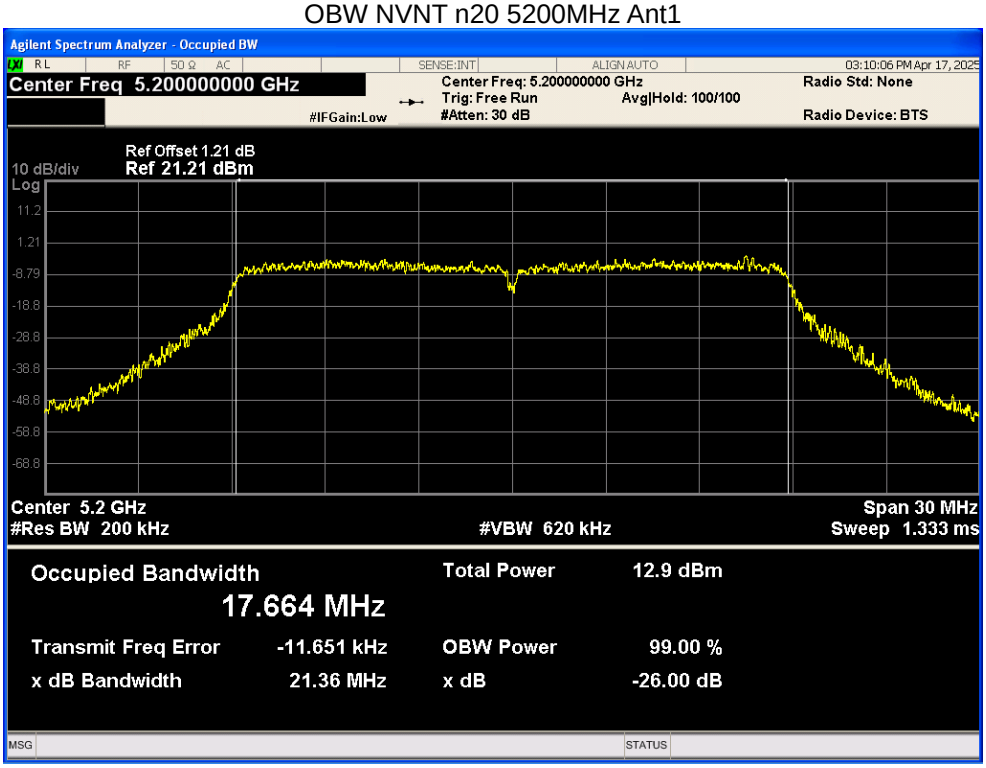
OBW NVNT ac80 5210MHz Ant1



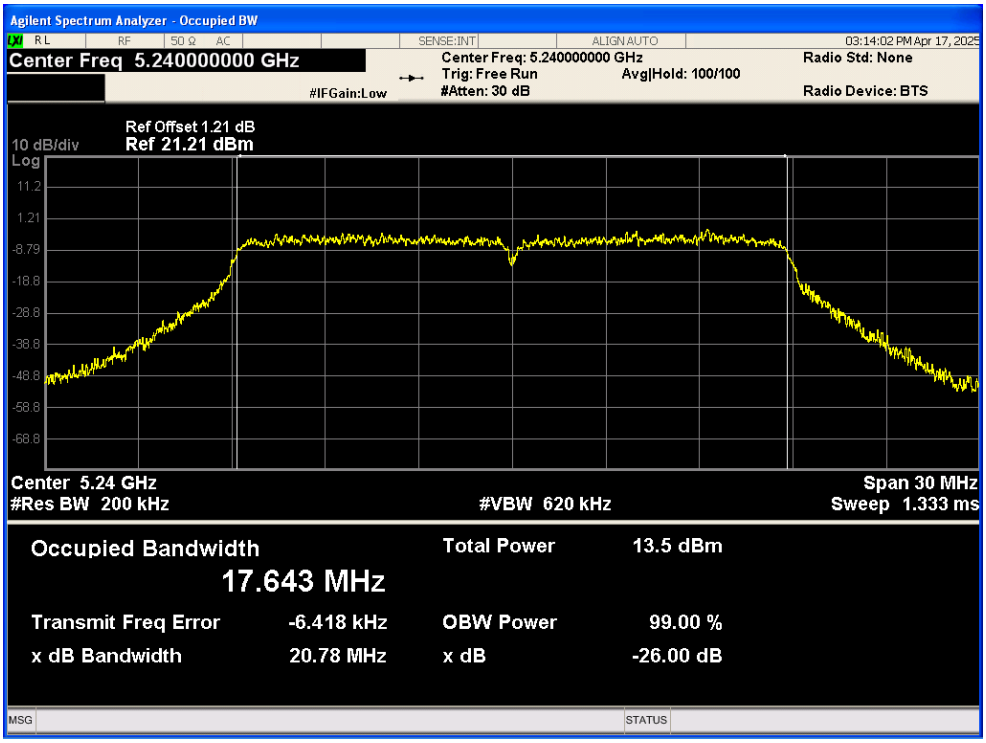
OBW NVNT n20 5180MHz Ant1



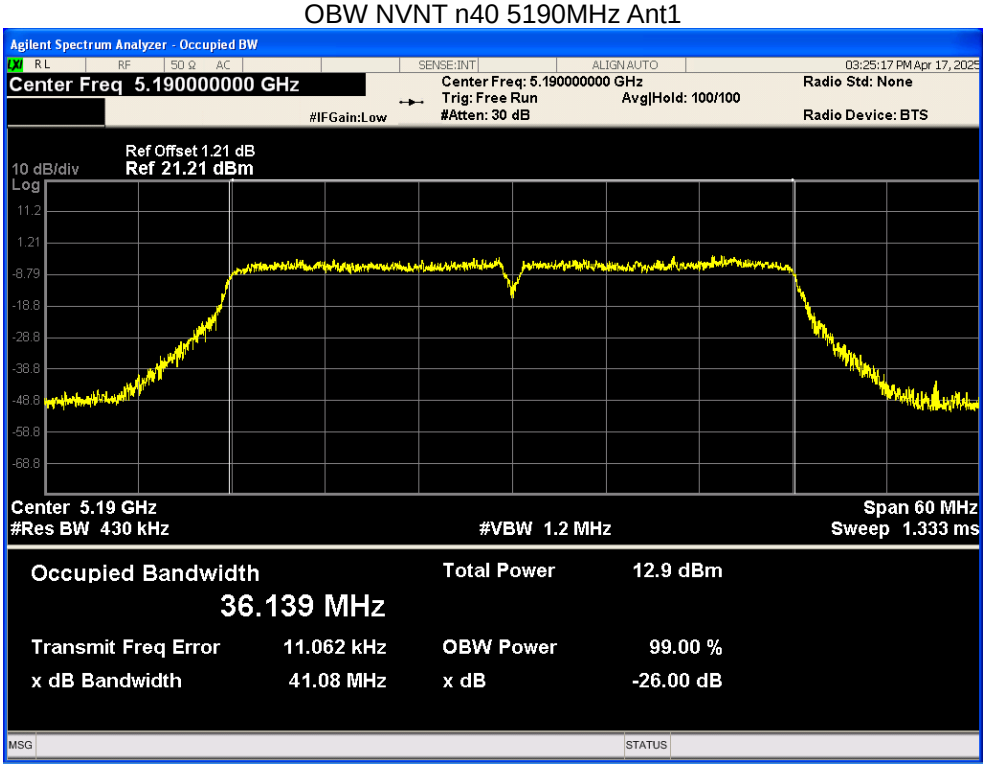
OBW NVNT n20 5200MHz Ant1



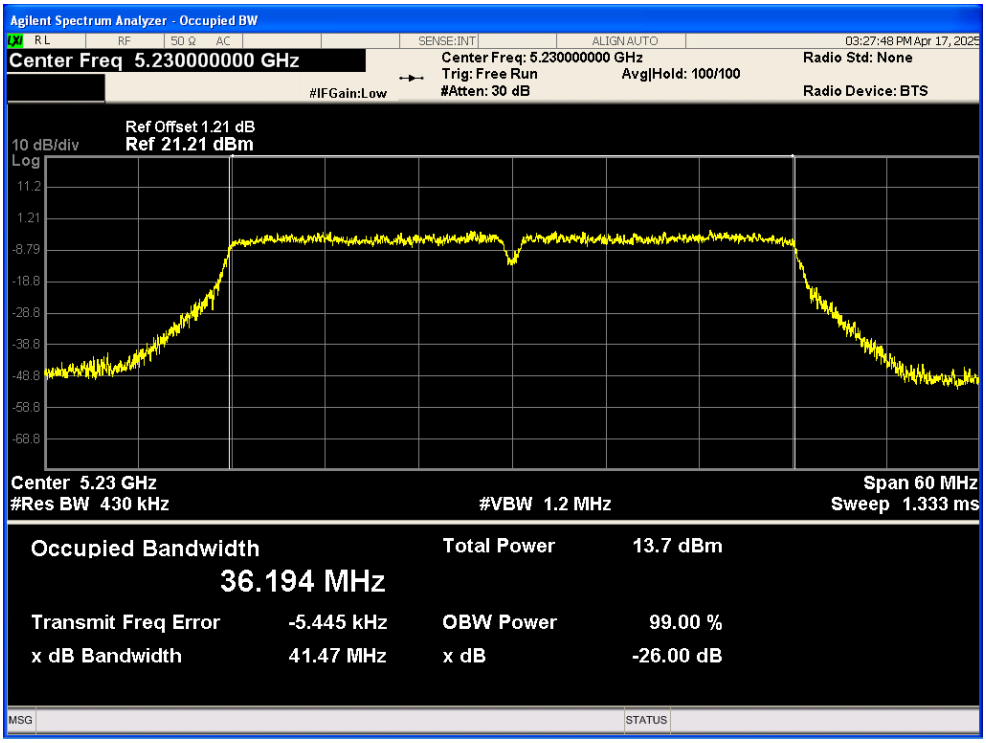
OBW NVNT n20 5240MHz Ant1



OBW NVNT n40 5190MHz Ant1



OBW NVNT n40 5230MHz Ant1

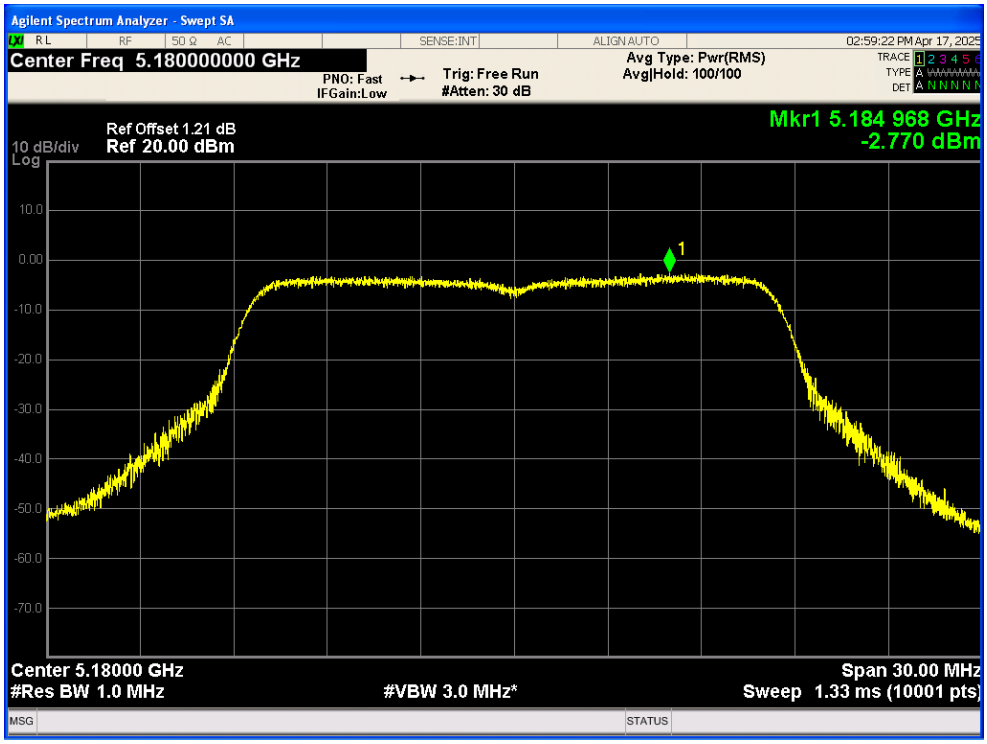


5.1.5 MAXIMUM POWER SPECTRAL DENSITY LEVEL

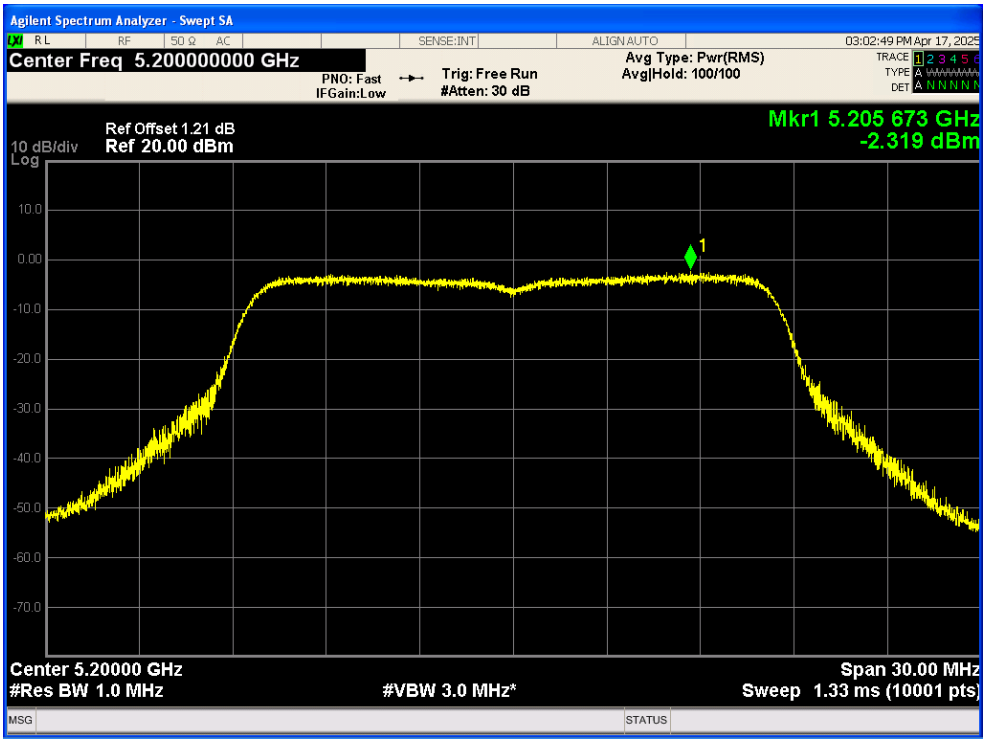
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	-2.77	11	Pass
NVNT	a	5200	Ant1	-2.319	11	Pass
NVNT	a	5240	Ant1	-2.113	11	Pass
NVNT	ac20	5180	Ant1	-3.839	11	Pass
NVNT	ac20	5200	Ant1	-2.998	11	Pass
NVNT	ac20	5240	Ant1	-2.727	11	Pass
NVNT	ac40	5190	Ant1	-6.54	11	Pass
NVNT	ac40	5230	Ant1	-6.04	11	Pass
NVNT	ac80	5210	Ant1	-7.971	11	Pass
NVNT	n20	5180	Ant1	-3.873	11	Pass
NVNT	n20	5200	Ant1	-3.258	11	Pass
NVNT	n20	5240	Ant1	-2.916	11	Pass
NVNT	n40	5190	Ant1	-6.802	11	Pass
NVNT	n40	5230	Ant1	-6.293	11	Pass

Note: The average power value already includes the duty cycle factor.

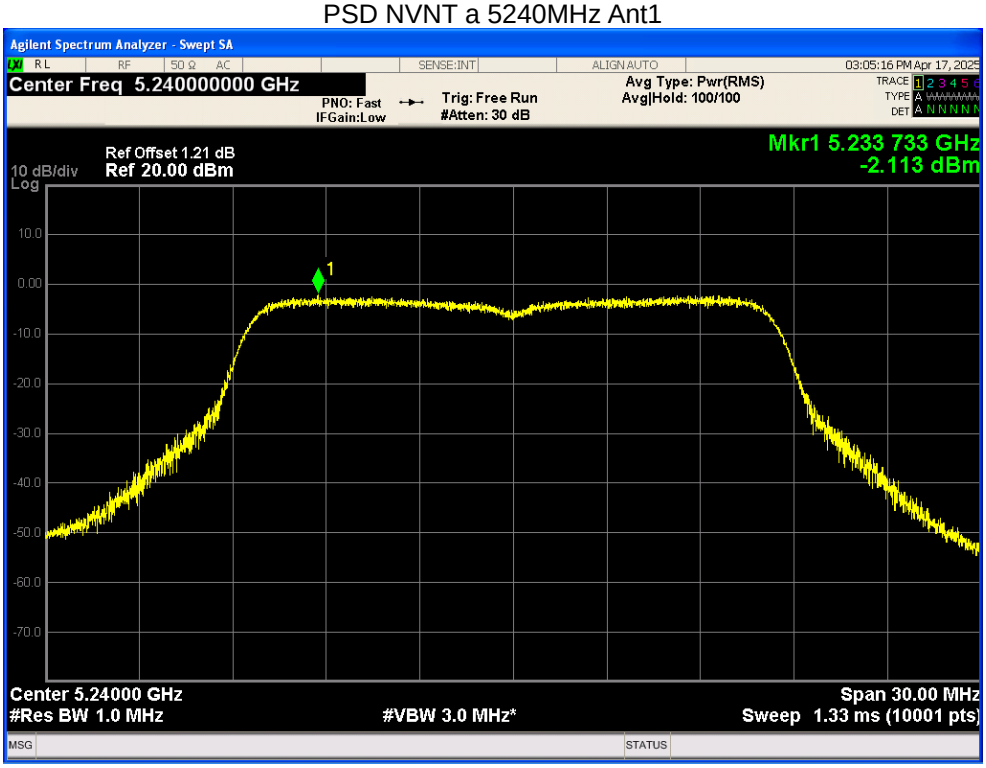
PSD NVNT a 5180MHz Ant1



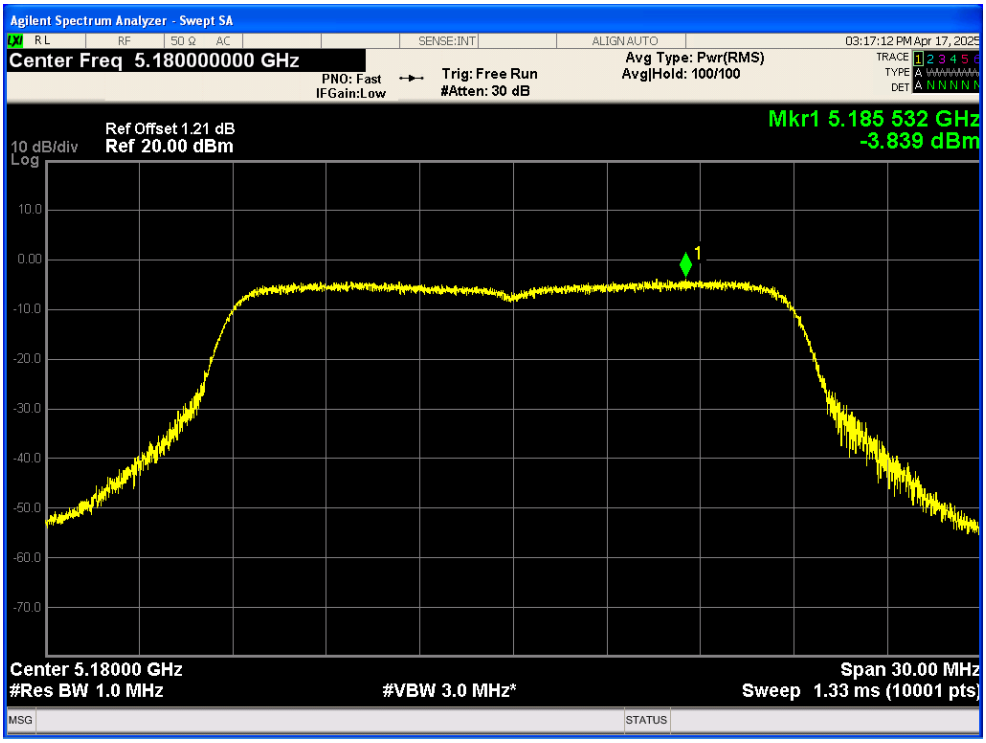
PSD NVNT a 5200MHz Ant1



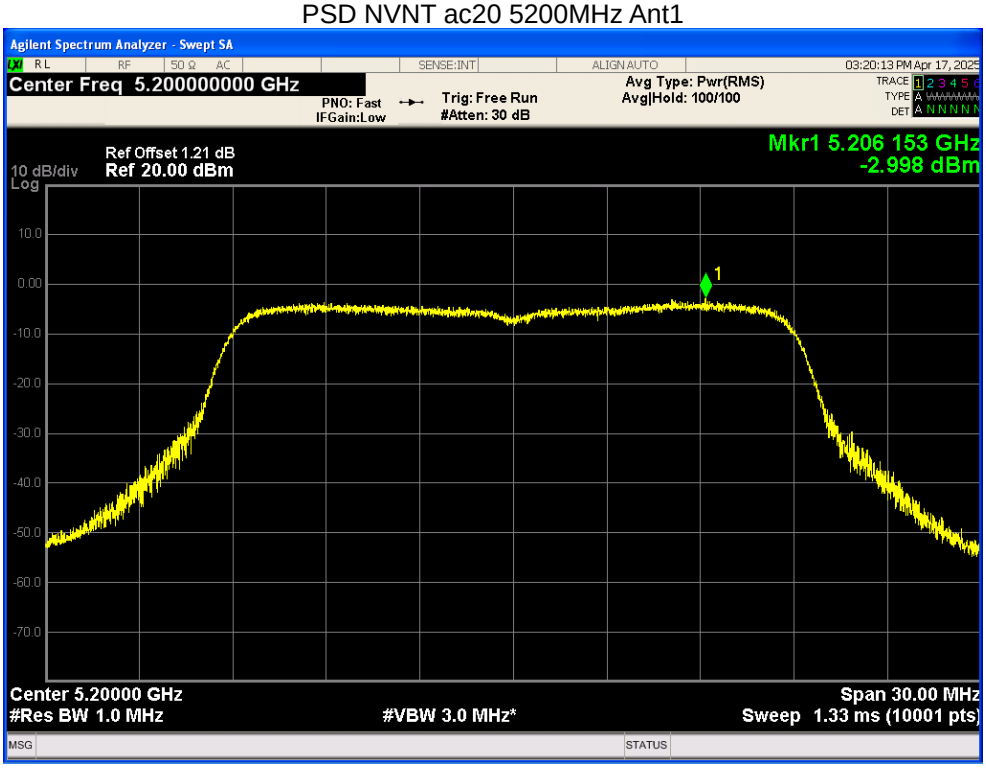
PSD NVNT a 5240MHz Ant1



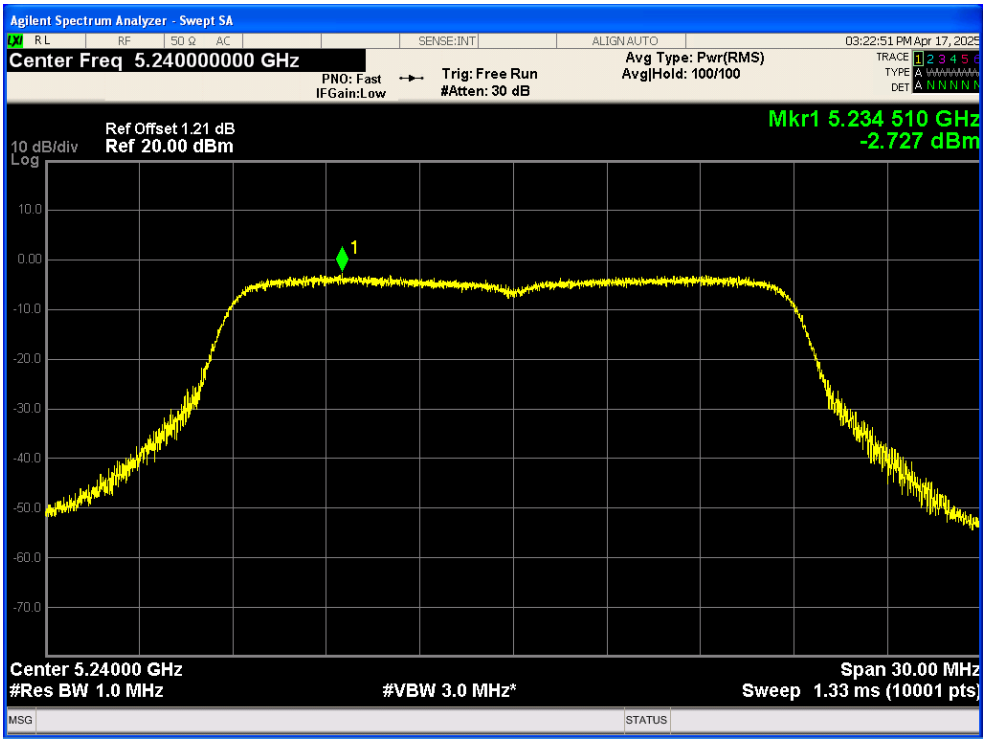
PSD NVNT ac20 5180MHz Ant1



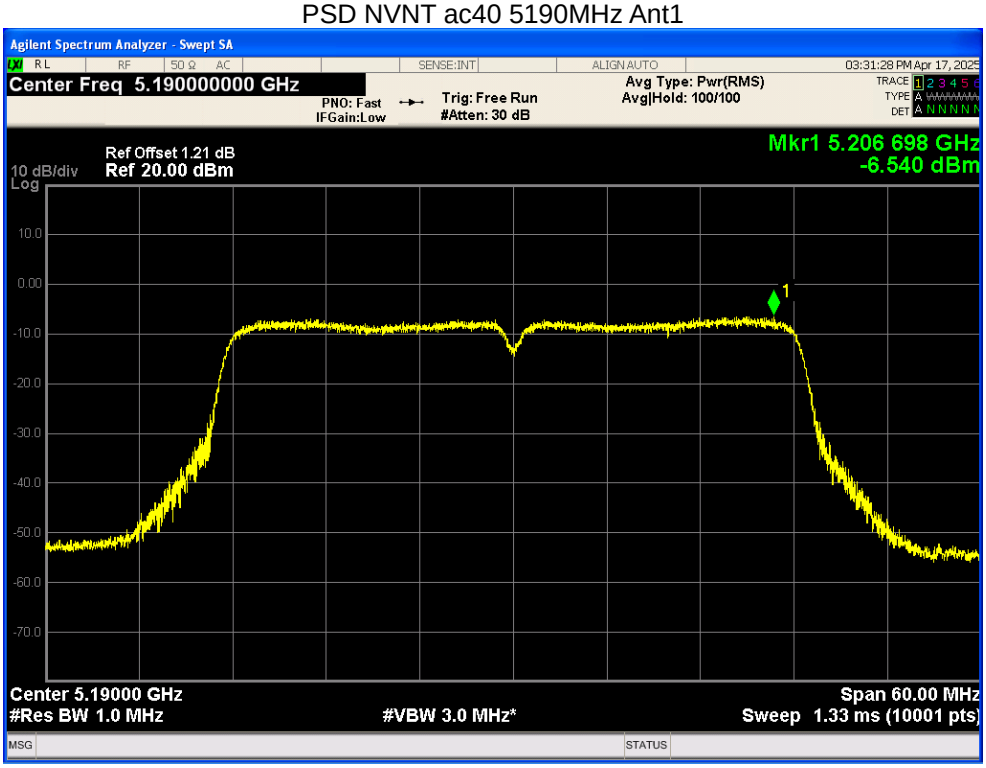
PSD NVNT ac20 5200MHz Ant1



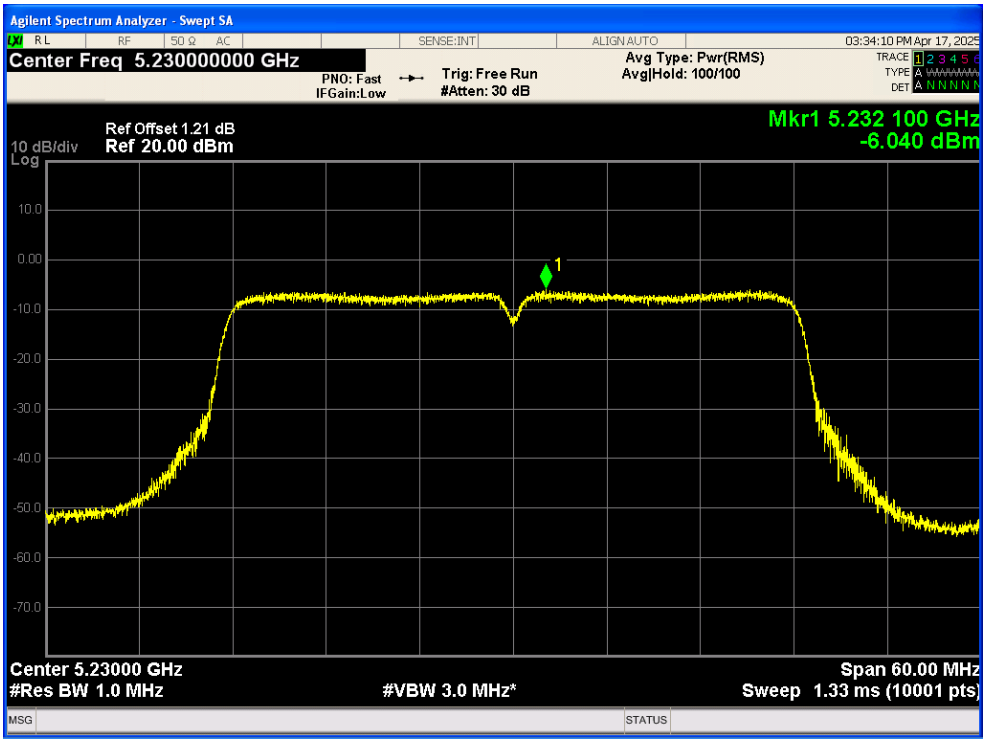
PSD NVNT ac20 5240MHz Ant1



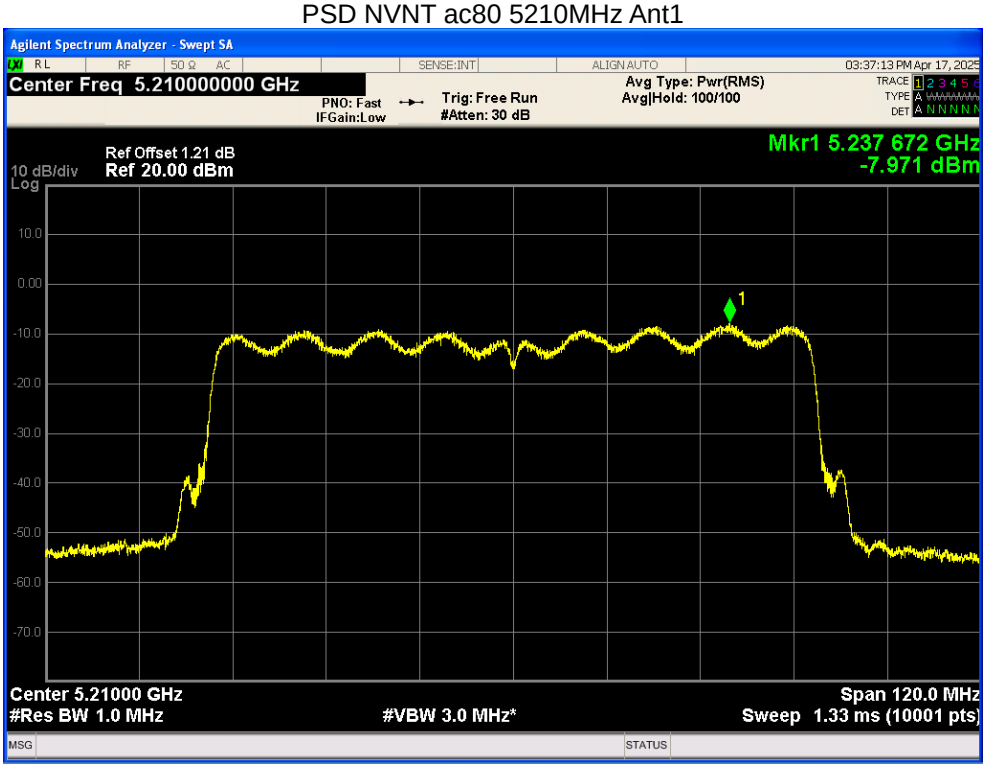
PSD NVNT ac40 5190MHz Ant1



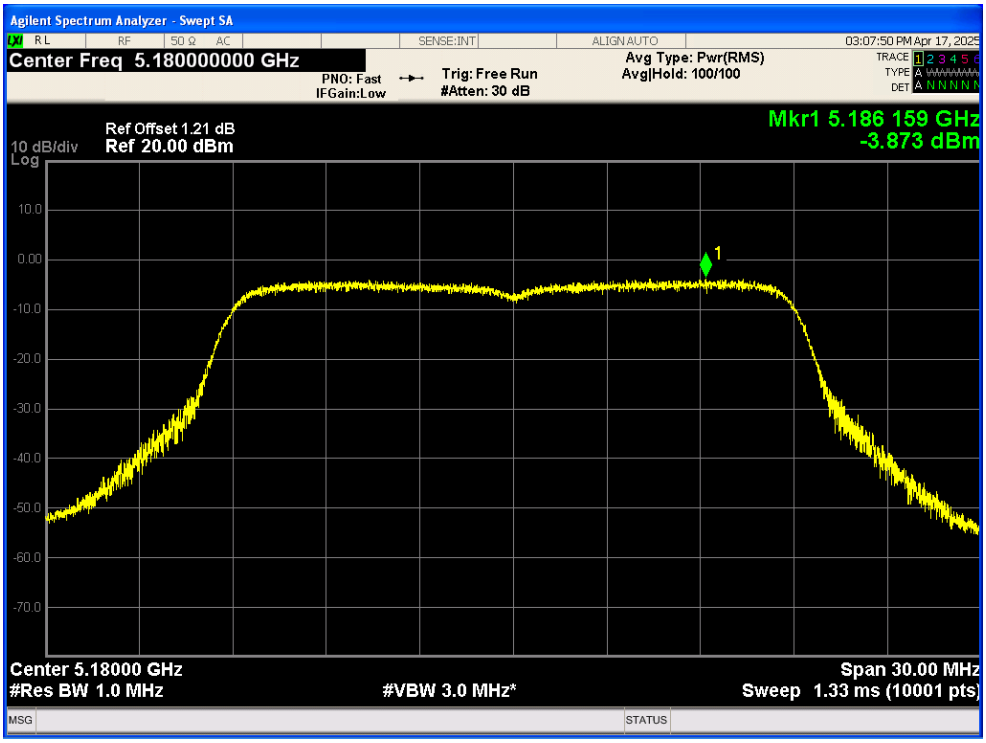
PSD NVNT ac40 5230MHz Ant1



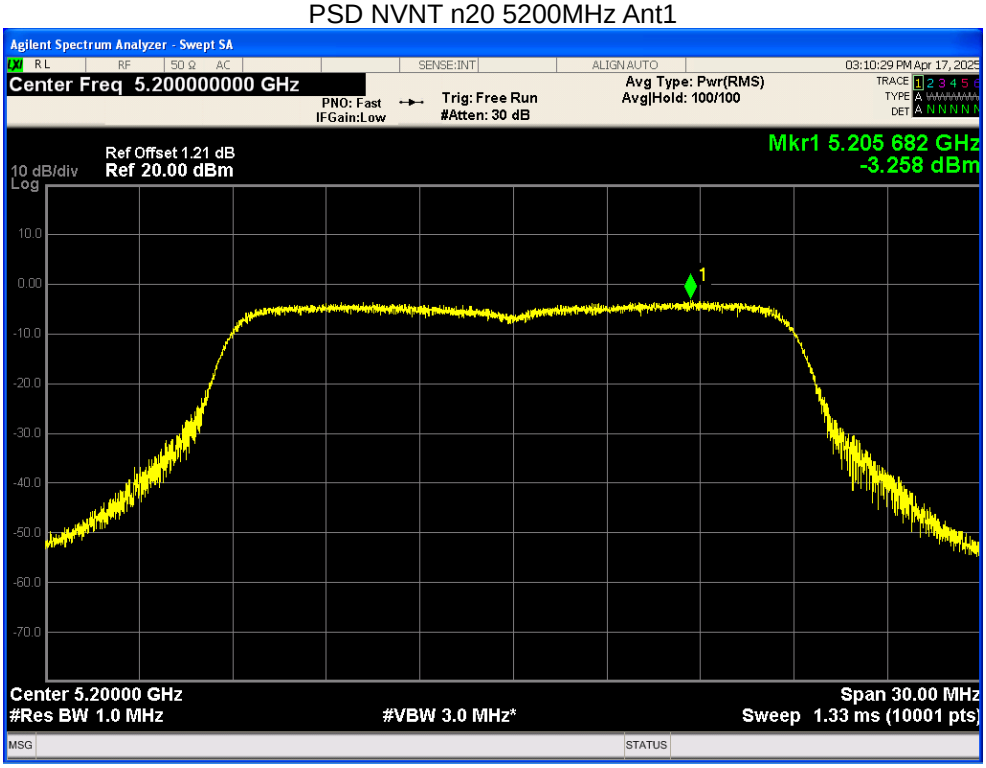
PSD NVNT ac80 5210MHz Ant1



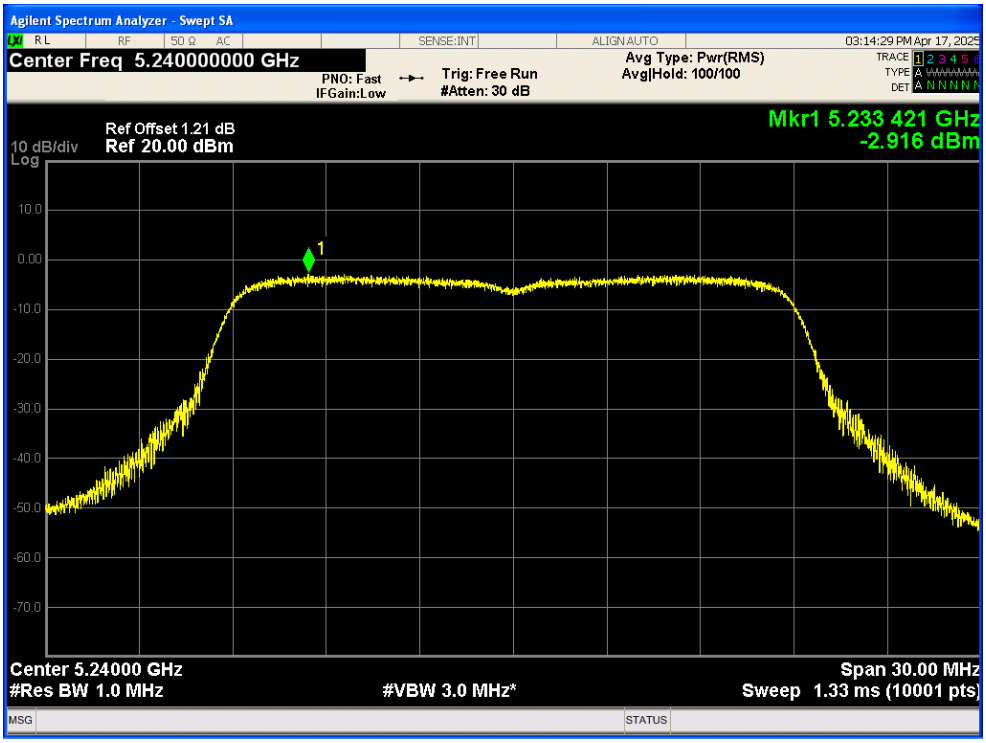
PSD NVNT n20 5180MHz Ant1



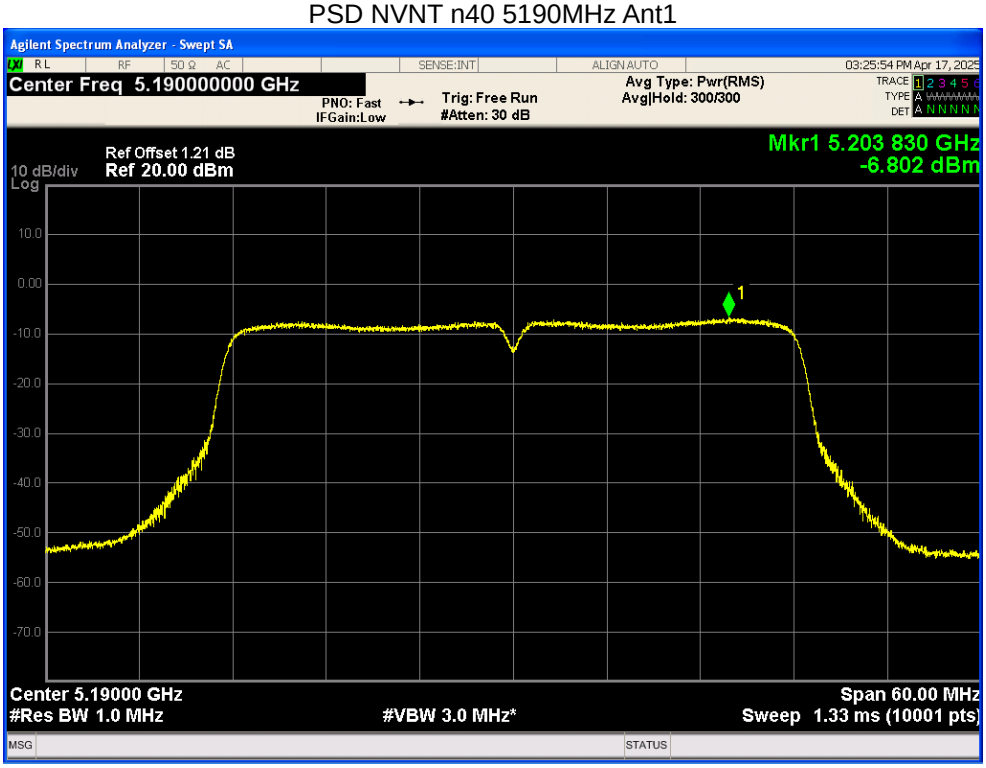
PSD NVNT n20 5200MHz Ant1



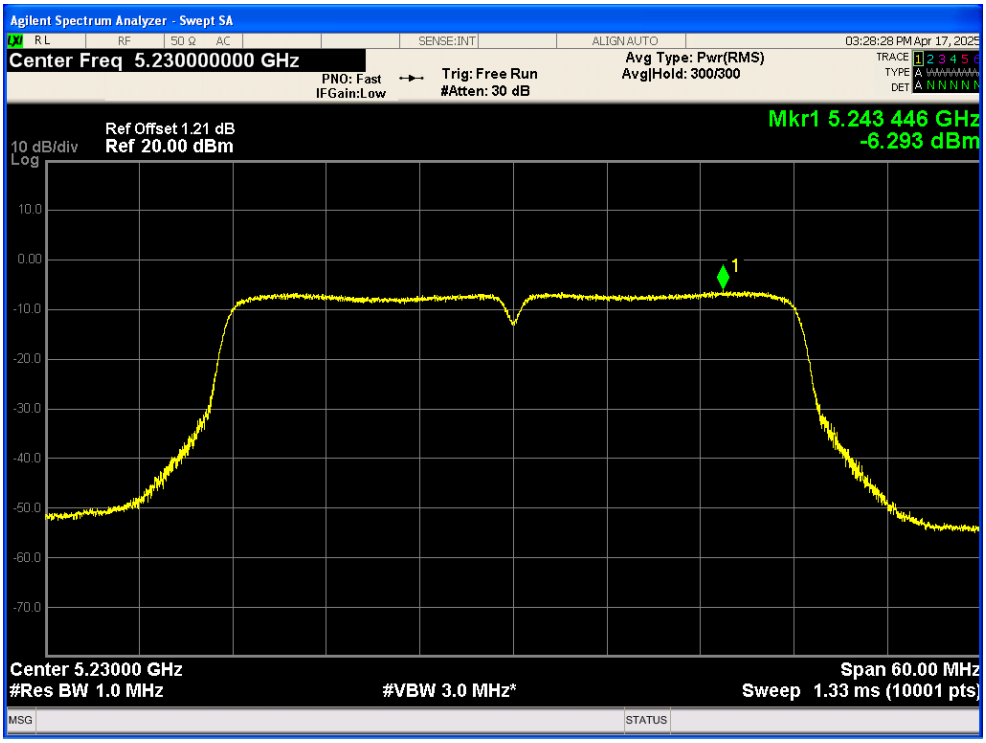
PSD NVNT n20 5240MHz Ant1



PSD NVNT n40 5190MHz Ant1



PSD NVNT n40 5230MHz Ant1

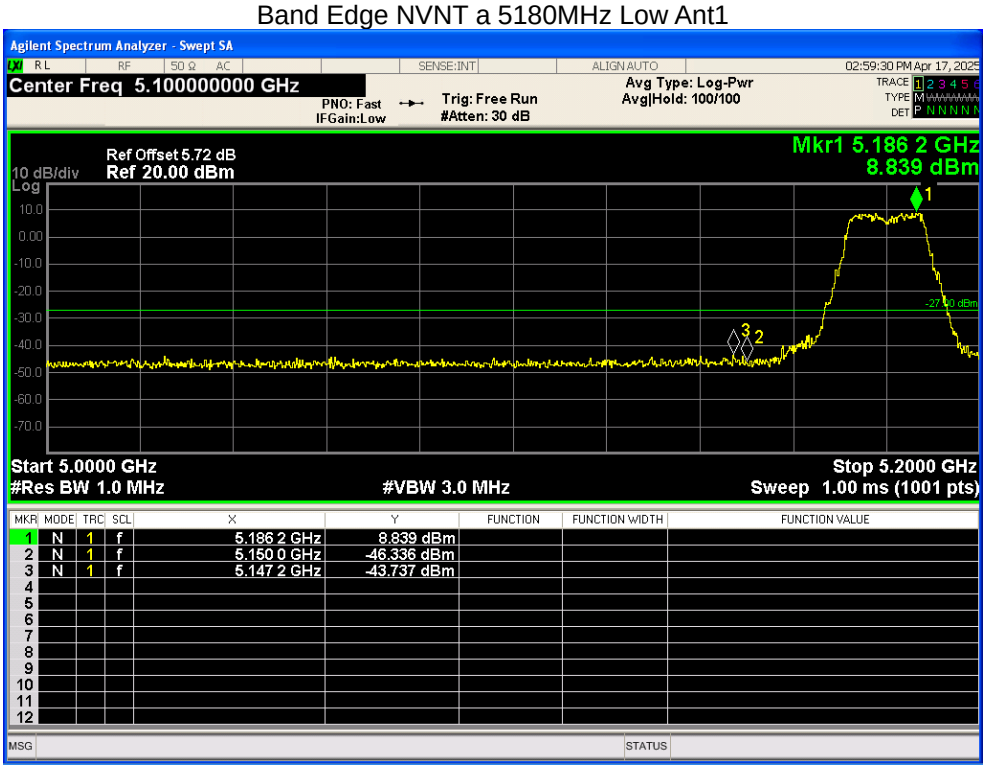


5.1.6 BAND EDGE

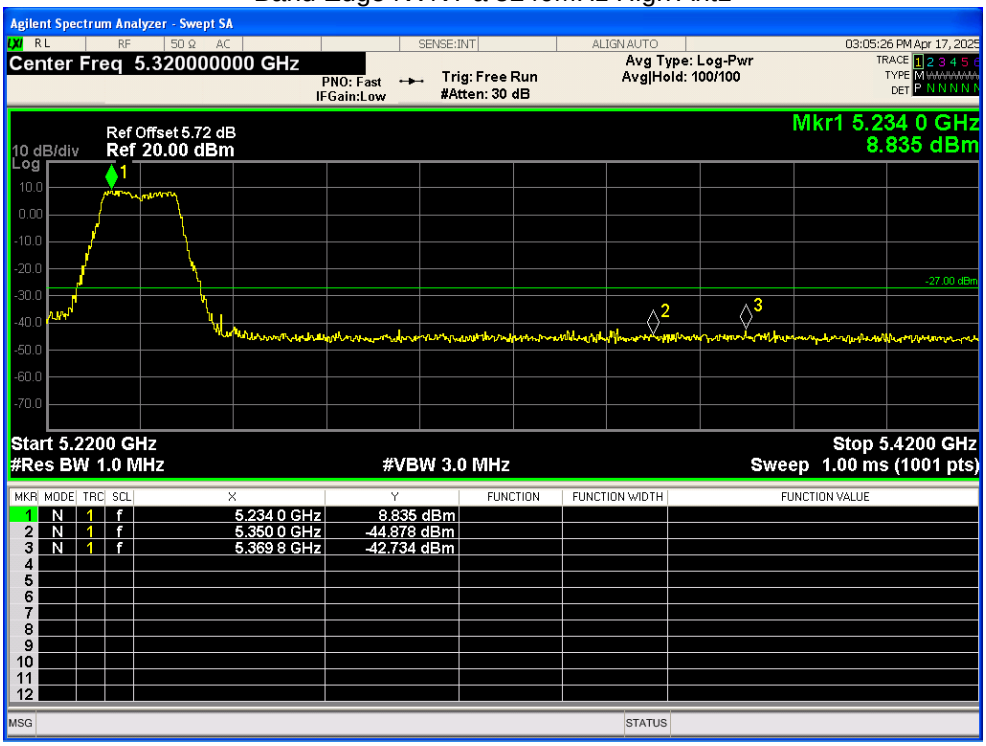
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	-43.73	-27	Pass
NVNT	a	5240	Ant1	-42.73	-27	Pass
NVNT	ac20	5180	Ant1	-43	-27	Pass
NVNT	ac20	5240	Ant1	-42.78	-27	Pass
NVNT	ac40	5190	Ant1	-41.41	-27	Pass
NVNT	ac40	5230	Ant1	-42.93	-27	Pass
NVNT	ac80	5210	Ant1	-39.06	-27	Pass
NVNT	ac80	5210	Ant1	-42.9	-27	Pass
NVNT	n20	5180	Ant1	-44.17	-27	Pass
NVNT	n20	5240	Ant1	-42.91	-27	Pass
NVNT	n40	5190	Ant1	-40.14	-27	Pass
NVNT	n40	5230	Ant1	-42.75	-27	Pass

Note: This test has increased antenna gain .

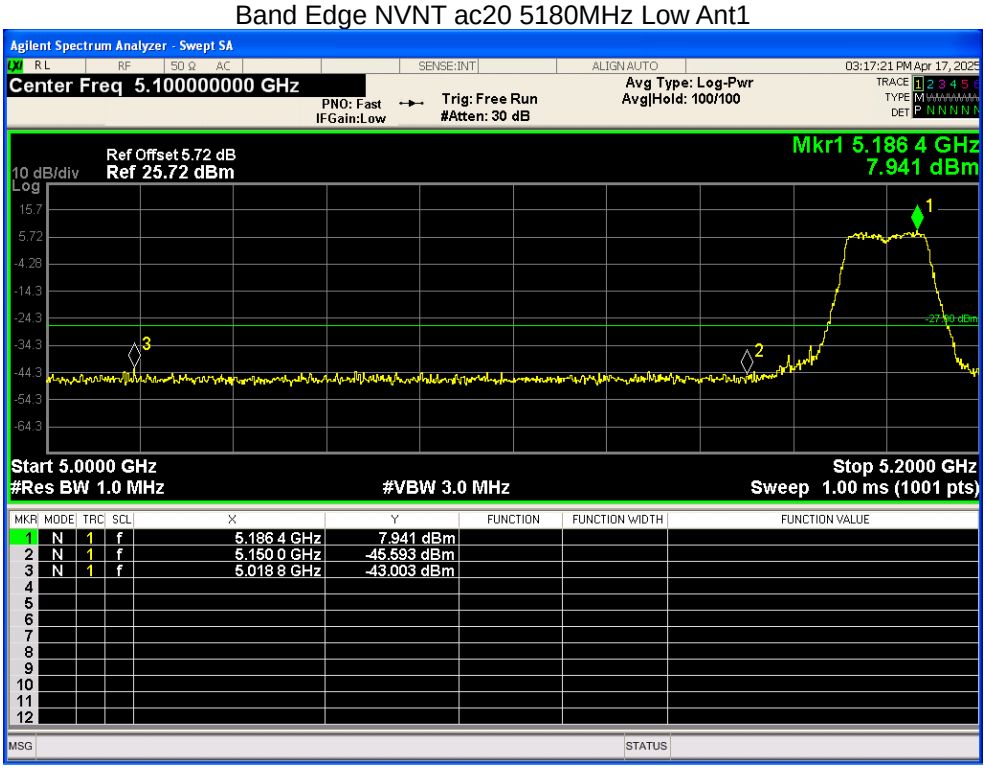
Band Edge NVNT a 5180MHz Low Ant1



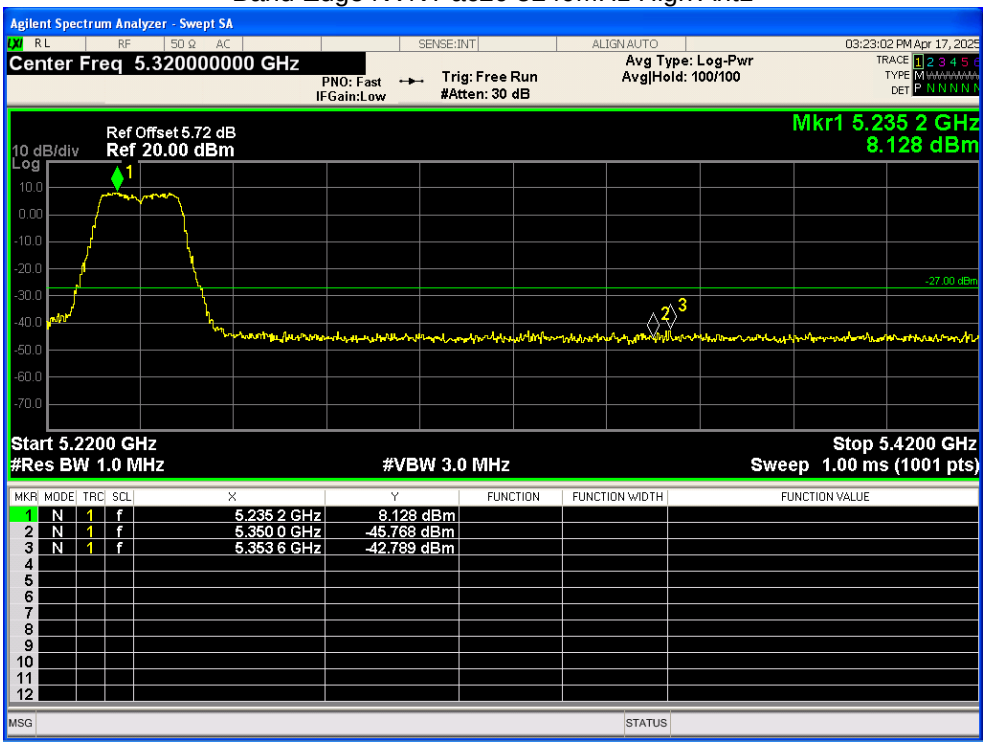
Band Edge NVNT a 5240MHz High Ant1



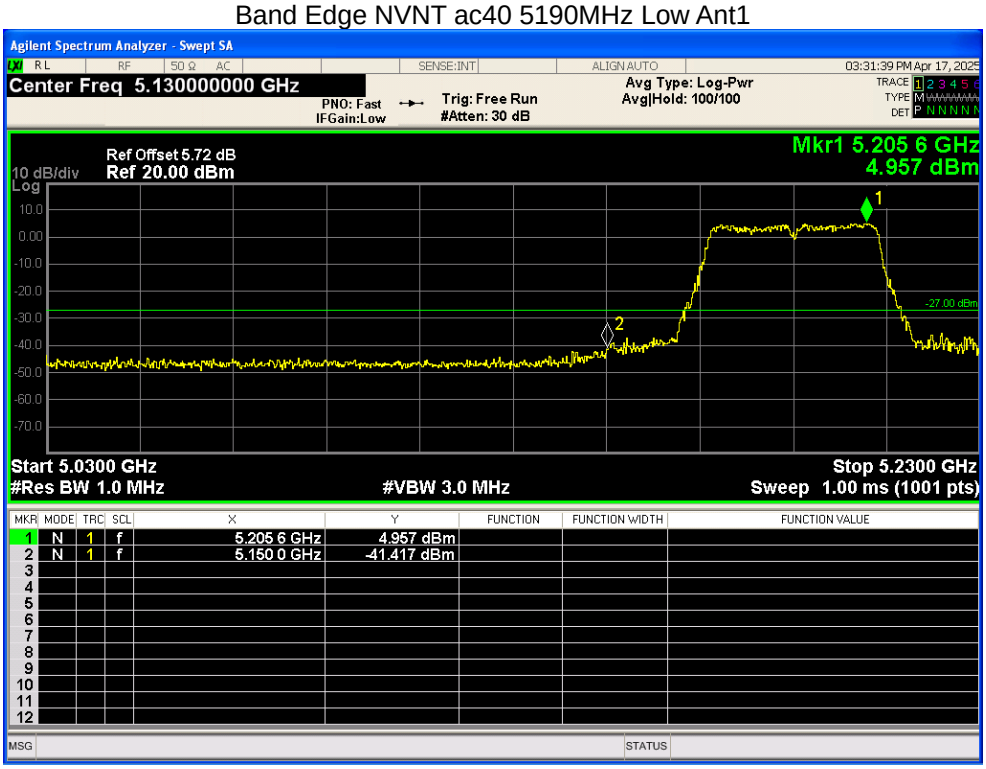
Band Edge NVNT ac20 5180MHz Low Ant1



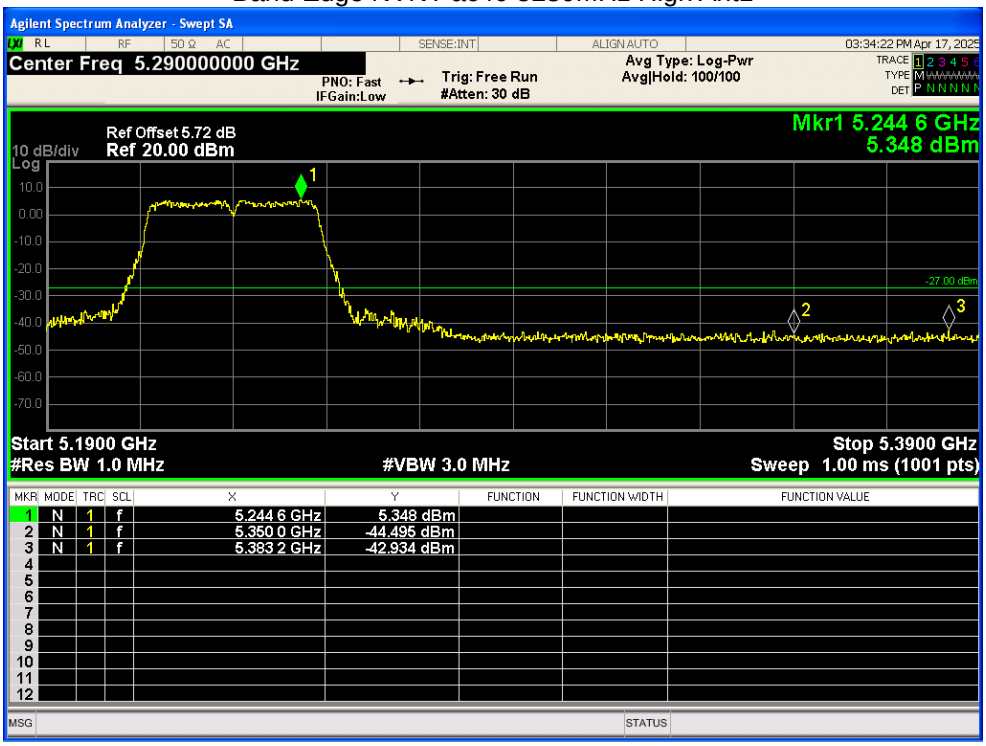
Band Edge NVNT ac20 5240MHz High Ant1



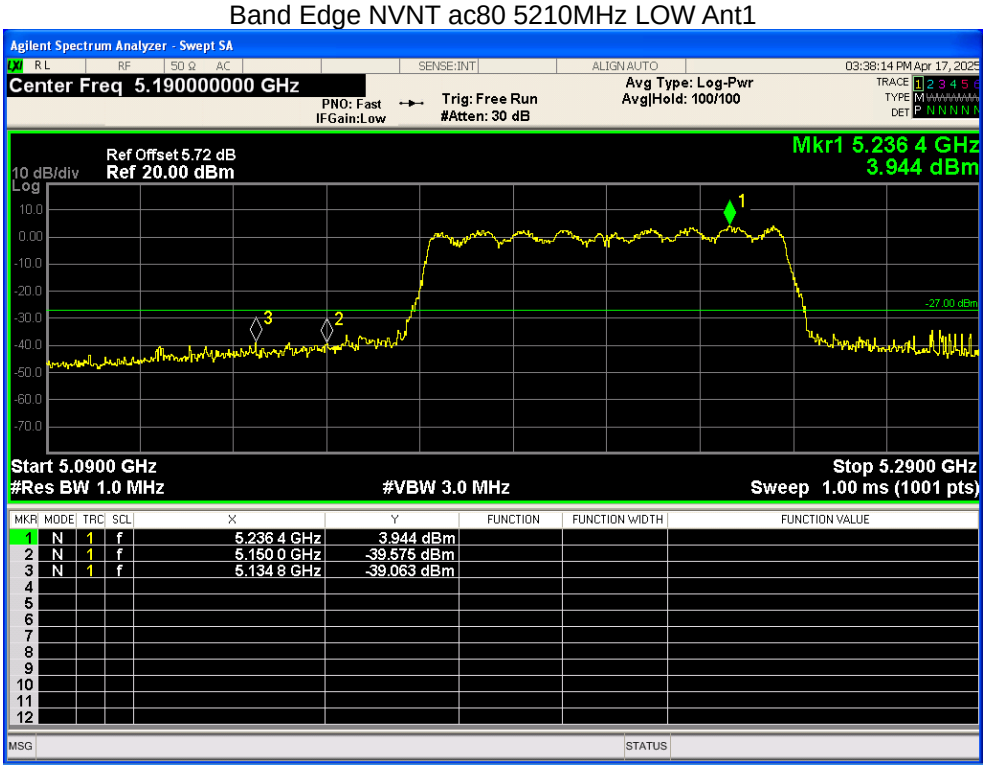
Band Edge NVNT ac40 5190MHz Low Ant1



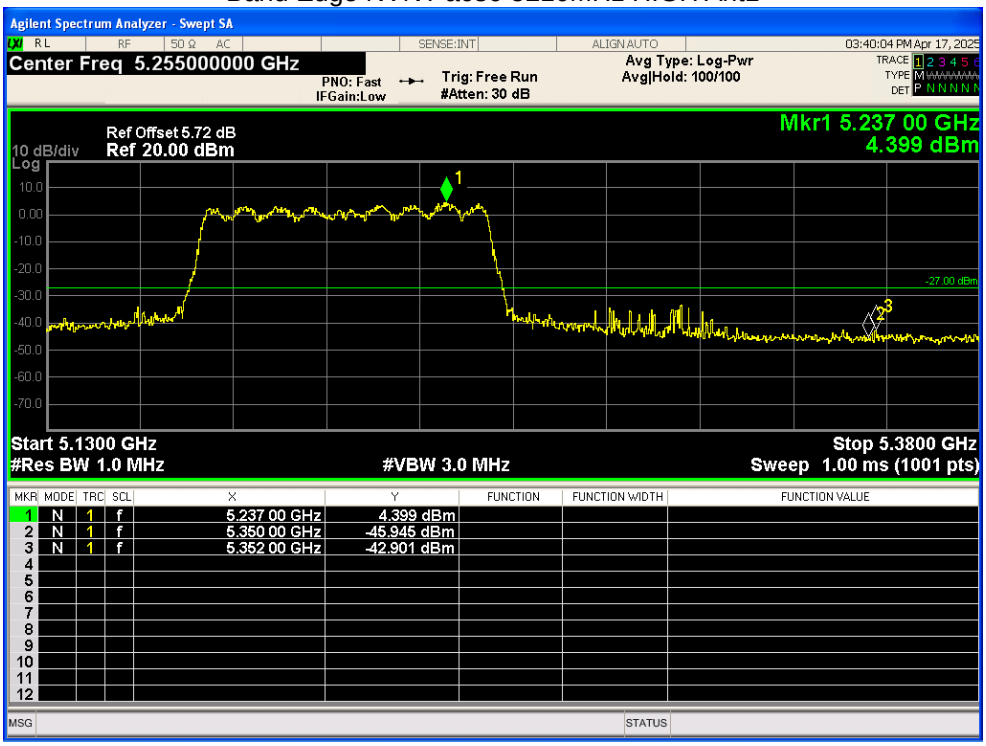
Band Edge NVNT ac40 5230MHz High Ant1



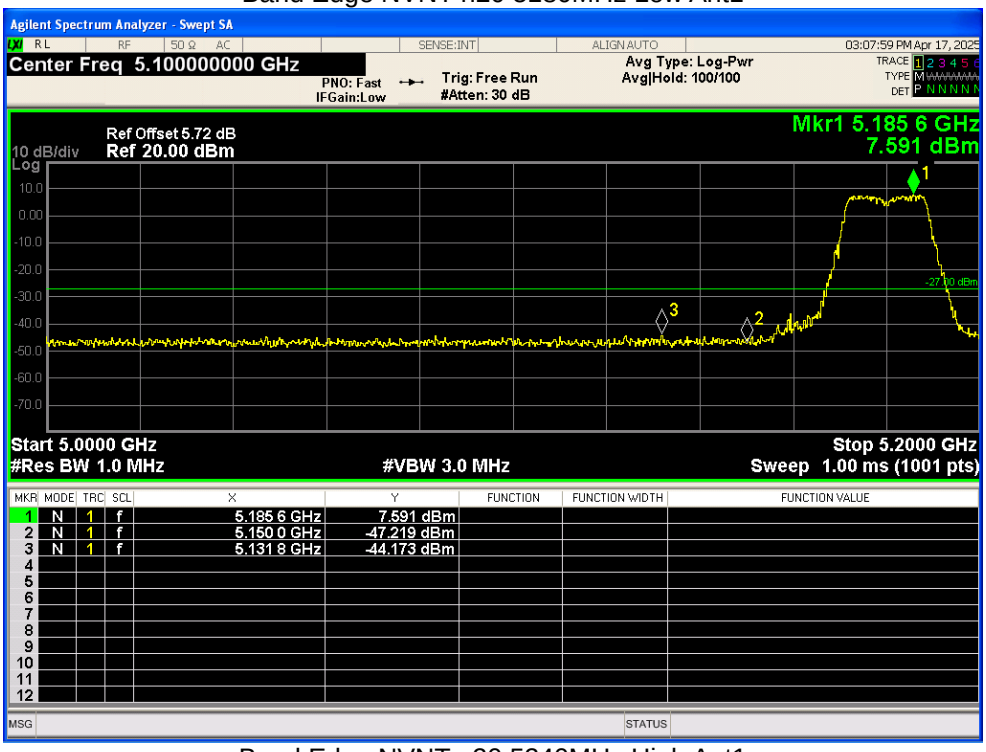
Band Edge NVNT ac80 5210MHz LOW Ant1



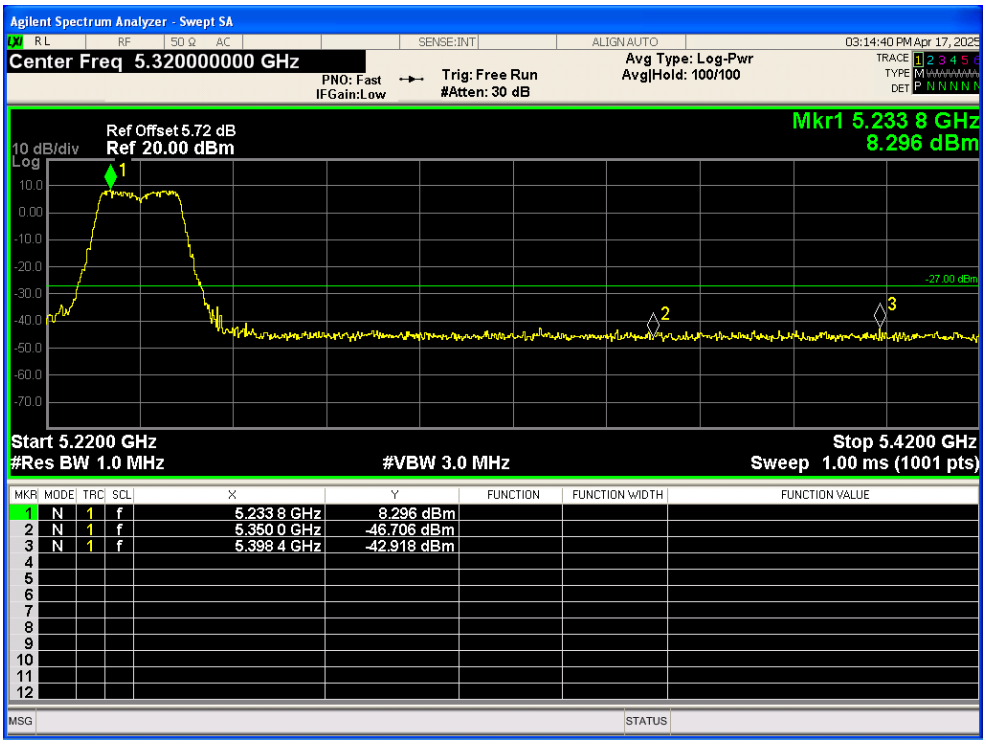
Band Edge NVNT ac80 5210MHz HIGH Ant1



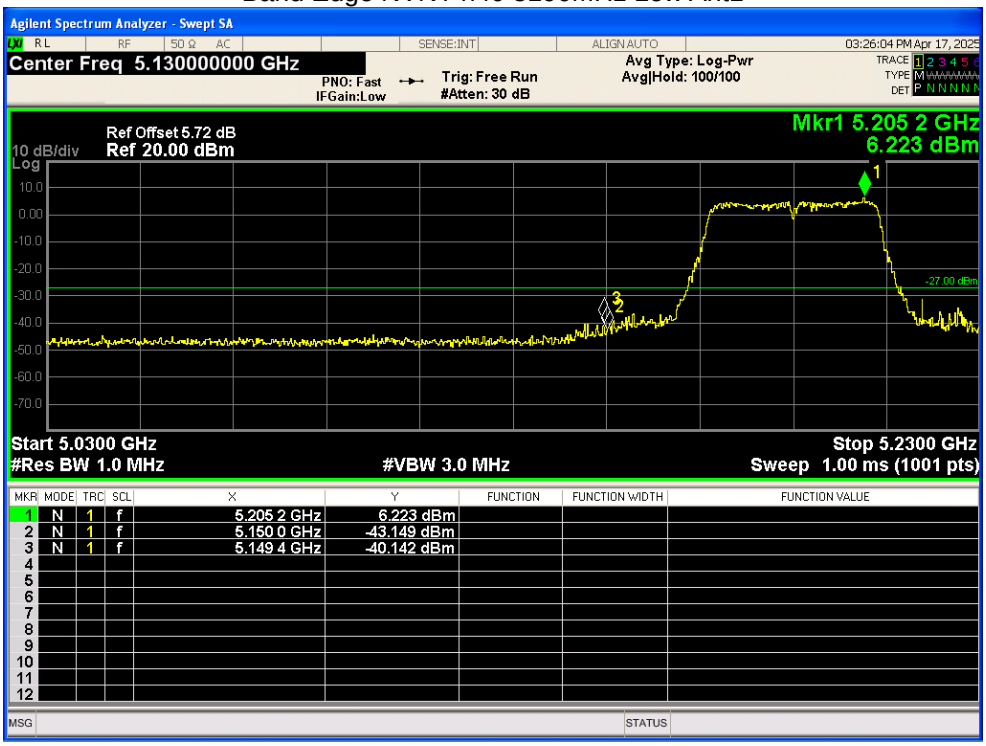
Band Edge NVNT n20 5180MHz Low Ant1



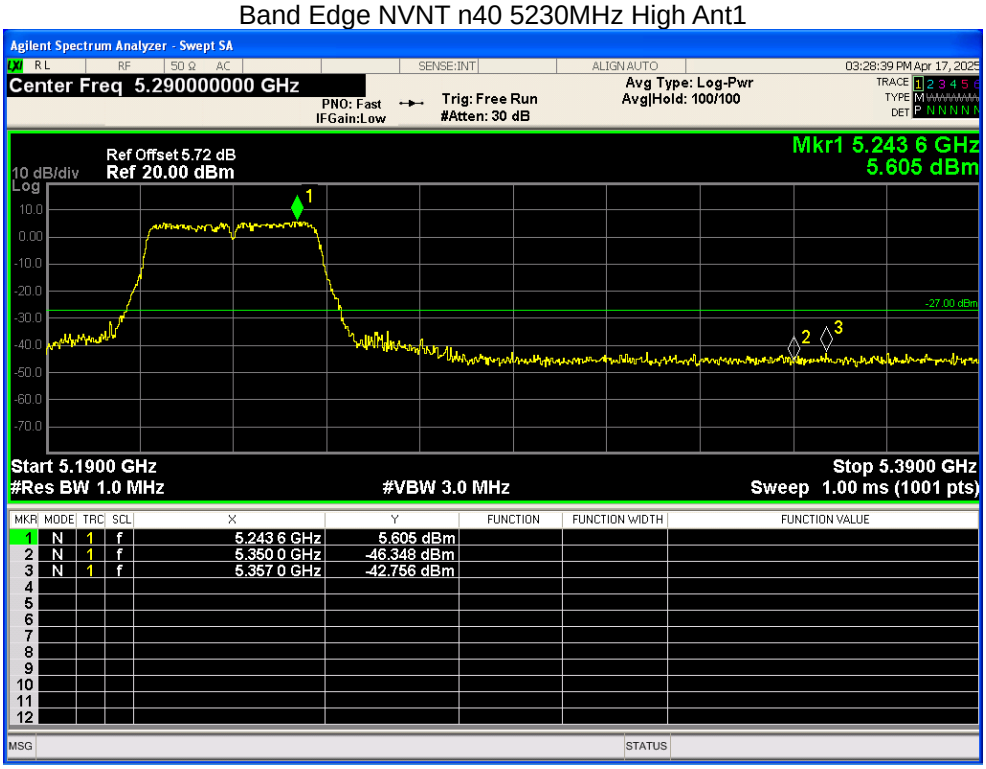
Band Edge NVNT n20 5240MHz High Ant1


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.320000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 100/100
03:14:40 PM Apr 17, 2025
Ref Offset 5.72 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.233 8 GHz
8.296 dBm
-27.00 dBm
Start 5.2200 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.4200 GHz
Sweep 1.00 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 5.233 8 GHz 8.296 dBm
2 N 1 f 5.350 0 GHz -46.706 dBm
3 N 1 f 5.398 4 GHz -42.918 dBm
MSG
STATUS

Band Edge NVNT n40 5190MHz Low Ant1



Band Edge NVNT n40 5230MHz High Ant1

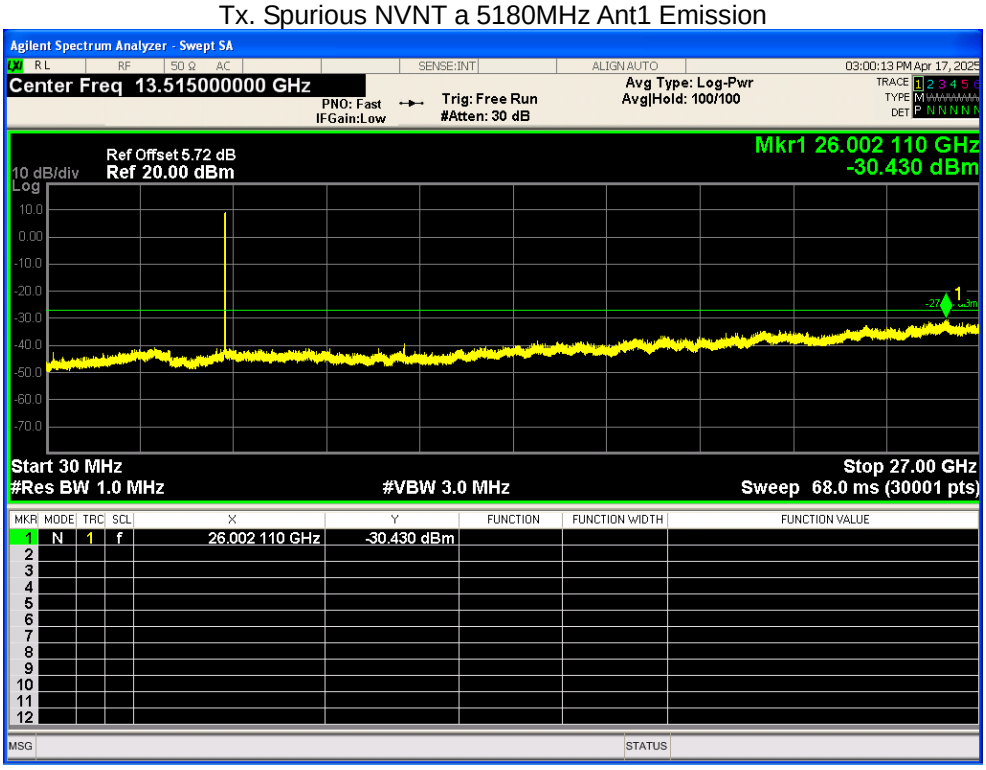


5.1.7 CONDUCTED RF SPURIOUS EMISSION

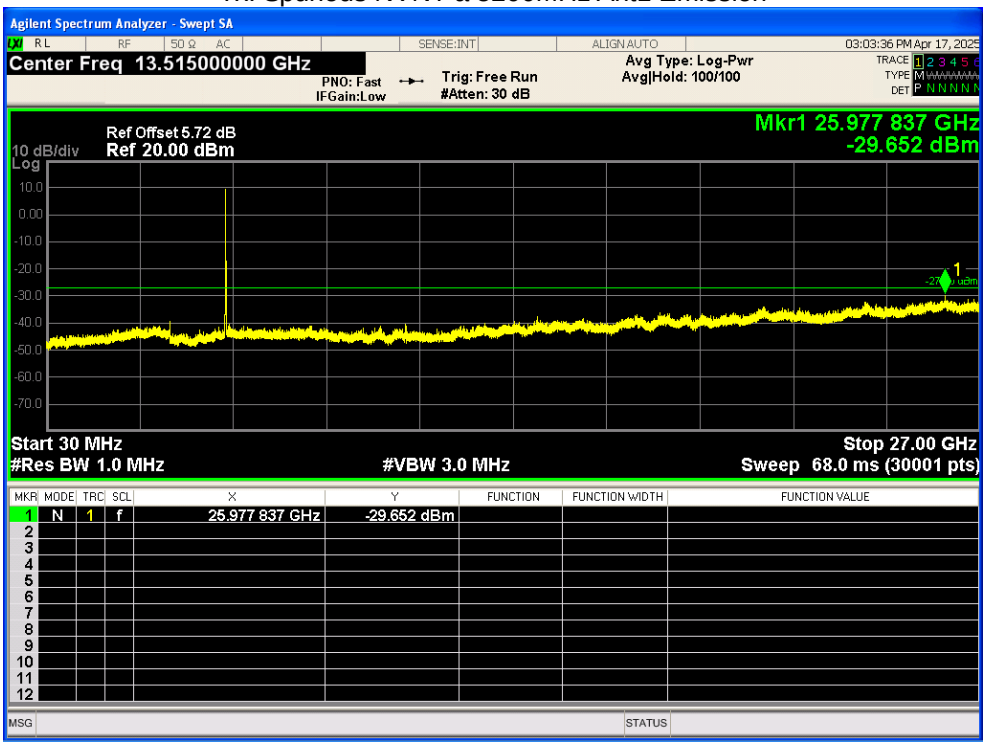
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	-30.43	-27	Pass
NVNT	a	5200	Ant1	-29.65	-27	Pass
NVNT	a	5240	Ant1	-31.28	-27	Pass
NVNT	ac20	5180	Ant1	-30.95	-27	Pass
NVNT	ac20	5200	Ant1	-30.53	-27	Pass
NVNT	ac20	5240	Ant1	-30.04	-27	Pass
NVNT	ac40	5190	Ant1	-30.93	-27	Pass
NVNT	ac40	5230	Ant1	-30.26	-27	Pass
NVNT	ac80	5210	Ant1	-39.92	-27	Pass
NVNT	n20	5180	Ant1	-31.15	-27	Pass
NVNT	n20	5200	Ant1	-30.13	-27	Pass
NVNT	n20	5240	Ant1	-30.2	-27	Pass
NVNT	n40	5190	Ant1	-30.94	-27	Pass
NVNT	n40	5230	Ant1	-30.92	-27	Pass

Note: This test has increased antenna gain .

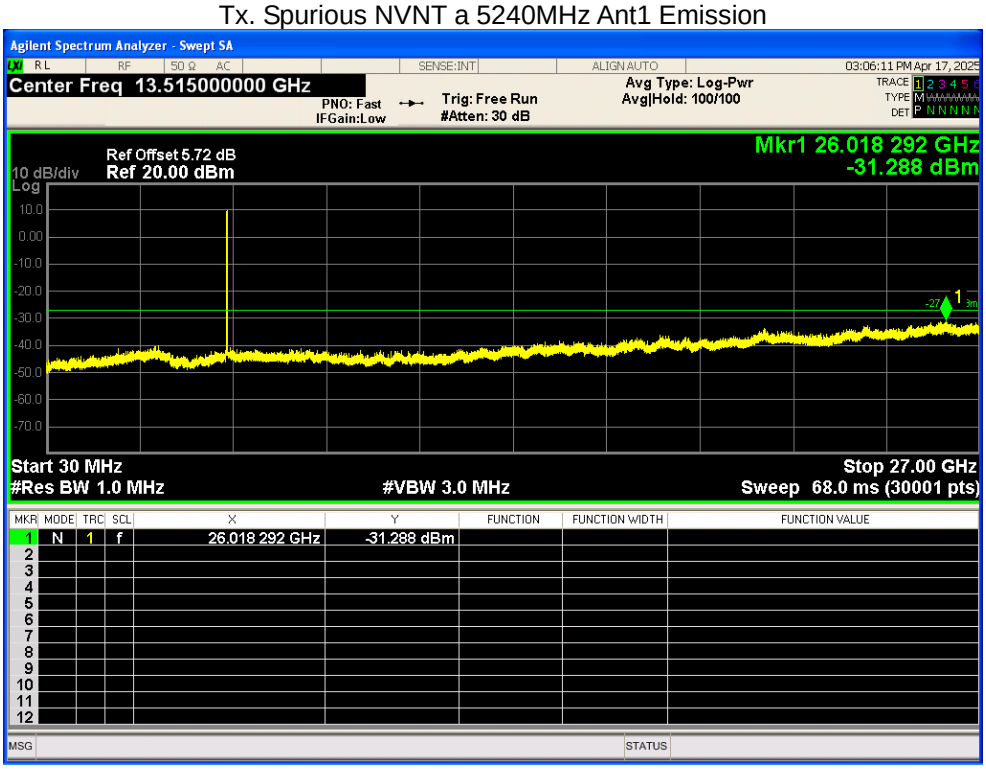
Tx. Spurious NVNT a 5180MHz Ant1 Emission



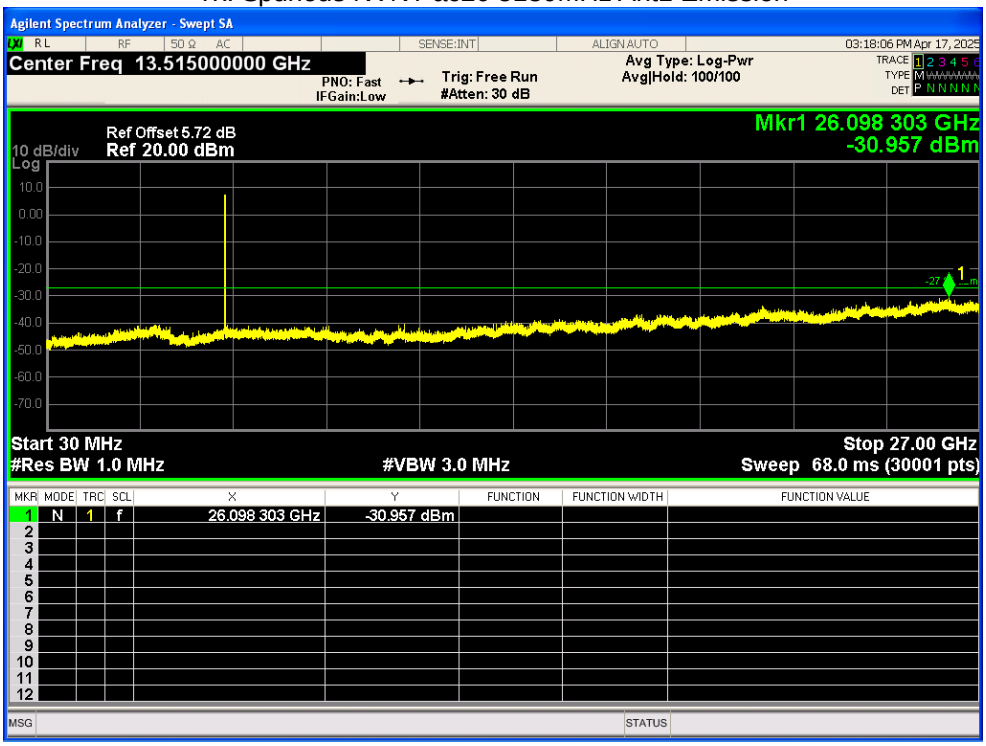
Tx. Spurious NVNT a 5200MHz Ant1 Emission



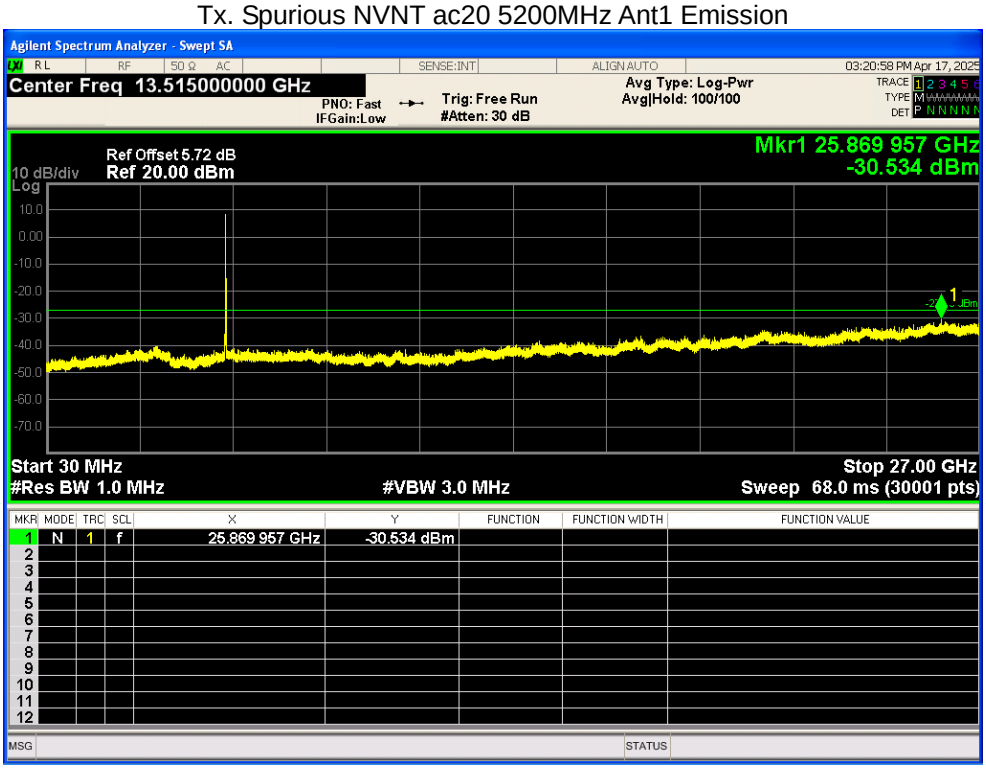
Tx. Spurious NVNT a 5240MHz Ant1 Emission



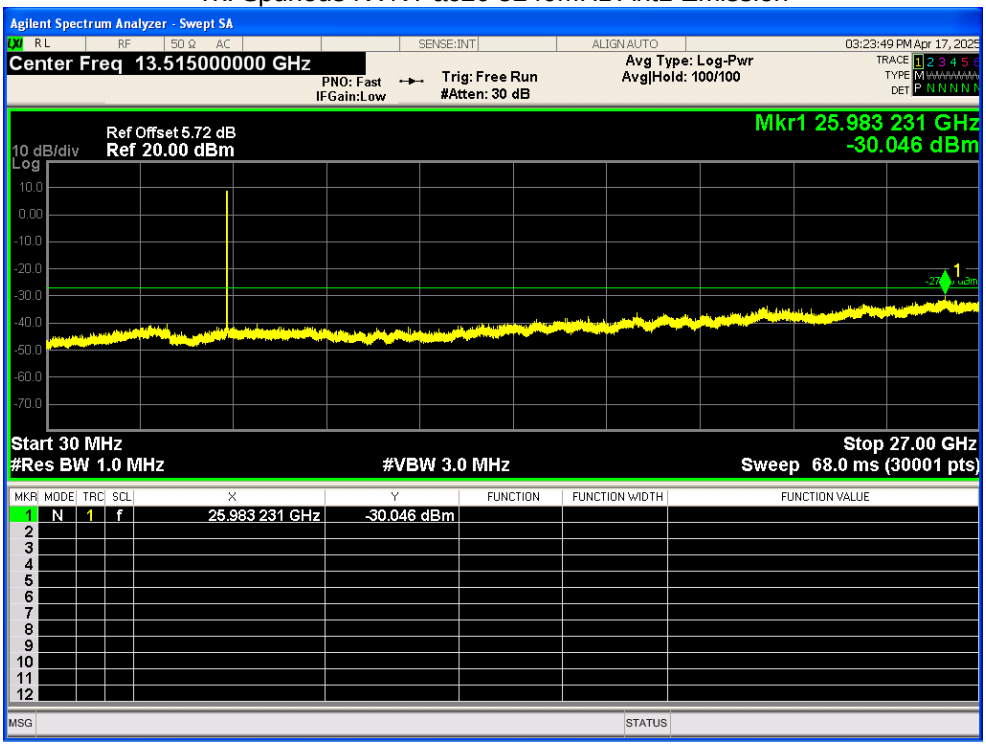
Tx. Spurious NVNT ac20 5180MHz Ant1 Emission



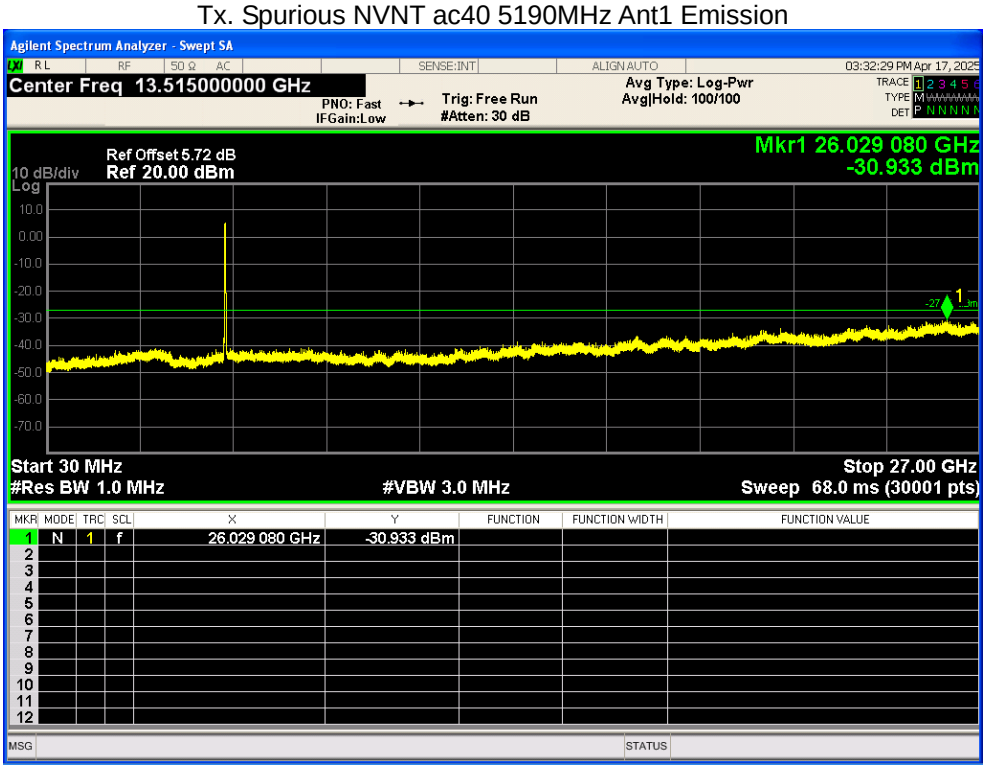
Tx. Spurious NVNT ac20 5200MHz Ant1 Emission



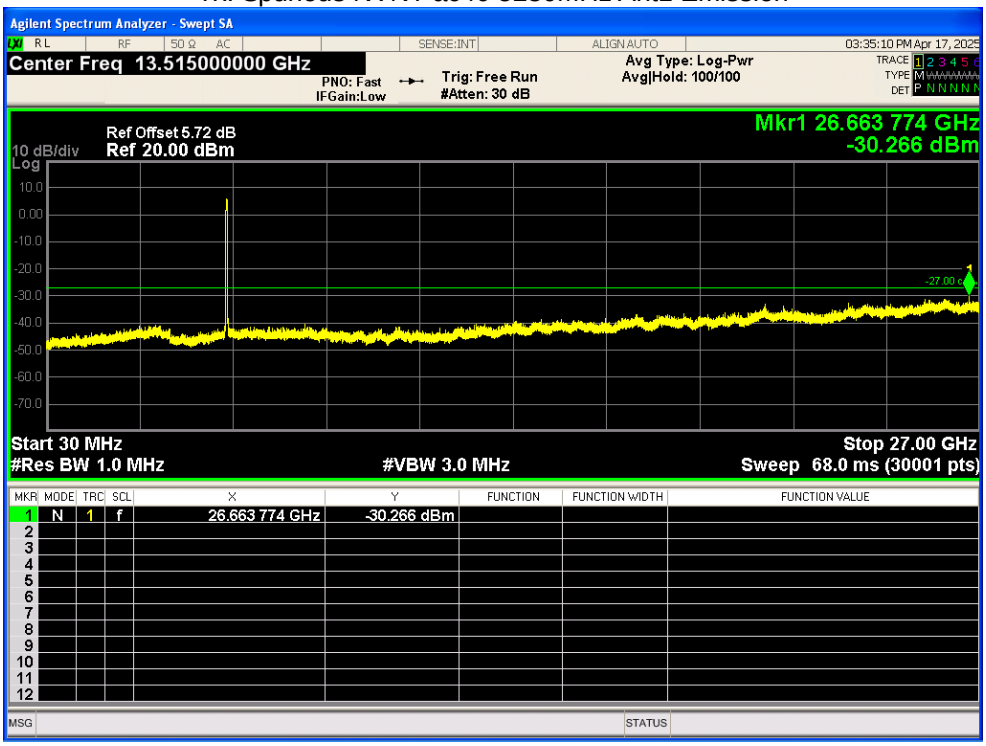
Tx. Spurious NVNT ac20 5240MHz Ant1 Emission



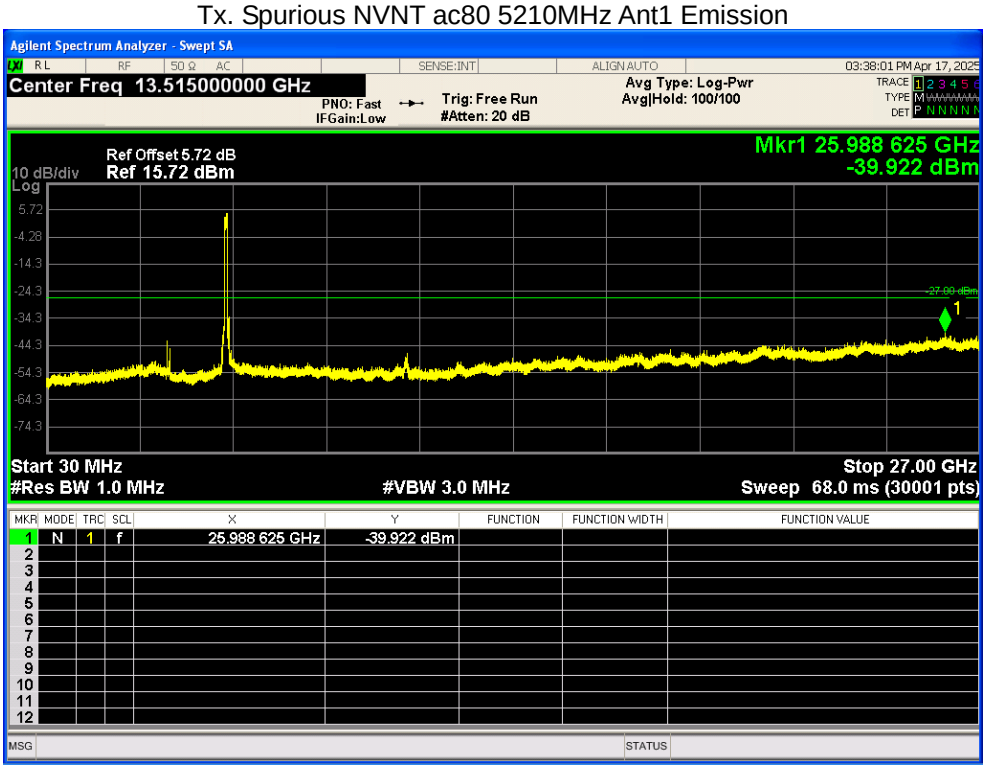
Tx. Spurious NVNT ac40 5190MHz Ant1 Emission



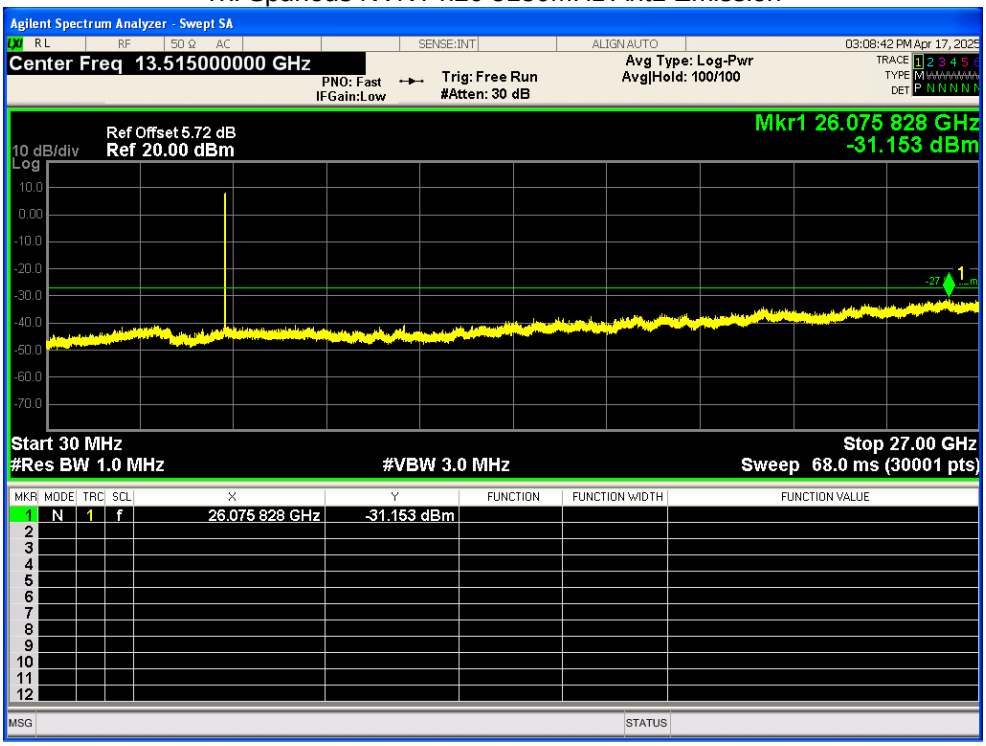
Tx. Spurious NVNT ac40 5230MHz Ant1 Emission



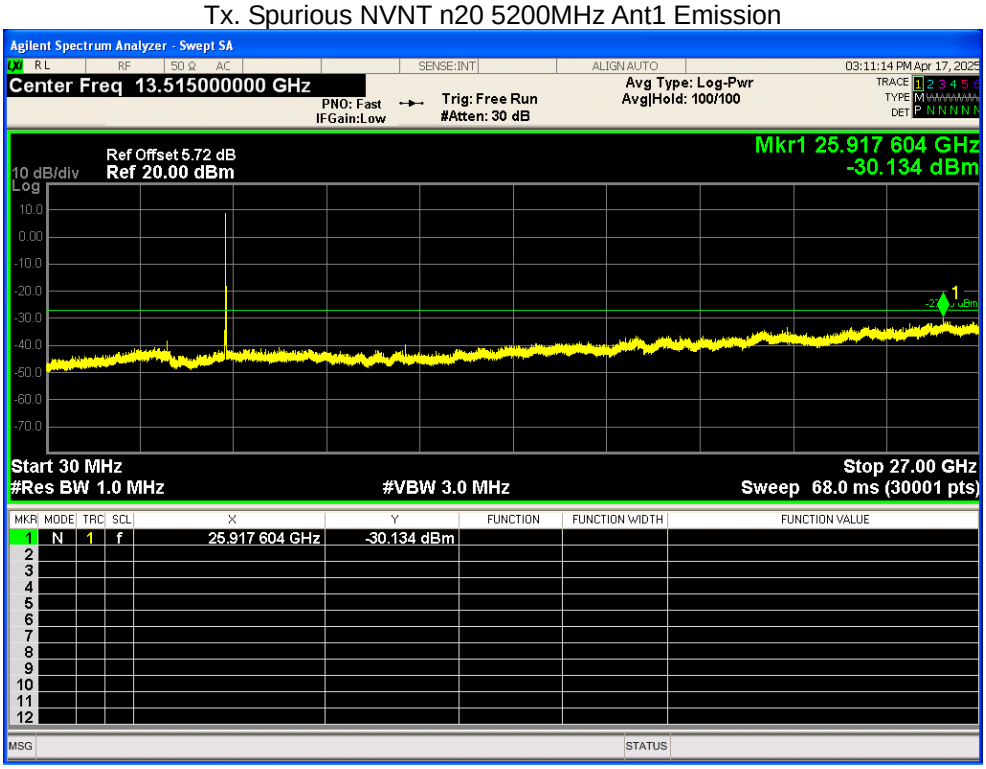
Tx. Spurious NVNT ac80 5210MHz Ant1 Emission



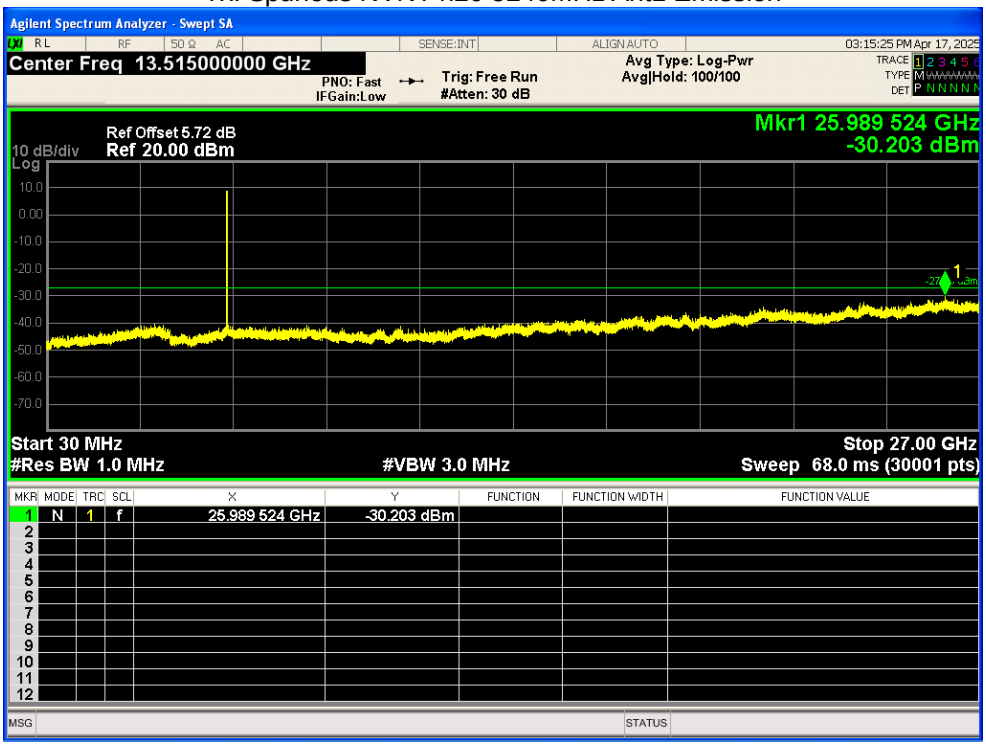
Tx. Spurious NVNT n20 5180MHz Ant1 Emission



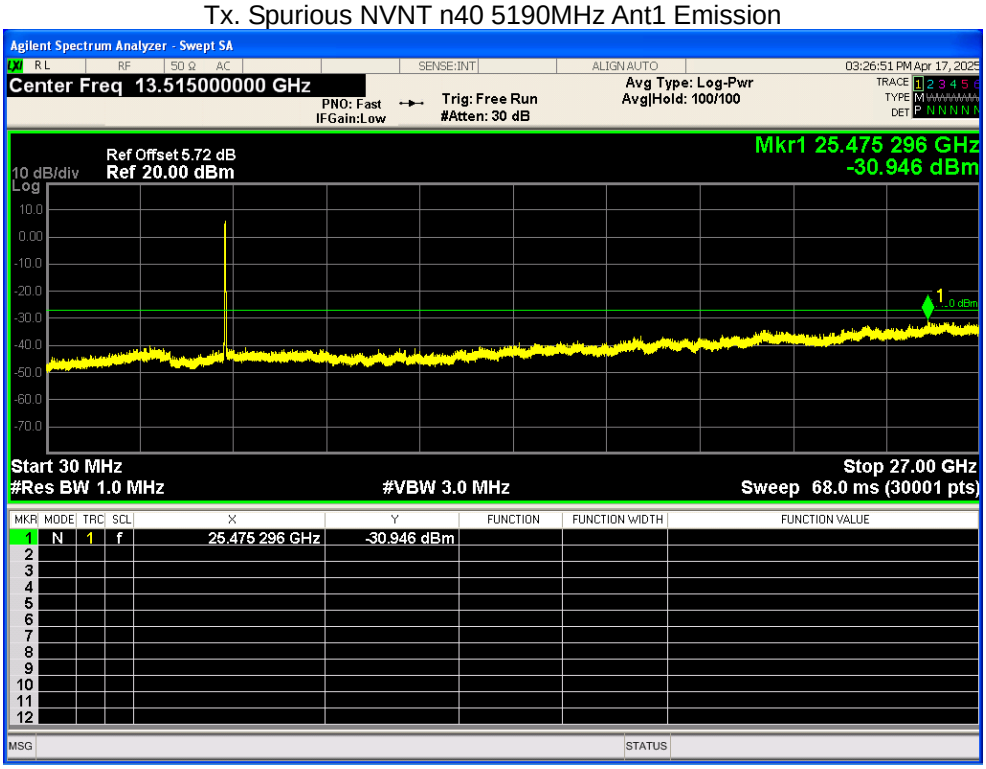
Tx. Spurious NVNT n20 5200MHz Ant1 Emission



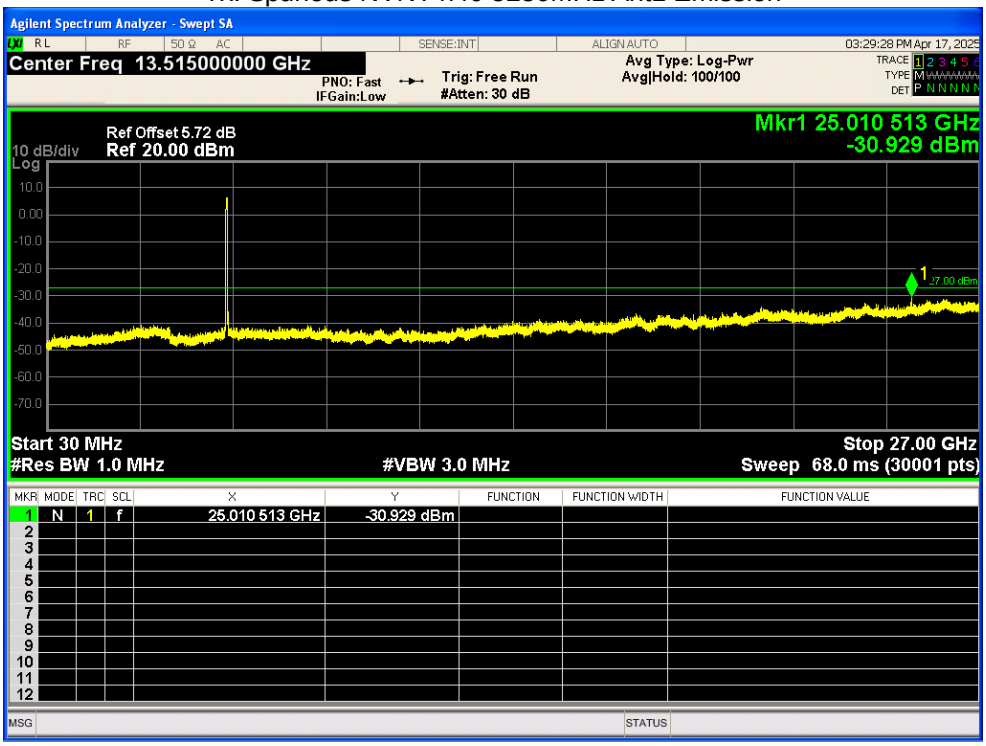
Tx. Spurious NVNT n20 5240MHz Ant1 Emission



Tx. Spurious NVNT n40 5190MHz Ant1 Emission



Tx. Spurious NVNT n40 5230MHz Ant1 Emission

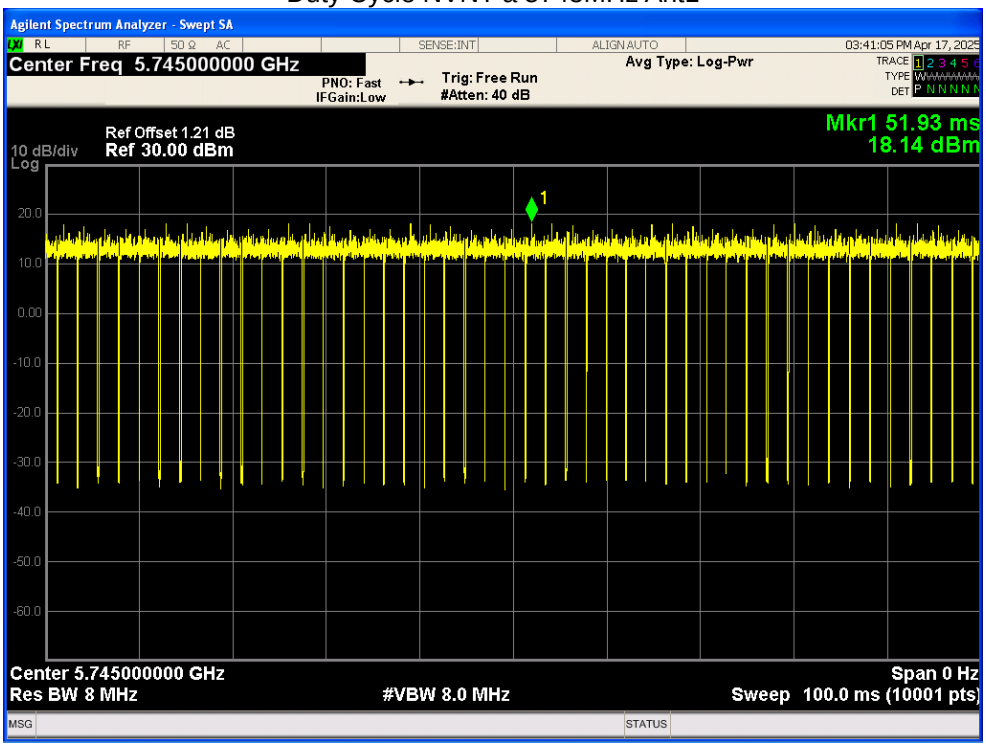


5.2 5.8G WIFI

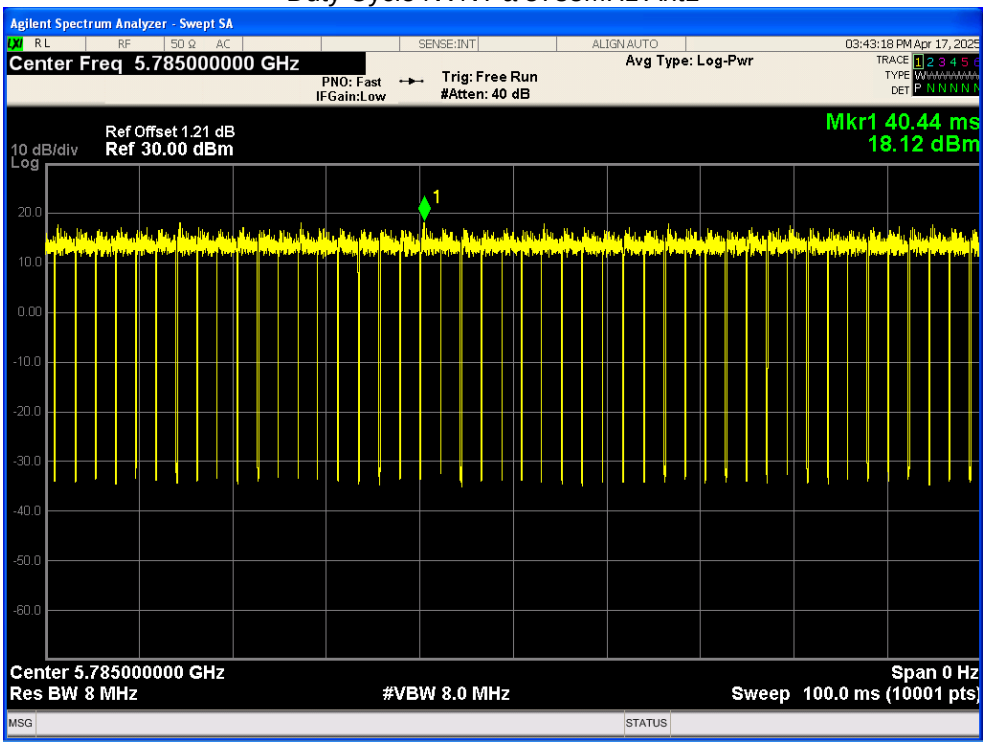
5.2.1 DUTY CYCLE

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5745	Ant1	95.36	0.21
NVNT	a	5785	Ant1	95.39	0.2
NVNT	a	5825	Ant1	95.82	0.19
NVNT	ac20	5745	Ant1	95.38	0.21
NVNT	ac20	5785	Ant1	94.85	0.23
NVNT	ac20	5825	Ant1	95.52	0.2
NVNT	ac40	5755	Ant1	91.6	0.38
NVNT	ac40	5795	Ant1	90.95	0.41
NVNT	ac80	5775	Ant1	80.3	0.95
NVNT	n20	5745	Ant1	95.27	0.21
NVNT	n20	5785	Ant1	95.41	0.2
NVNT	n20	5825	Ant1	95.41	0.2
NVNT	n40	5755	Ant1	91.4	0.39
NVNT	n40	5795	Ant1	91.43	0.39

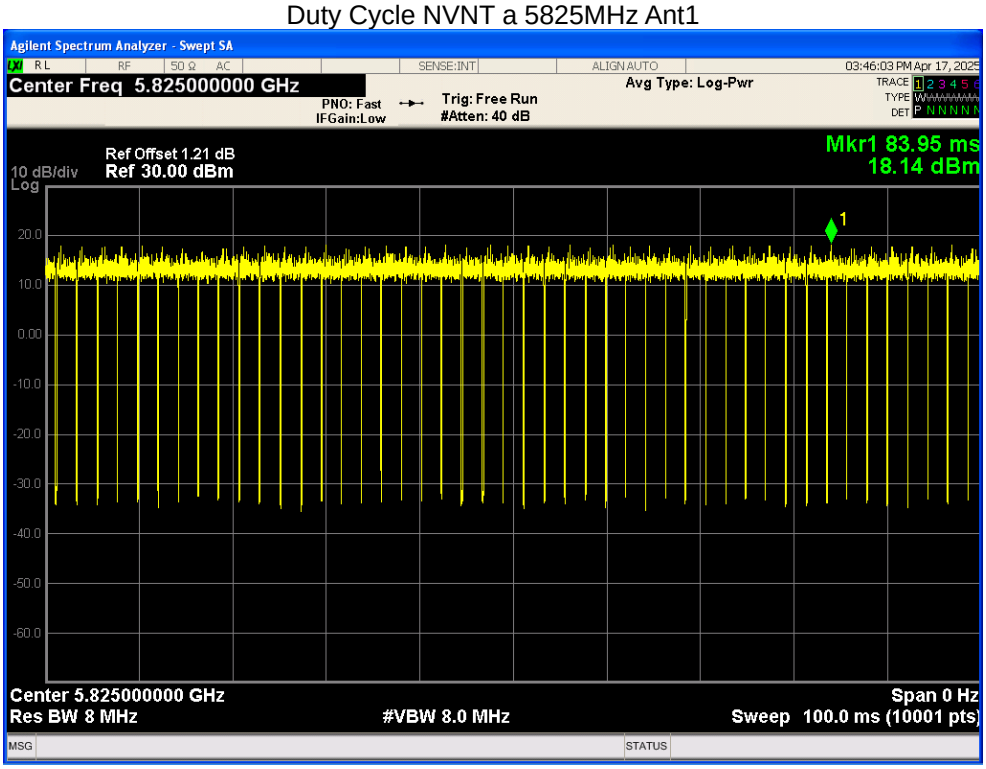
Duty Cycle NVNT a 5745MHz Ant1



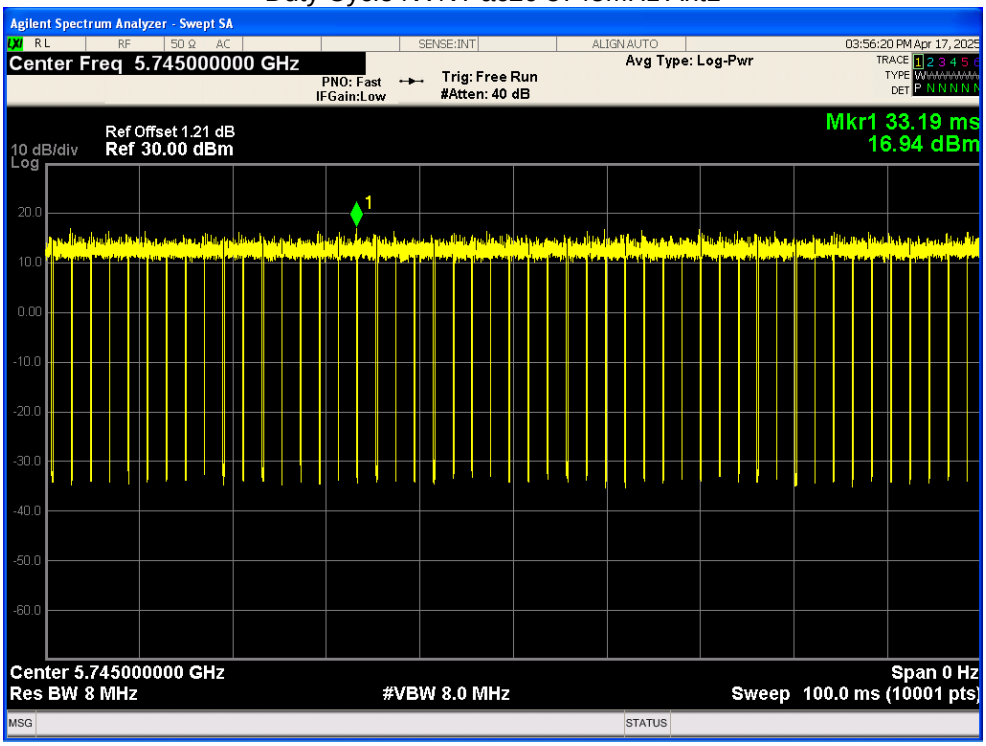
Duty Cycle NVNT a 5785MHz Ant1



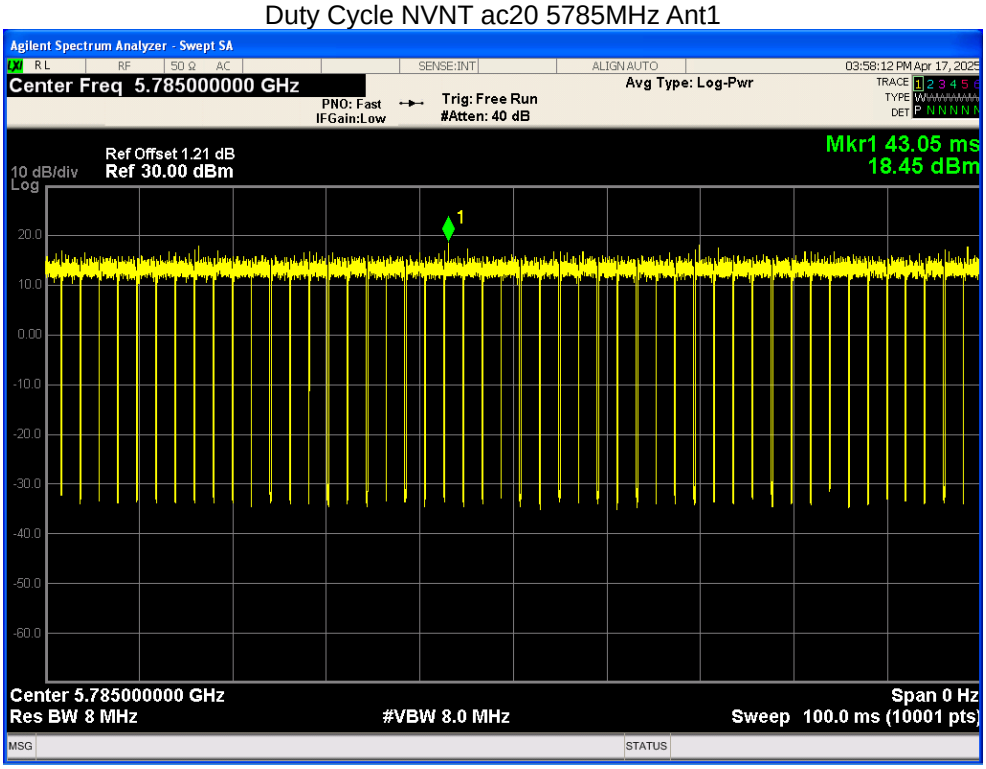
Duty Cycle NVNT a 5825MHz Ant1



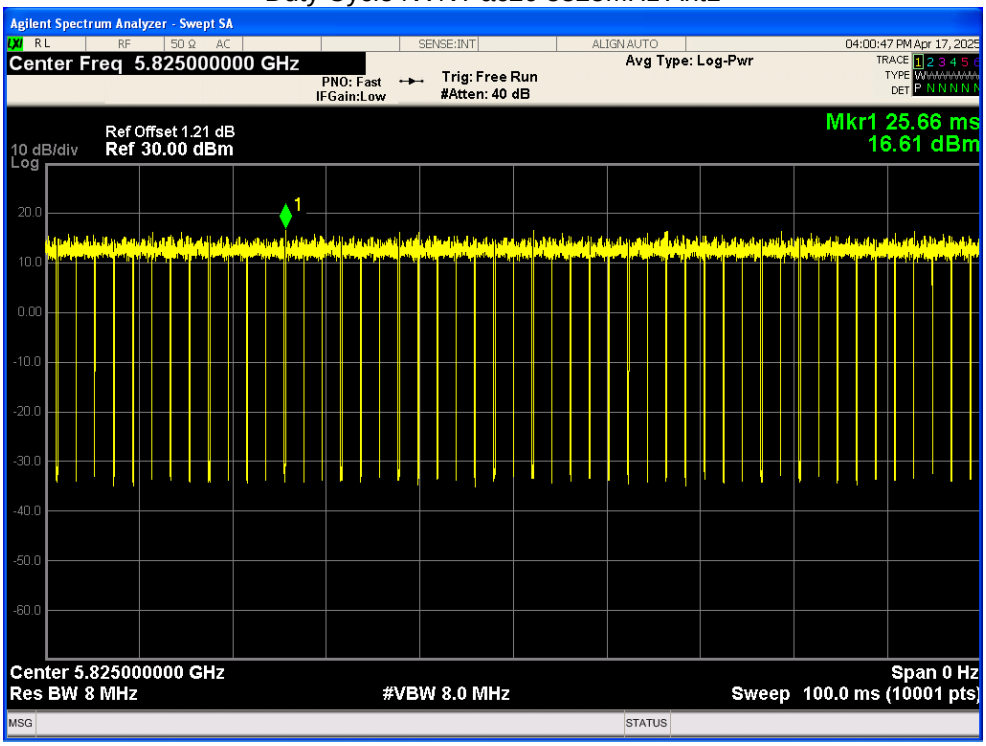
Duty Cycle NVNT ac20 5745MHz Ant1



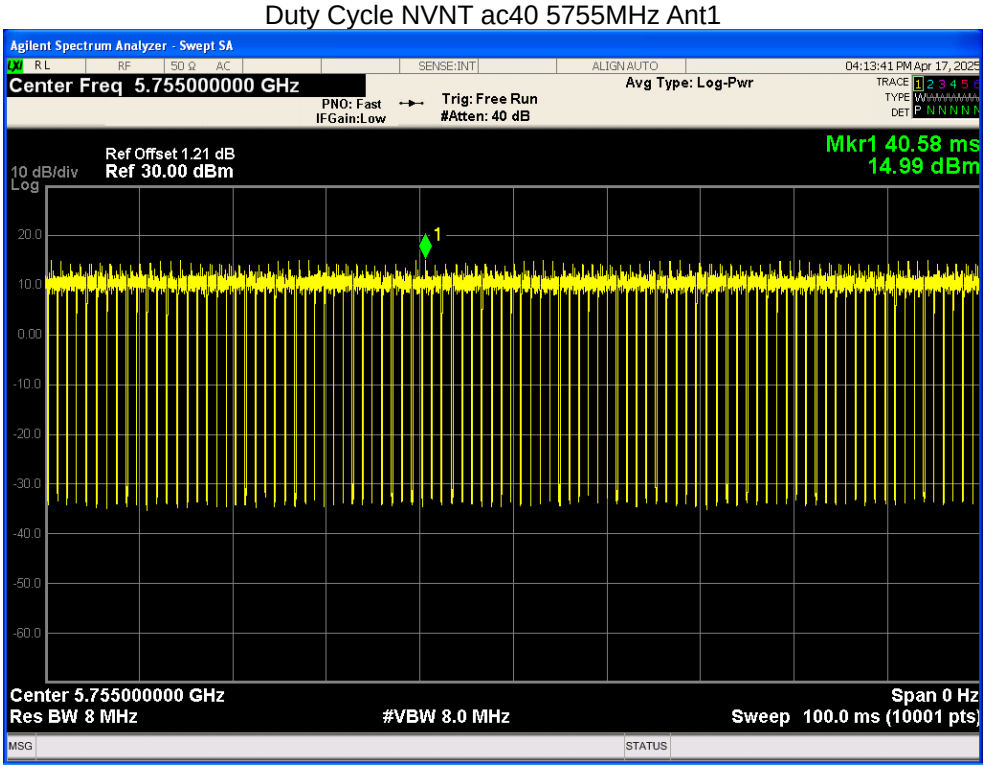
Duty Cycle NVNT ac20 5785MHz Ant1



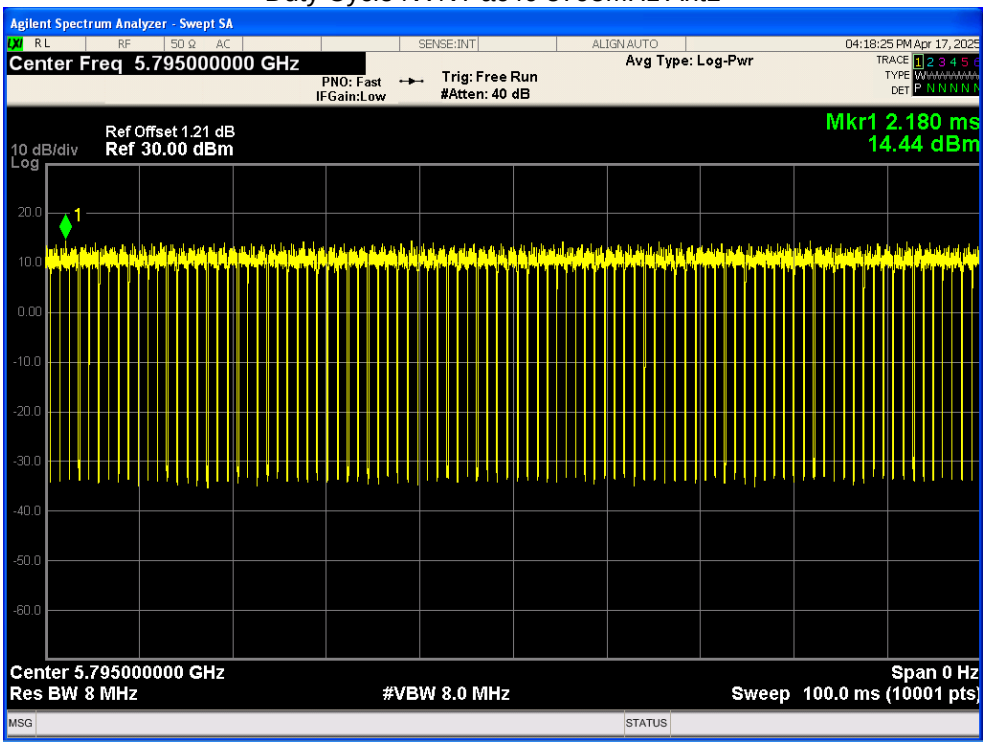
Duty Cycle NVNT ac20 5825MHz Ant1



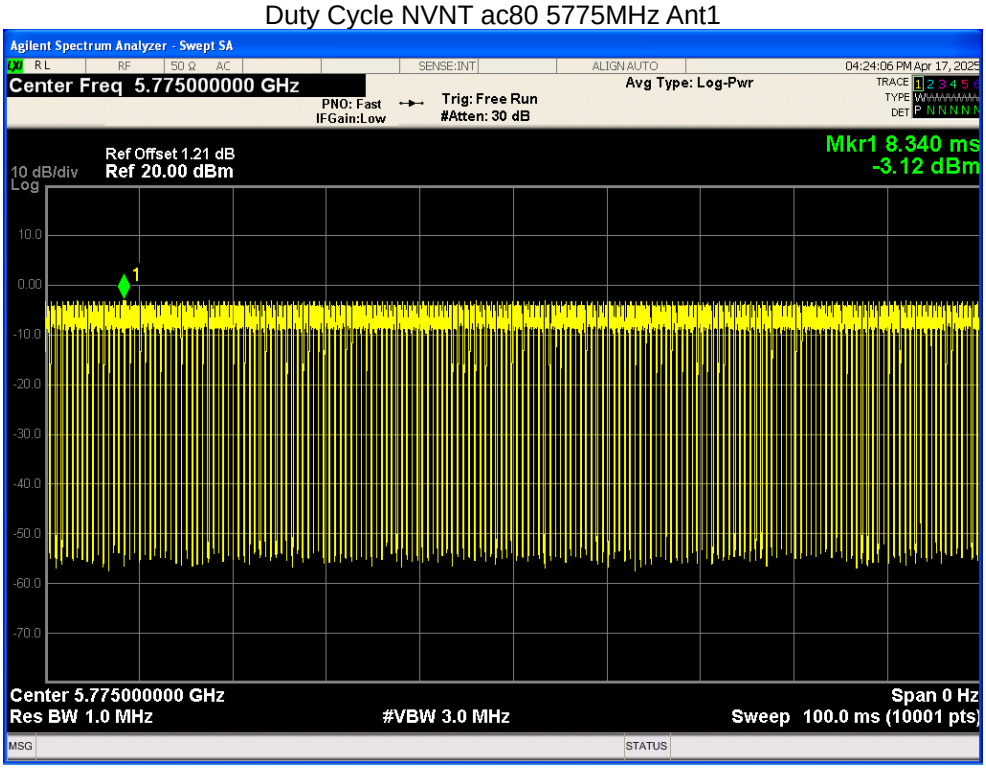
Duty Cycle NVNT ac40 5755MHz Ant1



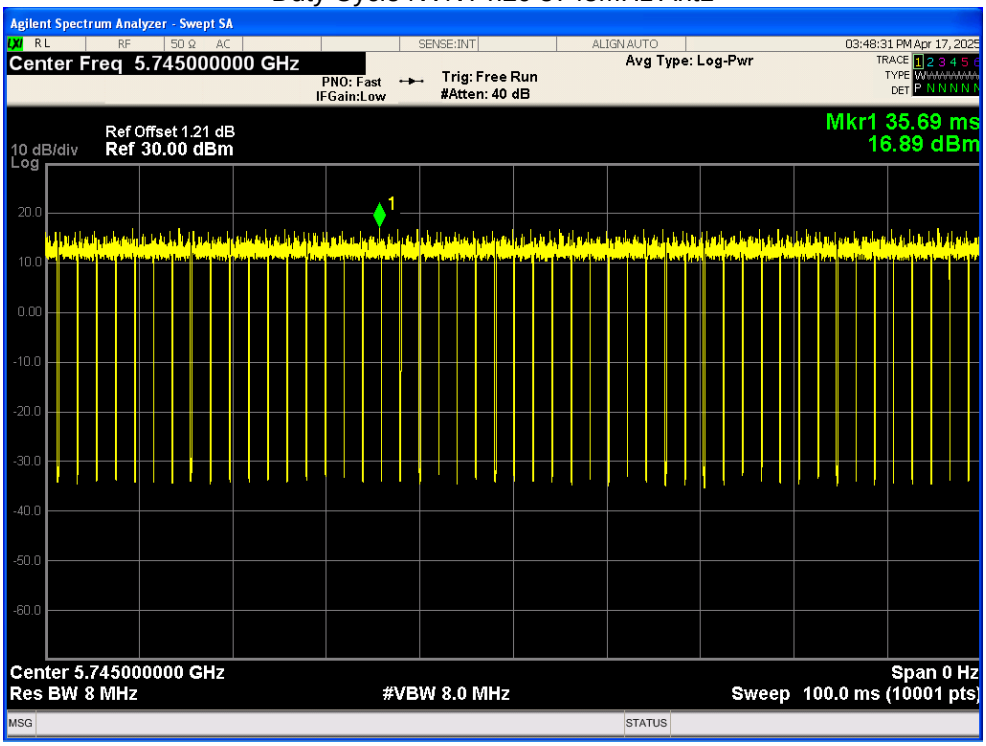
Duty Cycle NVNT ac40 5795MHz Ant1



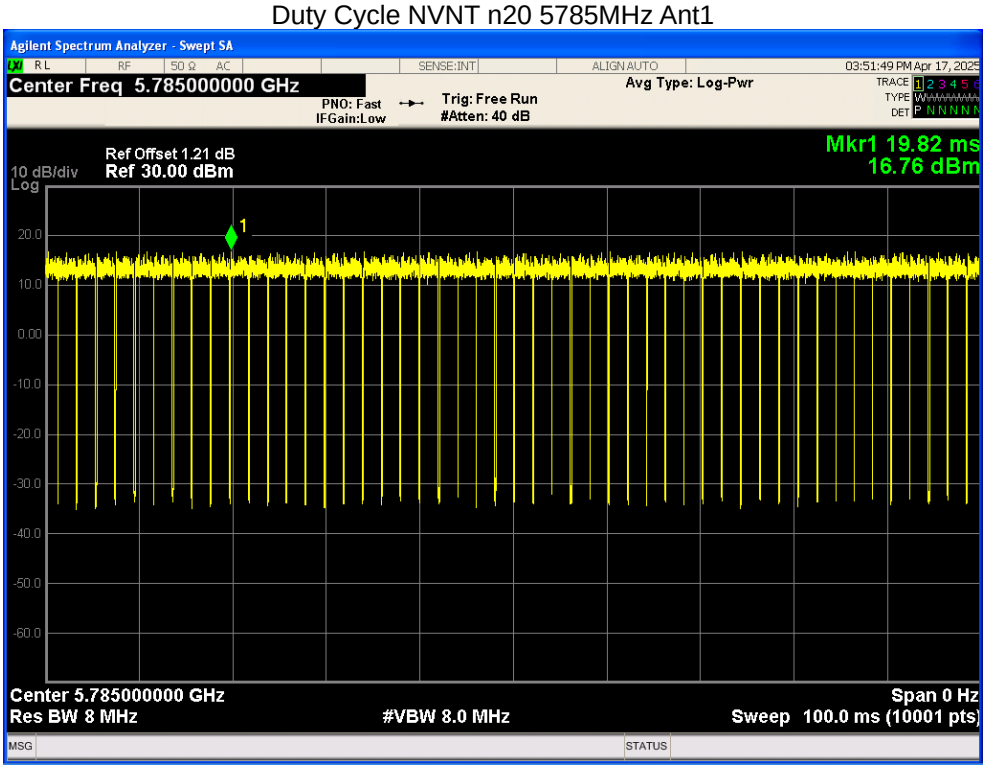
Duty Cycle NVNT ac80 5775MHz Ant1



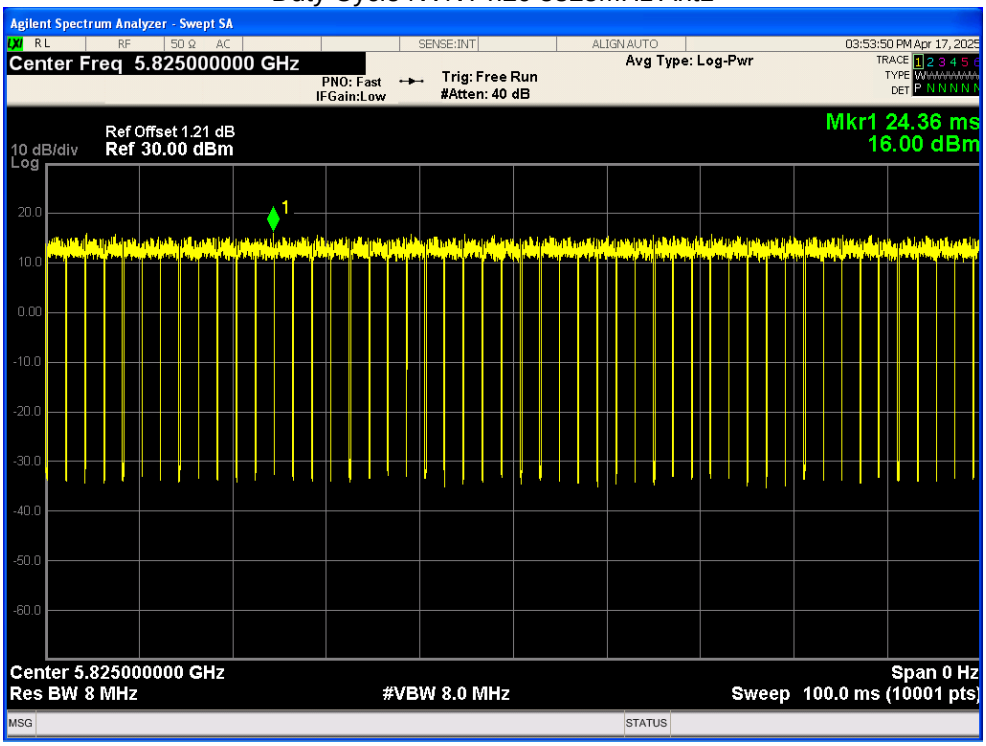
Duty Cycle NVNT n20 5745MHz Ant1



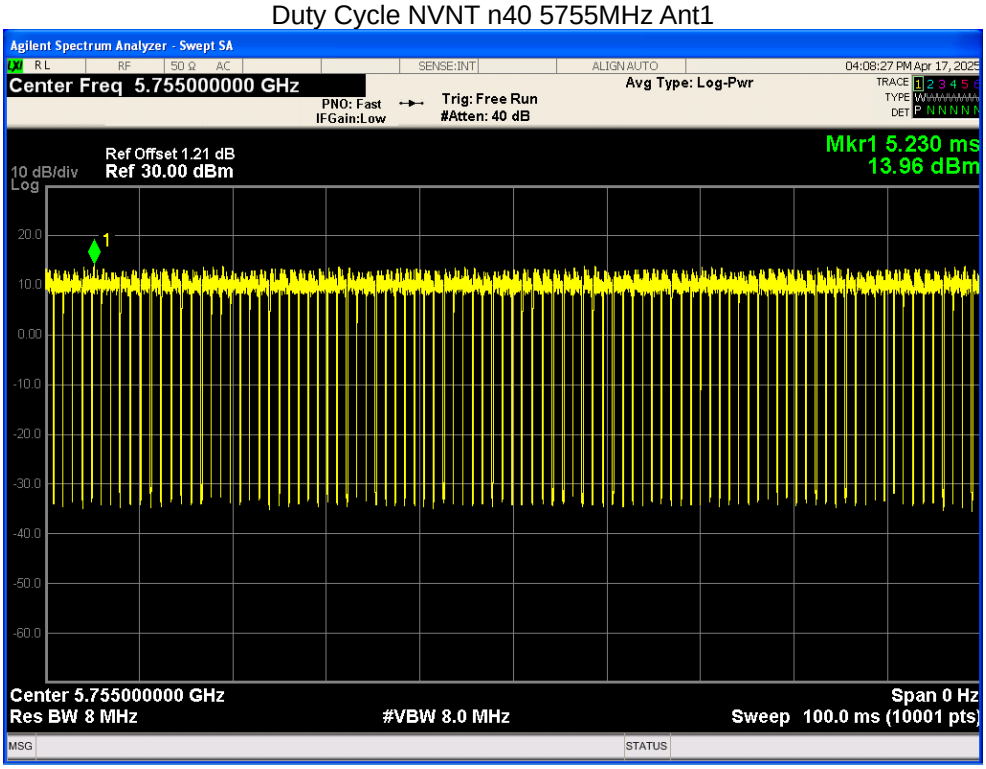
Duty Cycle NVNT n20 5785MHz Ant1



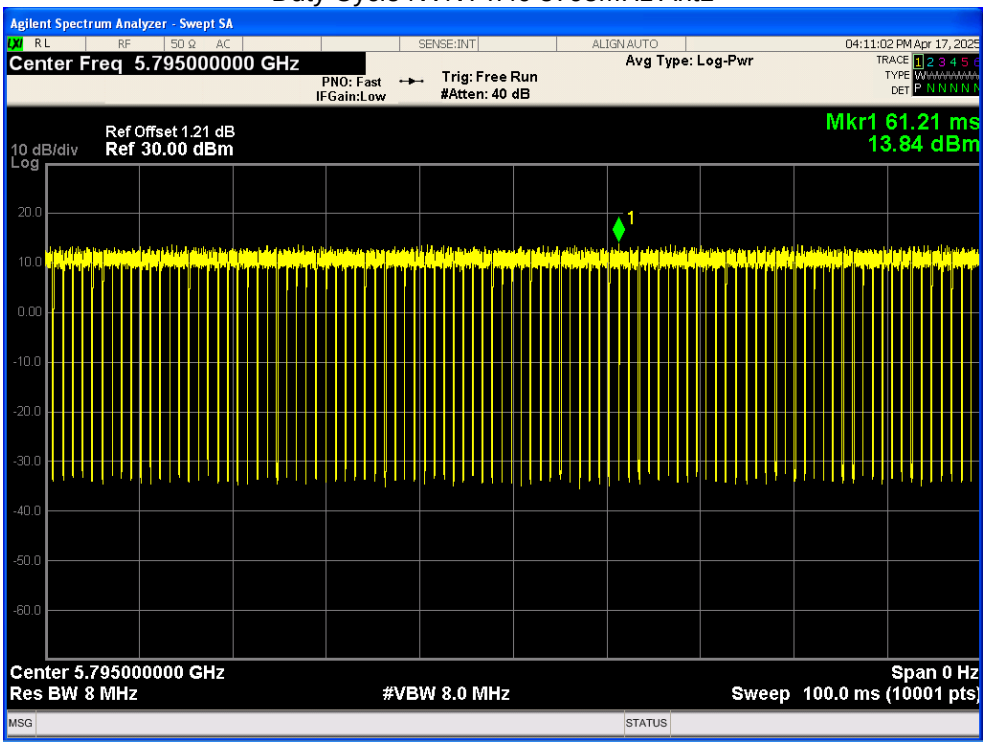
Duty Cycle NVNT n20 5825MHz Ant1



Duty Cycle NVNT n40 5755MHz Ant1



Duty Cycle NVNT n40 5795MHz Ant1



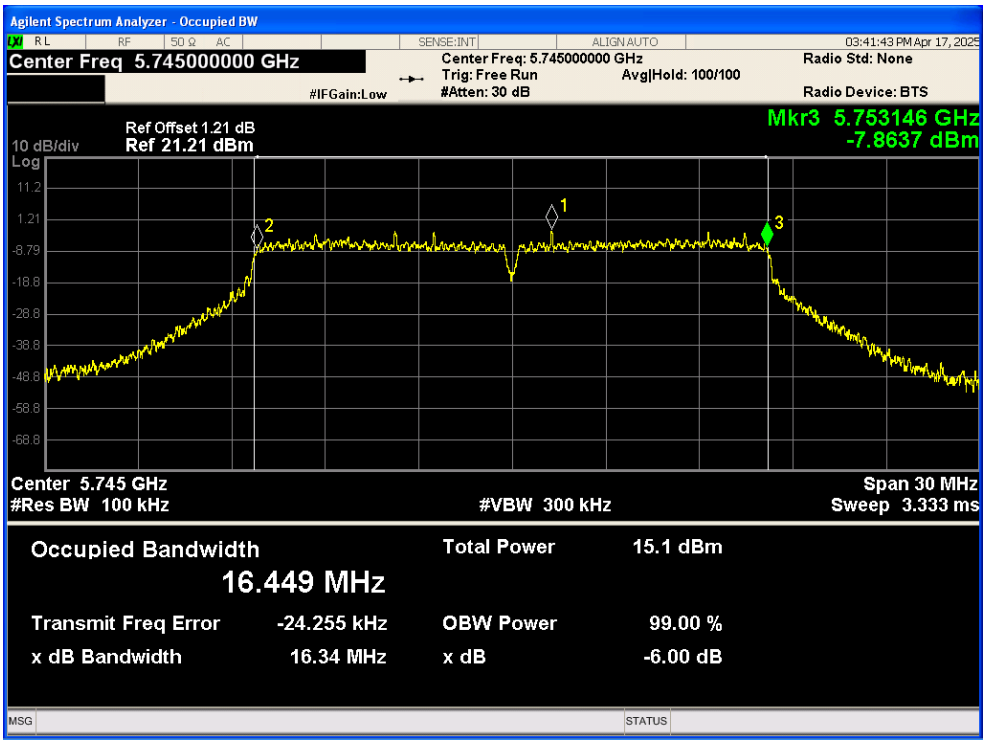
5.2.2 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	9.338	30	Pass
NVNT	a	5785	Ant1	9.788	30	Pass
NVNT	a	5825	Ant1	9.24	30	Pass
NVNT	ac20	5745	Ant1	9.17	30	Pass
NVNT	ac20	5785	Ant1	9.684	30	Pass
NVNT	ac20	5825	Ant1	9.199	30	Pass
NVNT	ac40	5755	Ant1	9.521	30	Pass
NVNT	ac40	5795	Ant1	9.873	30	Pass
NVNT	ac80	5775	Ant1	9.503	30	Pass
NVNT	n20	5745	Ant1	9.17	30	Pass
NVNT	n20	5785	Ant1	9.692	30	Pass
NVNT	n20	5825	Ant1	9.184	30	Pass
NVNT	n40	5755	Ant1	9.38	30	Pass
NVNT	n40	5795	Ant1	9.852	30	Pass

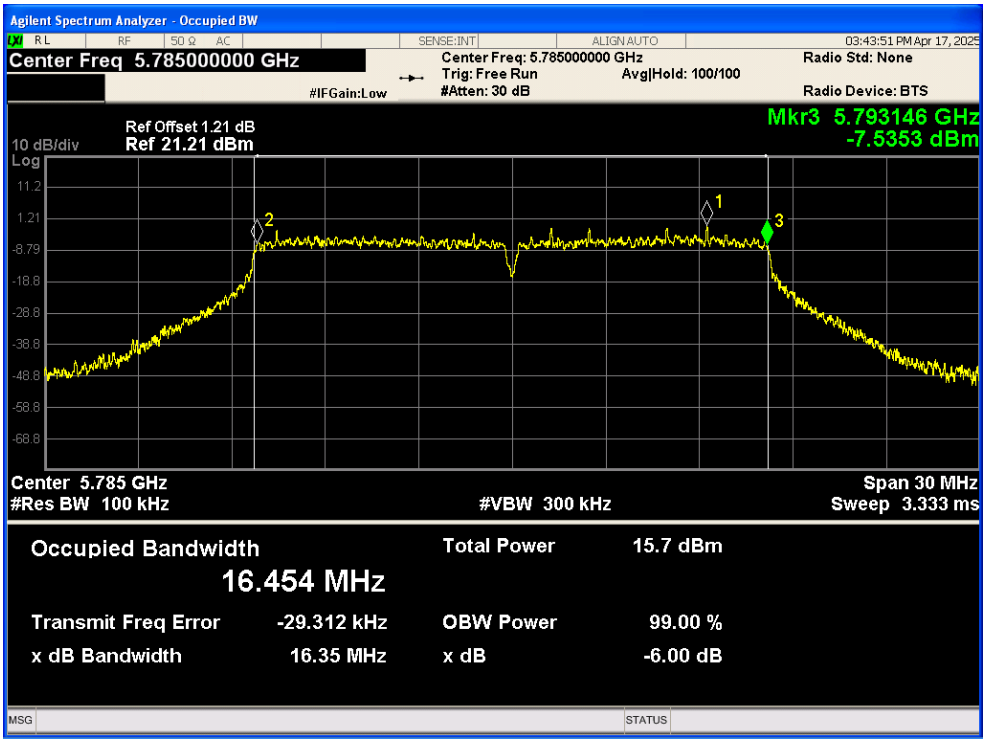
5.2.3 -6DB BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	Ant1	16.34	0.5	Pass
NVNT	a	5785	Ant1	16.35	0.5	Pass
NVNT	a	5825	Ant1	16.319	0.5	Pass
NVNT	ac20	5745	Ant1	17.302	0.5	Pass
NVNT	ac20	5785	Ant1	17.541	0.5	Pass
NVNT	ac20	5825	Ant1	17.321	0.5	Pass
NVNT	ac40	5755	Ant1	35.468	0.5	Pass
NVNT	ac40	5795	Ant1	36.011	0.5	Pass
NVNT	ac80	5775	Ant1	75.146	0.5	Pass
NVNT	n20	5745	Ant1	17.537	0.5	Pass
NVNT	n20	5785	Ant1	17.549	0.5	Pass
NVNT	n20	5825	Ant1	17.258	0.5	Pass
NVNT	n40	5755	Ant1	35.405	0.5	Pass
NVNT	n40	5795	Ant1	36.057	0.5	Pass

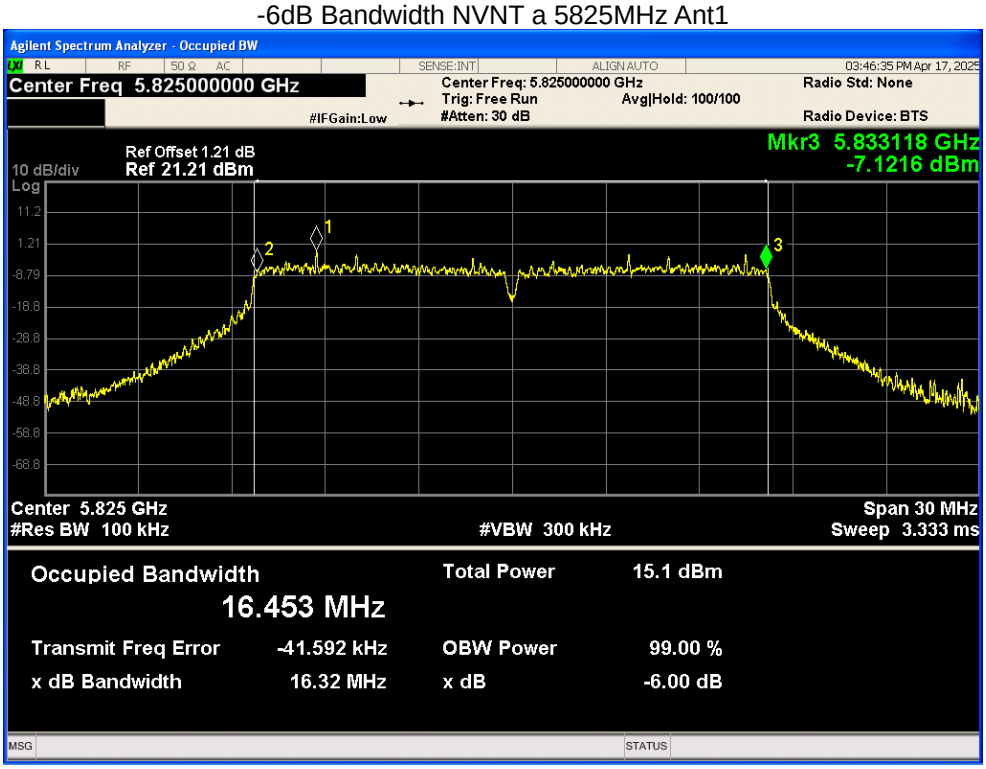
-6dB Bandwidth NVNT a 5745MHz Ant1



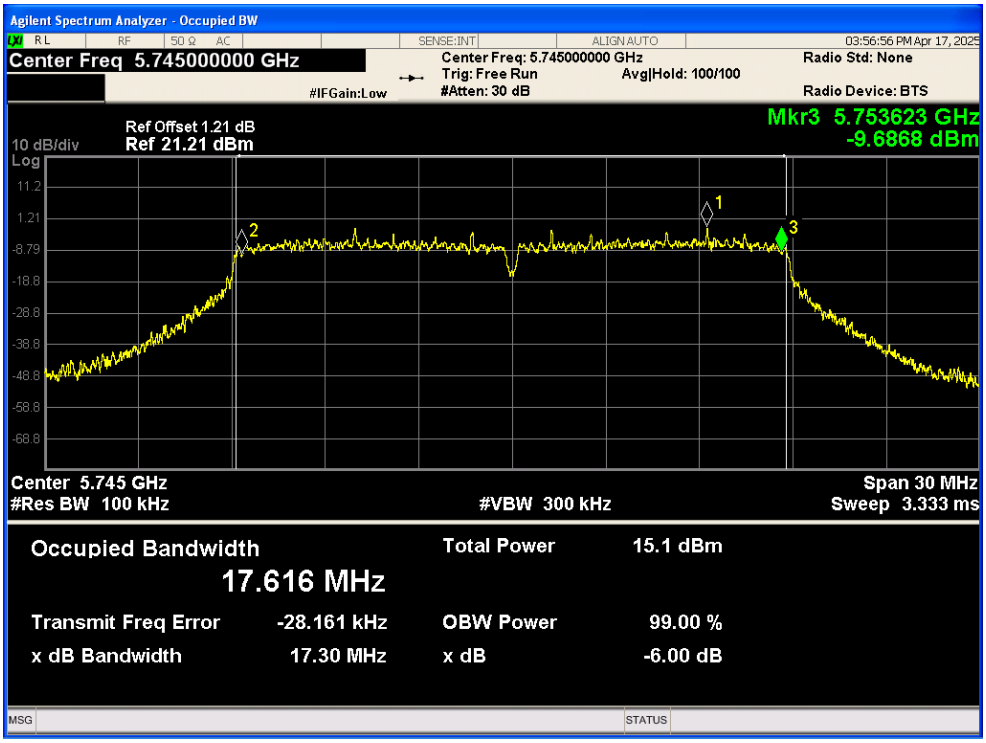
-6dB Bandwidth NVNT a 5785MHz Ant1



-6dB Bandwidth NVNT a 5825MHz Ant1



-6dB Bandwidth NVNT ac20 5745MHz Ant1



-6dB Bandwidth NVNT ac20 5785MHz Ant1