



RF TEST REPORT

Product Name: Smartphone

Model Name: VORTEX HD68

FCC ID: 2ADLJ-HD68

Issued For : Xwireless LLC.

11565 Old Georgetown Road, Rockville, MD, USA

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park,
No.177, Renmin West Road, Jinsha, Kengzi Street,
Pingshan District, Shenzhen, Guangdong, China

Report Number: LGT23L113RF04

Sample Received Date: Dec. 27, 2023

Date of Test: Dec. 27, 2023 – Jan. 23, 2024

Date of Issue: Jan. 23, 2024

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TEST REPORT CERTIFICATION

Applicant: Xwireless LLC.

Address: 11565 Old Georgetown Road, Rockville, MD, USA

Manufacturer: Xwireless LLC.

Address: 11565 Old Georgetown Road, Rockville, MD, USA

Product Name: Smartphone

Trademark: VORTEX

Model Name: VORTEX HD68

Sample Status: Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15.407, Subpart E ANSI C63.10-2013	PASS

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Revision History

Rev.	Issue Date	Contents
00	Jan. 23, 2024	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Part 15.407, KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC Part 15.407		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
15.407 (a) /15.407 (e)	26dB/6dB &99% Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	PASS
15.407(b)/15.205/15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(a)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	PASS

NOTE:

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

(2) All tests are according to ANSI C63.10-2013.



1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate:	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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	RF output power, conducted	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 2.84\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.39\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 5.10\text{dB}$
6	All emissions, radiated >6G	$\pm 5.48\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.79\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.80\text{dB}$

Note: The measurement uncertainty is not included in the test result.



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	Smartphone											
Trademark:	VORTEX											
Model Name:	VORTEX HD68											
Series Model:	N/A											
Model Difference:	N/A											
Product Description:	<table><tr><td rowspan="3">Operation Frequency:</td><td>IEEE 802.11a/n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz</td></tr><tr><td>IEEE 802.11a/n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz</td></tr><tr><td>802.11a(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11n(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11ac (OFDM): BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM</td></tr><tr><td>Antenna Designation:</td><td colspan="2">FPC</td></tr><tr><td>Antenna Gain(dBi)</td><td colspan="2">-0.18</td></tr></table> More details of EUT technical specification, please refer to the User Manual.		Operation Frequency:	IEEE 802.11a/n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz	IEEE 802.11a/n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz	802.11a(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11n(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11ac (OFDM): BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	Antenna Designation:	FPC		Antenna Gain(dBi)	-0.18	
Operation Frequency:	IEEE 802.11a/n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11 n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz											
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Antenna Designation:	FPC											
Antenna Gain(dBi)	-0.18											
Test Channel:	Please refer to the Note 3.											
Adapter:	Input: 100~240V, 50/60Hz, 0.3A Output: 5V, 2A, 10W											
Battery:	Rated Voltage: 3.85V											
Hardware Version:	S81D_V2.0X											
Software Version:	N/A											
Connecting I/O Port(s):	Please refer to the Note 1.											



Note

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2. The antenna information refers to the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.

3	Operation Frequency of channel	
	5.260GHz-5.320GHz	
	Channel	Frequency
	52	5260
	54	5270
	56	5280
	58	5290
	60	5300
	62	5310
	64	5320
	5.500GHz-5.720GHz	
	Channel	Frequency
	100	5500
	102	5510
	104	5520
	108	5540
	110	5550
	112	5560
	116	5580
	118	5590
	120	5600
	124	5620
	126	5630
	128	5640
	132	5660
	134	5670
	136	5680
	140	5700
	142	5710
	144	5720

Note:

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

Carrier Frequency Channel

Channel List for 802.11a/n/ac(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	100	5500	--	--	--	--
60	5300	116	5580	--	--	--	--
64	5320	140	5700	--	--	--	--



Channel List for 802.11n/ac(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	102	5510	--	--	--	--
62	5310	110	5550	--	--	--	--
134	5670	--	--	--	--	--	--

Channel List for 802.11ac(80MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290	106	5530	--	--	--	--
122	5610	--	--	--	--	--	--

2.2 DESCRIPTION OF TEST MODES

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

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a HT20 CH52&CH60&CH64	6 Mbps
Mode 2	TX IEEE 802.11n HT20 CH52&CH60&CH64	MCS 0
Mode 3	TX IEEE 802.11ac VHT20 CH52&CH60&CH64	NSS1 MCS0
Mode 4	TX IEEE 802.11n HT40 CH54 &CH62	MCS 0
Mode 5	TX IEEE 802.11ac VHT40 CH54 &CH62	NSS1 MCS0
Mode 6	TX IEEE 802.11ac VHT80 CH58	NSS1 MCS0
Mode 7	TX IEEE 802.11ac VHT80 CH106&CH122	NSS1 MCS0

- 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.
 (3) We have been tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.
 (4) The battery is fully-charged during the radiated and RF conducted test.

AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 7: TX Mode



2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test software Version	Test program: 5G WIFI B2	
DRTU	Mode Or Modulation type	Power setting
	a	24
	n20	15
	n40	15
	ac20	15
	ac40	15
	ac80	15
Test software Version	Test program: 5G WIFI B3	
DRTU	Mode Or Modulation type	Power setting
	a	24
	n20	15
	n40	15
	ac20	15
	ac40	15
	ac80	15

2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating
Adapter	N/A	HD86	N/A	Input: 100-240V ~ 50/60Hz 0.3A Output: 5V, 2A
USB-A to USB-C Cable	N/A	N/A	N/A	1m

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU8	100372	2023.04.13	2024.04.12
LISN	COM-POWER	LI-115	02032	2023.04.07	2024.04.06
LISN	SCHWARZBECK	NNLK 8122	00160	2023.04.07	2024.04.06
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2023.04.07	2024.04.06
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

RF Radiated Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU8	100372	2023.04.13	2024.04.12
Active loop Antenna	ETS	6502	00049544	2022.06.02	2025.06.01
Spectrum Analyzer	Keysight	N9010B	MY60242508	2023.08.14	2024.08.13
Bilog Antenna	Schwarzbeck	VULB 9168	01447	2022.12.12	2025.12.11
Horn Antenna	Schwarzbeck	3115	10SL0060	2022.06.02	2025.06.01
Pre-amplifier (9kHz-1GHz)	EMtrace	RP01A	02017	2023.04.07	2024.04.06
Pre-amplifier (1-26.5G)	Agilent	8449B	3008A4722	2023.04.07	2024.04.06
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

RF Conducted Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
Signal Analyzer	Keysight	N9010B	MY60242508	2023.08.14	2024.08.13
Signal Analyzer	Keysight	N9020A	MY50530994	2023.10.12	2024.10.10
RF Automatic Test system	MW	MW200-RFCB	MW220322L G	2023.04.13	2024.04.12
MXG Vector Signal Generator	Keysight	N5182B	MY59100717	2023.04.07	2024.04.06
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2023.08.14	2024.08.13
Attenuator	eastsheep	90db	N.A	2023.04.10	2024.04.09
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Digital multimeter	MASTECH	MS8261	MBGBC8305 3	2023.08.14	2024.08.13
Testing Software	MTS8310_V2.0.0.0_MW				



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “ * ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



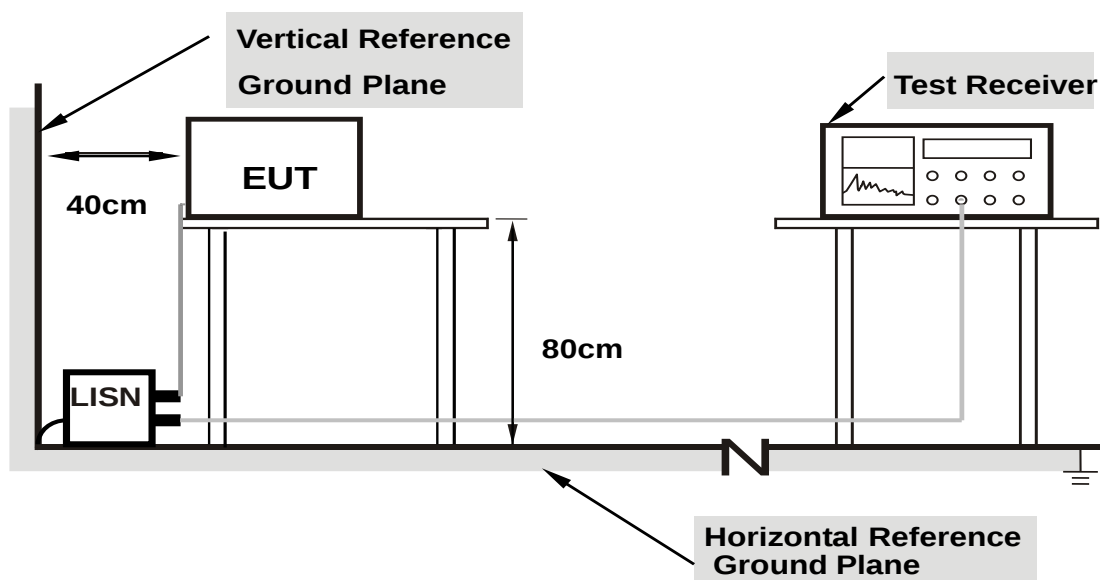
3.1.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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 40 cm long.
- 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.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

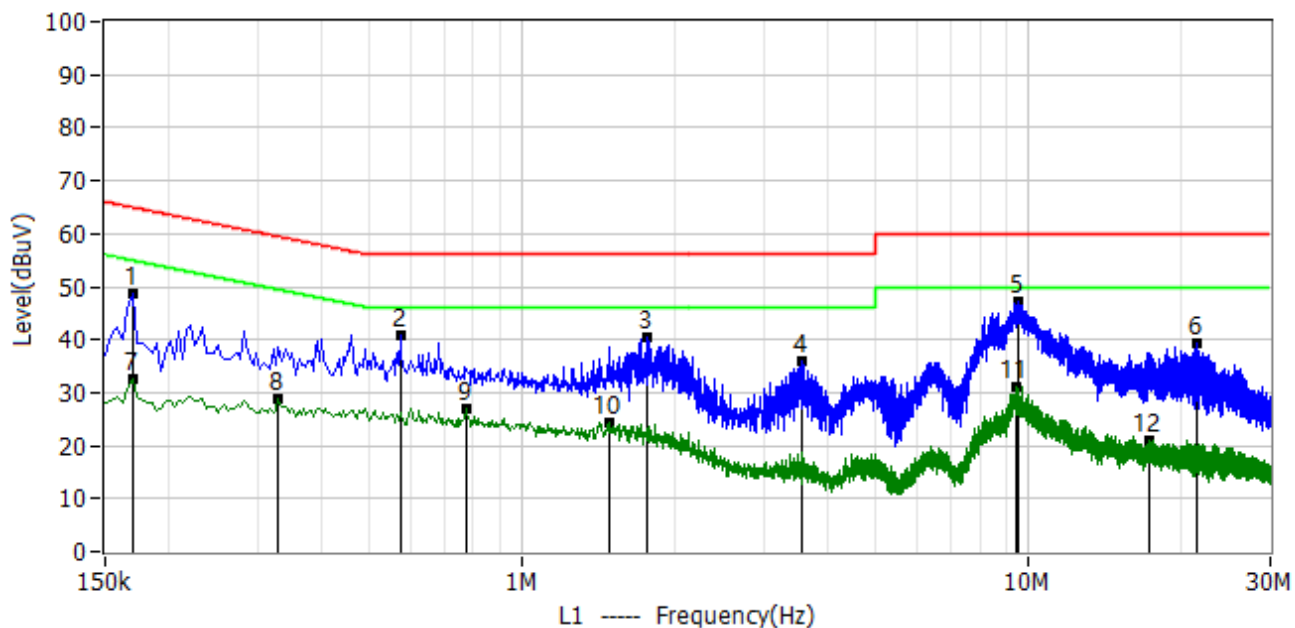
3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.1.6 TEST RESULTS

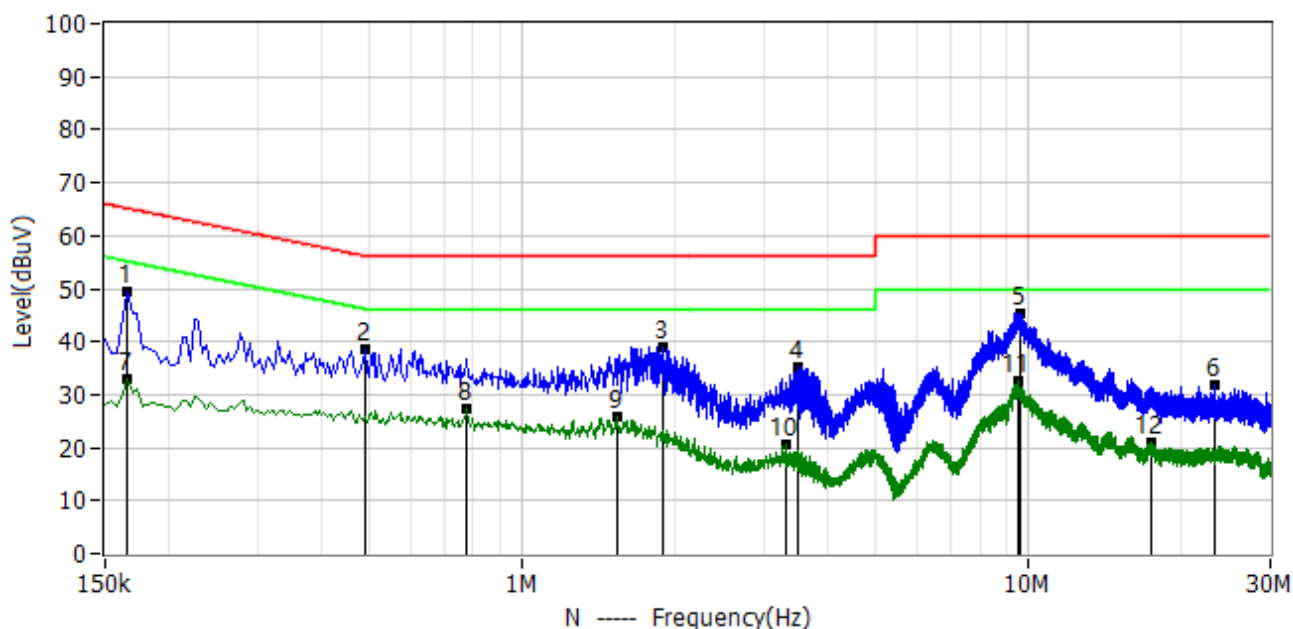
Project: LGT23L113	Test Engineer: LiuH
EUT: Smartphone	Temperature: 21.9°C
M/N: VORTEX HD68	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-12-30
Test Mode: TX 802.11a 5260	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.170	38.05	10.49	48.54	64.96	-16.42	QP	L1
2*	0.574	30.39	10.50	40.89	56.00	-15.11	QP	L1
3*	1.766	29.63	10.67	40.30	56.00	-15.70	QP	L1
4*	3.554	25.19	10.76	35.95	56.00	-20.05	QP	L1
5*	9.514	36.37	10.97	47.34	60.00	-12.66	QP	L1
6*	21.526	28.23	11.13	39.36	60.00	-20.64	QP	L1
7*	0.170	21.93	10.49	32.42	54.96	-22.54	AV	L1
8*	0.330	18.18	10.49	28.67	49.45	-20.78	AV	L1
9*	0.774	16.27	10.51	26.78	46.00	-19.22	AV	L1
10*	1.490	13.90	10.62	24.52	46.00	-21.48	AV	L1
11*	9.482	20.04	10.97	31.01	50.00	-18.99	AV	L1
12*	17.358	9.96	11.10	21.06	50.00	-28.94	AV	L1



Project: LGT23L113	Test Engineer: LiuH
EUT: Smartphone	Temperature: 21.9°C
M/N: VORTEX HD68	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2023-12-30
Test Mode: TX 802.11a 5260	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.166	39.09	10.49	49.58	65.16	-15.58	QP	N
2*	0.490	28.14	10.50	38.64	56.17	-17.52	QP	N
3*	1.894	28.36	10.70	39.06	56.00	-16.94	QP	N
4*	3.494	24.60	10.76	35.36	56.00	-20.64	QP	N
5*	9.658	34.49	10.99	45.48	60.00	-14.52	QP	N
6*	23.226	20.46	11.28	31.74	60.00	-28.26	QP	N
7*	0.166	22.39	10.49	32.88	55.16	-22.27	AV	N
8*	0.778	16.94	10.51	27.45	46.00	-18.55	AV	N
9*	1.538	15.16	10.63	25.79	46.00	-20.21	AV	N
10*	3.322	9.74	10.76	20.50	46.00	-25.50	AV	N
11*	9.494	21.50	10.99	32.49	50.00	-17.51	AV	N
12*	17.458	9.66	11.16	20.82	50.00	-29.18	AV	N



3.2 RADIATED EMISSION AND (BANDEGE) MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.407(b)7&15.205/209(a), then the limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	68.2	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15E.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Note: In case the emission radiated emission above 1000MHz fall within the restricted band the restricted frequency bands, the peak limit is 74 dBuV/m.



LIMITS OF EMISSIONS OUTSIDE OF THE FREQUENCY BANDS

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

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (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.

Note: $\text{dBuV/m(at 3M)} = \text{EIRP(dBm)} + 95.3$.

Peak Limit = $-27\text{dBm/MHz} + 95.3 = 68.3 \text{ dBuV/m}$.

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic (Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- 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 QuasiPeak detector mode will be re-measured.
- If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

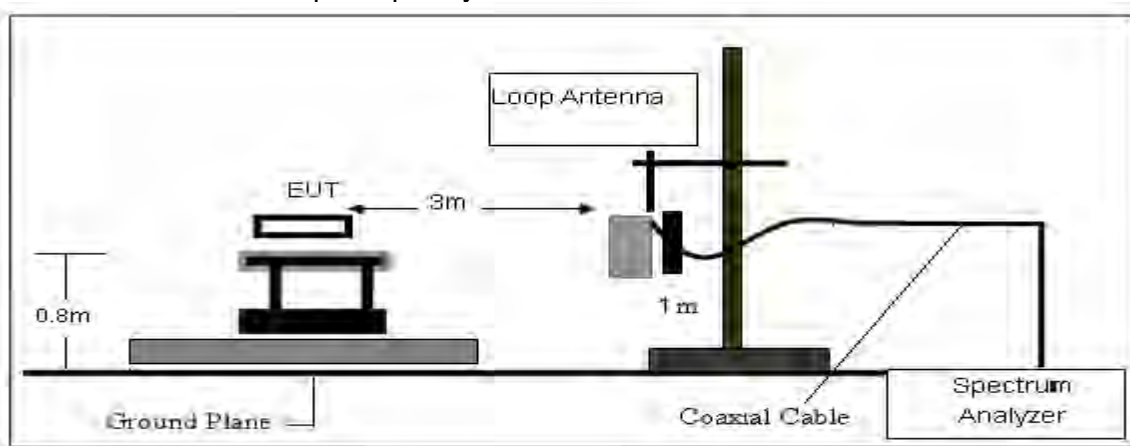
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.2 DEVIATION FROM TEST STANDARD

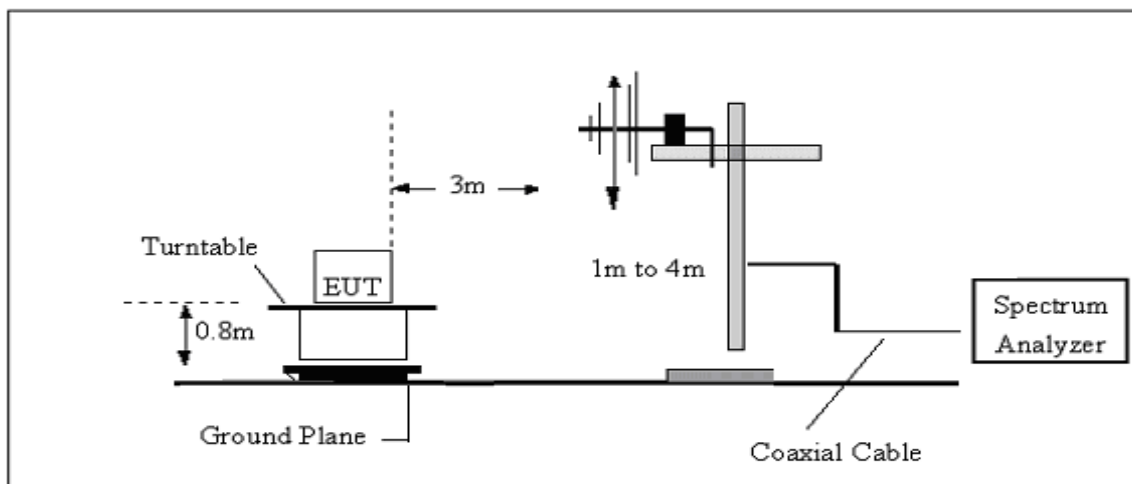
No deviation

3.2.3 TEST SETUP

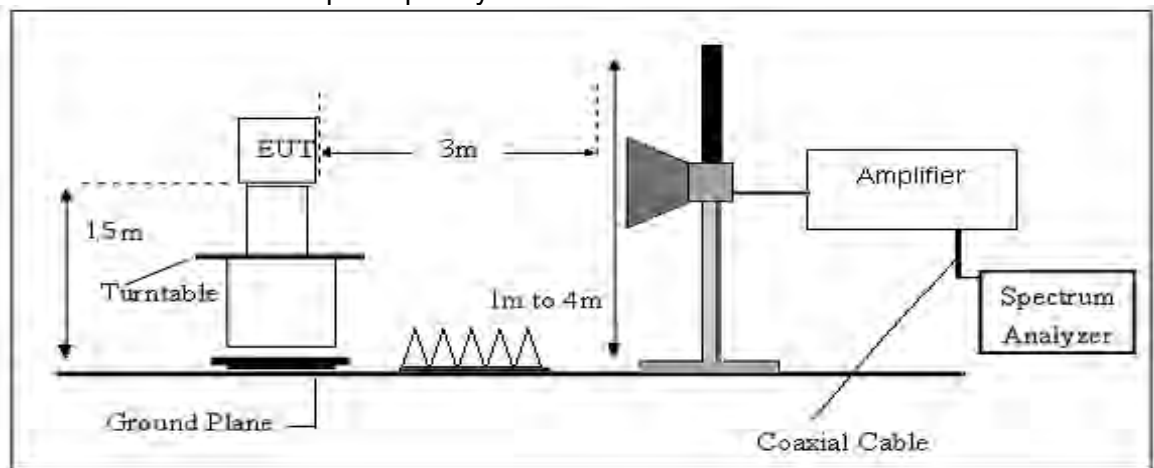
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz





3.2.4 EUT OPERATING 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.

3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$



3.2.6 TEST RESULTS

Results of Radiated Emissions (9 KHz~30MHz)

No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Remark
1*	-	-	-	-	-	-	-	See Note

Note:

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.

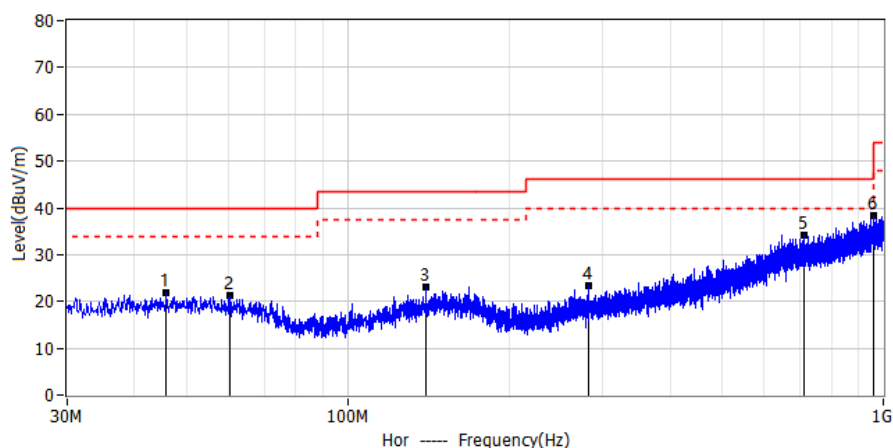
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

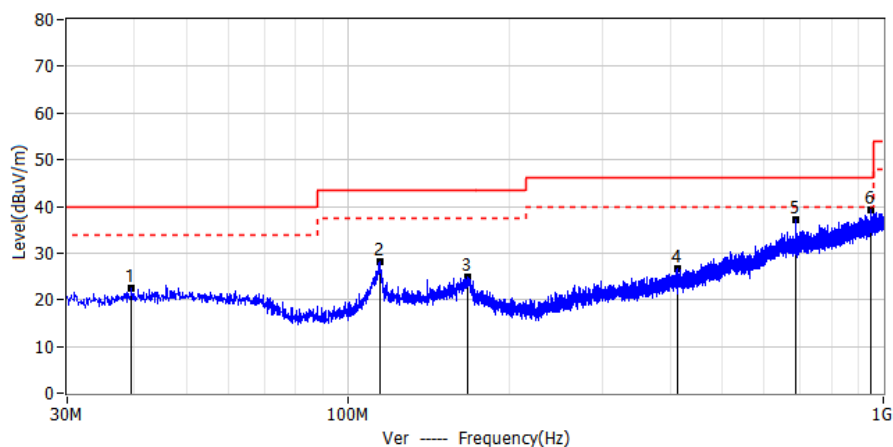


Results of Radiated Emissions (30MHz~1000MHz)

Project: LGT23L113	Test Engineer: Xiangdong Ma
EUT: Smartphone	Temperature: 26.9°C
M/N: VORTEX HD68	Humidity: 48%RH
Test Voltage: Battery	Test Data: 2023-12-28
Test Mode: TX 802.11a 5260	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	45.884	2.53	19.24	21.77	40.00	-18.23	QP	Hor
2*	60.191	2.62	18.63	21.25	40.00	-18.75	QP	Hor
3*	140.216	4.12	19.07	23.19	43.50	-20.31	QP	Hor
4*	281.836	3.74	19.56	23.30	46.00	-22.70	QP	Hor
5*	711.910	4.31	29.96	34.27	46.00	-11.73	QP	Hor
6*	958.411	4.09	34.12	38.21	46.00	-7.79	QP	Hor

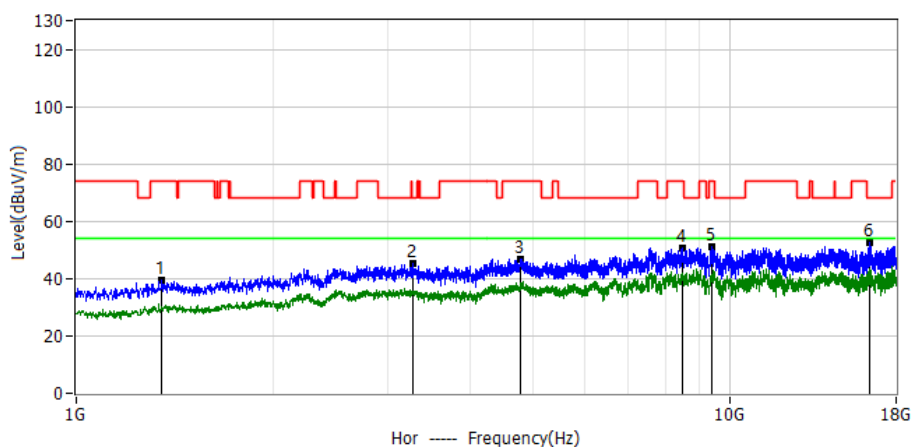


No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	39.579	3.23	19.31	22.54	40.00	-17.46	QP	Ver
2*	114.754	11.10	17.19	28.29	43.50	-15.21	QP	Ver
3*	167.619	4.94	19.80	24.74	43.50	-18.76	QP	Ver
4*	414.241	3.62	23.06	26.68	46.00	-19.32	QP	Ver
5*	687.539	7.61	29.69	37.30	46.00	-8.70	QP	Ver
6*	950.045	5.19	33.96	39.15	46.00	-6.85	QP	Ver



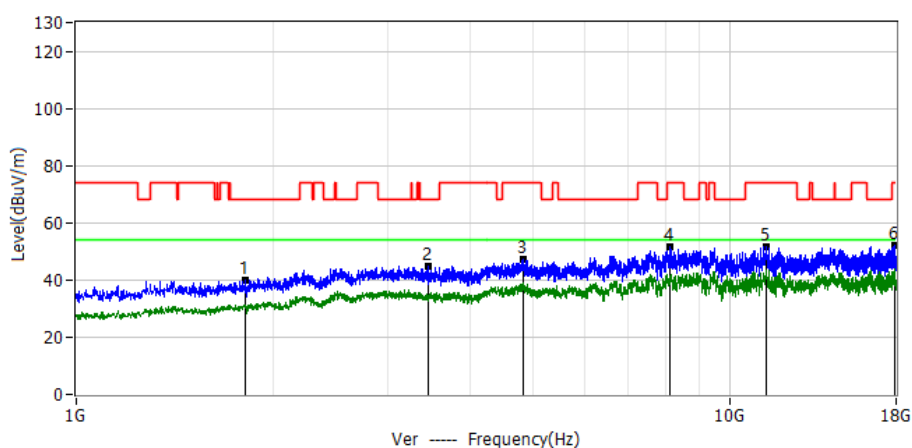
Results of Radiated Emissions (Above 1000MHz)

Test Mode: 802.11a 5260
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1352.7000	61.18	-21.83	39.35	74.00	-34.65	PK	Hor
2*	3273.7000	54.05	-8.92	45.13	68.20	-23.07	PK	Hor
3*	4788.9000	53.61	-6.79	46.82	74.00	-27.18	PK	Hor
4*	8458.7000	55.45	-4.66	50.79	74.00	-23.21	PK	Hor
5*	9400.1000	54.99	-3.87	51.12	74.00	-22.88	PK	Hor
6*	16361.6000	51.66	0.73	52.39	68.20	-15.81	PK	Hor

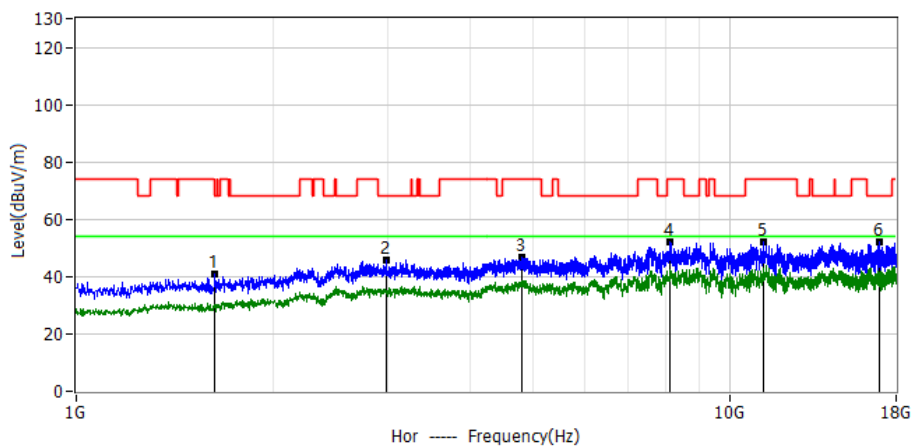
Test Mode: 802.11a 5260
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1811.7000	58.25	-18.31	39.94	68.20	-28.26	PK	Ver
2*	3460.7000	53.93	-9.02	44.91	68.20	-23.29	PK	Ver
3*	4842.0000	54.00	-6.84	47.16	74.00	-26.84	PK	Ver
4*	8125.1000	56.69	-5.27	51.42	74.00	-22.58	PK	Ver
5*	11395.5000	53.48	-1.83	51.65	74.00	-22.35	PK	Ver
6*	17923.5000	49.98	1.99	51.97	74.00	-22.03	PK	Ver

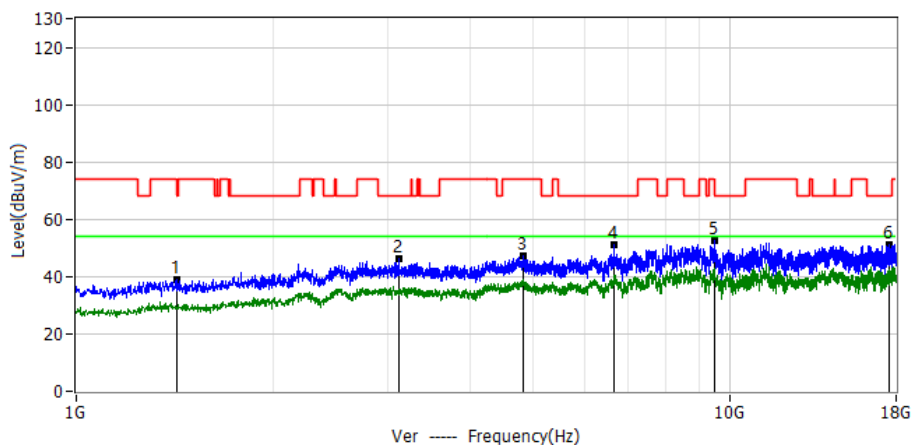


Test Mode: 802.11a 5300
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1631.1000	61.01	-20.01	41.00	68.20	-27.20	PK	Hor
2*	2986.9000	54.46	-8.84	45.62	68.20	-22.58	PK	Hor
3*	4810.1000	53.34	-6.81	46.53	74.00	-27.47	PK	Hor
4*	8125.1000	57.31	-5.27	52.04	74.00	-21.96	PK	Hor
5*	11268.0000	54.05	-1.85	52.20	74.00	-21.80	PK	Hor
6*	16943.9000	50.53	1.50	52.03	68.20	-16.17	PK	Hor

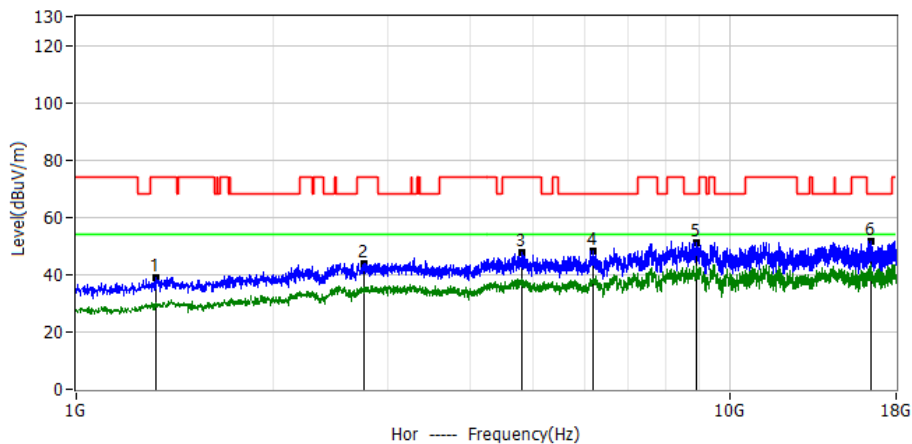
Test Mode: 802.11a 5300
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1427.1000	60.29	-21.33	38.96	68.20	-29.24	PK	Ver
2*	3118.6000	54.86	-8.83	46.03	68.20	-22.17	PK	Ver
3*	4839.9000	54.29	-6.84	47.45	74.00	-26.55	PK	Ver
4*	6671.6000	58.60	-7.48	51.12	68.20	-17.08	PK	Ver
5*	9476.6000	56.41	-3.91	52.50	74.00	-21.50	PK	Ver
6*	17581.4000	49.46	1.83	51.29	68.20	-16.91	PK	Ver

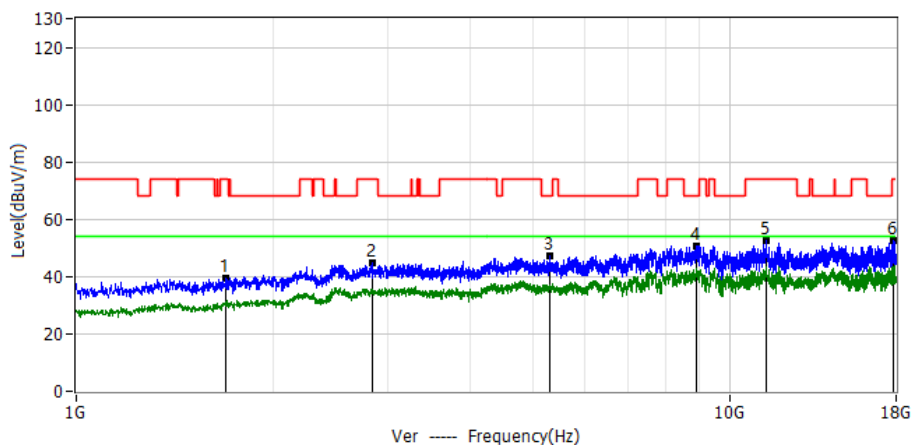


Test Mode: 802.11a 5320
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1325.1000	60.78	-22.04	38.74	74.00	-35.26	PK	Hor
2*	2757.4000	54.04	-10.00	44.04	74.00	-29.96	PK	Hor
3*	4801.6000	54.28	-6.80	47.48	74.00	-26.52	PK	Hor
4*	6180.7000	56.46	-8.30	48.16	68.20	-20.04	PK	Hor
5*	8915.6000	54.94	-3.82	51.12	68.20	-17.08	PK	Hor
6*	16463.6000	50.80	0.87	51.67	68.20	-16.53	PK	Hor

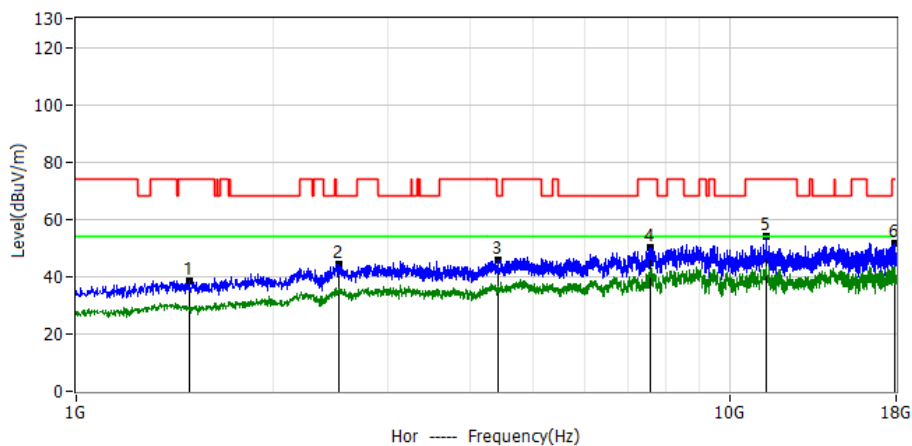
Test Mode: 802.11a 5320
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1694.9000	58.71	-19.41	39.30	74.00	-34.70	PK	Ver
2*	2836.0000	54.54	-9.60	44.94	74.00	-29.06	PK	Ver
3*	5309.5000	55.07	-8.05	47.02	68.20	-21.18	PK	Ver
4*	8919.9000	54.67	-3.82	50.85	68.20	-17.35	PK	Ver
5*	11395.5000	54.57	-1.83	52.74	74.00	-21.26	PK	Ver
6*	17813.0000	50.65	1.94	52.59	74.00	-21.41	PK	Ver

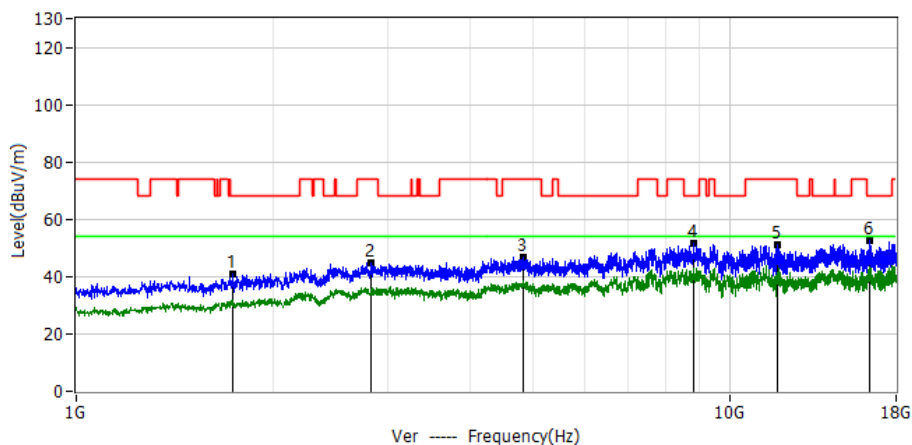


Test Mode: 802.11a 5500
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1486.6000	59.51	-21.02	38.49	74.00	-35.51	PK	Hor
2*	2527.9000	55.42	-11.16	44.26	68.20	-23.94	PK	Hor
3*	4431.9000	52.58	-6.78	45.80	68.20	-22.40	PK	Hor
4*	7583.2000	55.82	-5.66	50.16	74.00	-23.84	PK	Hor
5*	11384.9000	55.92	-1.84	54.08	74.00	-19.92	PK	Hor
6*	17929.9000	49.81	1.99	51.80	74.00	-22.20	PK	Hor

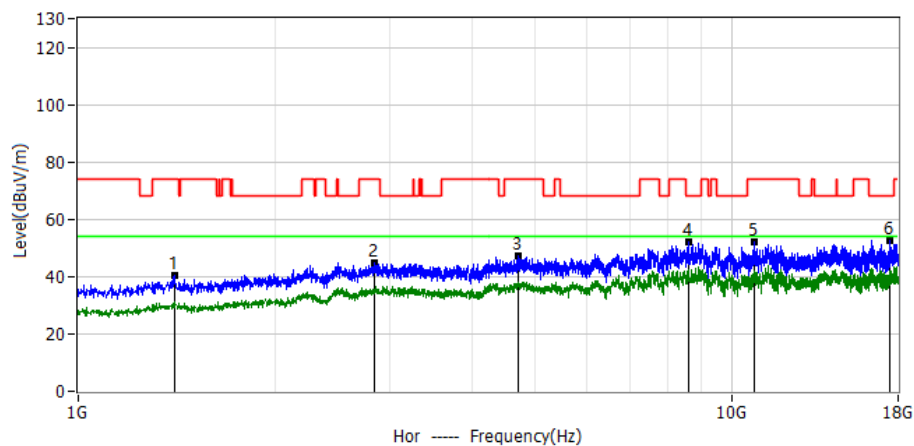
Test Mode: 802.11a 5500
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1737.4000	59.93	-19.01	40.92	68.20	-27.28	PK	Ver
2*	2831.7000	54.52	-9.62	44.90	74.00	-29.10	PK	Ver
3*	4822.9000	53.78	-6.82	46.96	74.00	-27.04	PK	Ver
4*	8805.1000	55.81	-4.03	51.78	68.20	-16.42	PK	Ver
5*	11816.2000	52.89	-1.80	51.09	74.00	-22.91	PK	Ver
6*	16359.5000	51.90	0.73	52.63	68.20	-15.57	PK	Ver

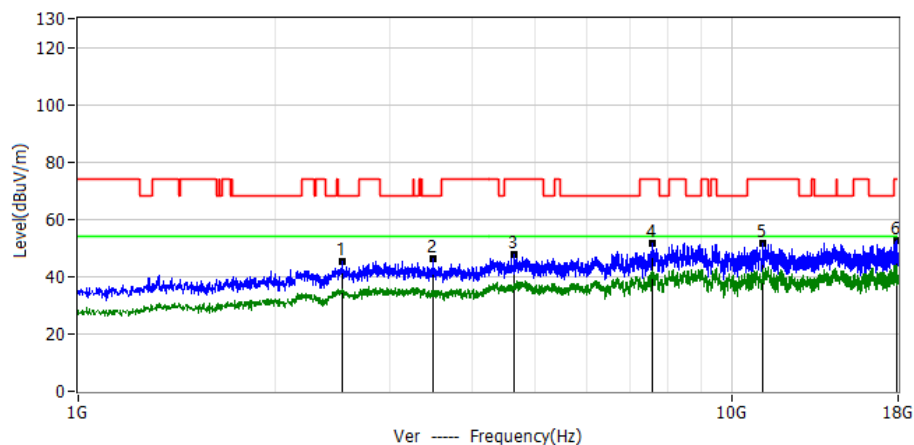


Test Mode: 802.11a 5580
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1401.6000	61.97	-21.46	40.51	74.00	-33.49	PK	Hor
2*	2846.6000	54.51	-9.55	44.96	74.00	-29.04	PK	Hor
3*	4720.9000	53.95	-6.72	47.23	74.00	-26.77	PK	Hor
4*	8594.7000	56.62	-4.41	52.21	68.20	-15.99	PK	Hor
5*	10817.5000	54.44	-2.29	52.15	74.00	-21.85	PK	Hor
6*	17470.9000	50.82	1.78	52.60	68.20	-15.60	PK	Hor

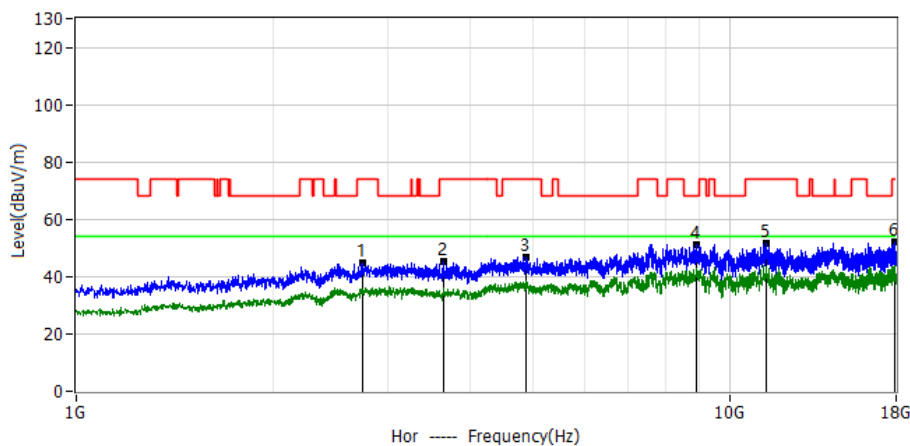
Test Mode: 802.11a 5580
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2538.5000	56.53	-11.11	45.42	68.20	-22.78	PK	Ver
2*	3494.7000	55.14	-9.04	46.10	68.20	-22.10	PK	Ver
3*	4648.6000	54.36	-6.65	47.71	74.00	-26.29	PK	Ver
4*	7579.0000	57.44	-5.66	51.78	74.00	-22.22	PK	Ver
5*	11151.1000	53.41	-1.86	51.55	74.00	-22.45	PK	Ver
6*	17923.5000	50.67	1.99	52.66	74.00	-21.34	PK	Ver

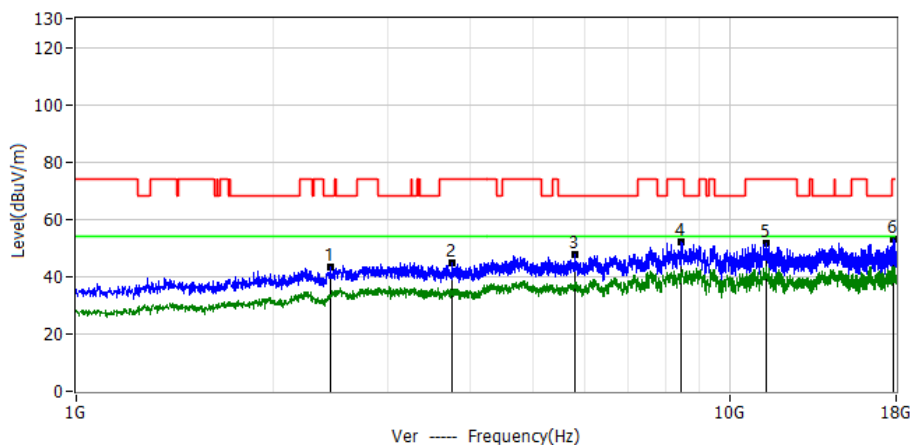


Test Mode: 802.11a 5700
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2744.6000	54.96	-10.06	44.90	74.00	-29.10	PK	Hor
2*	3645.6000	53.97	-8.89	45.08	74.00	-28.92	PK	Hor
3*	4871.7000	53.59	-6.87	46.72	74.00	-27.28	PK	Hor
4*	8919.9000	55.13	-3.82	51.31	68.20	-16.89	PK	Hor
5*	11376.4000	53.38	-1.84	51.54	74.00	-22.46	PK	Hor
6*	17921.4000	50.07	1.98	52.05	74.00	-21.95	PK	Hor

Test Mode: 802.11a 5700
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2455.6000	55.18	-11.76	43.42	68.20	-24.78	PK	Ver
2*	3764.6000	53.56	-8.76	44.80	74.00	-29.20	PK	Ver
3*	5791.9000	56.54	-8.65	47.89	68.20	-20.31	PK	Ver
4*	8452.4000	56.71	-4.67	52.04	74.00	-21.96	PK	Ver
5*	11380.6000	53.48	-1.84	51.64	74.00	-22.36	PK	Ver
6*	17823.6000	51.02	1.94	52.96	74.00	-21.04	PK	Ver

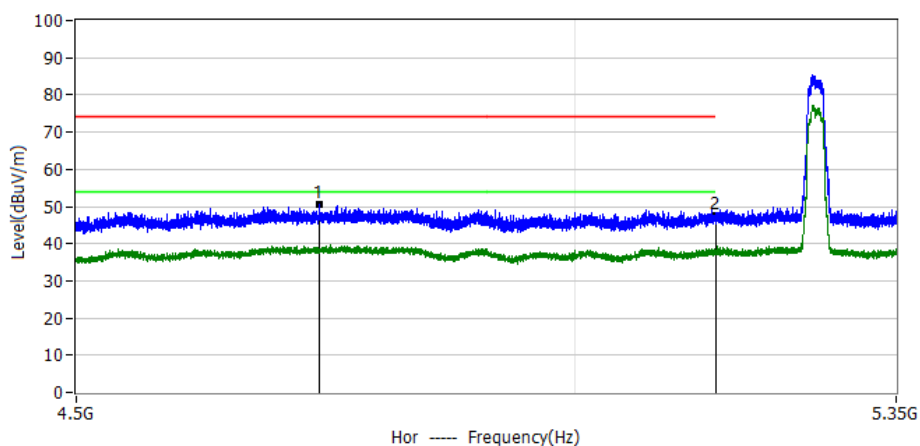
Remark:

In frequency ranges 18~25GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.



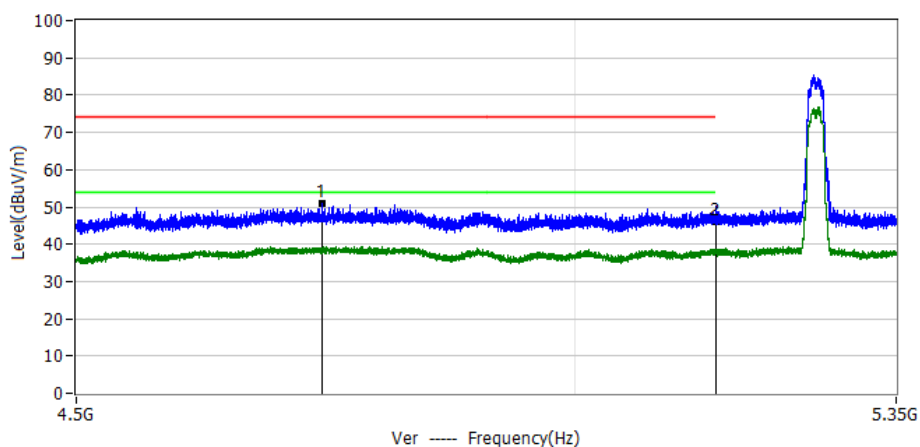
3.2.7 TEST RESULTS(Band edge Requirements)

Test Mode: 802.11a 5260
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4736.4000	57.32	-6.74	50.58	74.00	-23.42	PK	Hor
2*	5150.0000	55.11	-7.51	47.60	74.00	-26.40	PK	Hor

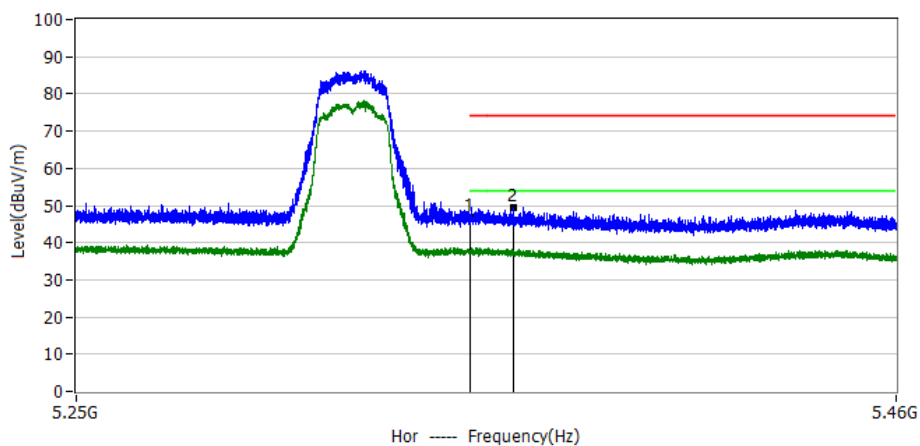
Test Mode: 802.11a 5260
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4740.1000	57.57	-6.74	50.83	74.00	-23.17	PK	Ver
2*	5150.0000	53.51	-7.51	46.00	74.00	-28.00	PK	Ver

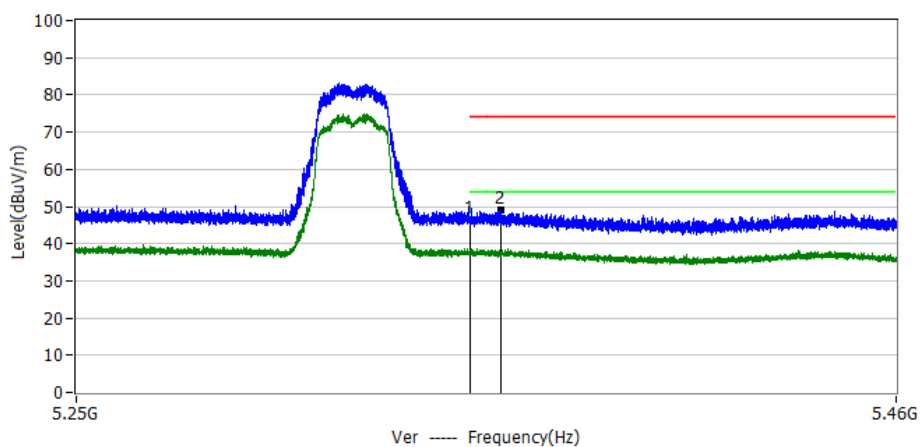


Project: 边带	Test Engineer: Xiangdong Ma
Test Mode: 802.11a 5320	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5350.0000	55.19	-8.19	47.00	74.00	-27.00	PK	Hor
2*	5360.8000	57.60	-8.23	49.37	74.00	-24.63	PK	Hor

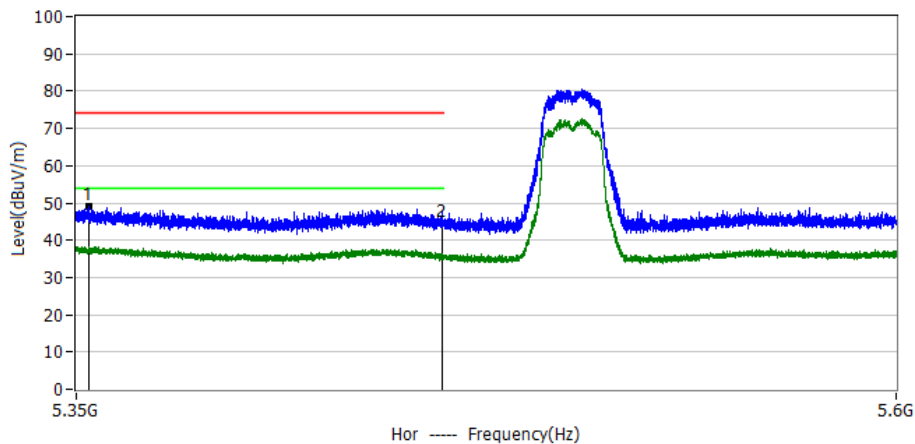
Test Mode: 802.11a 5320
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5350.0000	54.49	-8.19	46.30	74.00	-27.70	PK	Ver
2*	5357.7000	57.26	-8.22	49.04	74.00	-24.96	PK	Ver

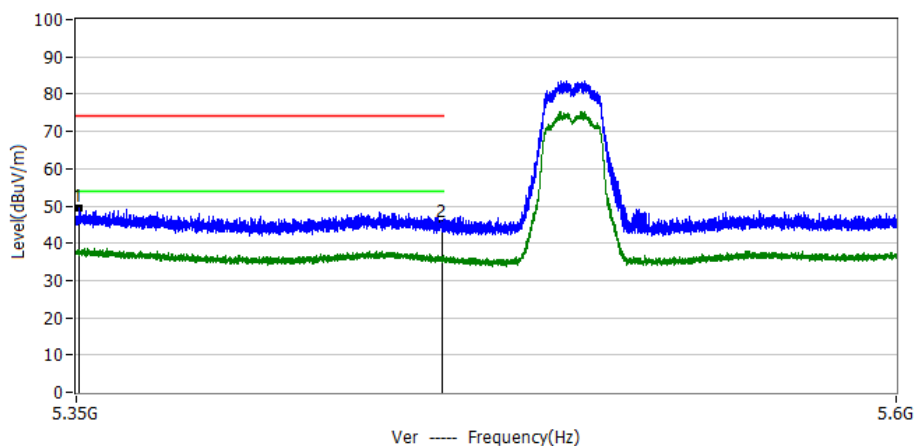


Test Mode: 802.11a 5500
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5353.6000	57.18	-8.20	48.98	74.00	-25.02	PK	Hor
2*	5460.0000	53.17	-8.57	44.60	74.00	-29.40	PK	Hor

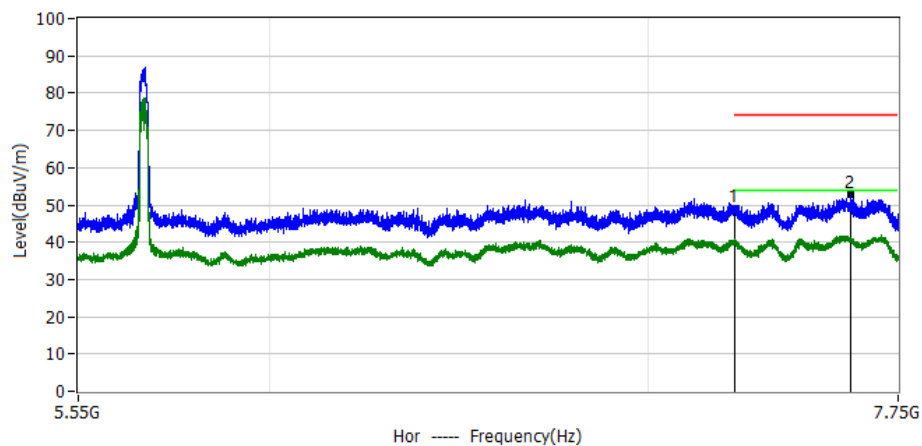
Test Mode: 802.11a 5500
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	5350.9000	57.61	-8.20	49.41	74.00	-24.59	PK	Ver
2*	5460.0000	53.97	-8.57	45.40	74.00	-28.60	PK	Ver

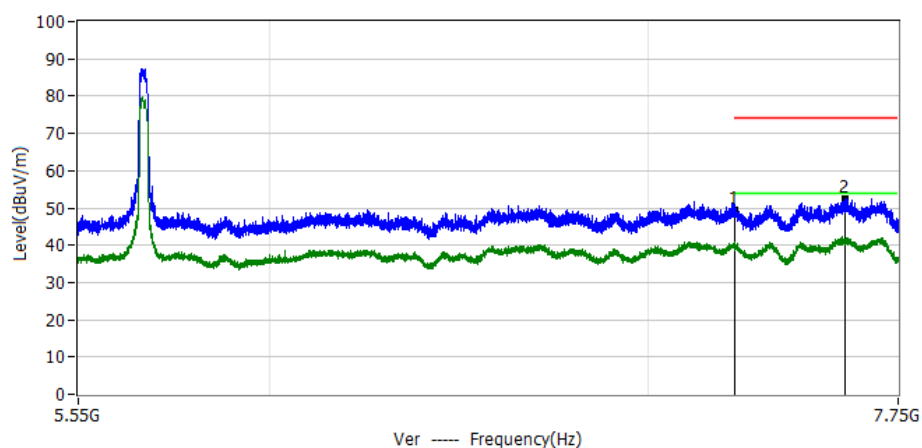


Test Mode: 802.11a 5700
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	7250.0000	55.53	-6.33	49.20	74.00	-24.80	PK	Hor
2*	7603.4000	58.60	-5.65	52.95	74.00	-21.05	PK	Hor

Test Mode: 802.11a 5700
Note:



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	7250.0000	55.93	-6.33	49.60	74.00	-24.40	PK	Ver
2*	7583.1000	58.10	-5.66	52.44	74.00	-21.56	PK	Ver



4. POWER SPECTRAL DENSITY TEST

4.1 LIMIT

1. For mobile and portable 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.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, 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.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (*i.e.*, 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

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

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

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

4.6 TEST RESULTS

For the measurement records, refer to the appendix I.



5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

5.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW $\geq$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

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

5.1.5 TEST RESULTS

For the measurement records, refer to the appendix I.



5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

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

5.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

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 $\geq 3 \cdot$ RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

5.2.2 DEVIATION FROM STANDARD

No deviation.

5.2.3 TEST SETUP



5.2.4 EUT OPERATION CONDITIONS

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

5.2.5 TEST RESULTS

For the measurement records, refer to the appendix I.



5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth.

5.3.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.
 - a) Set RBW = 100 kHz.
 - b) Set the video bandwidth (VBW) $\geq 3 \times$ 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.

5.3.2 DEVIATION FROM STANDARD

No deviation.

5.3.3 TEST SETUP



5.3.4 EUT OPERATION CONDITIONS

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

5.3.5 TEST RESULTS

For the measurement records, refer to the appendix I.



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz, If transmitting antennas of directional gain greater than 6 dBi are used.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used.

FCC Part15 (15.407) , Subpart E				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.407(a) (1) (iv)	Peak Output Power	0.25 watt	5150-5250	PASS
		The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)	5250-5350 5470-5725	
15.407(a) (3)		1 watt	5725-5825	

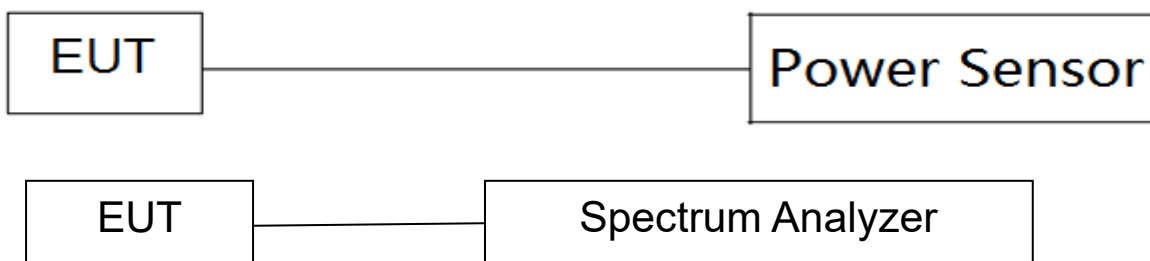
6.2 TEST PROCEDURE

The EUT was directly connected to the Power Sensor&PC

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS

For the measurement records, refer to the appendix I.



7. AUTOMATICALLY DISCONTINUE TRANSMISSION

7.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

7.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission



8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

Part 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.

8.2 EUT ANTENNA

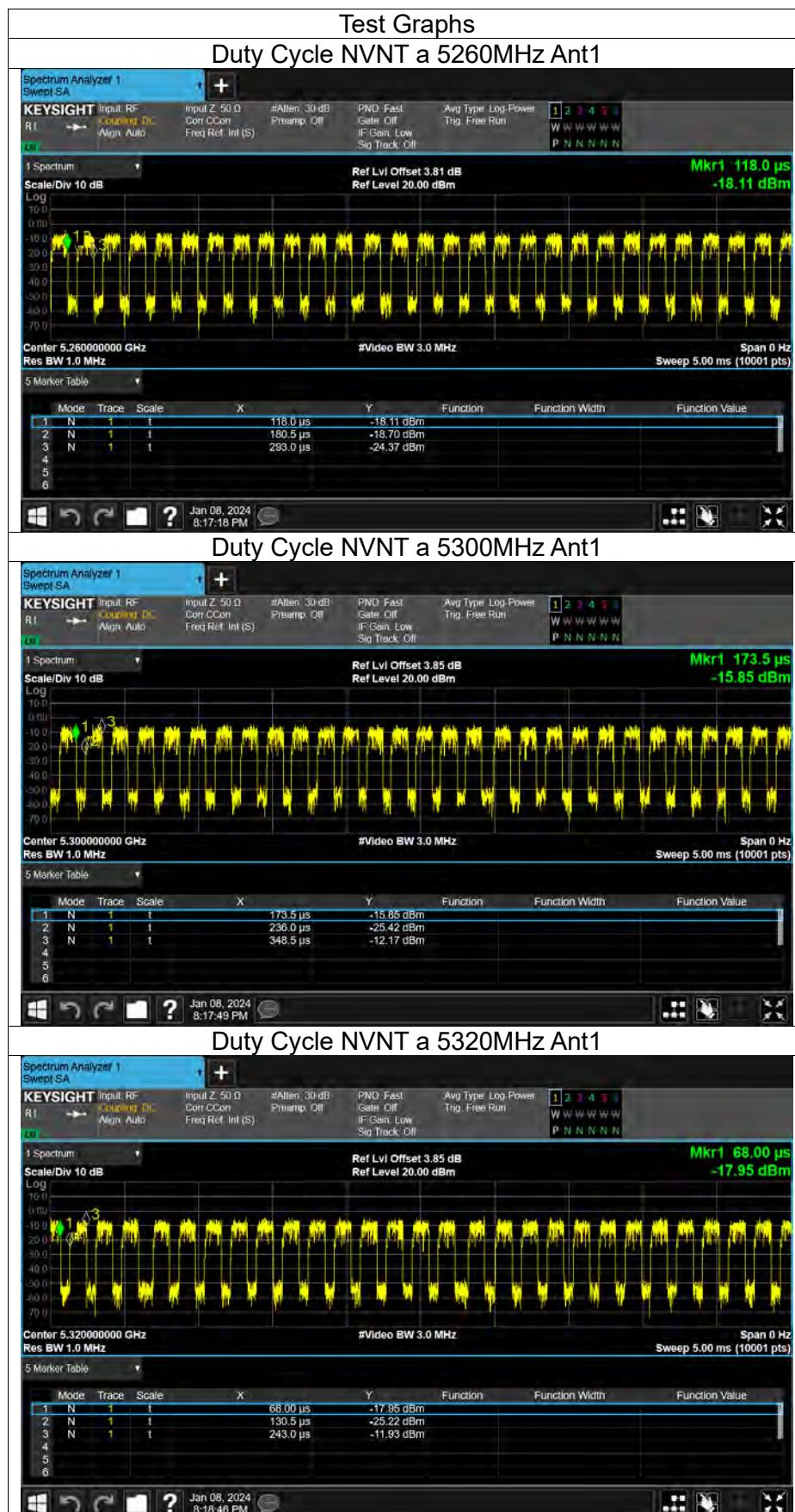
The EUT antenna is FPC Antenna. It comply with the standard requirement.

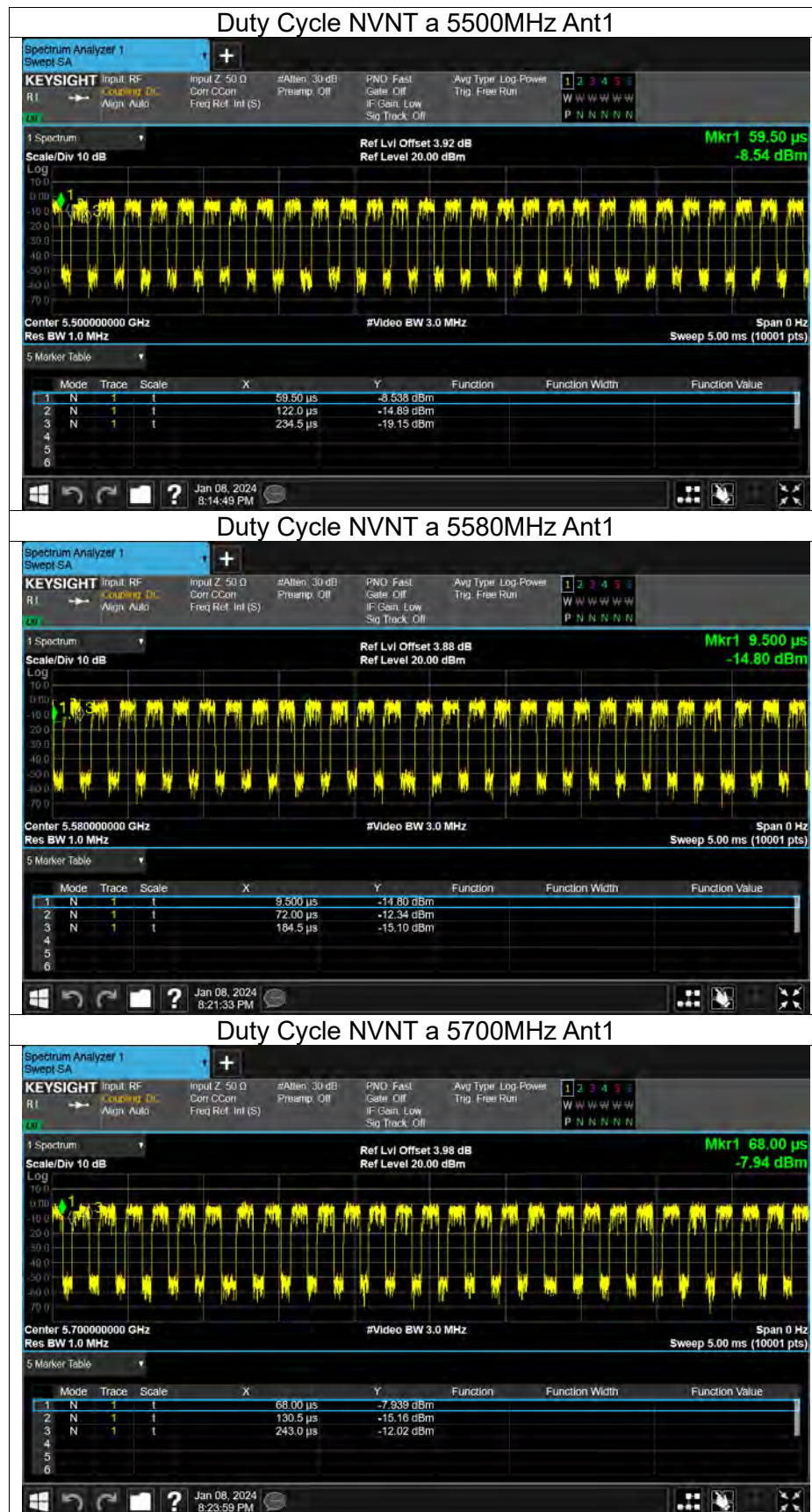


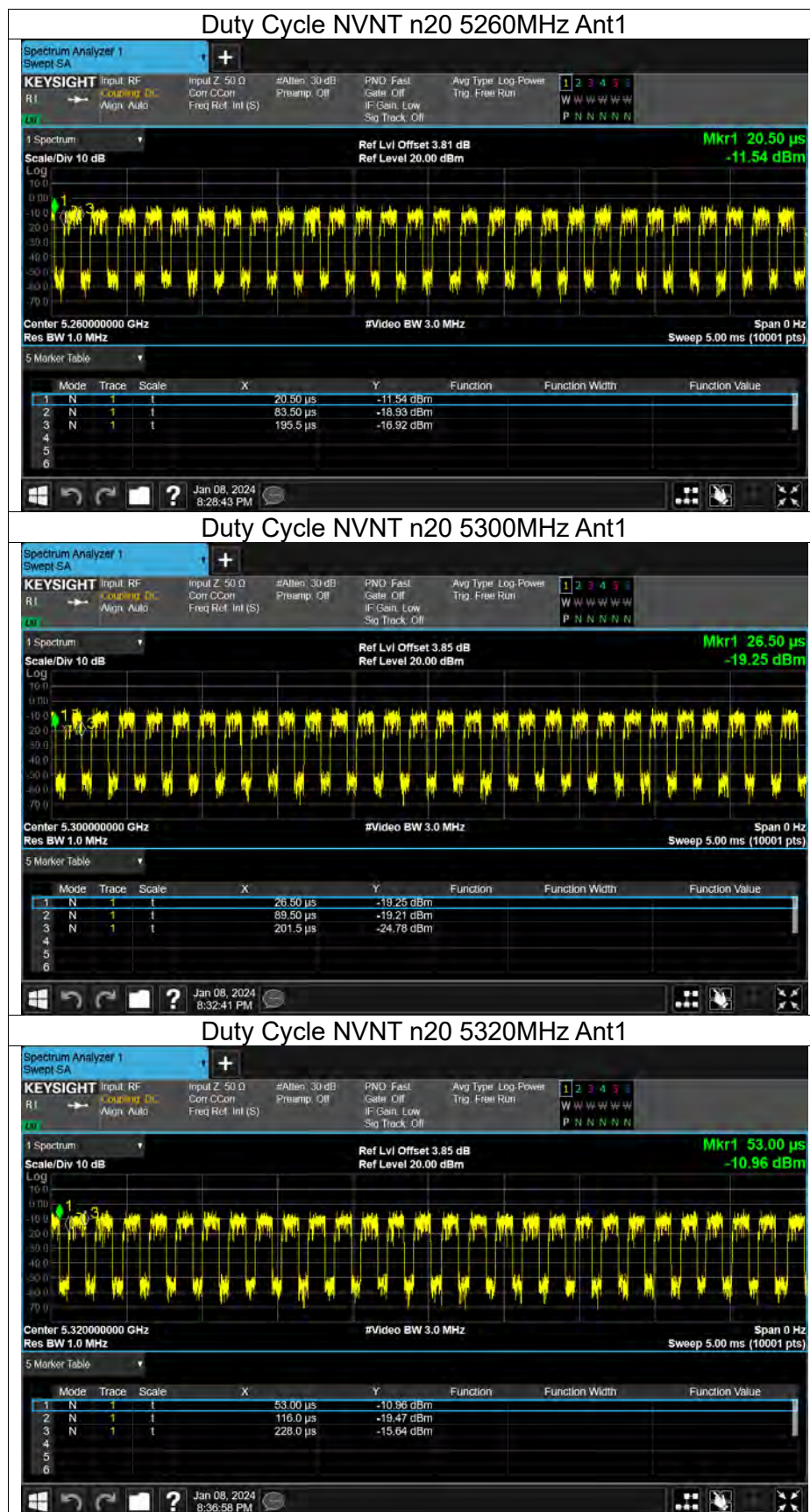
APPENDIX I - TEST RESULTS

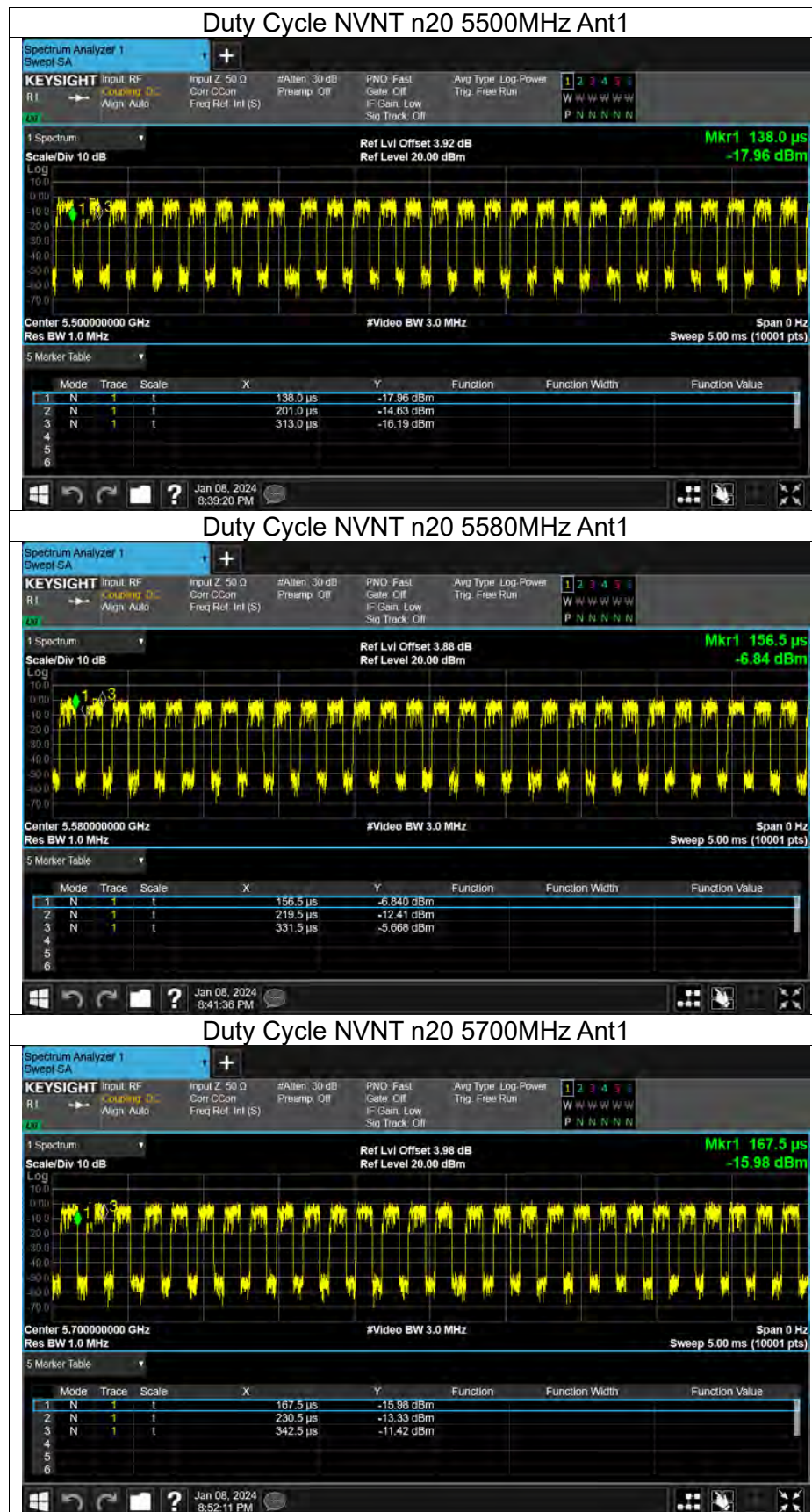
Duty Cycle

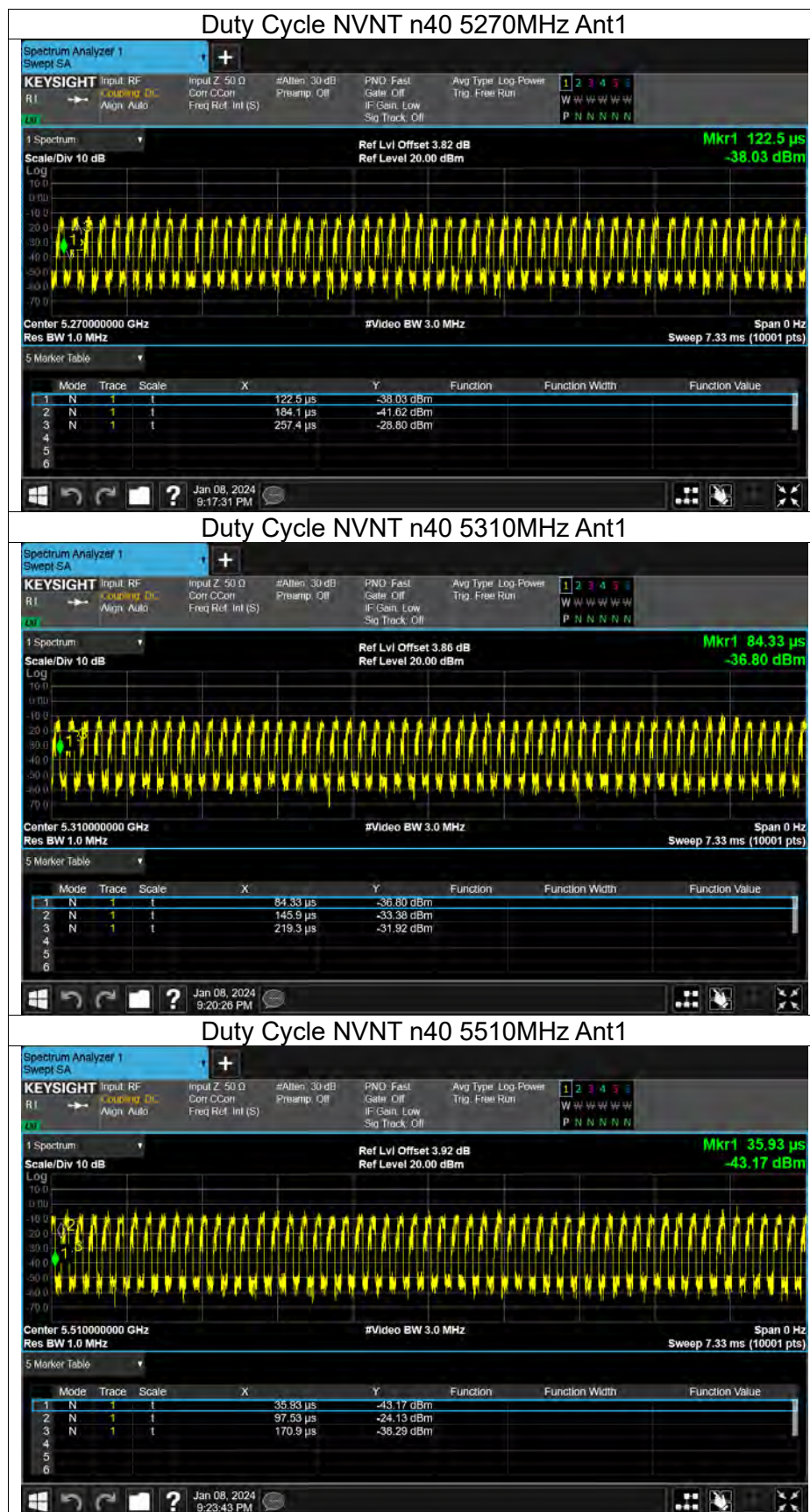
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5260	Ant1	64.29	1.92	8.89
NVNT	a	5300	Ant1	64.29	1.92	8.89
NVNT	a	5320	Ant1	64.29	1.92	8.89
NVNT	a	5500	Ant1	64.29	1.92	8.89
NVNT	a	5580	Ant1	64.29	1.92	8.89
NVNT	a	5700	Ant1	64.29	1.92	8.89
NVNT	n20	5260	Ant1	64	1.94	8.93
NVNT	n20	5300	Ant1	64	1.94	8.93
NVNT	n20	5320	Ant1	64	1.94	8.93
NVNT	n20	5500	Ant1	64	1.94	8.93
NVNT	n20	5580	Ant1	64	1.94	8.93
NVNT	n20	5700	Ant1	64	1.94	8.93
NVNT	n40	5270	Ant1	54.35	2.65	13.64
NVNT	n40	5310	Ant1	54.35	2.65	13.64
NVNT	n40	5510	Ant1	54.35	2.65	13.64
NVNT	n40	5550	Ant1	54.35	2.65	13.64
NVNT	n40	5670	Ant1	54.35	2.65	13.64
NVNT	ac20	5260	Ant1	65.66	1.83	8.37
NVNT	ac20	5300	Ant1	65.66	1.83	8.37
NVNT	ac20	5320	Ant1	65.66	1.83	8.37
NVNT	ac20	5500	Ant1	65.66	1.83	8.37
NVNT	ac20	5580	Ant1	65.66	1.83	8.37
NVNT	ac20	5700	Ant1	65.66	1.83	8.37
NVNT	ac40	5270	Ant1	54.22	2.66	13.66
NVNT	ac40	5310	Ant1	54.22	2.66	13.66
NVNT	ac40	5510	Ant1	57.14	2.43	12.25
NVNT	ac40	5550	Ant1	57.14	2.43	12.25
NVNT	ac40	5670	Ant1	57.14	2.43	12.25
NVNT	ac80	5290	Ant1	48.67	3.13	17.12
NVNT	ac80	5530	Ant1	48.67	3.13	17.12
NVNT	ac80	5610	Ant1	48.67	3.13	17.12

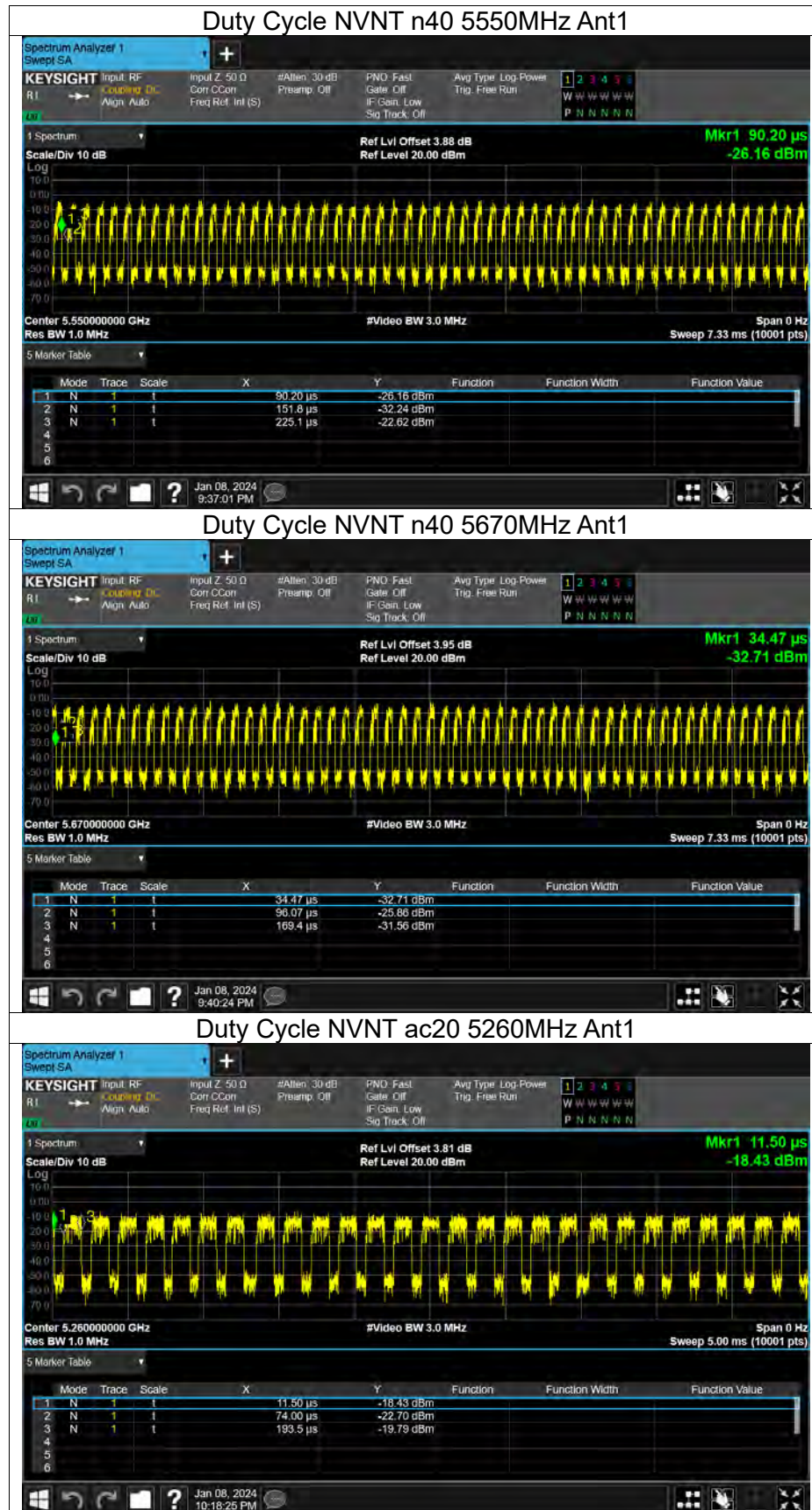


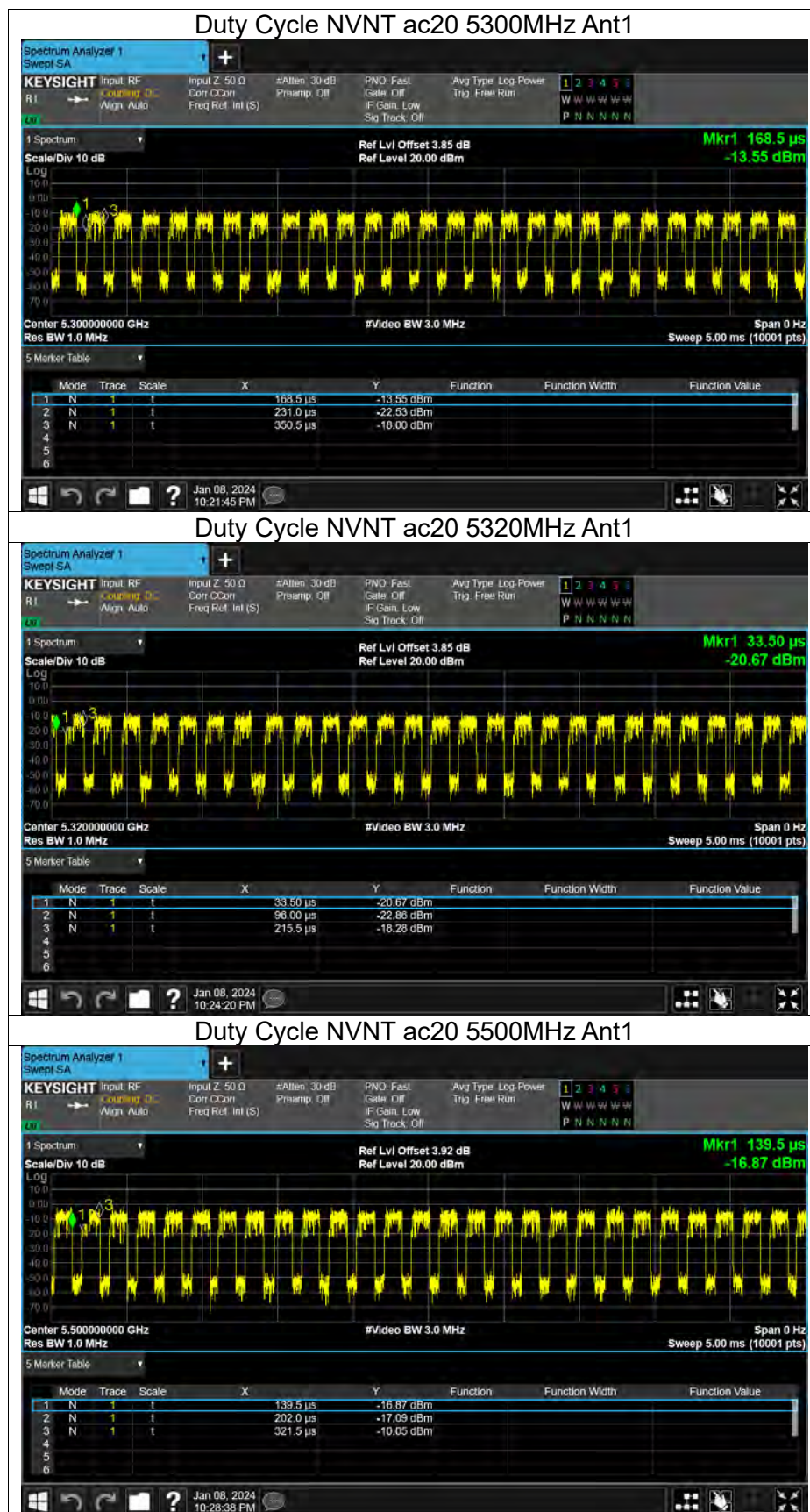


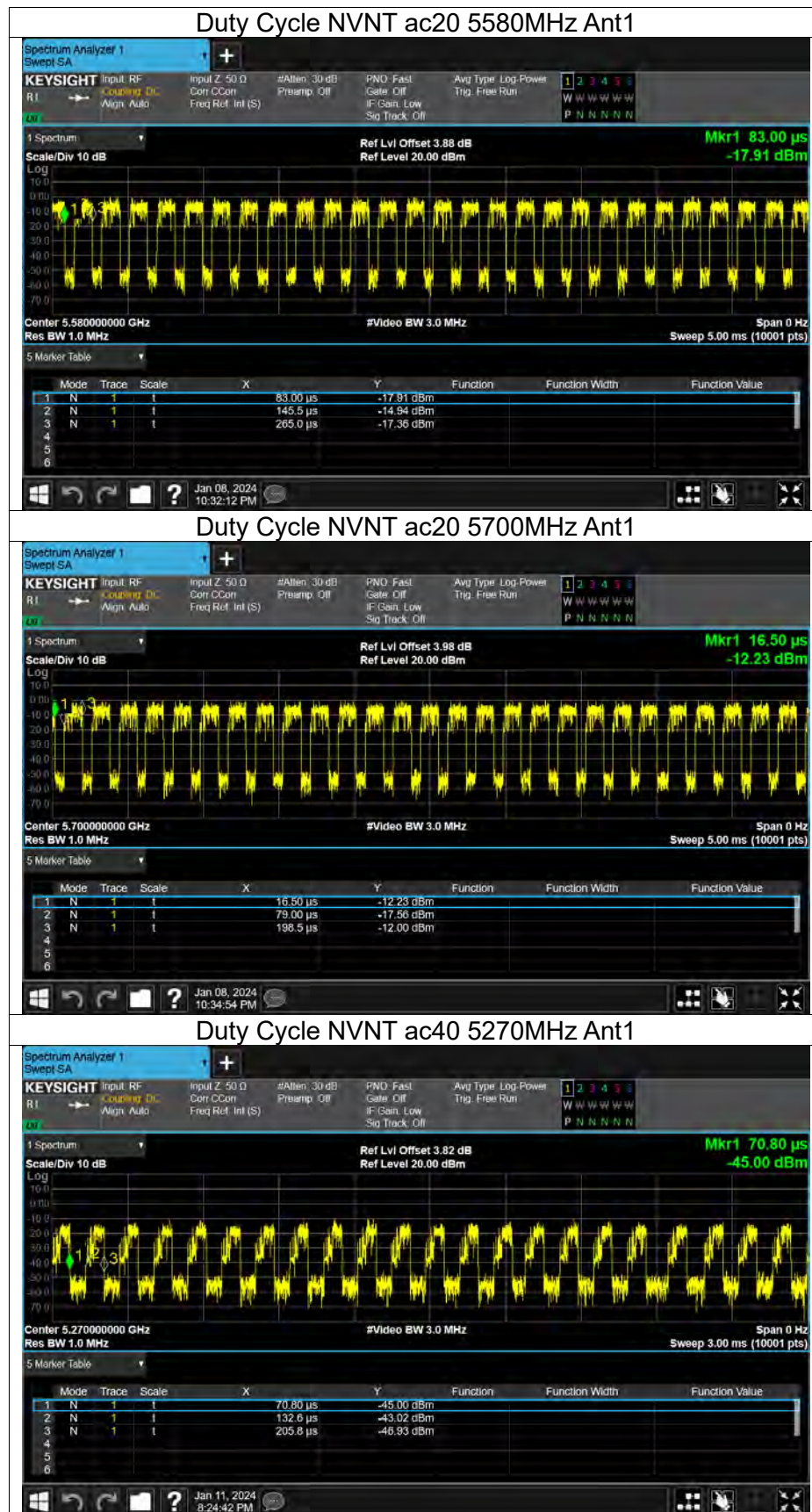


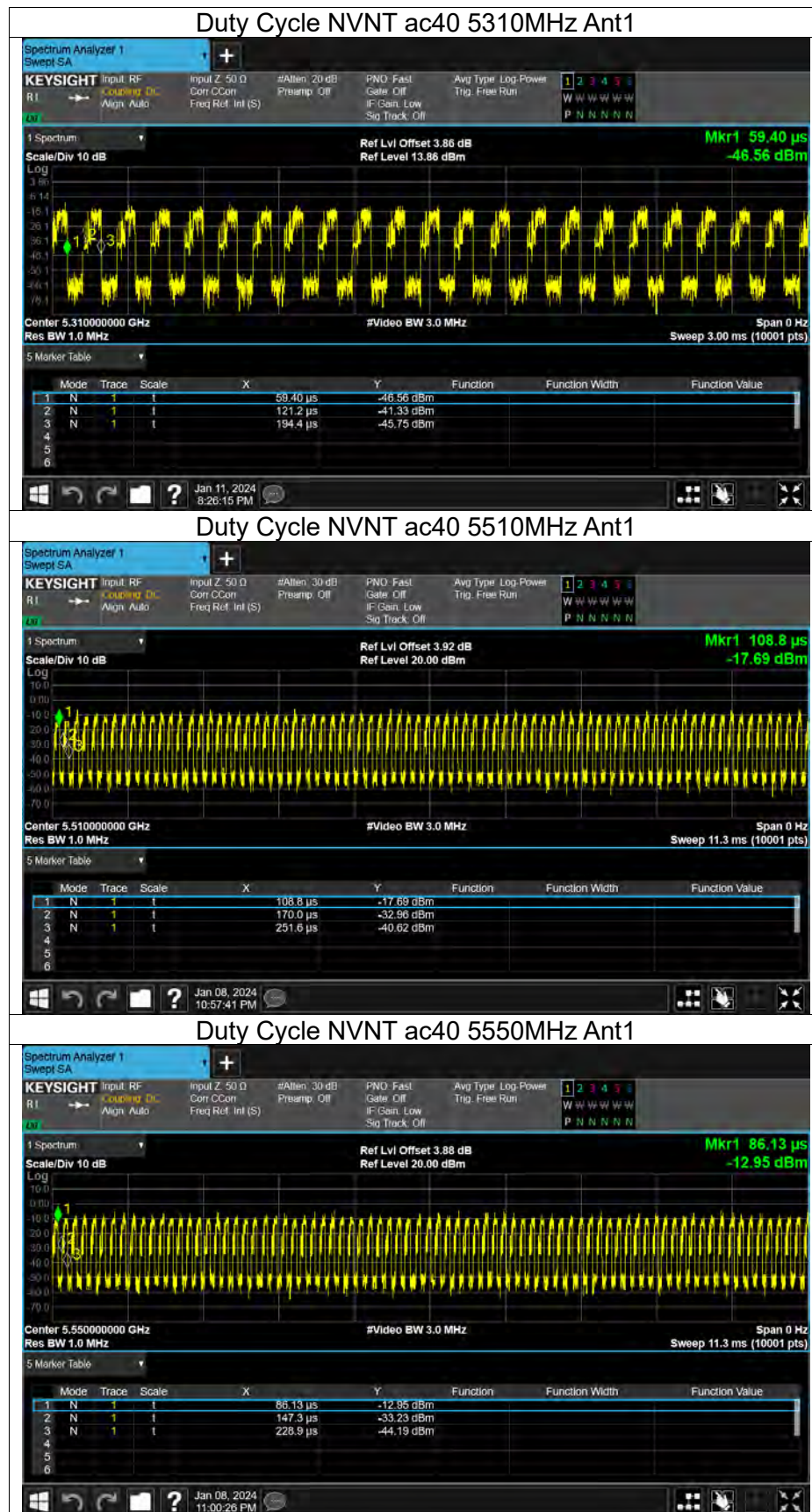


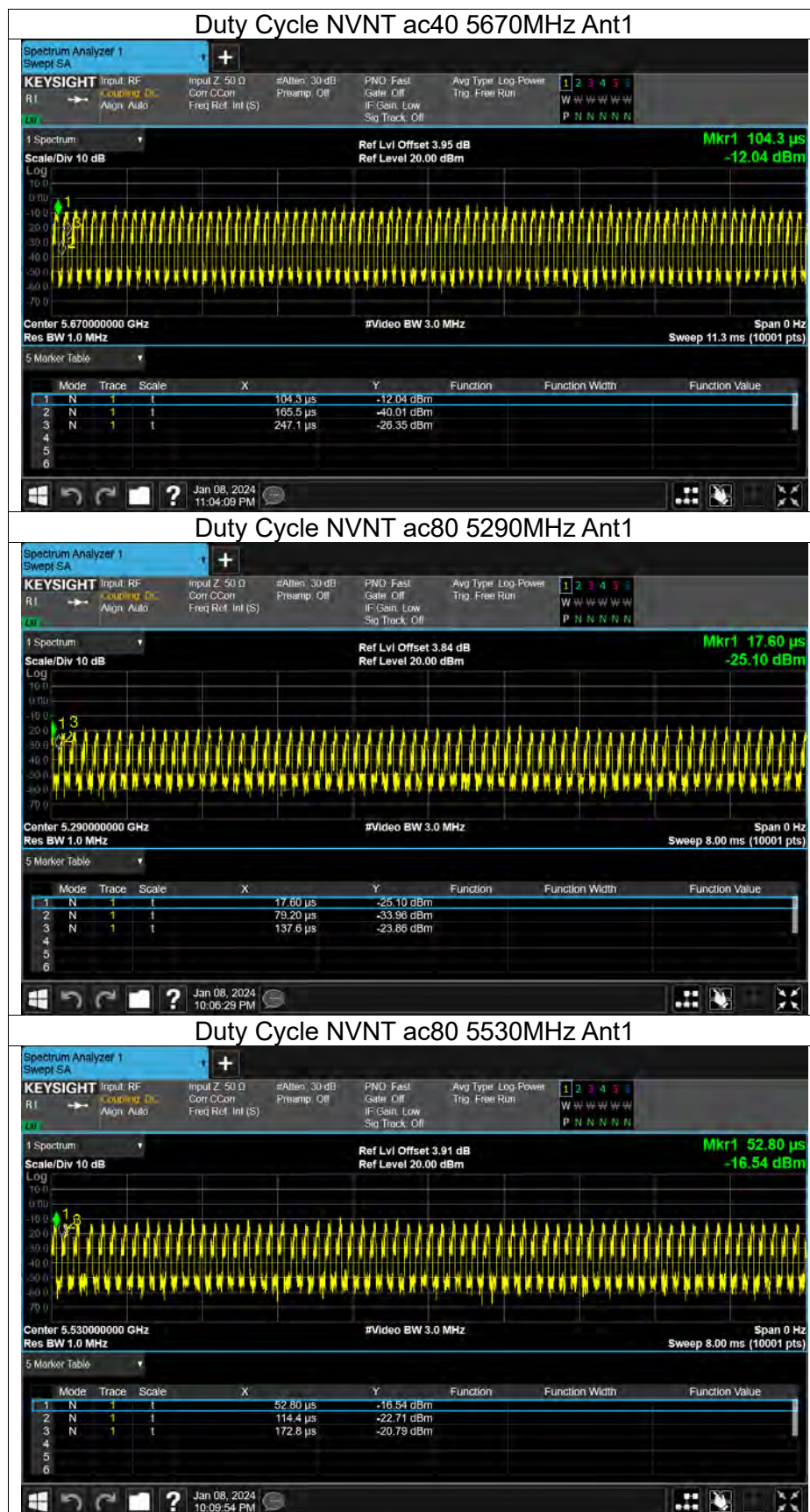


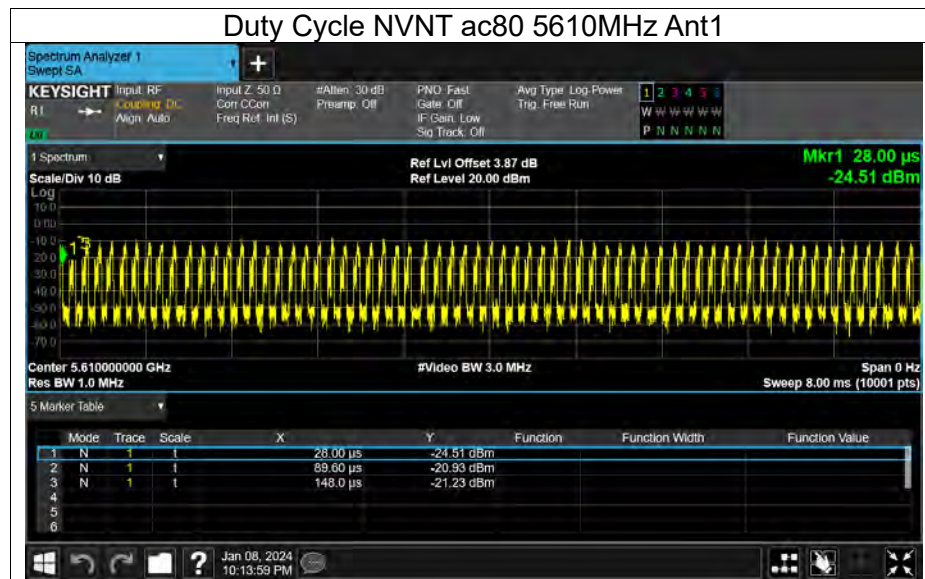














Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5260	Ant1	-0.78	2.16	1.38	24	Pass
NVNT	a	5300	Ant1	-0.88	2.16	1.28	24	Pass
NVNT	a	5320	Ant1	-0.83	2.16	1.33	24	Pass
NVNT	a	5500	Ant1	3.91	1.92	5.83	24	Pass
NVNT	a	5580	Ant1	5.58	1.92	7.5	24	Pass
NVNT	a	5700	Ant1	5.71	1.92	7.63	24	Pass
NVNT	n20	5260	Ant1	-3.96	1.94	-2.02	24	Pass
NVNT	n20	5300	Ant1	-4.04	1.94	-2.1	24	Pass
NVNT	n20	5320	Ant1	-3.9	1.94	-1.96	24	Pass
NVNT	n20	5500	Ant1	1.19	1.94	3.13	24	Pass
NVNT	n20	5580	Ant1	3.23	1.94	5.17	24	Pass
NVNT	n20	5700	Ant1	3.63	1.94	5.57	24	Pass
NVNT	n40	5270	Ant1	-4.28	2.65	-1.63	24	Pass
NVNT	n40	5310	Ant1	-4.43	2.65	-1.78	24	Pass
NVNT	n40	5510	Ant1	0.74	2.65	3.39	24	Pass
NVNT	n40	5550	Ant1	1.4	2.65	4.05	24	Pass
NVNT	n40	5670	Ant1	2.85	2.65	5.5	24	Pass
NVNT	ac20	5260	Ant1	-3.86	1.83	-2.03	24	Pass
NVNT	ac20	5300	Ant1	-3.89	1.83	-2.06	24	Pass
NVNT	ac20	5320	Ant1	-3.85	1.83	-2.02	24	Pass
NVNT	ac20	5500	Ant1	1.31	1.83	3.14	24	Pass
NVNT	ac20	5580	Ant1	3.29	1.83	5.12	24	Pass
NVNT	ac20	5700	Ant1	3.76	1.83	5.59	24	Pass
NVNT	ac40	5270	Ant1	-4.21	2.66	-1.55	24	Pass
NVNT	ac40	5310	Ant1	-4.3	2.66	-1.64	24	Pass
NVNT	ac40	5510	Ant1	0.73	2.43	3.16	24	Pass
NVNT	ac40	5550	Ant1	1.48	2.43	3.91	24	Pass
NVNT	ac40	5670	Ant1	3.02	2.43	5.45	24	Pass
NVNT	ac80	5290	Ant1	-5.32	3.13	-2.19	24	Pass
NVNT	ac80	5530	Ant1	0.67	3.13	3.8	24	Pass
NVNT	ac80	5610	Ant1	2.2	3.13	5.33	24	Pass



-26dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5260	Ant1	29.271	Pass
NVNT	a	5300	Ant1	29.867	Pass
NVNT	a	5320	Ant1	29.62	Pass
NVNT	a	5500	Ant1	29.649	Pass
NVNT	a	5580	Ant1	29.904	Pass
NVNT	a	5700	Ant1	29.493	Pass
NVNT	n20	5260	Ant1	29.241	Pass
NVNT	n20	5300	Ant1	27.303	Pass
NVNT	n20	5320	Ant1	29.664	Pass
NVNT	n20	5500	Ant1	29.824	Pass
NVNT	n20	5580	Ant1	29.882	Pass
NVNT	n20	5700	Ant1	29.641	Pass
NVNT	n40	5270	Ant1	59.303	Pass
NVNT	n40	5310	Ant1	59.596	Pass
NVNT	n40	5510	Ant1	55.613	Pass
NVNT	n40	5550	Ant1	59.821	Pass
NVNT	n40	5670	Ant1	59.992	Pass
NVNT	ac20	5260	Ant1	26.357	Pass
NVNT	ac20	5300	Ant1	24.667	Pass
NVNT	ac20	5320	Ant1	23.769	Pass
NVNT	ac20	5500	Ant1	27.099	Pass
NVNT	ac20	5580	Ant1	29.219	Pass
NVNT	ac20	5700	Ant1	29.39	Pass
NVNT	ac40	5270	Ant1	44.996	Pass
NVNT	ac40	5310	Ant1	44.759	Pass
NVNT	ac40	5510	Ant1	51.795	Pass
NVNT	ac40	5550	Ant1	47.146	Pass
NVNT	ac40	5670	Ant1	54.427	Pass
NVNT	ac80	5290	Ant1	81.66	Pass
NVNT	ac80	5530	Ant1	97.9	Pass
NVNT	ac80	5610	Ant1	95.049	Pass

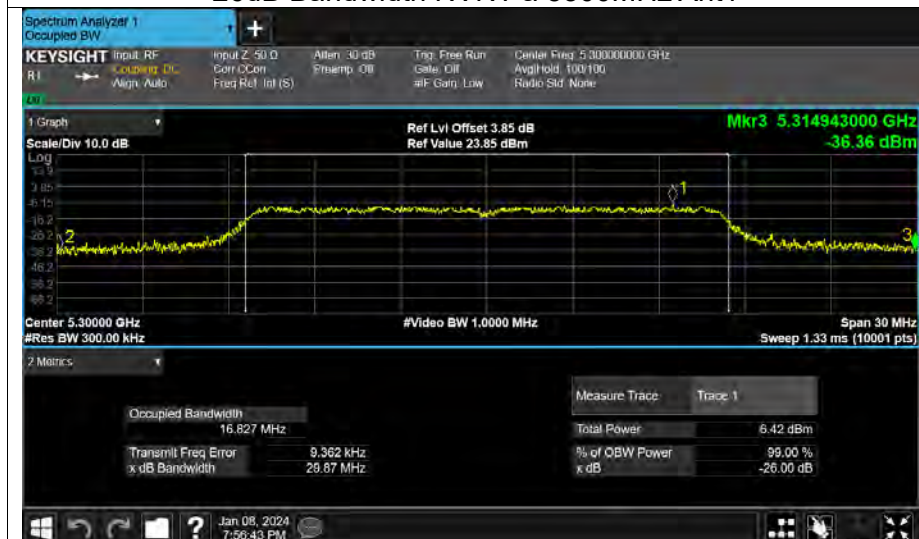


Test Graphs

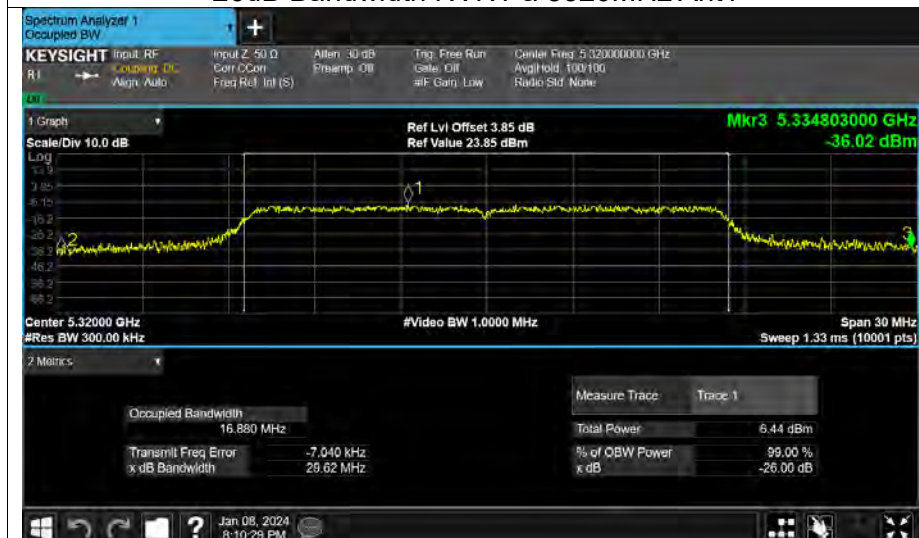
-26dB Bandwidth NVNT a 5260MHz Ant1



-26dB Bandwidth NVNT a 5300MHz Ant1



-26dB Bandwidth NVNT a 5320MHz Ant1





-26dB Bandwidth NVNT a 5500MHz Ant1



-26dB Bandwidth NVNT a 5580MHz Ant1



-26dB Bandwidth NVNT a 5700MHz Ant1

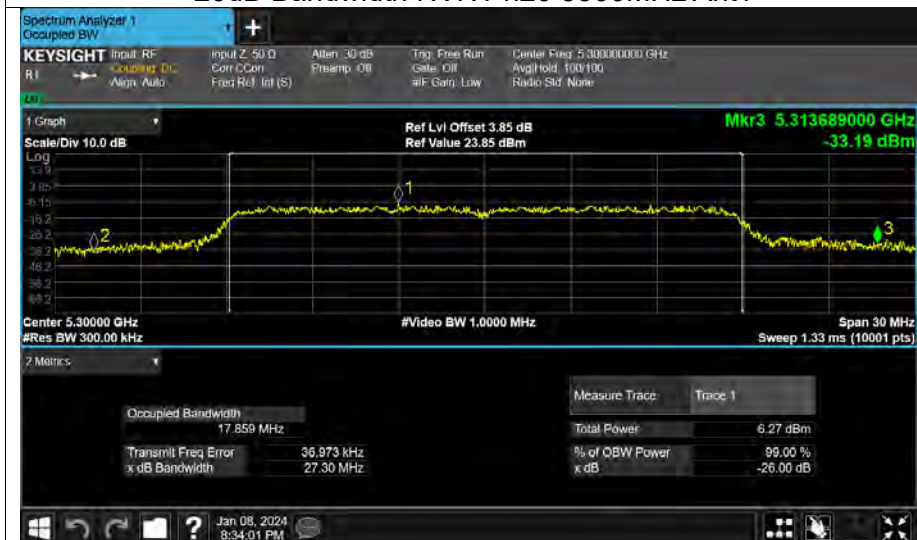




-26dB Bandwidth NVNT n20 5260MHz Ant1



-26dB Bandwidth NVNT n20 5300MHz Ant1



-26dB Bandwidth NVNT n20 5320MHz Ant1

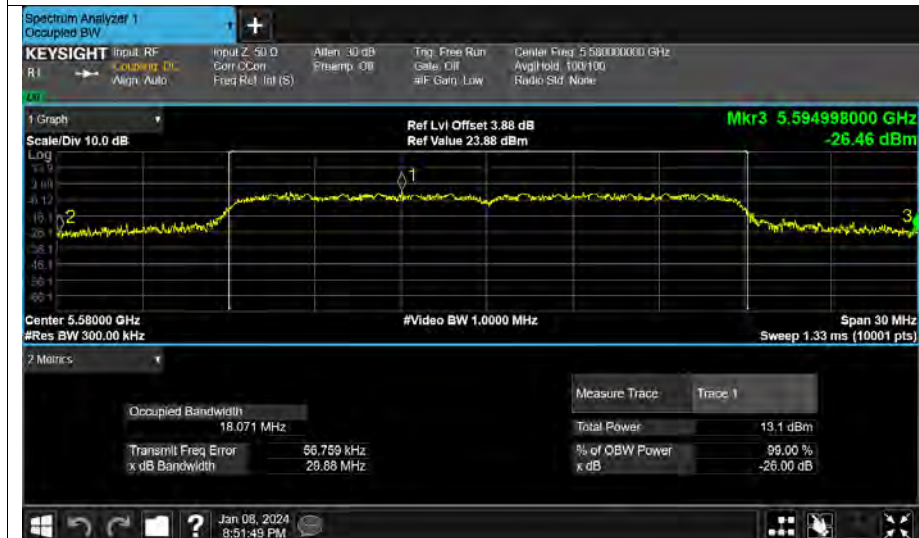




-26dB Bandwidth NVNT n20 5500MHz Ant1



-26dB Bandwidth NVNT n20 5580MHz Ant1



-26dB Bandwidth NVNT n20 5700MHz Ant1





-26dB Bandwidth NVNT n40 5270MHz Ant1



-26dB Bandwidth NVNT n40 5310MHz Ant1



-26dB Bandwidth NVNT n40 5510MHz Ant1





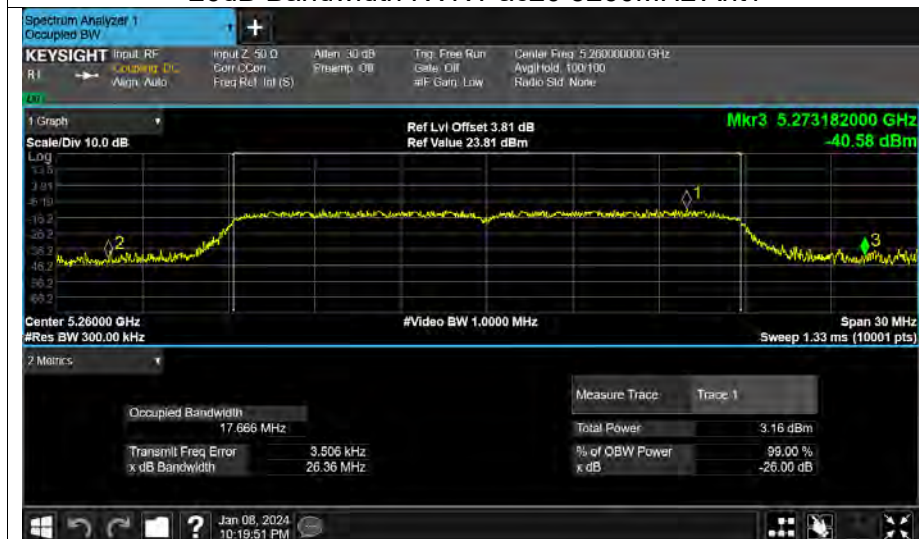
-26dB Bandwidth NVNT n40 5550MHz Ant1



-26dB Bandwidth NVNT n40 5670MHz Ant1



-26dB Bandwidth NVNT ac20 5260MHz Ant1

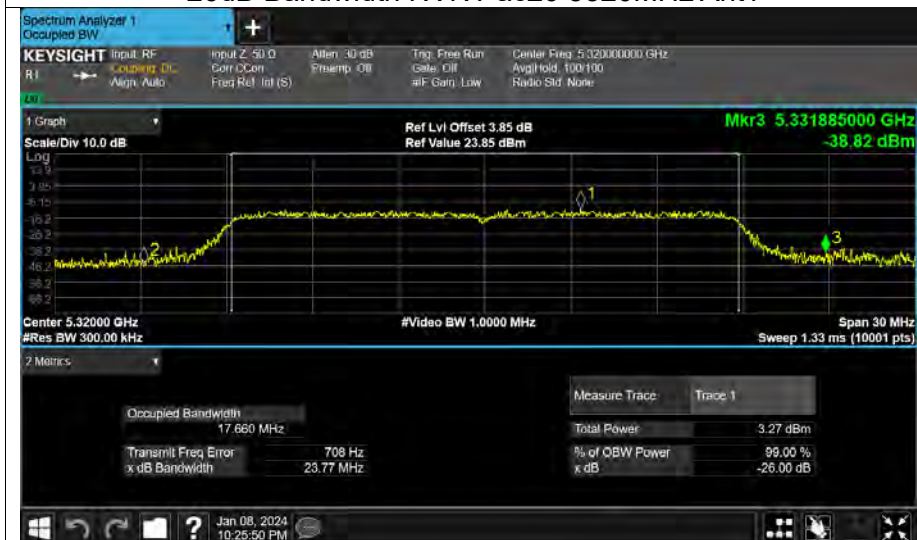




-26dB Bandwidth NVNT ac20 5300MHz Ant1



-26dB Bandwidth NVNT ac20 5320MHz Ant1



-26dB Bandwidth NVNT ac20 5500MHz Ant1





-26dB Bandwidth NVNT ac20 5580MHz Ant1



-26dB Bandwidth NVNT ac20 5700MHz Ant1



-26dB Bandwidth NVNT ac40 5270MHz Ant1





-26dB Bandwidth NVNT ac40 5310MHz Ant1

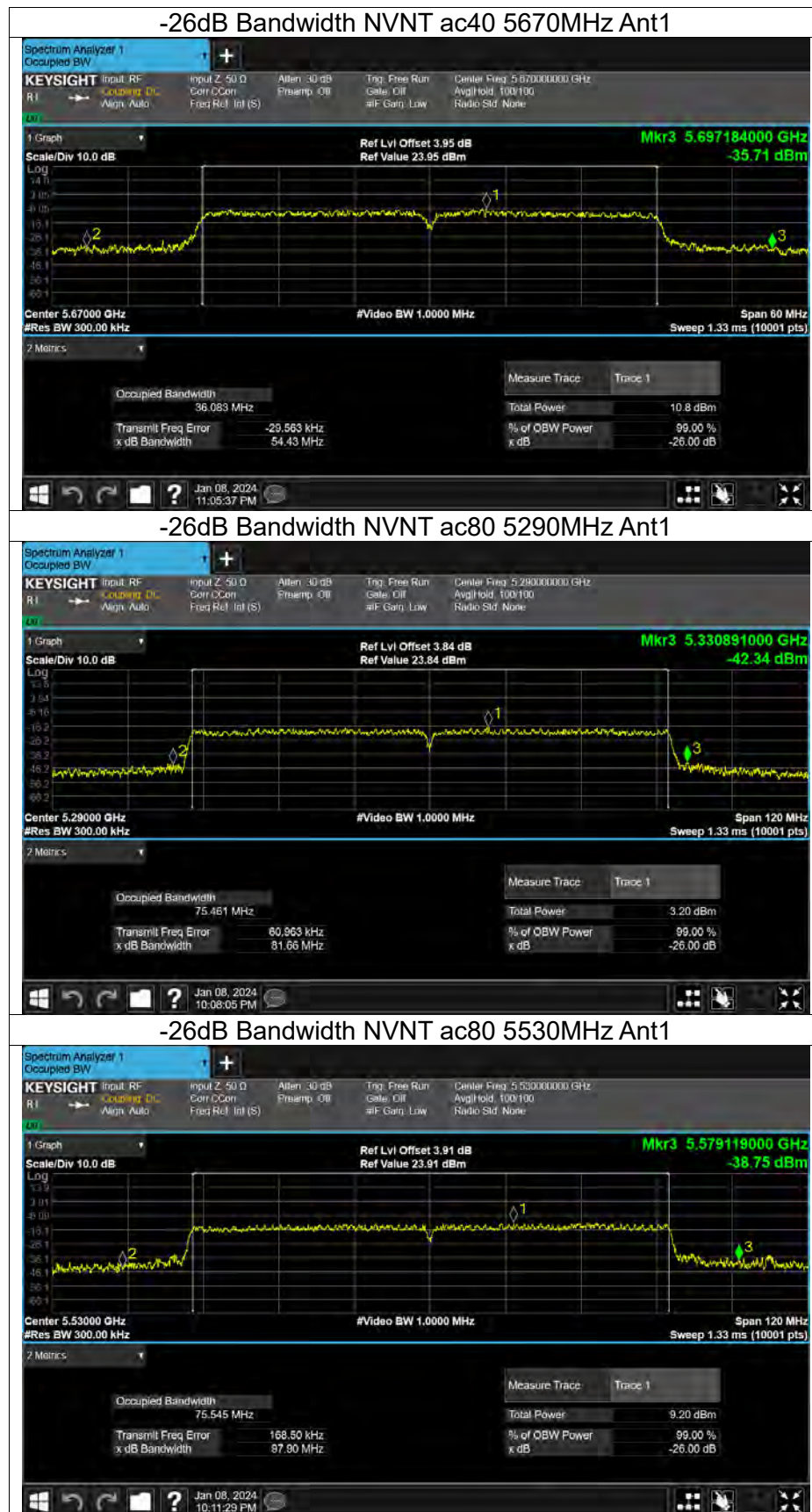


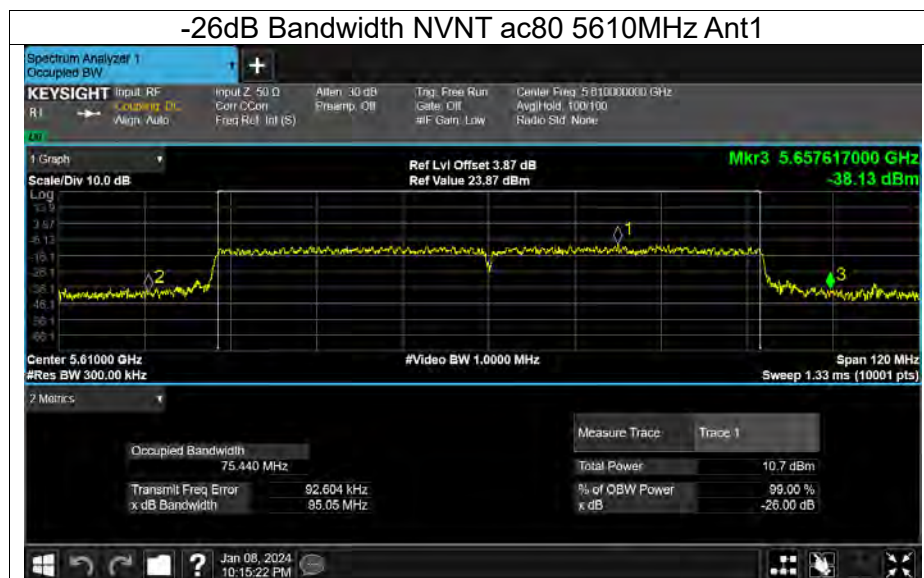
-26dB Bandwidth NVNT ac40 5510MHz Ant1



-26dB Bandwidth NVNT ac40 5550MHz Ant1









Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	a	5260	Ant1	16.667
NVNT	a	5300	Ant1	16.673
NVNT	a	5320	Ant1	16.646
NVNT	a	5500	Ant1	16.773
NVNT	a	5580	Ant1	16.86
NVNT	a	5700	Ant1	16.632
NVNT	n20	5260	Ant1	17.677
NVNT	n20	5300	Ant1	17.698
NVNT	n20	5320	Ant1	17.699
NVNT	n20	5500	Ant1	17.799
NVNT	n20	5580	Ant1	17.876
NVNT	n20	5700	Ant1	17.723
NVNT	n40	5270	Ant1	36.436
NVNT	n40	5310	Ant1	36.42
NVNT	n40	5510	Ant1	37.115
NVNT	n40	5550	Ant1	36.758
NVNT	n40	5670	Ant1	36.599
NVNT	ac20	5260	Ant1	17.587
NVNT	ac20	5300	Ant1	17.56
NVNT	ac20	5320	Ant1	17.563
NVNT	ac20	5500	Ant1	17.577
NVNT	ac20	5580	Ant1	17.639
NVNT	ac20	5700	Ant1	17.555
NVNT	ac40	5270	Ant1	36.113
NVNT	ac40	5310	Ant1	36.201
NVNT	ac40	5510	Ant1	36.261
NVNT	ac40	5550	Ant1	36.216
NVNT	ac40	5670	Ant1	36.21
NVNT	ac80	5290	Ant1	75.673
NVNT	ac80	5530	Ant1	75.754
NVNT	ac80	5610	Ant1	75.651





OBW NVNT a 5500MHz Ant1

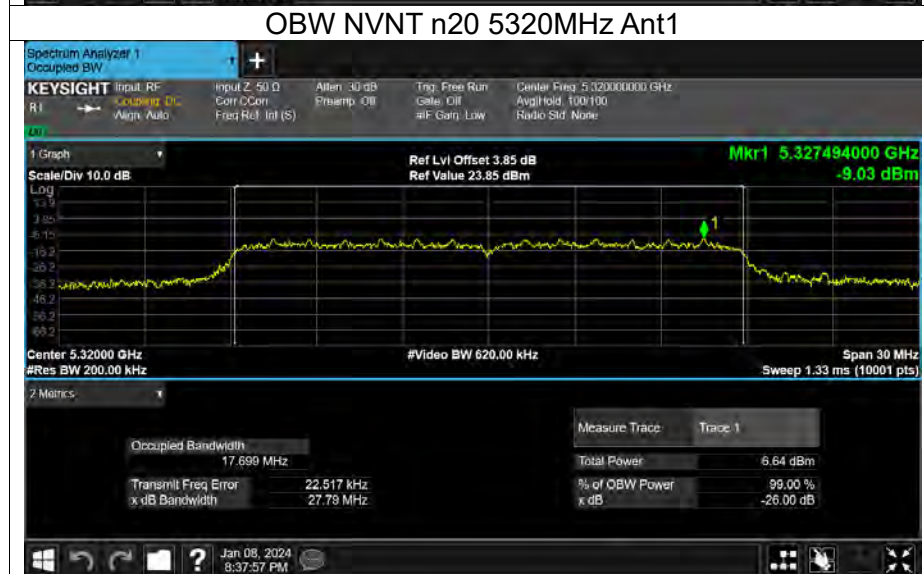
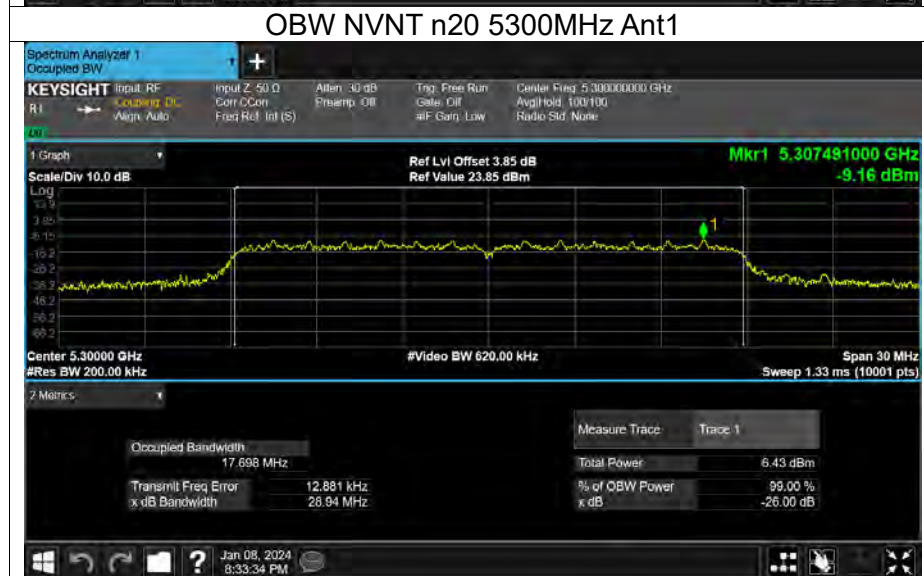
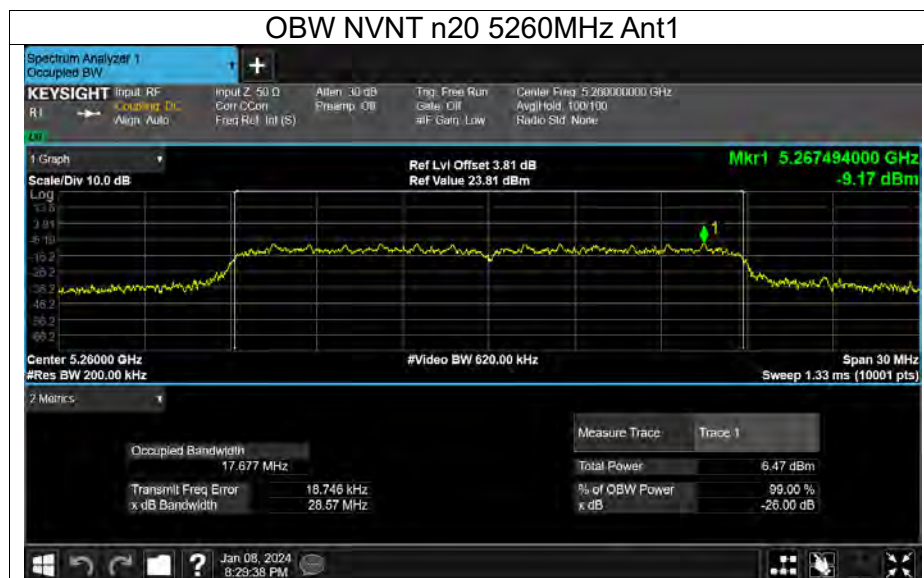


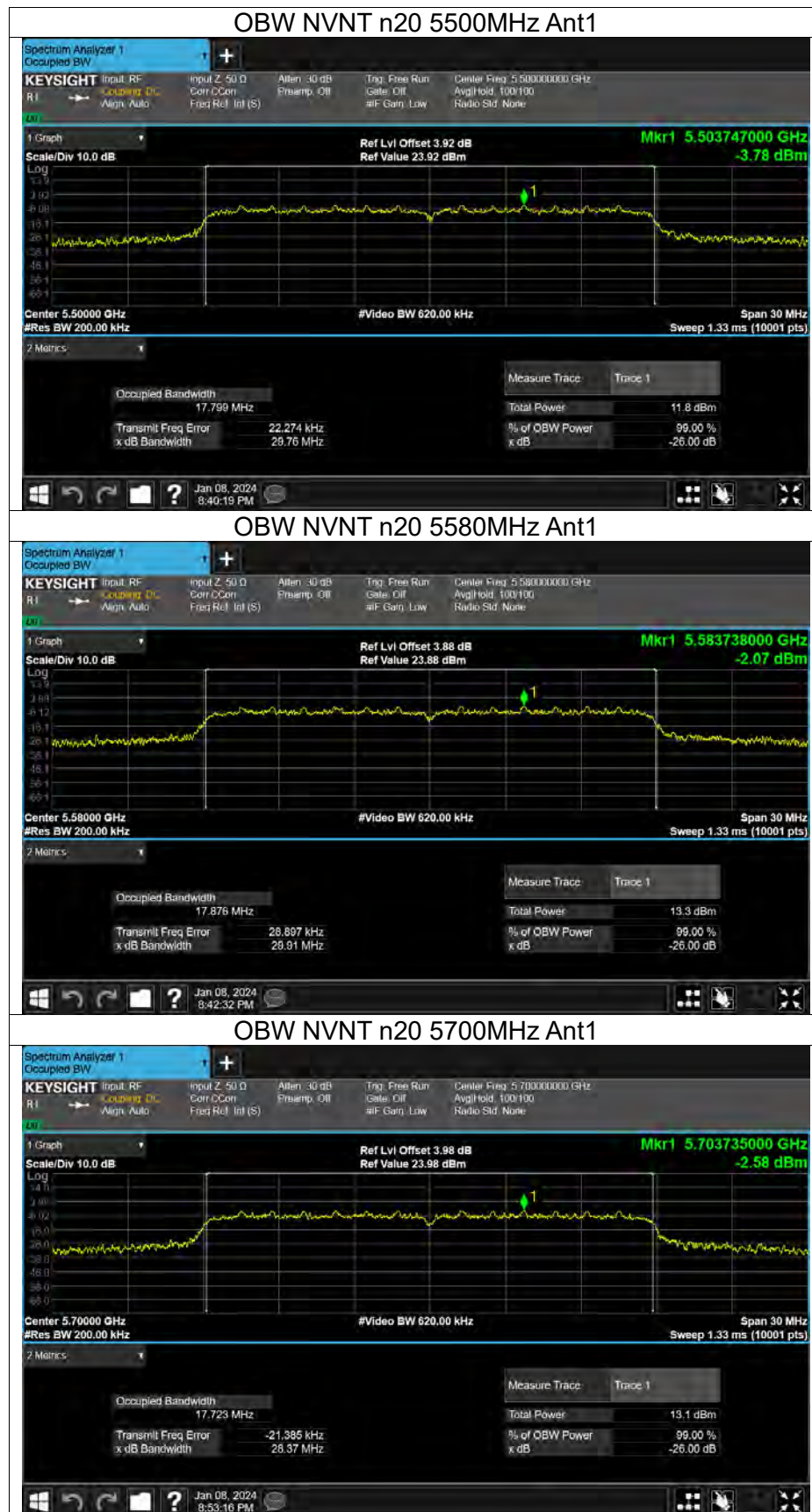
OBW NVNT a 5580MHz Ant1

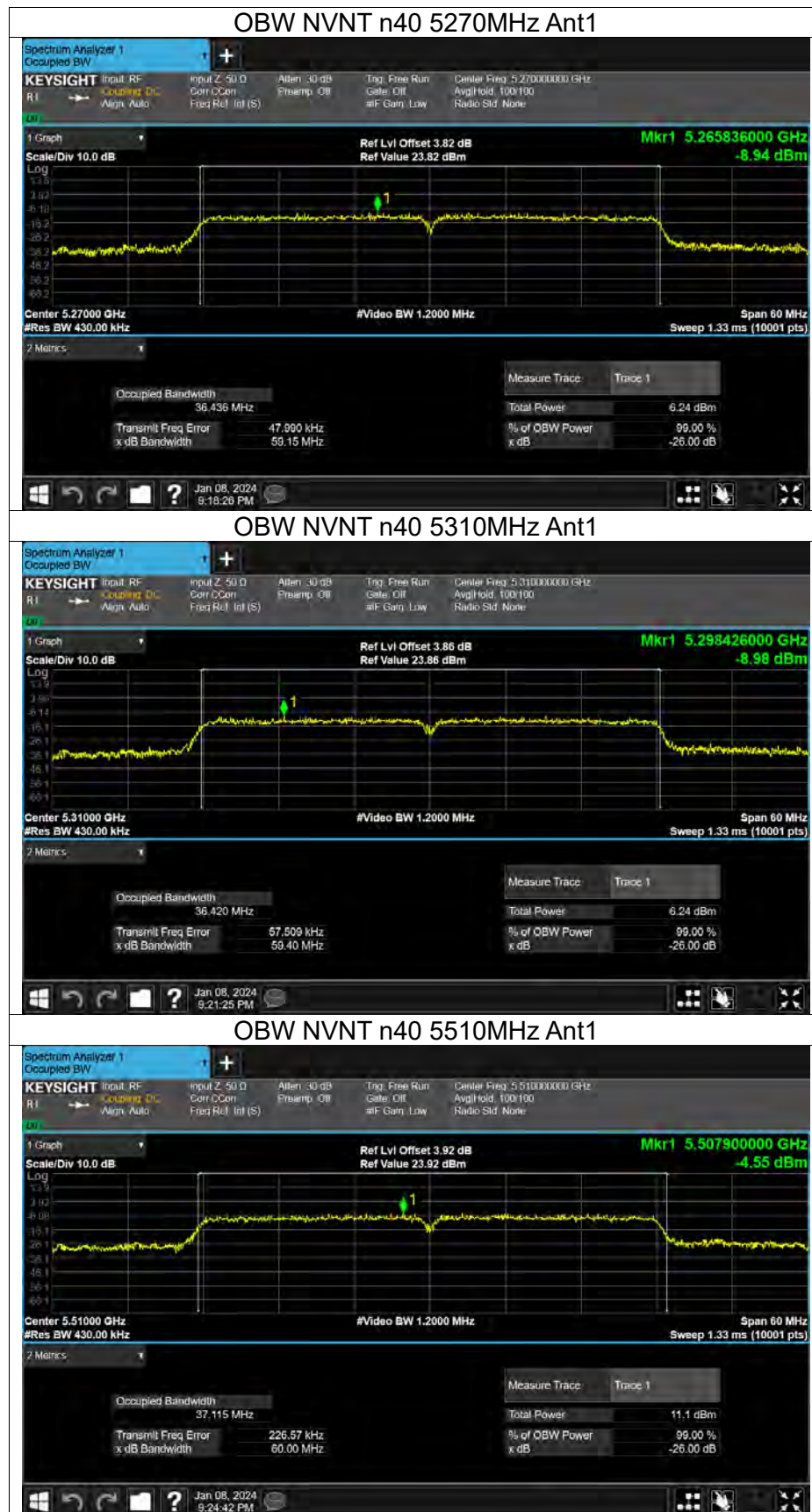


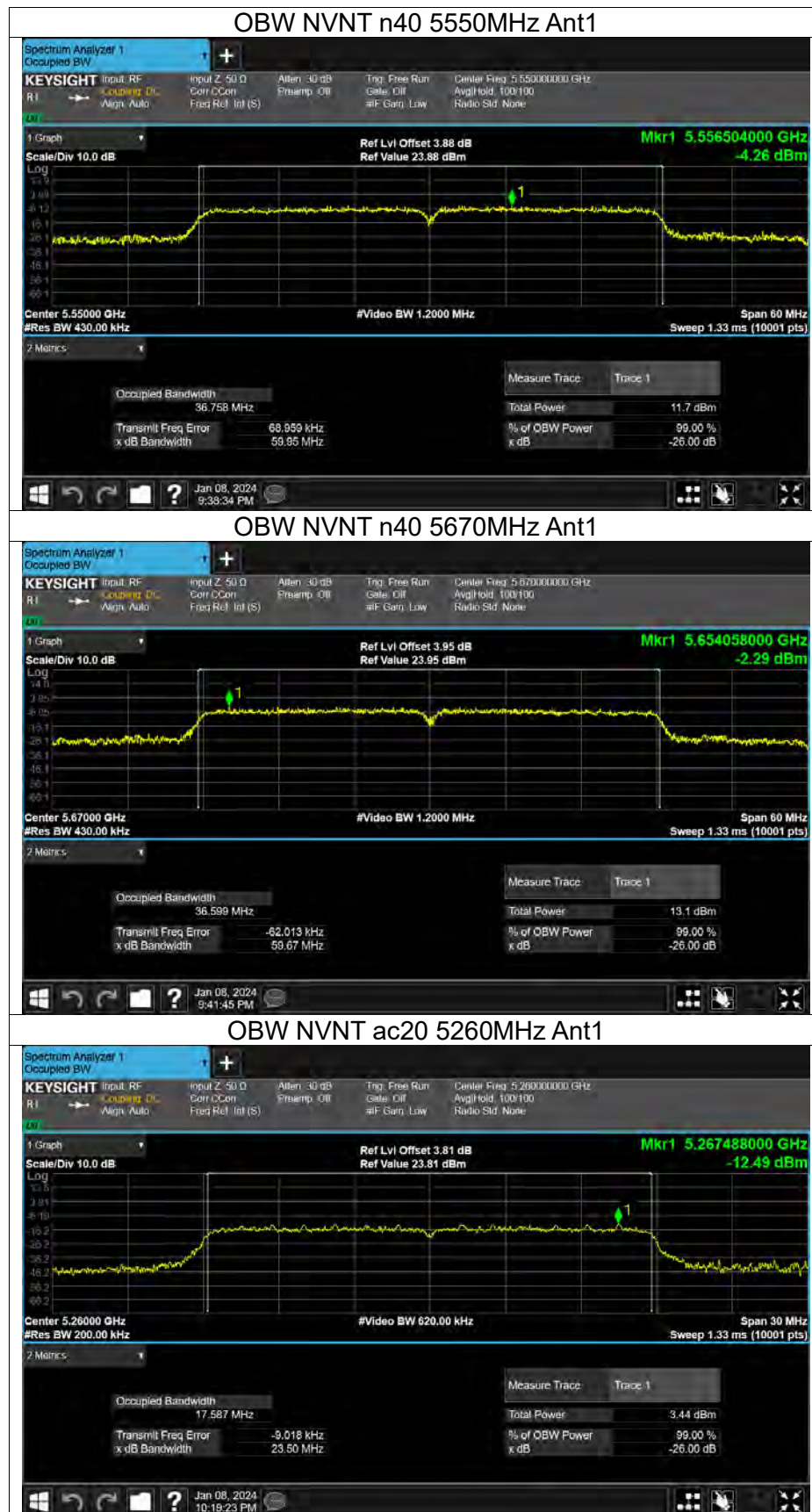
OBW NVNT a 5700MHz Ant1

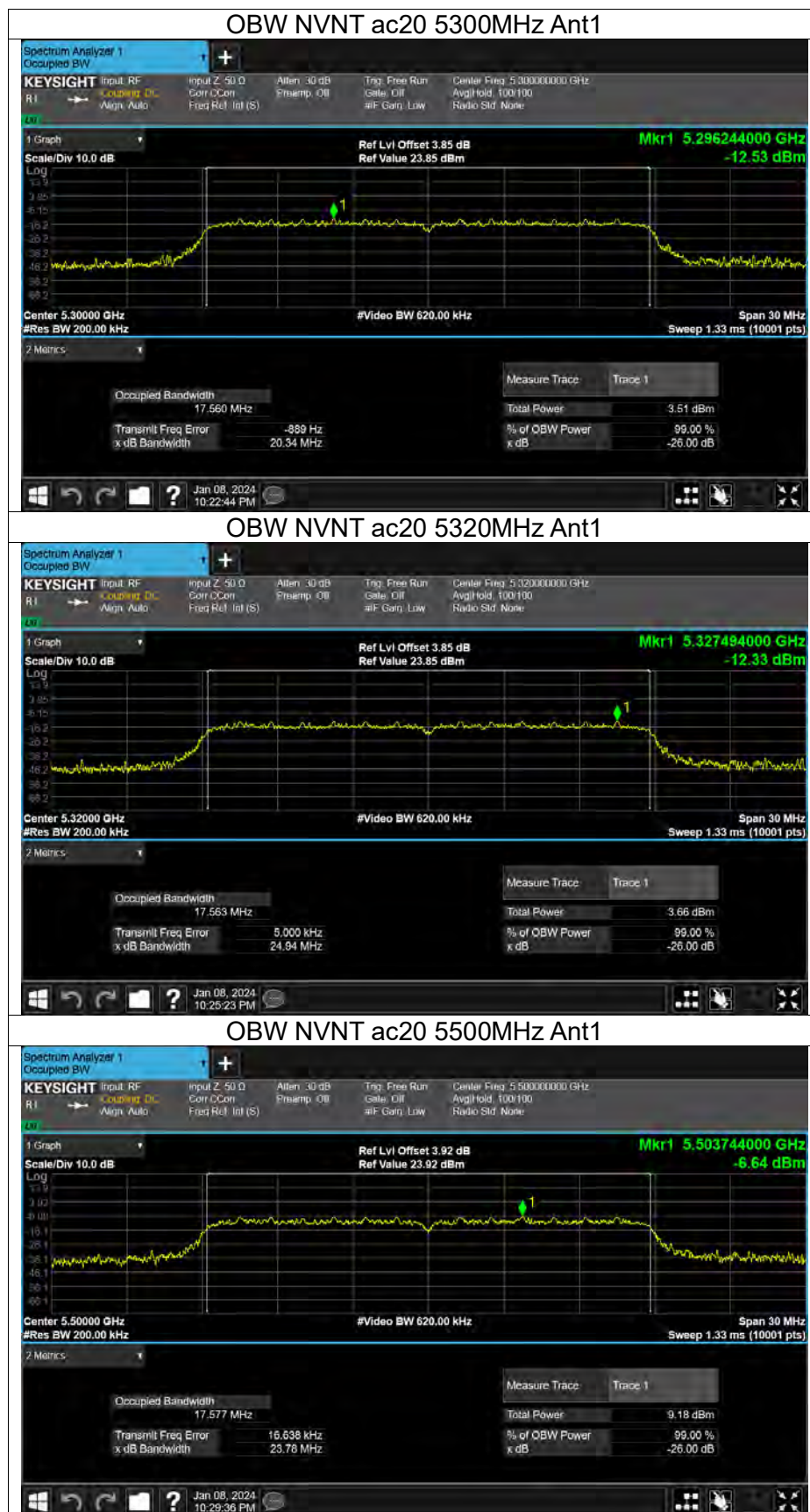


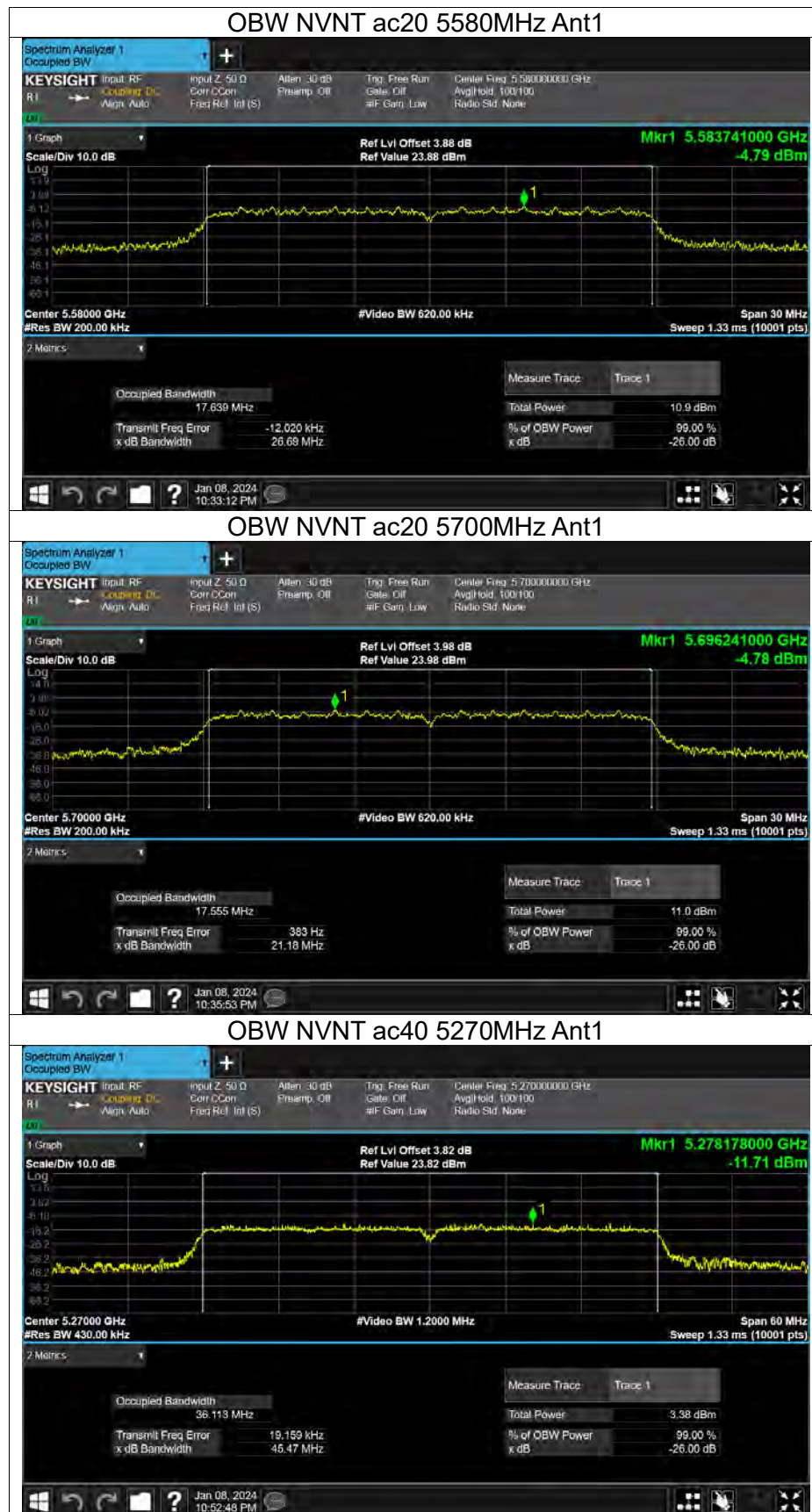


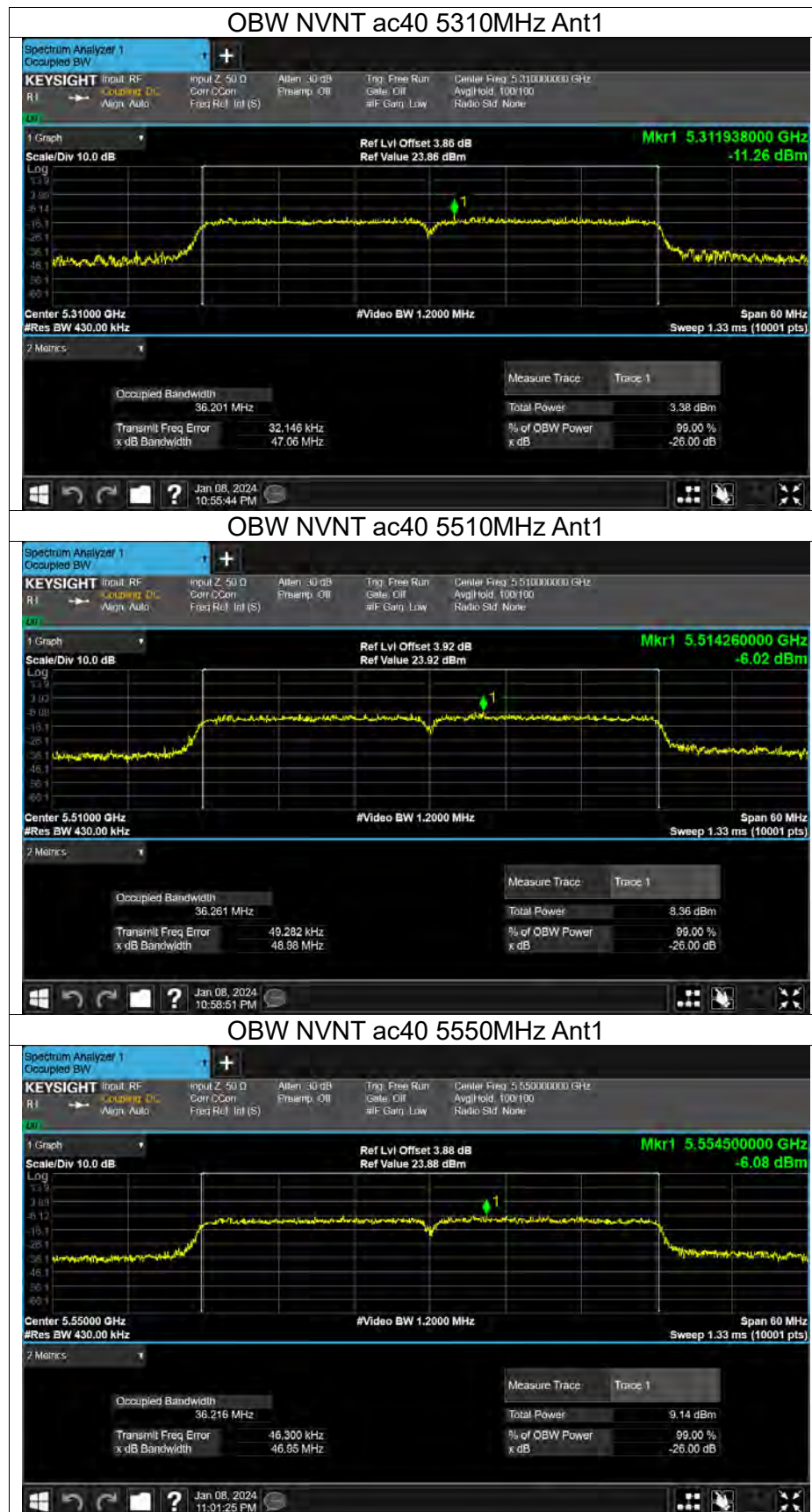














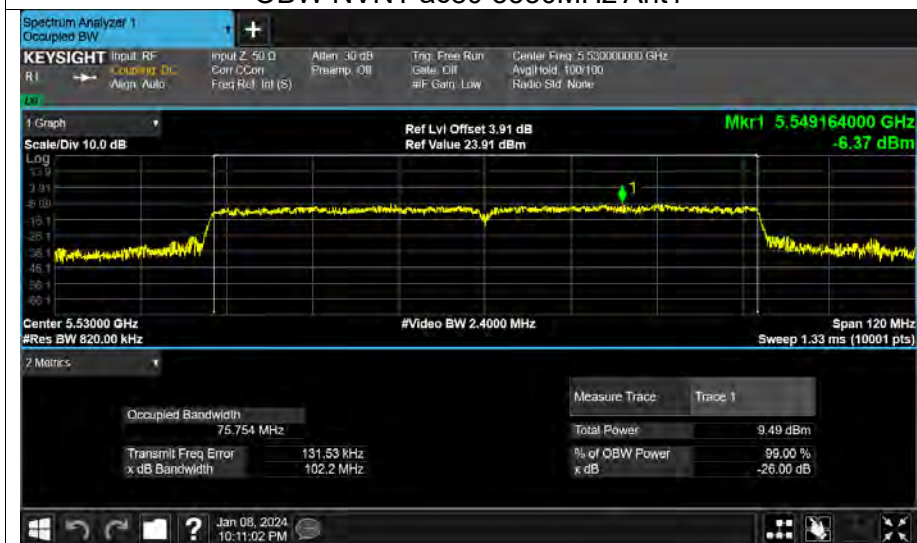
OBW NVNT ac40 5670MHz Ant1

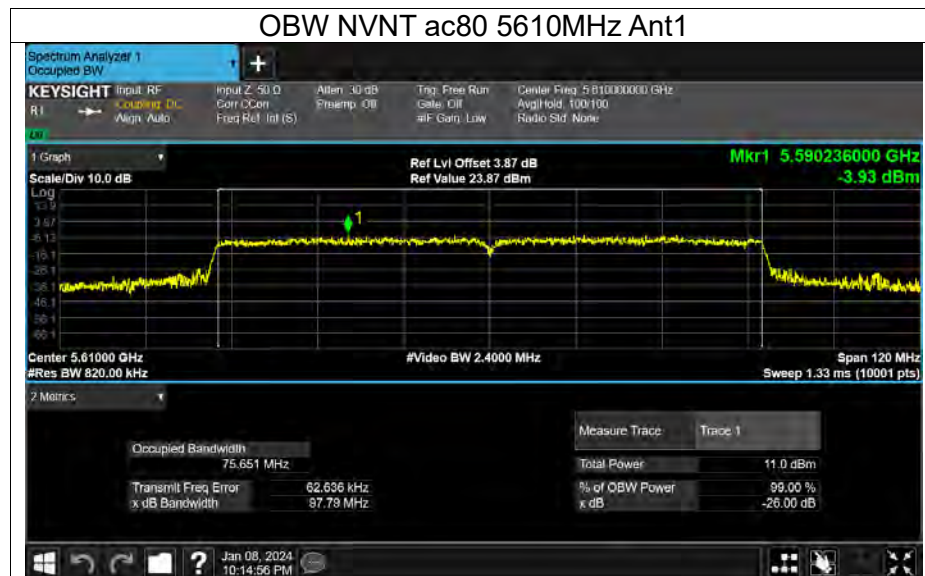


OBW NVNT ac80 5290MHz Ant1



OBW NVNT ac80 5530MHz Ant1

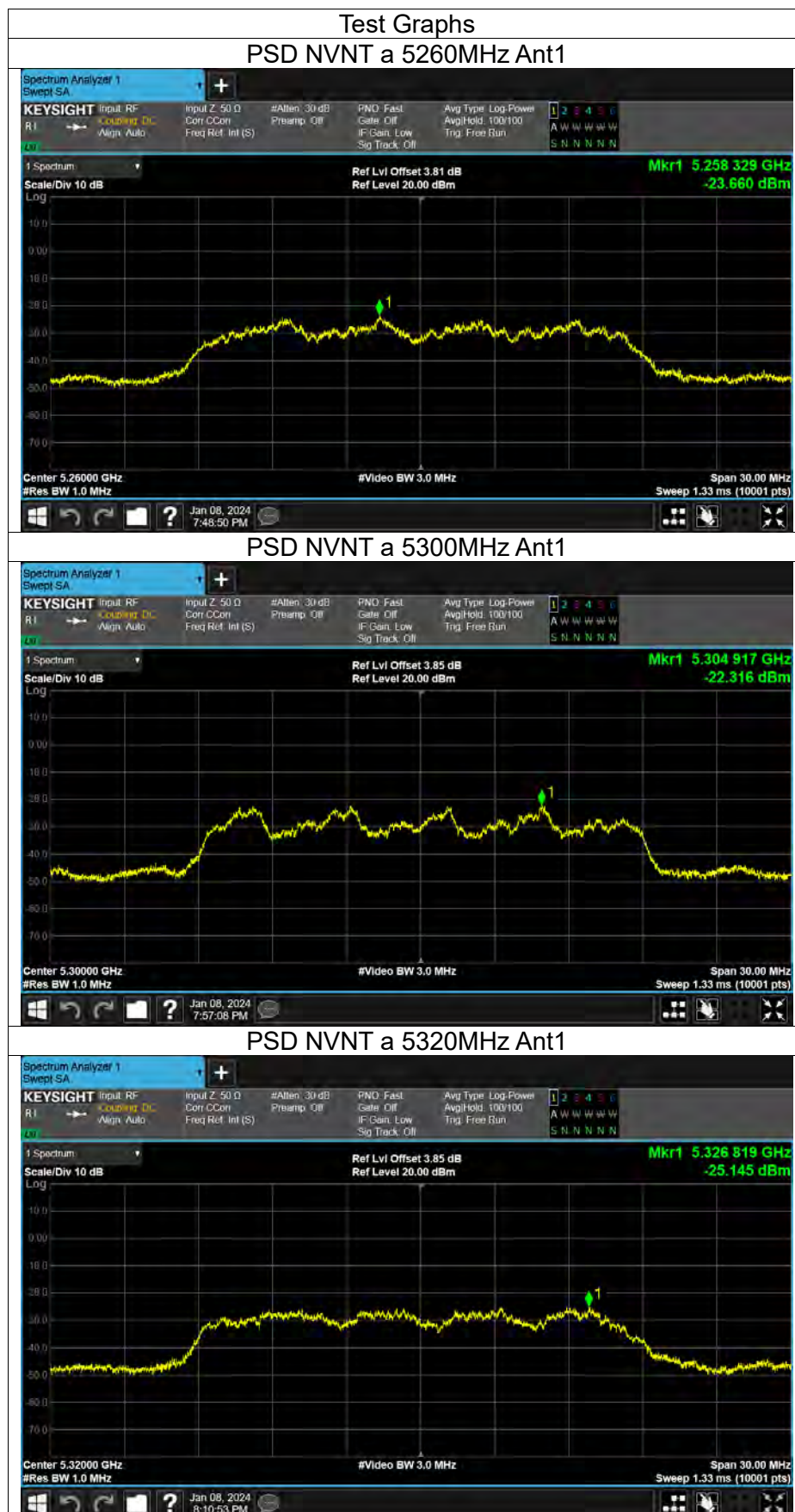






Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/MHz)	Duty Factor (dB)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
NVNT	a	5260	Ant1	-23.66	2.16	-21.5	11	Pass
NVNT	a	5300	Ant1	-22.32	2.16	-20.16	11	Pass
NVNT	a	5320	Ant1	-25.15	2.16	-22.99	11	Pass
NVNT	a	5500	Ant1	-18.64	1.92	-16.72	11	Pass
NVNT	a	5580	Ant1	-15.77	1.92	-13.85	11	Pass
NVNT	a	5700	Ant1	-19.09	1.92	-17.17	11	Pass
NVNT	n20	5260	Ant1	-24.11	1.94	-22.17	11	Pass
NVNT	n20	5300	Ant1	-26.02	1.94	-24.08	11	Pass
NVNT	n20	5320	Ant1	-25.15	1.94	-23.21	11	Pass
NVNT	n20	5500	Ant1	-20	1.94	-18.06	11	Pass
NVNT	n20	5580	Ant1	-17.5	1.94	-15.56	11	Pass
NVNT	n20	5700	Ant1	-17.47	1.94	-15.53	11	Pass
NVNT	n40	5270	Ant1	-30.94	2.65	-28.29	11	Pass
NVNT	n40	5310	Ant1	-31.76	2.65	-29.11	11	Pass
NVNT	n40	5510	Ant1	-27.3	2.65	-24.65	11	Pass
NVNT	n40	5550	Ant1	-25.57	2.65	-22.92	11	Pass
NVNT	n40	5670	Ant1	-25	2.65	-22.35	11	Pass
NVNT	ac20	5260	Ant1	-25.49	1.83	-23.66	11	Pass
NVNT	ac20	5300	Ant1	-26.21	1.83	-24.38	11	Pass
NVNT	ac20	5320	Ant1	-25.86	1.83	-24.03	11	Pass
NVNT	ac20	5500	Ant1	-20.29	1.83	-18.46	11	Pass
NVNT	ac20	5580	Ant1	-20.3	1.83	-18.47	11	Pass
NVNT	ac20	5700	Ant1	-21.56	1.83	-19.73	11	Pass
NVNT	ac40	5270	Ant1	-30.83	2.66	-28.17	11	Pass
NVNT	ac40	5310	Ant1	-32.39	2.66	-29.73	11	Pass
NVNT	ac40	5510	Ant1	-28.41	2.43	-25.98	11	Pass
NVNT	ac40	5550	Ant1	-27.39	2.43	-24.96	11	Pass
NVNT	ac40	5670	Ant1	-26.06	2.43	-23.63	11	Pass
NVNT	ac80	5290	Ant1	-34.82	3.13	-31.69	11	Pass
NVNT	ac80	5530	Ant1	-32.66	3.13	-29.53	11	Pass
NVNT	ac80	5610	Ant1	-31.09	3.13	-27.96	11	Pass





PSD NVNT a 5500MHz Ant1

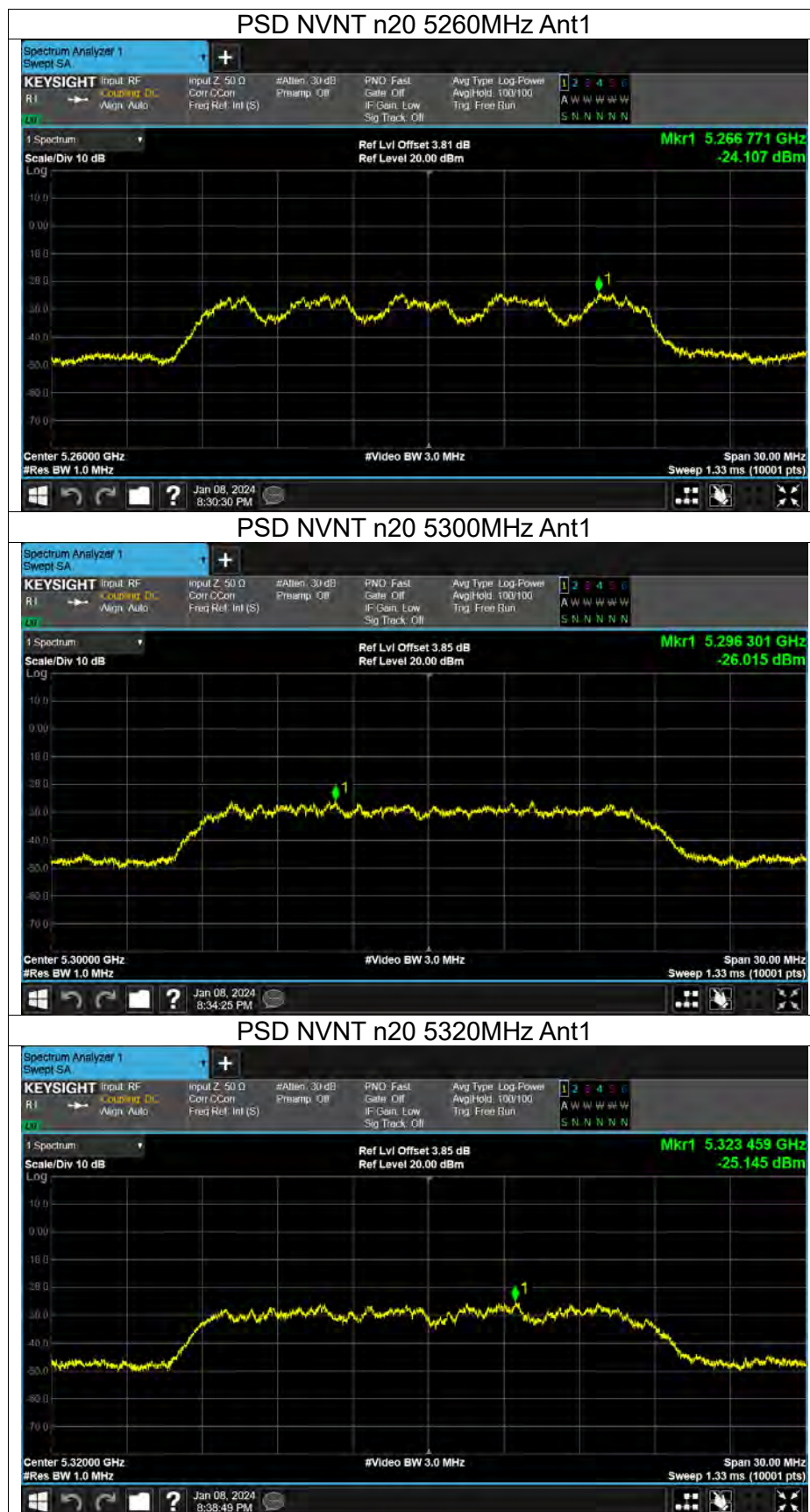


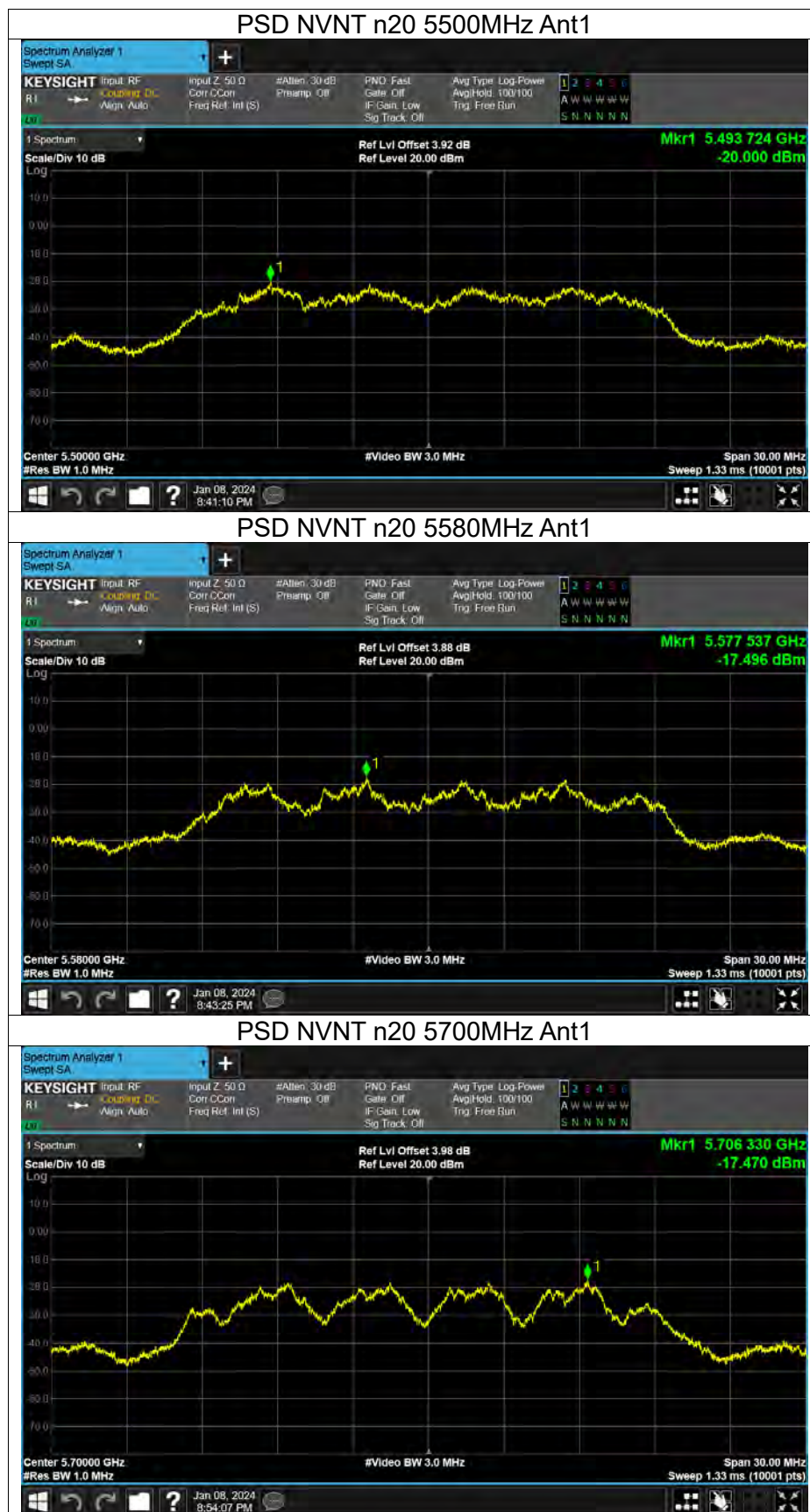
PSD NVNT a 5580MHz Ant1

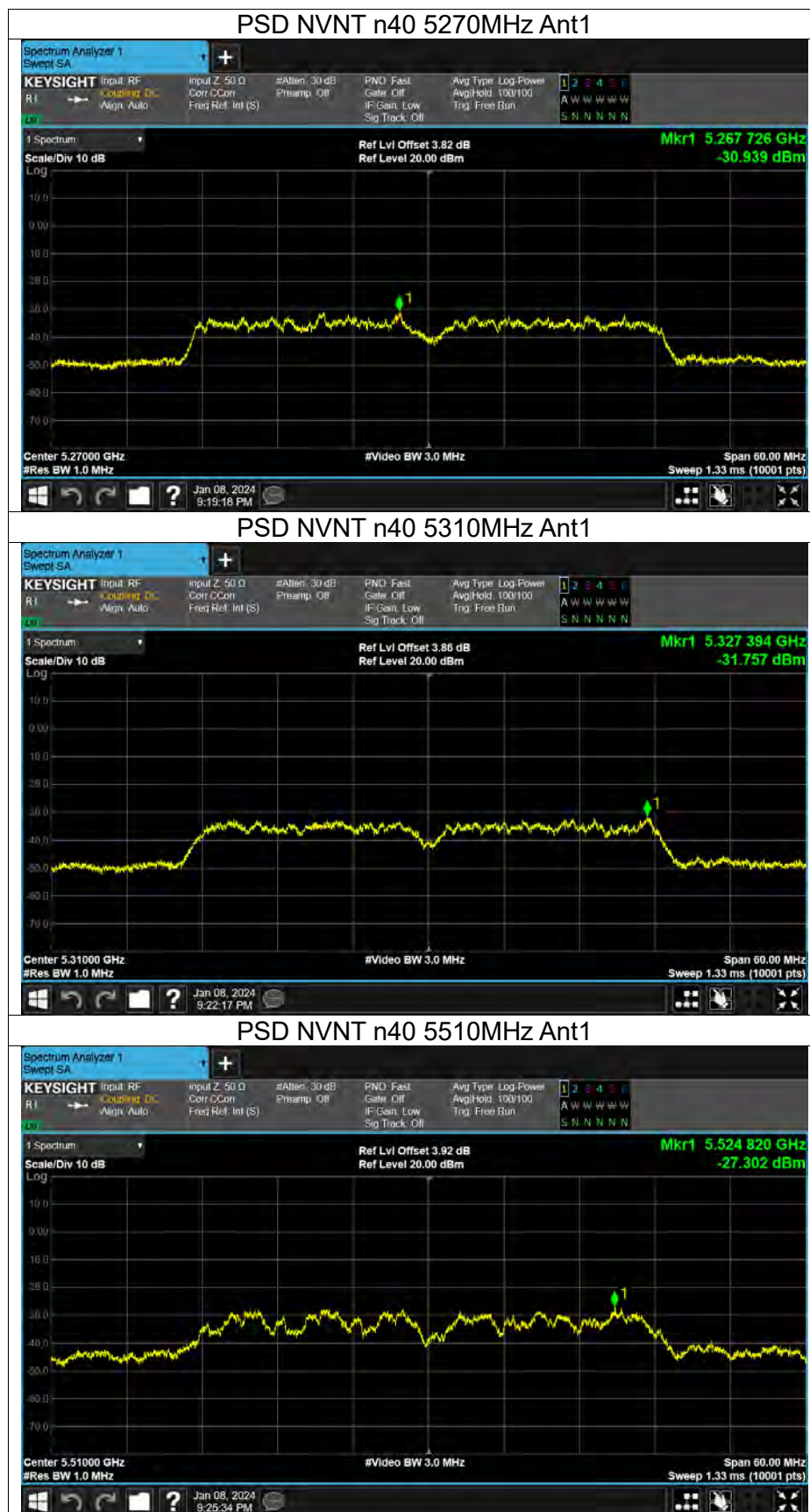


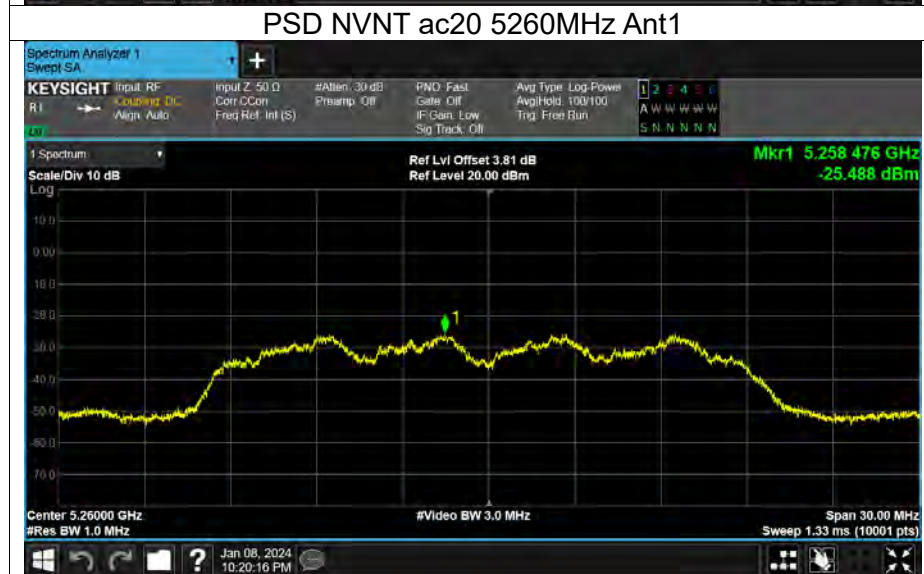
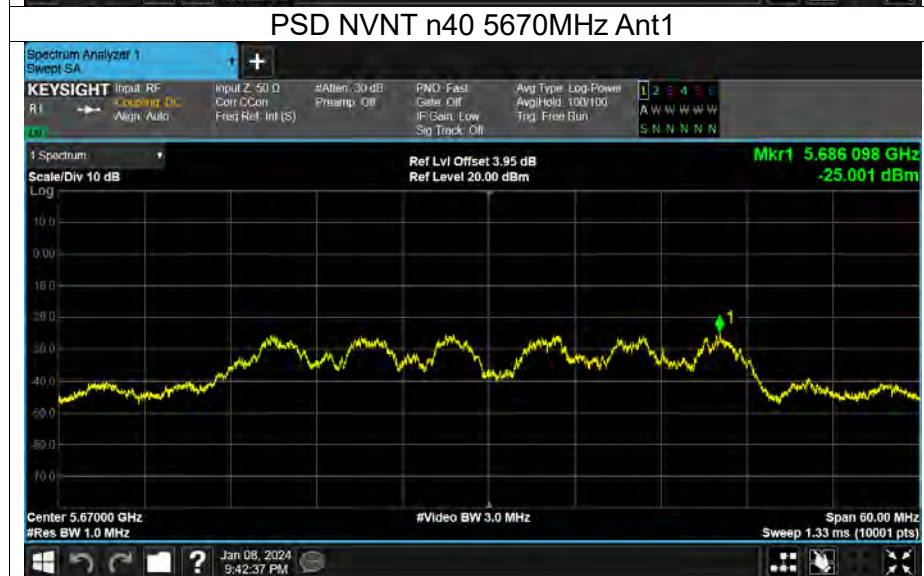
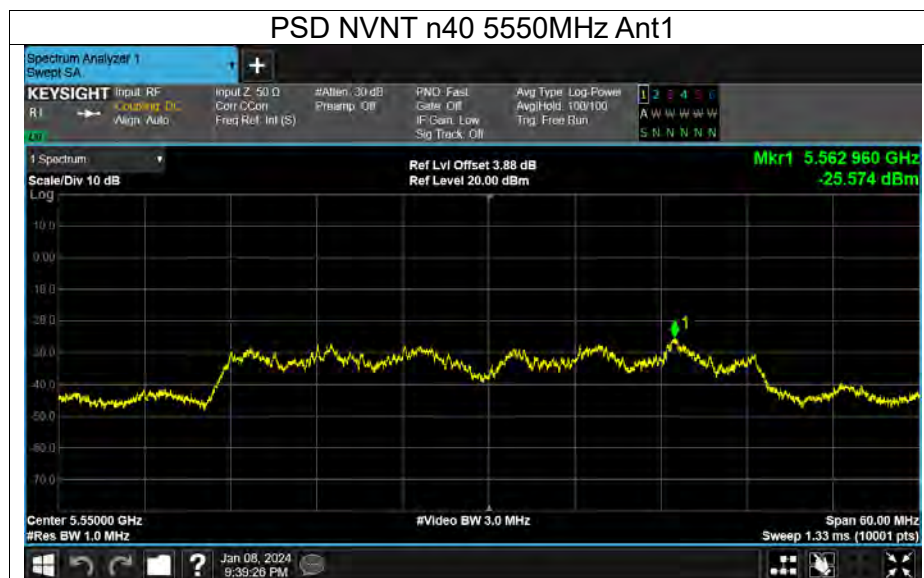
PSD NVNT a 5700MHz Ant1

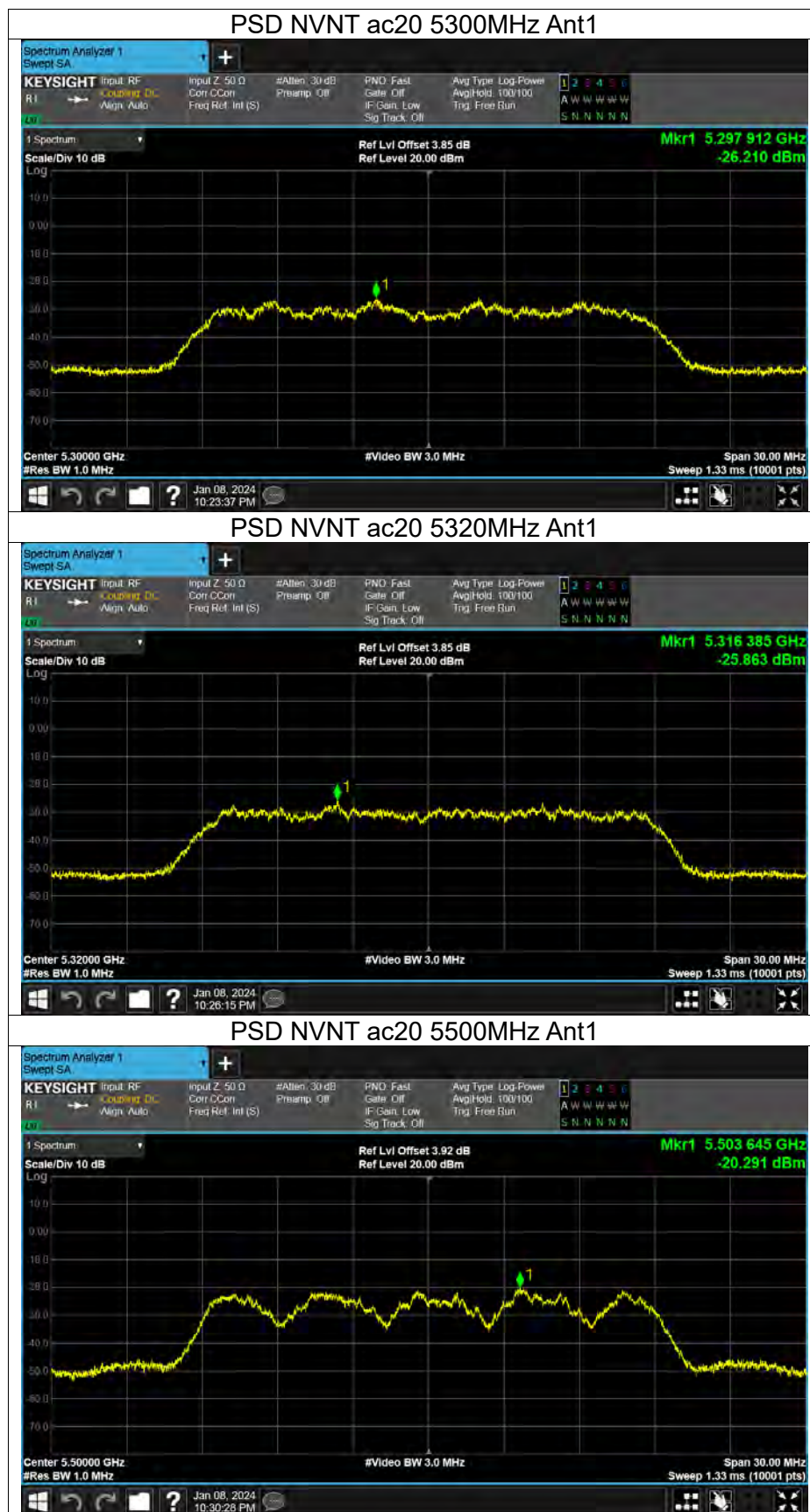


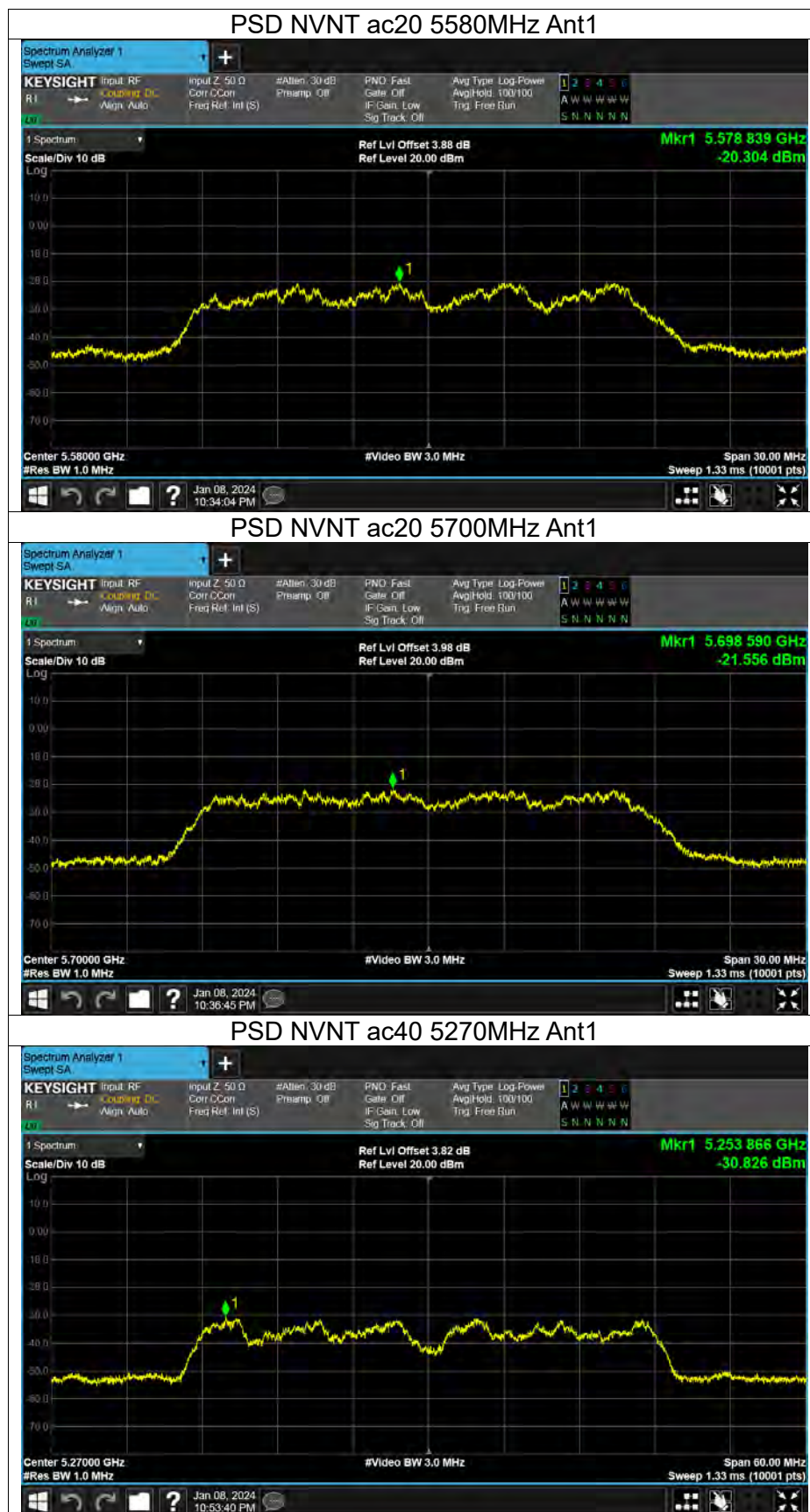


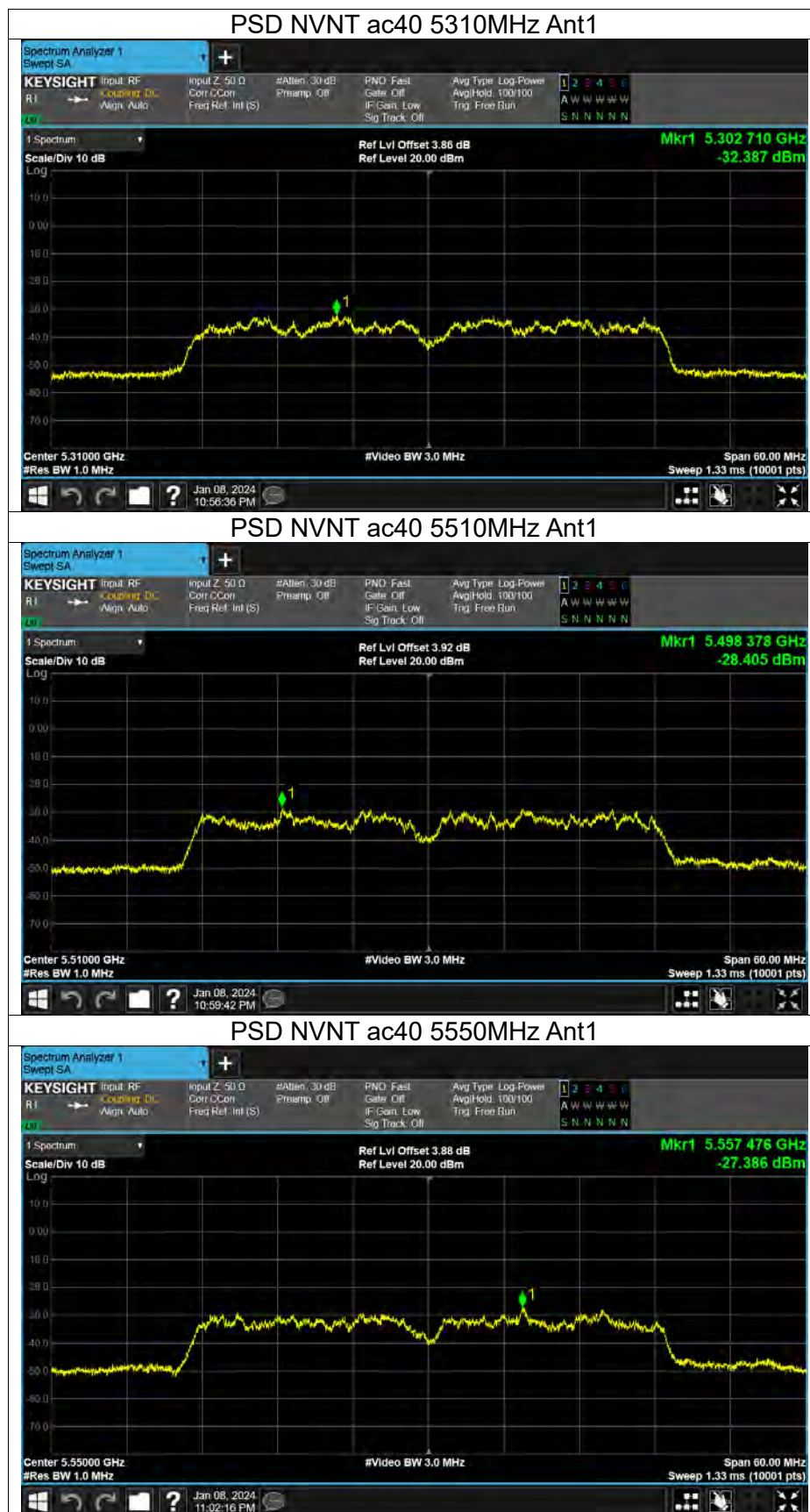


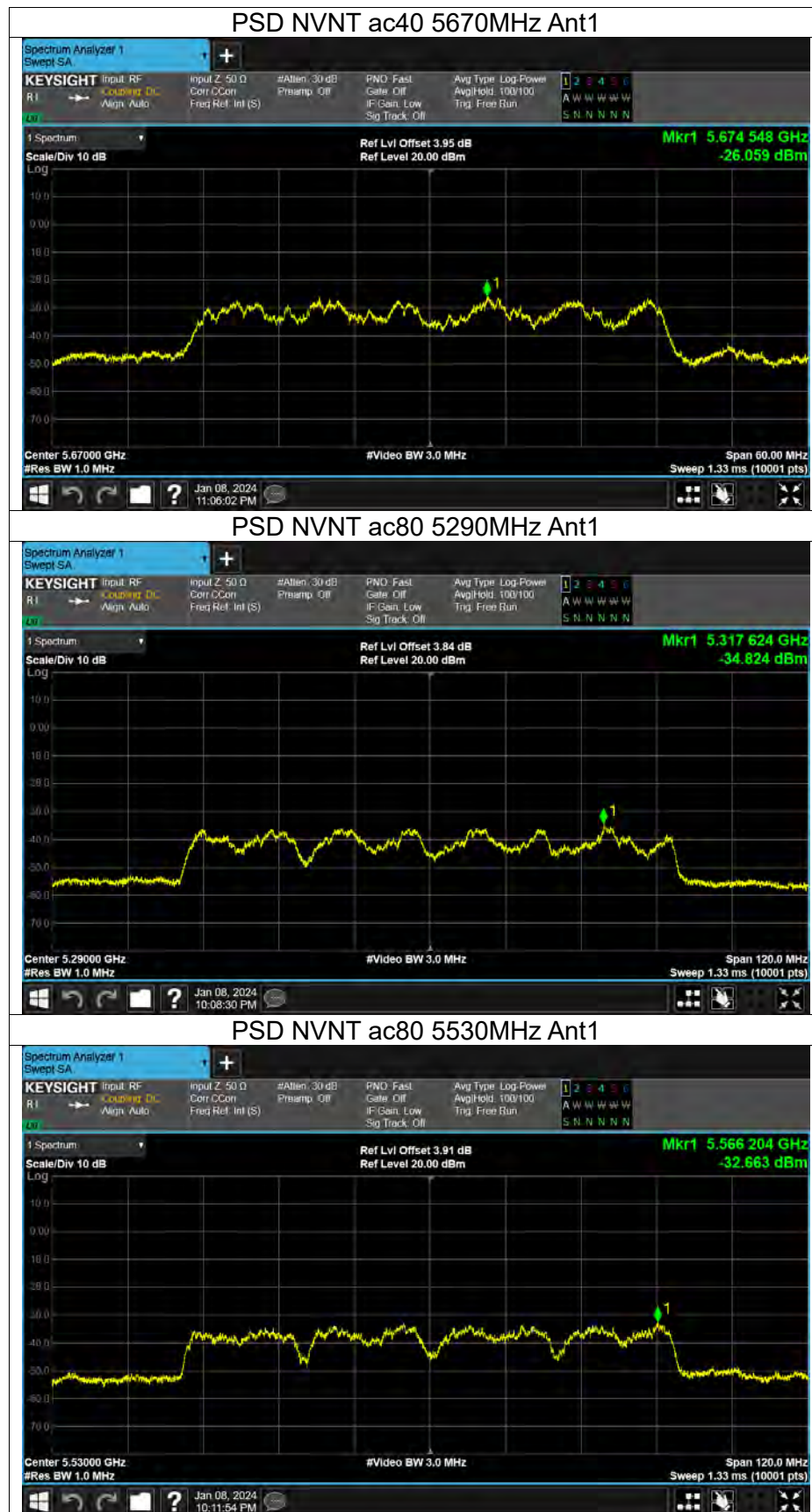


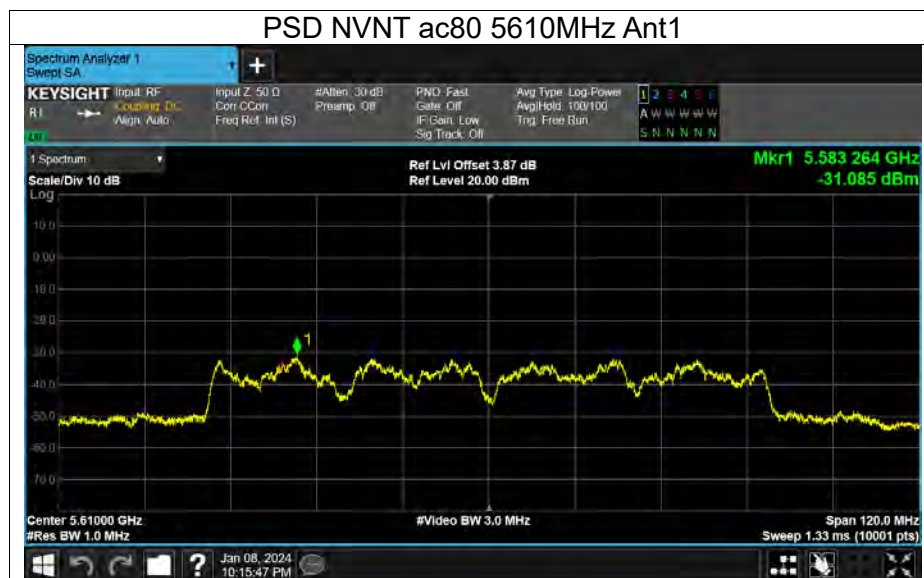












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