TEST REPORT

Report No.:	BCTC2308619941-1E
Applicant:	Shenzhen Viofo Technology Co.,Ltd
Product Name:	Car Dash Camera
Model/Type reference:	A229 Pro
Tested Date:	2023-08-16 to 2023-09-15
Issued Date:	2023-09-22

Shenzhen BCTC Testing Co., Ltd.

FCC ID: 2AMBW-A229PRO

Product Name:	Car Dash Camera
Trademark:	VIOFO
Model/Type Ref.:	A229 Pro, A229 Plus, A229 Plus 2CH, A229 Plus 3CH, A229 Pro 2CH, A229 Pro 3CH.
Prepared For:	Shenzhen Viofo Technology Co.,Ltd
Address:	Room201,Second Floor, Factory Building NO.1,Guanghui Science and Technology Park, Minqing Rd, Longhua Street, Longhua.District,Shenzhen.
Manufacturer:	Shenzhen Viofo Technology Co.,Ltd
Address:	Room201,Second Floor, Factory Building NO.1,Guanghui Science and Technology Park, Minqing Rd, Longhua Street, Longhua.District,Shenzhen.
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2022-08-16
Sample tested Date:	2023-08-16 to 2023-09-15
Report No.:	BCTC2308619941-1E
Test Standards:	FCC Part15 15.407 ANSI C63.10-2013 KDB 662911 D01 v02r01 KDB 789033 D02 v02r01
Test Results:	PASS

Tested by:

Brave Zeng/ Project Handler

Approved by:

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

Table of Content

Test Report Declaration Page
1. Version 5
2. Test Summary 6
3. Measurement Uncertainty 7
4. Product Information and Test Setup 8
4.1 Product Information 8
4.2 Test Setup Configuration 9
4.3 Support Equipment 9
4.4 Channel List 9
4.5 Test Mode 10
4.6 Table Of Parameters Of Text Software Setting 10
5. Test Facility And Test Instrument Used 11
5.1 Test Facility 11
5.2 Test Instrument Used 11
6. Conducted Emissions 13
6.1 Block Diagram Of Test Setup 13
6.2 Limit 13
6.3 Test Procedure 13
6.4 EUT Operating Conditions 13
6.5 Test Result 14
7. Radiated Emissions 15
7.1 Block Diagram Of Test Setup 15
7.2 Limit 16
7.3 Test Procedure 17
7.4 EUT Operating Conditions 18
7.5 Test Result 18
8. Power Spectral Density Test 36
8.1 Block Diagram Of Test Setup 36
8.2 Limit 36
8.3 Test Procedure 37
8.4 EUT Operating Conditions 37
8.5 Test Result 38
9. 26dB & 6dB & 99% Emission Bandwidth 54
9.1 Block Diagram Of Test Setup 54
9.2 Limit 54
9.3 Test Procedure 54
9.4 EUT Operating Conditions 54
9.5 Test Result 55
10. Maximum Conducted Output Power 85
10.1 Block Diagram Of Test Setup 85
10.2 Limit 85
10.3 Test Procedure 85
10.4 EUT Operating Conditions 86
10.5 Test Result 87

11. Out Of Band Emissions 89
11.1 Block Diagram Of Test Setup 89
11.2 Limit 89
11.3 Test Procedure 89
11.4 EUT Operating Conditions 89
11.5 Test Result 89
12. Spurious RF Conducted Emissions 102
12.1 Block Diagram Of Test Setup 102
12.2 Limit 102
12.3 Test Procedure 102
12.4 Test Result 102
13. Frequency Stability Measurement 117
13.1 Block Diagram Of Test Setup 117
13.2 Limit 117
13.3 Test Procedure 117
13.4 Test Result 118
14. Antenna Requirement 124
14.1 Limit 124
14.2 Test Result 124
15. EUT Test Setup Photographs 125

1. Version

Report No.	Issue Date	Description	Approved
BCTC2308619941-1E	2023-09-22	Original	Valid

2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Spurious Radiated Emissions	15.209(a), 15.407 (b)	PASS
2	Conducted Emission	15.207	N/A
3	26 dB and 99% Emission Bandwidth	15.407 (a)	PASS
4	Minimum 6 dB bandwidth	15.407(e)	PASS
5	Maximum Conducted Output Power	15.407 (a)	PASS
6	Band Edge	15.407(b)	PASS
7	Power Spectral Density	15.407 (a)	PASS
8	Spurious Emissions at Antenna Terminals	15.407(b)	PASS
9	Antenna Requirement	15.203	PASS

3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(9kHz-30MHz)	U=3.7dB
2	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission(150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59℃

4. Product Information and Test Setup

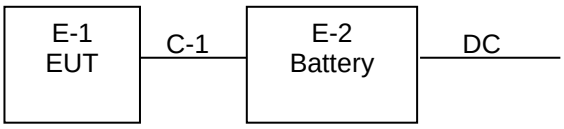
4.1 Product Information

Model/Type Ref.:	A229 Pro, A229 Plus, A229 Plus 2CH, A229 Plus 3CH, A229 Pro 2CH, A229 Pro 3CH.
Model differences:	All models covered in this report are the same with each other, except for different model No.,product name and appearance (for color, silk-screen only) for trading purpose. We choose A229 Pro as the final test prototype
Hardware Version:	N/A
Software Version:	N/A
IEEE 802.11 WLAN Mode Supported	☒802.11a ☒802.11n(20MHz channel bandwidth) ☒802.11n(40MHz channel bandwidth) ☒802.11ac(20MHz channel bandwidth) ☒802.11ac(40MHz channel bandwidth) ☒802.11ac(80MHz channel bandwidth)
Operation Frequency:	5180-5240MHz for 802.11a/n/ac(HT20); 5190-5230MHz for 802.11n/ac(HT40); 5210MHz for 802.11 ac80; 5745-5825 MHz for 802.11a/n/ac(HT20); 5755-5795 MHz for 802.11n/ac(HT40); 5775MHz for 802.11 ac 80
Data Rate	☒802.11a:54/48/36/24/18/12/9/6Mbps ☒802.11n:up to 300 Mbps ☒802.11ac:up to 867 Mbps
Type of Modulation:	☒OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n ☒OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac
Number Of Channel	4 channels for 802.11a/n20 in the 5180-5240MHz band ; 2 channels for 802.11 n40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ; 5 channels for 802.11a/n20 in the 5745-5825MHz band ; 2 channels for 802.11 n40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band
Transmit Power:	5180-5240 11.77dBm 5745-5825 10.55dBm
Antenna installation:	Internal antenna
Antenna Gain:	2.78 dBi
Power supply:	DC 12/24V

4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Car Dash Camera	N/A	A229 Pro	N/A	EUT
E-2	Battery	N/A	N/A	N/A	Battery

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	N/A	N/A

Notes:
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

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

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

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

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

Frequency and Channel list for 802.11a/n/ac (20 MHz) (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	-	-	-	-	-	-

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

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

4.5 Test Mode

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	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH38/ CH 46 802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	Link Mode

4.6 Table Of Parameters Of Text Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Test software Version	**CMD**		
Parameters	DEF	DEF	DEF

5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.
FCC Test Firm Registration Number: 712850
A2LA certificate registration number is: CN1212
ISED Registered No.: 23583
ISED CAB identifier: CN0017

5.2 Test Instrument Used

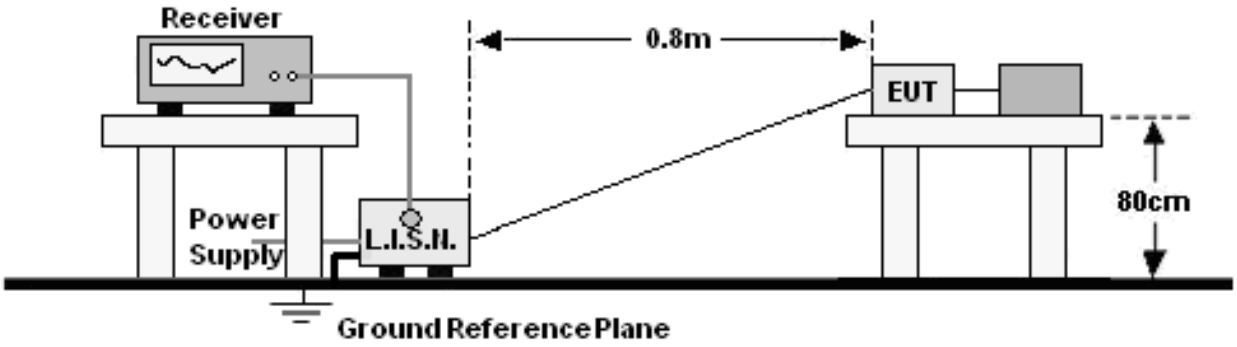
Conducted Emissions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Receiver	R&S	ESR3	102075	May 15, 2023	May 14, 2024
LISN	R&S	ENV216	101375	May 15, 2023	May 14, 2024
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Attenuator	\	10dB DC-6GHz	1650	May 15, 2023	May 14, 2024

RF Conducted Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Power Metter	Keysight	E4419	\	May 15, 2023	May 14, 2024
Power Sensor (AV)	Keysight	E9300A	\	May 15, 2023	May 14, 2024
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 15, 2023	May 14, 2024
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	May 15, 2023	May 14, 2024
Radio frequency control box	MAIWEI	MW100-RFCB	\	\	\
Software	MAIWEI	MTS 8310	\	\	\

Radiated Emissions Test (966 Chamber02)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
966 chamber	SKET	966 Room	966	Nov. 02. 2021	Nov. 01.2024
Receiver	R&S	ESR3	102075	May 15, 2023	May 14, 2024
Receiver	R&S	ESRI7	100010	Nov. 08. 2022	Nov. 07.2023
Amplifier	SKET	LNPA-30M01G-30	SK2021082004	Nov. 08. 2022	Nov. 07.2023
TRILOG Broadband Antenna	Schwarzbeck	VULB9168	1323	Mar. 06, 2022	Mar. 05, 2024
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	May 31, 2023	May 30, 2024
Amplifier	SKET	LAPA_01G18G-45dB	\	May 15, 2023	May 14, 2024
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 31, 2023	May 30, 2024
Amplifier(18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 15, 2023	May 14, 2024
Horn Antenn(18GHz-40GHz)	Schwarzbeck	BBHA9170	00822	May 31, 2023	May 30, 2024
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	May 15, 2023	May 14, 2024
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

6. Conducted Emissions

6.1 Block Diagram Of Test Setup



6.2 Limit

Frequency (MHz)	Limit (dBuV)	
	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00
Notes: 1. *Decreasing linearly with logarithm of frequency. 2. The lower limit shall apply at the transition frequencies.		

6.3 Test Procedure

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

a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 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.

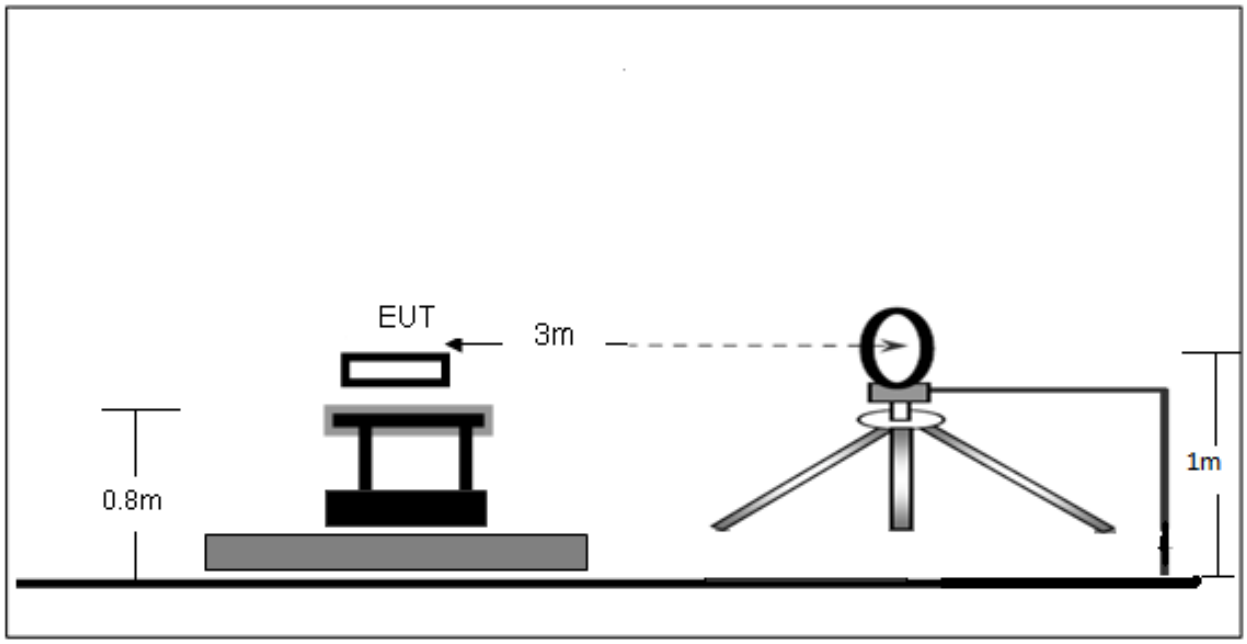
6.5 Test Result

The EUT is powered by the DC only, the test item is not applicable

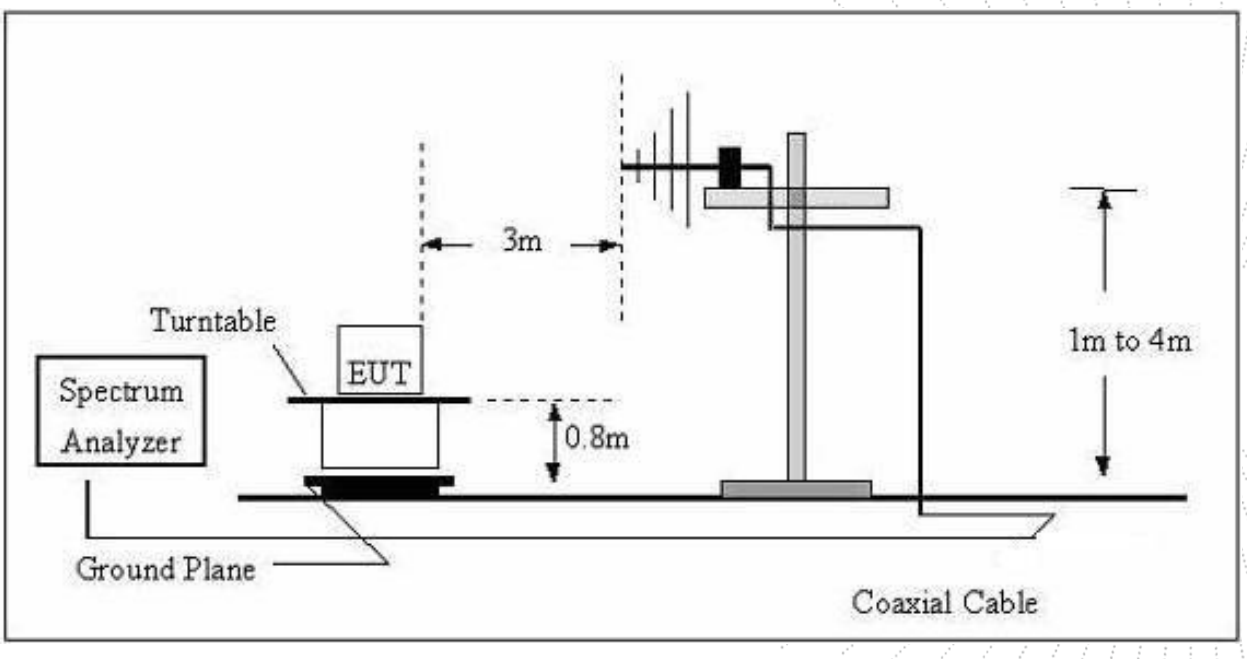
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

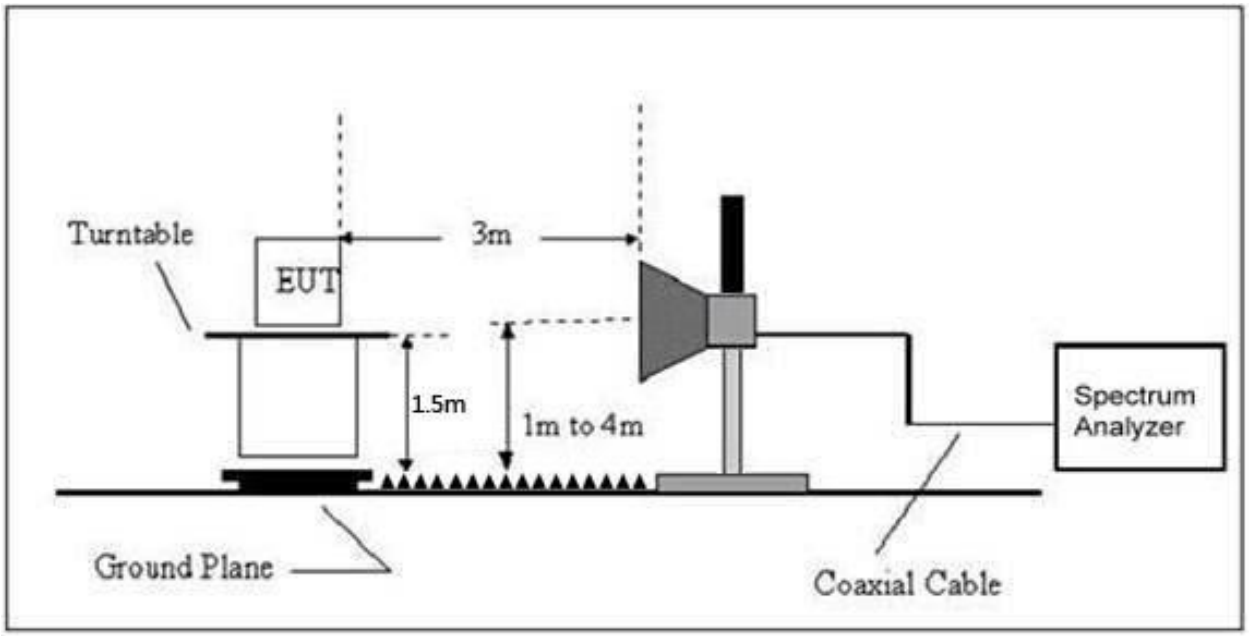
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



7.2 Limit

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

Frequency	Field Strength	Distance	Field Strength Limit at 3m Distance	
(MHz)	uV/m	(m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))}$ + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))}$ + 40
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)}$ + 40
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (dBuV/m) (at 3M)	
	Peak	Average
Above 1000	74	54

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

7.3 Test Procedure

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

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

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

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

Note:

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

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

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

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

7.4 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.

7.5 Test Result

Below 30MHz

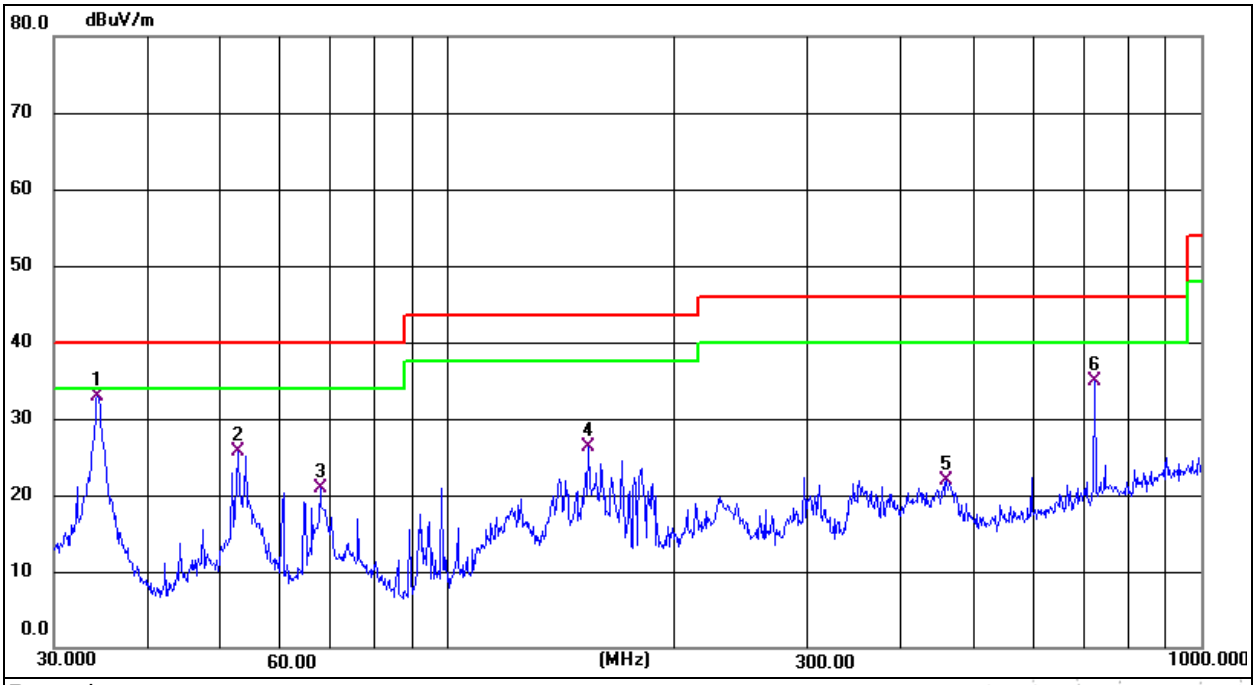
Temperature:	26℃	Relative Humidity:	24%
Pressure:	101 kPa	Test Voltage:	DC 24V
Test Mode:	Mode 4	Polarization:	--

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

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1GHz

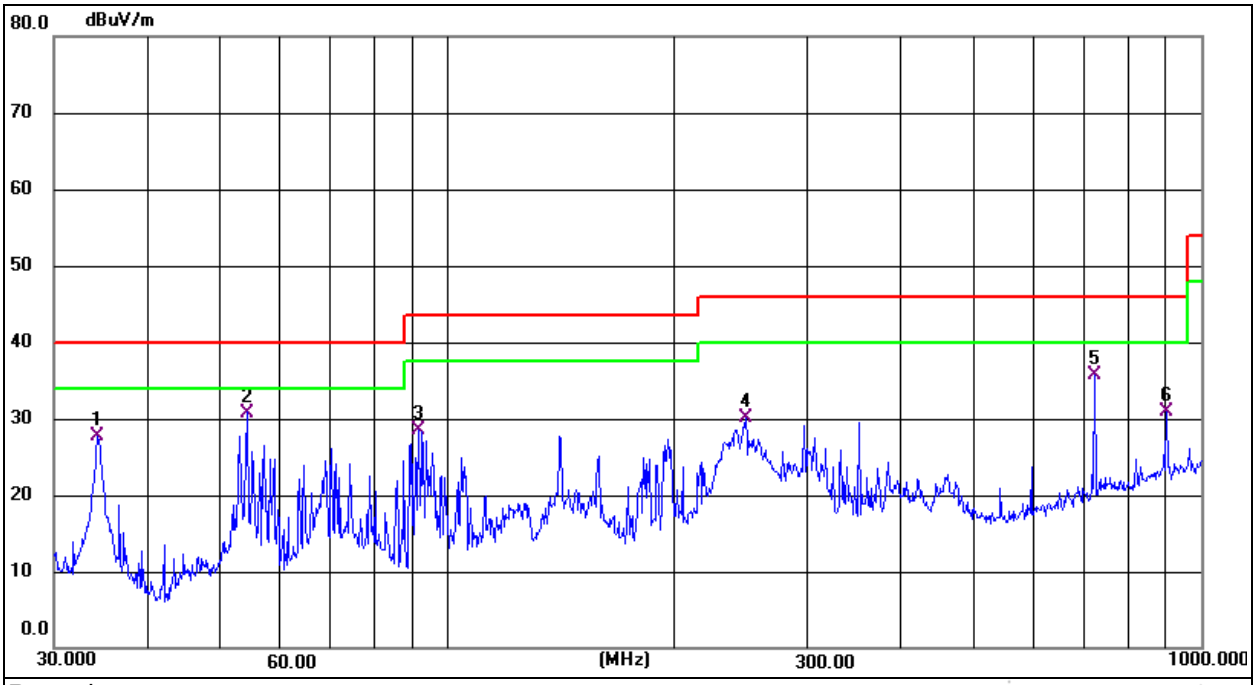
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kPa	Test Voltage ：	DC 24V
Test Mode ：	Mode 4	Polarization :	Horizontal



Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over= Measurement-Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	34.2760	54.00	-21.02	32.98	40.00	-7.02	QP
2	52.7600	47.17	-21.50	25.67	40.00	-14.33	QP
3	67.6751	43.82	-22.86	20.96	40.00	-19.04	QP
4	153.7385	44.32	-17.94	26.38	43.50	-17.12	QP
5	459.1144	33.83	-11.88	21.95	46.00	-24.05	QP
6	721.7258	40.56	-5.71	34.85	46.00	-11.15	QP

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kPa	Test Voltage ：	DC 24V
Test Mode ：	Mode 4	Polarization :	Vertical



Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over= Measurement-Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	34.2760	48.74	-21.02	27.72	40.00	-12.28	QP
2 *	54.2609	52.41	-21.61	30.80	40.00	-9.20	QP
3	91.4947	52.28	-23.70	28.58	43.50	-14.92	QP
4	248.5519	49.64	-19.52	30.12	46.00	-15.88	QP
5	721.7258	41.48	-5.71	35.77	46.00	-10.23	QP
6	900.1474	33.46	-2.53	30.93	46.00	-15.07	QP

Between 1GHz – 40GHz

Test Mode :	TX(5.1G) - 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G							
V	4434.151	71.97	-20.73	51.24	68.2	-16.96	PK
V	4434.151	59.71	-20.73	38.98	54	-15.02	AV
V	10360.092	61.92	-9.36	52.56	68.2	-15.64	PK
V	10360.092	49.58	-9.36	40.22	54	-13.78	AV
V	15540.056	63.64	-7.84	55.80	74	-18.20	PK
V	15540.056	49.20	-7.84	41.36	54	-12.64	AV
H	4434.094	71.08	-20.73	50.35	68.2	-17.85	PK
H	4434.094	59.58	-20.73	38.85	54	-15.15	AV
H	10360.072	60.27	-9.36	50.91	68.2	-17.29	PK
H	10360.072	49.41	-9.36	40.05	54	-13.95	AV
H	15540.132	60.05	-7.84	52.21	74	-21.79	PK
H	15540.132	49.87	-7.84	42.03	54	-11.97	AV
middle Channel (5200 MHz)-Above 1G							
V	4592.009	73.18	-20.42	52.76	74	-21.24	PK
V	4592.009	59.41	-20.42	39.00	54	-15.00	AV
V	10400.118	64.46	-9.30	55.16	68.2	-13.04	PK
V	10400.118	49.52	-9.30	40.22	54	-13.78	AV
V	15600.155	63.45	-7.82	55.63	74	-18.37	PK
V	15600.155	49.62	-7.82	41.80	54	-12.20	AV
H	4592.184	71.02	-20.42	50.60	74	-23.40	PK
H	4592.184	59.66	-20.42	39.25	54	-14.75	AV
H	10400.177	64.13	-9.30	54.83	68.2	-13.37	PK
H	10400.177	49.52	-9.30	40.22	54	-13.78	AV
H	15600.178	60.00	-7.82	52.18	74	-21.82	PK
H	15600.178	49.26	-7.82	41.44	54	-12.56	AV
High Channel (5240 MHz)-Above 1G							
V	4739.033	71.86	-20.12	51.74	74	-22.26	PK
V	4739.033	59.47	-20.12	39.35	54	-14.65	AV
V	10480.030	63.86	-9.18	54.68	68.2	-13.52	PK
V	10480.030	49.60	-9.18	40.42	54	-13.58	AV
V	15720.190	60.49	-7.78	52.71	74	-21.29	PK
V	15720.190	49.08	-7.78	41.30	54	-12.70	AV
H	4739.113	73.45	-20.12	53.33	74	-20.67	PK
H	4739.113	59.45	-20.12	39.33	54	-14.67	AV
H	10480.014	62.33	-9.18	53.15	68.2	-15.05	PK
H	10480.014	49.28	-9.18	40.10	54	-13.90	AV
H	15720.115	62.77	-7.78	54.99	74	-19.01	PK
H	15720.115	49.64	-7.78	41.86	54	-12.14	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode :	TX(5.1G) - 802.11n-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G							
V	4434.060	70.29	-20.73	49.56	68.2	-18.64	PK
V	4434.060	59.37	-20.73	38.64	54	-15.36	AV
V	10360.078	64.68	-9.36	55.32	68.2	-12.88	PK
V	10360.078	49.46	-9.36	40.10	54	-13.90	AV
V	15540.016	64.65	-7.84	56.81	74	-17.19	PK
V	15540.016	49.09	-7.84	41.25	54	-12.75	AV
H	4434.032	71.73	-20.73	50.99	68.2	-17.21	PK
H	4434.032	59.96	-20.73	39.22	54	-14.78	AV
H	10360.109	60.98	-9.36	51.62	68.2	-16.58	PK
H	10360.109	49.01	-9.36	39.65	54	-14.35	AV
H	15540.055	63.76	-7.84	55.92	74	-18.08	PK
H	15540.055	49.79	-7.84	41.95	54	-12.05	AV
middle Channel (5200 MHz)-Above 1G							
V	4592.099	71.61	-20.42	51.19	74	-22.81	PK
V	4592.099	59.95	-20.42	39.54	54	-14.46	AV
V	10400.025	64.90	-9.30	55.60	68.2	-12.60	PK
V	10400.025	49.62	-9.30	40.32	54	-13.68	AV
V	15600.125	60.07	-7.82	52.25	74	-21.75	PK
V	15600.125	49.76	-7.82	41.94	54	-12.06	AV
H	4592.060	74.49	-20.42	54.08	74	-19.92	PK
H	4592.060	59.89	-20.42	39.47	54	-14.53	AV
H	10400.120	63.39	-9.30	54.09	68.2	-14.11	PK
H	10400.120	49.65	-9.30	40.35	54	-13.65	AV
H	15600.051	60.50	-7.82	52.68	74	-21.32	PK
H	15600.051	49.38	-7.82	41.56	54	-12.44	AV
High Channel (5240 MHz)-Above 1G							
V	4739.005	74.17	-20.12	54.05	74	-19.95	PK
V	4739.005	59.33	-20.12	39.21	54	-14.79	AV
V	10480.163	61.59	-9.18	52.41	68.2	-15.79	PK
V	10480.163	49.52	-9.18	40.34	54	-13.66	AV
V	15720.137	63.80	-7.78	56.02	74	-17.98	PK
V	15720.137	49.81	-7.78	42.03	54	-11.97	AV
H	4739.062	73.21	-20.12	53.09	74	-20.91	PK
H	4739.062	59.57	-20.12	39.45	54	-14.55	AV
H	10480.050	64.47	-9.18	55.29	68.2	-12.91	PK
H	10480.050	49.27	-9.18	40.09	54	-13.91	AV
H	15720.084	60.79	-7.78	53.01	74	-20.99	PK
H	15720.084	49.37	-7.78	41.59	54	-12.41	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode :	TX(5.1G) - 802.11n-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G							
V	4434.081	74.26	-20.73	53.53	68.2	-14.67	PK
V	4434.081	59.89	-20.73	39.16	54	-14.84	AV
V	10380.147	62.45	-9.33	53.12	68.2	-15.08	PK
V	10380.147	49.42	-9.33	40.09	54	-13.91	AV
V	15570.146	64.63	-7.83	56.80	74	-17.20	PK
V	15570.146	49.93	-7.83	42.10	54	-11.90	AV
H	4434.132	72.29	-20.73	51.56	74	-22.44	PK
H	4434.132	59.69	-20.73	38.96	54	-15.04	AV
H	10380.192	61.68	-9.33	52.35	68.2	-15.85	PK
H	10380.192	49.18	-9.33	39.85	54	-14.15	AV
H	15570.122	64.82	-7.83	56.99	74	-17.01	PK
H	15570.122	49.93	-7.83	42.10	54	-11.90	AV
middle Channel (5230 MHz)-Above 1G							
V	4739.156	72.73	-20.12	52.61	68.2	-15.59	PK
V	4739.156	59.42	-20.12	39.30	54	-14.70	AV
V	10460.071	61.44	-9.21	52.23	68.2	-15.97	PK
V	10460.071	49.19	-9.21	39.98	54	-14.02	AV
V	15690.115	60.33	-7.79	52.54	74	-21.46	PK
V	15690.115	49.64	-7.79	41.85	54	-12.15	AV
H	4739.165	73.26	-20.12	53.14	68.2	-15.06	PK
H	4739.165	59.75	-20.12	39.63	54	-14.37	AV
H	10460.195	61.40	-9.21	52.19	68.2	-16.01	PK
H	10460.195	49.72	-9.21	40.51	54	-13.49	AV
H	15690.197	62.20	-7.79	54.41	74	-19.59	PK
H	15690.197	49.83	-7.79	42.04	54	-11.96	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode:	TX(5.1G) - 802.11ac-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G							
V	4434.121	74.93	-20.73	54.19	68.2	-14.01	PK
V	4434.121	59.60	-20.73	38.87	54	-15.13	AV
V	10360.139	60.08	-9.36	50.72	68.2	-17.48	PK
V	10360.139	49.96	-9.36	40.60	54	-13.40	AV
V	15540.168	64.71	-7.84	56.87	74	-17.13	PK
V	15540.168	49.50	-7.84	41.66	54	-12.34	AV
H	4434.142	72.15	-20.73	51.41	68.2	-16.79	PK
H	4434.142	59.98	-20.73	39.25	54	-14.75	AV
H	10360.086	62.53	-9.36	53.17	68.2	-15.03	PK
H	10360.086	49.42	-9.36	40.06	54	-13.94	AV
H	15540.044	62.73	-7.84	54.89	74	-19.11	PK
H	15540.044	49.66	-7.84	41.82	54	-12.18	AV
Middle Channel (5200 MHz)-Above 1G							
V	4592.040	73.35	-20.42	52.94	74	-21.06	PK
V	4592.040	59.11	-20.42	38.69	54	-15.31	AV
V	10400.184	64.98	-9.30	55.68	68.2	-12.52	PK
V	10400.184	49.79	-9.30	40.49	54	-13.51	AV
V	15600.141	60.72	-7.82	52.90	74	-21.10	PK
V	15600.141	49.08	-7.82	41.26	54	-12.74	AV
H	4592.128	74.34	-20.42	53.92	74	-20.08	PK
H	4592.128	59.27	-20.42	38.85	54	-15.15	AV
H	10400.019	64.86	-9.30	55.56	68.2	-12.64	PK
H	10400.019	49.48	-9.30	40.18	54	-13.82	AV
H	15600.083	64.31	-7.82	56.49	74	-17.51	PK
H	15600.083	49.99	-7.82	42.17	54	-11.83	AV
High Channel (5240 MHz)-Above 1G							
V	4739.099	72.98	-20.12	52.86	74	-21.14	PK
V	4739.099	59.80	-20.12	39.68	54	-14.32	AV
V	10480.159	64.04	-9.18	54.86	68.2	-13.34	PK
V	10480.159	49.24	-9.18	40.06	54	-13.94	AV
V	15720.125	61.42	-7.78	53.64	74	-20.36	PK
V	15720.125	49.33	-7.78	41.55	54	-12.45	AV
H	4739.099	72.88	-20.12	52.76	74	-21.24	PK
H	4739.099	59.42	-20.12	39.30	54	-14.70	AV
H	10480.193	64.10	-9.18	54.92	68.2	-13.28	PK
H	10480.193	49.74	-9.18	40.56	54	-13.44	AV
H	15720.007	60.51	-7.78	52.73	74	-21.27	PK
H	15720.007	49.54	-7.78	41.76	54	-12.24	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode:	TX(5.1G) - 802.11ac-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G							
V	4434.100	72.80	-20.73	52.07	68.2	-16.13	PK
V	4434.100	59.53	-20.73	38.80	54	-15.20	AV
V	10380.028	60.58	-9.33	51.25	68.2	-16.95	PK
V	10380.028	49.36	-9.33	40.03	54	-13.97	AV
V	15570.026	62.62	-7.83	54.79	74	-19.21	PK
V	15570.026	49.14	-7.83	41.31	54	-12.69	AV
H	4434.025	73.69	-20.73	52.96	74	-21.04	PK
H	4434.025	59.16	-20.73	38.43	54	-15.57	AV
H	10380.135	60.93	-9.33	51.60	68.2	-16.60	PK
H	10380.135	49.35	-9.33	40.02	54	-13.98	AV
H	15570.116	61.35	-7.83	53.52	74	-20.48	PK
H	15570.116	49.66	-7.83	41.83	54	-12.17	AV
High Channel (5230 MHz)-Above 1G							
V	4739.156	74.81	-20.12	54.69	68.2	-13.51	PK
V	4739.156	59.54	-20.12	39.42	54	-14.58	AV
V	10460.135	62.65	-9.21	53.44	68.2	-14.76	PK
V	10460.135	49.10	-9.21	39.89	54	-14.11	AV
V	15690.025	62.78	-7.79	54.99	74	-19.01	PK
V	15690.025	49.94	-7.79	42.15	54	-11.85	AV
H	4739.195	73.27	-20.12	53.15	68.2	-15.05	PK
H	4739.195	59.25	-20.12	39.13	54	-14.87	AV
H	10460.194	60.35	-9.21	51.14	68.2	-17.06	PK
H	10460.194	49.22	-9.21	40.01	54	-13.99	AV
H	15690.113	62.73	-7.79	54.94	74	-19.06	PK
H	15690.113	49.48	-7.79	41.69	54	-12.31	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode:	TX(5.1G) - 802.11ac-HT80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
(5210 MHz)-Above 1G							
V	4434.000	74.22	-20.73	53.49	68.2	-14.71	PK
V	4434.000	59.12	-20.73	38.39	54	-15.61	AV
V	10420.025	64.03	-9.27	54.76	68.2	-13.44	PK
V	10420.025	49.86	-9.27	40.59	54	-13.41	AV
V	15630.177	60.36	-7.81	52.55	74	-21.45	PK
V	15630.177	49.83	-7.81	42.02	54	-11.98	AV
H	4434.020	71.86	-20.73	51.12	68.2	-17.08	PK
H	4434.020	59.73	-20.73	39.00	54	-15.00	AV
H	10420.045	63.20	-9.27	53.93	68.2	-14.27	PK
H	10420.045	49.85	-9.27	40.58	54	-13.42	AV
H	15630.165	60.12	-7.81	52.31	74	-21.69	PK
H	15630.165	49.36	-7.81	41.55	54	-12.45	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

- ☒Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
- All the modes 802.11a/n/ac has been tested and the worst result 802.11ac recorded as below:

Test mode: 802.11ac Frequency(MHz): 5180

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5149.019	H	67.78	74	49.76	54
5149.019	V	57.96	74	46.51	54

Test mode: 802.11ac Frequency(MHz): 5240

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5372.31	H	57.98	74	45.39	54
5356.29	V	55.96	74	45.21	54

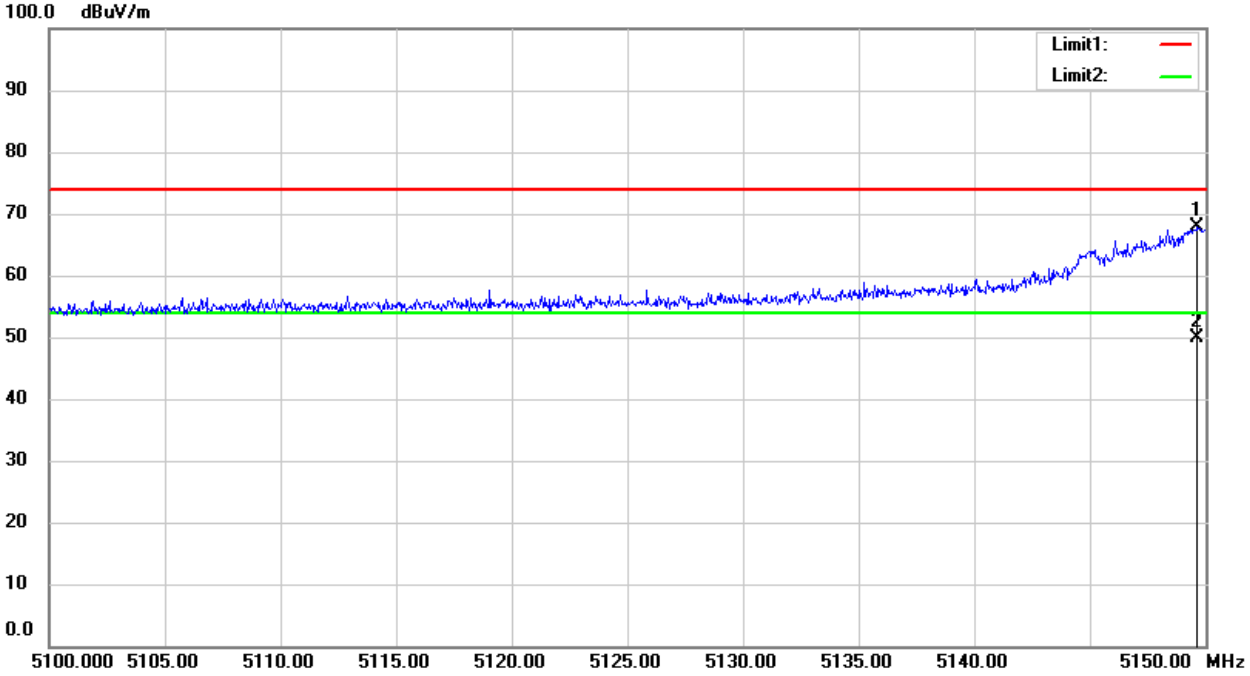
Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp

U-NII - 1

Test Model Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

☒802.11ac ☐802.11n(HT20) ☐802.11n(HT40)

☒5180 ☐5200 ☐5240 Ant.Pol H

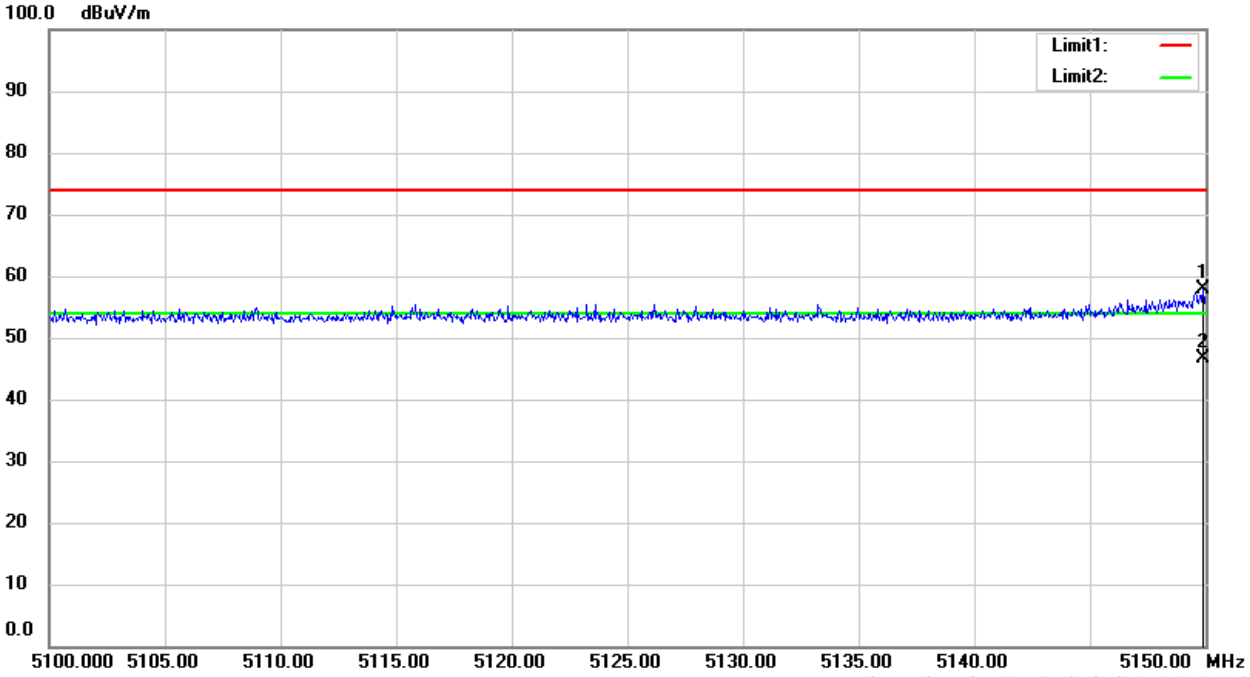


U-NII - 1

Test Model Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

☒802.11ac ☐802.11n(HT20) ☐802.11n(HT40)

☒5180 ☐5200 ☐5240 Ant.Pol V

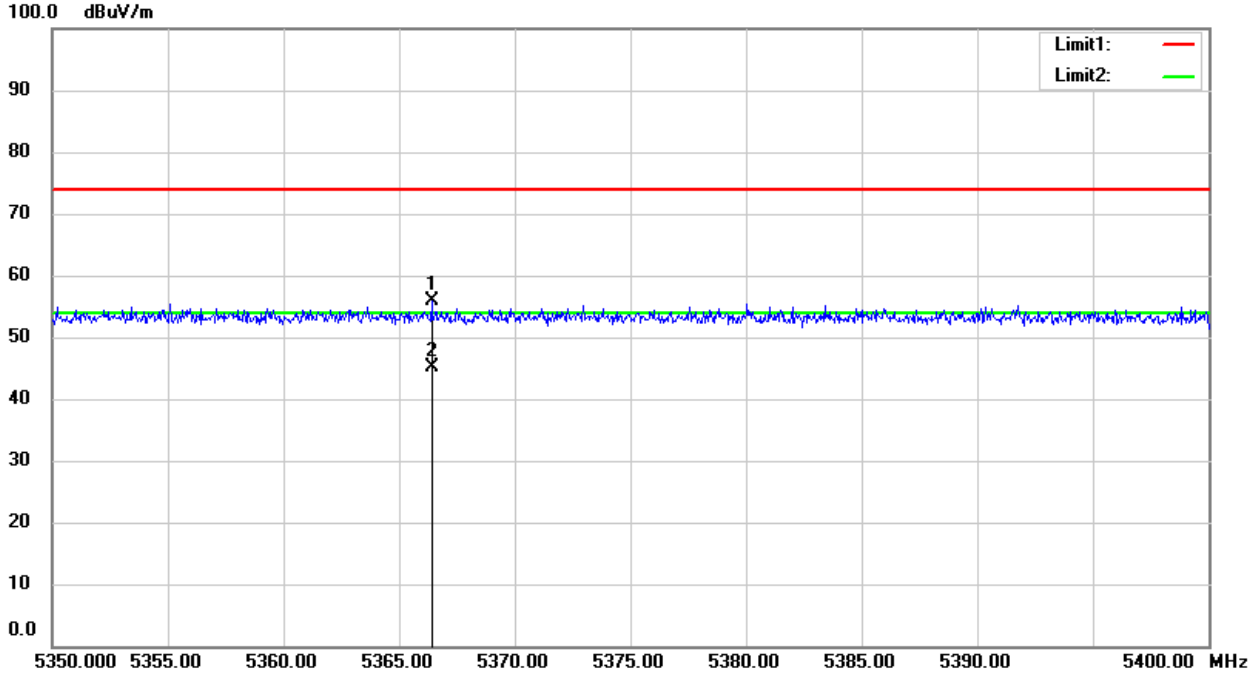


U-NII - 1

Test Model Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)

☒802.11ac ☐802.11n(HT20) ☐802.11n(HT40)

☐5180 ☐5200 ☒5240 Ant.Pol H

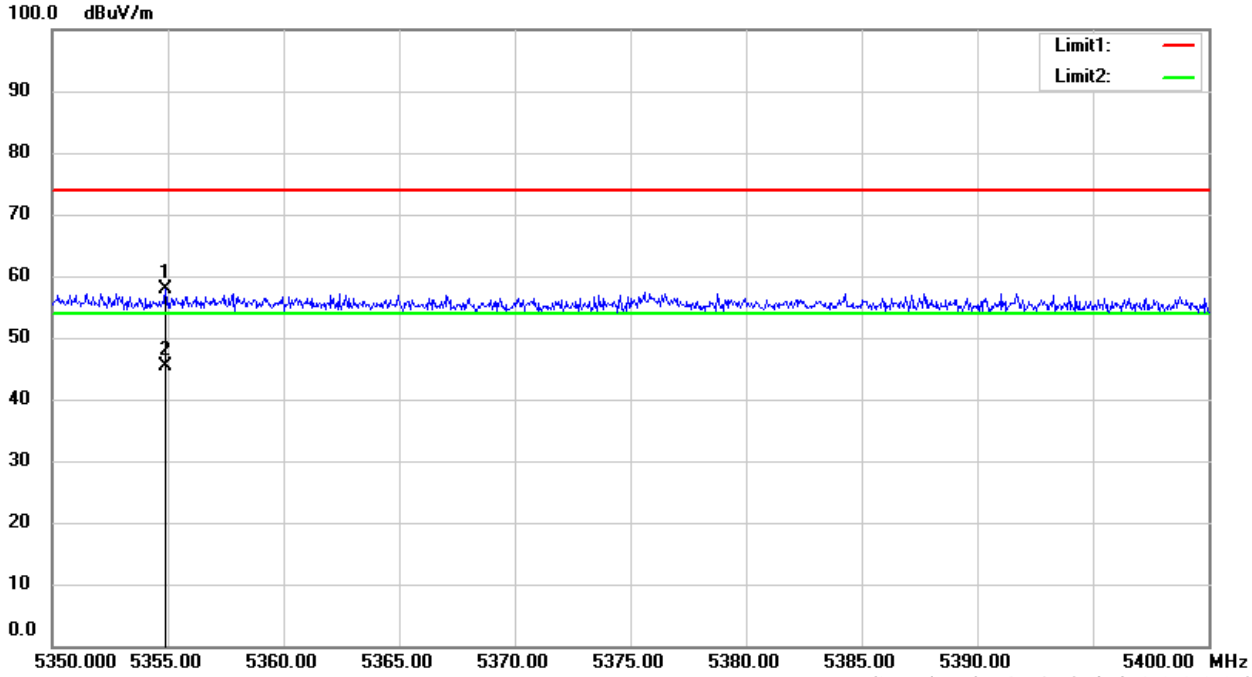


U-NII - 1

Test Model Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)

☒802.11ac ☐802.11n(HT20) ☐802.11n(HT40)

☐5180 ☐5200 ☒5240 Ant.Pol V



Test Mode:	TX(5.8G) - 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G							
V	4679.011	73.14	-20.24	52.89	74	-21.11	PK
V	4679.011	59.62	-20.24	39.38	54	-14.62	AV
V	11490.060	63.53	-8.79	54.74	68.2	-13.46	PK
V	11490.060	49.60	-8.79	40.81	54	-13.19	AV
V	17235.023	57.02	-3.18	53.84	68.2	-14.36	PK
V	17235.023	44.34	-3.18	41.16	54	-12.84	AV
H	4679.154	72.40	-20.73	51.67	74	-22.33	PK
H	4679.154	59.44	-20.73	38.71	54	-15.29	AV
H	11490.183	61.39	-8.79	52.60	68.2	-15.60	PK
H	11490.183	49.61	-8.79	40.82	54	-13.18	AV
H	17235.121	55.02	-3.18	51.84	68.2	-16.36	PK
H	17235.121	44.63	-3.18	41.45	54	-12.55	AV
Middle Channel (5785 MHz)-Above 1G							
V	4592.101	74.09	-20.42	53.67	74	-20.33	PK
V	4592.101	59.11	-20.42	38.70	54	-15.30	AV
V	11570.080	63.07	-8.86	54.21	68.2	-13.99	PK
V	11570.080	49.56	-8.86	40.70	54	-13.30	AV
V	17355.075	56.38	-2.52	53.86	68.2	-14.34	PK
V	17355.075	44.96	-2.52	42.44	54	-11.56	AV
H	4592.097	70.08	-20.42	49.66	74	-24.34	PK
H	4592.097	59.76	-20.42	39.34	54	-14.66	AV
H	11570.178	60.94	-8.86	52.08	68.2	-16.12	PK
H	11570.178	49.42	-8.86	40.56	54	-13.44	AV
H	17355.021	57.84	-2.52	55.32	68.2	-12.88	PK
H	17355.021	44.62	-2.52	42.10	54	-11.90	AV
High Channel (5825 MHz)-Above 1G							
V	6039.097	74.83	-18.93	55.90	68.2	-12.30	PK
V	6039.097	59.43	-18.93	40.50	54	-13.50	AV
V	11650.096	64.08	-8.92	55.16	74	-18.84	PK
V	11650.096	49.03	-8.92	40.11	54	-13.89	AV
V	17475.049	58.12	-1.86	56.26	68.2	-11.94	PK
V	17475.049	44.35	-1.86	42.49	54	-11.51	AV
H	6039.169	74.28	-18.93	55.34	68.2	-12.86	PK
H	6039.169	59.12	-18.93	40.19	54	-13.81	AV
H	11650.052	61.16	-8.92	52.24	74	-21.76	PK
H	11650.052	49.13	-8.92	40.21	54	-13.79	AV
H	17475.077	56.31	-1.86	54.45	68.2	-13.75	PK
H	17475.077	44.63	-1.86	42.77	54	-11.23	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode:	TX(5.8G) - 802.11n-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G							
V	4679.027	71.81	-20.24	51.57	74	-22.43	PK
V	4679.027	59.88	-20.24	39.63	54	-14.37	AV
V	11490.092	64.94	-8.79	56.15	68.2	-12.05	PK
V	11490.092	49.80	-8.79	41.01	54	-12.99	AV
V	17235.072	55.84	-3.18	52.66	68.2	-15.54	PK
V	17235.072	44.89	-3.18	41.71	54	-12.29	AV
H	4679.020	72.81	-20.24	52.57	74	-21.43	PK
H	4679.020	59.17	-20.24	38.93	54	-15.07	AV
H	11490.103	60.14	-8.79	51.35	68.2	-16.85	PK
H	11490.103	49.72	-8.79	40.93	54	-13.07	AV
H	17235.016	57.35	-3.18	54.17	68.2	-14.03	PK
H	17235.016	44.11	-3.18	40.93	54	-13.07	AV
Middle Channel (5785 MHz)-Above 1G							
V	4592.120	71.19	-20.42	50.77	74	-23.23	PK
V	4592.120	59.25	-20.42	38.83	54	-15.17	AV
V	11570.166	62.25	-8.86	53.39	68.2	-14.81	PK
V	11570.166	49.79	-8.86	40.93	54	-13.07	AV
V	17355.145	59.33	-2.52	56.81	68.2	-11.39	PK
V	17355.145	44.79	-2.52	42.27	54	-11.73	AV
H	4592.109	72.01	-20.42	51.60	74	-22.40	PK
H	4592.109	59.26	-20.42	38.84	54	-15.16	AV
H	11570.152	61.45	-8.86	52.59	68.2	-15.61	PK
H	11570.152	49.21	-8.86	40.35	54	-13.65	AV
H	17355.124	55.87	-2.52	53.35	68.2	-14.85	PK
H	17355.124	44.80	-2.52	42.28	54	-11.72	AV
High Channel (5825 MHz)-Above 1G							
V	6039.049	73.05	-18.93	54.12	68.2	-14.08	PK
V	6039.049	59.10	-18.93	40.17	54	-13.83	AV
V	11650.137	62.59	-8.92	53.67	74	-20.33	PK
V	11650.137	49.85	-8.92	40.93	54	-13.07	AV
V	17475.090	59.73	-1.86	57.87	68.2	-10.33	PK
V	17475.090	44.00	-1.86	42.14	54	-11.86	AV
H	6039.104	73.49	-18.93	54.56	68.2	-13.64	PK
H	6039.104	59.66	-18.93	40.72	54	-13.28	AV
H	11650.139	62.82	-8.92	53.90	74	-20.10	PK
H	11650.139	49.98	-8.92	41.06	54	-12.94	AV
H	17475.099	57.47	-1.86	55.61	68.2	-12.59	PK
H	17475.099	44.64	-1.86	42.78	54	-11.22	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode:	TX(5.8G) - 802.11n-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5755 MHz)-Above 1G							
V	4679.044	74.42	-20.24	54.18	74	-19.82	PK
V	4679.044	59.30	-20.24	39.06	54	-14.94	AV
V	11510.019	60.84	-8.81	52.03	74	-21.97	PK
V	11510.019	49.15	-8.81	40.34	54	-13.66	AV
V	17265.086	56.98	-3.01	53.97	68.2	-14.23	PK
V	17265.086	44.24	-3.01	41.23	54	-12.77	AV
H	4679.152	74.44	-20.24	54.20	74	-19.80	PK
H	4679.152	59.74	-20.24	39.50	54	-14.50	AV
H	11510.016	64.22	-8.81	55.41	74	-18.59	PK
H	11510.016	49.69	-8.81	40.88	54	-13.12	AV
H	17265.008	55.25	-3.01	52.24	68.2	-15.96	PK
H	17265.008	44.08	-3.01	41.07	54	-12.93	AV
High Channel (5795 MHz)-Above 1G							
V	6039.046	72.17	-18.93	53.24	68.2	-14.96	PK
V	6039.046	59.50	-18.93	40.57	54	-13.43	AV
V	11590.058	62.72	-8.87	53.85	74	-20.15	PK
V	11590.058	49.02	-8.87	40.15	54	-13.85	AV
V	17385.051	55.76	-2.35	53.41	68.2	-14.79	PK
V	17385.051	44.56	-2.35	42.21	54	-11.79	AV
H	6039.035	70.19	-18.93	51.26	68.2	-16.94	PK
H	6039.035	59.75	-18.93	40.81	54	-13.19	AV
H	11590.177	63.86	-8.87	54.99	74	-19.01	PK
H	11590.177	49.69	-8.87	40.82	54	-13.18	AV
H	17385.048	55.47	-2.35	53.12	68.2	-15.08	PK
H	17385.048	44.64	-2.35	42.29	54	-11.71	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode:	TX(5.8G) - 802.11ac-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G							
V	4679.060	73.55	-20.24	53.31	74	-20.69	PK
V	4679.060	59.57	-20.24	39.33	54	-14.67	AV
V	11490.055	64.37	-8.79	55.58	68.2	-12.62	PK
V	11490.055	49.83	-8.79	41.04	54	-12.96	AV
V	17235.116	56.63	-3.18	53.45	68.2	-14.75	PK
V	17235.116	44.31	-3.18	41.13	54	-12.87	AV
H	4679.005	74.39	-20.24	54.15	74	-19.85	PK
H	4679.005	59.40	-20.24	39.16	54	-14.84	AV
H	11490.168	63.02	-8.79	54.23	68.2	-13.97	PK
H	11490.168	49.55	-8.79	40.76	54	-13.24	AV
H	17235.050	58.66	-3.18	55.48	68.2	-12.72	PK
H	17235.050	44.80	-3.18	41.62	54	-12.38	AV
Middle Channel (5785 MHz)-Above 1G							
V	4592.077	74.33	-20.42	53.91	74	-20.09	PK
V	4592.077	59.92	-20.42	39.51	54	-14.49	AV
V	11570.033	61.16	-8.86	52.30	68.2	-15.90	PK
V	11570.033	49.72	-8.86	40.86	54	-13.14	AV
V	17355.004	58.63	-2.52	56.11	68.2	-12.09	PK
V	17355.004	44.67	-2.52	42.15	54	-11.85	AV
H	4592.066	73.67	-20.42	53.25	74	-20.75	PK
H	4592.066	59.84	-20.42	39.43	54	-14.57	AV
H	11570.040	63.80	-8.86	54.94	68.2	-13.26	PK
H	11570.040	49.13	-8.86	40.27	54	-13.73	AV
H	17355.135	57.57	-2.52	55.05	68.2	-13.15	PK
H	17355.135	44.72	-2.52	42.20	54	-11.80	AV
High Channel (5825 MHz)-Above 1G							
V	6039.077	72.92	-18.93	53.99	68.2	-14.21	PK
V	6039.077	59.93	-18.93	41.00	54	-13.00	AV
V	11650.122	60.86	-8.92	51.94	74	-22.06	PK
V	11650.122	49.71	-8.92	40.79	54	-13.21	AV
V	17475.131	55.72	-1.86	53.86	68.2	-14.34	PK
V	17475.131	44.88	-1.86	43.02	54	-10.98	AV
H	6039.093	71.16	-18.93	52.22	68.2	-15.98	PK
H	6039.093	59.00	-18.93	40.07	54	-13.93	AV
H	11650.091	61.55	-8.92	52.63	74	-21.37	PK
H	11650.091	49.07	-8.92	40.15	54	-13.85	AV
H	17475.048	57.96	-1.86	56.10	68.2	-12.10	PK
H	17475.048	44.94	-1.86	43.08	54	-10.92	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

Test Mode:	TX(5.8G) - 802.11ac-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5755 MHz)-Above 1G							
V	4679.149	73.46	-20.24	53.22	74	-20.78	Pk
V	4679.149	59.24	-20.24	39.00	54	-15.00	AV
V	11510.112	60.49	-8.81	51.68	74	-22.32	Pk
V	11510.112	49.08	-8.81	40.27	54	-13.73	AV
V	17265.021	55.39	-3.01	52.38	68.2	-15.82	Pk
V	17265.021	44.46	-3.01	41.45	54	-12.55	AV
H	4679.009	73.11	-20.24	52.86	74	-21.14	Pk
H	4679.009	59.92	-20.24	39.68	54	-14.32	AV
H	11510.090	64.43	-8.81	55.62	74	-18.38	Pk
H	11510.090	49.04	-8.81	40.23	54	-13.77	AV
H	17265.186	56.14	-3.01	53.13	68.2	-15.07	Pk
H	17265.186	44.48	-3.01	41.47	54	-12.53	AV
High Channel (5795 MHz)-Above 1G							
V	6039.121	73.31	-18.93	54.37	68.2	-13.83	Pk
V	6039.121	59.81	-18.93	40.87	54	-13.13	AV
V	11590.159	61.92	-8.87	53.05	74	-20.95	Pk
V	11590.159	49.75	-8.87	40.88	54	-13.12	AV
V	17385.040	55.37	-2.35	53.02	68.2	-15.18	Pk
V	17385.040	44.43	-2.35	42.08	54	-11.92	AV
H	6039.077	71.41	-18.93	52.47	68.2	-15.73	Pk
H	6039.077	59.93	-18.93	41.00	54	-13.00	AV
H	11590.156	60.93	-8.87	52.06	74	-21.94	Pk
H	11590.156	49.72	-8.87	40.85	54	-13.15	AV
H	17385.131	59.23	-2.35	56.88	68.2	-11.32	Pk
H	17385.131	44.85	-2.35	42.50	54	-11.50	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

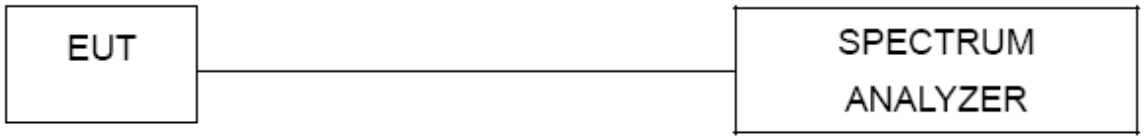
Test Mode:	TX(5.8G) - 802.11ac-HT80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Limits (dBuV/m)	Margin (dB)	Detector Type
(5775 MHz)-Above 1G							
V	4679.146	71.52	-20.24	51.27	74	-22.73	Pk
V	4679.146	59.51	-20.24	39.27	54	-14.73	AV
V	11550.128	62.21	-8.84	53.37	74	-20.63	Pk
V	11550.128	49.51	-8.84	40.67	54	-13.33	AV
V	17325.119	57.51	-2.68	54.83	68.2	-13.37	Pk
V	17325.119	44.87	-2.68	42.19	54	-11.81	AV
H	4679.068	73.30	-20.24	53.06	74	-20.94	Pk
H	4679.068	59.18	-20.24	38.94	54	-15.06	AV
H	11550.070	62.55	-8.84	53.71	74	-20.29	Pk
H	11550.070	49.92	-8.84	41.08	54	-12.92	AV
H	17325.110	57.49	-2.68	54.81	68.2	-13.39	Pk
H	17325.110	44.97	-2.68	42.29	54	-11.71	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.

8. Power Spectral Density Test

8.1 Block Diagram Of Test Setup



8.2 Limit

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.

8.3 Test Procedure

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:
a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

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

8.4 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.

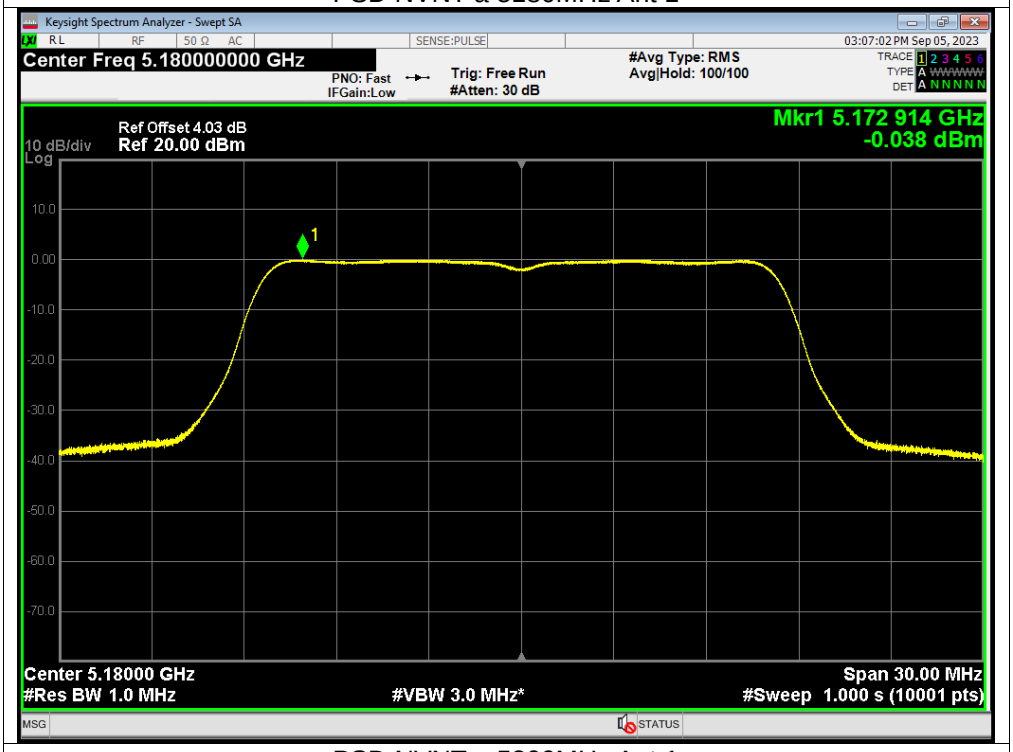
8.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 24V
Test Mode:	(5180-5240MHz)		

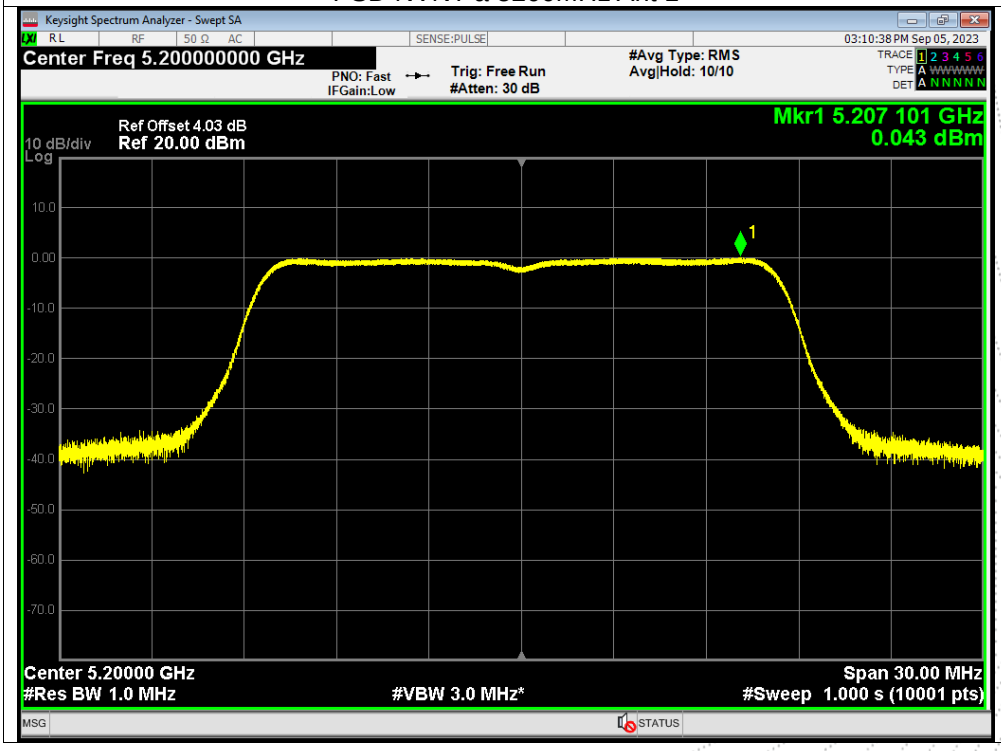
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
NVNT	a	5180	-0.04	11	Pass
NVNT	a	5200	0.04	11	Pass
NVNT	a	5240	-0.5	11	Pass
NVNT	n20	5180	0.21	11	Pass
NVNT	n20	5200	-0.11	11	Pass
NVNT	n20	5240	-0.56	11	Pass
NVNT	n40	5190	-2.8	11	Pass
NVNT	n40	5230	-1.62	11	Pass
NVNT	ac20	5180	-0.28	11	Pass
NVNT	ac20	5200	-0.15	11	Pass
NVNT	ac20	5240	-0.99	11	Pass
NVNT	ac40	5190	0.51	11	Pass
NVNT	ac40	5230	-1.25	11	Pass
NVNT	ac80	5210	-7	11	Pass

Test Graphs

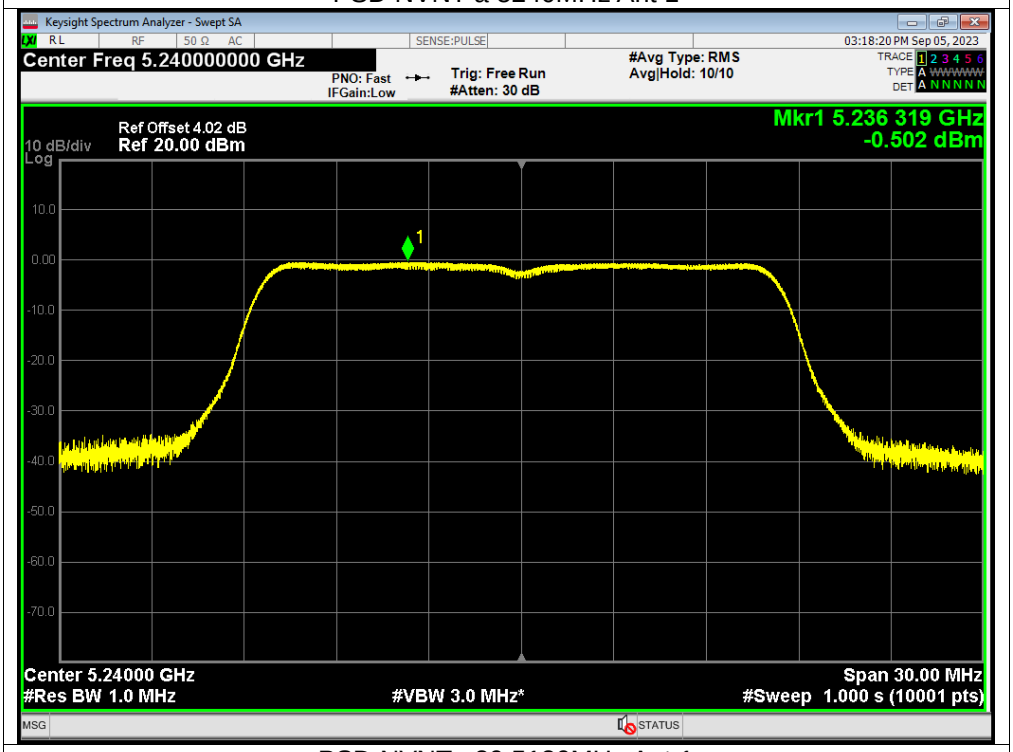
PSD NVNT a 5180MHz Ant 1



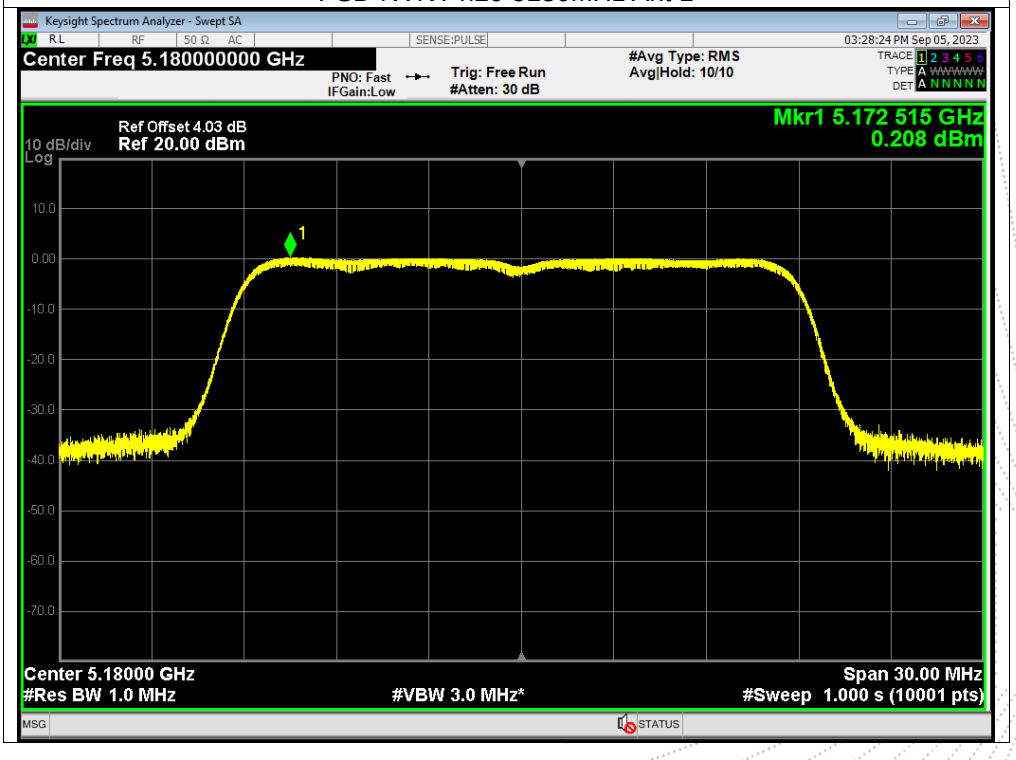
PSD NVNT a 5200MHz Ant 1



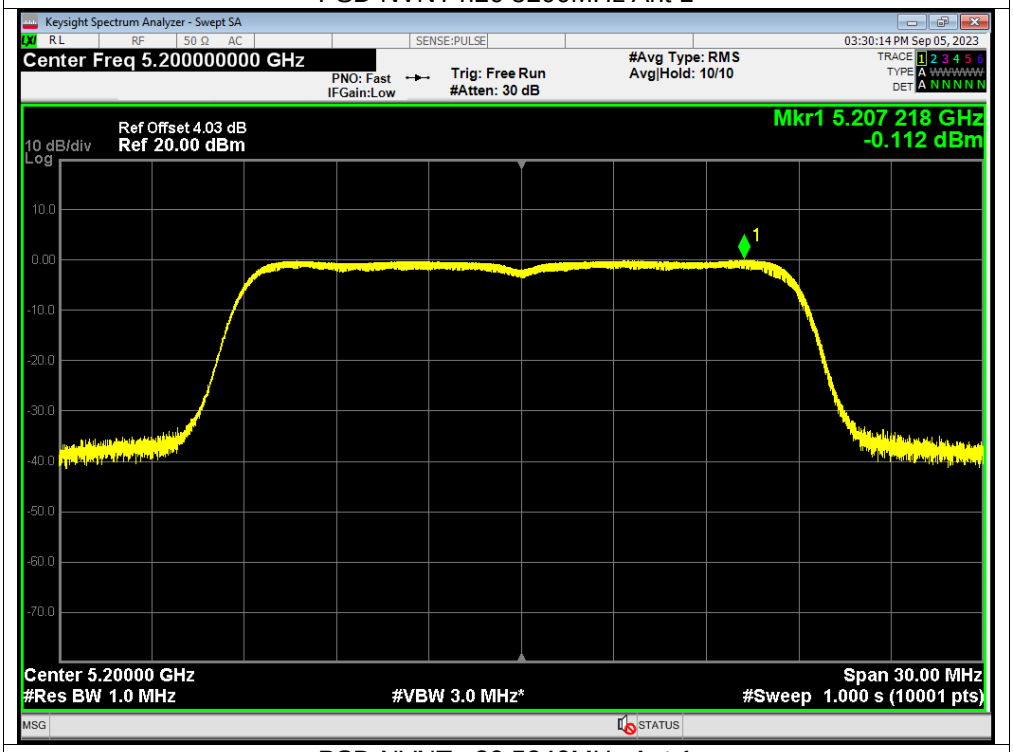
PSD NVNT a 5240MHz Ant 1



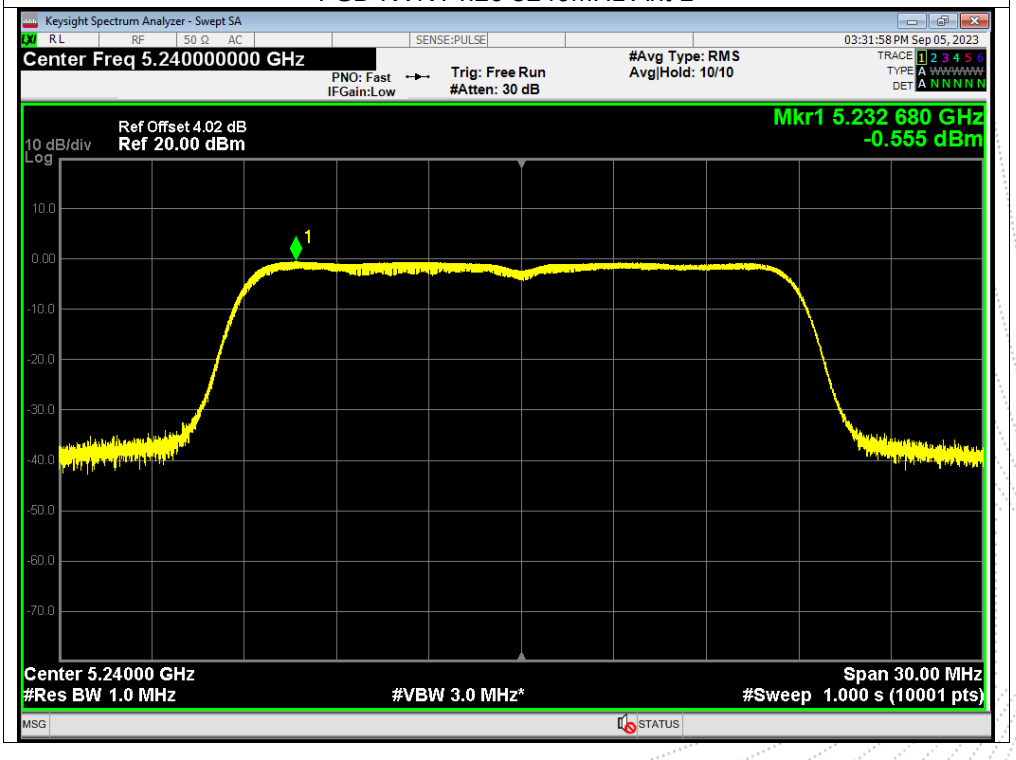
PSD NVNT n20 5180MHz Ant 1



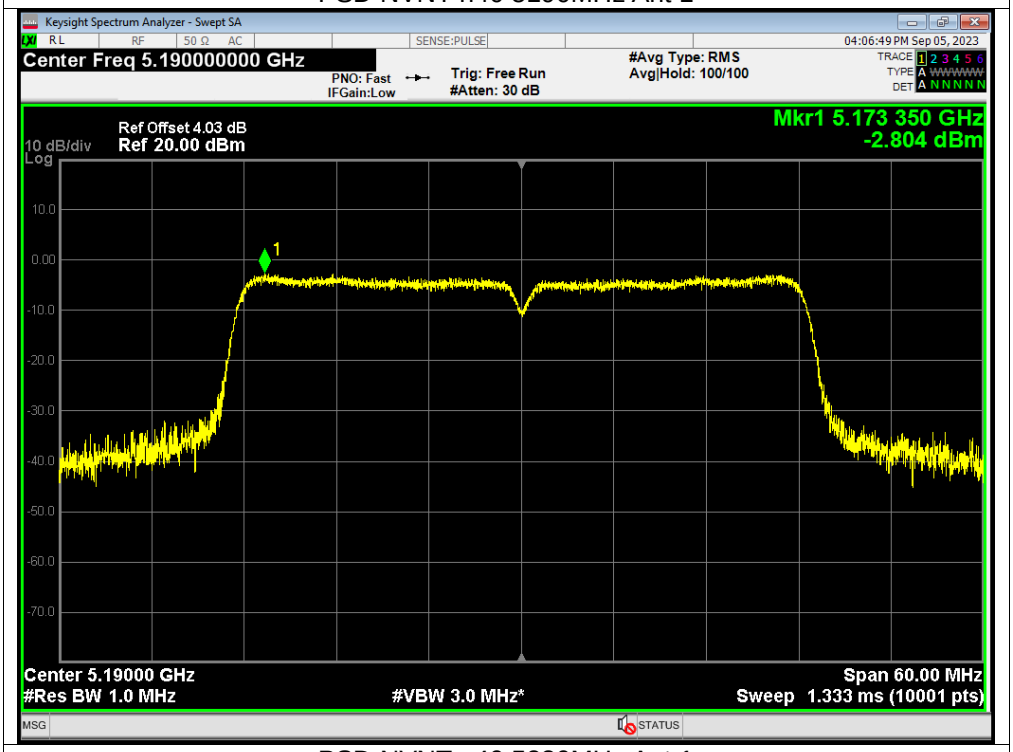
PSD NVNT n20 5200MHz Ant 1



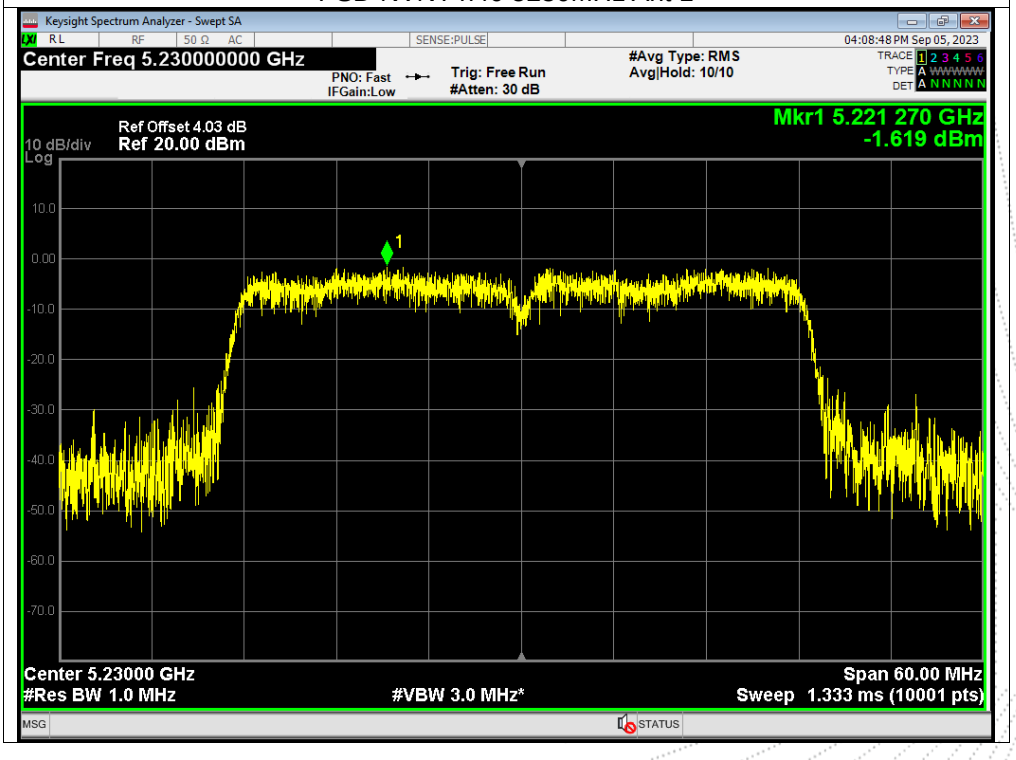
PSD NVNT n20 5240MHz Ant 1



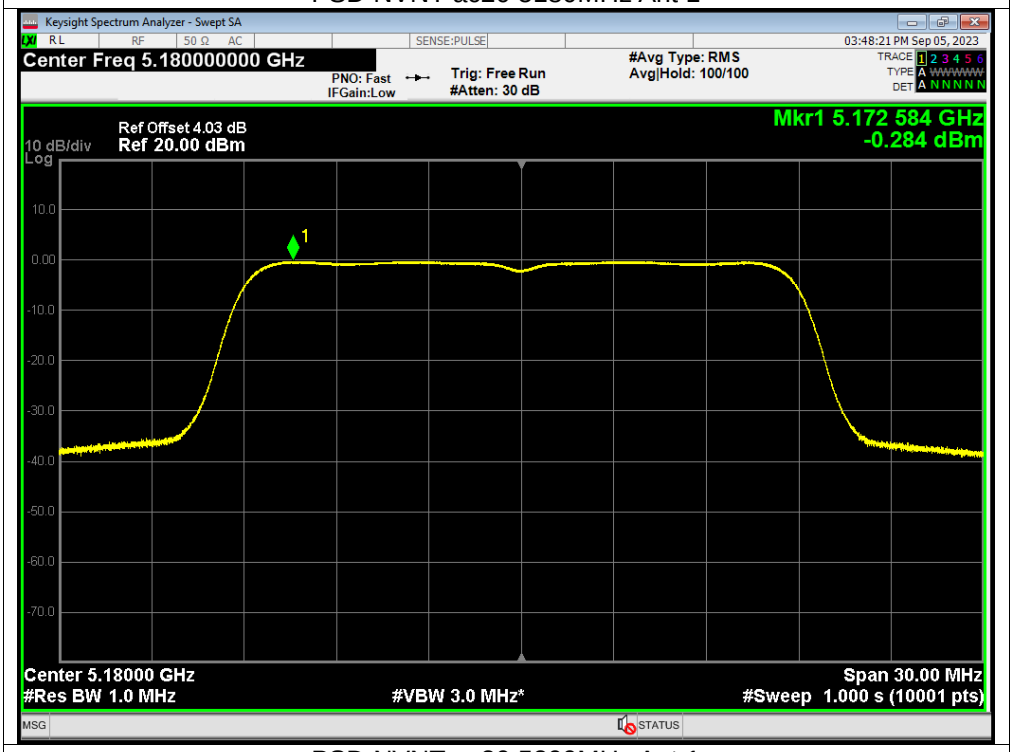
PSD NVNT n40 5190MHz Ant 1



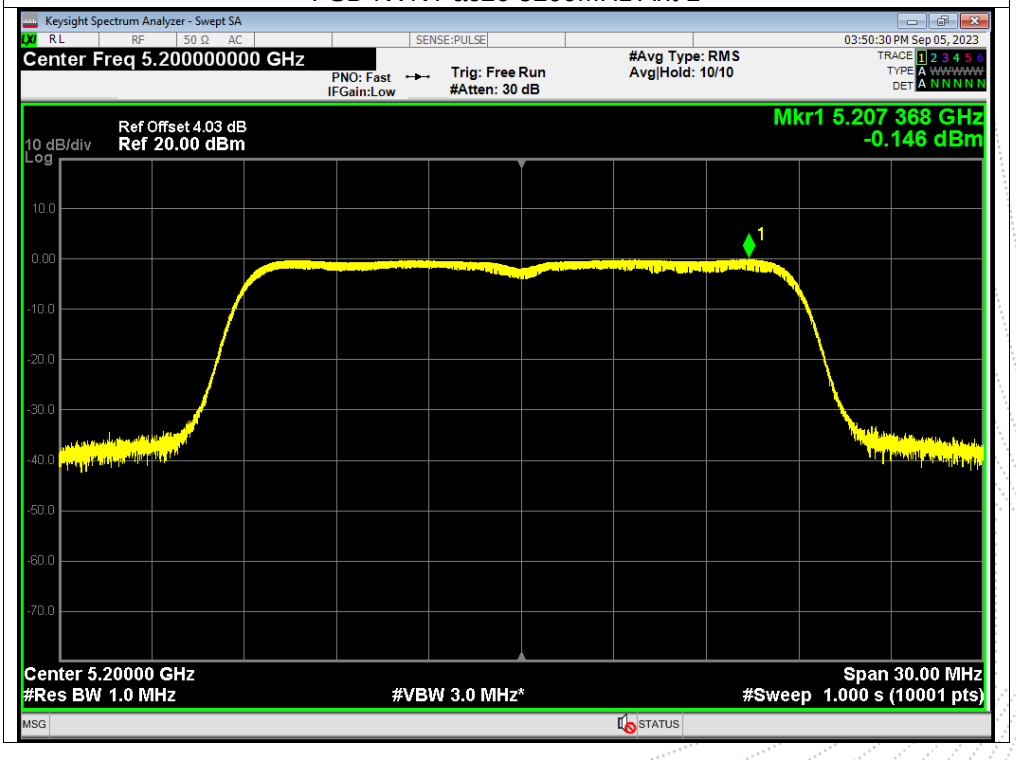
PSD NVNT n40 5230MHz Ant 1



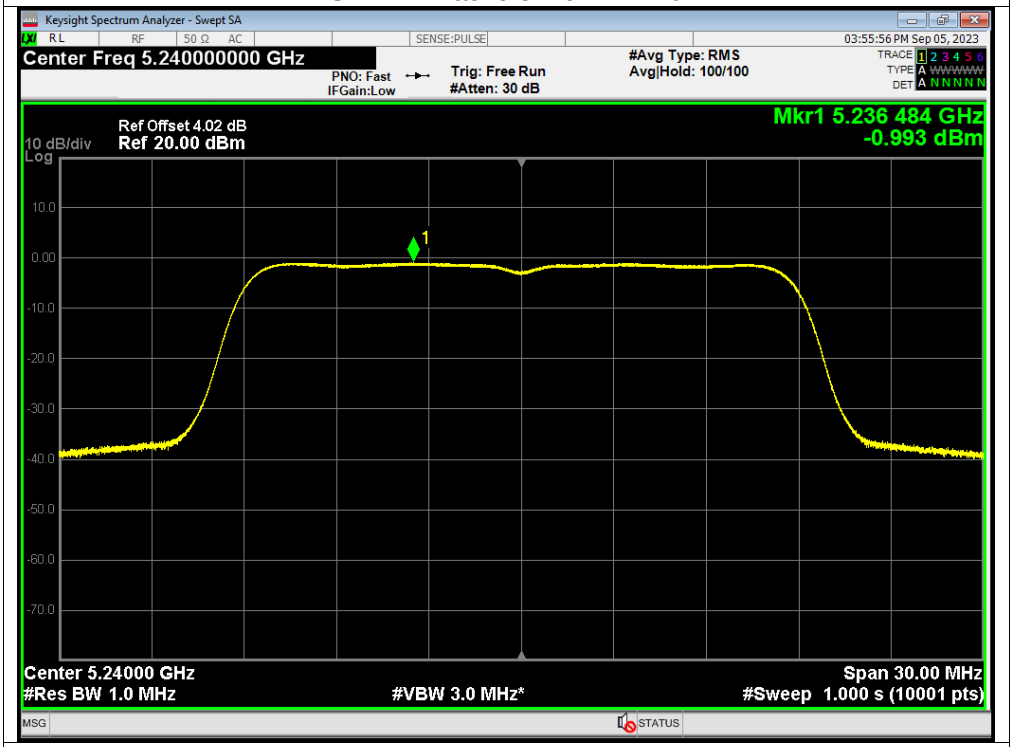
PSD NVNT ac20 5180MHz Ant 1



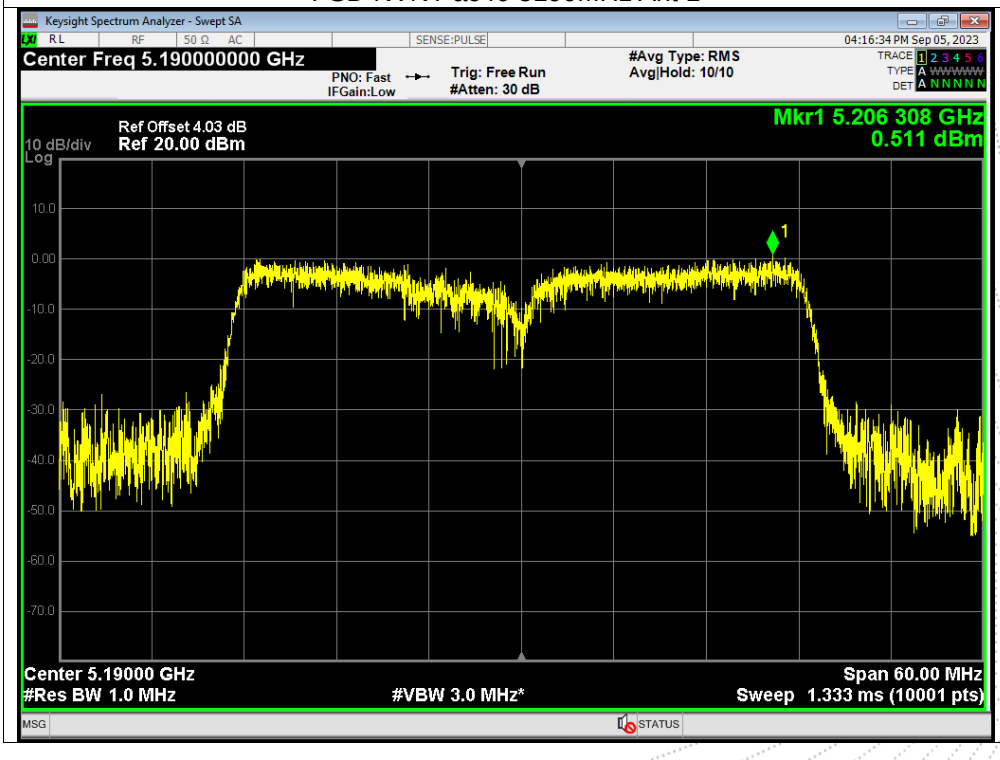
PSD NVNT ac20 5200MHz Ant 1



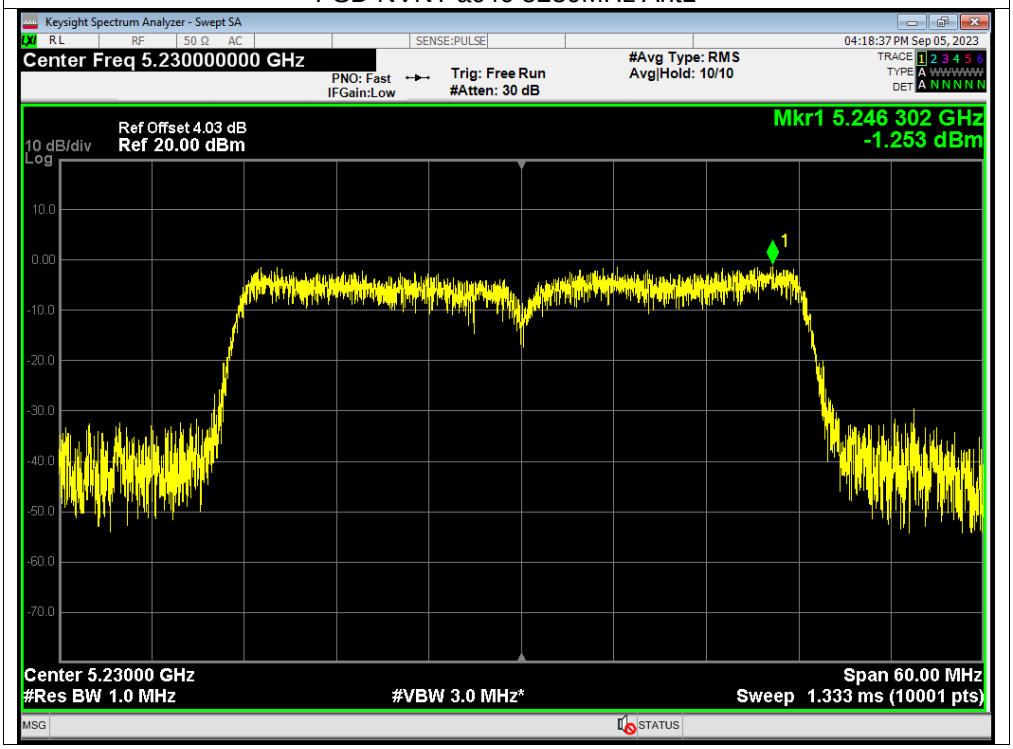
PSD NVNT ac20 5240MHz Ant 1



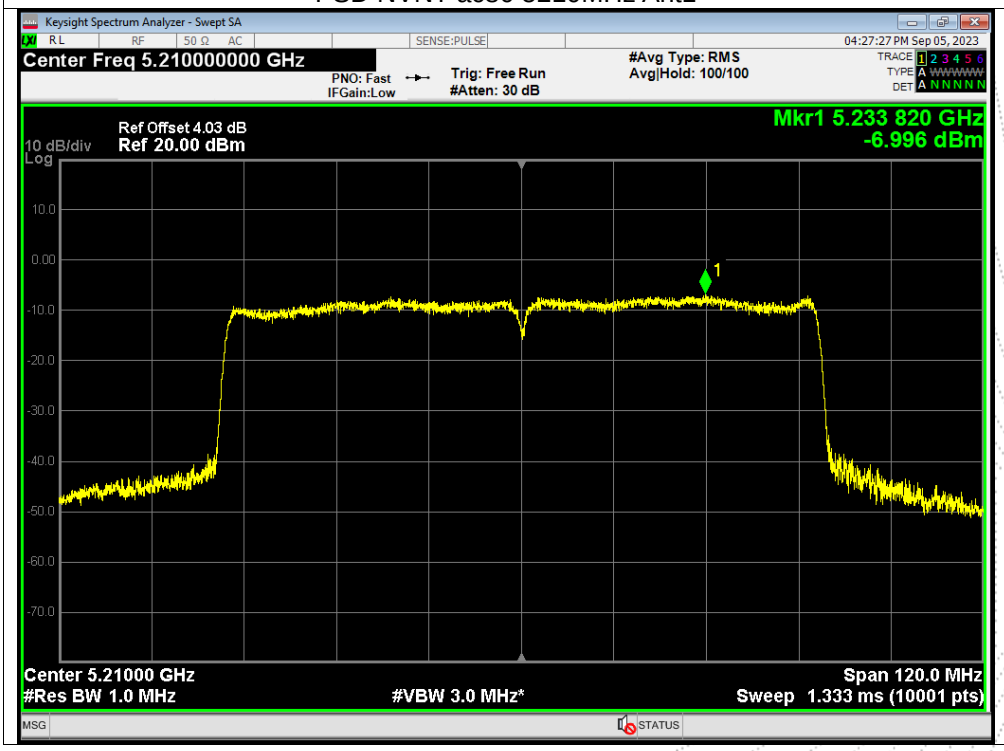
PSD NVNT ac40 5190MHz Ant 1



PSD NVNT ac40 5230MHz Ant1



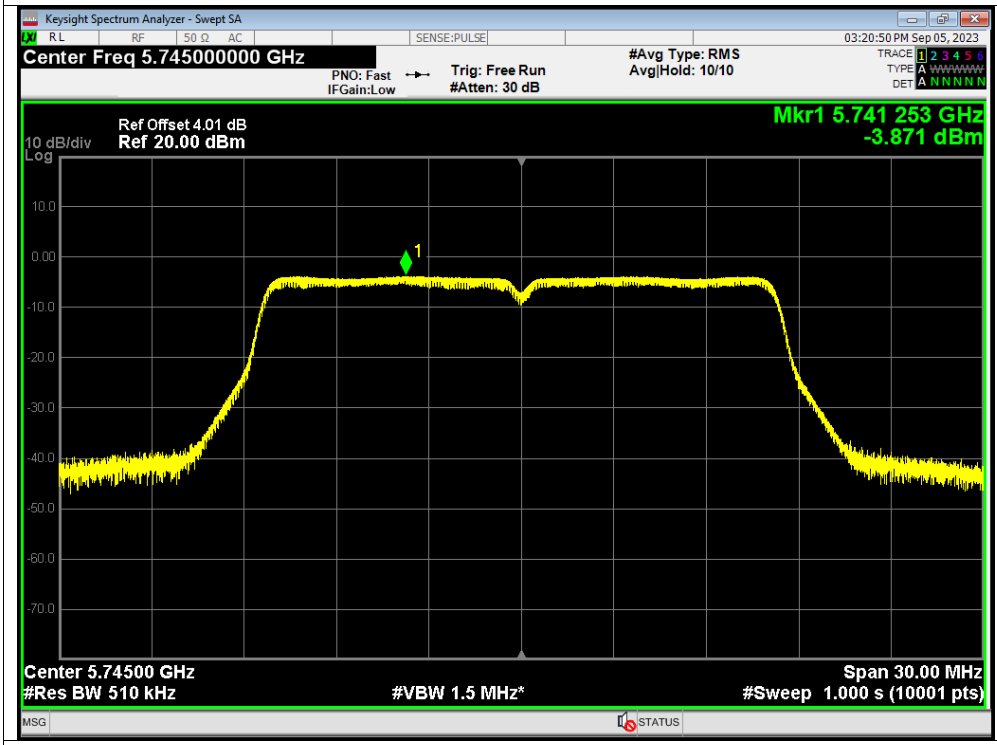
PSD NVNT ac80 5210MHz Ant1



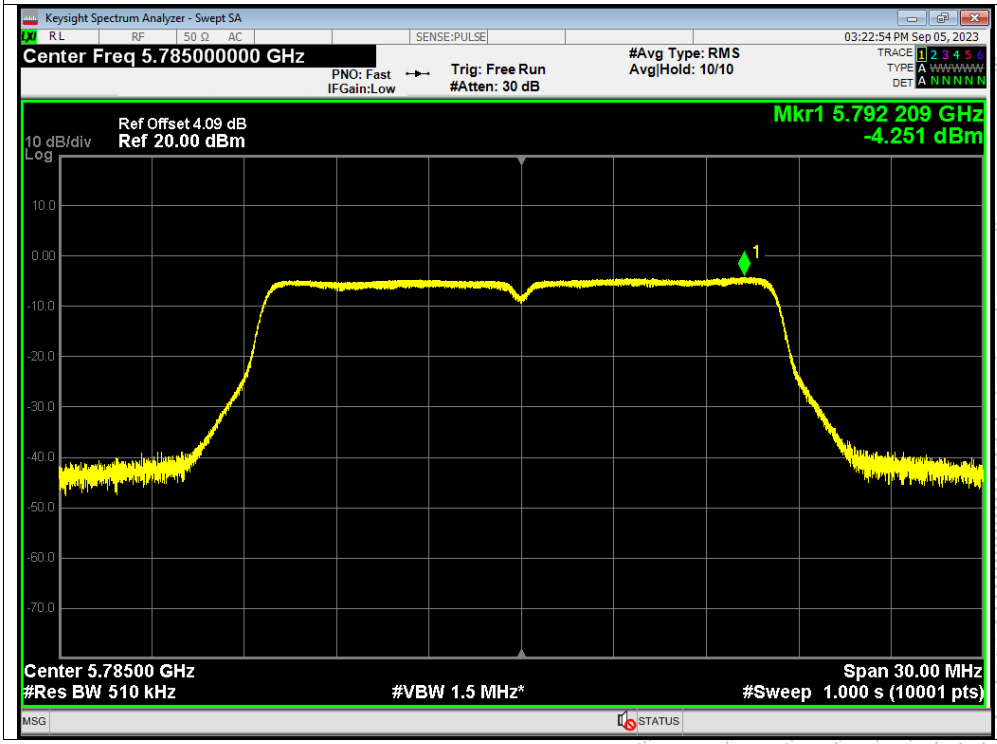
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 24V
Test Mode:	(5745-5825MHz)		

Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
NVNT	a	5745	-3.87	30	Pass
NVNT	a	5785	-4.25	30	Pass
NVNT	a	5825	-5.11	30	Pass
NVNT	n20	5745	-4.1	30	Pass
NVNT	n20	5785	-4.41	30	Pass
NVNT	n20	5825	-5.01	30	Pass
NVNT	n40	5755	-9.12	30	Pass
NVNT	n40	5795	-7.22	30	Pass
NVNT	ac20	5745	-1.84	30	Pass
NVNT	ac20	5785	-4.39	30	Pass
NVNT	ac20	5825	-2.82	30	Pass
NVNT	ac40	5755	-4.98	30	Pass
NVNT	ac40	5795	-7.46	30	Pass
NVNT	ac80	5775	-8.66	30	Pass

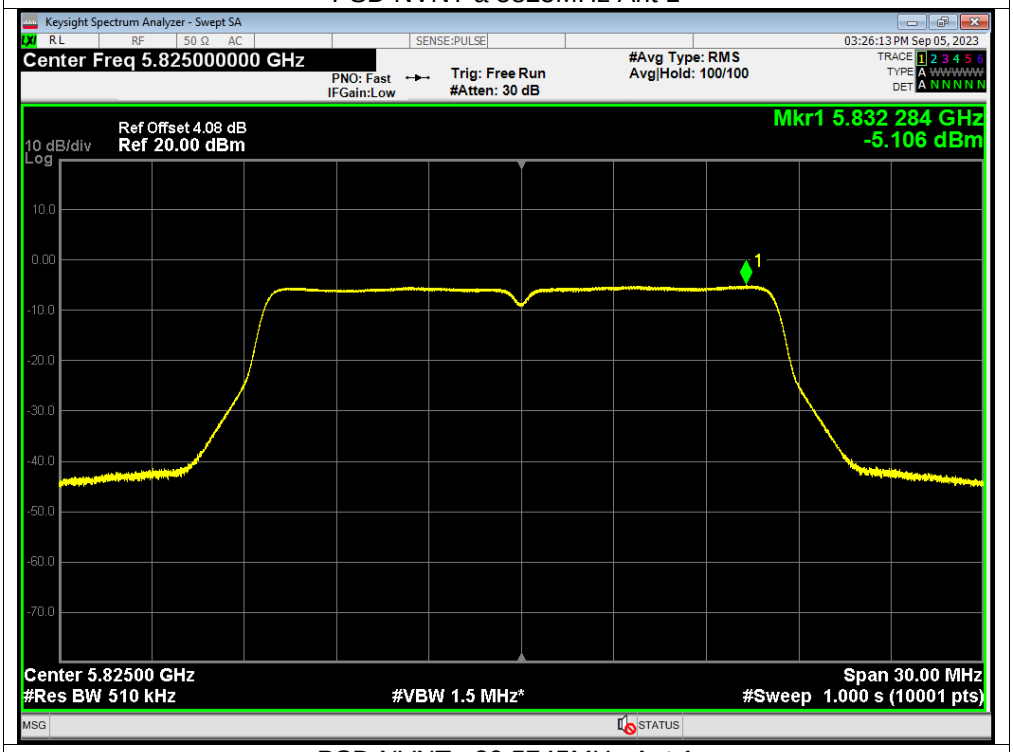
Test Graphs
PSD NVNT a 5745MHz Ant 1



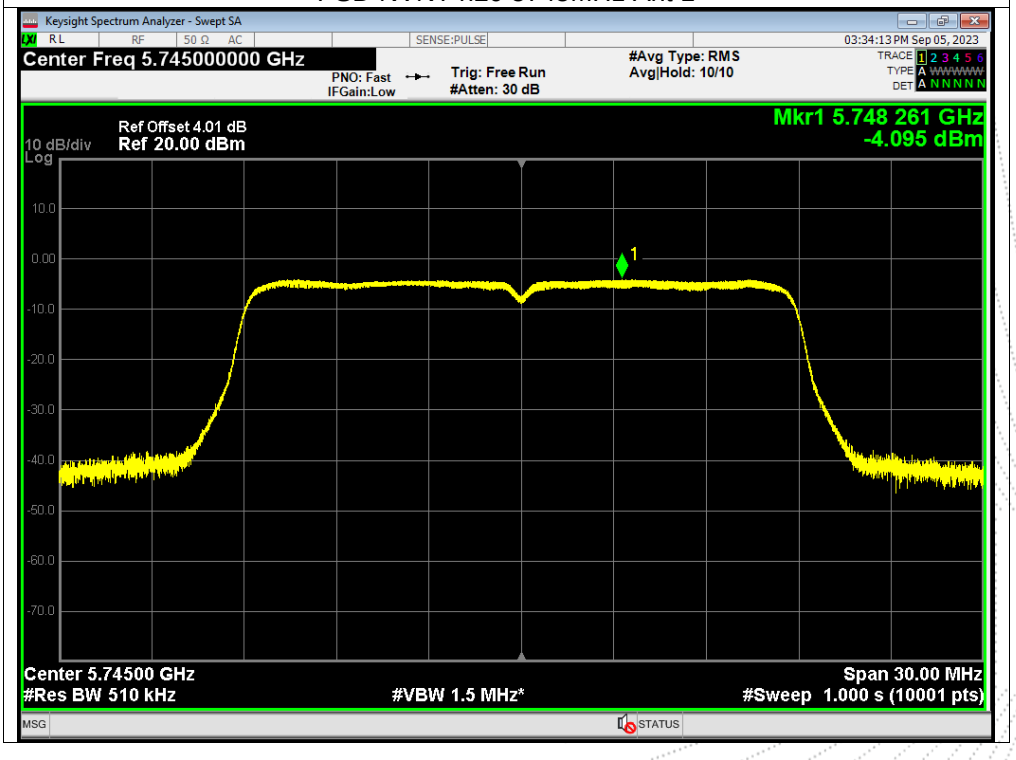
PSD NVNT a 5785MHz Ant 1



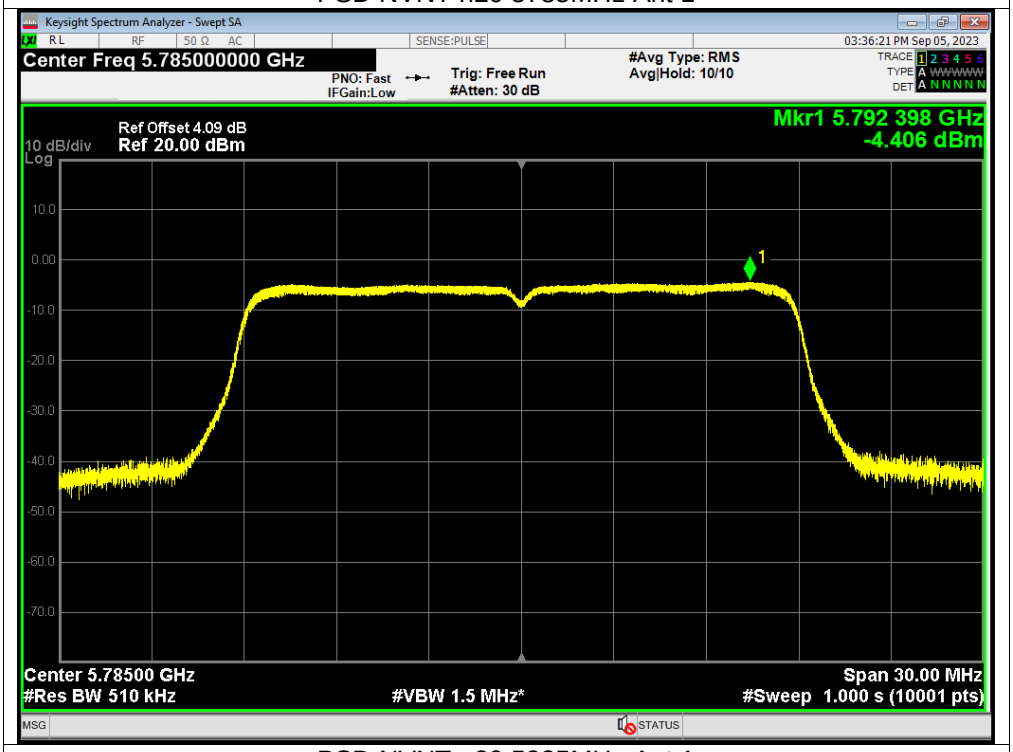
PSD NVNT a 5825MHz Ant 1



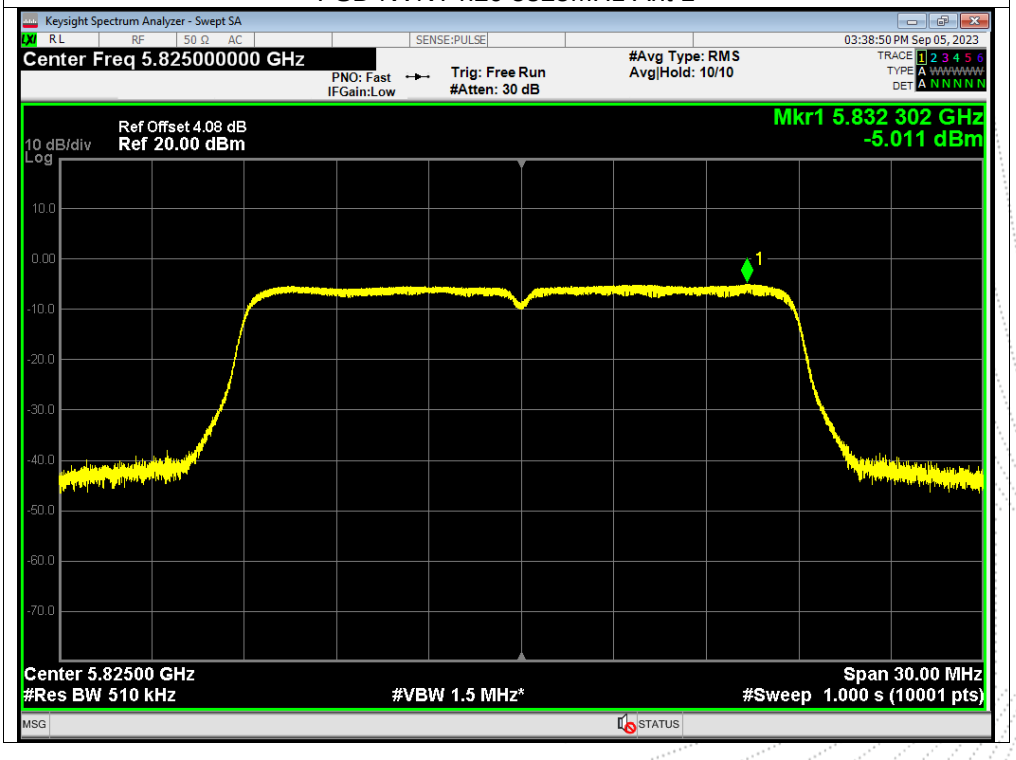
PSD NVNT n20 5745MHz Ant 1



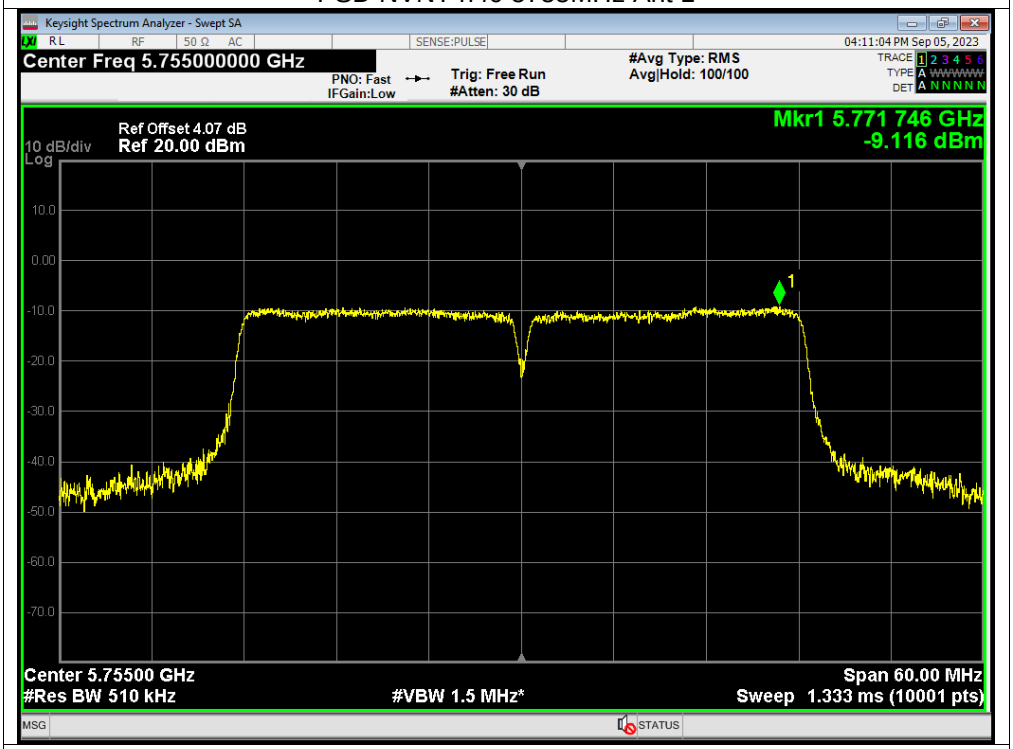
PSD NVNT n20 5785MHz Ant 1



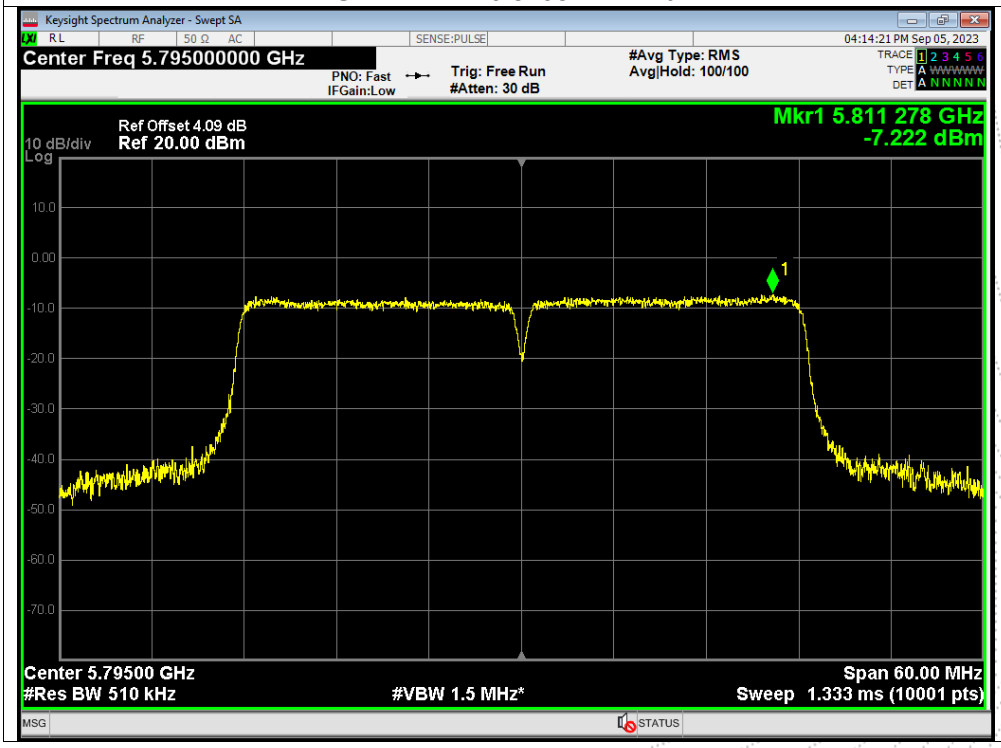
PSD NVNT n20 5825MHz Ant 1



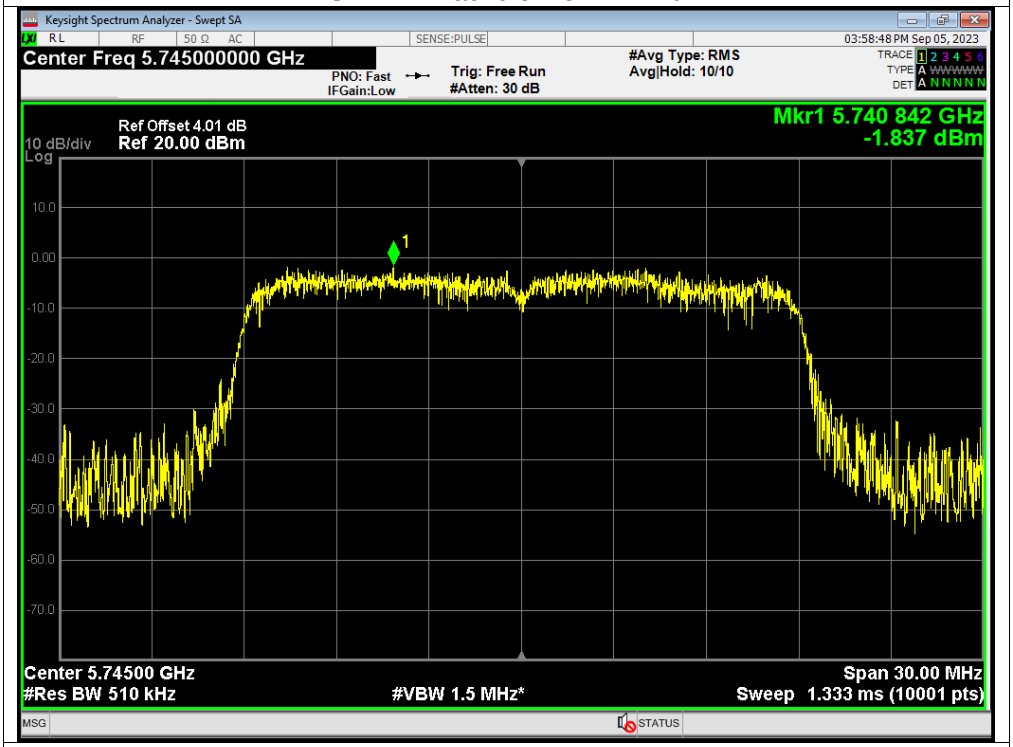
PSD NVNT n40 5755MHz Ant 1



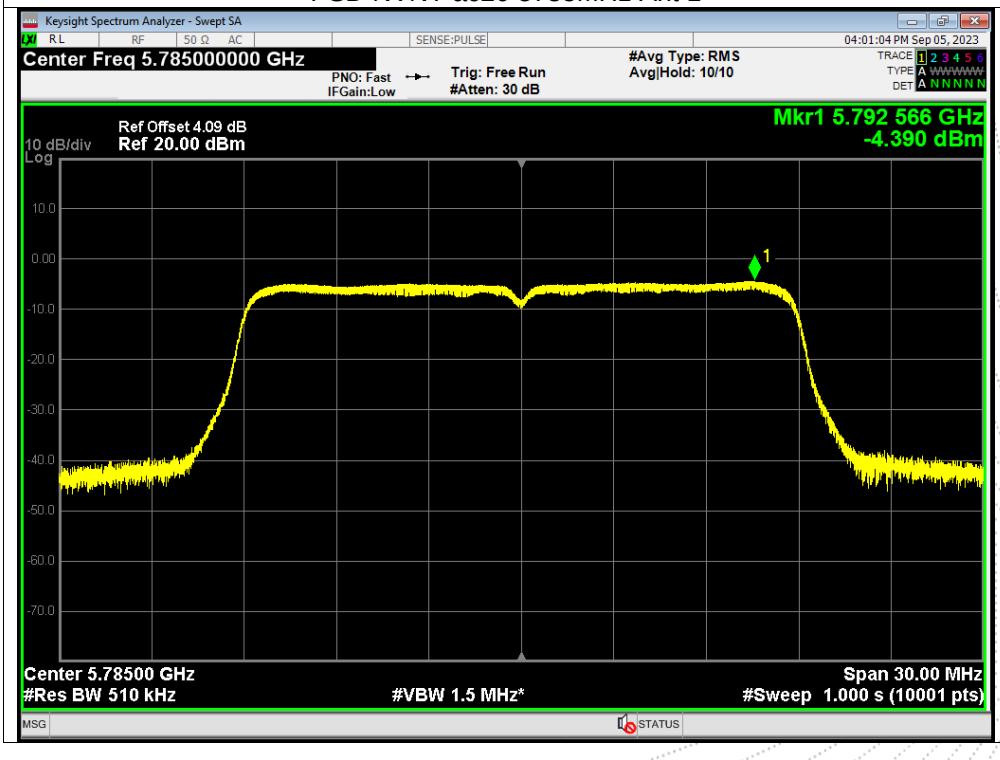
PSD NVNT n40 5795MHz Ant 1



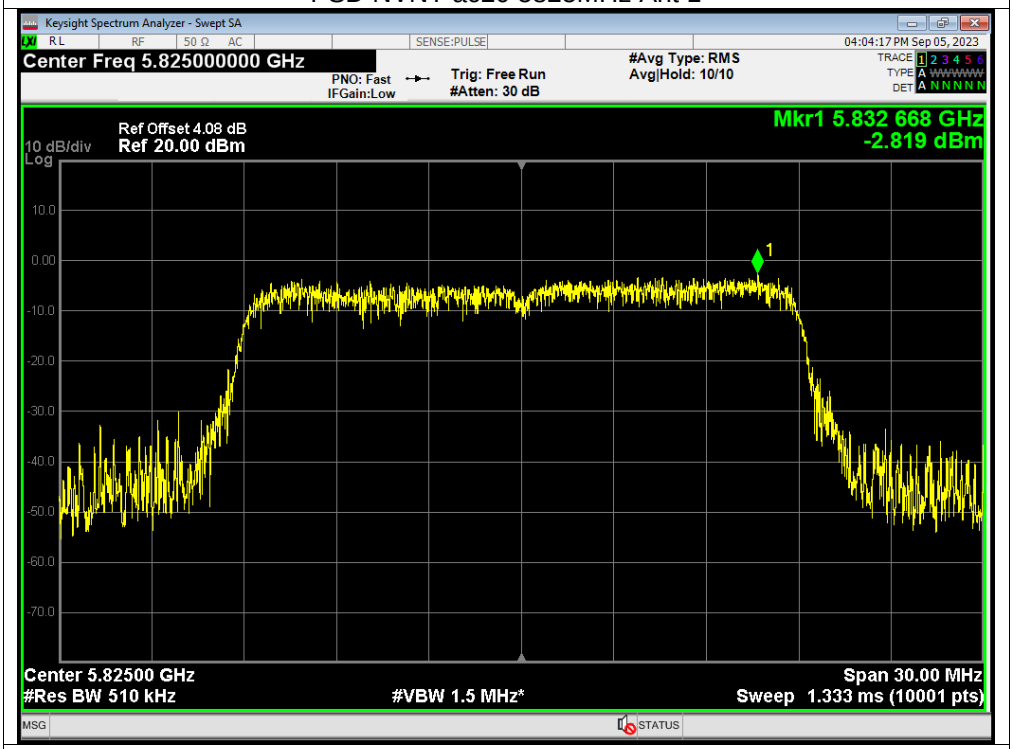
PSD NVNT ac20 5745MHz Ant 1



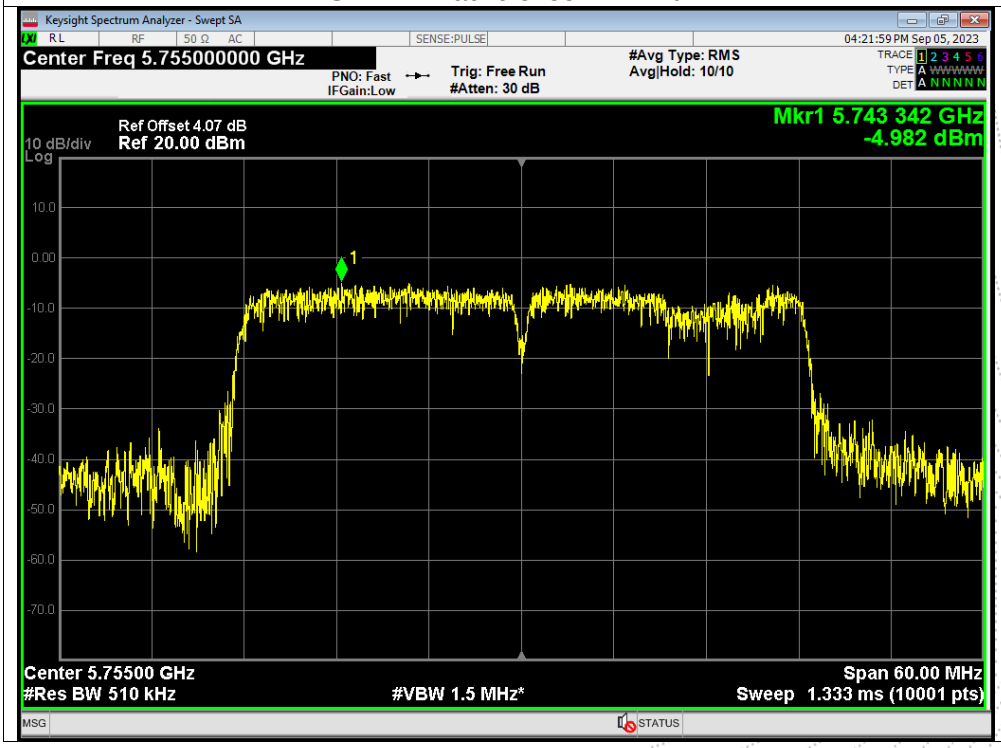
PSD NVNT ac20 5785MHz Ant 1



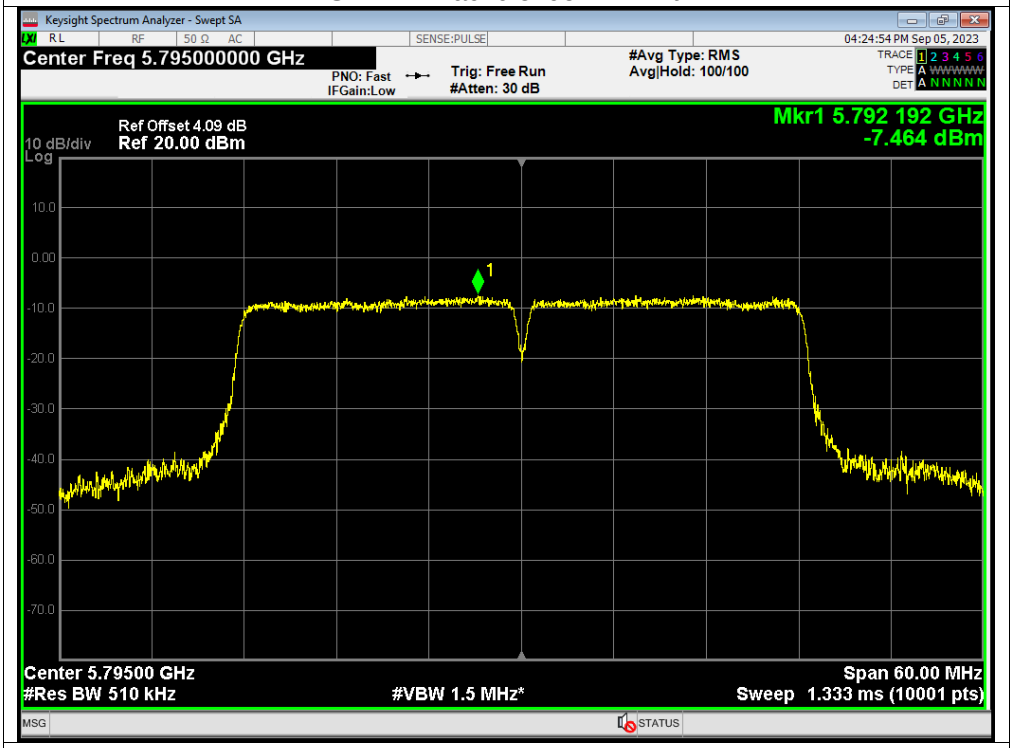
PSD NVNT ac20 5825MHz Ant 1



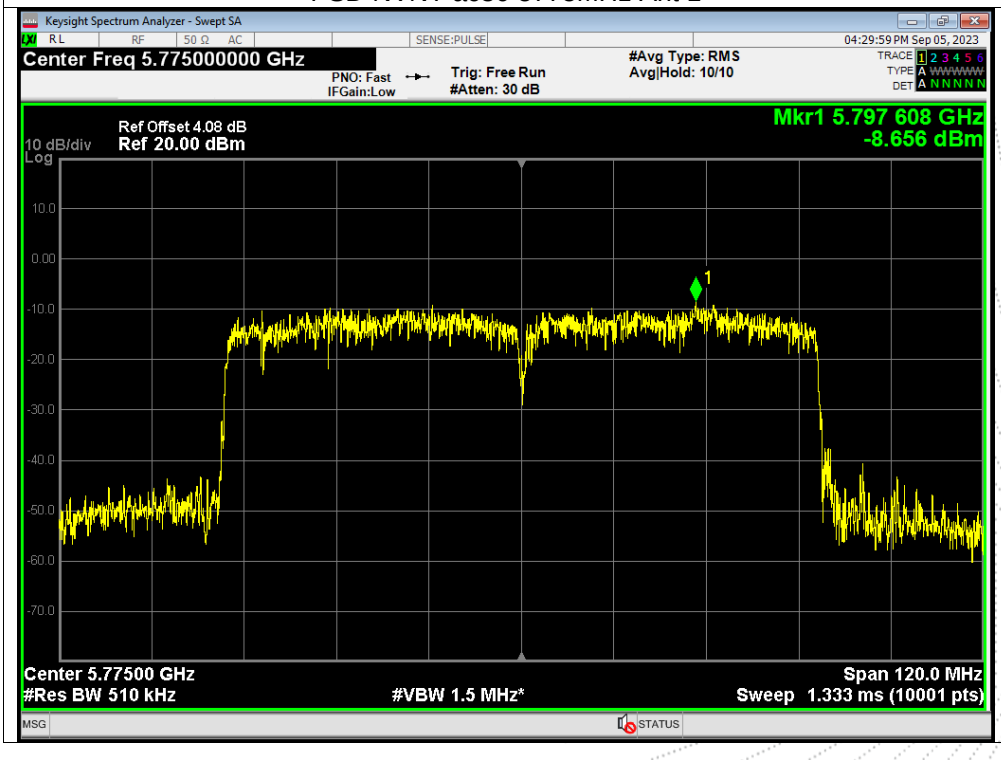
PSD NVNT ac40 5755MHz Ant 1



PSD NVNT ac40 5795MHz Ant 1

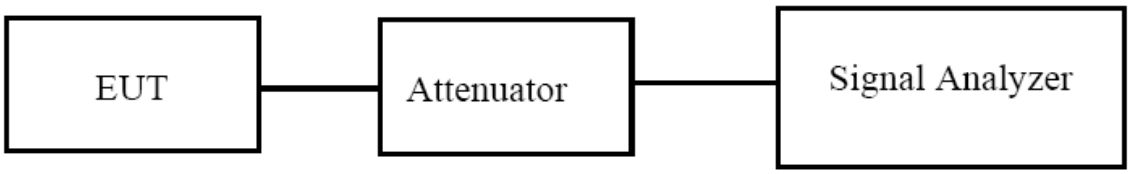


PSD NVNT ac80 5775MHz Ant 1



9. 26dB & 6dB & 99% Emission Bandwidth

9.1 Block Diagram Of Test Setup



9.2 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.

9.3 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.

9.4 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.

9.5 Test Result

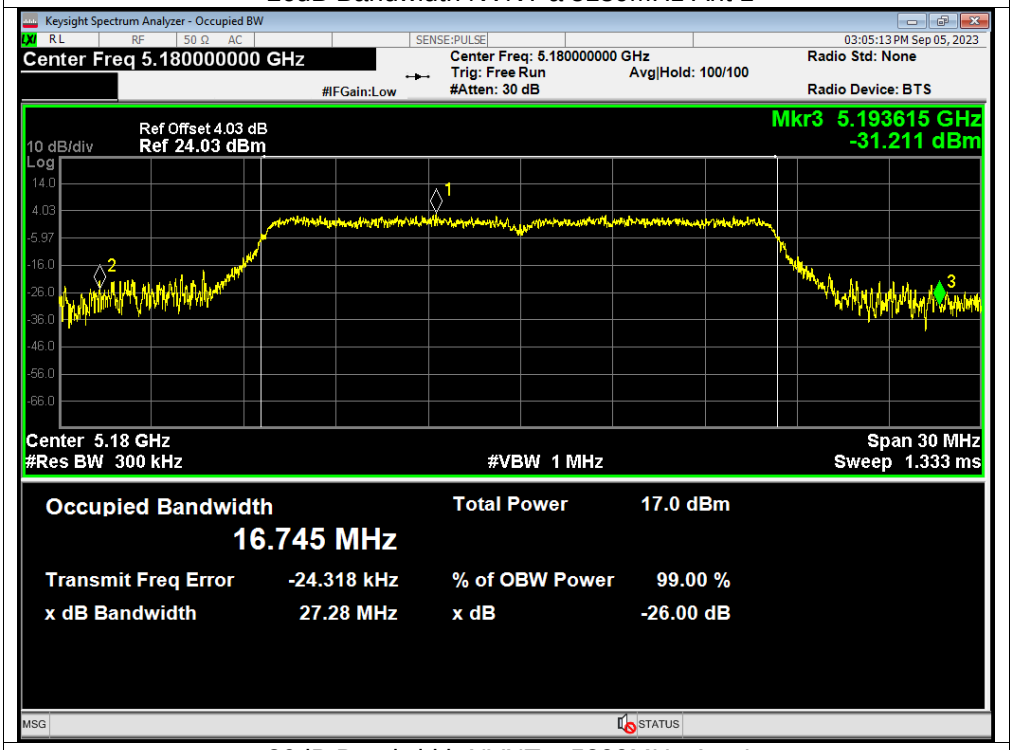
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 24V
Test Mode:	(5180-5240MHz)		

Condition	Mode	Frequency (MHz)	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	27.278	Pass
NVNT	a	5200	27.088	Pass
NVNT	a	5240	27.171	Pass
NVNT	n20	5180	27.507	Pass
NVNT	n20	5200	23.929	Pass
NVNT	n20	5240	26.691	Pass
NVNT	n40	5190	49.225	Pass
NVNT	n40	5230	46.526	Pass
NVNT	ac20	5180	28.674	Pass
NVNT	ac20	5200	27.995	Pass
NVNT	ac20	5240	29.042	Pass
NVNT	ac40	5190	52.015	Pass
NVNT	ac40	5230	41.615	Pass
NVNT	ac80	5210	78.424	Pass

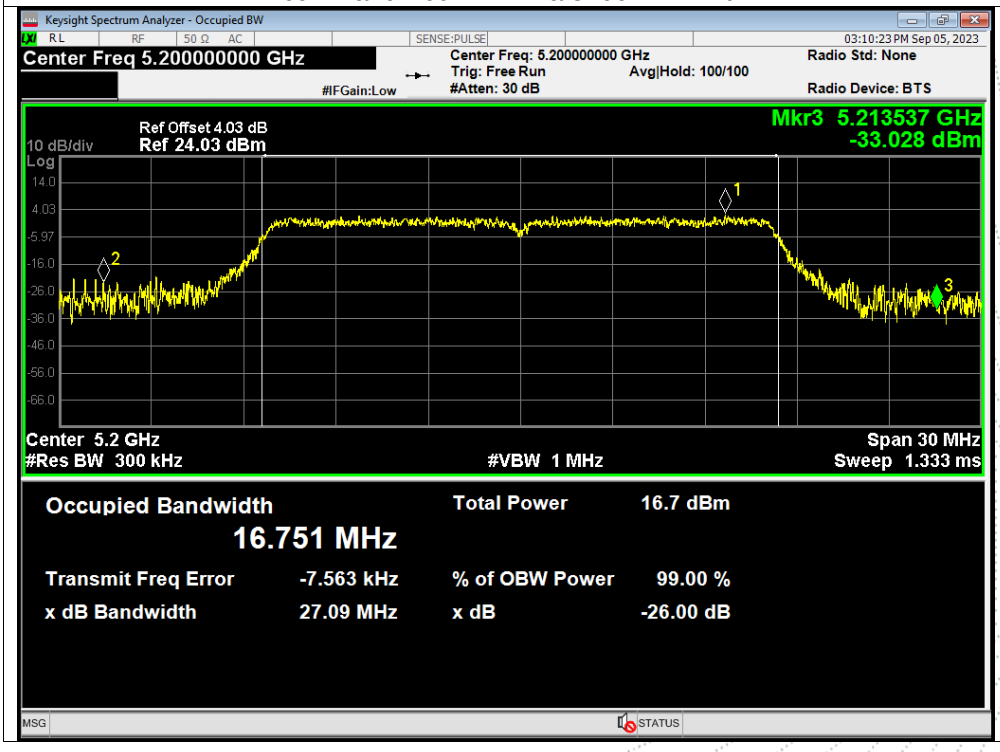
Condition	Mode	Frequency (MHz)	99% OBW (MHz)
NVNT	a	5180	16.581
NVNT	a	5200	16.593
NVNT	a	5240	16.559
NVNT	n20	5180	17.619
NVNT	n20	5200	17.639
NVNT	n20	5240	17.621
NVNT	n40	5190	36.36
NVNT	n40	5230	36.236
NVNT	ac20	5180	17.617
NVNT	ac20	5200	17.608
NVNT	ac20	5240	17.607
NVNT	ac40	5190	36.351
NVNT	ac40	5230	36.254
NVNT	ac80	5210	75.427
NVNT	ax80	5210	75.427

Test Graphs

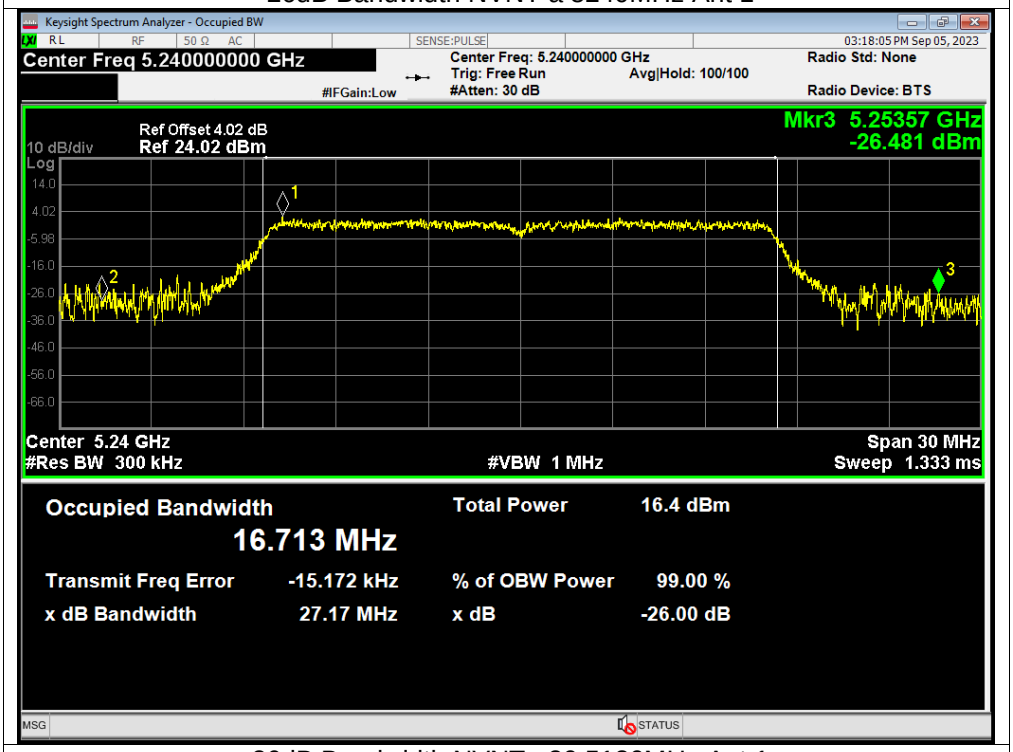
-26dB Bandwidth NVNT a 5180MHz Ant 1



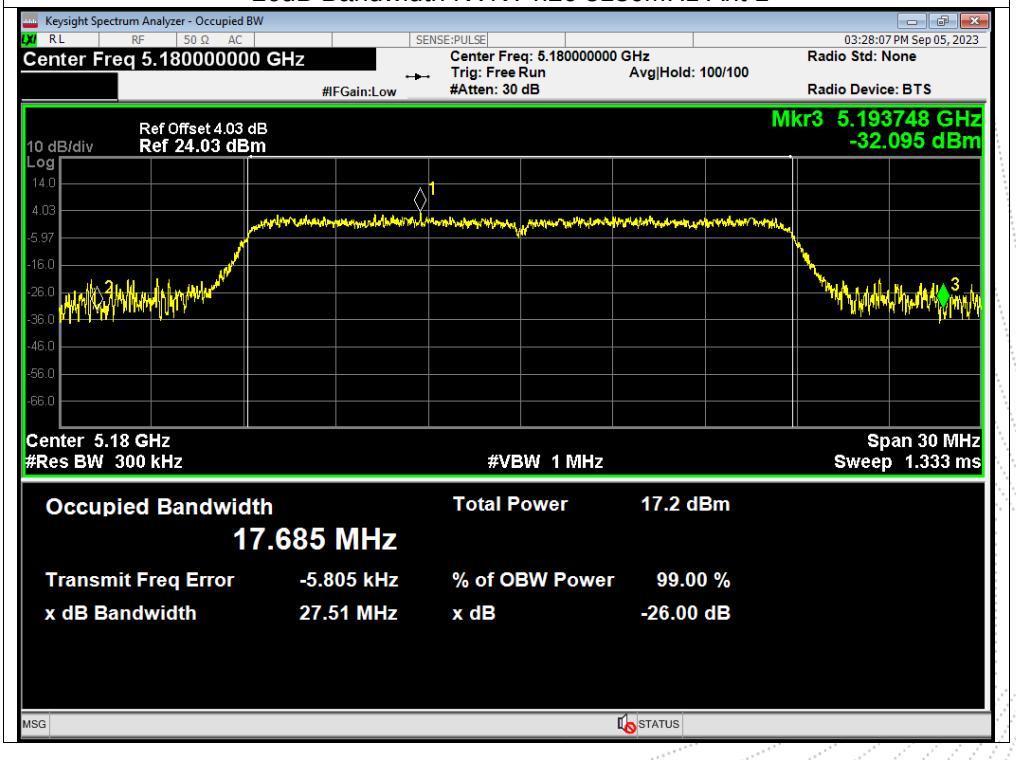
-26dB Bandwidth NVNT a 5200MHz Ant 1



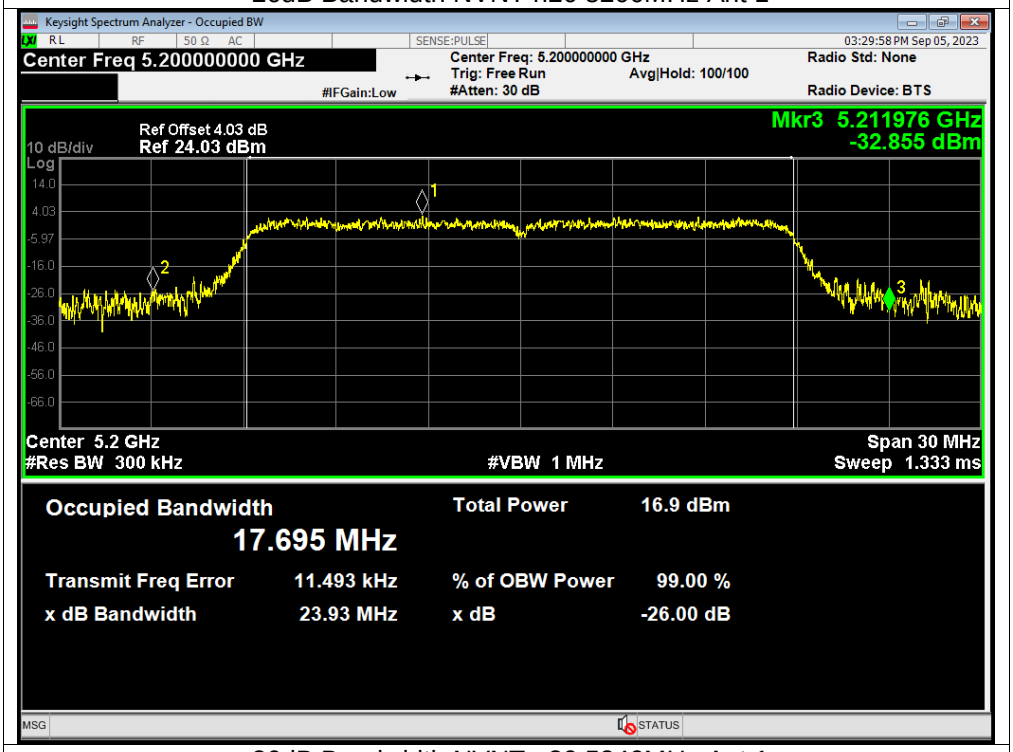
-26dB Bandwidth NVNT a 5240MHz Ant 1



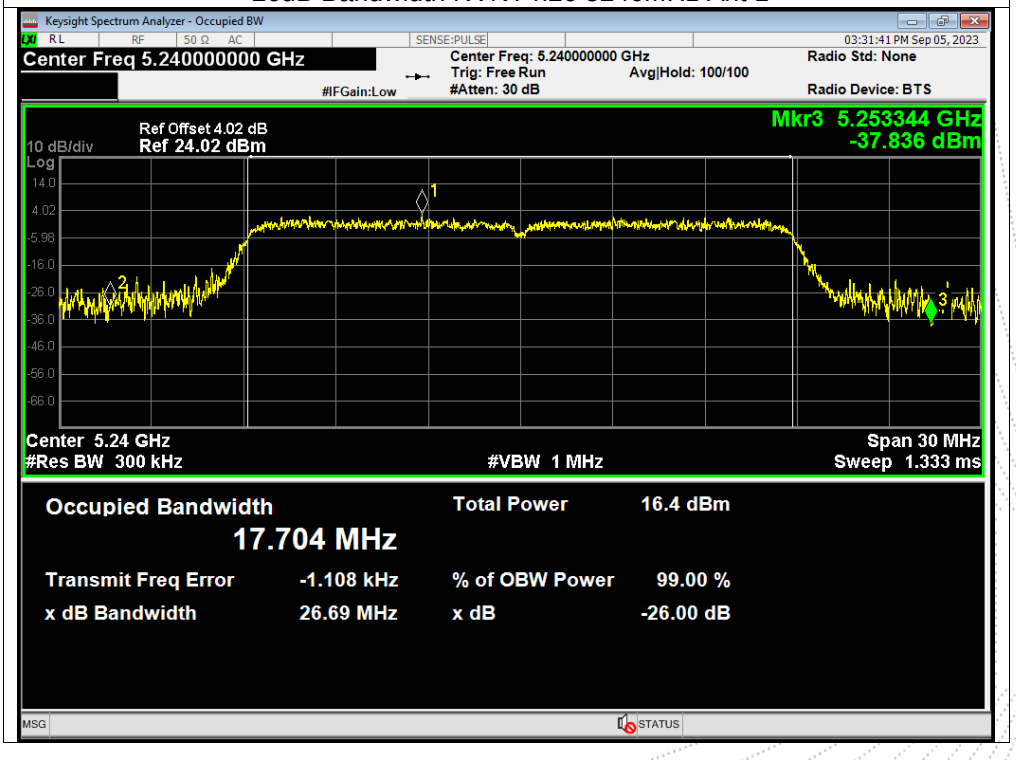
-26dB Bandwidth NVNT n20 5180MHz Ant 1



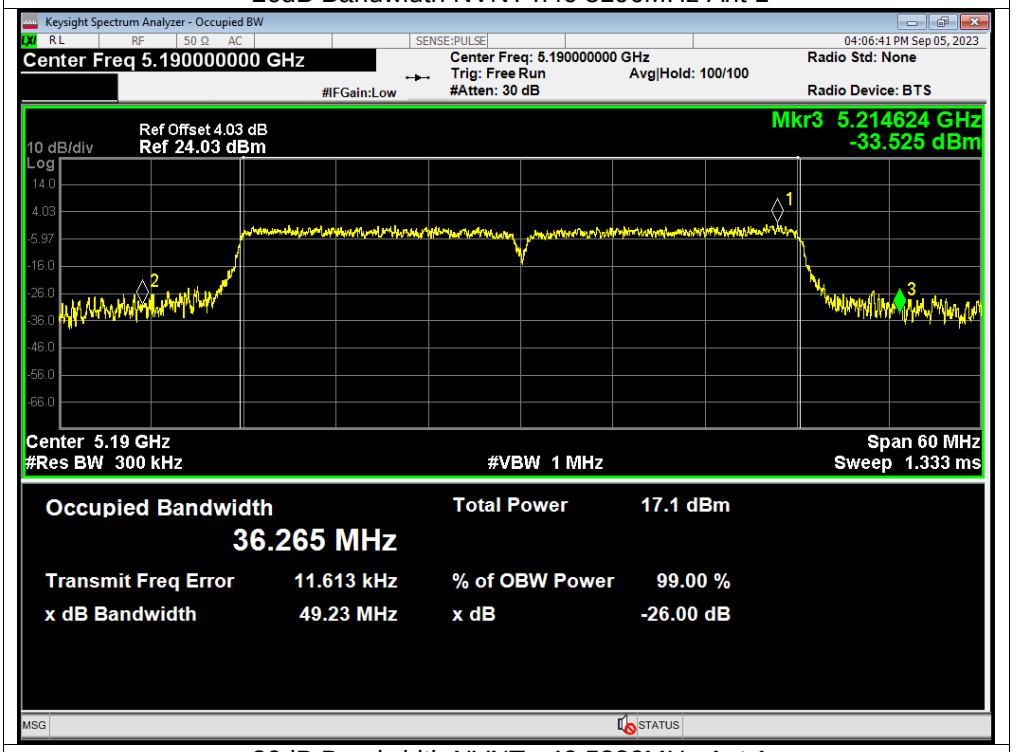
-26dB Bandwidth NVNT n20 5200MHz Ant 1



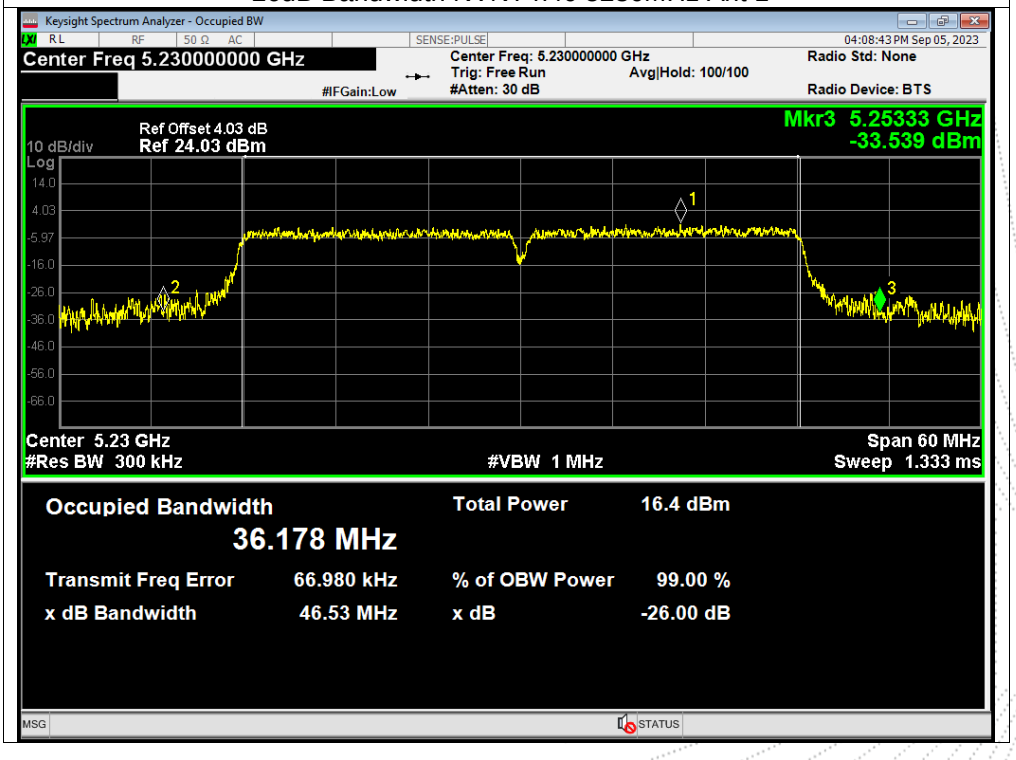
-26dB Bandwidth NVNT n20 5240MHz Ant 1



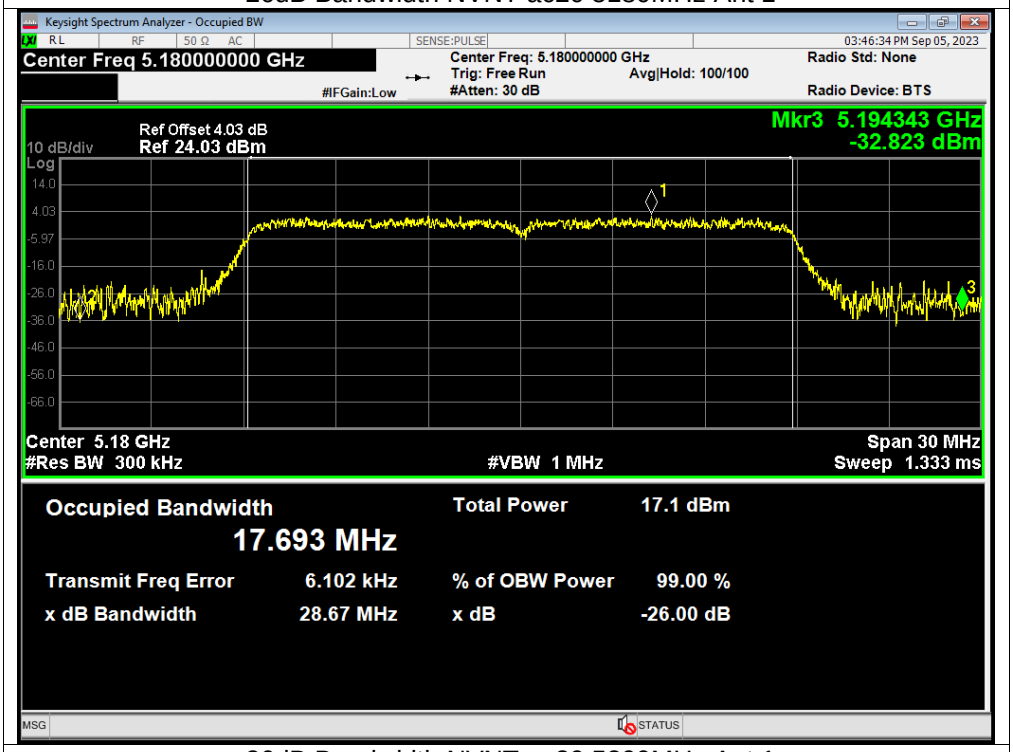
-26dB Bandwidth NVNT n40 5190MHz Ant 1



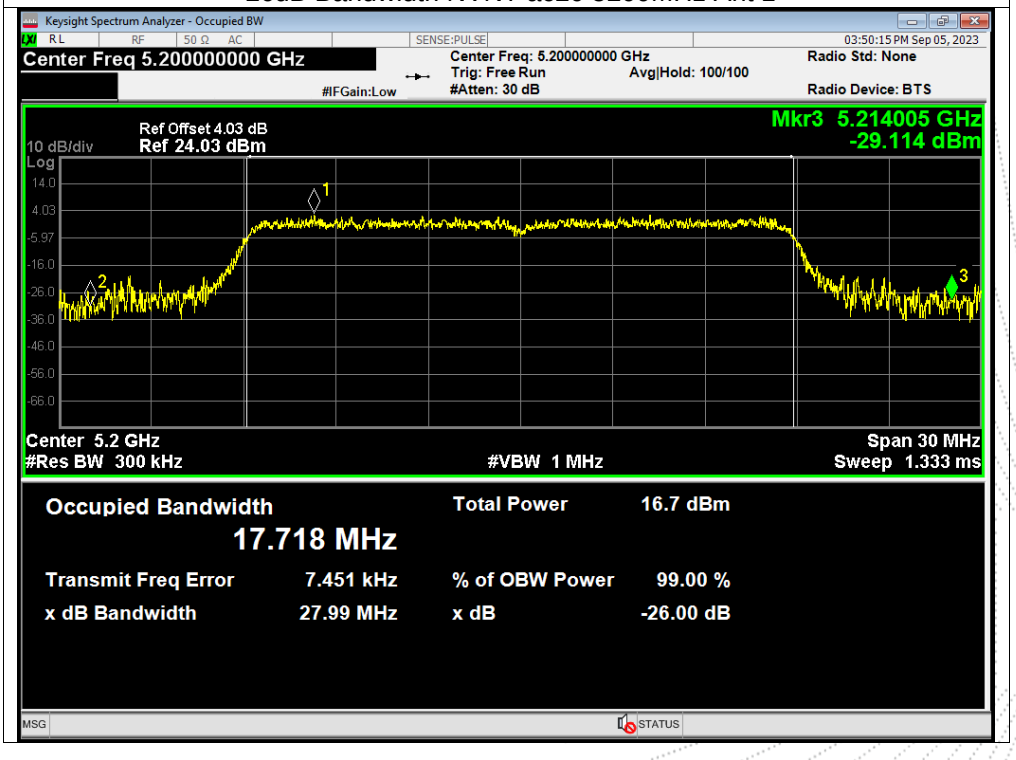
-26dB Bandwidth NVNT n40 5230MHz Ant 1



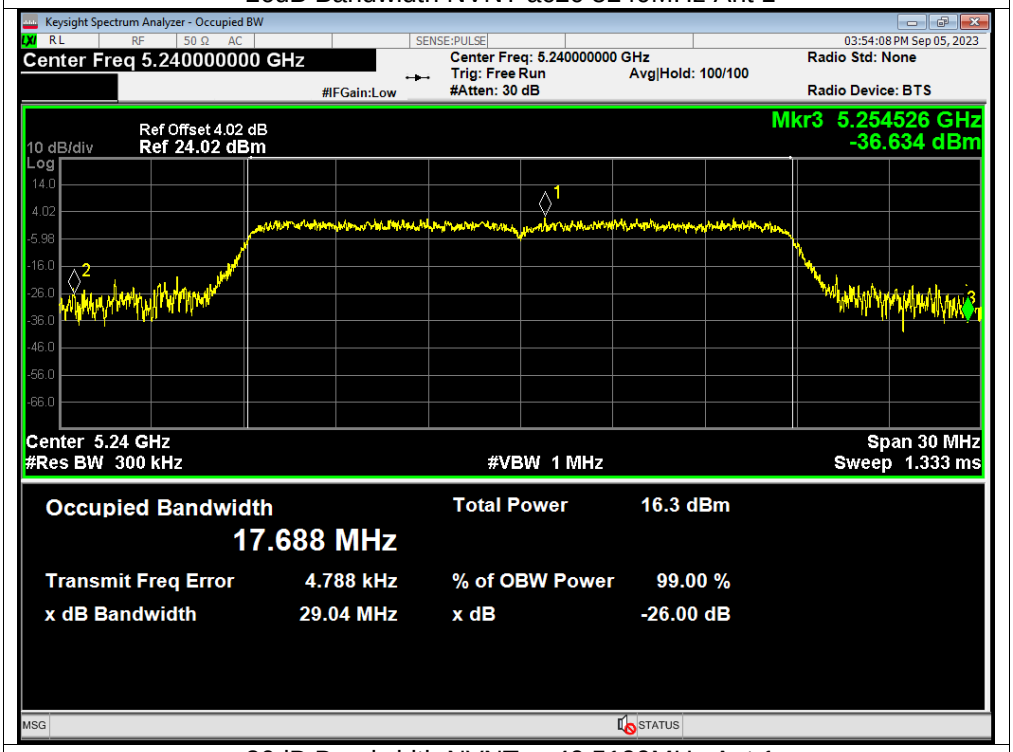
-26dB Bandwidth NVNT ac20 5180MHz Ant 1



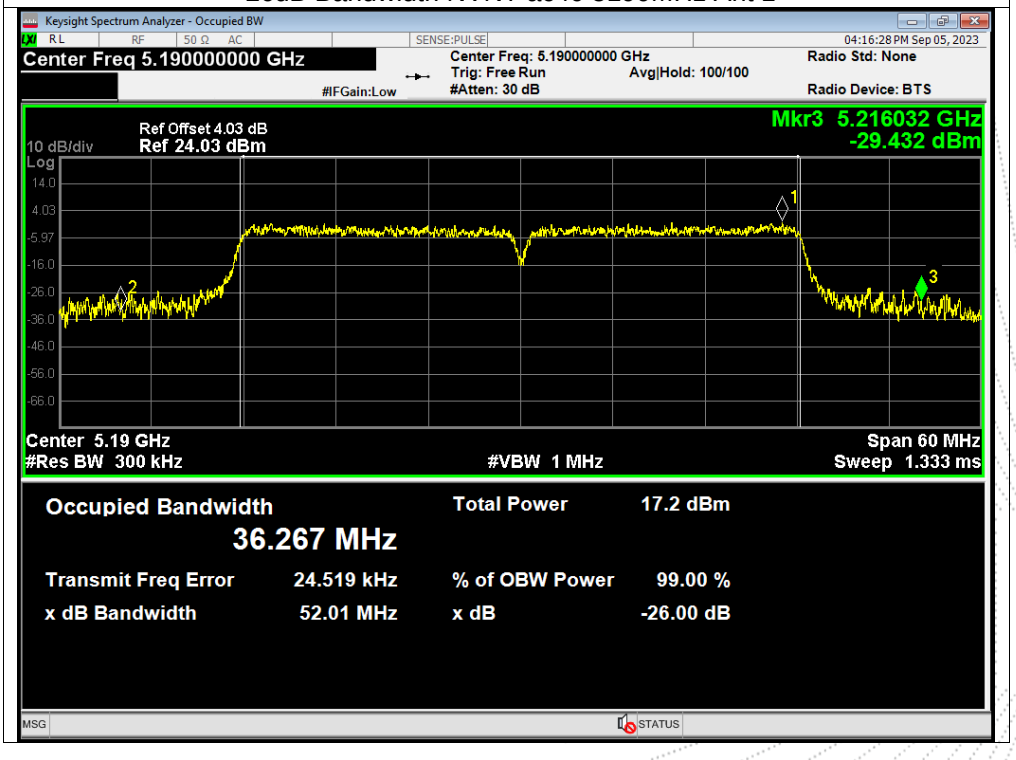
-26dB Bandwidth NVNT ac20 5200MHz Ant 1



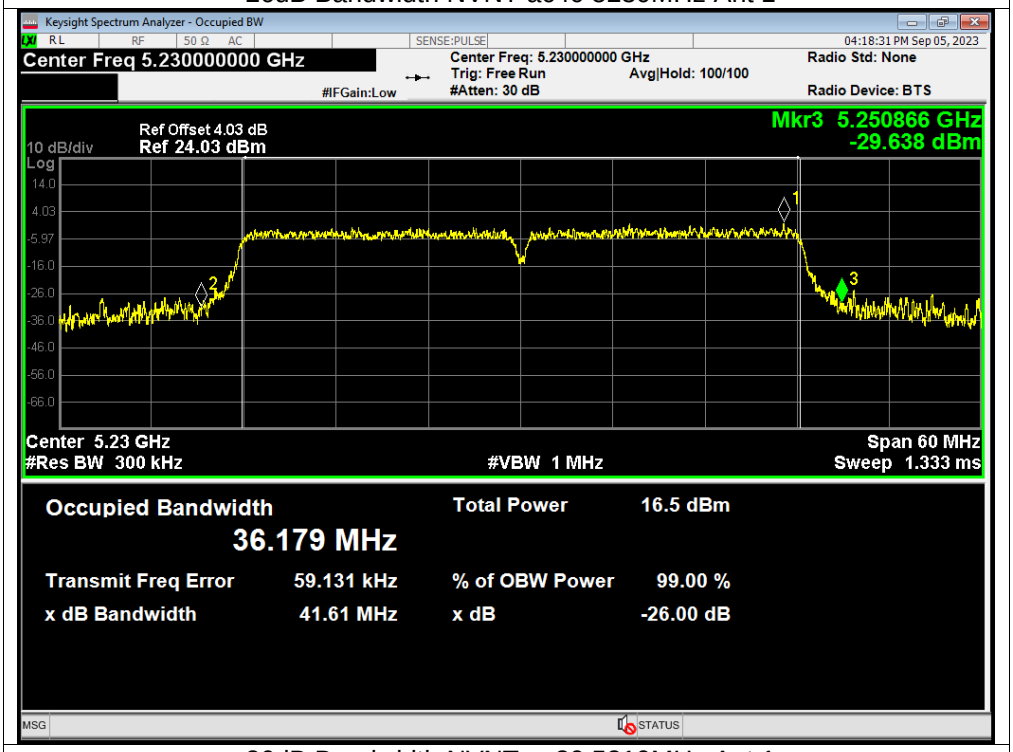
-26dB Bandwidth NVNT ac20 5240MHz Ant 1



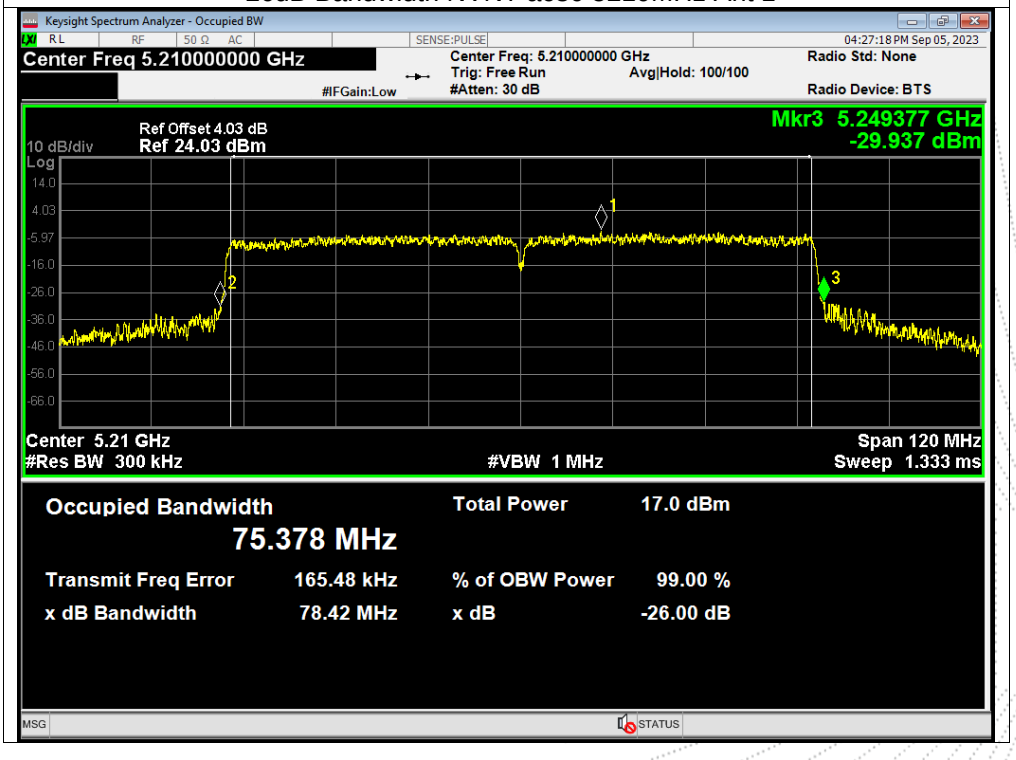
-26dB Bandwidth NVNT ac40 5190MHz Ant 1



-26dB Bandwidth NVNT ac40 5230MHz Ant 1

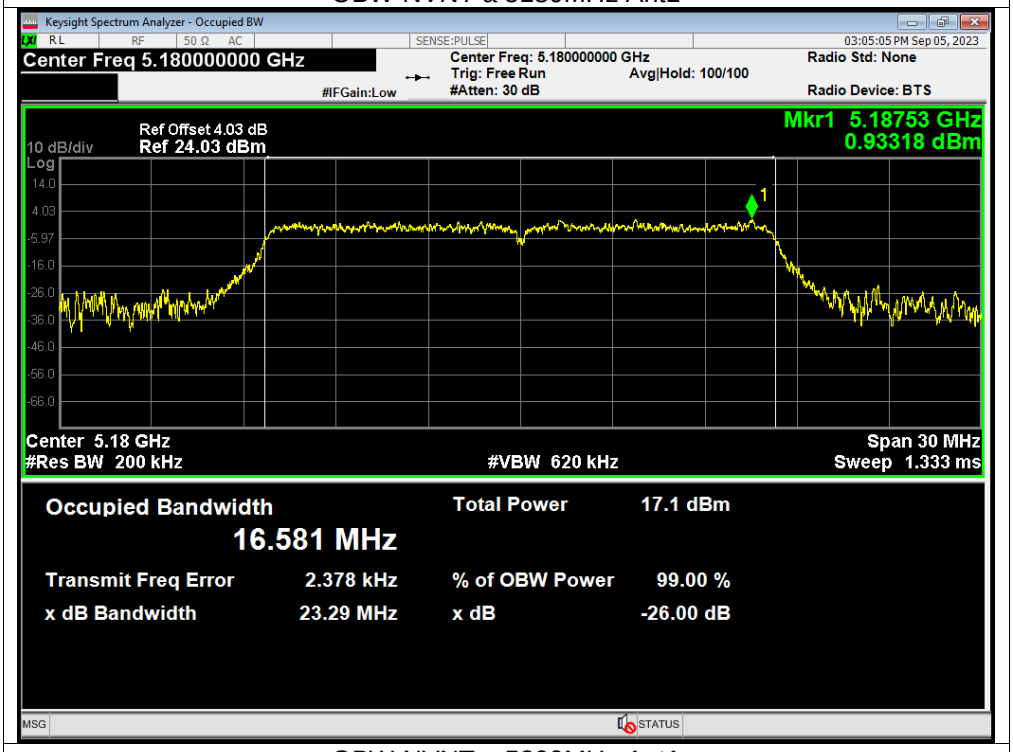


-26dB Bandwidth NVNT ac80 5210MHz Ant 1

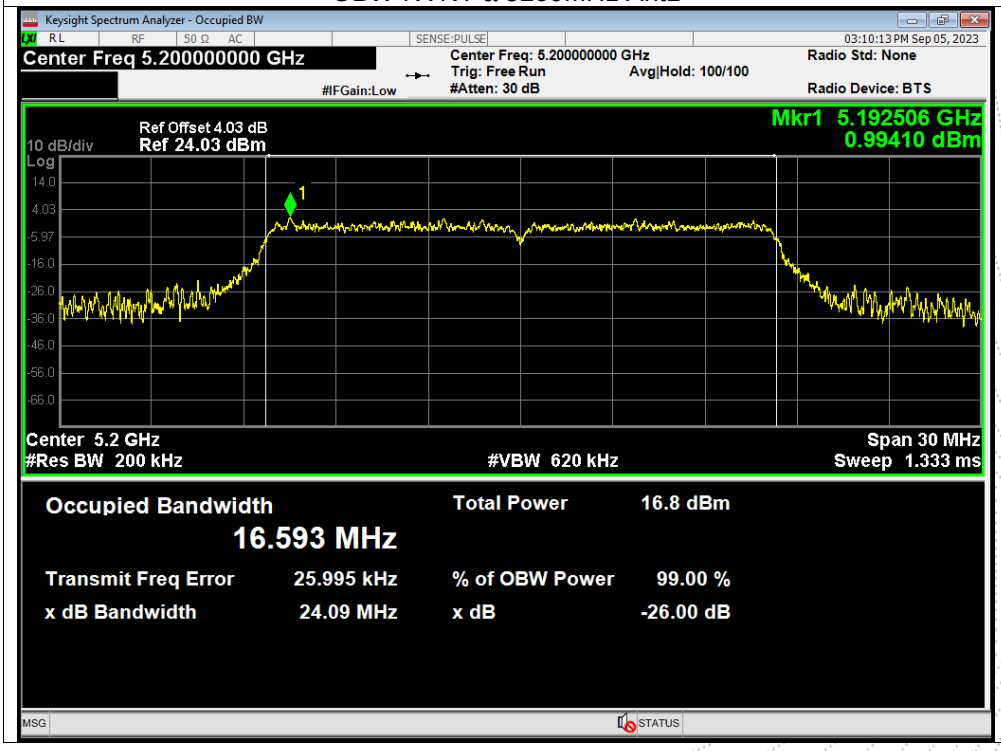


Test Graphs

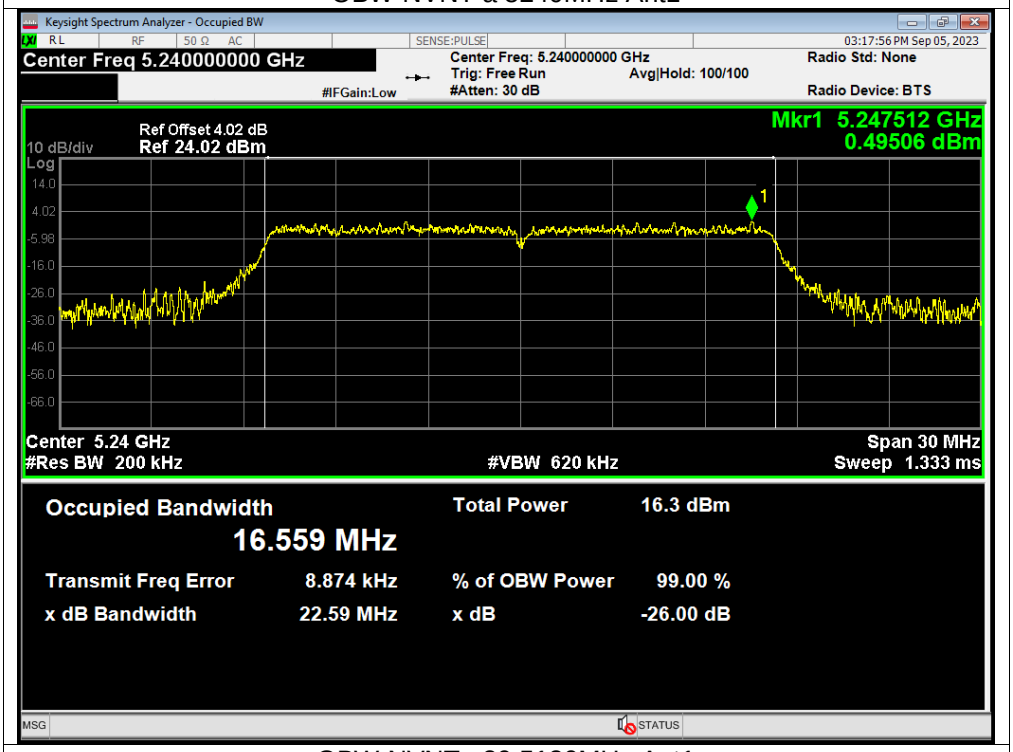
OBW NVNT a 5180MHz Ant1



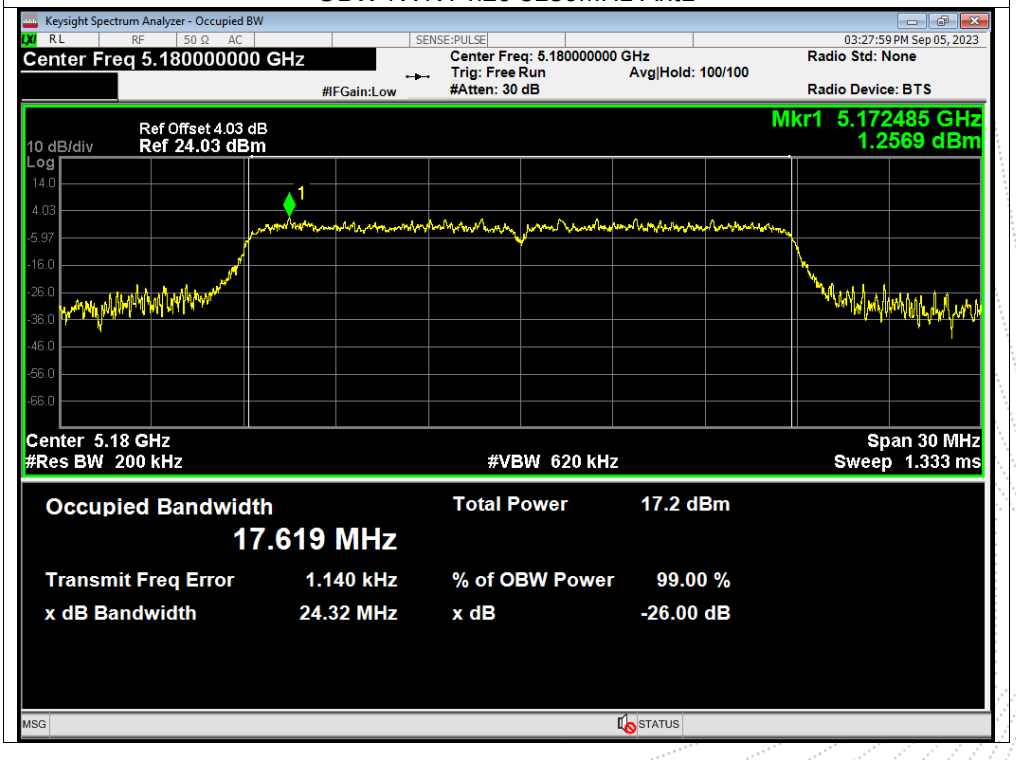
OBW NVNT a 5200MHz Ant1



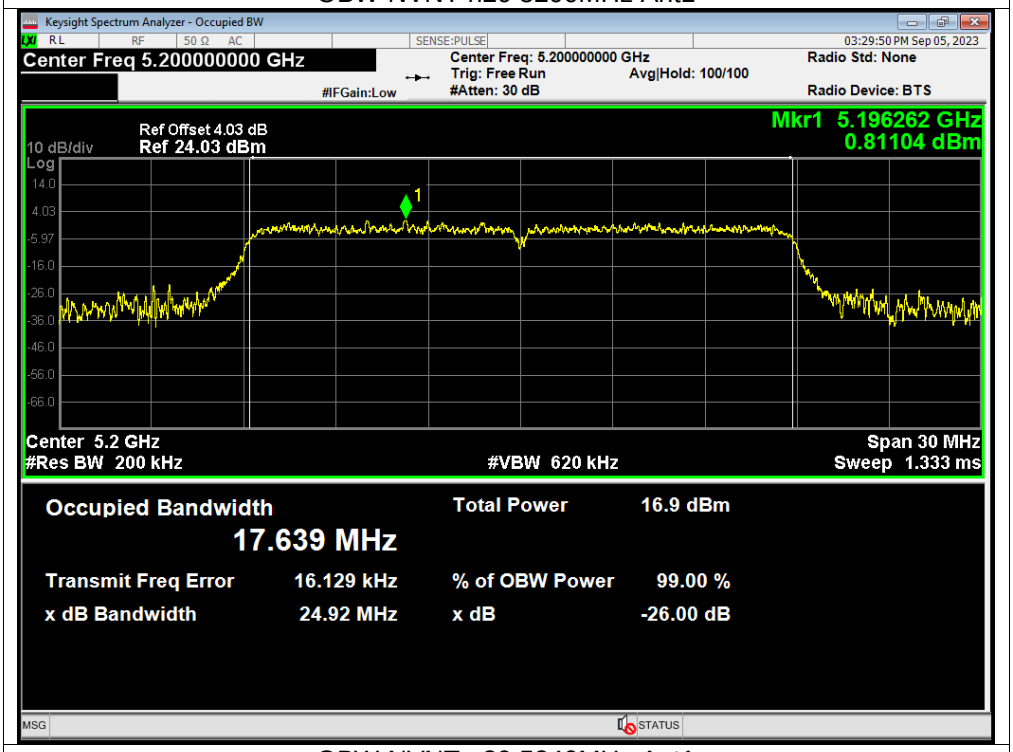
OBW NVNT a 5240MHz Ant1



OBW NVNT n20 5180MHz Ant1



OBW NVNT n20 5200MHz Ant1



OBW NVNT n20 5240MHz Ant1