TEST REPORT

Report No.:	BCTC2203708244-4E
Applicant:	ROCKPI TRADING LIMITED
Product Name:	ROCK Pi E
Model/Type Ref.:	ROCK Pi E D8W2
Tested Date:	2022-03-23 to 2022-04-02
Issued Date:	2022-04-02

Shenzhen BCTC Testing Co., Ltd.

FCC ID: 2A3PA-ROCK-PI-E

Product Name:	ROCK Pi E
Trademark:	N/A
Model/Type Ref.:	ROCK Pi E D8W2 ROCK Pi E D8W2P, ROCK Pi E D4W1P
Prepared For:	ROCKPI TRADING LIMITED
Address:	Room 11, 27 / f, Ga wah international centre, 191 Javaroad, north point, Hong Kong, China
Manufacturer:	ROCKPI TRADING LIMITED
Address:	Room 11, 27 / f, Ga wah international centre, 191 Javaroad, north point, Hong Kong, China
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:	2022-03-23
Sample tested Date:	2022-03-23 to 2022-04-02
Issue Date:	2022-04-02
Report No.:	BCTC2203708244-4E
Test Standards	FCC Part15 15.407 ANSI C63.10-2013 KDB 662911 D01 v02r01 KDB 789033 D02 v02r01
Test Results	PASS

Tested by:

Lei Chen

Lei Chen/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

(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2203708244-4E	2022-04-02	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)(1) 15.407 (b)(4) 15.407 (b)(8) 15.407 (b)(9)	PASS
2	Conducted Emission	15.207	PASS
3	26 dB and 99% Emission Bandwidth	15.407 (a)(12) 15.1049	PASS
4	Minimum 6 dB bandwidth	15.407(e)	PASS
5	Maximum Conducted Output Power	15.407 (a)(1) 15.407 (a)(3)	PASS
6	Band Edge	2.1051, 15.407(b)(1) 15.407(b)(4)	PASS
7	Power Spectral Density	15.407 (a)(1) 15.407 (a)(3)	PASS
8	Spurious Emissions at Antenna Terminals	2.1051, 15.407(b)	PASS
9	Antenna Requirement	15.203	PASS
10	Frequency Stability	15.407(g)	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

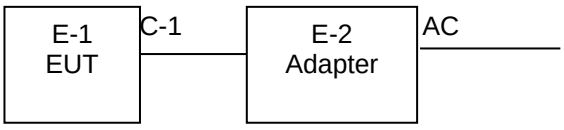
4.1 Product Information

Model/Type Ref.:	ROCK Pi E D8W2 ROCK Pi E D8W2P, ROCK Pi E D4W1P
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	N/A
Software Version:	N/A
IEEE 802.11 WLAN Mode Supported	802.11a/n/ac(20MHz channel bandwidth) 802.11n/ac(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(HT20)/ac20; 5755-5795 MHz for 802.11a/n(HT40)/ac40;
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40/VHT80):NSS1, MCS0-MCS
Type of Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
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 5 channels for 802.11a/n20 in the 5745-5825MHz band ; 2 channels for 802.11 n40 in the 5755-5795MHz band ;
Antenna installation:	FPCB antenna
Antenna Gain:	2dBi
Ratings:	USB: DC 5V

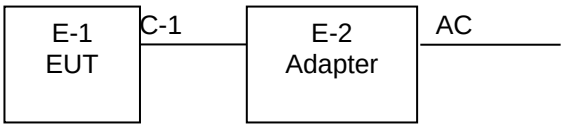
4.2 Test Setup Configuration

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

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	ROCK Pi E	N/A	ROCK Pi E D8W2	N/A	EUT
E-2	Adapter	N/A	BCTC001	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5M	DC cable unshielded

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

5.1G

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

5.8G

802.11a/n/ac(20MHz) 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)	Channel	Frequency (MHz)
151	5755	159	5795	-	-	-	-

802.11n/ac (80MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	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.

5.1G

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

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n/ ac 20 CH36/ CH40/ CH 48
Mode 2	802.11n/ ac40 CH38/ CH 46
Mode 3	802.11 ac80 CH 42/
Mode 4	Link Mode
Note:	
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.	

5.8G

Pretest Mode	Description
Mode 1	802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac 80 CH155
Mode 4	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac 80 CH155
Mode 4	Link Mode
Note:	
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.	

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	SecureCRT		
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, Tangwei, 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
IC Registered No.: 23583

5.2 Test Instrument Used

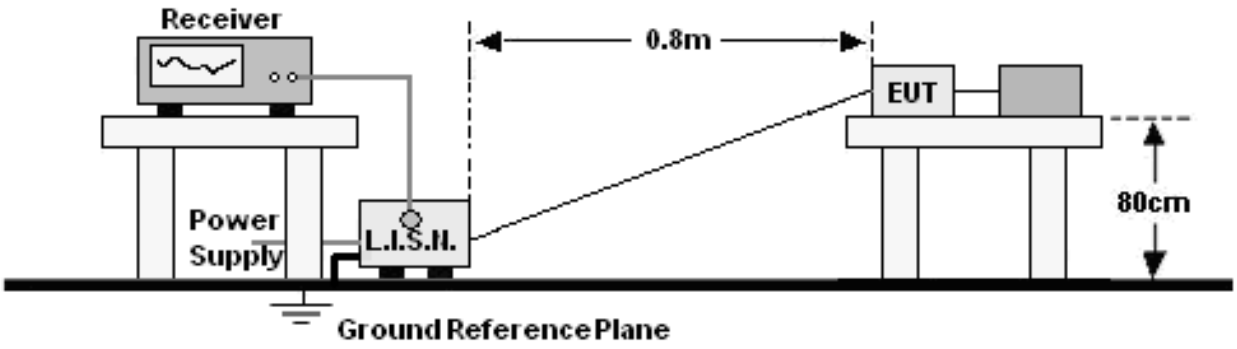
Conducted emissions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
LISN	R&S	ENV216	101375	May 28, 2021	May 27, 2022
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Attenuator	\	10dB DC-6GHz	1650	May 28, 2021	May 27, 2022

RF Conducted Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Power Metter	Keysight	E4419	\	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9300A	\	May 28, 2021	May 27, 2022
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	\	May 28, 2021	May 27, 2022

Radiated emissions Test (966 chamber)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
Receiver	R&S	ESRP	101154	May 28, 2021	May 27, 2022
Amplifier	SKET	LAPA_01G18G-45dB	\	May 28, 2021	May 27, 2022
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 28, 2021	May 27, 2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	Jun. 01, 2021	May 31, 2022
Horn Antenna	Schwarzbeck	BBHA9120D	1541	Jun. 02, 2021	Jun. 01, 2022
Horn Antenn(18GHz-40GHz)	Schwarzbeck	BBHA9170	00822	Jun. 15, 2021	Jun. 14, 2022
Amplifier(18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 28, 2021	May 27, 2022
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Jun. 02, 2021	Jun. 01, 2022
RF cables1(9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	May 28, 2021	May 27, 2022
RF cables2(30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	May 28, 2021	May 27, 2022
RF cables3(1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	May 28, 2021	May 27, 2022
Power Metter	Keysight	E4419	\	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9300A	\	May 28, 2021	May 27, 2022
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	\	May 28, 2021	May 27, 2022
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

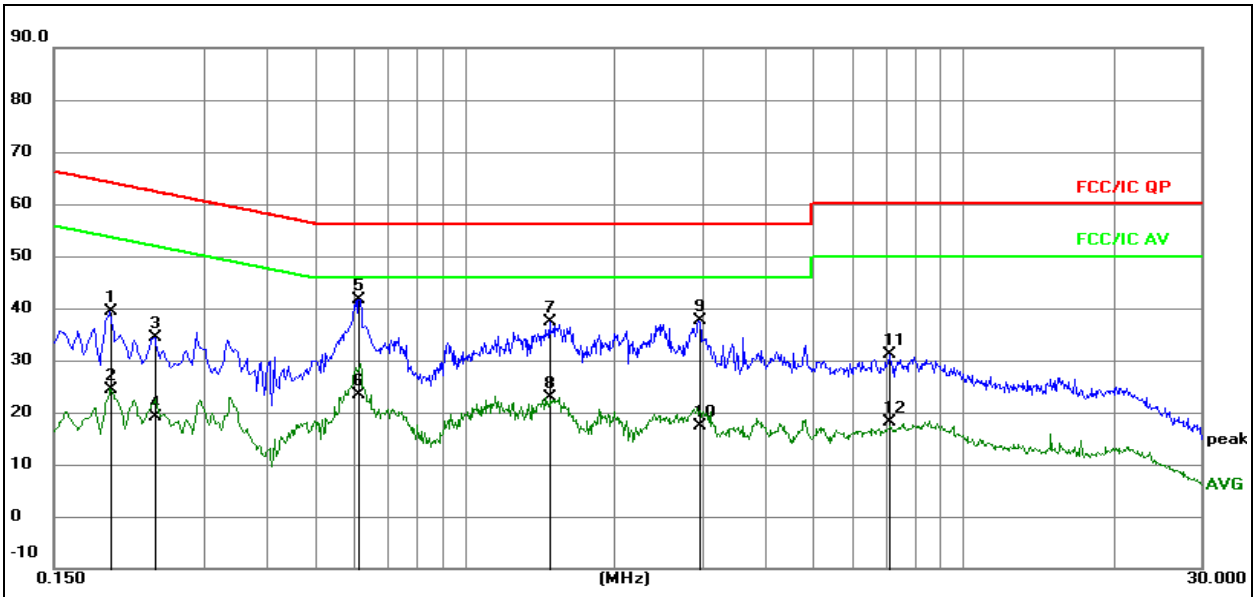
a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak 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

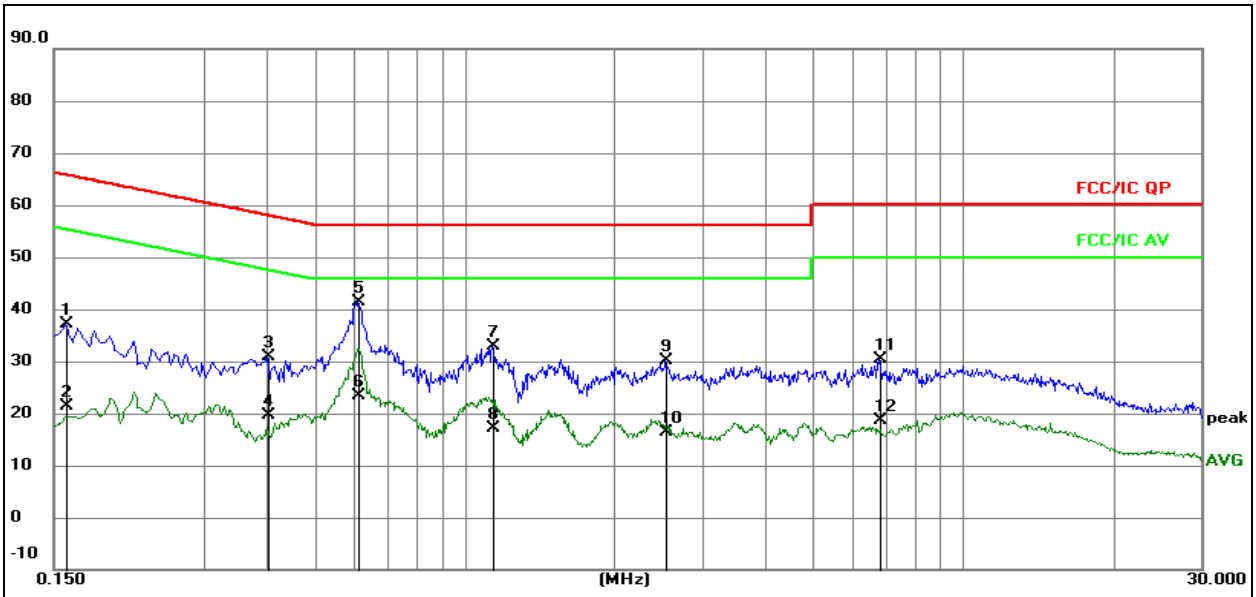
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1945	19.69	19.60	39.29	63.84	-24.55	QP
2		0.1945	4.72	19.60	24.32	53.84	-29.52	AVG
3		0.2391	14.77	19.60	34.37	62.13	-27.76	QP
4		0.2391	-0.38	19.60	19.22	52.13	-32.91	AVG
5	*	0.6108	21.99	19.61	41.60	56.00	-14.40	QP
6		0.6108	3.86	19.61	23.47	46.00	-22.53	AVG
7		1.4796	17.66	19.62	37.28	56.00	-18.72	QP
8		1.4796	3.31	19.62	22.93	46.00	-23.07	AVG
9		2.9463	17.93	19.65	37.58	56.00	-18.42	QP
10		2.9463	-2.27	19.65	17.38	46.00	-28.62	AVG
11		7.0997	11.28	19.73	31.01	60.00	-28.99	QP
12		7.0997	-1.69	19.73	18.04	50.00	-31.96	AVG

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4



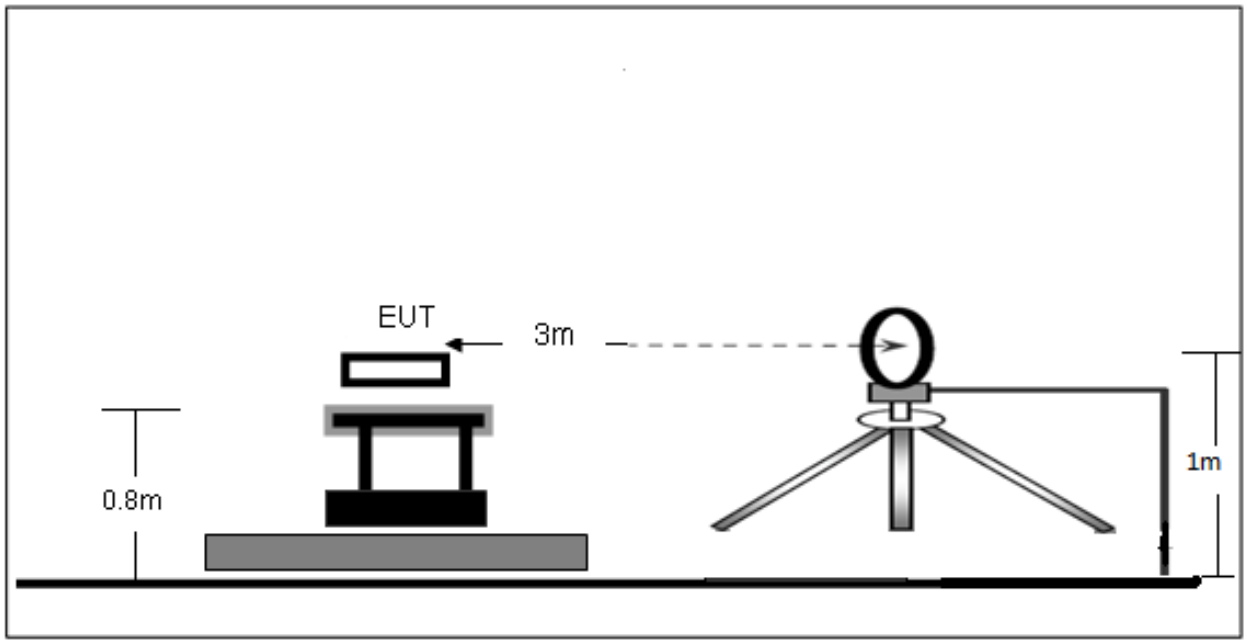
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1590	17.52	19.60	37.12	65.52	-28.40	QP
2		0.1590	1.76	19.60	21.36	55.52	-34.16	AVG
3		0.4020	11.26	19.61	30.87	57.81	-26.94	QP
4		0.4020	0.10	19.61	19.71	47.81	-28.10	AVG
5	*	0.6134	21.79	19.61	41.40	56.00	-14.60	QP
6		0.6134	3.80	19.61	23.41	46.00	-22.59	AVG
7		1.1355	13.19	19.62	32.81	56.00	-23.19	QP
8		1.1355	-2.54	19.62	17.08	46.00	-28.92	AVG
9		2.5350	10.57	19.63	30.20	56.00	-25.80	QP
10		2.5350	-3.22	19.63	16.41	46.00	-29.59	AVG
11		6.7785	10.65	19.73	30.38	60.00	-29.62	QP
12		6.7785	-1.02	19.73	18.71	50.00	-31.29	AVG

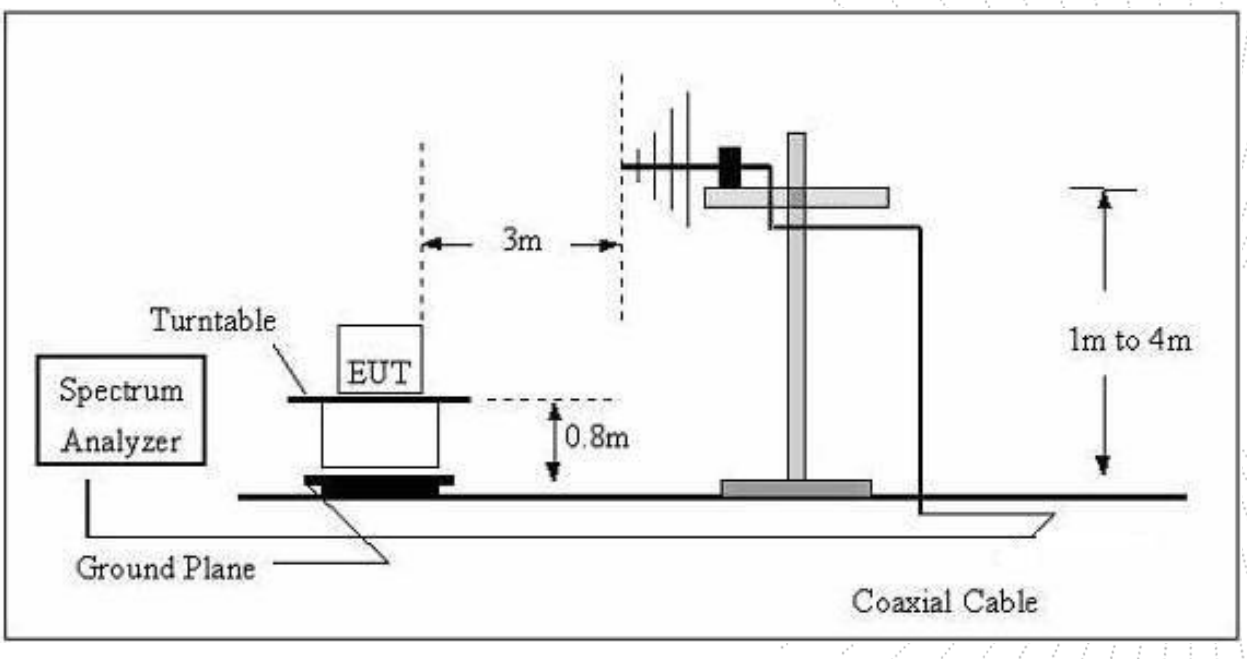
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

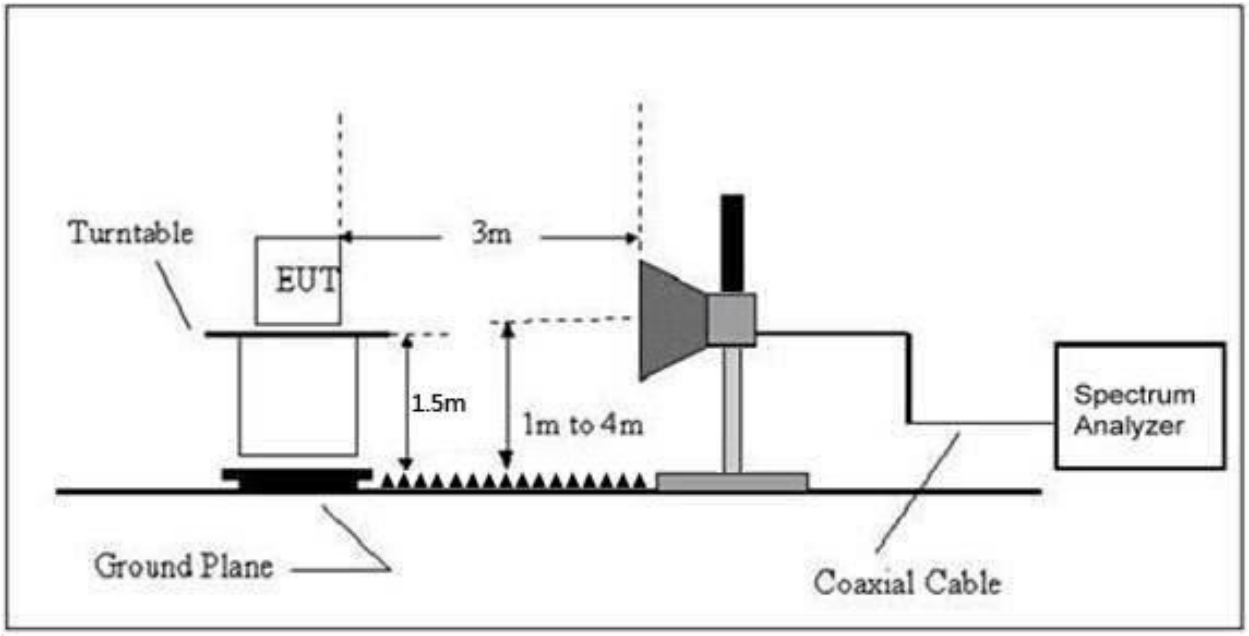
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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.

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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

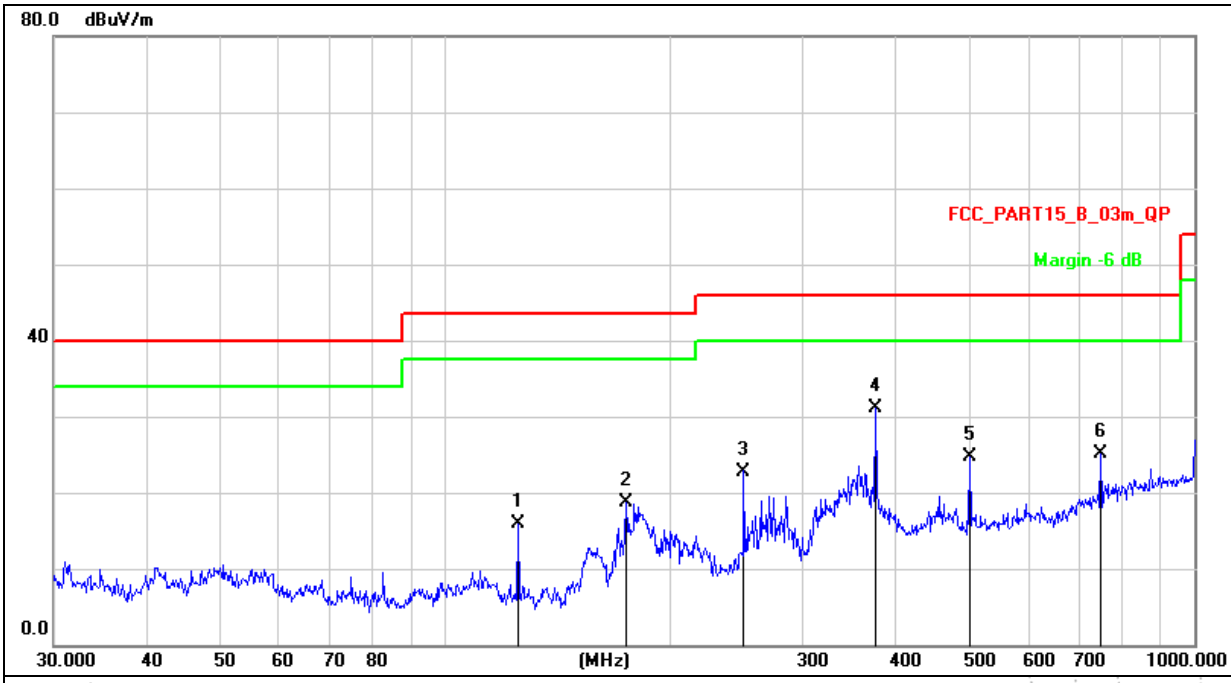
Temperature：	26℃	Relative Humidity：	24%
Pressure：	101 kPa	Test Voltage ：	AC120V/60Hz
Test Mode ：	Mode 4	Polarization :	--

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

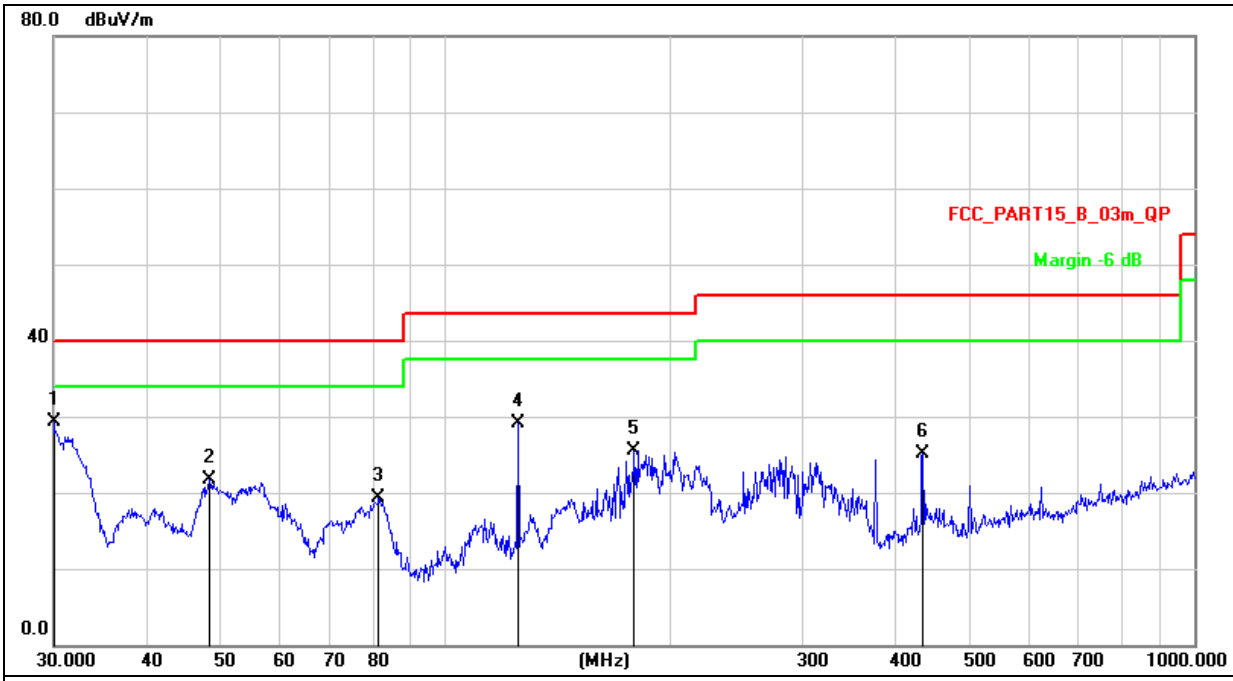
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kPa	Test Voltage ：	AC 120V/60Hz
Test Mode:	Mode 4	Polarization :	Horizontal



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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		125.0066	33.87	-17.89	15.98	43.50	-27.52	QP
2		174.4241	36.69	-17.94	18.75	43.50	-24.75	QP
3		250.3012	37.94	-15.14	22.80	46.00	-23.20	QP
4	*	375.9385	42.77	-11.64	31.13	46.00	-14.87	QP
5		501.1790	33.53	-8.91	24.62	46.00	-21.38	QP
6		750.1083	29.42	-4.34	25.08	46.00	-20.92	QP

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kpa	Test Voltage ：	AC 120V/60Hz
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.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	30.0000	46.52	-17.28	29.24	40.00	-10.76	QP
2		48.5016	36.59	-14.93	21.66	40.00	-18.34	QP
3		81.4970	39.40	-20.06	19.34	40.00	-20.66	QP
4		125.0066	46.94	-17.89	29.05	43.50	-14.45	QP
5		178.7584	43.18	-17.66	25.52	43.50	-17.98	QP
6		434.0651	35.48	-10.33	25.15	46.00	-20.85	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	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.052	62.10	5.94	35.40	44.00	59.44	68.2	-8.76	PK
V	4434.052	43.40	5.94	35.40	44.00	40.74	54	-13.26	AV
V	10360.027	60.65	8.46	39.75	44.50	64.36	68.2	-3.84	PK
V	10360.027	43.09	8.46	39.75	44.50	46.80	54	-7.20	AV
V	15540.189	64.28	10.12	38.80	44.10	69.10	74	-4.90	PK
V	15540.189	43.44	10.12	38.80	42.70	49.66	54	-4.34	AV
H	4434.183	60.53	5.94	35.18	44.00	57.65	68.2	-10.55	PK
H	4434.183	43.28	5.94	35.18	44.00	40.40	54	-13.60	AV
H	10360.015	52.30	8.46	38.71	44.50	54.97	68.2	-13.23	PK
H	10360.015	44.27	8.46	38.71	44.50	46.94	54	-7.06	AV
H	15540.063	51.70	10.12	38.38	44.10	56.10	74	-17.90	PK
H	15540.063	40.52	10.12	38.38	44.10	44.92	54	-9.08	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.109	62.07	6.48	36.35	44.05	60.85	74	-13.15	PK
V	4592.109	43.06	6.48	36.35	44.05	41.84	54	-12.16	AV
V	10400.131	64.49	8.47	37.88	44.51	66.33	68.2	-1.87	PK
V	10400.131	43.33	8.47	37.88	44.51	45.17	54	-8.83	AV
V	15600.036	64.31	10.12	38.80	44.10	69.13	74	-4.87	PK
V	15600.036	43.91	10.12	38.80	42.70	50.13	54	-3.87	AV
H	4592.020	63.41	6.48	36.37	44.05	62.21	74	-11.79	PK
H	4592.020	43.96	6.48	36.37	44.05	42.76	54	-11.24	AV
H	10400.143	54.02	8.47	38.64	44.50	56.63	68.2	-11.57	PK
H	10400.143	41.47	8.47	38.64	44.50	44.08	54	-9.92	AV
H	15600.183	52.45	10.12	38.38	44.10	56.85	74	-17.15	PK
H	15600.183	44.54	10.12	38.38	44.10	48.94	54	-5.06	AV
High Channel (5240 MHz)-Above 1G									
V	4739.098	61.60	7.10	37.24	43.50	62.44	74	-11.56	PK
V	4739.098	43.43	7.10	37.24	43.50	44.27	54	-9.73	AV
V	10480.116	61.44	8.46	37.68	44.50	63.08	68.2	-5.12	PK
V	10480.116	43.75	8.46	37.68	44.50	45.39	54	-8.61	AV
V	15720.200	62.07	10.12	38.80	44.10	66.89	74	-7.11	PK
V	15720.200	43.35	10.12	38.80	42.70	49.57	54	-4.43	AV
H	4739.079	61.41	7.10	37.24	43.50	62.25	74	-11.75	PK
H	4739.079	43.34	7.10	37.24	43.50	44.18	54	-9.82	AV
H	10480.017	52.29	8.46	38.57	44.50	54.82	68.2	-13.38	PK
H	10480.017	40.83	8.46	38.57	44.50	43.36	54	-10.64	AV
H	15720.049	53.68	10.12	38.38	44.10	58.08	74	-15.92	PK
H	15720.049	44.75	10.12	38.38	44.10	49.15	54	-4.85	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	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.013	63.81	5.94	35.40	44.00	61.15	68.2	-7.05	PK
V	4434.013	43.54	5.94	35.40	44.00	40.88	54	-13.12	AV
V	10360.178	60.07	8.46	39.75	44.50	63.78	68.2	-4.42	PK
V	10360.178	43.48	8.46	39.75	44.50	47.19	54	-6.81	AV
V	15540.178	60.14	10.12	38.80	44.10	64.96	74	-9.04	PK
V	15540.178	43.65	10.12	38.80	42.70	49.87	54	-4.13	AV
H	4434.023	61.40	5.94	35.18	44.00	58.52	68.2	-9.68	PK
H	4434.023	43.04	5.94	35.18	44.00	40.16	54	-13.84	AV
H	10360.094	53.72	8.46	38.71	44.50	56.39	68.2	-11.81	PK
H	10360.094	41.98	8.46	38.71	44.50	44.65	54	-9.35	AV
H	15540.107	53.08	10.12	38.38	44.10	57.48	74	-16.52	PK
H	15540.107	43.24	10.12	38.38	44.10	47.64	54	-6.36	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.067	64.69	6.48	36.35	44.05	63.47	74	-10.53	PK
V	4592.067	43.82	6.48	36.35	44.05	42.60	54	-11.40	AV
V	10400.113	61.14	8.47	37.88	44.51	62.98	68.2	-5.22	PK
V	10400.113	43.07	8.47	37.88	44.51	44.91	54	-9.09	AV
V	15600.005	64.86	10.12	38.80	44.10	69.68	74	-4.32	PK
V	15600.005	43.22	10.12	38.80	42.70	49.44	54	-4.56	AV
H	4592.091	61.69	6.48	36.37	44.05	60.49	74	-13.51	PK
H	4592.091	43.40	6.48	36.37	44.05	42.20	54	-11.80	AV
H	10400.188	50.41	8.47	38.64	44.50	53.02	68.2	-15.18	PK
H	10400.188	44.36	8.47	38.64	44.50	46.97	54	-7.03	AV
H	15600.157	51.46	10.12	38.38	44.10	55.86	74	-18.14	PK
H	15600.157	40.60	10.12	38.38	44.10	45.00	54	-9.00	AV
High Channel (5240 MHz)-Above 1G									
V	4739.014	62.10	7.10	37.24	43.50	62.94	74	-11.06	PK
V	4739.014	43.31	7.10	37.24	43.50	44.15	54	-9.85	AV
V	10480.047	64.84	8.46	37.68	44.50	66.48	68.2	-1.72	PK
V	10480.047	43.45	8.46	37.68	44.50	45.09	54	-8.91	AV
V	15720.082	64.89	10.12	38.80	44.10	69.71	74	-4.29	PK
V	15720.082	43.41	10.12	38.80	42.70	49.63	54	-4.37	AV
H	4739.053	61.20	7.10	37.24	43.50	62.04	74	-11.96	PK
H	4739.053	43.58	7.10	37.24	43.50	44.42	54	-9.58	AV
H	10480.188	54.47	8.46	38.57	44.50	57.00	68.2	-11.20	PK
H	10480.188	41.20	8.46	38.57	44.50	43.73	54	-10.27	AV
H	15720.153	52.32	10.12	38.38	44.10	56.72	74	-17.28	PK
H	15720.153	44.96	10.12	38.38	44.10	49.36	54	-4.64	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	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G									
V	4434.086	63.20	5.94	35.40	44.00	60.54	68.2	-7.66	PK
V	4434.086	43.35	5.94	35.40	44.00	40.69	54	-13.31	AV
V	10380.056	63.05	8.46	39.75	44.50	66.76	68.2	-1.44	PK
V	10380.056	43.50	8.46	39.75	44.50	47.21	54	-6.79	AV
V	15570.129	64.90	10.12	38.80	44.10	69.72	74	-4.28	PK
V	15570.129	43.23	10.12	38.80	42.70	49.45	54	-4.55	AV
H	4434.063	64.11	5.94	35.18	44.00	61.23	74	-12.77	PK
H	4434.063	43.91	5.94	35.18	44.00	41.03	54	-12.97	AV
H	10380.132	52.90	8.46	38.71	44.50	55.57	68.2	-12.63	PK
H	10380.132	41.29	8.46	38.71	44.50	43.96	54	-10.04	AV
H	15570.075	51.10	10.12	38.38	44.10	55.50	74	-18.50	PK
H	15570.075	40.93	10.12	38.38	44.10	45.33	54	-8.67	AV
middle Channel (5230 MHz)-Above 1G									
V	4739.197	62.00	6.48	36.35	44.05	60.78	68.2	-7.42	PK
V	4739.197	43.80	6.48	36.35	44.05	42.58	54	-11.42	AV
V	10460.174	64.94	8.47	37.88	44.51	66.78	68.2	-1.42	PK
V	10460.174	43.73	8.47	37.88	44.51	45.57	54	-8.43	AV
V	15690.072	60.33	10.12	38.80	44.10	65.15	74	-8.85	PK
V	15690.072	43.13	10.12	38.80	42.70	49.35	54	-4.65	AV
H	4739.133	63.77	6.48	36.37	44.05	62.57	68.2	-5.63	PK
H	4739.133	43.02	6.48	36.37	44.05	41.82	54	-12.18	AV
H	10460.097	50.56	8.47	38.64	44.50	53.17	68.2	-15.03	PK
H	10460.097	42.21	8.47	38.64	44.50	44.82	54	-9.18	AV
H	15690.090	50.26	10.12	38.38	44.10	54.66	74	-19.34	PK
H	15690.090	42.67	10.12	38.38	44.10	47.07	54	-6.93	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) - 802.11 AC20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.070	63.85	5.94	35.40	44.00	61.19	68.2	-7.01	PK
V	4434.070	43.40	5.94	35.40	44.00	40.74	54	-13.26	AV
V	10360.133	63.03	8.46	39.75	44.50	66.74	68.2	-1.46	PK
V	10360.133	43.73	8.46	39.75	44.50	47.44	54	-6.56	AV
V	15540.174	64.63	10.12	38.80	44.10	69.45	74	-4.55	PK
V	15540.174	43.05	10.12	38.80	42.70	49.27	54	-4.73	AV
H	4434.198	61.52	5.94	35.18	44.00	58.64	68.2	-9.56	PK
H	4434.198	43.88	5.94	35.18	44.00	41.00	54	-13.00	AV
H	10360.172	54.56	8.46	38.71	44.50	57.23	68.2	-10.97	PK
H	10360.172	42.86	8.46	38.71	44.50	45.53	54	-8.47	AV
H	15540.079	53.05	10.12	38.38	44.10	57.45	74	-16.55	PK
H	15540.079	41.60	10.12	38.38	44.10	46.00	54	-8.00	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.000	62.20	6.48	36.35	44.05	60.98	74	-13.02	PK
V	4592.000	43.26	6.48	36.35	44.05	42.04	54	-11.96	AV
V	10400.104	60.98	8.47	37.88	44.51	62.82	68.2	-5.38	PK
V	10400.104	43.95	8.47	37.88	44.51	45.79	54	-8.21	AV
V	15600.091	64.44	10.12	38.80	44.10	69.26	74	-4.74	PK
V	15600.091	43.09	10.12	38.80	42.70	49.31	54	-4.69	AV
H	4592.030	64.48	6.48	36.37	44.05	63.28	74	-10.72	PK
H	4592.030	43.24	6.48	36.37	44.05	42.04	54	-11.96	AV
H	10400.174	52.08	8.47	38.64	44.50	54.69	68.2	-13.51	PK
H	10400.174	41.45	8.47	38.64	44.50	44.06	54	-9.94	AV
H	15600.027	51.53	10.12	38.38	44.10	55.93	74	-18.07	PK
H	15600.027	41.88	10.12	38.38	44.10	46.28	54	-7.72	AV
High Channel (5240 MHz)-Above 1G									
V	4739.063	62.07	7.10	37.24	43.50	62.91	74	-11.09	PK
V	4739.063	43.16	7.10	37.24	43.50	44.00	54	-10.00	AV
V	10480.005	62.90	8.46	37.68	44.50	64.54	68.2	-3.66	PK
V	10480.005	43.84	8.46	37.68	44.50	45.48	54	-8.52	AV
V	15720.060	64.81	10.12	38.80	44.10	69.63	74	-4.37	PK
V	15720.060	43.51	10.12	38.80	42.70	49.73	54	-4.27	AV
H	4739.142	61.22	7.10	37.24	43.50	62.06	74	-11.94	PK
H	4739.142	43.08	7.10	37.24	43.50	43.92	54	-10.08	AV
H	10480.157	50.18	8.46	38.57	44.50	52.71	68.2	-15.49	PK
H	10480.157	43.23	8.46	38.57	44.50	45.76	54	-8.24	AV
H	15720.179	53.38	10.12	38.38	44.10	57.78	74	-16.22	PK
H	15720.179	44.00	10.12	38.38	44.10	48.40	54	-5.60	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) - 802.11 AC40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G									
V	4434.005	64.33	5.94	35.40	44.00	61.67	68.2	-6.53	PK
V	4434.005	43.99	5.94	35.40	44.00	41.33	54	-12.67	AV
V	10380.113	60.01	8.46	39.75	44.50	63.72	68.2	-4.48	PK
V	10380.113	43.38	8.46	39.75	44.50	47.09	54	-6.91	AV
V	15570.175	64.08	10.12	38.80	44.10	68.90	74	-5.10	PK
V	15570.175	43.43	10.12	38.80	42.70	49.65	54	-4.35	AV
H	4434.132	61.25	5.94	35.18	44.00	58.37	74	-15.63	PK
H	4434.132	43.83	5.94	35.18	44.00	40.95	54	-13.05	AV
H	10380.200	53.13	8.46	38.71	44.50	55.80	68.2	-12.40	PK
H	10380.200	40.63	8.46	38.71	44.50	43.30	54	-10.70	AV
H	15570.130	53.47	10.12	38.38	44.10	57.87	74	-16.13	PK
H	15570.130	41.39	10.12	38.38	44.10	45.79	54	-8.21	AV
middle Channel (5230 MHz)-Above 1G									
V	4739.134	64.89	6.48	36.35	44.05	63.67	68.2	-4.53	PK
V	4739.134	43.91	6.48	36.35	44.05	42.69	54	-11.31	AV
V	10460.057	64.60	8.47	37.88	44.51	66.44	68.2	-1.76	PK
V	10460.057	43.91	8.47	37.88	44.51	45.75	54	-8.25	AV
V	15690.068	64.07	10.12	38.80	44.10	68.89	74	-5.11	PK
V	15690.068	43.03	10.12	38.80	42.70	49.25	54	-4.75	AV
H	4739.066	64.48	6.48	36.37	44.05	63.28	68.2	-4.92	PK
H	4739.066	43.05	6.48	36.37	44.05	41.85	54	-12.15	AV
H	10460.146	54.46	8.47	38.64	44.50	57.07	68.2	-11.13	PK
H	10460.146	41.08	8.47	38.64	44.50	43.69	54	-10.31	AV
H	15690.179	51.91	10.12	38.38	44.10	56.31	74	-17.69	PK
H	15690.179	44.35	10.12	38.38	44.10	48.75	54	-5.25	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) - 802.11 AC80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
(5210 MHz)-Above 1G									
V	4434.032	60.63	5.94	35.40	44.00	57.97	68.2	-10.23	PK
V	4434.032	43.22	5.94	35.40	44.00	40.56	54	-13.44	AV
V	10420.185	61.45	8.46	39.75	44.50	65.16	68.2	-3.04	PK
V	10420.185	43.19	8.46	39.75	44.50	46.90	54	-7.10	AV
V	15630.156	63.28	10.12	38.80	44.10	68.10	74	-5.90	PK
V	15630.156	43.40	10.12	38.80	42.70	49.62	54	-4.38	AV
H	4434.162	62.36	5.94	35.18	44.00	59.48	68.2	-8.72	PK
H	4434.162	43.59	5.94	35.18	44.00	40.71	54	-13.29	AV
H	10420.014	51.17	8.46	38.71	44.50	53.84	68.2	-14.36	PK
H	10420.014	43.44	8.46	38.71	44.50	46.11	54	-7.89	AV
H	15630.140	51.29	10.12	38.38	44.10	55.69	74	-18.31	PK
H	15630.140	43.69	10.12	38.38	44.10	48.09	54	-5.91	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) -- 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.120	59.36	5.94	35.40	44.00	56.70	74	-17.30	PK
V	4679.120	43.09	5.94	35.40	44.00	40.43	54	-13.57	AV
V	11490.057	54.80	8.46	39.75	44.50	58.51	68.2	-9.69	PK
V	11490.057	43.31	8.46	39.75	44.50	47.02	54	-6.98	AV
V	17235.158	59.04	10.12	38.80	44.10	63.86	68.2	-4.34	PK
V	17235.158	43.85	10.12	38.80	42.70	50.07	54	-3.93	AV
H	4679.035	56.16	5.94	35.18	44.00	53.28	74	-20.72	PK
H	4679.035	43.20	5.94	35.18	44.00	40.32	54	-13.68	AV
H	11490.049	52.99	8.46	38.71	44.50	55.66	68.2	-12.54	PK
H	11490.049	43.86	8.46	38.71	44.50	46.53	54	-7.47	AV
H	17235.138	50.51	10.12	38.38	44.10	54.91	68.2	-13.29	PK
H	17235.138	44.50	10.12	38.38	44.10	48.90	54	-5.10	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.003	58.06	6.48	36.35	44.05	56.84	74	-17.16	PK
V	4592.003	43.85	6.48	36.35	44.05	42.63	54	-11.37	AV
V	11570.190	57.67	8.47	37.88	44.51	59.51	68.2	-8.69	PK
V	11570.190	43.75	8.47	37.88	44.51	45.59	54	-8.41	AV
V	17355.084	57.00	10.12	38.80	44.10	61.82	68.2	-6.38	PK
V	17355.084	39.28	10.12	38.80	42.70	45.50	54	-8.50	AV
H	4592.165	57.75	6.48	36.37	44.05	56.55	74	-17.45	PK
H	4592.165	43.54	6.48	36.37	44.05	42.34	54	-11.66	AV
H	11570.077	54.44	8.47	38.64	44.50	57.05	68.2	-11.15	PK
H	11570.077	43.98	8.47	38.64	44.50	46.59	54	-7.41	AV
H	17355.139	53.30	10.12	38.38	44.10	57.70	68.2	-10.50	PK
H	17355.139	43.69	10.12	38.38	44.10	48.09	54	-5.91	AV
High Channel (5825 MHz)-Above 1G									
V	6039.081	60.99	7.10	37.24	43.50	61.83	68.2	-6.37	PK
V	6039.081	43.71	7.10	37.24	43.50	44.55	54	-9.45	AV
V	11650.187	59.50	8.46	37.68	44.50	61.14	74	-12.86	PK
V	11650.187	43.62	8.46	37.68	44.50	45.26	54	-8.74	AV
V	17475.126	57.40	10.12	38.80	44.10	62.22	68.2	-5.98	PK
V	17475.126	43.20	10.12	38.80	42.70	49.42	54	-4.58	AV
H	6039.049	55.63	7.10	37.24	43.50	56.47	68.2	-11.73	PK
H	6039.049	43.47	7.10	37.24	43.50	44.31	54	-9.69	AV
H	11650.124	52.42	8.46	38.57	44.50	54.95	74	-19.05	PK
H	11650.124	43.50	8.46	38.57	44.50	46.03	54	-7.97	AV
H	17475.134	53.14	10.12	38.38	44.10	57.54	68.2	-10.66	PK
H	17475.134	40.46	10.12	38.38	44.10	44.86	54	-9.14	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 (5.8G) --802.11n-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.145	57.90	5.94	35.40	44.00	55.24	74	-18.76	PK
V	4679.145	43.31	5.94	35.40	44.00	40.65	54	-13.35	AV
V	11490.161	55.11	8.46	39.75	44.50	58.82	68.2	-9.38	PK
V	11490.161	43.23	8.46	39.75	44.50	46.94	54	-7.06	AV
V	17235.135	62.00	10.12	38.80	44.10	66.82	68.2	-1.38	PK
V	17235.135	43.82	10.12	38.80	42.70	50.04	54	-3.96	AV
H	4679.181	58.95	5.94	35.18	44.00	56.07	74	-17.93	PK
H	4679.181	43.13	5.94	35.18	44.00	40.25	54	-13.75	AV
H	11490.166	50.93	8.46	38.71	44.50	53.60	68.2	-14.60	PK
H	11490.166	44.74	8.46	38.71	44.50	47.41	54	-6.59	AV
H	17235.178	51.74	10.12	38.38	44.10	56.14	68.2	-12.06	PK
H	17235.178	41.10	10.12	38.38	44.10	45.50	54	-8.50	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.134	60.44	6.48	36.35	44.05	59.22	74	-14.78	PK
V	4592.134	43.72	6.48	36.35	44.05	42.50	54	-11.50	AV
V	11570.131	58.76	8.47	37.88	44.51	60.60	68.2	-7.60	PK
V	11570.131	43.04	8.47	37.88	44.51	44.88	54	-9.12	AV
V	17355.053	59.60	10.12	38.80	44.10	64.42	68.2	-3.78	PK
V	17355.053	43.14	10.12	38.80	42.70	49.36	54	-4.64	AV
H	4592.144	60.61	6.48	36.37	44.05	59.41	74	-14.59	PK
H	4592.144	43.62	6.48	36.37	44.05	42.42	54	-11.58	AV
H	11570.128	52.20	8.47	38.64	44.50	54.81	68.2	-13.39	PK
H	11570.128	41.87	8.47	38.64	44.50	44.48	54	-9.52	AV
H	17355.031	53.05	10.12	38.38	44.10	57.45	68.2	-10.75	PK
H	17355.031	41.03	10.12	38.38	44.10	45.43	54	-8.57	AV
High Channel (5825 MHz)-Above 1G									
V	6039.110	57.22	7.10	37.24	43.50	58.06	68.2	-10.14	PK
V	6039.110	43.74	7.10	37.24	43.50	44.58	54	-9.42	AV
V	11650.189	58.76	8.46	37.68	44.50	60.40	74	-13.60	PK
V	11650.189	43.43	8.46	37.68	44.50	45.07	54	-8.93	AV
V	17475.062	57.99	10.12	38.80	44.10	62.81	68.2	-5.39	PK
V	17475.062	43.48	10.12	38.80	42.70	49.70	54	-4.30	AV
H	6039.143	56.75	7.10	37.24	43.50	57.59	68.2	-10.61	PK
H	6039.143	43.93	7.10	37.24	43.50	44.77	54	-9.23	AV
H	11650.191	54.64	8.46	38.57	44.50	57.17	74	-16.83	PK
H	11650.191	42.21	8.46	38.57	44.50	44.74	54	-9.26	AV
H	17475.041	52.78	10.12	38.38	44.10	57.18	68.2	-11.02	PK
H	17475.041	42.64	10.12	38.38	44.10	47.04	54	-6.96	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 (5.8G) -- 802.11n-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5755 MHz)-Above 1G									
V	4679.047	59.42	5.94	35.40	44.00	56.76	74	-17.24	PK
V	4679.047	43.25	5.94	35.40	44.00	40.59	54	-13.41	AV
V	11510.056	55.85	8.46	39.75	44.50	59.56	74	-14.44	PK
V	11510.056	43.28	8.46	39.75	44.50	46.99	54	-7.01	AV
V	17265.026	56.50	10.12	38.80	44.10	61.32	68.2	-6.88	PK
V	17265.026	2.00	10.12	38.80	42.70	8.22	54	-45.78	AV
H	4679.076	60.36	5.94	35.18	44.00	57.48	74	-16.52	PK
H	4679.076	43.62	5.94	35.18	44.00	40.74	54	-13.26	AV
H	11510.128	54.38	8.46	38.71	44.50	57.05	74	-16.95	PK
H	11510.128	41.59	8.46	38.71	44.50	44.26	54	-9.74	AV
H	17265.083	53.96	10.12	38.38	44.10	58.36	68.2	-9.84	PK
H	17265.083	42.18	10.12	38.38	44.10	46.58	54	-7.42	AV
middle Channel (5795 MHz)-Above 1G									
V	6039.091	56.77	6.48	36.35	44.05	55.55	68.2	-12.65	PK
V	6039.091	43.51	6.48	36.35	44.05	42.29	54	-11.71	AV
V	11590.008	59.34	8.47	37.88	44.51	61.18	74	-12.82	PK
V	11590.008	43.18	8.47	37.88	44.51	45.02	54	-8.98	AV
V	17385.185	55.22	10.12	38.80	44.10	60.04	68.2	-8.16	PK
V	17385.185	41.56	10.12	38.80	42.70	47.78	54	-6.22	AV
H	6039.105	58.34	6.48	36.37	44.05	57.14	68.2	-11.06	PK
H	6039.105	43.23	6.48	36.37	44.05	42.03	54	-11.97	AV
H	11590.176	52.48	8.47	38.64	44.50	55.09	74	-18.91	PK
H	11590.176	41.98	8.47	38.64	44.50	44.59	54	-9.41	AV
H	17385.138	54.00	10.12	38.38	44.10	58.40	68.2	-9.80	PK
H	17385.138	41.18	10.12	38.38	44.10	45.58	54	-8.42	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) --802.11AC20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.126	58.35	5.94	35.40	44.00	55.69	74	-18.31	PK
V	4679.126	43.45	5.94	35.40	44.00	40.79	54	-13.21	AV
V	11490.035	56.20	8.46	39.75	44.50	59.91	68.2	-8.29	PK
V	11490.035	43.23	8.46	39.75	44.50	46.94	54	-7.06	AV
V	17235.121	61.79	10.12	38.80	44.10	66.61	68.2	-1.59	PK
V	17235.121	43.24	10.12	38.80	42.70	49.46	54	-4.54	AV
H	4679.098	59.46	5.94	35.18	44.00	56.58	74	-17.42	PK
H	4679.098	43.74	5.94	35.18	44.00	40.86	54	-13.14	AV
H	11490.172	48.69	8.46	38.71	44.50	51.36	68.2	-16.84	PK
H	11490.172	44.93	8.46	38.71	44.50	47.60	54	-6.40	AV
H	17235.067	51.32	10.12	38.38	44.10	55.72	68.2	-12.48	PK
H	17235.067	40.06	10.12	38.38	44.10	44.46	54	-9.54	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.126	61.31	6.48	36.35	44.05	60.09	74	-13.91	PK
V	4592.126	43.45	6.48	36.35	44.05	42.23	54	-11.77	AV
V	11570.008	55.11	8.47	37.88	44.51	56.95	68.2	-11.25	PK
V	11570.008	43.27	8.47	37.88	44.51	45.11	54	-8.89	AV
V	17355.195	59.50	10.12	38.80	44.10	64.32	68.2	-3.88	PK
V	17355.195	43.67	10.12	38.80	42.70	49.89	54	-4.11	AV
H	4592.059	58.87	6.48	36.37	44.05	57.67	74	-16.33	PK
H	4592.059	43.48	6.48	36.37	44.05	42.28	54	-11.72	AV
H	11570.096	52.89	8.47	38.64	44.50	55.50	68.2	-12.70	PK
H	11570.096	41.74	8.47	38.64	44.50	44.35	54	-9.65	AV
H	17355.089	53.11	10.12	38.38	44.10	57.51	68.2	-10.69	PK
H	17355.089	43.13	10.12	38.38	44.10	47.53	54	-6.47	AV
High Channel (5825 MHz)-Above 1G									
V	6039.190	56.27	7.10	37.24	43.50	57.11	68.2	-11.09	PK
V	6039.190	43.72	7.10	37.24	43.50	44.56	54	-9.44	AV
V	11650.039	58.54	8.46	37.68	44.50	60.18	74	-13.82	PK
V	11650.039	43.16	8.46	37.68	44.50	44.80	54	-9.20	AV
V	17475.136	57.72	10.12	38.80	44.10	62.54	68.2	-5.66	PK
V	17475.136	43.75	10.12	38.80	42.70	49.97	54	-4.03	AV
H	6039.169	59.34	7.10	37.24	43.50	60.18	68.2	-8.02	PK
H	6039.169	43.26	7.10	37.24	43.50	44.10	54	-9.90	AV
H	11650.170	54.29	8.46	38.57	44.50	56.82	74	-17.18	PK
H	11650.170	43.48	8.46	38.57	44.50	46.01	54	-7.99	AV
H	17475.146	54.83	10.12	38.38	44.10	59.23	68.2	-8.97	PK
H	17475.146	42.67	10.12	38.38	44.10	47.07	54	-6.93	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) -- 802.11AC40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5755 MHz)-Above 1G									
V	4679.154	58.99	5.94	35.40	44.00	56.33	74	-17.67	PK
V	4679.154	43.93	5.94	35.40	44.00	41.27	54	-12.73	AV
V	11510.166	55.74	8.46	39.75	44.50	59.45	74	-14.55	PK
V	11510.166	43.35	8.46	39.75	44.50	47.06	54	-6.94	AV
V	17265.144	59.75	10.12	38.80	44.10	64.57	68.2	-3.63	PK
V	17265.144	2.00	10.12	38.80	42.70	8.22	54	-45.78	AV
H	4679.131	59.67	5.94	35.18	44.00	56.79	74	-17.21	PK
H	4679.131	43.20	5.94	35.18	44.00	40.32	54	-13.68	AV
H	11510.064	50.68	8.46	38.71	44.50	53.35	74	-20.65	PK
H	11510.064	42.50	8.46	38.71	44.50	45.17	54	-8.83	AV
H	17265.186	50.68	10.12	38.38	44.10	55.08	68.2	-13.12	PK
H	17265.186	42.82	10.12	38.38	44.10	47.22	54	-6.78	AV
middle Channel (5795 MHz)-Above 1G									
V	6039.122	56.74	6.48	36.35	44.05	55.52	68.2	-12.68	PK
V	6039.122	43.99	6.48	36.35	44.05	42.77	54	-11.23	AV
V	11590.077	55.37	8.47	37.88	44.51	57.21	74	-16.79	PK
V	11590.077	43.52	8.47	37.88	44.51	45.36	54	-8.64	AV
V	17385.165	55.11	10.12	38.80	44.10	59.93	68.2	-8.27	PK
V	17385.165	41.59	10.12	38.80	42.70	47.81	54	-6.19	AV
H	6039.049	59.90	6.48	36.37	44.05	58.70	68.2	-9.50	PK
H	6039.049	43.77	6.48	36.37	44.05	42.57	54	-11.43	AV
H	11590.157	54.22	8.47	38.64	44.50	56.83	74	-17.17	PK
H	11590.157	44.49	8.47	38.64	44.50	47.10	54	-6.90	AV
H	17385.074	51.22	10.12	38.38	44.10	55.62	68.2	-12.58	PK
H	17385.074	40.50	10.12	38.38	44.10	44.90	54	-9.10	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.

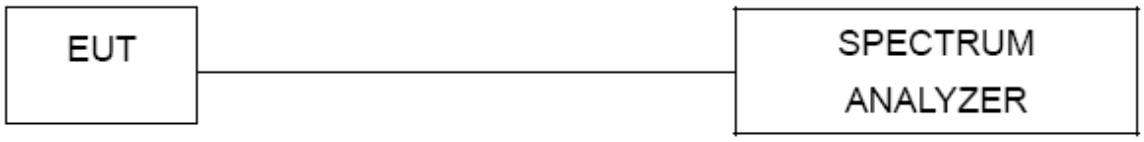
Test Mode :	TX (5.8G) -- 802.11AC80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5775 MHz)-Above 1G									
V	4679.071	58.78	5.94	35.40	44.00	56.12	74	-17.88	PK
V	4679.071	43.74	5.94	35.40	44.00	41.08	54	-12.92	AV
V	11550.126	58.88	8.46	39.75	44.50	62.59	74	-11.41	PK
V	11550.126	42.01	8.46	39.75	44.50	45.72	54	-8.28	AV
V	17325.041	59.23	10.12	38.80	44.10	64.05	68.2	-4.15	PK
V	17325.041	41.52	10.12	38.80	42.70	47.74	54	-6.26	AV
H	4679.179	59.00	5.94	35.18	44.00	56.12	74	-17.88	PK
H	4679.179	43.17	5.94	35.18	44.00	40.29	54	-13.71	AV
H	11550.083	54.98	8.46	38.71	44.50	57.65	74	-16.35	PK
H	11550.083	42.03	8.46	38.71	44.50	44.70	54	-9.30	AV
H	17325.182	50.70	10.12	38.38	44.10	55.10	68.2	-13.10	PK
H	17325.182	42.66	10.12	38.38	44.10	47.06	54	-6.94	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.

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8.4 EUT Operating Conditions

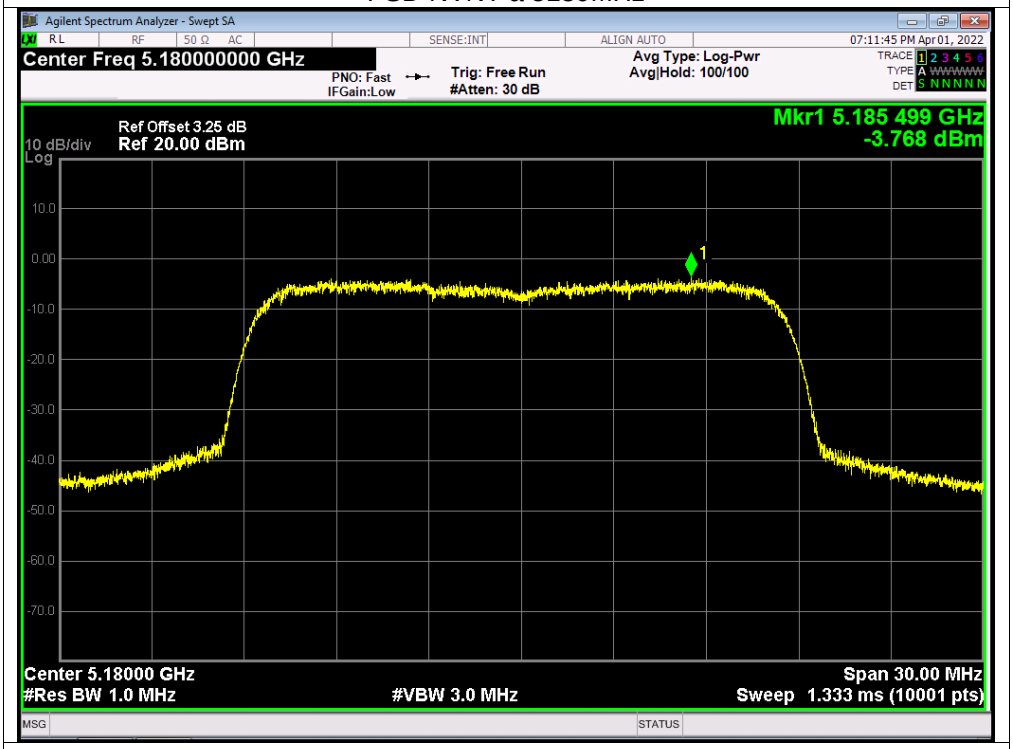
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

8.5 Test Result

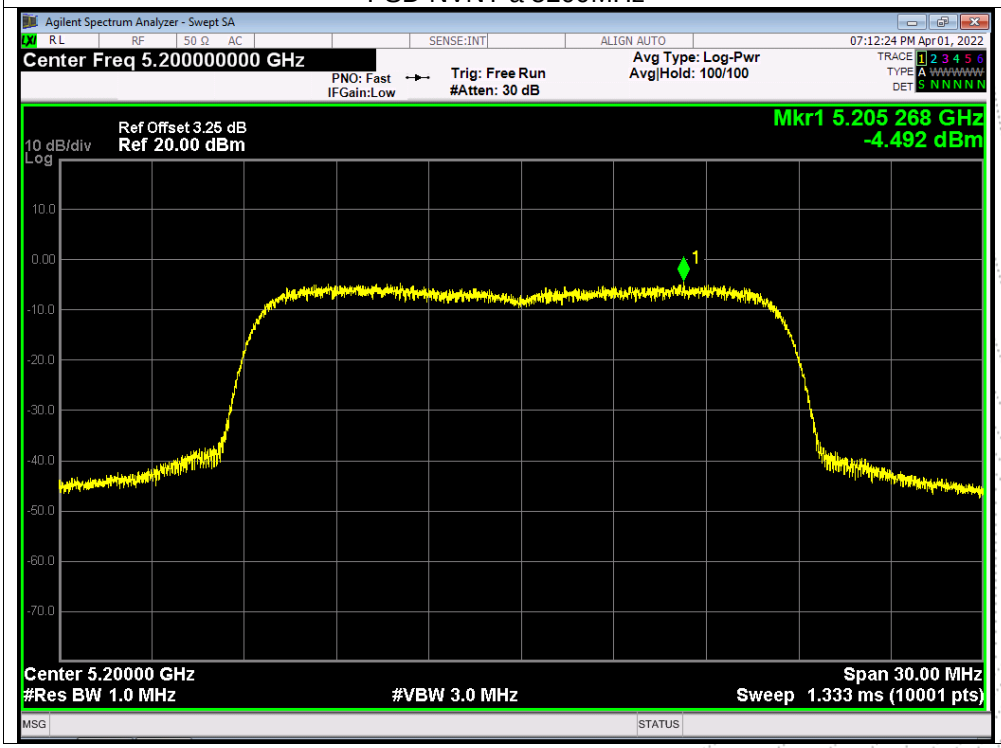
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

Test Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
802.11 a	5180 MHz	-3.77	11	PASS
	5200 MHz	-4.49	11	PASS
	5240 MHz	-4.42	11	PASS
802.11 n20	5180 MHz	-3.73	11	PASS
	5200 MHz	-5.87	11	PASS
	5240 MHz	-4.21	11	PASS
802.11 n40	5190 MHz	-6.65	11	PASS
	5230 MHz	-6.74	11	PASS
802.11 AC20	5180 MHz	-4.53	11	PASS
	5200 MHz	-5.47	11	PASS
	5240 MHz	-4.1	11	PASS
802.11 AC40	5190 MHz	-7.41	11	PASS
	5230 MHz	-8.2	11	PASS
802.11 AC80	5210 MHz	-10.44	11	PASS

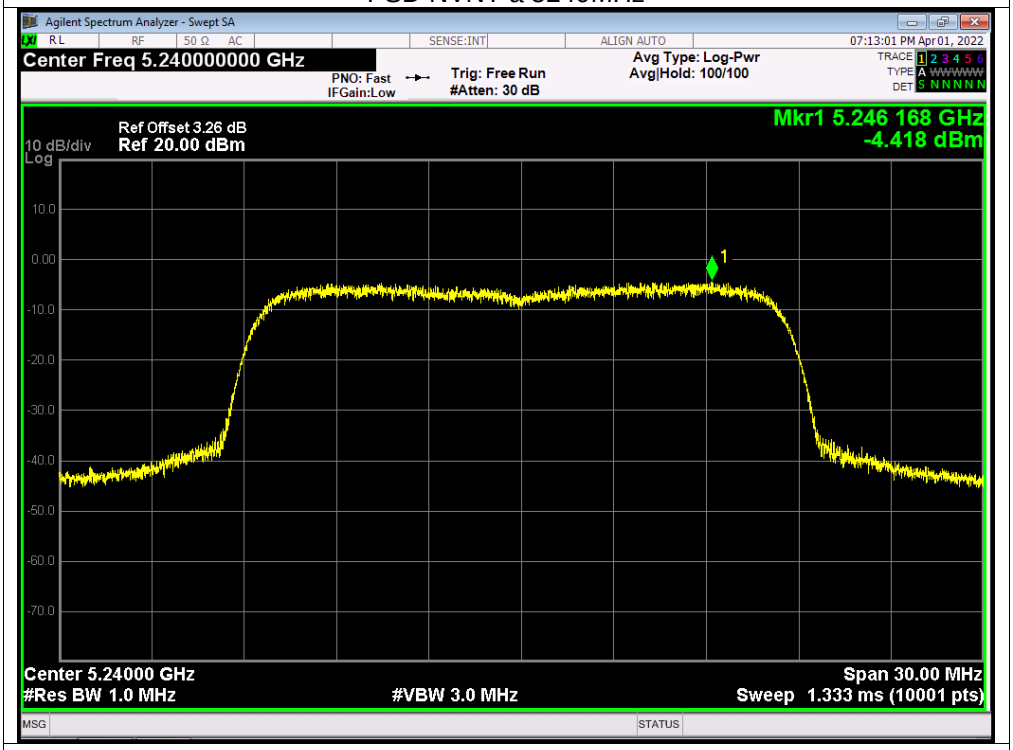
Test Graphs
PSD NVNT a 5180MHz



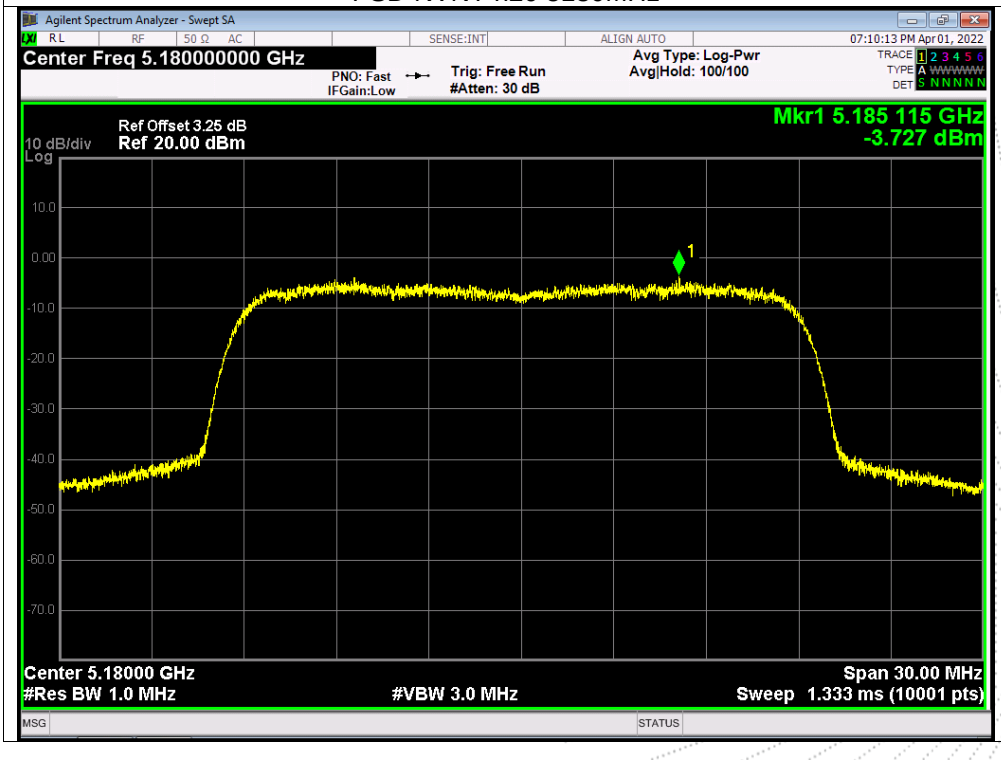
PSD NVNT a 5200MHz



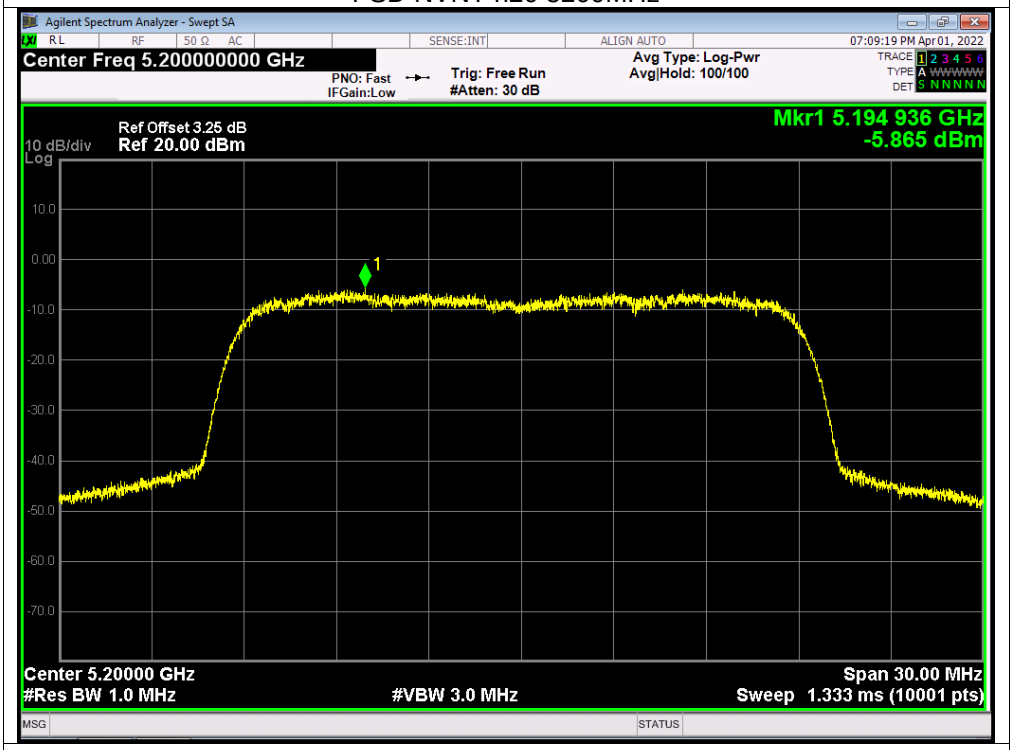
PSD NVNT a 5240MHz



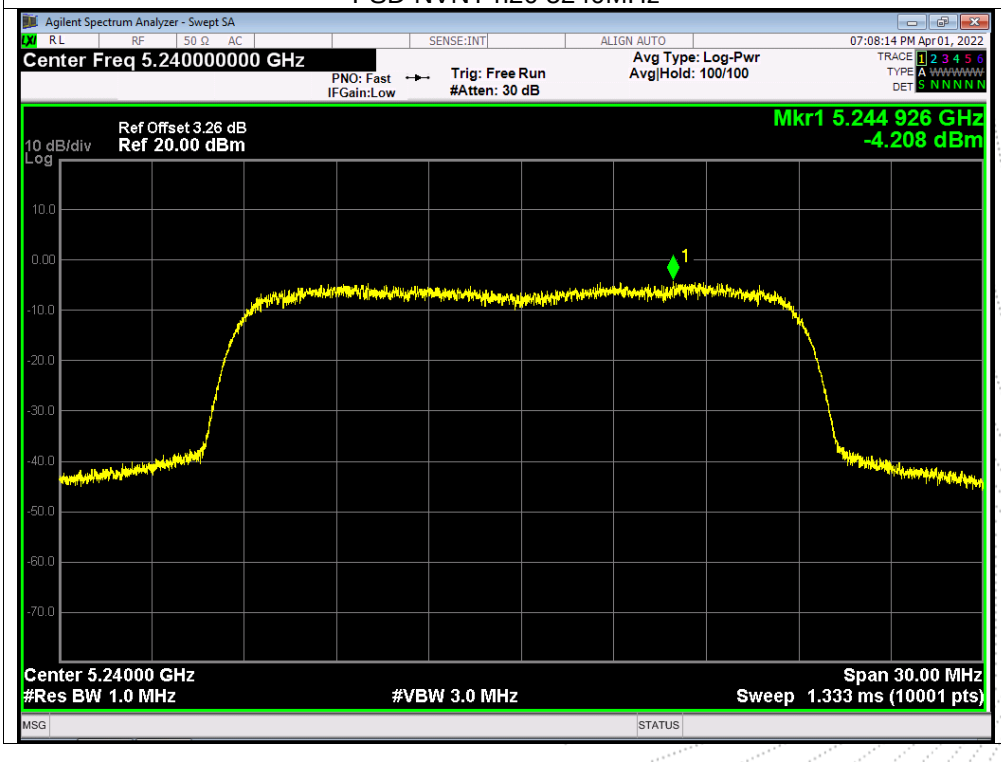
PSD NVNT n20 5180MHz



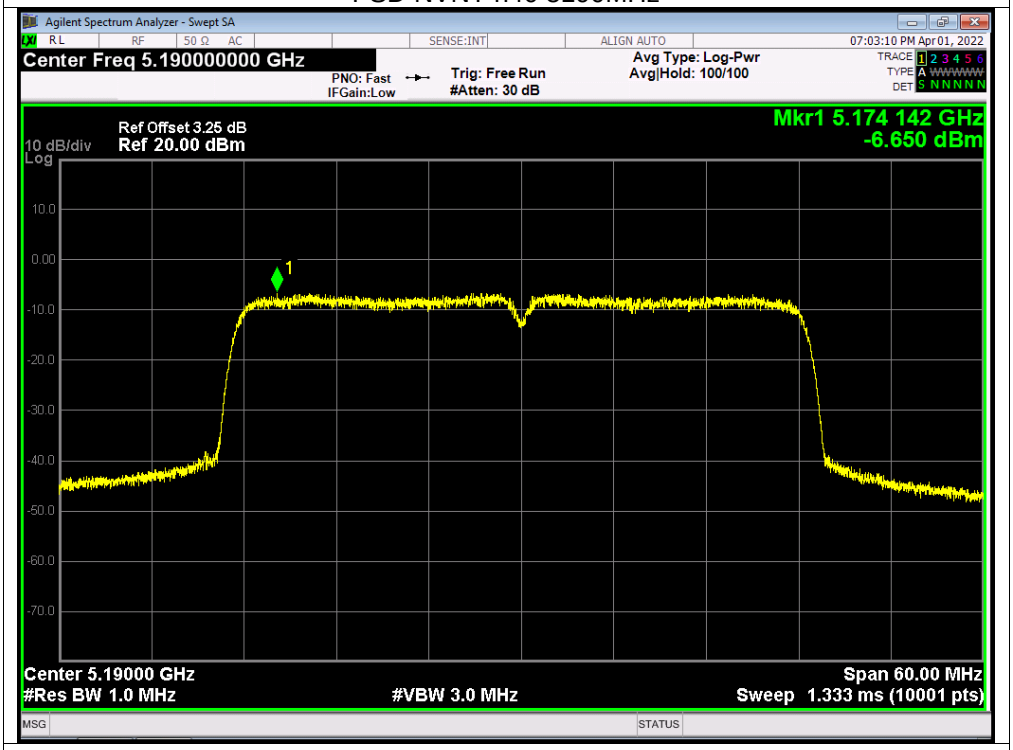
PSD NVNT n20 5200MHz



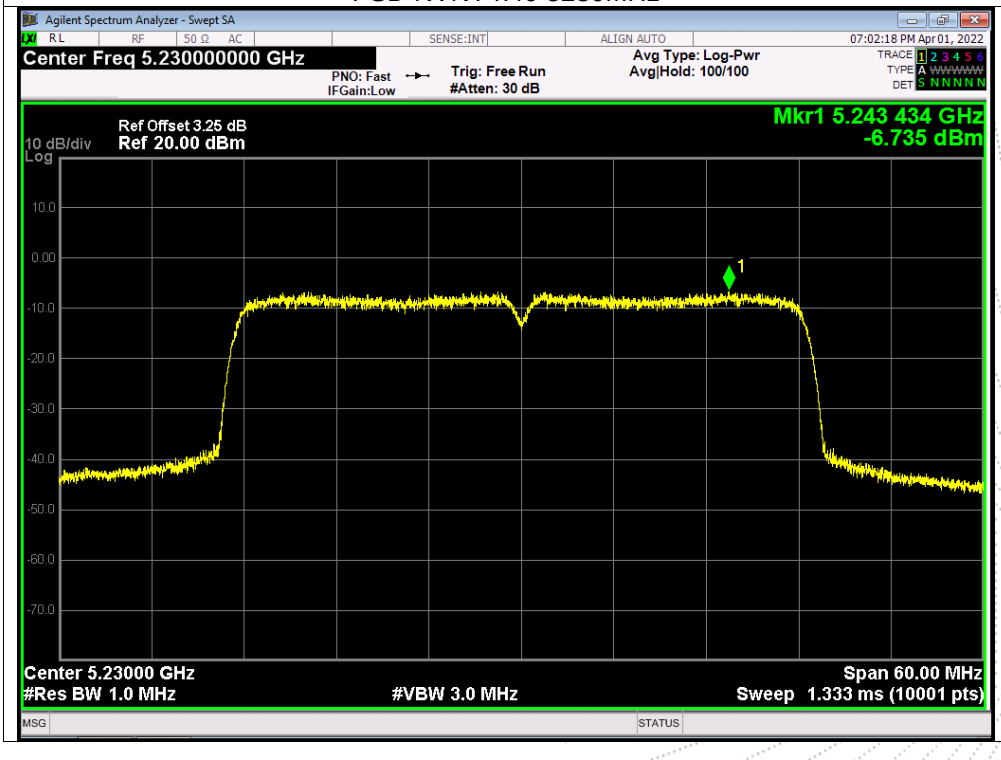
PSD NVNT n20 5240MHz



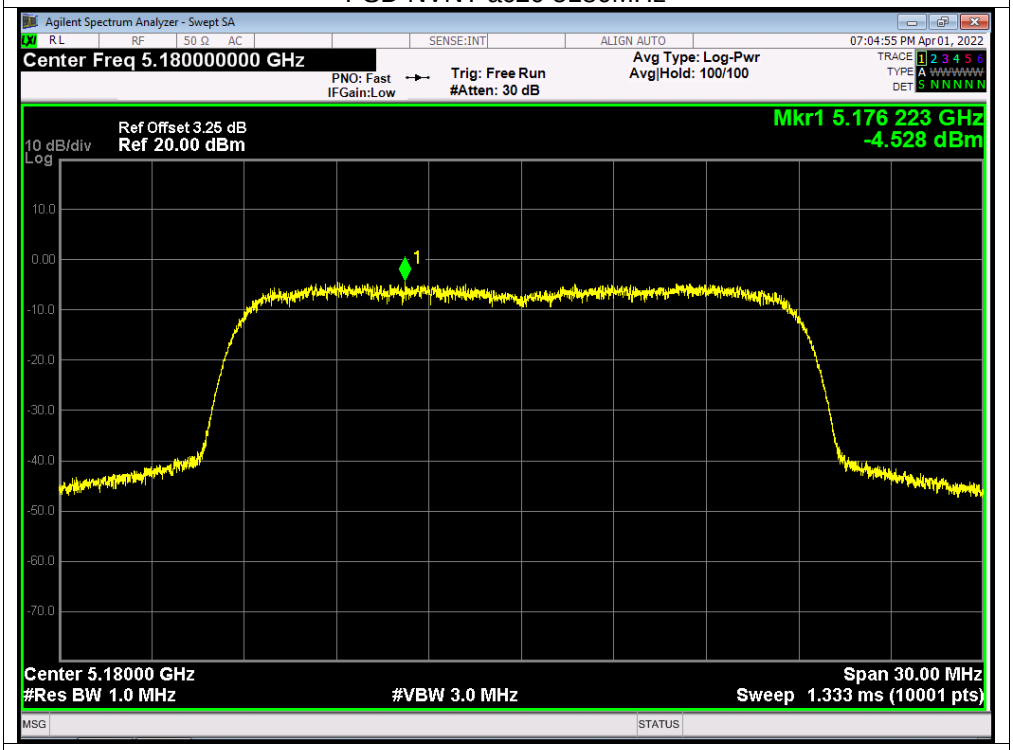
PSD NVNT n40 5190MHz



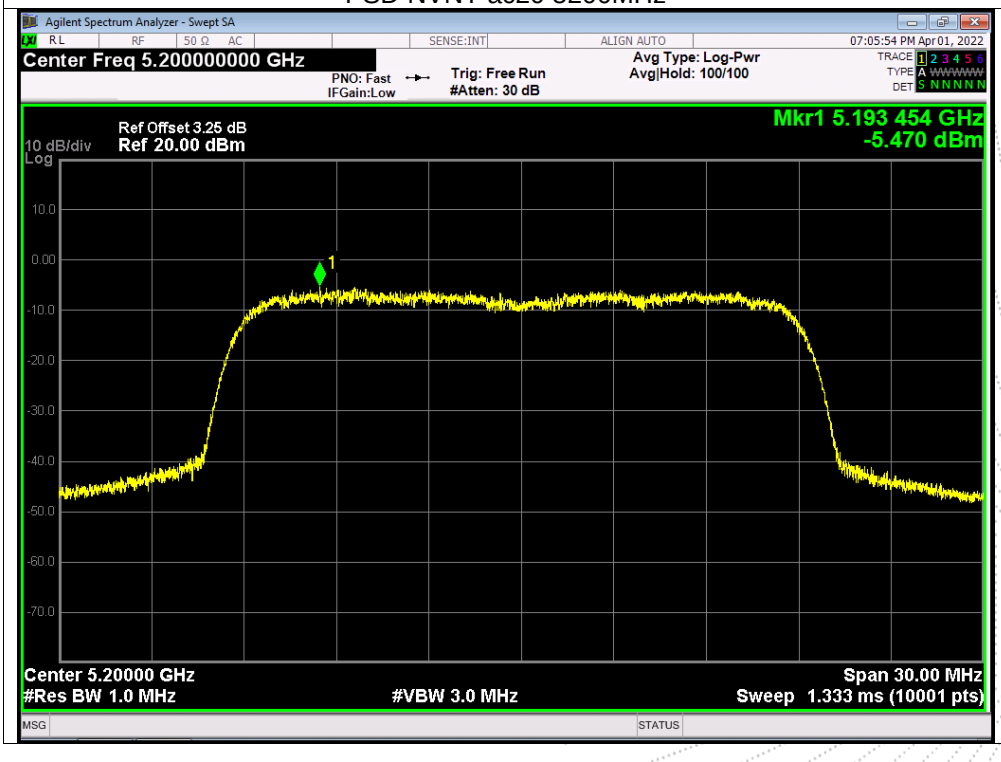
PSD NVNT n40 5230MHz



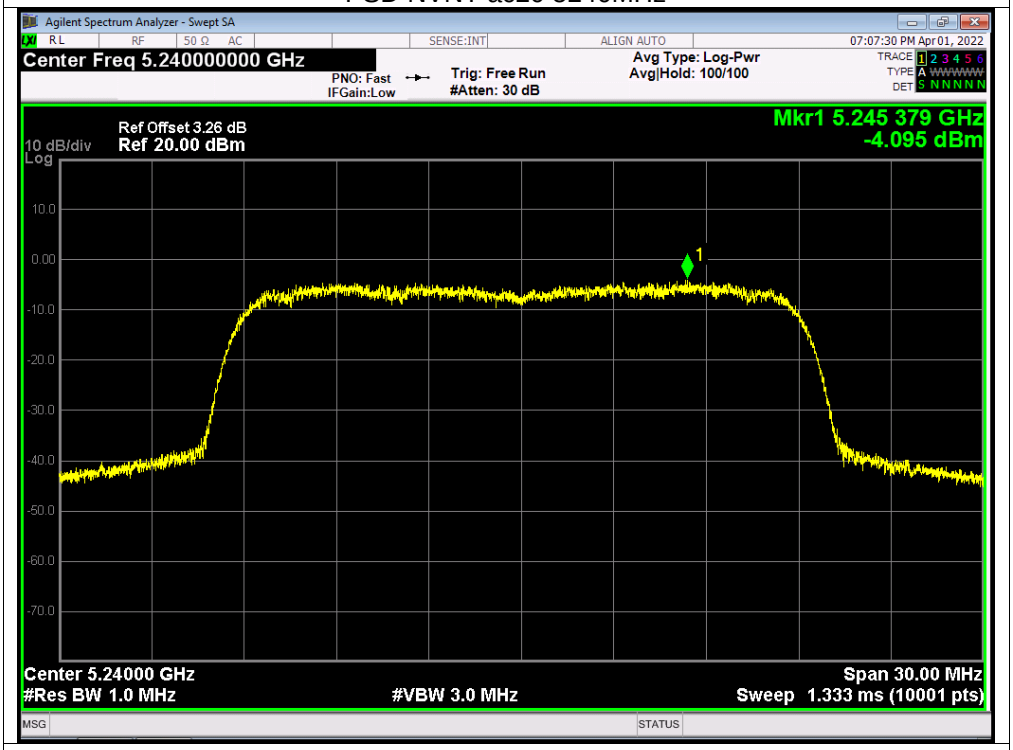
PSD NVNT ac20 5180MHz



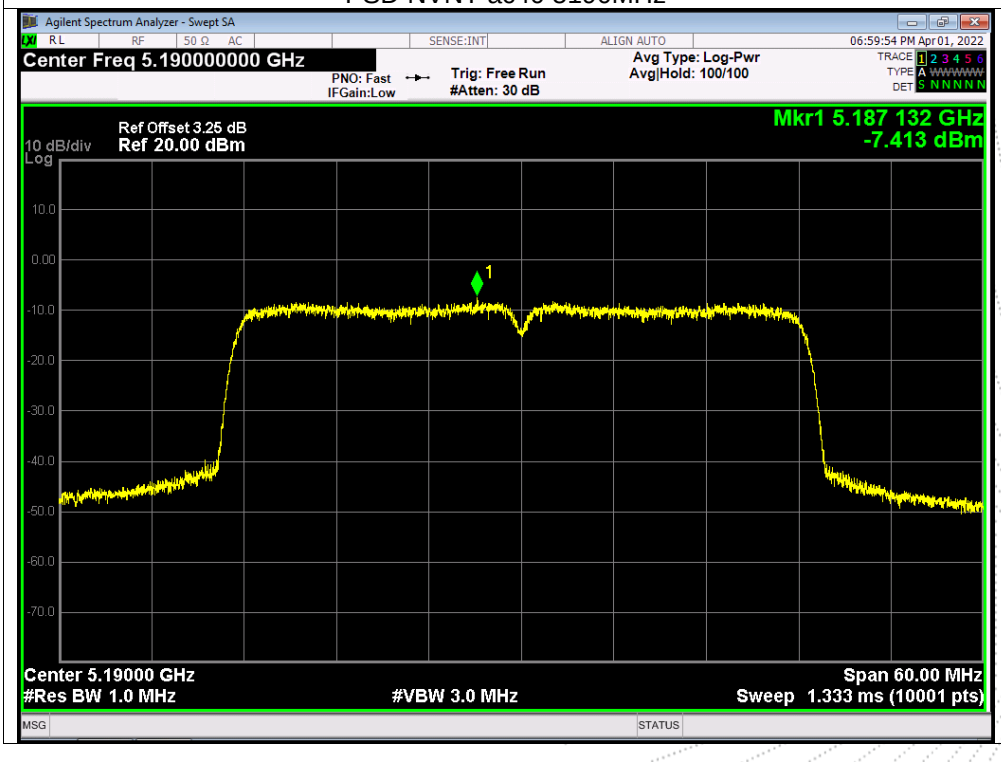
PSD NVNT ac20 5200MHz



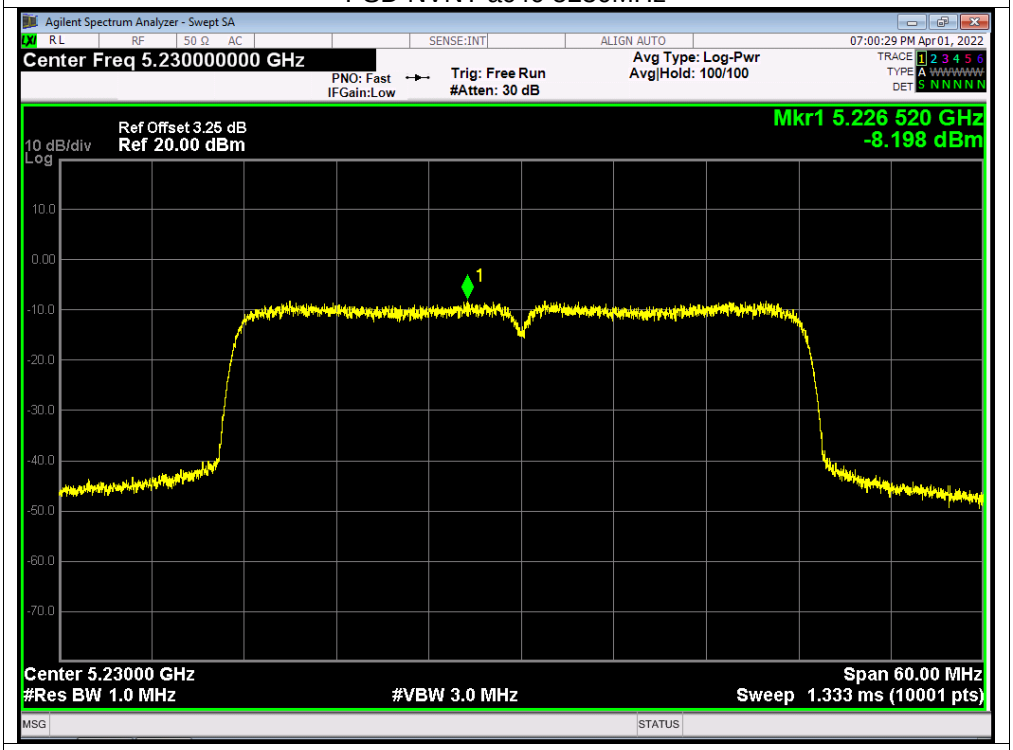
PSD NVNT ac20 5240MHz



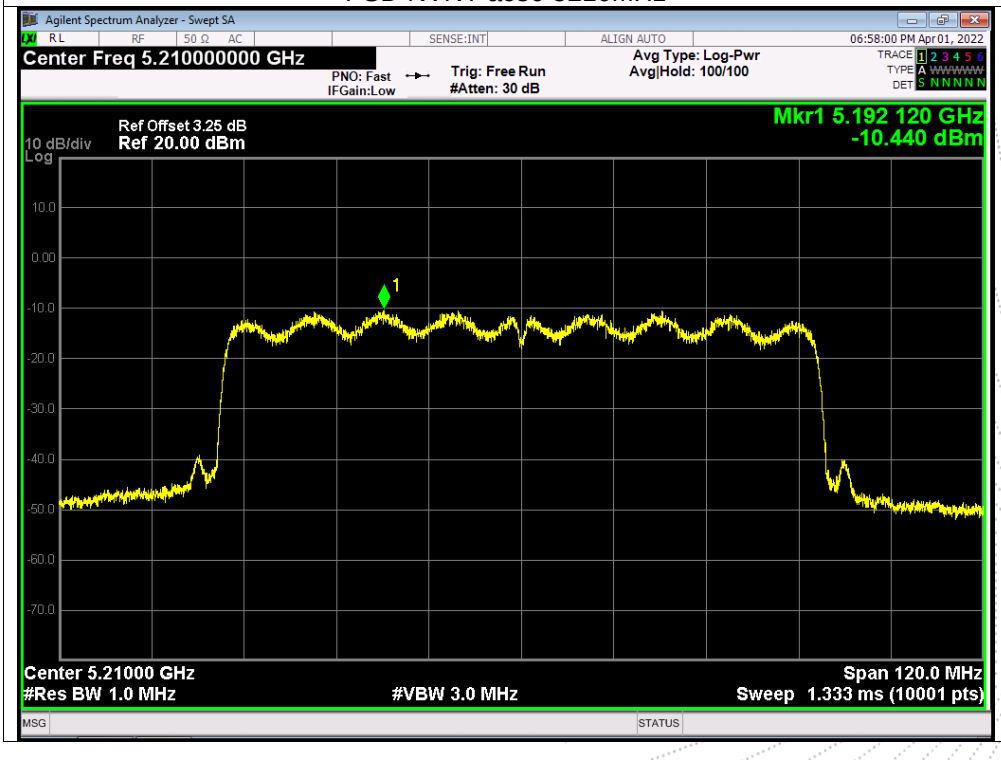
PSD NVNT ac40 5190MHz



PSD NVNT ac40 5230MHz



PSD NVNT ac80 5210MHz

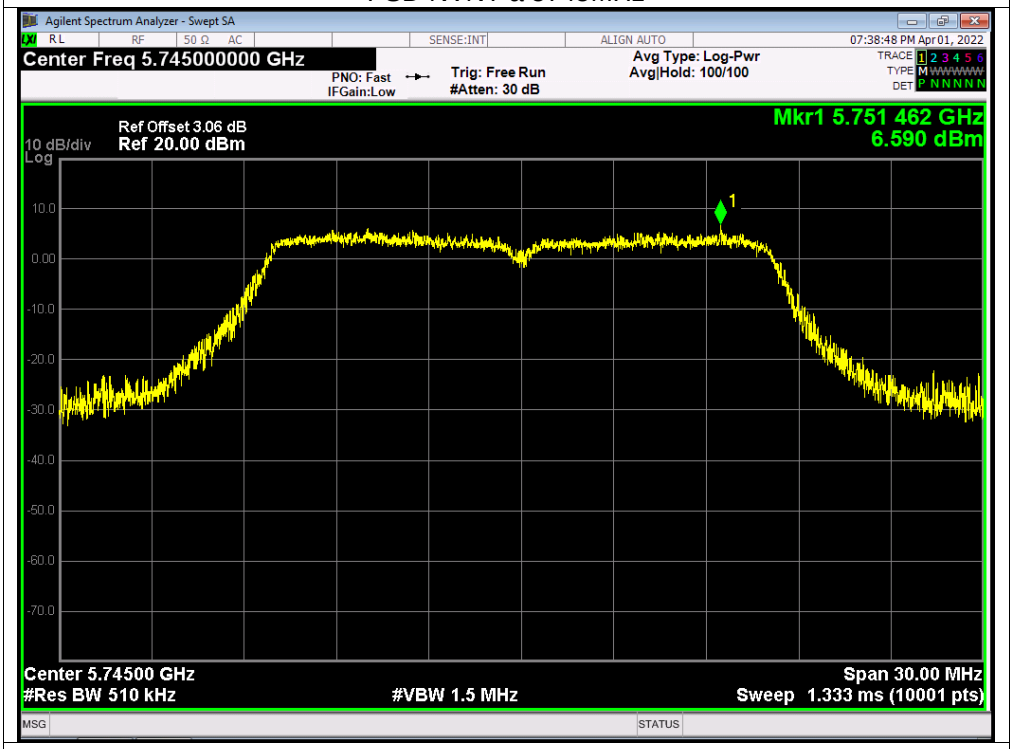


Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-3 (5745-5825MHz)		

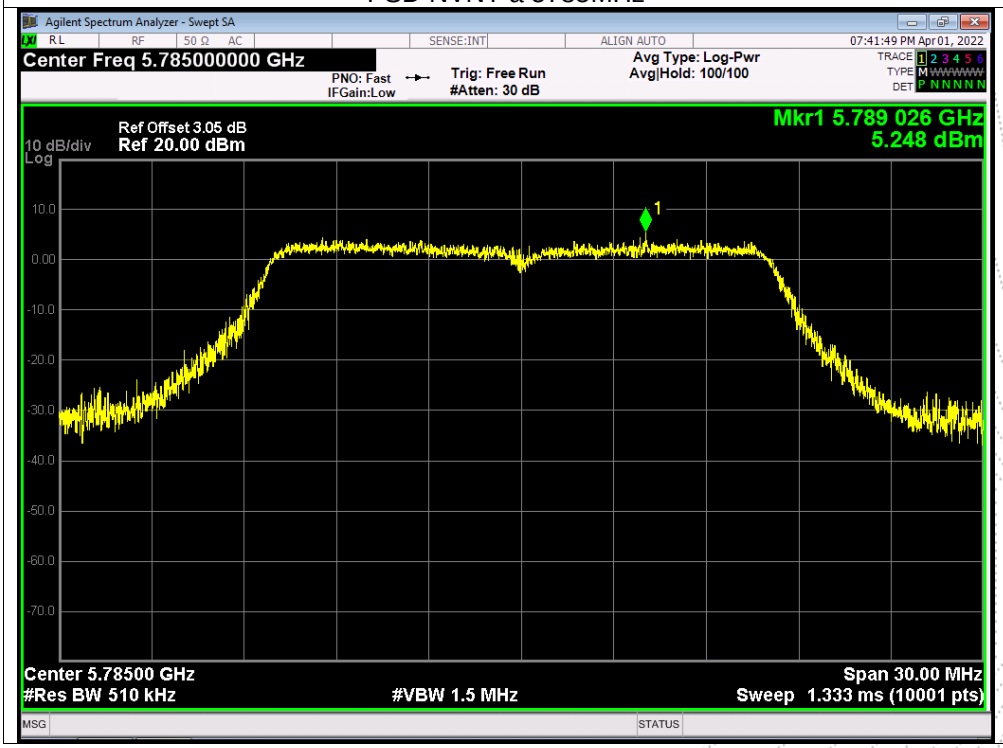
Mode	Frequency	Measured Power Density (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11 a	5745 MHz	6.59	30	PASS
	5785 MHz	5.25	30	PASS
	5825 MHz	3.83	30	PASS
802.11 n20	5745 MHz	5.58	30	PASS
	5785 MHz	3.86	30	PASS
	5825 MHz	2.45	30	PASS
802.11 n40	5755 MHz	0.03	30	PASS
	5795 MHz	-1.29	30	PASS
802.11 AC20	5745 MHz	4.59	30	PASS
	5785 MHz	3.77	30	PASS
	5825 MHz	1.09	30	PASS
802.11 AC40	5755 MHz	-0.05	30	PASS
	5795 MHz	-1.26	30	PASS
802.11 AC80	5775 MHz	-1.49	30	PASS

Test Graphs

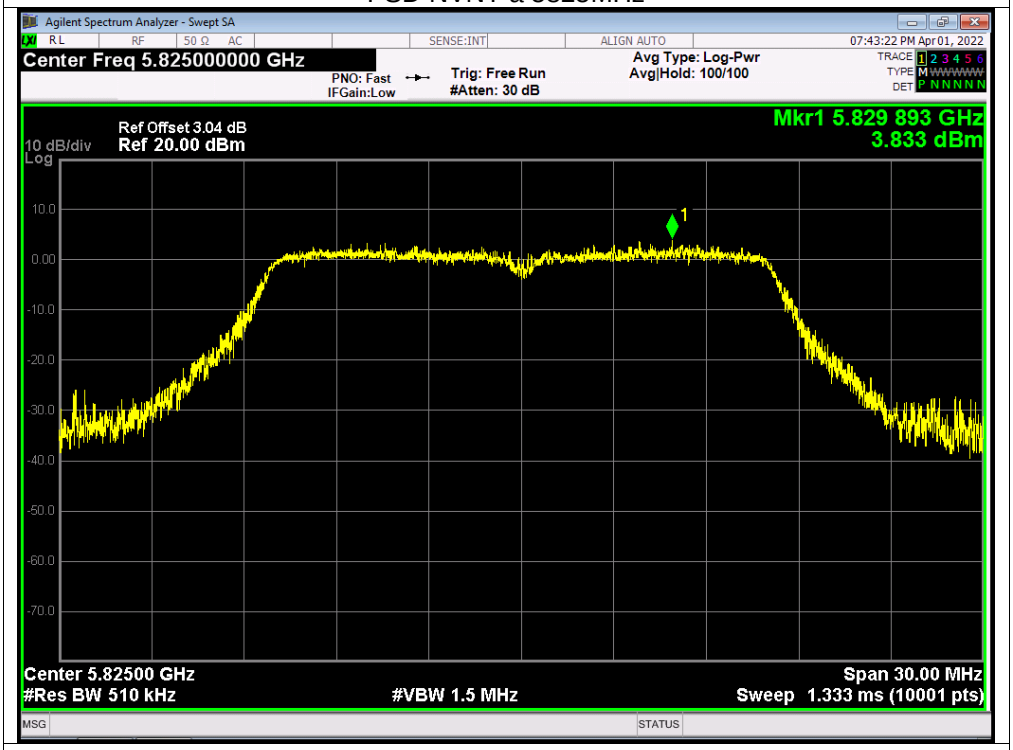
PSD NVNT a 5745MHz



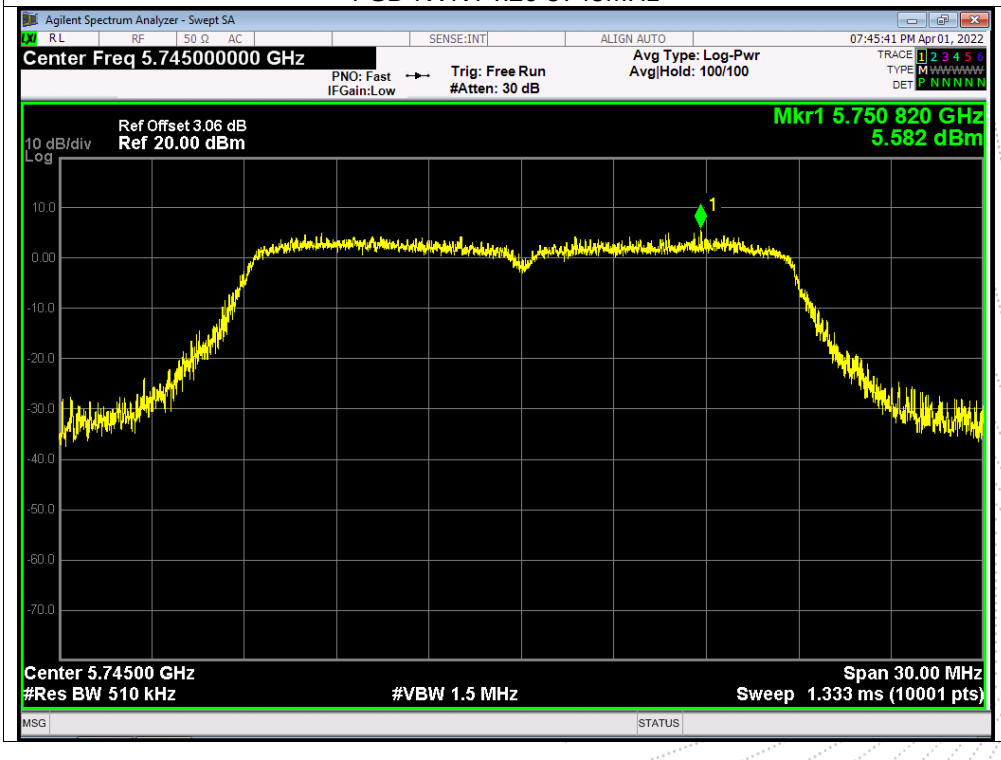
PSD NVNT a 5785MHz



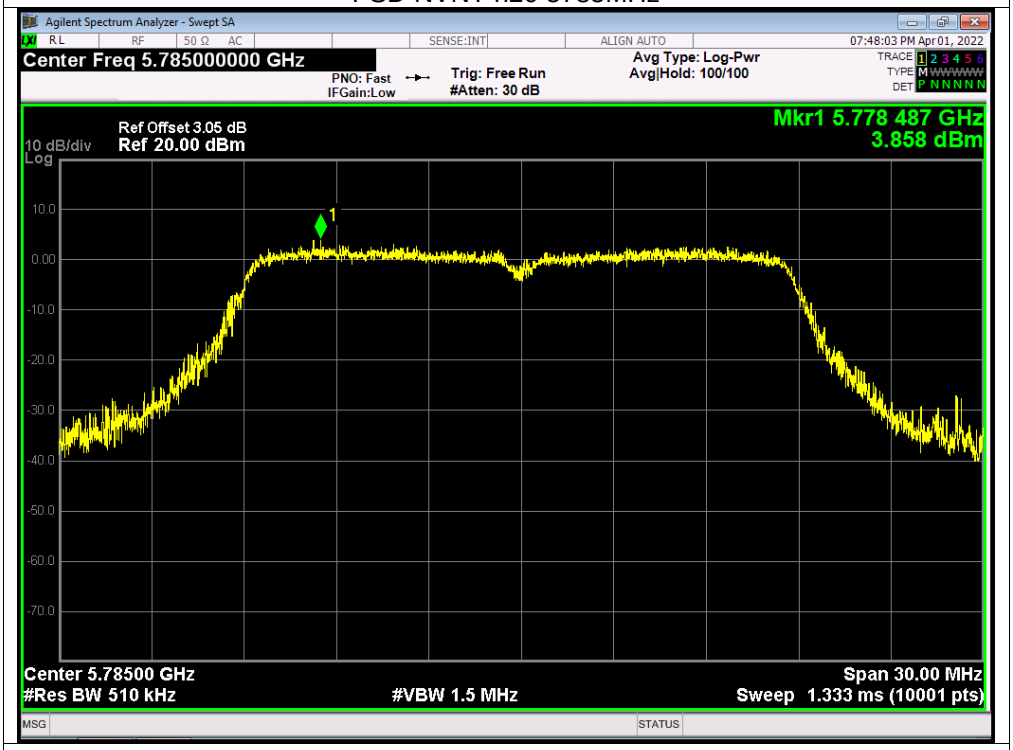
PSD NVNT a 5825MHz



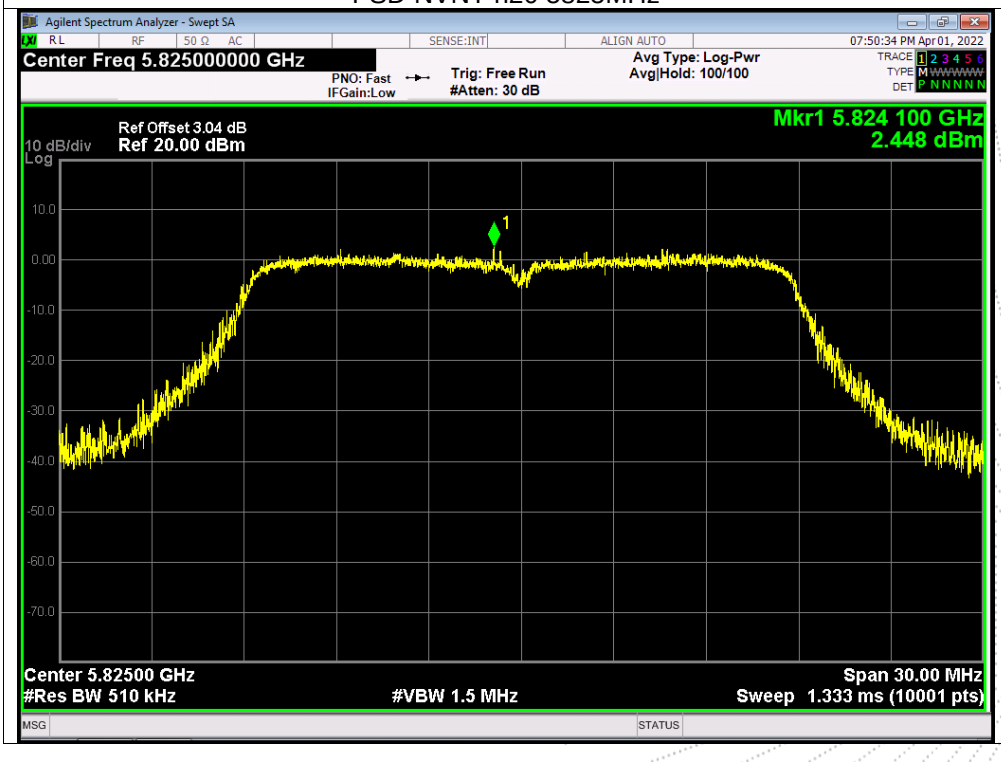
PSD NVNT n20 5745MHz



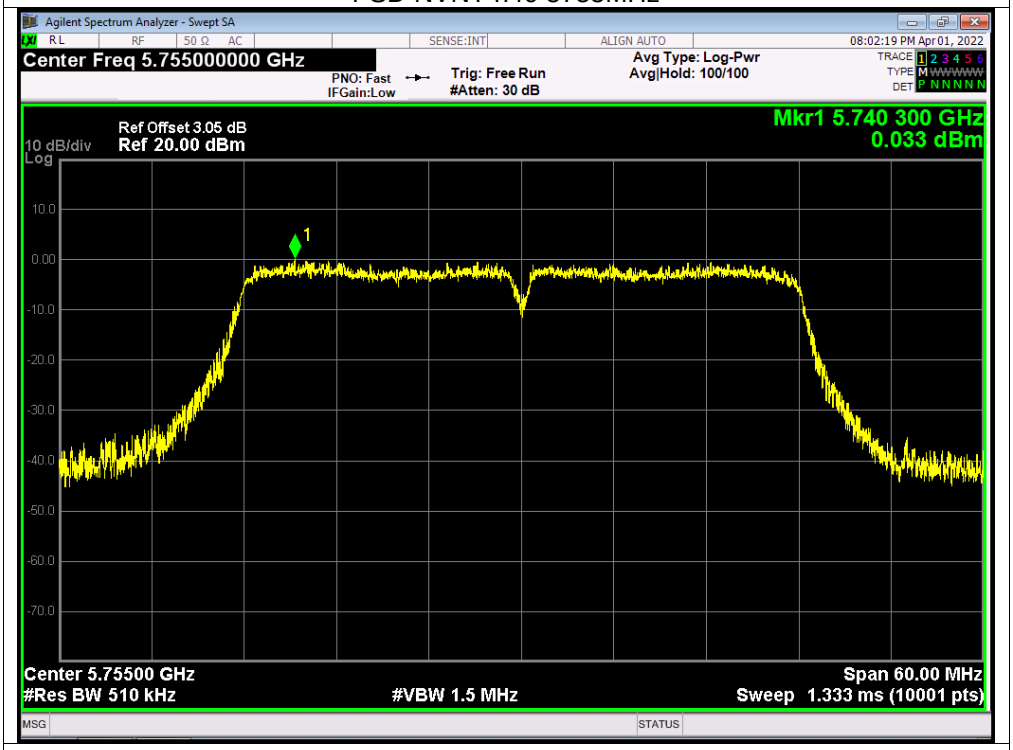
PSD NVNT n20 5785MHz



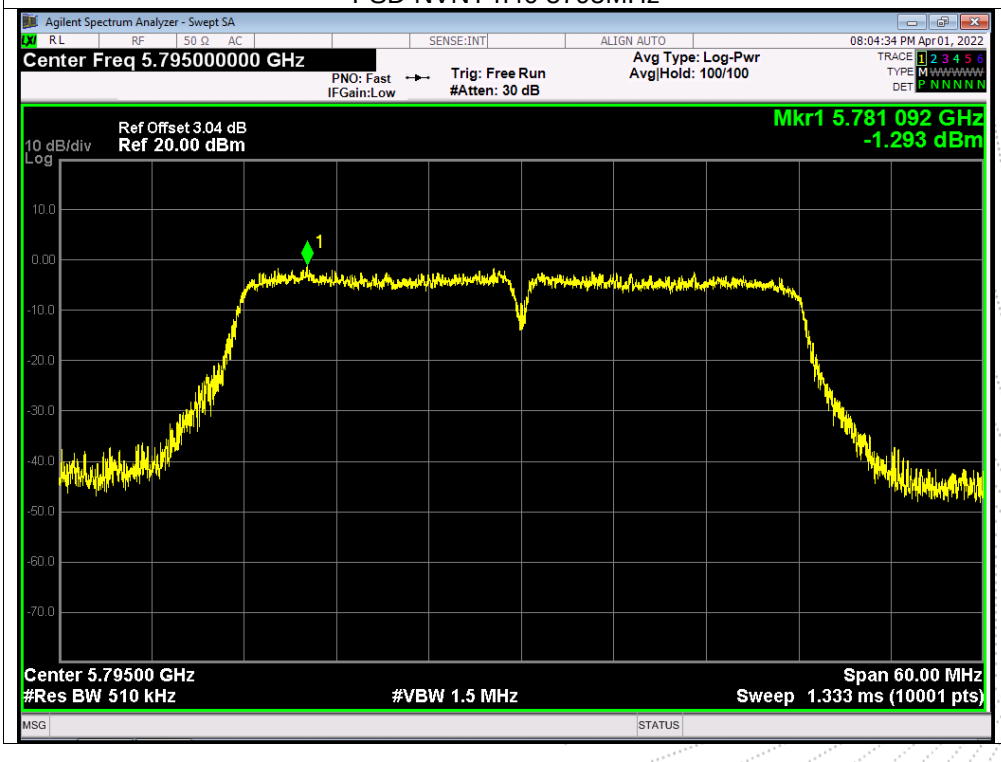
PSD NVNT n20 5825MHz



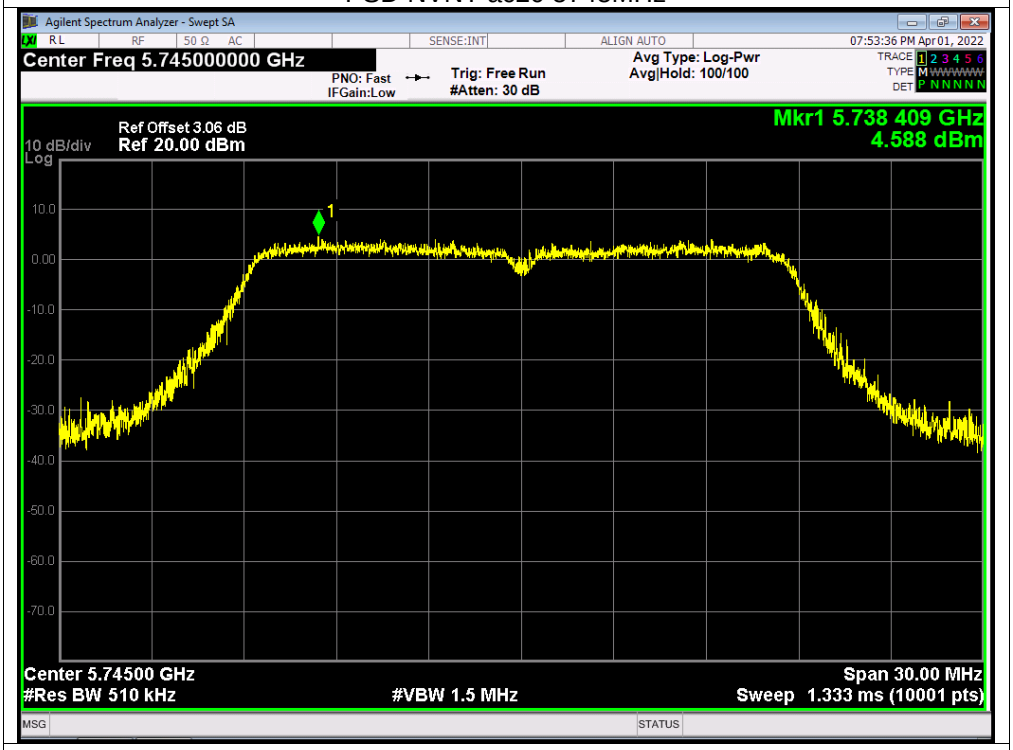
PSD NVNT n40 5755MHz



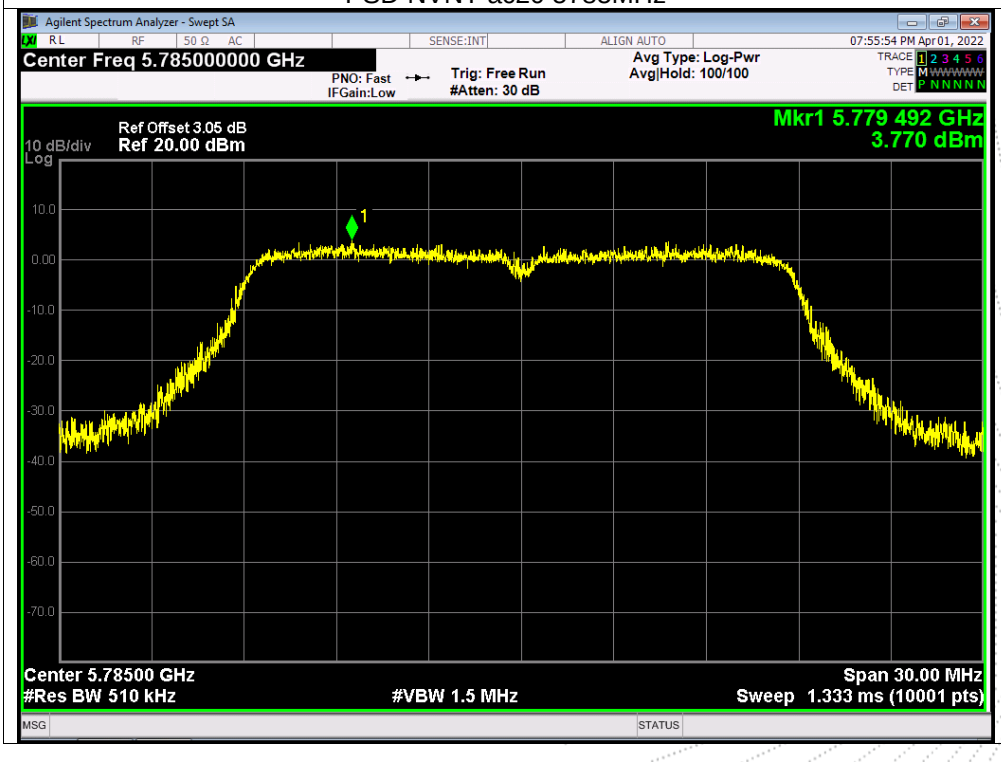
PSD NVNT n40 5795MHz



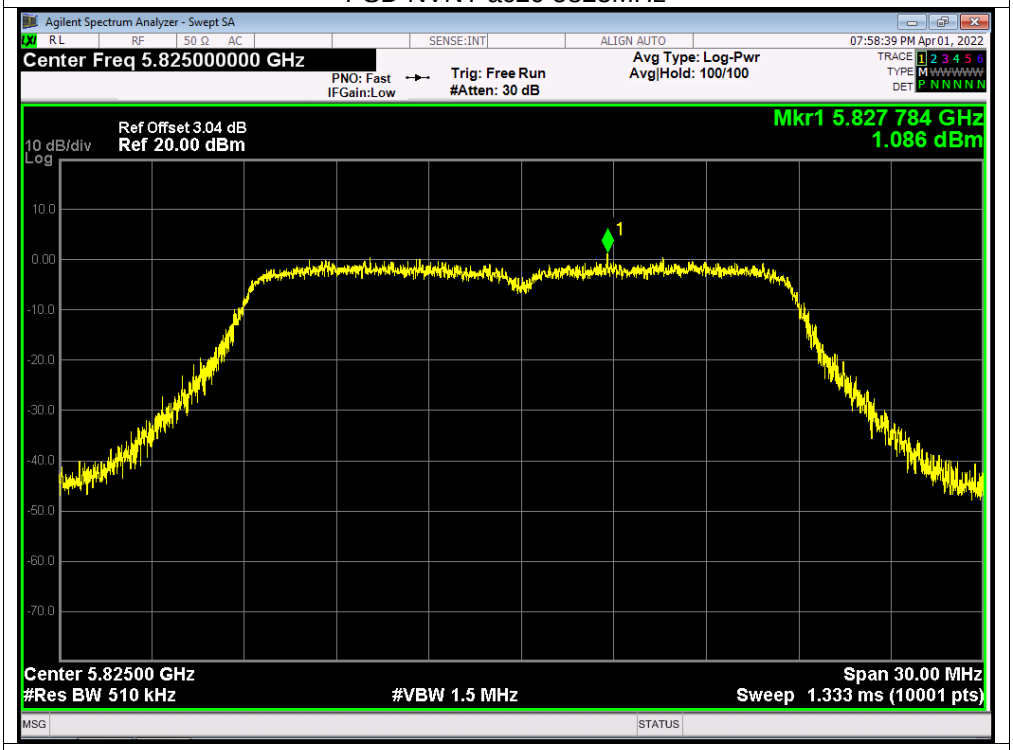
PSD NVNT ac20 5745MHz



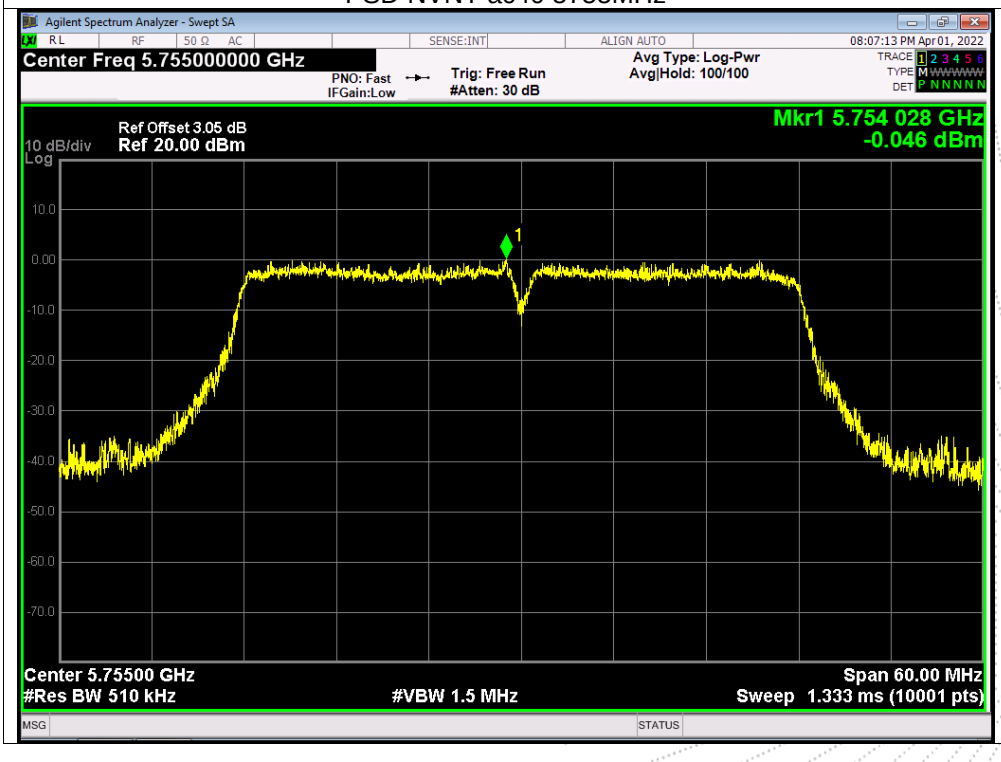
PSD NVNT ac20 5785MHz



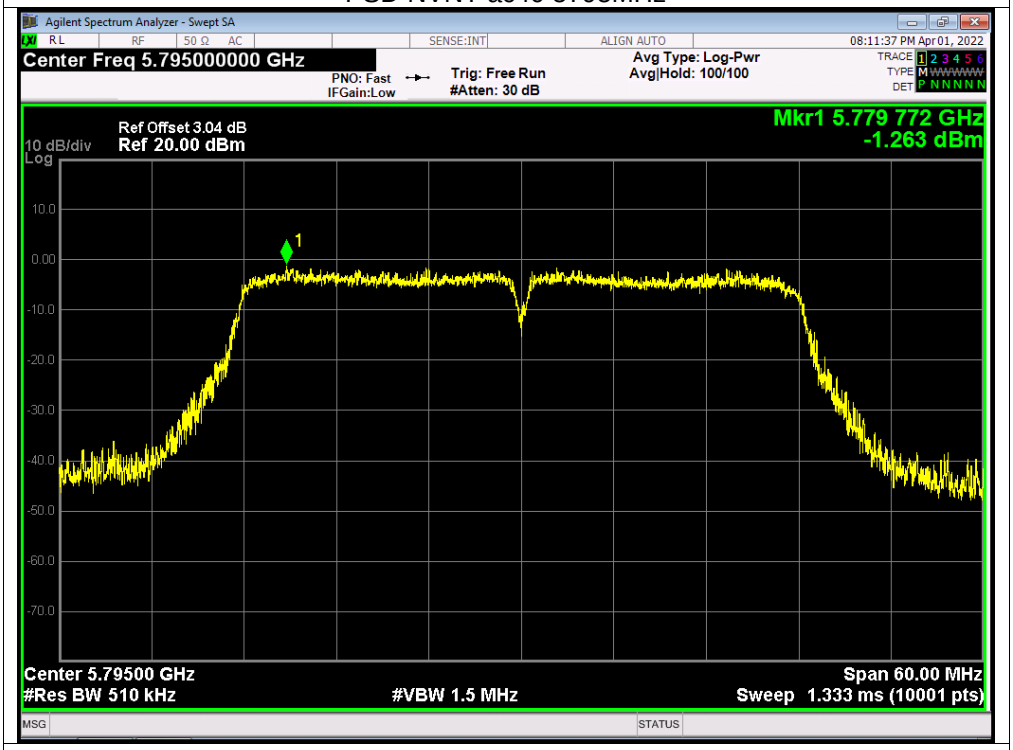
PSD NVNT ac20 5825MHz



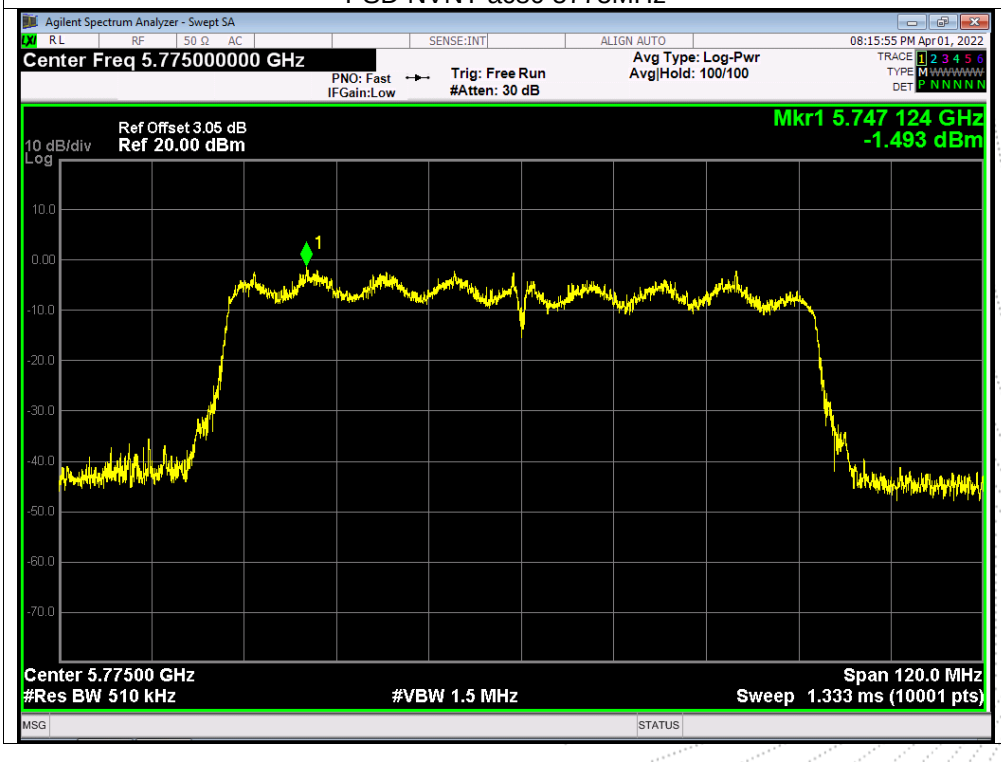
PSD NVNT ac40 5755MHz



PSD NVNT ac40 5795MHz

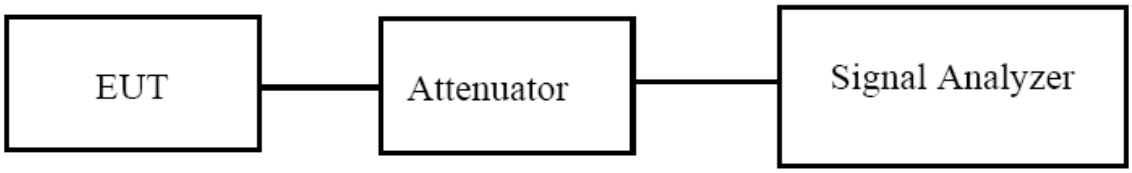


PSD NVNT ac80 5775MHz



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

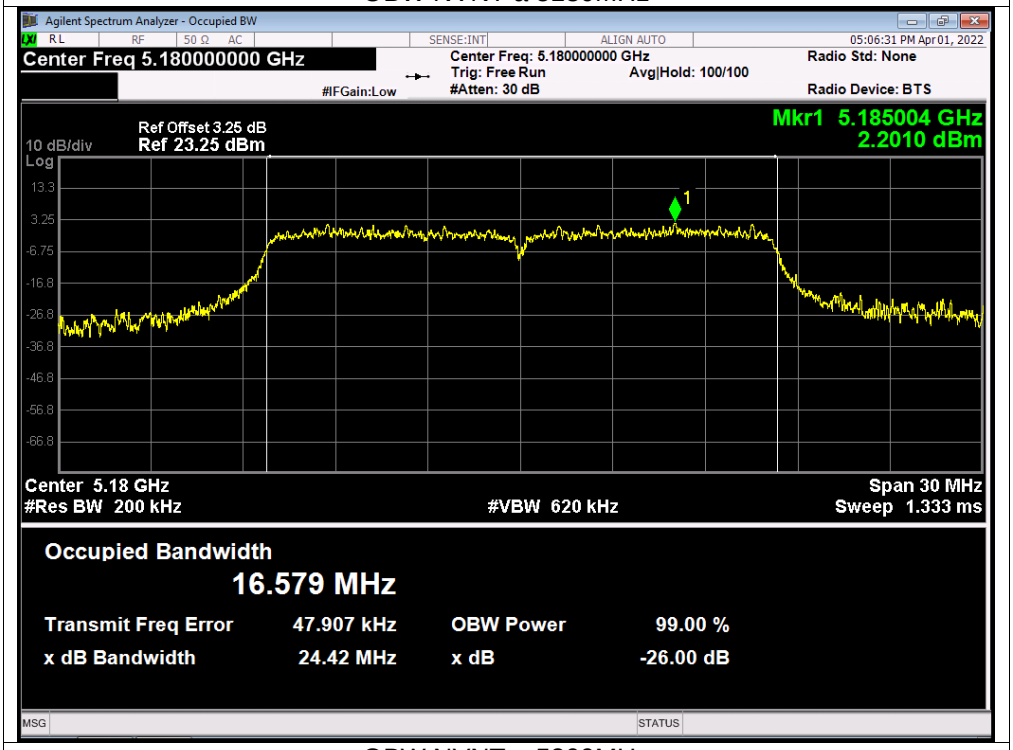
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth(MHz)	Result
802.11a	CH36	5180	16.579	28.133	Pass
	CH40	5200	16.648	28.364	Pass
	CH48	5240	16.721	29.577	Pass
802.11 n20	CH36	5180	17.634	22.162	Pass
	CH40	5200	17.643	25.105	Pass
	CH48	5240	17.667	27.299	Pass
802.11 n40	CH 38	5190	36.071	48.405	Pass
	CH 46	5230	36.128	53.234	Pass
802.11 AC20	CH36	5180	17.63	23.983	Pass
	CH40	5200	17.718	25.944	Pass
	CH48	5240	17.697	26.432	Pass
802.11 AC40	CH 38	5190	36.135	51.047	Pass
	CH 46	5230	36.211	58.426	Pass
802.11 AC80	CH 42	5210	75.164	82.865	Pass

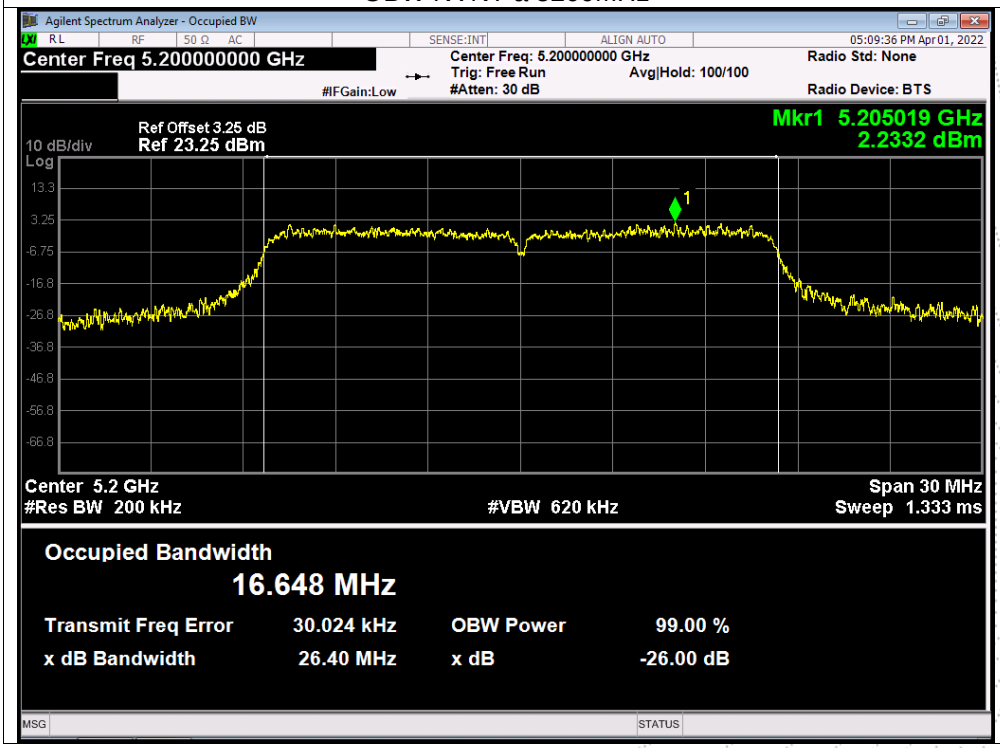
99% OBW

Test Graphs

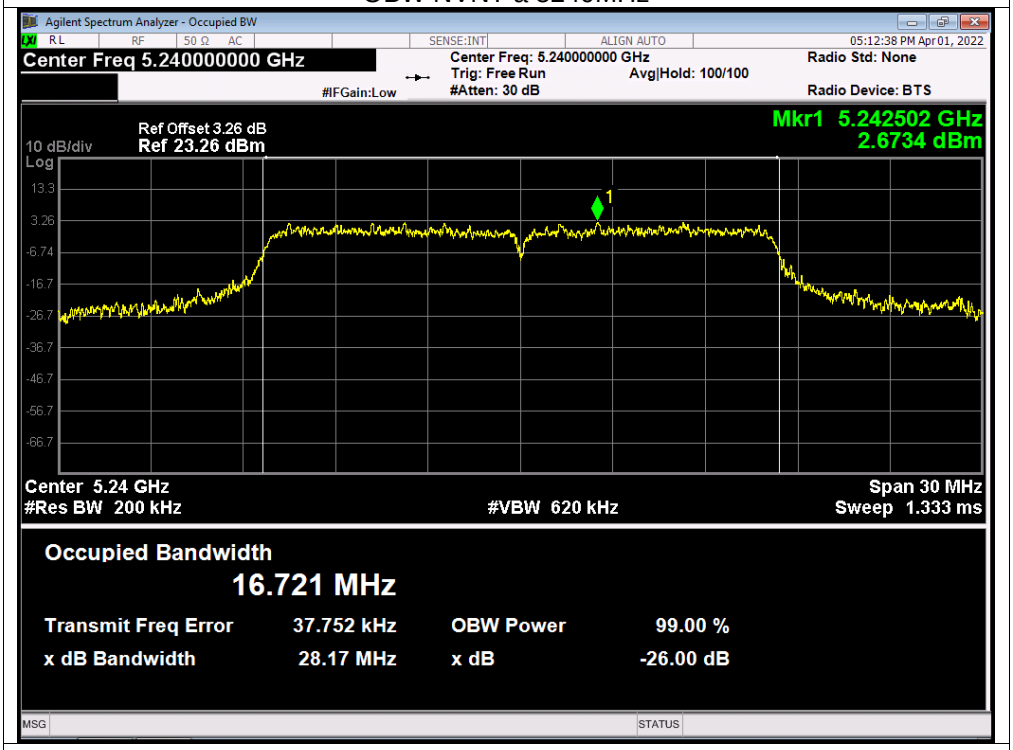
OBW NVNT a 5180MHz



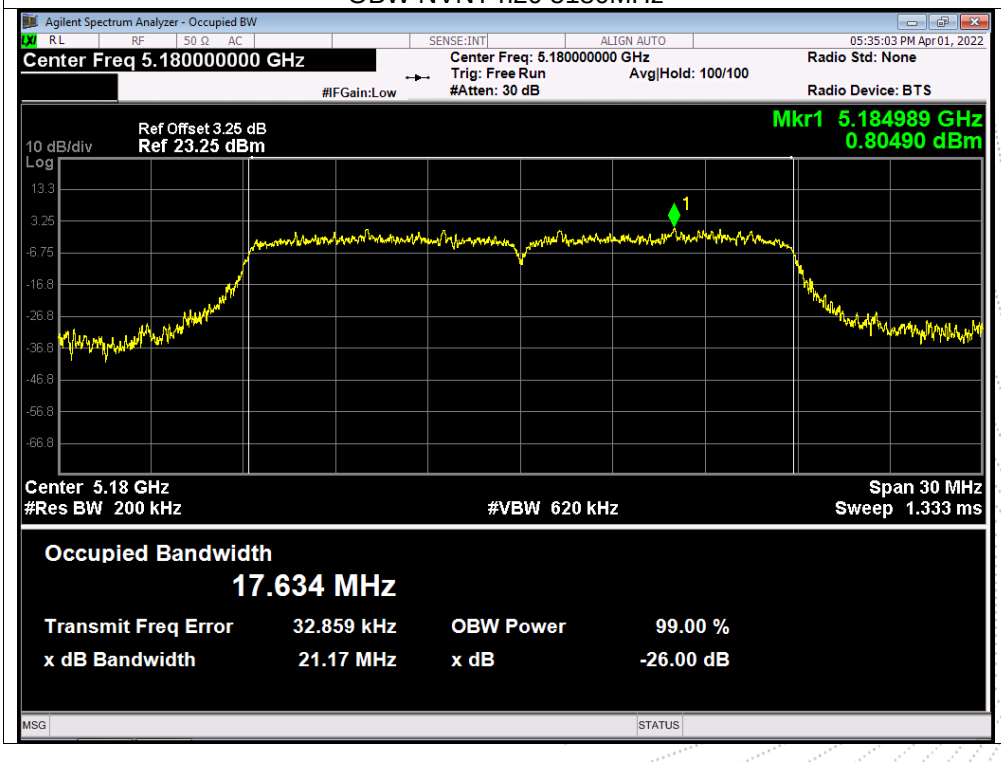
OBW NVNT a 5200MHz



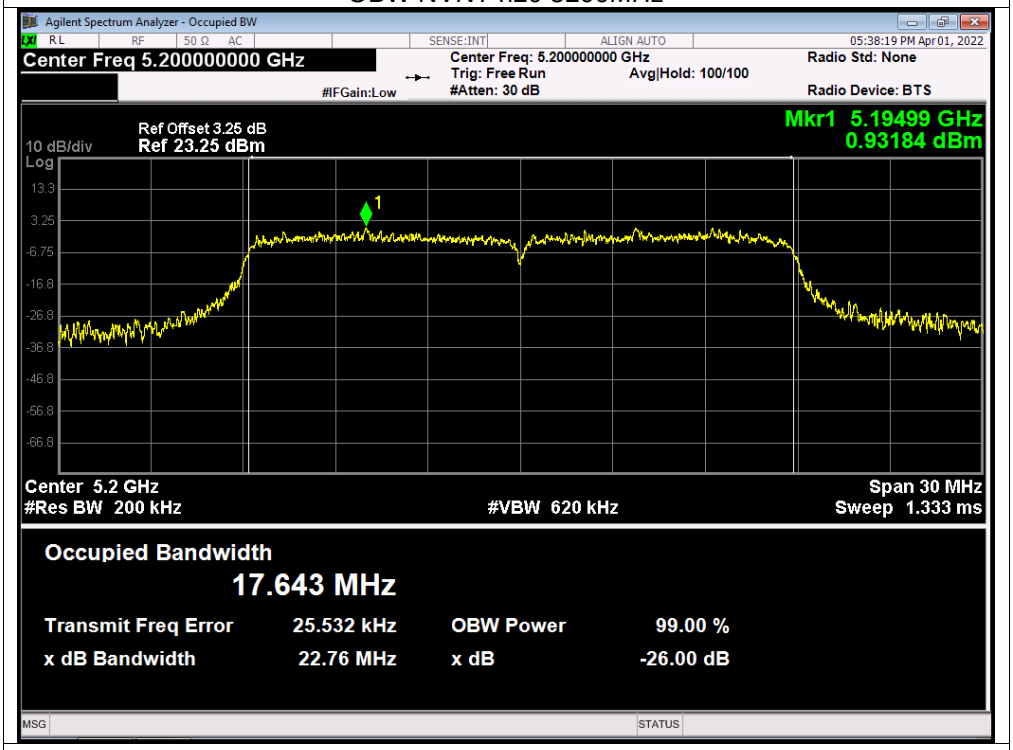
OBW NVNT a 5240MHz



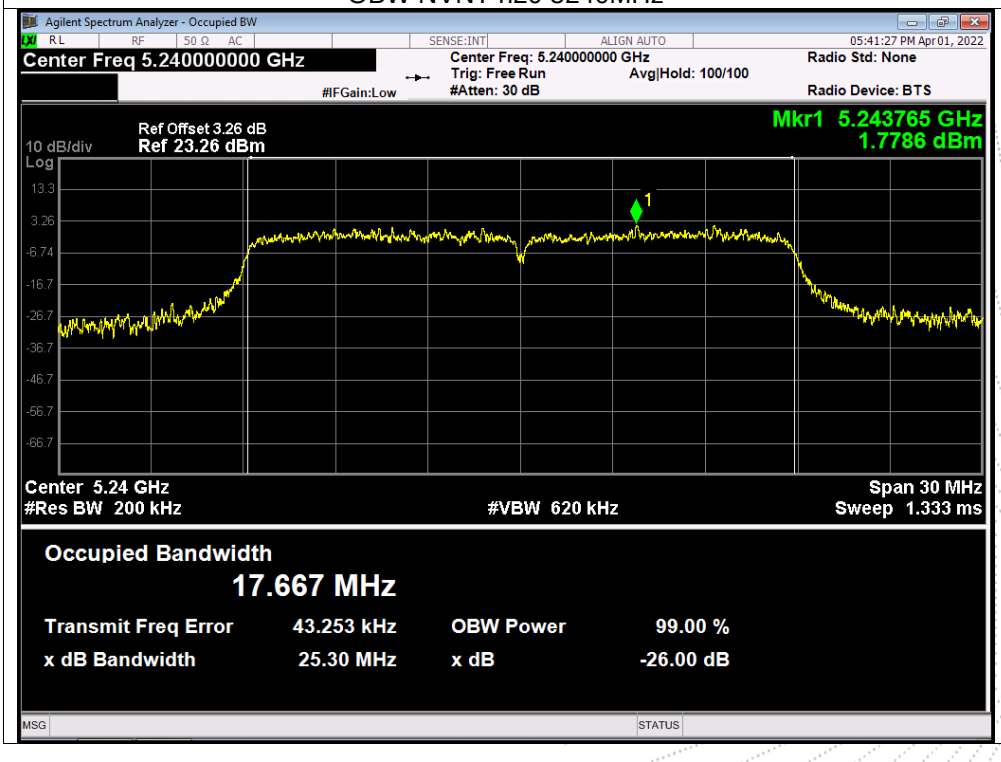
OBW NVNT n20 5180MHz



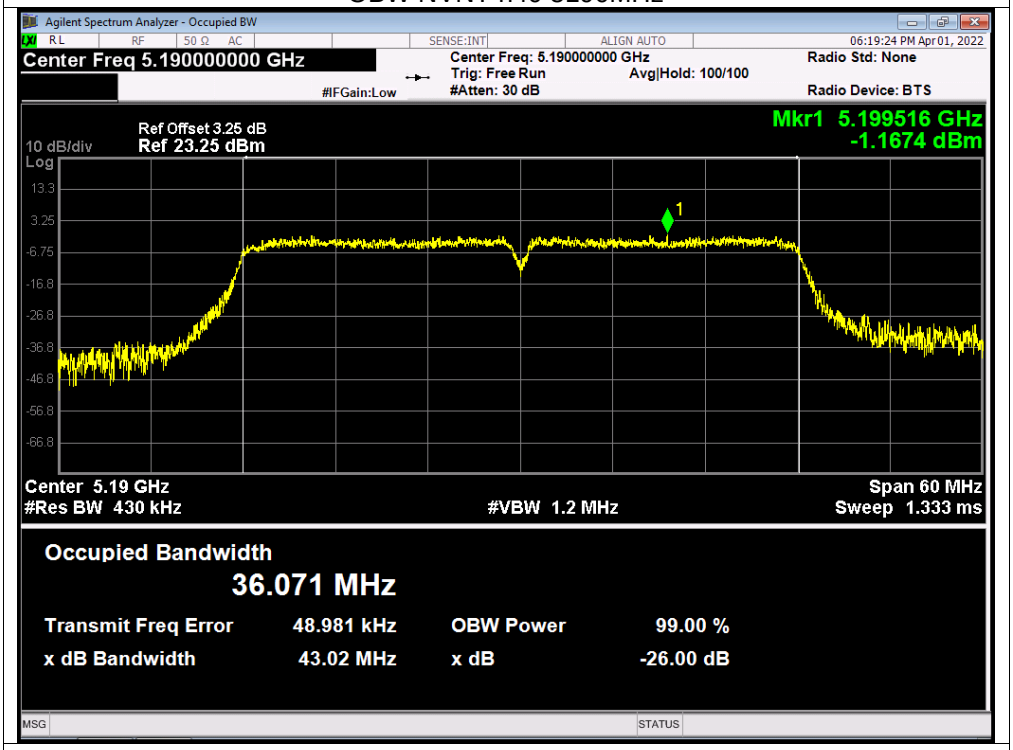
OBW NVNT n20 5200MHz



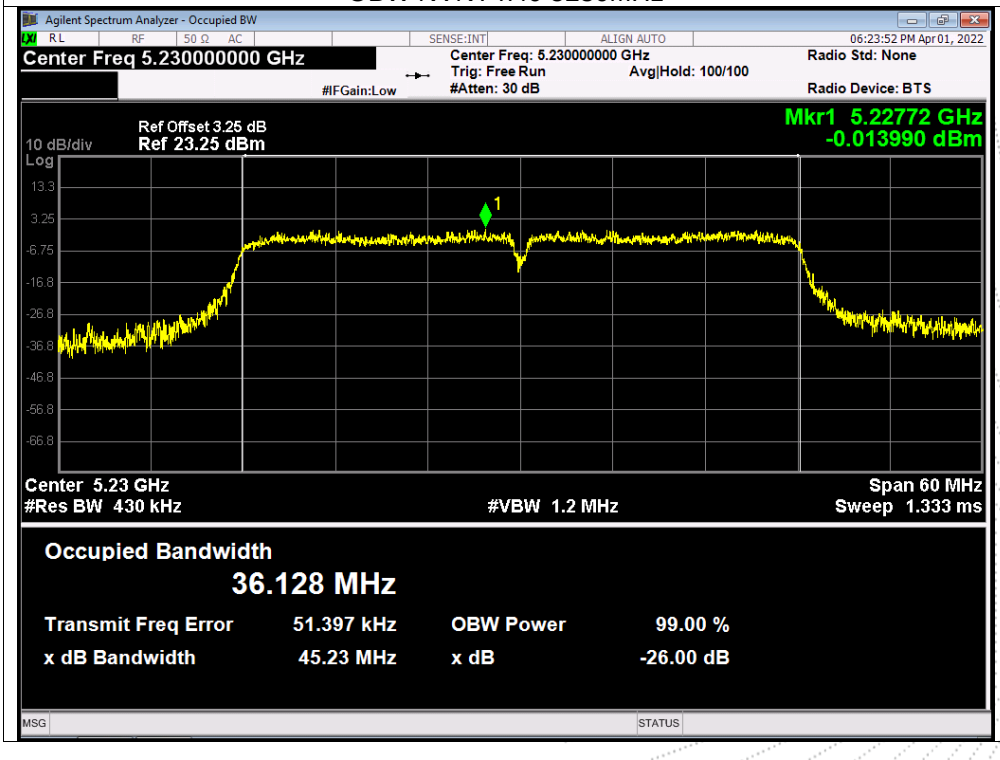
OBW NVNT n20 5240MHz



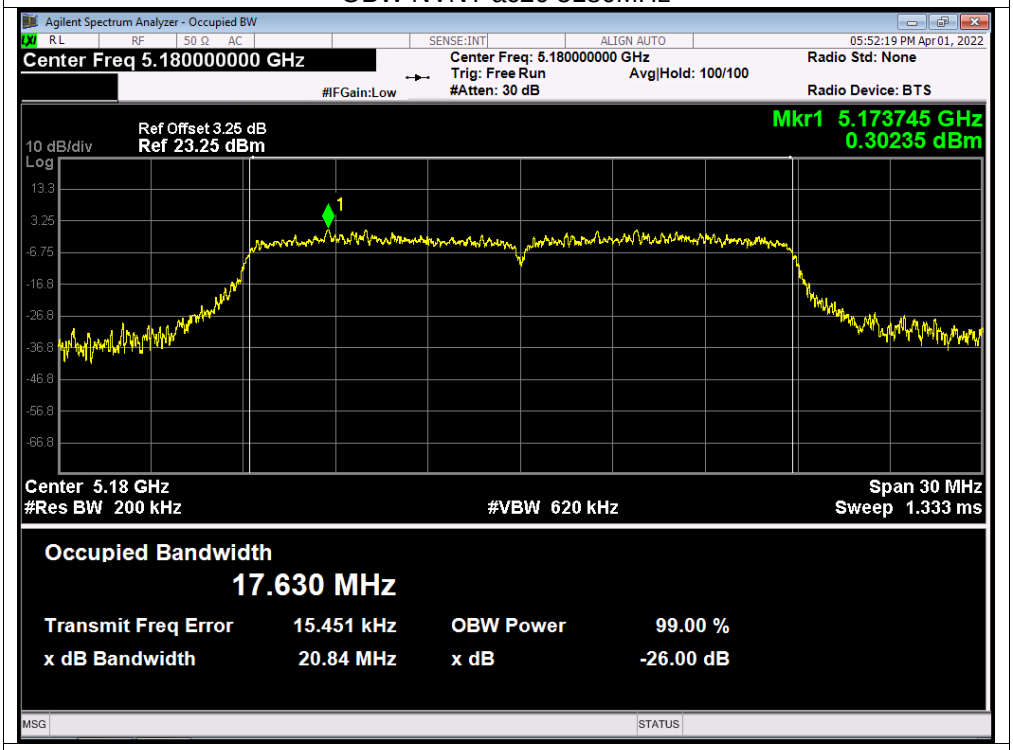
OBW NVNT n40 5190MHz



OBW NVNT n40 5230MHz



OBW NVNT ac20 5180MHz



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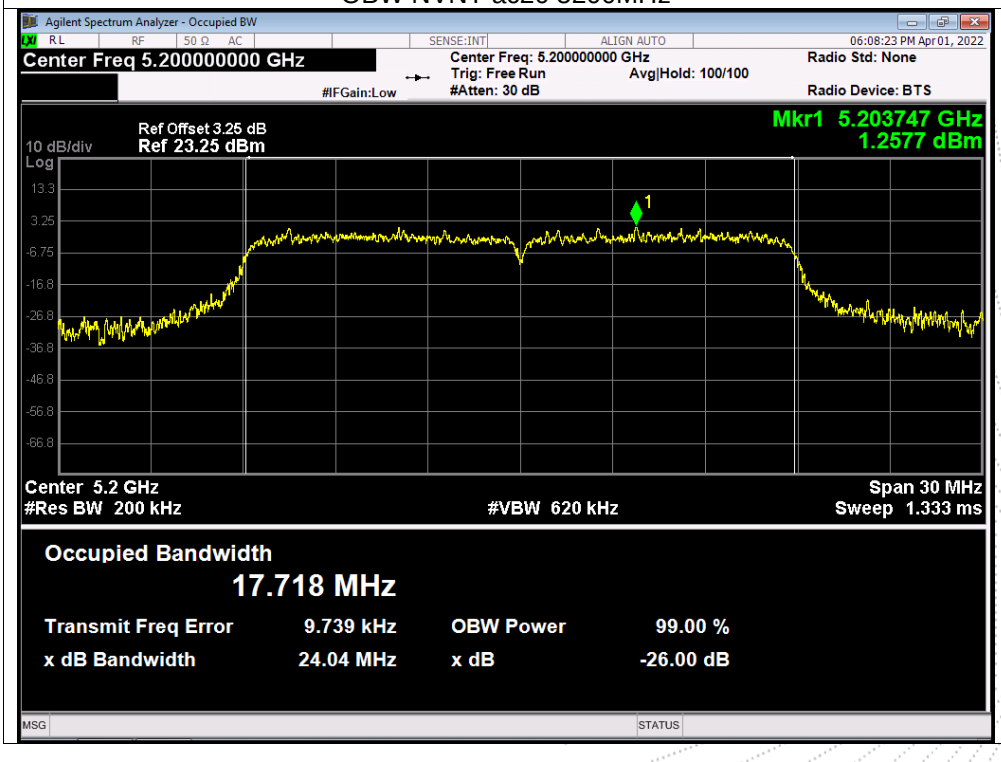

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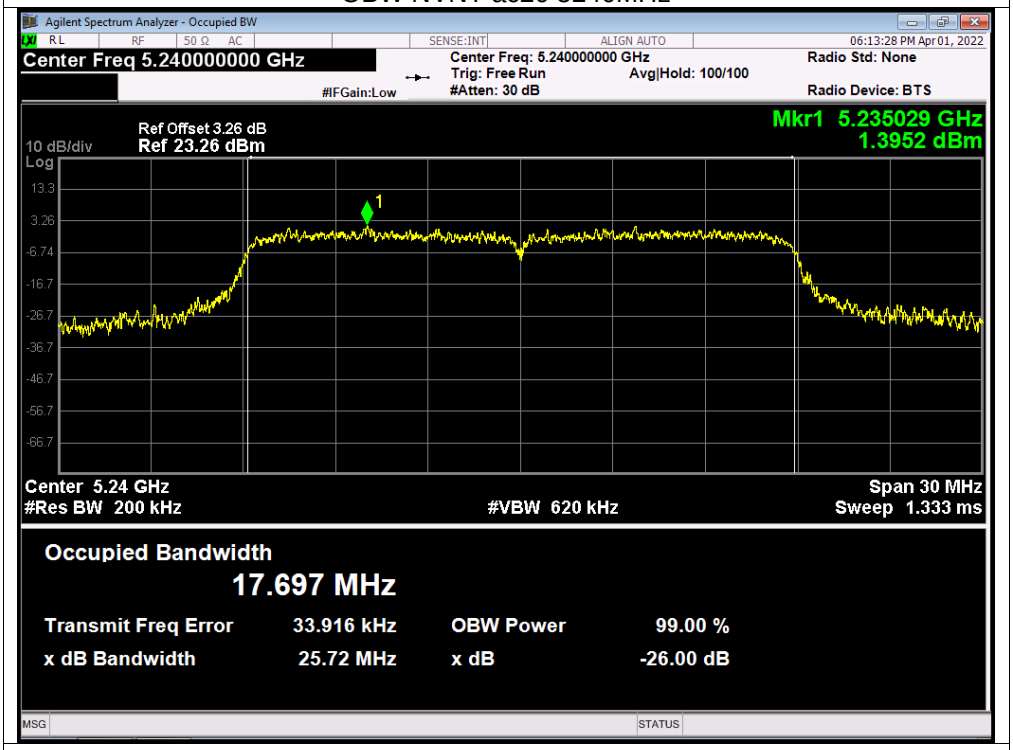

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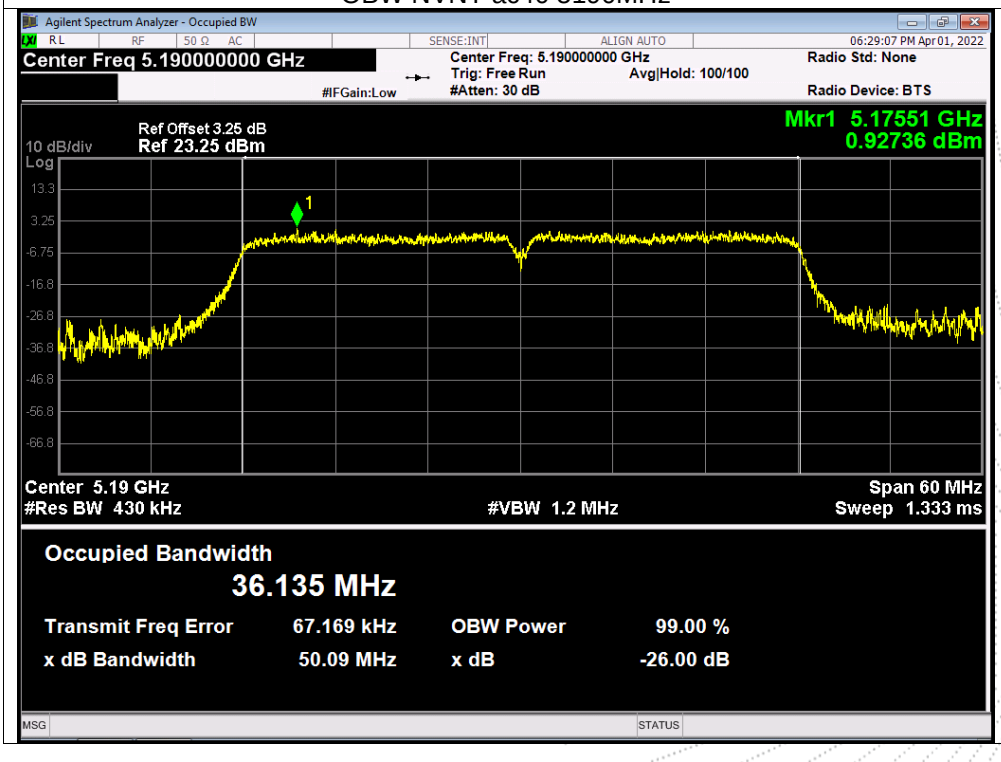
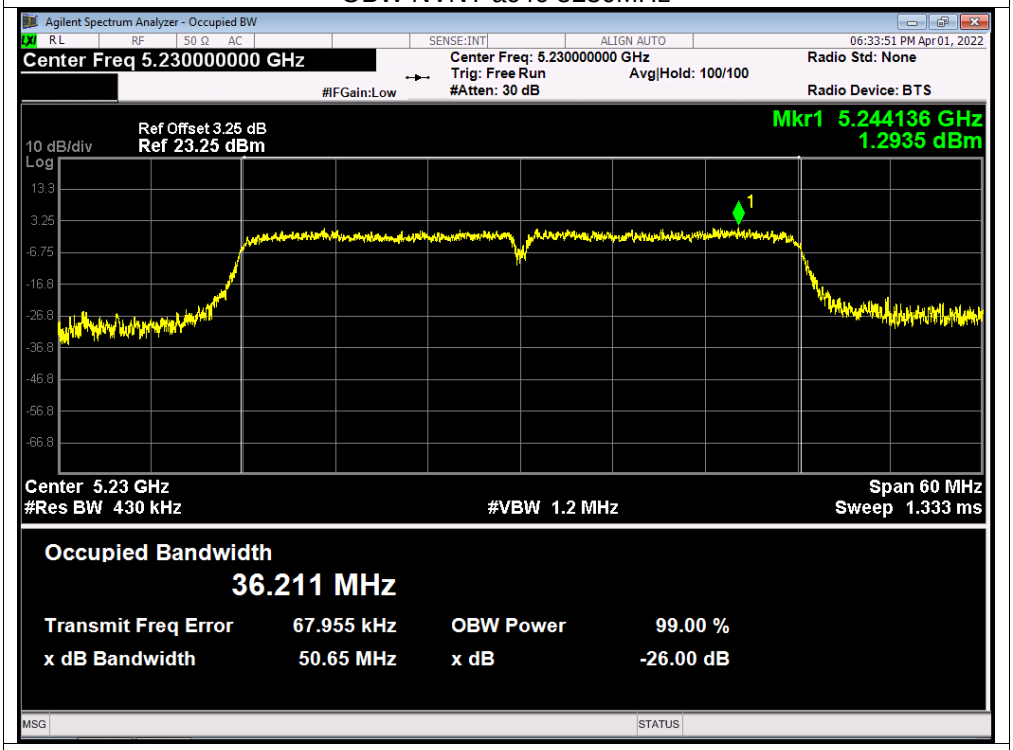
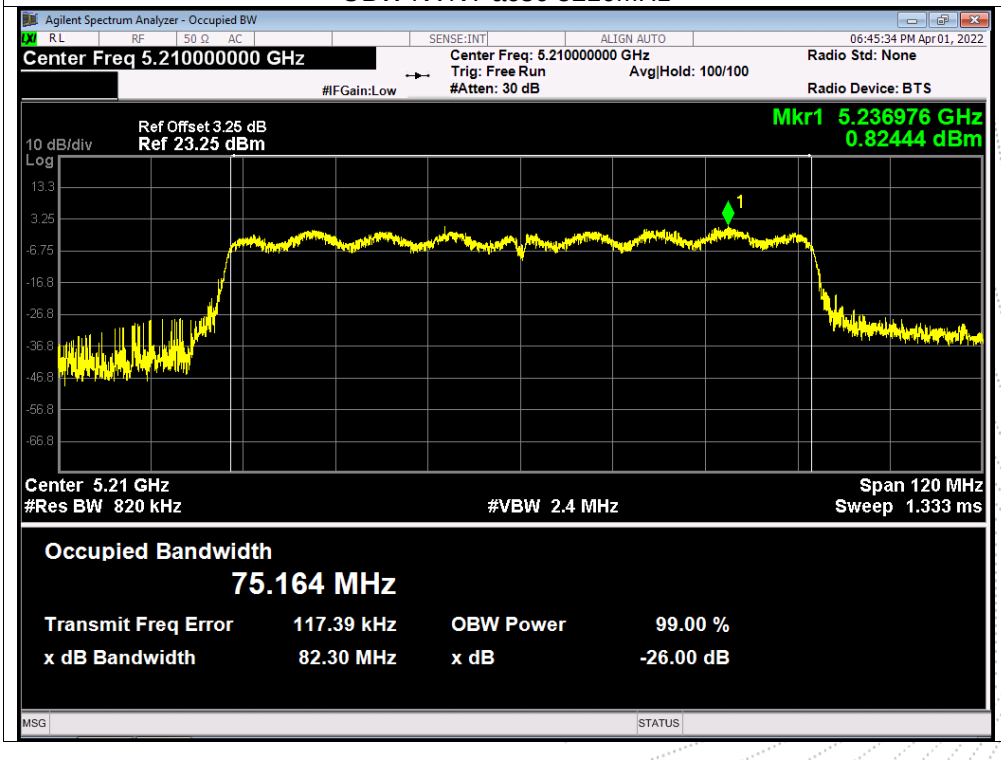


OBW NVNT ac40 5230MHz



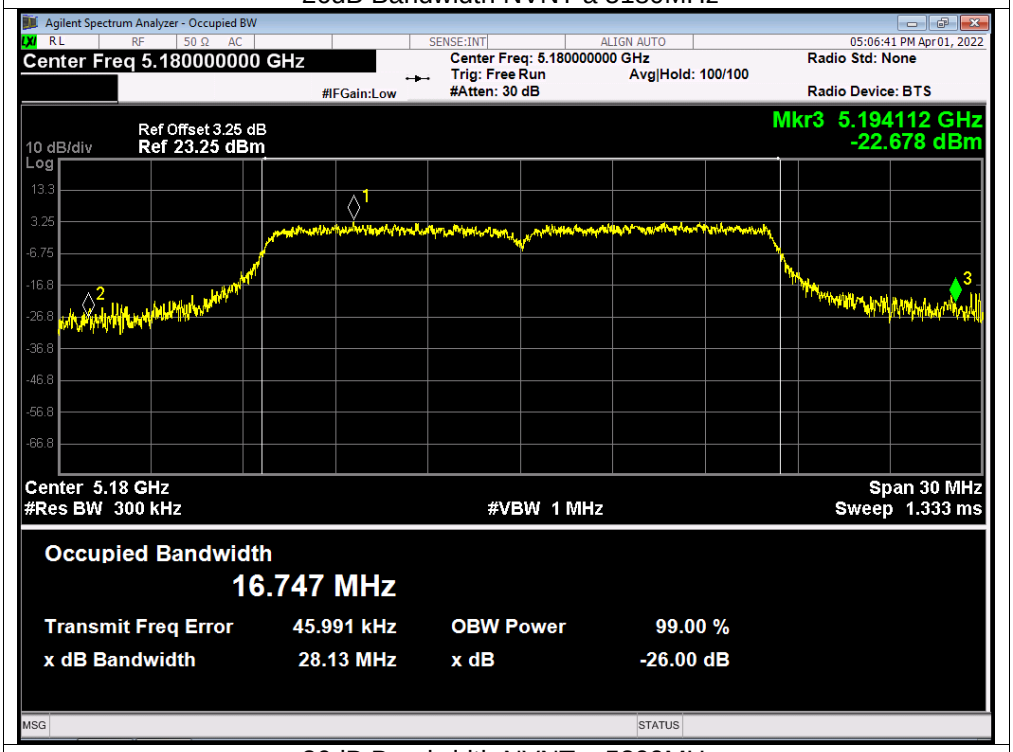
OBW NVNT ac80 5210MHz



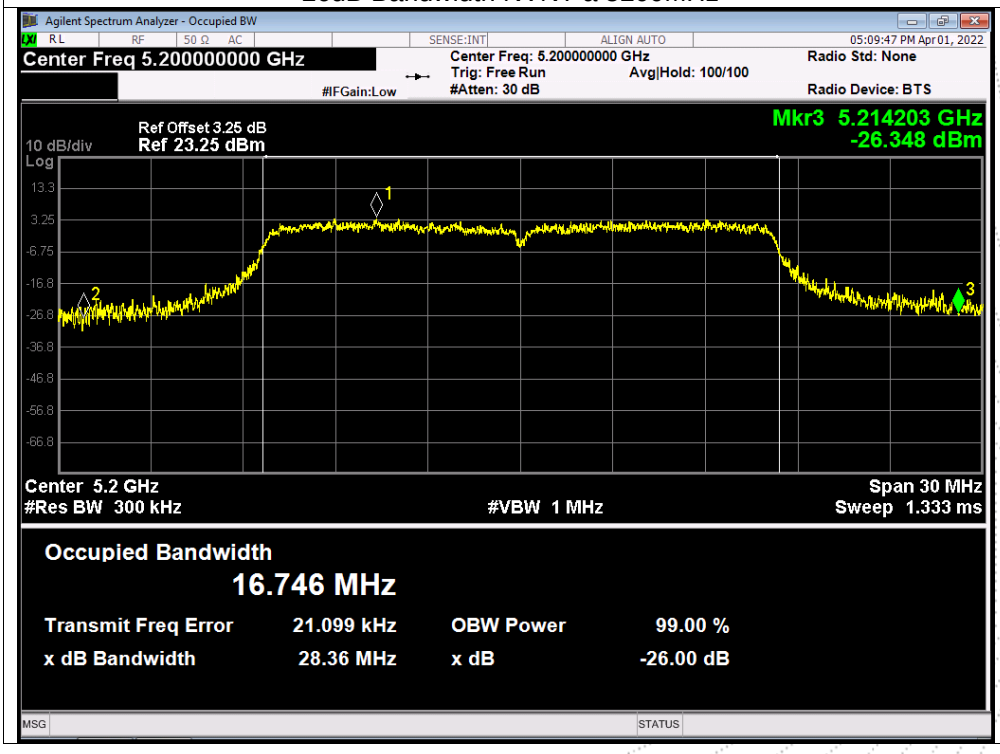
-26dB Bandwidth

Test Graphs

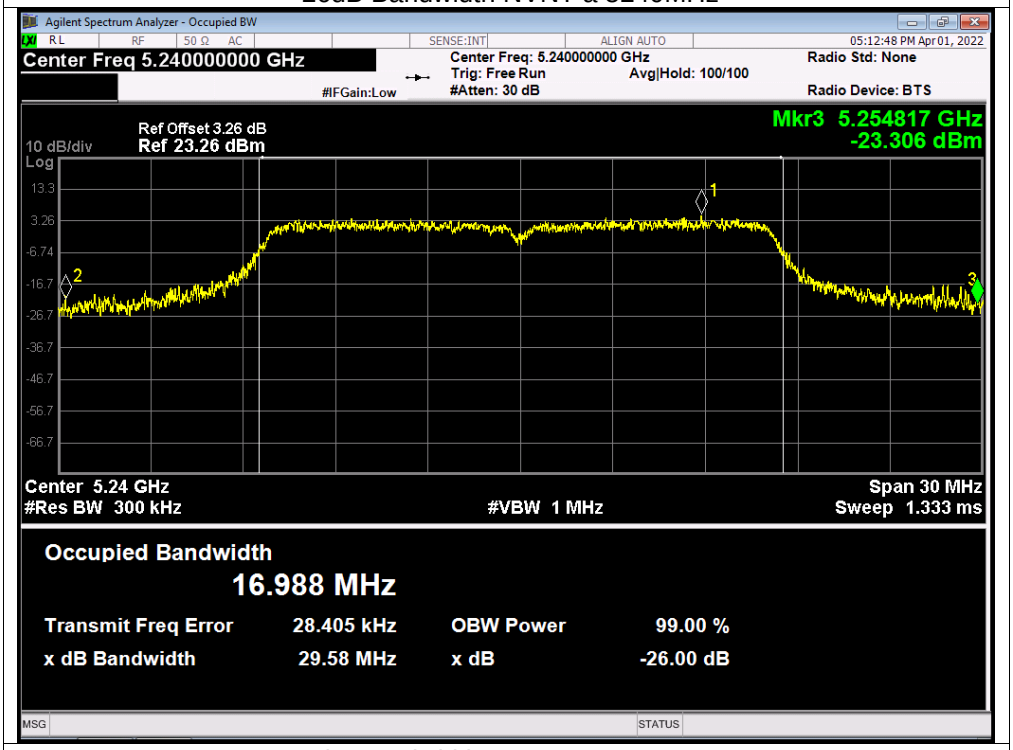
-26dB Bandwidth NVNT a 5180MHz



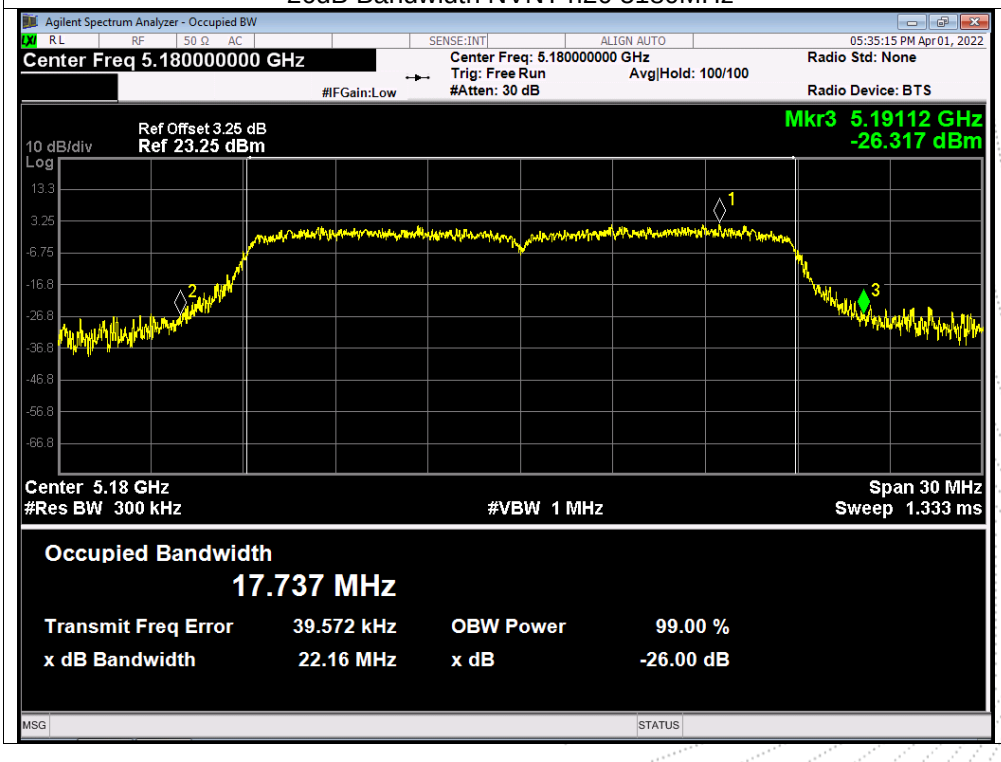
-26dB Bandwidth NVNT a 5200MHz



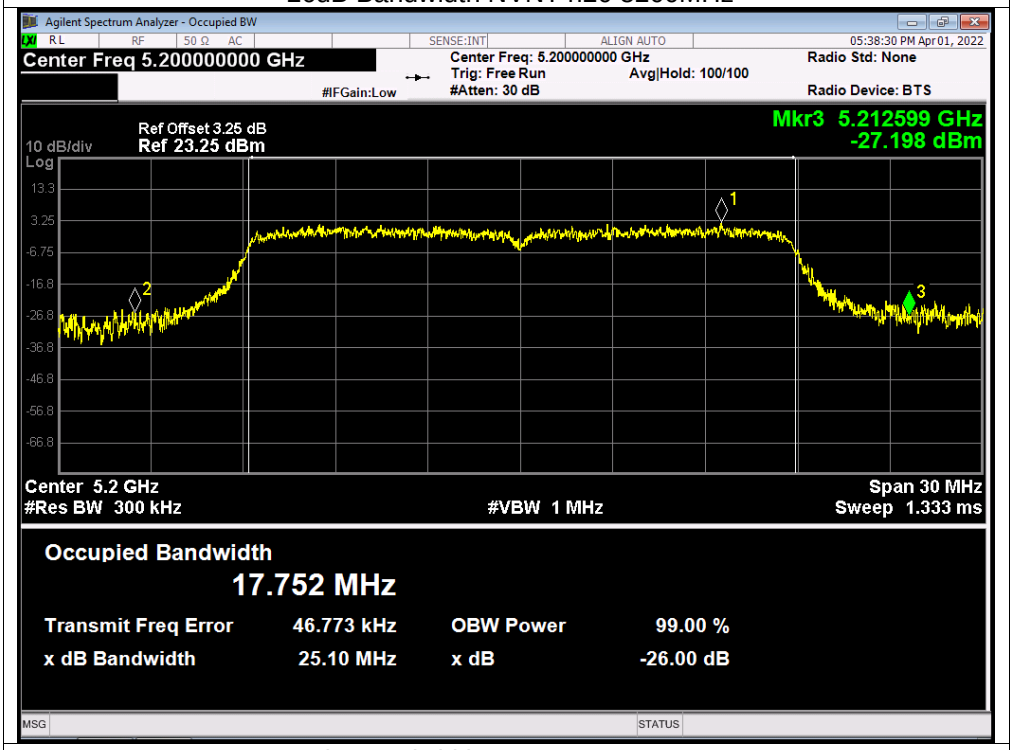
-26dB Bandwidth NVNT a 5240MHz



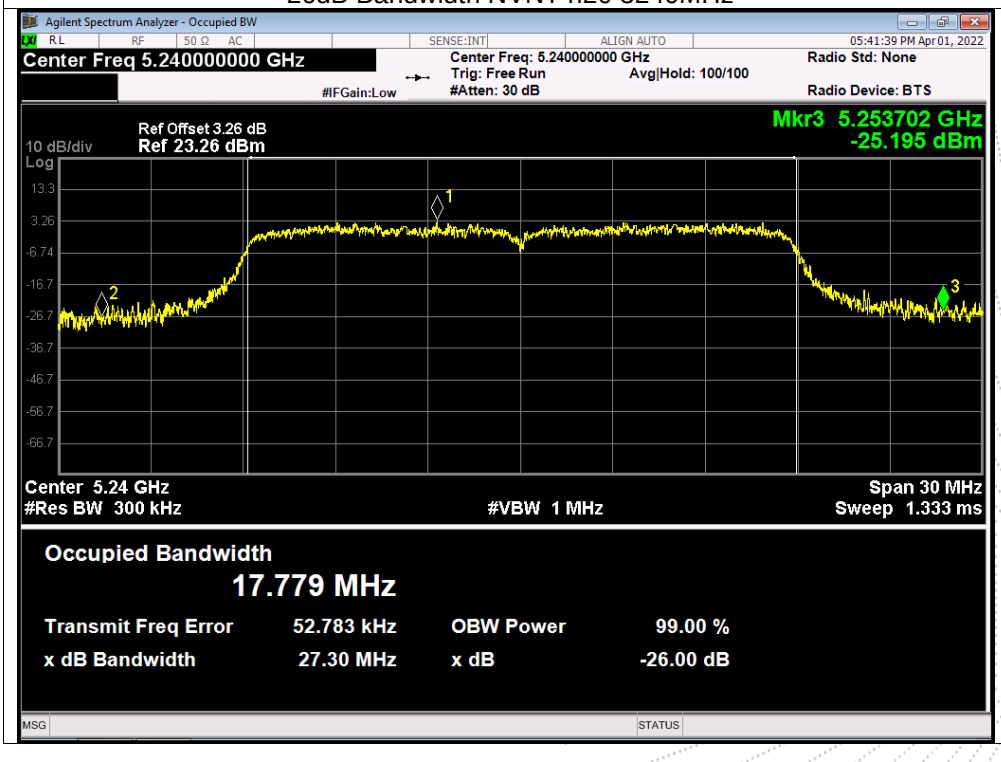
-26dB Bandwidth NVNT n20 5180MHz



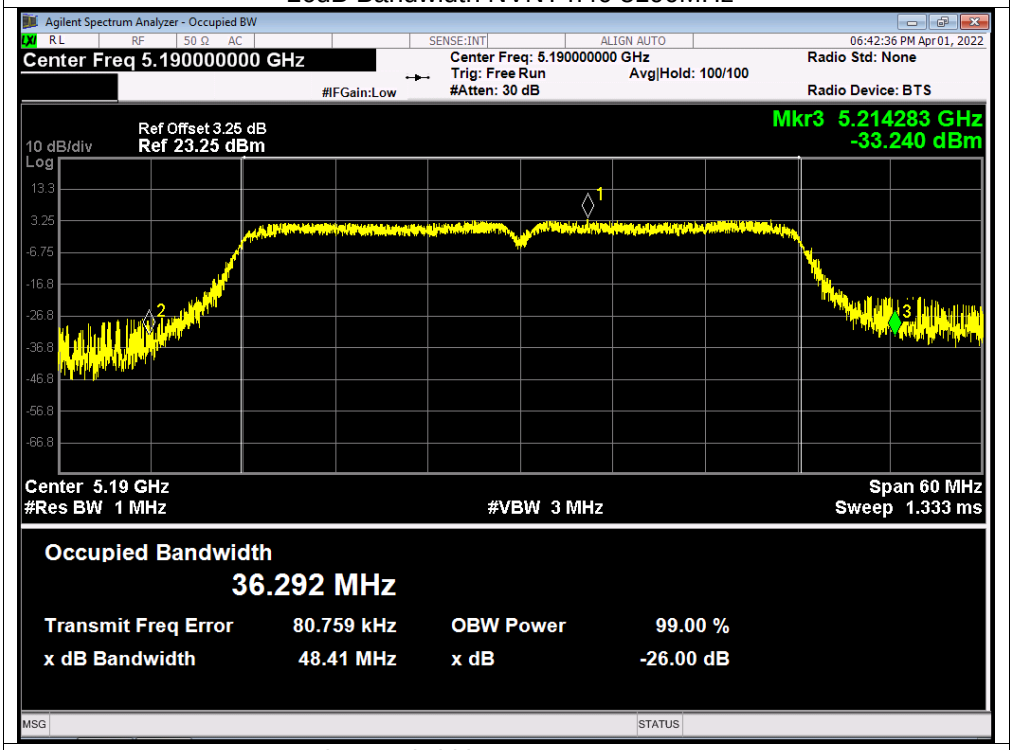
-26dB Bandwidth NVNT n20 5200MHz



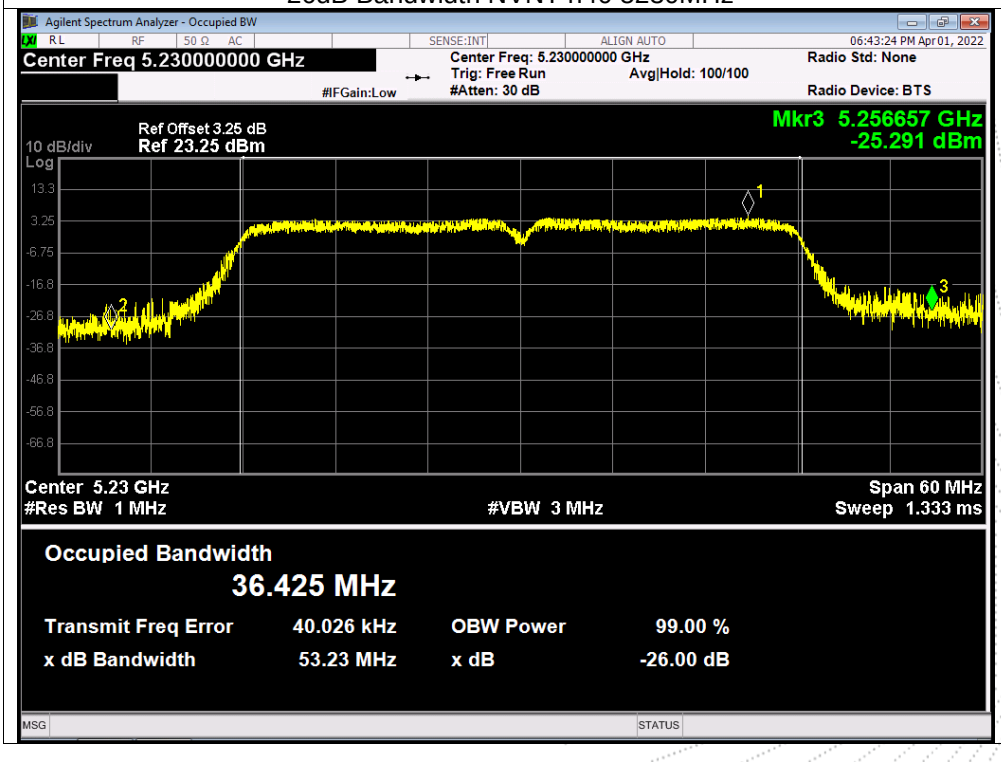
-26dB Bandwidth NVNT n20 5240MHz



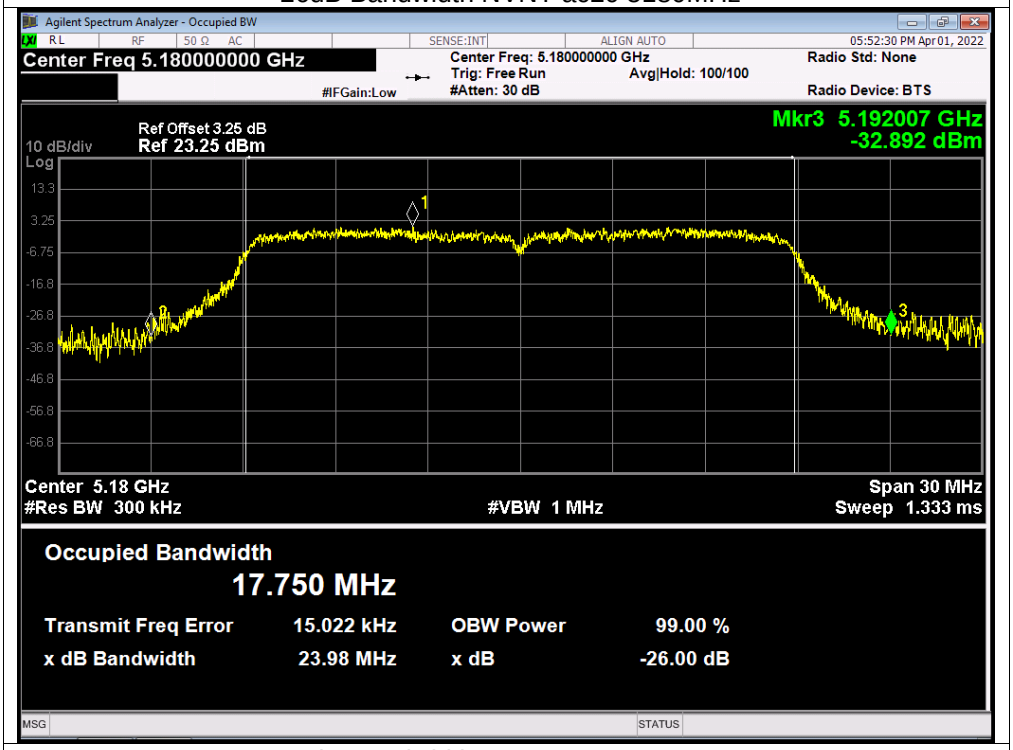
-26dB Bandwidth NVNT n40 5190MHz



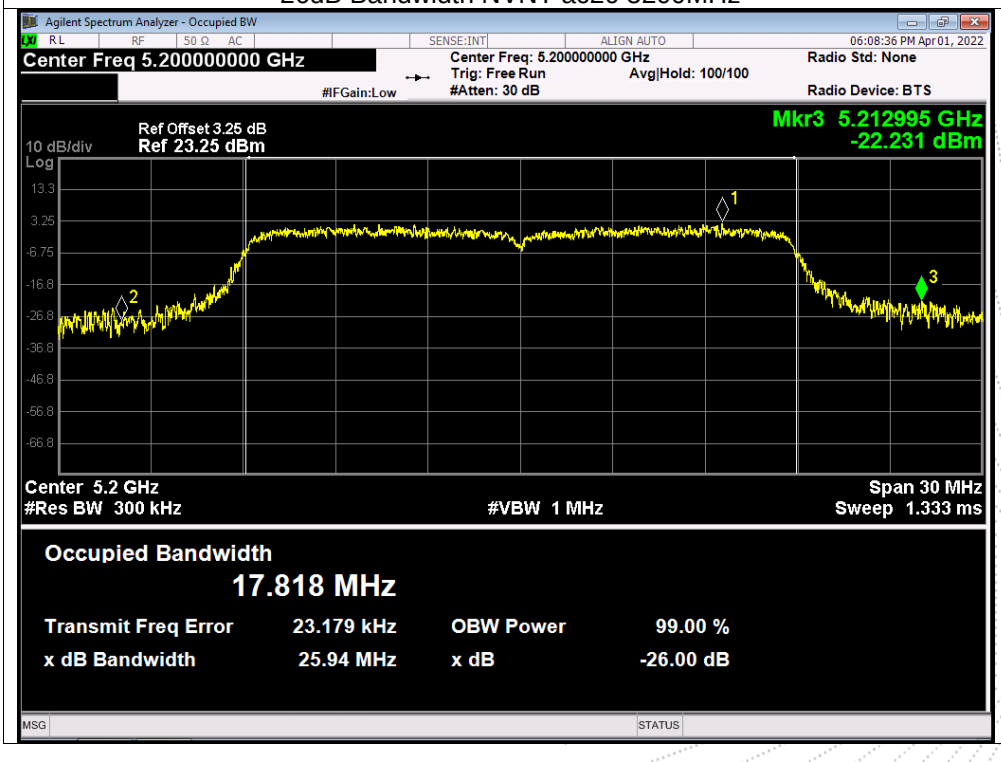
-26dB Bandwidth NVNT n40 5230MHz



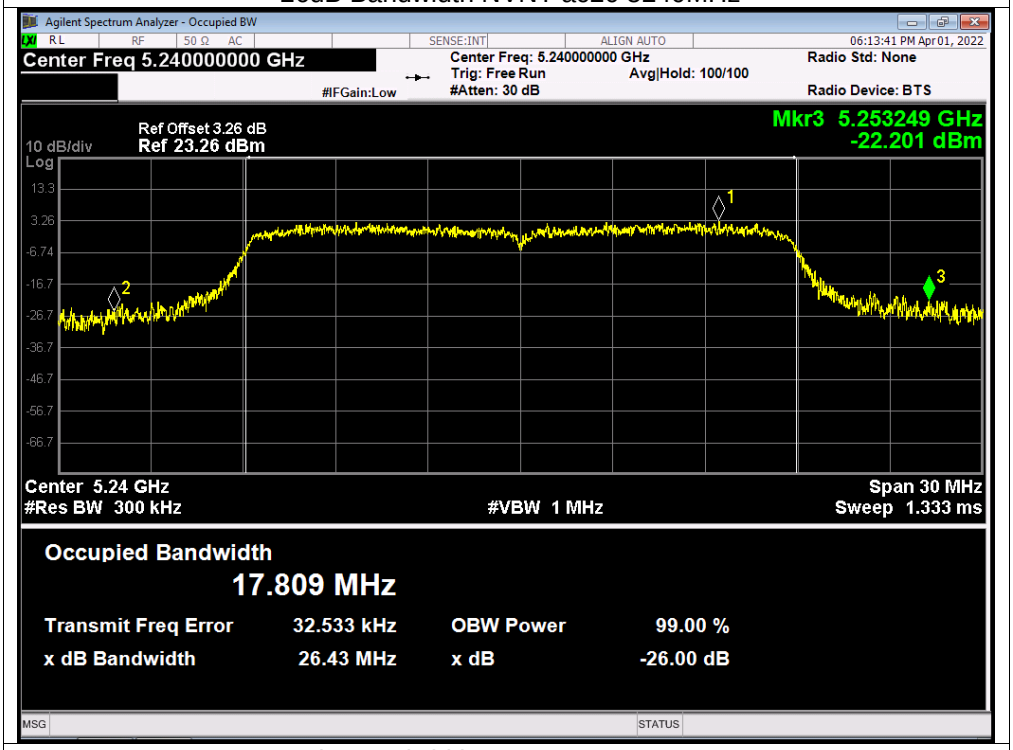
-26dB Bandwidth NVNT ac20 5180MHz



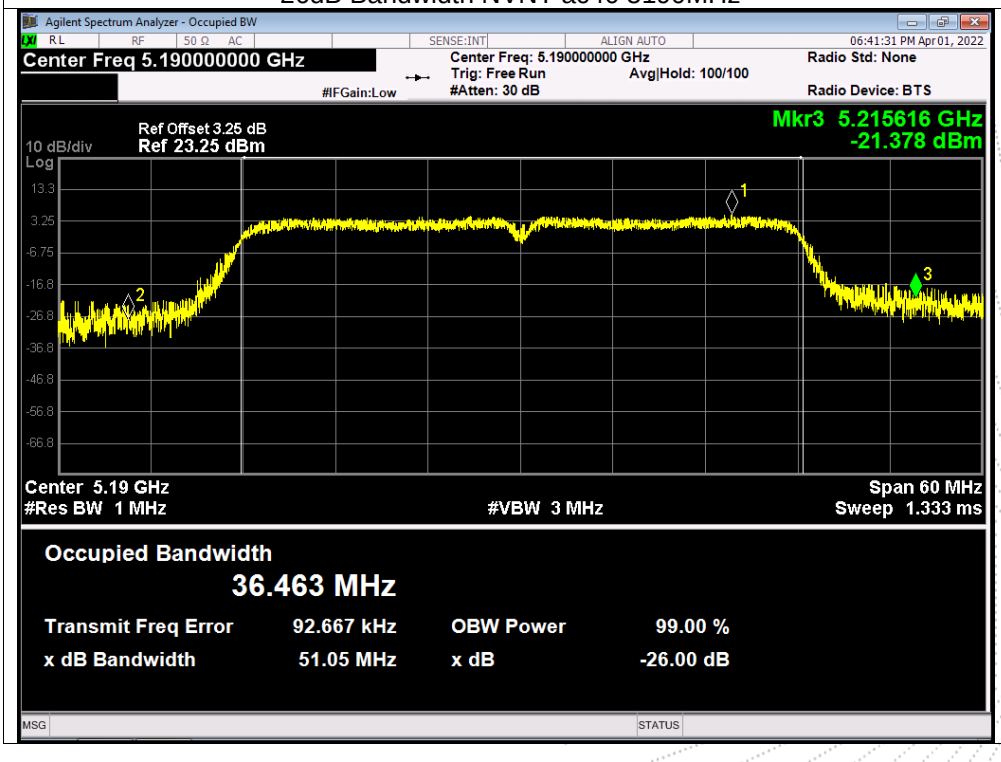
-26dB Bandwidth NVNT ac20 5200MHz



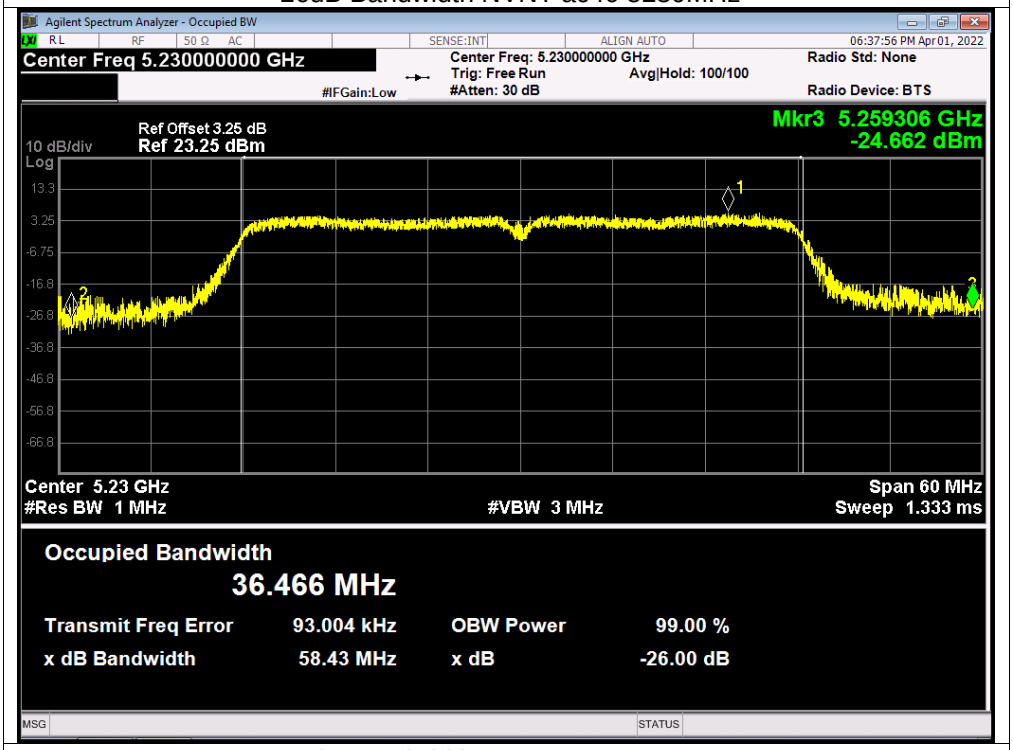
-26dB Bandwidth NVNT ac20 5240MHz



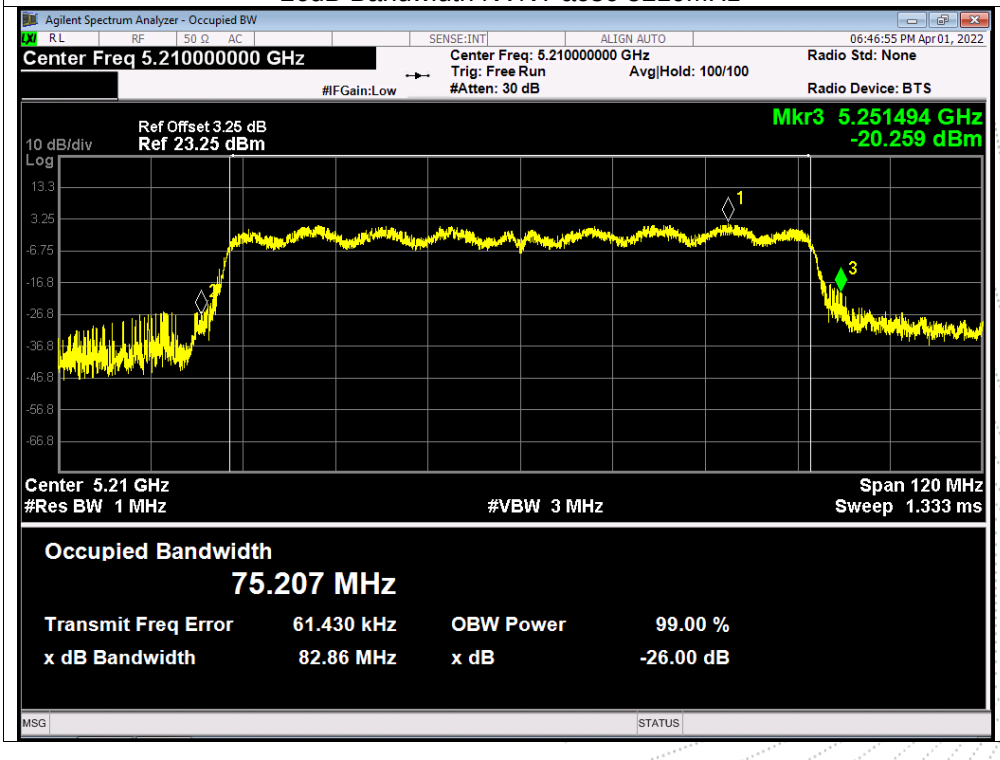
-26dB Bandwidth NVNT ac40 5190MHz



-26dB Bandwidth NVNT ac40 5230MHz



-26dB Bandwidth NVNT ac80 5210MHz



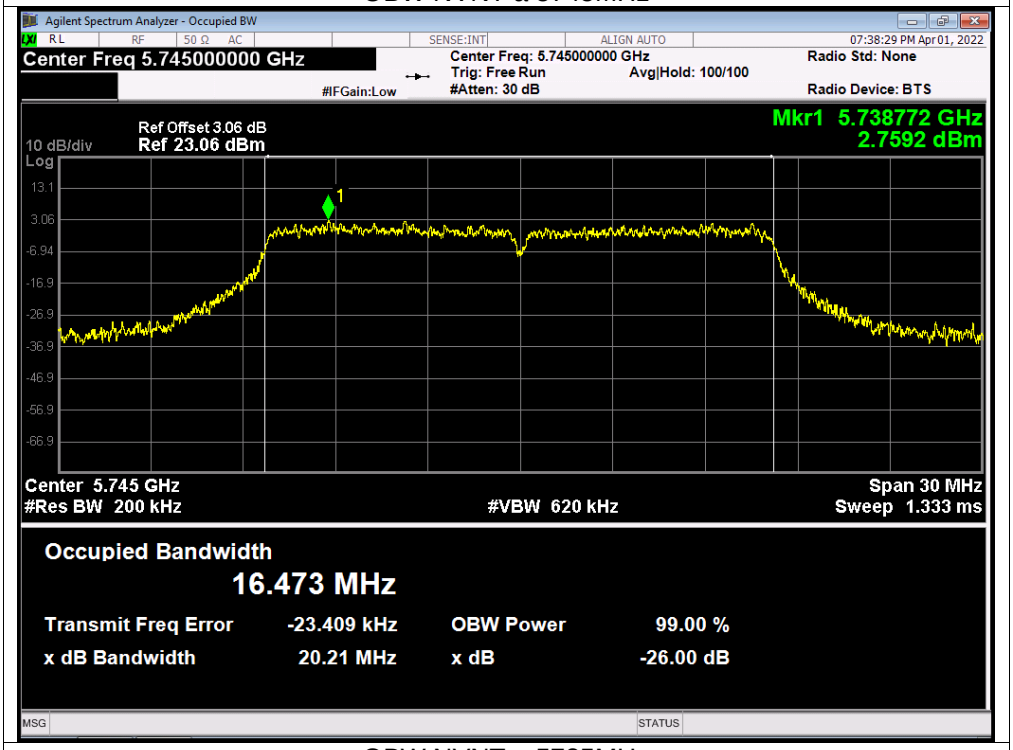
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-3(5745-5825MHz)		

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	6dB bandwidth (MHz)	Limit kHz	Result
802.11a	CH149	5745	16.473	16.288	≥500	Pass
	CH157	5785	16.527	16.33	≥500	Pass
	CH165	5825	16.508	16.33	≥500	Pass
802.11 n20	CH149	5745	17.652	16.561	≥500	Pass
	CH157	5785	17.607	16.918	≥500	Pass
	CH165	5825	17.621	16.991	≥500	Pass
802.11 n40	CH151	5755	36.091	35.388	≥500	Pass
	CH159	5795	36.095	35.674	≥500	Pass
802.11 AC20	CH149	5745	17.662	17.149	≥500	Pass
	CH157	5785	17.631	16.306	≥500	Pass
	CH165	5825	17.603	16.881	≥500	Pass
802.11 AC40	CH151	5755	36.086	35.437	≥500	Pass
	CH159	5795	36.118	35.056	≥500	Pass
802.11 AC80	CH151	5755	75.156	75.07	≥500	Pass

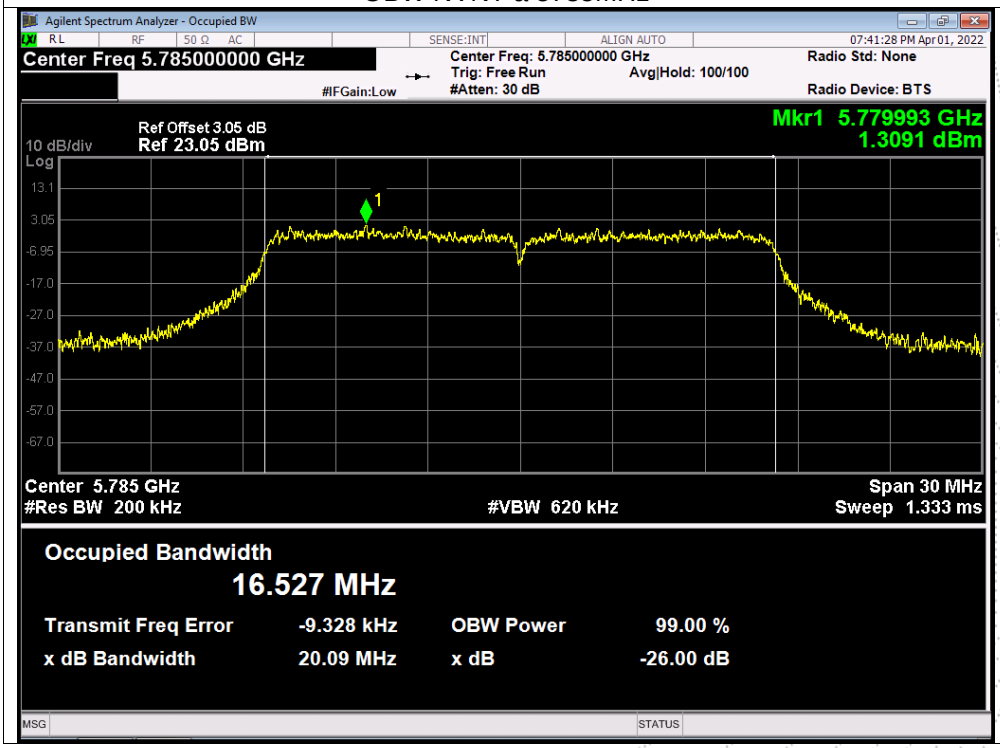
99% OBW

Test Graphs

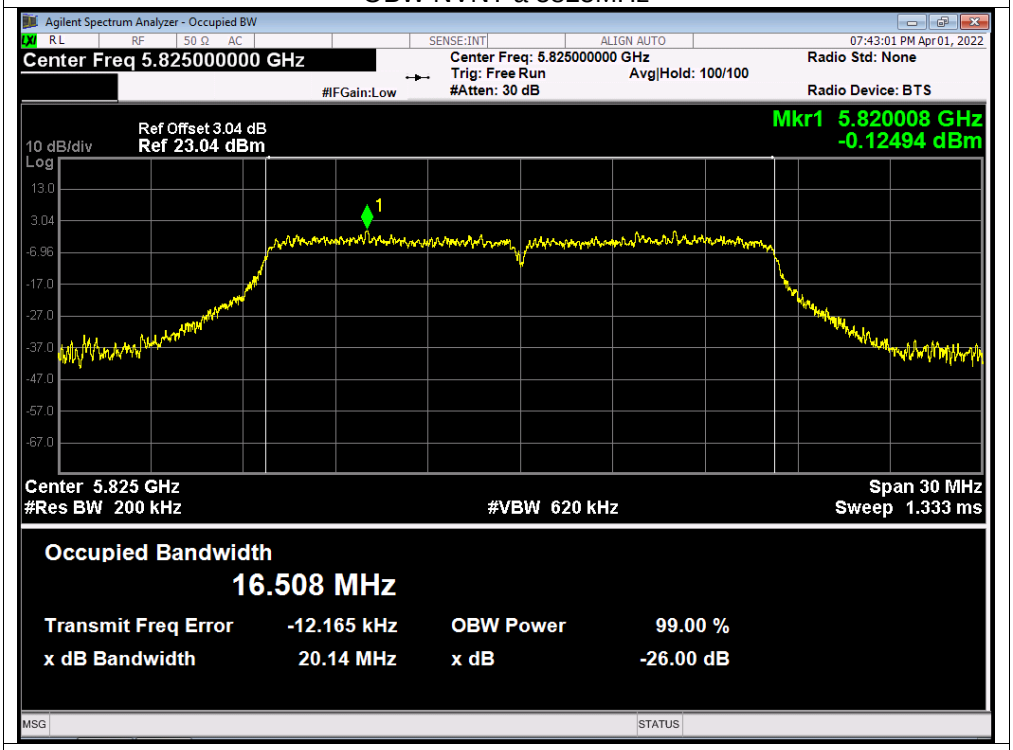
OBW NVNT a 5745MHz



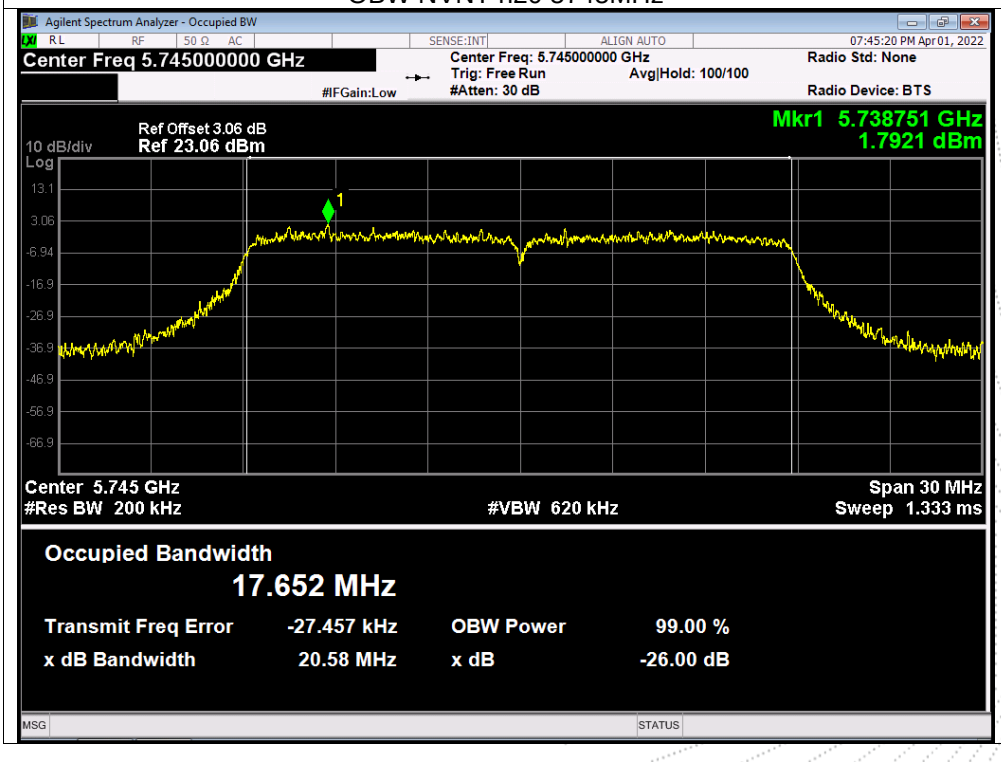
OBW NVNT a 5785MHz



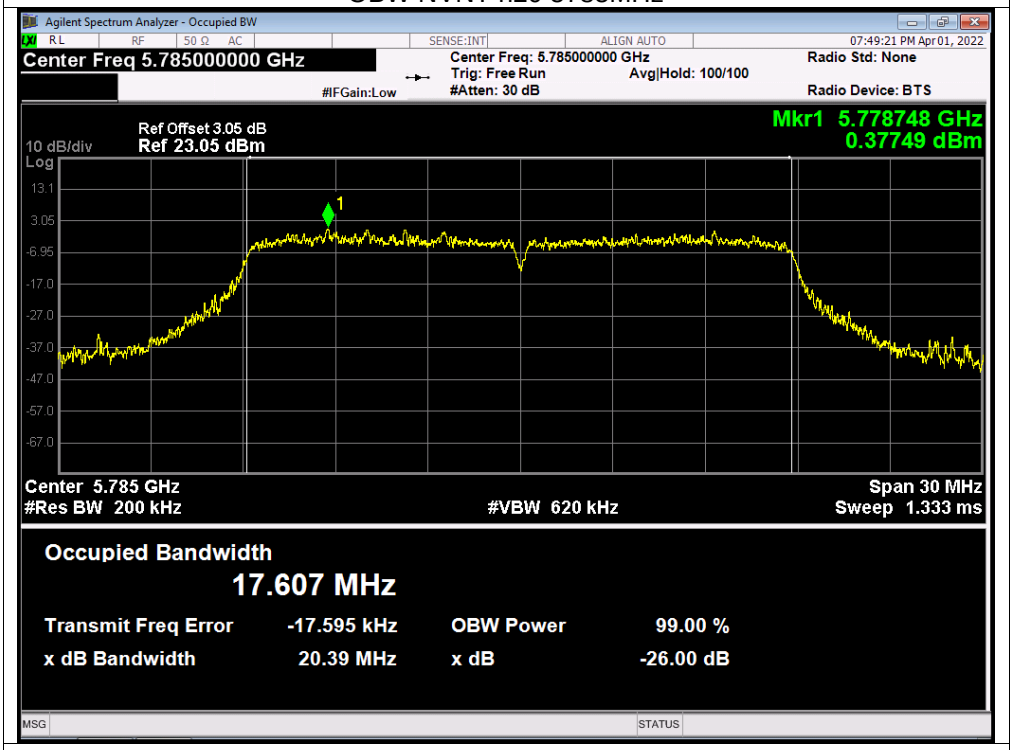
OBW NVNT a 5825MHz



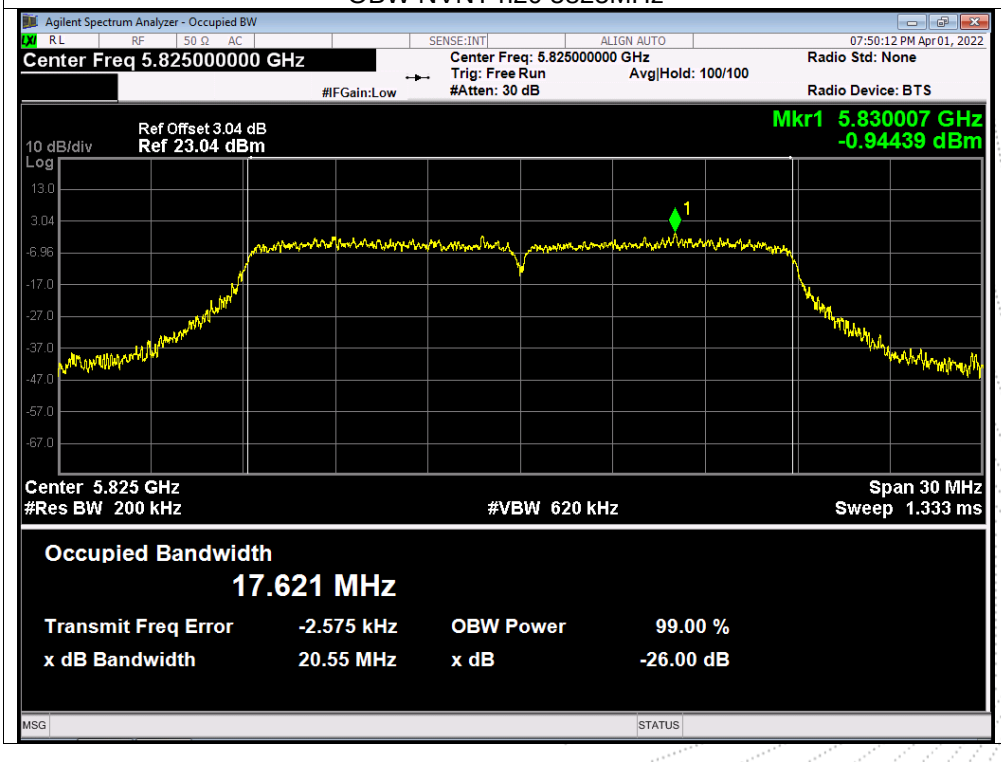
OBW NVNT n20 5745MHz



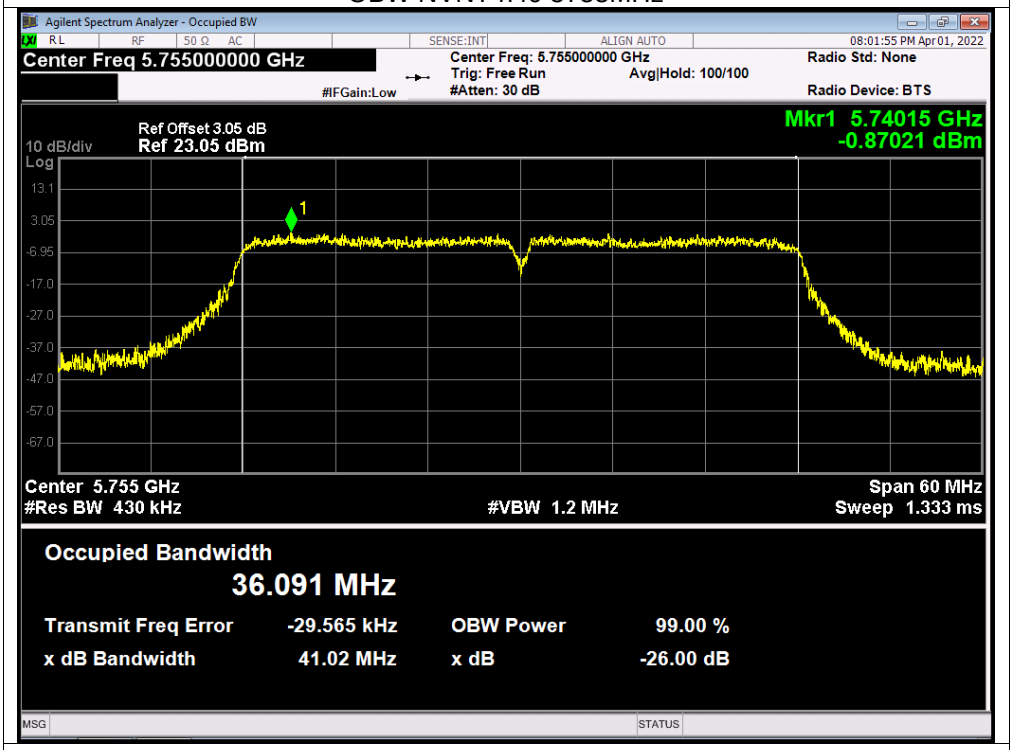
OBW NVNT n20 5785MHz



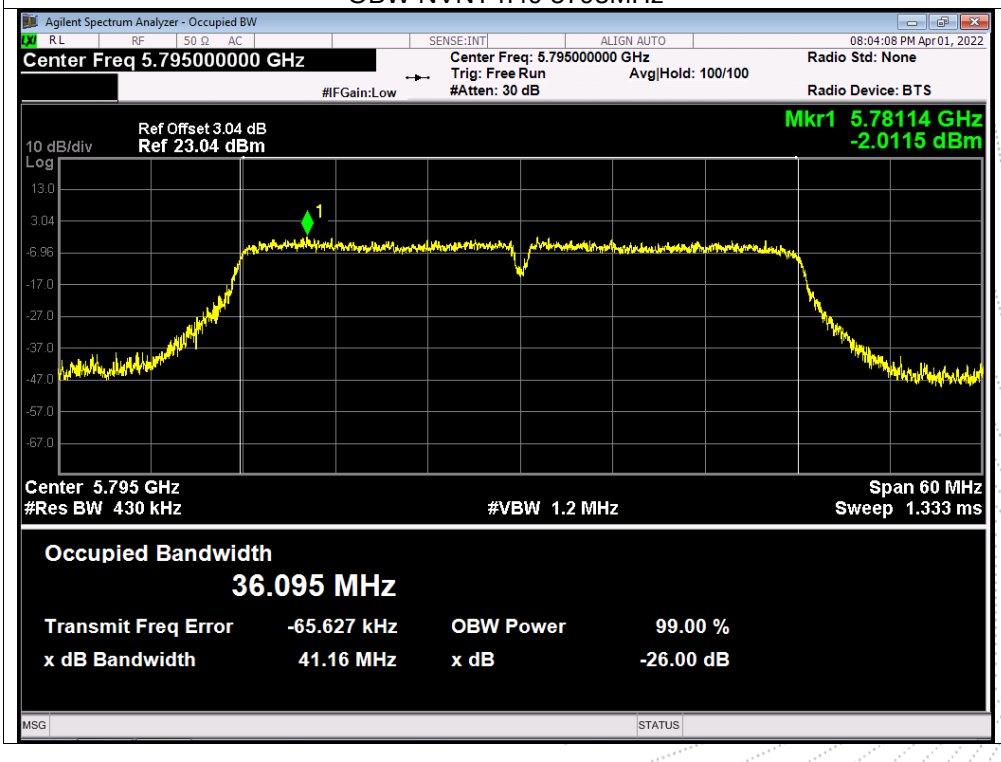
OBW NVNT n20 5825MHz



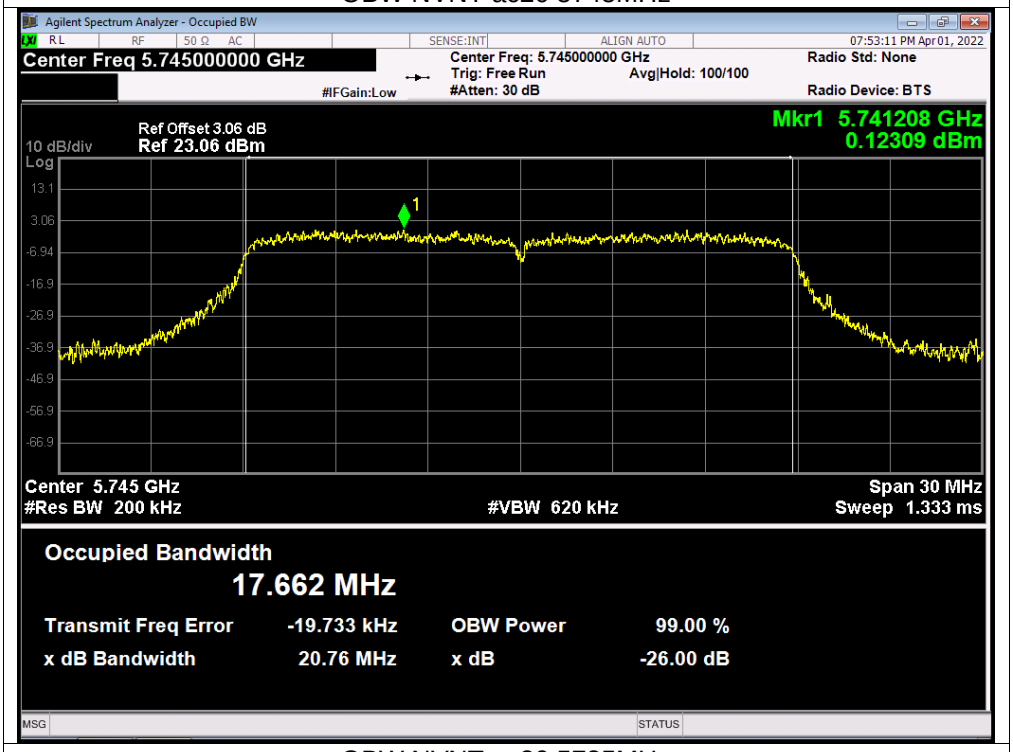
OBW NVNT n40 5755MHz



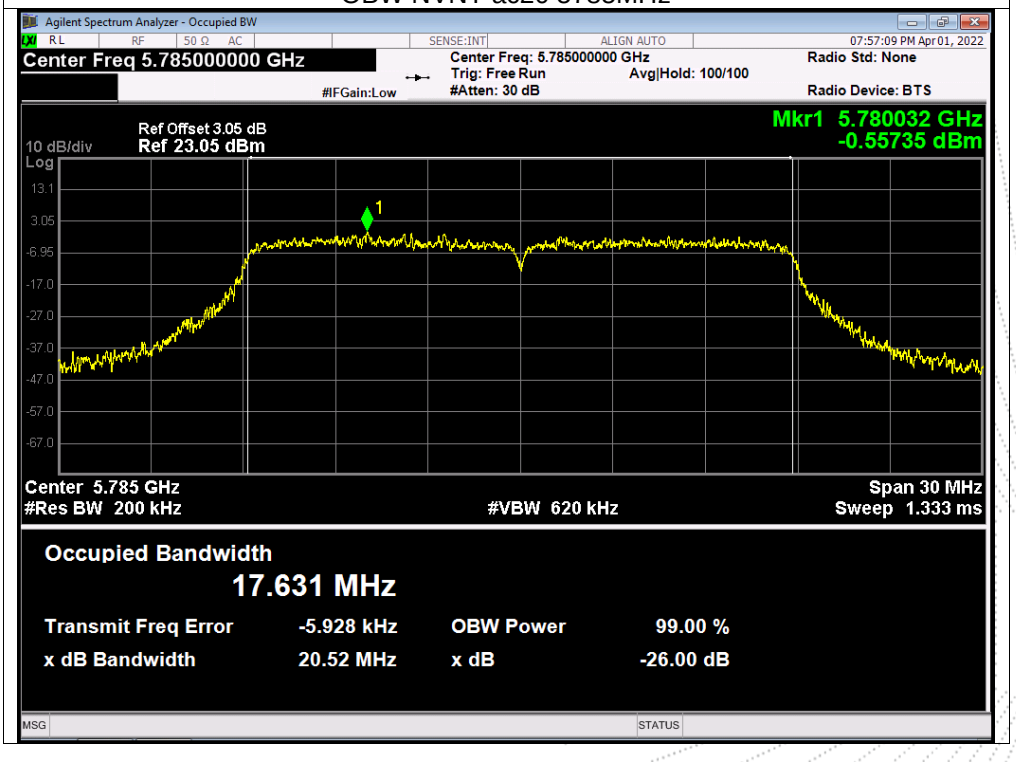
OBW NVNT n40 5795MHz



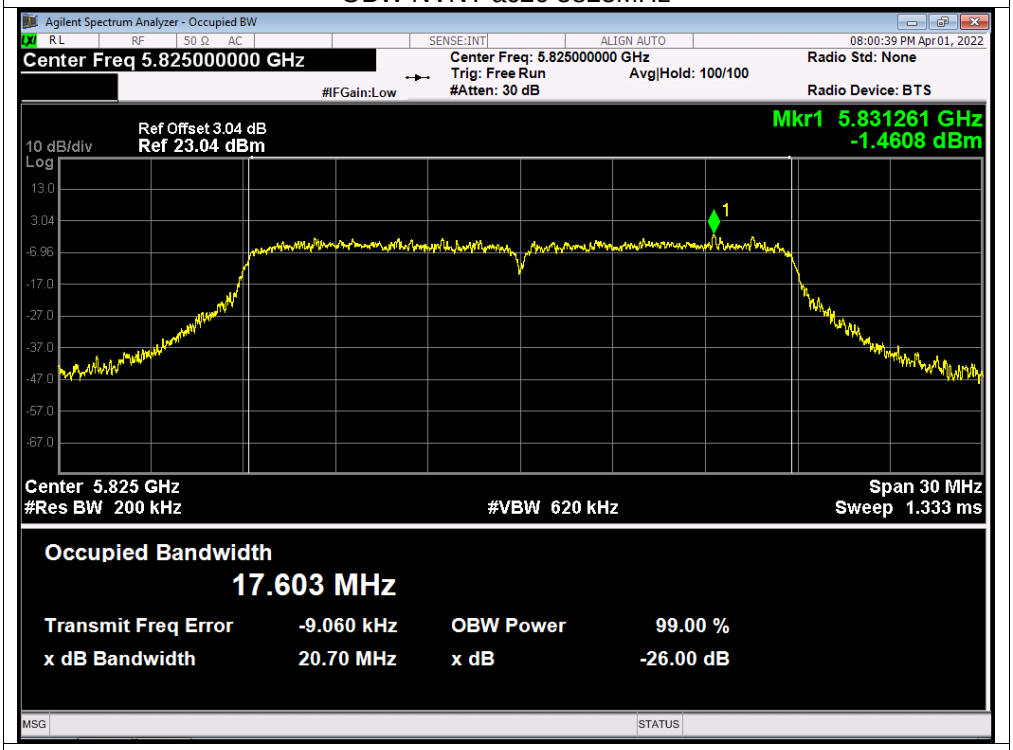
OBW NVNT ac20 5745MHz



OBW NVNT ac20 5785MHz



OBW NVNT ac20 5825MHz



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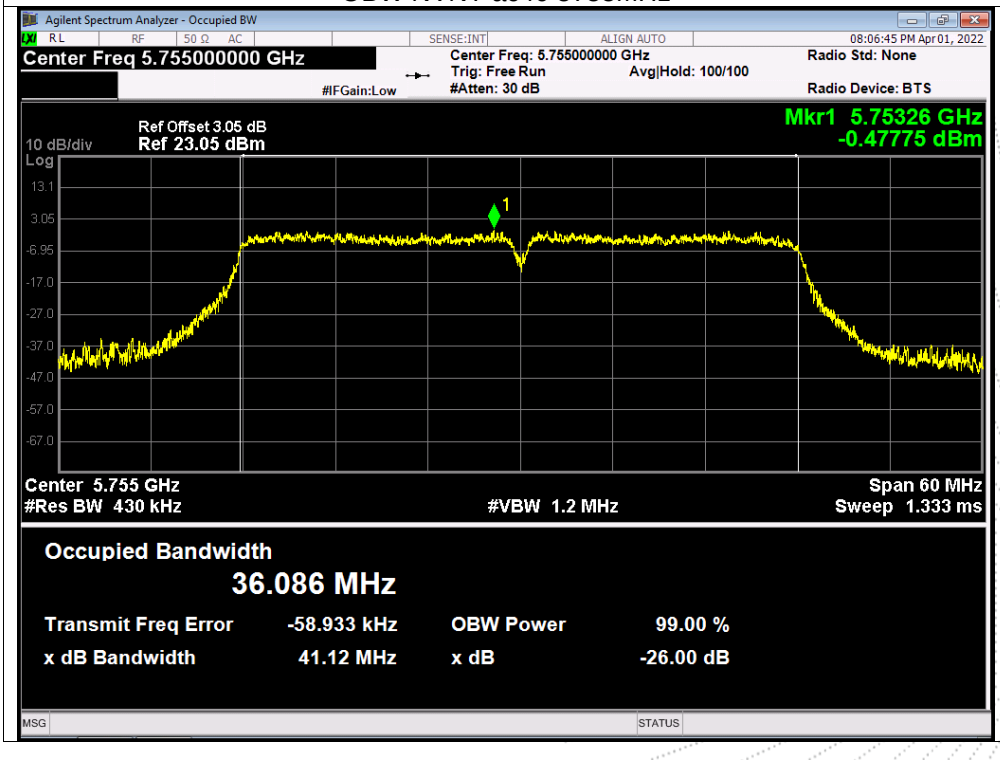
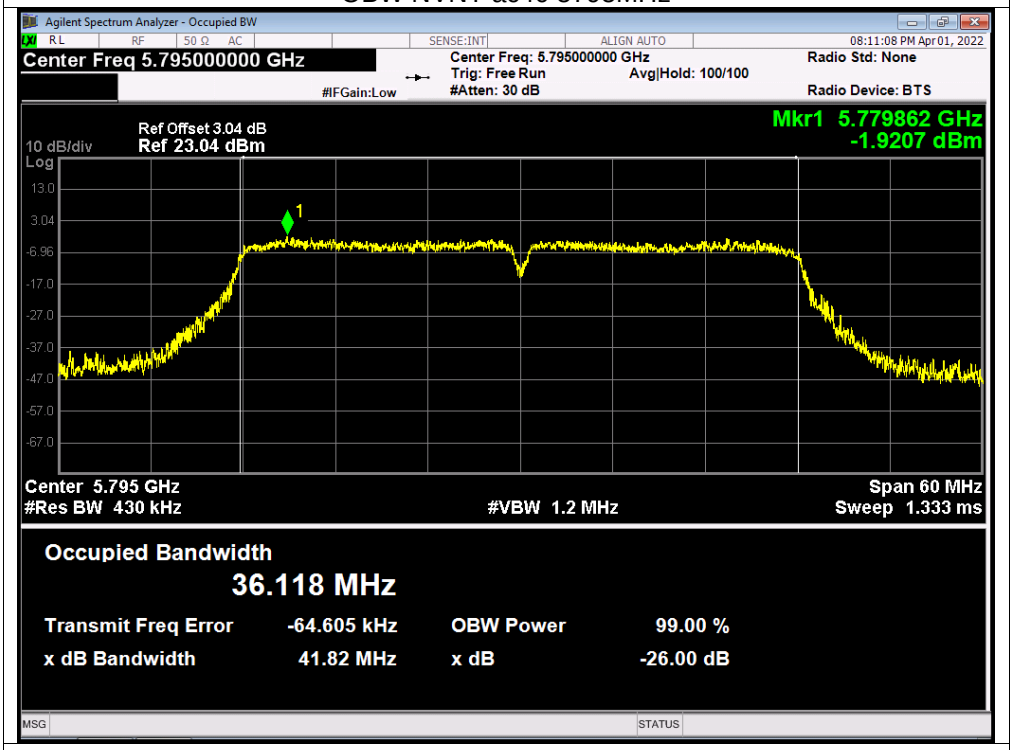
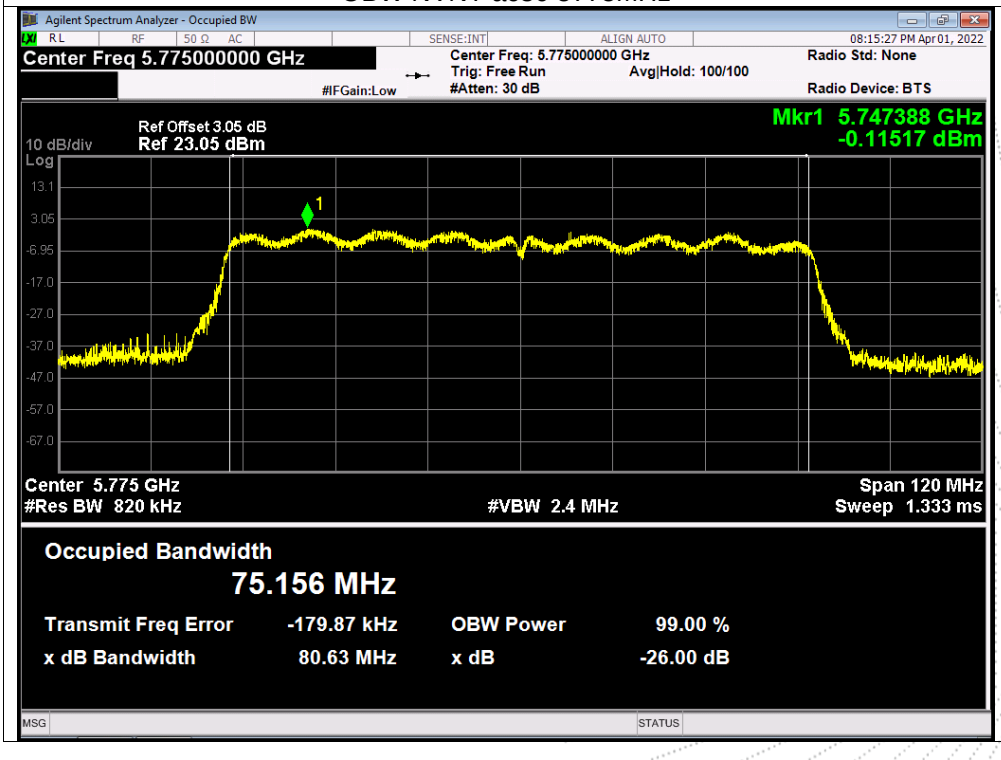


OBW NVNT ac40 5795MHz



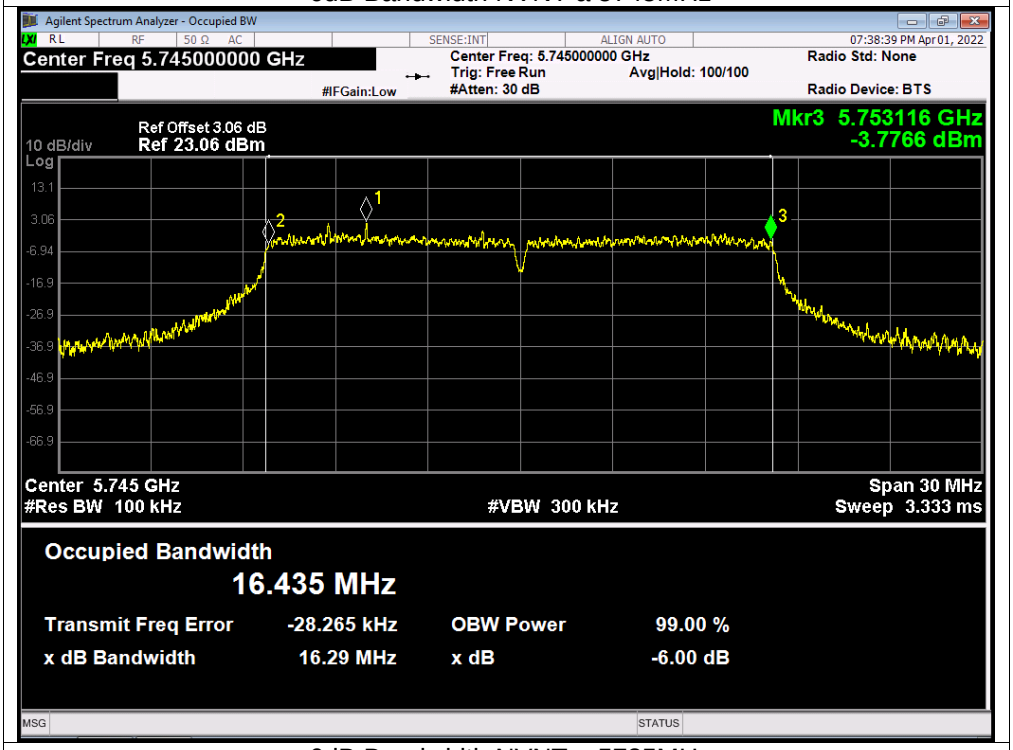
OBW NVNT ac80 5775MHz



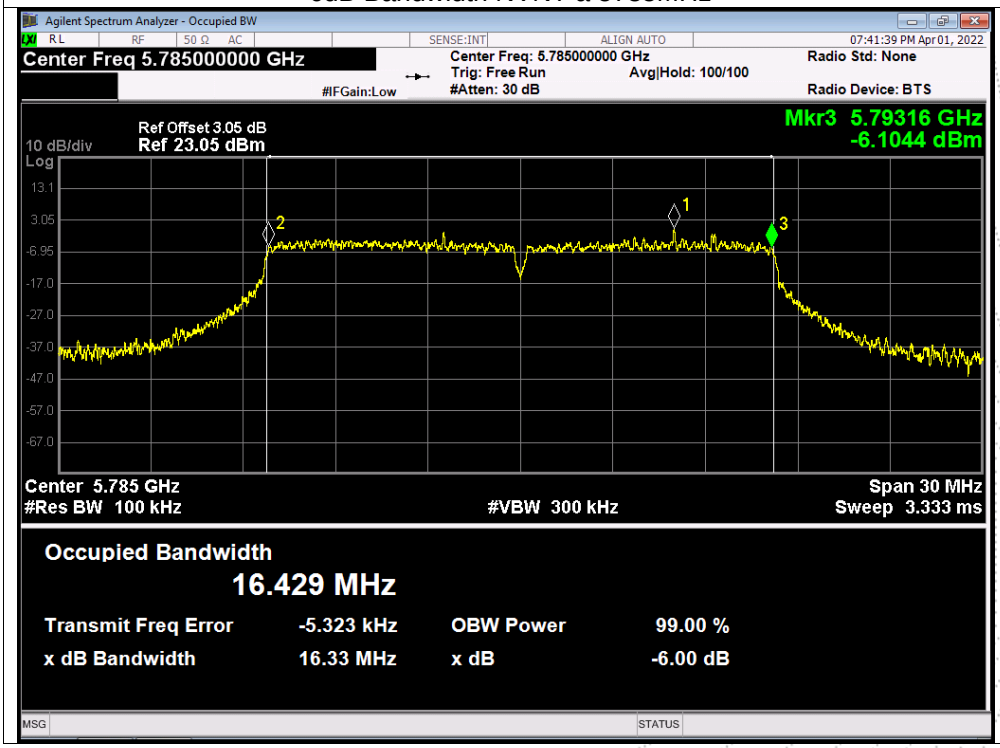
-6dB Bandwidth

Test Graphs

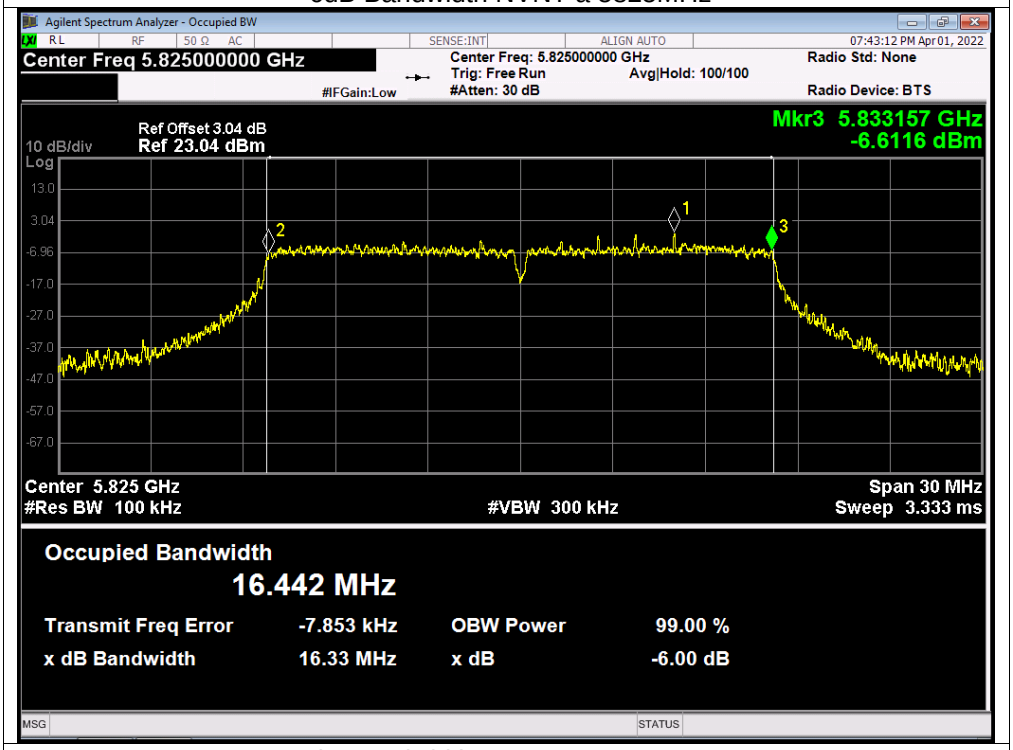
-6dB Bandwidth NVNT a 5745MHz



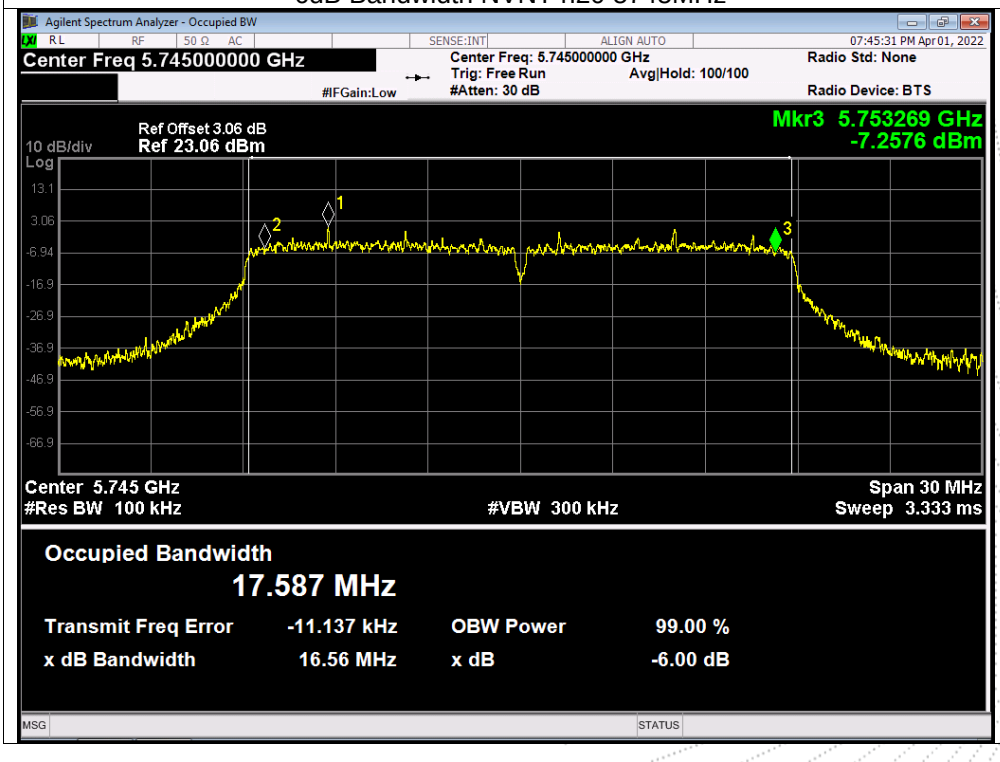
-6dB Bandwidth NVNT a 5785MHz



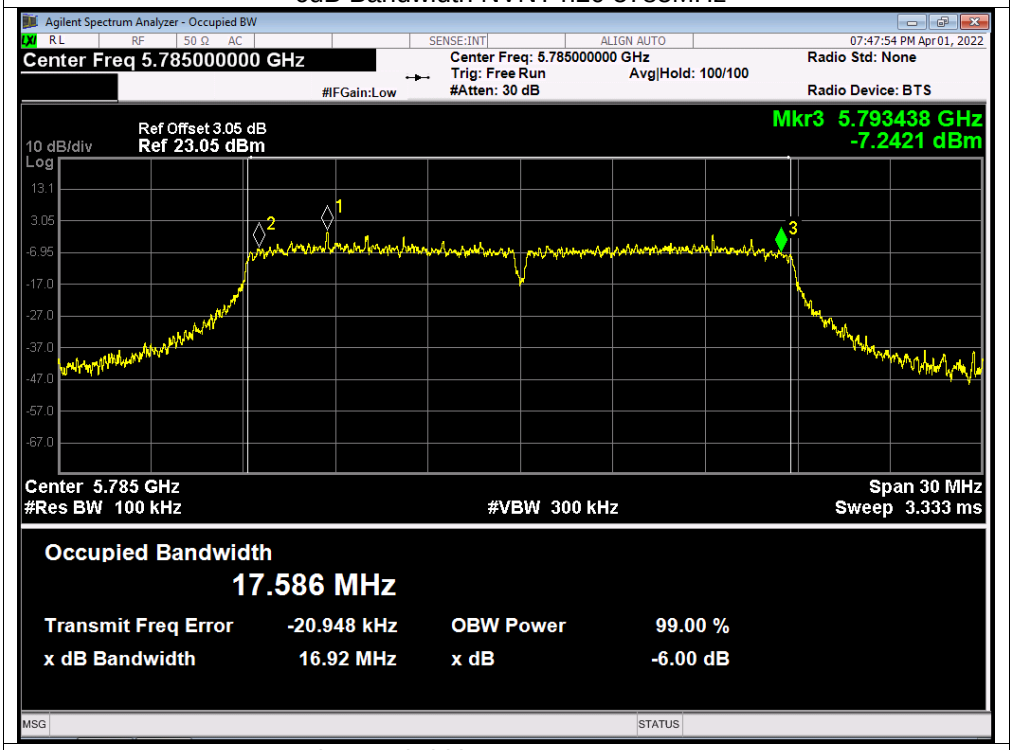
-6dB Bandwidth NVNT a 5825MHz



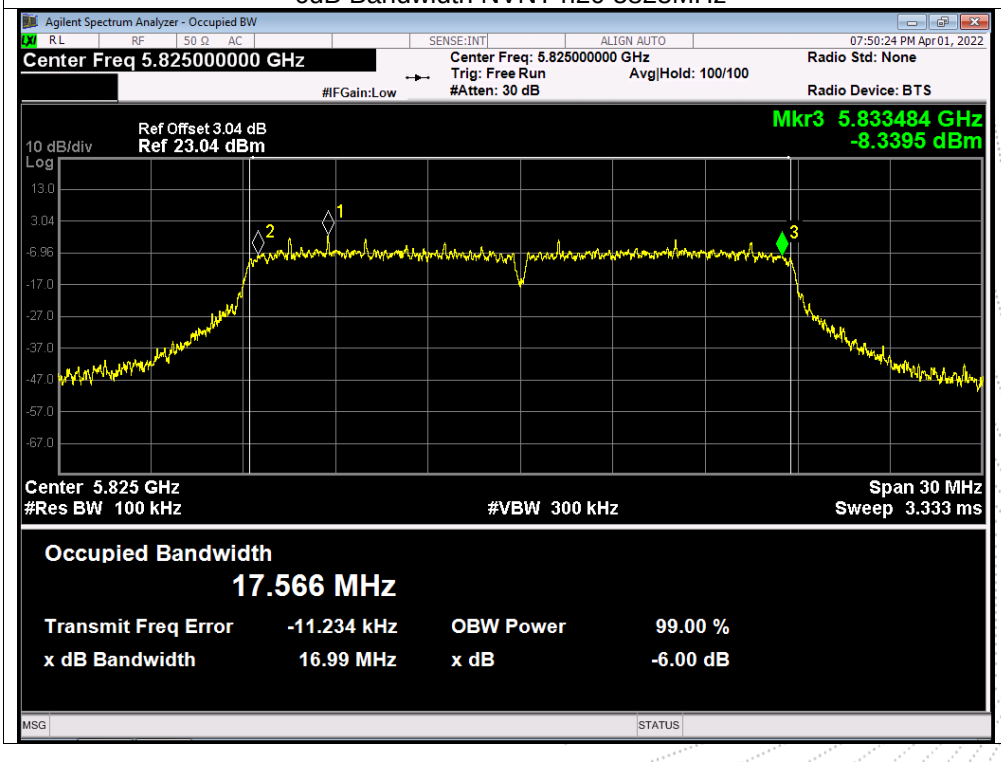
-6dB Bandwidth NVNT n20 5745MHz



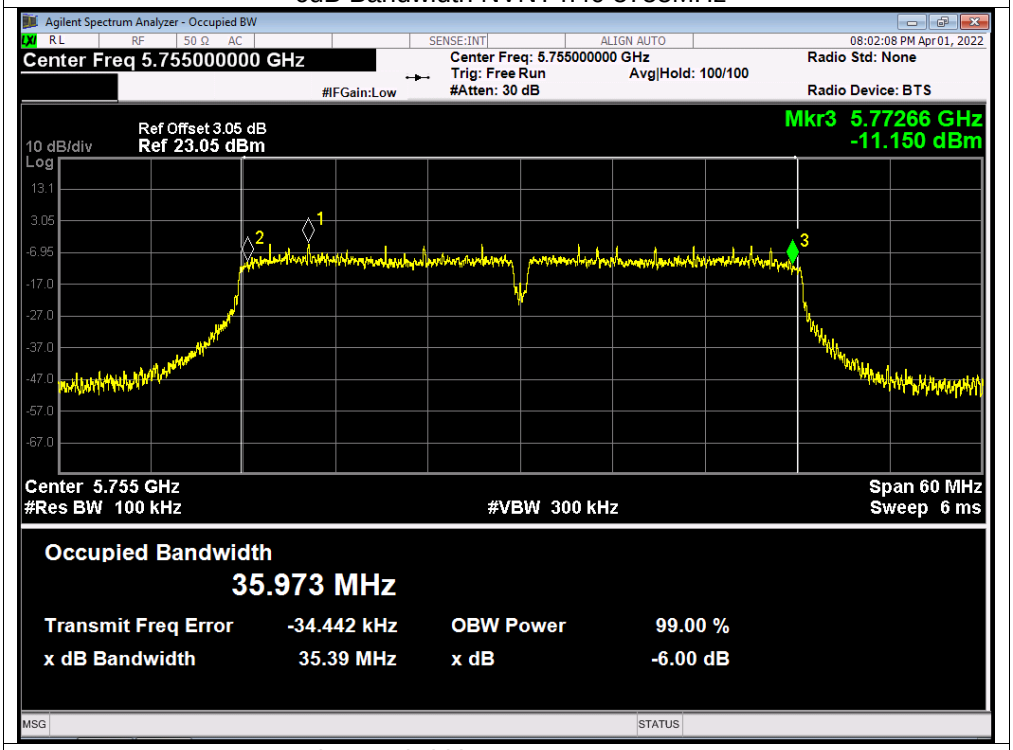
-6dB Bandwidth NVNT n20 5785MHz



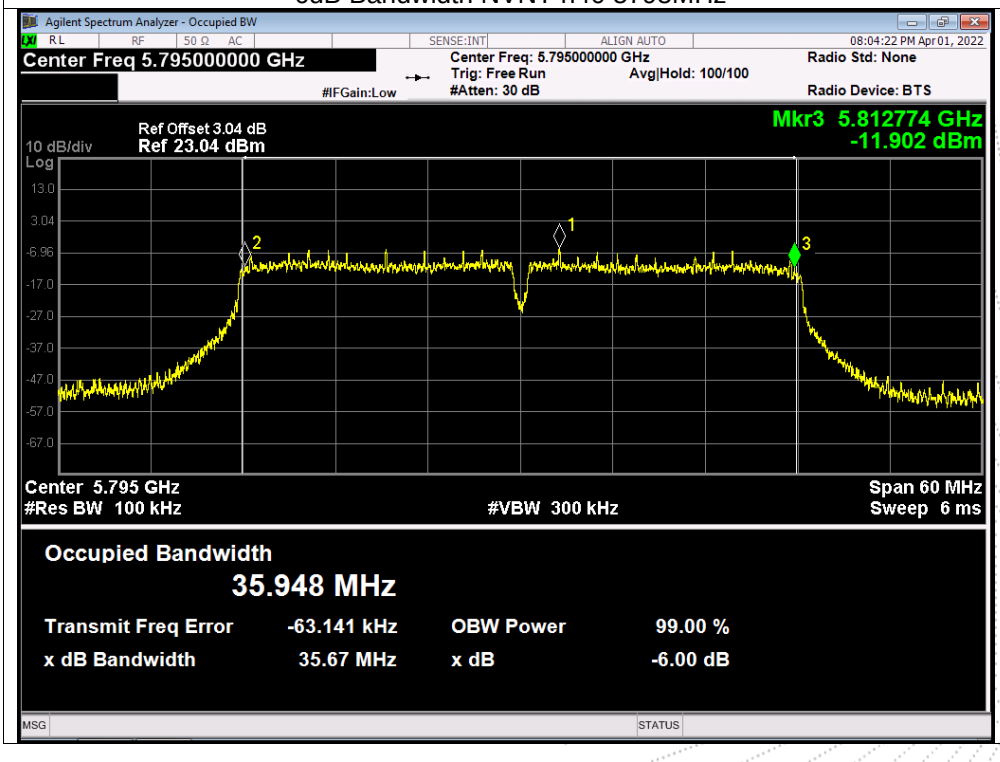
-6dB Bandwidth NVNT n20 5825MHz



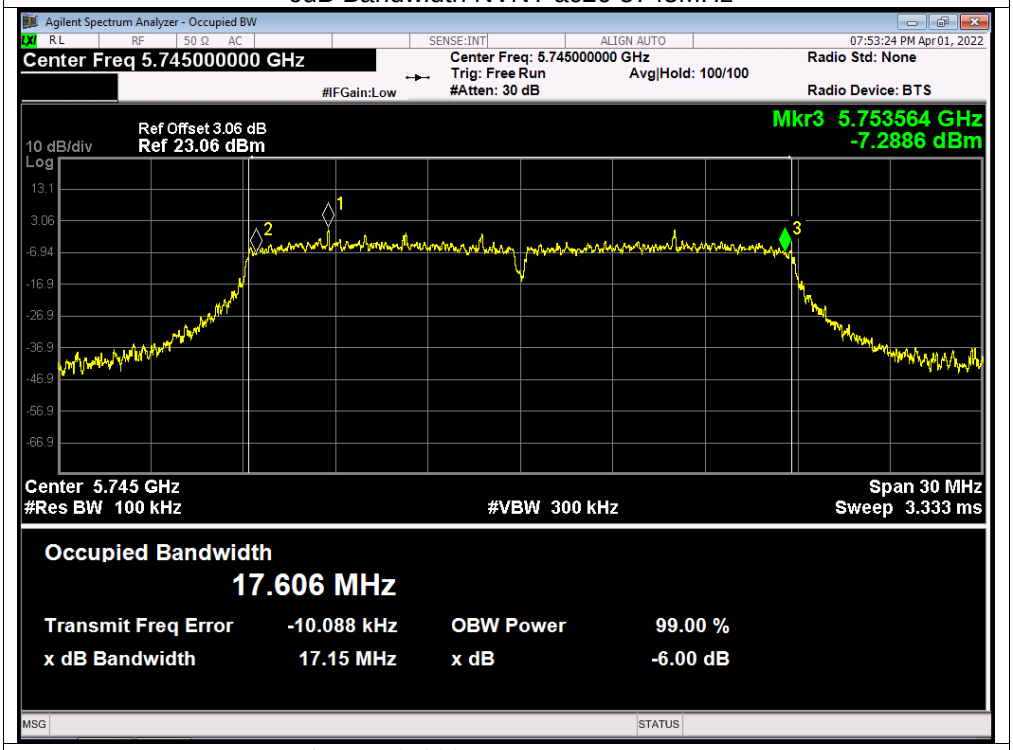
-6dB Bandwidth NVNT n40 5755MHz



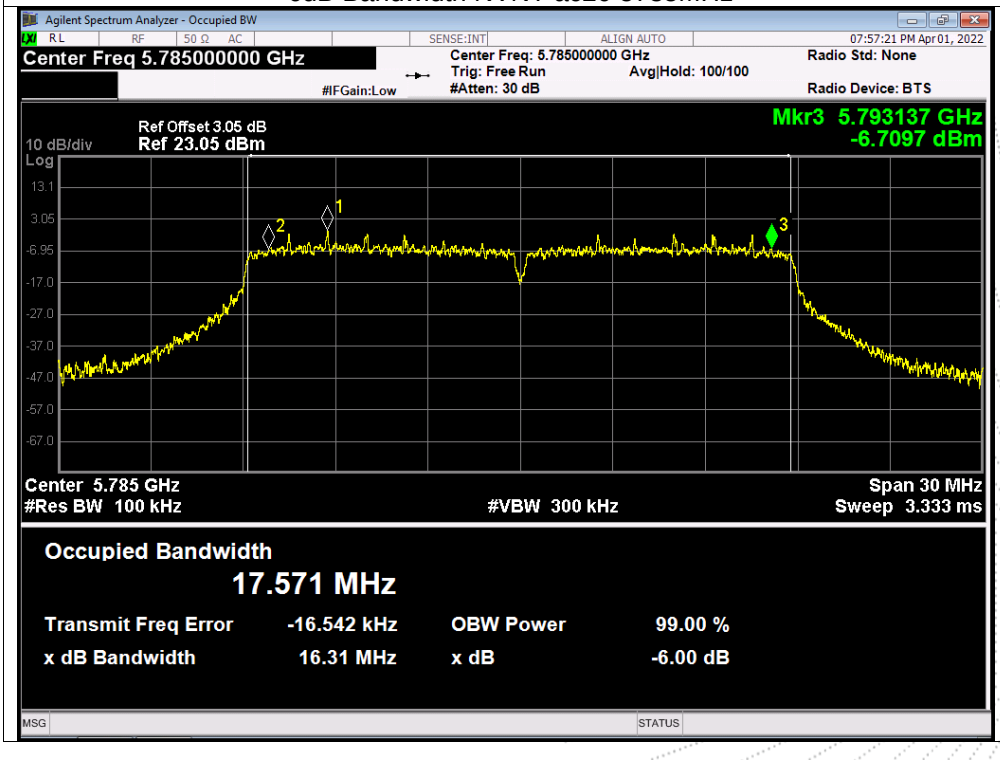
-6dB Bandwidth NVNT n40 5795MHz



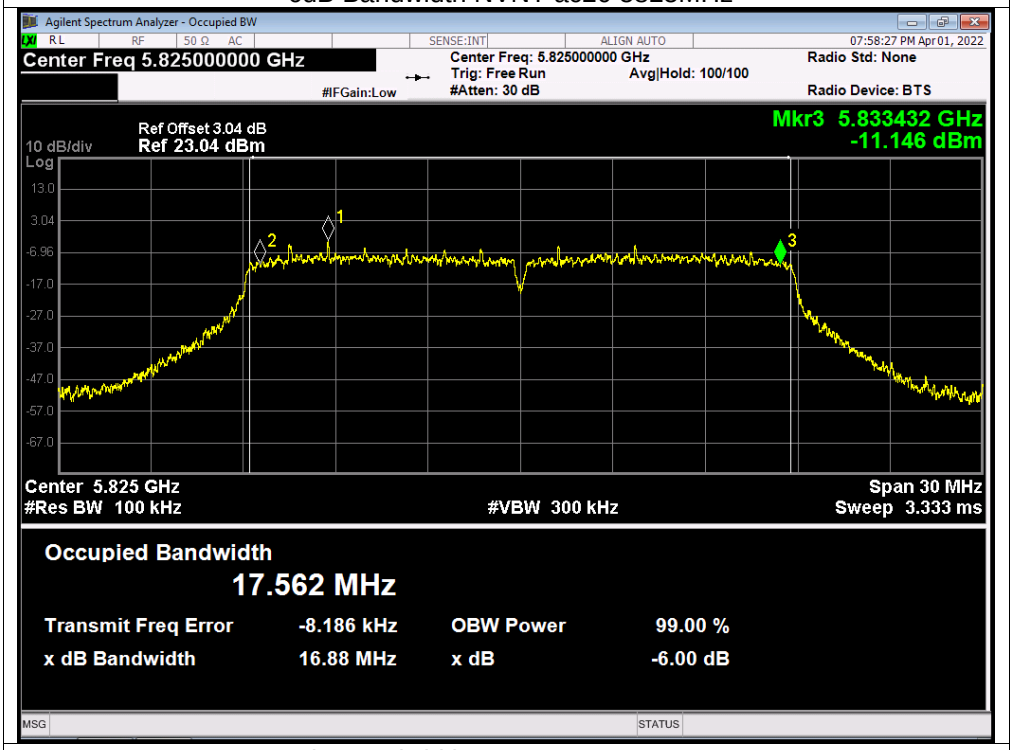
-6dB Bandwidth NVNT ac20 5745MHz



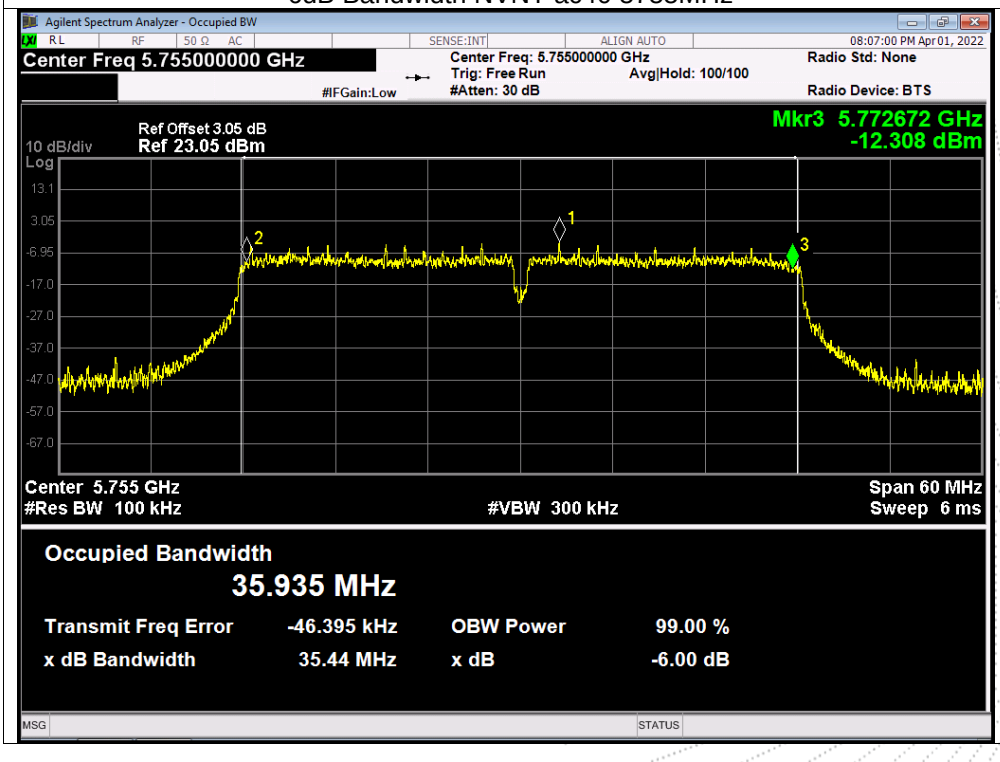
-6dB Bandwidth NVNT ac20 5785MHz



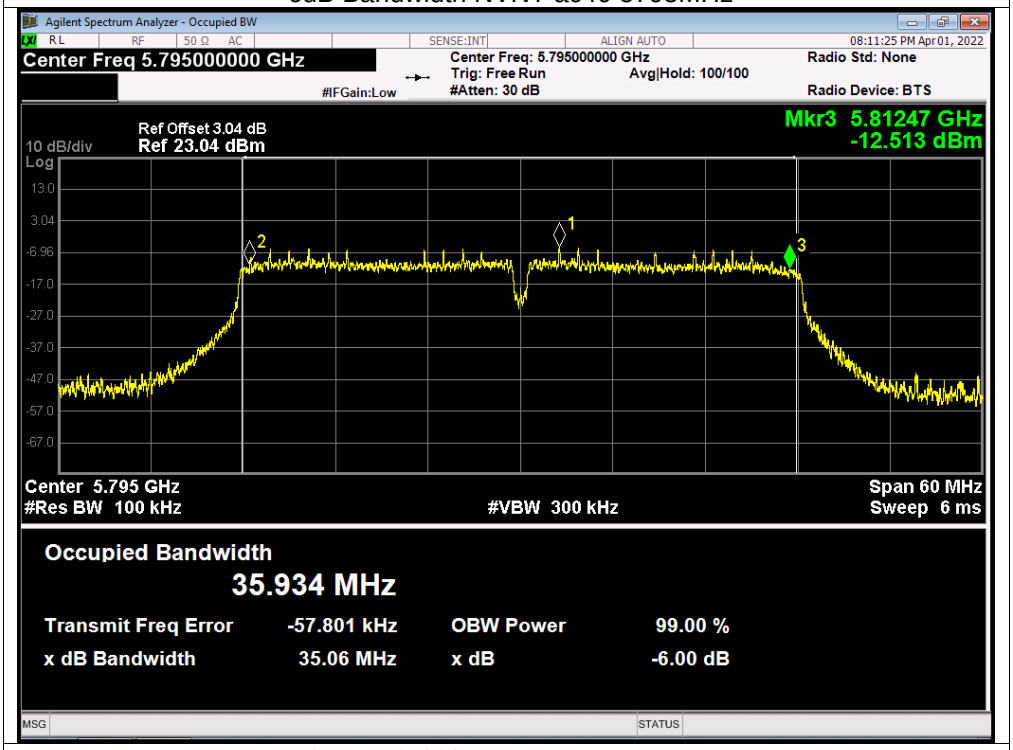
-6dB Bandwidth NVNT ac20 5825MHz



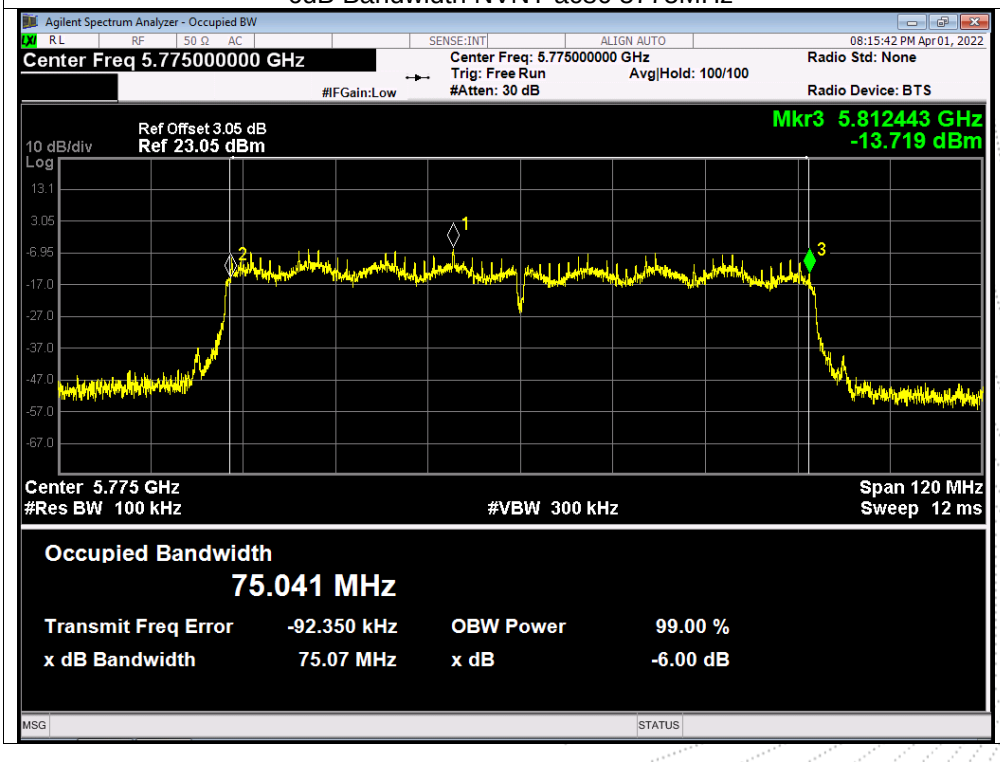
-6dB Bandwidth NVNT ac40 5755MHz



-6dB Bandwidth NVNT ac40 5795MHz

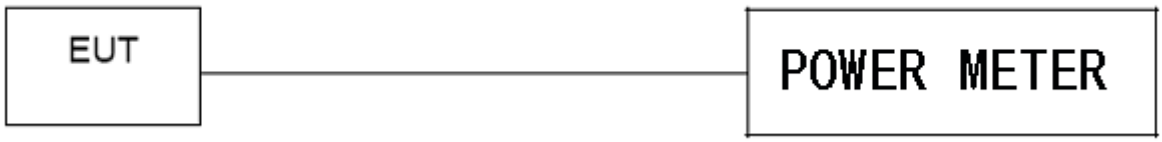


-6dB Bandwidth NVNT ac80 5775MHz



10. Maximum Conducted Output Power

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407

The maximum conduced output power should not exceed:

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

10.3 Test Procedure

Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

• The EUT transmits continuously (or with a duty cycle ≥ 98 percent).

• Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

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

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

10.4 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.

10.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

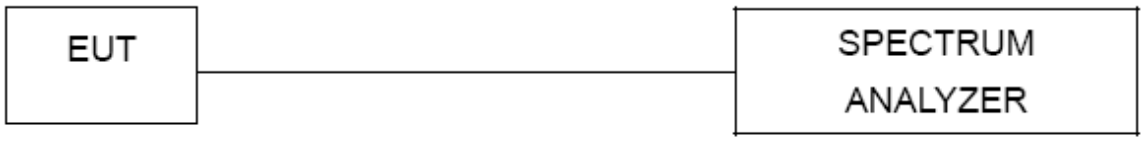
Mode	Test Channel	Frequency	Maximum output power. Antenna port (AV)	LIMIT	Result
		(MHz)	(dBm)	dBm	
TX 802.11a Mode	CH36	5180	11.93	23.98	Pass
	CH40	5200	12.3	23.98	Pass
	CH48	5240	13.09	23.98	Pass
TX 802.11 n20M Mode	CH36	5180	10.89	23.98	Pass
	CH40	5200	11.23	23.98	Pass
	CH48	5240	11.89	23.98	Pass
TX 802.11 n40M Mode	CH38	5190	9.19	23.98	Pass
	CH46	5230	9.83	23.98	Pass
TX 802.11 AC20M Mode	CH36	5180	10.33	23.98	Pass
	CH40	5200	11.46	23.98	Pass
	CH48	5240	11.88	23.98	Pass
TX 802.11 AC40M Mode	CH38	5190	10.64	23.98	Pass
	CH46	5230	10.93	23.98	Pass
TX 802.11 AC80M Mode	CH42	5210	8.67	23.98	Pass

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Mode	Test Channel	Frequency	Maximum output power. Antenna port (AV)	LIMIT	Result
		(MHz)	(dBm)	dBm	
TX 802.11a Mode	CH 149	5745	12.49	30	Pass
	CH 157	5785	11.08	30	Pass
	CH 165	5825	9.58	30	Pass
TX 802.11 n20M Mode	CH 149	5745	11.34	30	Pass
	CH 157	5785	9.95	30	Pass
	CH 165	5825	9.14	30	Pass
TX 802.11 n40M Mode	CH 151	5755	9.44	30	Pass
	CH 159	5795	7.95	30	Pass
TX 802.11 AC20M Mode	CH 149	5745	11	30	Pass
	CH 157	5785	9.39	30	Pass
	CH 165	5825	8.51	30	Pass
TX 802.11 AC40M Mode	CH 151	5755	9.96	30	Pass
	CH 159	5795	7.98	30	Pass
TX 802.11 AC80M Mode	CH 151	5775	8.85	30	Pass

11. Out Of Band Emissions

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) 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.

11.3 Test Procedure

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

11.4 EUT Operating Conditions

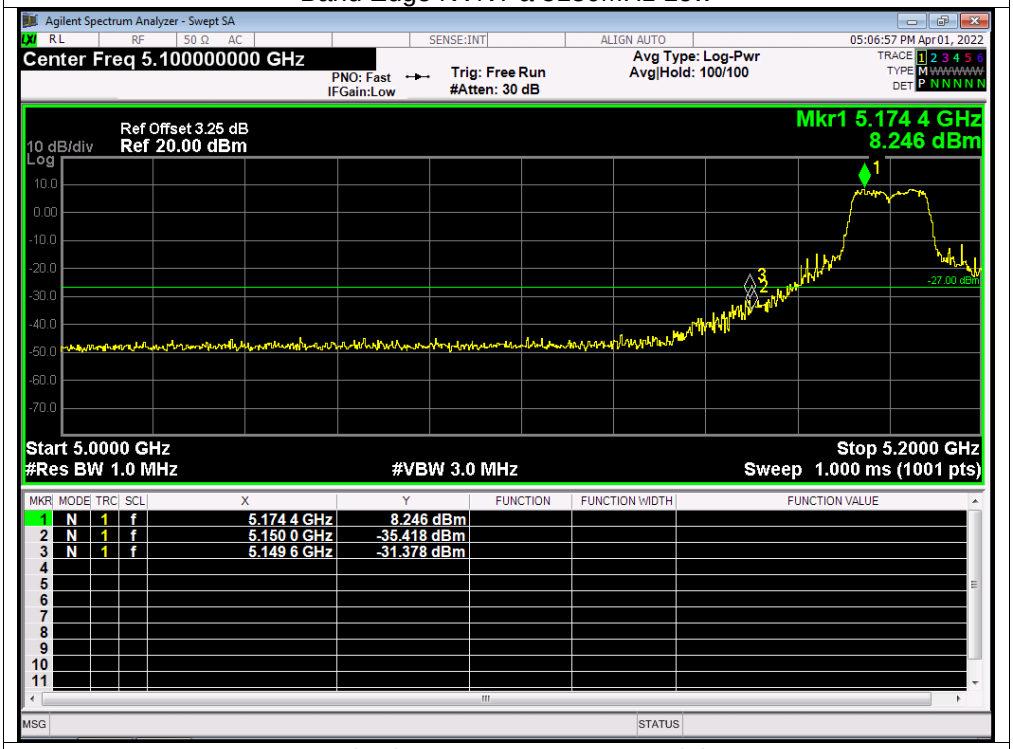
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

11.5 Test Result

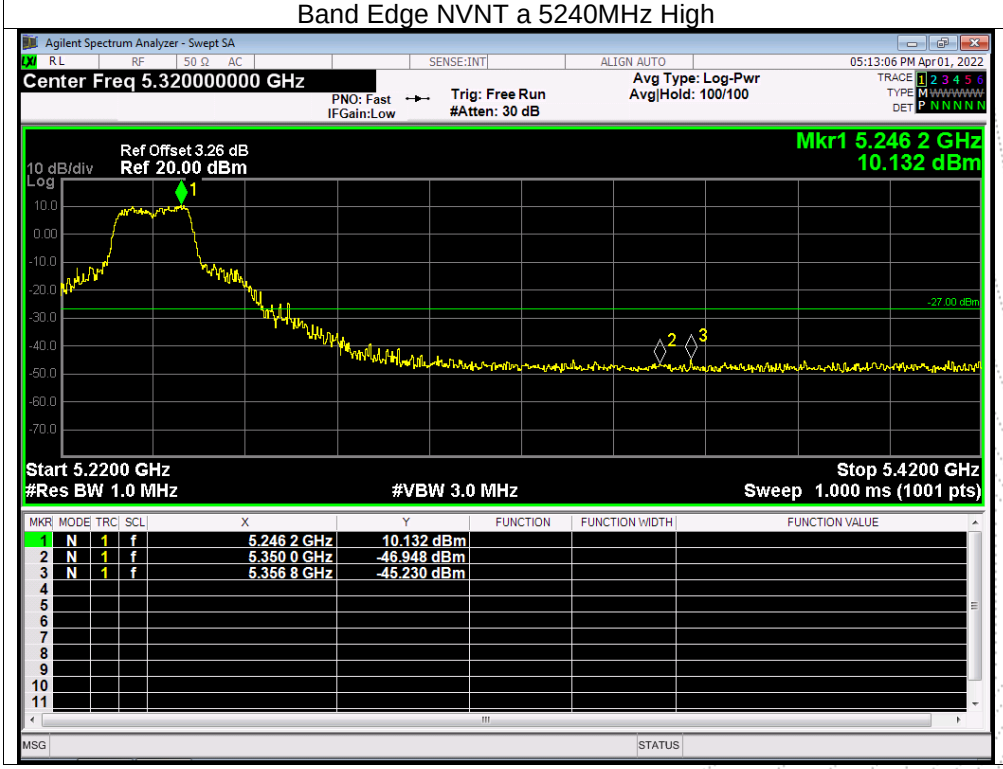
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

Condition	Mode	Frequency (MHz)	Max Value (dBm)
NVNT	a	5180	-31.37
NVNT	a	5240	-45.23
NVNT	n20	5180	-31.75
NVNT	n20	5240	-45.22
NVNT	n40	5190	-35.39
NVNT	n40	5230	-45.64
NVNT	ac20	5180	-39.07
NVNT	ac20	5240	-44.04
NVNT	ac40	5190	-30.99
NVNT	ac40	5230	-44.83
NVNT	ac80	5210	-42.4
NVNT	ac80	5210	-34.44

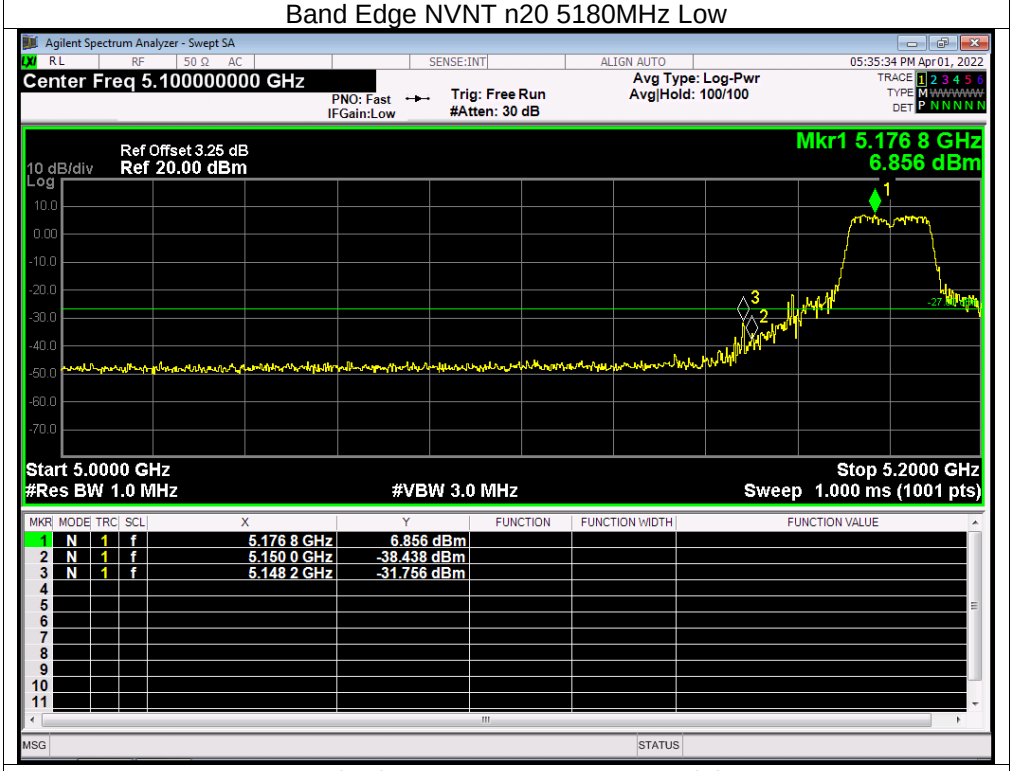
Test Graphs
Band Edge NVNT a 5180MHz Low



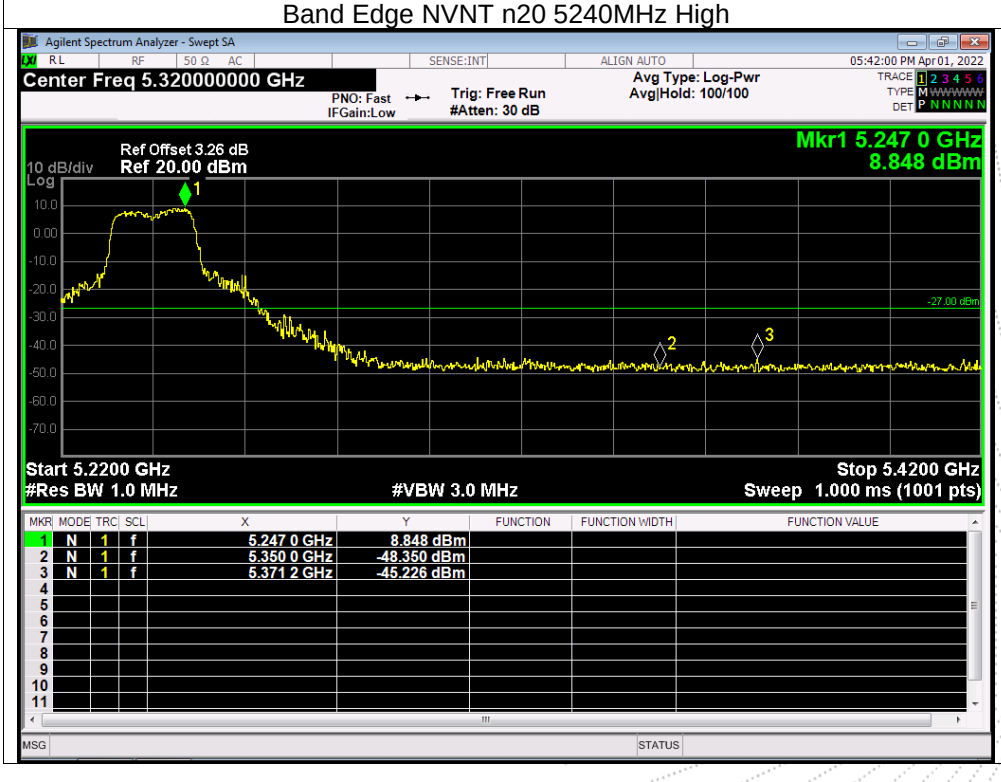
Band Edge NVNT a 5240MHz High



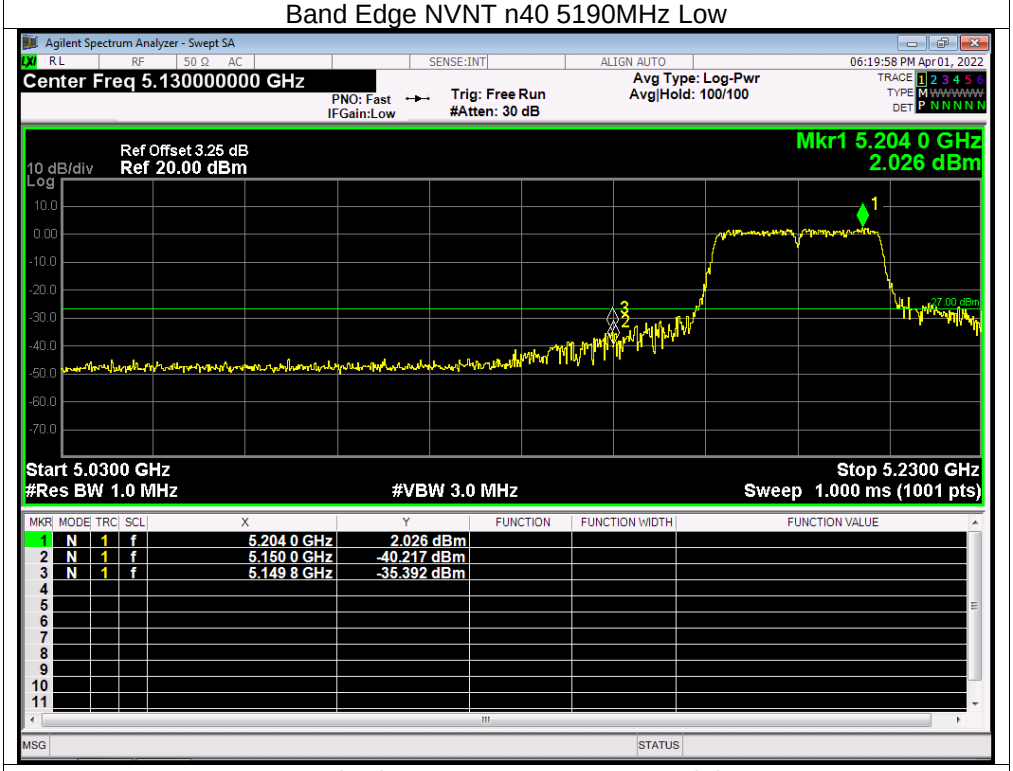
Band Edge NVNT n20 5180MHz Low



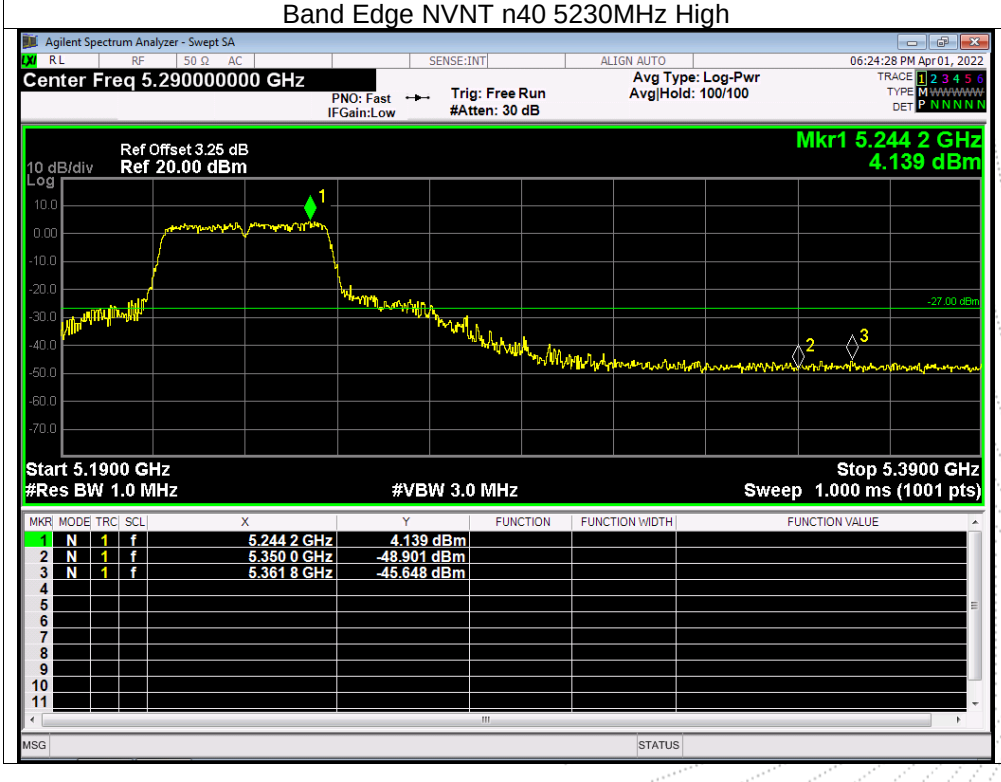
Band Edge NVNT n20 5240MHz High



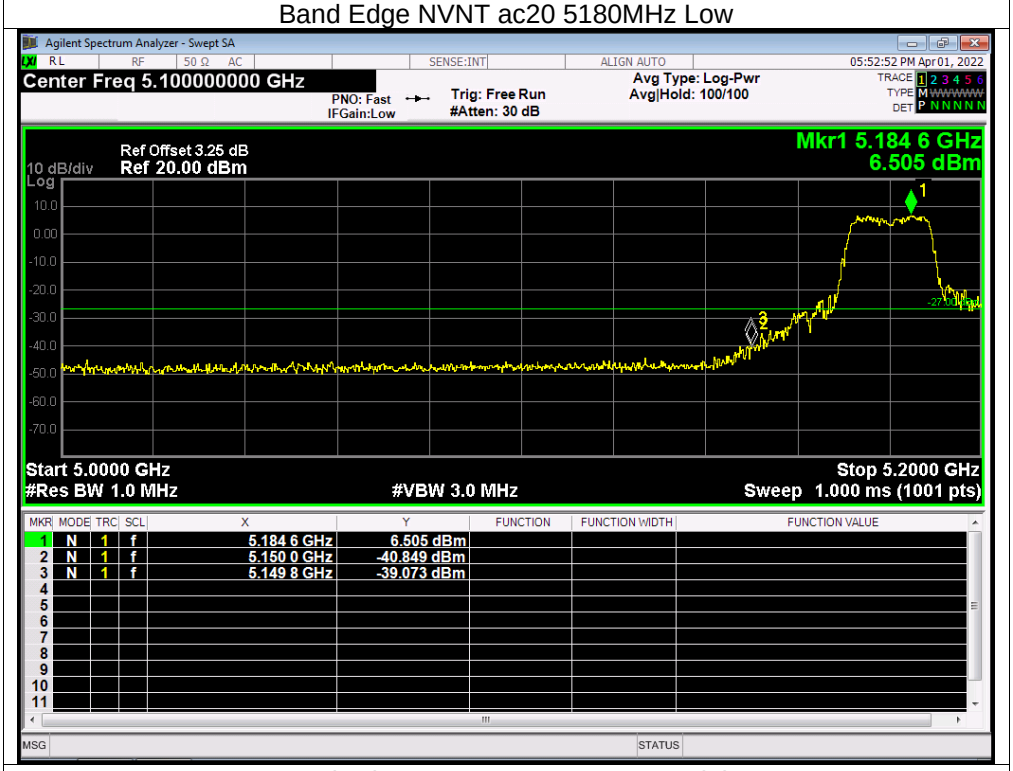
Band Edge NVNT n40 5190MHz Low



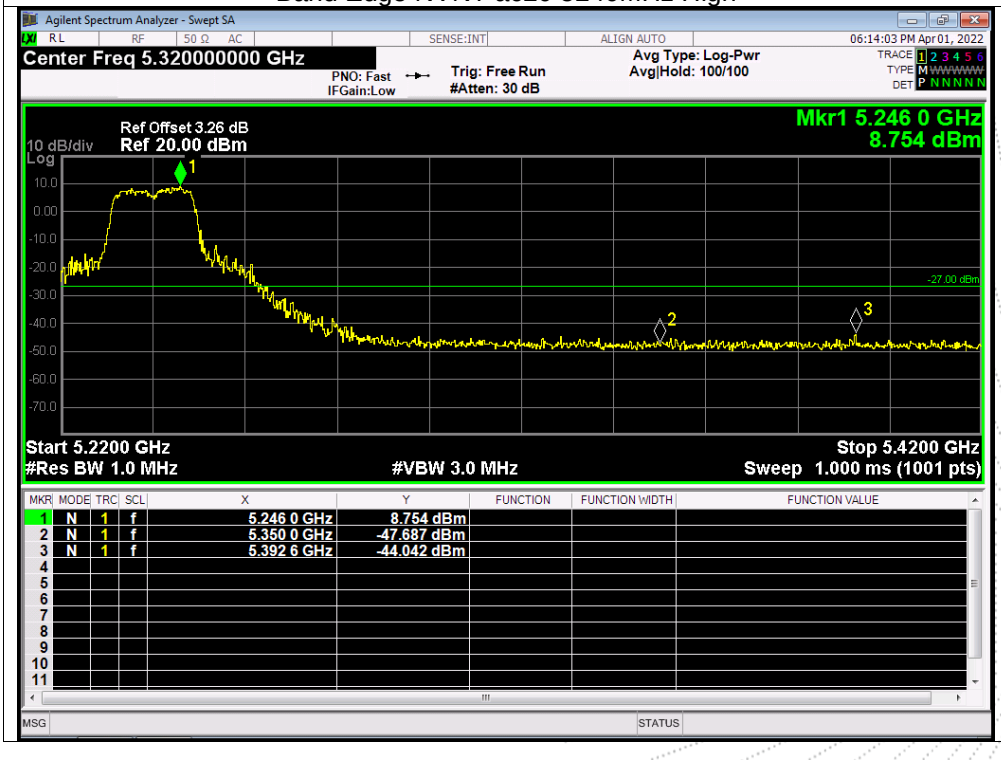
Band Edge NVNT n40 5230MHz High



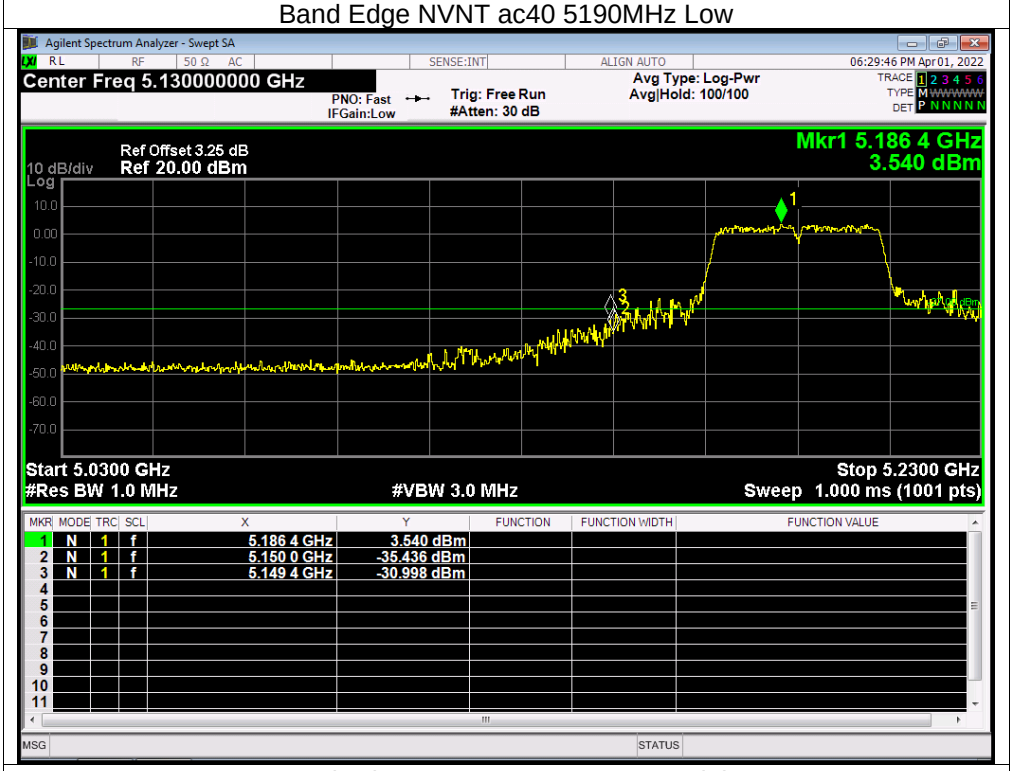
Band Edge NVNT ac20 5180MHz Low



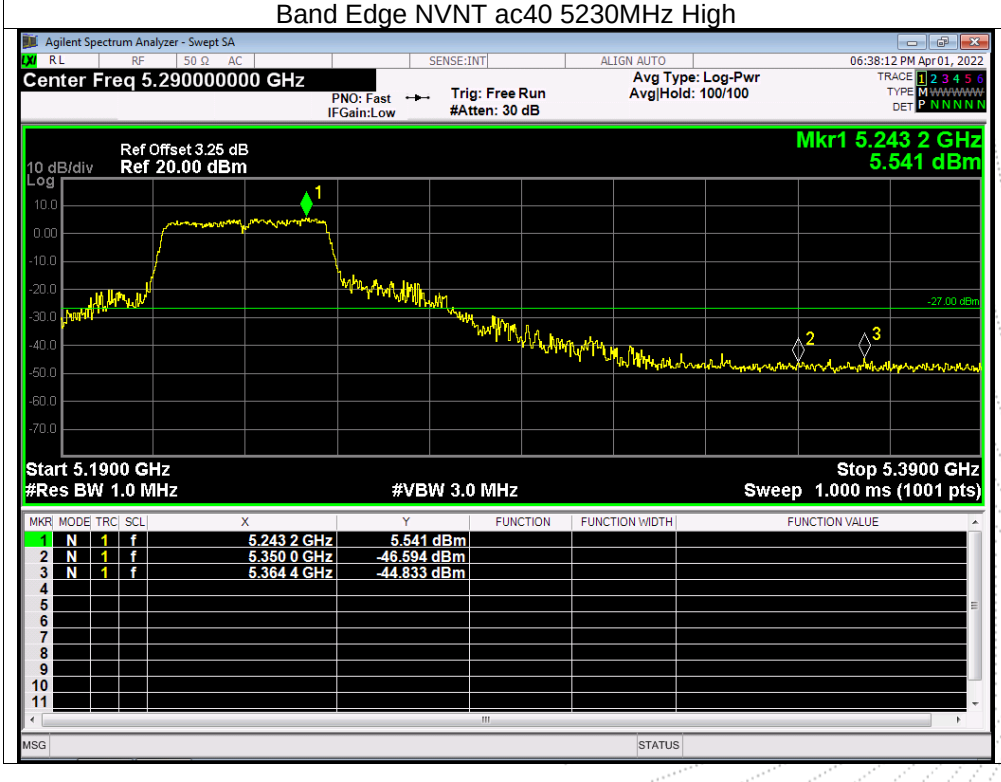
Band Edge NVNT ac20 5240MHz High



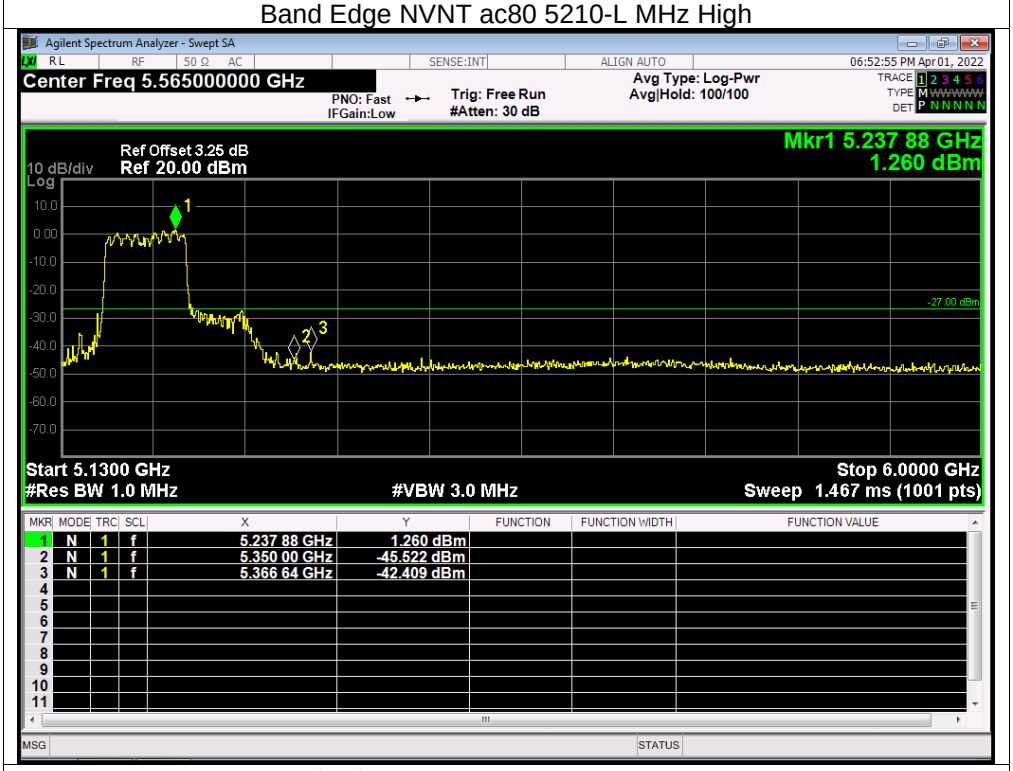
Band Edge NVNT ac40 5190MHz Low



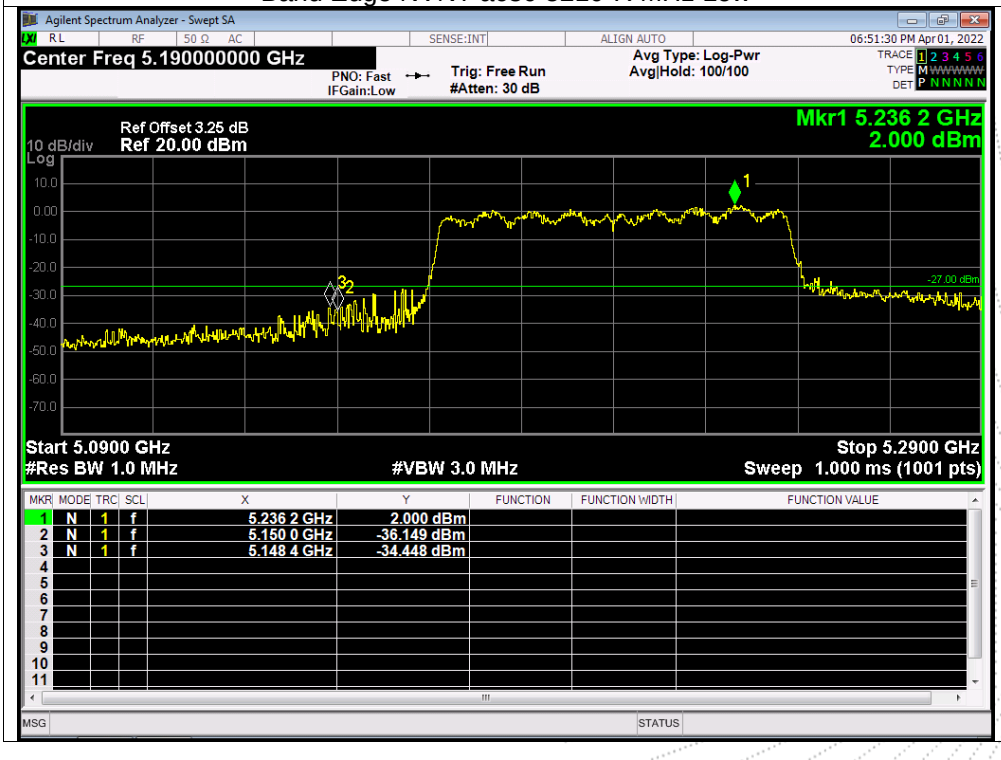
Band Edge NVNT ac40 5230MHz High



Band Edge NVNT ac80 5210-L MHz High



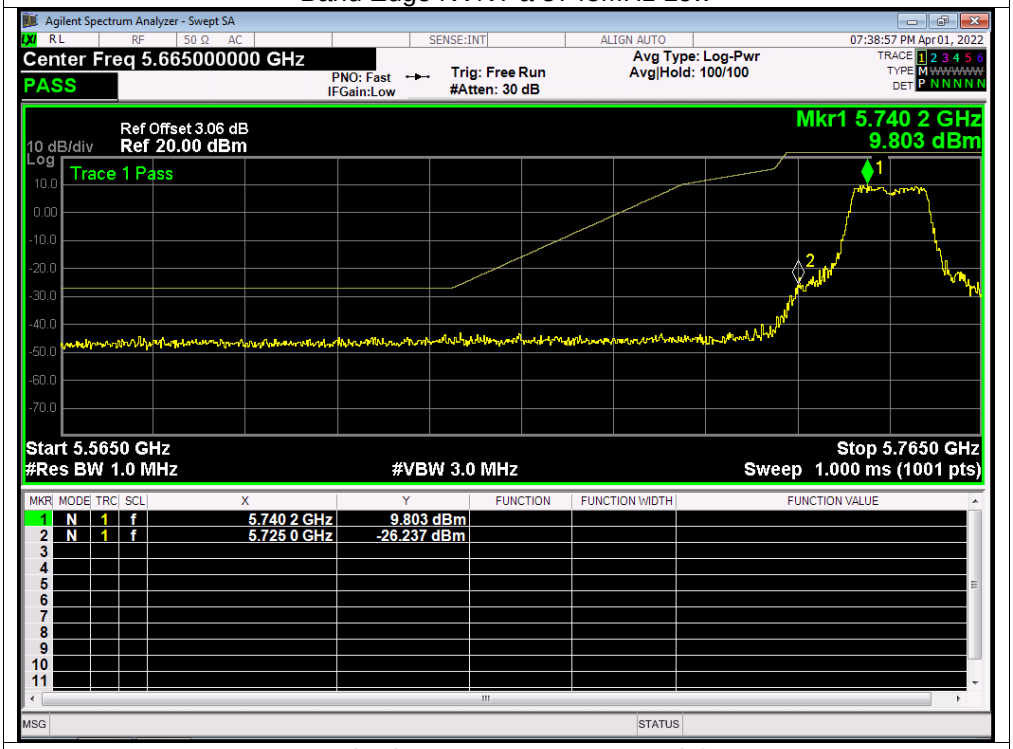
Band Edge NVNT ac80 5210-R MHz Low



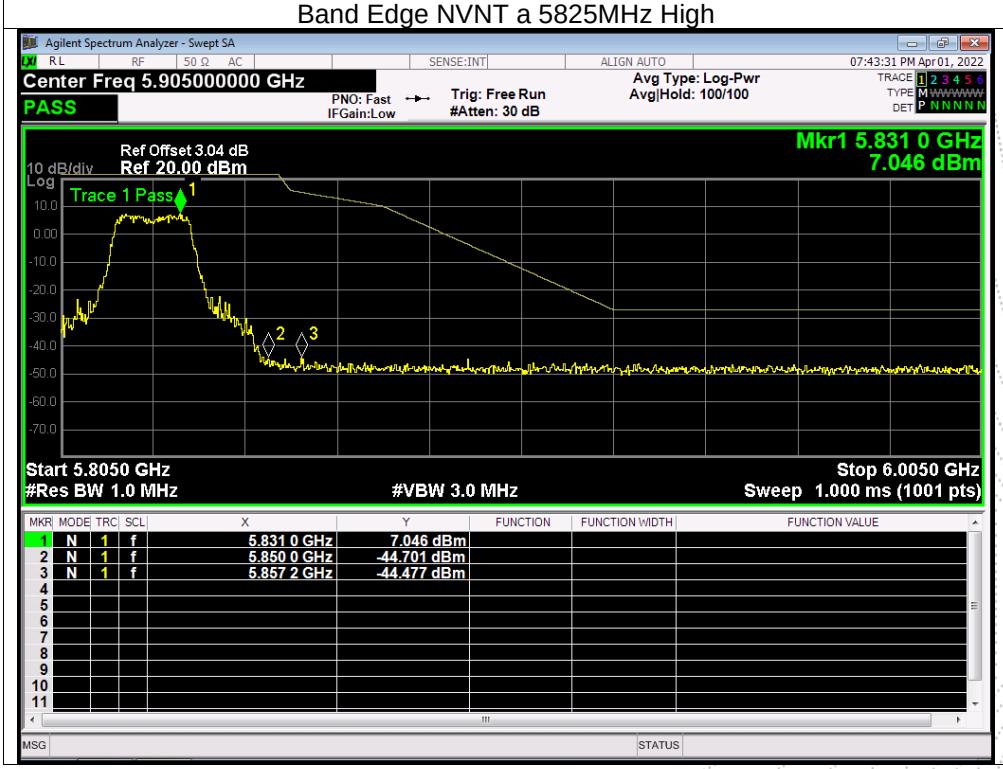
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Condition	Mode	Frequency (MHz)	Max Value (dBm)
NVNT	a	5745	-26.23
NVNT	a	5825	-44.47
NVNT	n20	5745	-28.96
NVNT	n20	5825	-44.86
NVNT	n40	5755	-32.87
NVNT	n40	5795	-44.84
NVNT	ac20	5745	-24.26
NVNT	ac20	5825	-45.39
NVNT	ac40	5755	-32.85
NVNT	ac40	5795	-45.86
NVNT	ac80	5775	-37.29
NVNT	ac80	5775	-34.16

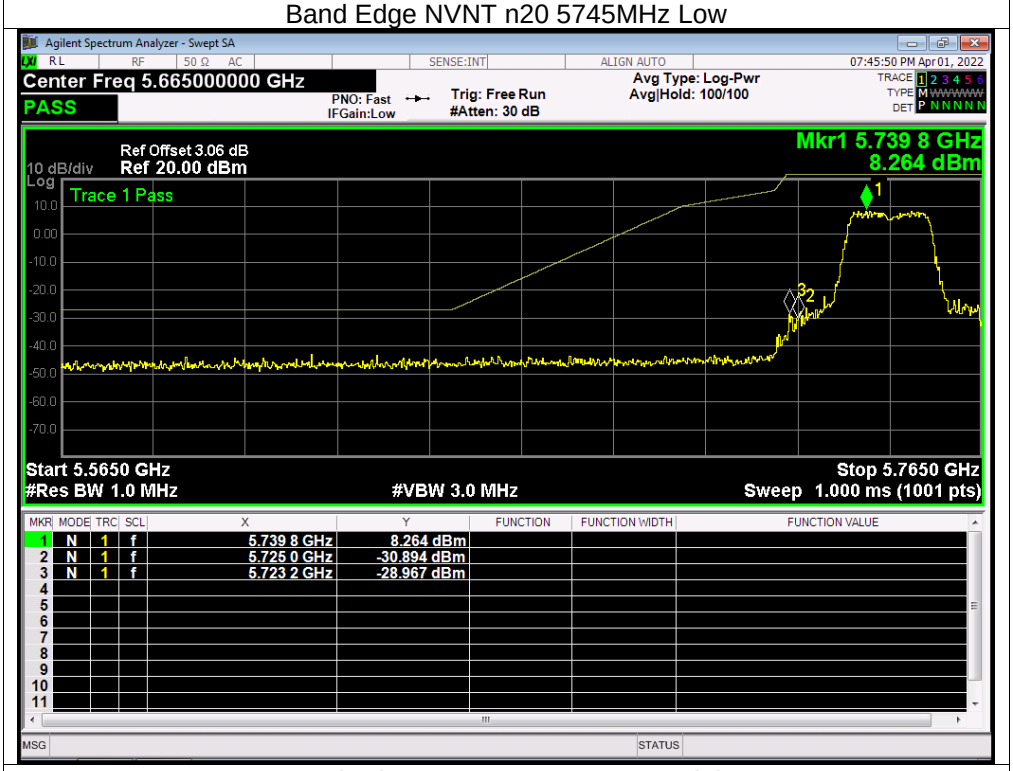
Test Graphs
Band Edge NVNT a 5745MHz Low



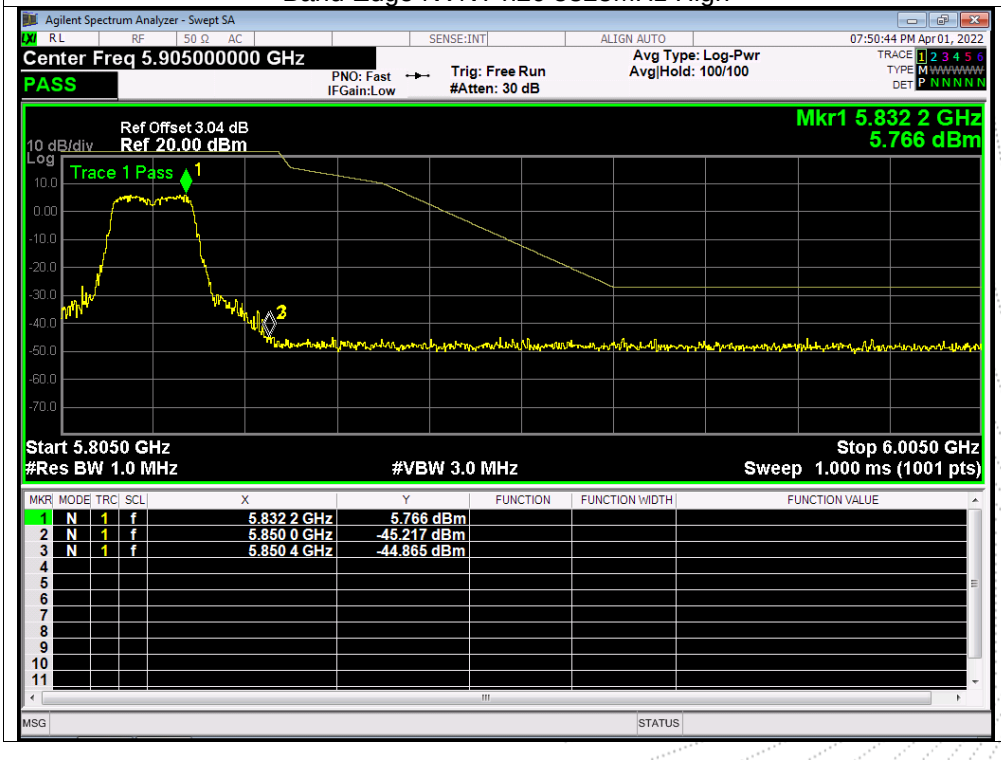
Band Edge NVNT a 5825MHz High



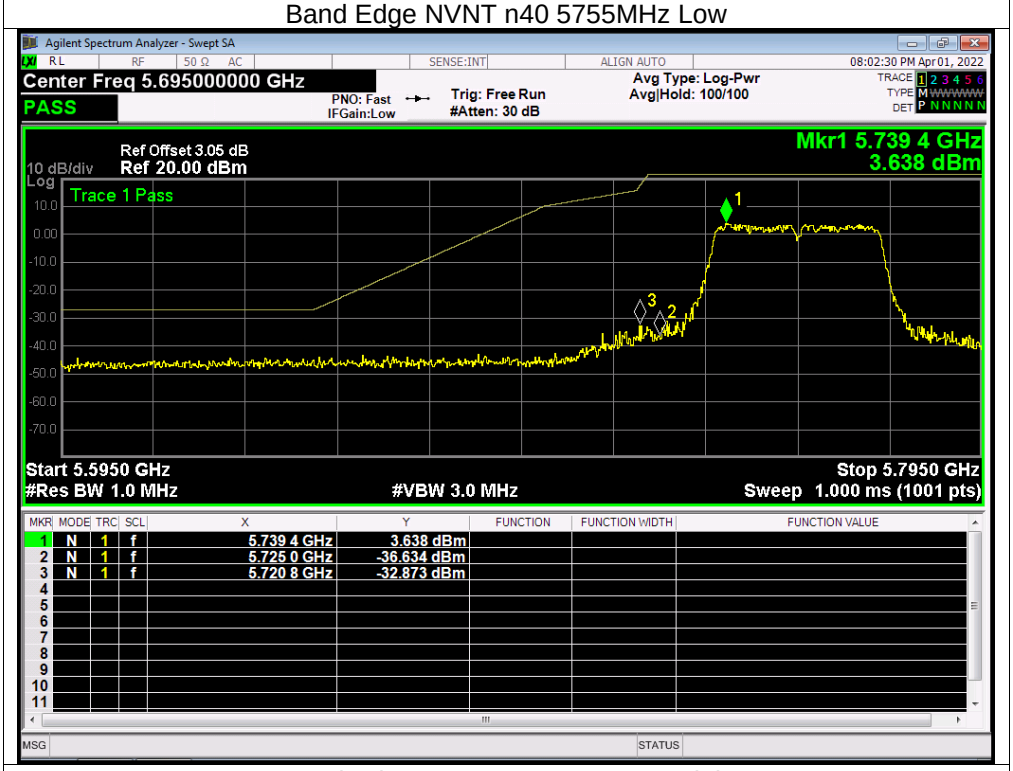
Band Edge NVNT n20 5745MHz Low



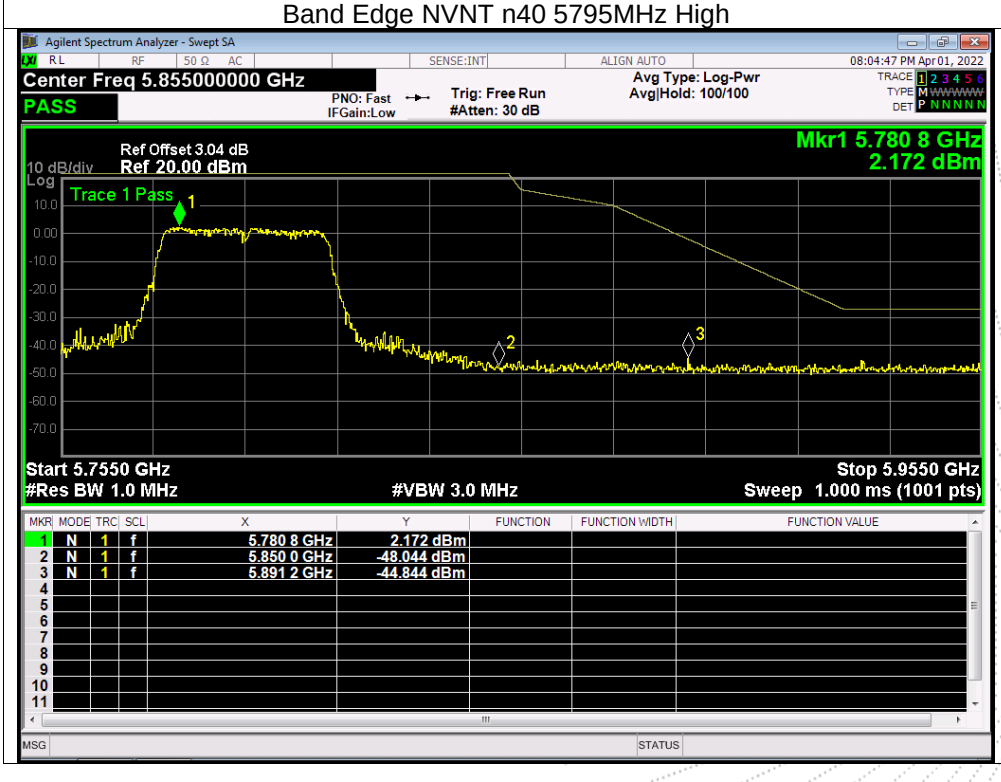
Band Edge NVNT n20 5825MHz High



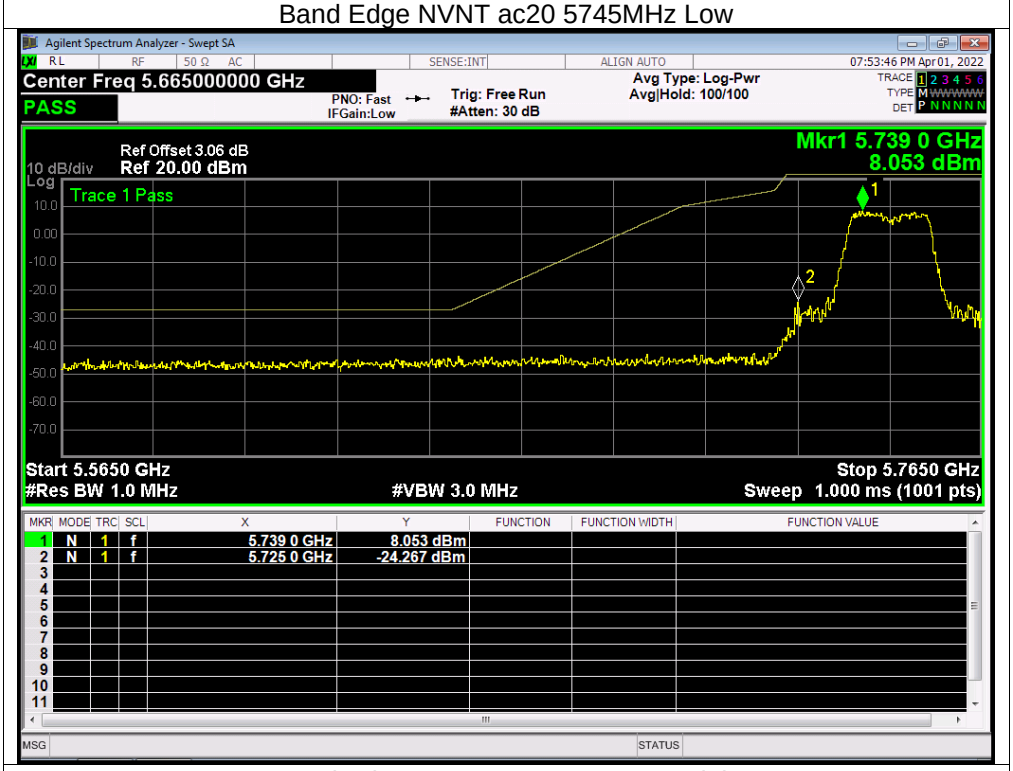
Band Edge NVNT n40 5755MHz Low



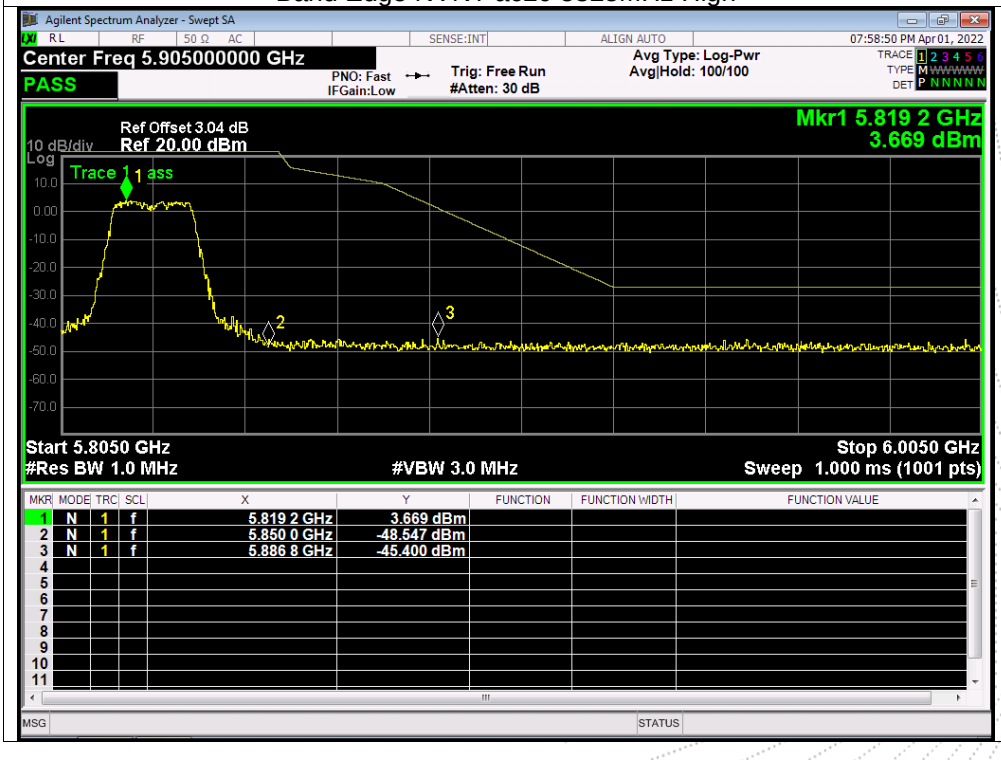
Band Edge NVNT n40 5795MHz High



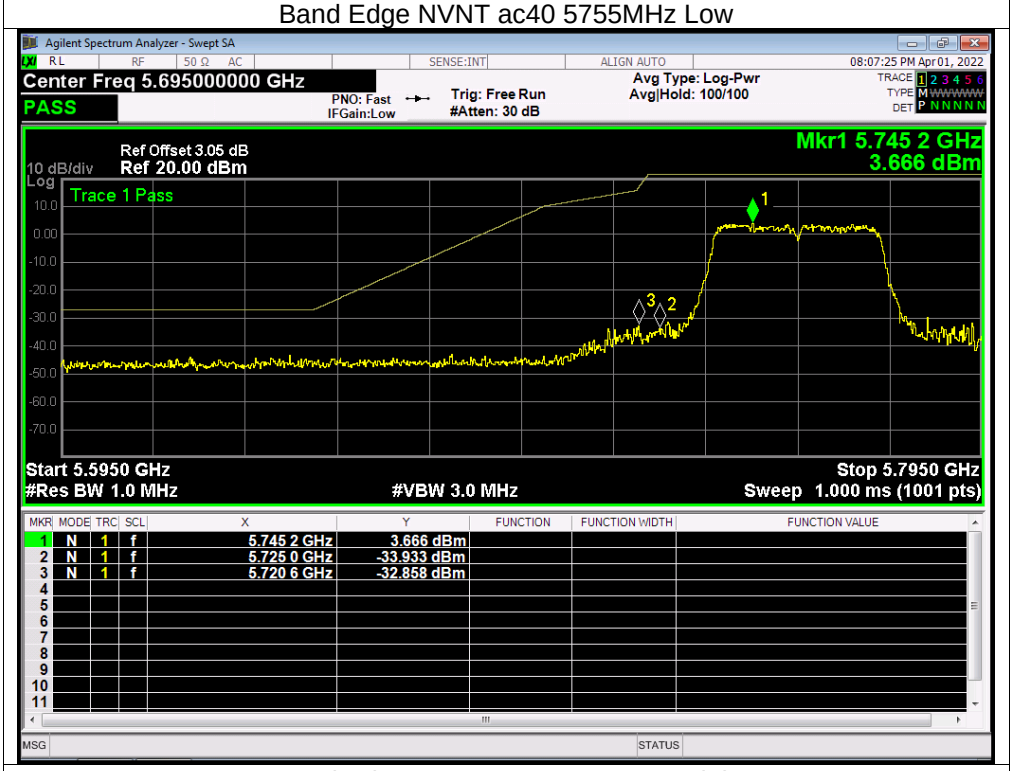
Band Edge NVNT ac20 5745MHz Low



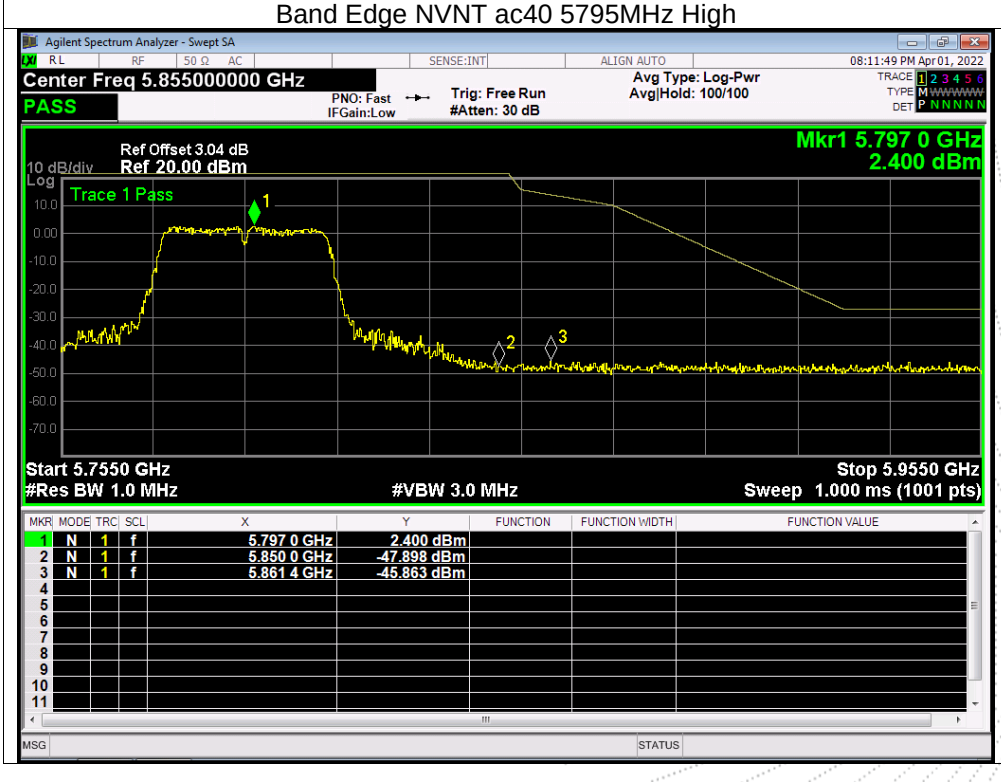
Band Edge NVNT ac20 5825MHz High



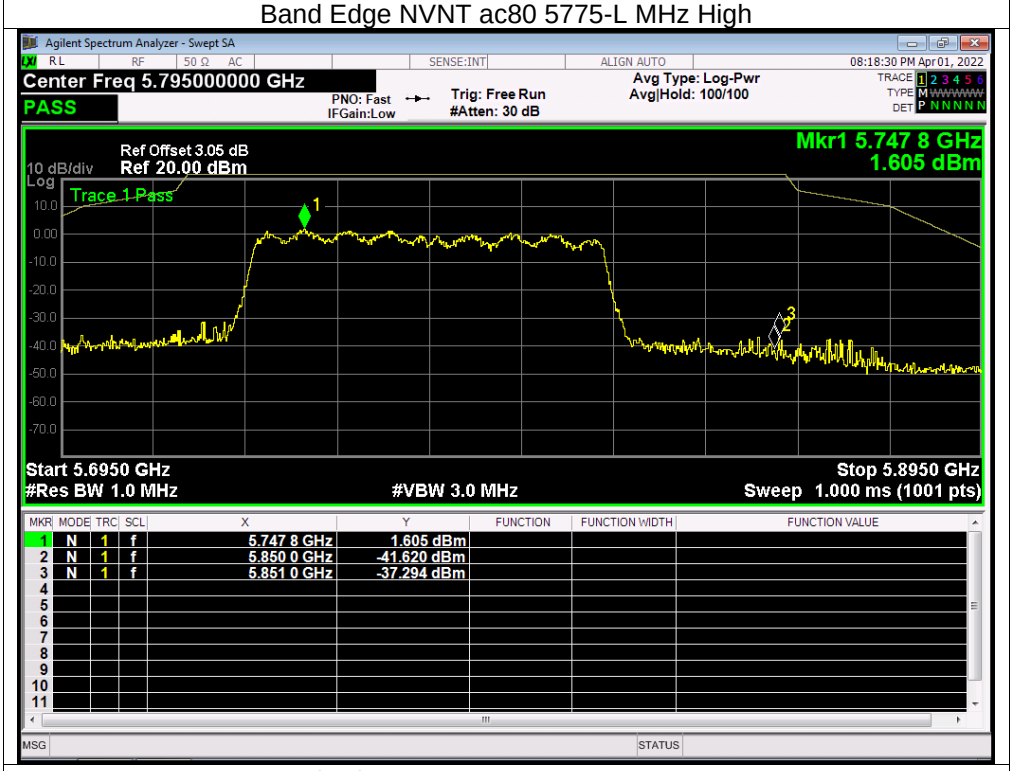
Band Edge NVNT ac40 5755MHz Low



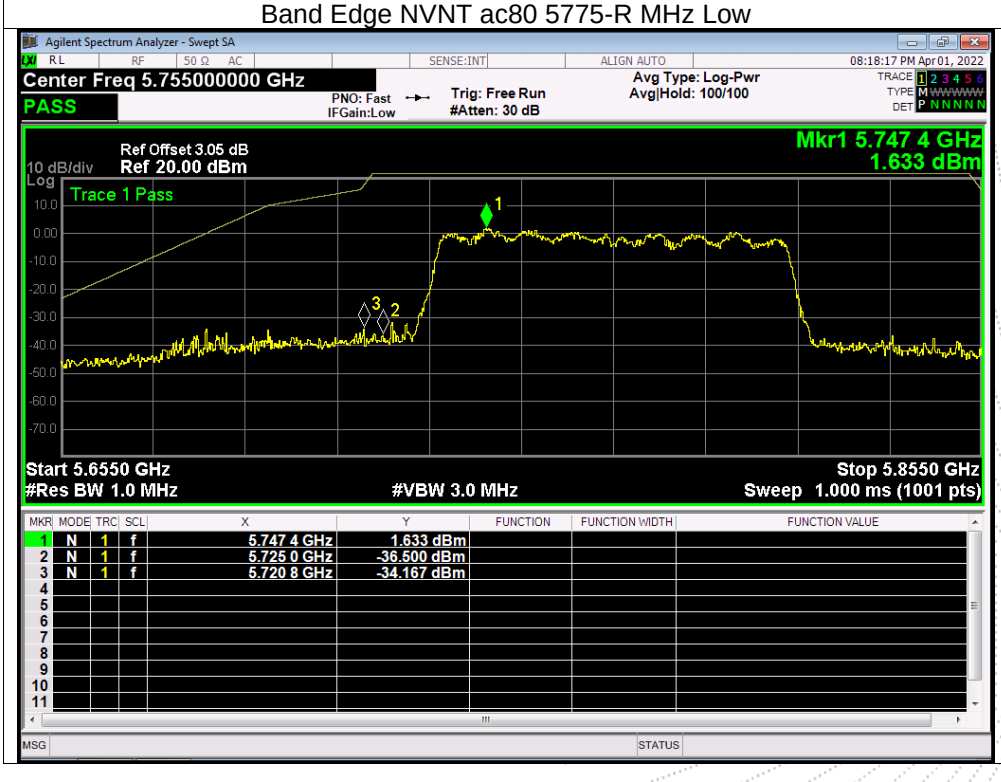
Band Edge NVNT ac40 5795MHz High



Band Edge NVNT ac80 5775-L MHz High

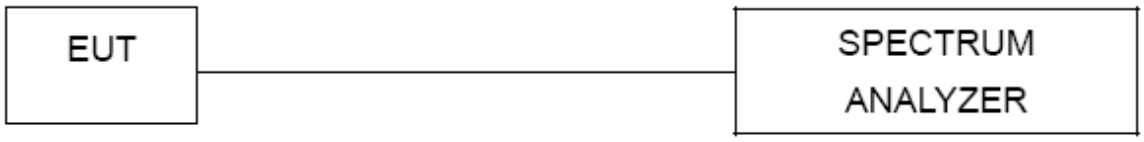


Band Edge NVNT ac80 5775-R MHz Low



12. Spurious RF Conducted Emissions

12.1 Block Diagram Of Test Setup



12.2 Limit

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 5.725-5.85 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..

12.3 Test Procedure

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

5. Repeat above procedures until all measured frequencies were complete.

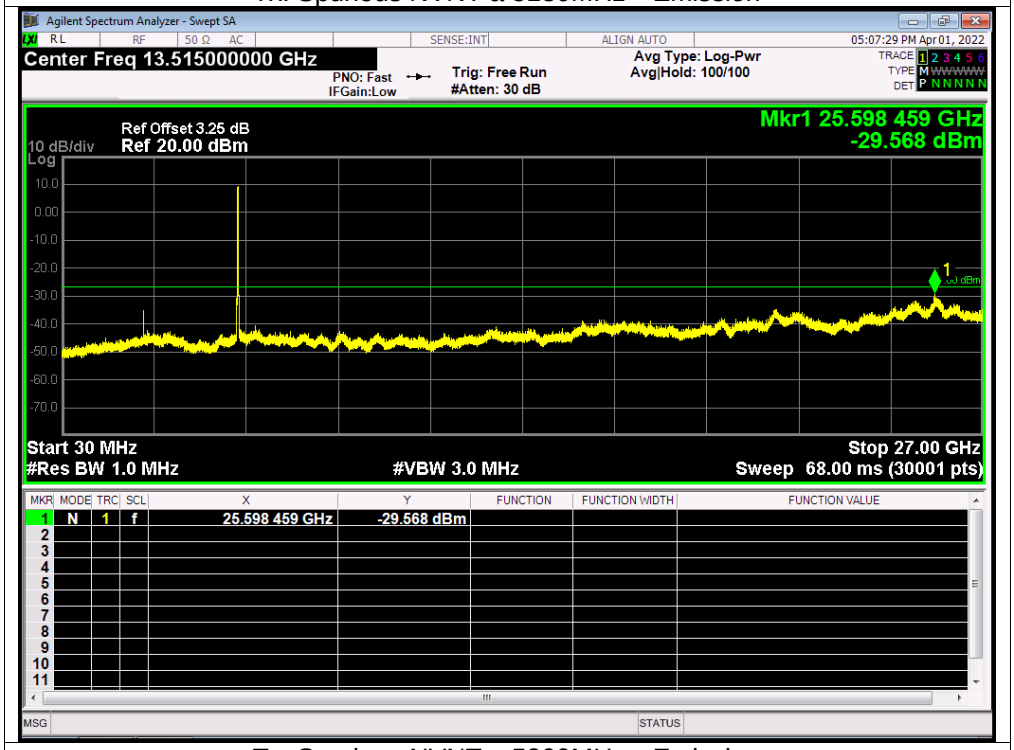
12.4 Test Result

Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

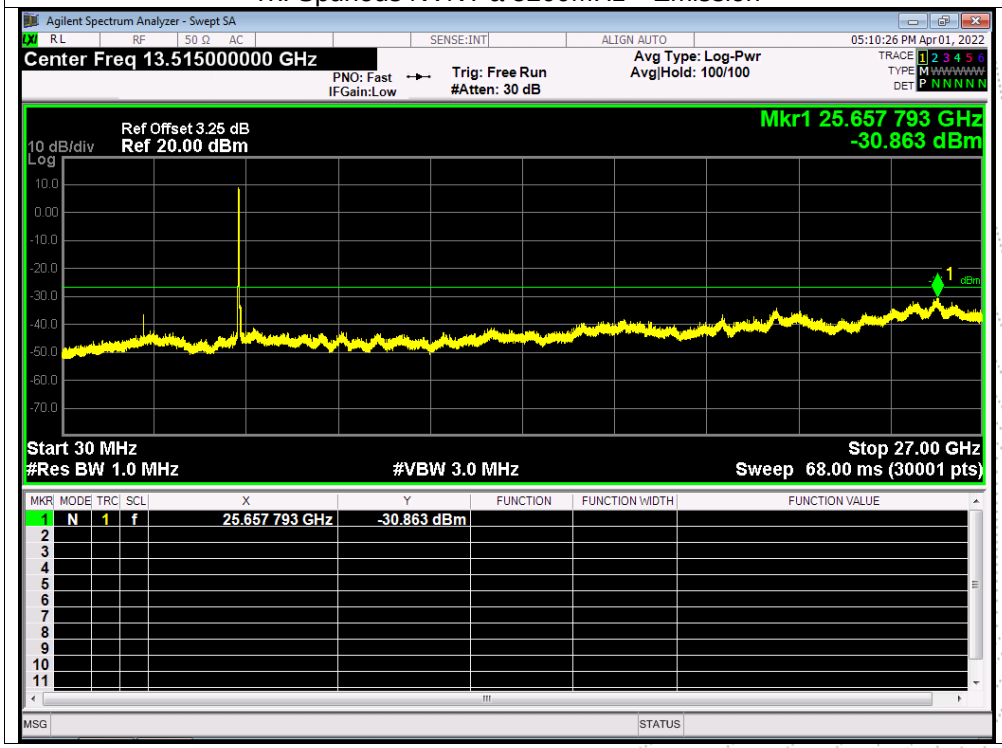
About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

5.1G

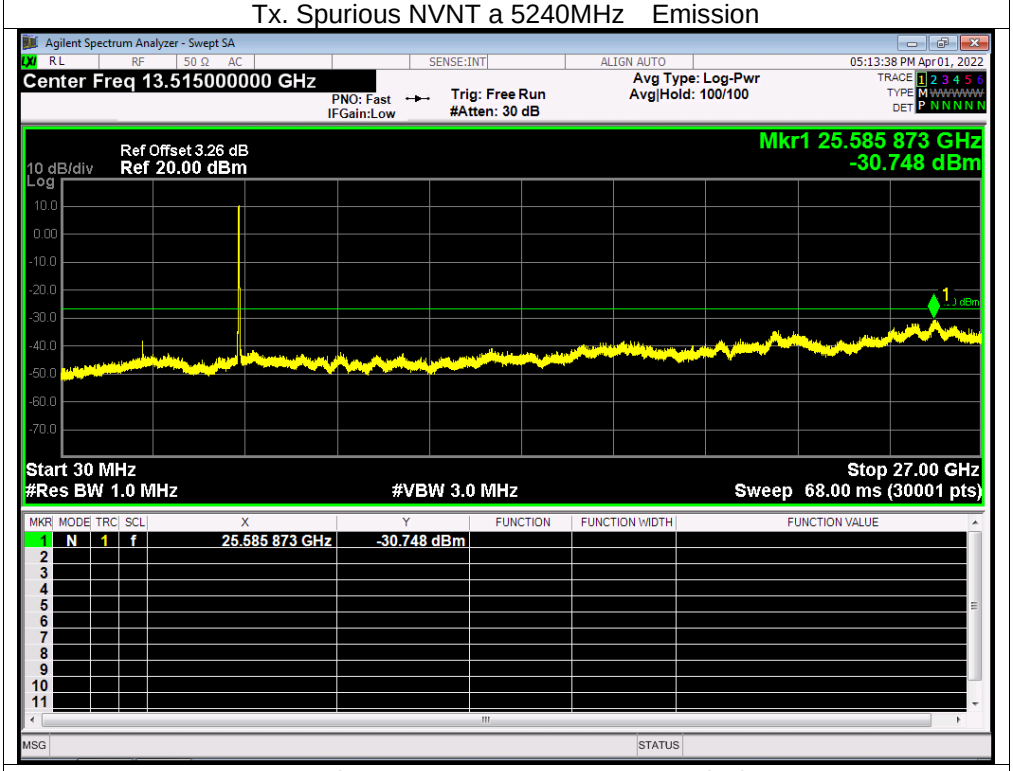
Test Graphs
Tx. Spurious NVNT a 5180MHz Emission



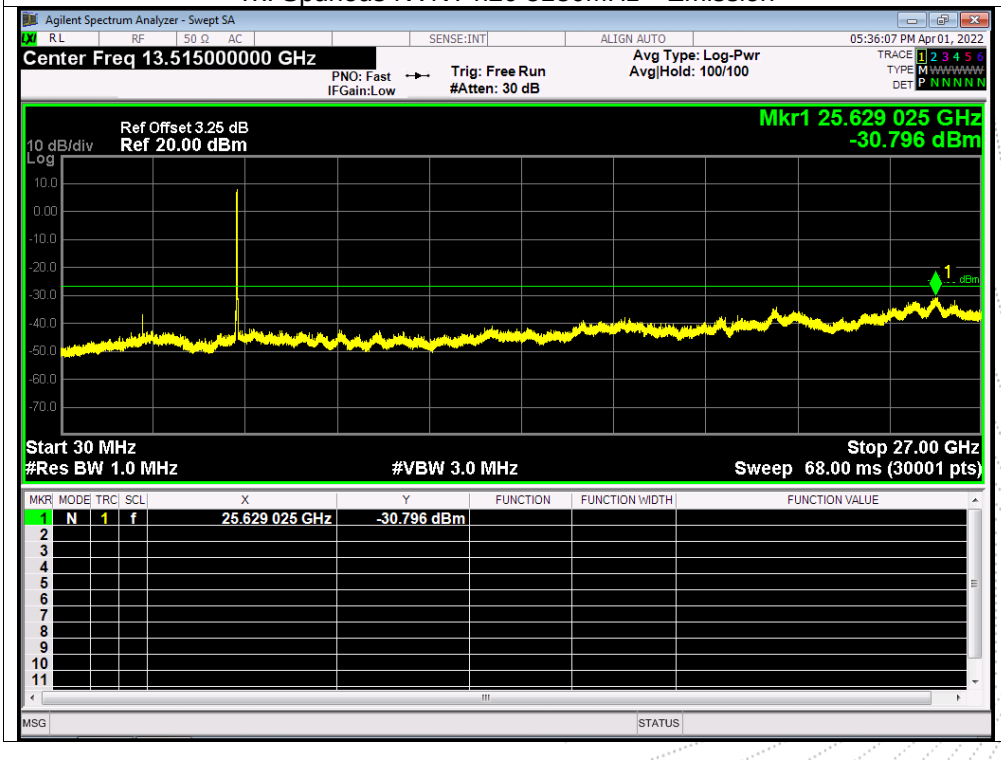
Tx. Spurious NVNT a 5200MHz Emission



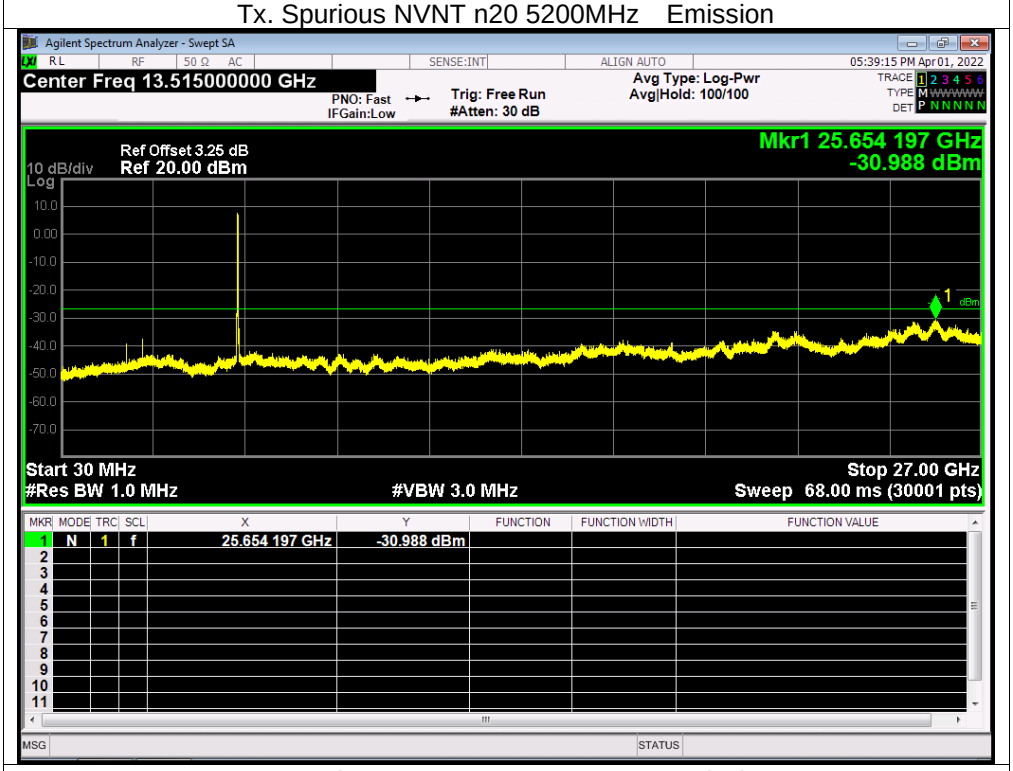
Tx. Spurious NVNT a 5240MHz Emission



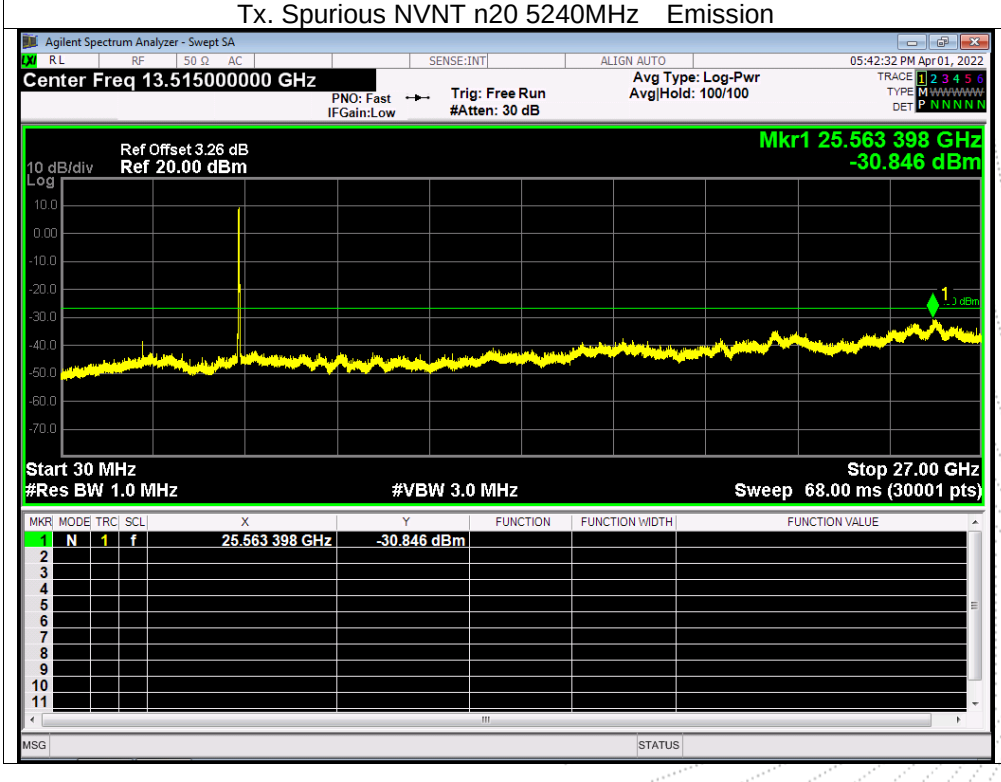
Tx. Spurious NVNT n20 5180MHz Emission



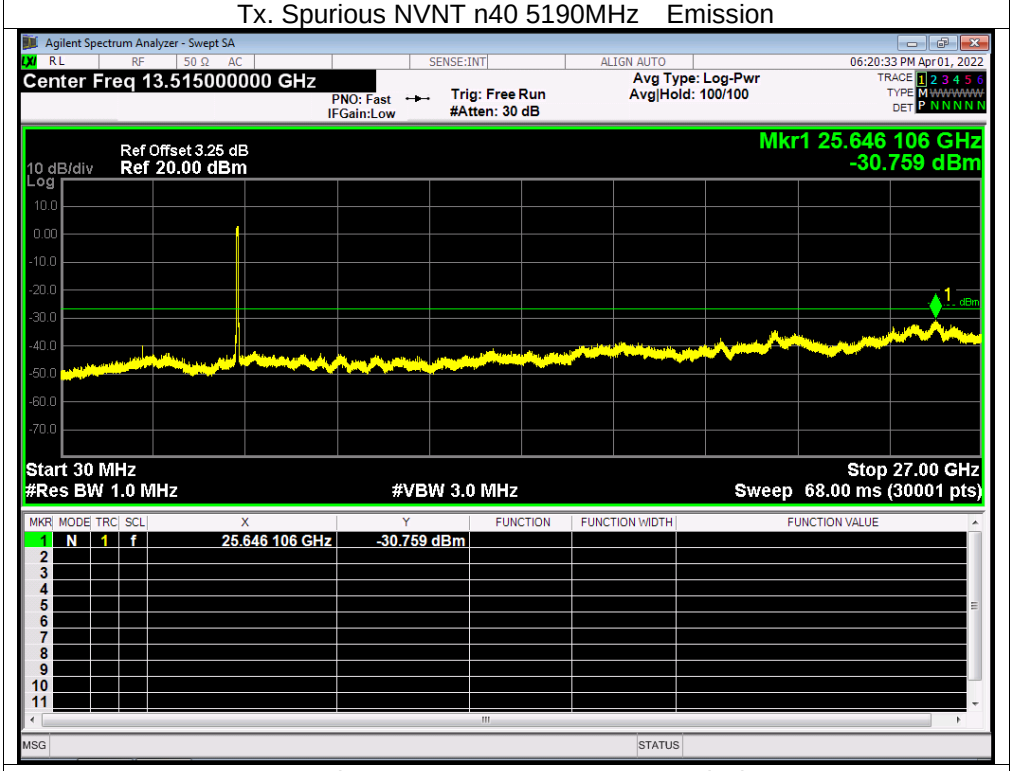
Tx. Spurious NVNT n20 5200MHz Emission



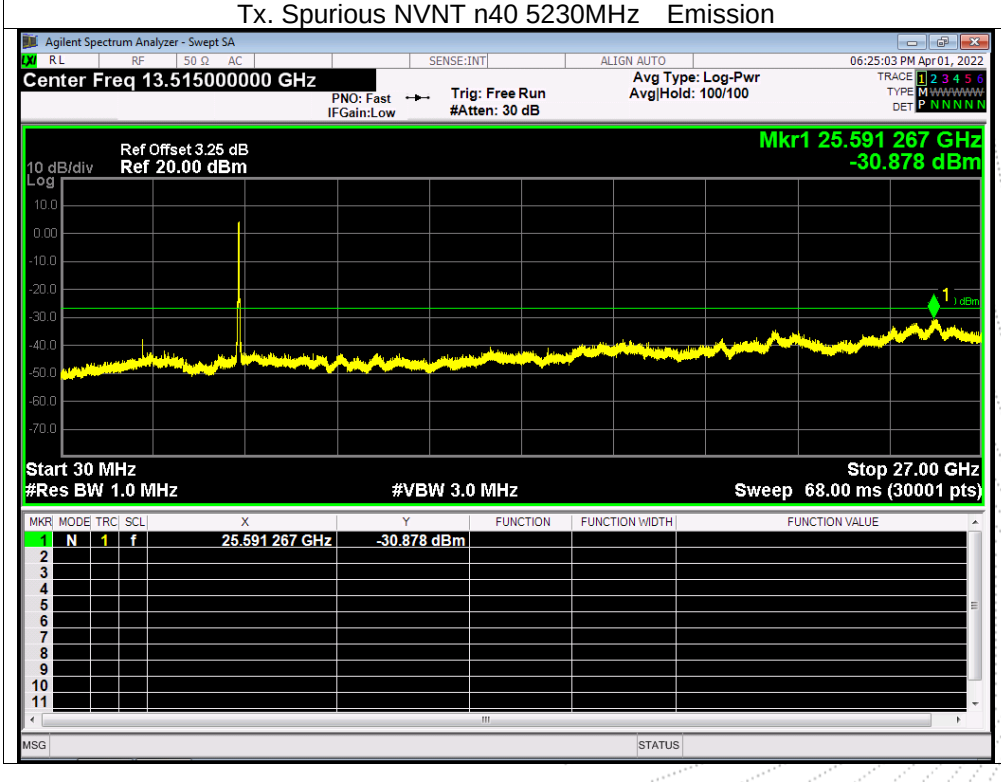
Tx. Spurious NVNT n20 5240MHz Emission



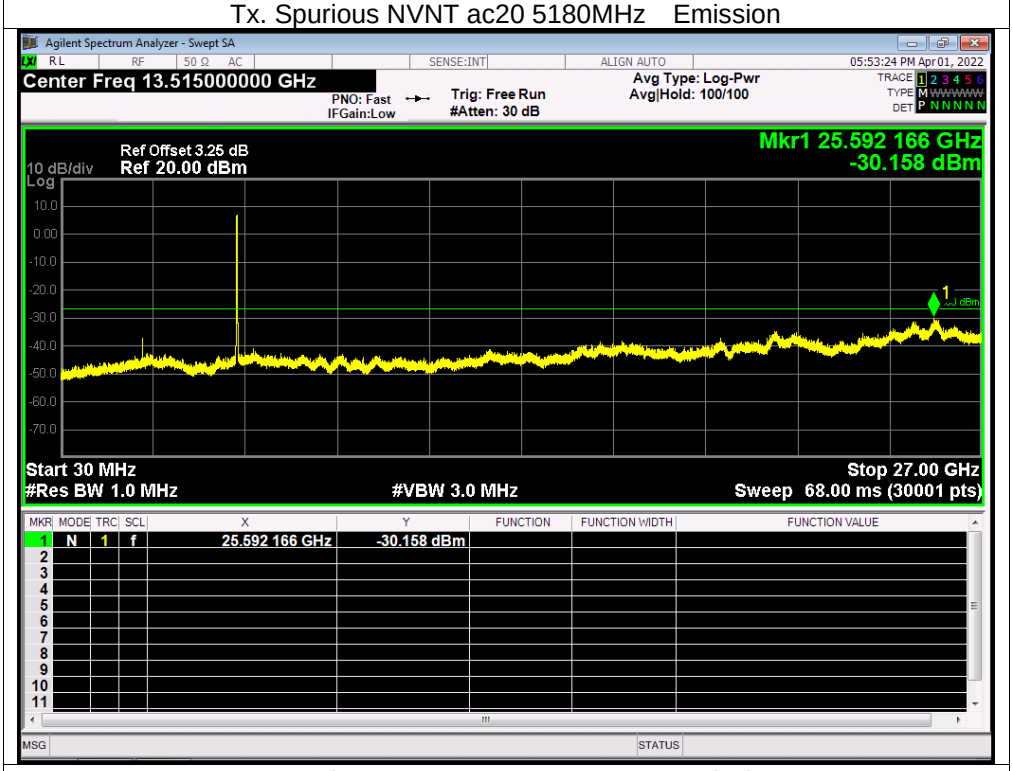
Tx. Spurious NVNT n40 5190MHz Emission



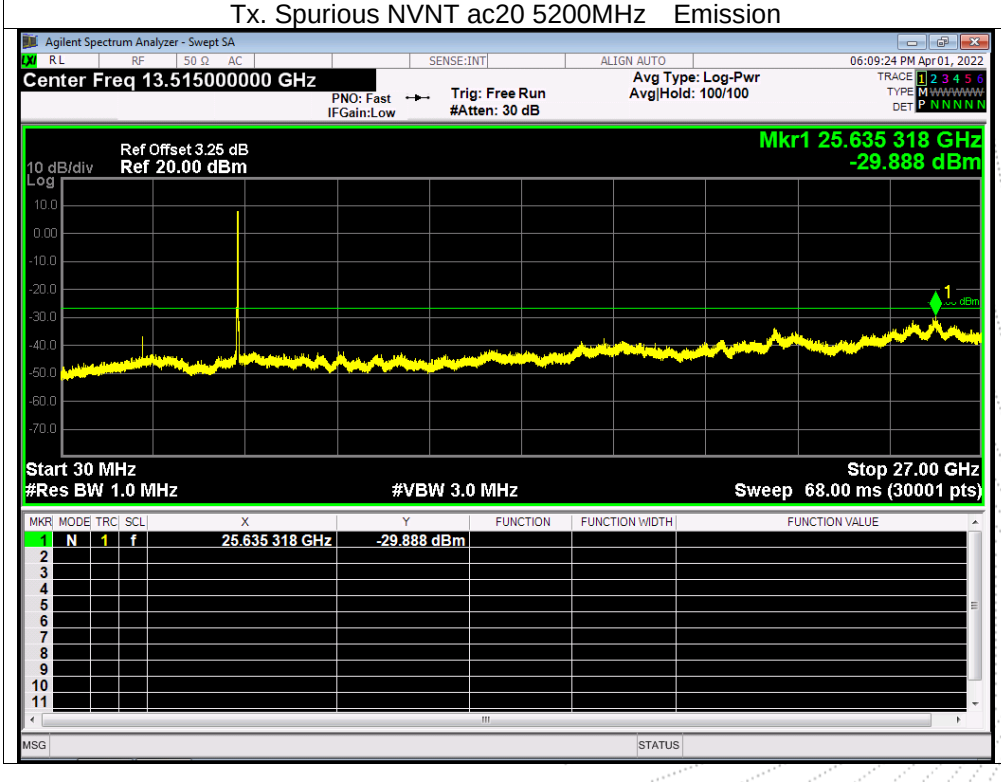
Tx. Spurious NVNT n40 5230MHz Emission



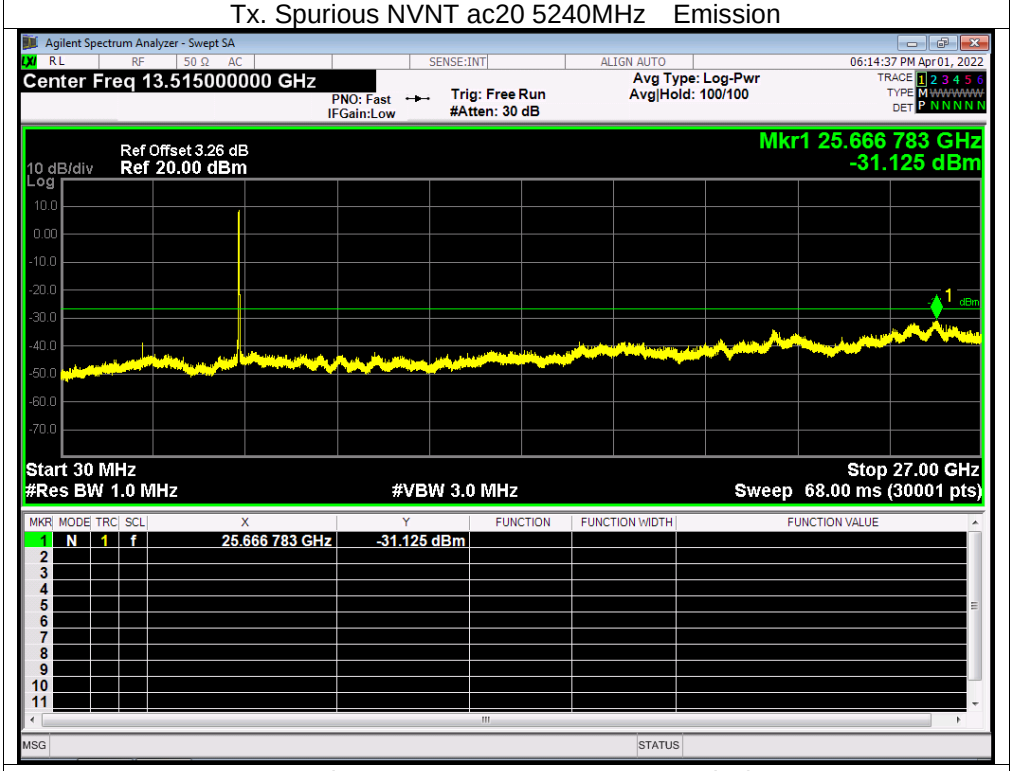
Tx. Spurious NVNT ac20 5180MHz Emission



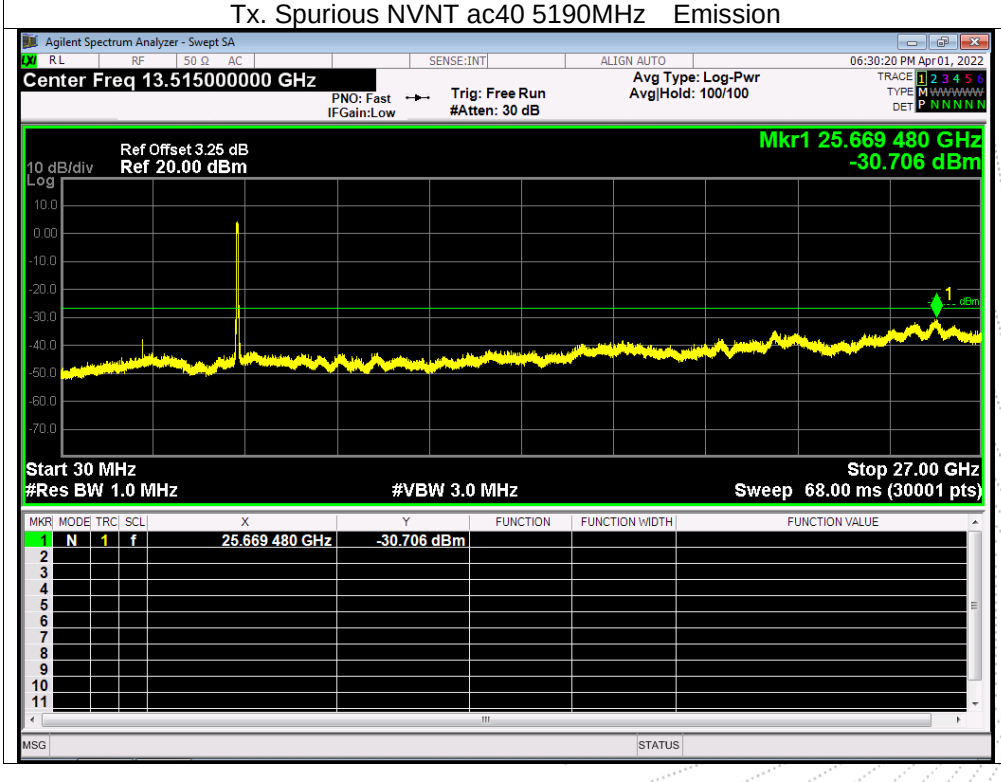
Tx. Spurious NVNT ac20 5200MHz Emission



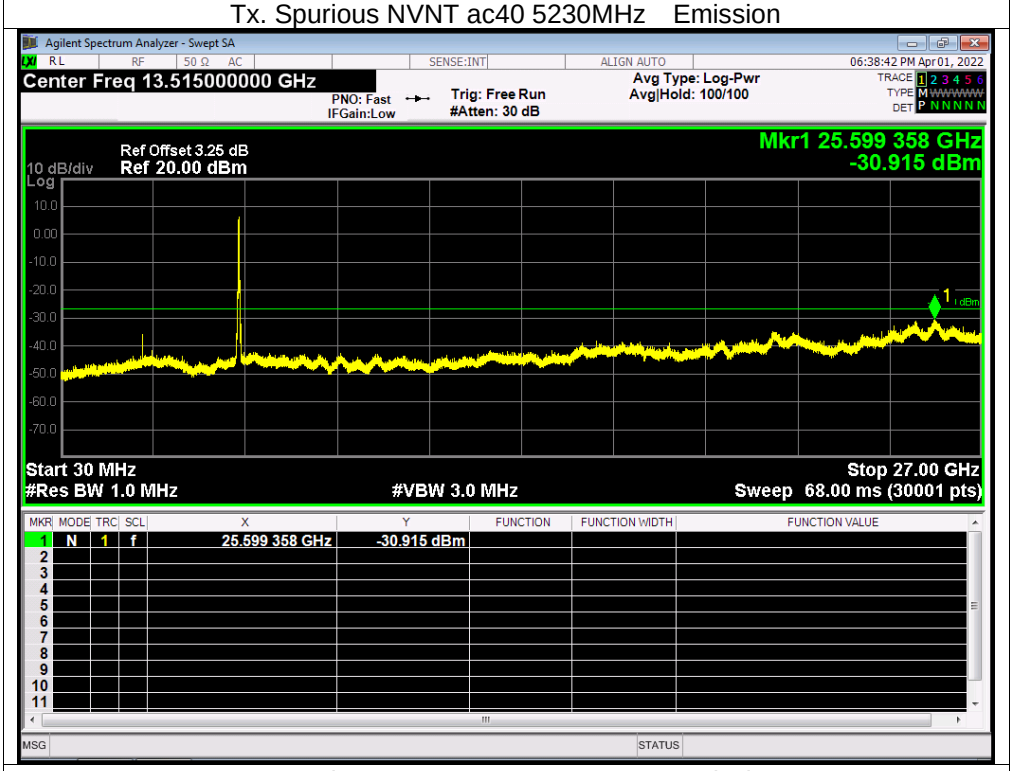
Tx. Spurious NVNT ac20 5240MHz Emission



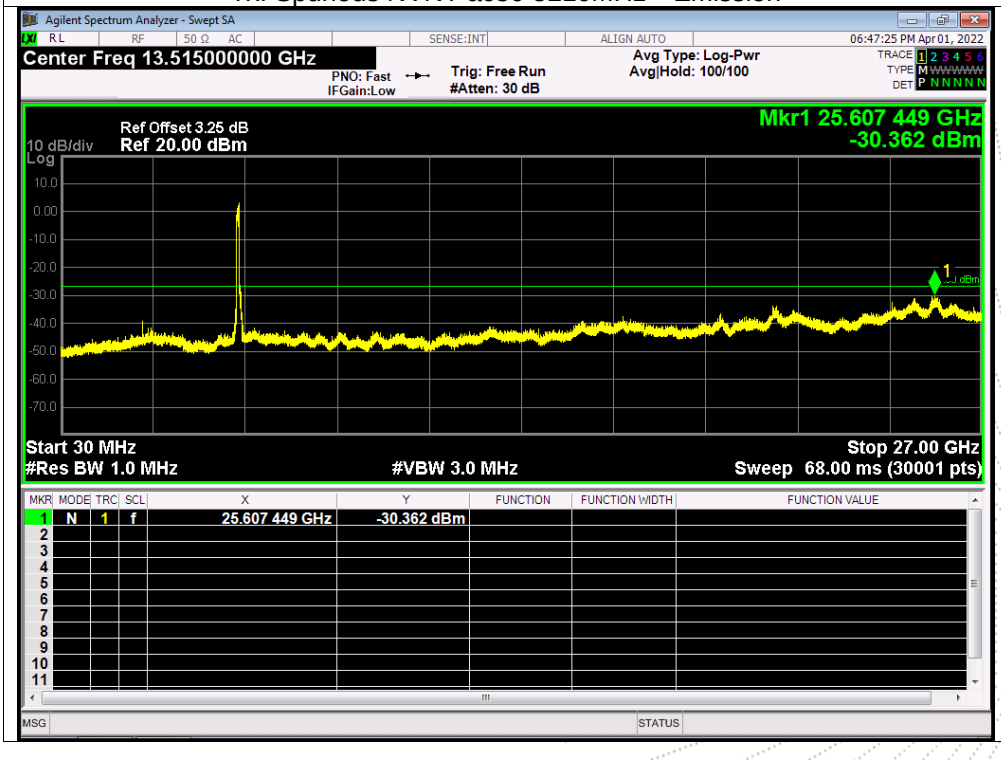
Tx. Spurious NVNT ac40 5190MHz Emission



Tx. Spurious NVNT ac40 5230MHz Emission



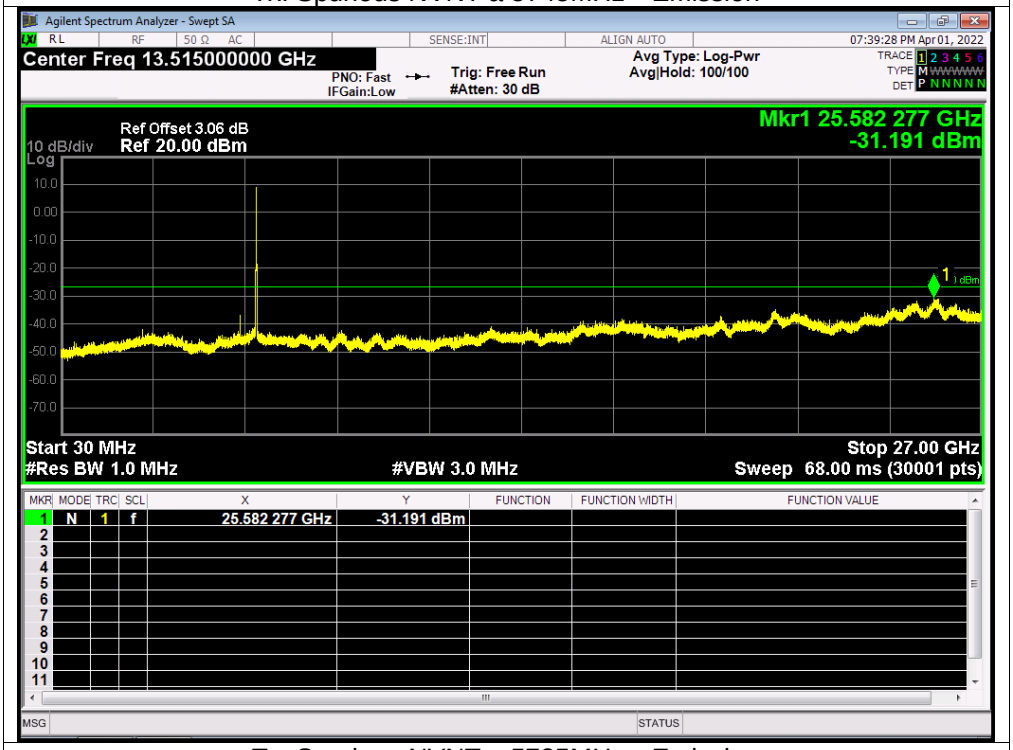
Tx. Spurious NVNT ac80 5210MHz Emission



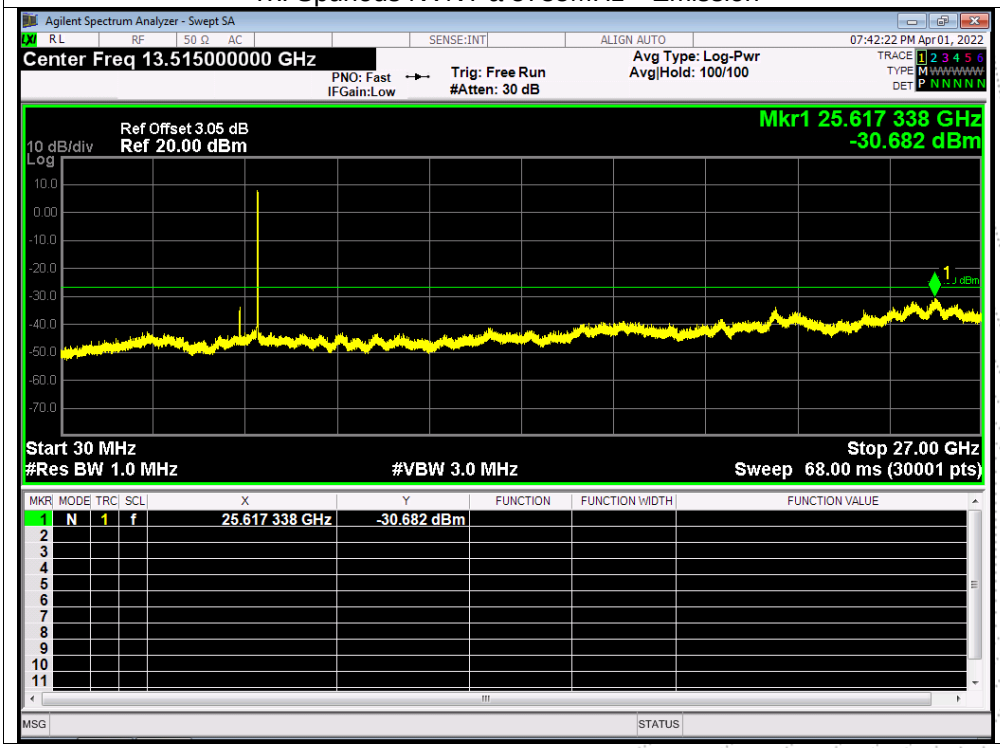
5.8G

Test Graphs

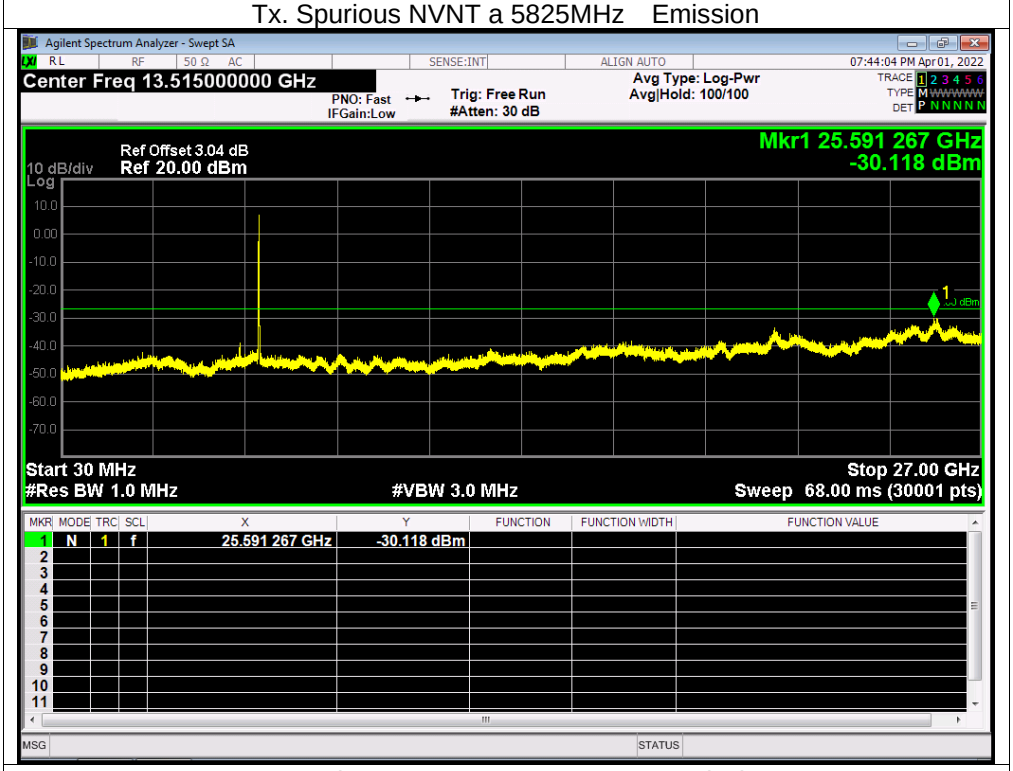
Tx. Spurious NVNT a 5745MHz Emission



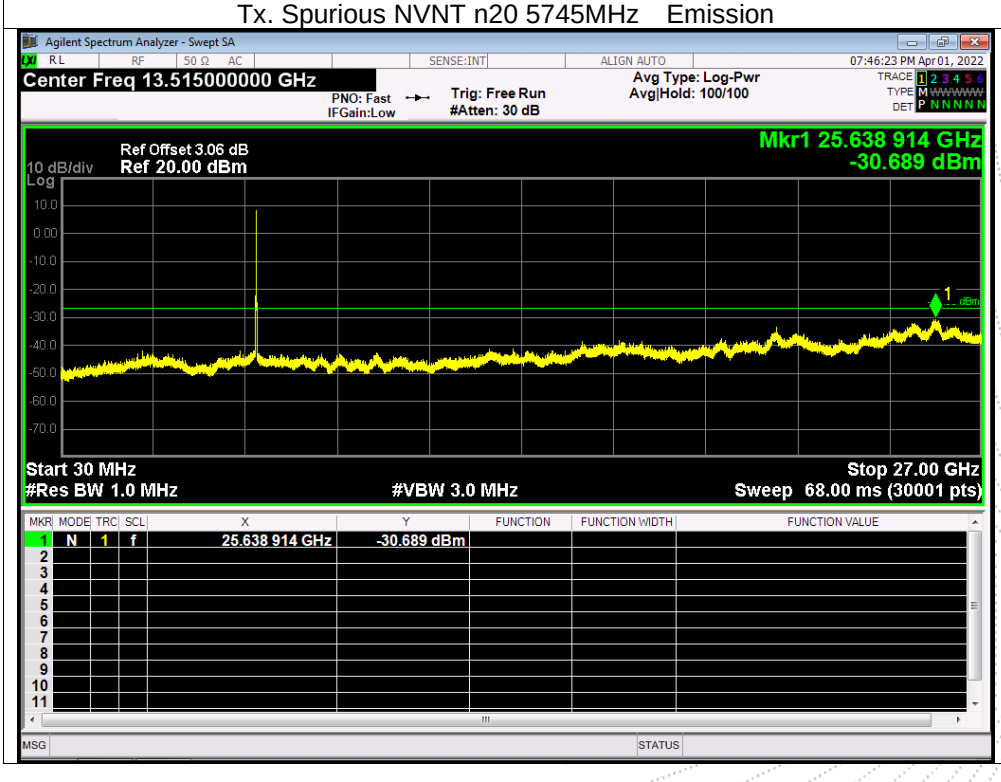
Tx. Spurious NVNT a 5785MHz Emission



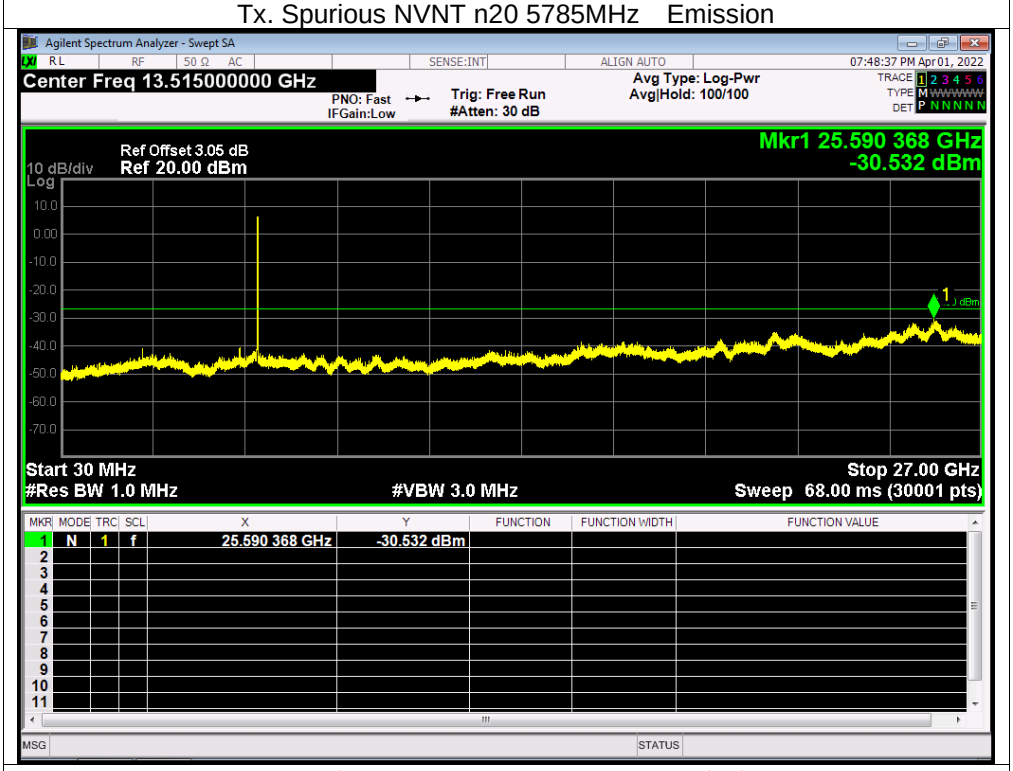
Tx. Spurious NVNT a 5825MHz Emission



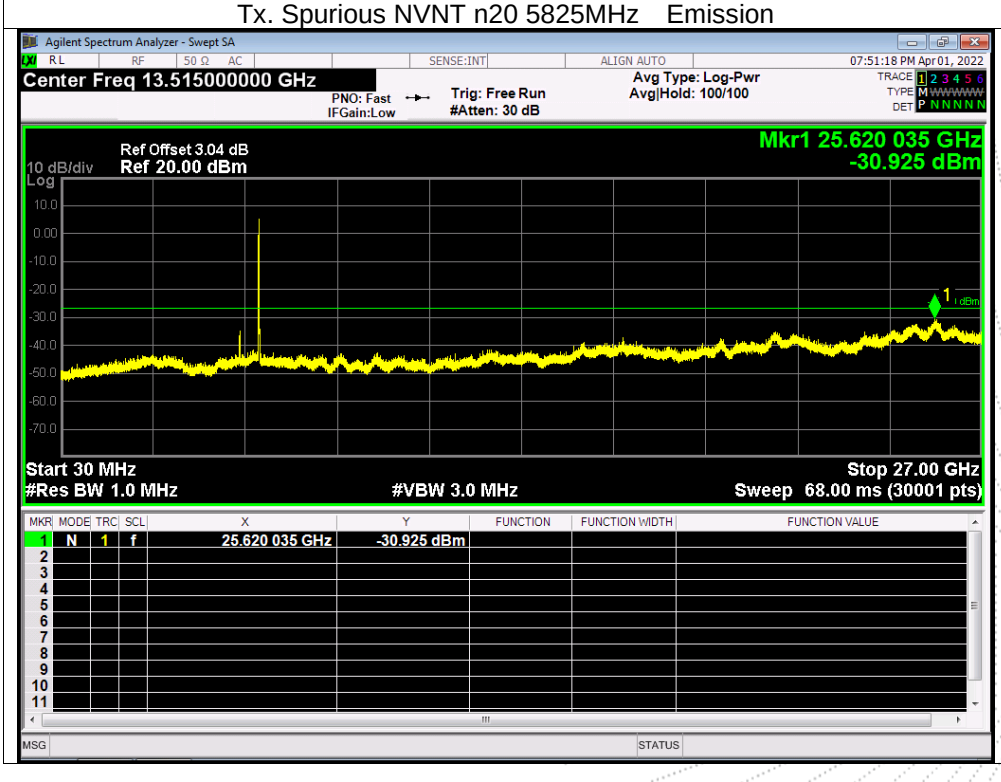
Tx. Spurious NVNT n20 5745MHz Emission



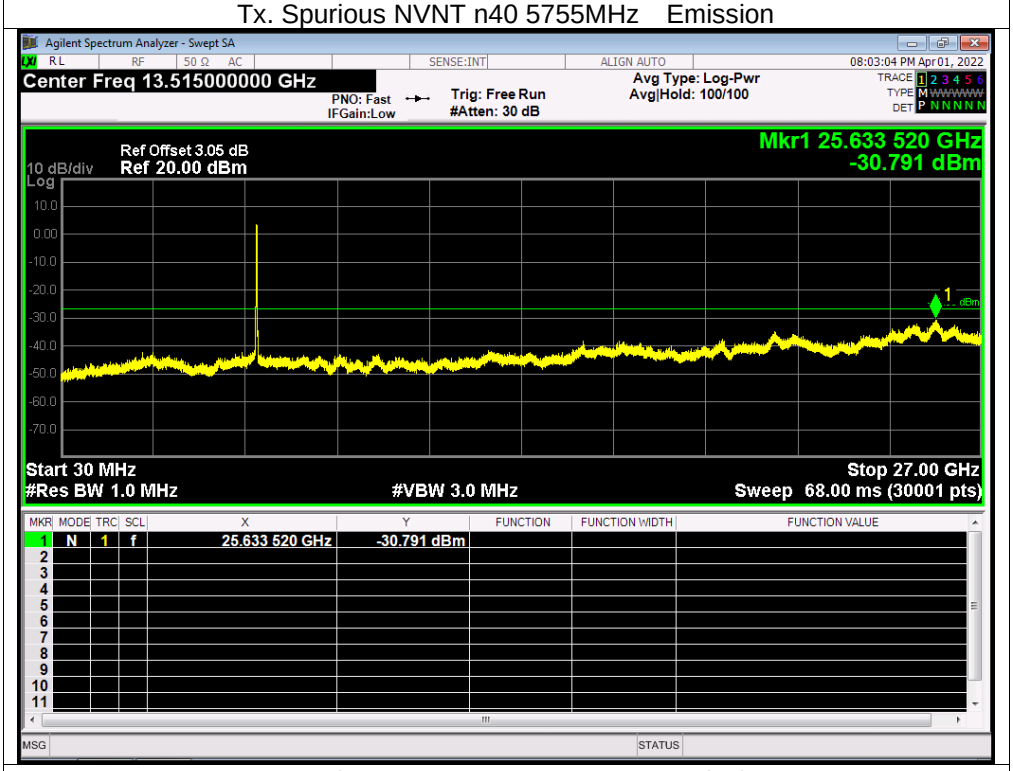
Tx. Spurious NVNT n20 5785MHz Emission



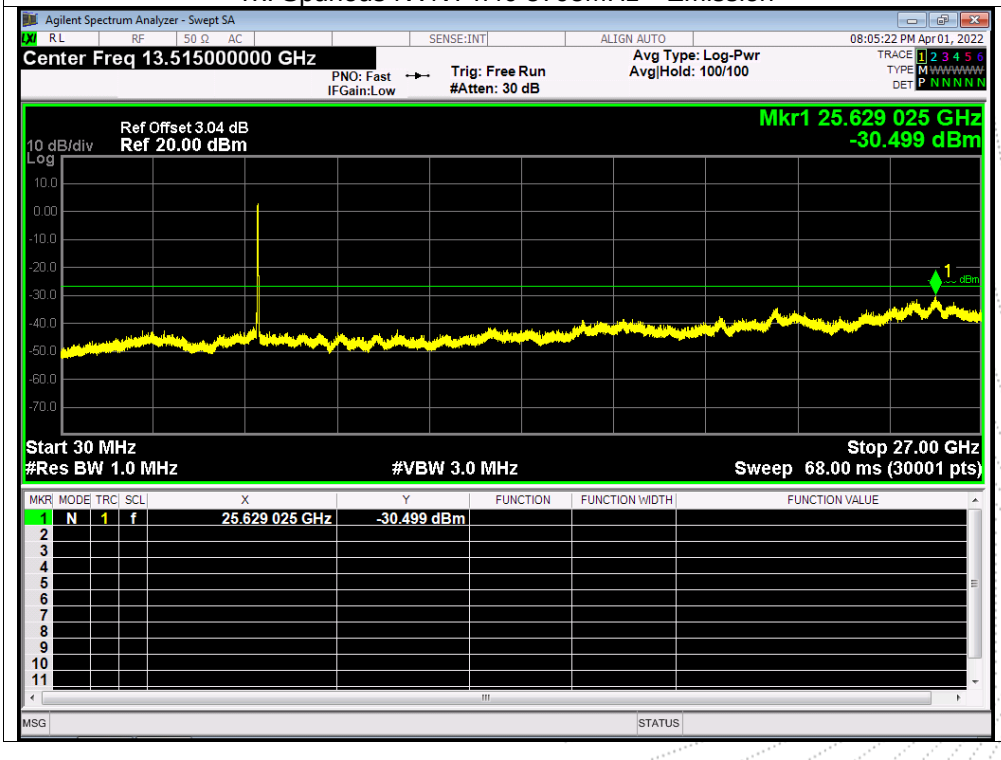
Tx. Spurious NVNT n20 5825MHz Emission



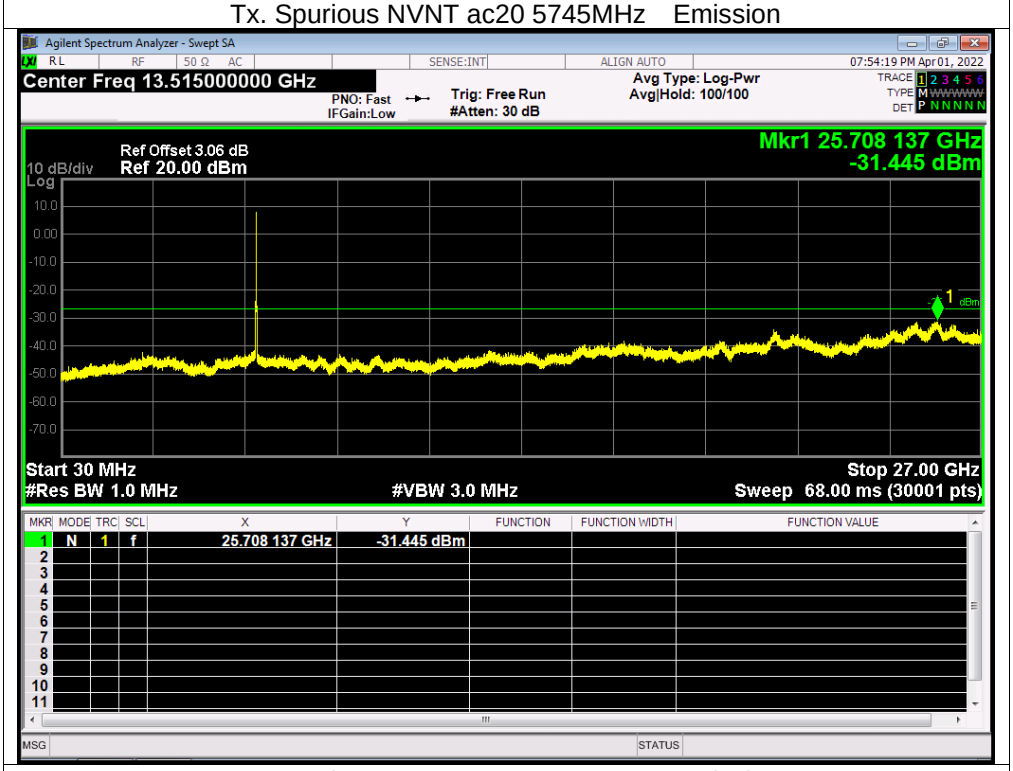
Tx. Spurious NVNT n40 5755MHz Emission



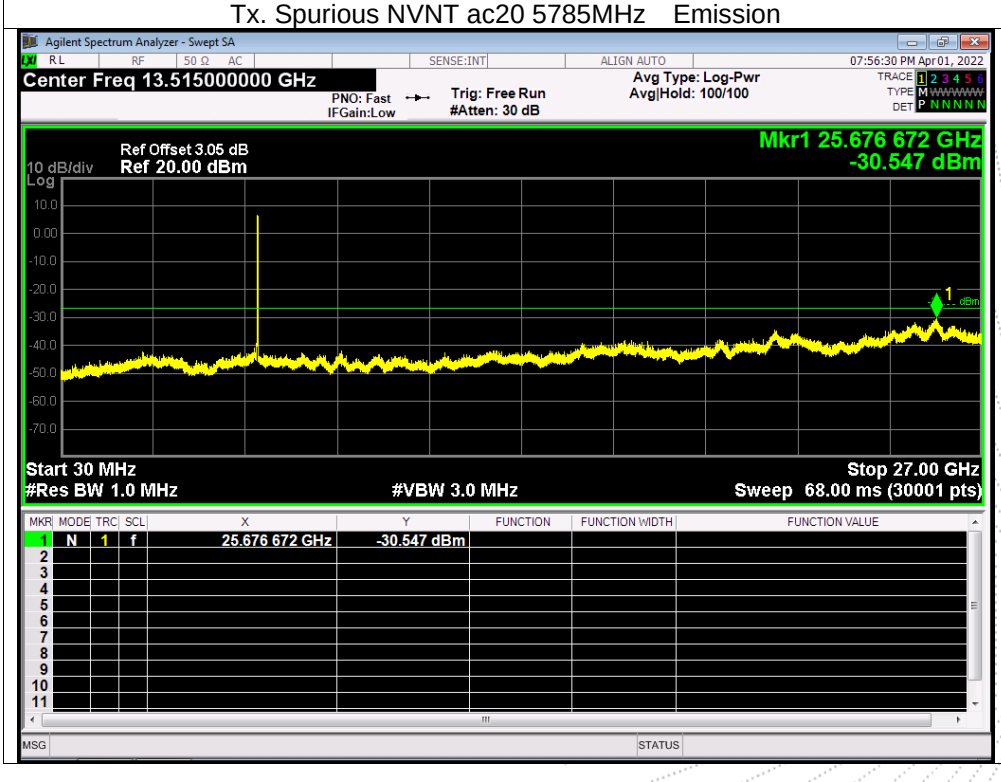
Tx. Spurious NVNT n40 5795MHz Emission



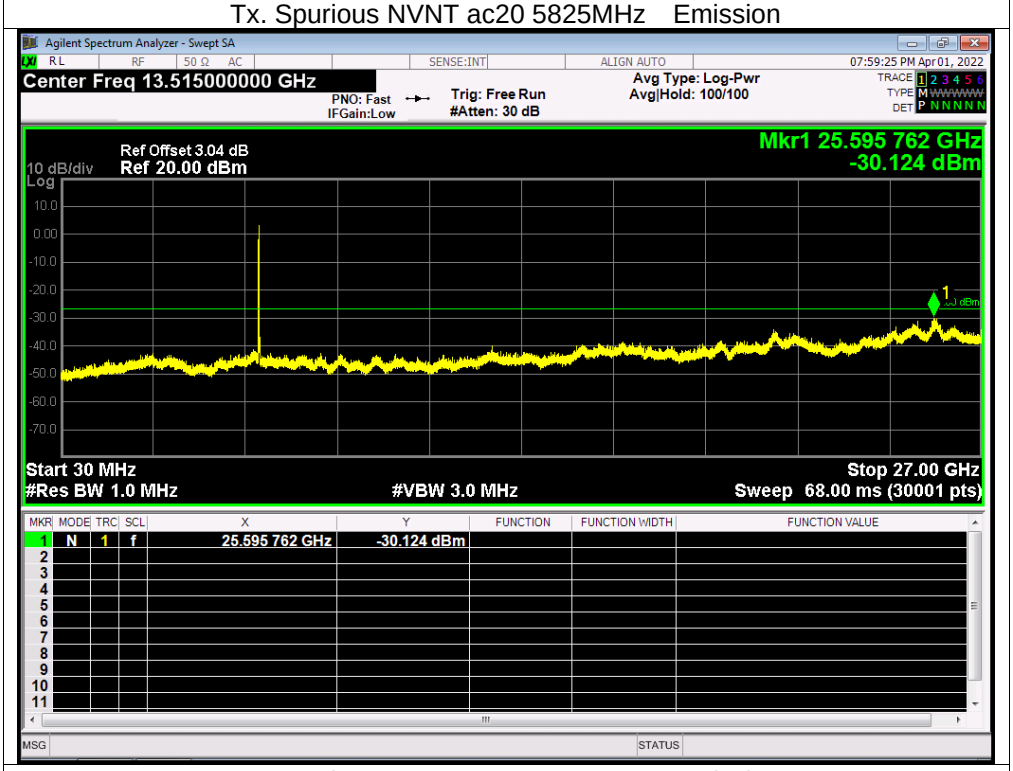
Tx. Spurious NVNT ac20 5745MHz Emission



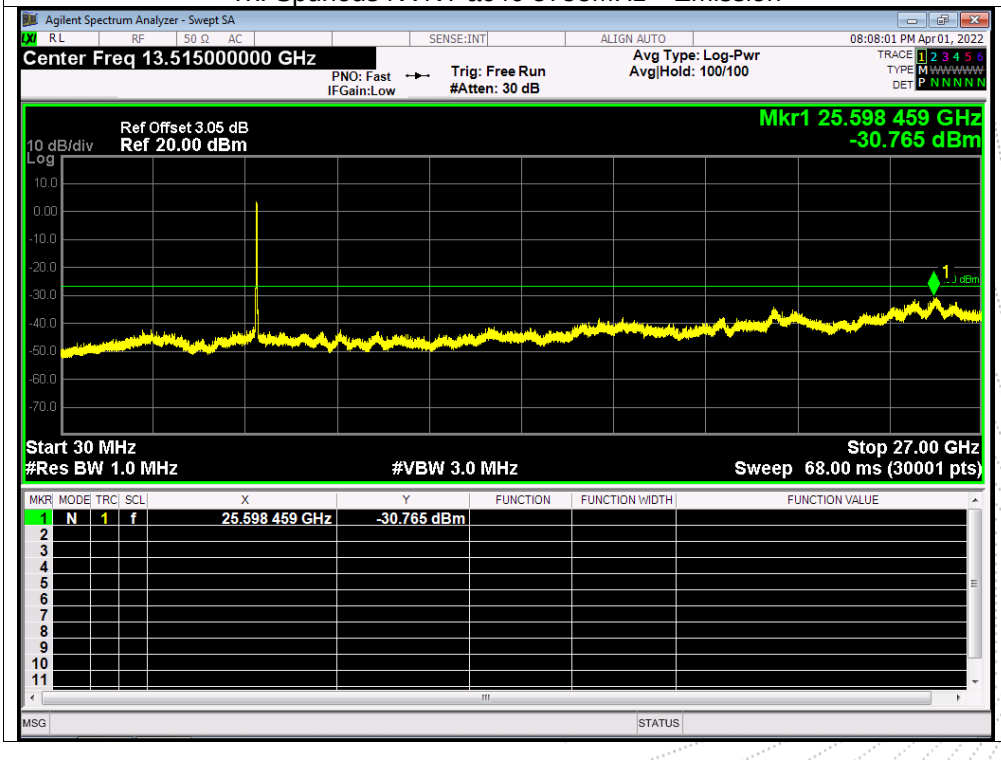
Tx. Spurious NVNT ac20 5785MHz Emission



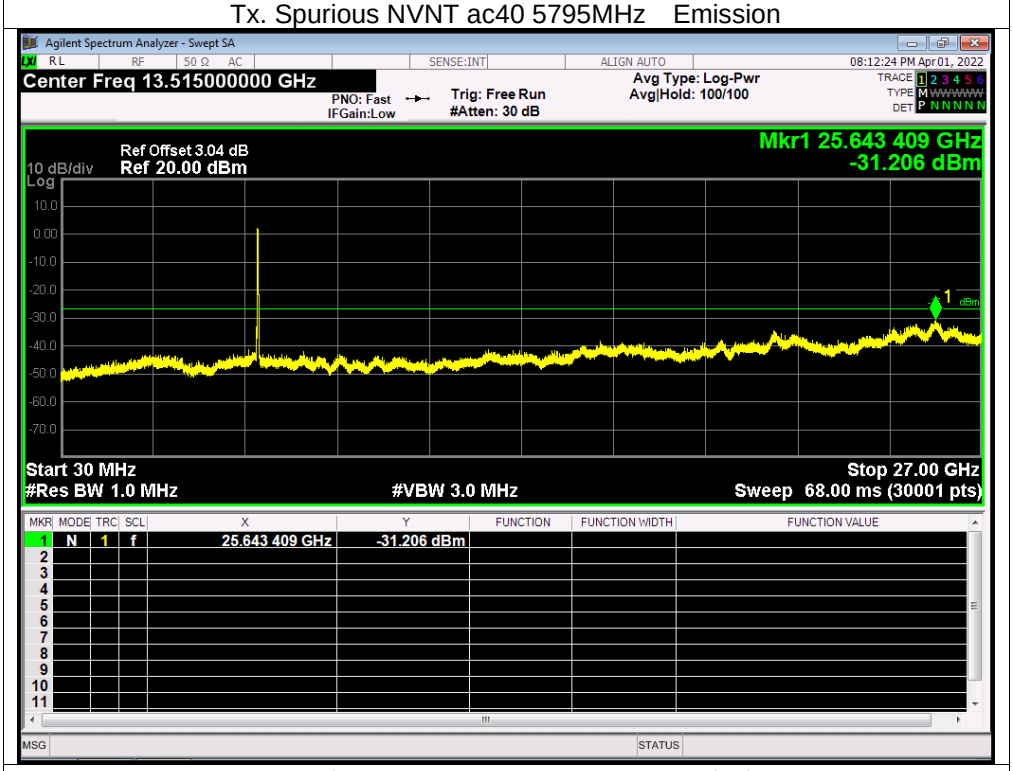
Tx. Spurious NVNT ac20 5825MHz Emission



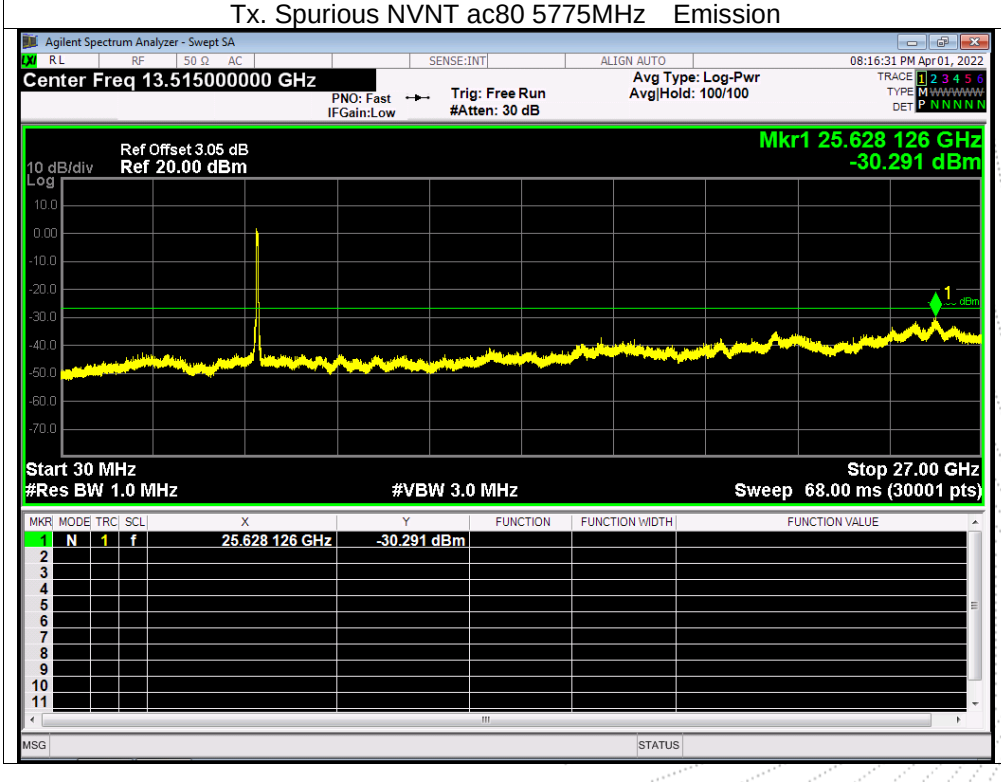
Tx. Spurious NVNT ac40 5755MHz Emission



Tx. Spurious NVNT ac40 5795MHz Emission

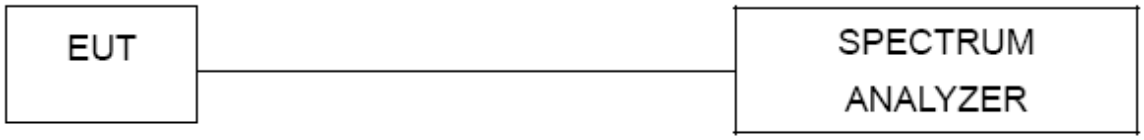


Tx. Spurious NVNT ac80 5775MHz Emission



13. Frequency Stability Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.
The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)..

13.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and he limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is -20°C~70°C.

13.4 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5180.0140	5180	0.0140	2.7100
		V max (V)	138.00	5180.0172	5180	0.0172	3.3151
		V min (V)	102.00	5180.0105	5180	0.0105	2.0345
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5180.0109	5180	0.0109	2.1044
		T (°C)	-10	5180.0053	5180	0.0053	1.0239
		T (°C)	0	5180.0052	5180	0.0052	0.9944
		T (°C)	10	5180.0014	5180	0.0014	0.2767
		T (°C)	20	5180.0094	5180	0.0094	1.8112
		T (°C)	30	5180.0051	5180	0.0051	0.9816
		T (°C)	40	5180.0104	5180	0.0104	2.0095
		T (°C)	50	5180.0037	5180	0.0037	0.7198
		T (°C)	60	5180.0003	5180	0.0003	0.0528
		T (°C)	70	5180.0050	5180	0.0050	0.9608
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5200.0047	5200	0.0047	0.9068
		V max (V)	138.00	5200.0087	5200	0.0087	1.6636
		V min (V)	102.00	5200.0121	5200	0.0121	2.3327
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5200.00090	5200	0.00090	0.1724
		T (°C)	-10	5200.00625	5200	0.00625	1.2023
		T (°C)	0	5200.00560	5200	0.00560	1.0774
		T (°C)	10	5200.00034	5200	0.00034	0.0647
		T (°C)	20	5200.01271	5200	0.01271	2.4436
		T (°C)	30	5200.00345	5200	0.00345	0.6637
		T (°C)	40	5200.00337	5200	0.00337	0.6472
		T (°C)	50	5200.00651	5200	0.00651	1.2513
		T (°C)	60	5200.00801	5200	0.00801	1.5398
		T (°C)	70	5200.00664	5200	0.00664	1.2770
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5240.0134	5240	0.0134	2.5555
		V max (V)	138.00	5240.0069	5240	0.0069	1.3196
		V min (V)	102.00	5240.0053	5240	0.0053	1.0043
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5240.0028	5240	0.0028	0.5253
		T (°C)	-10	5240.0086	5240	0.0086	1.6332
		T (°C)	0	5240.0091	5240	0.0091	1.7282
		T (°C)	10	5240.0035	5240	0.0035	0.6658
		T (°C)	20	5240.0053	5240	0.0053	1.0155
		T (°C)	30	5240.0112	5240	0.0112	2.1444
		T (°C)	40	5240.0049	5240	0.0049	0.9271
		T (°C)	50	5240.0082	5240	0.0082	1.5674
		T (°C)	60	5240.0114	5240	0.0114	2.1745
		T (°C)	70	5240.0020	5240	0.0020	0.3815
Limits				5150-5250 MHz			
Result				Complies			

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Hzst Mode ：	TX Frequency(5745-5825MHz)		

Voltage vs. Frequency Stabilit

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5745.00508	5745	0.00508	0.8846
		V max (V)	138.00	5745.00611	5745	0.00611	1.0643
		V min (V)	102.00	5745.00417	5745	0.00417	0.7261
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5745.00982	5745	0.00982	1.7085
		T (°C)	-10	5745.00329	5745	0.00329	0.5722
		T (°C)	0	5745.01138	5745	0.01138	1.9804
		T (°C)	10	5745.00966	5745	0.00966	1.6814
		T (°C)	20	5745.00644	5745	0.00644	1.1209
		T (°C)	30	5745.01027	5745	0.01027	1.7876
		T (°C)	40	5745.00191	5745	0.00191	0.3327
		T (°C)	50	5745.00083	5745	0.00083	0.1436
		T (°C)	60	5745.01105	5745	0.01105	1.9237
		T (°C)	70	5745.00250	5745	0.00250	0.4352
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5785.00565	5785	0.00565	0.9765
		V max (V)	138.00	5785.01351	5785	0.01351	2.3353
		V min (V)	102.00	5785.00096	5785	0.00096	0.1663
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5785.00812	5785	0.00812	1.4034
		T (°C)	-10	5785.00313	5785	0.00313	0.5411
		T (°C)	0	5785.01183	5785	0.01183	2.0444
		T (°C)	10	5785.00982	5785	0.00982	1.6979
		T (°C)	20	5785.00542	5785	0.00542	0.9369
		T (°C)	30	5785.01075	5785	0.01075	1.8585
		T (°C)	40	5785.00090	5785	0.00090	0.1554
		T (°C)	50	5785.01273	5785	0.01273	2.2013
		T (°C)	60	5785.00003	5785	0.00003	0.0052
		T (°C)	70	5785.00449	5785	0.00449	0.7760
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5825.00908	5825	0.00908	1.5581
		V max (V)	138.00	5825.01259	5825	0.01259	2.1618
		V min (V)	102.00	5825.00812	5825	0.00812	1.3932
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5825.00125	5825	0.00125	0.2152
		T (°C)	-10	5825.00675	5825	0.00675	1.1579
		T (°C)	0	5825.01194	5825	0.01194	2.0495
		T (°C)	10	5825.00360	5825	0.00360	0.6176
		T (°C)	20	5825.01285	5825	0.01285	2.2058
		T (°C)	30	5825.00543	5825	0.00543	0.9330
		T (°C)	40	5825.00221	5825	0.00221	0.3789
		T (°C)	50	5825.00072	5825	0.00072	0.1234
		T (°C)	60	5825.00597	5825	0.00597	1.0250
		T (°C)	70	5825.00822	5825	0.00822	1.4107
Limits				5725-5850 MHz			
Result				Complies			

14. Duty Cycle Of Test Signal

14.1 Standard Requirement

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

14.2 Formula

Duty Cycle = Ton / (Ton+Toff)

14.3 Test Procedure

1.Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

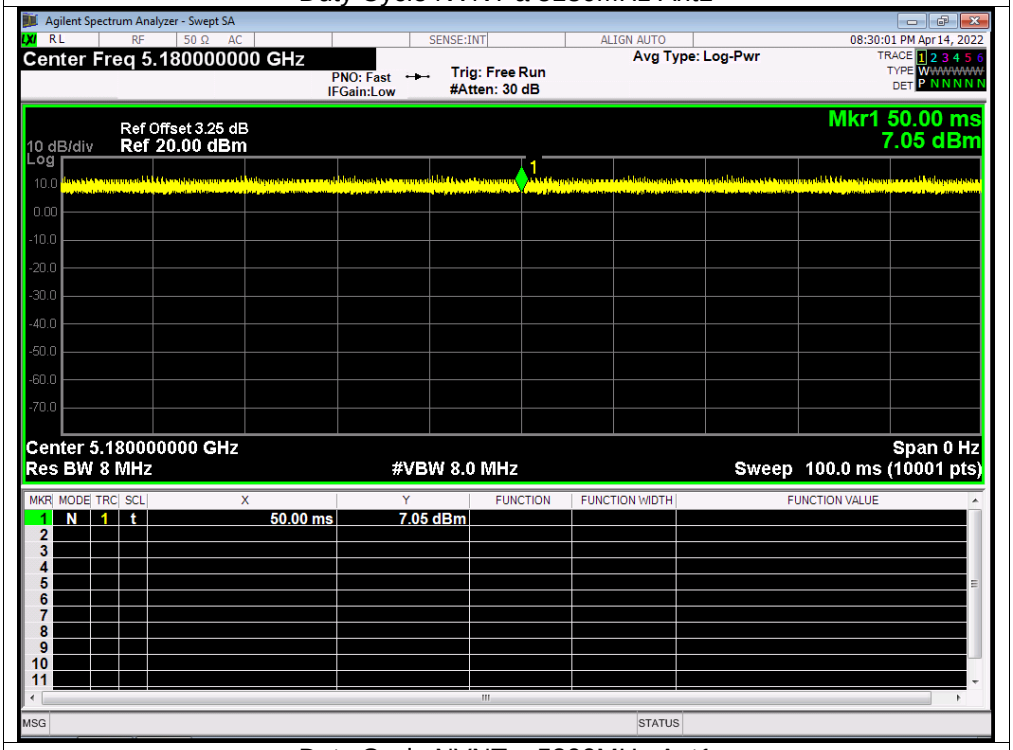
14.4 Test Result

5.1G

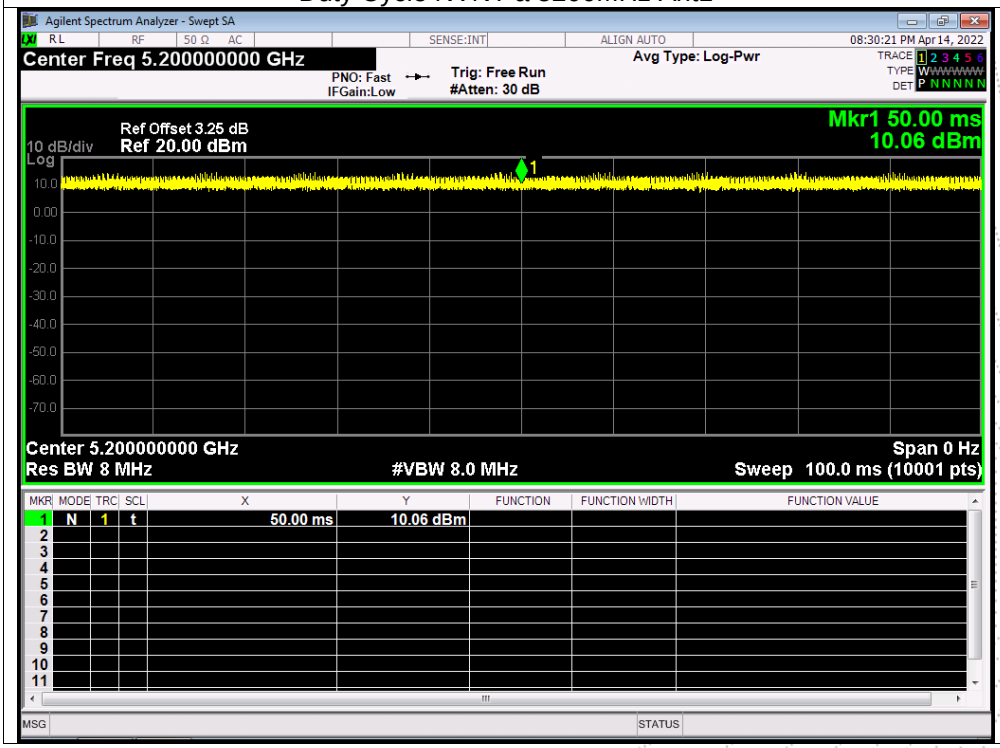
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	100	0	0
NVNT	a	5200	100	0	0
NVNT	a	5240	100	0	0
NVNT	n20	5180	100	0	0
NVNT	n20	5200	100	0	0
NVNT	n20	5240	100	0	0
NVNT	n40	5190	100	0	0
NVNT	n40	5230	100	0	0
NVNT	ac20	5180	100	0	0
NVNT	ac20	5200	100	0	0
NVNT	ac20	5240	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac40	5230	100	0	0
NVNT	ac80	5210	100	0	0

Test Graphs

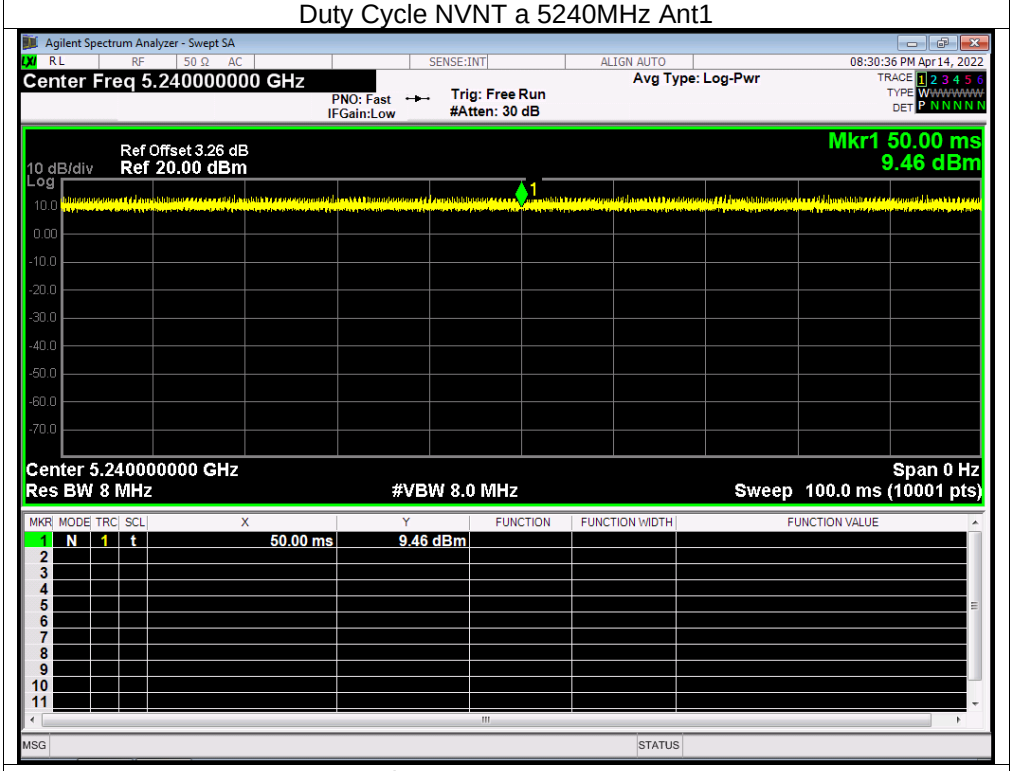
Duty Cycle NVNT a 5180MHz Ant1



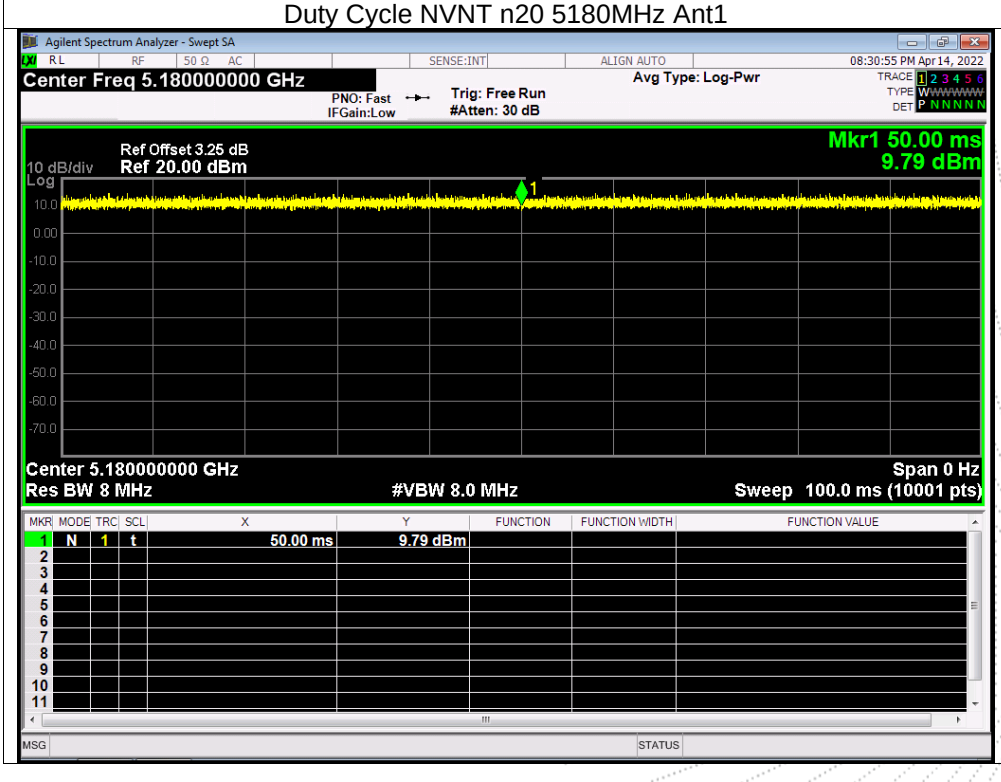
Duty Cycle NVNT a 5200MHz Ant1



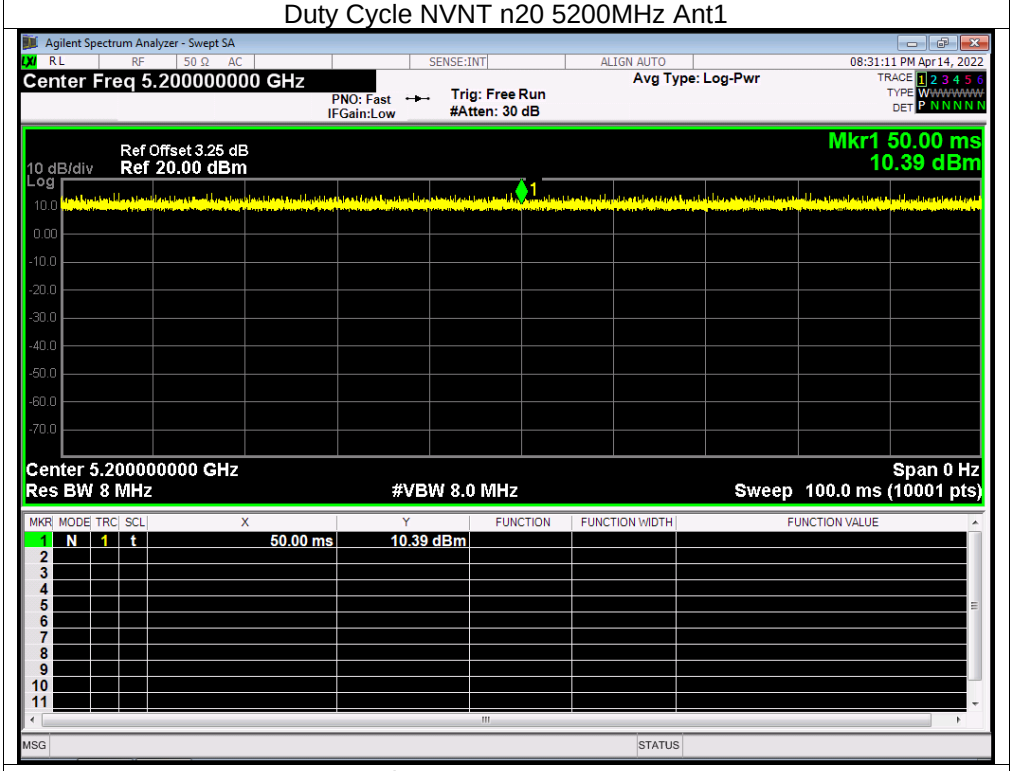
Duty Cycle NVNT a 5240MHz Ant1



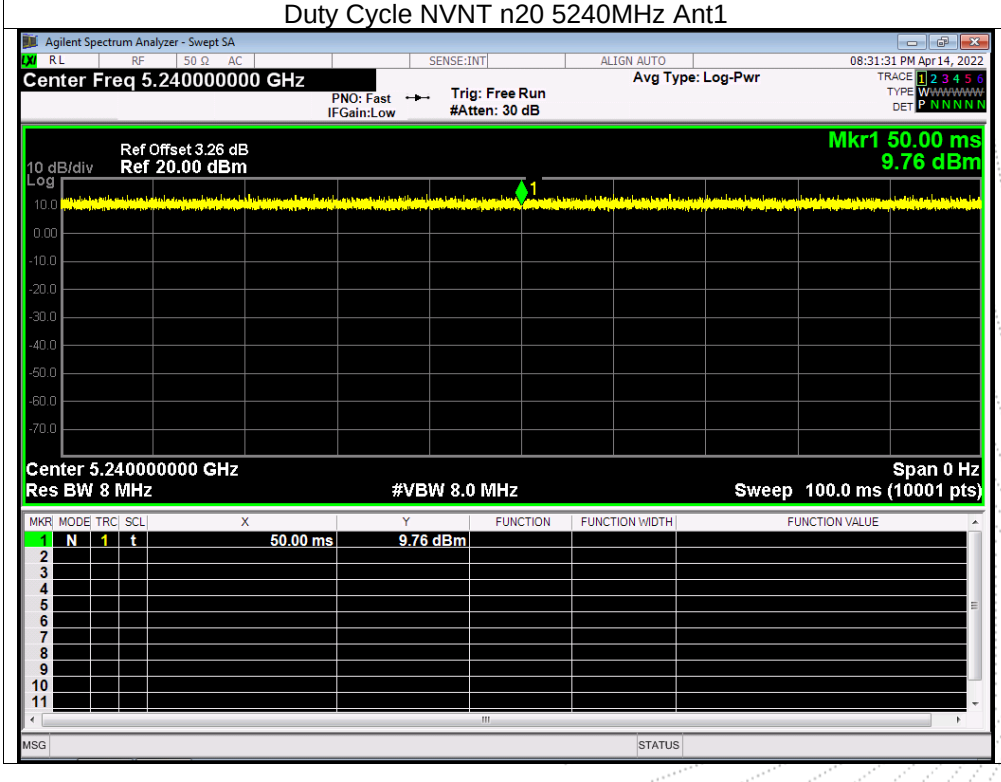
Duty Cycle NVNT n20 5180MHz Ant1



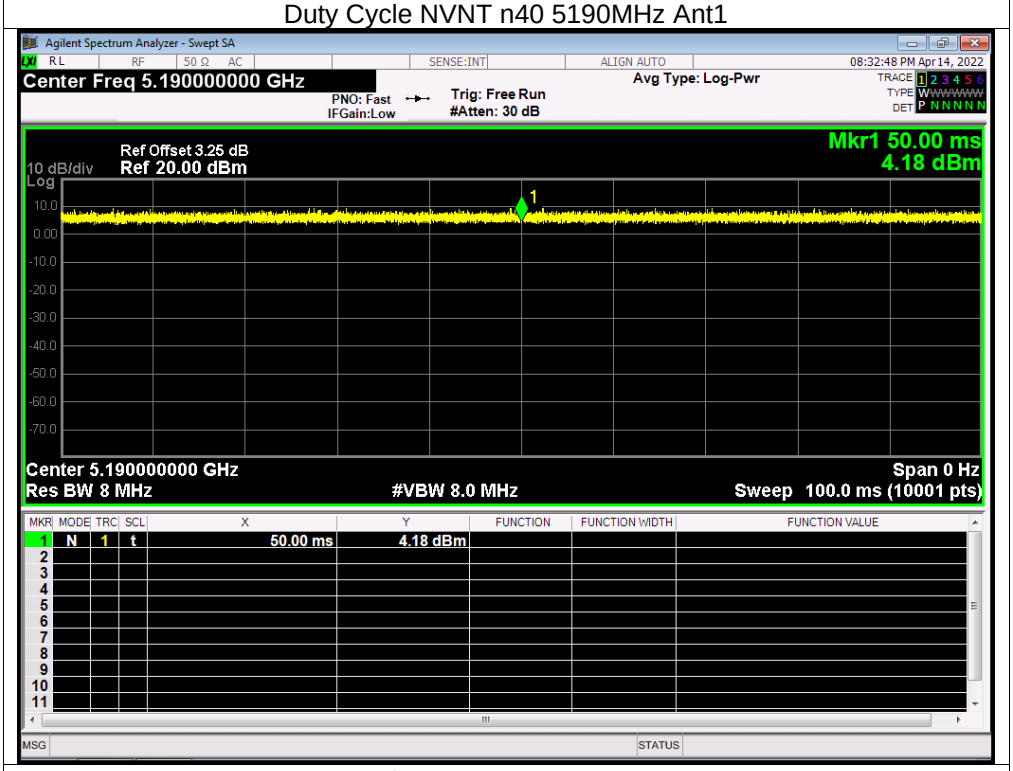
Duty Cycle NVNT n20 5200MHz Ant1



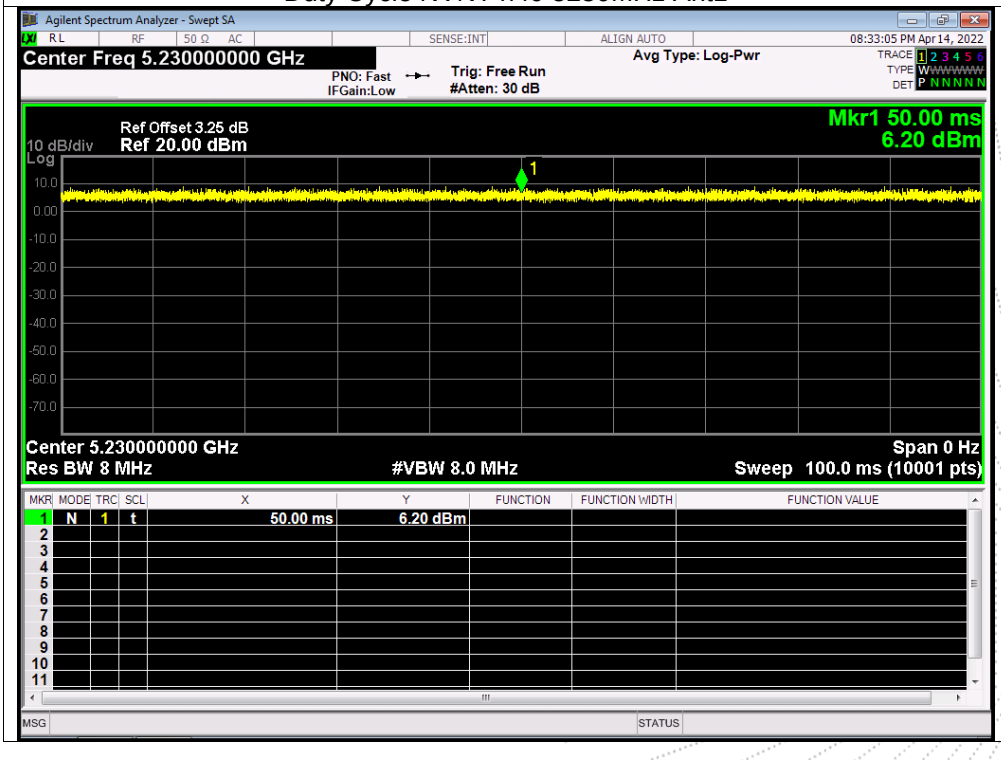
Duty Cycle NVNT n20 5240MHz Ant1



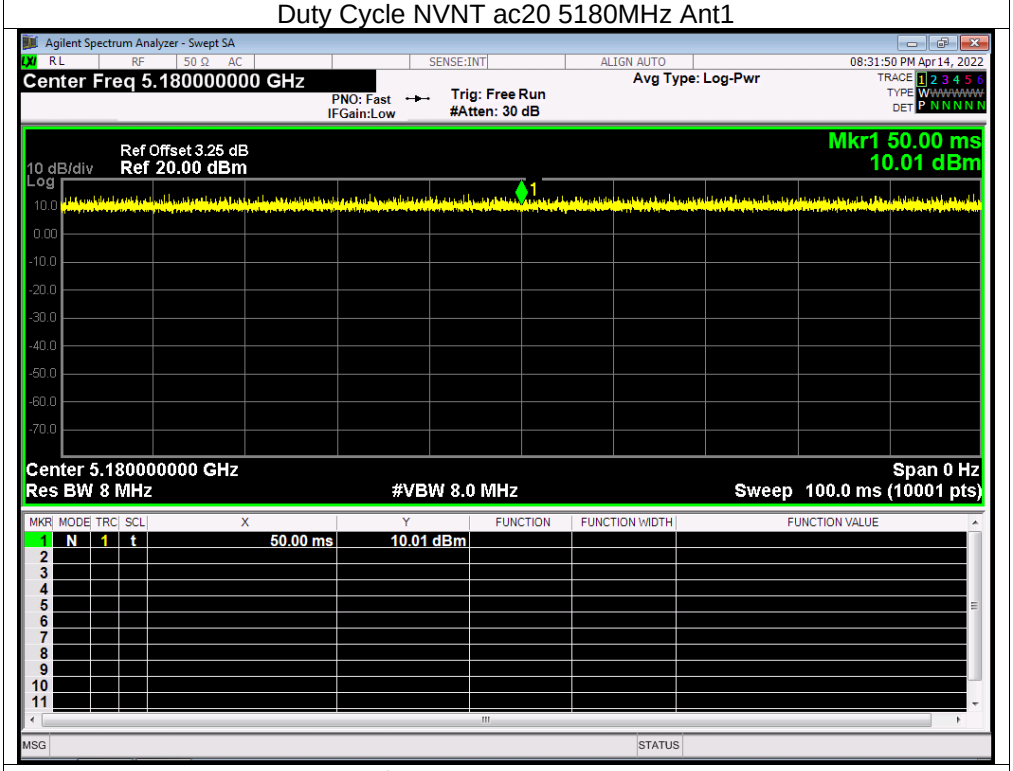
Duty Cycle NVNT n40 5190MHz Ant1



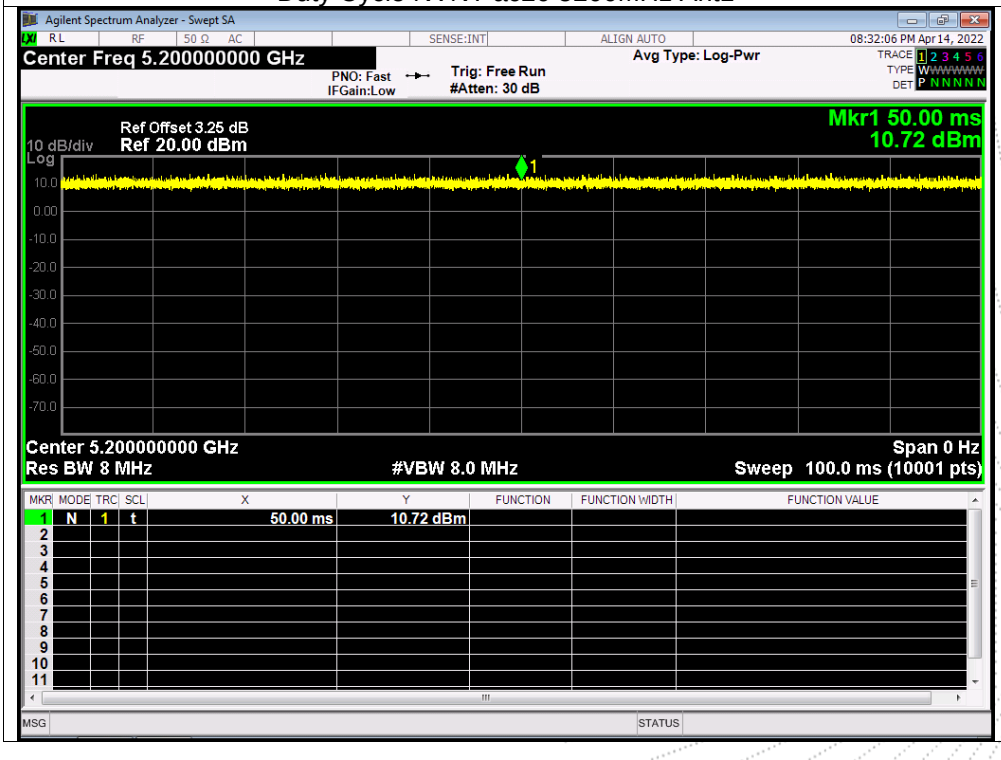
Duty Cycle NVNT n40 5230MHz Ant1



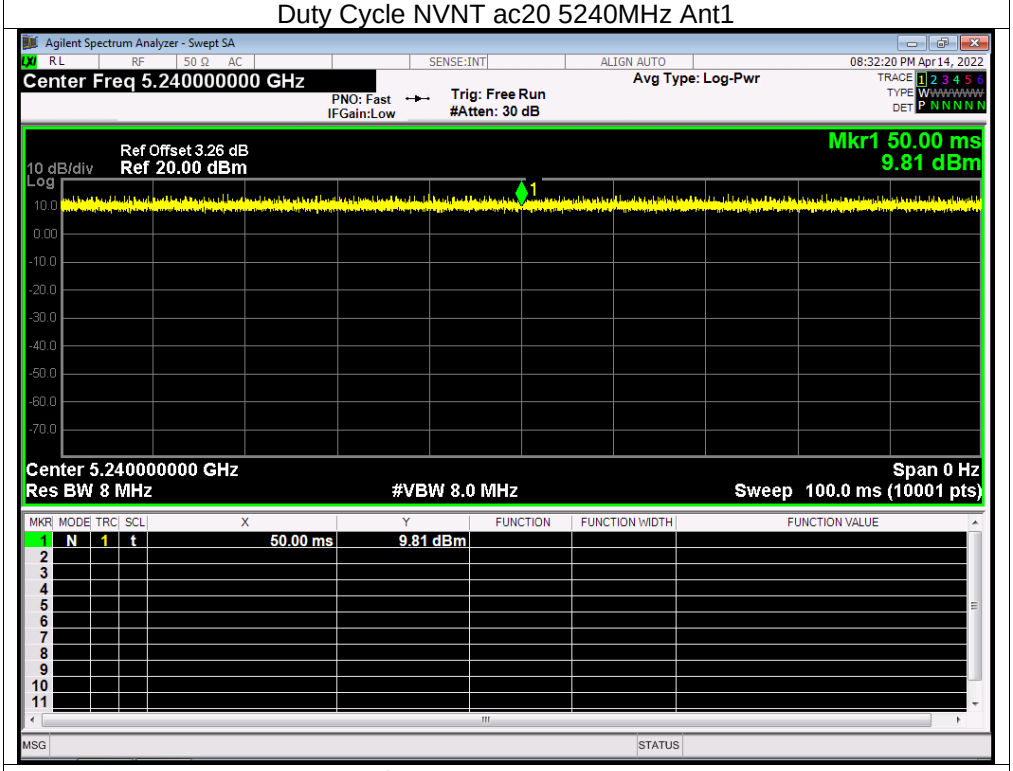
Duty Cycle NVNT ac20 5180MHz Ant1



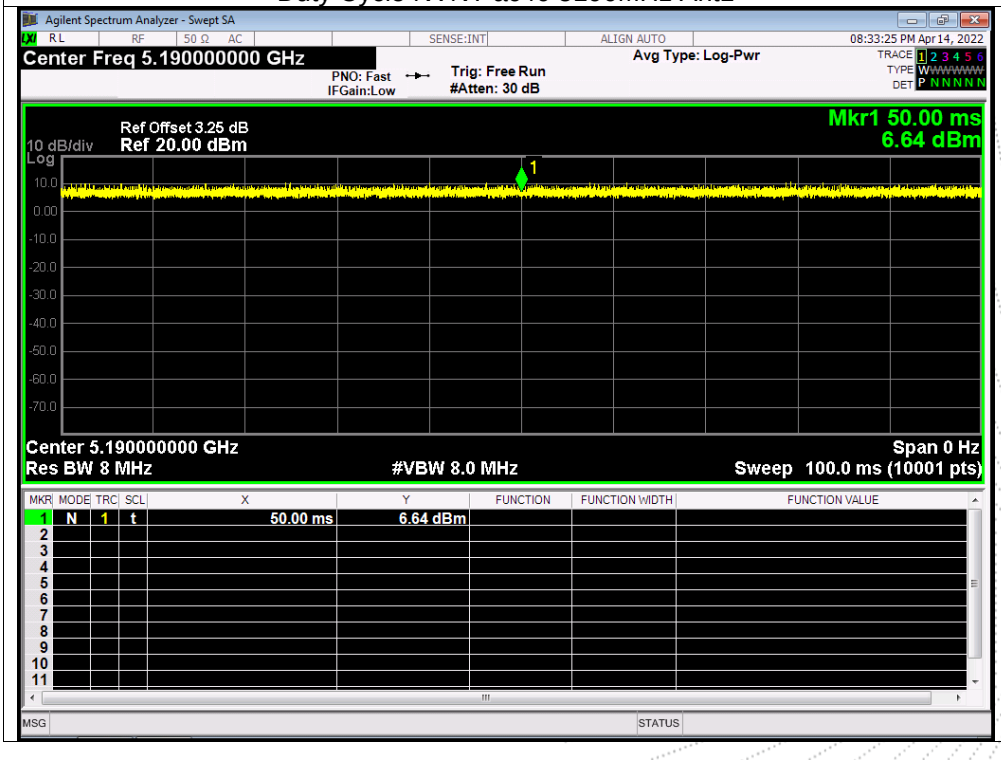
Duty Cycle NVNT ac20 5200MHz Ant1



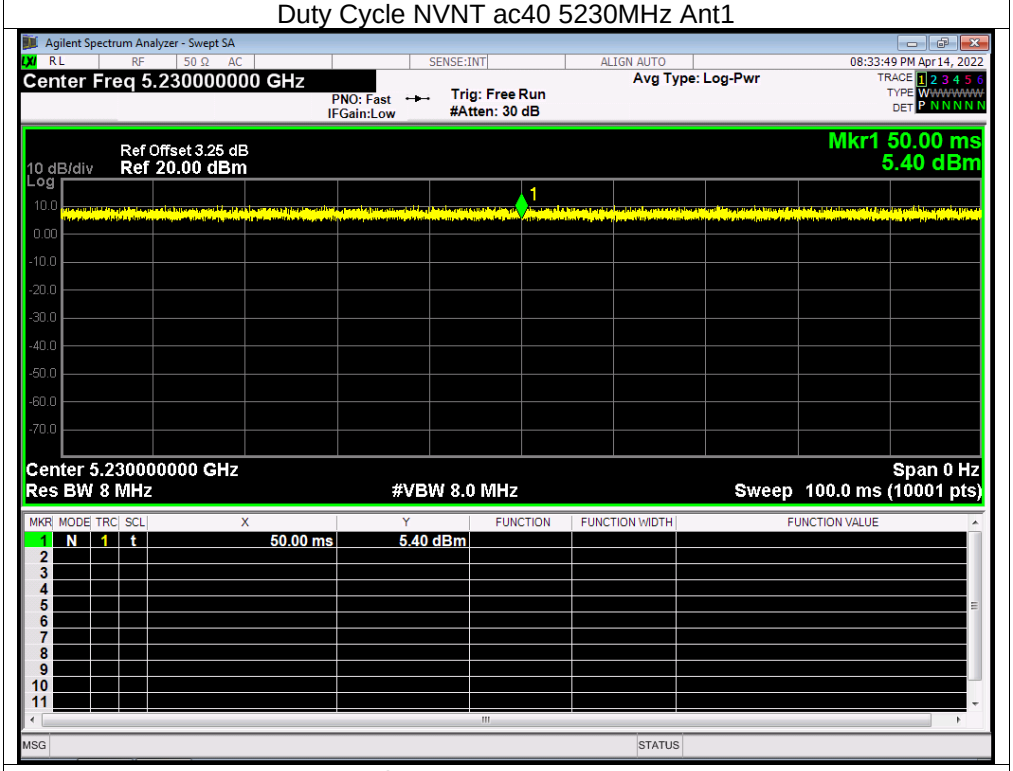
Duty Cycle NVNT ac20 5240MHz Ant1



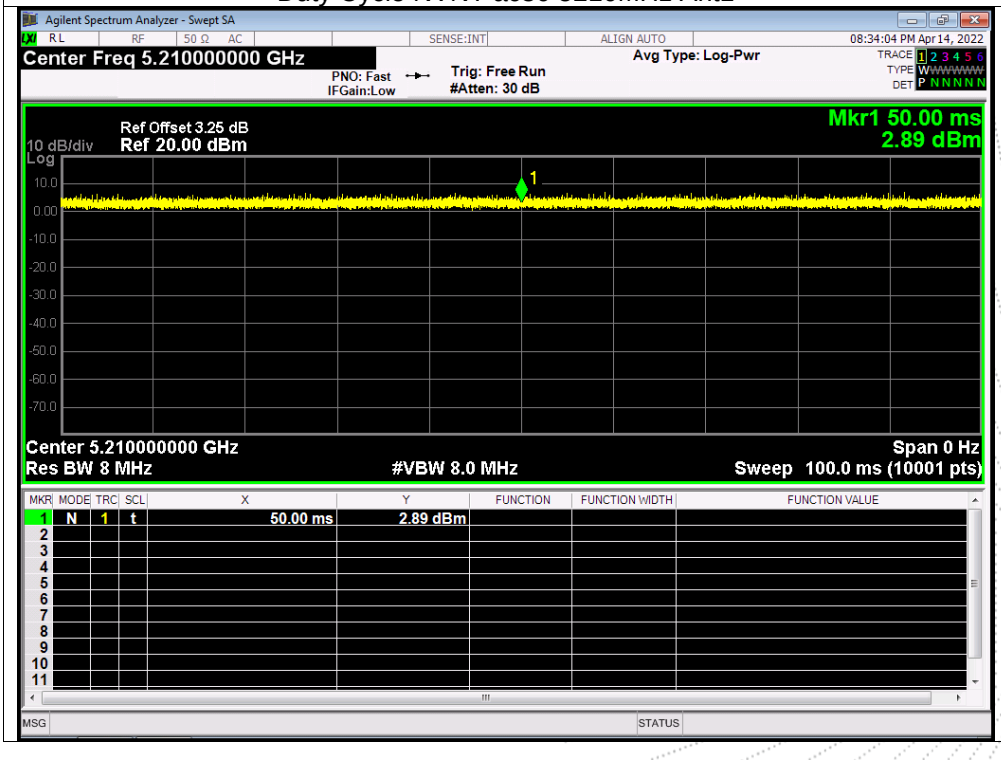
Duty Cycle NVNT ac40 5190MHz Ant1



Duty Cycle NVNT ac40 5230MHz Ant1



Duty Cycle NVNT ac80 5210MHz Ant1

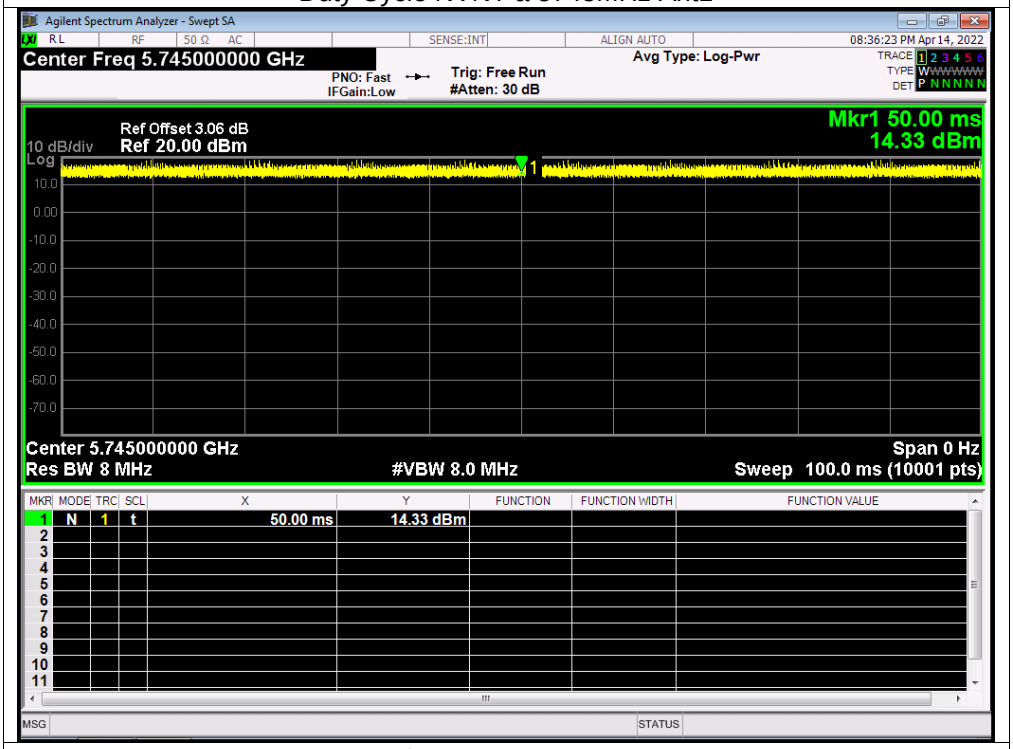


5.8G

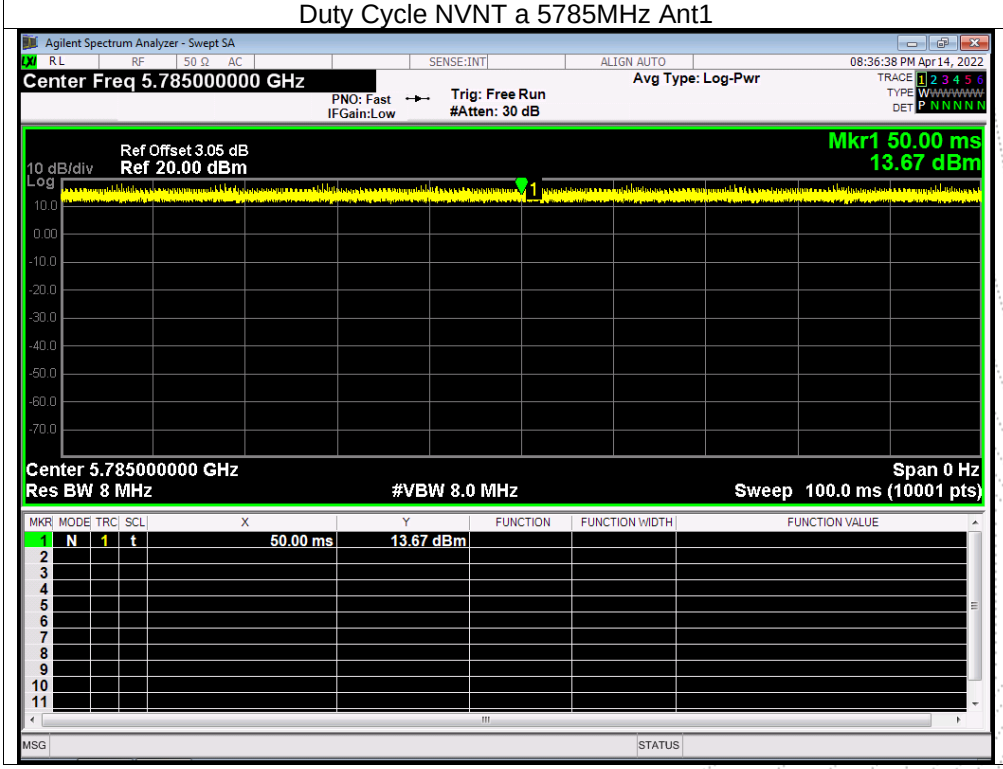
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	100	0	0
NVNT	a	5785	100	0	0
NVNT	a	5825	100	0	0
NVNT	n20	5745	100	0	0
NVNT	n20	5785	100	0	0
NVNT	n20	5825	100	0	0
NVNT	n40	5755	100	0	0
NVNT	n40	5795	100	0	0
NVNT	ac20	5745	100	0	0
NVNT	ac20	5785	100	0	0
NVNT	ac20	5825	100	0	0
NVNT	ac40	5755	100	0	0
NVNT	ac40	5795	100	0	0
NVNT	ac80	5775	100	0	0

Test Graphs

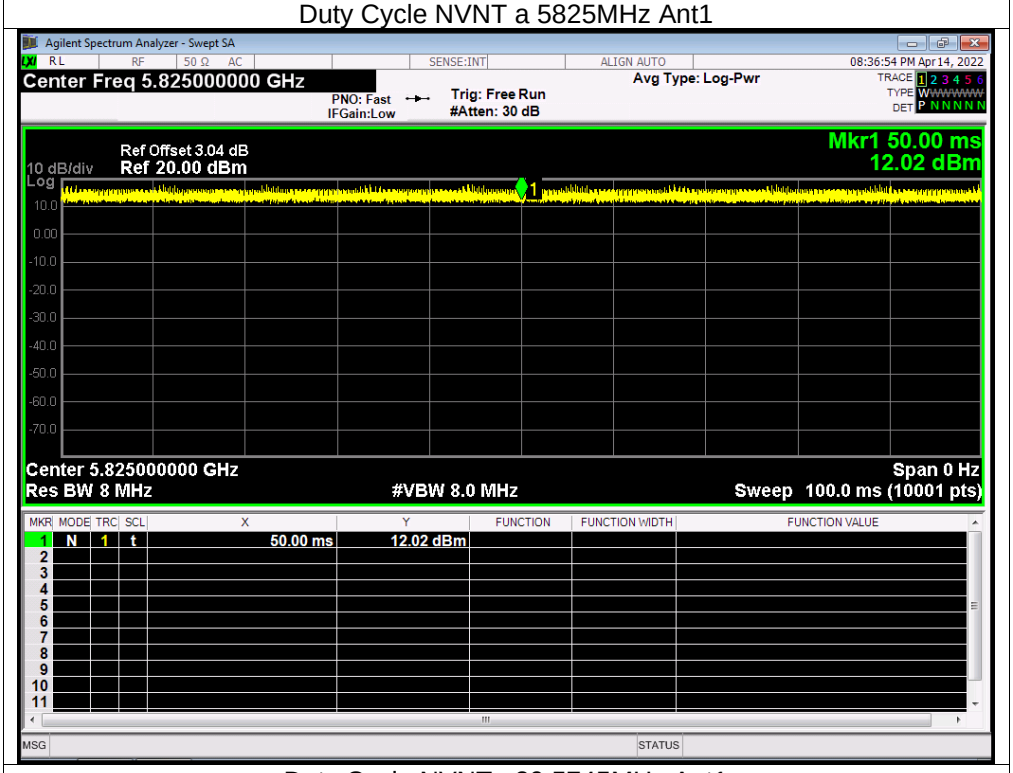
Duty Cycle NVNT a 5745MHz Ant1



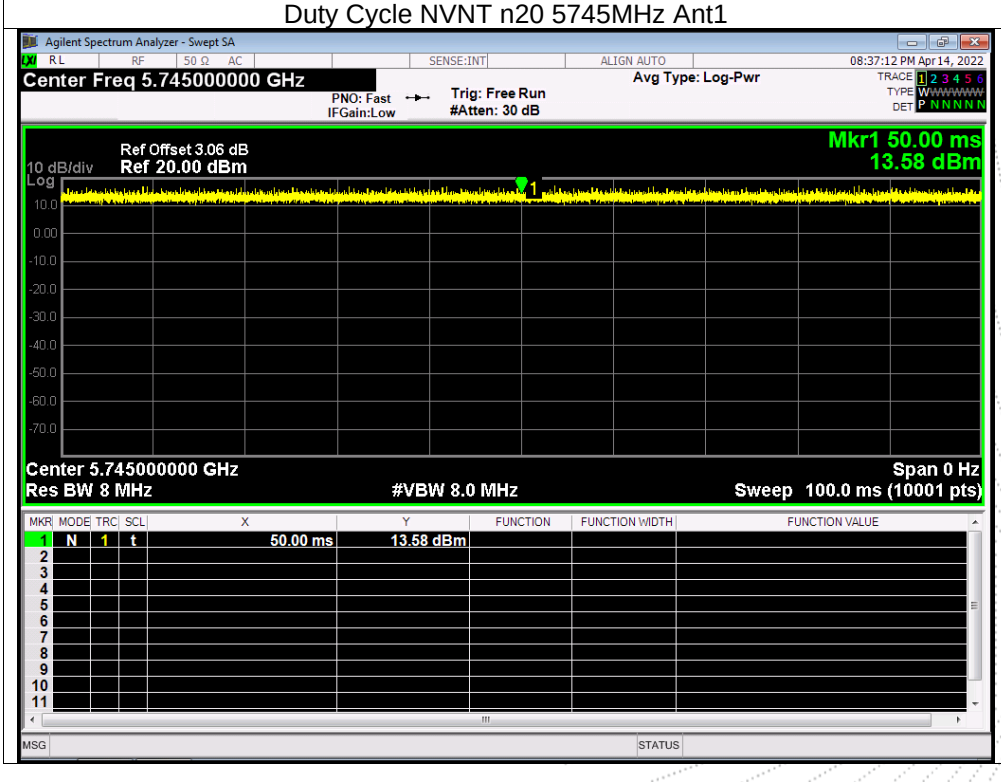
Duty Cycle NVNT a 5785MHz Ant1



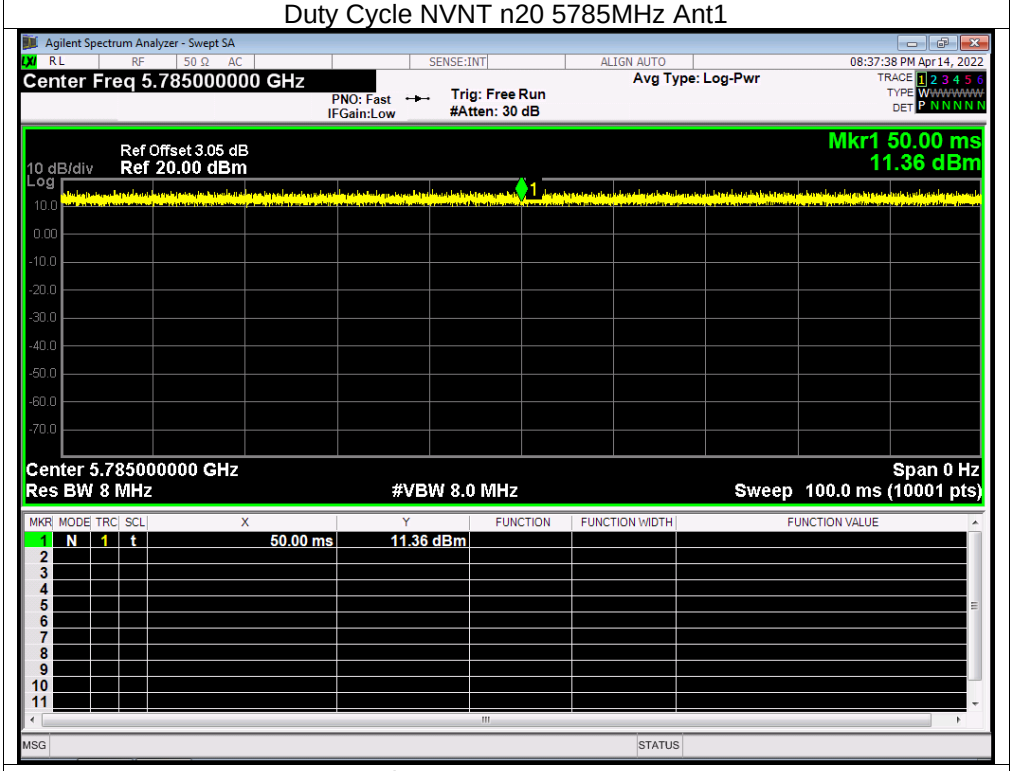
Duty Cycle NVNT a 5825MHz Ant1



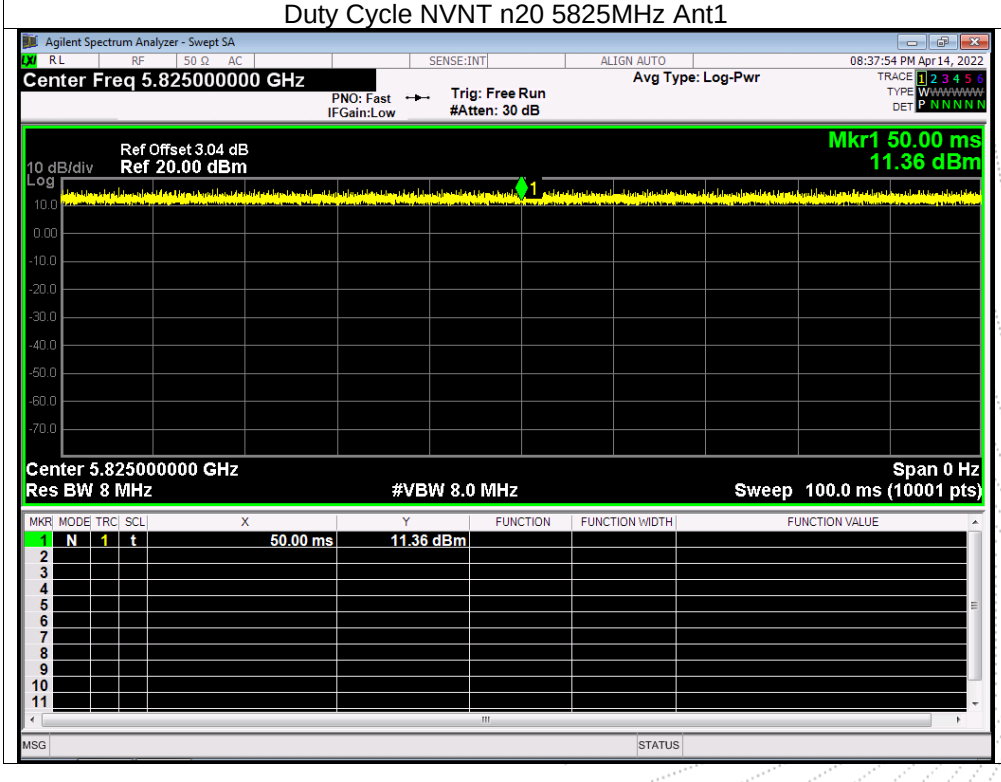
Duty Cycle NVNT n20 5745MHz Ant1



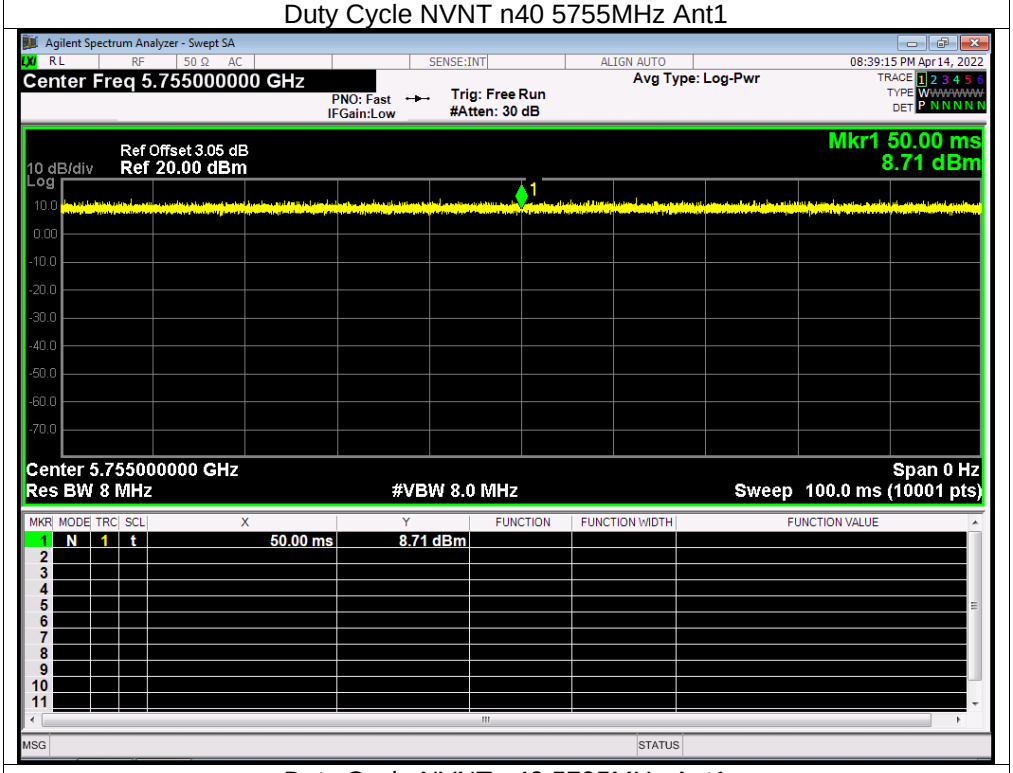
Duty Cycle NVNT n20 5785MHz Ant1



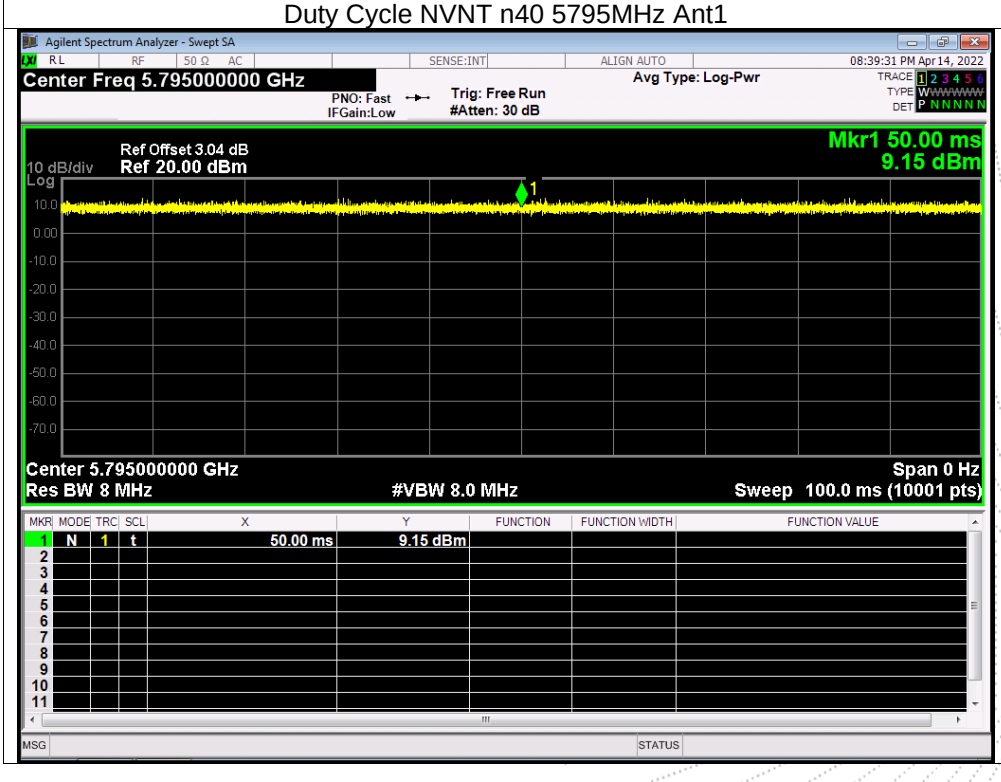
Duty Cycle NVNT n20 5825MHz Ant1



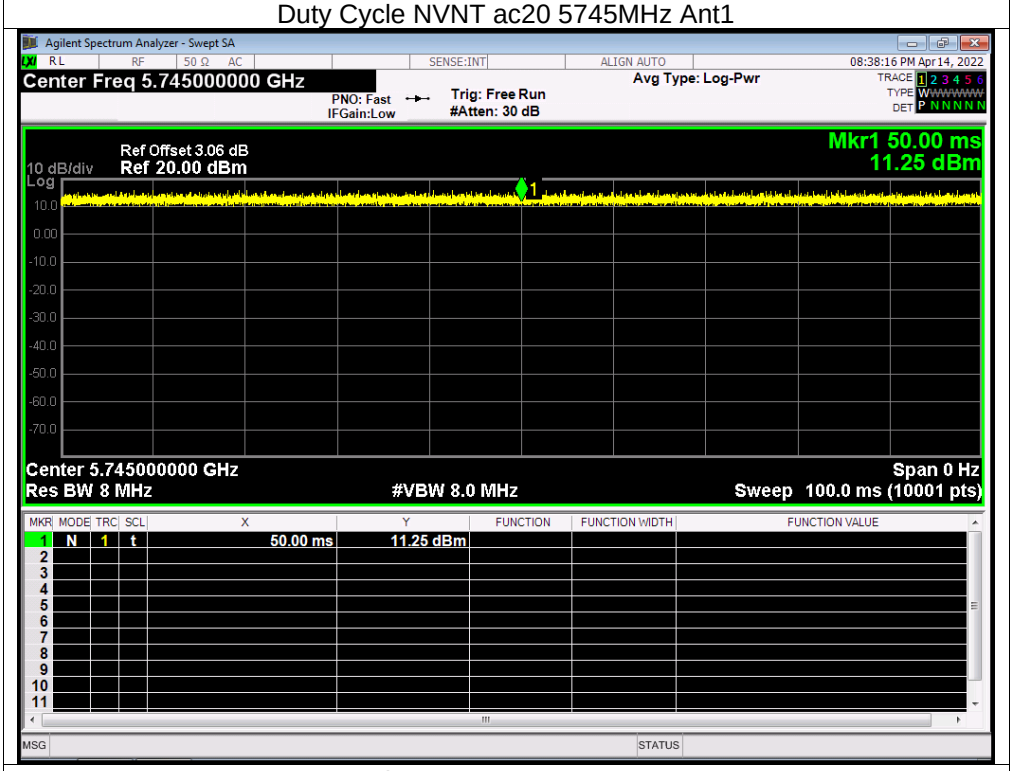
Duty Cycle NVNT n40 5755MHz Ant1



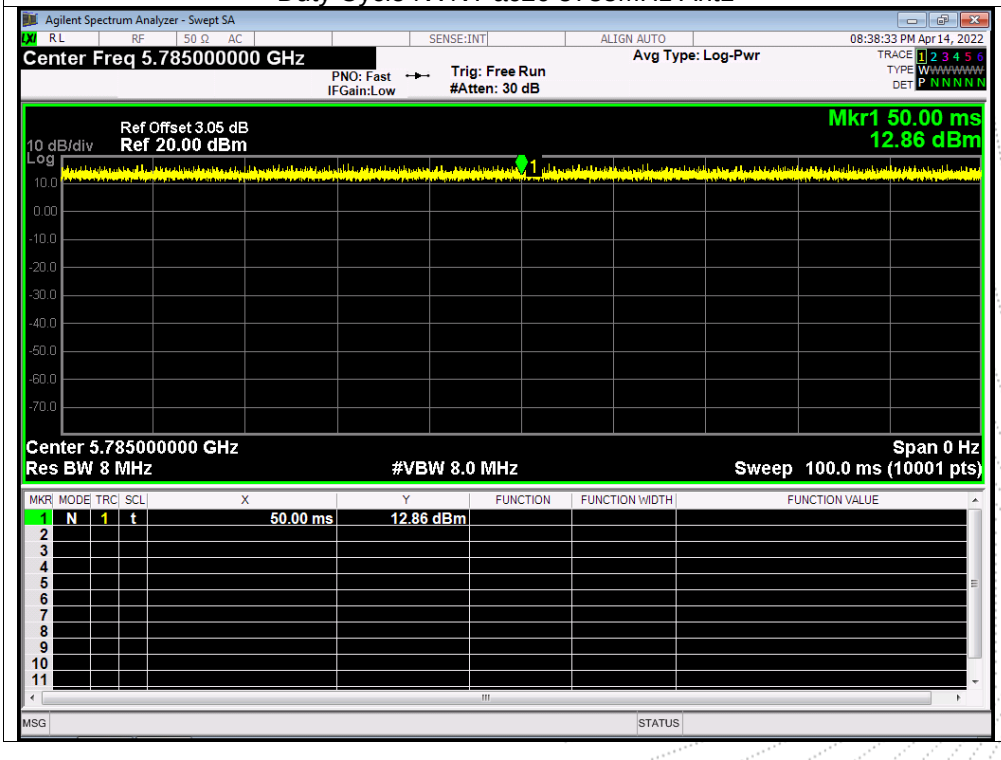
Duty Cycle NVNT n40 5795MHz Ant1



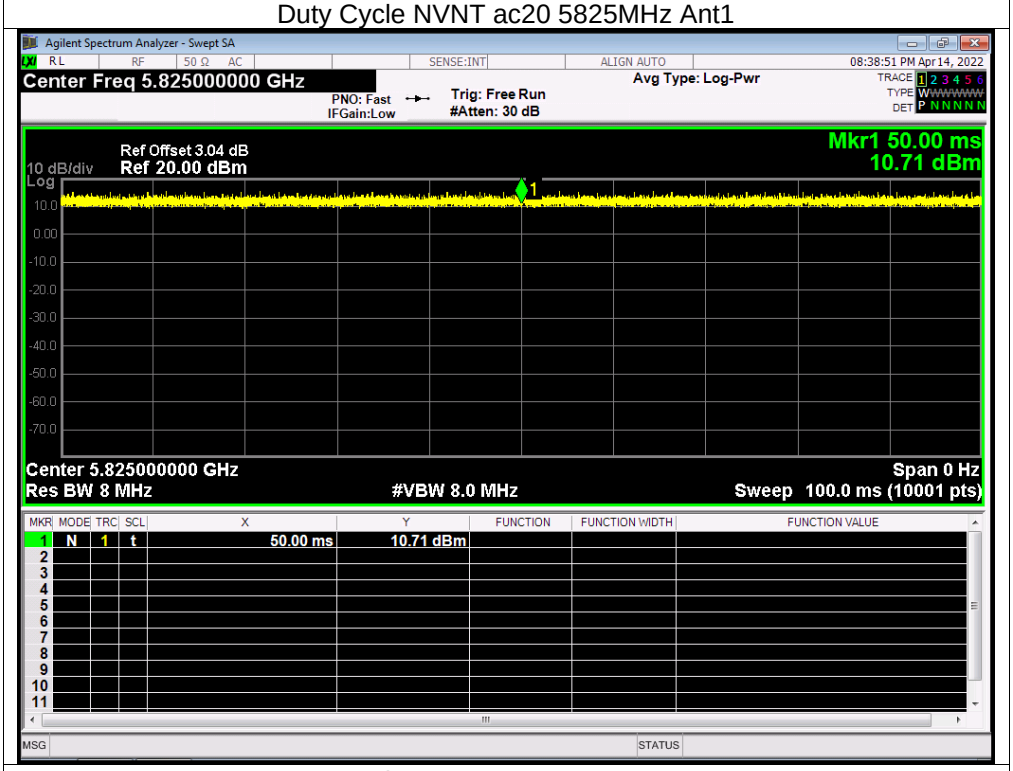
Duty Cycle NVNT ac20 5745MHz Ant1



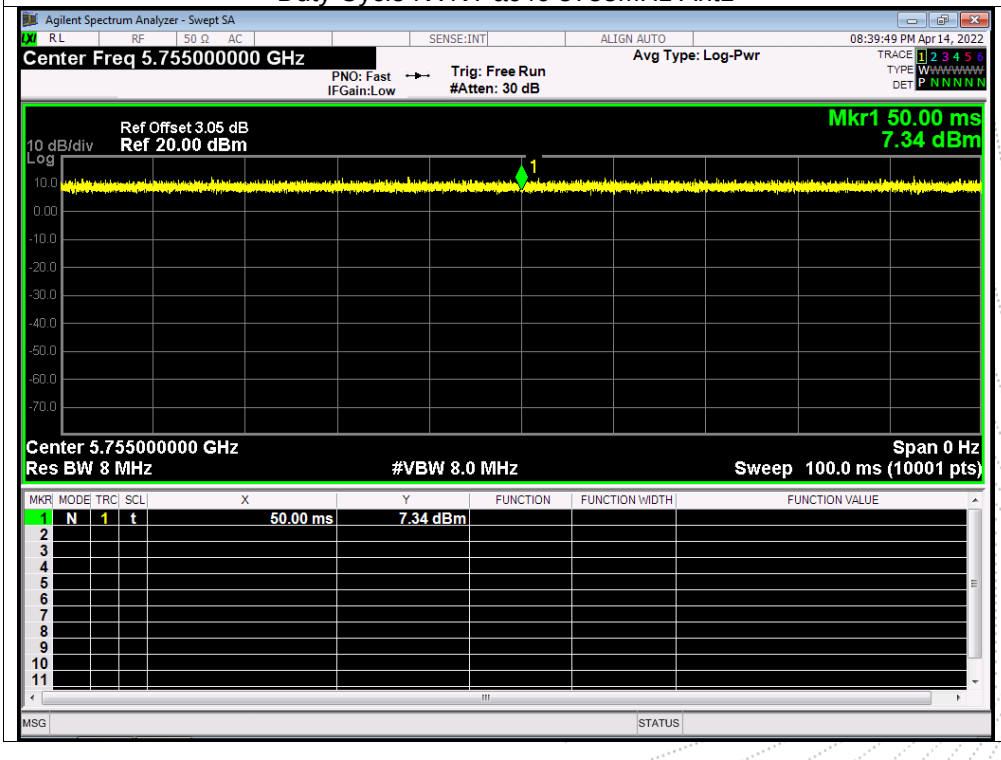
Duty Cycle NVNT ac20 5785MHz Ant1



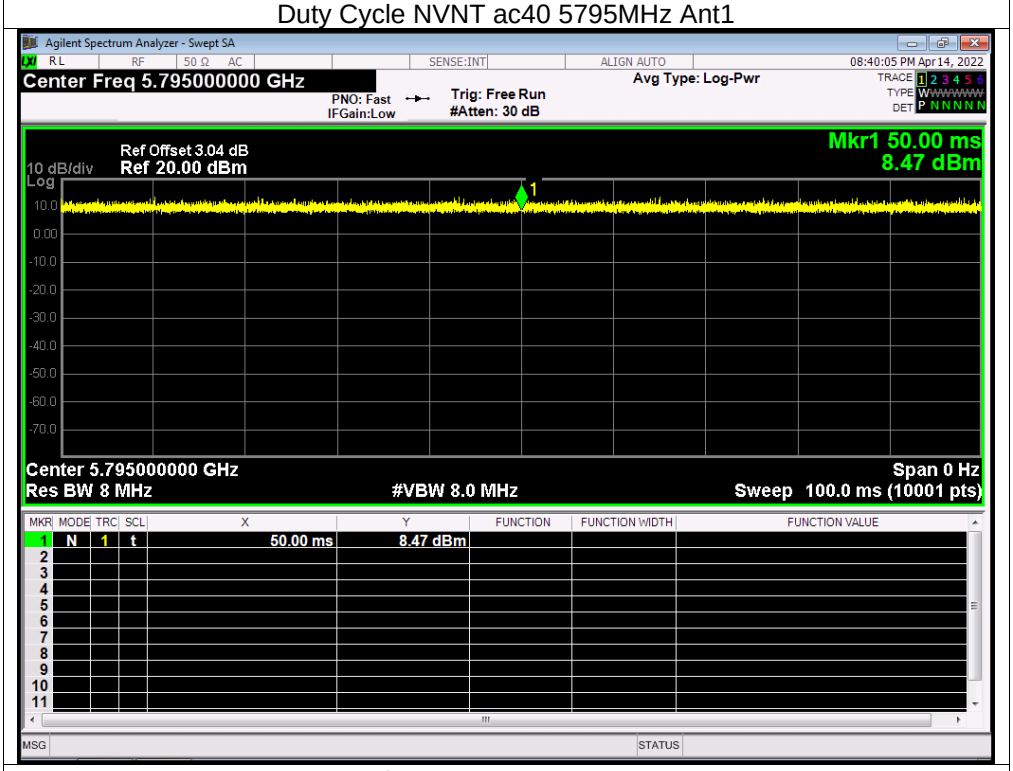
Duty Cycle NVNT ac20 5825MHz Ant1



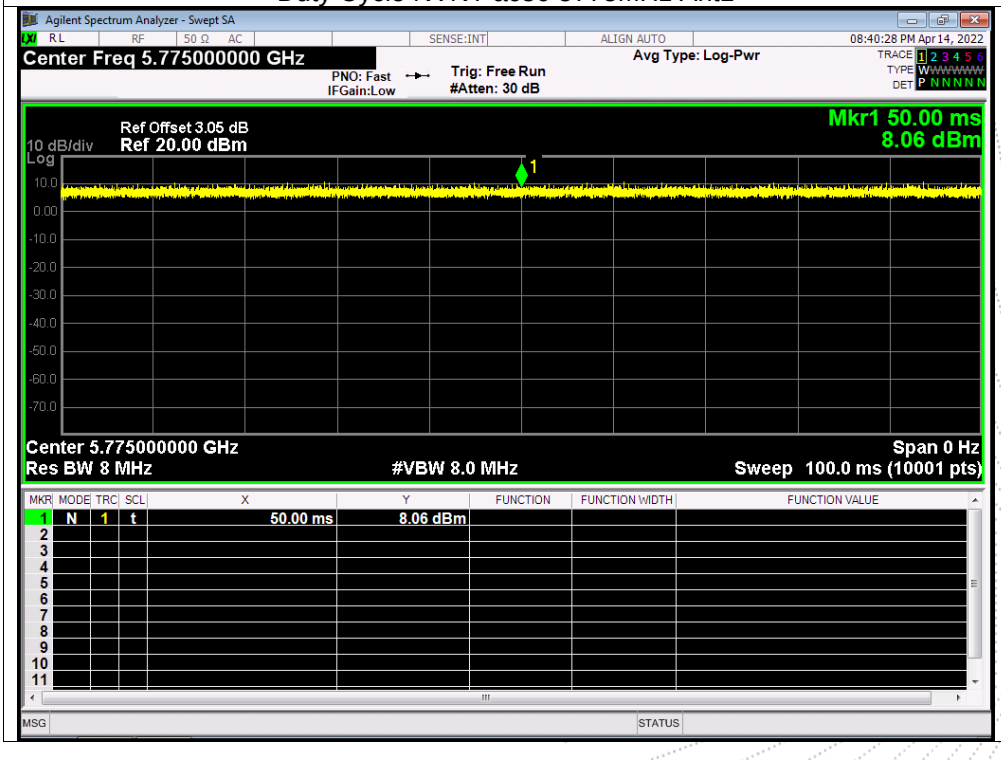
Duty Cycle NVNT ac40 5755MHz Ant1



Duty Cycle NVNT ac40 5795MHz Ant1



Duty Cycle NVNT ac80 5775MHz Ant1



15. Antenna Requirement

15.1 Limit

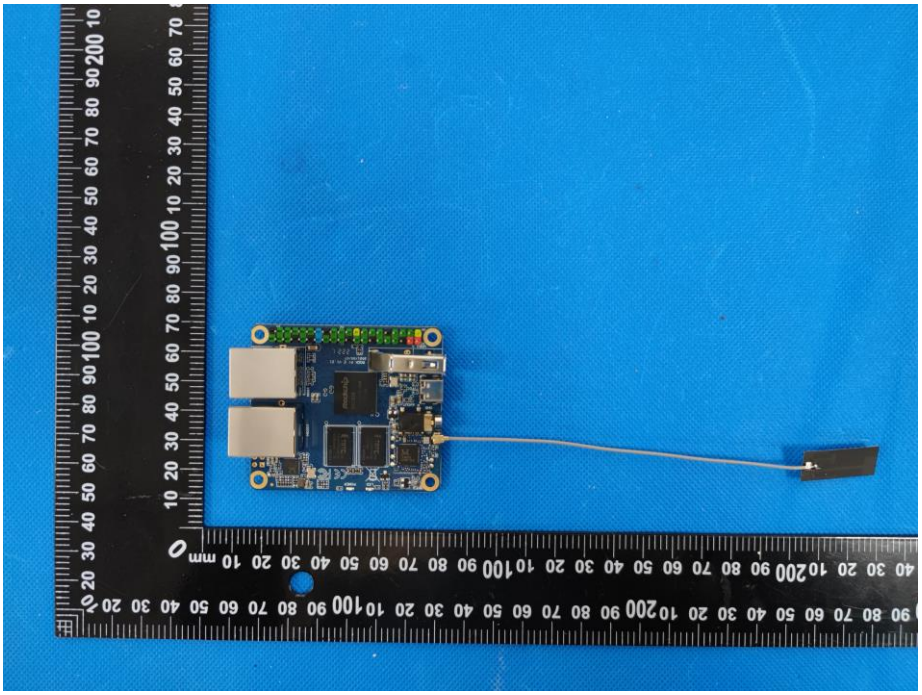
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

15.2 Test Result

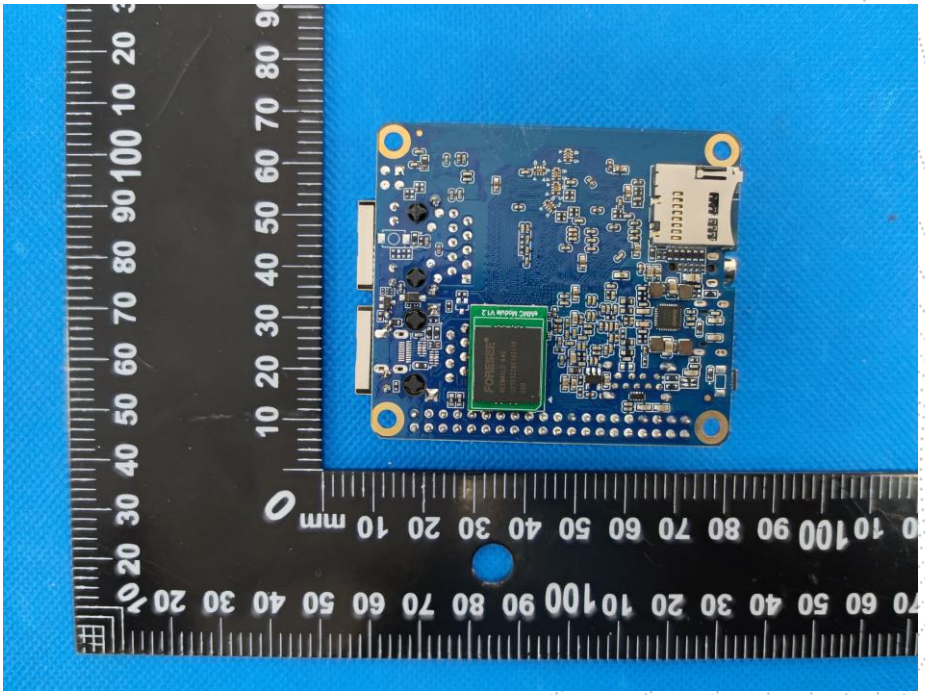
The EUT antenna is FPCB antenna, fulfill the requirement of this section.

16. EUT Photographs

EUT Photo 1

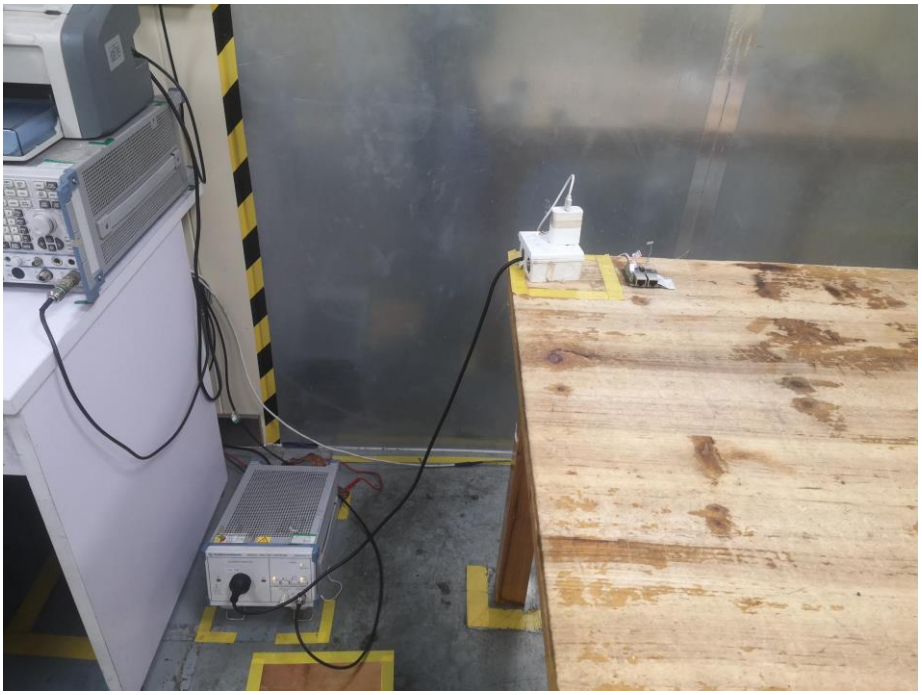


EUT Photo 2

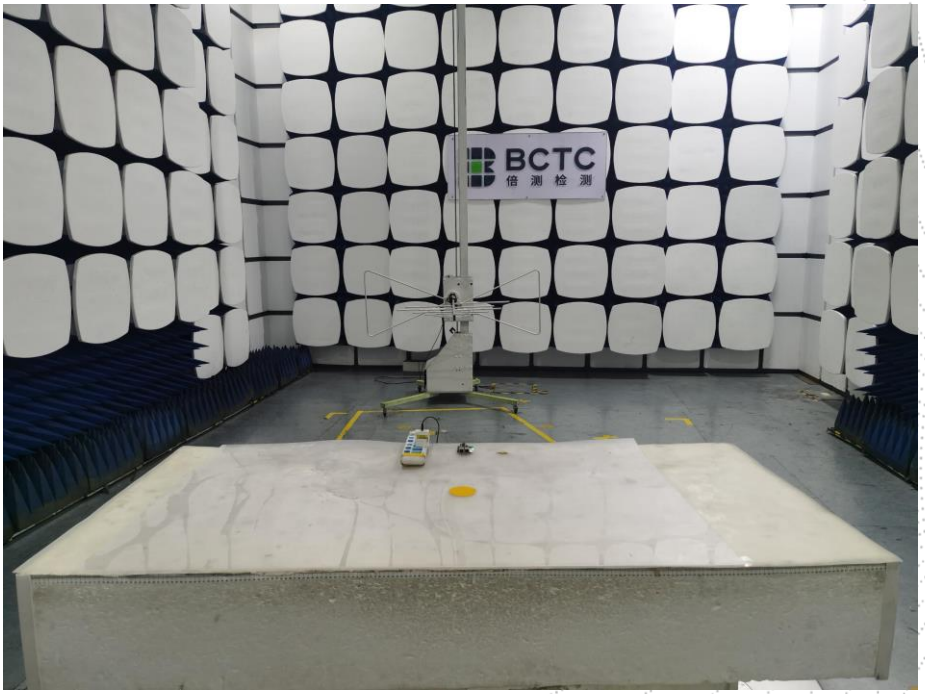


17. EUT Test Setup Photographs

Conducted Measurement Photo



Radiated Measurement Photos

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STATEMENT

1.The equipment lists are traceable to the national reference standards.

2.The test report can not be partially copied unless prior written approval is issued from our lab.

3.The test report is invalid without stamp of laboratory.

4.The test report is invalid without signature of person(s) testing and authorizing.

5.The test process and test result is only related to the Unit Under Test.

6.The quality system of our laboratory is in accordance with ISO/IEC17025.

7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

Address:
1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL：400-788-9558

P.C.: 518103

FAX：0755-33229357

Website：http://www.chnbctc.com

E-Mail：bctc@bctc-lab.com.cn

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