

TEST REPORT

FCC ID: 2AQOO-N10A464P

Product: Notebook

Model No.: WWNEO10A4BK64-P

**Additional Model No.: WWNEO10A4WH64-P, WWNEO10A4PK64-P,
WWNEO10A4SL64-P, WWNEO10A4BL64-P, WWNEO10A4TU64-P,
WWNEO10A4GO64-P**

Trade Mark: THOMSON

Report No.: TCT201130E906

Issued Date: Dec. 23, 2020

Issued for:

GROUPSFIT

80/84 route de la Liberation, PONTAULT COMBAULT, 77340, France

Issued By:

Shenzhen Tongce Testing Lab.

**1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District,
Shenzhen, Guangdong, China**

TEL: +86-755-27673339

FAX: +86-755-27673332

Note: This report shall not be reproduced except in full, without the written approval of Shenzhen Tongce Testing Lab.

**This document may be altered or revised by Shenzhen Tongce Testing Lab. personnel only, and shall be noted in
the revision section of the document. The test results in the report only apply to the tested sample.**

TABLE OF CONTENTS

1. Test Certification.....	3
2. Test Result Summary	4
3. EUT Description	5
4. General Information.....	7
4.1. Test environment and mode.....	7
4.2. Description of Support Units.....	8
5. Facilities and Accreditations	9
5.1. Facilities	9
5.2. Location	9
5.3. Measurement Uncertainty.....	9
6. Test Results and Measurement Data	10
6.1. Antenna requirement	10
6.2. Conducted Emission.....	11
6.3. Maximum Conducted Output Power.....	15
6.4. 6dB Emission Bandwidth	17
6.5. 26dB Bandwidth and 99% Occupied Bandwidth	18
6.6. Power Spectral Density.....	19
6.7. Band edge	20
6.8. Unwanted Emission	29
6.9. Frequency Stability Measurement	38

Appendix A: Test Result of Conducted Test

Appendix B: Photographs of Test Setup

Appendix C: Photographs of EUT

1. Test Certification

Product:	Notebook
Model No.:	WWNEO10A4BK64-P
Additional Model No.:	WWNEO10A4WH64-P, WWNEO10A4PK64-P, WWNEO10A4SL64-P, WWNEO10A4BL64-P, WWNEO10A4TU64-P, WWNEO10A4GO64-P
Trade Mark:	THOMSON
Applicant:	GROUPSFIT
Address:	80/84 route de la Liberation, PONTAULT COMBAULT, 77340, France
Manufacturer:	GROUPSFIT
Address:	80/84 route de la Liberation, PONTAULT COMBAULT, 77340, France
Date of Test:	Dec. 01, 2020 – Dec. 22, 2020
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2016 KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General U-NII Test Procedures New Rules v02r01

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

Brews Xu

Date:

Dec. 22, 2020

Brews Xu

Reviewed By:

Berry Zhao

Date:

Dec. 23, 2020

Approved By:



Tomsin

Date:

Dec. 23, 2020

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Maximum Conducted Output Power	§15.407(a)	PASS
6dB Emission Bandwidth	§15.407(e)	PASS
99% Occupied Bandwidth	§15.407(a)	PASS
Power Spectral Density	§15.407(a)	PASS
Restricted Bands around fundamental frequency	§15.407(b)	PASS
Radiated Emission	§15.407(b)	PASS
Frequency Stability	§15.407(g)	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product:	Notebook
Model No.:	WWNEO10A4BK64-P
Additional Model No.:	WWNEO10A4WH64-P, WWNEO10A4PK64-P, WWNEO10A4SL64-P, WWNEO10A4BL64-P, WWNEO10A4TU64-P, WWNEO10A4GO64-P
Trade Mark:	THOMSON
Operation Frequency:	Band 3: 5725 MHz -5850 MHz
Channel Bandwidth:	802.11a: 20MHz 802.11n: 20MHz, 40MHz 802.11ac: 20MHz, 40MHz, 80MHz
Modulation Technology:	Orthogonal Frequency Division Multiplexing(OFDM)
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK
Antenna Type:	Internal Antenna
Antenna Gain:	2.2dBi
Power Supply:	Rechargeable Li-ion Battery DC 3.7V
AC adapter:	Adapter Information: Model: MX15X-0502500UX Input: AC 100-240V, 50/60Hz, 0.4A Output: DC 5V, 2.5A
Remark:	All models above are identical in interior structure, electrical circuits and components, and just model names are different for the marketing requirement.

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

Test Frequency each of channel**Band 3**

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745	151	5755	155	5775
157	5785	159	5795		
165	5825				

Note:

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

4. General Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)
<p>The sample was placed 0.8m/1.5m for blow/above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.</p>	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
Mode	Data rate
802.11a	6 Mbps
802.11n(HT20)	6.5 Mbps
802.11n(HT40)	13.5 Mbps
802.11ac(VHT20)	6.5 Mbps
802.11ac(VHT40)	13.5 Mbps
802.11ac(VHT80)	29.3 Mbps

Final Test Mode:

Operation mode:	Keep the EUT in continuous transmitting with modulation
-----------------	---

4.2. Description of Support Units

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

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

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.
3. For conducted measurements (Output Power, Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of SHENZHEN TONGCE TESTING LAB has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab.

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

5.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$

6. Test Results and Measurement Data

6.1. Antenna requirement

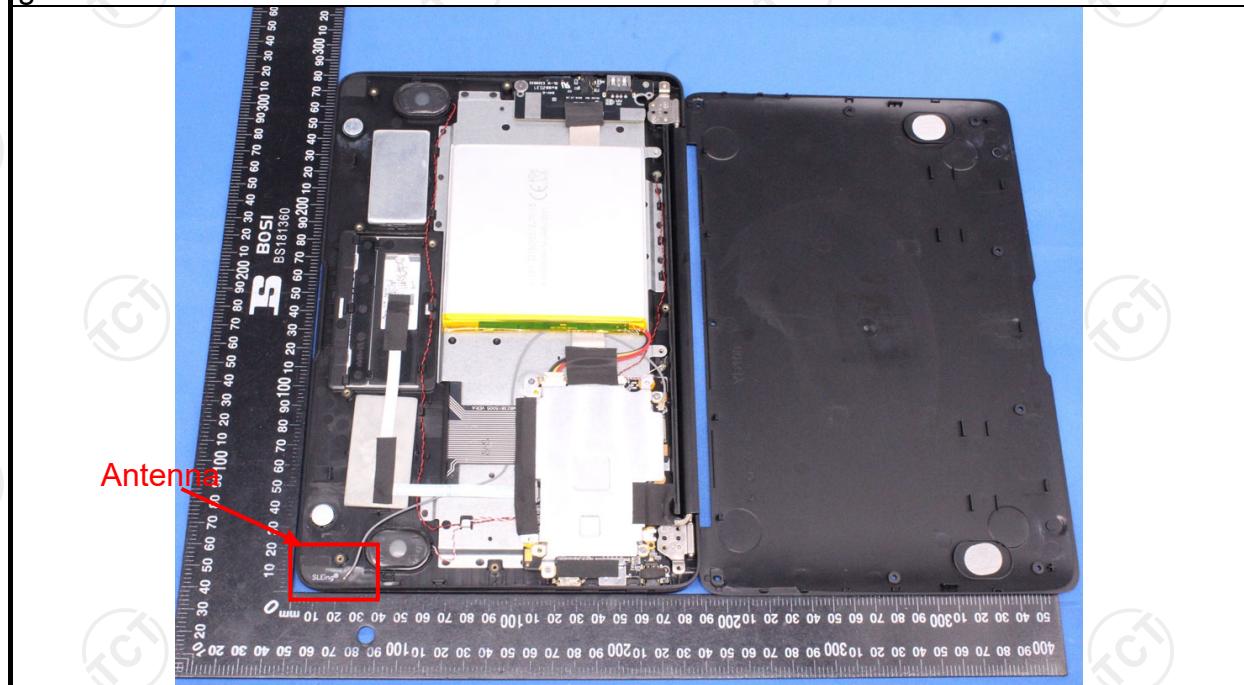
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
------------------------------	-------------------------------------

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

E.U.T Antenna:

The WIFI antenna is internal antenna which permanently attached, and the best case gain of the antenna is 2.2dBi.



6.2. Conducted Emission

6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	<p>Reference Plane</p> <p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test Mode:	Tx Mode														
Test Procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 														
Test Result:	PASS														

6.2.2. Test Instruments

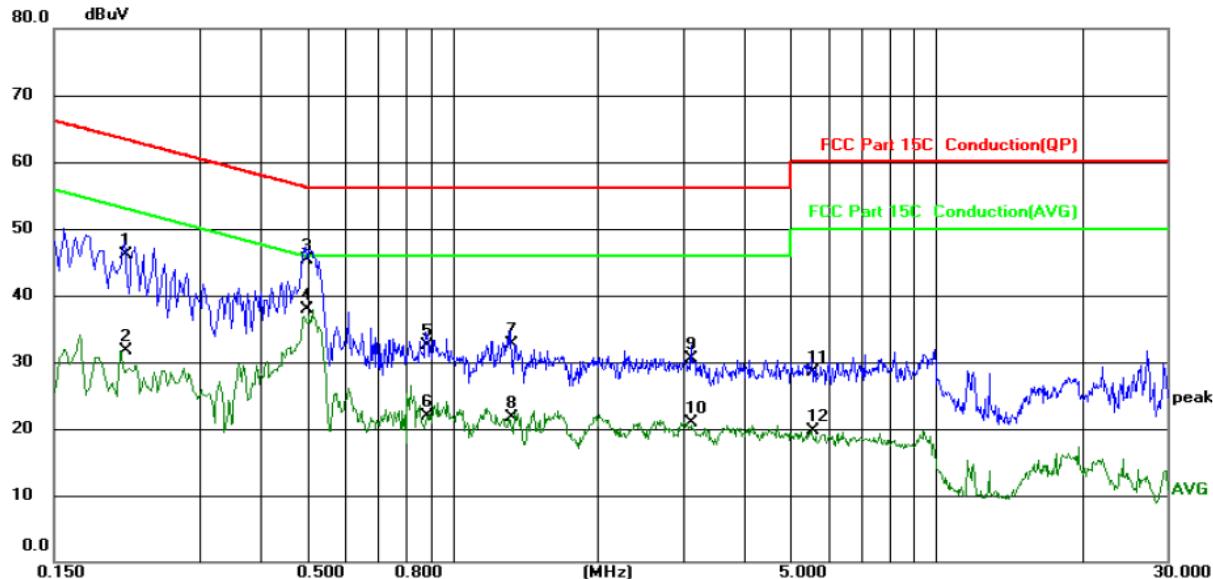
Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	R&S	ESCI3	100898	Jul. 27, 2021
LISN-2	Schwarzbeck	NSLK 8126	8126453	Sep. 11, 2021
Line-5	TCT	CE-05	N/A	Sep. 02, 2021
EMI Test Software	Shurples Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site				Phase: <i>L1</i>			Temperature: 25 (C)	
Limit: FCC Part 15C Conduction(QP)				Power: AC120V/60Hz			Humidity: 55 %RH	
No.	Mk.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dB μ V	dB	dB μ V	dB	Detector	Comment
1	0.2100	36.11	10.08	46.19	63.21	-17.02	QP	
2	0.2100	21.54	10.08	31.62	53.21	-21.59	AVG	
3	0.4980	35.19	10.10	45.29	56.03	-10.74	QP	
4 *	0.4980	27.74	10.10	37.84	46.03	-8.19	AVG	
5	0.8820	22.34	10.13	32.47	56.00	-23.53	QP	
6	0.8820	11.75	10.13	21.88	46.00	-24.12	AVG	
7	1.3180	22.48	10.15	32.63	56.00	-23.37	QP	
8	1.3180	11.51	10.15	21.66	46.00	-24.34	AVG	
9	3.1180	20.23	10.21	30.44	56.00	-25.56	QP	
10	3.1180	10.74	10.21	20.95	46.00	-25.05	AVG	
11	5.5380	18.27	10.30	28.57	60.00	-31.43	QP	
12	5.5380	9.37	10.30	19.67	50.00	-30.33	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)

Limit (dB μ V) = Limit stated in standard

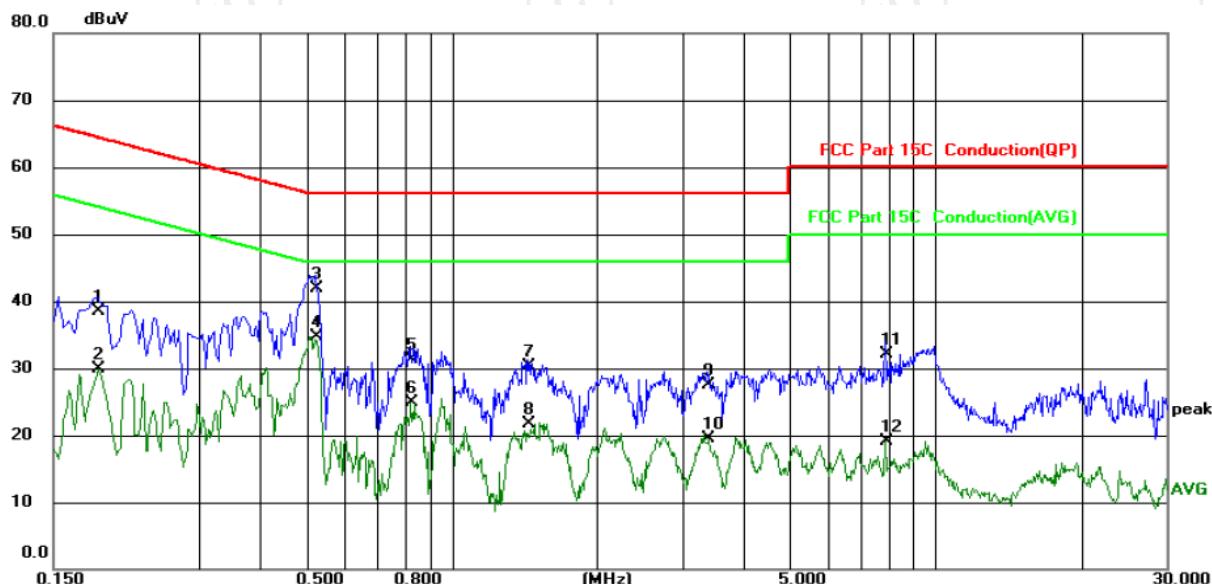
Margin (dB) = Measurement (dB μ V) – Limits (dB μ V)

Q.P. = Quasi-Peak

AVG = average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site				Phase: <i>N</i>			Temperature: 25 (C)	
Limit: FCC Part 15C Conduction(QP)				Power: AC120V/60Hz			Humidity: 55 %RH	
No.	Mk.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBμV	dB	dBμV	dB	Detector	Comment
1	0.1860	28.49	10.08	38.57	64.21	-25.64	QP	
2	0.1860	19.91	10.08	29.99	54.21	-24.22	AVG	
3	0.5220	31.86	10.10	41.96	56.00	-14.04	QP	
4 *	0.5220	24.65	10.10	34.75	46.00	-11.25	AVG	
5	0.8260	21.20	10.13	31.33	56.00	-24.67	QP	
6	0.8260	14.76	10.13	24.89	46.00	-21.11	AVG	
7	1.4380	20.15	10.16	30.31	56.00	-25.69	QP	
8	1.4380	11.55	10.16	21.71	46.00	-24.29	AVG	
9	3.3700	17.23	10.23	27.46	56.00	-28.54	QP	
10	3.3700	9.32	10.23	19.55	46.00	-26.45	AVG	
11	7.8700	21.78	10.39	32.17	60.00	-27.83	QP	
12	7.8700	8.71	10.39	19.10	50.00	-30.90	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dB μ V) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dB μ V) = Reading level (dB μ V) + Corr. Factor (dB)

Limit (dB μ V) = Limit stated in standard

Margin (dB) = Measurement (dB μ V) – Limits (dB μ V)

Q.P. = Quasi-Peak

AVG = average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Measurements were conducted in all three channels (high, middle, low) and all modulation (802.11a, 802.11n(HT20), 802.11n(HT40), 802.11ac(VHT20), 802.11ac(VHT40), 802.11ac(VHT80) and the worst case Mode (Lowest channel and 802.11a was submitted only).

6.3. Maximum Conducted Output Power

6.3.1. Test Specification

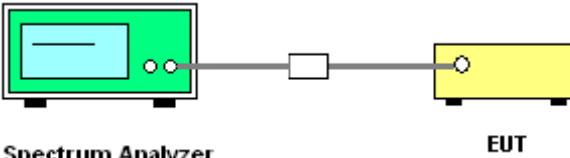
6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2021
Power Meter	Agilent	E4418B	GB43312526	Sep. 21, 2021
Power Sensor	Agilent	E9301A	MY41497725	Sep. 21, 2021
RF Cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 02, 2021
Antenna Connector	TCT	RFC-03	N/A	Sep. 02, 2021

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.4. 6dB Emission Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	>500kHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none">1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C2. Set to the maximum power setting and enable the EUT transmit continuously.3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.4. Measure and record the results in the test report.
Test Result:	PASS

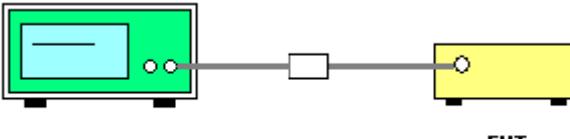
6.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2021
4 Ch. Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	N/A	Sep. 02, 2021
Combiner Box	Ascentest	AT890-RFB	N/A	Sep. 02, 2021

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.5. 26dB Bandwidth and 99% Occupied Bandwidth

6.5.1. Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D
Limit:	No restriction limits
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none"> 1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	PASS

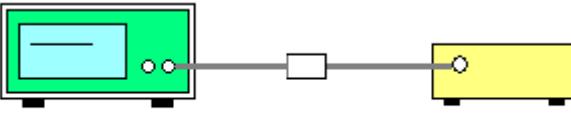
6.5.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2021
RF Cable (9KHz-26.5GHz)	TCT	RE-high-02	N/A	Sep. 02, 2021
Antenna Connector	TCT	RFC-03	N/A	Sep. 02, 2021

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.6. Power Spectral Density

6.6.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407 (a)	
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F	
Limit:	<p>≤11.00dBm/MHz for Band 1 5150MHz-5250MHz(client device)</p> <p>≤11.00dBm/MHz for Band 2A&2C 5250-5350&5470-5725</p> <p>≤30.00dBm/500KHz for Band 3 5725MHz-5850MHz</p> <p>The e.i.r,p spectral density for Band 1 5150MHz – 5250 MHz should not exceed 10dBm/MHz</p>	
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p>	
Test Mode:	Transmitting mode with modulation	
Test Procedure:	<ol style="list-style-type: none"> 1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 1. Set RBW = 510 kHz/1 MHz, VBW \geq 3*RBW, Sweep time = Auto, Detector = RMS. 2. Allow the sweeps to continue until the trace stabilizes. 3. Use the peak marker function to determine the maximum amplitude level. 4. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment. 	
Test Result:	PASS	

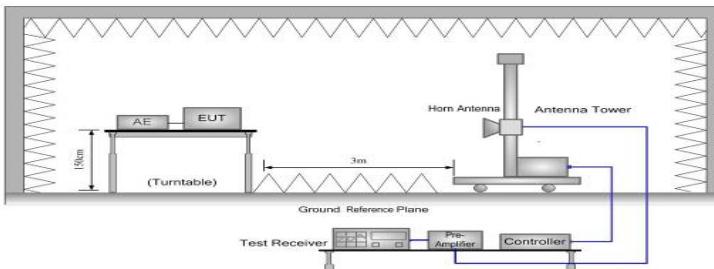
6.6.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2021
RF Cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 02, 2021
Antenna Connector	TCT	RFC-03	N/A	Sep. 02, 2021

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.7. Band edge

6.7.1. Test Specification

Test Requirement:	FCC CFR47 Part 15E Section 15.407																										
Test Method:	ANSI C63.10 2013																										
Limit:	<p>In un-restricted band: For Band 1&2A&2C: -27dBm/MHz For Band 3:</p> <table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>Limit (dBm/MHz)</th> <th>Frequency (MHz)</th> <th>Limit (dBm/MHz)</th> </tr> </thead> <tbody> <tr> <td>< 5650</td> <td>-27</td> <td>5850~5855</td> <td>27~15.6</td> </tr> <tr> <td>5650~5700</td> <td>-27~10</td> <td>5855~5875</td> <td>15.6~10</td> </tr> <tr> <td>5700~5720</td> <td>10~15.6</td> <td>5875~5925</td> <td>10~27</td> </tr> <tr> <td>5720~5725</td> <td>15.6~27</td> <td>> 5925</td> <td>-27</td> </tr> </tbody> </table> <p>$E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2 @3\text{m}$</p> <p>In restricted band:</p> <table border="1"> <thead> <tr> <th>Detector</th> <th>Limit@3m</th> </tr> </thead> <tbody> <tr> <td>Peak</td> <td>74dBμV/m</td> </tr> <tr> <td>AVG</td> <td>54dBμV/m</td> </tr> </tbody> </table>	Frequency (MHz)	Limit (dBm/MHz)	Frequency (MHz)	Limit (dBm/MHz)	< 5650	-27	5850~5855	27~15.6	5650~5700	-27~10	5855~5875	15.6~10	5700~5720	10~15.6	5875~5925	10~27	5720~5725	15.6~27	> 5925	-27	Detector	Limit@3m	Peak	74dB μ V/m	AVG	54dB μ V/m
Frequency (MHz)	Limit (dBm/MHz)	Frequency (MHz)	Limit (dBm/MHz)																								
< 5650	-27	5850~5855	27~15.6																								
5650~5700	-27~10	5855~5875	15.6~10																								
5700~5720	10~15.6	5875~5925	10~27																								
5720~5725	15.6~27	> 5925	-27																								
Detector	Limit@3m																										
Peak	74dB μ V/m																										
AVG	54dB μ V/m																										
Test Setup:																											
Test Mode:	Transmitting mode with modulation																										
Test Procedure:	<ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 																										

	6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasipeak or average method as specified and then reported in a data sheet.
Test Result:	PASS

6.7.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHWARZ	ESIB7	100197	Jul. 27, 2021
Spectrum Analyzer	ROHDE&SCHWARZ	FSQ40	200061	Sep. 11, 2021
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2021
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 02, 2021
Pre-amplifier	HP	8447D	2727A05017	Sep. 02, 2021
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Horn Antenna	A-INFO	LB-180400-KF	J211020657	Sep. 02, 2021
Line-4	TCT	RE-high-04	N/A	Sep. 02, 2021
Line-8	TCT	RE-01	N/A	Jul. 27, 2021
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
EMI Test Software	Shurples Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.7.3. Test Data

802.11 a	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 3	Lowest	5725	61.55	5.82	67.37	112.2	/	-44.83	H
		5725	66.62	5.82	72.44	112.2	/	-39.76	V
	Highest	5850	61.14	6.52	67.66	112.2	/	-44.54	H
		5850	60.28	6.52	66.80	112.2	/	-45.40	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

802.11 nHT20	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 3	Lowest	5725	59.44	8.21	67.65	112.2	/	-44.55	H
		5725	56.47	8.21	64.68	112.2	/	-47.52	V
	Highest	5850	60.58	8.87	69.45	112.2	/	-42.75	H
		5850	58.36	8.87	67.23	112.2	/	-44.97	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

802.11 nHT40	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 3	Lowest	5725	60.25	5.82	66.07	112.2	/	-46.13	H
		5725	54.63	5.82	60.45	112.2	/	-51.75	V
	Highest	5850	62.27	6.52	68.79	112.2	/	-43.41	H
		5850	60.39	6.52	66.91	112.2	/	-45.29	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

802.11 ac HT20	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 3	Lowest	5725	64.87	8.21	73.08	112.2	/	-39.12	H
		5725	58.26	8.21	66.47	112.2	/	-45.73	V
	Highest	5850	60.74	8.87	69.61	112.2	/	-42.59	H
		5850	58.35	8.87	67.22	112.2	/	-44.98	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

802.11 ac HT40	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 3	Lowest	5725	68.53	5.82	74.35	112.2	/	-37.85	H
		5725	66.62	5.82	72.44	112.2	/	-39.76	V
	Highest	5850	63.47	6.52	69.99	112.2	/	-42.21	H
		5850	60.45	6.52	66.97	112.2	/	-45.23	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

802.11 ac HT80	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 3	Lowest	5725	65.58	8.21	73.79	112.2	/	-38.41	H
		5725	68.73	8.21	76.94	112.2	/	-35.26	V
	Highest	5850	60.37	8.87	69.24	112.2	/	-42.96	H
		5850	68.42	8.87	77.29	112.2	/	-34.91	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

Band 3 Band-edge for RF Conducted Emissions

 802.11a
/LCH

 802.11a
/HCH

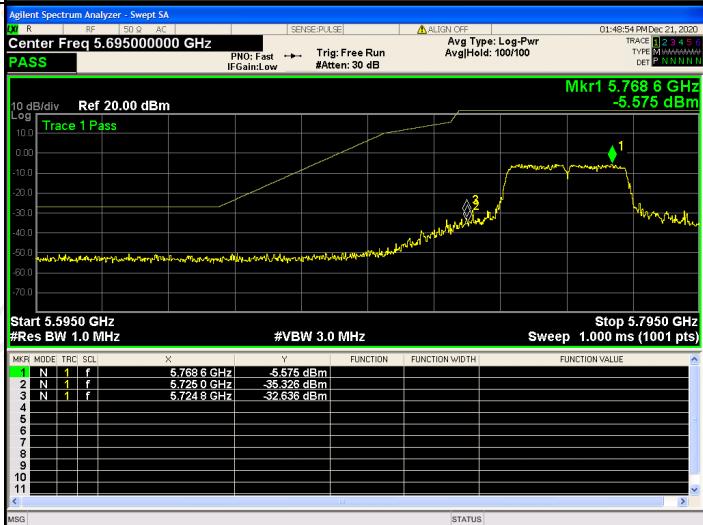
 802.11n
HT20 / LCH


Band 3 Band-edge for RF Conducted Emissions

802.11n
HT20 / HCH



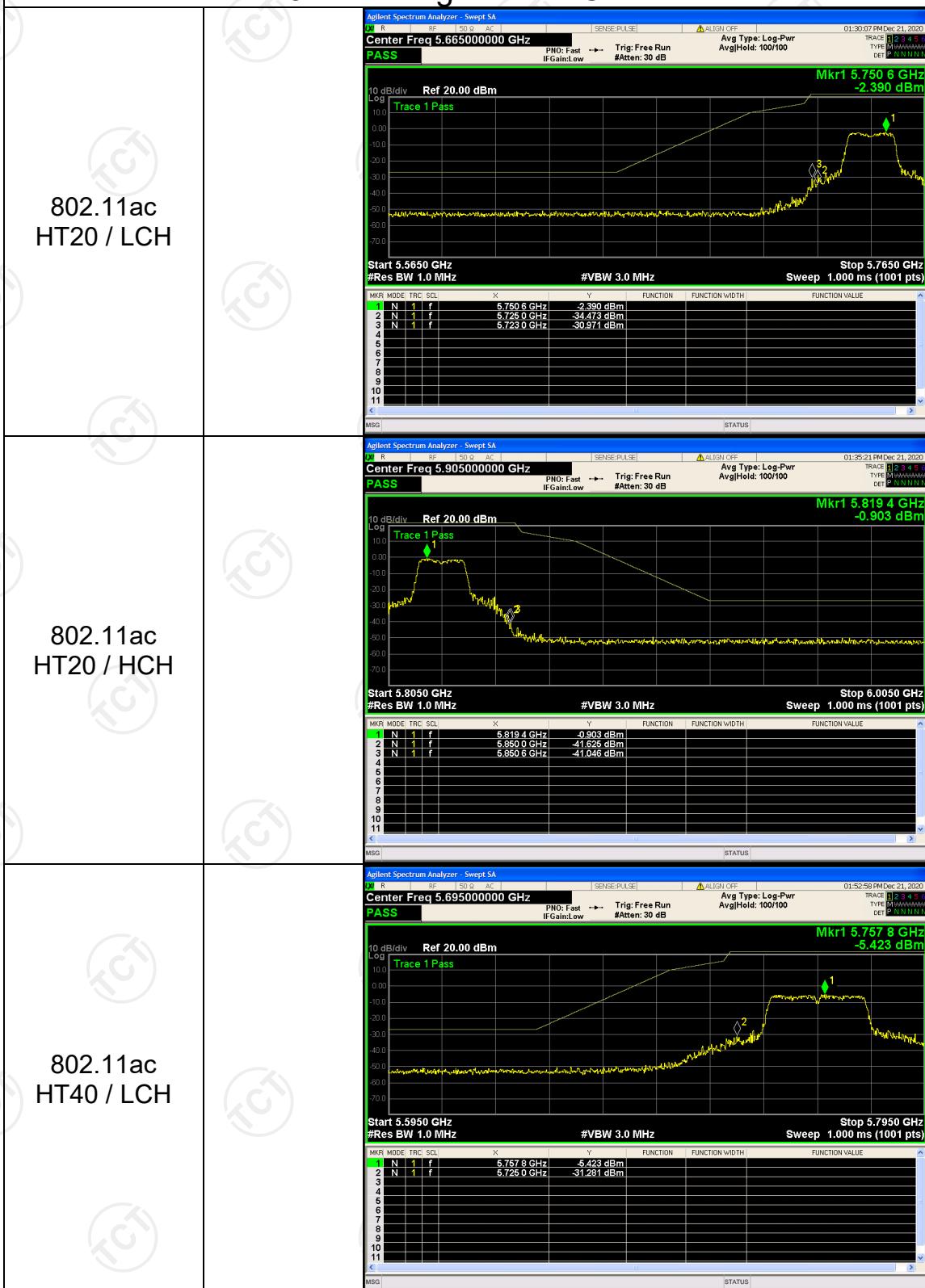
802.11n
HT40 /LCH



802.11n
HT40 /HCH



Band 3 Band-edge for RF Conducted Emissions

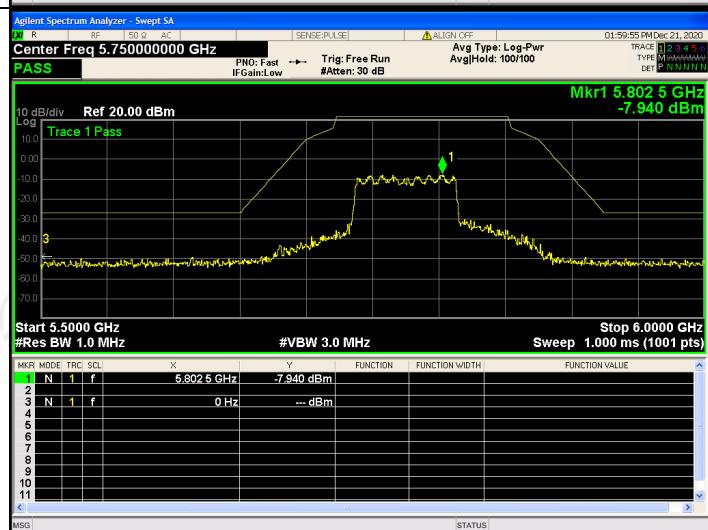


Band 3 Band-edge for RF Conducted Emissions

802.11ac
HT40 / HCH

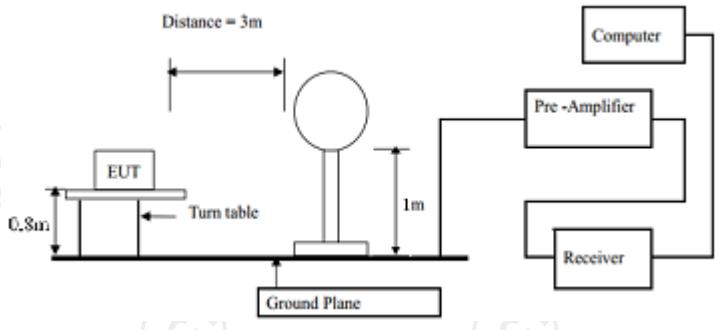


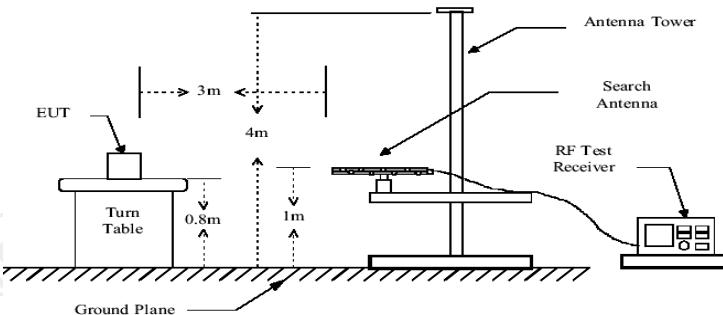
802.11ac
HT80 / MCH



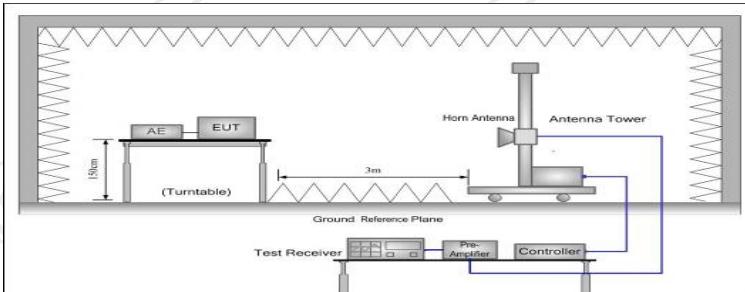
6.8. Unwanted Emission

6.8.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205																																				
Test Method:	KDB 789033 D02 v02r01																																				
Frequency Range:	9kHz to 40GHz																																				
Measurement Distance:	3 m																																				
Antenna Polarization:	Horizontal & Vertical																																				
Operation mode:	Transmitting mode with modulation																																				
Receiver Setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>9kHz- 150kHz</td> <td>Quasi-peak</td> <td>200Hz</td> <td>1kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>150kHz- 30MHz</td> <td>Quasi-peak</td> <td>9kHz</td> <td>30kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>120KHz</td> <td>300KHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td rowspan="2">Above 1GHz</td><td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value			
Frequency	Detector	RBW	VBW	Remark																																	
9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value																																	
150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value																																	
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value																																	
Above 1GHz	Peak	1MHz	3MHz	Peak Value																																	
	Peak	1MHz	10Hz	Average Value																																	
Limit:	<p>Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Field Strength (microvolts/meter)</th> <th>Measurement Distance (meters)</th> </tr> </thead> <tbody> <tr> <td>0.009-0.490</td> <td>2400/F(KHz)</td> <td>300</td> </tr> <tr> <td>0.490-1.705</td> <td>24000/F(KHz)</td> <td>30</td> </tr> <tr> <td>1.705-30</td> <td>30</td> <td>30</td> </tr> <tr> <td>30-88</td> <td>100</td> <td>3</td> </tr> <tr> <td>88-216</td> <td>150</td> <td>3</td> </tr> <tr> <td>216-960</td> <td>200</td> <td>3</td> </tr> <tr> <td>Above 960</td> <td>500</td> <td>3</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBuV/m @3m)</th> <th>Detector</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Above 1G</td><td>74.0</td> <td>Peak</td> </tr> <tr> <td>54.0</td> <td>Average</td> </tr> </tbody> </table>					Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)	0.009-0.490	2400/F(KHz)	300	0.490-1.705	24000/F(KHz)	30	1.705-30	30	30	30-88	100	3	88-216	150	3	216-960	200	3	Above 960	500	3	Frequency	Limit (dBuV/m @3m)	Detector	Above 1G	74.0	Peak	54.0	Average
Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)																																			
0.009-0.490	2400/F(KHz)	300																																			
0.490-1.705	24000/F(KHz)	30																																			
1.705-30	30	30																																			
30-88	100	3																																			
88-216	150	3																																			
216-960	200	3																																			
Above 960	500	3																																			
Frequency	Limit (dBuV/m @3m)	Detector																																			
Above 1G	74.0	Peak																																			
	54.0	Average																																			
Test setup:	<p>For radiated emissions below 30MHz</p>  <p>Distance = 3m</p> <p>0.8m</p> <p>Turn table</p> <p>1m</p> <p>Ground Plane</p> <p>30MHz to 1GHz</p>																																				



Above 1GHz



1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Test Procedure:

Test results:

PASS

6.8.2. Test Instruments

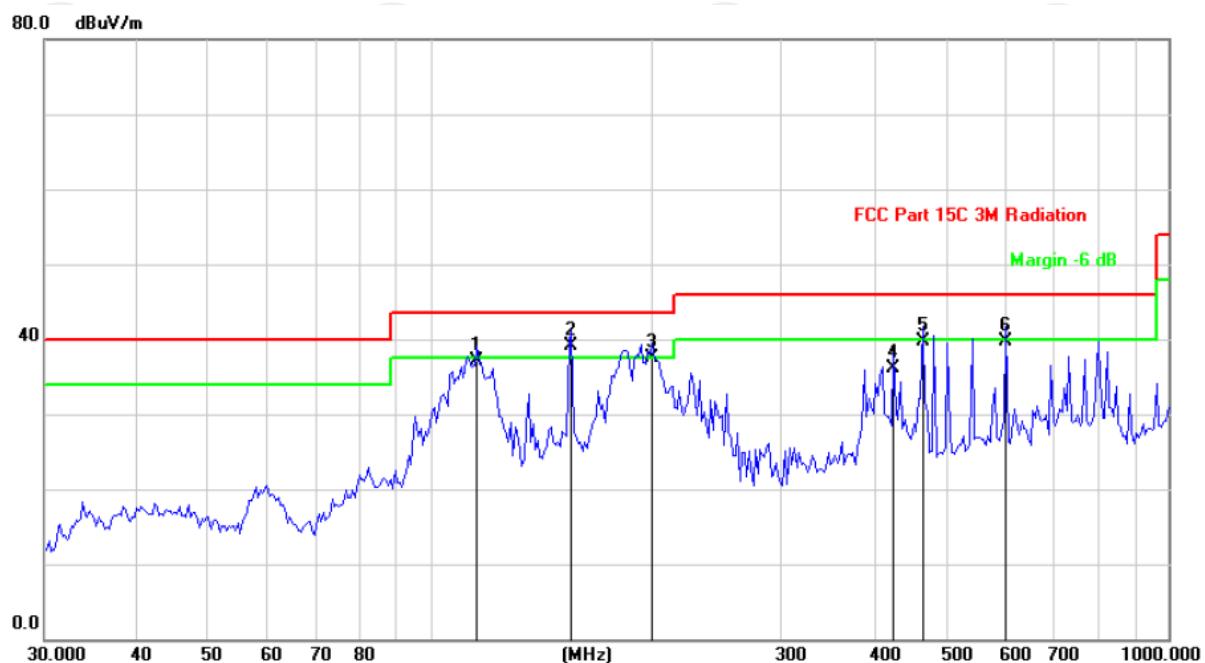
Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESIB7	100197	Jul. 27, 2021
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ40	200061	Sep. 11, 2021
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 02, 2021
Pre-amplifier	HP	8447D	2727A05017	Sep. 02, 2021
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Horn Antenna	A-INFO	LB-180400-KF	J211020657	Sep. 04, 2022
Antenna Mast	Keleto	RE-AM	N/A	N/A
Line-4	TCT	RE-high-04	N/A	Sep. 02, 2021
Line-8	TCT	RE-01	N/A	Jul. 27, 2021
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

6.8.3. Test Data

Please refer to following diagram for individual

Below 1GHz

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 25

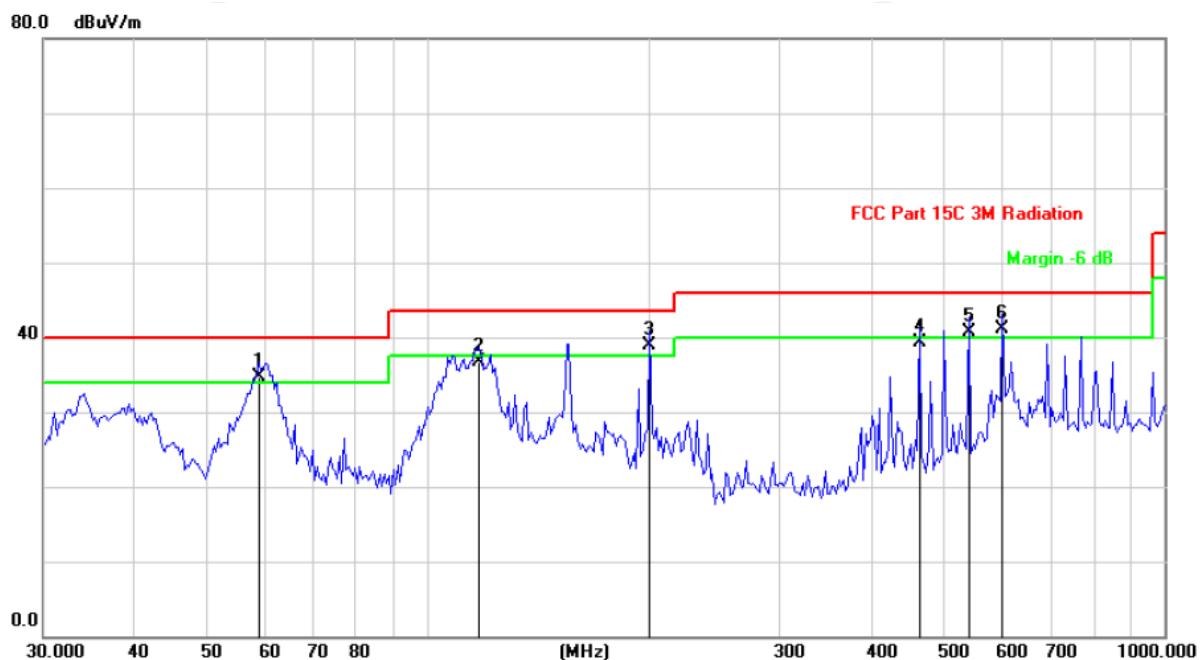
Limit: FCC Part 15C 3M Radiation

Power: AC 120V/60Hz

Humidity: 55 %

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		115.6320	50.59	-13.57	37.02	43.50	-6.48	QP
2	*	155.3305	54.58	-15.41	39.17	43.50	-4.33	QP
3		200.0432	50.89	-13.40	37.49	43.50	-6.01	QP
4		424.2998	44.67	-8.66	36.01	46.00	-9.99	QP
5		464.8867	48.05	-8.29	39.76	46.00	-6.24	QP
6		602.9287	44.99	-5.32	39.67	46.00	-6.33	QP

Vertical:



Site	Polarization: Vertical	Temperature: 25
Limit: FCC Part 15C 3M Radiation		Power: AC 120V/60Hz
		Humidity: 55 %

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	58.8977	48.53	-13.87	34.66	40.00	-5.34	QP
2		117.2686	50.40	-13.72	36.68	43.50	-6.82	QP
3	*	200.0432	52.22	-13.40	38.82	43.50	-4.68	QP
4		464.8867	47.50	-8.29	39.21	46.00	-6.79	QP
5	!	542.6104	47.62	-6.84	40.78	46.00	-5.22	QP
6	!	602.9287	46.46	-5.32	41.14	46.00	-4.86	QP

Note: 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

2. Measurements were conducted in all three channels (high, middle, low) and all modulation (802.11a, 802.11n(HT20), 802.11n(HT40), 802.11ac(VHT20), 802.11ac(VHT40), 802.11nac(VHT80), and the worst case Mode (Highest channel and 802.11n(HT20)) was submitted only.

3. Measurement (dB μ V) = Reading level + Correction Factor, correction Factor= Antenna Factor + Cable loss - Pre-amplifier.

Modulation Type: Band 3									
11a(HT20) CH149: 5745MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11490	H	39.58	---	8.09	47.67	---	74	54	-6.33
17235	H	37.46	---	9.67	47.13	---	68.2	---	-21.07
---	H	---	---	---	---	---	---	---	---
11490	V	41.46	---	8.09	49.55	---	74	54	-4.45
17235	V	38.24	---	9.67	47.91	---	68.2	---	-20.29
---	V	---	---	---	---	---	---	---	---

11a(HT20) CH157: 5785MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11570	H	40.58	---	8.10	48.68	---	74	54	-5.32
17355	H	37.78	---	9.65	47.43	---	68.2	---	-20.77
---	H	---	---	---	---	---	---	---	---
11570	V	39.97	---	8.10	48.07	---	74	54	-5.93
17355	V	36.35	---	9.65	46.00	---	68.2	---	-22.20
---	V	---	---	---	---	---	---	---	---

11a(HT20) CH161: 5825MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11650	H	39.56	---	8.12	47.68	---	74	54	-6.32
17475	H	37.80	---	9.62	47.42	---	68.2	---	-20.78
---	H	---	---	---	---	---	---	---	---
11650	V	40.25	---	8.12	48.37	---	74	54	-5.63
17475	V	37.56	---	9.62	47.18	---	68.2	---	-21.02
---	V	---	---	---	---	---	---	---	---

11n(HT20) CH151: 5745MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11510	H	40.36	---	8.09	48.45	---	74	54	-5.55
17265	H	36.78	---	9.67	46.45	---	68.2	---	-21.75
---	H	---	---	---	---	---	---	---	---
11510	V	40.17	---	8.09	48.26	---	74	54	-5.74
17265	V	37.55	---	9.67	47.22	---	68.2	---	-20.98
---	V	---	---	---	---	---	---	---	---

11n(HT20) CH157: 5785MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11570	H	40.77	---	8.10	48.87	---	74	54	-5.13
17355	H	37.56	---	9.65	47.21	---	68.2	---	-20.99
---	H	---	---	---	---	---	---	---	---
11570	V	39.96	---	8.10	48.06	---	74	54	-5.94
17355	V	35.87	---	9.65	45.52	---	68.2	---	-22.68
---	V	---	---	---	---	---	---	---	---

11n(HT20) CH165: 5825MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11650	H	39.56	---	8.12	47.68	---	74	54	-6.32
17475	H	37.14	---	9.62	46.76	---	68.2	---	-21.44
---	H	---	---	---	---	---	---	---	---
11650	V	40.52	---	8.12	48.64	---	74	54	-5.36
17475	V	37.26	---	9.62	46.88	---	68.2	---	-21.32
---	V	---	---	---	---	---	---	---	---

11n(HT40) CH151: 5755MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11510	H	41.46	---	8.09	49.55	---	74	54	-4.45
17265	H	38.25	---	9.67	47.92	---	68.2	---	-20.28
---	H	---	---	---	---	---	---	---	---
11510	V	41.05	---	8.09	49.14	---	74	54	-4.86
17265	V	37.68	---	9.67	47.35	---	68.2	---	-20.85
---	V	---	---	---	---	---	---	---	---

11n(HT40) CH159: 5795MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11590	H	40.22	---	8.10	48.32	---	74	54	-5.68
17385	H	38.27	---	9.65	47.92	---	68.2	---	-20.28
---	H	---	---	---	---	---	---	---	---
11590	V	40.36	---	8.10	48.46	---	74	54	-5.54
17385	V	37.58	---	9.65	47.23	---	68.2	---	-20.97
---	V	---	---	---	---	---	---	---	---

11ac(VHT20) CH149: 5745MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11490	H	40.56	---	8.09	48.65	---	74	54	-5.35
17235	H	38.42	---	9.67	48.09	---	68.2	---	-20.11
---	H	---	---	---	---	---	---	---	---
11490	V	39.78	---	8.09	47.87	---	74	54	-6.13
17235	V	37.55	---	9.67	47.22	---	68.2	---	-20.98
---	V	---	---	---	---	---	---	---	---

11ac(VHT20) CH157: 5785MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11570	H	39.25	---	8.10	47.35	---	74	54	-6.65
17355	H	37.14	---	9.65	46.79	---	68.2	---	-21.41
---	H	---	---	---	---	---	---	---	---
11570	V	37.59	---	8.10	45.69	---	74	54	-8.31
17355	V	35.57	---	9.65	45.22	---	68.2	---	-22.98
---	V	---	---	---	---	---	---	---	---

11ac(VHT20) CH165: 5825MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11650	H	40.18	---	8.12	48.30	---	74	54	-5.70
17475	H	37.82	---	9.62	47.44	---	68.2	---	-20.76
---	H	---	---	---	---	---	---	---	---
11650	V	40.25	---	8.12	48.37	---	74	54	-5.63
17475	V	35.79	---	9.62	45.41	---	68.2	---	-22.79
---	V	---	---	---	---	---	---	---	---

11ac(VHT40) CH151: 5755MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11510	H	40.26	---	8.09	48.35	---	74	54	-5.65
17265	H	37.44	---	9.67	47.11	---	68.2	---	-21.09
---	H	---	---	---	---	---	---	---	---
11510	V	41.19	---	8.09	49.28	---	74	54	-4.72
17265	V	38.21	---	9.67	47.88	---	68.2	---	-20.32
---	V	---	---	---	---	---	---	---	---

11ac(VHT40) CH159: 5795MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11590	H	40.27	---	8.10	48.37	---	74	54	-5.63
17385	H	36.14	---	9.65	45.79	---	68.2	---	-22.41
---	H	---	---	---	---	---	---	---	---
11590	V	40.65	---	8.10	48.75	---	74	54	-5.25
17385	V	38.43	---	9.65	48.08	---	68.2	---	-20.12
---	V	---	---	---	---	---	---	---	---

11ac(VHT80) CH155: 5775MHz

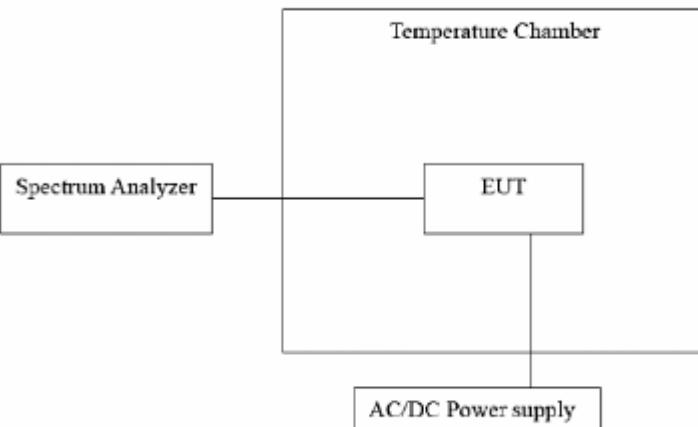
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB μ V)	AV reading (dB μ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB μ V/m)	AV limit (dB μ V/m)	Margin (dB)
					Peak (dB μ V/m)	AV (dB μ V/m)			
11550	H	40.55	---	8.09	48.64	---	74	54	-5.36
17325	H	35.62	---	9.66	45.28	---	68.2	---	-22.92
---	H	---	---	---	---	---	---	---	---
11550	V	41.86	---	8.09	49.95	---	74	54	-4.05
17325	V	37.46	---	9.66	47.12	---	68.2	---	-21.08
---	V	---	---	---	---	---	---	---	---

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dB μ V/m)-Average limit (dB μ V/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 40GHz.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

6.9. Frequency Stability Measurement

6.9.1. Test Specification

Test Requirement:	FCC Part15 Section 15.407(g)
Test Method:	ANSI C63.10: 2013
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 45 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Test Setup:	 <pre> graph LR SA[Spectrum Analyzer] --- EUT[EUT] EUT --- AC[AC/DC Power supply] AC --- TCh[Temperature Chamber] </pre>
Test Procedure:	<p>The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage.</p> <p>b. Turn the EUT on and couple its output to a spectrum analyzer.</p> <p>c. Turn the EUT off and set the chamber to the highest temperature specified.</p> <p>d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize.</p> <p>e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.</p> <p>f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.</p>
Test Result:	PASS
Remark:	Pre-scan was performed at all models(11a,11n,11ac), the worst case (11ac) was found and test data was shown in this report.

Test plots as follows:

Test mode:		802.11ac(VHT20)	Frequency(MHz):	5745
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.7V	5745.0005	500	PASS
35		5744.9983	-1700	PASS
25		5744.9975	-2500	PASS
15		5744.9938	-6200	PASS
5		5744.9927	-7300	PASS
0		5745.0008	800	PASS
20		5744.9904	-9600	PASS
	3.3	5744.9920	-8000	PASS
	4.2	5744.9882	-11800	PASS

Test mode:		802.11ac(VHT20)	Frequency(MHz):	5785
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.7V	5784.9968	-3200	PASS
35		5784.9959	-4100	PASS
25		5784.9942	-5800	PASS
15		5784.9978	-2200	PASS
5		5785.0011	1100	PASS
0		5784.9900	-10000	PASS
20		5784.9896	-10400	PASS
	3.3	5784.9920	-8000	PASS
	4.2	5784.9887	-11300	PASS

Test mode:		802.11ac(VHT20)	Frequency(MHz):	5825
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.7V	5825.0010	1000	PASS
35		5824.9878	-12200	PASS
25		5824.9913	-8700	PASS
15		5824.9883	-11700	PASS
5		5824.9960	-4000	PASS
0		5825.0007	700	PASS
20		5824.9874	-12600	PASS
	3.3	5824.9920	-8000	PASS
	4.2	5824.9865	-13500	PASS

Test mode:		802.11ac(VHT40)	Frequency(MHz):	5755
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.7V	5755.0023	2300	PASS
35		5754.9980	-2000	PASS
25		5754.9998	-200	PASS
15		5754.9885	-11500	PASS
5		5754.9863	-13700	PASS
0		5754.9852	-14800	PASS
20	3.3	5754.9866	-13400	PASS
	3.7	5754.9920	-8000	PASS
	4.2	5754.9903	-9700	PASS

Test mode:		802.11ac(VHT40)	Frequency(MHz):	5795
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.7V	5794.9874	-12600	PASS
35		5794.9852	-14800	PASS
25		5794.9895	-10500	PASS
15		5794.9944	-5600	PASS
5		5794.9967	-3300	PASS
0		5795.0018	1800	PASS
20	3.3	5794.9988	-1200	PASS
	3.7	5794.9920	-8000	PASS
	4.2	5794.9896	-10400	PASS

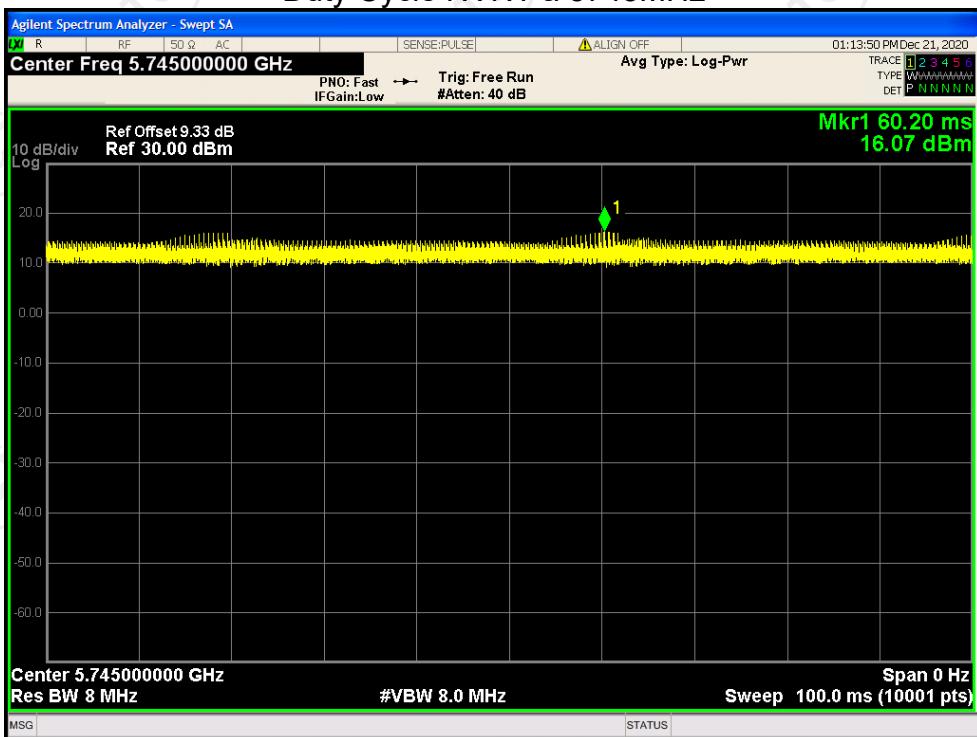
Test mode:		802.11ac(VHT80)	Frequency(MHz):	5775
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.7V	5775.0020	2000	PASS
35		5775.0004	400	PASS
25		5774.9954	-4600	PASS
15		5774.9978	-2200	PASS
5		5774.9869	-13100	PASS
0		5774.9895	-10500	PASS
20	3.3	5774.9905	-9500	PASS
	3.7	5774.9920	-8000	PASS
	4.2	5774.9947	-5300	PASS

Appendix A: Test Result of Conducted Test

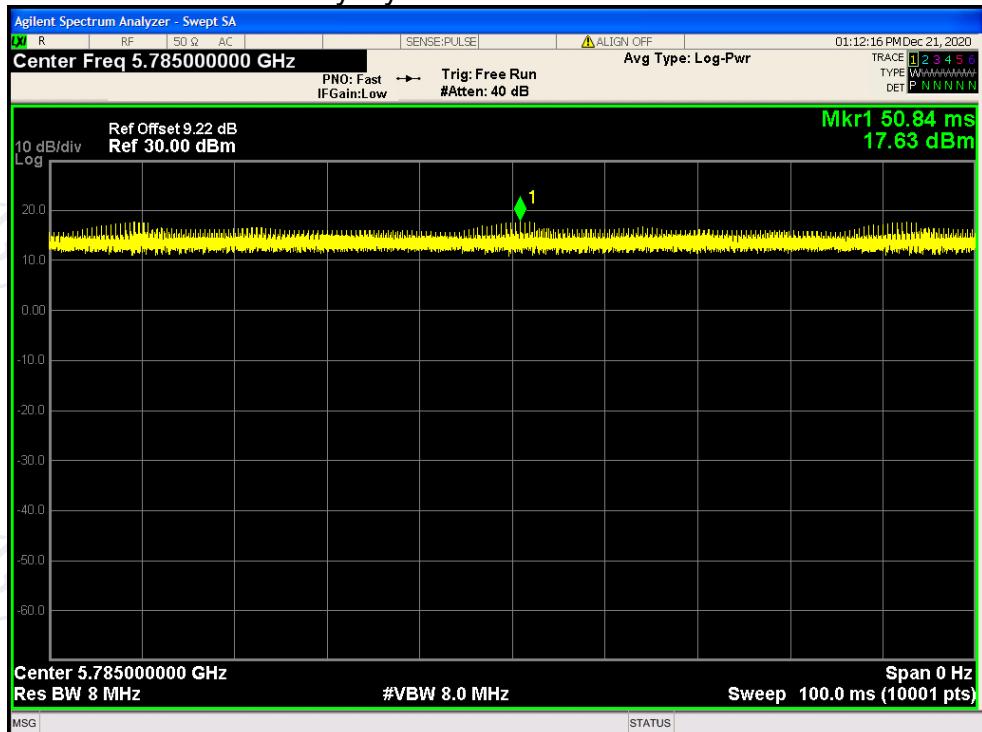
Duty Cycle

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

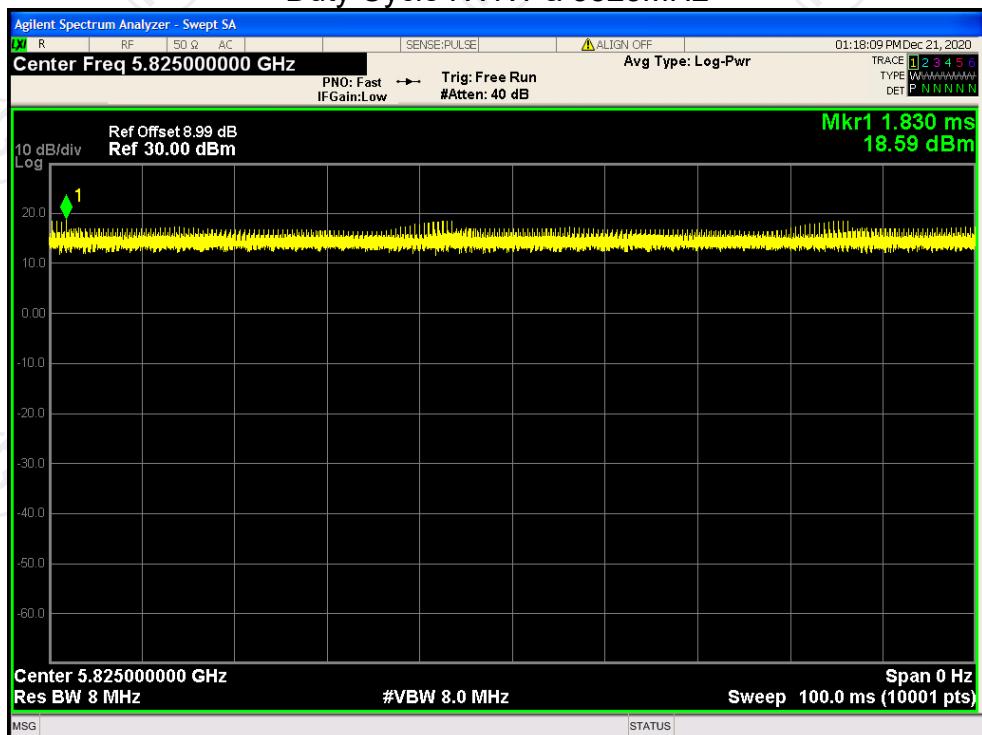
Duty Cycle NVNT a 5745MHz



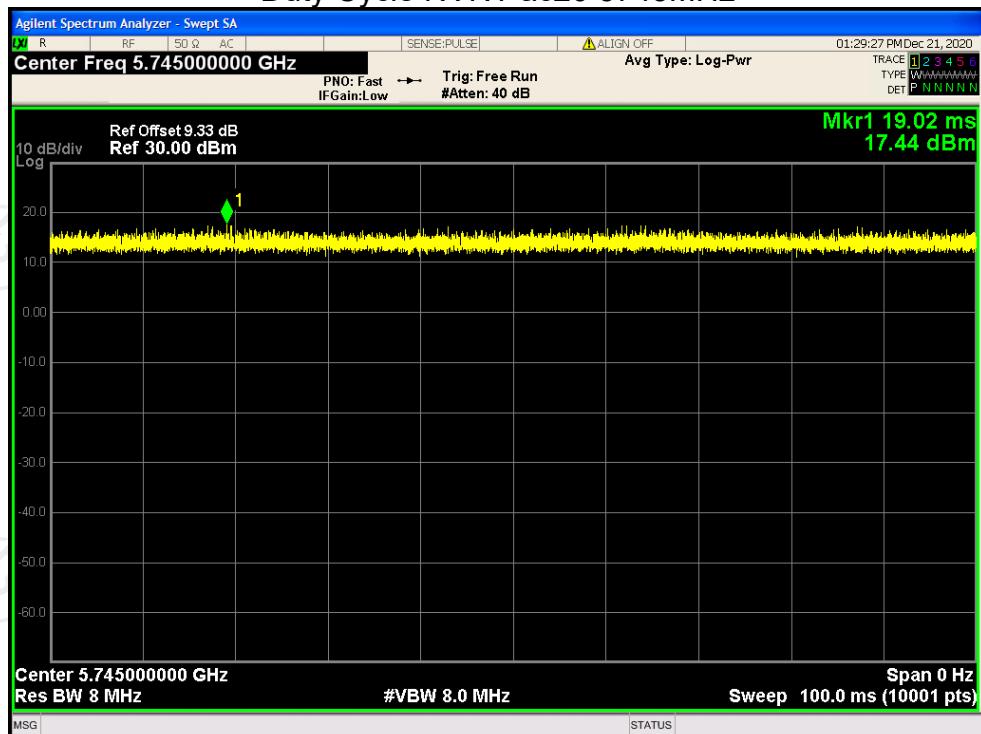
Duty Cycle NVNT a 5785MHz



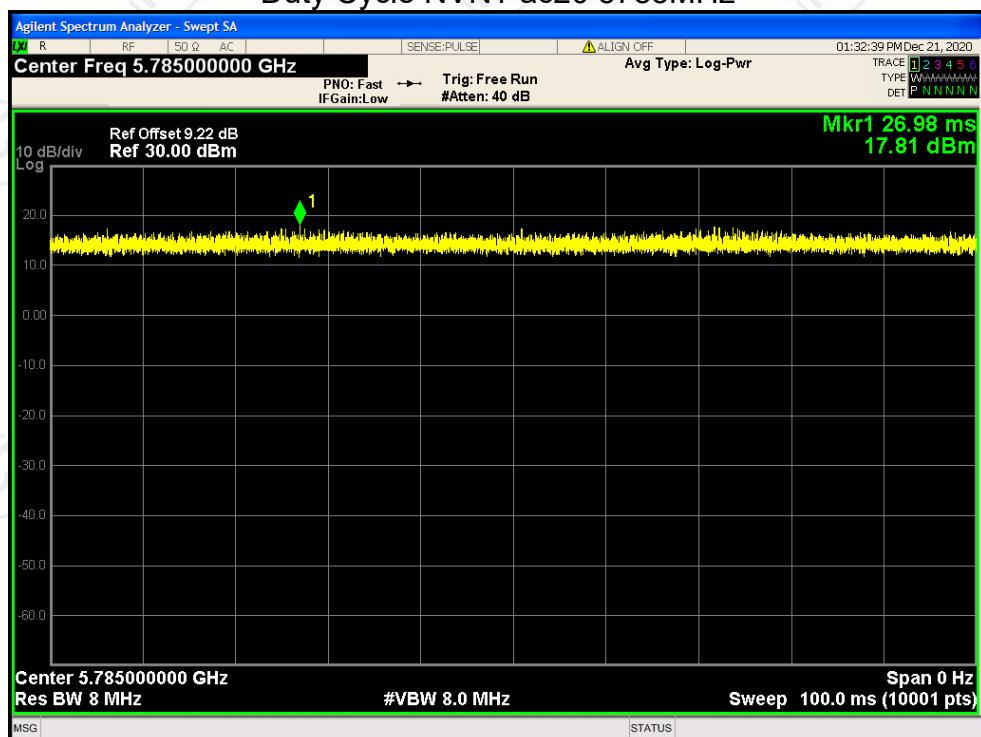
Duty Cycle NVNT a 5825MHz



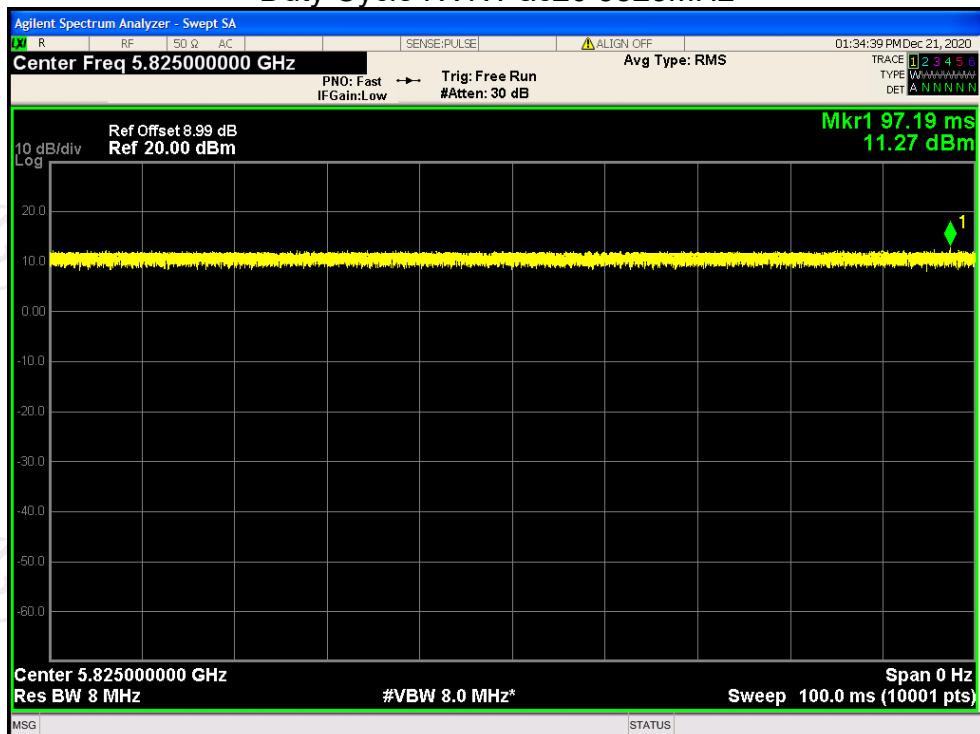
Duty Cycle NVNT ac20 5745MHz



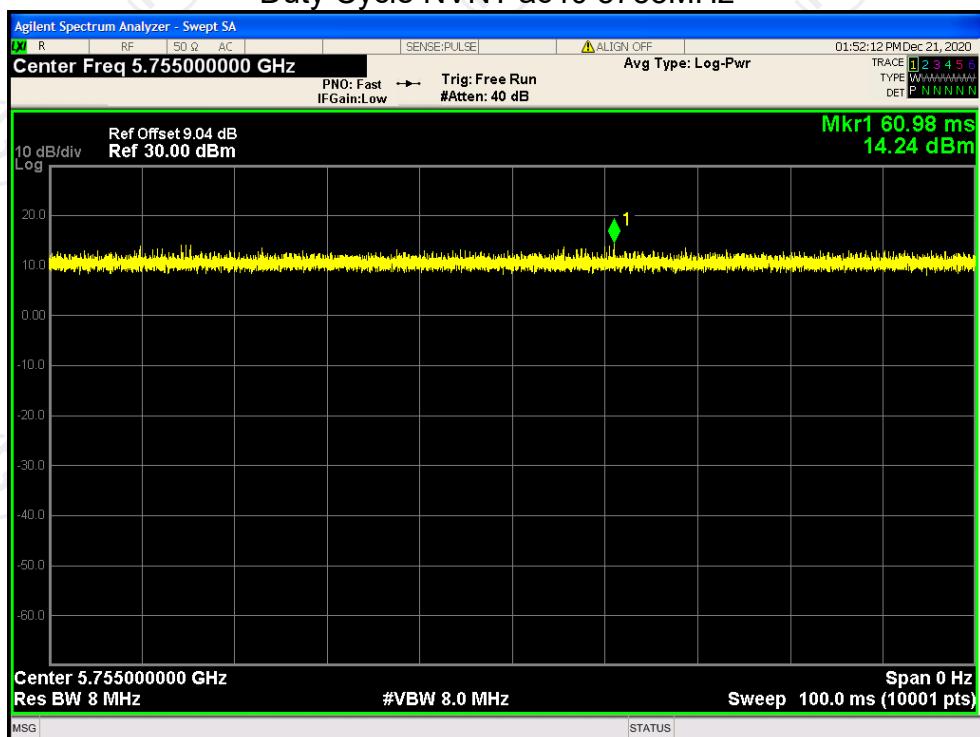
Duty Cycle NVNT ac20 5785MHz



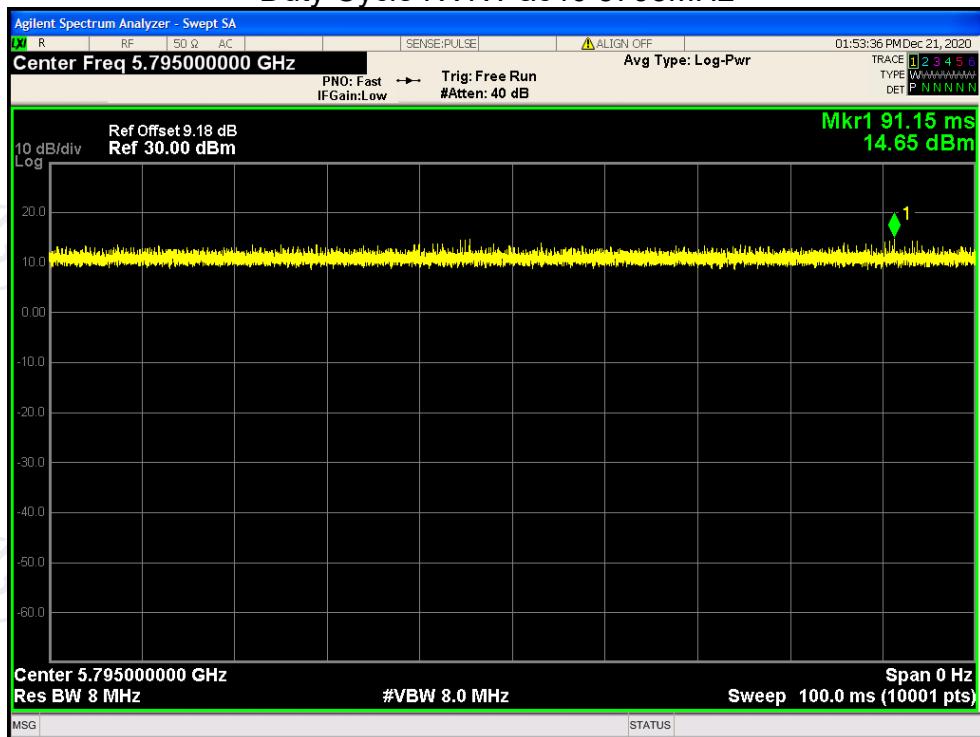
Duty Cycle NVNT ac20 5825MHz



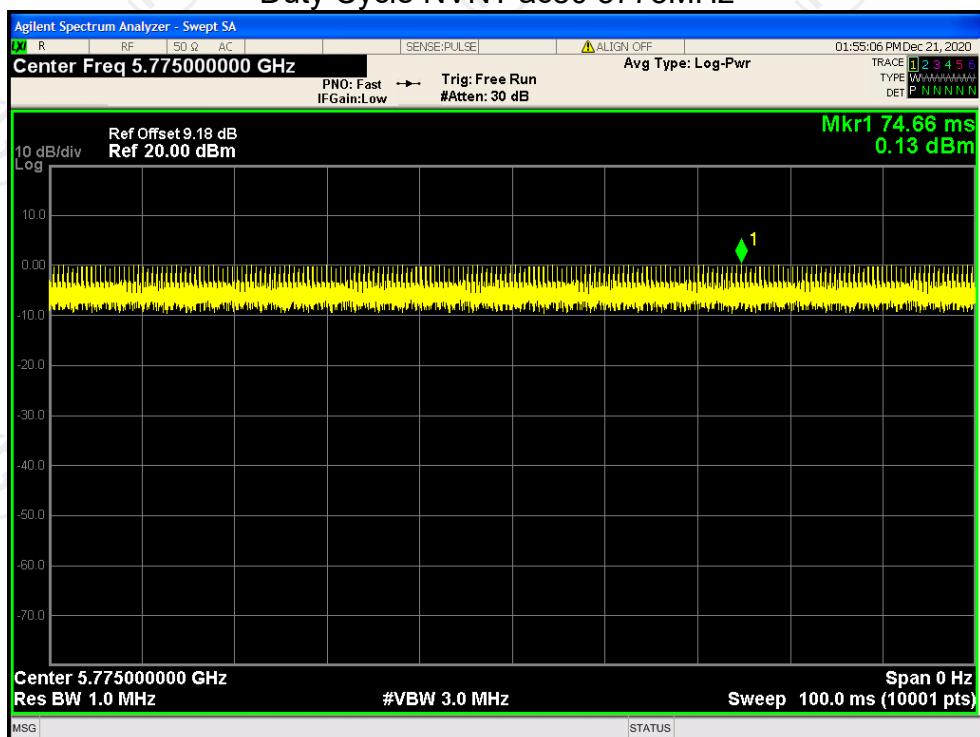
Duty Cycle NVNT ac40 5755MHz



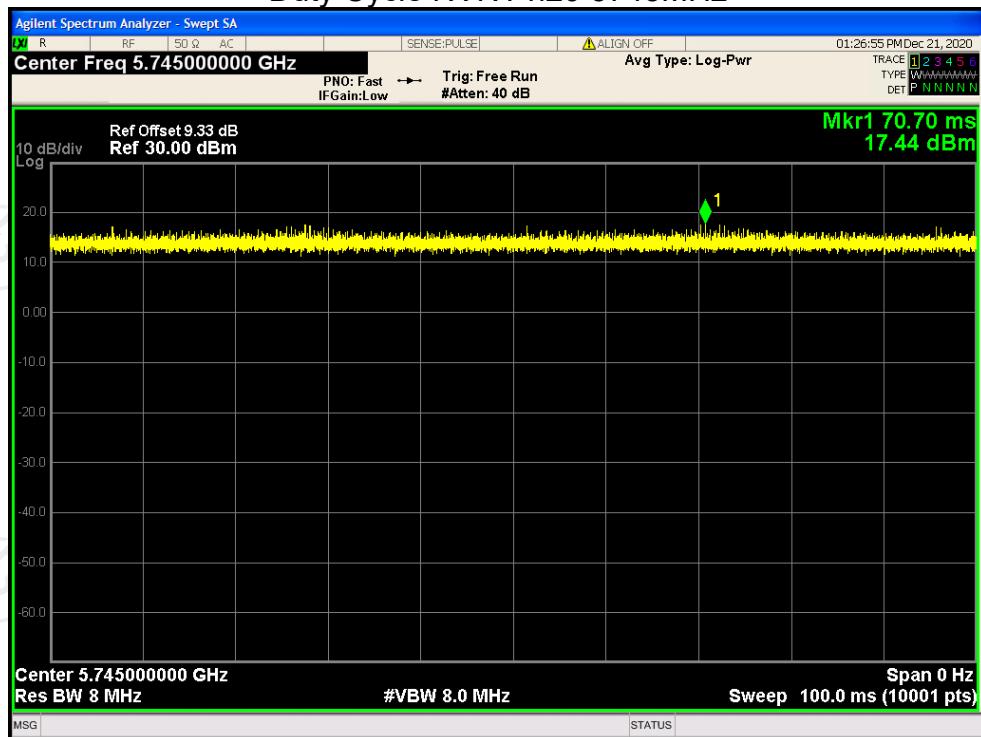
Duty Cycle NVNT ac40 5795MHz



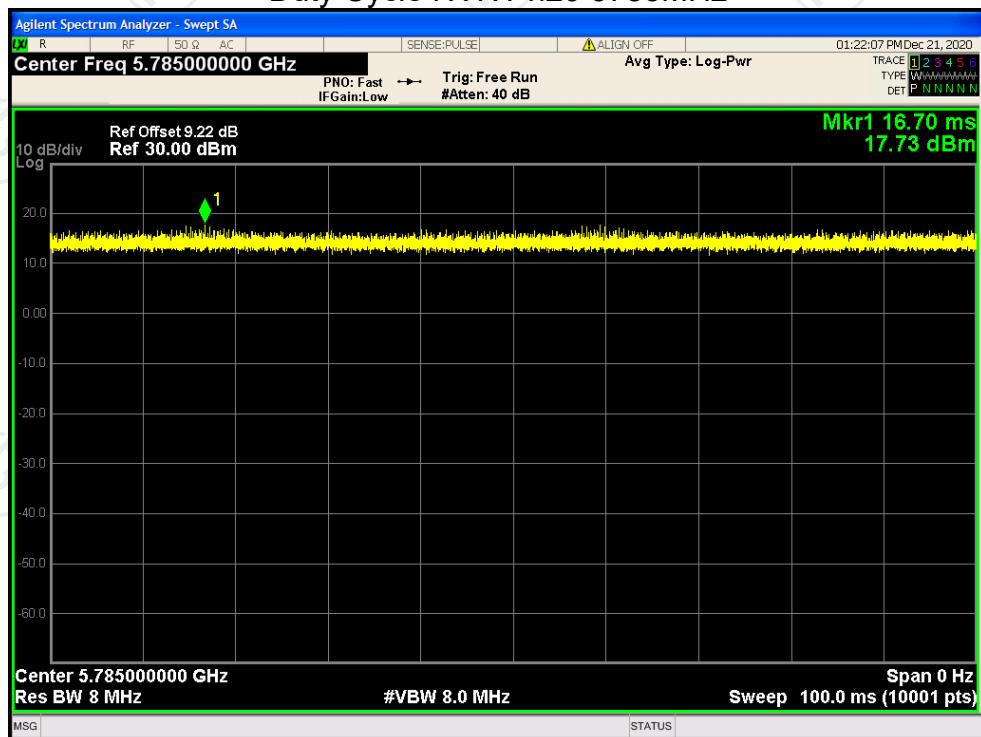
Duty Cycle NVNT ac80 5775MHz



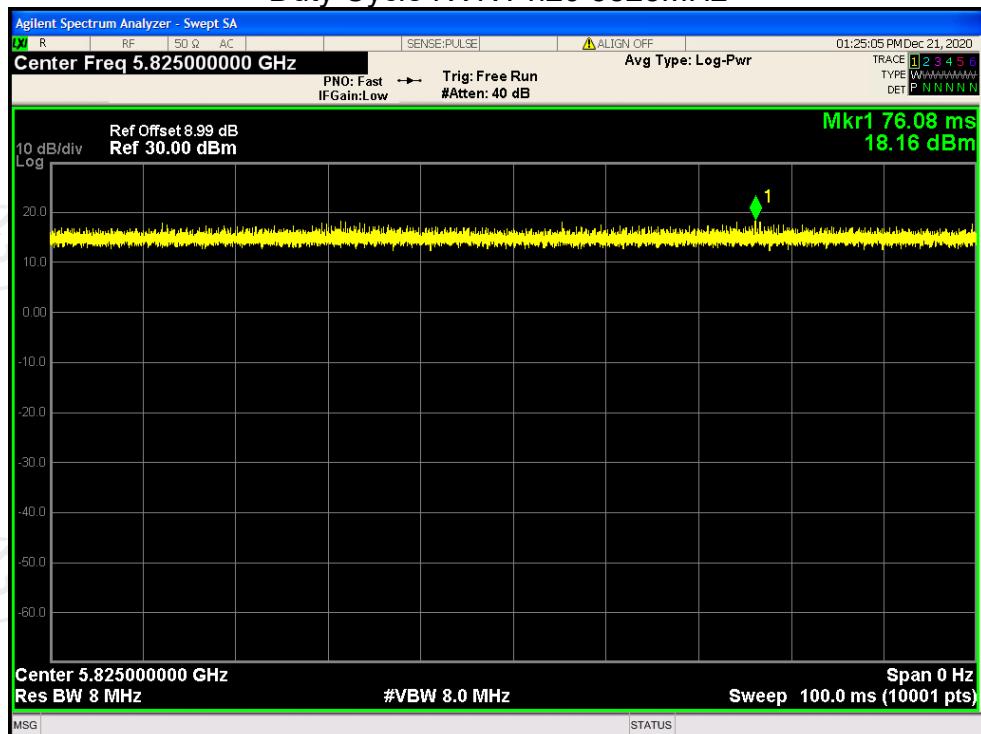
Duty Cycle NVNT n20 5745MHz



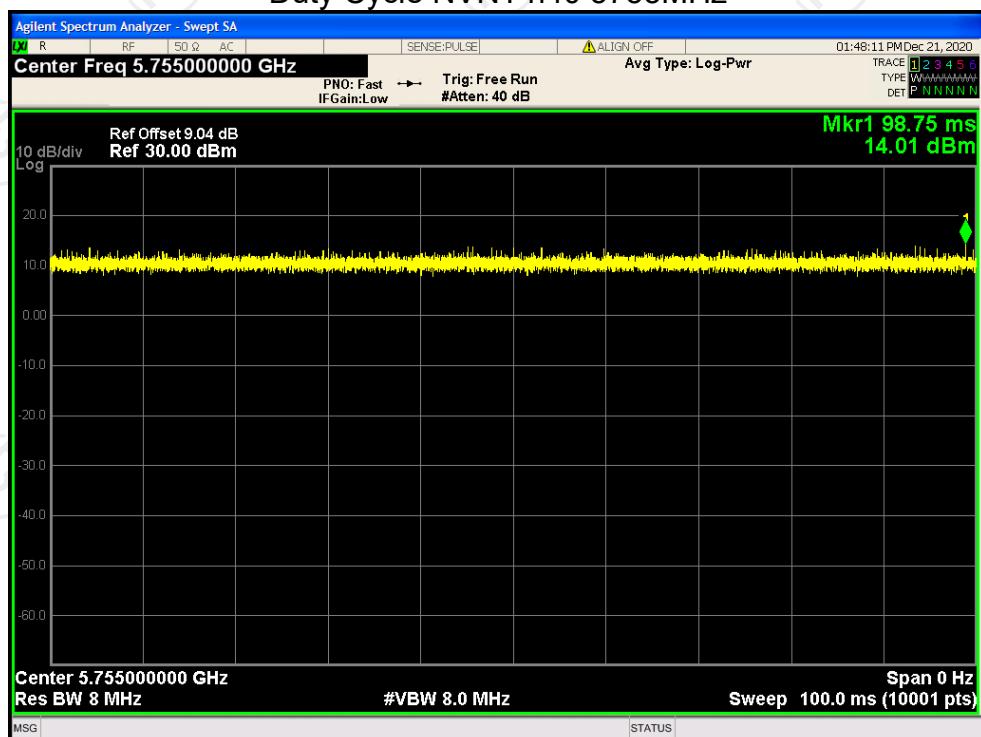
Duty Cycle NVNT n20 5785MHz



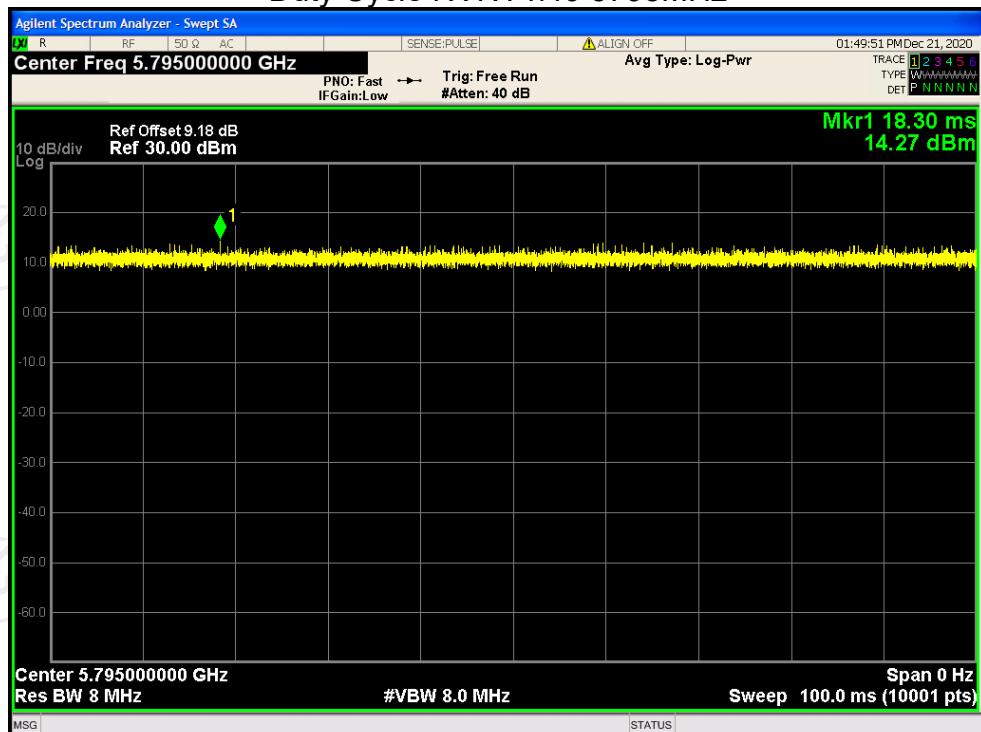
Duty Cycle NVNT n20 5825MHz



Duty Cycle NVNT n40 5755MHz



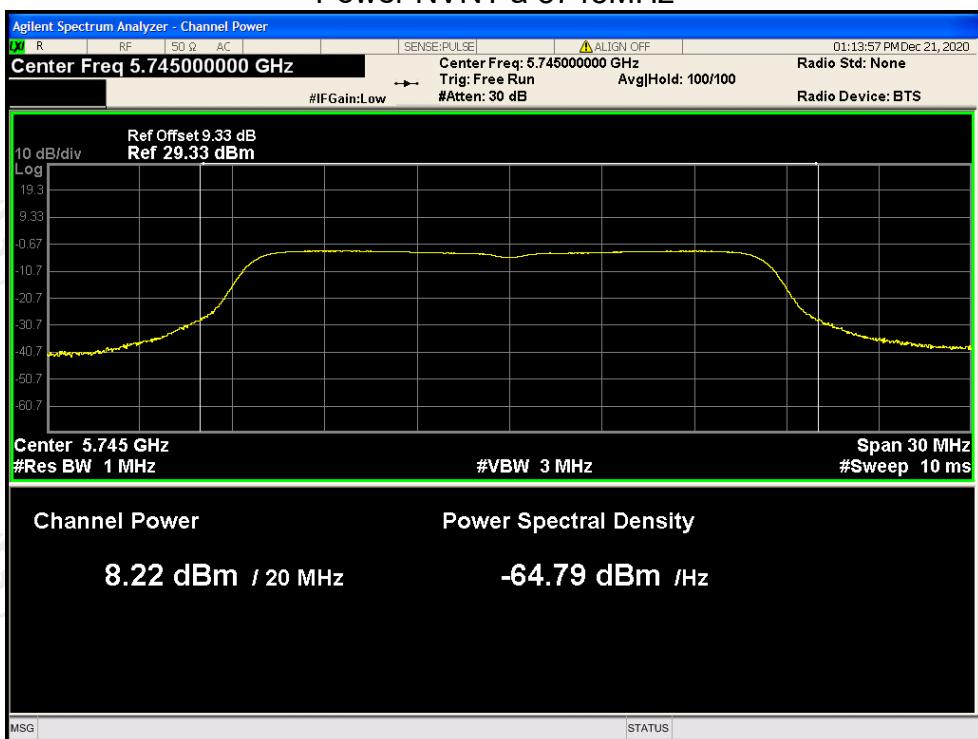
Duty Cycle NVNT n40 5795MHz



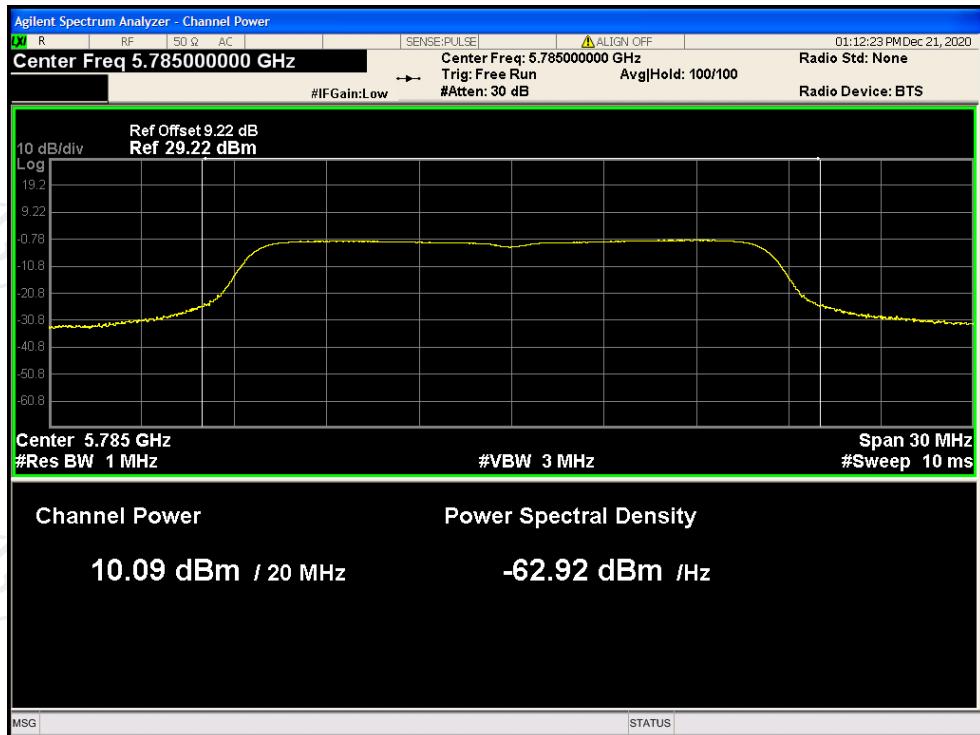
Maximum Conducted Output Power

Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
a	5745	8.221	30	Pass
a	5785	10.087	30	Pass
a	5825	10.922	30	Pass
ac20	5745	10.324	30	Pass
ac20	5785	10.756	30	Pass
ac20	5825	11.532	30	Pass
ac40	5755	10.193	30	Pass
ac40	5795	10.556	30	Pass
ac80	5775	10.273	30	Pass
n20	5745	10.375	30	Pass
n20	5785	10.845	30	Pass
n20	5825	11.578	30	Pass
n40	5755	10.118	30	Pass
n40	5795	10.403	30	Pass

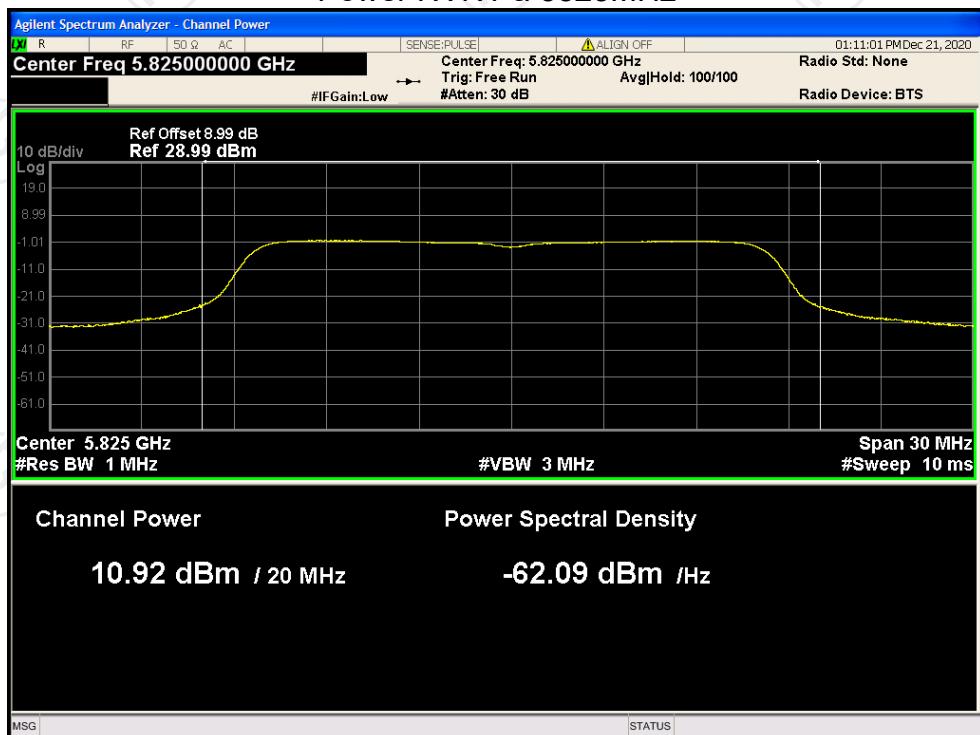
Power NVNT a 5745MHz



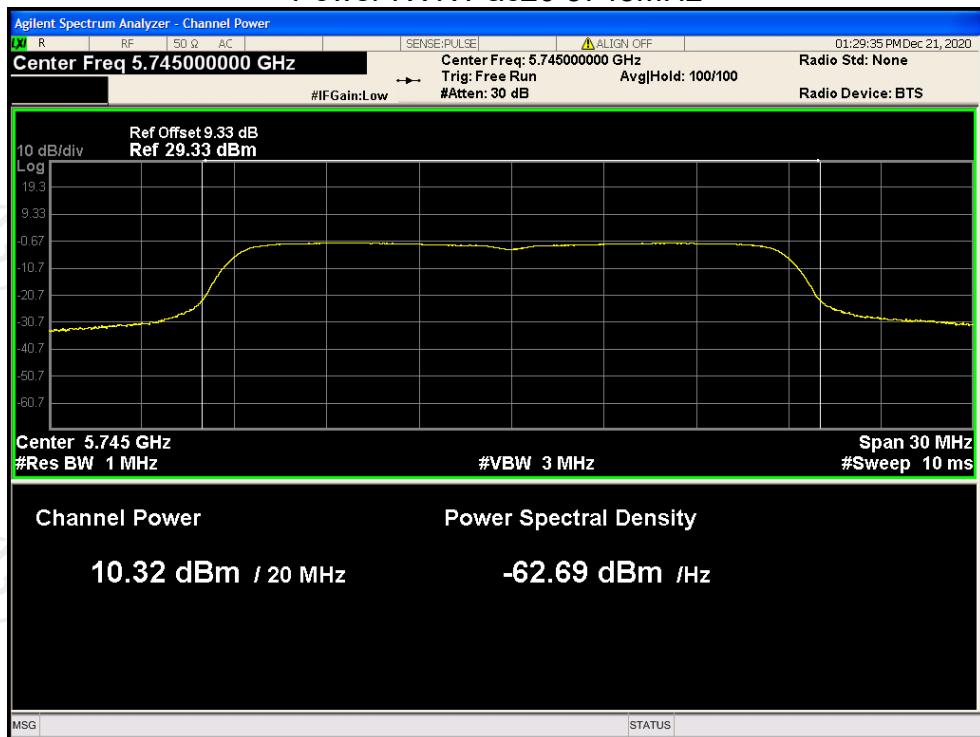
Power NVNT a 5785MHz



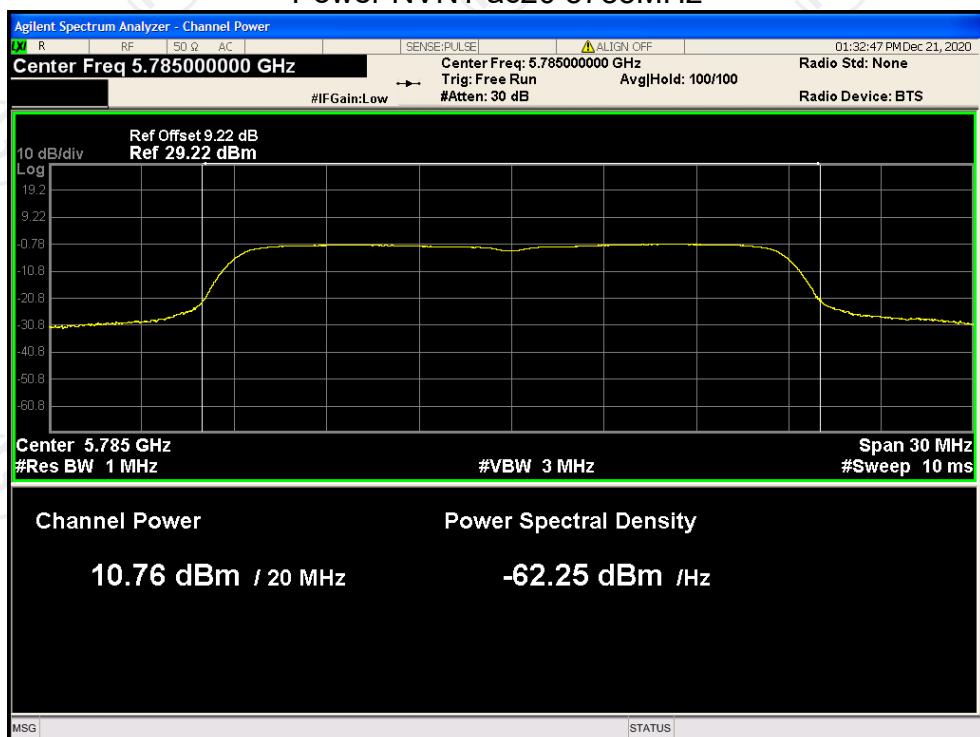
Power NVNT a 5825MHz



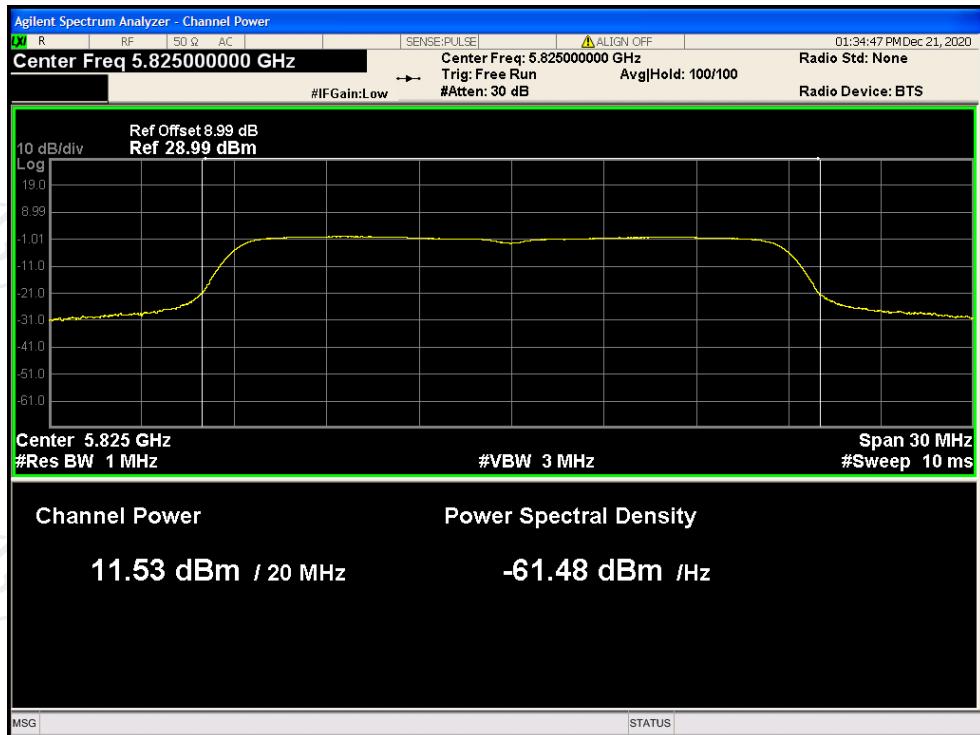
Power NVNT ac20 5745MHz



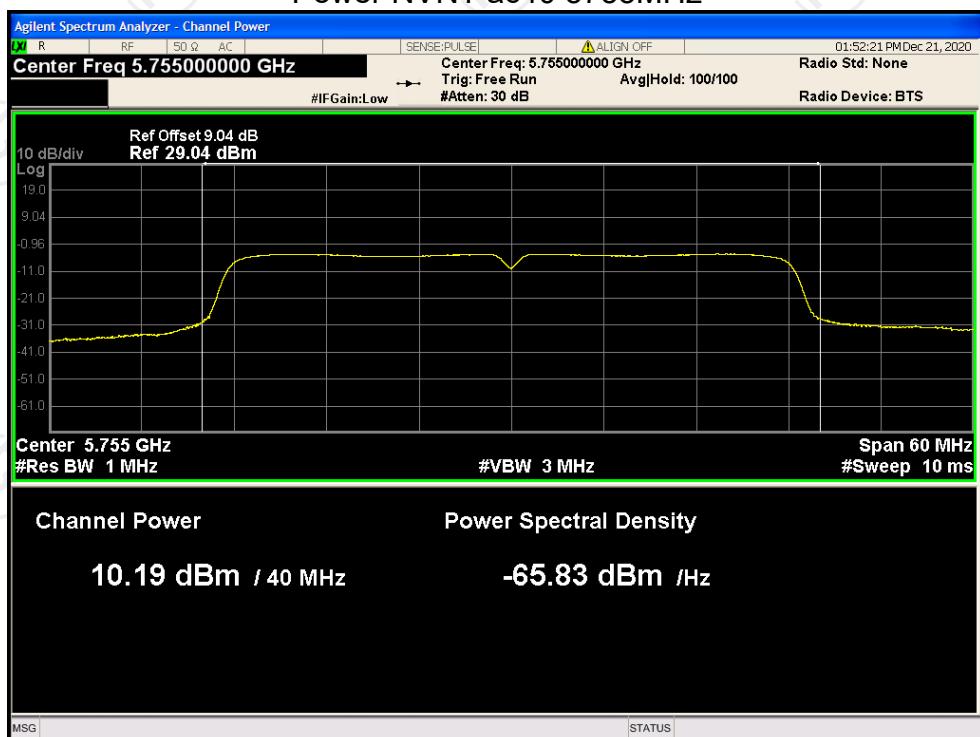
Power NVNT ac20 5785MHz



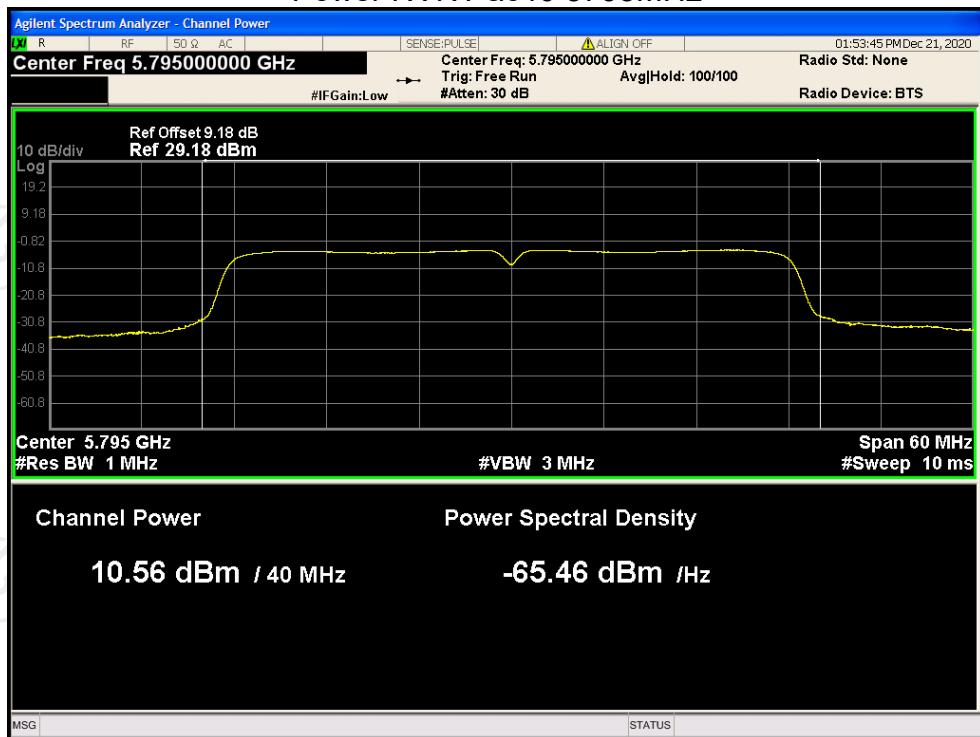
Power NVNT ac20 5825MHz



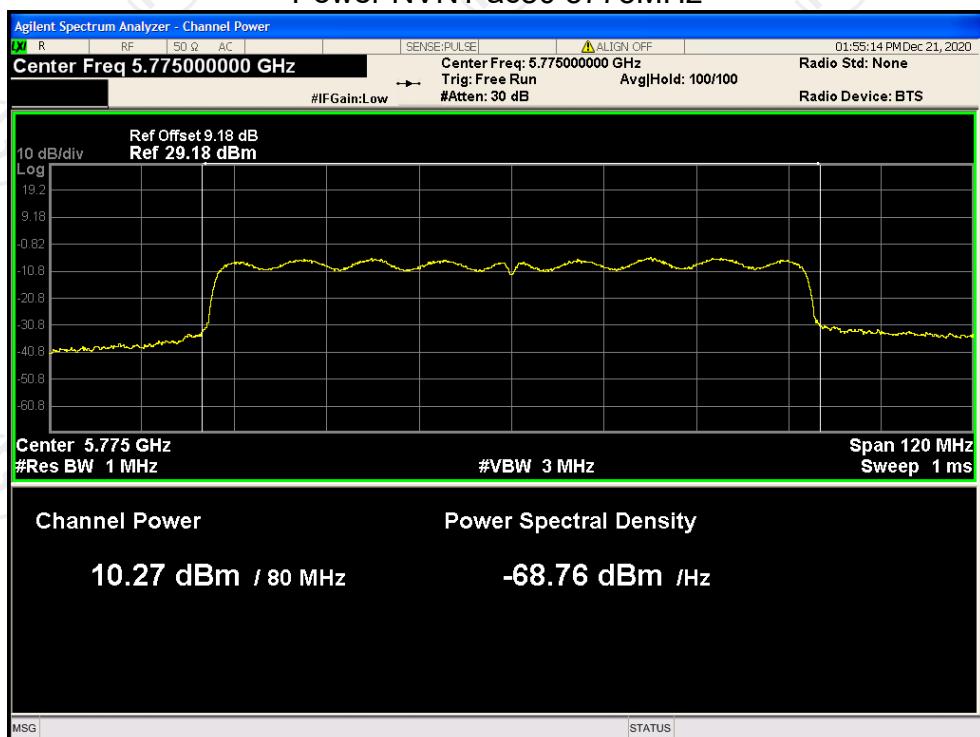
Power NVNT ac40 5755MHz



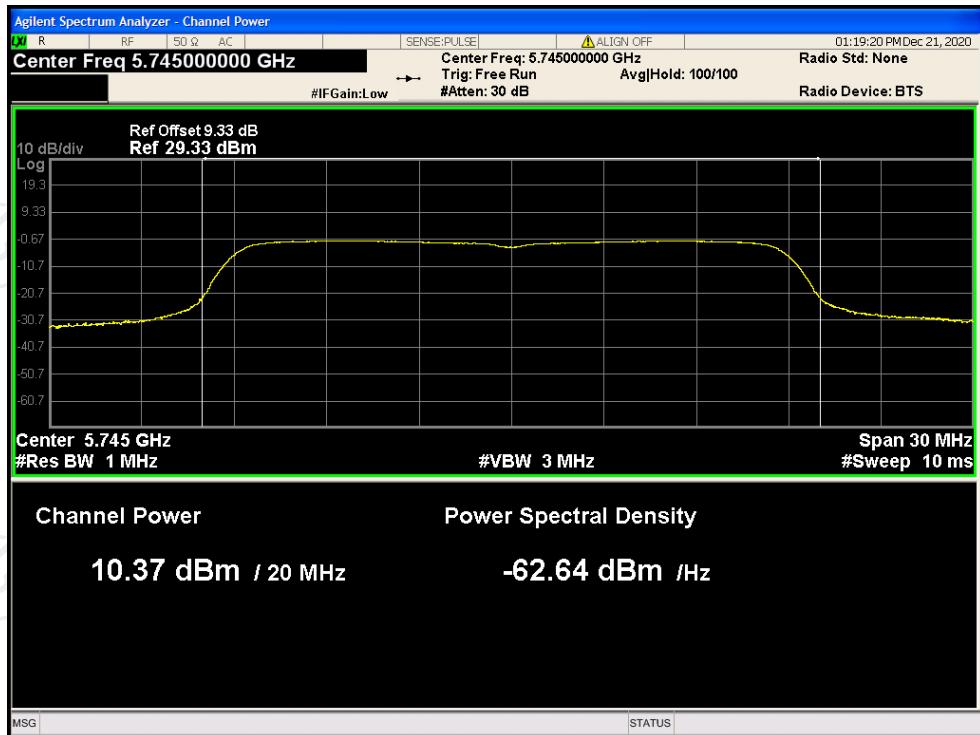
Power NVNT ac40 5795MHz



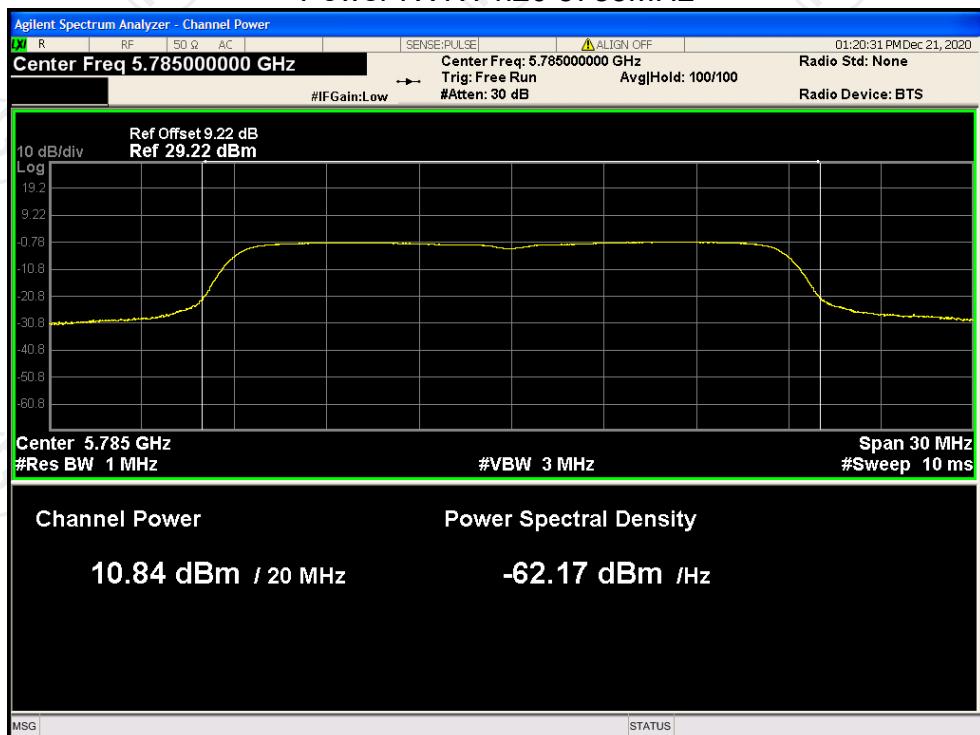
Power NVNT ac80 5775MHz



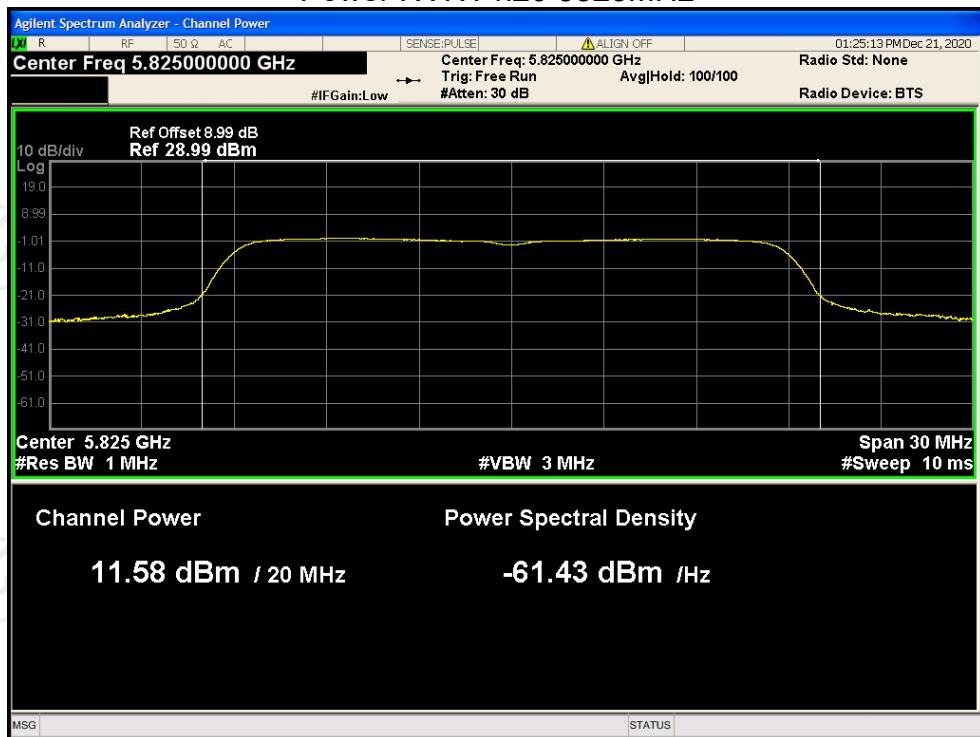
Power NVNT n20 5745MHz



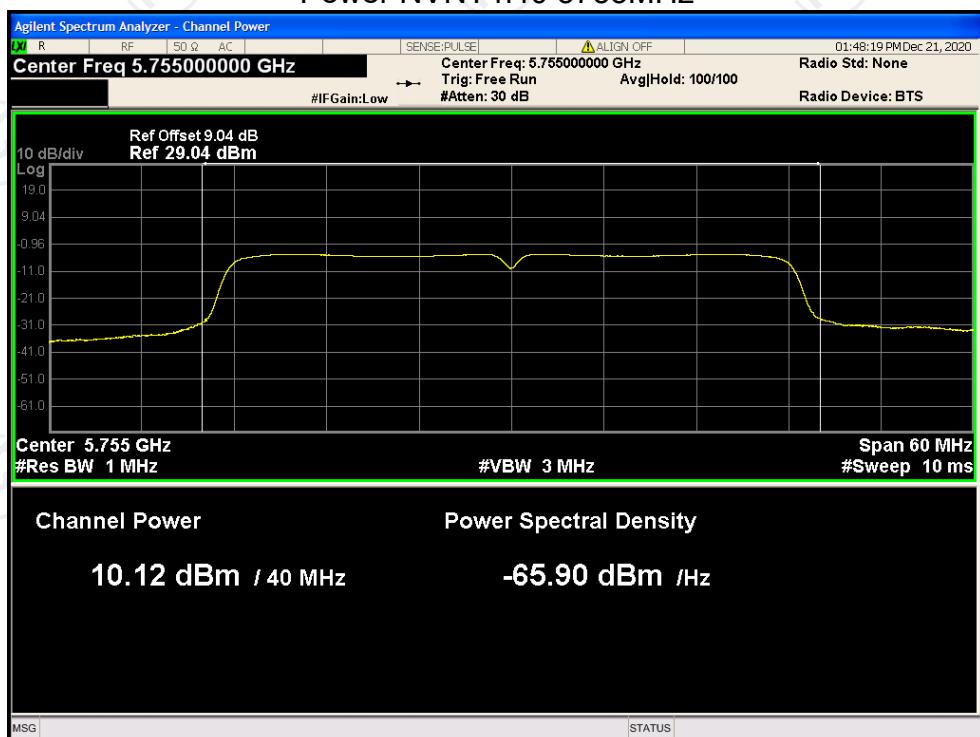
Power NVNT n20 5785MHz



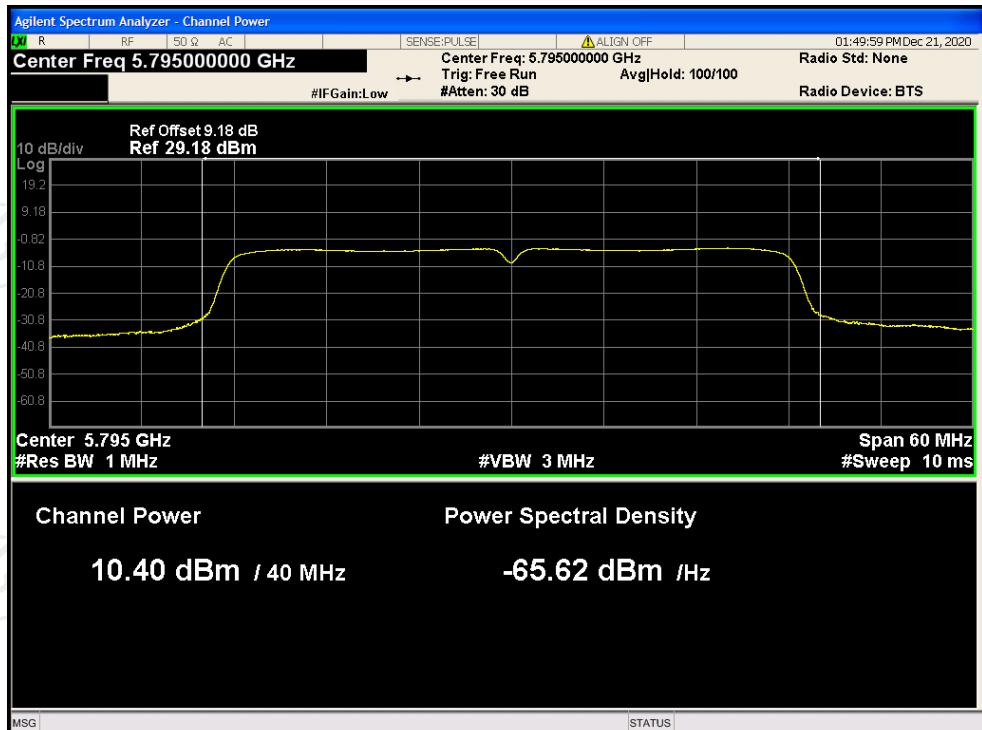
Power NVNT n20 5825MHz



Power NVNT n40 5755MHz



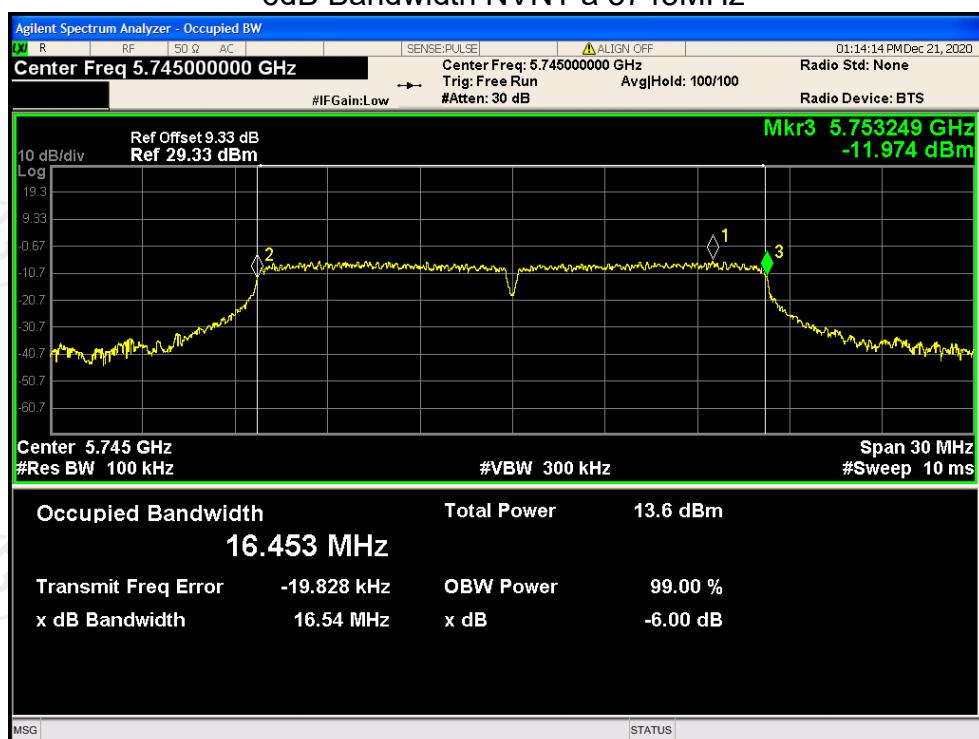
Power NVNT n40 5795MHz



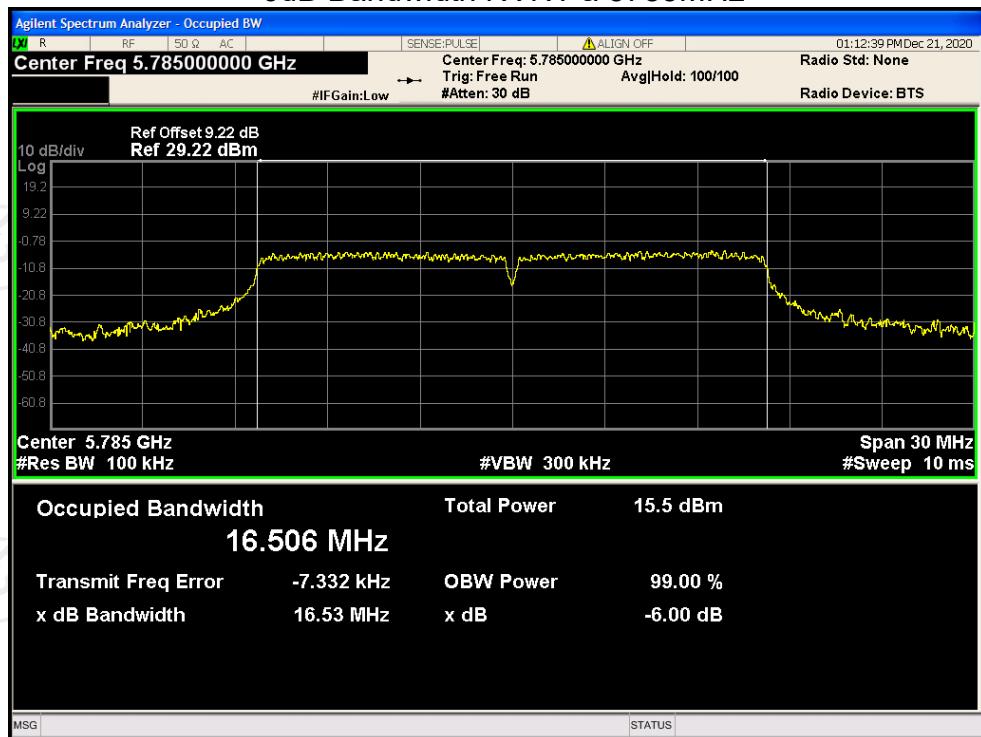
-6dB Bandwidth

Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
a	5745	16.537	0.5	Pass
a	5785	16.526	0.5	Pass
a	5825	16.539	0.5	Pass
ac20	5745	17.618	0.5	Pass
ac20	5785	17.714	0.5	Pass
ac20	5825	17.695	0.5	Pass
ac40	5755	36.408	0.5	Pass
ac40	5795	36.398	0.5	Pass
ac80	5775	76.312	0.5	Pass
n20	5745	17.644	0.5	Pass
n20	5785	17.633	0.5	Pass
n20	5825	17.657	0.5	Pass
n40	5755	36.398	0.5	Pass
n40	5795	36.395	0.5	Pass

-6dB Bandwidth NVNT a 5745MHz



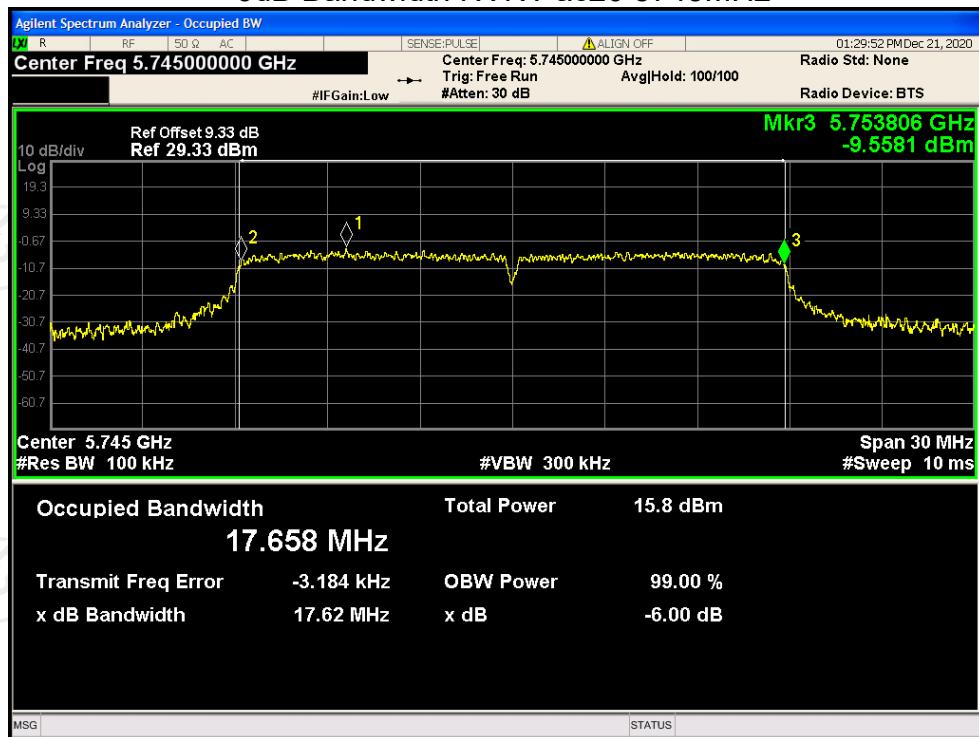
-6dB Bandwidth NVNT a 5785MHz



-6dB Bandwidth NVNT a 5825MHz



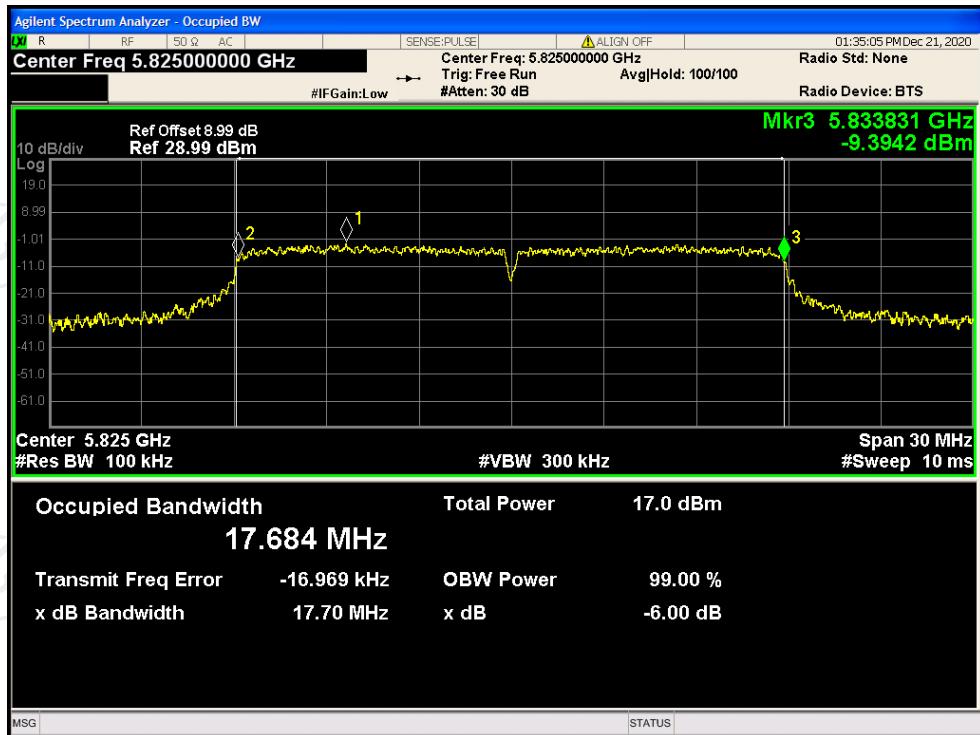
-6dB Bandwidth NVNT ac20 5745MHz



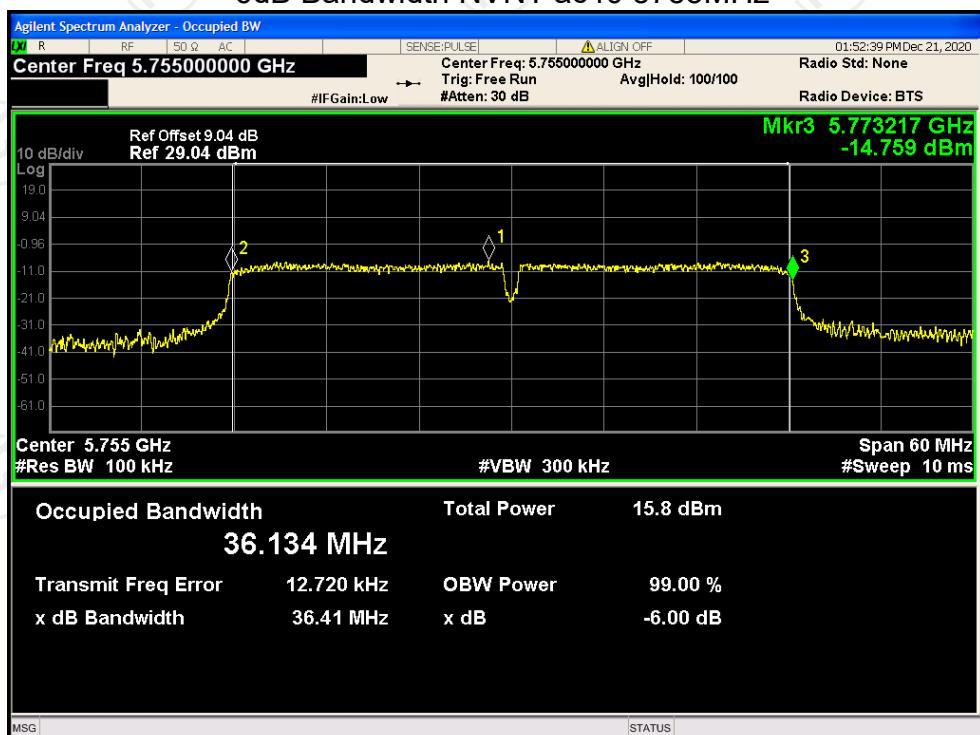
-6dB Bandwidth NVNT ac20 5785MHz



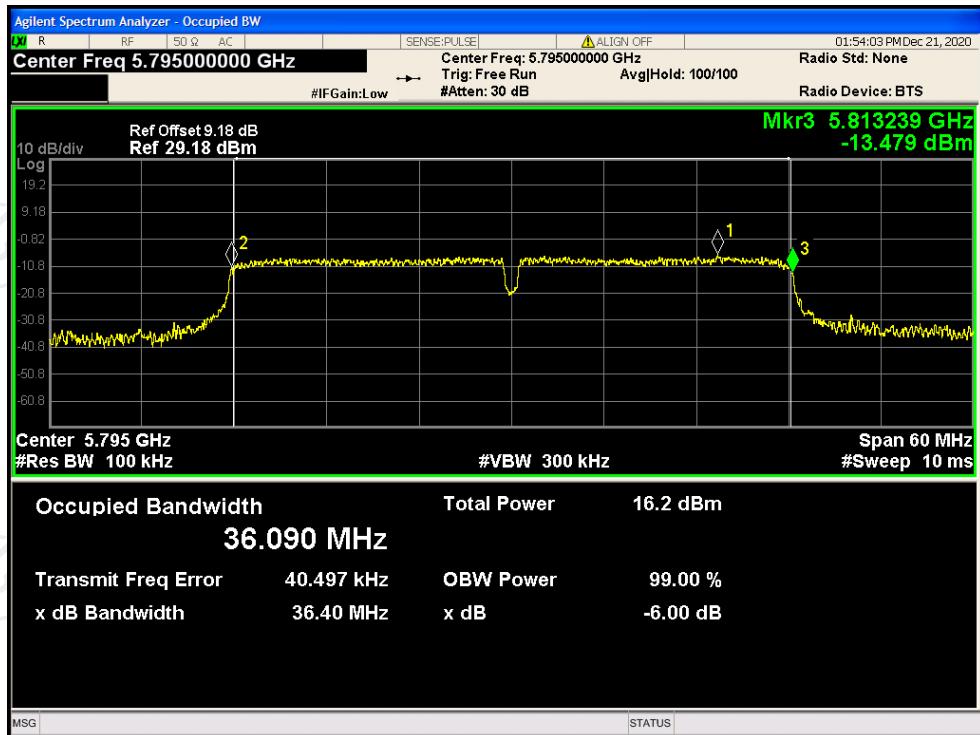
-6dB Bandwidth NVNT ac20 5825MHz



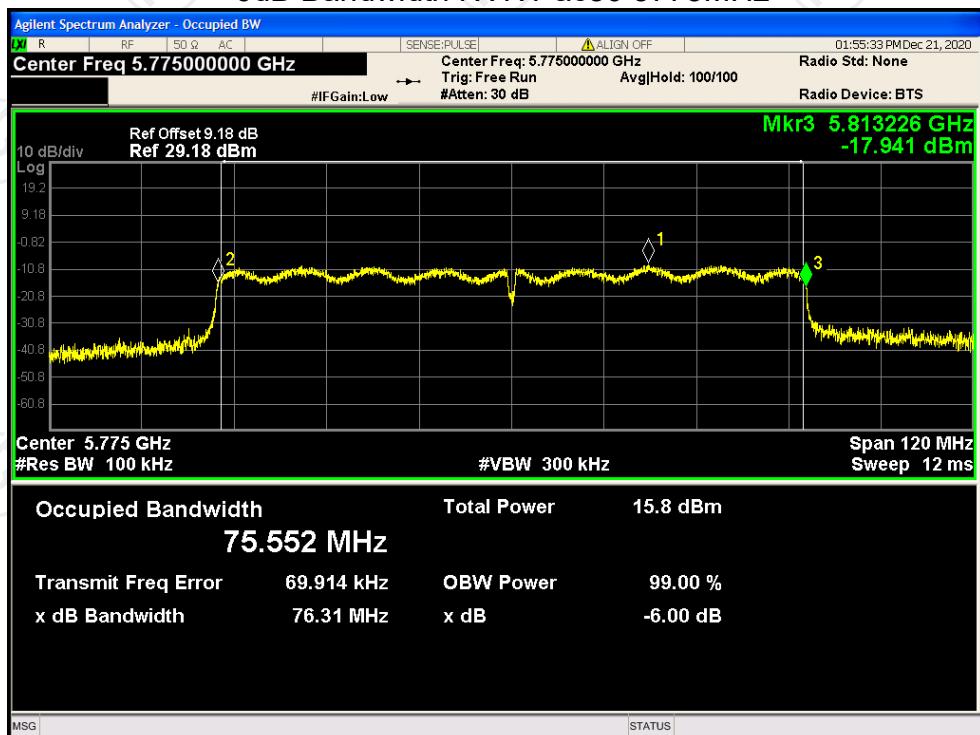
-6dB Bandwidth NVNT ac40 5755MHz



-6dB Bandwidth NVNT ac40 5795MHz



-6dB Bandwidth NVNT ac80 5775MHz



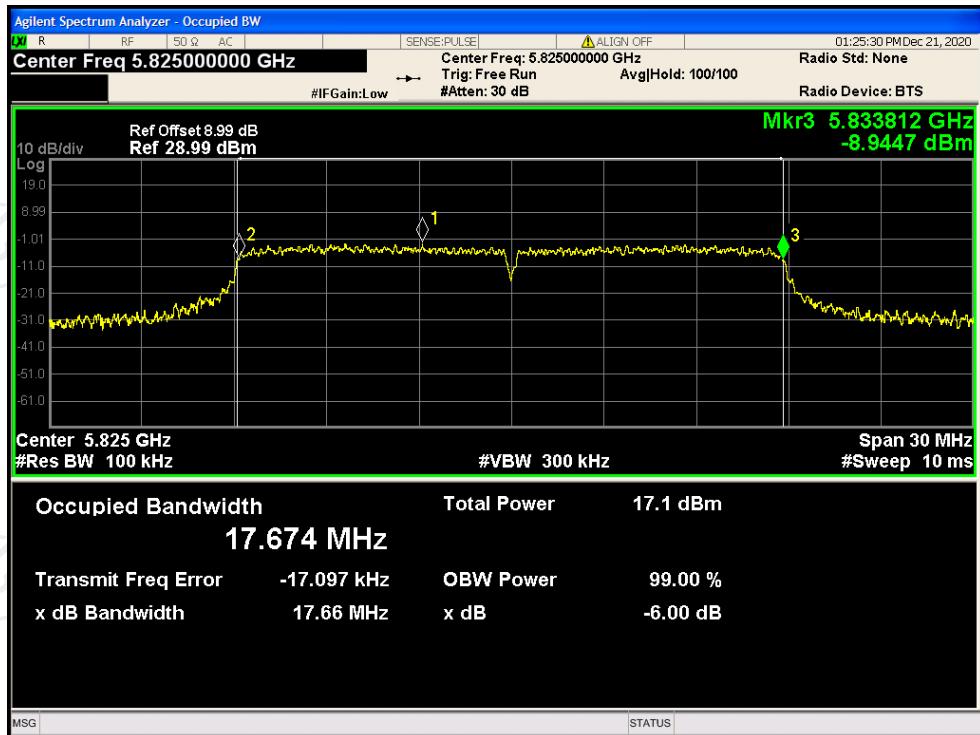
-6dB Bandwidth NVNT n20 5745MHz



-6dB Bandwidth NVNT n20 5785MHz



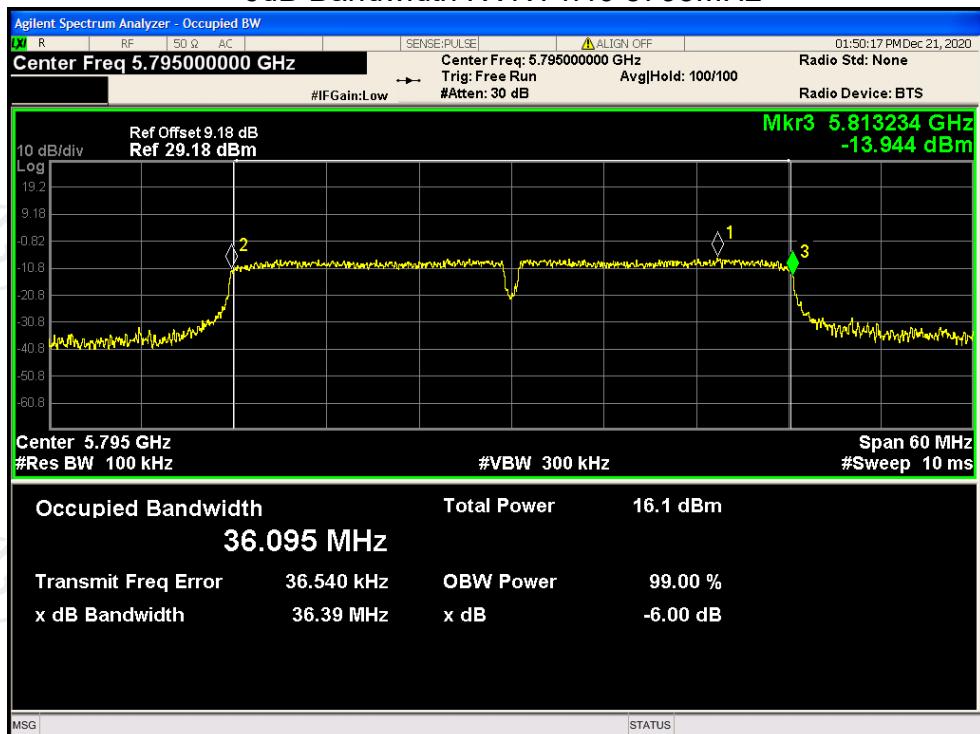
-6dB Bandwidth NVNT n20 5825MHz



-6dB Bandwidth NVNT n40 5755MHz



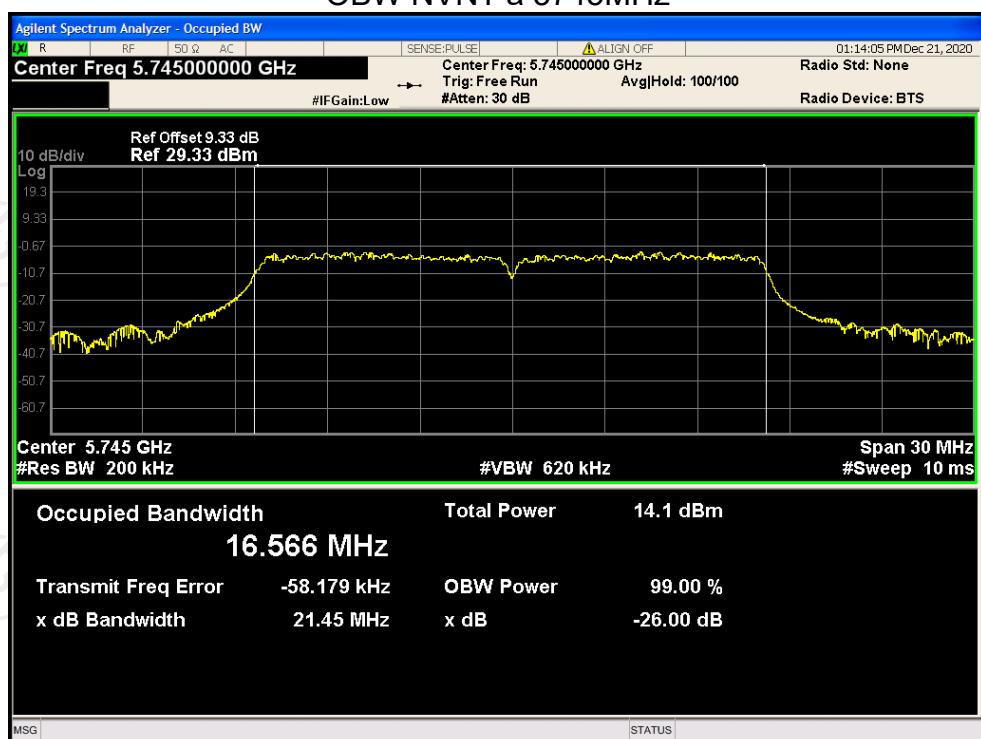
-6dB Bandwidth NVNT n40 5795MHz



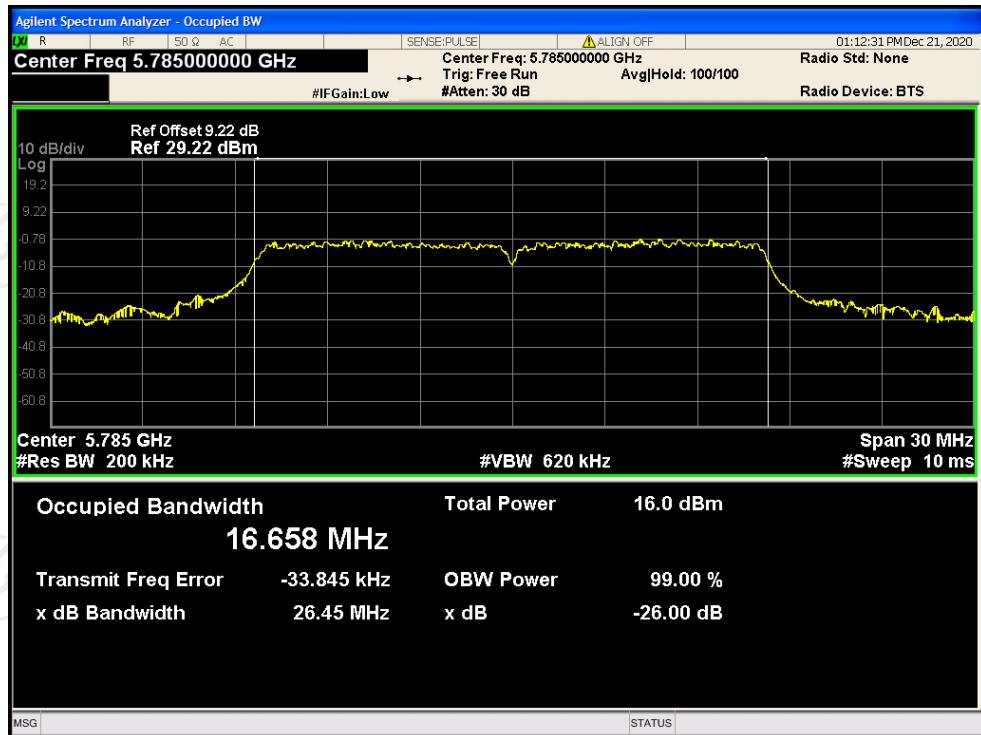
Occupied Channel Bandwidth

Mode	Frequency (MHz)	99% OBW (MHz)
a	5745	16.56647182
a	5785	16.65806234
a	5825	16.64049874
ac20	5745	17.78779517
ac20	5785	17.8188987
ac20	5825	17.8108109
ac40	5755	36.3412083
ac40	5795	36.29050989
ac80	5775	75.64358099
n20	5745	17.79319563
n20	5785	17.83053863
n20	5825	17.78658369
n40	5755	36.34086037
n40	5795	36.28252693

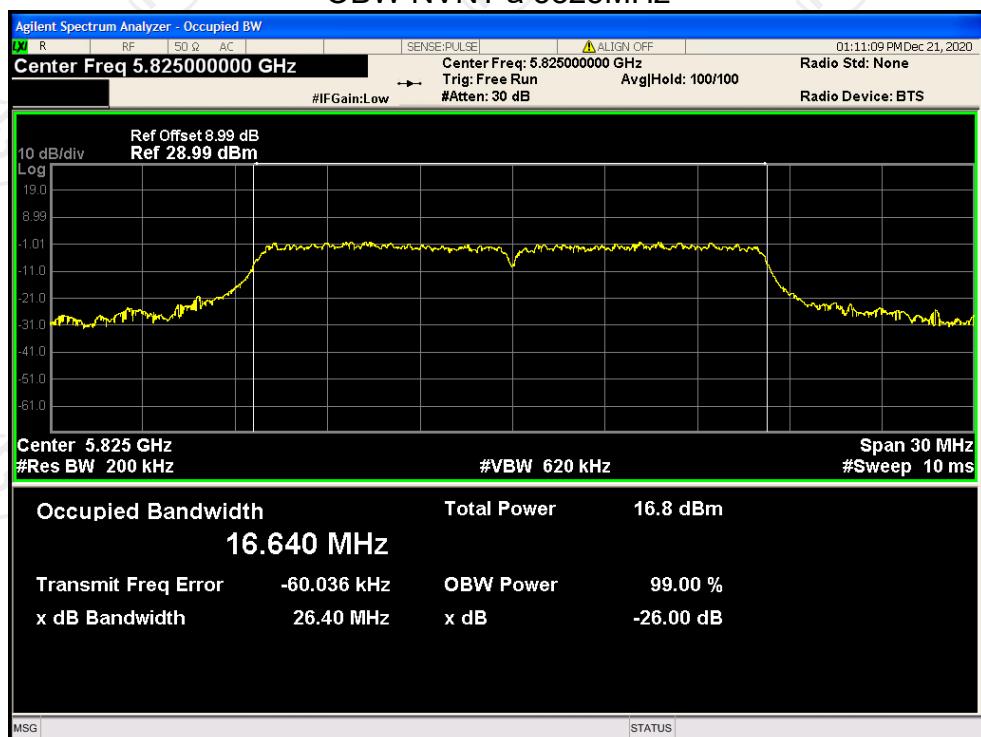
OBW NVNT a 5745MHz



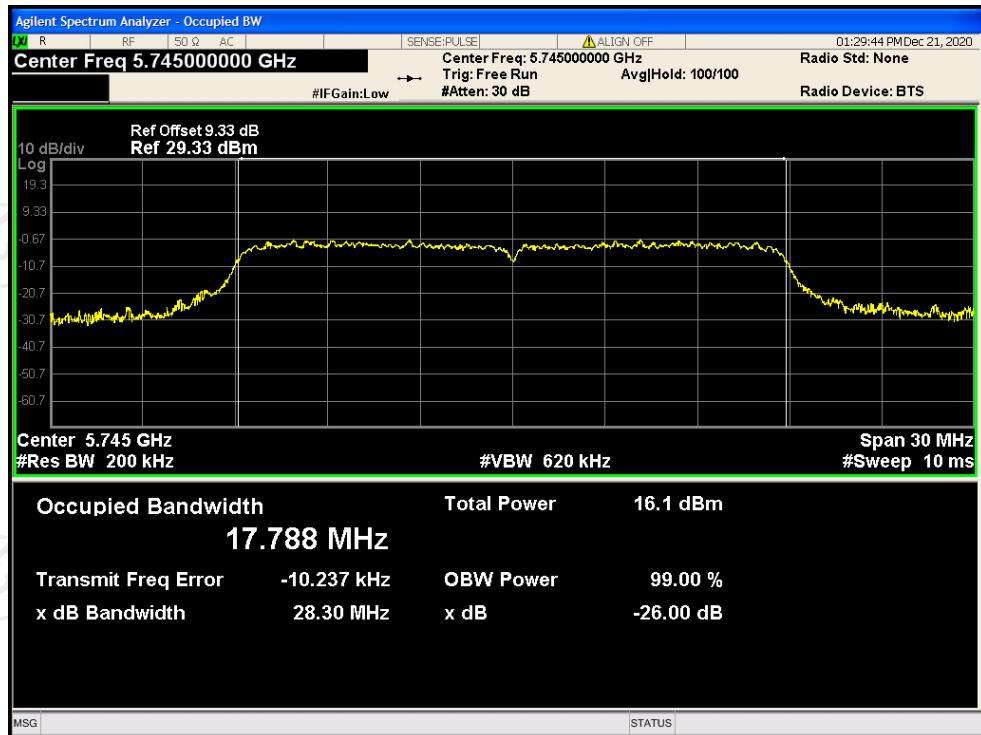
OBW NVNT a 5785MHz



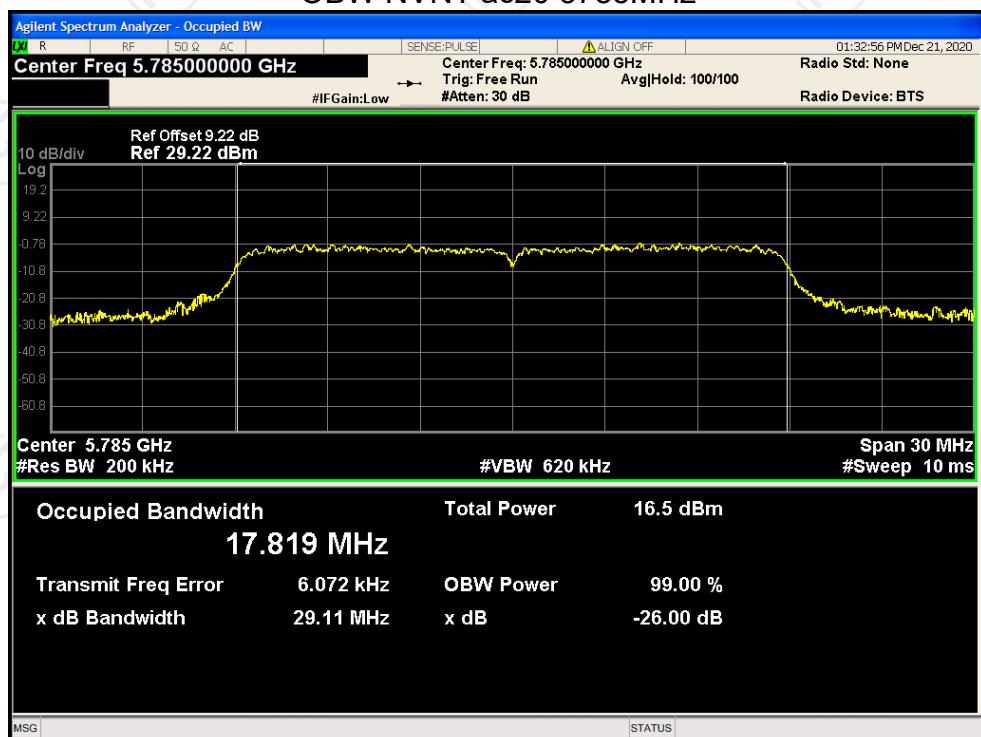
OBW NVNT a 5825MHz



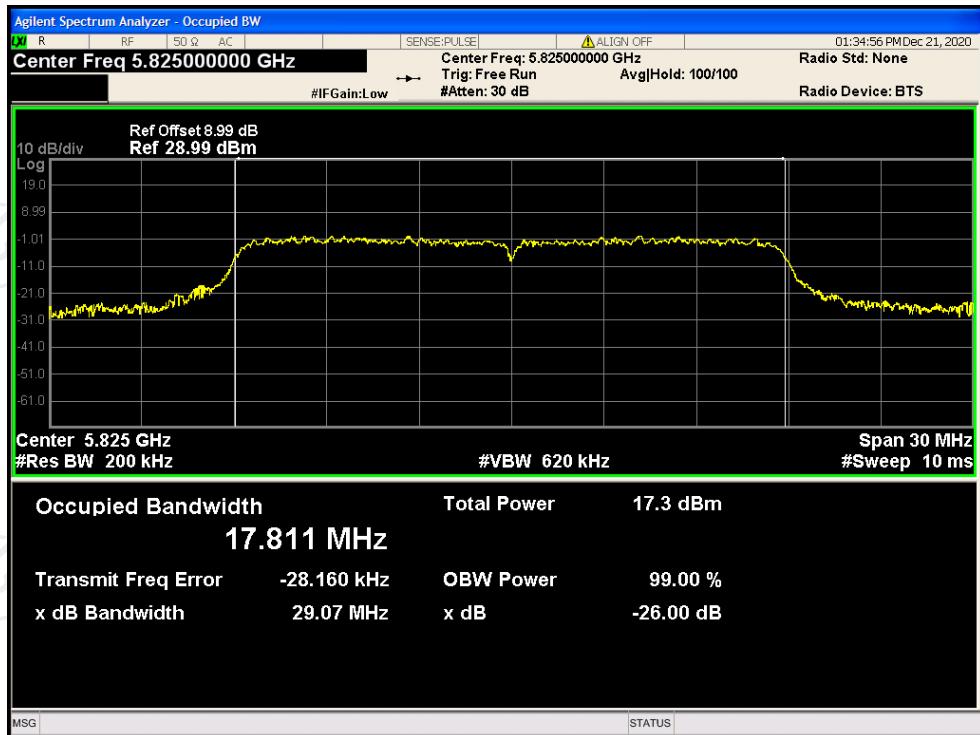
OBW NVNT ac20 5745MHz



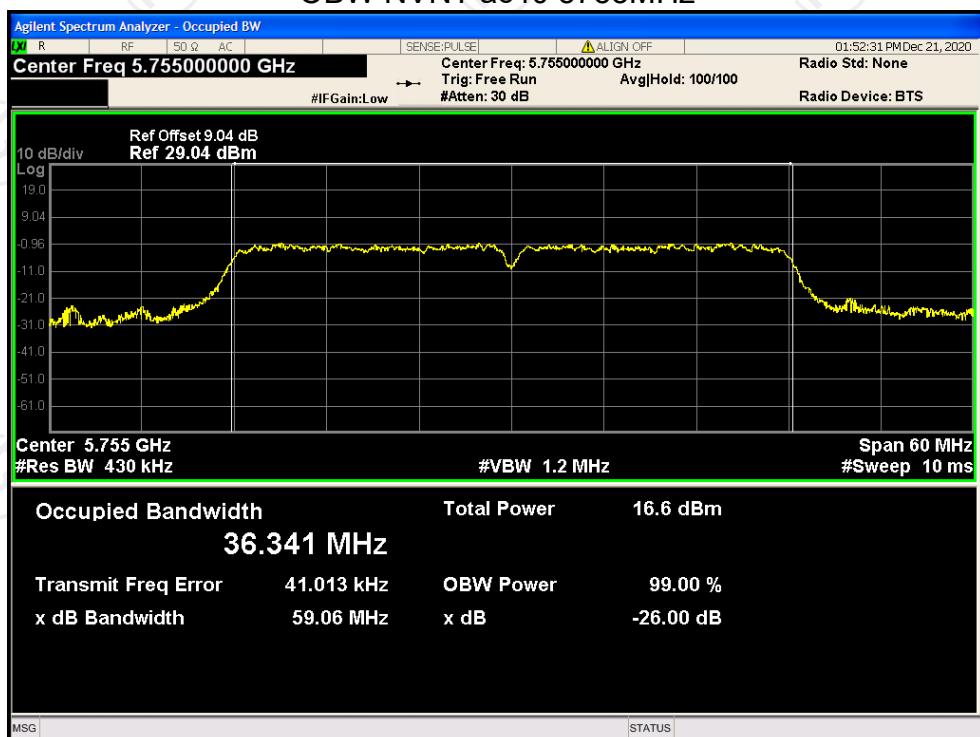
OBW NVNT ac20 5785MHz



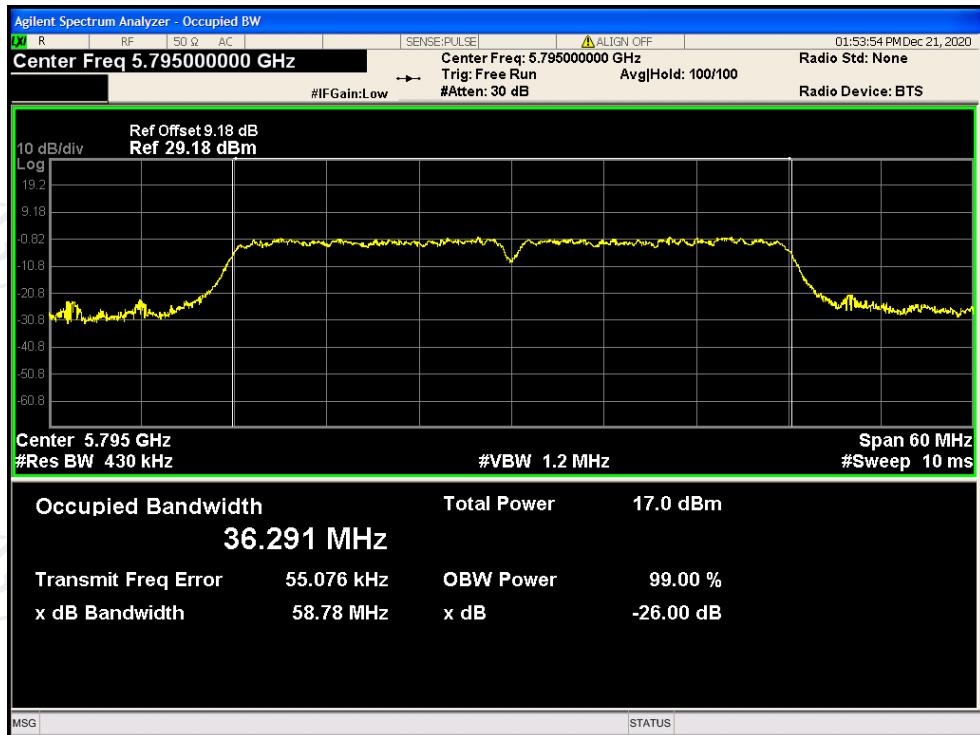
OBW NVNT ac20 5825MHz



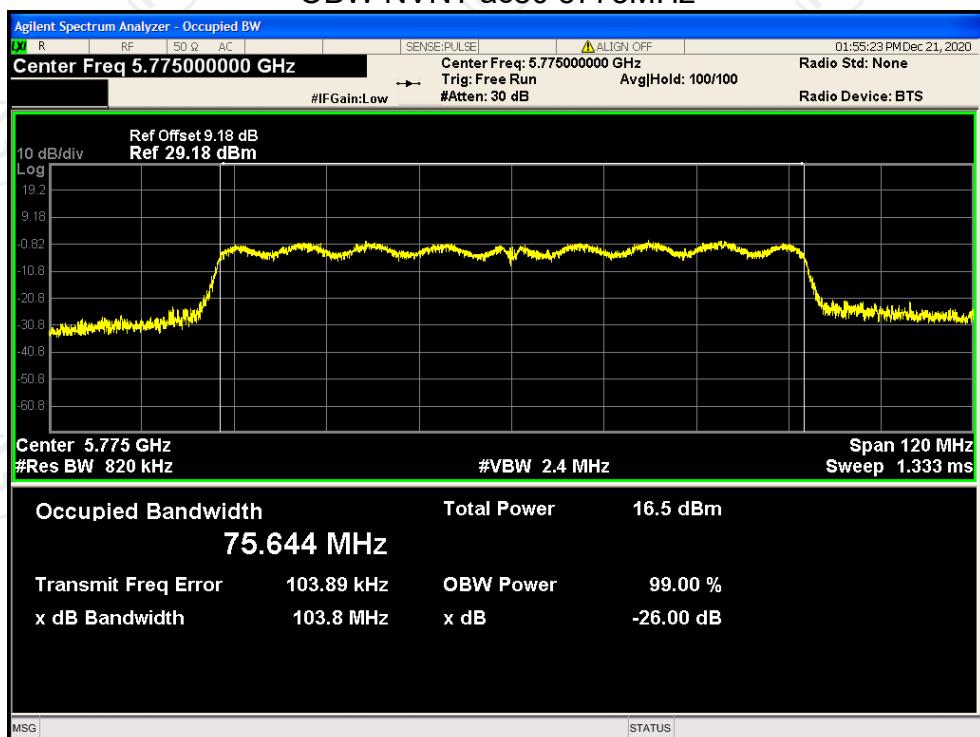
OBW NVNT ac40 5755MHz



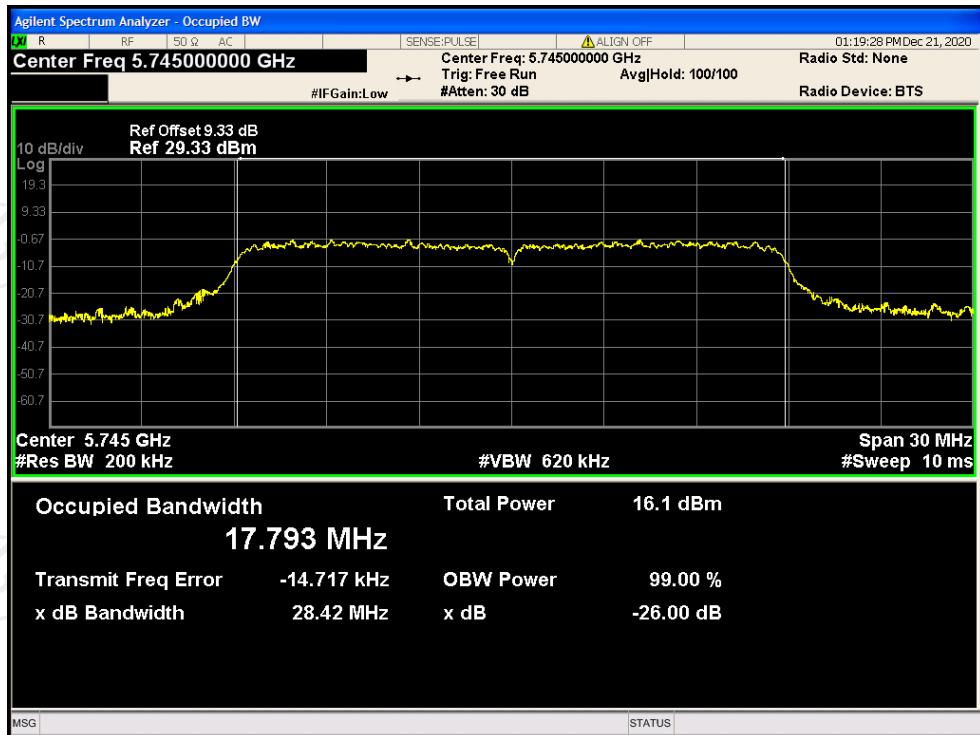
OBW NVNT ac40 5795MHz



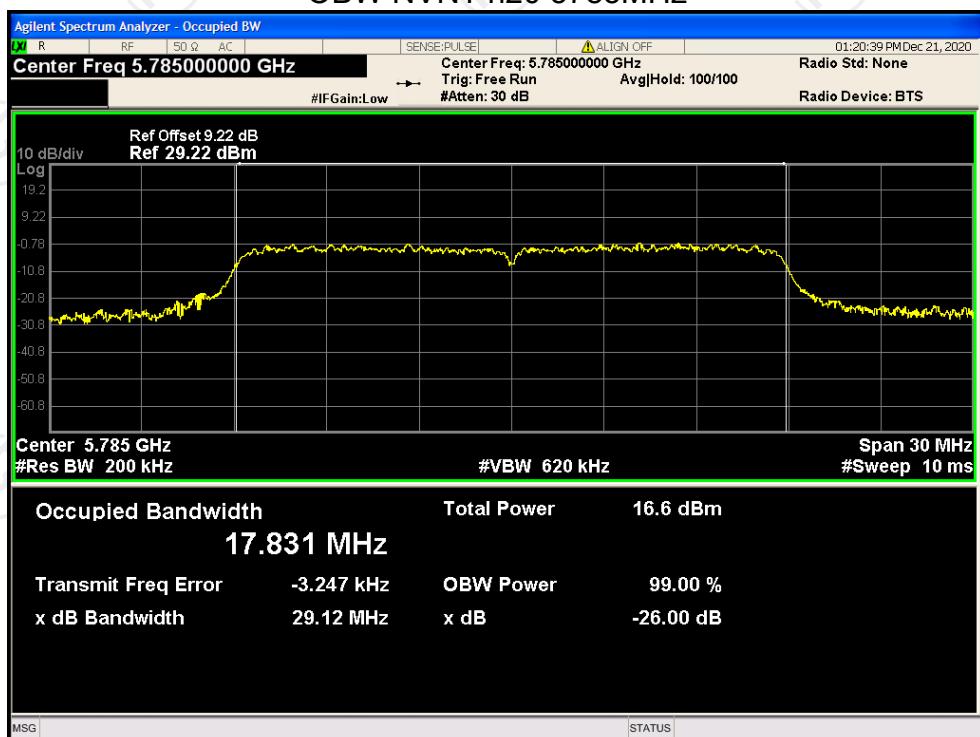
OBW NVNT ac80 5775MHz



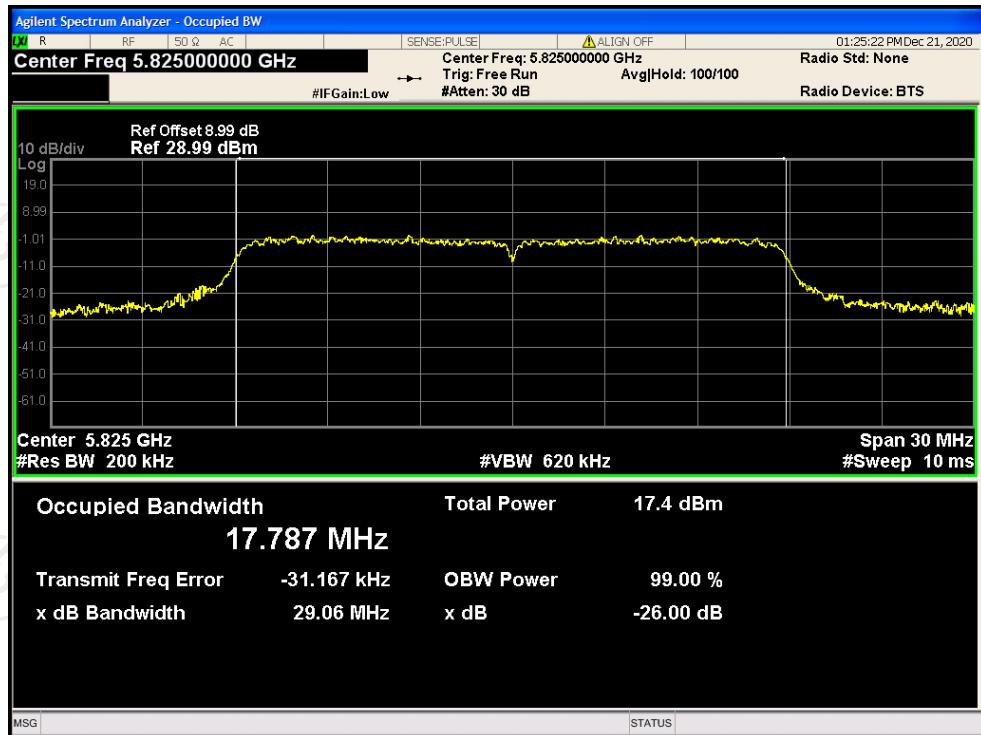
OBW NVNT n20 5745MHz



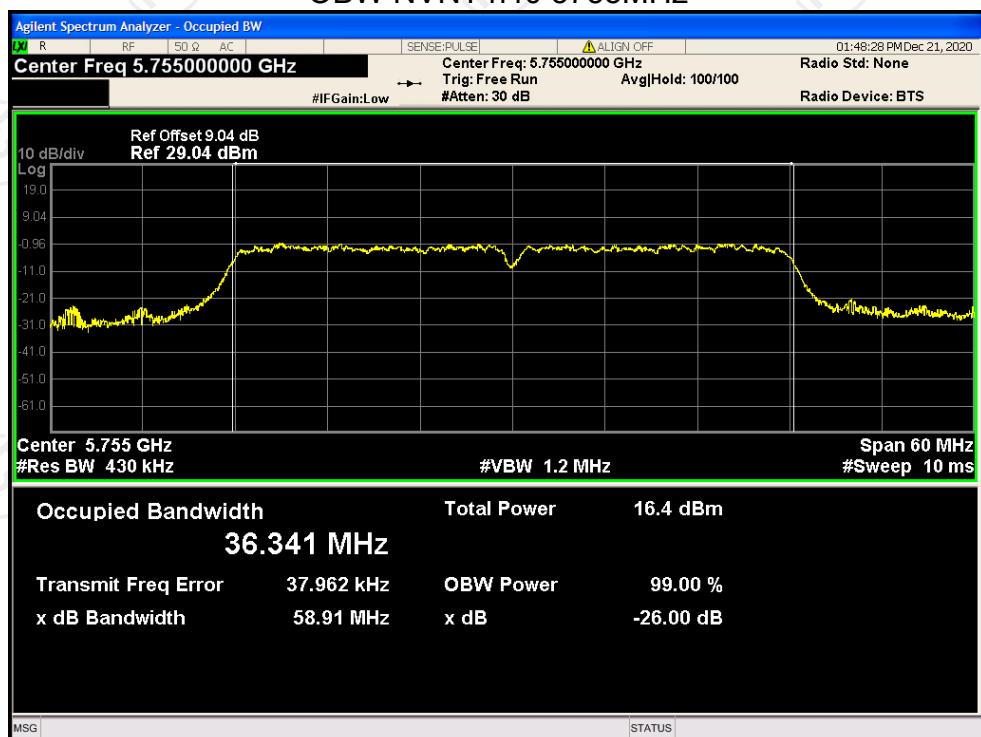
OBW NVNT n20 5785MHz



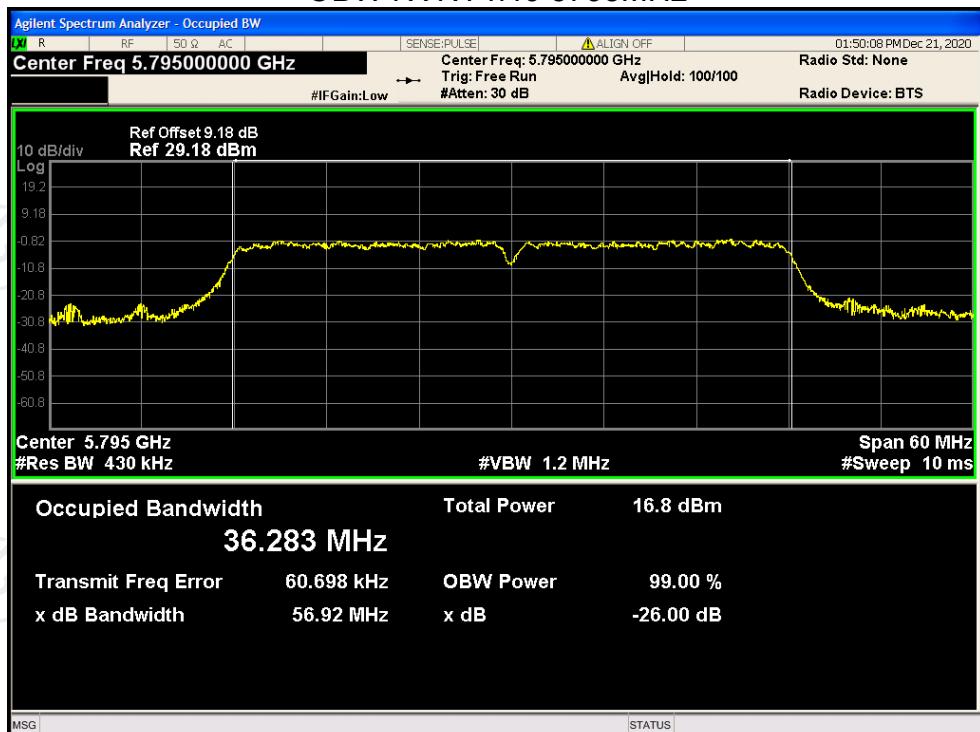
OBW NVNT n20 5825MHz



OBW NVNT n40 5755MHz



OBW NVNT n40 5795MHz



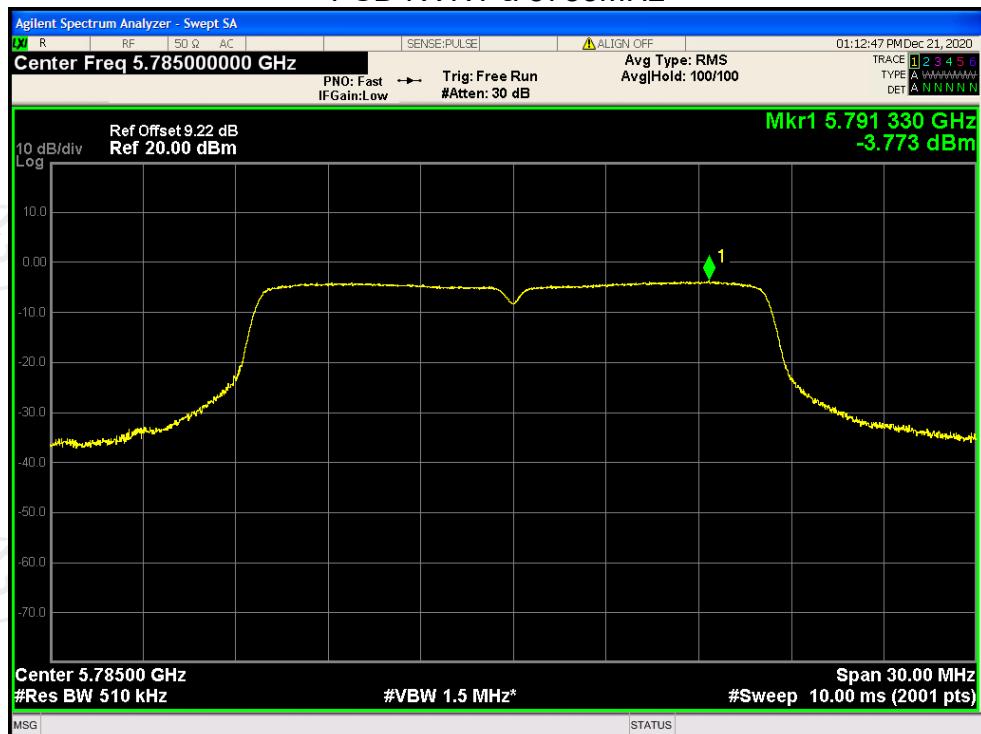
Maximum Power Spectral Density Level

Mode	Frequency (MHz)	Max PSD (dBm/510KHz)	Max PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
a	5745	-5.759	-5.845	30	Pass
a	5785	-3.773	-3.859	30	Pass
a	5825	-3	-3.086	30	Pass
ac20	5745	-3.821	-3.907	30	Pass
ac20	5785	-3.343	-3.429	30	Pass
ac20	5825	-2.645	-2.731	30	Pass
ac40	5755	-7.251	-7.337	30	Pass
ac40	5795	-6.711	-6.797	30	Pass
ac80	5775	-7.962	-8.048	30	Pass
n20	5745	-3.787	-3.873	30	Pass
n20	5785	-3.232	-3.318	30	Pass
n20	5825	-2.512	-2.598	30	Pass
n40	5755	-7.331	-7.417	30	Pass
n40	5795	-6.838	-6.924	30	Pass

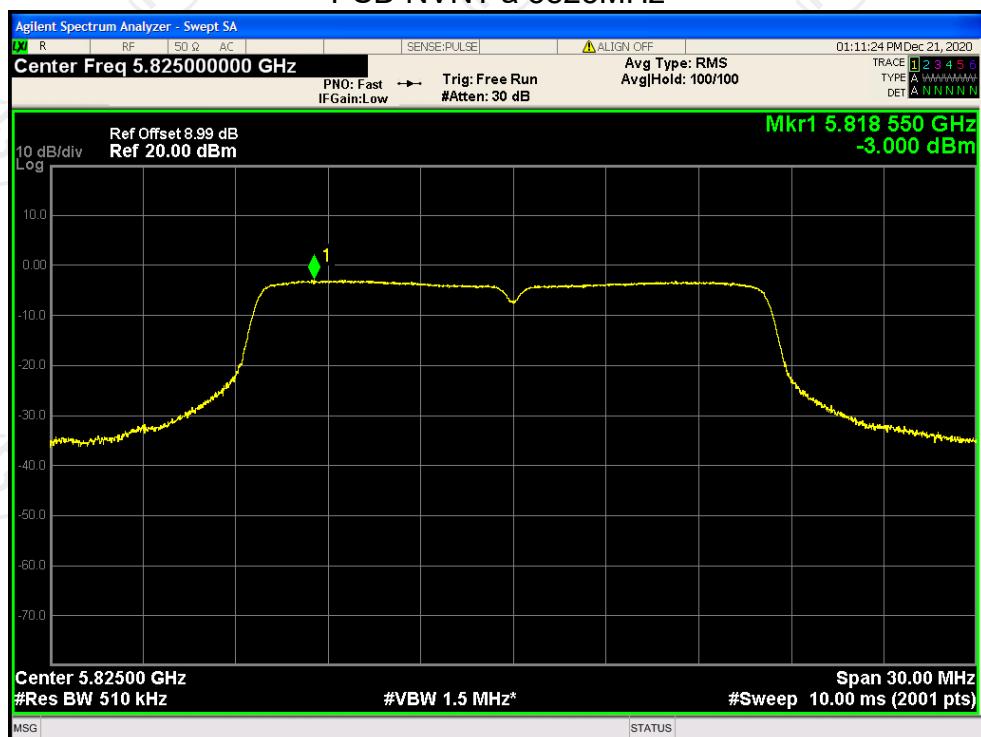
PSD NVNT a 5745MHz



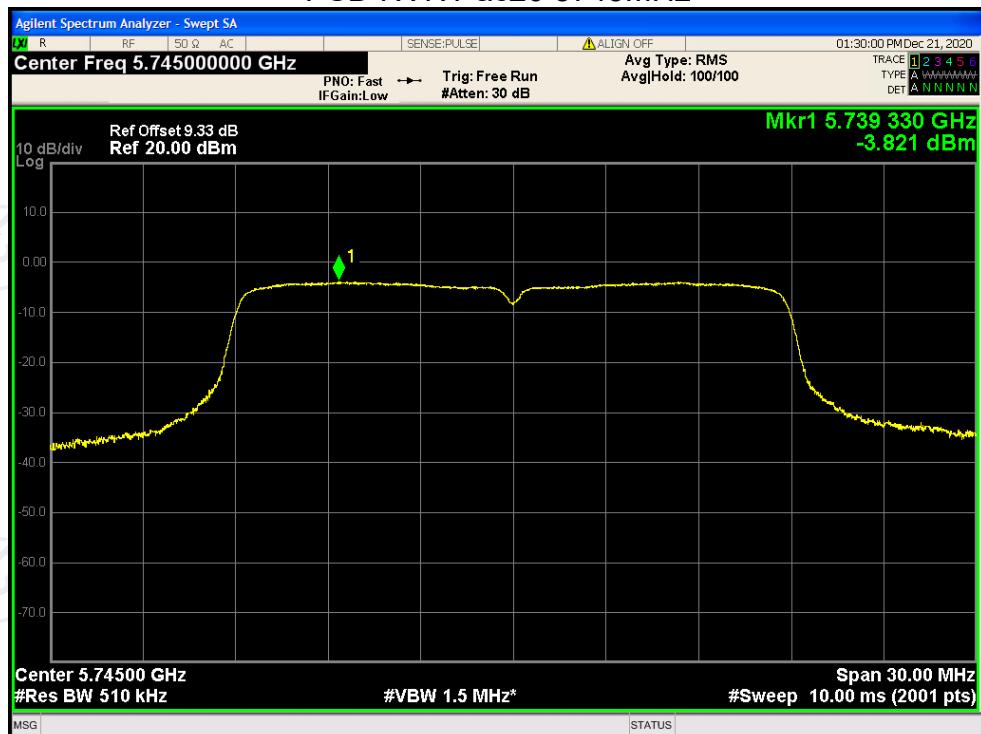
PSD NVNT a 5785MHz



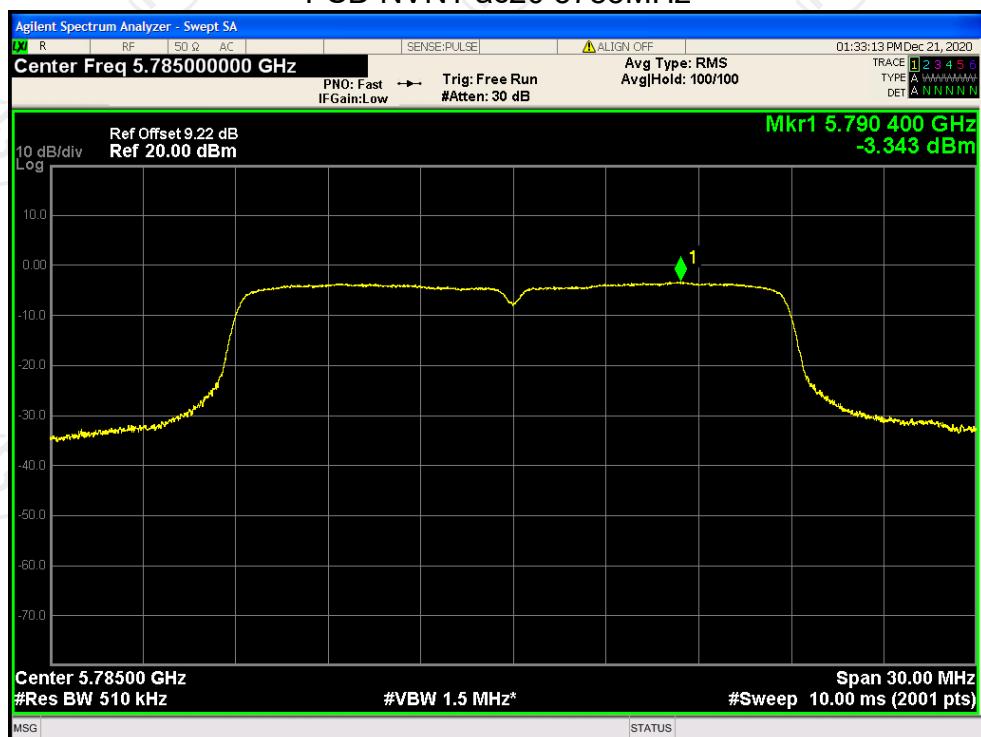
PSD NVNT a 5825MHz



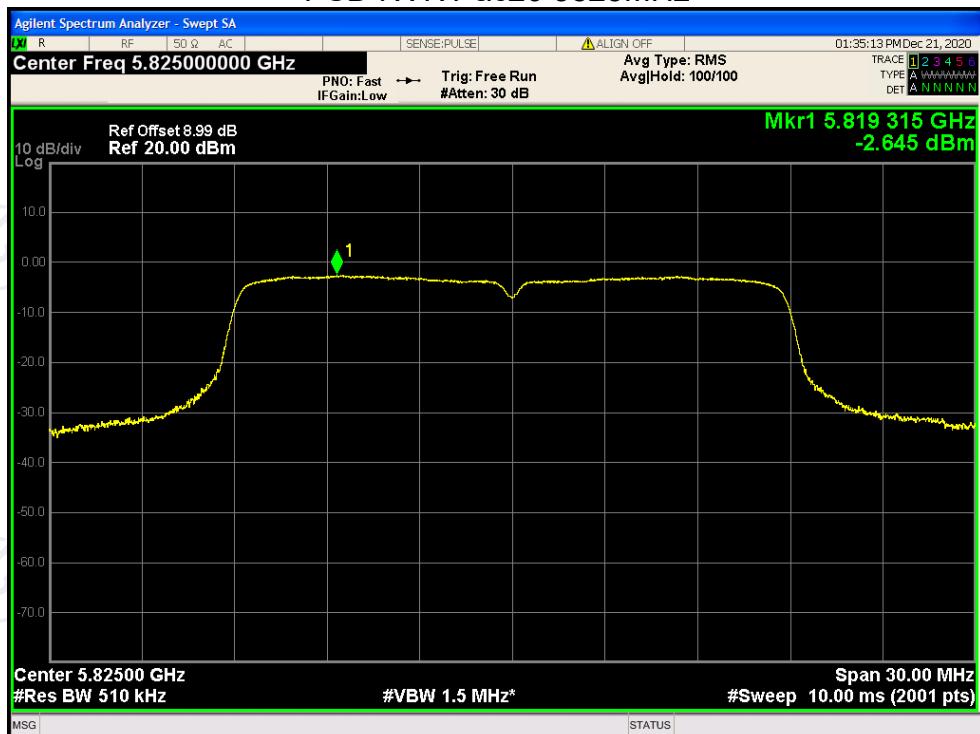
PSD NVNT ac20 5745MHz



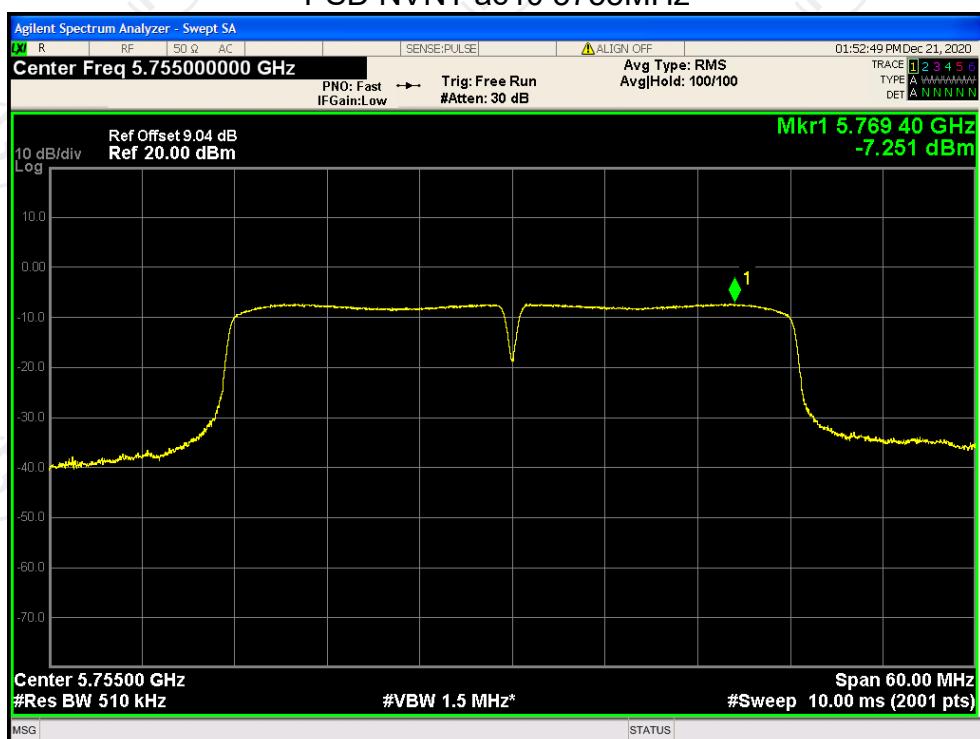
PSD NVNT ac20 5785MHz



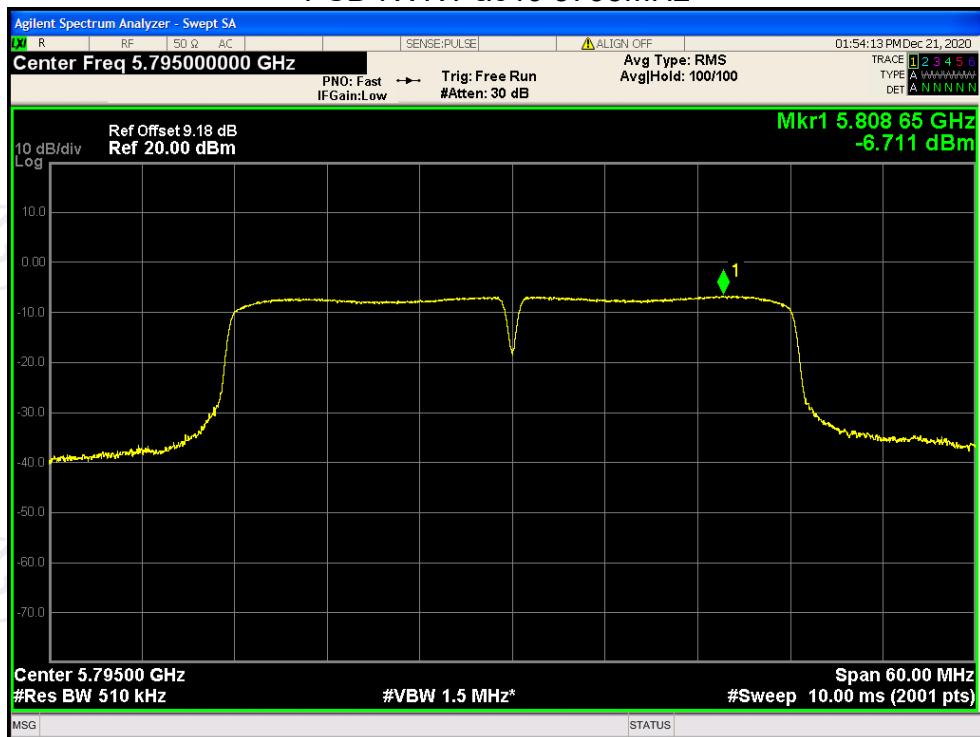
PSD NVNT ac20 5825MHz



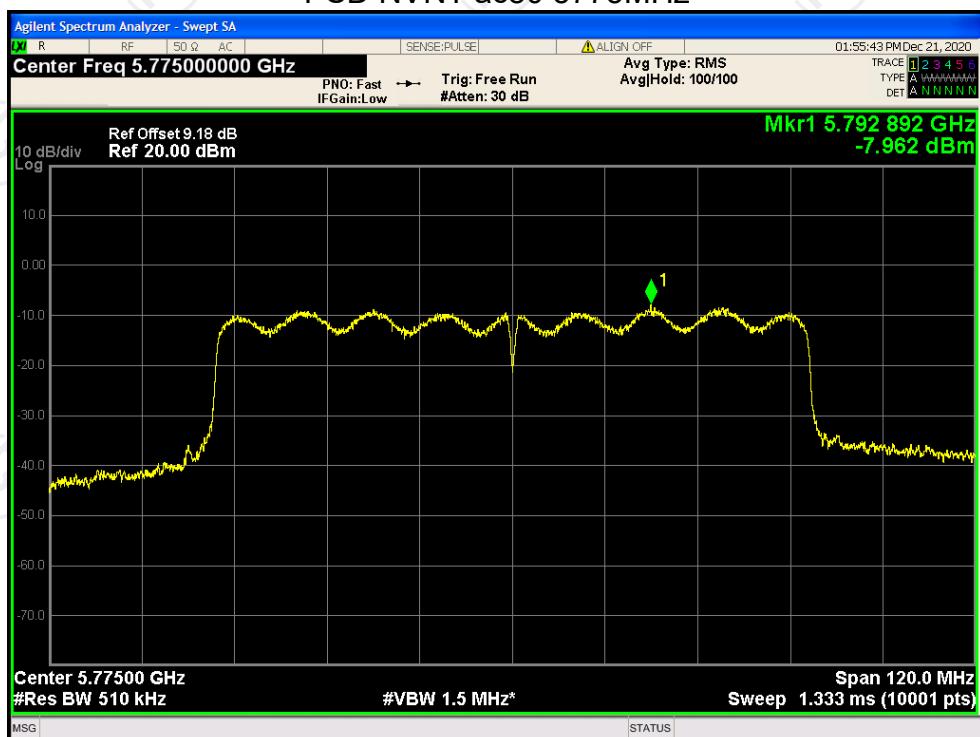
PSD NVNT ac40 5755MHz



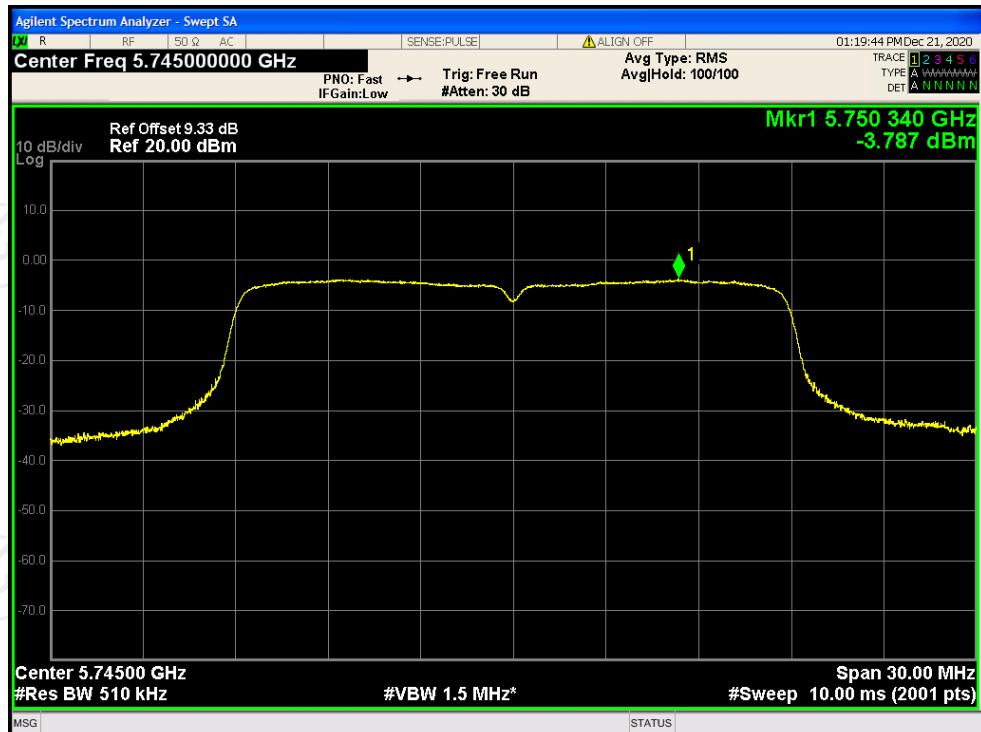
PSD NVNT ac40 5795MHz



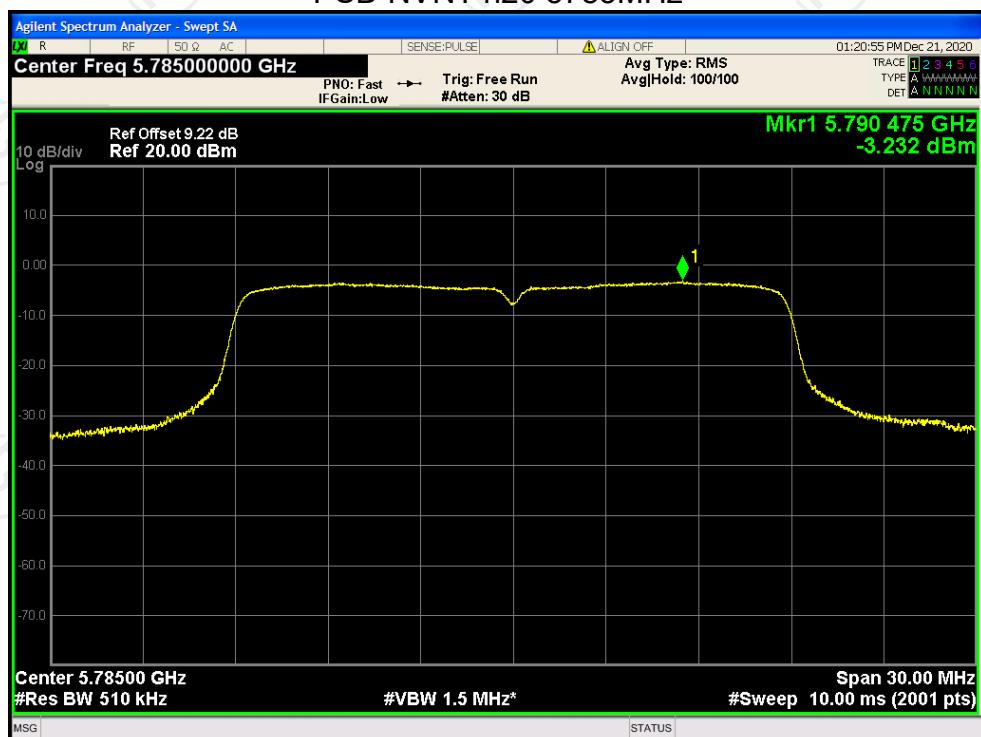
PSD NVNT ac80 5775MHz



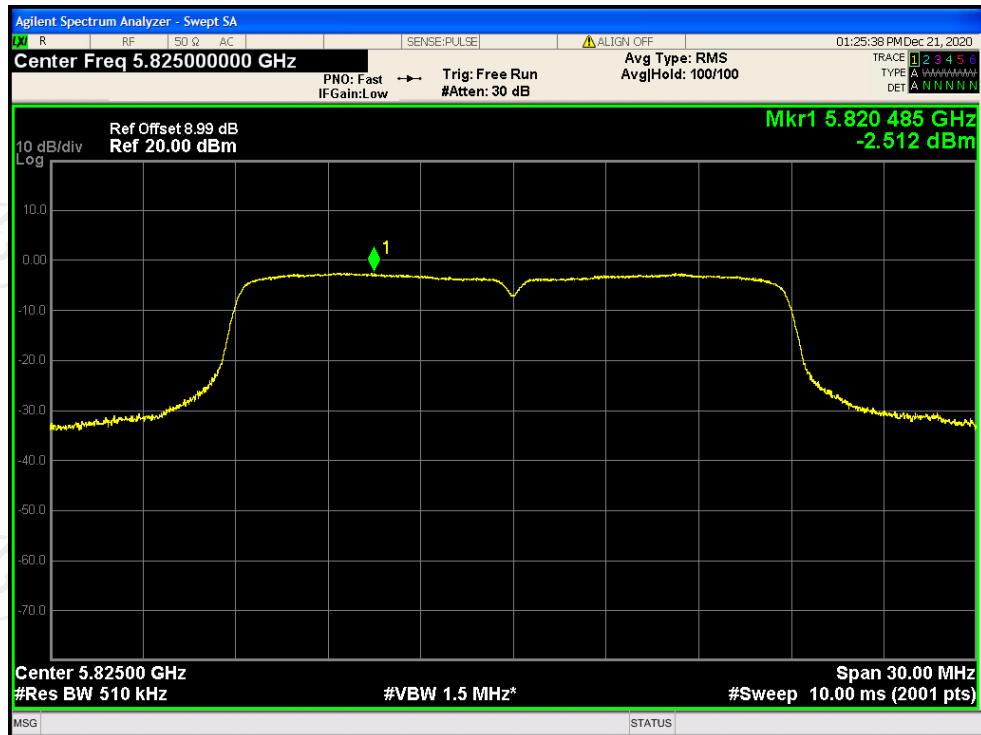
PSD NVNT n20 5745MHz



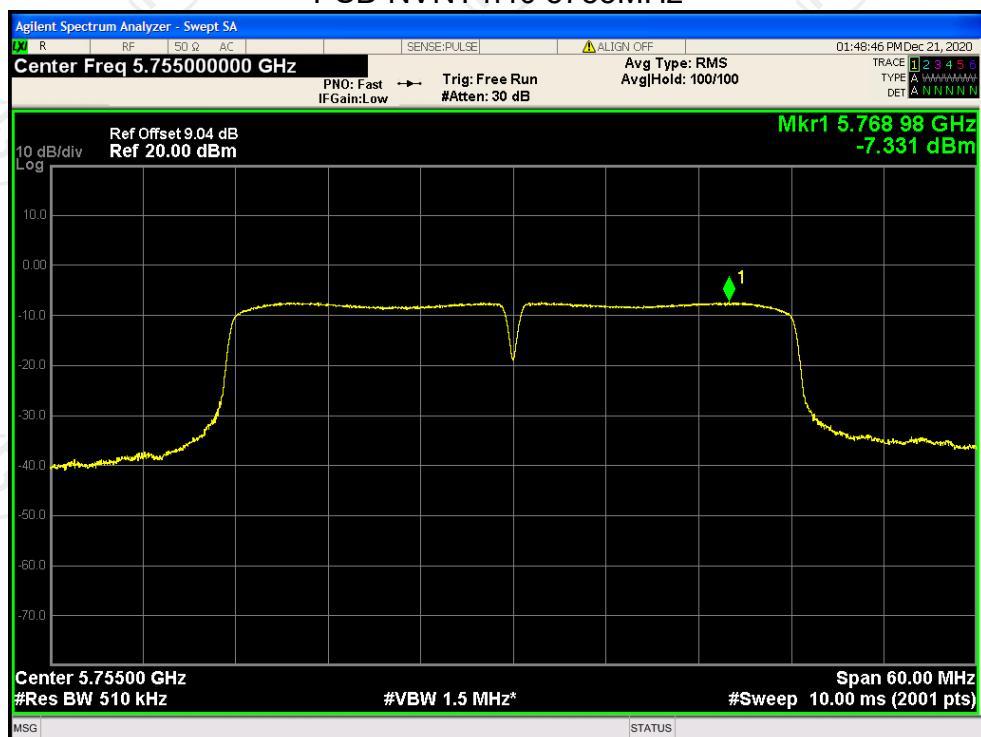
PSD NVNT n20 5785MHz



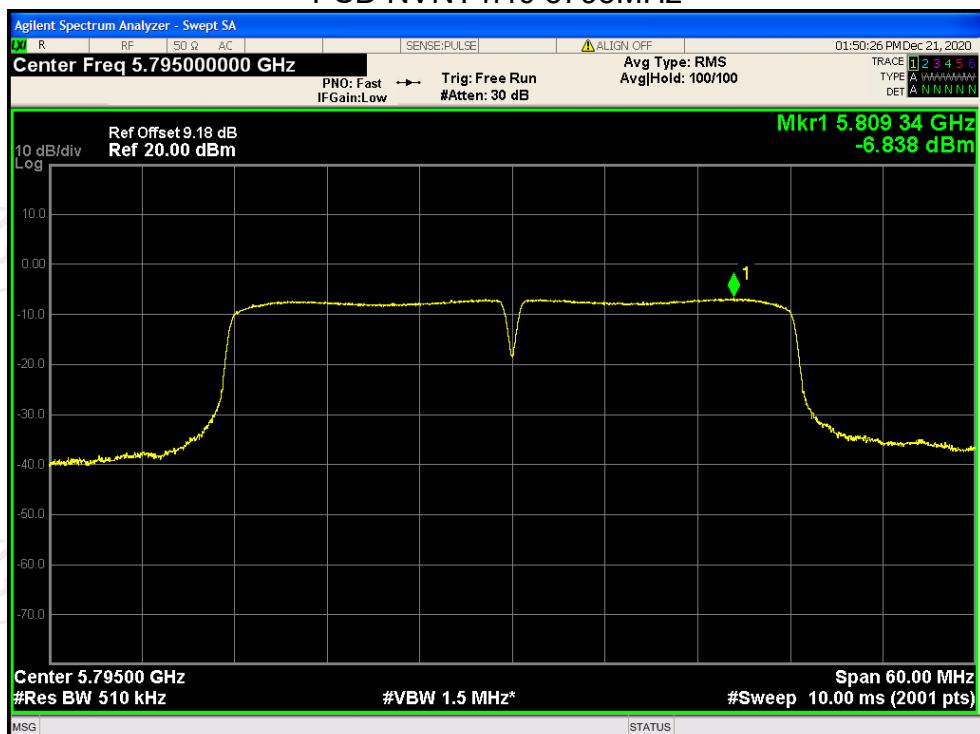
PSD NVNT n20 5825MHz



PSD NVNT n40 5755MHz



PSD NVNT n40 5795MHz



Appendix B: Photographs of Test Setup

Refer to the test report No. TCT201130E902

Appendix C: Photographs of EUT

Refer to the test report No. TCT201130E902

*****END OF REPORT*****