

FCC Test Report

Product Name	Portable Computer
Model No	P109F
FCC ID	E2K-P109F

Applicant	Dell Inc.
Address	One Dell Way, Round Rock, Texas 78682, USA

Date of Receipt	Dec. 22, 2020
Issued Date	Feb. 20, 2021
Report No.	20C0808R-E3032110126
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

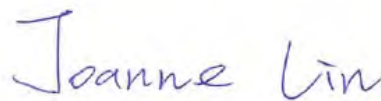
Issued Date: Feb. 20, 2021

Report No.: 20C0808R-E3032110126



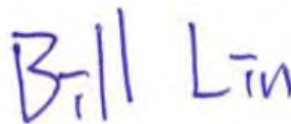
Product Name	Portable Computer
Applicant	Dell Inc.
Address	One Dell Way, Round Rock, Texas 78682, USA
Manufacturer	Dell Inc.
Model No.	P109F
FCC ID.	E2K-P109F
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	ALIENWARE
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E ANSI C63.4: 2014, ANSI C63.10: 2013 KDB Publication 789033
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Joanne Lin)

Tested By :



(Senior Engineer / Bill Lin)

Approved By :



(Director / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

Revision History

Report No.	Version	Description	Issued Date
20C0808R-E3032110126	V1.0	Initial issue of report.	Feb. 20, 2021

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Portable Computer
Trade Name	ALIENWARE
FCC ID.	E2K-P109F
Model No.	P109F
Frequency Range	802.11a/n/ax-20MHz: 5180-5320MHz, 5500-5700MHz, 5720 MHz, 5745-5825MHz 802.11n/ax-40MHz: 5190-5310MHz, 5510-5670MHz, 5710 MHz, 5755-5795MHz 802.11ac/ax-80MHz: 5210-5290MHz, 5530-5690MHz, 5775MHz 802.11ac/ax-160MHz: 5250MHz, 5570MHz
Number of Channels	802.11a/n/ax-20MHz: 25 802.11n/ax-40MHz: 12 802.11ac/ax-80MHz: 6 802.11ac/ax-160MHz: 2
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 1733.3Mbps 802.11ax: up to 2402Mbps
Type of Modulation	802.11a/n/ac/ax: OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Antenna Type	PIFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table "Antenna List"
Power Cable	Shielded, 1.8m
Power Adapter	MFR: DELL, M/N: HA240PM190 Input: AC 100-240V~5A, 50-60Hz Output: 19.5V=12.31A, 240.0W Cable Out: Shielded, 1.8m, with two ferrite cores bonded.

Antenna List

No.	Manufacturer	Part No.	Antenna type	Peak Gain
1	Hong-BO Co., Ltd.	260-24363 (DC33002IL0L) (Main) 260-24362 (DC33002IL1L) (Aux)	PIFA Antenna	-1.96dBi for 5.15~5.25GHz -1.05dBi for 5.25~5.35GHz -0.48dBi for 5.47~5.725GHz -0.29dBi for 5.725~5.85GHz
2	Wistron Neweb Corporation	DC33002IK0L (81EABG15.G09) (Main) DC33002IK1L (81EABG15.G10) (Aux)	PIFA Antenna	0.15dBi for 5.15~5.25GHz 0.95dBi for 5.25~5.35GHz 1.28dBi for 5.47~5.725GHz 1.28dBi for 5.725~5.85GHz

Note:

- (1) The antenna of EUT is conforming to FCC 15.203.
- (2) Only the higher gain antenna was tested and recorded in this report.

802.11a/n/ax-20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 036:	5180 MHz	Channel 040:	5200 MHz	Channel 044:	5220 MHz	Channel 048:	5240 MHz
Channel 052:	5260 MHz	Channel 056:	5280 MHz	Channel 060:	5300 MHz	Channel 064:	5320 MHz
Channel 100:	5500 MHz	Channel 104:	5520 MHz	Channel 108:	5540 MHz	Channel 112:	5560 MHz
Channel 116:	5580 MHz	Channel 120:	5600 MHz	Channel 124:	5620 MHz	Channel 128:	5640 MHz
Channel 132:	5660 MHz	Channel 136:	5680 MHz	Channel 140:	5700 MHz	Channel 144:	5720 MHz
Channel 149:	5745 MHz	Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz
Channel 165:	5825 MHz						

802.11n/ax-40MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 038:	5190 MHz	Channel 046:	5230 MHz	Channel 054:	5270 MHz	Channel 062:	5310 MHz
Channel 102:	5510 MHz	Channel 110:	5550 MHz	Channel 118:	5590 MHz	Channel 126:	5630 MHz
Channel 134:	5670 MHz	Channel 142:	5710 MHz	Channel 151:	5755 MHz	Channel 159:	5795 MHz

802.11ac/ax-80MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 042:	5210 MHz	Channel 058:	5290 MHz	Channel 106:	5530 MHz	Channel 122:	5610 MHz
Channel 138:	5690 MHz	Channel 155:	5775 MHz				

802.11ac/ax-160MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency
Channel 50:	5250 MHz	Channel 114:	5570 MHz

Note:

1. This device is an Portable Computer with a built-in WLAN (802.11a/b/g/n/ac/ax) with Bluetooth (5.0 and V3.0+HS, V2.1+EDR) transceiver, this report for 5GHz WLAN.
2. This report is based on the comprehensive requirements of KDB 996369 D02. The end product only evaluates RF power and spurious emissions. The original RF module test report is 181210-03.TR01, 181210-03.TR02, 181210-03.TR03.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report.
5. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance of transmitter with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.

Test Mode	Mode 1 SISO A: Transmit (802.11a_6Mbps)
	Mode 2 SISO A: Transmit (802.11n-20BW_7.2Mbps)
	Mode 3 SISO A: Transmit (802.11n-40BW_15Mbps)
	Mode 4 SISO A: Transmit (802.11ac-80BW_32.5Mbps)
	Mode 5 SISO A: Transmit (802.11ac-160BW_65Mbps)
	Mode 6 SISO A: Transmit (802.11ax-20BW_8.6Mbps)
	Mode 7 SISO A: Transmit (802.11ax-40BW_17.2Mbps)
	Mode 8 SISO A: Transmit (802.11ax-80BW_36Mbps)
	Mode 9 SISO A: Transmit (802.11ax-160BW_72.1Mbps)
	Mode 10 SISO B: Transmit (802.11a_6Mbps)
	Mode 11 SISO B: Transmit (802.11n-20BW_7.2Mbps)
	Mode 12 SISO B: Transmit (802.11n-40BW_15Mbps)
	Mode 13 SISO B: Transmit (802.11ac-80BW_32.5Mbps)
	Mode 14 SISO B: Transmit (802.11ac-160BW_65Mbps)
	Mode 15 SISO B Transmit (802.11ax-20BW_8.6Mbps)
	Mode 16 SISO B: Transmit (802.11ax-40BW_17.2Mbps)
	Mode 17 SISO B: Transmit (802.11ax-80BW_36Mbps)
	Mode 18 SISO B: Transmit (802.11ax-160BW_72.1Mbps)
	Mode 19 MIMO: Transmit (802.11n-20BW_14.4Mbps)
	Mode 20 MIMO: Transmit (802.11n-40BW_30Mbps)
	Mode 21 MIMO: Transmit (802.11ac-80BW_65Mbps)
	Mode 22 MIMO: Transmit (802.11ac-160BW_130Mbps)
	Mode 23 MIMO: Transmit (802.11ax-20BW_17.2Mbps)
	Mode 24 MIMO: Transmit (802.11ax-40BW_34.4Mbps)
	Mode 25 MIMO: Transmit (802.11ax-80BW_72.1Mbps)
	Mode 26 MIMO: Transmit (802.11ax-160BW_144.1Mbps)
	Mode 27 SISO A: Transmit (802.11ax-20BW_8.6Mbps) (Partial RU)
	Mode 28 SISO A: Transmit (802.11ax-40BW_17.2Mbps) (Partial RU)
	Mode 29 SISO A: Transmit (802.11ax-80BW_36Mbps) (Partial RU)
	Mode 30 SISO A: Transmit (802.11ax-160BW_72.1Mbps) (Partial RU)
	Mode 31 SISO B Transmit (802.11ax-20BW_8.6Mbps) (Partial RU)
	Mode 32 SISO B: Transmit (802.11ax-40BW_17.2Mbps) (Partial RU)
	Mode 33 SISO B: Transmit (802.11ax-80BW_36Mbps) (Partial RU)
	Mode 34 SISO B: Transmit (802.11ax-160BW_72.1Mbps) (Partial RU)
	Mode 35 MIMO: Transmit (802.11ax-20BW_17.2Mbps) (Partial RU)
	Mode 36 MIMO: Transmit (802.11ax-40BW_34.4Mbps) (Partial RU)
	Mode 37 MIMO: Transmit (802.11ax-80BW_72.1Mbps) (Partial RU)
	Mode 38 MIMO: Transmit (802.11ax-160BW_144.1Mbps) (Partial RU)
	Mode 39: Transmit-SISO A
	Mode 40: Transmit-SISO B
	Mode 41: Transmit-MIMO

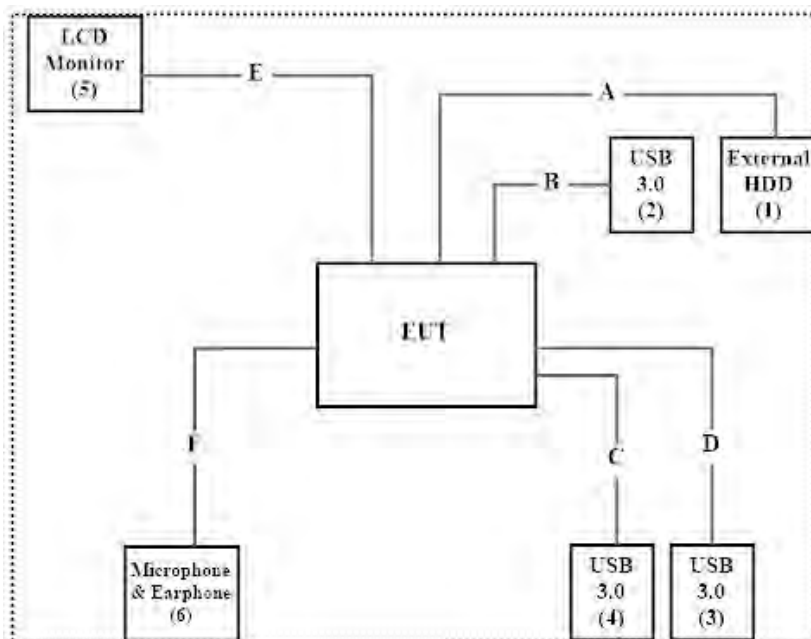
1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 External HDD	SanDisk	SanDisk Extreme 900	N/A	N/A
2 USB 3.0	Transcend	TS1TSJ25M3	D468623806	N/A
3 USB 3.0	Transcend	TS1TSJ25M3	D468623815	N/A
4 USB 3.0	Transcend	TS1TSJ25M3	D468623807	N/A
5 LCD Monitor	Lenovo	T24d	V5CZ4279	N/A
6 Microphone & Earphone	Verbatim	C09024VB	N/A	N/A

Signal Cable Type	Signal cable Description
A USB Cable	Shielded, 0.5m
B USB Cable	Shielded, 0.4m
C USB Cable	Shielded, 0.4m
D USB Cable	Shielded, 0.4m
E HDMI Cable	Shielded, 1.8m
F Microphone & Earphone Cable	Non-shielded, 2.0m

1.3. Configuration of tested System



1.4. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.3.
- (2) Execute software "DRTU Ver. 22.3500.0.0-01462" on the EUT.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press "OK" to start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	22°C
	Humidity (%RH)	10~90 %	44.3%
Radiated Emission	Temperature (°C)	10~40 °C	16.8°C
	Humidity (%RH)	10~90 %	60.9%
Conductive	Temperature (°C)	10~40 °C	20.4°C
	Humidity (%RH)	10~90 %	51.2%

USA : FCC Registration Number: TW0023

Canada : IC Registration Number: 25880

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No.159, Sec. 2, Wenhua 1st Rd., Linkou Dist.,
New Taipei City 24457, Taiwan, R.O.C.

Phone number : 886-2-2602-7968
Fax number : 866-2-2602-3286
Email address : info.tw@dekra.com
Website : <http://www.dekra.com.tw>

1.6. List of Test Item and Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	101601	2020.05.28	2021.05.27
X	Two-Line V-Network	R&S	ENV216	101306	2020.03.25	2021.03.24
X	Two-Line V-Network	R&S	ENV216	101307	2020.04.17	2021.04.16
X	Coaxial Cable	DEKRA	RG400_BNC	RF001	2020.05.24	2021.05.23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0

For Conducted measurements /ASR2

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103466	2020.12.28	2021.12.27
X	Peak Power Analyzer	KEYSIGHT	8900B	MY51000539	2020.05.13	2021.05.12
X	Power Sensor	KEYSIGHT	N1923A	MY59240002	2020.05.22	2021.05.21
X	Power Sensor	KEYSIGHT	N1923A	MY59240003	2020.05.22	2021.05.21

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test System V9.0.5

For Radiated measurements /ACB1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	AMETEK	HLA6121	49611	2020.03.16	2021.03.15
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2020.05.20	2021.05.19
X	Horn Antenna	ETS-Lindgren	3117	00201259	2020.10.23	2021.10.22
X	Horn Antenna	Com-Power	AH-840	101087	2020.06.08	2021.06.07
X	Pre-Amplifier	EMCI	EMC001330	980316	2020.06.23	2021.06.22
X	Pre-Amplifier	EMCI	EMC051835SE	980313	2020.11.25	2021.11.24
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2020.06.24	2021.06.23
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2020.06.10	2021.06.09
	Filter	MICRO TRONICS	BRM50702	G251	2020.09.17	2021.09.16
X	Filter	MICRO TRONICS	BRM50716	G188	2020.09.17	2021.09.16
X	EMI Test Receiver	R&S	ESR7	101601	2020.05.28	2021.05.27
X	Spectrum Analyzer	R&S	FSV40	101148	2020.03.16	2021.03.15
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2020.07.03	2021.07.02
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2020.06.10	2021.06.09

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

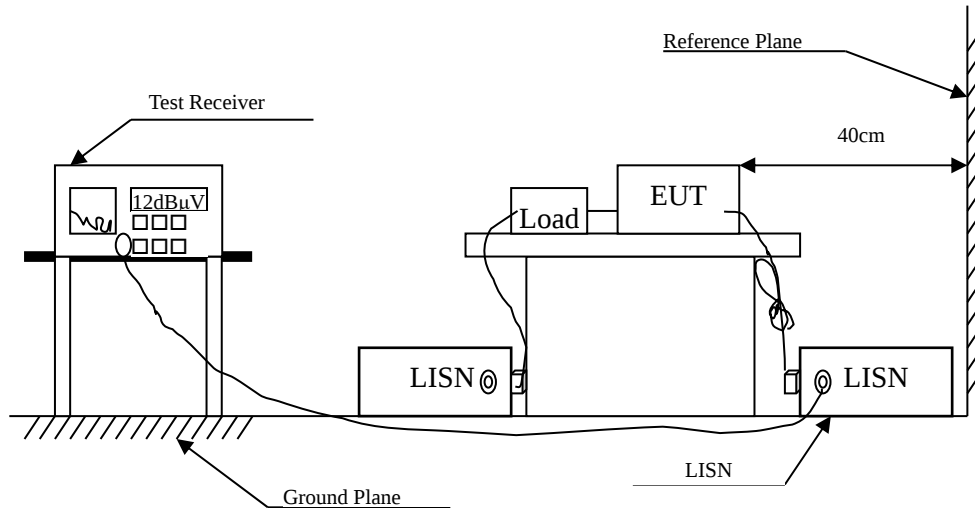
Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Maximun conducted output power	Power Meter ± 0.91 dB	Spectrum Analyzer ± 2.53 dB
Radiated Emission	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB
Duty Cycle	± 2.31 msec	

1.8. Summary of Test Results

Description	Result
Conducted Emission	Pass
Maximun conducted output power	Pass
Peak Power Spectral Density	Refer to Note 1
Radiated Emission	Pass
Band Edge	Refer to Note 1
Occupied Bandwidth	Refer to Note 1
Duty Cycle	--
Note 1 : This report is a partial report. The test items above were based on the comprehensive requirements of KDB 996369 D02 in which only RF power, Transmitter unwanted emissions and Receiver spurious emissions were performed. For other test data please refer to original modular report. (Original report no.: 181210-03.TR01, 181210-03.TR02, 181210-03.TR03, Brand: Intel® Wi-Fi 6 AX200, Model: AX200NGW)	

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

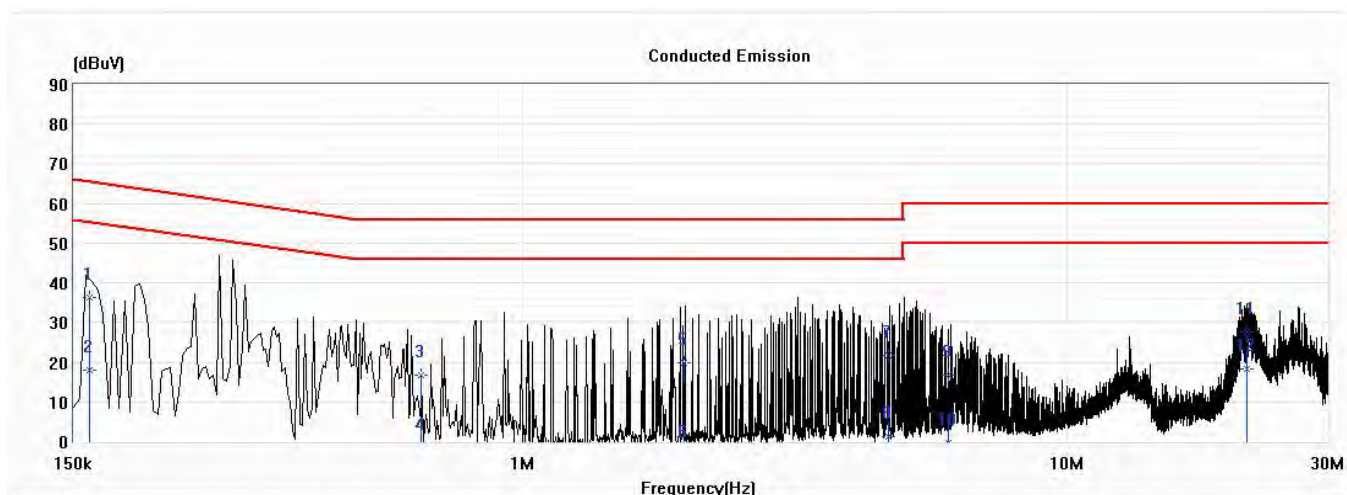
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

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 C63.4:2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Test Result of Conducted Emission

Product : Portable Computer
 Test Item : Conducted Emission Test
 Power Line : L 1
 Test Mode : Mode 26 MIMO: Transmit (802.11ax-160BW_144.1Mbps) (5250MHz)
 Test Date : 2021/02/20

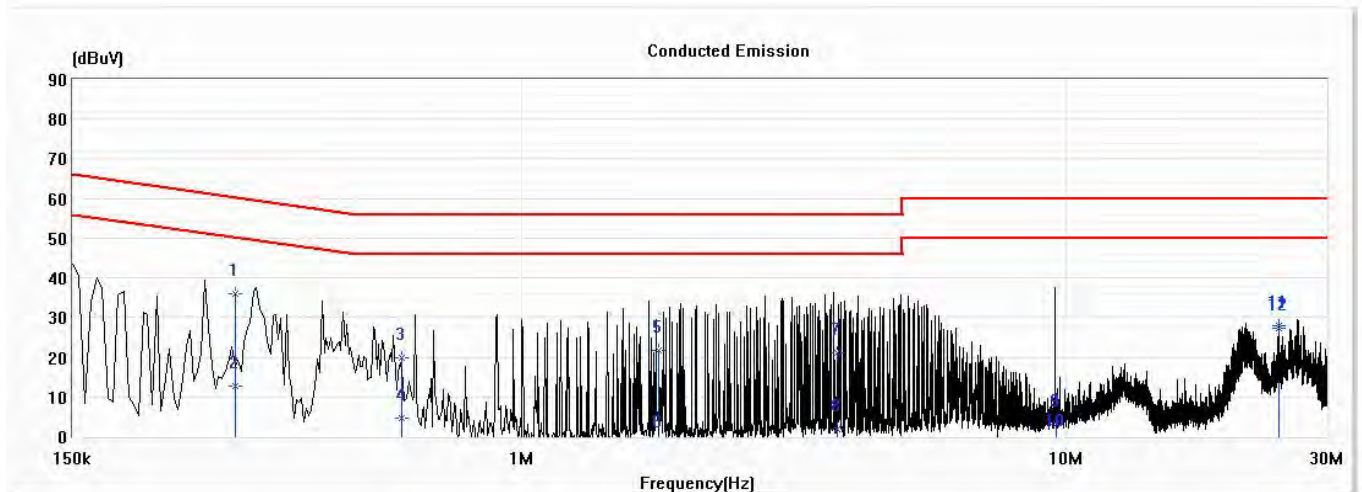


No	Frequency (MHz)	Emission Level (dBμV)	Limit (dBμV)	Margin (dB)	Reading Level (dBμV)	Correct Factor (dB)	Detector Type
*1	0.160	36.34	65.46	-29.12	26.68	9.66	QP
2	0.160	18.08	55.46	-37.37	8.43	9.66	AV
3	0.652	16.91	56.00	-39.09	7.24	9.67	QP
4	0.652	-1.70	46.00	-47.70	-11.37	9.67	AV
5	1.975	19.97	56.00	-36.03	10.25	9.72	QP
6	1.975	-3.38	46.00	-49.38	-13.10	9.72	AV
7	4.690	21.82	56.00	-34.18	12.03	9.79	QP
8	4.690	1.31	46.00	-44.69	-8.48	9.79	AV
9	6.036	16.74	60.00	-43.26	6.93	9.82	QP
10	6.036	-0.16	50.00	-50.16	-9.97	9.82	AV
11	21.374	27.56	60.00	-32.44	17.59	9.97	QP
12	21.374	18.44	50.00	-31.56	8.48	9.97	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Portable Computer
 Test Item : Conducted Emission Test
 Power Line : N
 Test Mode : Mode 26 MIMO: Transmit (802.11ax-160BW_144.1Mbps) (5250MHz)
 Test Date : 2021/02/20

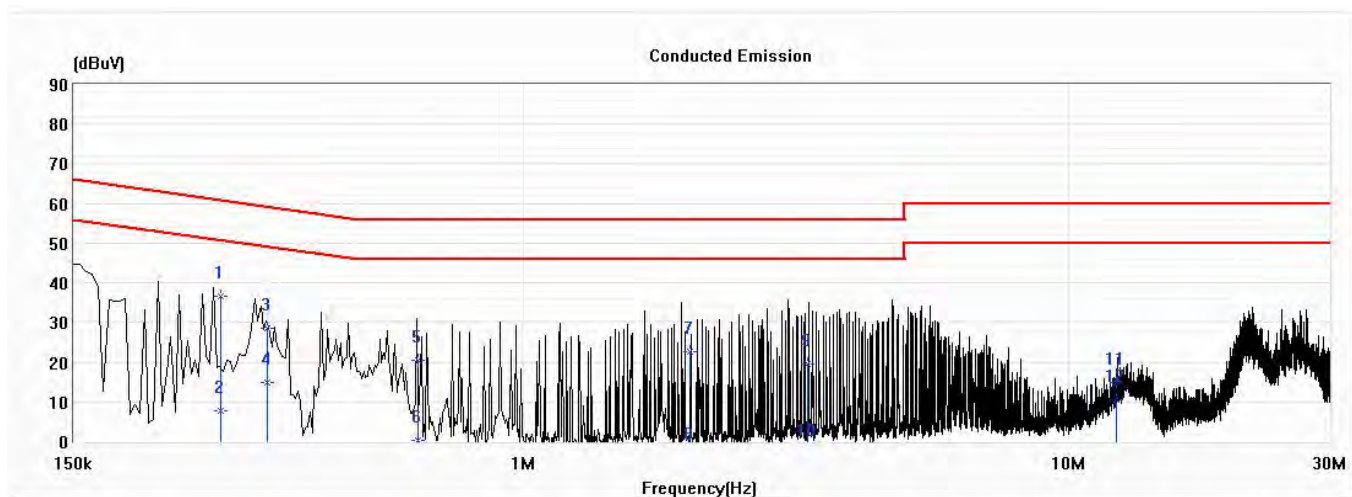


No	Frequency (MHz)	Emission Level (dBμV)	Limit (dBμV)	Margin (dB)	Reading Level (dBμV)	Correct Factor (dB)	Detector Type
1	0.298	36.00	60.29	-24.29	26.33	9.67	QP
2	0.298	12.83	50.29	-37.46	3.16	9.67	AV
3	0.601	19.92	56.00	-36.08	10.25	9.67	QP
4	0.601	4.59	46.00	-41.41	-5.08	9.67	AV
5	1.780	21.65	56.00	-34.35	11.93	9.72	QP
6	1.780	-2.05	46.00	-48.05	-11.77	9.72	AV
7	3.796	21.10	56.00	-34.90	11.33	9.78	QP
8	3.796	1.90	46.00	-44.10	-7.88	9.78	AV
9	9.572	3.19	60.00	-56.81	-6.71	9.91	QP
10	9.572	-1.86	50.00	-51.86	-11.76	9.91	AV
11	24.577	28.03	60.00	-31.97	17.96	10.08	QP
*12	24.577	27.43	50.00	-22.57	17.35	10.08	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Portable Computer
 Test Item : Conducted Emission Test
 Power Line : L 1
 Test Mode : Mode 26 MIMO: Transmit (802.11ax-160BW_144.1Mbps) (5570MHz)
 Test Date : 2021/02/20

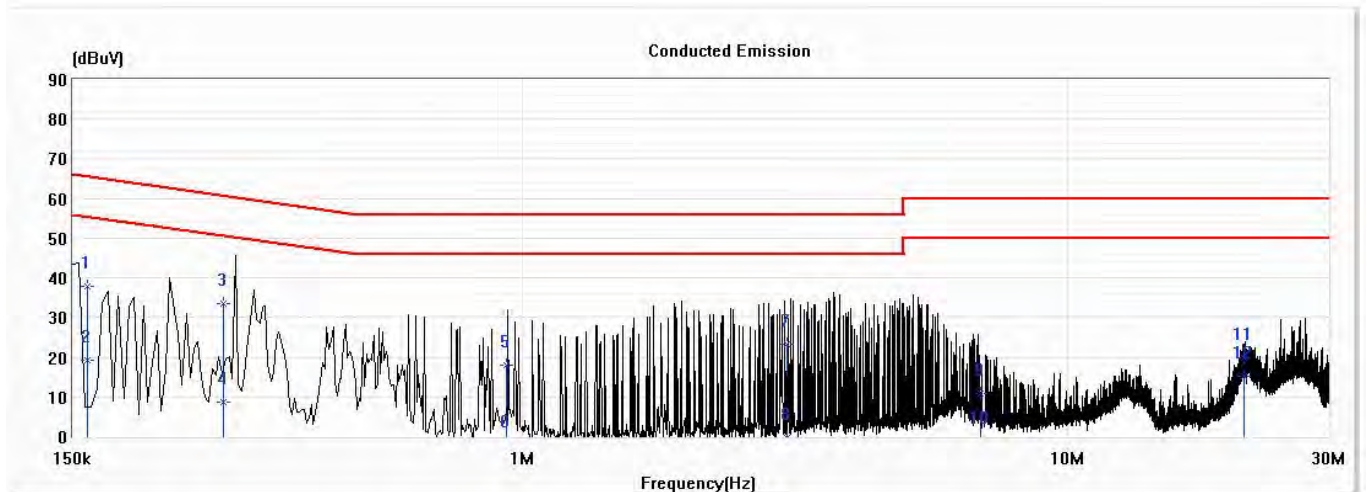


No	Frequency (MHz)	Emission Level (dBμV)	Limit (dBμV)	Margin (dB)	Reading Level (dBμV)	Correct Factor (dB)	Detector Type
*1	0.279	36.60	60.85	-24.25	26.94	9.65	QP
2	0.279	7.88	50.85	-42.97	-1.77	9.65	AV
3	0.340	28.49	59.21	-30.72	18.83	9.66	QP
4	0.340	15.01	49.21	-34.20	5.36	9.66	AV
5	0.640	20.45	56.00	-35.55	10.78	9.67	QP
6	0.640	0.38	46.00	-45.62	-9.29	9.67	AV
7	2.019	22.71	56.00	-33.29	12.99	9.72	QP
8	2.019	-4.04	46.00	-50.04	-13.76	9.72	AV
9	3.309	19.66	56.00	-36.34	9.91	9.76	QP
10	3.309	-2.97	46.00	-48.97	-12.72	9.76	AV
11	12.197	14.96	60.00	-45.04	5.05	9.92	QP
12	12.197	10.63	50.00	-39.37	0.72	9.92	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Portable Computer
 Test Item : Conducted Emission Test
 Power Line : N
 Test Mode : Mode 26 MIMO: Transmit (802.11ax-160BW_144.1Mbps) (5570MHz)
 Test Date : 2021/02/20



No	Frequency (MHz)	Emission Level (dBμV)	Limit (dBμV)	Margin (dB)	Reading Level (dBμV)	Correct Factor (dB)	Detector Type
1	0.159	37.86	65.50	-27.64	28.19	9.67	QP
2	0.159	19.35	55.50	-36.15	9.68	9.67	AV
*3	0.284	33.41	60.70	-27.29	23.74	9.67	QP
4	0.284	8.57	50.70	-42.14	-1.10	9.67	AV
5	0.934	18.04	56.00	-37.96	8.35	9.69	QP
6	0.934	-2.19	46.00	-48.19	-11.88	9.69	AV
7	3.058	23.27	56.00	-32.73	13.51	9.76	QP
8	3.058	-0.37	46.00	-46.37	-10.13	9.76	AV
9	6.911	10.71	60.00	-49.29	0.86	9.85	QP
10	6.911	-1.10	50.00	-51.10	-10.95	9.85	AV
11	21.052	19.97	60.00	-40.03	9.92	10.06	QP
12	21.052	15.23	50.00	-34.77	5.17	10.06	AV

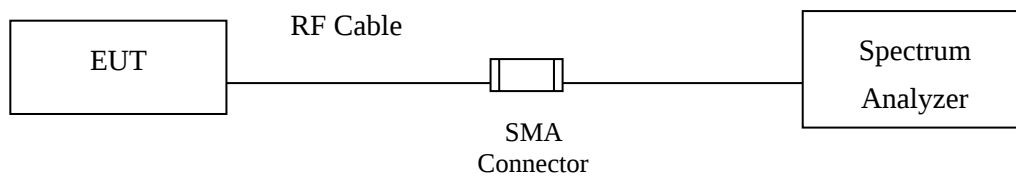
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

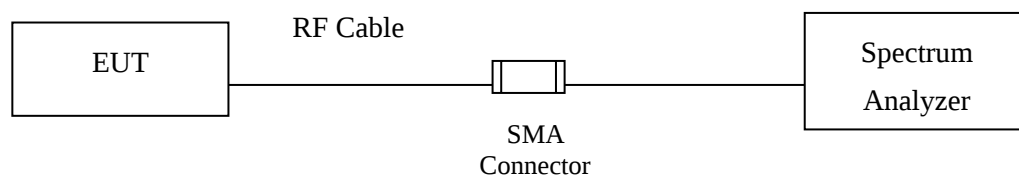
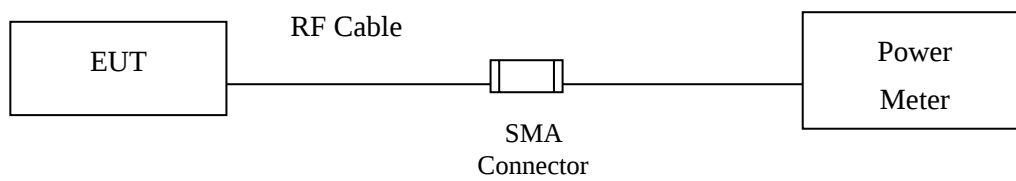
3. Maximun conducted output power

3.1. Test Setup

Occupied Bandwidth



Conduction Power Measurement



3.2. Limits

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 conducted output power over the frequency band of operation shall not exceed 1 W. provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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 conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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 conducted output power over the frequency band of operation shall not exceed 1 W. 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. 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 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 mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. 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.

3.3. Test Procedure

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was measured with an average power meter employing a video bandwidth greater the 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

802.11an (BW $\leq$ 40MHz) Maximum conducted output power using KDB 789033 section E)3)b)
Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth.

802.11ac (BW=80MHz) Maximum conducted output power using KDB 789033 section E)2)b)
Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D03 section D) procedure is used for measurements.

3.4. Test Result of Maximum conducted output power

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 1 SISO A: Transmit (802.11a_6Mbps)

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
		Measurement Level (dBm)							
36	5180	18.85	--	--	--	--	--	--	--
40	5200	20.77	20.7	20.66	20.58	20.51	20.45	20.42	20.35
48	5240	20.95	--	--	--	--	--	--	--
52	5260	20.9	--	--	--	--	--	--	--
56	5280	21.09	20.99	20.89	20.86	20.81	20.71	20.68	20.61
64	5320	18.25	--	--	--	--	--	--	--
100	5500	18.89	--	--	--	--	--	--	--
120	5600	20.94	20.85	20.82	20.77	20.72	20.65	20.58	20.51
140	5700	18.8	--	--	--	--	--	--	--
149	5745	20.98	--	--	--	--	--	--	--
157	5785	20.92	20.84	20.74	20.68	20.62	20.52	20.44	20.41
165	5825	20.63	--	--	--	--	--	--	--

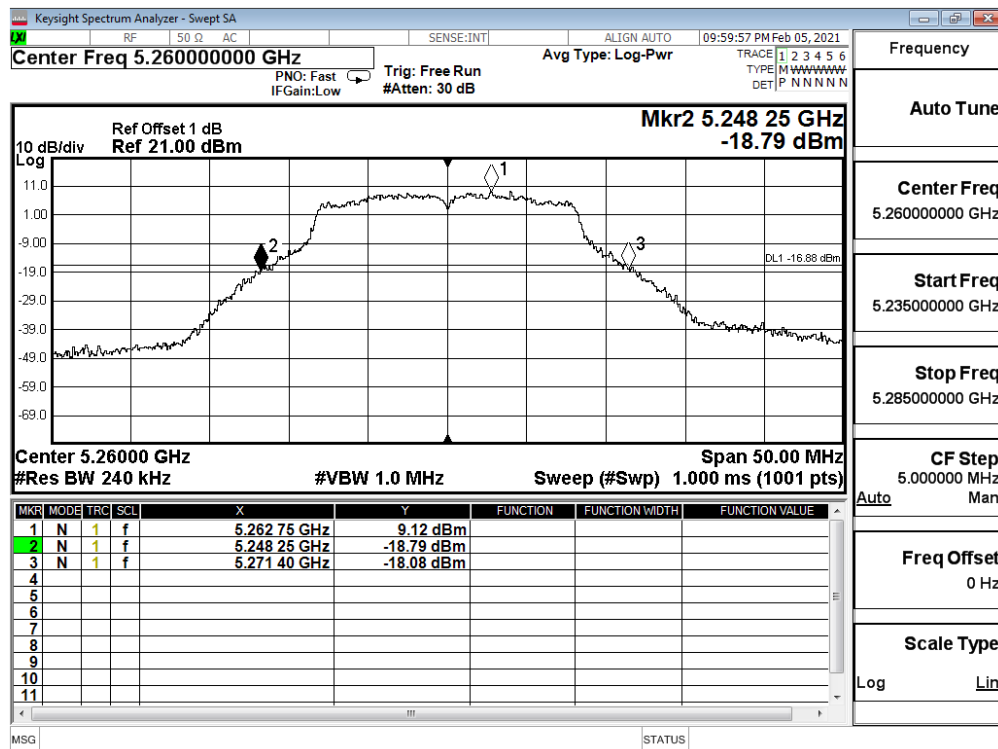
Note: Maximum conducted output power Value = Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

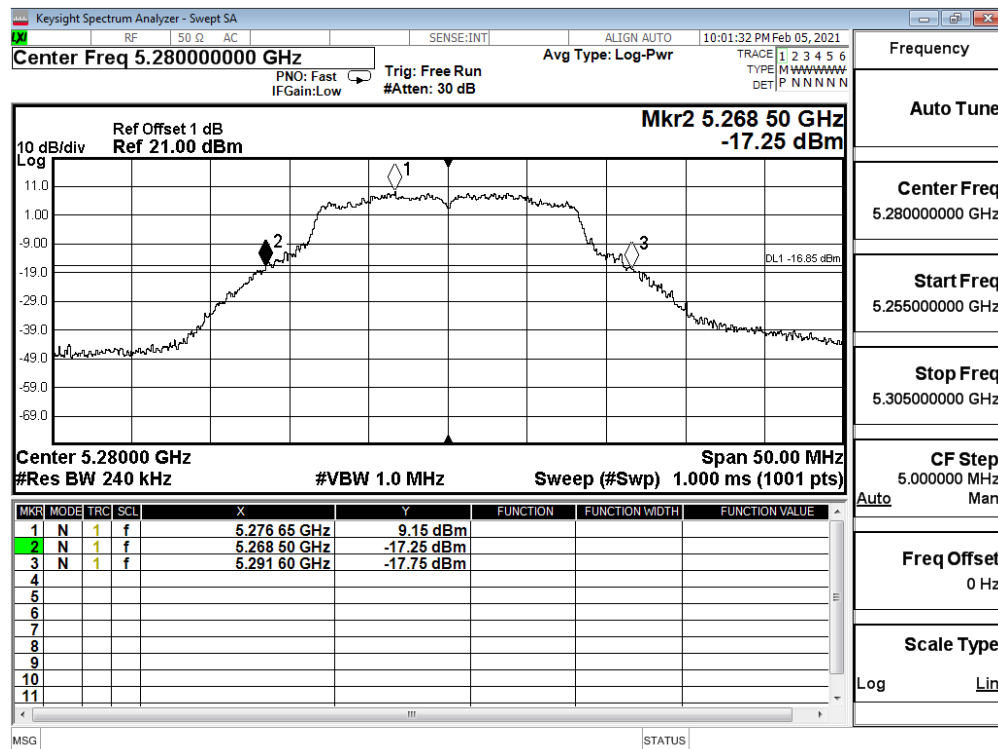
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
36	5180	--	18.85	24	--	Pass
40	5200	--	20.77	24	--	Pass
48	5240	--	20.95	24	--	Pass
52	5260	23.15	20.90	24	24.65	Pass
56	5280	23.10	21.09	24	24.64	Pass
64	5320	23.55	18.25	24	24.72	Pass
100	5500	26.85	18.89	24	25.29	Pass
120	5600	22.95	20.94	24	24.61	Pass
140	5700	27.20	18.80	24	25.35	Pass
149	5745	--	20.98	30	--	Pass
157	5785	--	20.92	30	--	Pass
165	5825	--	20.63	30	--	Pass

26dB Occupied Bandwidth:

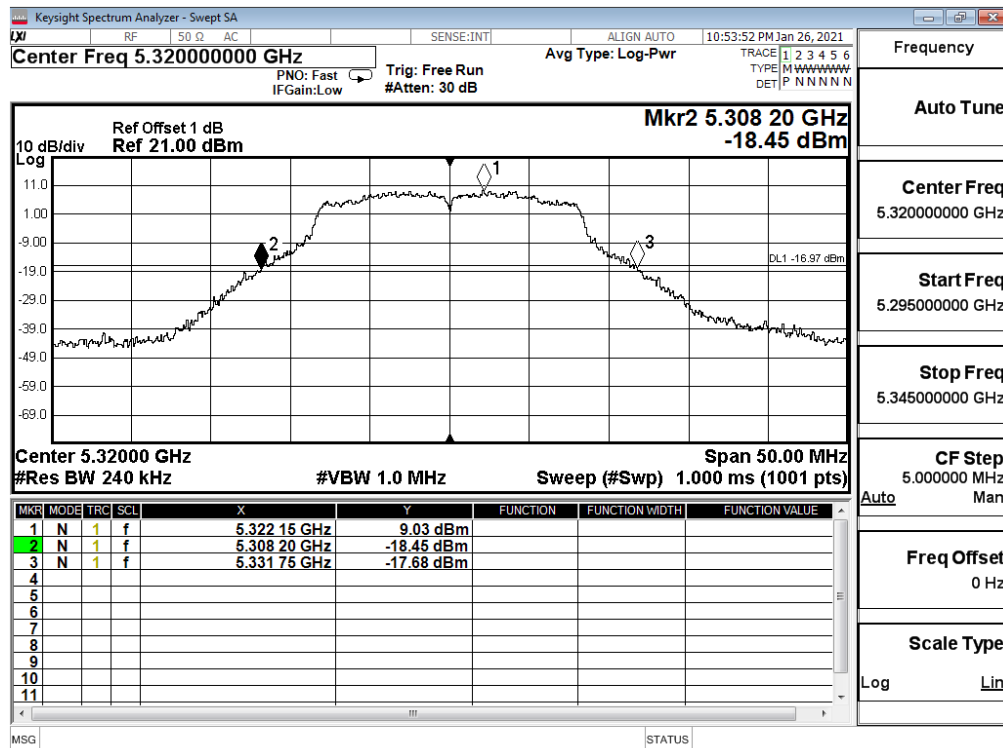
Channel 52



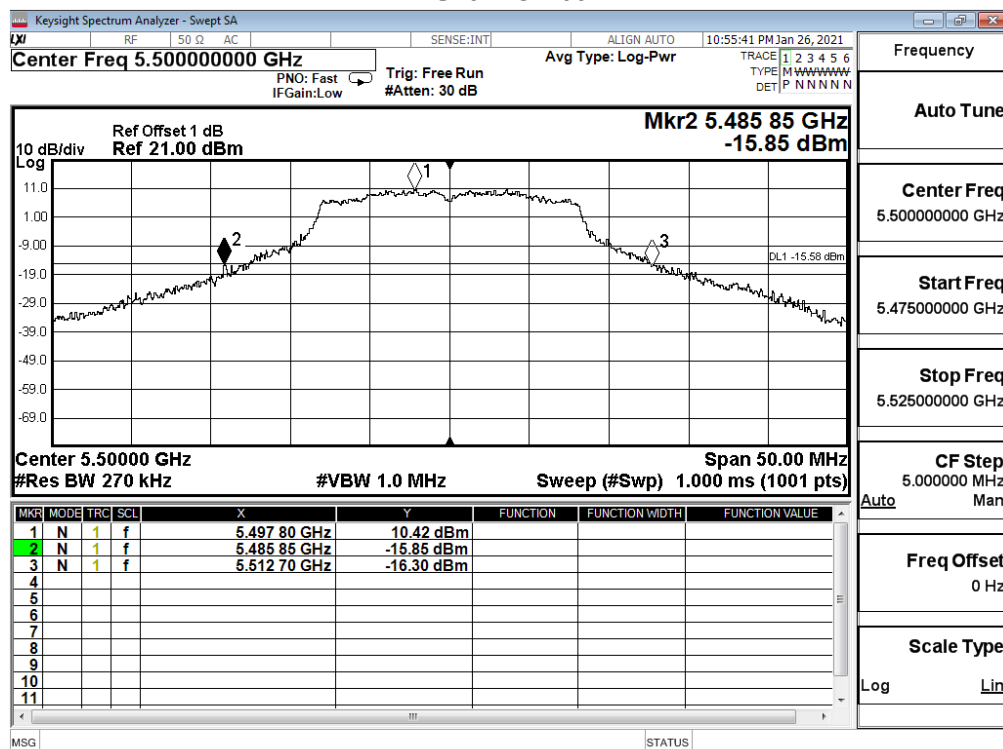
Channel 56



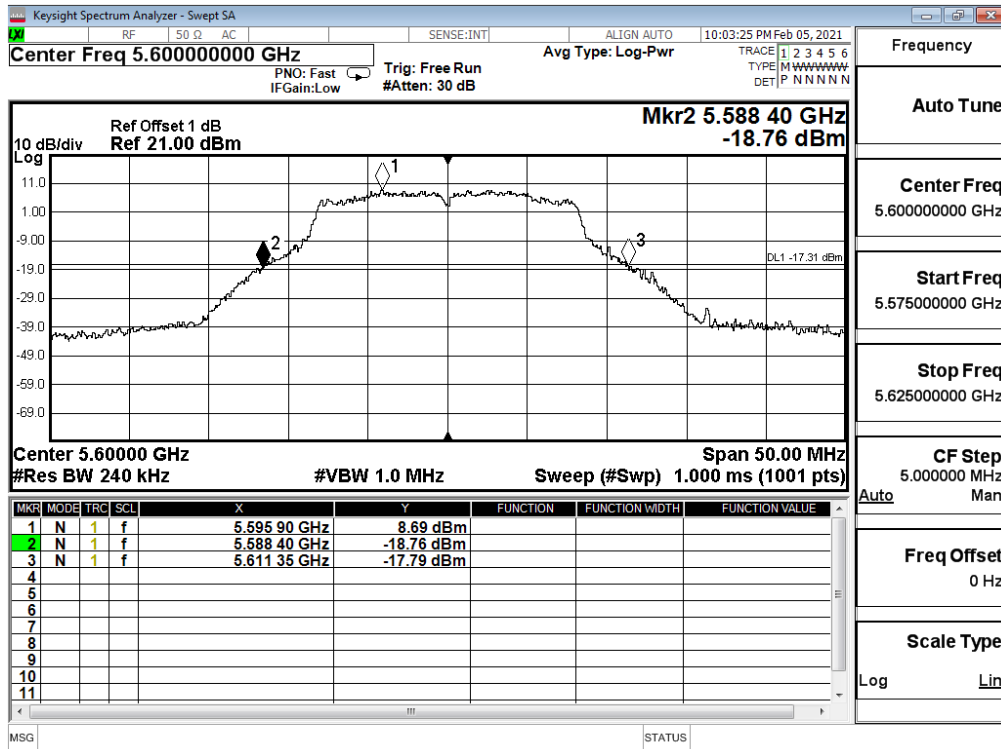
Channel 64



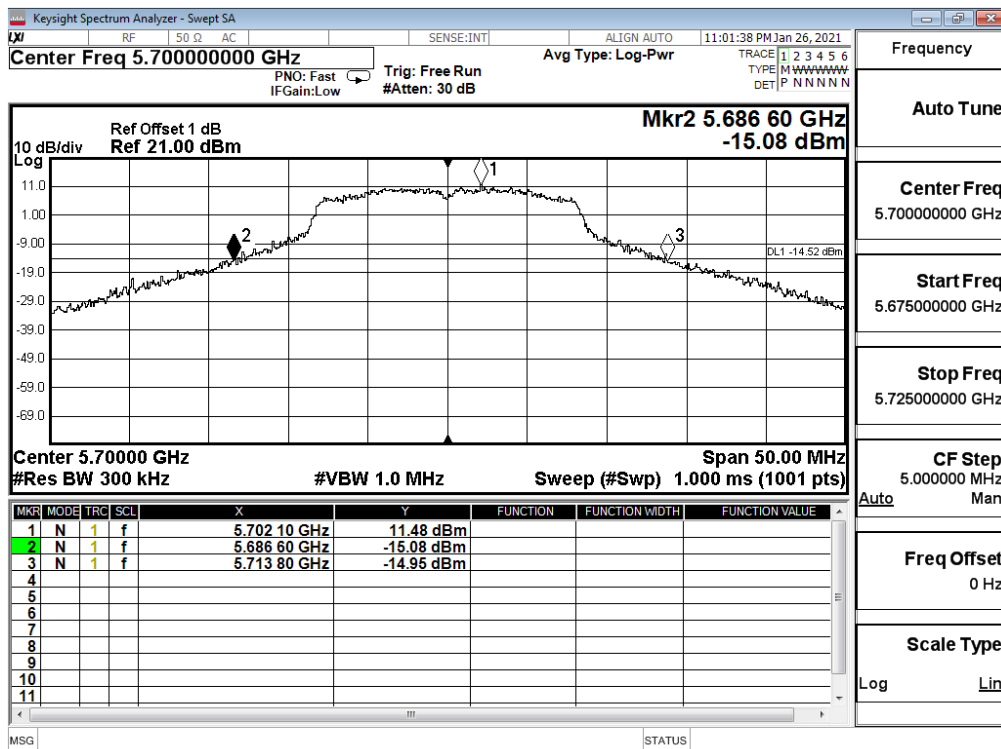
Channel 100



Channel 120



Channel 140



Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 2 SISO A: Transmit (802.11n-20BW_7.2Mbps)

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2
		Measurement Level (dBm)							
36	5180	18.81	--	--	--	--	--	--	--
40	5200	20.73	20.64	20.61	20.51	20.42	20.34	20.24	20.17
48	5240	20.75	--	--	--	--	--	--	--
52	5260	20.96	--	--	--	--	--	--	--
56	5280	20.86	20.82	20.78	20.74	20.65	20.61	20.52	20.47
64	5320	18.15	--	--	--	--	--	--	--
100	5500	18.78	--	--	--	--	--	--	--
120	5600	20.74	20.65	20.55	20.46	20.37	20.31	20.21	20.13
140	5700	18.78	--	--	--	--	--	--	--
144(U-NII-2C)	5720	20.1	20.06	20	19.93	19.89	19.79	19.76	19.68
144(U-NII-3)	5720	12.91	12.82	12.79	12.7	12.61	12.55	12.52	12.49
149	5745	20.95	--	--	--	--	--	--	--
157	5785	21.02	20.96	20.93	20.86	20.80	20.77	20.73	20.70
165	5825	20.84	--	--	--	--	--	--	--

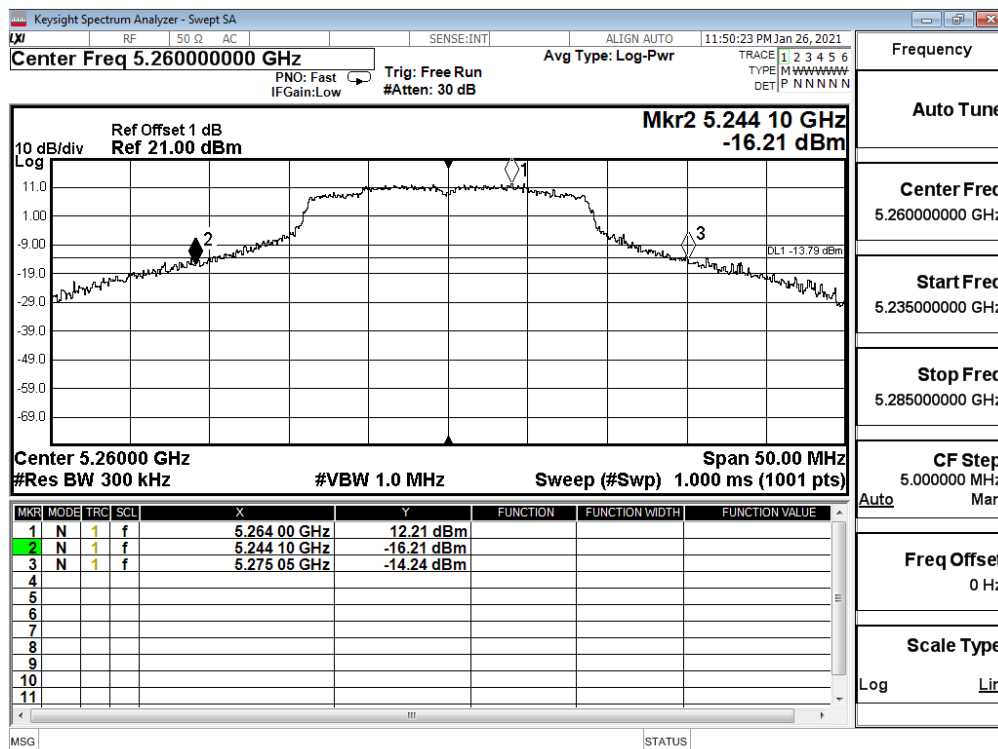
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

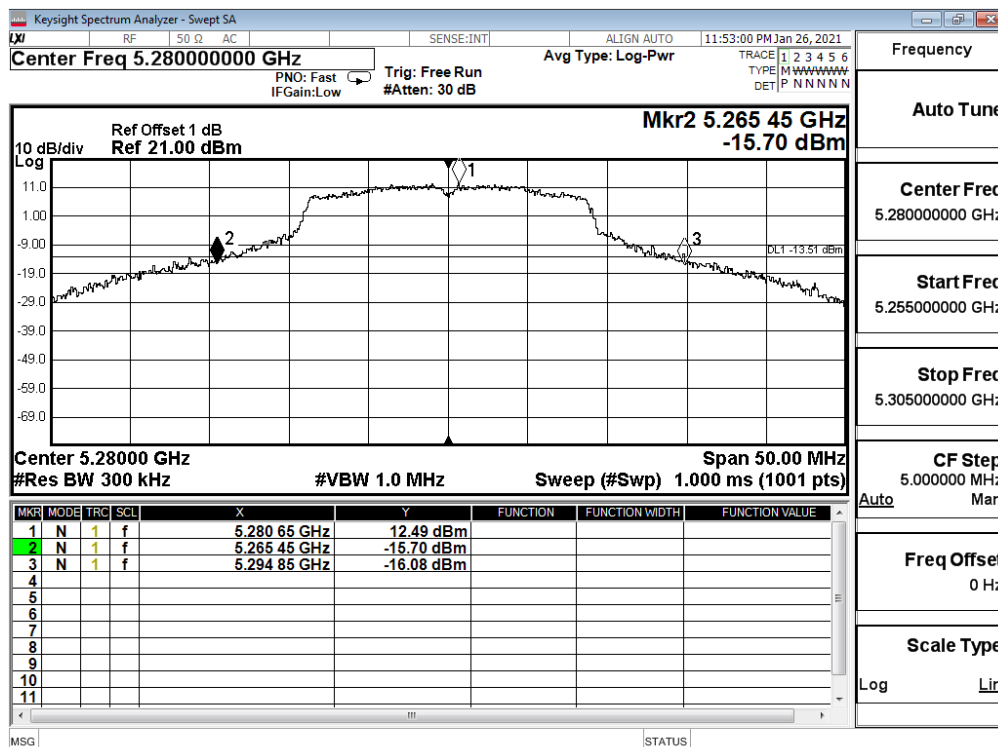
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
36	5180	--	18.81	24	--	Pass
40	5200	--	20.73	24	--	Pass
48	5240	--	20.75	24	--	Pass
52	5260	30.95	20.96	24	25.91	Pass
56	5280	29.40	20.86	24	25.68	Pass
64	5320	23.50	18.15	24	24.71	Pass
100	5500	23.85	18.78	24	24.77	Pass
120	5600	30.90	20.74	24	25.90	Pass
140	5700	24.35	18.78	24	24.86	Pass
144(U-NII-2C)	5720	16.80	20.10	24	23.25	Pass
144(U-NII-3)	5720	--	12.91	30	--	Pass
149	5745	--	20.95	30	--	Pass
157	5785	--	21.02	30	--	Pass
165	5825	--	20.84	30	--	Pass

26dB Occupied Bandwidth:

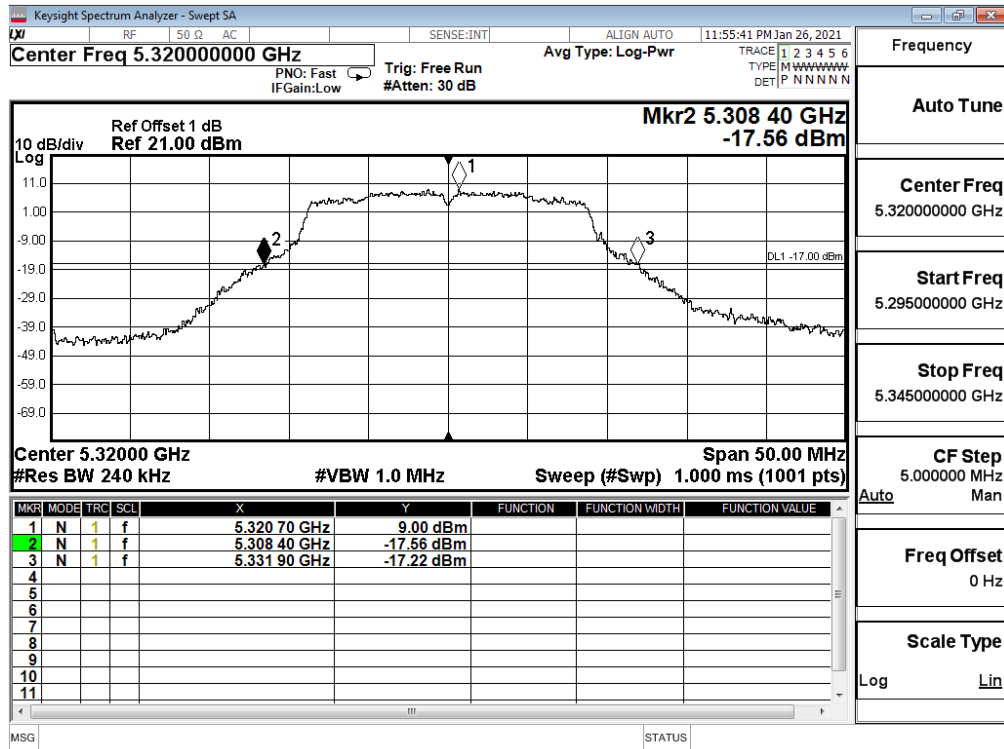
Channel 52



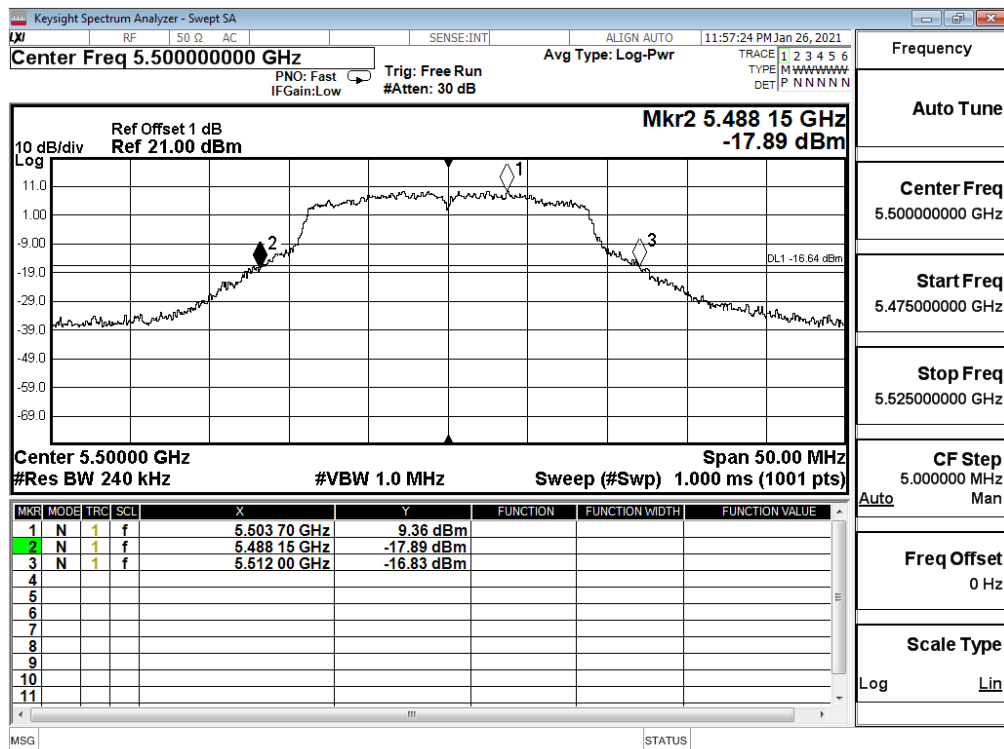
Channel 56



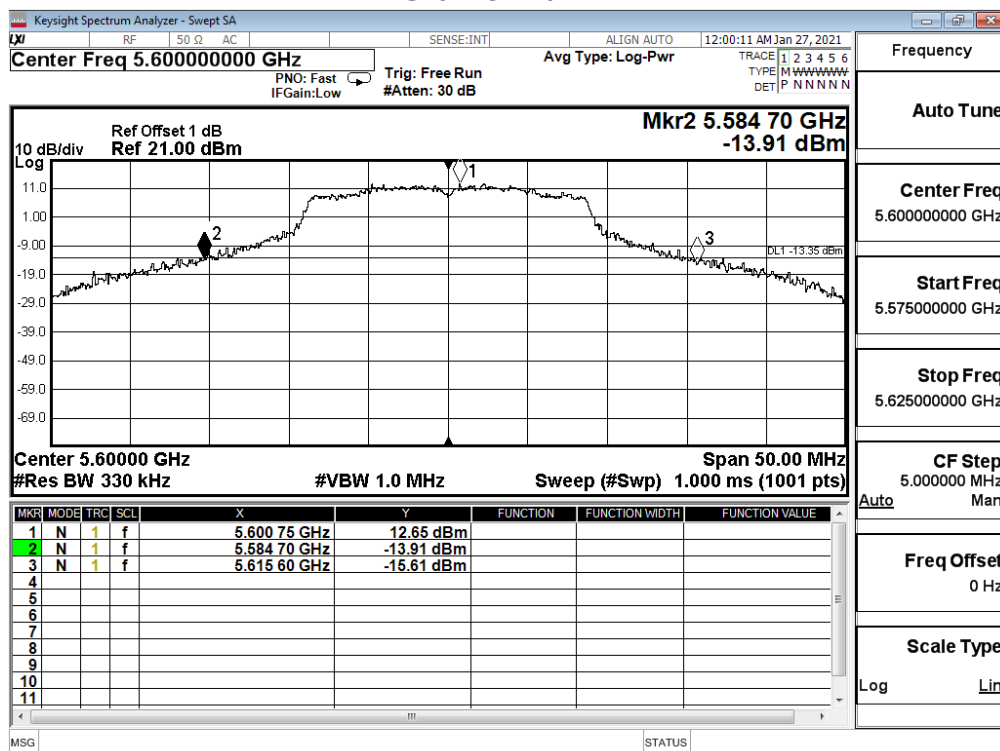
Channel 64



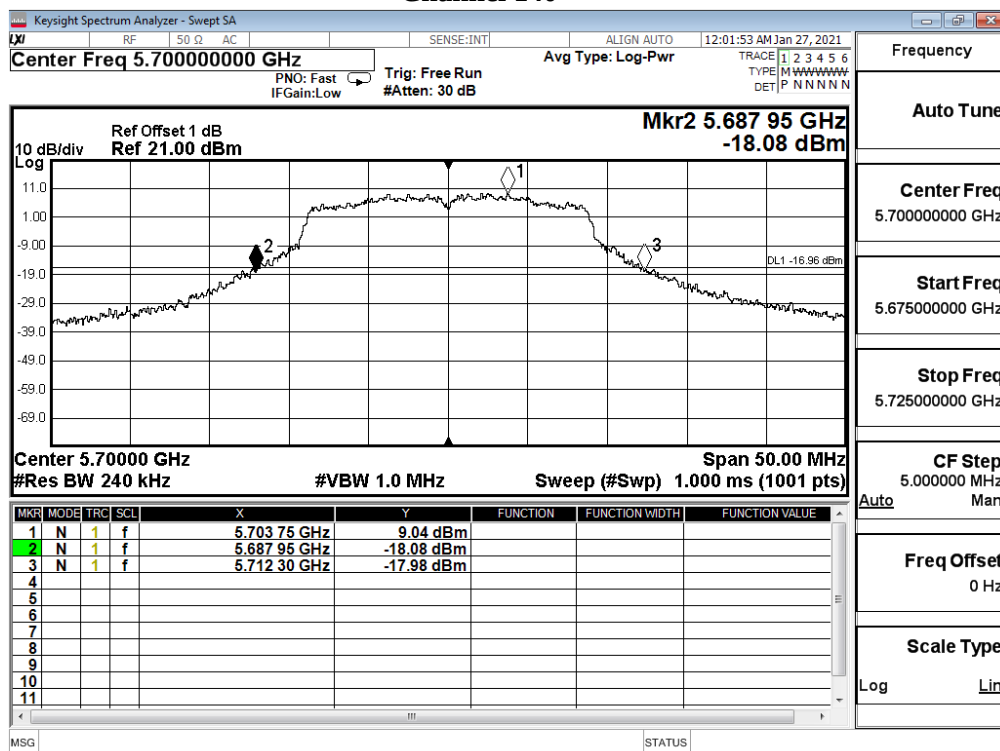
Channel 100



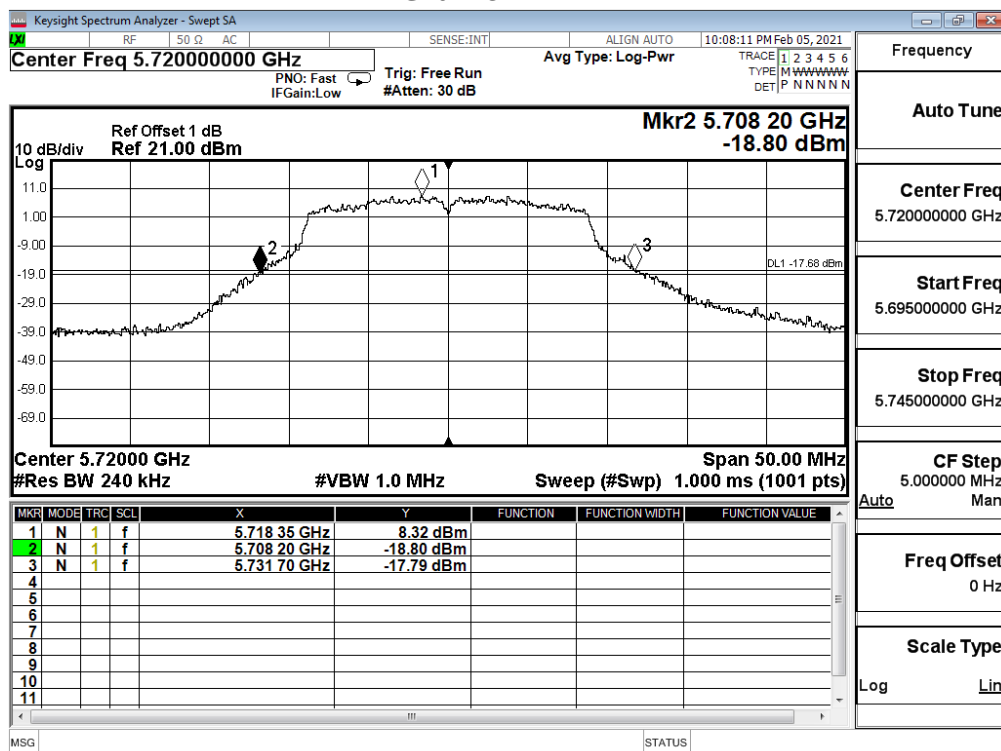
Channel 120

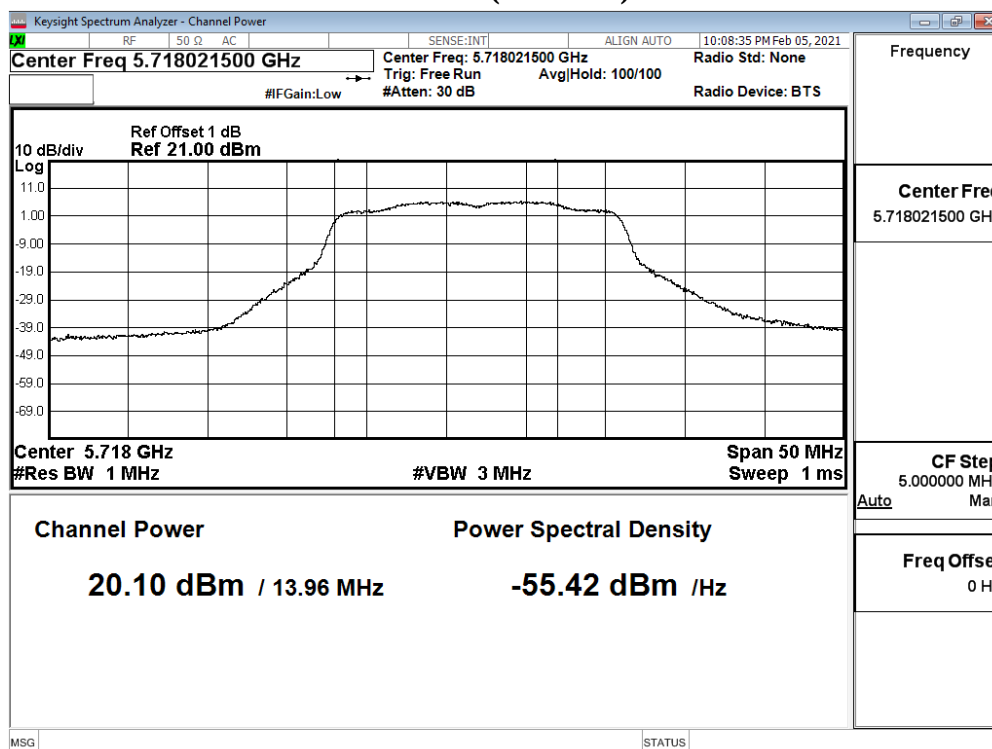
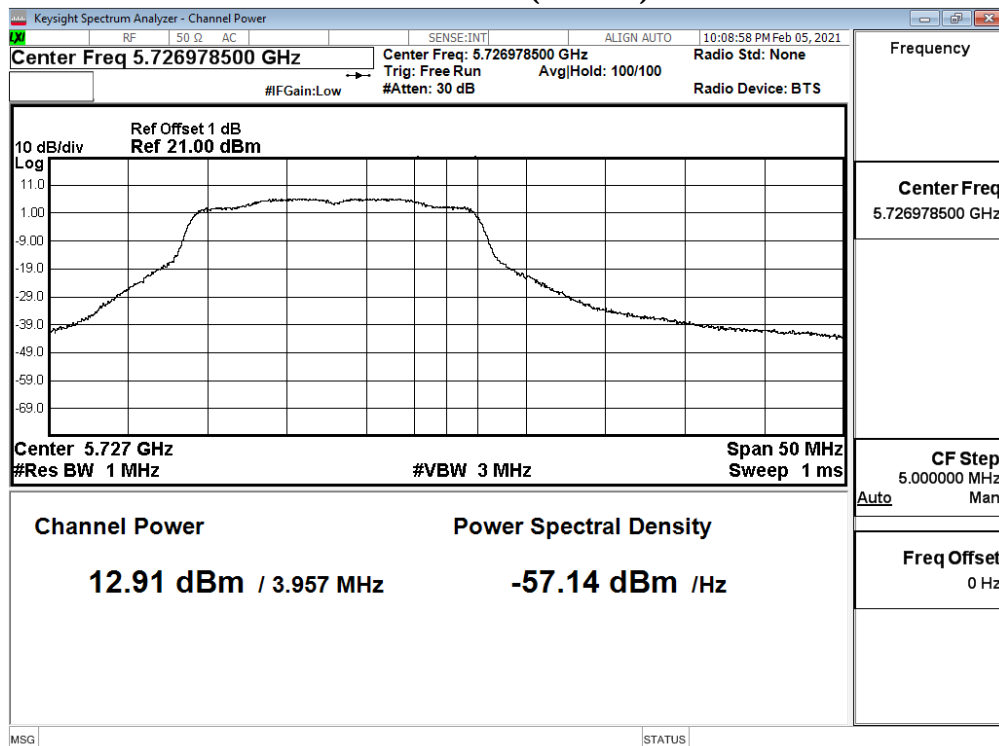


Channel 140



Channel 144



Maximum conducted output power:**Channel 144 (U-NII-2C)****Maximum conducted output power:****Channel 144 (U-NII-3)**

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 3 SISO A: Transmit (802.11n-40BW_15Mbps)

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		15	30	45	60	90	120	135	150
		Measurement Level (dBm)							
38	5190	18.31	--	--	--	--	--	--	--
46	5230	20.35	20.26	20.21	20.16	20.06	20.02	19.92	19.83
54	5270	20.18	--	--	--	--	--	--	--
62	5310	17	16.96	16.9	16.85	16.81	16.71	16.65	16.59
102	5510	18.27	--	--	--	--	--	--	--
118	5590	20.88	20.79	20.73	20.68	20.65	20.55	20.50	20.44
134	5670	19.02	--	--	--	--	--	--	--
142(U-NII-2C)	5710	20.44	20.38	20.33	20.24	20.15	20.1	20.04	19.99
142(U-NII-3)	5710	7.82	7.72	7.62	7.58	7.53	7.44	7.35	7.31
151	5755	20.82	--	--	--	--	--	--	--
159	5795	20.76	20.68	20.6	20.55	20.51	20.48	20.42	20.38

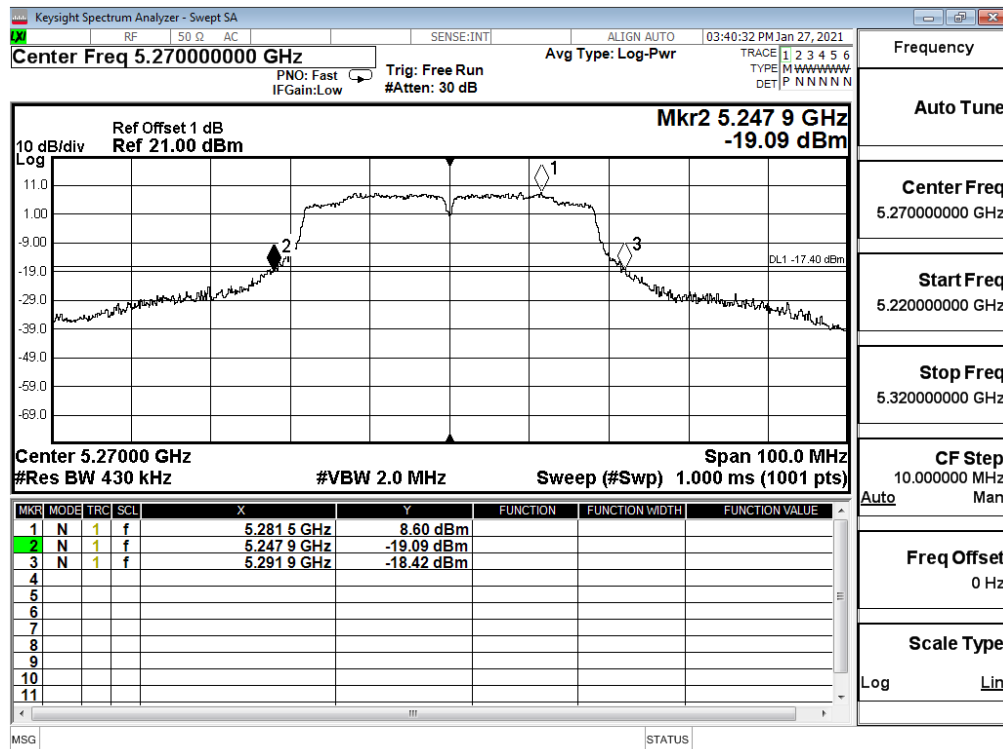
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

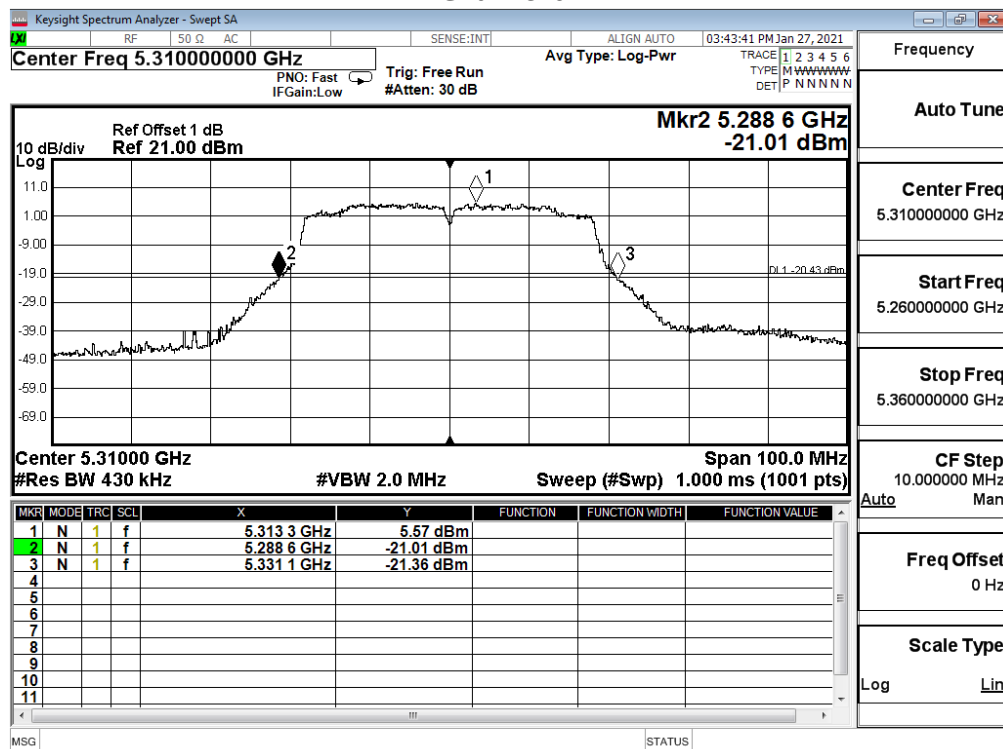
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
38	5190	--	18.31	24	--	Pass
46	5230	--	20.35	24	--	Pass
54	5270	44.00	20.18	24	27.43	Pass
62	5310	42.50	17.00	24	27.28	Pass
102	5510	42.90	18.27	24	27.32	Pass
118	5590	49.50	20.88	24	27.95	Pass
134	5670	44.20	19.02	24	27.45	Pass
142(U-NII-2C)	5710	36.60	20.44	24	26.63	Pass
142(U-NII-3)	5710	--	7.82	30	--	Pass
151	5755	--	20.82	30	--	Pass
159	5795	--	20.76	30	--	Pass

26dB Occupied Bandwidth:

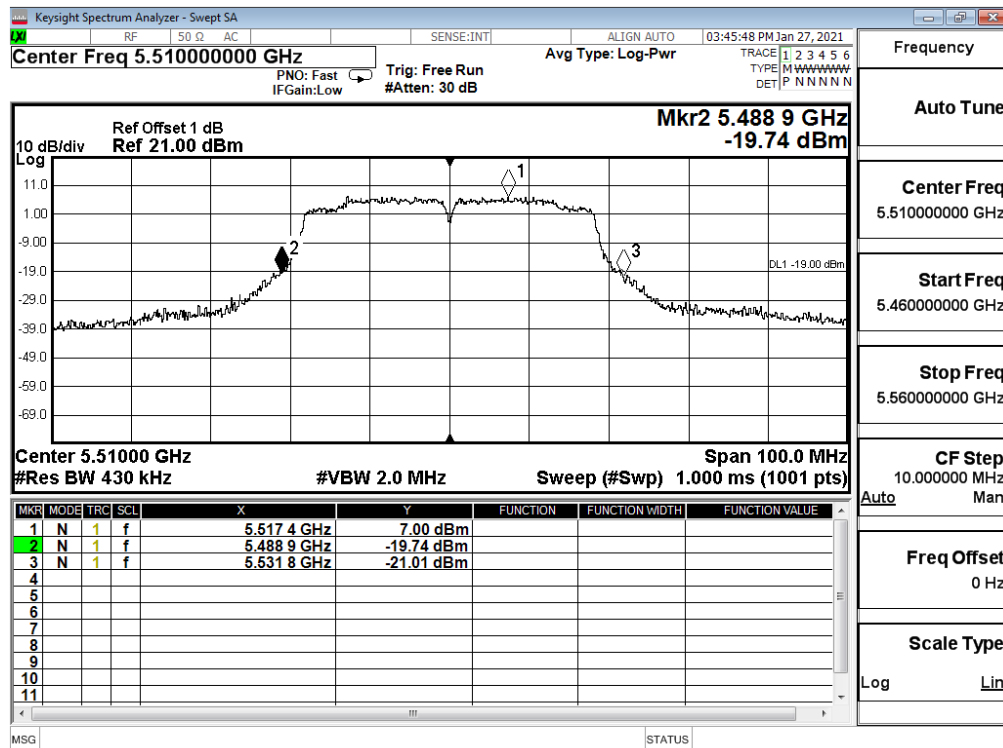
Channel 54



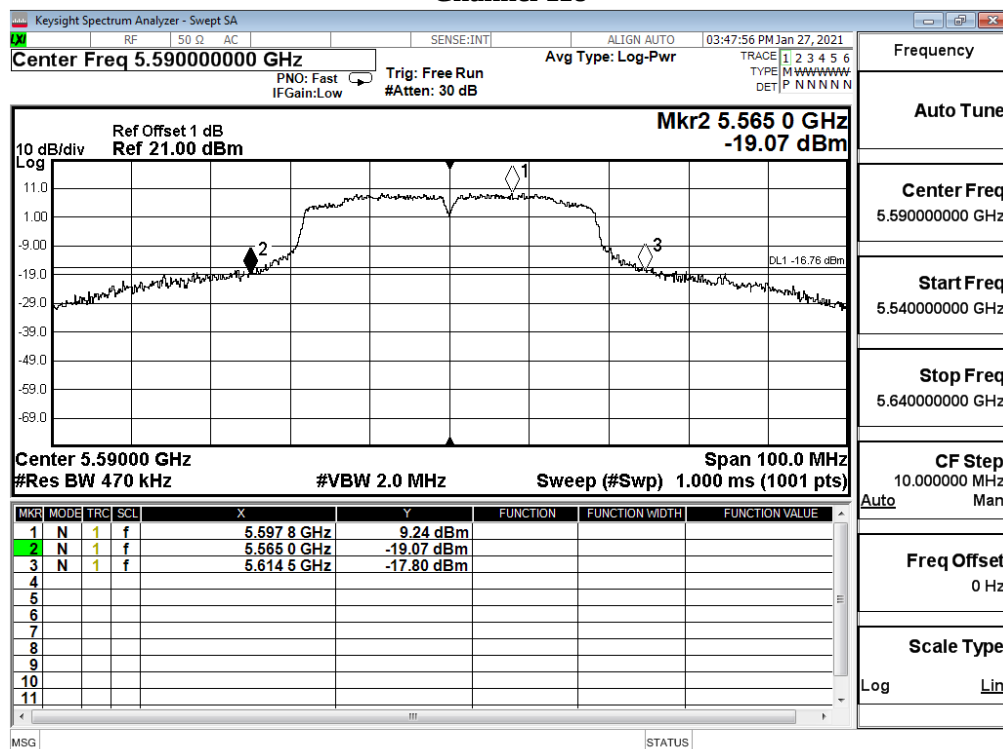
Channel 62



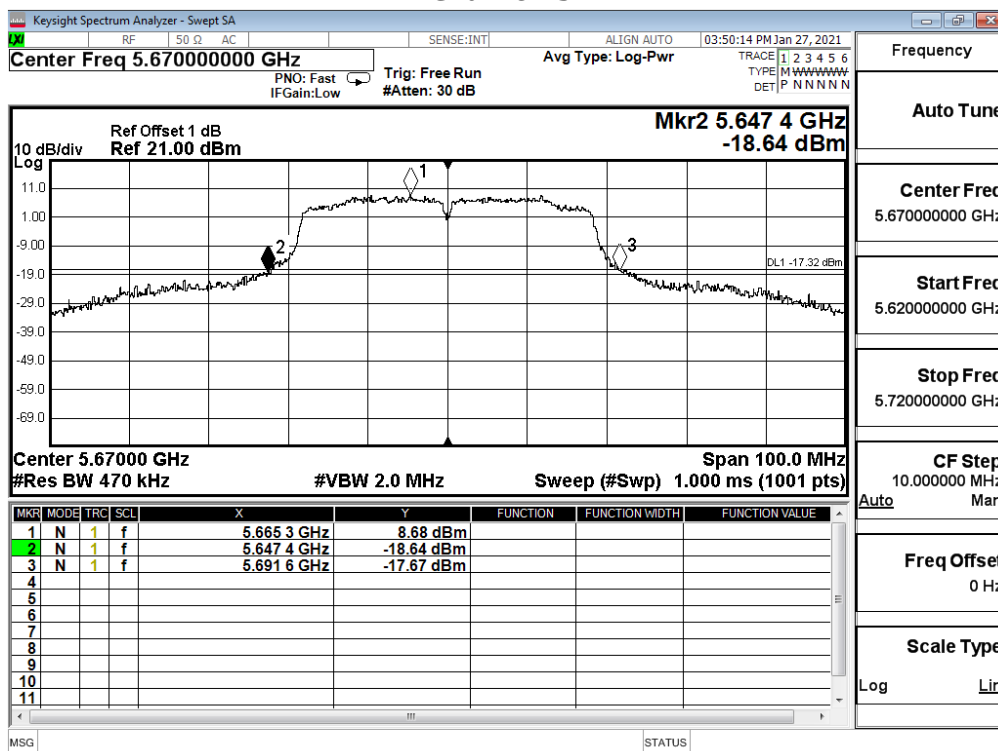
Channel 102



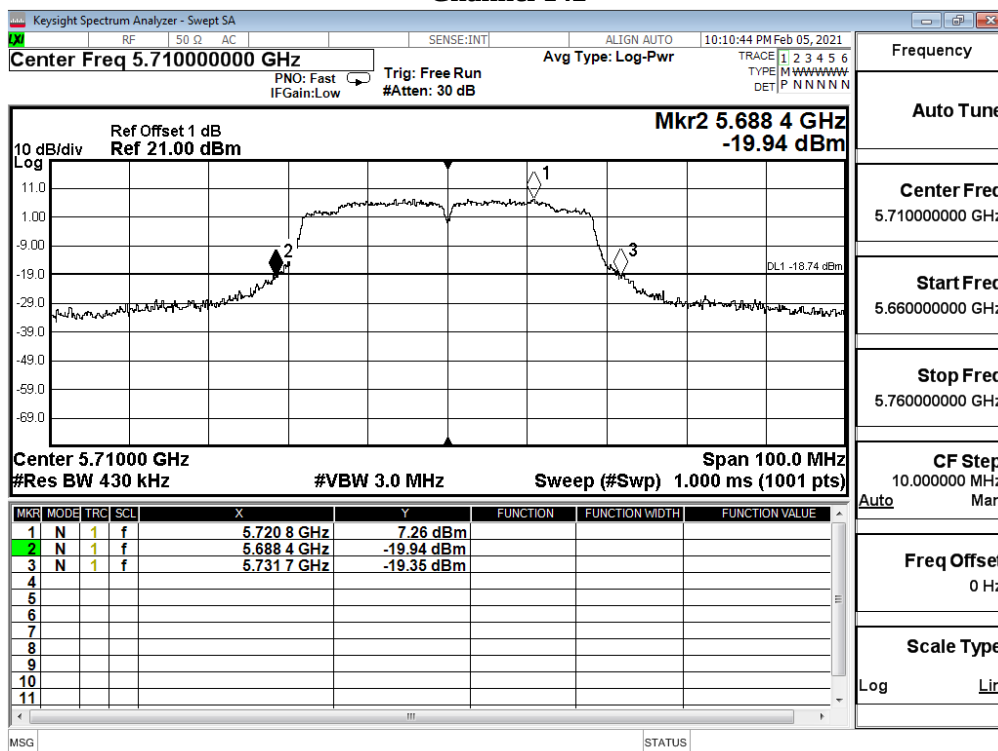
Channel 118

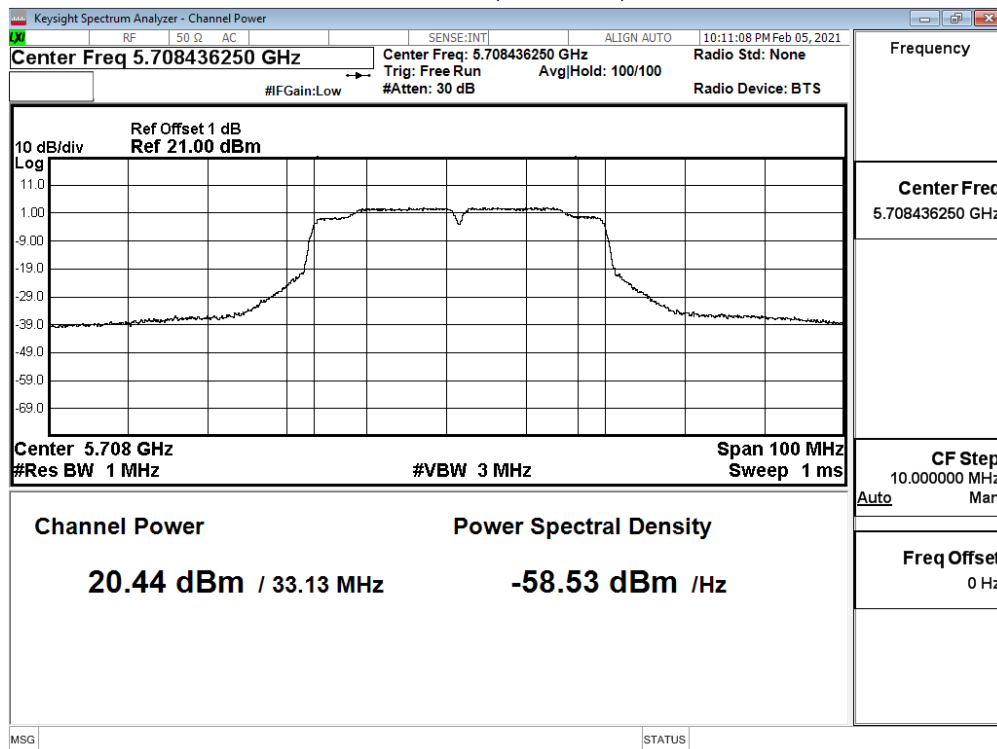
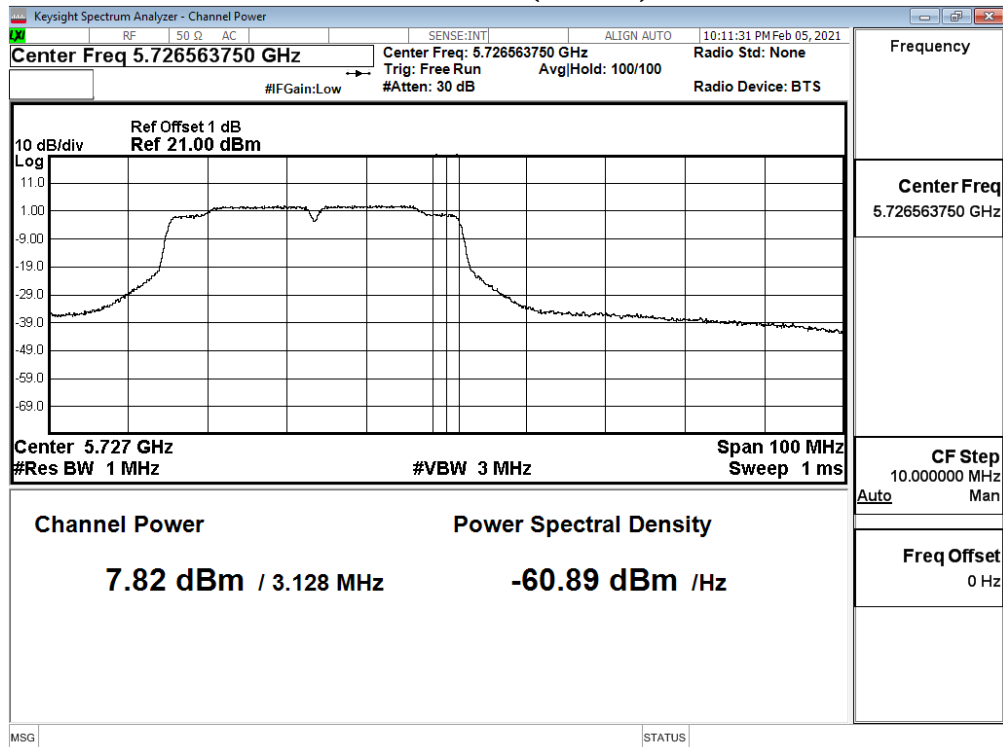


Channel 134



Channel 142



Maximum conducted output power:**Channel 142 (U-NII-2C)****Maximum conducted output power:****Channel 142 (U-NII-3)**

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 4 SISO A: Transmit (802.11ac-80BW_32.5Mbps)

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		32.5	65	97.5	130	195	260	292.5	325	390	433.3
42	5210	18.51	18.46	18.38	18.29	18.19	18.13	18.05	18.02	17.93	17.88
58	5290	18.28	18.19	18.13	18.05	18.02	17.93	17.90	17.86	17.77	17.68
106	5530	18.32	--	--	--	--	--	--	--	--	--
122	5610	19.1	19.01	18.94	18.91	18.87	18.77	18.71	18.67	18.58	18.54
138 (U-NII-2C)	5690	20.66	20.58	20.52	20.49	20.42	20.36	20.26	20.18	20.14	20.1
138 (U-NII-3)	5690	3.58	3.48	3.42	3.39	3.32	3.23	3.2	3.17	3.12	3.03
155	5775	18.82	18.72	18.68	18.65	18.62	18.55	18.52	18.46	18.43	18.33

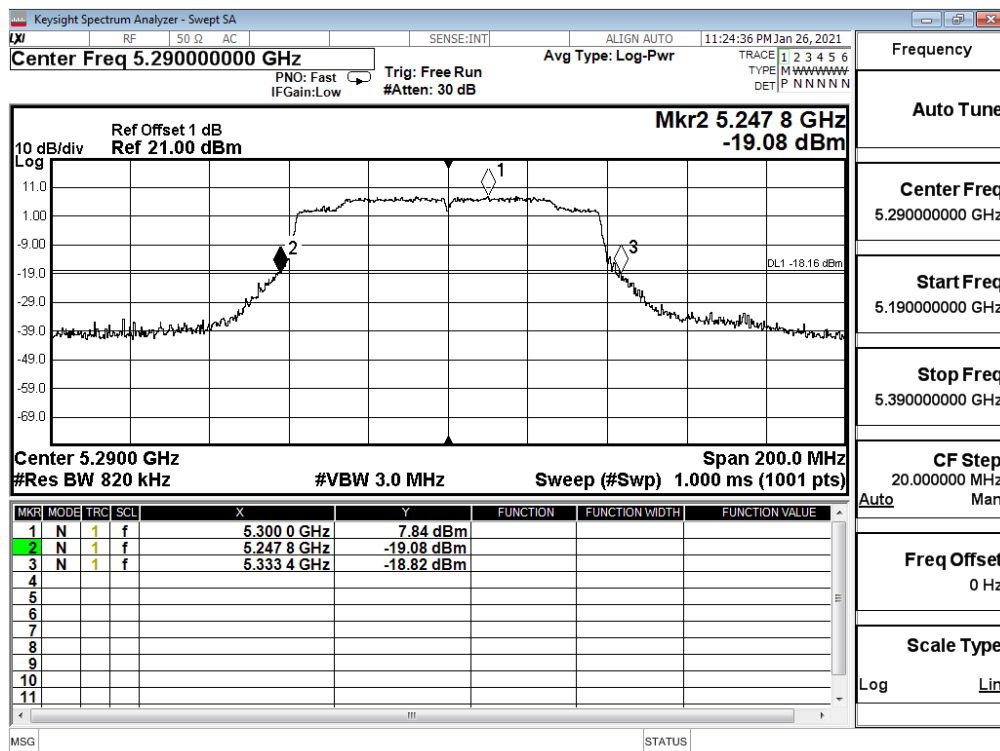
Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Maximum conducted output power Measurement:

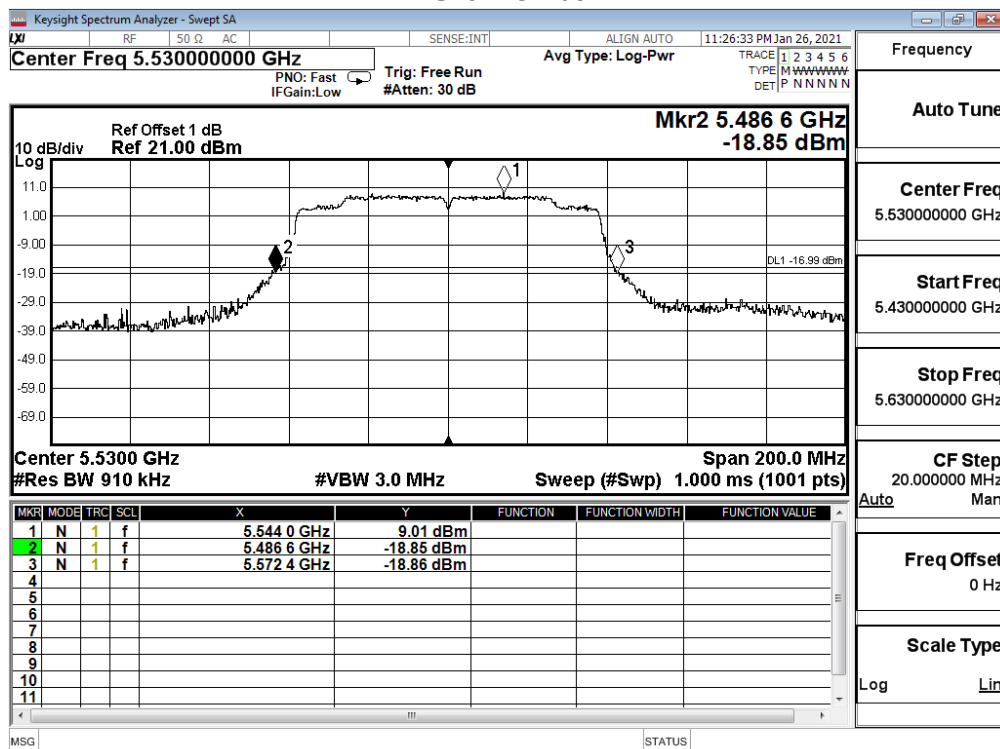
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
42	5210	--	18.51	24	--	Pass
58	5290	85.60	18.28	24	30.32	Pass
106	5530	85.80	18.32	24	30.33	Pass
122	5610	87.00	19.10	24	30.40	Pass
138 (U-NII-2C)	5690	79.20	20.66	24	29.99	Pass
138 (U-NII-3)	5690	--	3.58	30	--	Pass
155	5775	--	18.82	30	--	Pass

26dB Occupied Bandwidth:

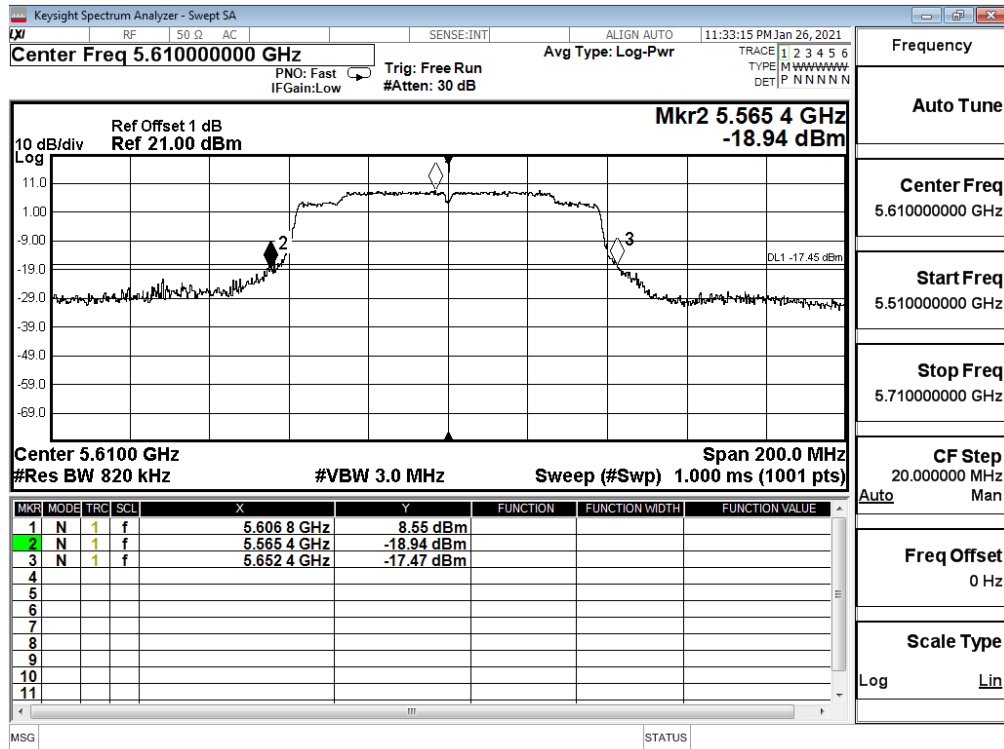
Channel 58



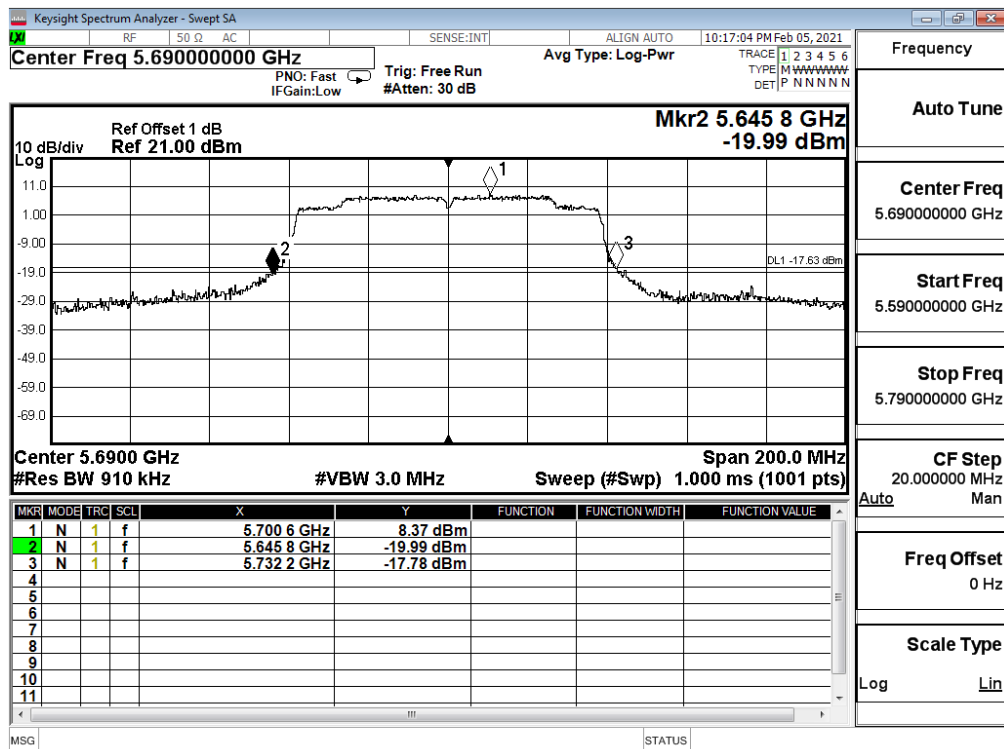
Channel 106

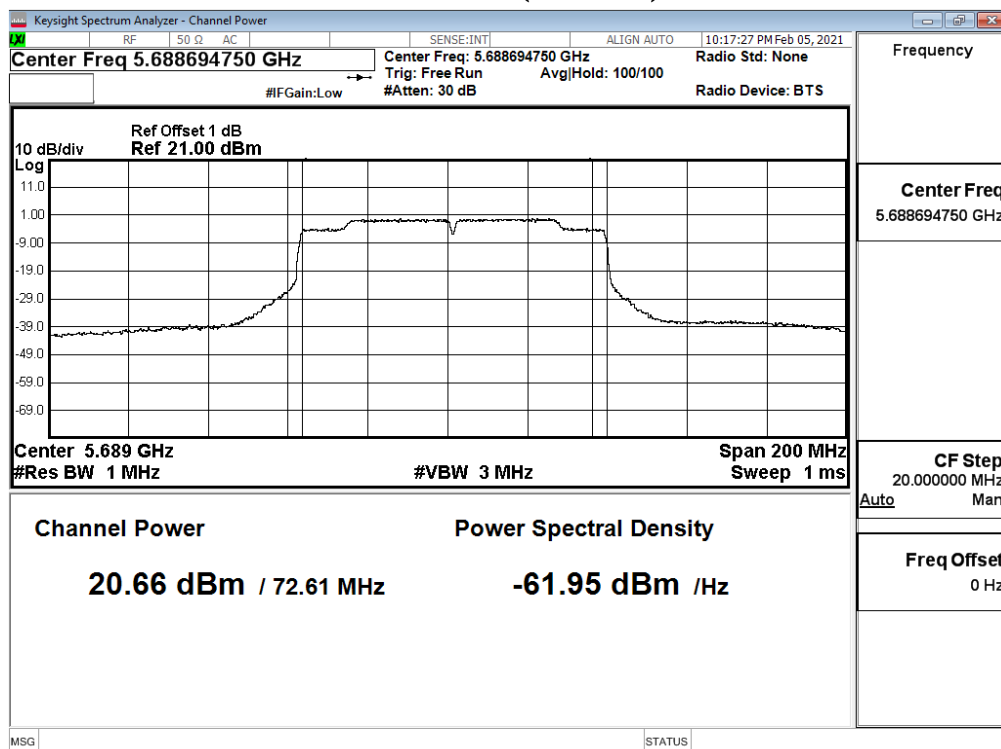
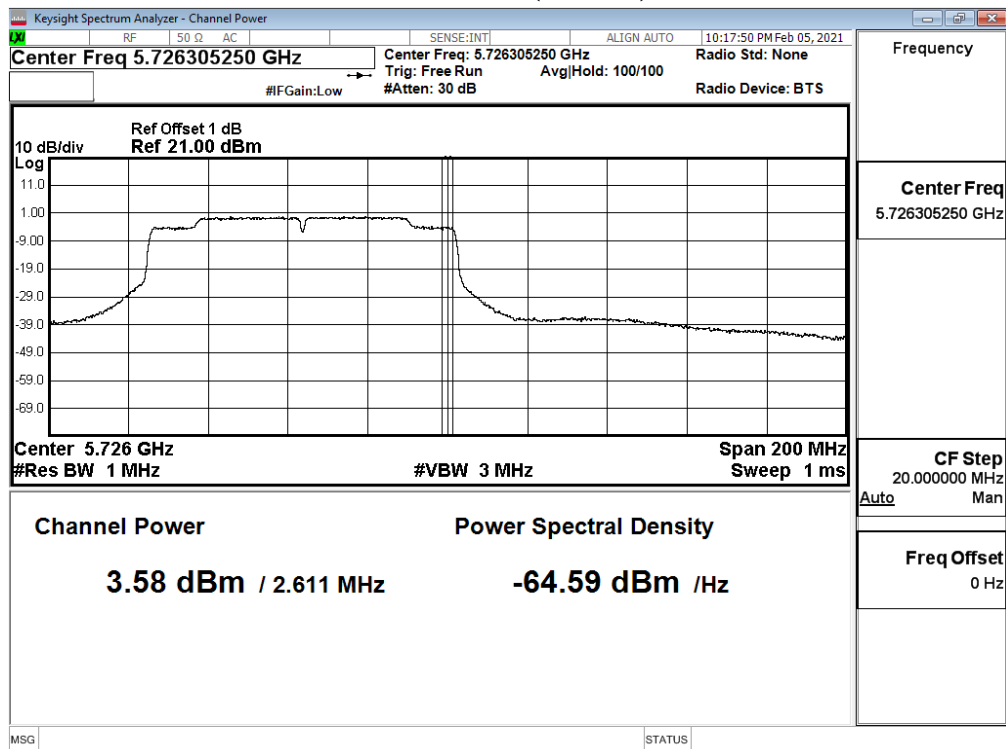


Channel 122



Channel 138



Maximum conducted output power:**Channel 138 (U-NII-2C)****Maximum conducted output power:****Channel 138 (U-NII-3)**

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/03
 Test Mode : Mode 5 SISO A: Transmit (802.11ac-160BW_65Mbps)

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		65	130	195	260	390	520	585	650	780	866.7
50 (U-NII-1)	5250	11.39	11.32	11.24	11.15	11.12	11.07	10.97	10.94	10.87	10.82
50 (U-NII-2A)	5250	11.57	11.47	11.43	11.34	11.31	11.23	11.18	11.13	11.04	11.01
114	5570	14.86	14.83	14.73	14.63	14.58	14.51	14.48	14.39	14.33	14.27

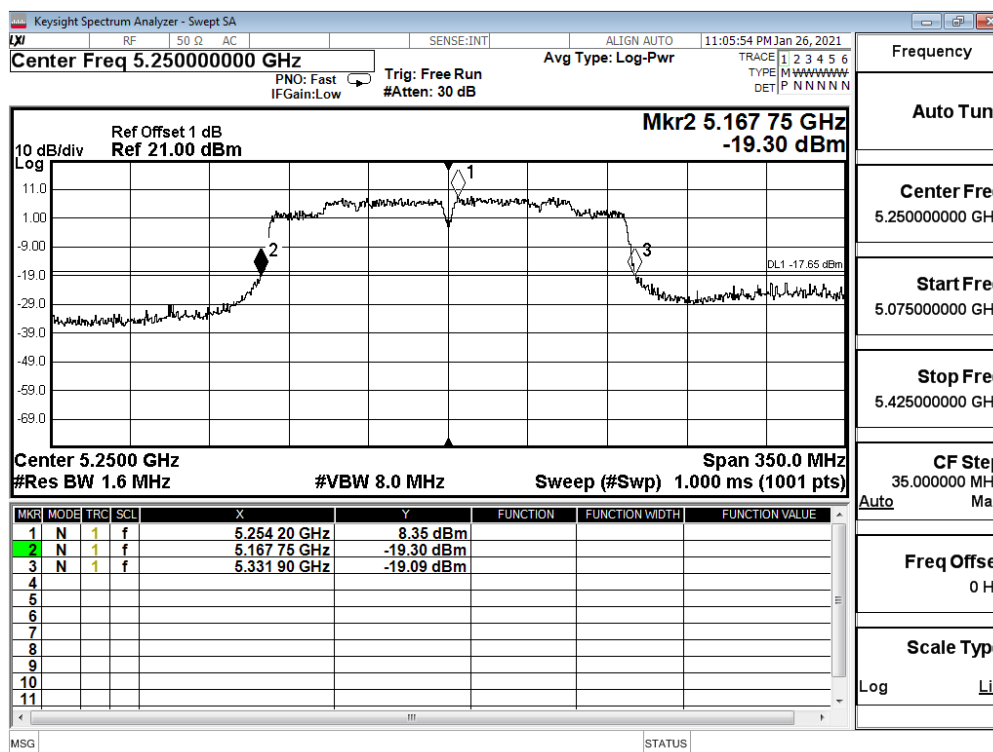
Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Maximum conducted output power Measurement:

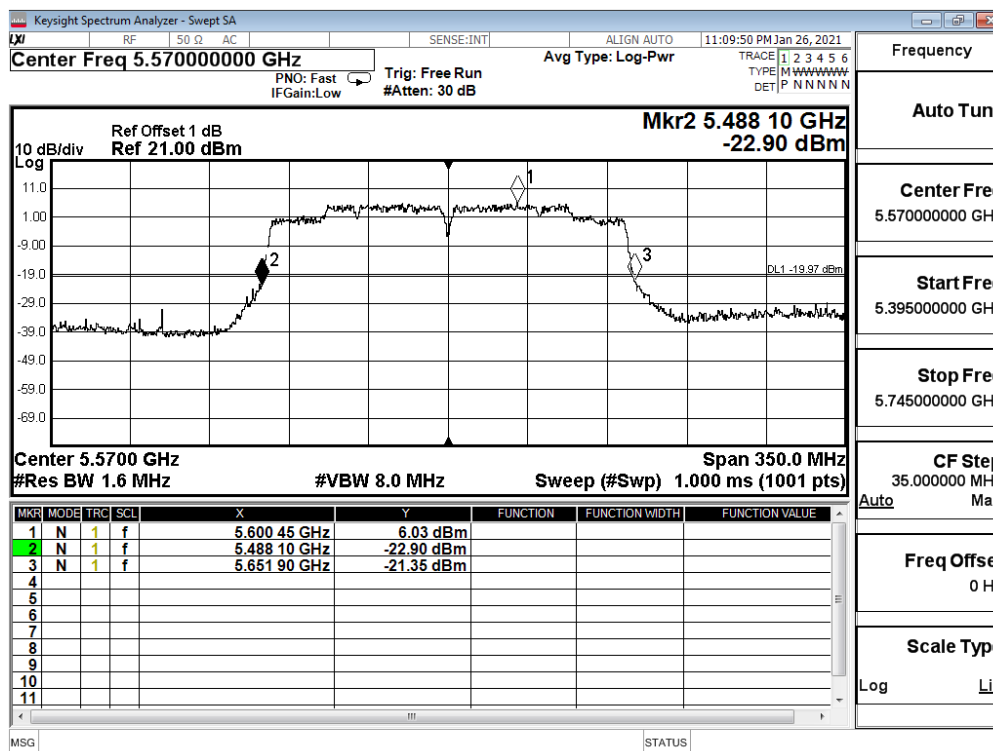
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
50 (U-NII-1)	5250	--	11.39	24	--	Pass
50 (U-NII-2A)	5250	81.90	11.57	24	30.13	Pass
114	5570	163.80	14.86	24	33.14	Pass

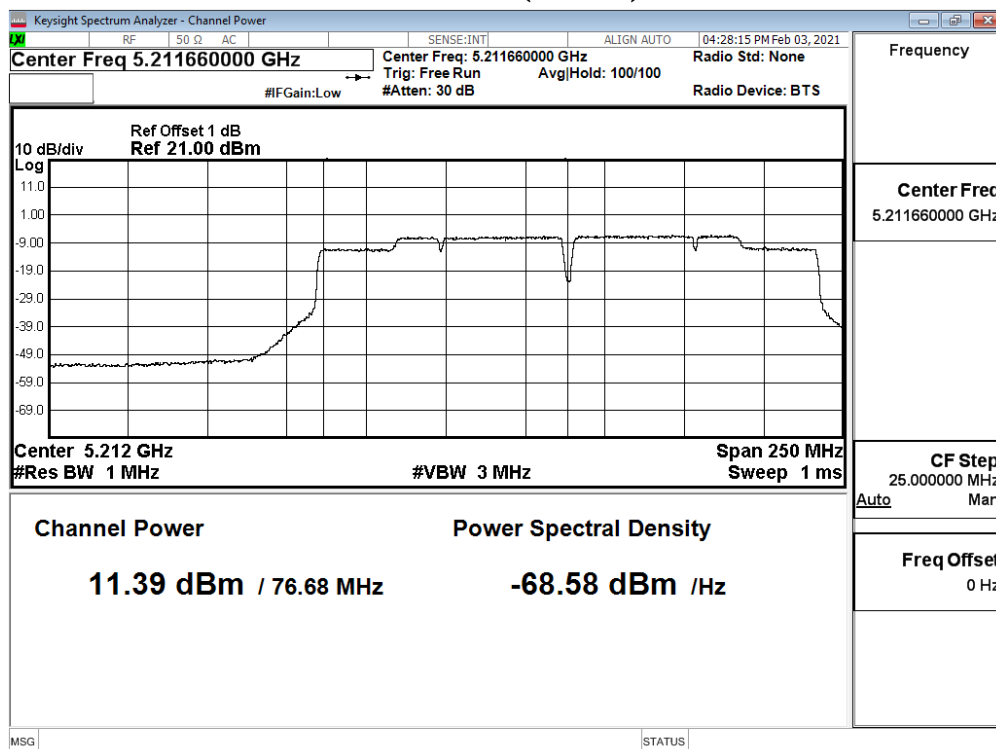
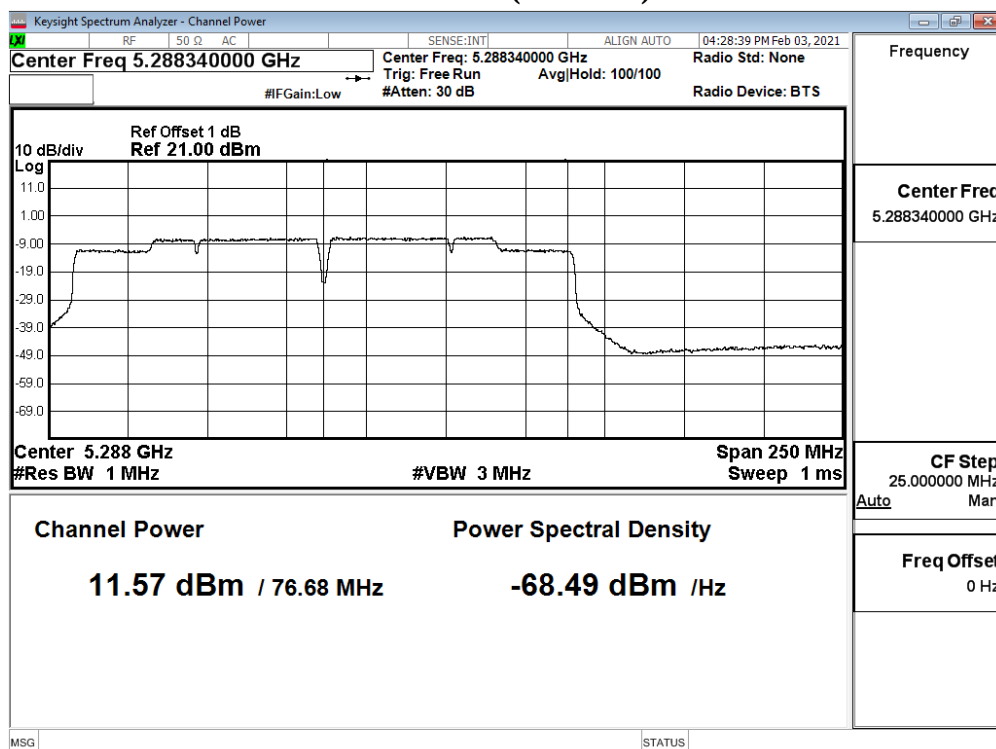
26dB Occupied Bandwidth:

Channel 50



Channel 114



Maximum conducted output power:**Channel 50 (U-NII-1)****Maximum conducted output power:****Channel 50 (U-NII-2A)**

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/01/27
 Test Mode : Mode 10 SISO B: Transmit (802.11a_6Mbps)

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
		Measurement Level (dBm)							
36	5180	18.84	--	--	--	--	--	--	--
40	5200	20.99	20.9	20.81	20.74	20.66	20.60	20.53	20.49
48	5240	20.96	--	--	--	--	--	--	--
52	5260	20.85	--	--	--	--	--	--	--
56	5280	20.78	20.69	20.61	20.54	20.45	20.38	20.31	20.21
64	5320	18.41	--	--	--	--	--	--	--
100	5500	19.05	--	--	--	--	--	--	--
120	5600	21.01	20.94	20.85	20.75	20.69	20.64	20.59	20.56
140	5700	19.28	--	--	--	--	--	--	--
149	5745	21	--	--	--	--	--	--	--
157	5785	20.97	20.93	20.86	20.81	20.71	20.65	20.56	20.50
165	5825	20.89	--	--	--	--	--	--	--

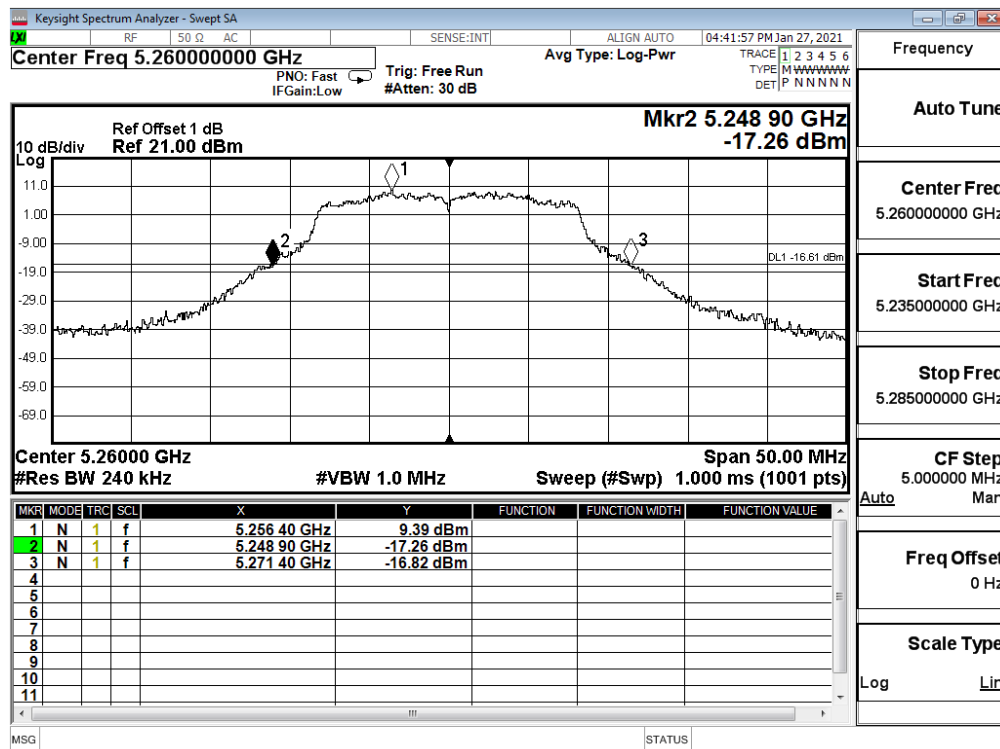
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

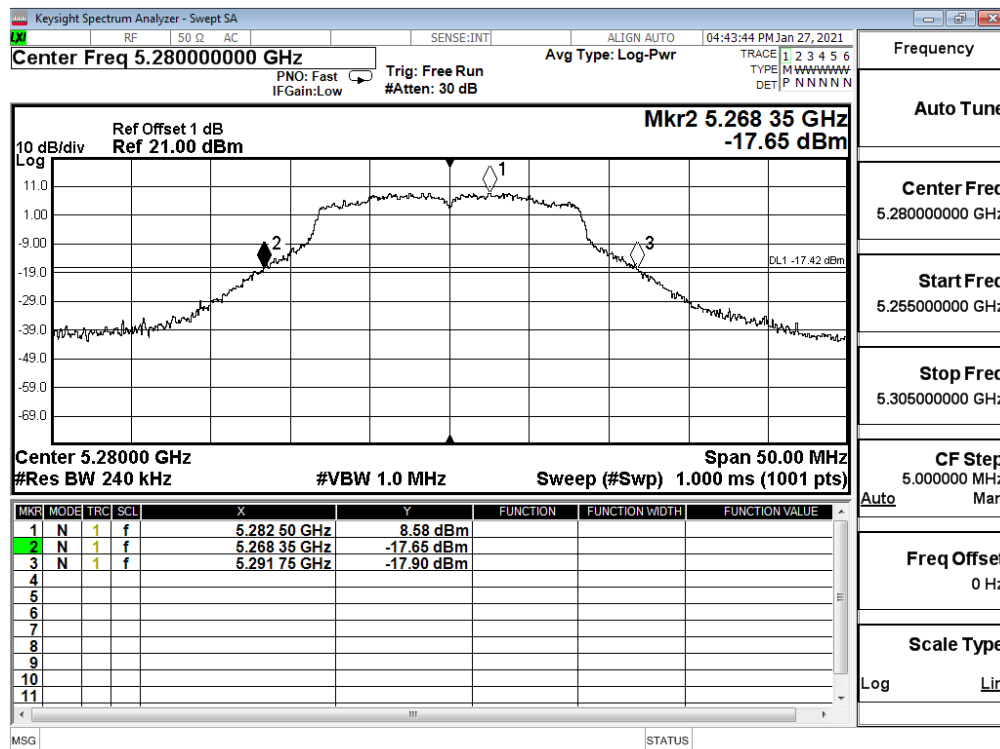
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
36	5180	--	18.84	24	--	Pass
40	5200	--	20.99	24	--	Pass
48	5240	--	20.96	24	--	Pass
52	5260	28.85	20.85	24	25.60	Pass
56	5280	31.85	20.78	24	26.03	Pass
64	5320	23.55	18.41	24	24.72	Pass
100	5500	26.85	19.05	24	25.29	Pass
120	5600	41.50	21.01	24	27.18	Pass
140	5700	27.20	19.28	24	25.35	Pass
149	5745	--	21.00	30	--	Pass
157	5785	--	20.97	30	--	Pass
165	5825	--	20.89	30	--	Pass

26dB Occupied Bandwidth:

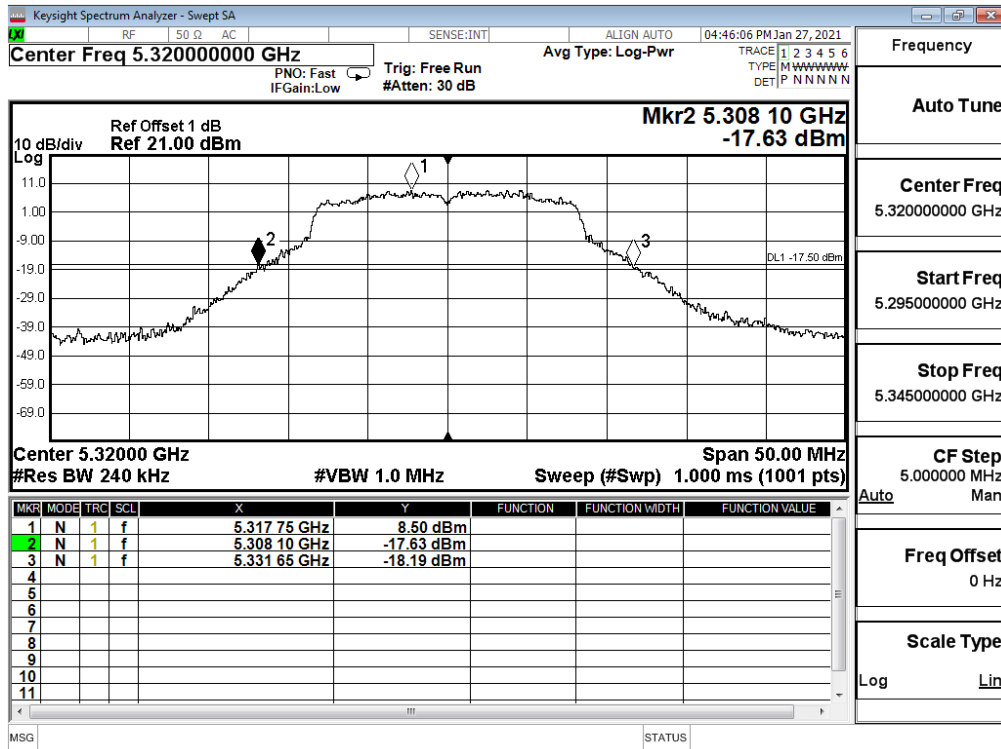
Channel 52



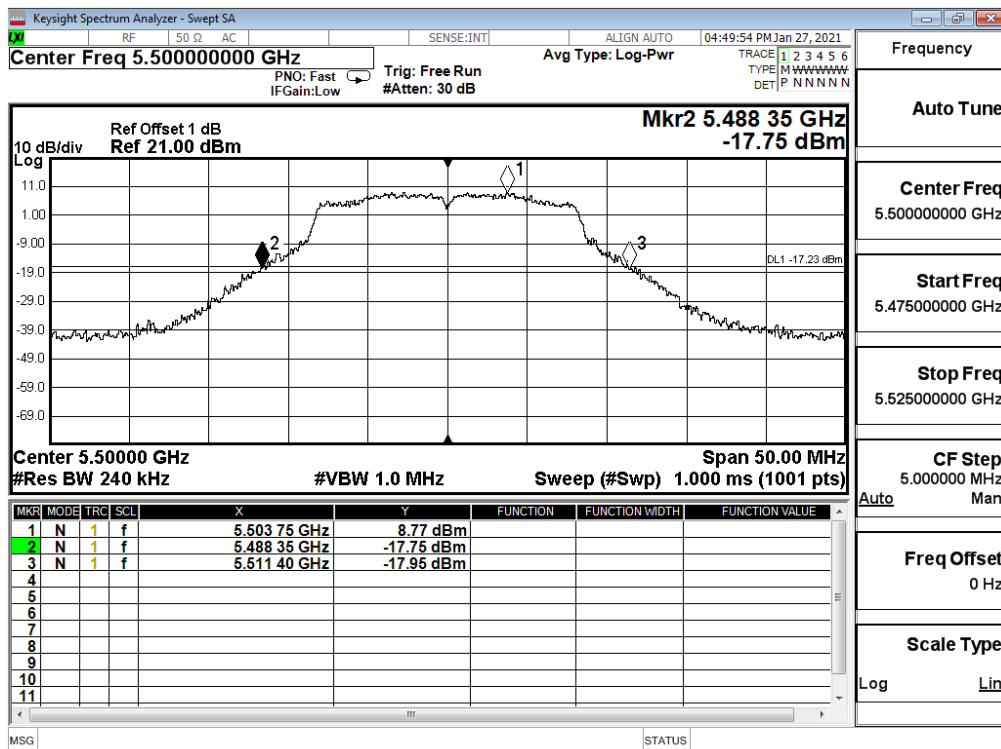
Channel 56



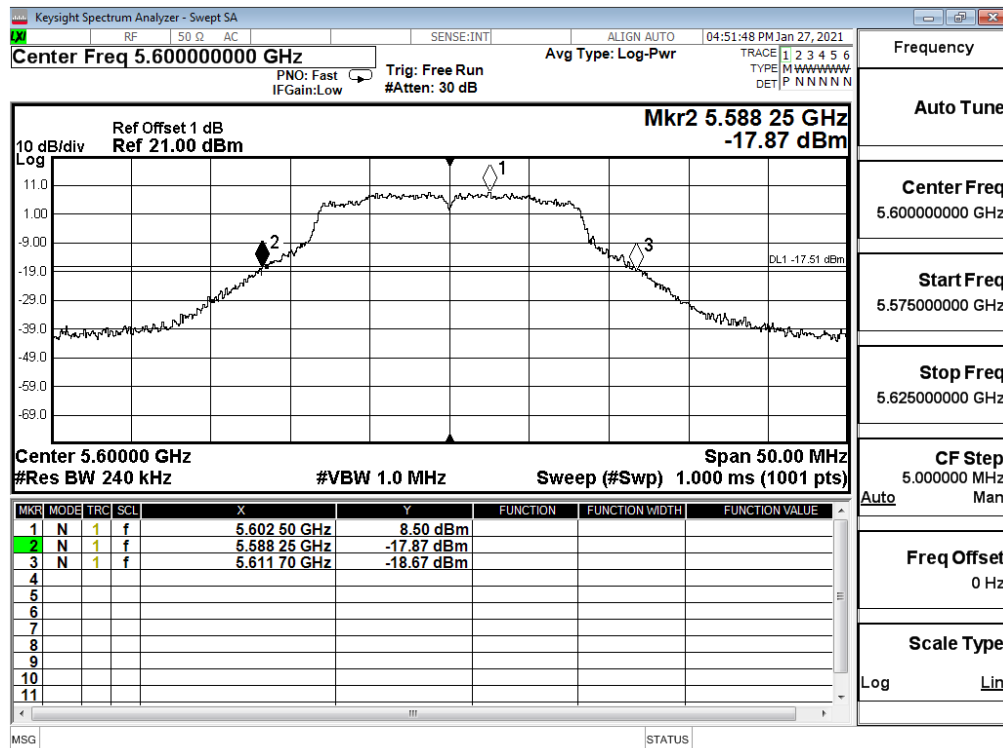
Channel 64



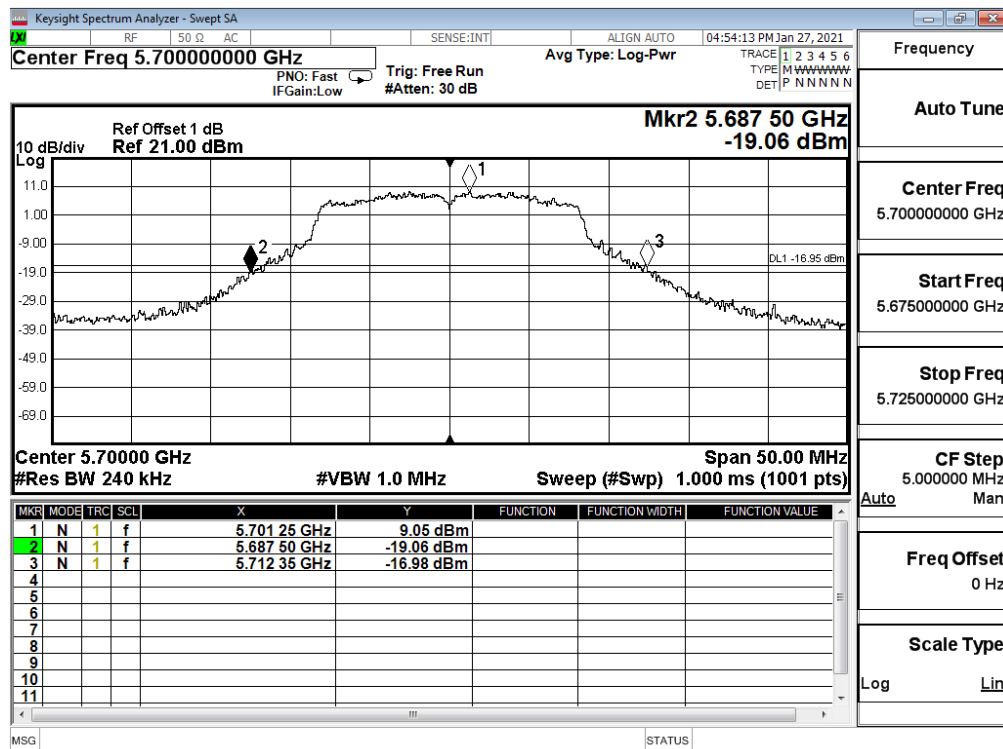
Channel 100



Channel 120



Channel 140



Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/01/27
 Test Mode : Mode 11 SISO B: Transmit (802.11n-20BW_7.2Mbps)

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2
		Measurement Level (dBm)							
36	5180	18.87	--	--	--	--	--	--	--
40	5200	20.94	20.9	20.81	20.71	20.64	20.58	20.51	20.44
48	5240	20.91	--	--	--	--	--	--	--
52	5260	20.78	--	--	--	--	--	--	--
56	5280	20.7	20.65	20.62	20.52	20.49	20.45	20.37	20.34
64	5320	17.56	--	--	--	--	--	--	--
100	5500	18.84	--	--	--	--	--	--	--
120	5600	20.79	20.74	20.7	20.64	20.54	20.50	20.45	20.40
140	5700	19.15	--	--	--	--	--	--	--
144(U-NII-2C)	5720	20.27	20.23	20.18	20.13	20.09	20	19.93	19.86
144(U-NII-3)	5720	12.74	12.66	12.62	12.58	12.48	12.41	12.35	12.28
149	5745	20.85	--	--	--	--	--	--	--
157	5785	20.98	20.9	20.81	20.75	20.66	20.60	20.57	20.47
165	5825	20.98	--	--	--	--	--	--	--

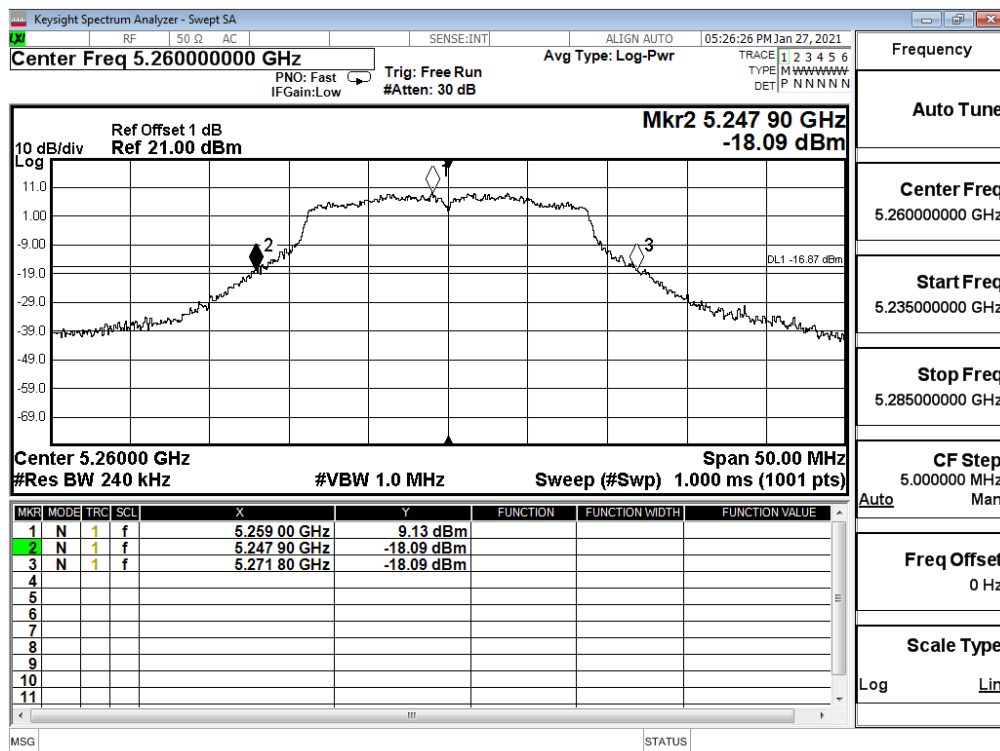
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

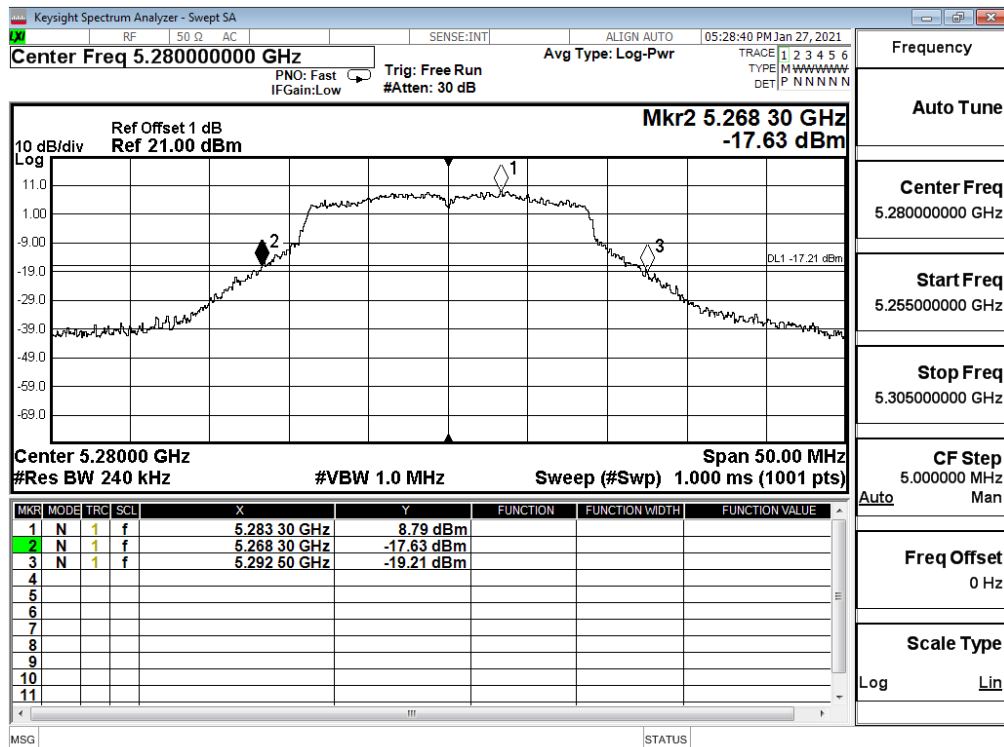
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
36	5180	--	18.87	24	--	Pass
40	5200	--	20.94	24	--	Pass
48	5240	--	20.91	24	--	Pass
52	5260	30.95	20.78	24	25.91	Pass
56	5280	29.40	20.70	24	25.68	Pass
64	5320	23.50	17.56	24	24.71	Pass
100	5500	23.85	18.84	24	24.77	Pass
120	5600	30.90	20.79	24	25.90	Pass
140	5700	24.35	19.15	24	24.86	Pass
144(U-NII-2C)	5720	26.00	20.27	24	25.15	Pass
144(U-NII-3)	5720	--	12.74	30	--	Pass
149	5745	--	20.85	30	--	Pass
157	5785	--	20.98	30	--	Pass
165	5825	--	20.98	30	--	Pass

26dB Occupied Bandwidth:

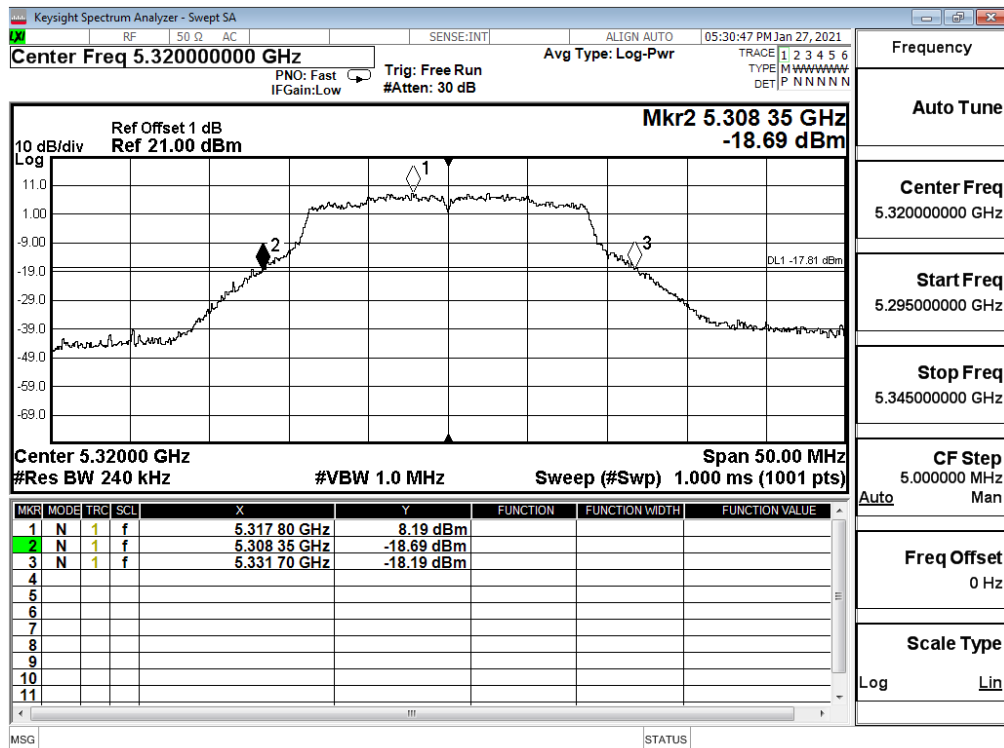
Channel 52



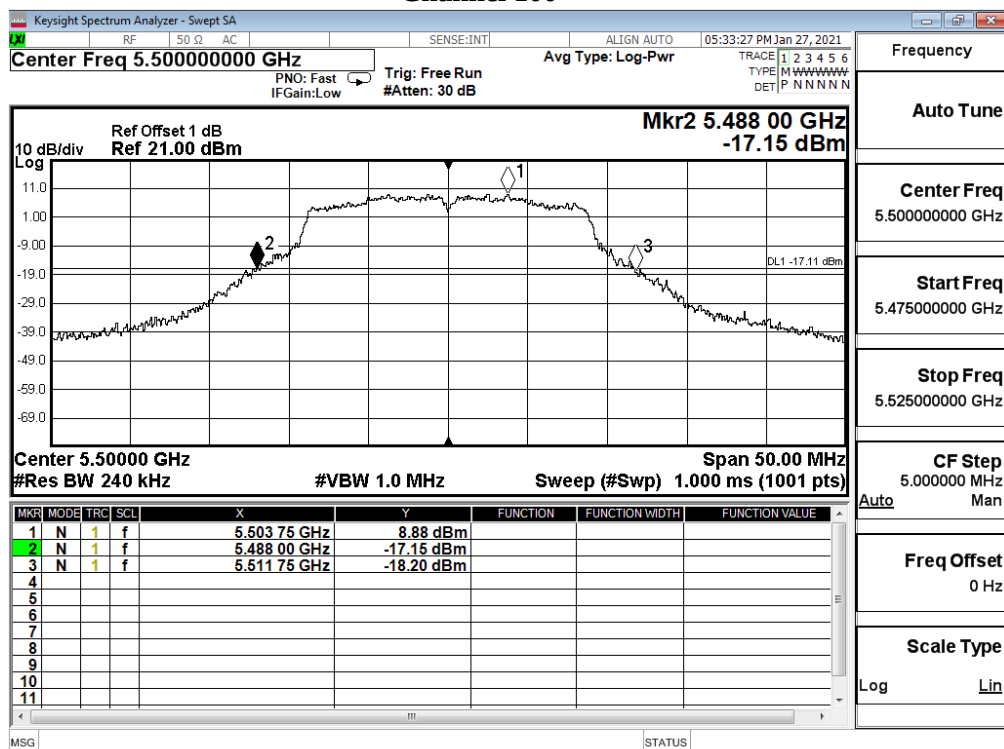
Channel 56



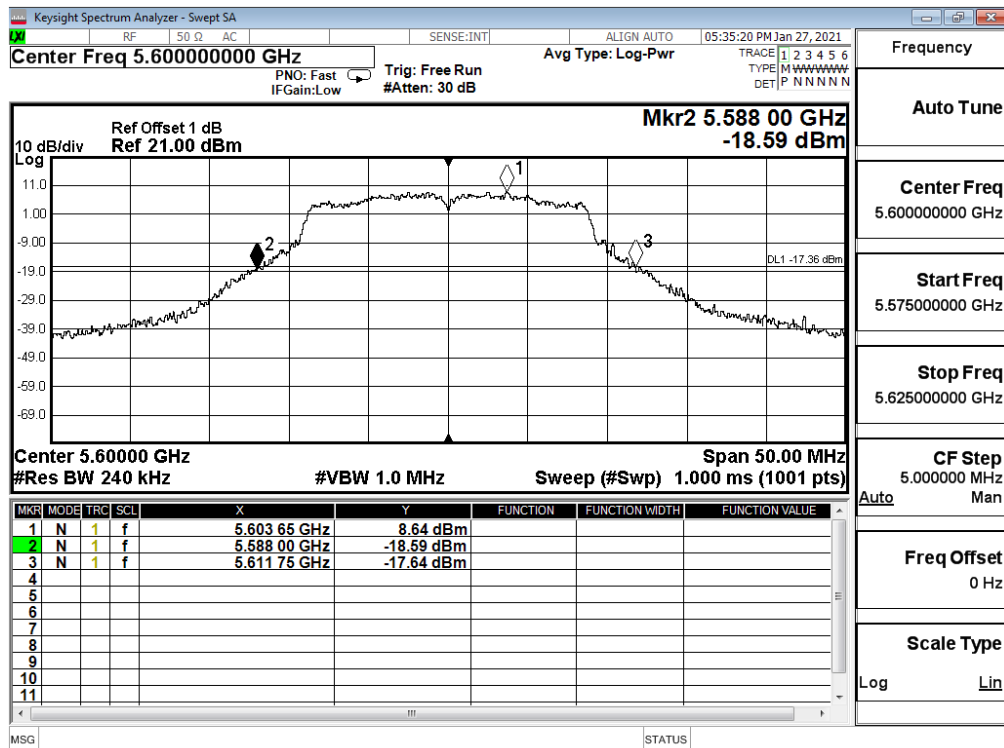
Channel 64



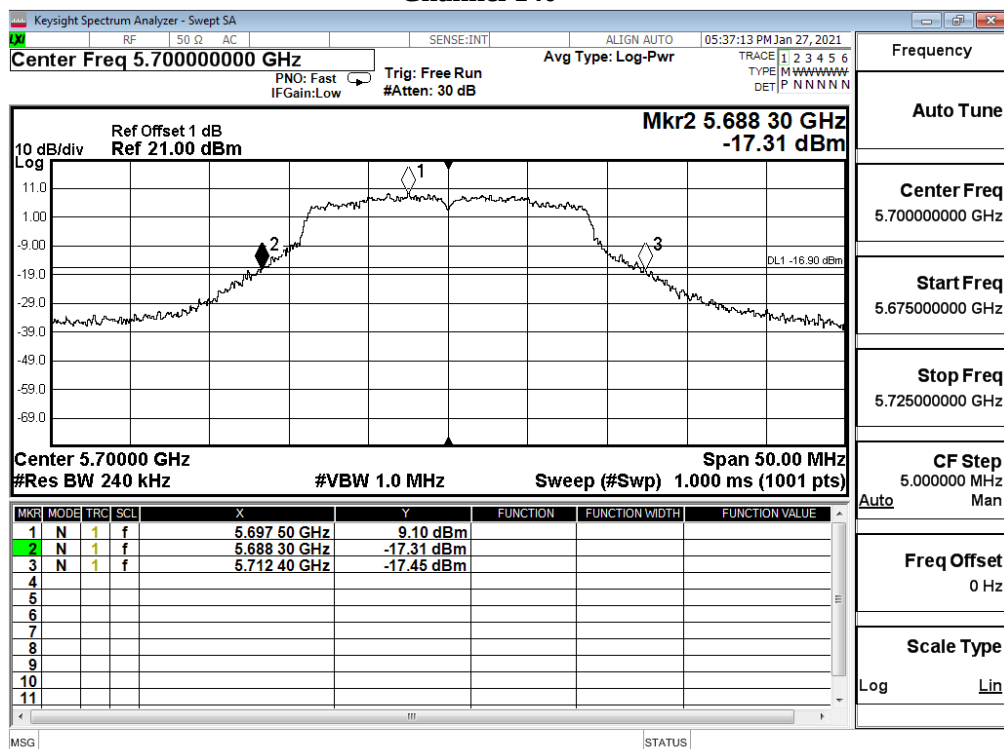
Channel 100



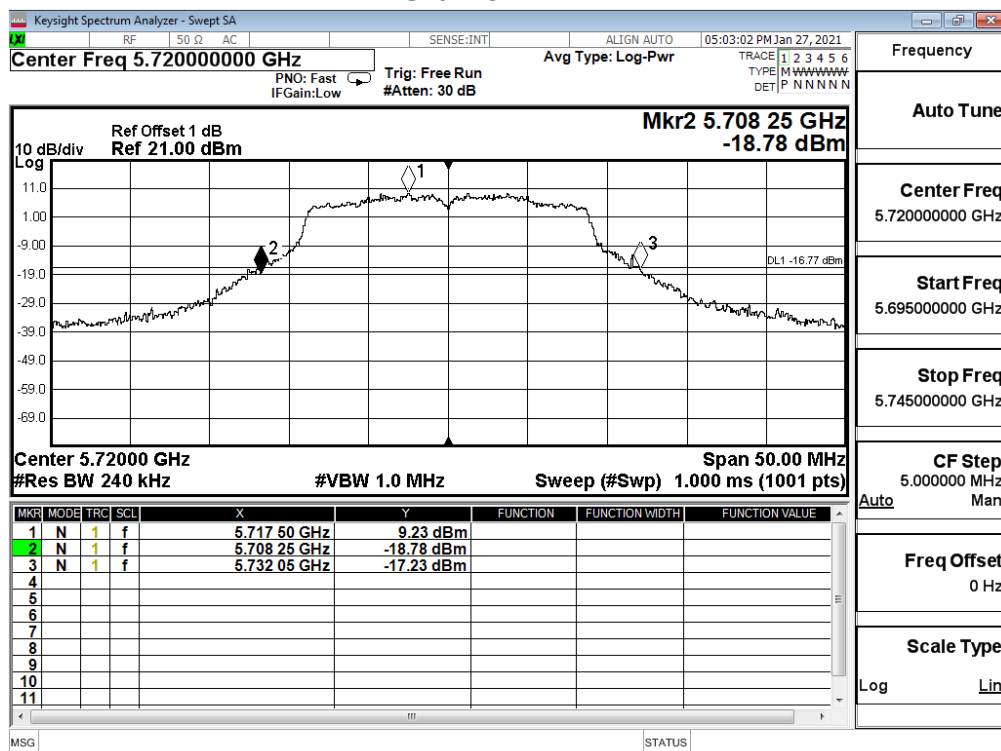
Channel 120

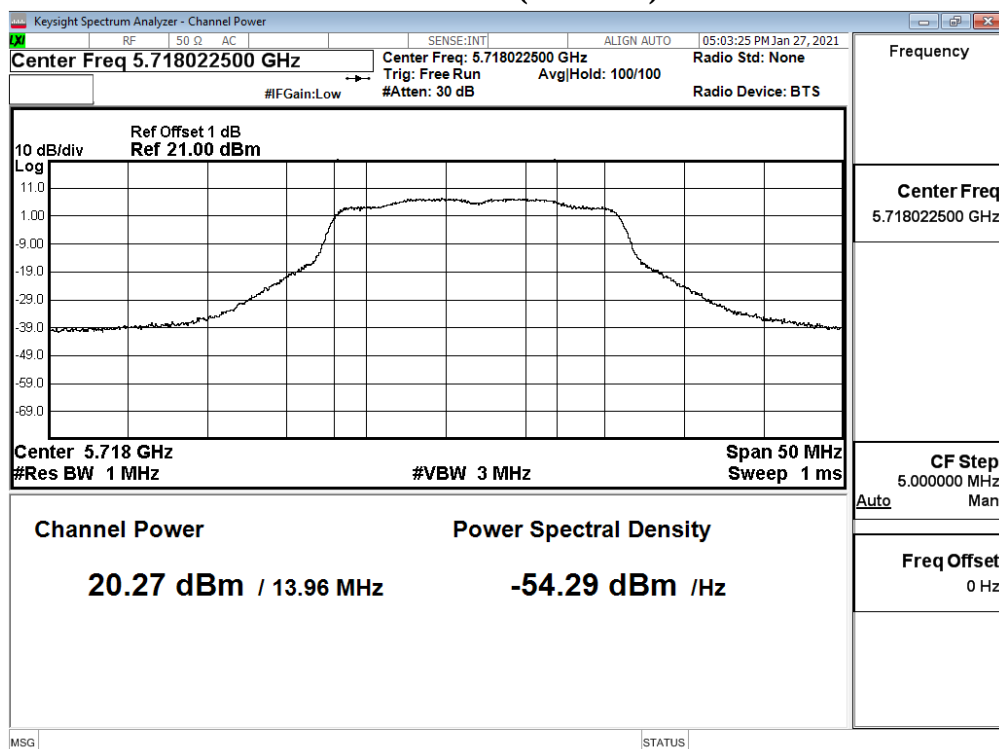
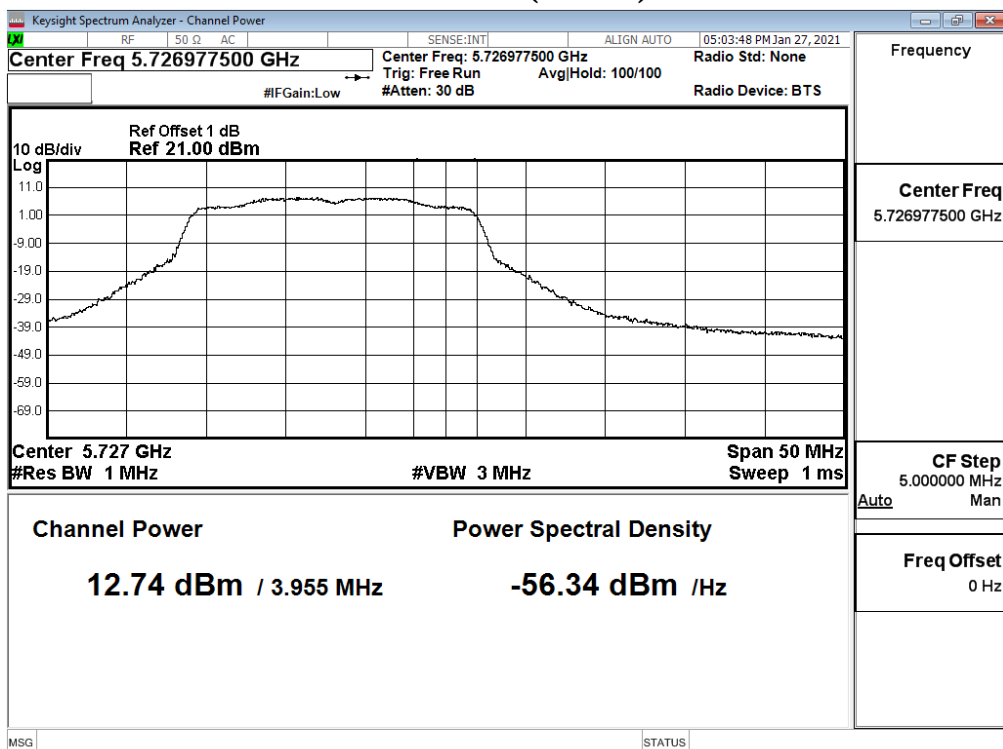


Channel 140



Channel 144



Maximum conducted output power:**Channel 144 (U-NII-2C)****Maximum conducted output power:****Channel 144 (U-NII-3)**

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 12 SISO B: Transmit (802.11n-40BW_15Mbps)

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		15	30	45	60	90	120	135	150
		Measurement Level (dBm)							
38	5190	18.31	--	--	--	--	--	--	--
46	5230	20.48	20.42	20.32	20.29	20.22	20.19	20.14	20.05
54	5270	20.42	--	--	--	--	--	--	--
62	5310	16.98	16.94	16.9	16.82	16.75	16.71	16.68	16.58
102	5510	18.53	--	--	--	--	--	--	--
118	5590	20.78	20.75	20.72	20.64	20.55	20.45	20.35	20.32
134	5670	19.43	--	--	--	--	--	--	--
142(U-NII-2C)	5710	20.72	20.69	20.62	20.52	20.44	20.39	20.3	20.27
142(U-NII-3)	5710	7.87	7.8	7.72	7.64	7.6	7.52	7.42	7.33
151	5755	20.85	--	--	--	--	--	--	--
159	5795	20.76	20.67	20.57	20.53	20.49	20.43	20.33	20.25

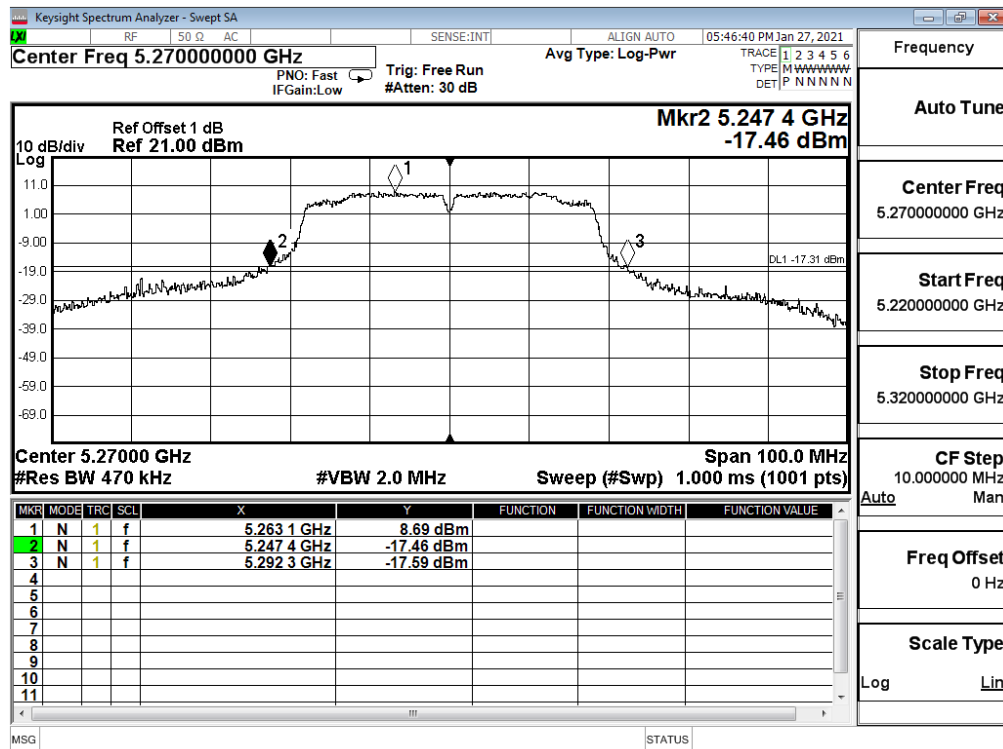
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

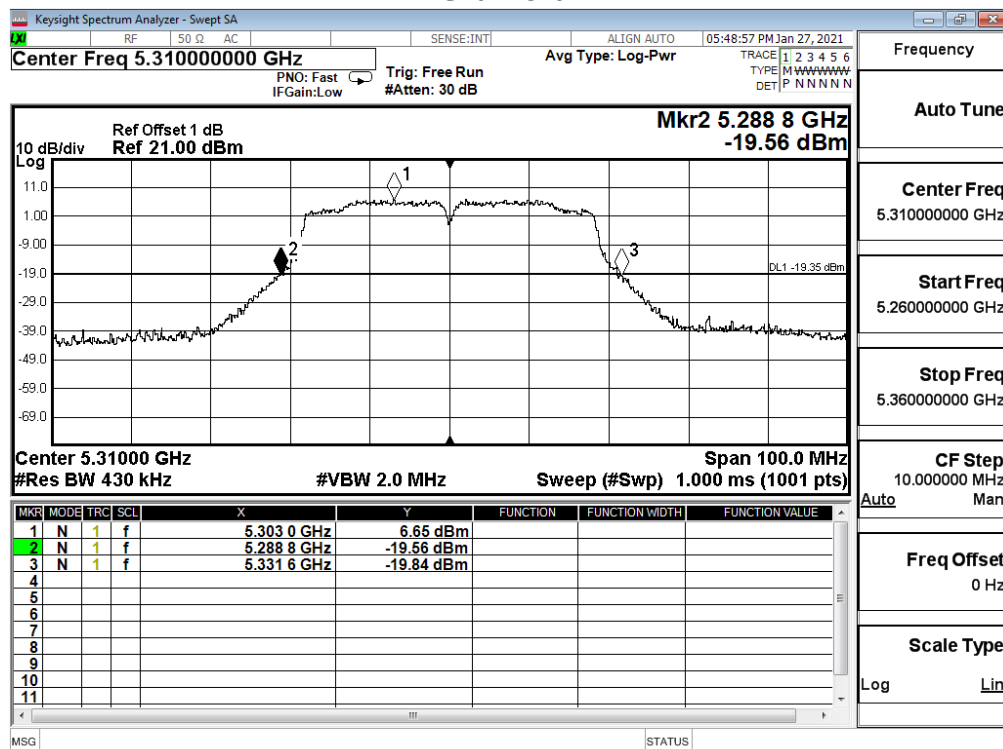
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
38	5190	--	18.31	24	--	Pass
46	5230	--	20.48	24	--	Pass
54	5270	44.00	20.42	24	27.43	Pass
62	5310	42.50	16.98	24	27.28	Pass
102	5510	42.90	18.53	24	27.32	Pass
118	5590	49.50	20.78	24	27.95	Pass
134	5670	42.50	19.43	24	27.28	Pass
142(U-NII-2C)	5710	36.20	20.72	24	26.59	Pass
142(U-NII-3)	5710	--	7.87	30	--	Pass
151	5755	--	20.85	30	--	Pass
159	5795	--	20.76	30	--	Pass

26dB Occupied Bandwidth:

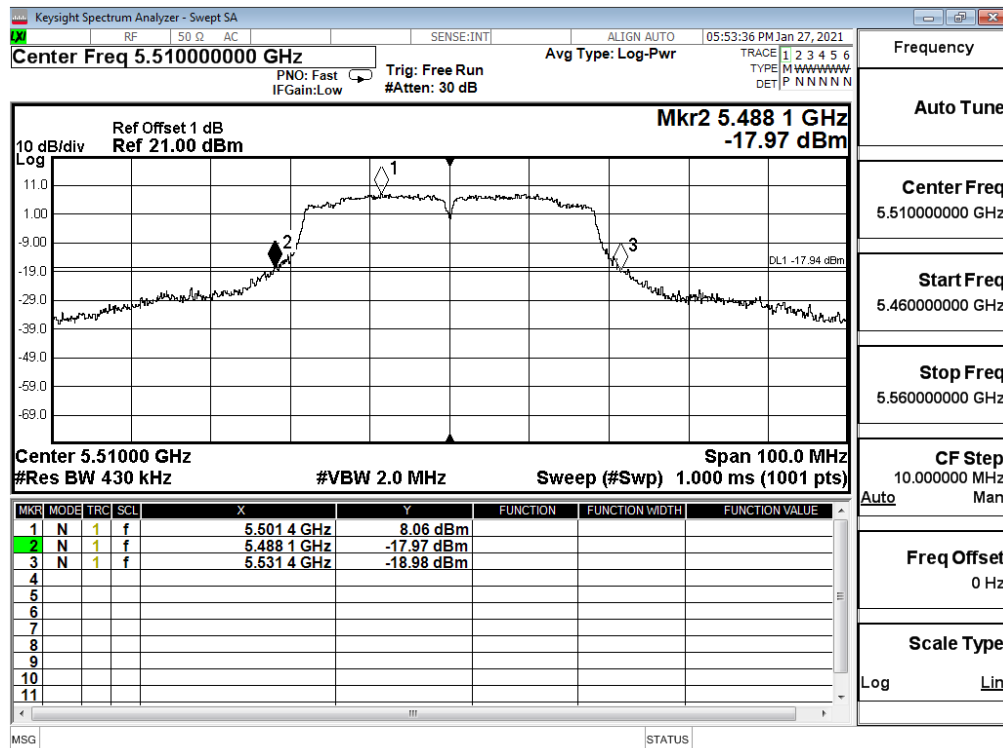
Channel 54



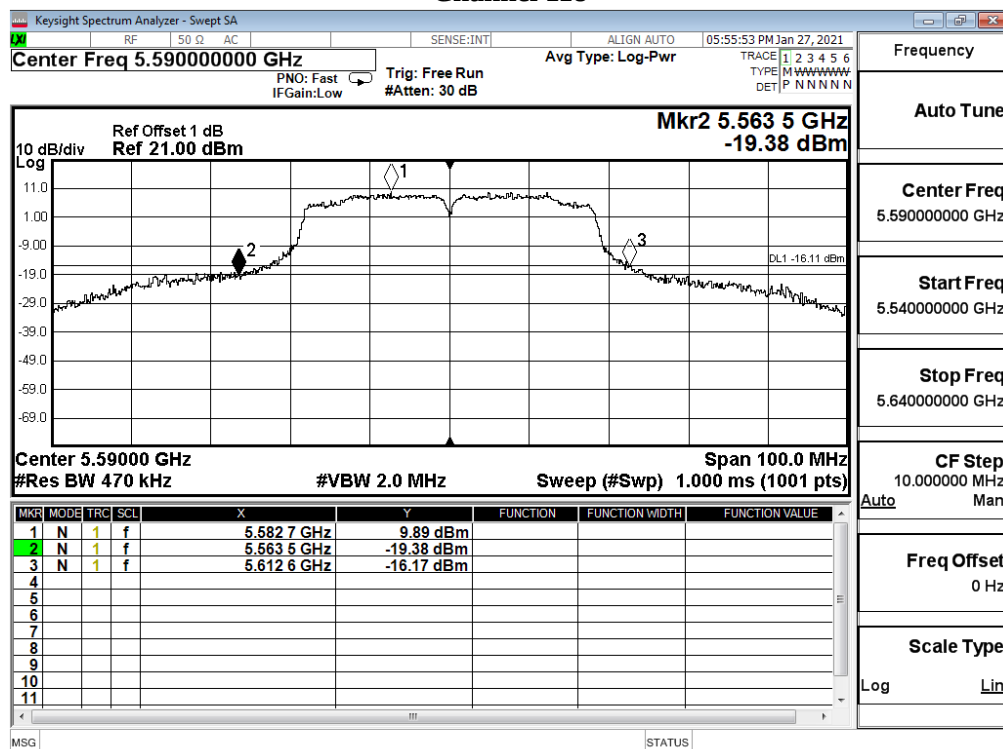
Channel 62



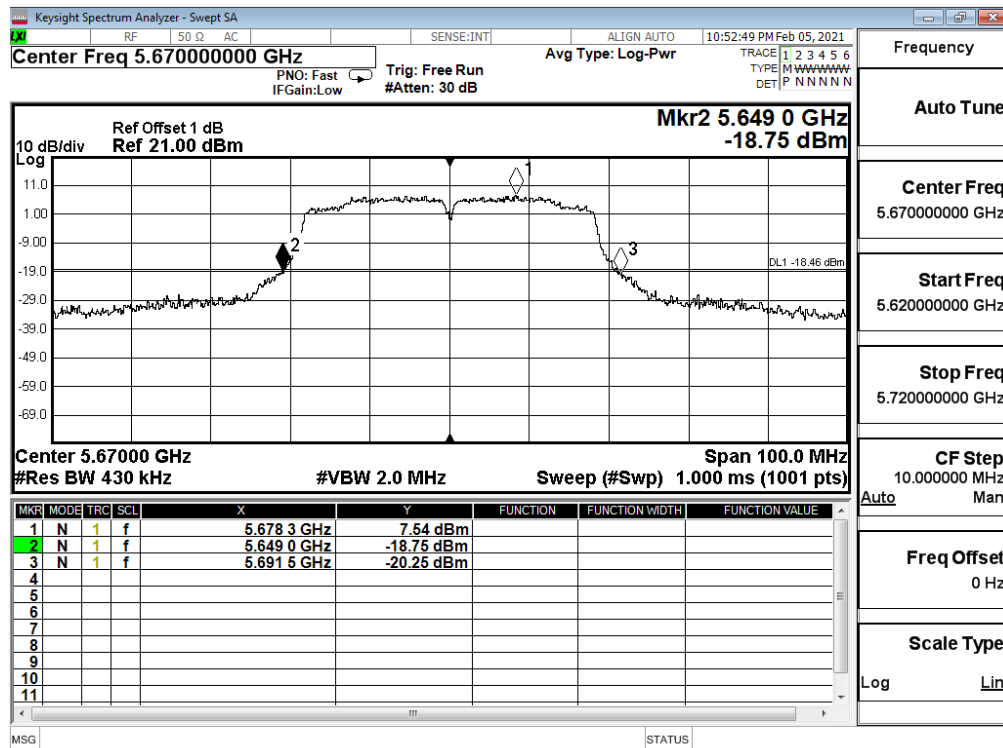
Channel 102



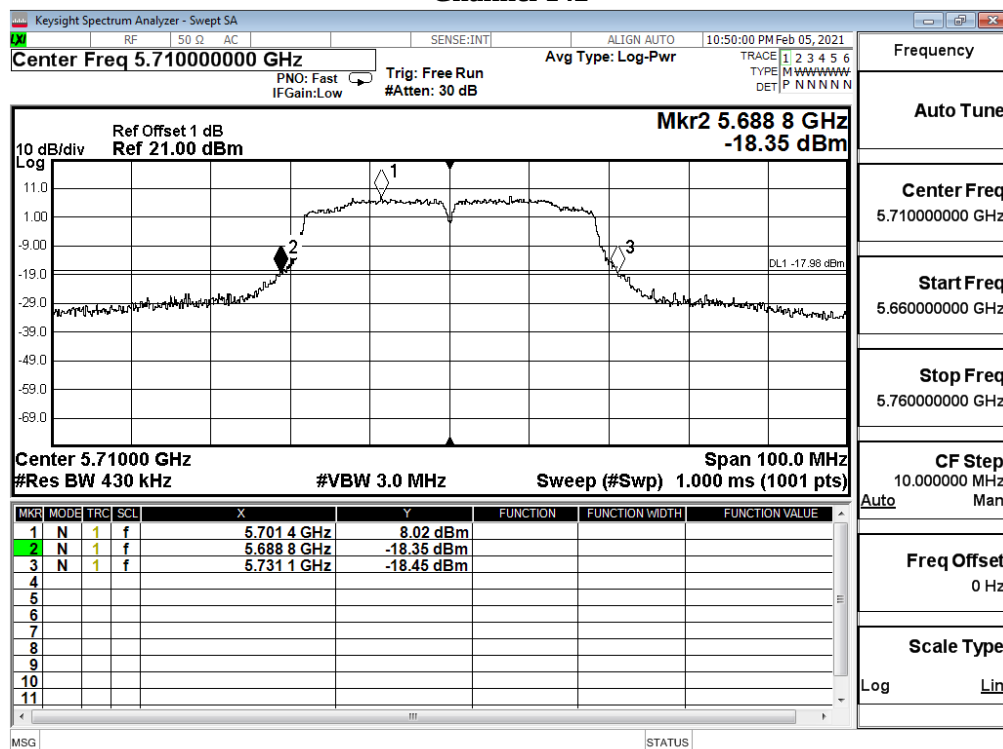
Channel 118

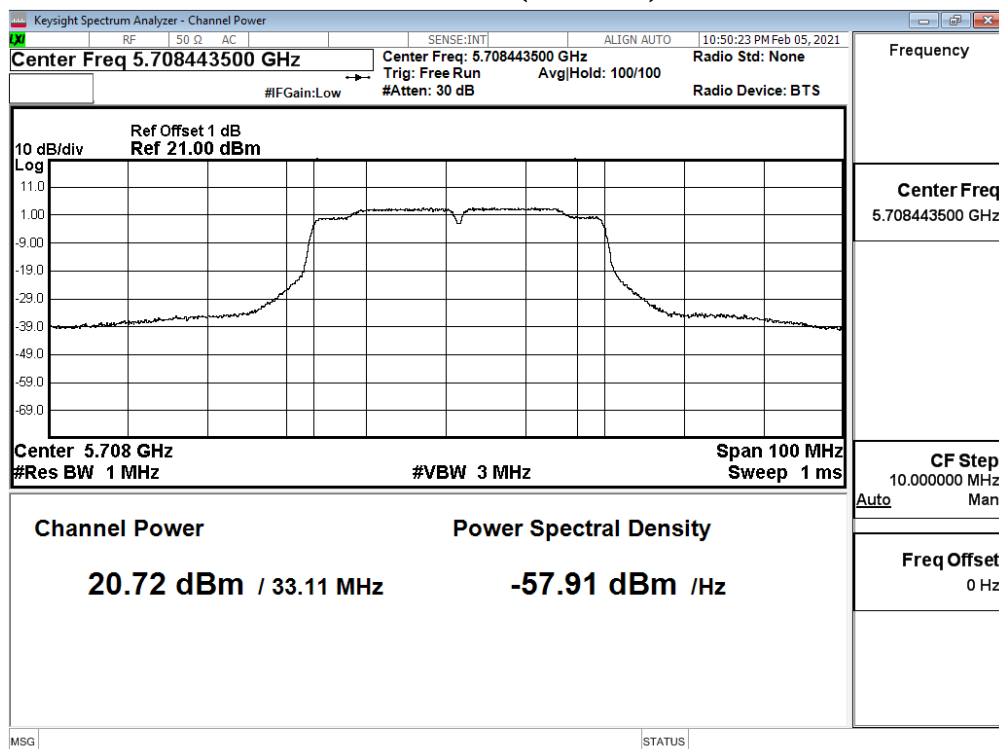
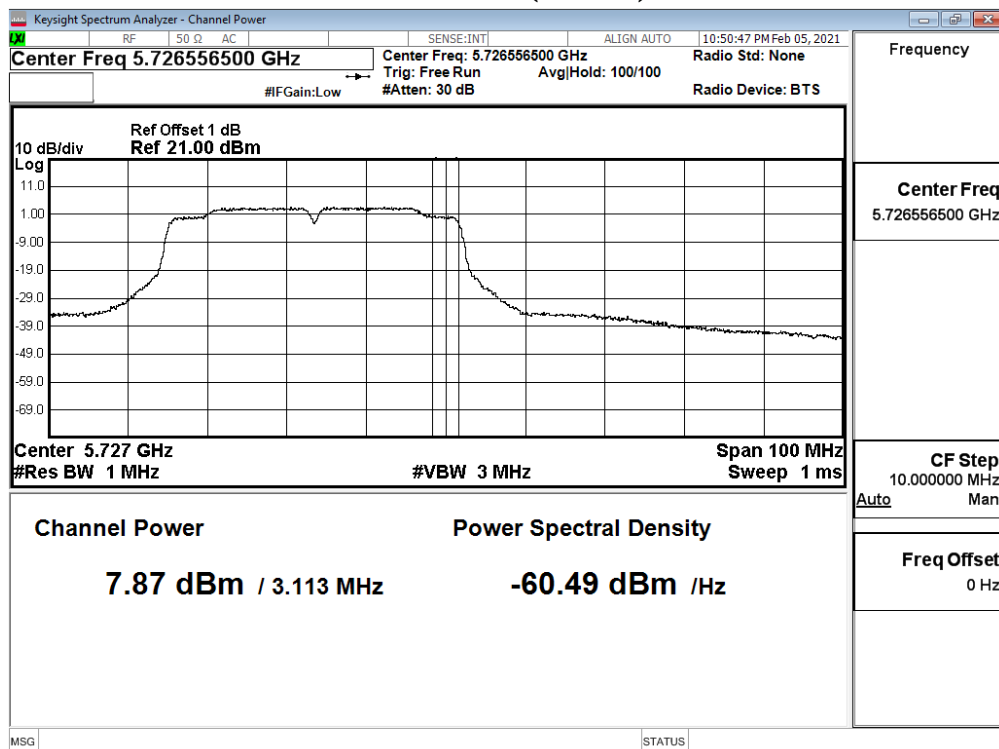


Channel 134



Channel 142



Maximum conducted output power:**Channel 142 (U-NII-2C)****Maximum conducted output power:****Channel 142 (U-NII-3)**

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/01/27
 Test Mode : Mode 13 SISO B: Transmit (802.11ac-80BW_32.5Mbps)

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		32.5	65	97.5	130	195	260	292.5	325	390	433.3
42	5210	18.68	18.65	18.55	18.51	18.41	18.33	18.25	18.15	18.08	17.99
58	5290	18.28	18.25	18.22	18.18	18.10	18.06	17.97	17.90	17.84	17.77
106	5530	18.65	--	--	--	--	--	--	--	--	--
122	5610	19.7	19.66	19.6	19.55	19.49	19.45	19.36	19.33	19.27	19.22
138 (U-NII-2C)	5690	20.78	20.7	20.6	20.56	20.46	20.41	20.36	20.33	20.25	20.21
138 (U-NII-3)	5690	4.31	4.23	4.14	4.1	4.01	3.96	3.89	3.79	3.74	3.66
155	5775	18.67	18.62	18.54	18.49	18.45	18.35	18.31	18.23	18.14	18.11

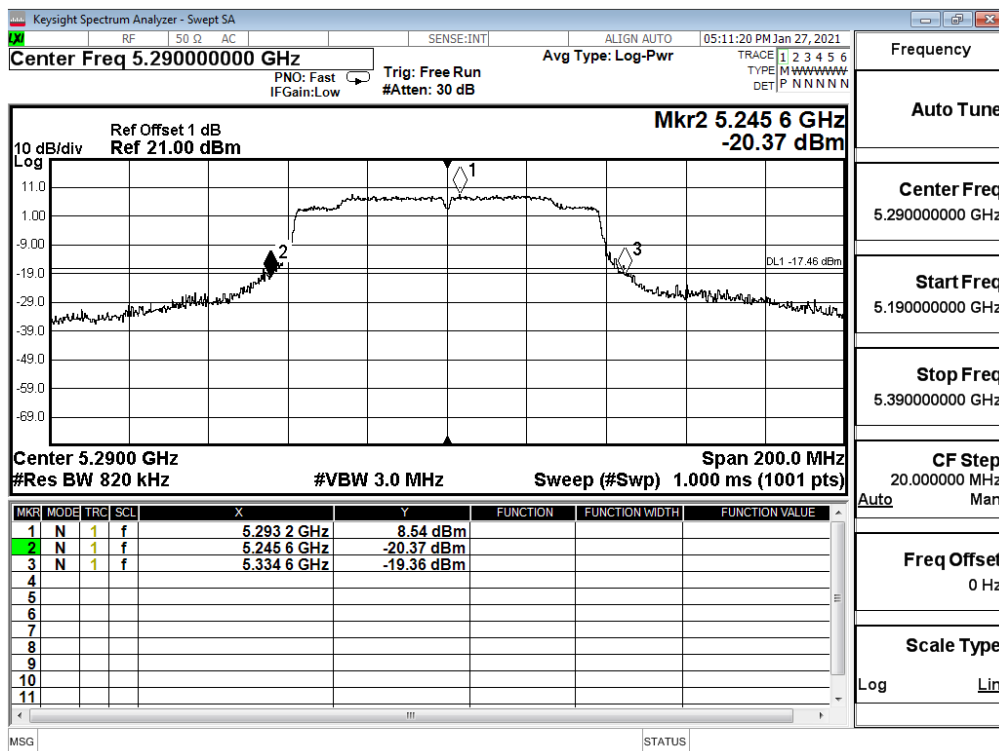
Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Maximum conducted output power Measurement:

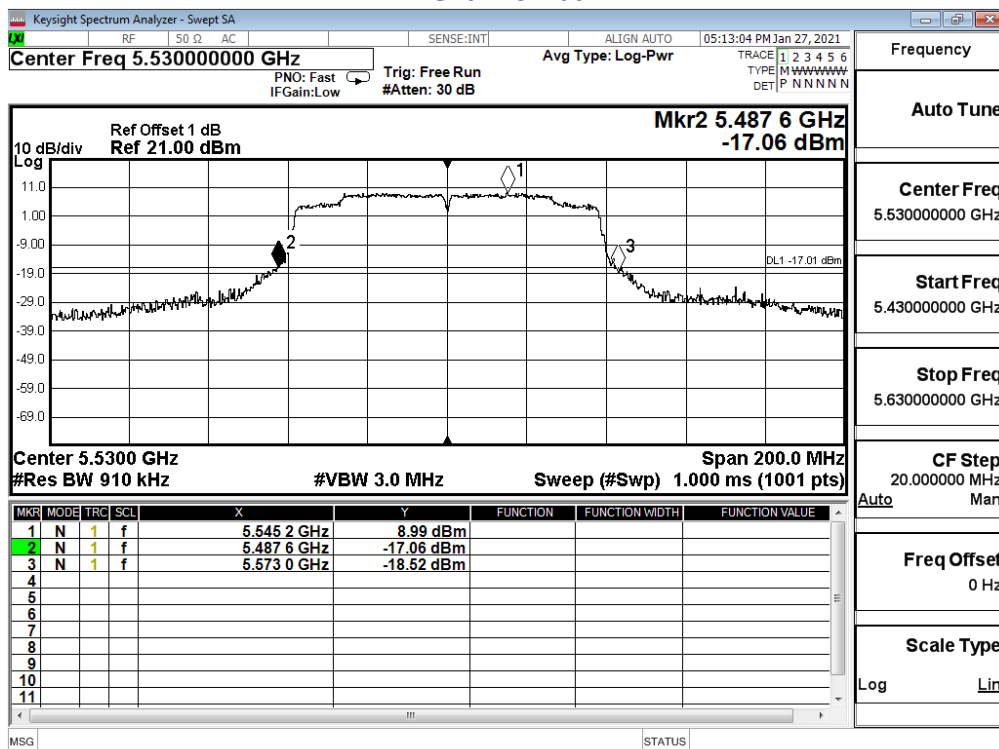
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
42	5210	--	18.68	24	--	Pass
58	5290	89.00	18.28	24	30.49	Pass
106	5530	85.40	18.65	24	30.31	Pass
122	5610	114.40	19.70	24	31.58	Pass
138 (U-NII-2C)	5690	106.60	20.78	24	31.28	Pass
138 (U-NII-3)	5690	--	4.31	30	--	Pass
155	5775	--	18.67	30	--	Pass

26dB Occupied Bandwidth:

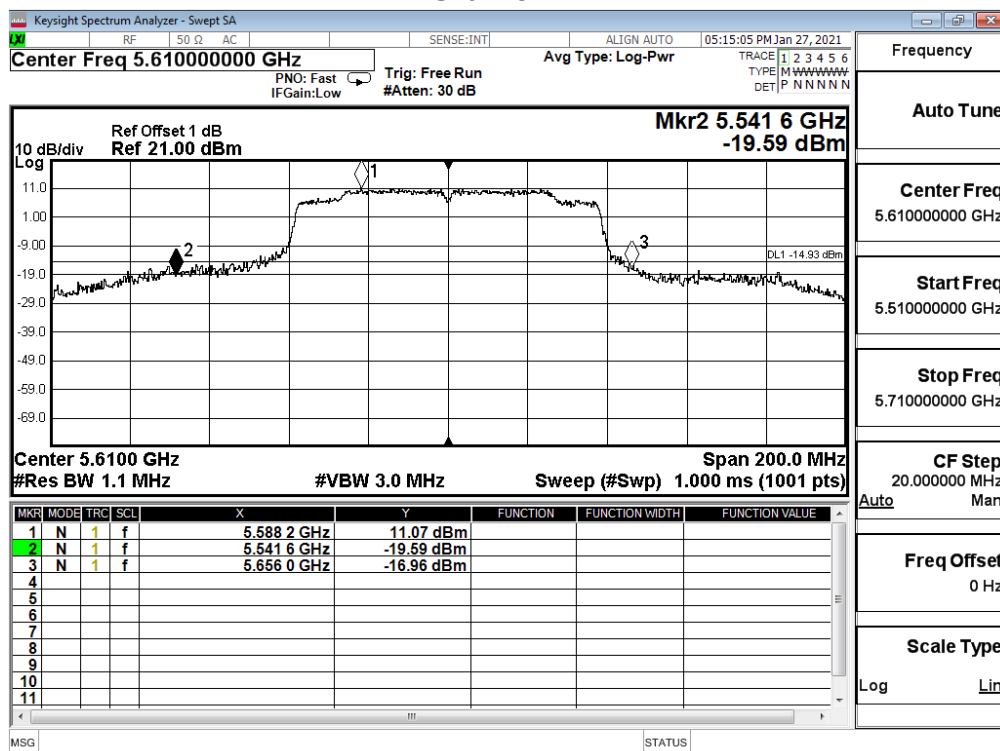
Channel 58



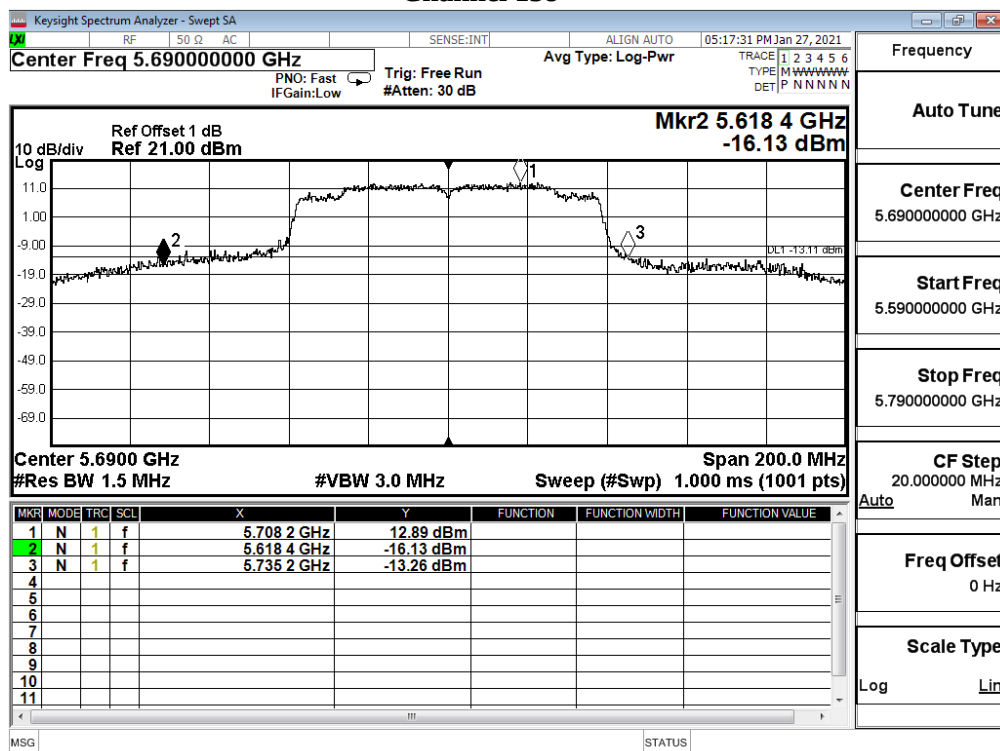
Channel 106

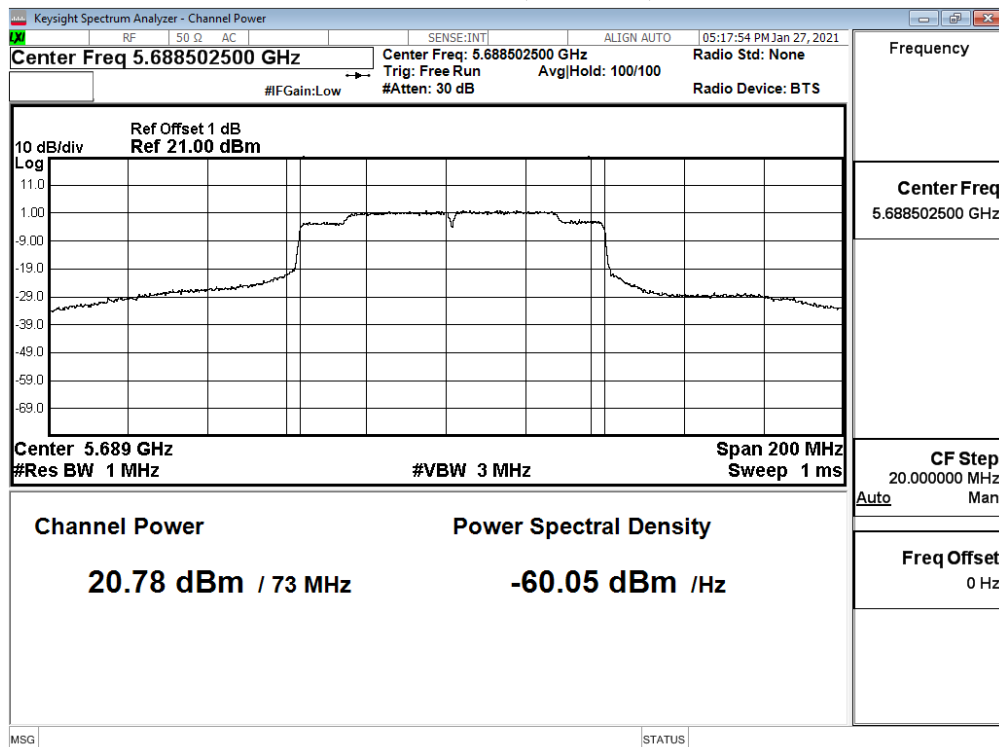
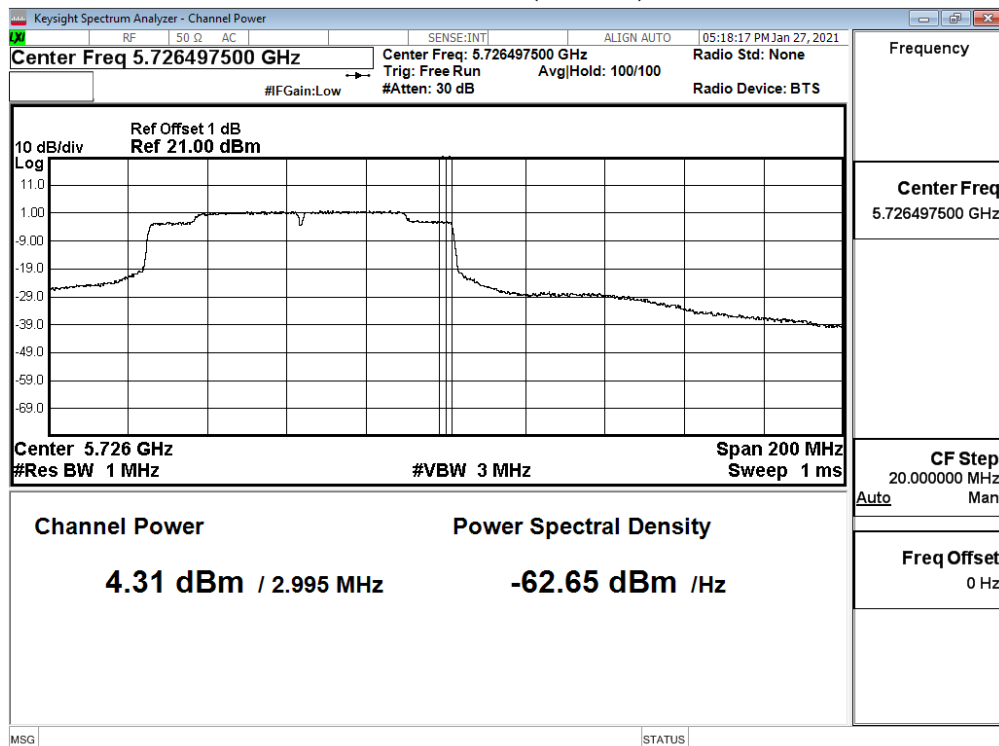


Channel 122



Channel 138



Maximum conducted output power:**Channel 138 (U-NII-2C)****Maximum conducted output power:****Channel 138 (U-NII-3)**

Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/03
 Test Mode : Mode 14 SISO B: Transmit (802.11ac-160BW_65Mbps)

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		65	130	195	260	390	520	585	650	780	866.7
50 (U-NII-1)	5250	11.71	11.65	11.56	11.52	11.49	11.46	11.43	11.34	11.26	11.16
50 (U-NII-2A)	5250	11.56	11.49	11.41	11.36	11.29	11.19	11.09	11.01	10.97	10.89
114	5570	15.18	15.09	15.04	14.99	14.9	14.85	14.81	14.77	14.67	14.57

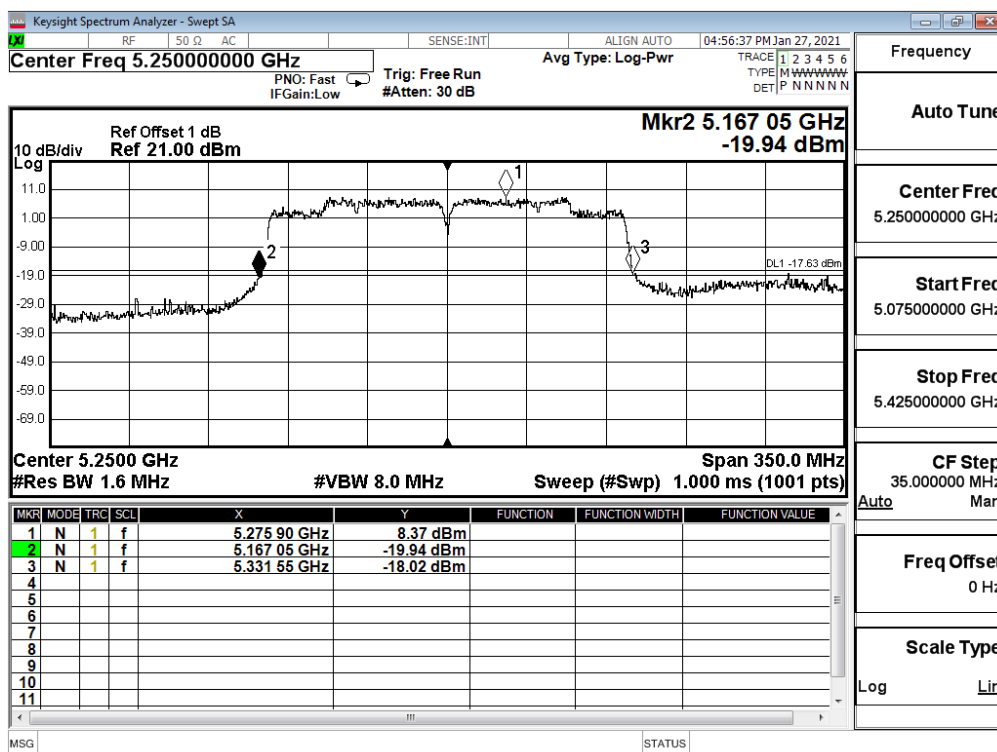
Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Maximum conducted output power Measurement:

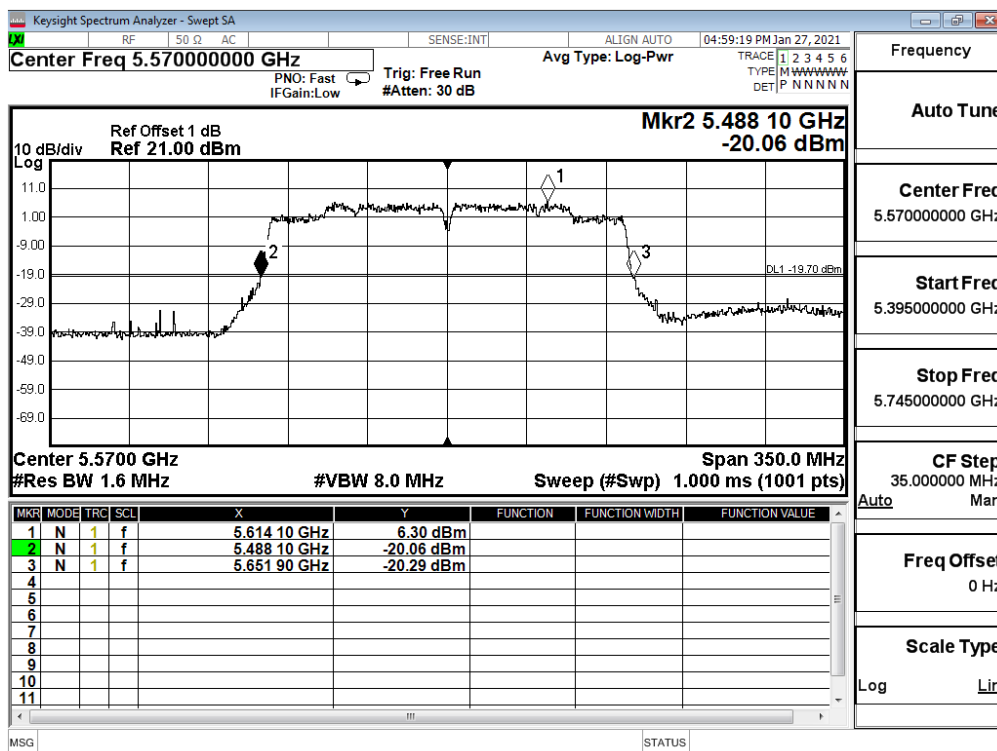
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
50 (U-NII-1)	5250	--	11.71	24	--	Pass
50 (U-NII-2A)	5250	81.55	11.56	24	30.11	Pass
114	5570	163.80	15.18	24	33.14	Pass

26dB Occupied Bandwidth:

Channel 50

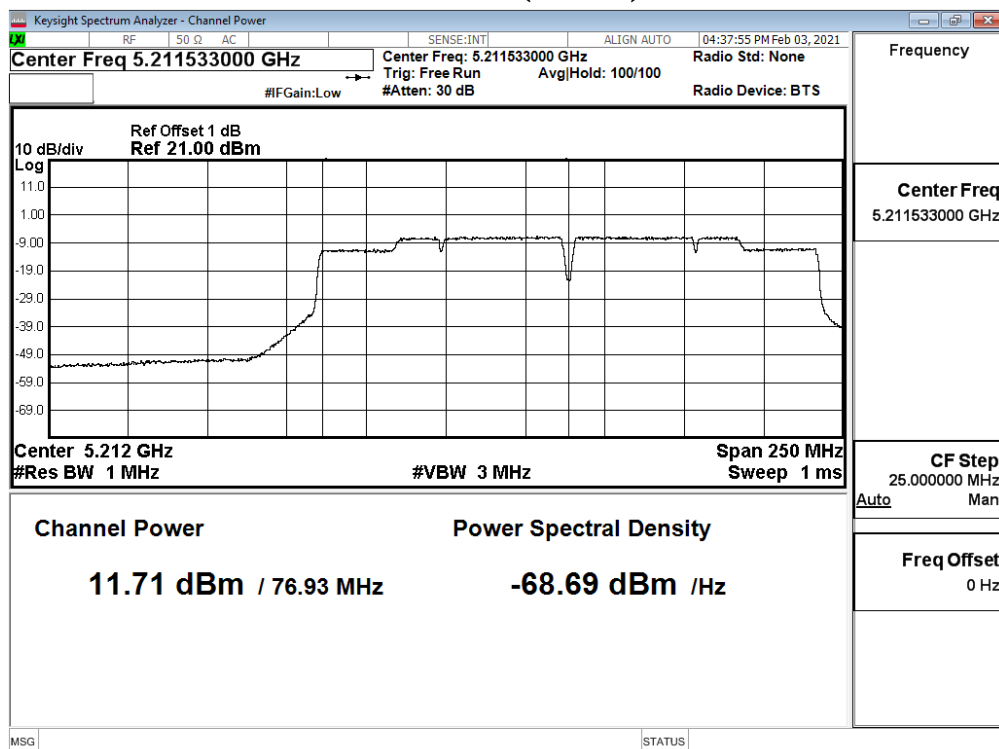


Channel 114



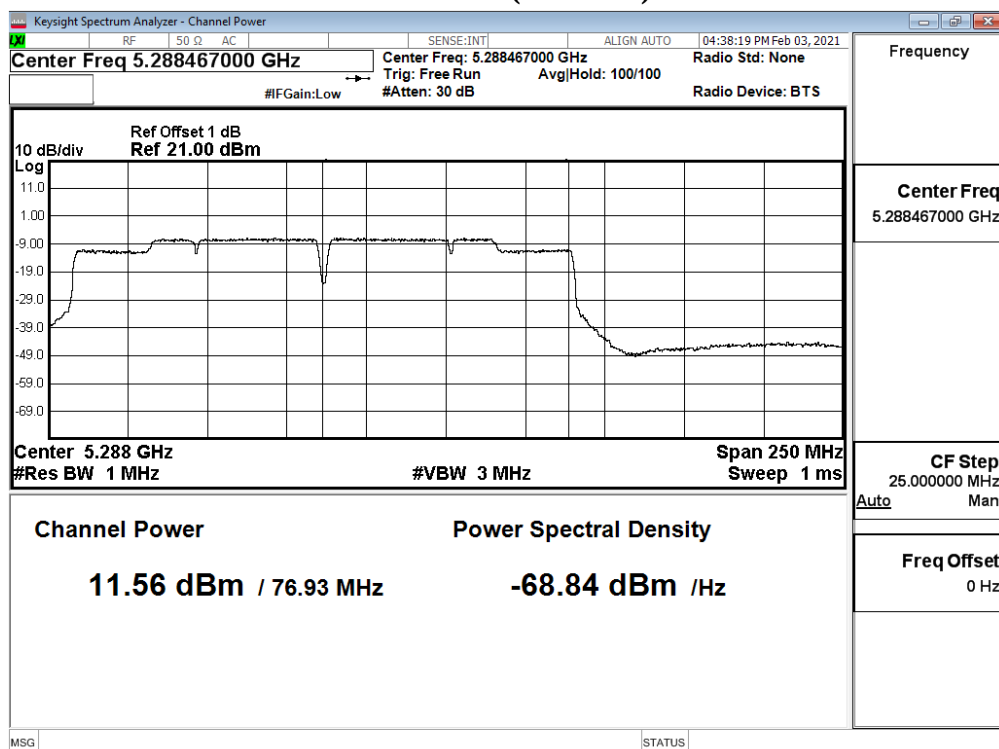
Maximum conducted output power:

Channel 50 (U-NII-1)



Maximum conducted output power:

Channel 50 (U-NII-2A)



Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 19 MIMO: Transmit (802.11n-20BW_14.4Mbps)

Chain A

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4
36	5180	18.03	--	--	--	--	--	--	--
40	5200	19.45	19.41	19.34	19.26	19.22	19.19	19.15	19.06
48	5240	19.59	--	--	--	--	--	--	--
52	5260	18.85	--	--	--	--	--	--	--
56	5280	19.45	19.4	19.34	19.27	19.22	19.19	19.11	19.05
64	5320	16.52	--	--	--	--	--	--	--
100	5500	18.1	--	--	--	--	--	--	--
120	5600	19.61	19.52	19.44	19.37	19.32	19.23	19.13	19.03
140	5700	16.82	--	--	--	--	--	--	--
144(U-NII-2C)	5720	18.8	18.74	18.68	18.58	18.52	18.43	18.35	18.29
144(U-NII-3)	5720	11.46	11.41	11.35	11.29	11.22	11.19	11.12	11.08
149	5745	19.81	--	--	--	--	--	--	--
157	5785	19.79	19.74	19.66	19.59	19.55	19.45	19.41	19.35
165	5825	19.65	--	--	--	--	--	--	--

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Chain B

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4
36	5180	17.96	--	--	--	--	--	--	--
40	5200	19.28	19.22	19.12	19.05	19	18.93	18.83	18.75
48	5240	19.41	--	--	--	--	--	--	--
52	5260	18.85	--	--	--	--	--	--	--
56	5280	19.31	19.24	19.17	19.11	19.04	18.94	18.89	18.79
64	5320	16.57	--	--	--	--	--	--	--
100	5500	18.12	--	--	--	--	--	--	--
120	5600	19.69	19.66	19.57	19.47	19.42	19.34	19.3	19.2
140	5700	18.63	--	--	--	--	--	--	--
144(U-NII-2C)	5720	19.32	19.25	19.16	19.13	19.09	19.05	18.95	18.89
144(U-NII-3)	5720	11.89	11.86	11.8	11.77	11.73	11.68	11.58	11.54
149	5745	19.73	--	--	--	--	--	--	--
157	5785	19.92	19.88	19.85	19.8	19.73	19.7	19.62	19.58
165	5825	19.87	--	--	--	--	--	--	--

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

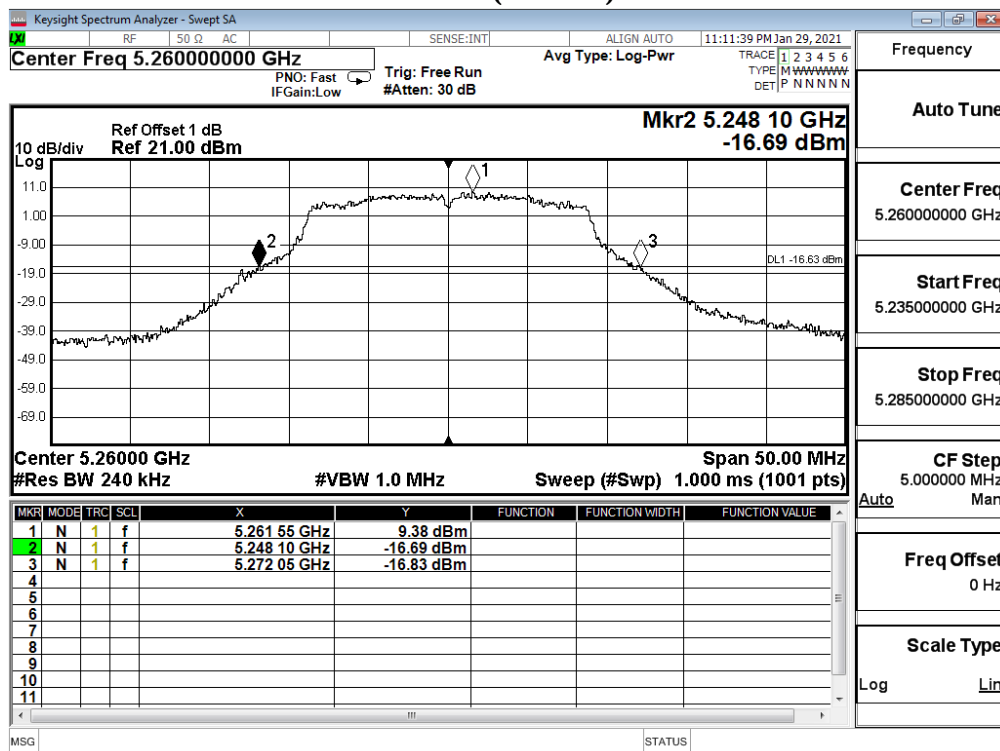
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit		Result
						(dBm)	dBm+10log(BW)	
36	5180	--	18.03	17.96	21.01	24	--	Pass
40	5200	--	19.45	19.28	22.38	24	--	Pass
48	5240	--	19.59	19.41	22.51	24	--	Pass
52	5260	23.95	18.85	18.85	21.86	24	24.79	Pass
56	5280	25.45	19.45	19.31	22.39	24	25.06	Pass
64	5320	22.80	16.52	16.57	19.56	24	24.58	Pass
100	5500	24.00	18.10	18.12	21.12	24	24.80	Pass
120	5600	25.85	19.61	19.69	22.66	24	25.12	Pass
140	5700	23.30	16.82	18.63	20.83	24	24.67	Pass
144(U-NII-2C)	5720	17.45	18.80	19.32	22.08	24	23.42	Pass
144(U-NII-3)	5720	--	11.46	11.89	14.69	30	--	Pass
149	5745	--	19.81	19.73	22.78	30	--	Pass
157	5785	--	19.79	19.92	22.87	30	--	Pass
165	5825	--	19.65	19.87	22.77	30	--	Pass

Note:

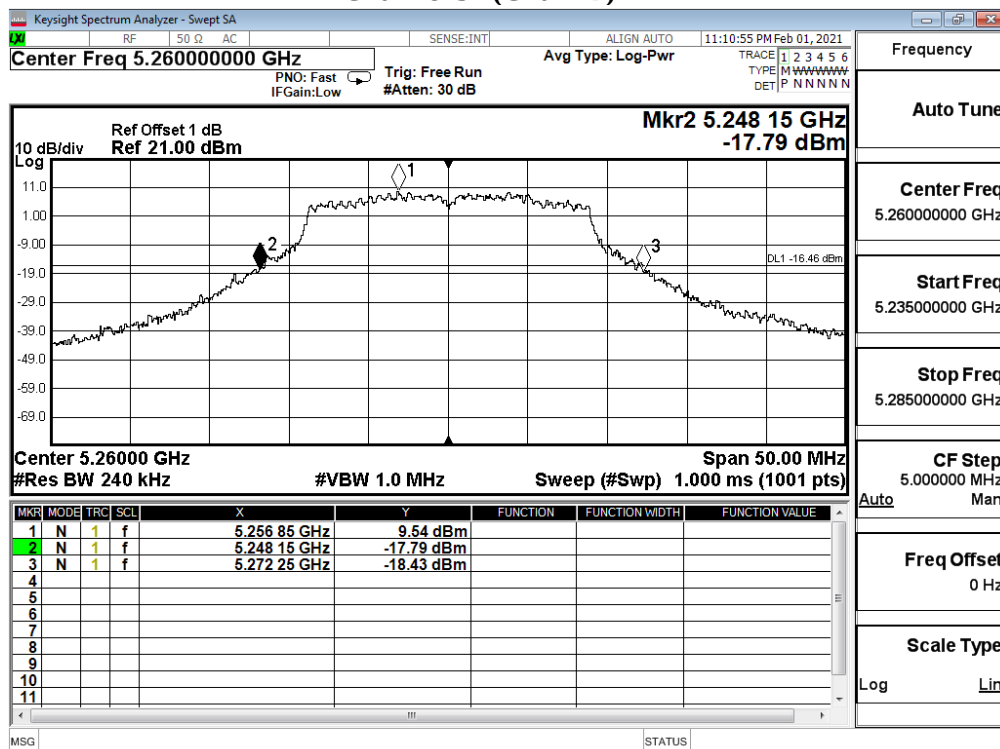
1. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
2. 26dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

26dB Occupied Bandwidth:

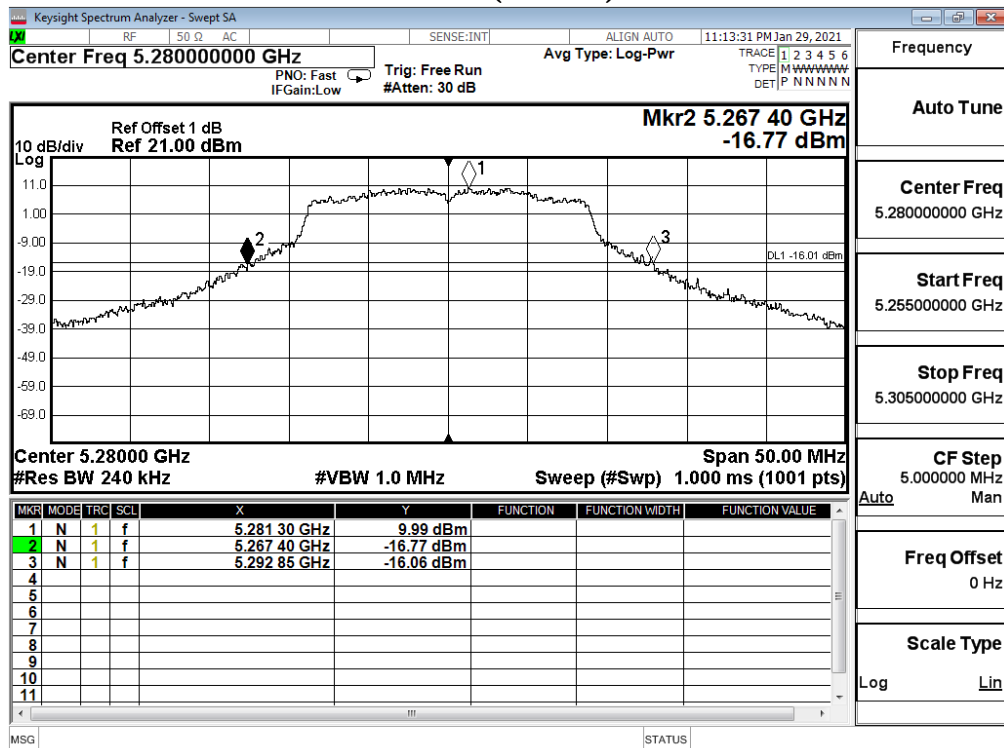
Channel 52 (Chain A)



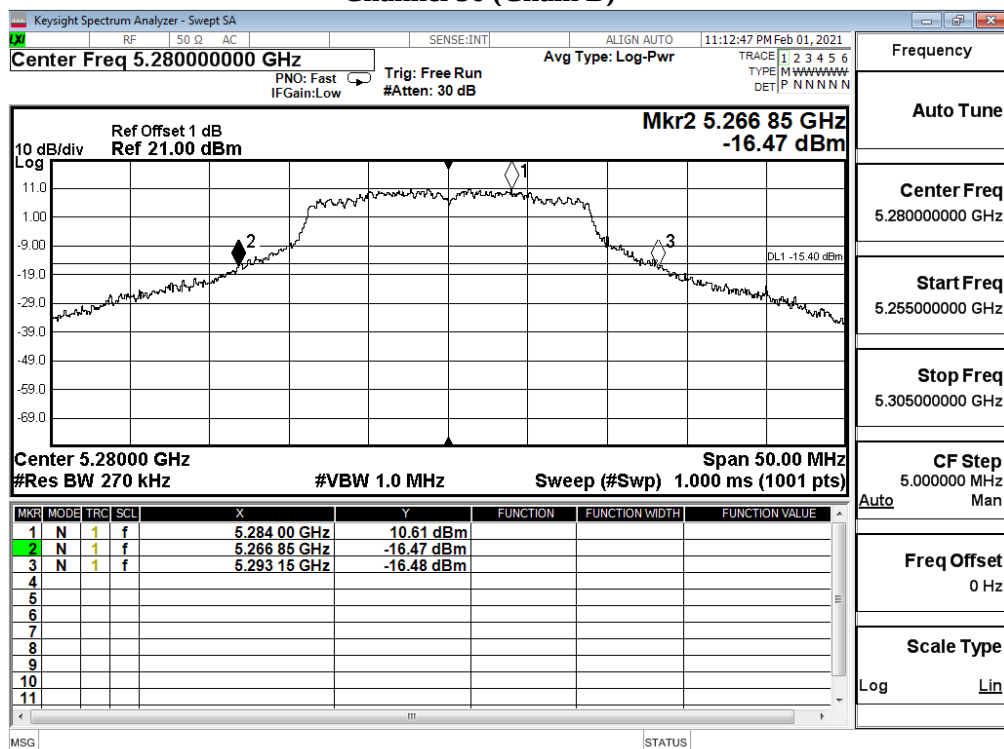
Channel 52 (Chain B)



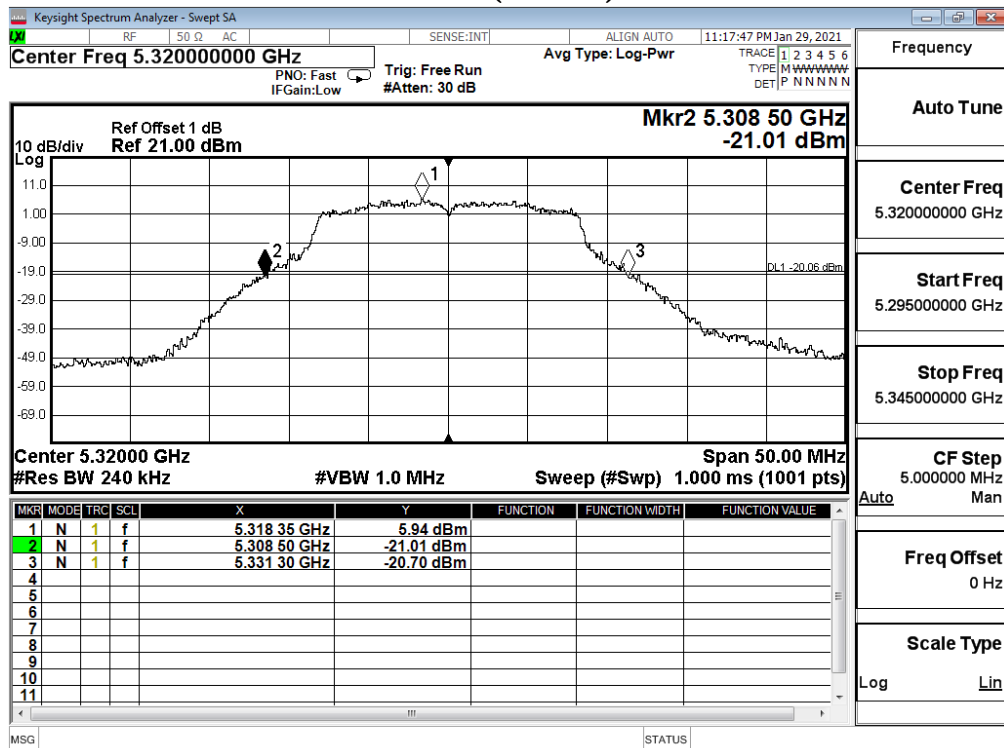
Channel 56 (Chain A)



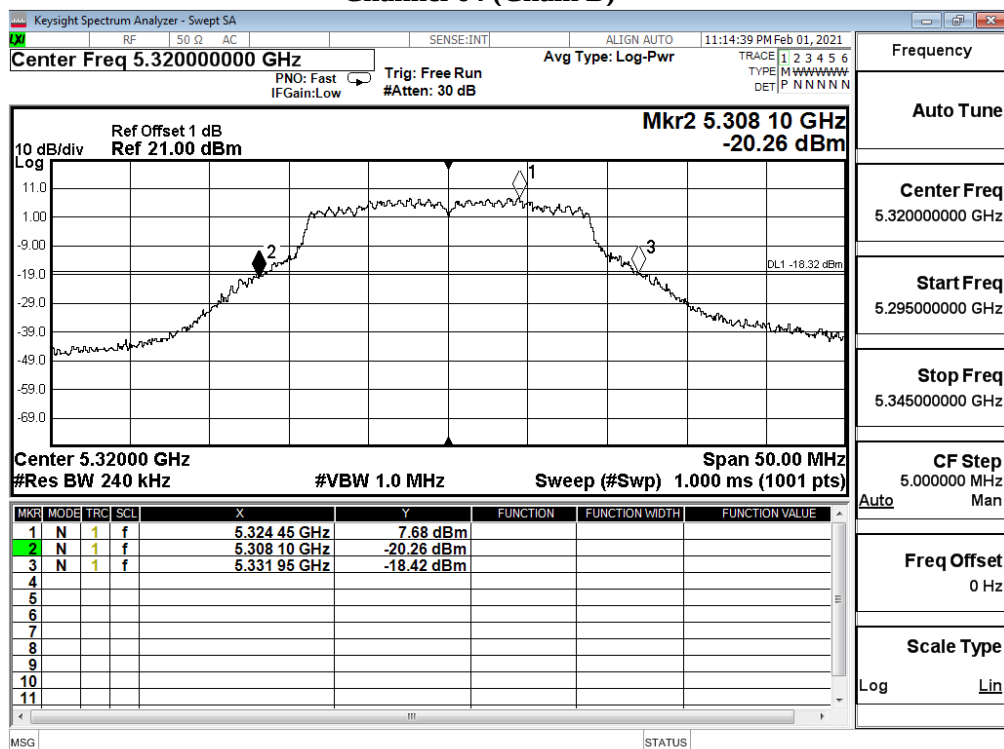
Channel 56 (Chain B)



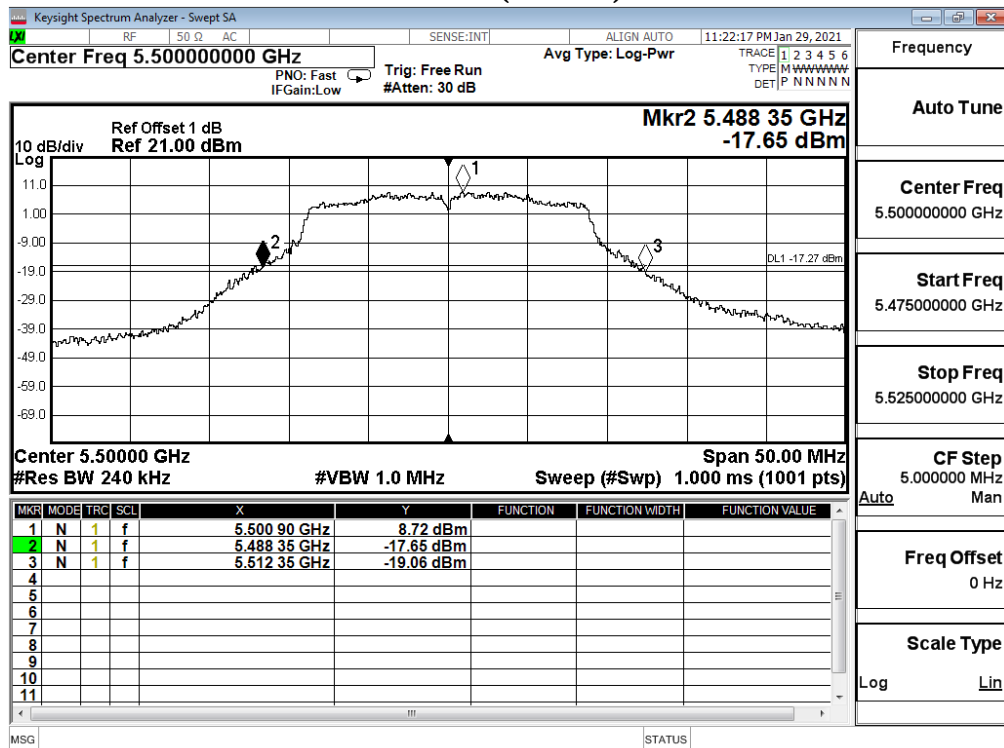
Channel 64 (Chain A)



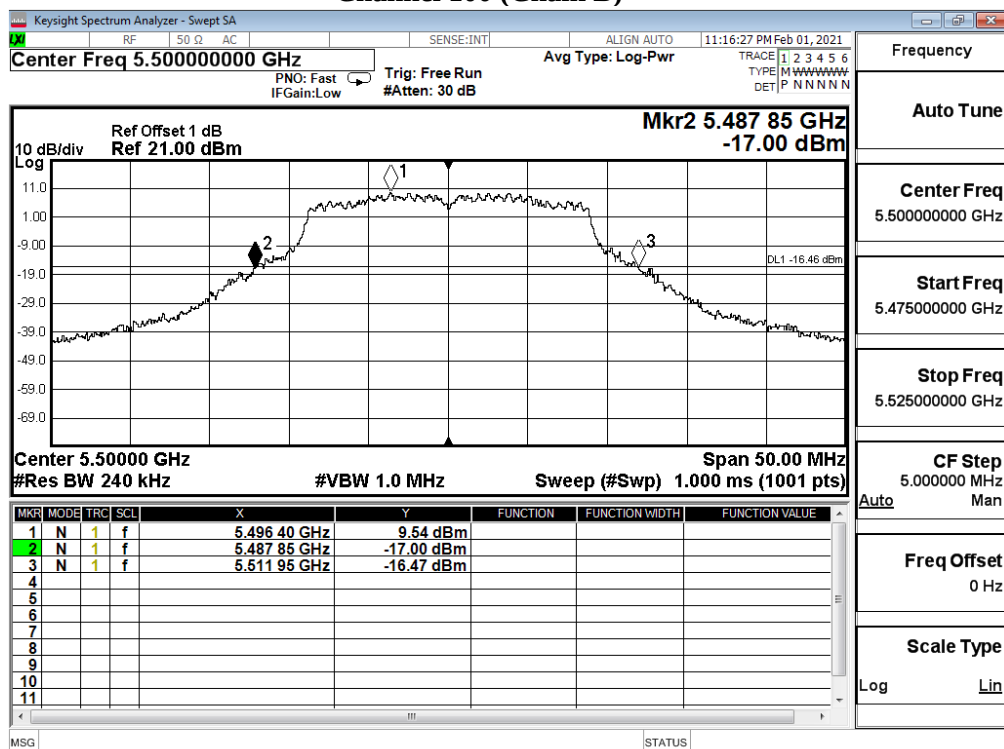
Channel 64 (Chain B)



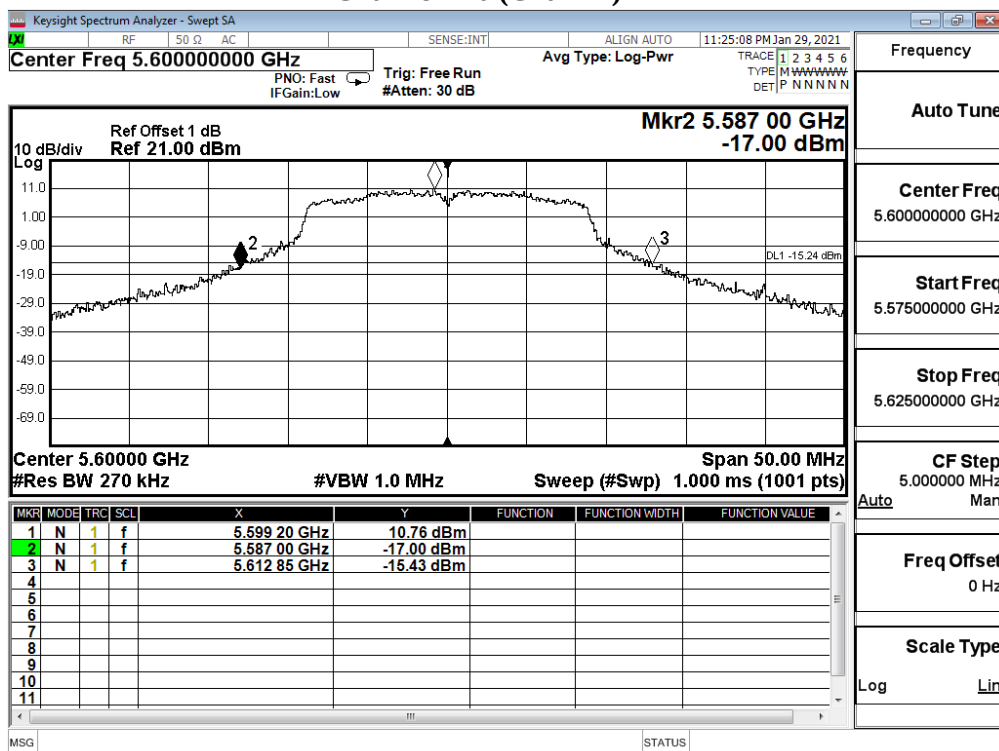
Channel 100 (Chain A)



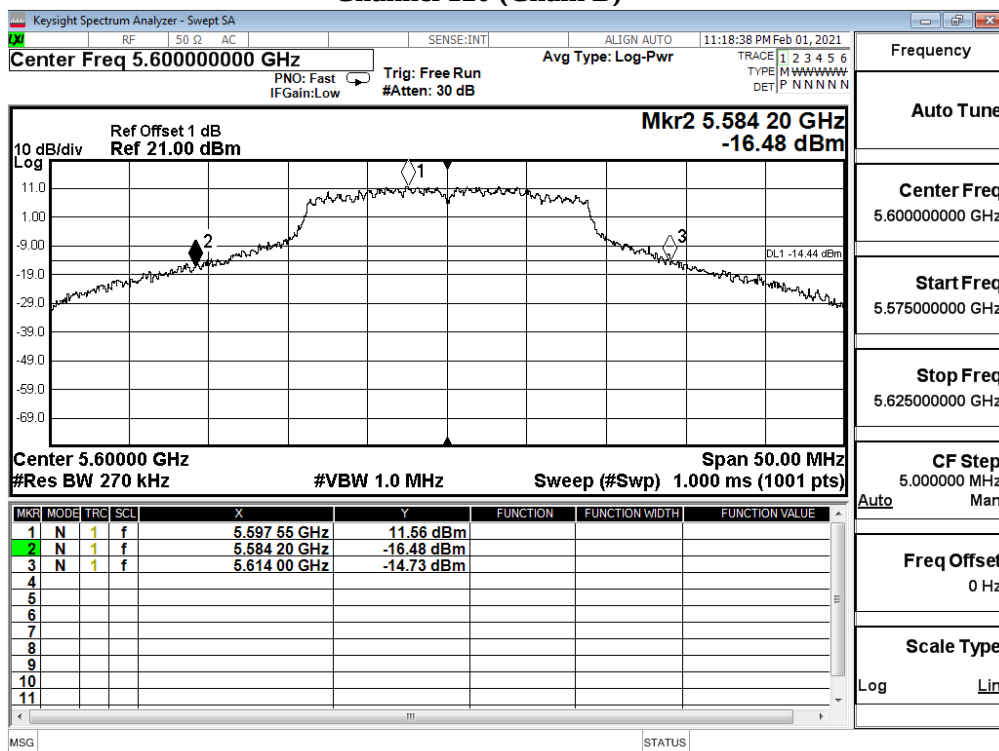
Channel 100 (Chain B)



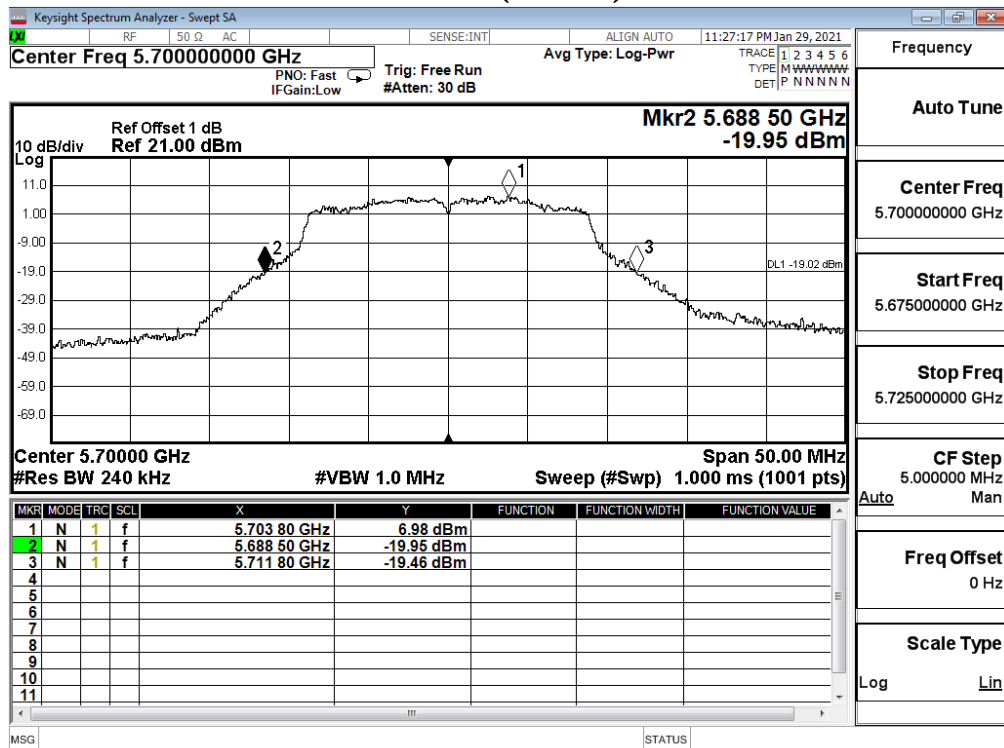
Channel 120 (Chain A)



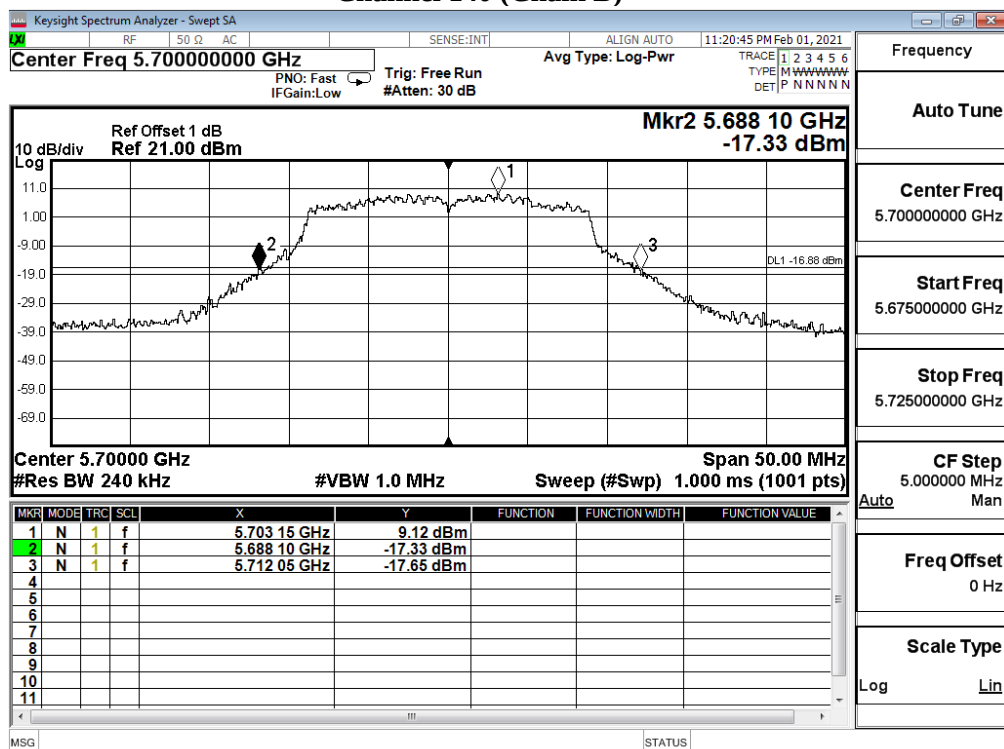
Channel 120 (Chain B)



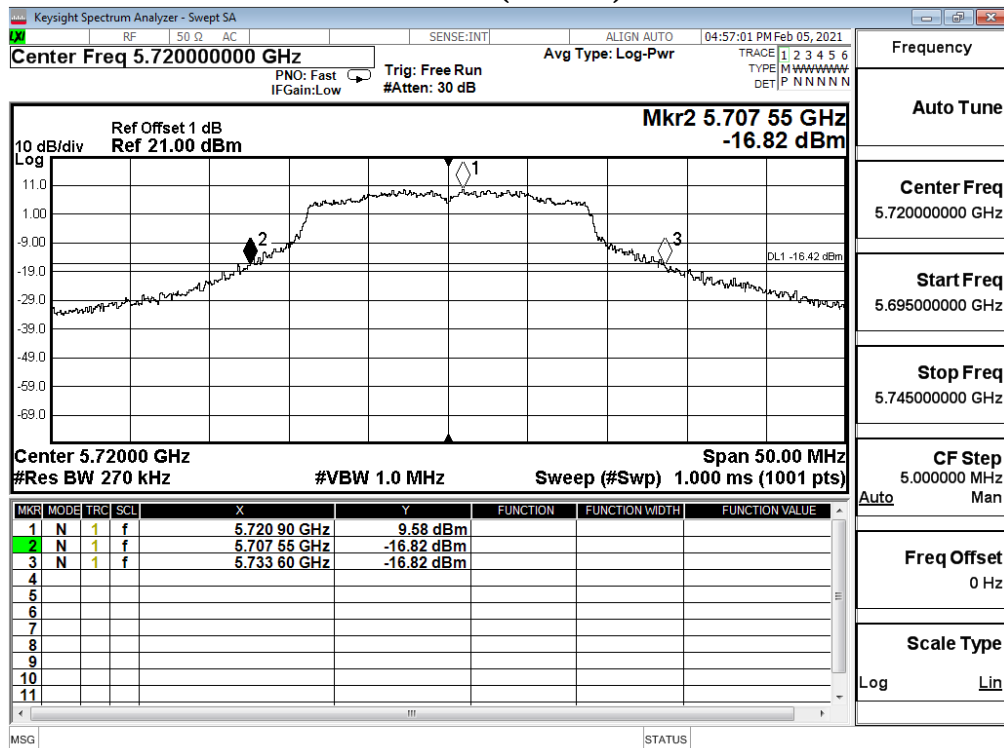
Channel 140 (Chain A)



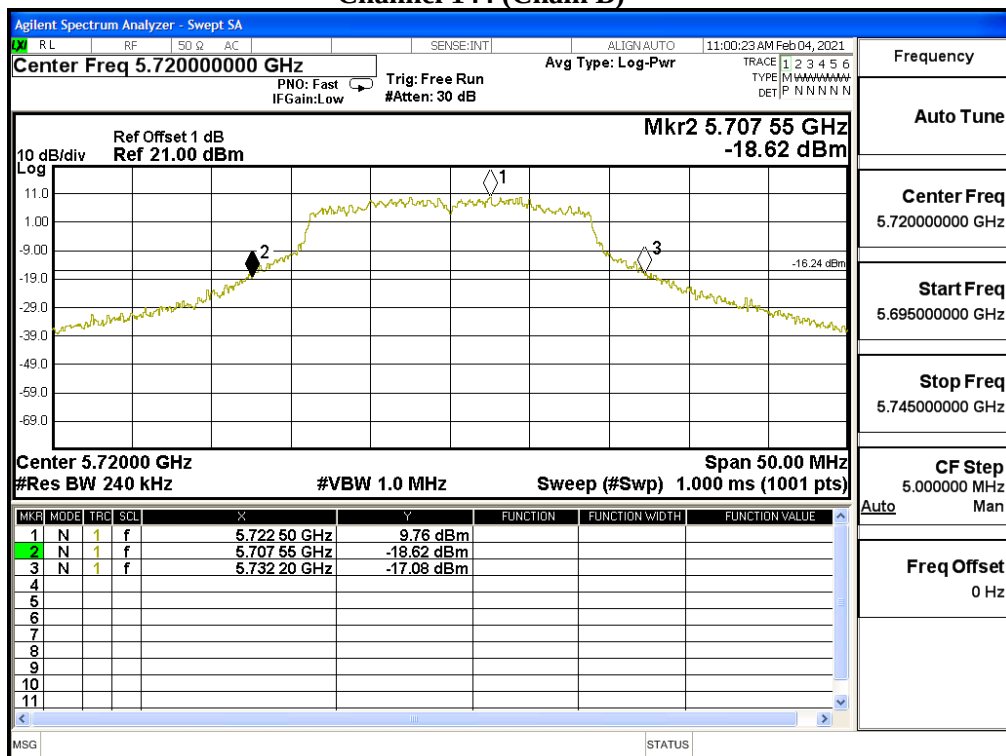
Channel 140 (Chain B)



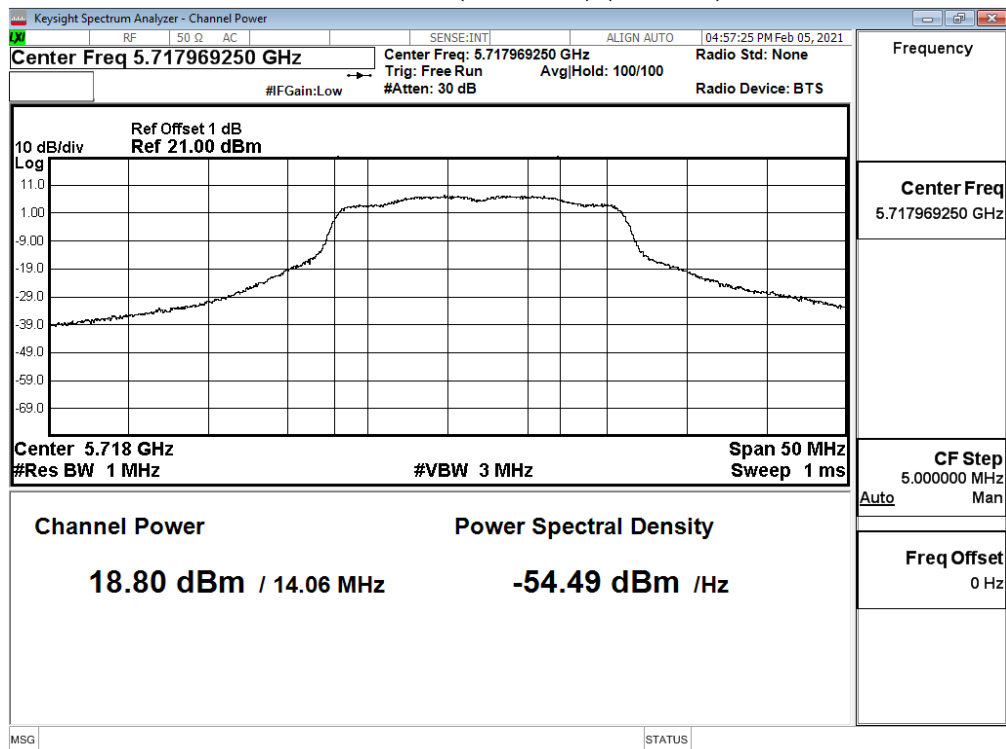
Channel 144 (Chain A)



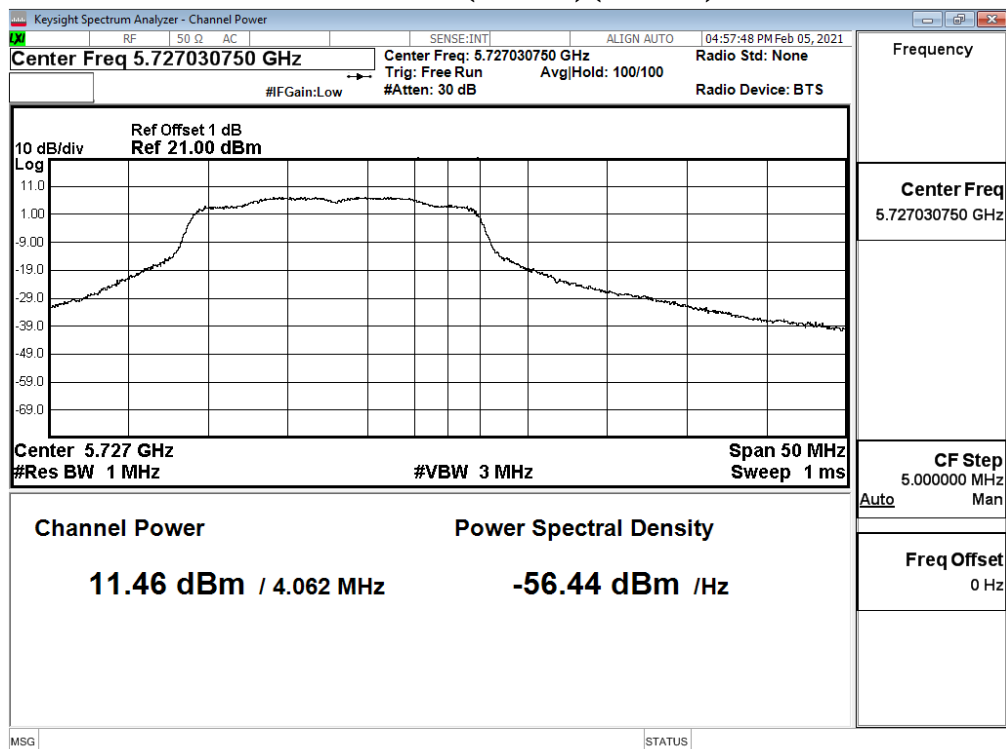
Channel 144 (Chain B)



Maximum conducted output power:
Channel 144 (U-NII-2C) (Chain A)

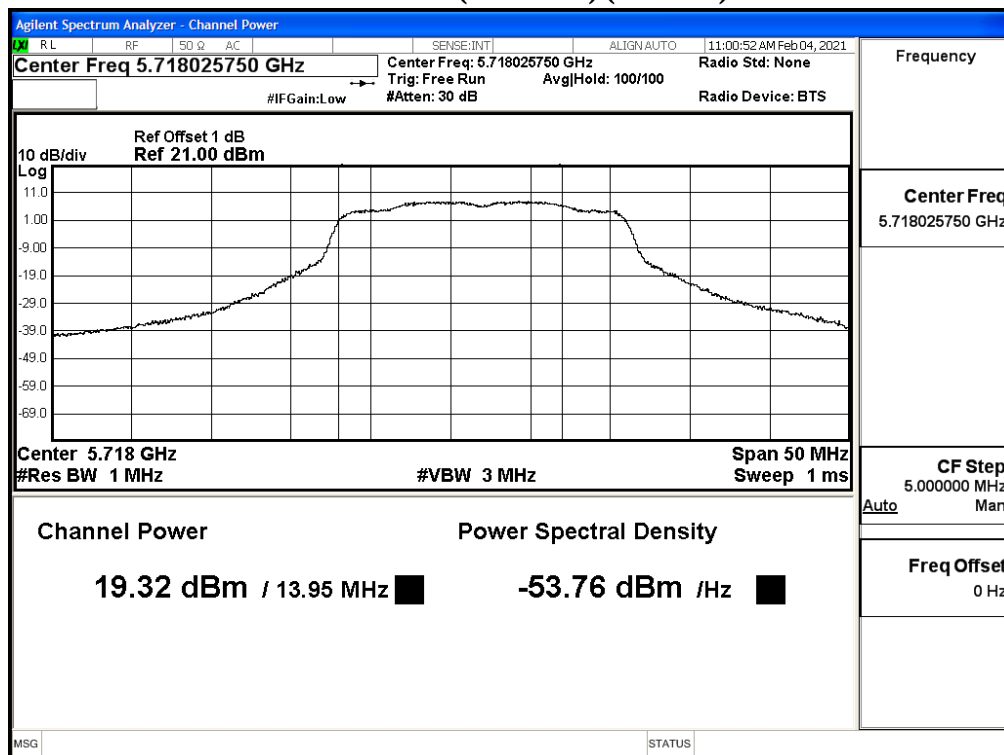


Maximum conducted output power:
Channel 144 (U-NII-3) (Chain A)



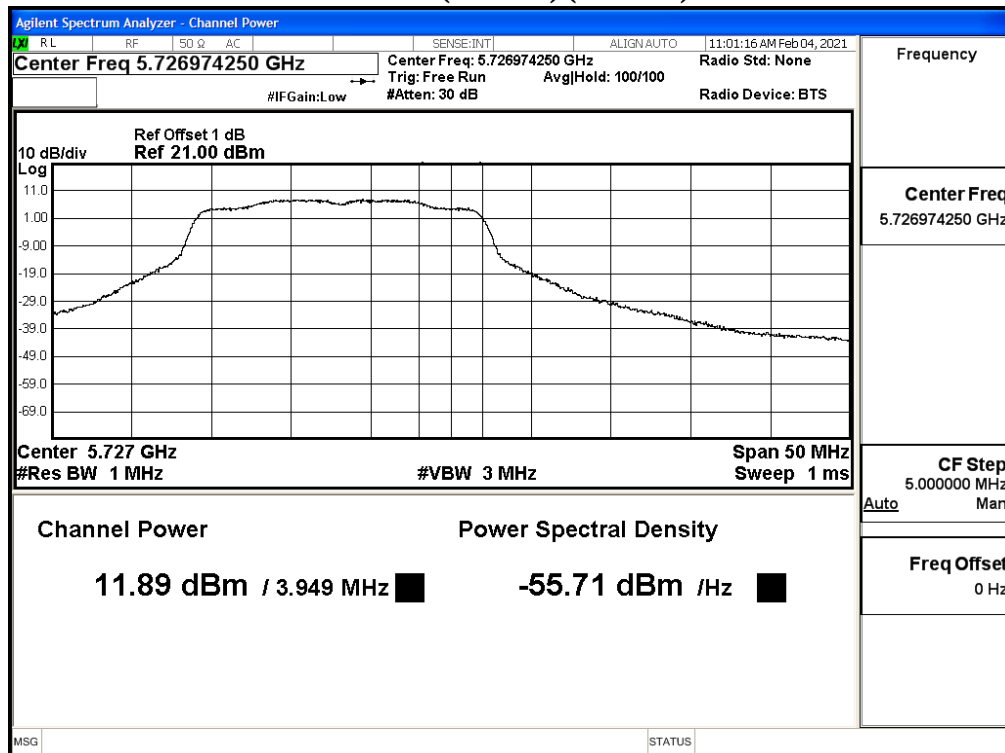
Maximum conducted output power:

Channel 144 (U-NII-2C) (Chain B)



Maximum conducted output power:

Channel 144 (U-NII-3) (Chain B)



Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 20 MIMO: Transmit (802.11n-40BW_30Mbps)

Chain A

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		30	60	90	120	180	240	270	300
38	5190	17.04	--	--	--	--	--	--	--
46	5230	18.96	18.89	18.84	18.76	18.67	18.62	18.52	18.44
54	5270	18.82	--	--	--	--	--	--	--
62	5310	14.06	13.99	13.89	13.84	13.81	13.75	13.67	13.59
102	5510	17.78	--	--	--	--	--	--	--
118	5590	19.89	19.81	19.72	19.64	19.6	19.51	19.42	19.39
134	5670	18.52	--	--	--	--	--	--	--
142(U-NII-2C)	5710	19.73	19.63	19.56	19.53	19.5	19.44	19.35	19.28
142(U-NII-3)	5710	7.29	7.2	7.15	7.11	7.08	7.02	6.96	6.9
151	5755	20	--	--	--	--	--	--	--
159	5795	19.87	19.77	19.7	19.63	19.56	19.51	19.41	19.35

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Chain B

Cable loss=1.0dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		30	60	90	120	180	240	270	300
38	5190	17.22	--	--	--	--	--	--	--
46	5230	19.05	18.95	18.9	18.87	18.77	18.73	18.67	18.59
54	5270	18.81	--	--	--	--	--	--	--
62	5310	14.35	14.28	14.2	14.13	14.09	13.99	13.9	13.8
102	5510	17.81	--	--	--	--	--	--	--
118	5590	19.99	19.94	19.85	19.78	19.71	19.63	19.58	19.53
134	5670	19.08	--	--	--	--	--	--	--
142(U-NII-2C)	5710	19.74	19.71	19.63	19.56	19.5	19.43	19.35	19.29
142(U-NII-3)	5710	7.12	7.02	6.99	6.9	6.8	6.72	6.67	6.6
151	5755	19.66	--	--	--	--	--	--	--
159	5795	19.61	19.55	19.51	19.45	19.4	19.37	19.29	19.2

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

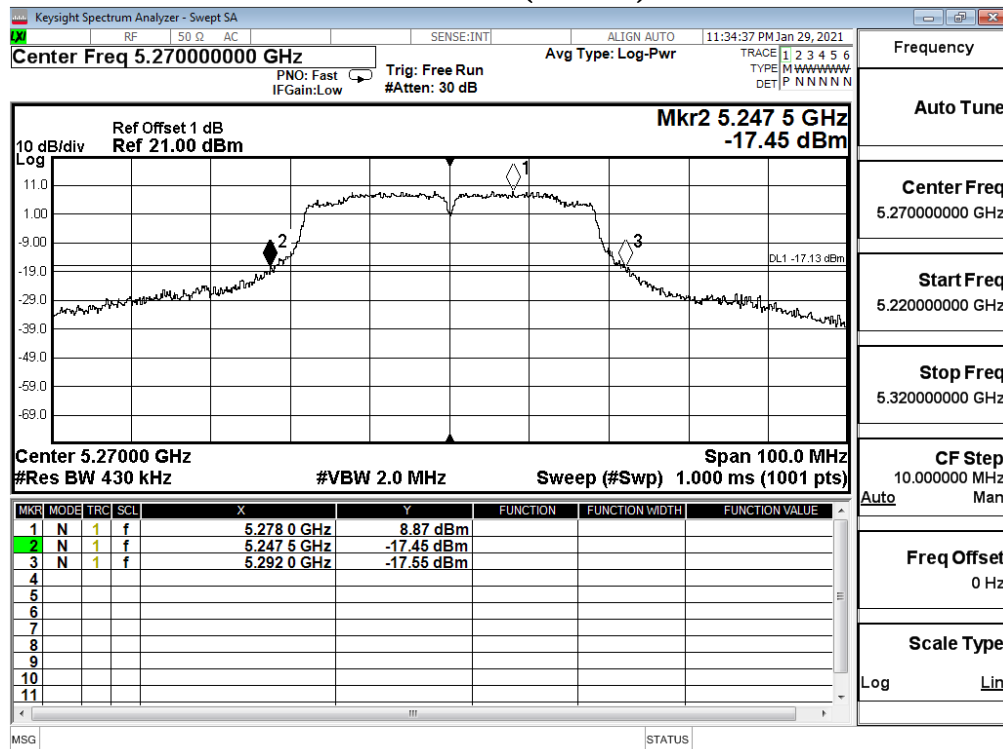
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit		Result
						(dBm)	dBm+10log(BW)	
38	5190	--	17.04	17.22	20.14	24	--	Pass
46	5230	--	18.96	19.05	22.02	24	--	Pass
54	5270	42.00	18.82	18.81	21.83	24	27.23	Pass
62	5310	41.80	14.06	14.35	17.22	24	27.21	Pass
102	5510	41.70	17.78	17.81	20.81	24	27.20	Pass
118	5590	43.30	19.89	19.99	22.95	24	27.36	Pass
134	5670	45.00	18.52	19.08	21.82	24	27.53	Pass
142(U-NII-2C)	5710	36.10	19.73	19.74	22.75	30	26.58	Pass
142(U-NII-3)	5710	--	7.29	7.12	10.22	30	--	Pass
151	5755	--	20.00	19.66	22.84	30	--	Pass
159	5795	--	19.87	19.61	22.75	30	--	Pass

Note:

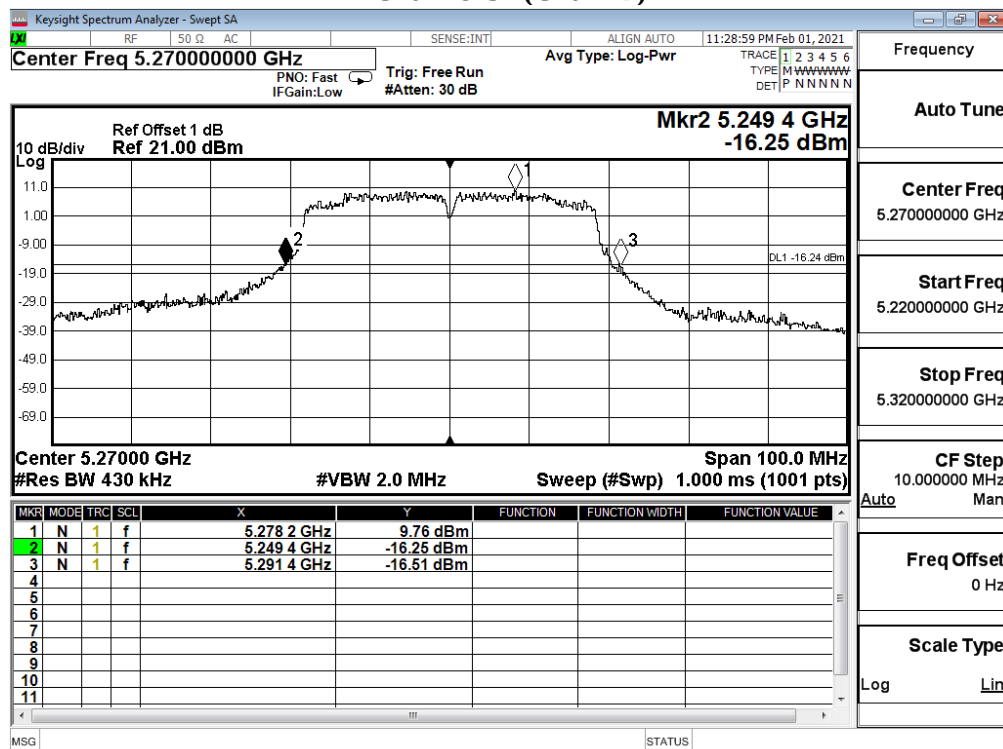
1. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
2. 26dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

26dB Occupied Bandwidth:

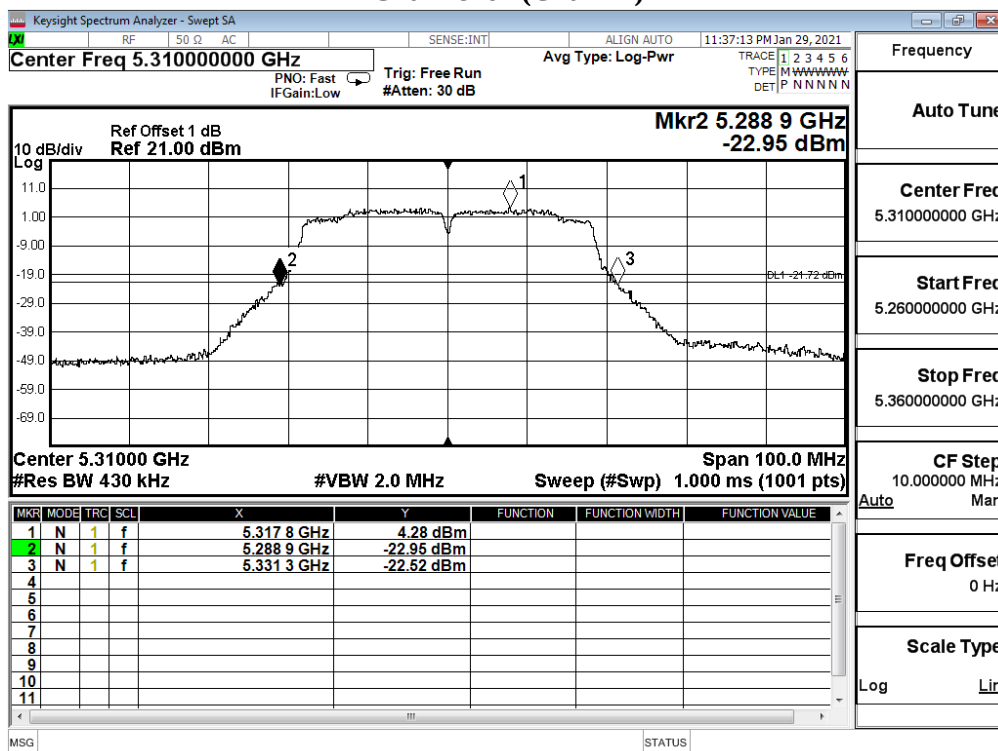
Channel 54 (Chain A)



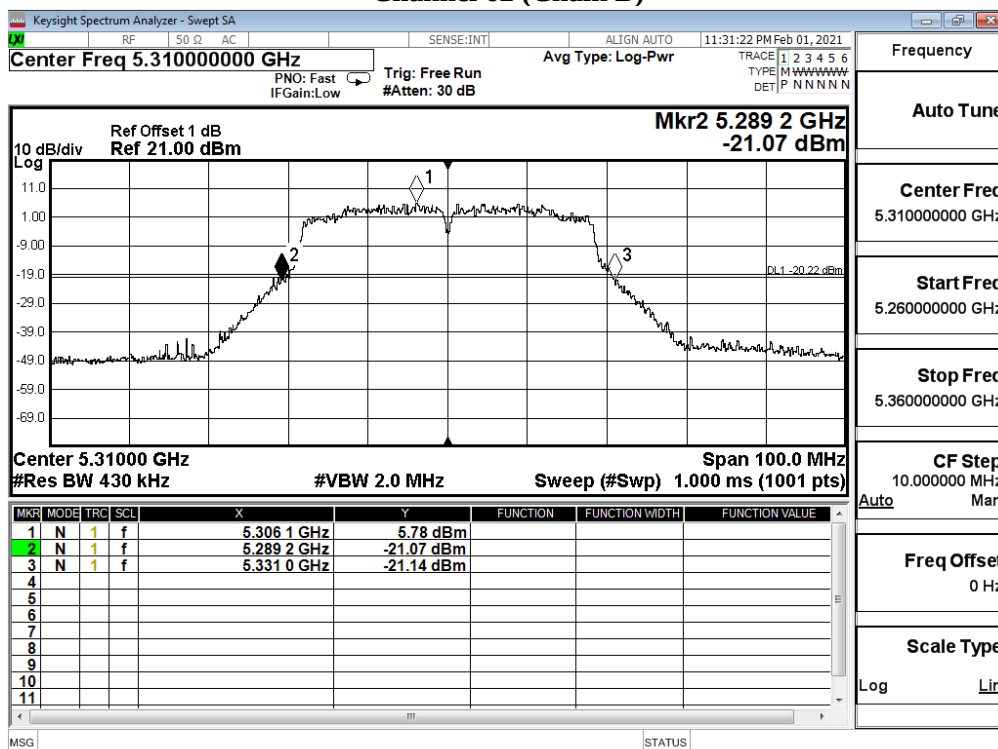
Channel 54 (Chain B)



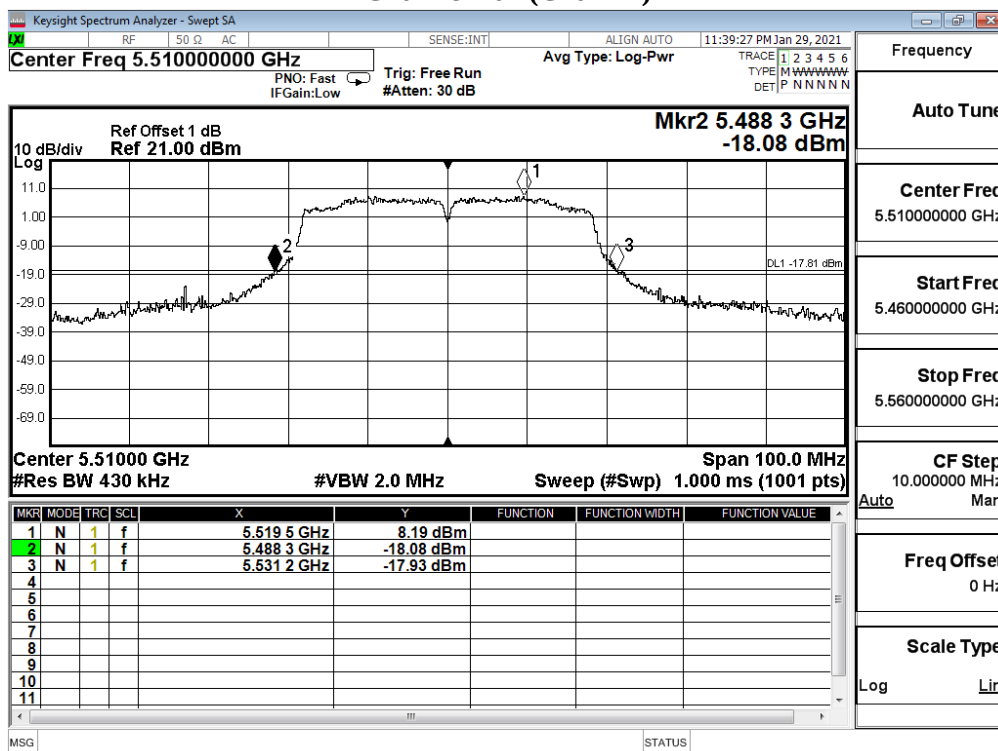
Channel 62 (Chain A)



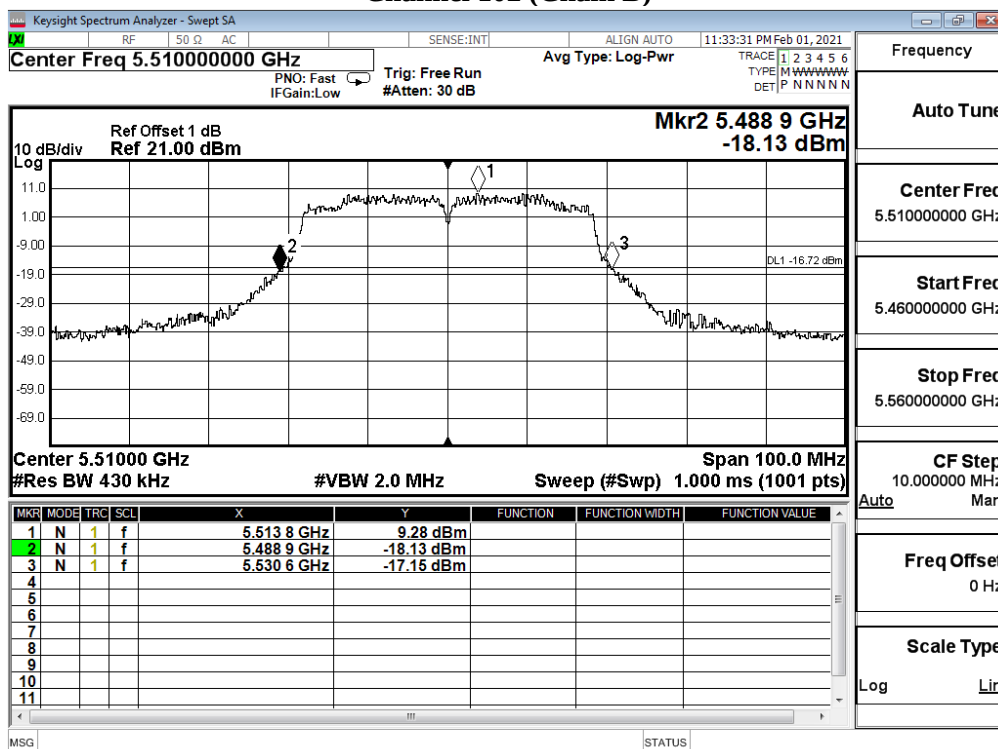
Channel 62 (Chain B)



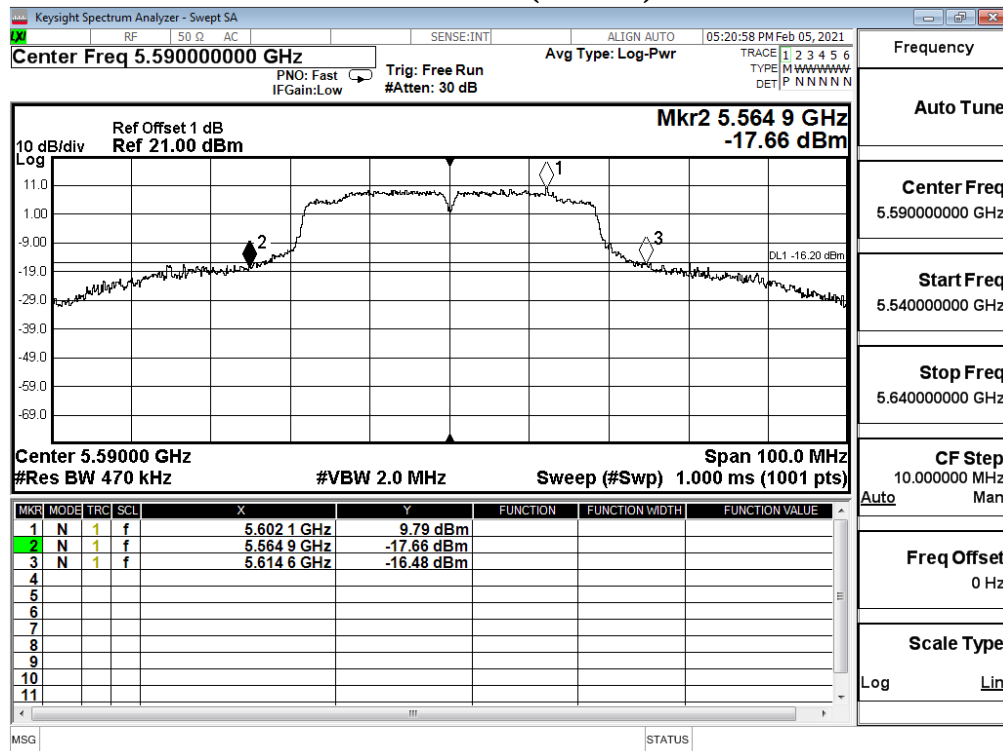
Channel 102 (Chain A)



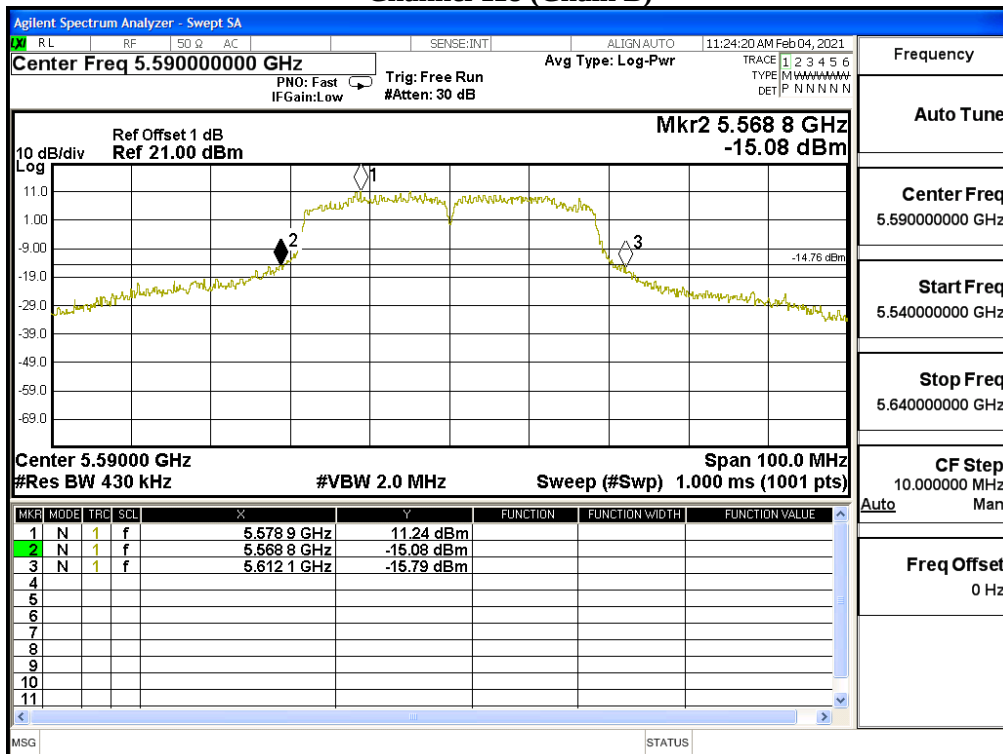
Channel 102 (Chain B)



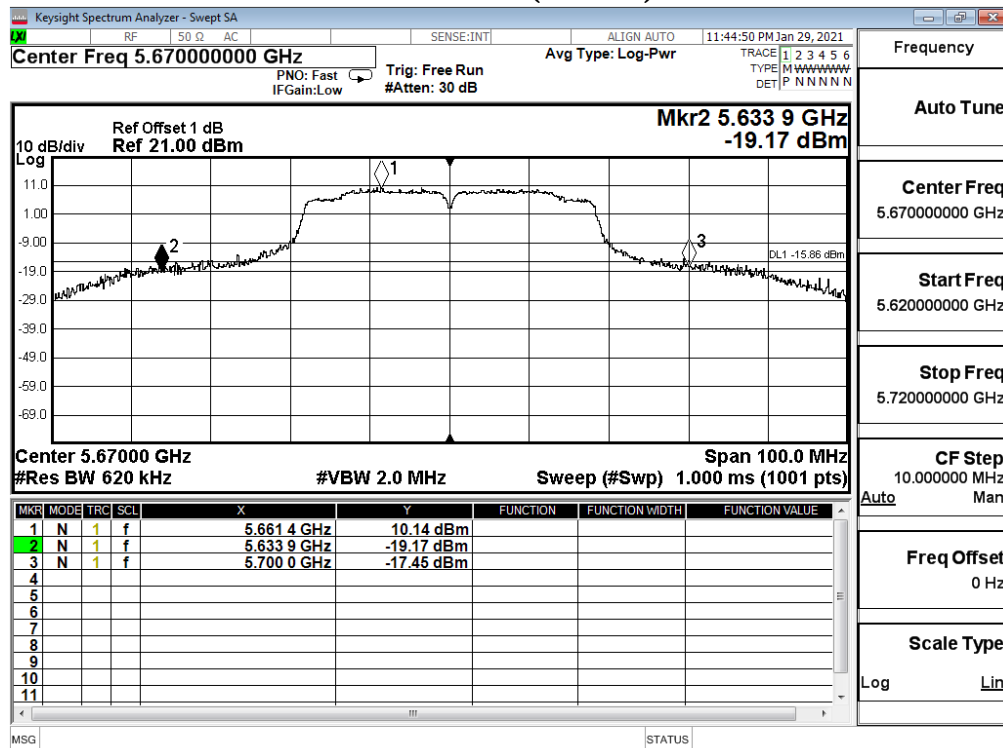
Channel 118 (Chain A)



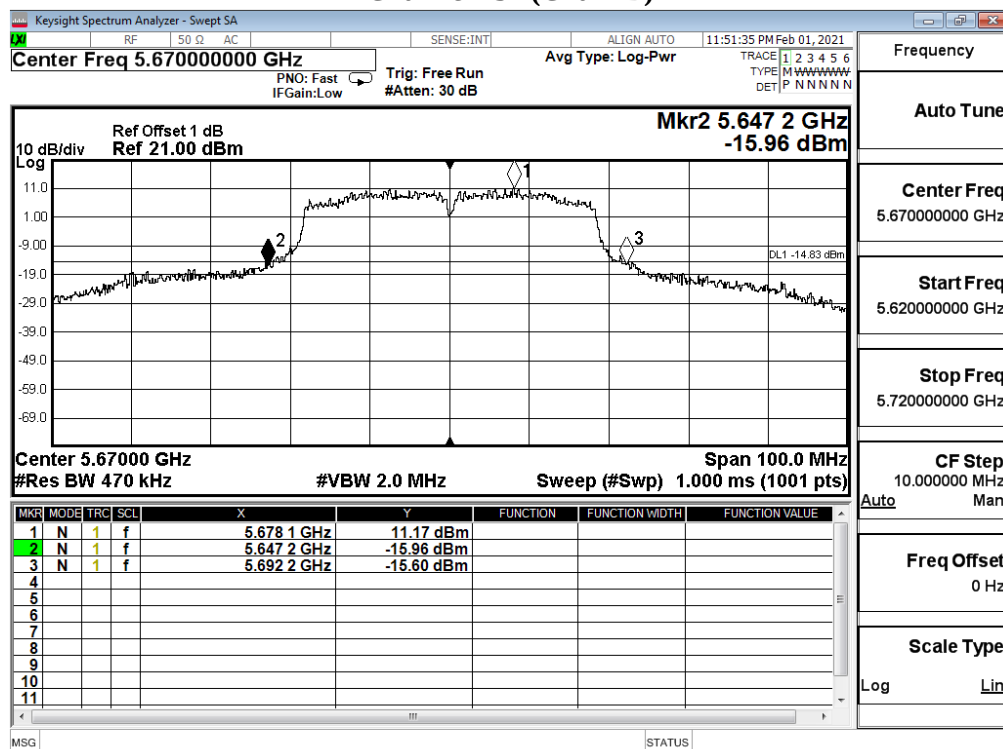
Channel 118 (Chain B)



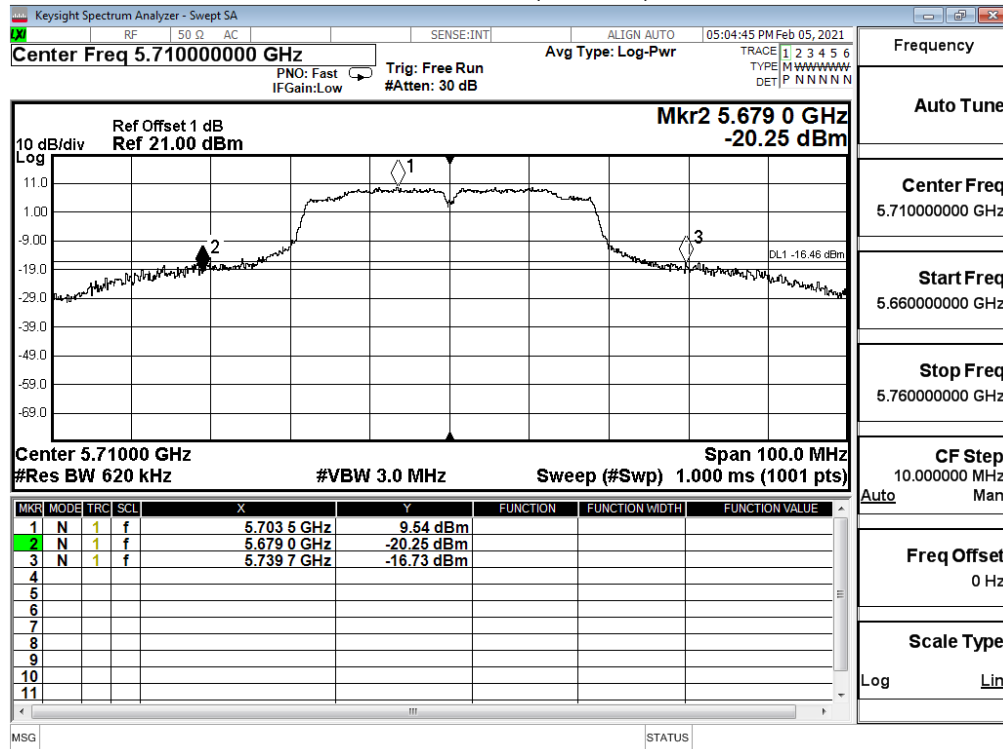
Channel 134 (Chain A)



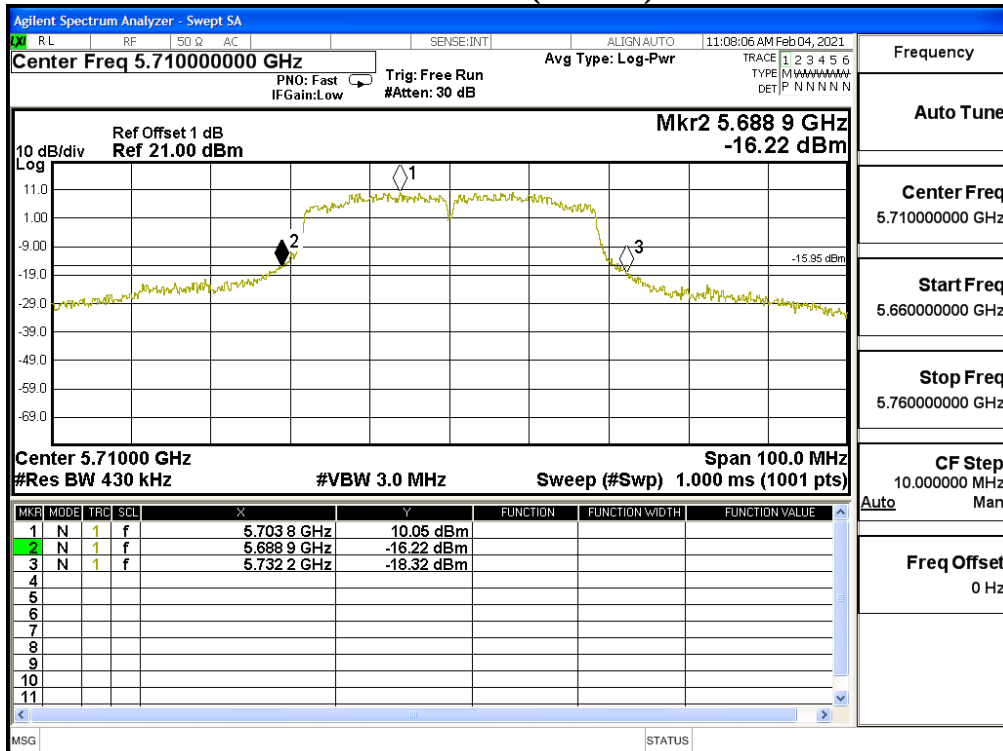
Channel 134 (Chain B)

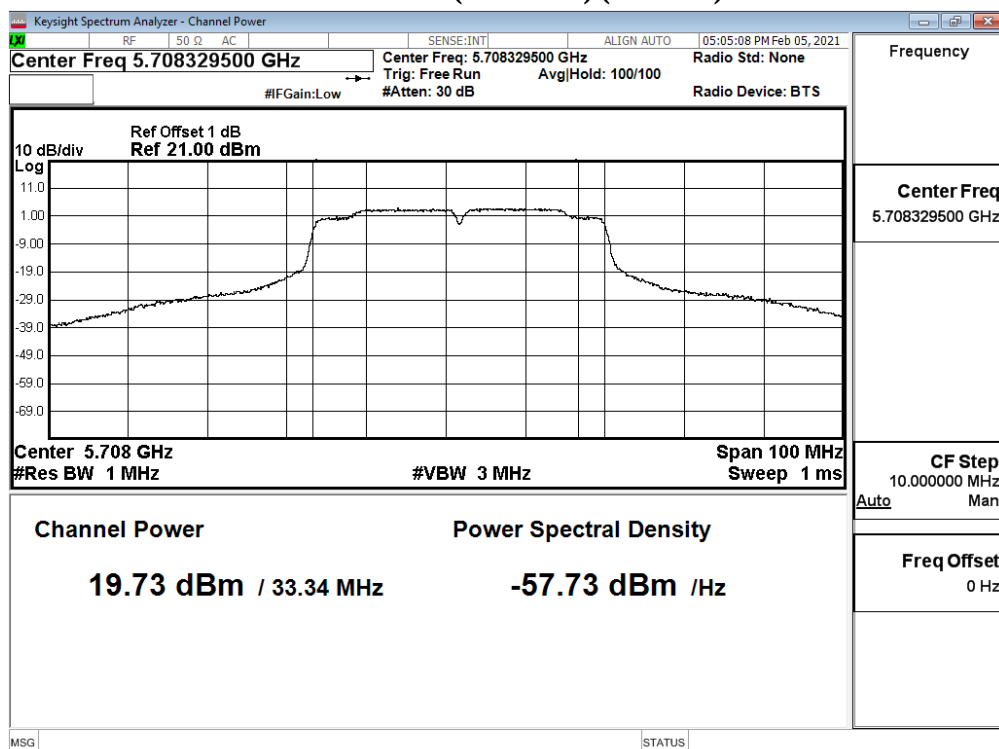
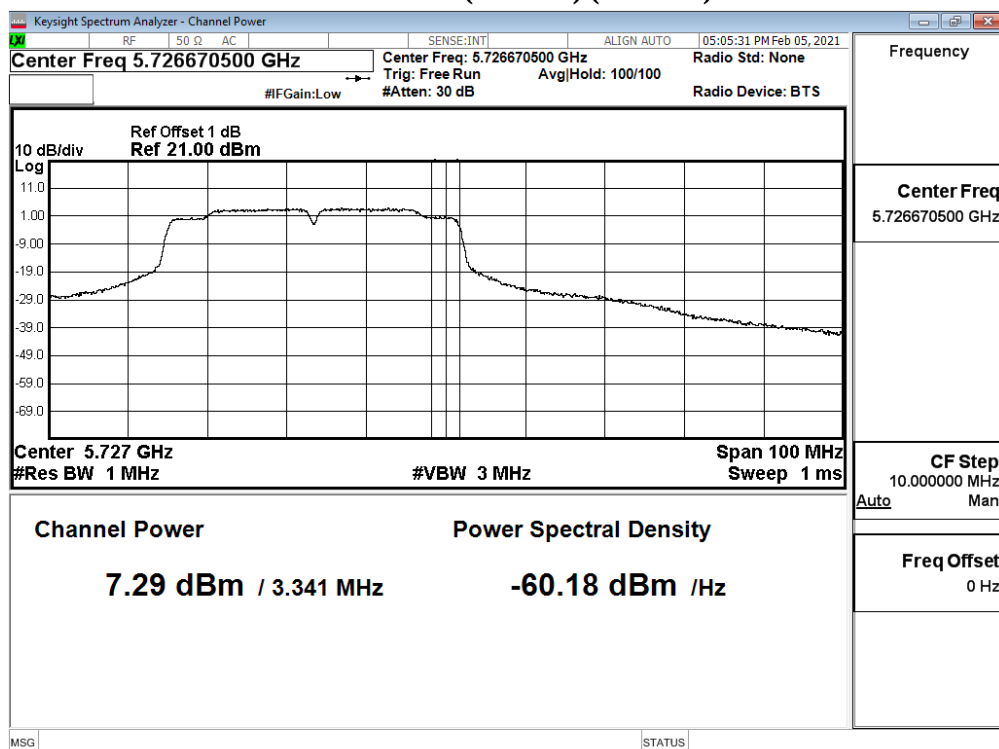


Channel 142 (Chain A)

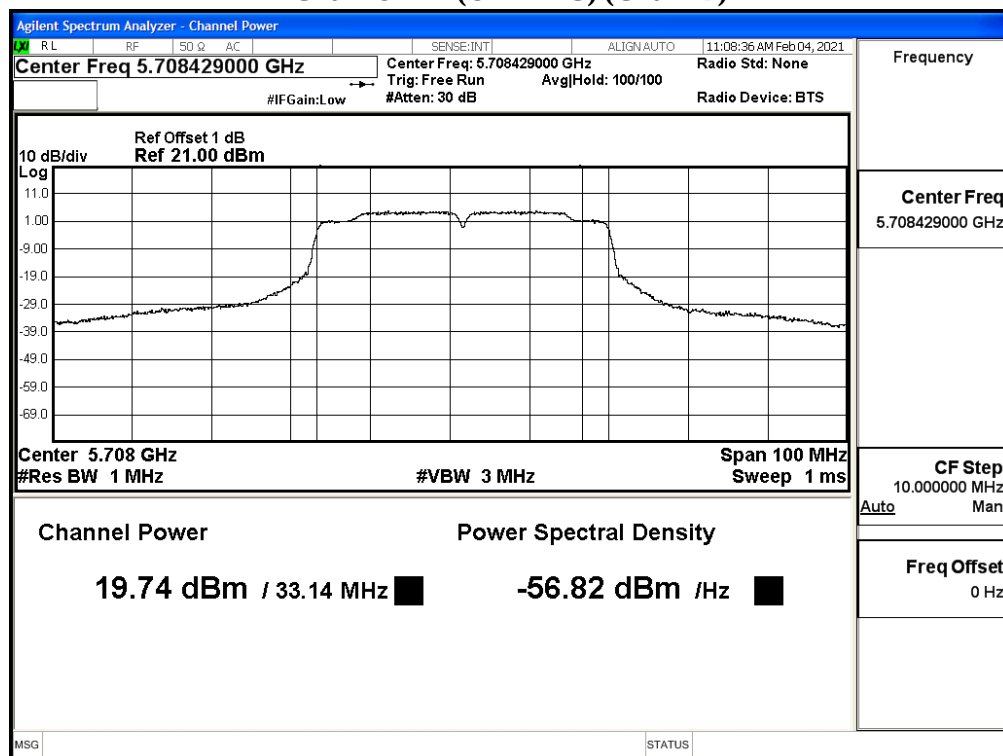


Channel 142 (Chain B)

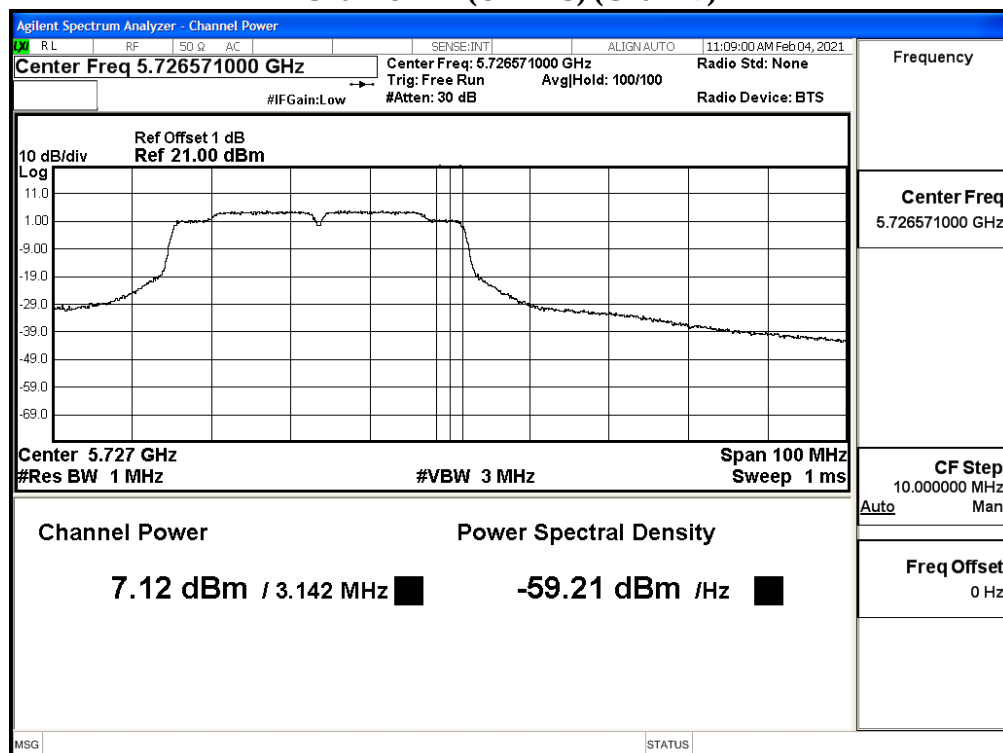


Maximum conducted output power:**Channel 142 (U-NII-2C) (Chain A)****Maximum conducted output power:****Channel 142 (U-NII-3) (Chain A)**

Maximum conducted output power:
Channel 142 (U-NII-2C) (Chain B)



Maximum conducted output power:
Channel 142 (U-NII-3) (Chain B)



Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/05
 Test Mode : Mode 21 MIMO: Transmit (802.11ac-80BW_65Mbps)

Chain A

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		65	130	1965	260	390	520	585	650	780	866.7
42	5210	17.05	16.98	16.91	16.84	16.75	16.71	16.68	16.6	16.50	16.47
58	5290	15.6	15.55	15.47	15.44	15.36	15.33	15.24	15.18	15.13	15.03
106	5530	17.53	--	--	--	--	--	--	--	--	--
122	5610	18.65	18.61	18.55	18.50	18.47	18.38	18.30	18.26	18.18	18.09
138 (U-NII-2C)	5690	19.71	19.62	19.55	19.5	19.45	19.35	19.31	19.28	19.19	19.14
138 (U-NII-3)	5690	2.72	2.69	2.6	2.55	2.49	2.41	2.38	2.29	2.21	2.17
155	5775	17.81	17.77	17.7	17.64	17.56	17.48	17.45	17.42	17.33	17.30

Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Chain B

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		65	130	1965	260	390	520	585	650	780	866.7
42	5210	17.09	17	16.94	16.91	16.83	16.76	16.73	16.69	16.63	16.59
58	5290	15.67	15.57	15.5	15.46	15.36	15.32	15.22	15.18	15.08	15.05
106	5530	17.74	--	--	--	--	--	--	--	--	--
122	5610	18.66	18.59	18.49	18.42	18.36	18.29	18.26	18.21	18.12	18.08
138 (U-NII-2C)	5690	19.85	19.81	19.75	19.69	19.59	19.56	19.52	19.47	19.4	19.36
138 (U-NII-3)	5690	2.18	2.1	2	1.93	1.89	1.8	1.71	1.65	1.57	1.53
155	5775	17.77	17.69	17.65	17.56	17.5	17.46	17.38	17.32	17.29	17.19

Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Maximum conducted output power Measurement:

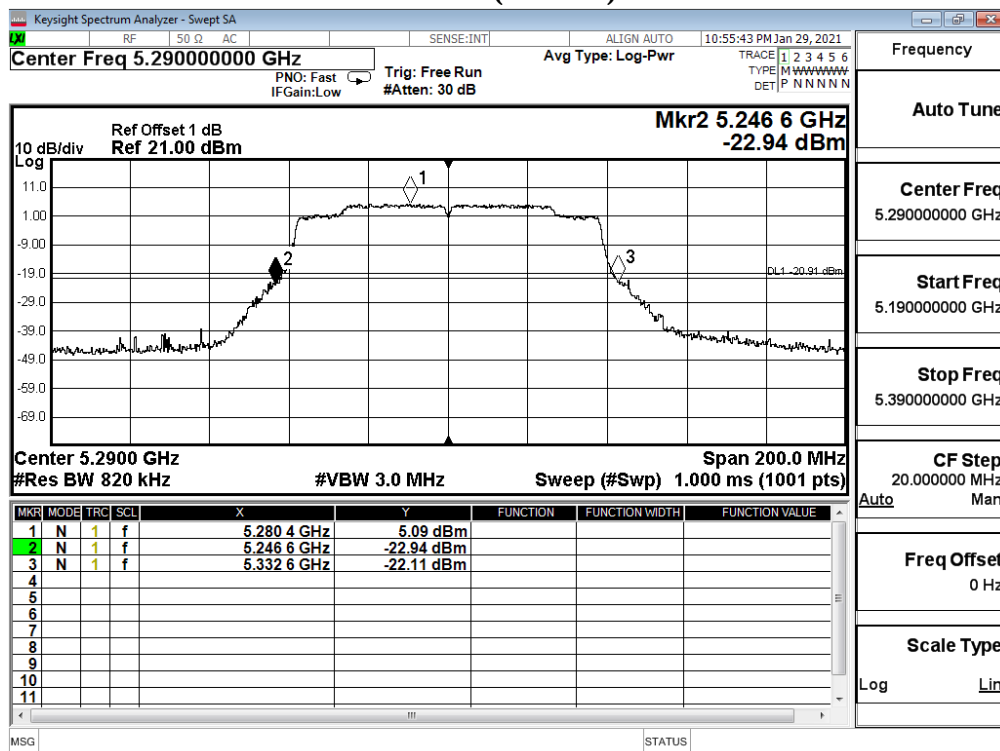
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit		Result
						(dBm)	dBm+10log(BW)	
42	5210	--	17.05	17.09	20.08	24	--	Pass
58	5290	84.40	15.60	15.67	18.65	24	30.26	Pass
106	5530	83.80	17.53	17.74	20.65	24	30.23	Pass
122	5610	83.80	18.65	18.66	21.67	24	30.23	Pass
138 (U-NII-2C)	5690	77.80	19.71	19.85	22.79	24	29.91	Pass
138 (U-NII-3)	5690	9.40	2.72	2.18	5.47	30	20.73	Pass
155	5775	--	17.81	17.77	20.80	30	--	Pass

Note:

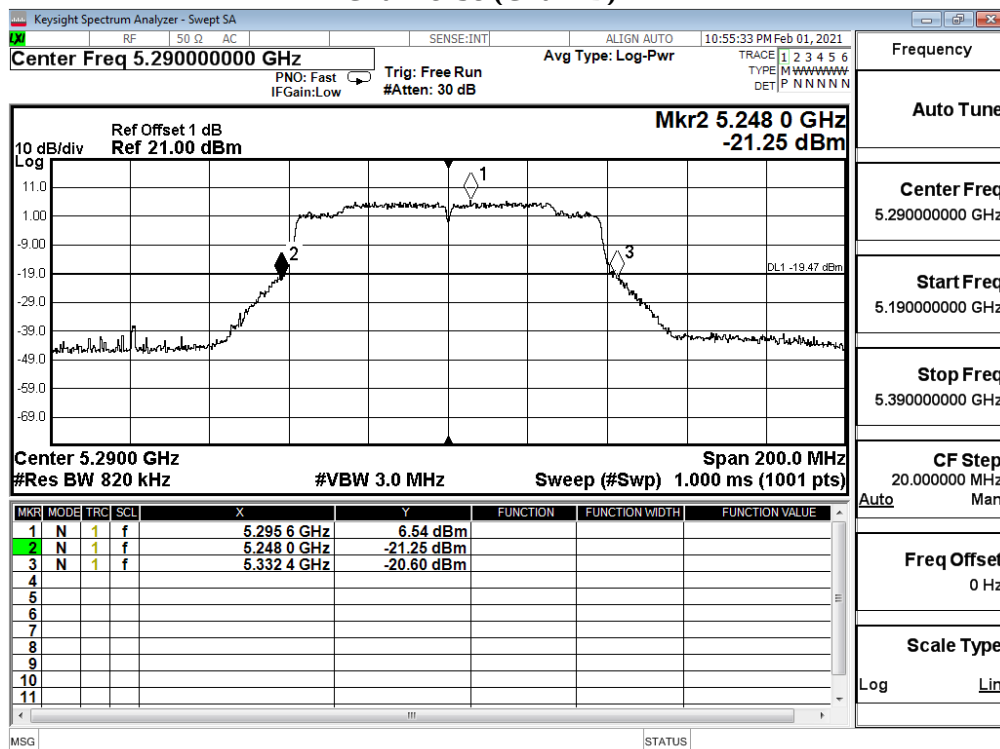
1. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
2. 26dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

26dB Occupied Bandwidth:

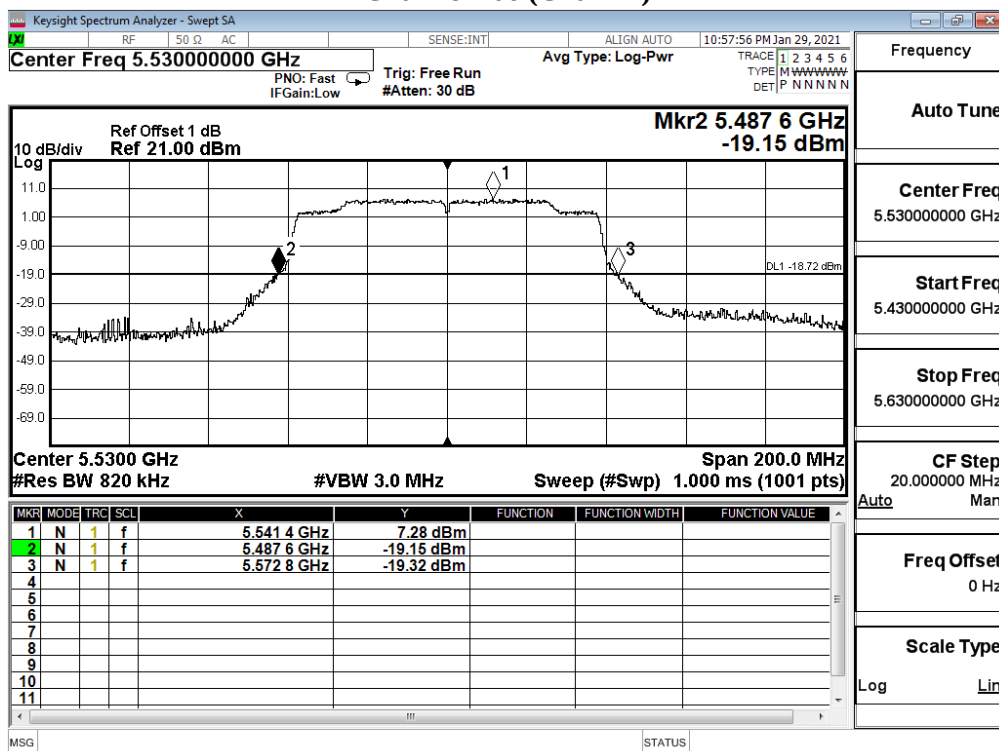
Channel 58 (Chain A)



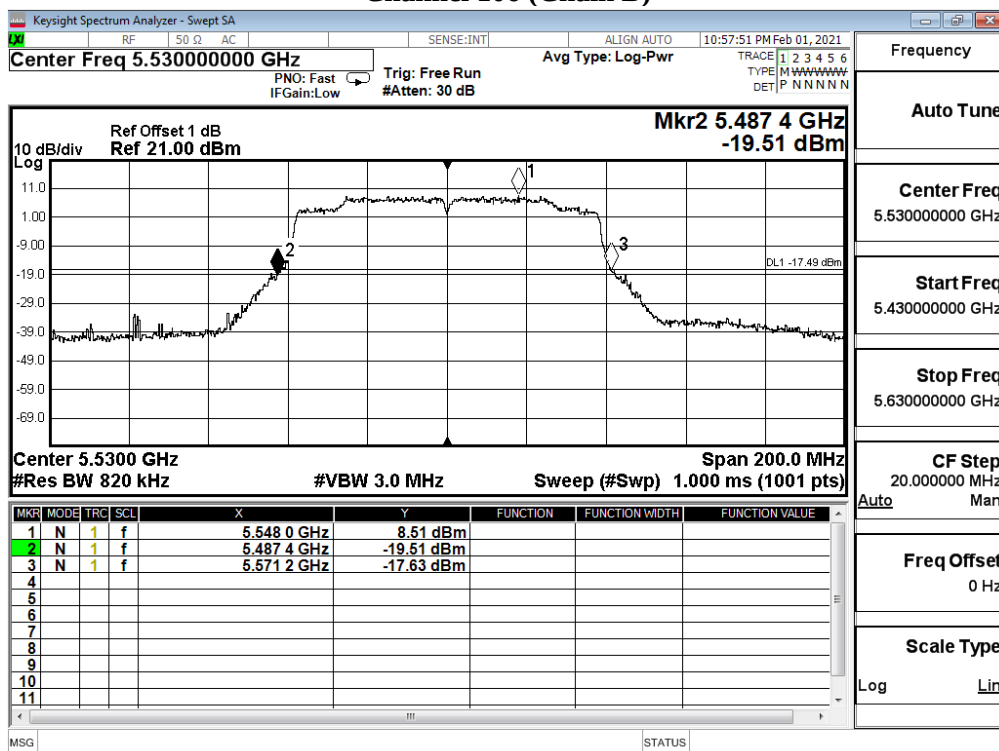
Channel 58 (Chain B)



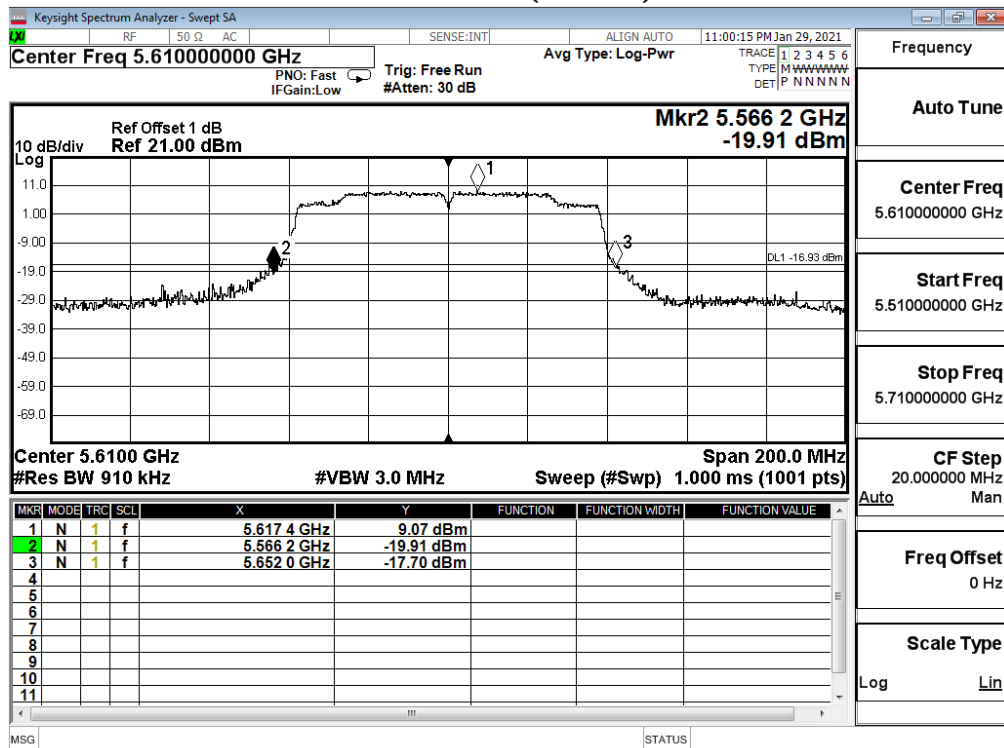
Channel 106 (Chain A)



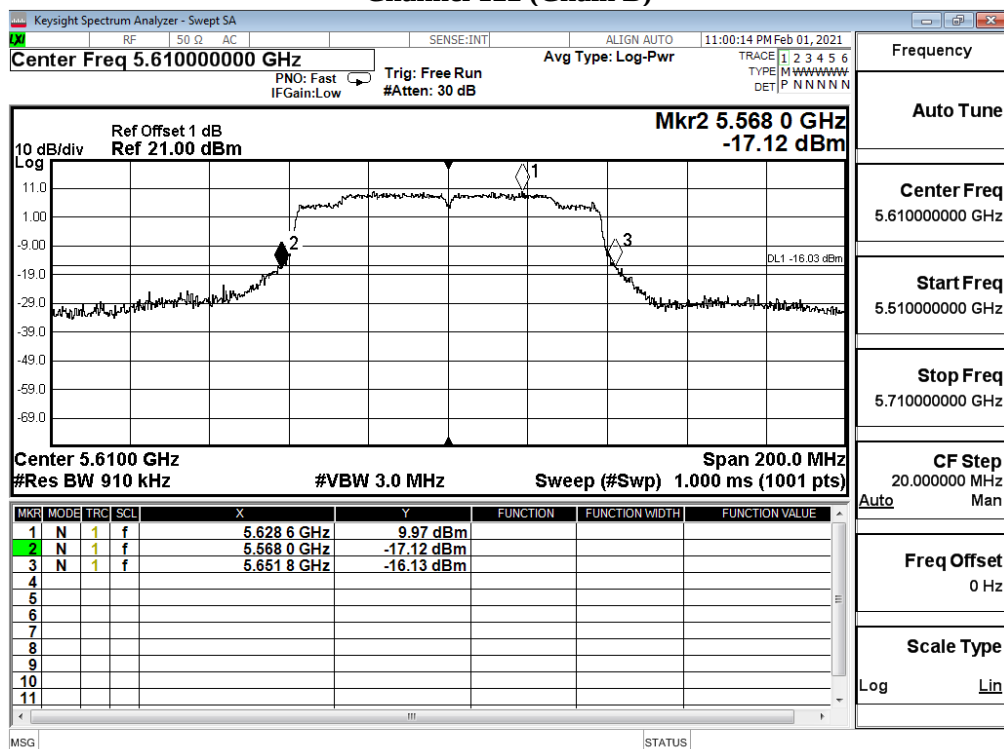
Channel 106 (Chain B)



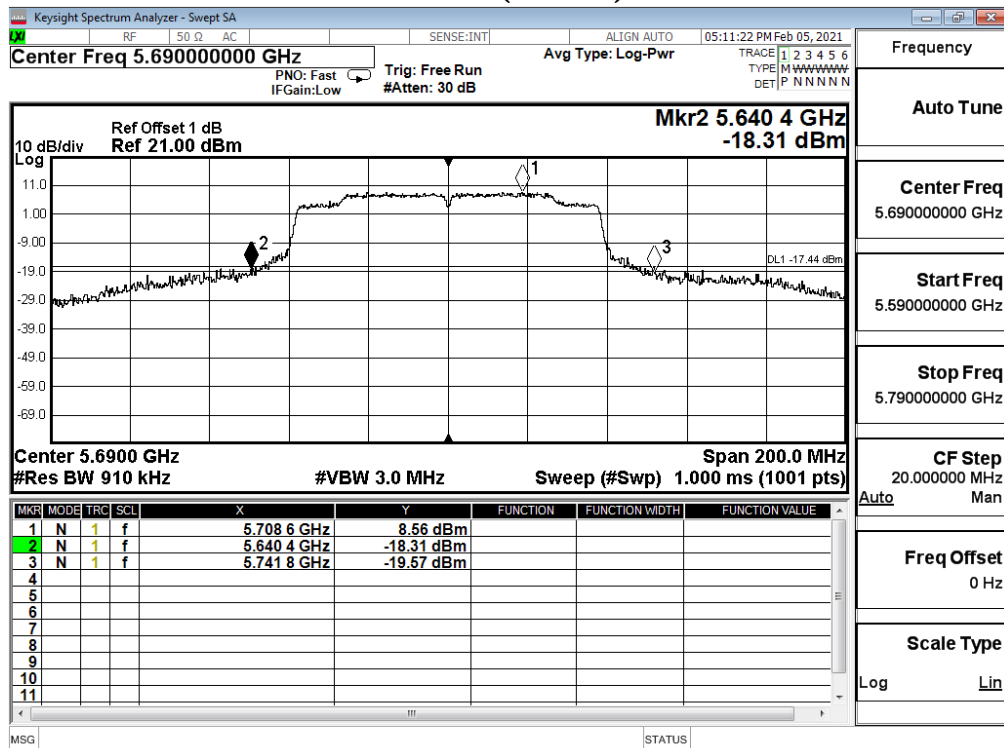
Channel 122 (Chain A)



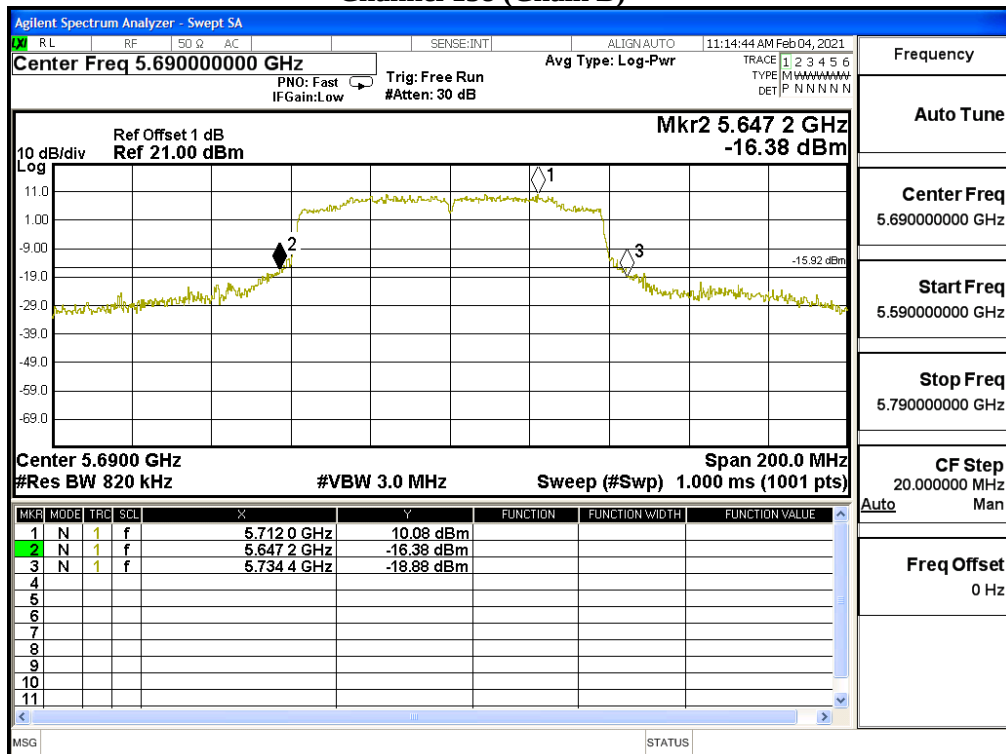
Channel 122 (Chain B)

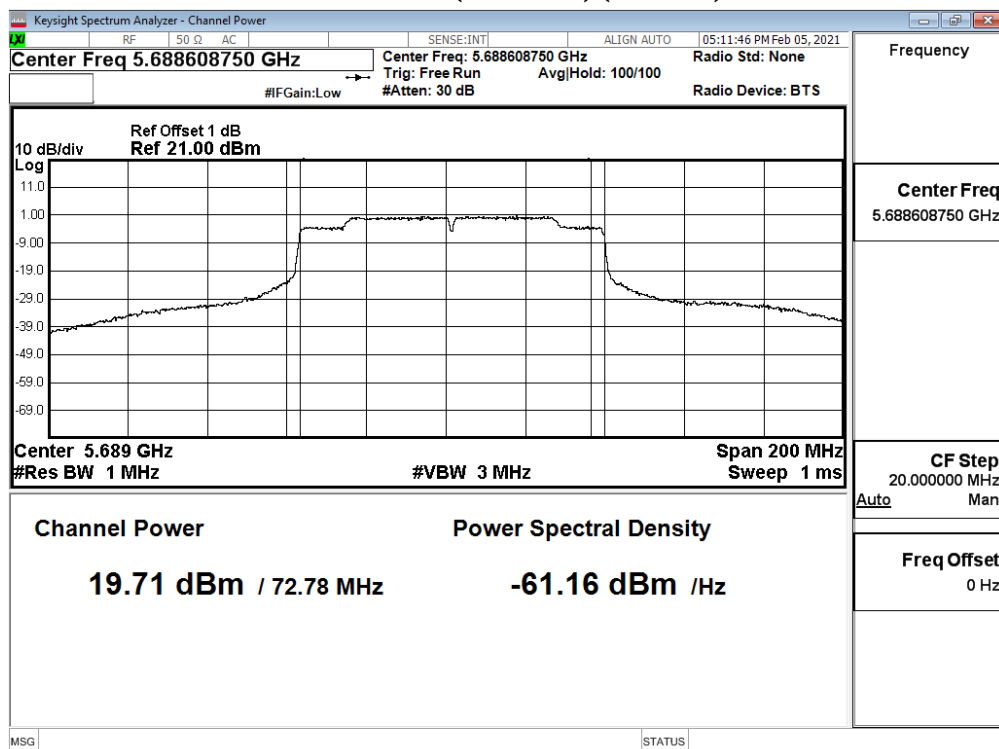
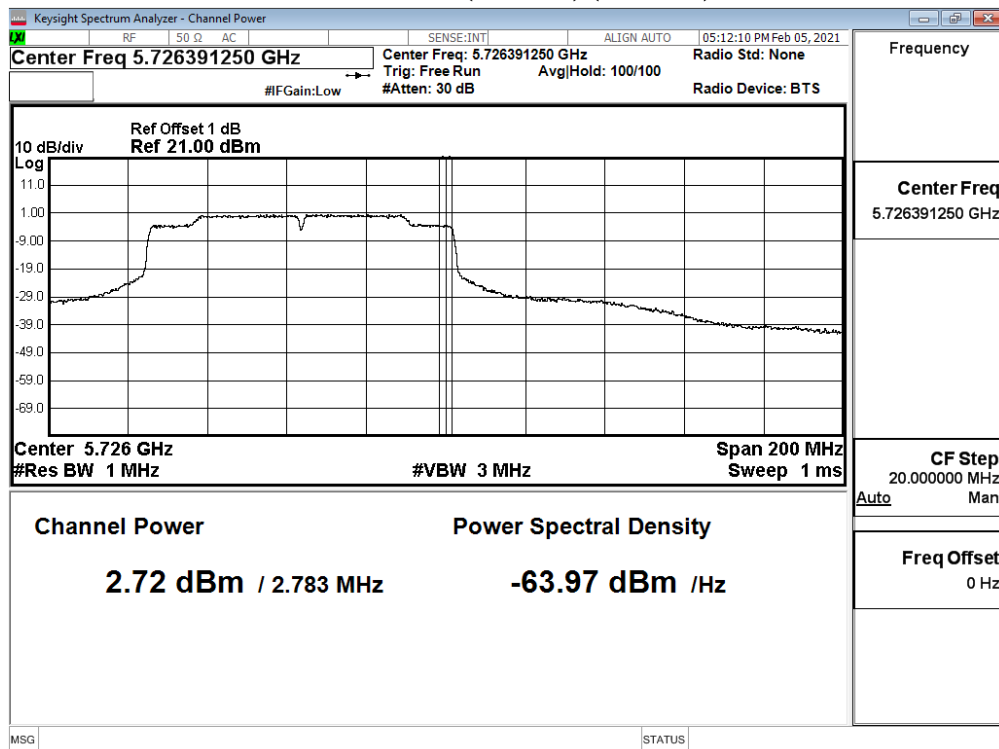


Channel 138 (Chain A)



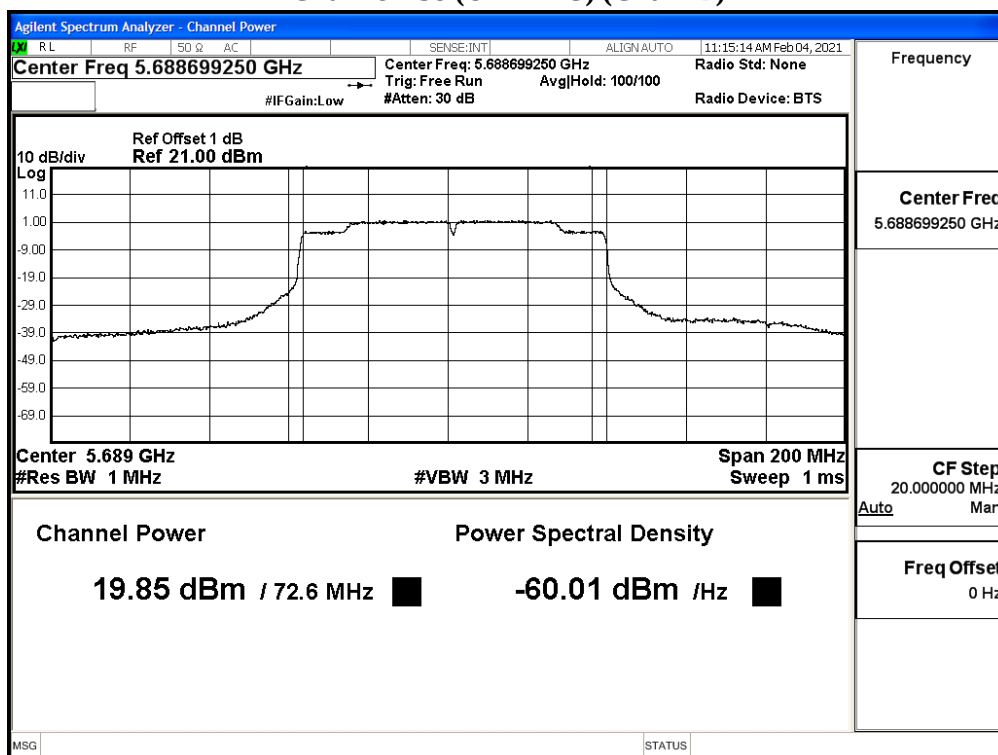
Channel 138 (Chain B)



Maximum conducted output power:**Channel 138 (U-NII-2C) (Chain A)****Maximum conducted output power:****Channel 138 (U-NII-3) (Chain A)**

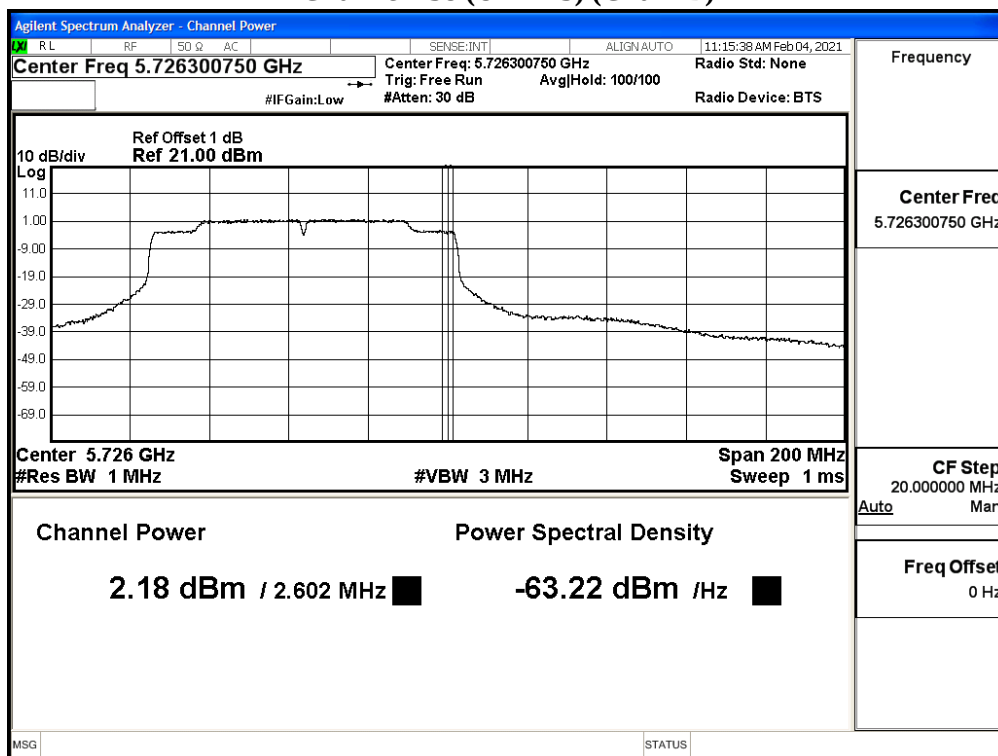
Maximum conducted output power:

Channel 138 (U-NII-2C) (Chain B)



Maximum conducted output power:

Channel 138 (U-NII-3) (Chain B)



Product : Portable Computer
 Test Item : Maximum conducted output power
 Test Date : 2021/02/03
 Test Mode : Mode 22 MIMO: Transmit (802.11ac-160BW_130Mbps)

Chain A

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		130	260	390	520	780	1040	1170	1300	1560	1733.3
50 (U-NII-1)	5250	10.02	9.92	9.85	9.77	9.74	9.66	9.62	9.57	9.54	9.45
50 (U-NII-2A)	5250	10.03	9.99	9.93	9.87	9.82	9.72	9.64	9.55	9.52	9.43
114	5570	13.22	13.13	13.08	12.99	12.91	12.88	12.78	12.71	12.68	12.61

Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Chain B

Cable loss=1.0dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		130	260	390	520	780	1040	1170	1300	1560	1733.3
50 (U-NII-1)	5250	10.29	10.24	10.18	10.09	10.04	9.98	9.94	9.89	9.79	9.71
50 (U-NII-2A)	5250	10.01	9.94	9.86	9.78	9.74	9.68	9.62	9.53	9.47	9.42
114	5570	14.32	14.25	14.15	14.09	14.02	13.99	13.95	13.92	13.87	13.80

Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

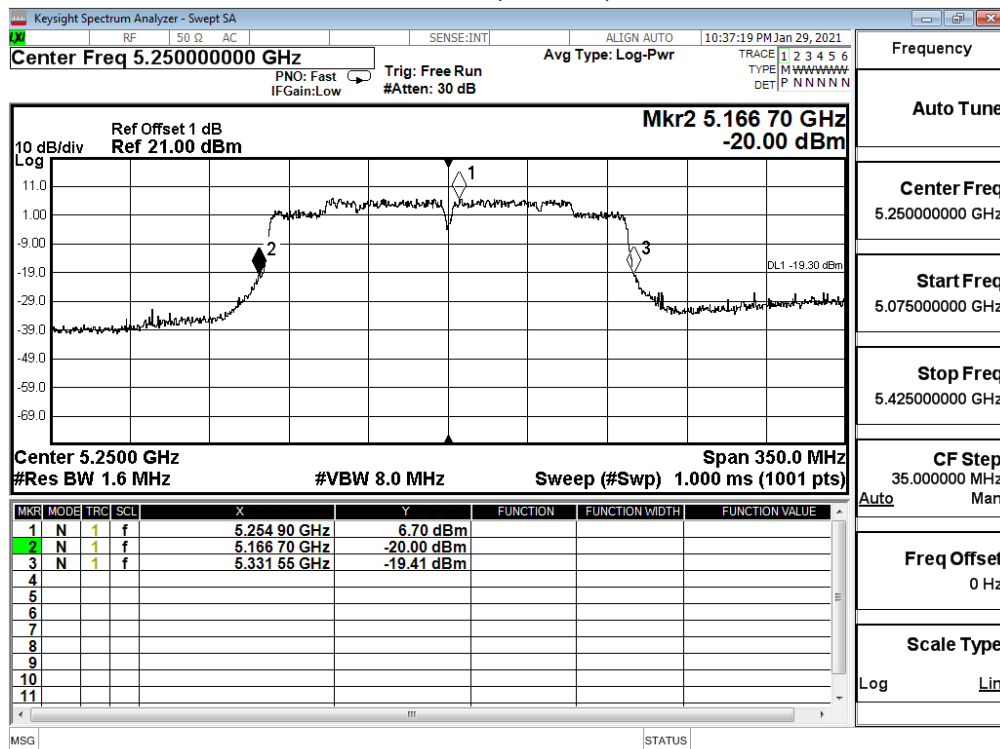
Maximum conducted output power Measurement:

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit		Result
						(dBm)	dBm+10log(BW)	
50(U-NII-1)	5250	--	10.02	10.29	13.17	24	--	Pass
50(U-NII-2A)	5250	81.55	10.03	10.01	13.03	24	30.11	Pass
114	5570	163.10	13.22	14.32	16.82	24	33.12	Pass

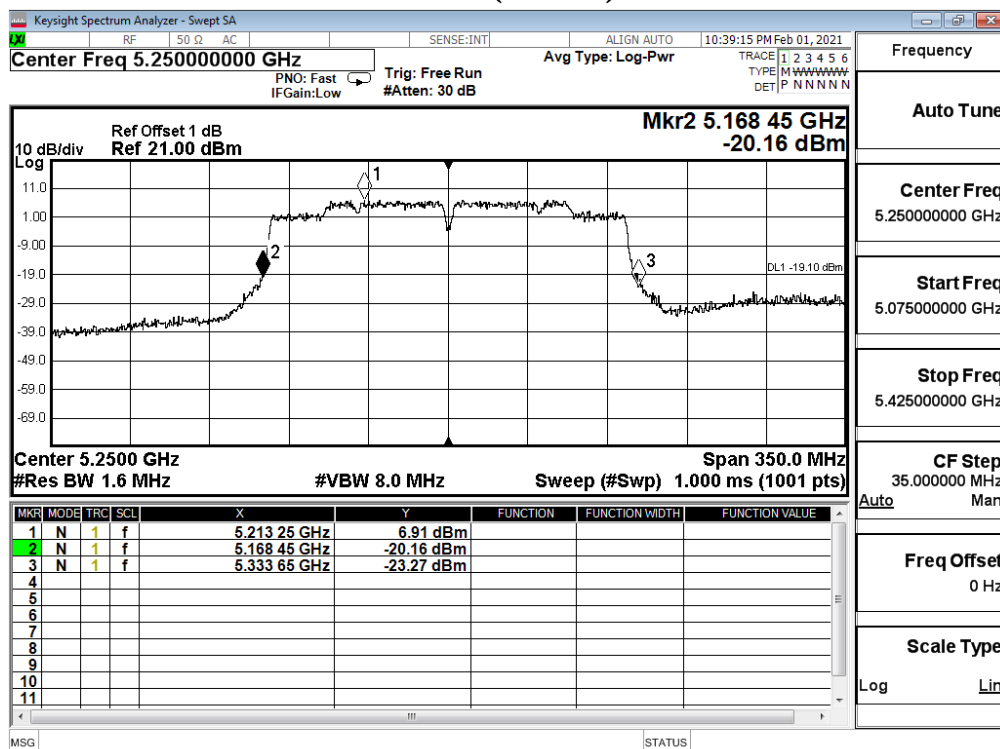
Note:

1. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
2. 26dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

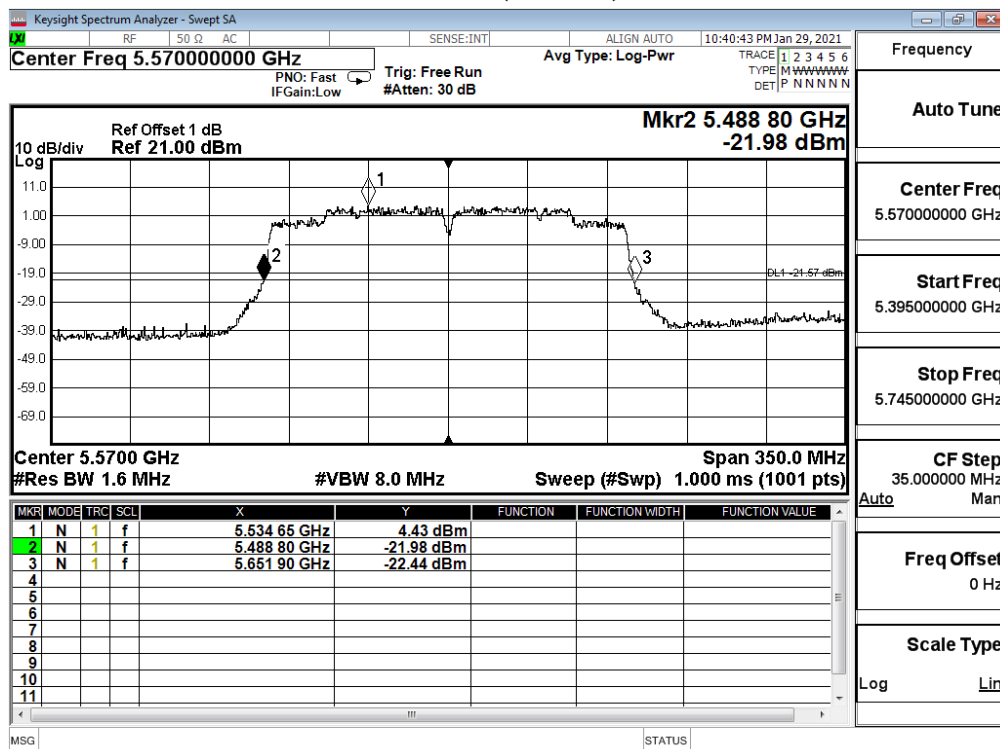
26dB Occupied Bandwidth: Channel 50 (Chain A)



Channel 50 (Chain B)



Channel 114 (Chain A)



Channel 114 (Chain B)

