

## FCC Test Report (Class II Permissive Change)

Product Name	NPort Device Server
Model No	NPort W2250A, NPort W2150A, NPort W2250A-T, NPort W2150A-T
FCC ID	SLE-W2X50A

Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST., NEW TAIPEI CITY, TAIWAN

Date of Receipt	Jul. 20, 2018
Issued Date	Nov. 26, 2018
Report No.	1870341R-RFUSP05V00
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.

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# Test Report

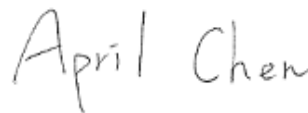
Issued Date: Nov. 26, 2018

Report No.: 1870341R-RFUSP05V00



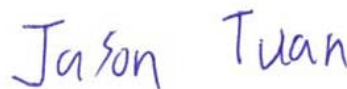
Product Name	NPort Device Server
Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST., NEW TAIPEI CITY, TAIWAN
Manufacturer	MOXA Inc.
Model No.	NPort W2250A, NPort W2150A, NPort W2250A-T, NPort W2150A-T
EUT Rated Voltage	DC 12~48V, AC 110~230V
EUT Test Voltage	DC24V, AC 110V/60Hz
Trade Name	MOXA
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v02
Test Result	Complied

Documented By :



(Senior Adm. Specialist / April Chen)

Tested By :



(Engineer / Jason Tuan)

Approved By :



(Director / Vincent Lin)

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	NPort Device Server
Trade Name	MOXA
FCC ID.	SLE-W2X50A
Model No.	NPort W2250A, NPort W2150A, NPort W2250A-T, NPort W2150A-T
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz
Number of Channels	802.11a/n-20MHz: 24; 802.11n-40MHz: 11
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 150Mbps
Type of Modulation	802.11a/n:OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna type	Dipole Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Power Adapter(Optional)	MFR: ENG, M/N: 6A-061WP12 Input: AC 100-240V, 50-60Hz 0.3A Output: 12V $\overline{\text{---}}$ 0.5A Cable out: Non-Shielded, 1.6m

#### Antenna List :

No.	Manufacturer	Model No.	Antenna Type	Peak Gain
1	KINSUN	ANT-WDB-ARM-02	Dipole	0.81dBi for 5.150-5.250 GHz 0.38dBi for 5.250-5.350 GHz -1.39dBi for 5.470-5.725 GHz -0.39dBi for 5.725-5.850 GHz

Note: 1. The antenna of EUT is conform to FCC 15.203

2. Only the higher gain antenna was tested and recorded in this report.

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

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 36:	5180 MHz	Channel 40:	5200 MHz	Channel 44:	5220 MHz	Channel 48:	5240 MHz
Channel 52:	5260 MHz	Channel 56:	5280 MHz	Channel 60:	5300 MHz	Channel 64:	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 149:	5745 MHz
Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz	Channel 165:	5825 MHz

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

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 38:	5190 MHz	Channel 46:	5230 MHz	Channel 54:	5270 MHz	Channel 62:	5310 MHz
Channel 102:	5510 MHz	Channel 110:	5550 MHz	Channel 118:	5590 MHz	Channel 126:	5630 MHz
Channel 134:	5670 MHz	Channel 151:	5755 MHz	Channel 159:	5795 MHz		

Note:

1. This device is aNPort Device Serverwith a built-in 802.11a/b/g/n WLAN transceiver, this report for 5GHz WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report.
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
6. The EUT is including series models for different is listed as below:

Item	Model Type	Description
1	NPort W2150A	1 Port Wireless Device Server, 3-in-1, 802.11a/b/g/n, 12-48 VDC, 0 to 55°C
2	NPort W2150A-T	1 Port Wireless Device Server, 3-in-1, 802.11a/b/g/n, 12-48 VDC, -40 to 75°C
3	NPort W2250A	2 Port Wireless Device Server, 3-in-1, 802.11a/b/g/n, 12-48 VDC, 0 to 55°C
4	NPort W2250A-T	2 Port Wireless Device Server, 3-in-1, 802.11a/b/g/n, 12-48 VDC, -40 to 75°C

7. This is to request a Class II permissive change for FCC ID: SLE-W2X50A, originally granted on 05/05/2016. (NII of New rule) and 05/30/2012(DTS).

The major change filed under this application is:

Change

- #1: Add a new antenna, the antenna type is the same, the 2.4GHz antenna gain is higher than the original application 5GHz antenna gain is lower than the original application.

Origina (dBi)	New (dBi)	Freq Band
1.21	2.04	2.4GHz
1.73	0.81	5.150-5.250 GHz
1.73	0.38	5.250-5.350 GHz
1.73	-1.39	5.470-5.725 GHz
1.73	-0.39	5.725-5.850 GHz

#2: To replace some EOL components, we re-design the PCB board which changes the details as below.

Components no.		Changes	Before	New
Flash	U4	Same electrical characteristics, different capacity	64Mb	256Mb
RTC Crystal	X1	Same electrical characteristics	NA	NA
Socket connector	JP4	Removed the connector	NA	NA
Ethernet PHY	U15	Same electrical characteristics	NA	NA
CPLD	U21	Change CPLD to a logic IC, the working voltage is different	CPLD(3.3V)	logic (5V)

#3: The originally application of DTS band is 802.11 b/g , add 802.11n-20 mode through Software changes.

#4: The originally application of NII band is 802.11a , add 802.11n-20 mode through Software changes.

Test Mode	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 7.2Mbps) Mode 3: Transmit (802.11n-40BW 15Mbps)
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### 1.3. Tested System Details

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

Test Item		AC			
Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude E5440	HG26TZ1	Non-Shielded, 0 .8m
2	Test Fixture	MOXA	N/A	N/A	N/A
3	Notebook PC	DELL	Latitude E5440	B6TYTZ1	Non-Shielded, 0 .8m

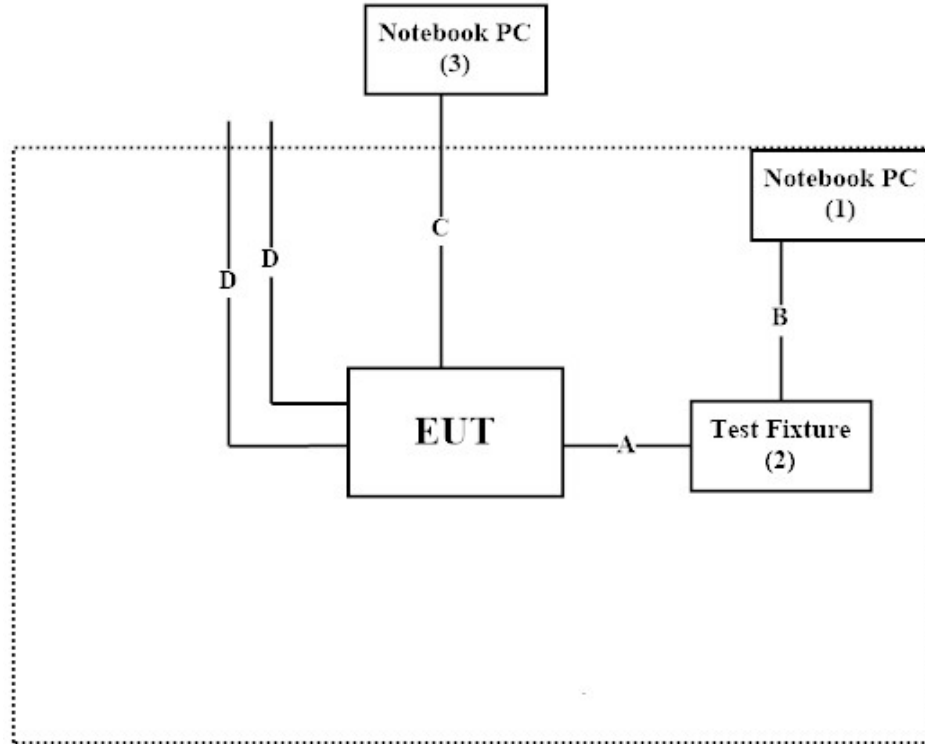
Signal Cable Type		Signal cable Description
A	RS-232 to single Cable	Non-Shielded, 0.3m.
B	USB Cable	Non-Shielded, 1m
C	LAN Cable	Non-Shielded, 2m
D	Fiber optic Cable	Non-Shielded, 2m, two PCS.

Test Item		DC			
Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude E5440	HG26TZ1	Non-Shielded, 0 .8m
2	Test Fixture	MOXA	N/A	N/A	N/A
3	DC Power Supply	Agilent	E3646A	MY53020023	N/A
4	Notebook PC	DELL	Latitude E5440	B6TYTZ1	Non-Shielded, 0 .8m

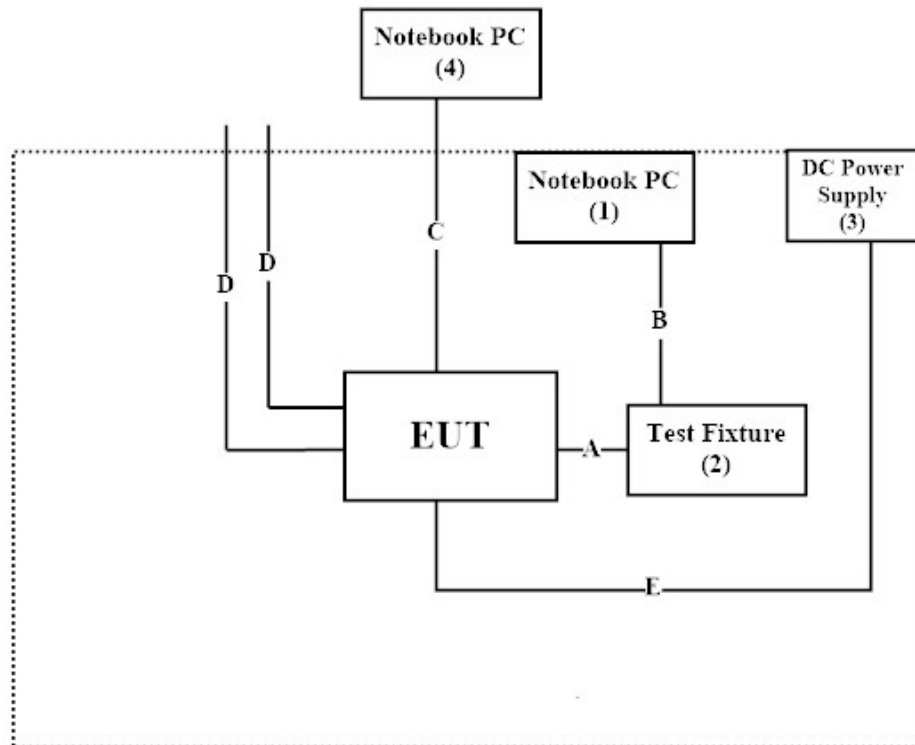
Signal Cable Type		Signal cable Description
A	RS-232 to single Cable	Non-Shielded, 0.3m.
B	USB Cable	Non-Shielded, 1m
C	LAN Cable	Non-Shielded, 2m
D	Fiber optic Cable	Non-Shielded, 2m, two PCS.
E	Power Cable	Non-Shielded, 1.5m

### 1.4. Configuration of tested System

Test Item AC



Test Item DC





## **1.5. EUT Exercise Software**

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Putty v0.26.0.0“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.

## 1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

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FCC Accreditation Number: TW3023

**1.7. Summary of Test Results**

<b>Chapter</b>	<b>Clause FCC Part 15</b>	<b>Test Content</b>	<b>Result</b>
2	<b>15.207</b>	<u>Conducted Emission</u>	PASS
3	<b>15.407(a)</b>	<u>Maximun conducted output power</u>	PASS
4	<b>15.407(a)</b>	<u>Peak Power Spectral Density</u>	PASS
5	<b>15.209</b>	<u>Radiated Emission</u>	PASS
6	<b>15.407(b)</b>	<u>Band Edge</u>	PASS
7	<b>15.407(a)(3)</b>	<u>Occupied Bandwidth</u>	PASS
8	--	<u>Duty Cycle</u>	--

## 1.8. List of Test Equipment

### For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/02/12	2019/02/11
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2018/10/13	2019/10/12
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/08/01	2019/07/31
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/07/25	2019/07/24
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/07/25	2019/07/24
X	EMI Test Receiver	R&S	ESCS 30	100369	2018/11/07	2019/11/06
X	LISN	R&S	ESH3-Z5	836679/017	2018/02/09	2019/02/08
X	LISN	R&S	ENV216	100097	2018/02/09	2019/02/08
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20

### For Radiated measurements /Site3/CB8

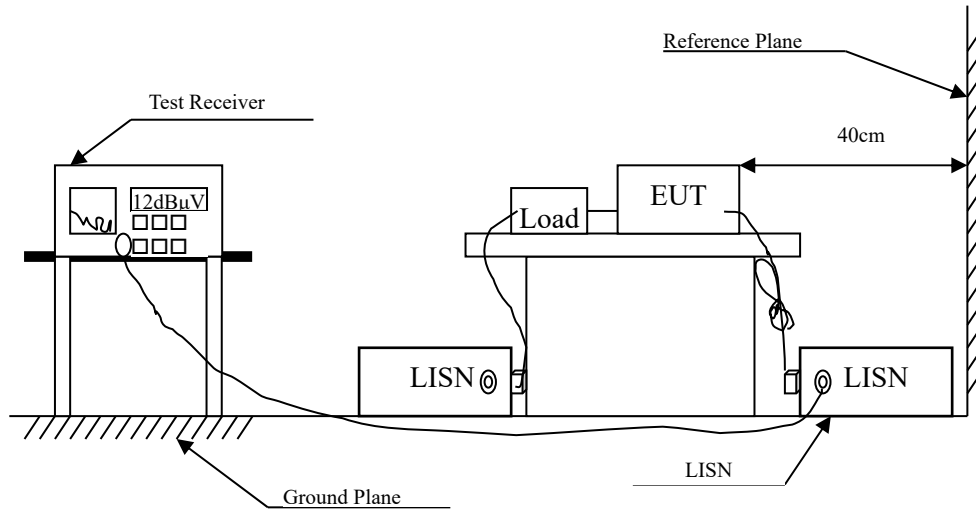
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/03/12	2019/03/11
X	Loop Antenna	Teseq	HLA6121	37133	2018/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2018/06/14	2019/06/13
X	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
X	Horn Antenna	SCHWARZBECK	9120D	576	2017/11/30	2018/11/29
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
X	Horn Antenna	Com-Power	AH-840	101043	2018/01/09	2019/01/08
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/03/21	2019/03/20
X	Filter	MICRO-TRONICS	BRM50702	G270	2018/08/06	2019/08/05
X	Filter	MICRO-TRONICS	BRM50716	G196	2018/08/06	2019/08/05

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 :QuieTek EMI 2.0 V2.1.113.

## 2. Conducted Emission

### 2.1. Test Setup



## 2.2. Limits

<b>FCC Part 15 Subpart C Paragraph 15.207 (dB<math>\mu</math>V) Limit</b>		
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 invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

## 2.4. Uncertainty

$\pm 2.26$  dB

## 2.5. Test Result of Conducted Emission

Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5230MHz) -AC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.162	9.745	38.300	48.045	-17.612	65.657
0.173	9.742	38.520	48.262	-17.081	65.343
0.193	9.738	36.420	46.158	-18.613	64.771
0.224	9.739	33.780	43.519	-20.367	63.886
0.459	9.748	37.560	47.308	-9.863	57.171
0.810	9.773	25.500	35.273	-20.727	56.000
<b>Average</b>					
0.162	9.745	23.020	32.765	-22.892	55.657
0.173	9.742	24.540	34.282	-21.061	55.343
0.193	9.738	21.610	31.348	-23.423	54.771
0.224	9.739	19.470	29.209	-24.677	53.886
0.459	9.748	27.330	37.078	-10.093	47.171
0.810	9.773	15.470	25.243	-20.757	46.000

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 : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5230MHz) -AC

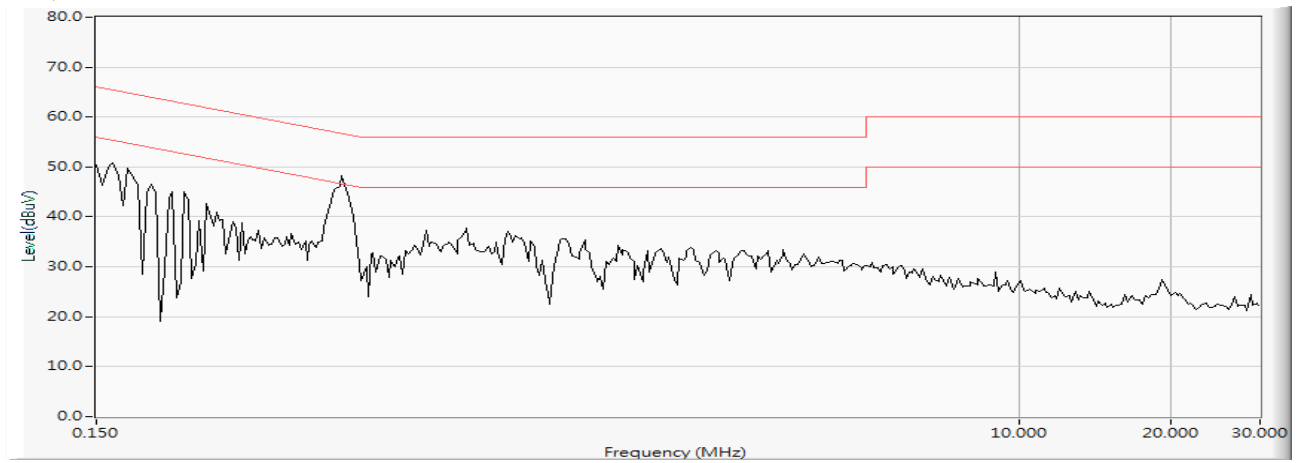
Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.154	9.738	40.220	49.958	-15.928	65.886
0.170	9.737	38.820	48.557	-16.872	65.429
0.205	9.738	35.360	45.098	-19.331	64.429
0.216	9.738	33.440	43.178	-20.936	64.114
0.459	9.738	34.380	44.118	-13.053	57.171
1.005	9.771	20.500	30.271	-25.729	56.000
<b>Average</b>					
0.154	9.738	27.140	36.878	-19.008	55.886
0.170	9.737	25.490	35.227	-20.202	55.429
0.205	9.738	21.180	30.918	-23.511	54.429
0.216	9.738	19.400	29.138	-24.976	54.114
0.459	9.738	27.080	36.818	-10.353	47.171
1.005	9.771	12.500	22.271	-23.729	46.000

Note:

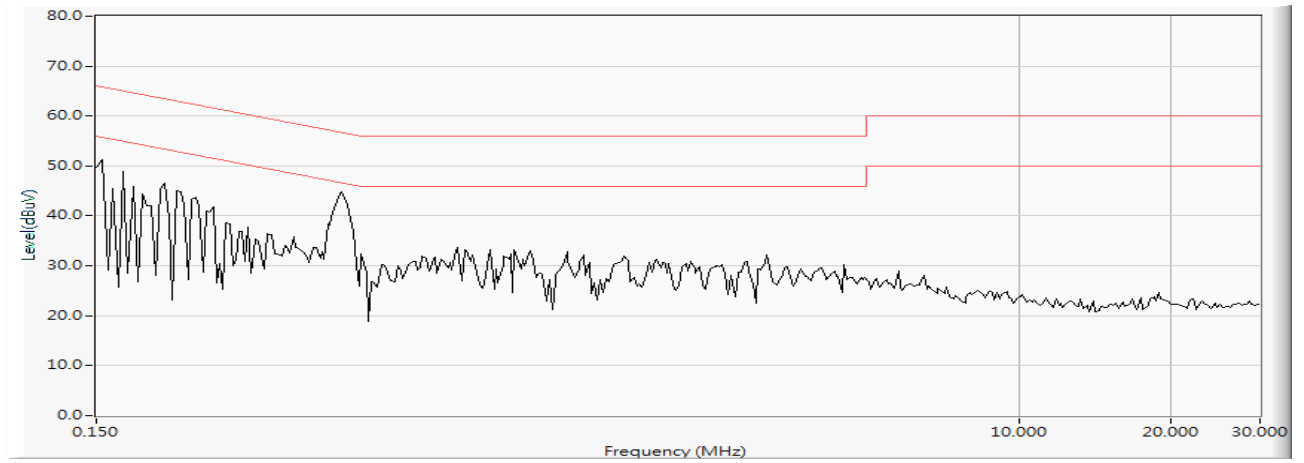
1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



**LINE 1**



**LINE 2**



Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5310MHz) -AC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.158	9.746	39.300	49.046	-16.725	65.771
0.166	9.744	38.600	48.344	-17.199	65.543
0.193	9.738	36.600	46.338	-18.433	64.771
0.220	9.739	33.720	43.459	-20.541	64.000
0.463	9.749	37.220	46.969	-10.088	57.057
0.795	9.772	25.600	35.372	-20.628	56.000
<b>Average</b>					
0.158	9.746	24.620	34.366	-21.405	55.771
0.166	9.744	24.540	34.284	-21.259	55.543
0.193	9.738	21.900	31.638	-23.133	54.771
0.220	9.739	20.060	29.799	-24.201	54.000
0.463	9.749	26.890	36.639	-10.418	47.057
0.795	9.772	15.530	25.302	-20.698	46.000

## Note:

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

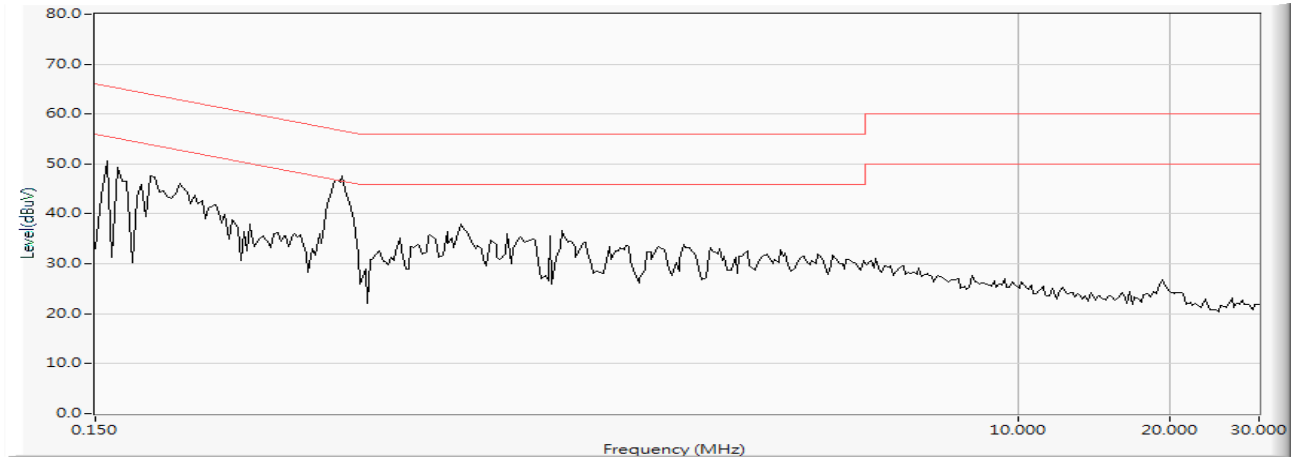
Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5310MHz) -AC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.154	9.738	40.120	49.858	-16.028	65.886
0.170	9.737	38.700	48.437	-16.992	65.429
0.185	9.737	36.600	46.337	-18.663	65.000
0.197	9.738	34.960	44.698	-19.959	64.657
0.463	9.739	34.220	43.959	-13.098	57.057
1.252	9.781	20.320	30.101	-25.899	56.000
<b>Average</b>					
0.154	9.738	26.560	36.298	-19.588	55.886
0.170	9.737	25.110	34.847	-20.582	55.429
0.185	9.737	22.660	32.397	-22.603	55.000
0.197	9.738	20.200	29.938	-24.719	54.657
0.463	9.739	27.330	37.069	-9.988	47.057
1.252	9.781	11.370	21.151	-24.849	46.000

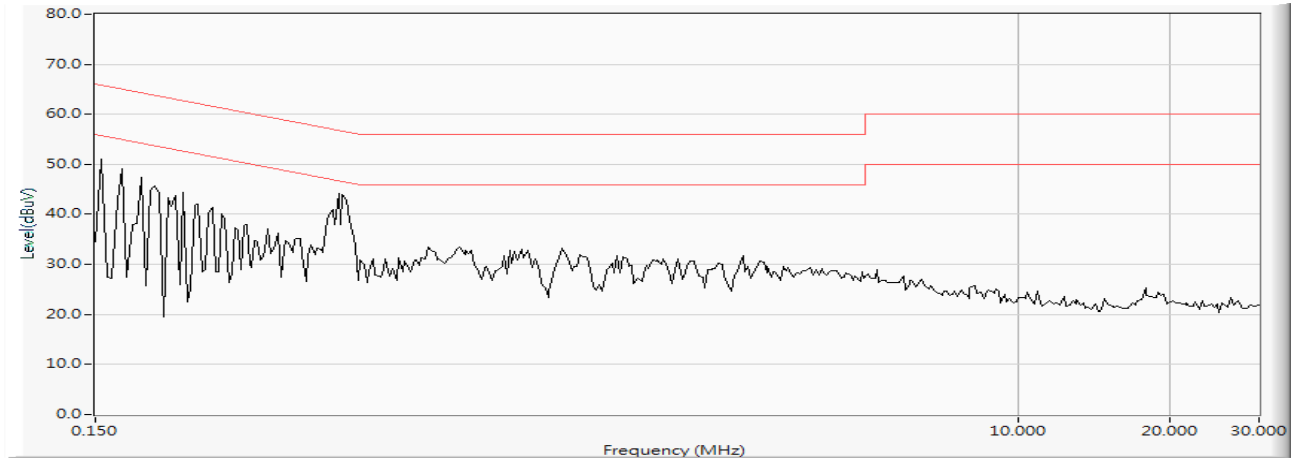
Note:

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

**LINE 1**



**LINE 2**



Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5670MHz) -AC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.150	9.749	39.760	49.509	-16.491	66.000
0.173	9.742	37.920	47.662	-17.681	65.343
0.181	9.740	36.400	46.140	-18.974	65.114
0.197	9.738	35.540	45.278	-19.379	64.657
0.463	9.749	37.220	46.969	-10.088	57.057
0.798	9.772	25.640	35.412	-20.588	56.000
<b>Average</b>					
0.150	9.749	25.860	35.609	-20.391	56.000
0.173	9.742	24.540	34.282	-21.061	55.343
0.181	9.740	21.550	31.290	-23.824	55.114
0.197	9.738	20.270	30.008	-24.649	54.657
0.463	9.749	26.760	36.509	-10.548	47.057
0.798	9.772	15.760	25.532	-20.468	46.000

## Note:

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

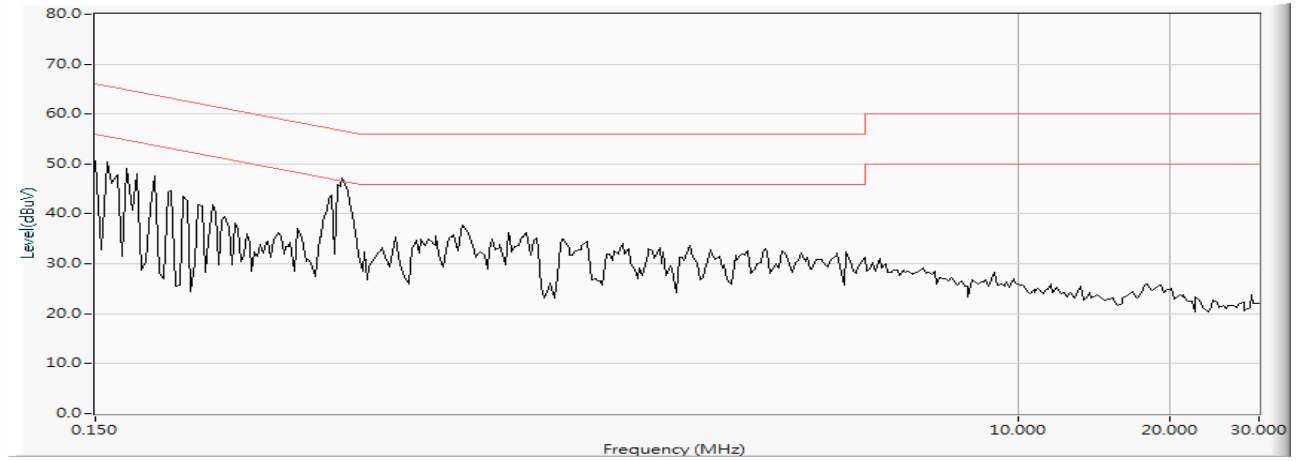
Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps) (5670MHz) -AC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.154	9.738	39.780	49.518	-16.368	65.886
0.166	9.736	38.160	47.896	-17.647	65.543
0.185	9.737	36.600	46.337	-18.663	65.000
0.220	9.739	33.420	43.159	-20.841	64.000
0.463	9.739	34.240	43.979	-13.078	57.057
0.802	9.762	22.460	32.222	-23.778	56.000
<b>Average</b>					
0.154	9.738	26.420	36.158	-19.728	55.886
0.166	9.736	23.700	33.436	-22.107	55.543
0.185	9.737	22.560	32.297	-22.703	55.000
0.220	9.739	19.470	29.209	-24.791	54.000
0.463	9.739	27.330	37.069	-9.988	47.057
0.802	9.762	15.350	25.112	-20.888	46.000

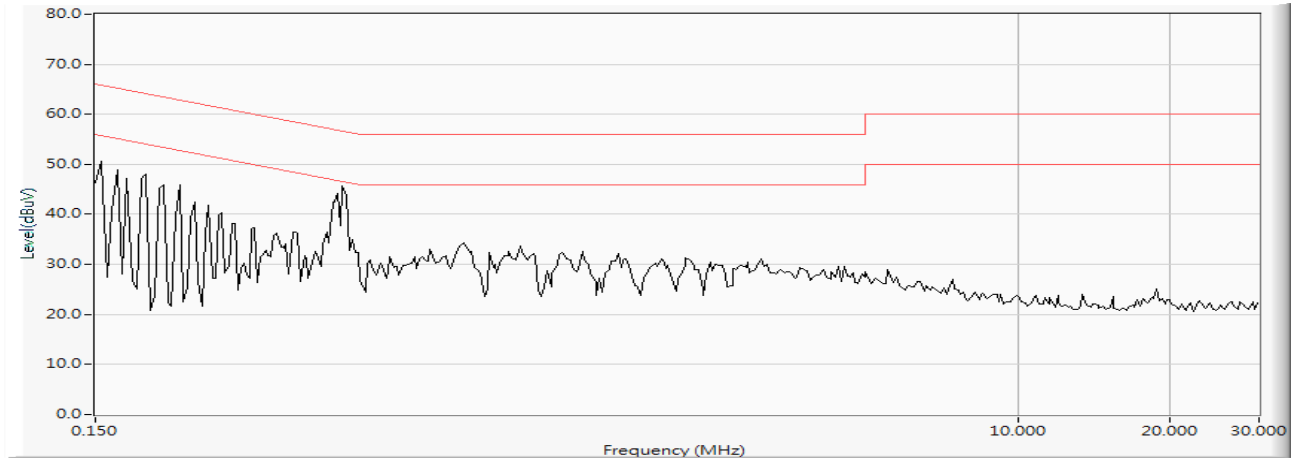
Note:

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

**LINE 1**



**LINE 2**



Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/10/02  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps) (5755MHz) -AC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.197	9.738	36.460	46.198	-18.459	64.657
0.466	9.749	36.860	46.609	-10.362	56.971
0.916	9.777	28.200	37.977	-18.023	56.000
2.025	9.822	22.780	32.602	-23.398	56.000
3.361	9.866	21.100	30.966	-25.034	56.000
14.685	10.157	15.620	25.777	-34.223	60.000
<b>Average</b>					
0.197	9.738	21.670	31.408	-23.249	54.657
0.466	9.749	27.260	37.009	-9.962	46.971
0.916	9.777	15.880	25.657	-20.343	46.000
2.025	9.822	13.070	22.892	-23.108	46.000
3.361	9.866	11.470	21.336	-24.664	46.000
14.685	10.157	4.810	14.967	-35.033	50.000

Note:

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



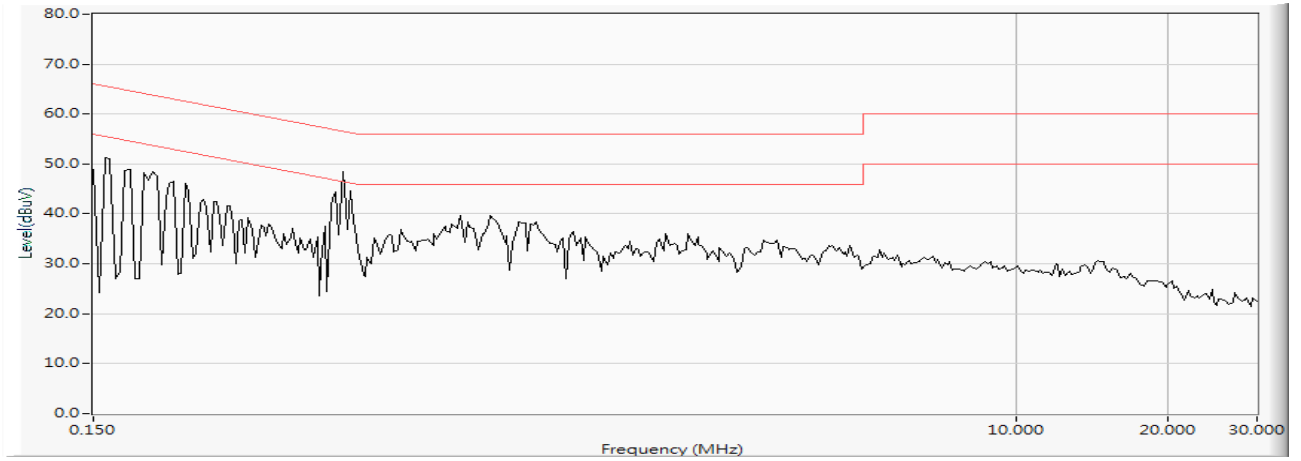
Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/10/02  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps) (5755MHz) -AC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.193	9.738	36.560	46.298	-18.473	64.771
0.470	9.739	30.780	40.519	-16.338	56.857
0.791	9.762	20.340	30.102	-25.898	56.000
1.404	9.787	17.540	27.327	-28.673	56.000
2.045	9.823	17.280	27.103	-28.897	56.000
14.959	10.242	13.680	23.922	-36.078	60.000
<b>Average</b>					
0.193	9.738	26.950	36.688	-18.083	54.771
0.470	9.739	25.410	35.149	-11.708	46.857
0.791	9.762	12.810	22.572	-23.428	46.000
1.404	9.787	13.120	22.907	-23.093	46.000
2.045	9.823	13.490	23.313	-22.687	46.000
14.959	10.242	1.140	11.382	-38.618	50.000

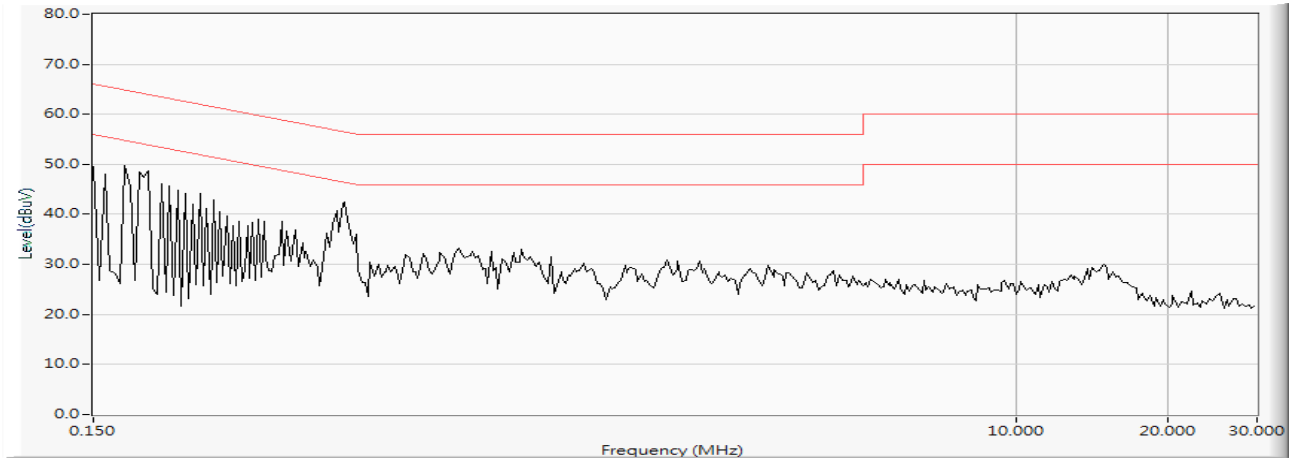
Note:

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

**LINE 1**



**LINE 2**



Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5230MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.189	9.737	41.240	50.977	-13.909	64.886
0.236	9.739	42.480	52.219	-11.324	63.543
0.263	9.740	44.100	53.840	-8.931	62.771
0.537	9.752	38.120	47.872	-8.128	56.000
0.654	9.756	38.720	48.476	-7.524	56.000
1.955	9.820	40.980	50.800	-5.200	56.000
<b>Average</b>					
0.189	9.737	25.350	35.087	-19.799	54.886
0.236	9.739	28.600	38.339	-15.204	53.543
0.263	9.740	38.630	48.370	-4.401	52.771
0.537	9.752	30.200	39.952	-6.048	46.000
0.654	9.756	31.180	40.936	-5.064	46.000
1.955	9.820	31.180	41.000	-5.000	46.000

## Note:

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

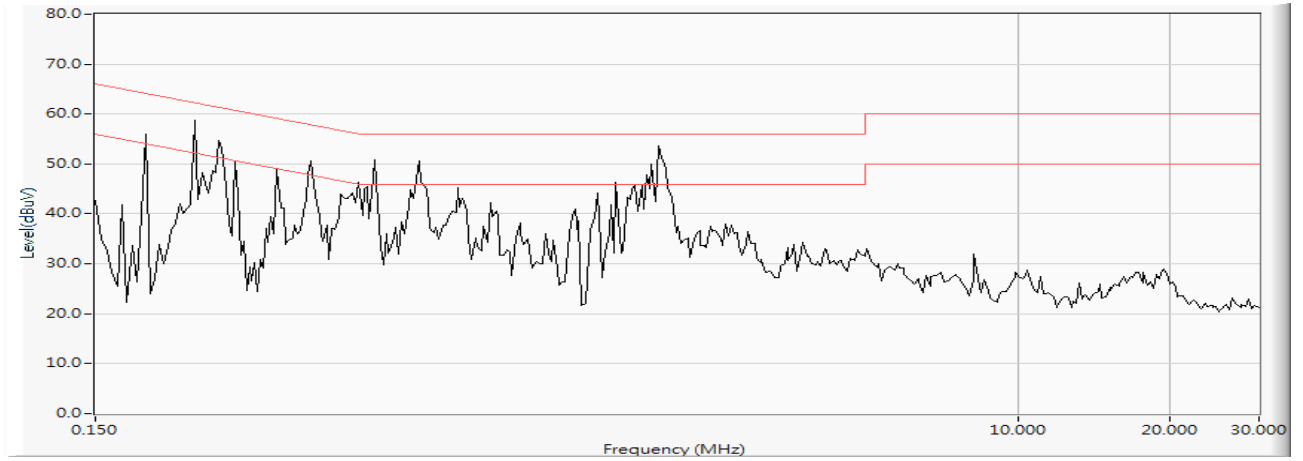
Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5230MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.181	9.737	40.040	49.777	-15.337	65.114
0.255	9.740	38.480	48.220	-14.780	63.000
0.314	9.732	28.200	37.932	-23.382	61.314
0.396	9.736	37.100	46.836	-12.135	58.971
0.642	9.746	28.820	38.566	-17.434	56.000
2.033	9.823	40.680	50.503	-5.497	56.000
<b>Average</b>					
0.181	9.737	21.700	31.437	-23.677	55.114
0.255	9.740	27.820	37.560	-15.440	53.000
0.314	9.732	8.260	17.992	-33.322	51.314
0.396	9.736	32.970	42.706	-6.265	48.971
0.642	9.746	19.330	29.076	-16.924	46.000
2.033	9.823	28.520	38.343	-7.657	46.000

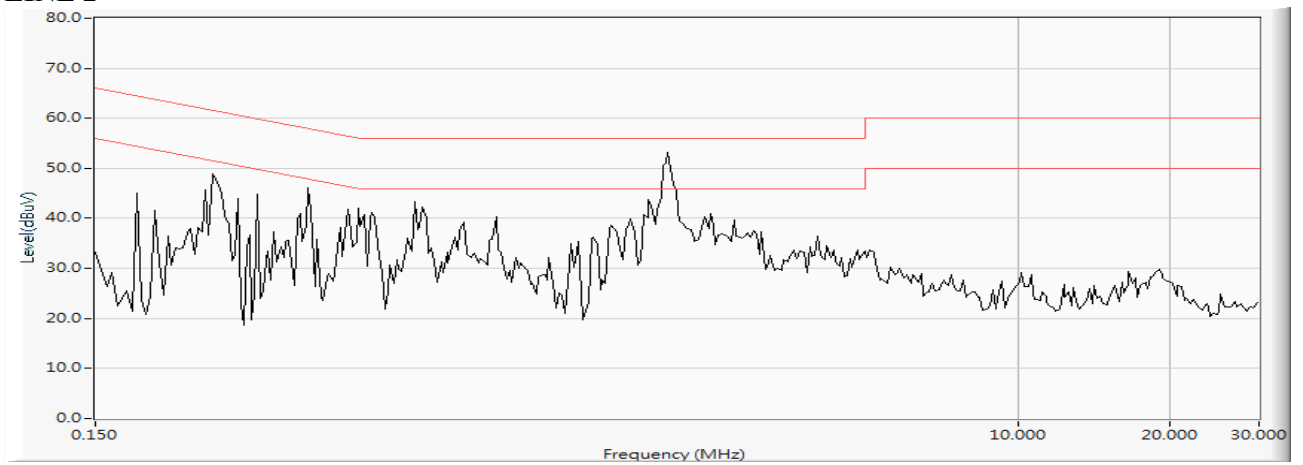
Note:

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

**LINE 1**



**LINE 2**



Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5310MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.177	9.741	40.420	50.161	-15.068	65.229
0.267	9.741	44.080	53.821	-8.836	62.657
0.295	9.742	38.920	48.662	-13.195	61.857
0.396	9.746	40.840	50.586	-8.385	58.971
0.521	9.751	39.300	49.051	-6.949	56.000
1.888	9.817	37.280	47.097	-8.903	56.000
<b>Average</b>					
0.177	9.741	16.430	26.171	-29.058	55.229
0.267	9.741	38.400	48.141	-4.516	52.657
0.295	9.742	18.850	28.592	-23.265	51.857
0.396	9.746	34.600	44.346	-4.625	48.971
0.521	9.751	32.240	41.991	-4.009	46.000
1.888	9.817	26.490	36.307	-9.693	46.000

## Note:

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

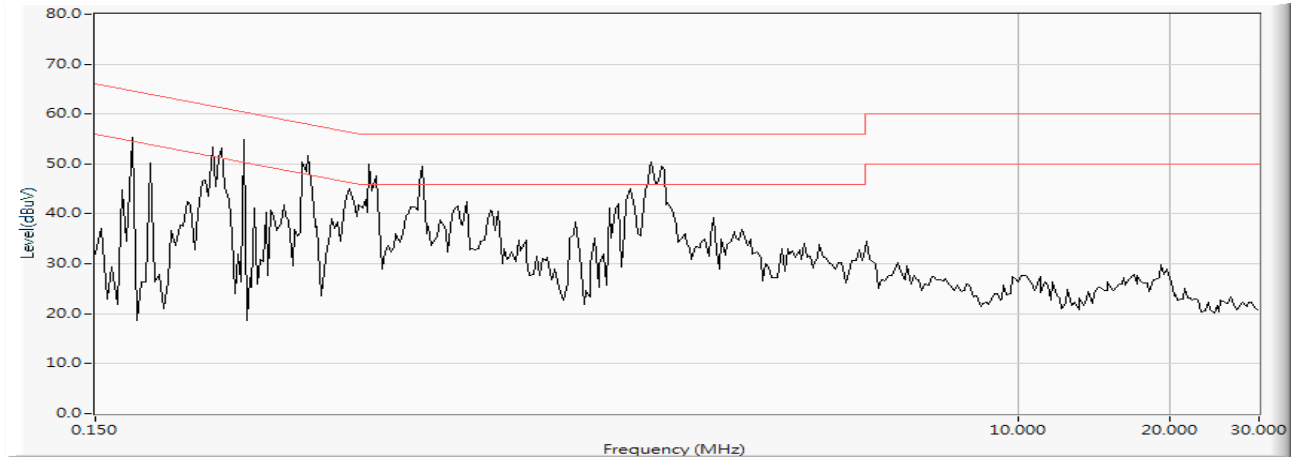
Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5310MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.197	9.738	38.640	48.378	-16.279	64.657
0.216	9.738	35.920	45.658	-18.456	64.114
0.263	9.740	42.080	51.820	-10.951	62.771
0.408	9.736	35.940	45.676	-12.953	58.629
0.525	9.741	34.780	44.521	-11.479	56.000
2.013	9.822	39.660	49.482	-6.518	56.000
<b>Average</b>					
0.197	9.738	20.540	30.278	-24.379	54.657
0.216	9.738	19.550	29.288	-24.826	54.114
0.263	9.740	33.590	43.330	-9.441	52.771
0.408	9.736	23.410	33.146	-15.483	48.629
0.525	9.741	24.870	34.611	-11.389	46.000
2.013	9.822	28.840	38.662	-7.338	46.000

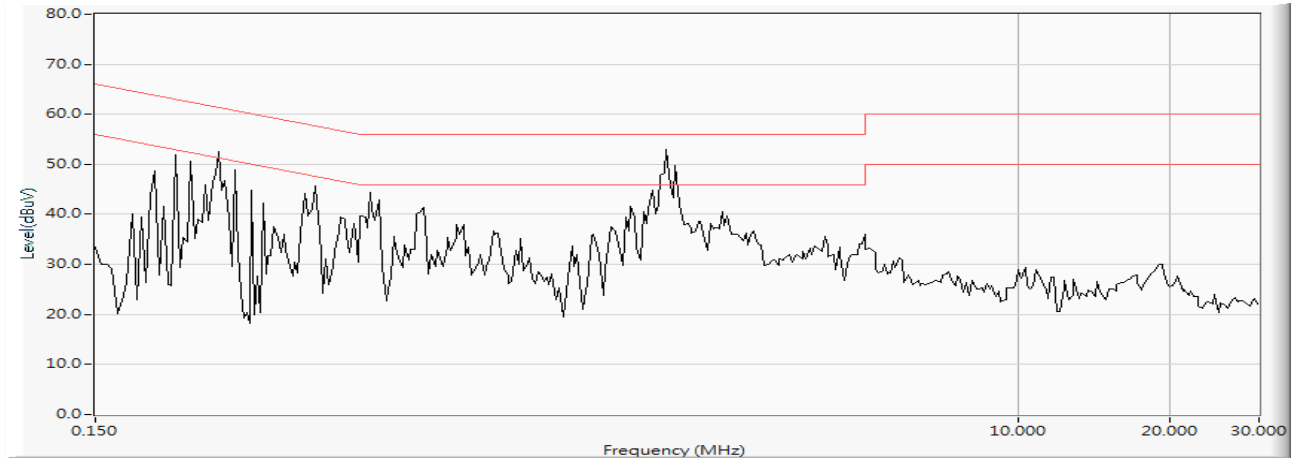
Note:

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

**LINE 1**



**LINE 2**





Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)(5670MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.173	9.742	41.380	51.122	-14.221	65.343
0.248	9.740	43.400	53.140	-10.060	63.200
0.283	9.741	42.240	51.981	-10.219	62.200
0.400	9.746	41.200	50.946	-7.911	58.857
0.658	9.757	39.140	48.897	-7.103	56.000
1.959	9.820	37.940	47.760	-8.240	56.000
<b>Average</b>					
0.173	9.742	17.200	26.942	-28.401	55.343
0.248	9.740	34.490	44.230	-8.970	53.200
0.283	9.741	23.270	33.011	-19.189	52.200
0.400	9.746	34.810	44.556	-4.301	48.857
0.658	9.757	31.660	41.417	-4.583	46.000
1.959	9.820	27.970	37.790	-8.210	46.000

## Note:

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

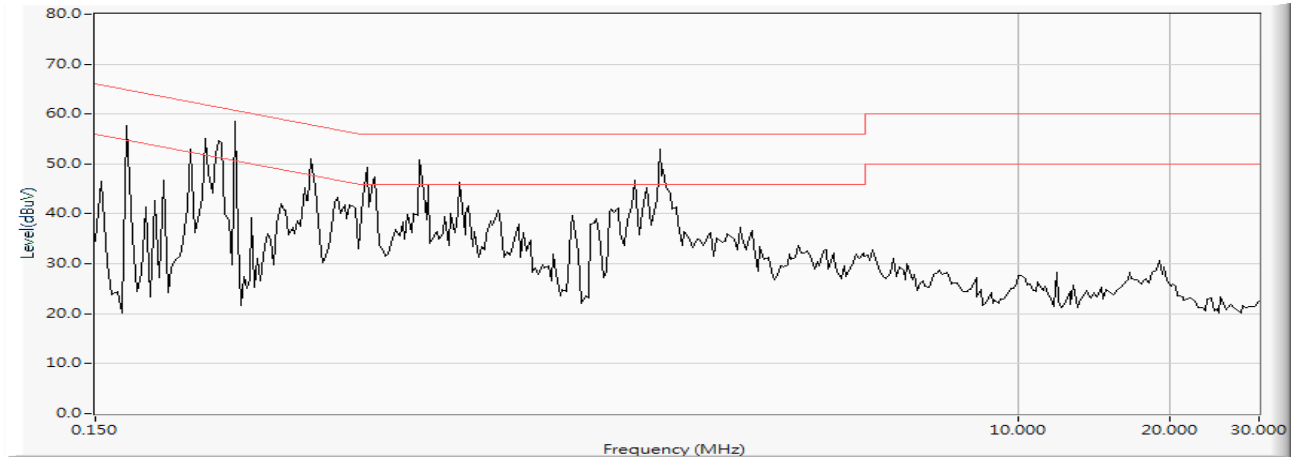
Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/08/31  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps) (5670MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.267	9.741	42.400	52.141	-10.516	62.657
0.392	9.736	37.080	46.816	-12.270	59.086
0.474	9.739	29.720	39.459	-17.284	56.743
0.662	9.747	34.080	43.827	-12.173	56.000
1.591	9.805	26.780	36.585	-19.415	56.000
2.021	9.822	39.940	49.762	-6.238	56.000
<b>Average</b>					
0.267	9.741	33.470	43.211	-9.446	52.657
0.392	9.736	27.140	36.876	-12.210	49.086
0.474	9.739	21.950	31.689	-15.054	46.743
0.662	9.747	24.620	34.367	-11.633	46.000
1.591	9.805	16.590	26.395	-19.605	46.000
2.021	9.822	29.190	39.012	-6.988	46.000

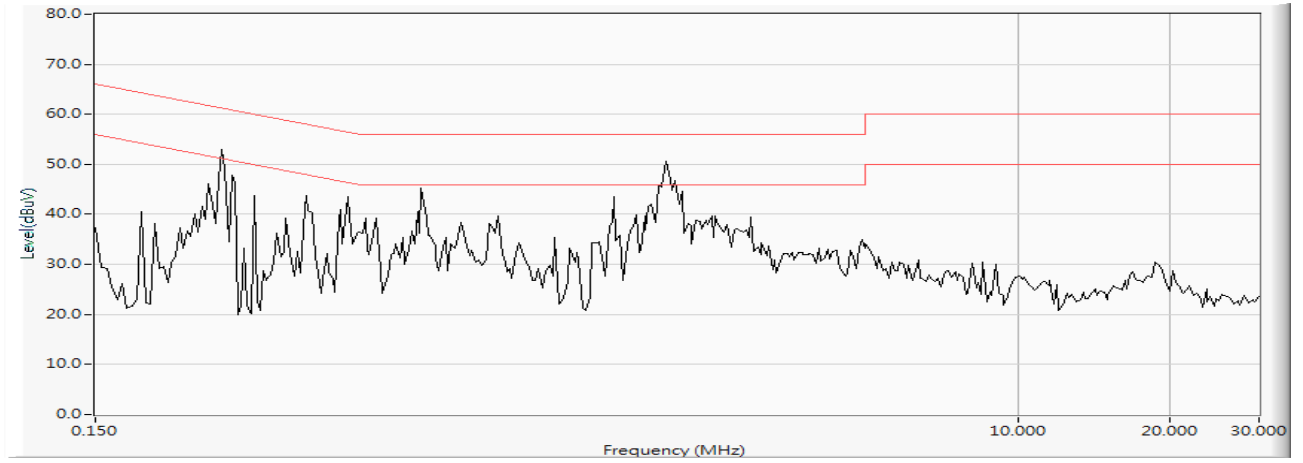
Note:

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

**LINE 1**



**LINE 2**



Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/10/02  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps) (5755MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.193	9.738	37.720	47.458	-17.313	64.771
0.459	9.748	35.940	45.688	-11.483	57.171
0.935	9.778	28.480	38.258	-17.742	56.000
2.279	9.832	22.560	32.392	-23.608	56.000
3.334	9.866	21.400	31.266	-24.734	56.000
14.845	10.160	15.340	25.500	-34.500	60.000
<b>Average</b>					
0.193	9.738	22.820	32.558	-22.213	54.771
0.459	9.748	26.360	36.108	-11.063	47.171
0.935	9.778	16.100	25.878	-20.122	46.000
2.279	9.832	11.560	21.392	-24.608	46.000
3.334	9.866	11.750	21.616	-24.384	46.000
14.845	10.160	5.060	15.220	-34.780	50.000

Note:

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

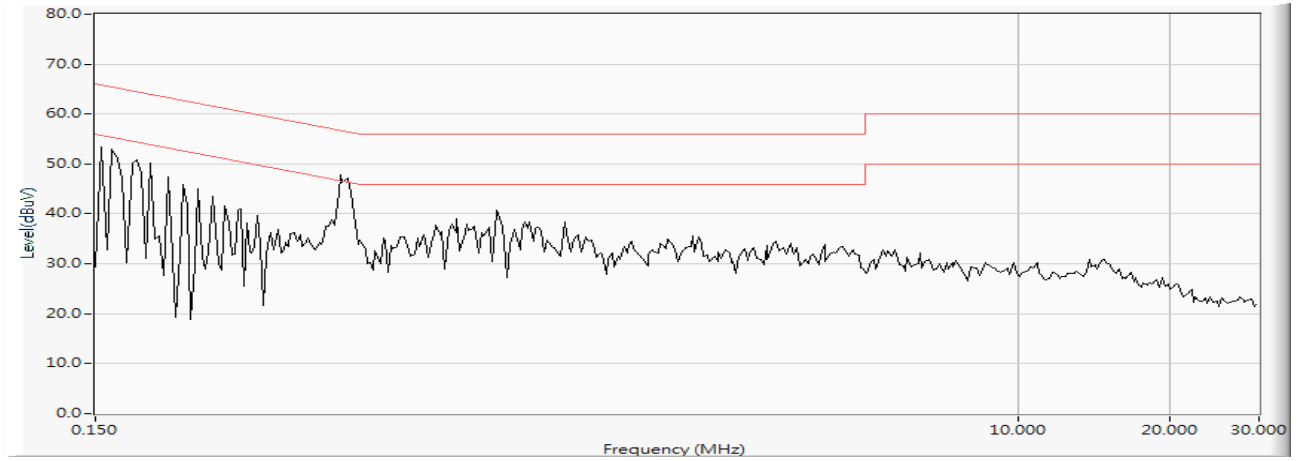
Product : NPort Device Server  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/10/02  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps) (5755MHz) -DC

Frequency MHz	Correct Factor dB	Reading Level dB $\mu$ V	Measurement Level dB $\mu$ V	Margin dB	Limit dB $\mu$ V
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.181	9.737	38.300	48.037	-17.077	65.114
0.459	9.738	30.280	40.018	-17.153	57.171
0.787	9.762	20.320	30.082	-25.918	56.000
0.970	9.769	18.020	27.789	-28.211	56.000
3.431	9.868	13.720	23.588	-32.412	56.000
14.716	10.237	14.620	24.857	-35.143	60.000
<b>Average</b>					
0.181	9.737	23.170	32.907	-22.207	55.114
0.459	9.738	25.490	35.228	-11.943	47.171
0.787	9.762	13.450	23.212	-22.788	46.000
0.970	9.769	7.510	17.279	-28.721	46.000
3.431	9.868	7.430	17.298	-28.702	46.000
14.716	10.237	1.860	12.097	-37.903	50.000

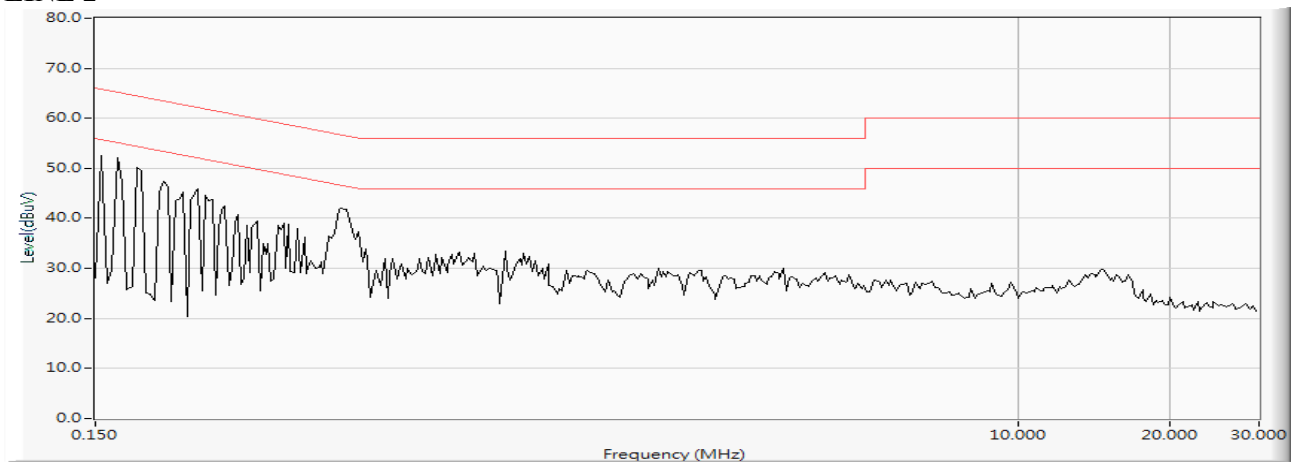
Note:

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

**LINE 1**



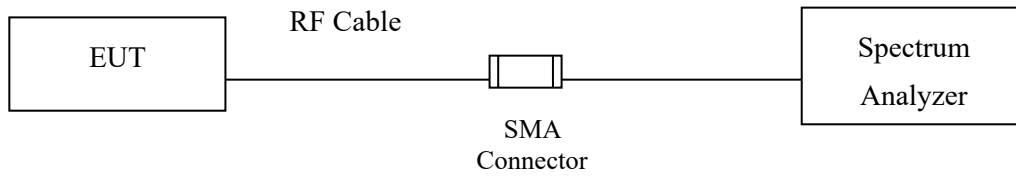
**LINE 2**



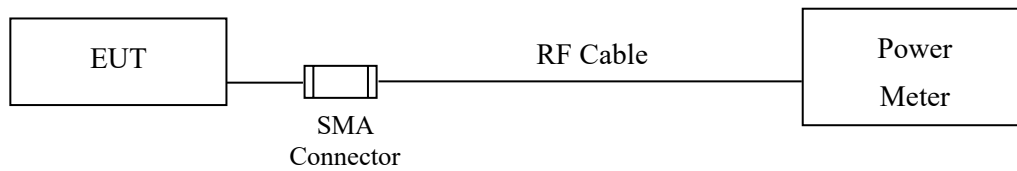
### 3. Maximun conducted output power

#### 3.1. Test Setup

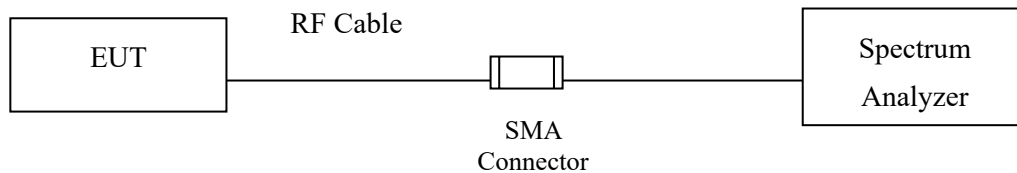
##### 99%Occupied Bandwidth



##### Conduction Power Measurement (for 802.11an)



##### Conduction Power Measurement (for 802.11ac)



## 3.2. Limits

### 3.2.1. 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.

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



3.2.3. 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 U-NII 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 than the 6 dB 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.

802.11a (BW  $\leq$  40 MHz) 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 has a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65 MHz)

802.11ac (BW=80 MHz) 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. Uncertainty

$\pm 1.27$  dB

### 3.5. Test Result of Maximum conducted output power

Product : NPort Device Server  
 Test Item : Maximum conducted output power  
 Test Site : No.3 OATS  
 Test Date : 2018/08/24  
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Cable loss=1dB		Average Power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		6	9	12	18	24	36	48	54	
		Measurement Level (dBm)								
36	5180	14.25	--	--	--	--	--	--	--	<24dBm
44	5220	14.65	14.52	14.4	14.29	14.13	14.01	13.93	13.80	<24dBm
48	5240	14.93	--	--	--	--	--	--	--	<24dBm
52	5260	14.72	--	--	--	--	--	--	--	<24dBm
60	5300	13.81	13.69	13.54	13.42	13.29	13.12	13.04	12.93	<24dBm
64	5320	13.87	--	--	--	--	--	--	--	<24dBm
100	5500	12.96	--	--	--	--	--	--	--	<24dBm
116	5580	13.11	13.01	12.9	12.79	12.65	12.54	12.41	12.29	<24dBm
140	5700	12.95	--	--	--	--	--	--	--	<24dBm
149	5745	15.49	--	--	--	--	--	--	--	<30dBm
157	5785	15.51	15.49	15.47	15.45	15.44	15.41	15.38	15.37	<30dBm
165	5825	15.41	--	--	--	--	--	--	--	<30dBm

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

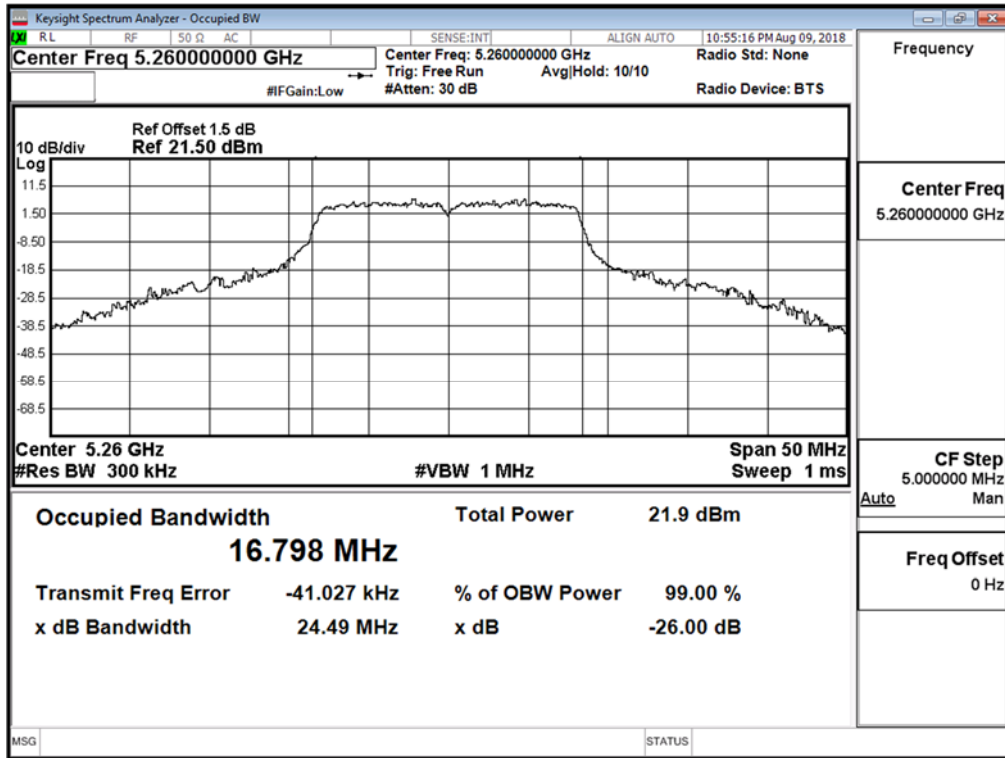
**Maximum conducted output power Measurement:**

Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	14.25	24	--
44	5220	--	14.65	24	--
48	5240	--	14.93	24	--
52	5260	16.798	14.72	24	23.25
60	5300	16.766	13.81	24	23.24
64	5320	16.764	13.87	24	23.24
100	5500	16.725	12.96	24	23.23
116	5580	16.700	13.11	24	23.23
140	5700	16.730	12.95	24	23.23
149	5745	--	15.49	30	--
157	5785	--	15.51	30	--
165	5825	--	15.41	30	--

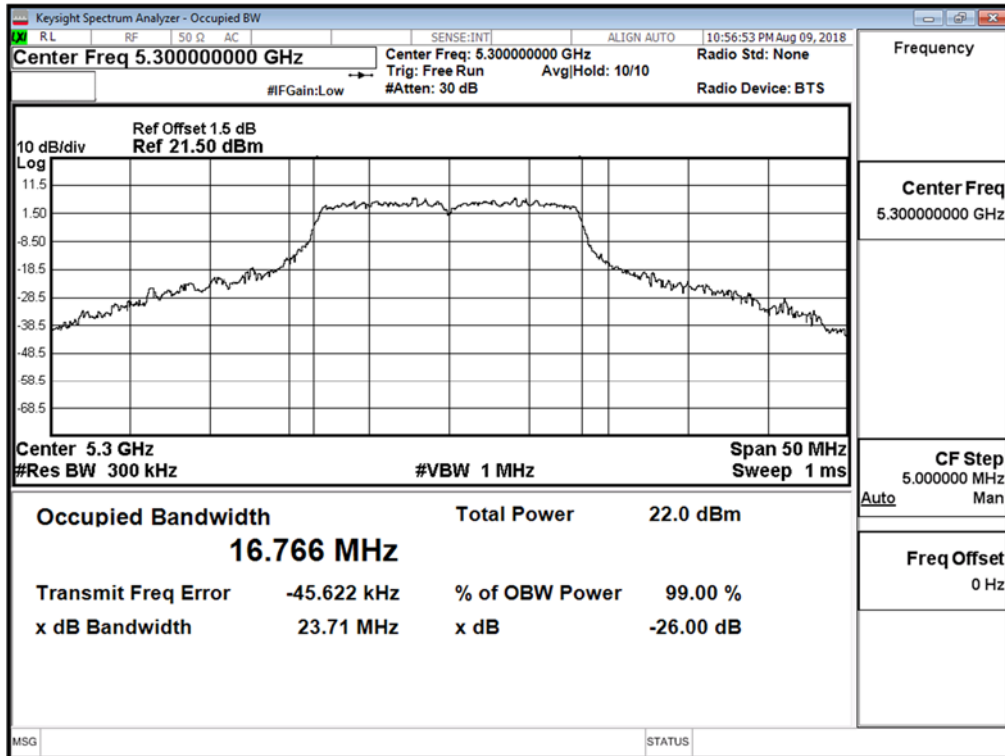
Note: Power Output Value =Reading value on average power meter + cable loss

99% Occupied Bandwidth:

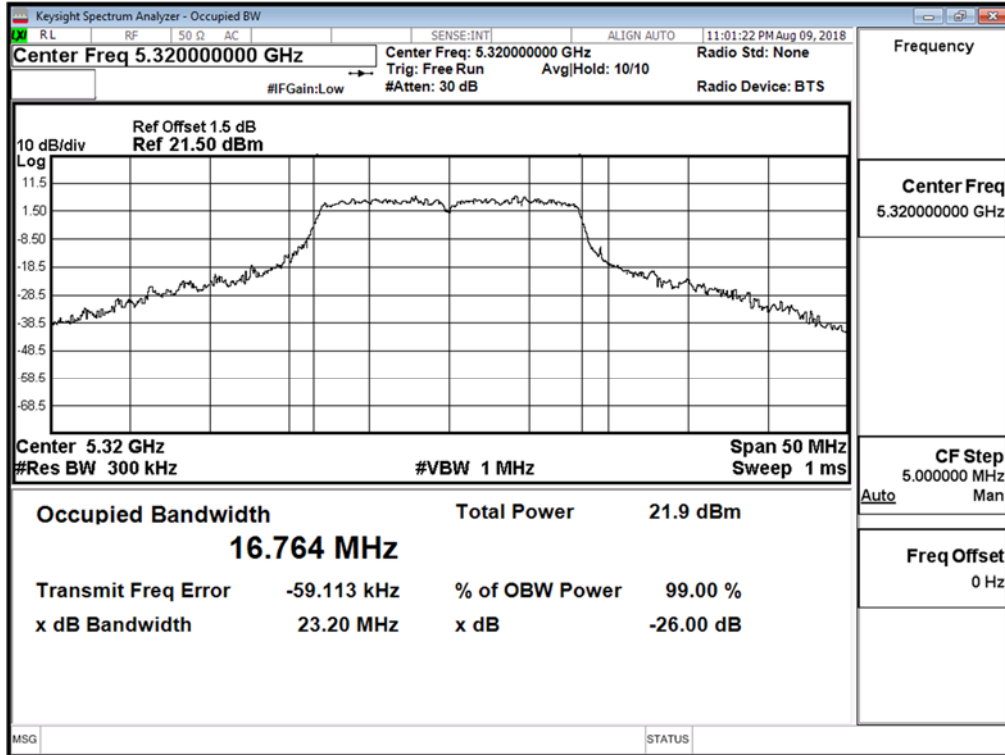
Channel 52:



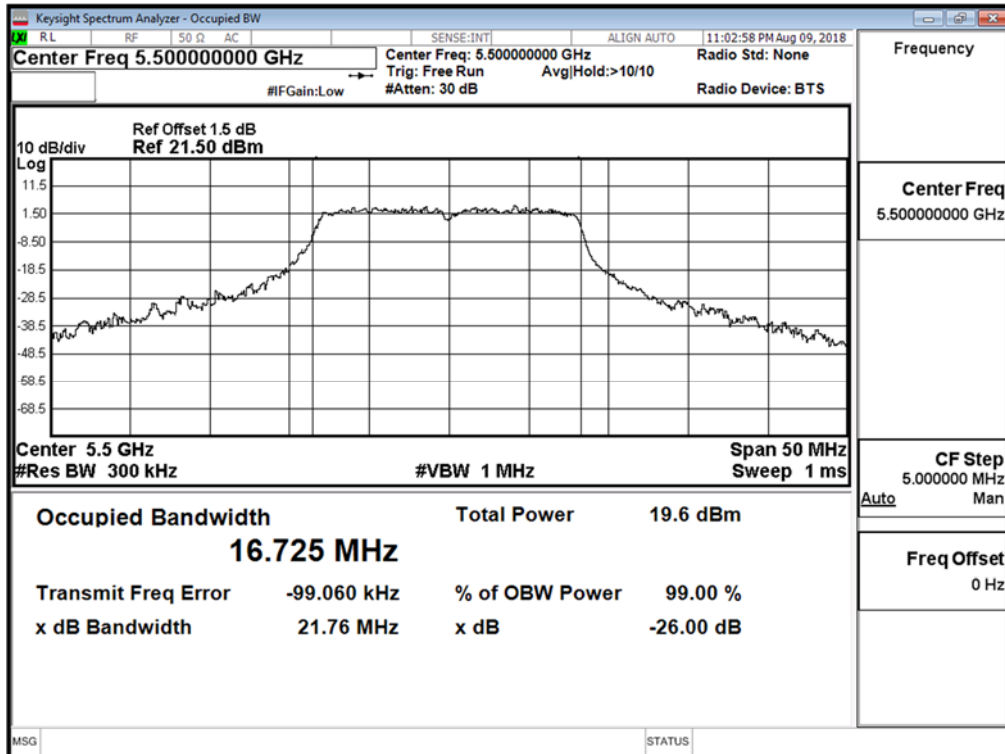
Channel 60:



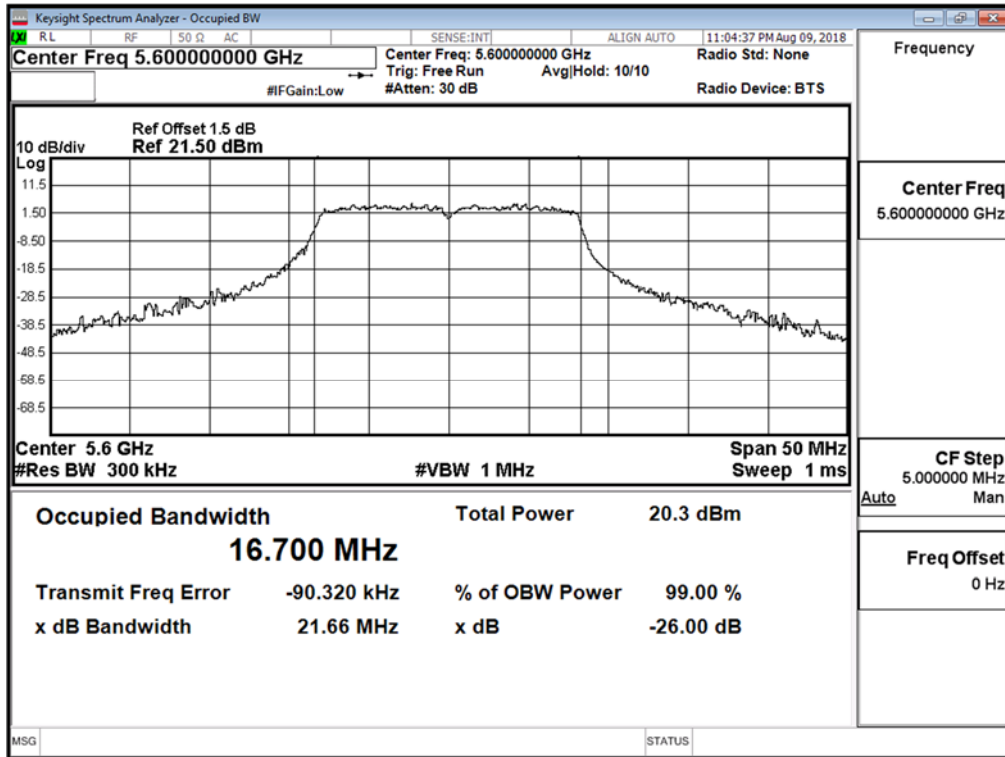
**Channel 64:**



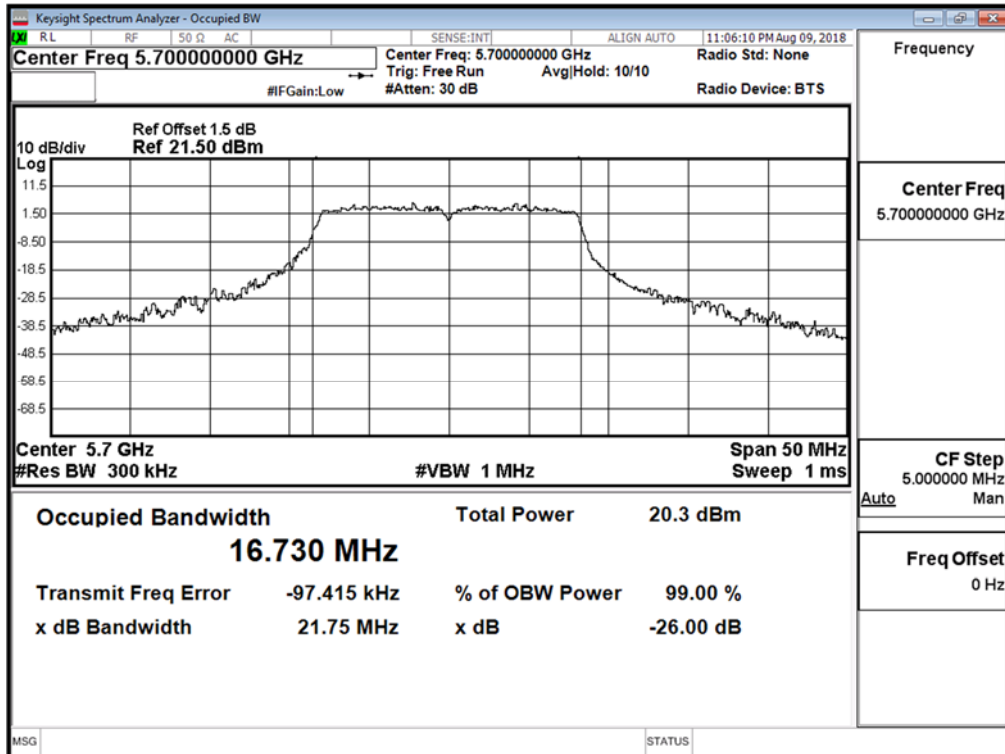
**Channel 100:**



**Channel 120:**



**Channel 140:**



Product : NPort Device Server  
 Test Item : Maximum conducted output power  
 Test Site : No.3 OATS  
 Test Date : 2018/11/26  
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

Cable loss=1dB		Average Power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	
		Measurement Level (dBm)								
36	5180	14.92	--	--	--	--	--	--	--	<24dBm
44	5220	14.71	14.6	14.49	14.32	14.23	14.13	14.02	13.91	<24dBm
48	5240	14.98	--	--	--	--	--	--	--	<24dBm
52	5260	14.75	--	--	--	--	--	--	--	<24dBm
60	5300	14.97	14.82	14.7	14.59	14.46	14.32	14.15	14.02	<24dBm
64	5320	14.76	--	--	--	--	--	--	--	<24dBm
100	5500	13.21	--	--	--	--	--	--	--	<24dBm
116	5580	13.11	13.05	12.99	12.93	12.87	12.81	12.75	12.69	<24dBm
140	5700	11.13	--	--	--	--	--	--	--	<24dBm
149	5745	14.63	--	--	--	--	--	--	--	<30dBm
157	5785	14.52	14.4	14.29	14.17	14.04	13.92	13.80	13.68	<30dBm
165	5825	14.82	--	--	--	--	--	--	--	<30dBm

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

**Maximum conducted output power Measurement:**

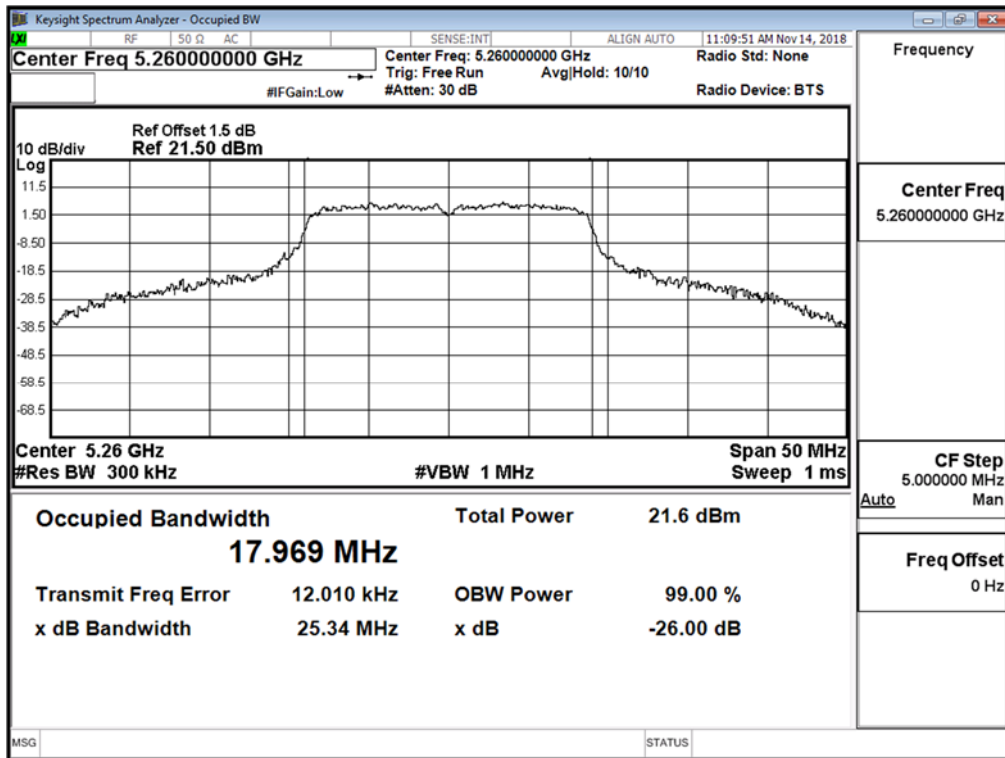
Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
36	5180	--	14.92	24	--	Pass
44	5220	--	14.71	24	--	Pass
48	5240	--	14.98	24	--	Pass
52	5260	17.969	14.75	24	23.55	Pass
60	5300	18.046	14.97	24	23.56	Pass
64	5320	17.960	14.76	24	23.54	Pass
100	5500	17.968	13.21	24	23.54	Pass
116	5580	18.218	13.11	24	23.61	Pass
140	5700	17.785	11.13	24	23.50	Pass
149	5745	--	14.63	30	--	Pass
157	5785	--	14.52	30	--	Pass
165	5825	--	14.82	30	--	Pass

Note: Power Output Value = Reading value on average power meter + cable loss

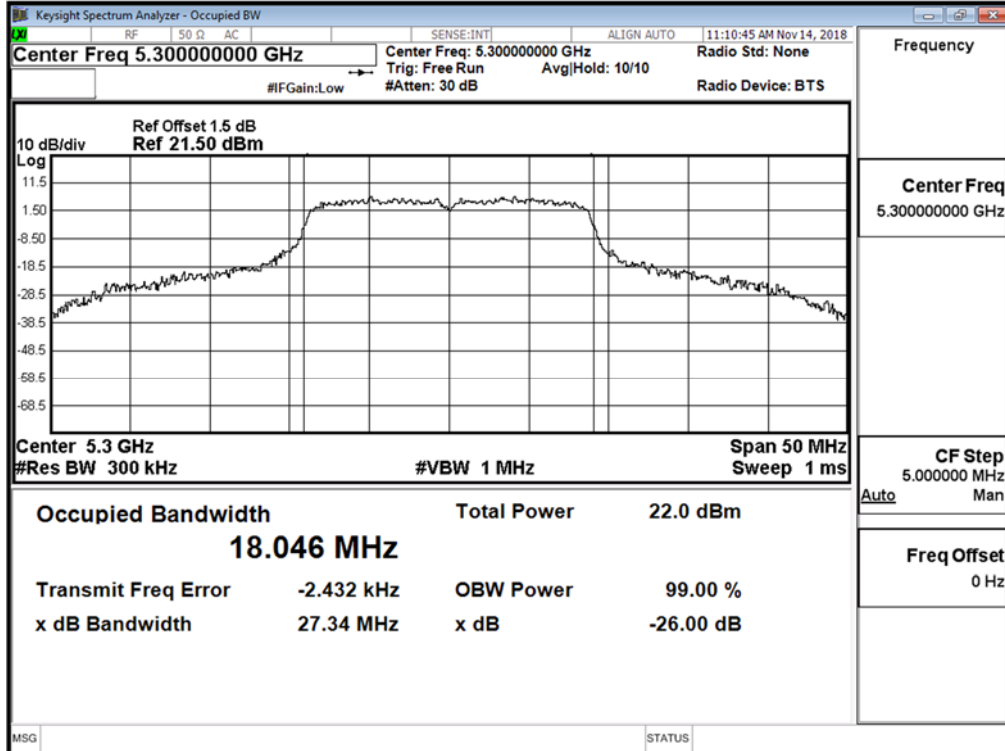


99% Occupied Bandwidth:

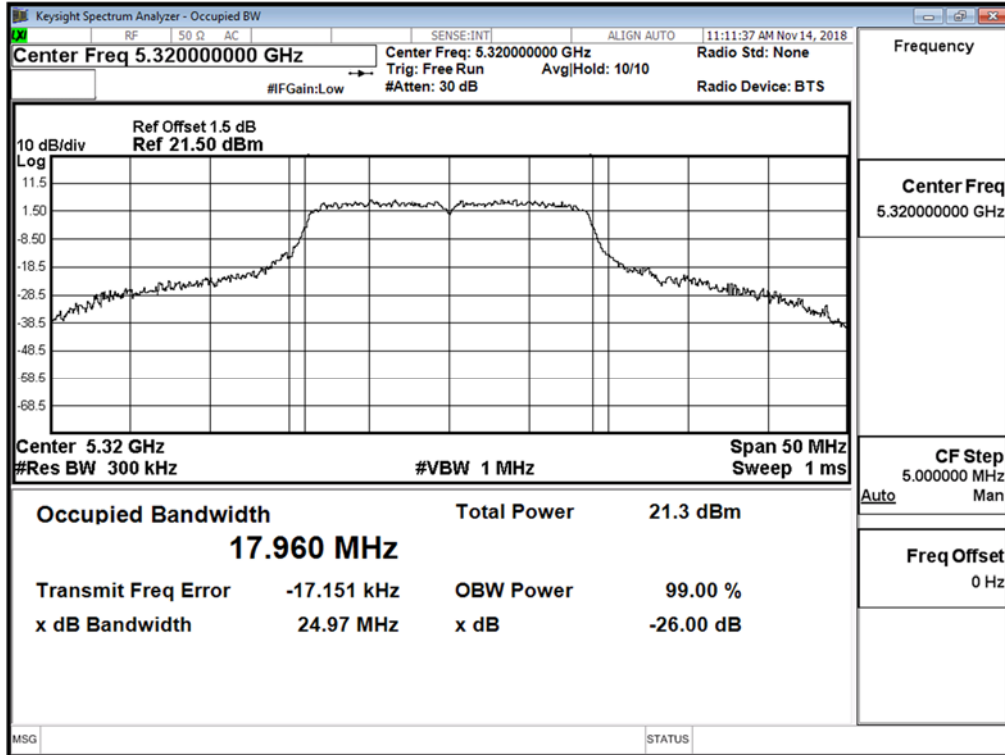
Channel 52:



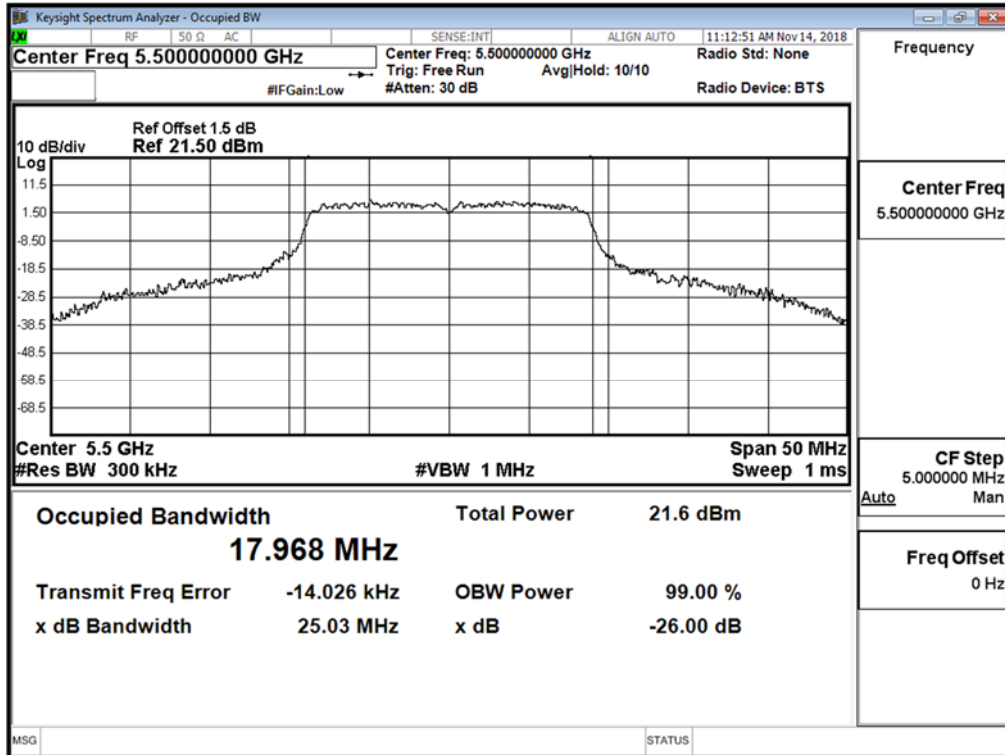
Channel 60:



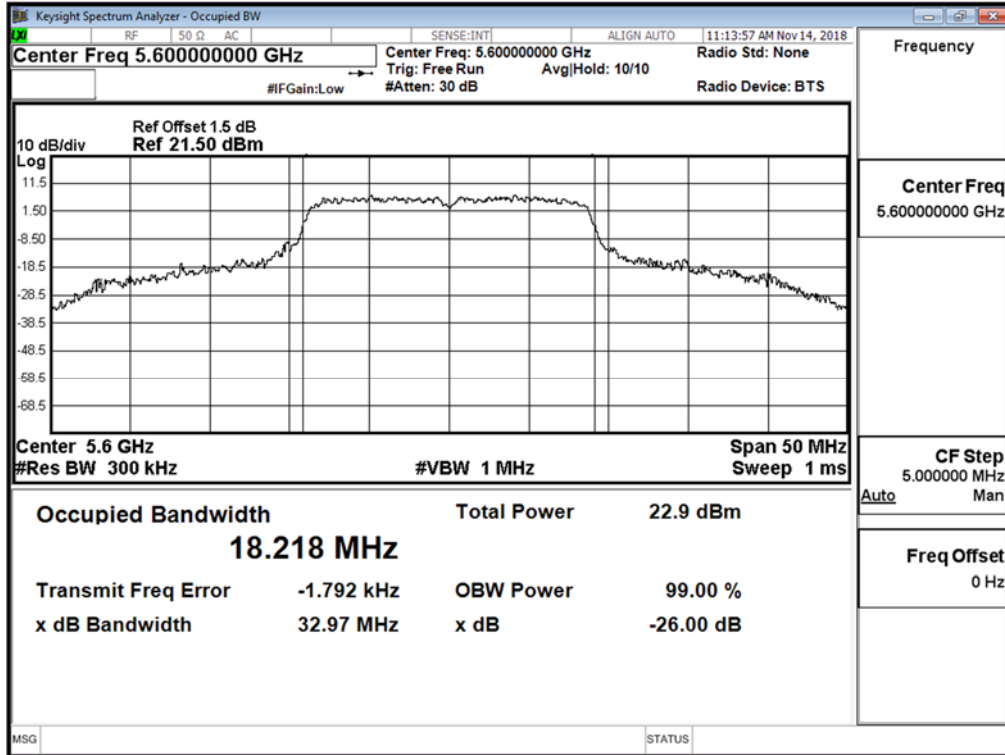
**Channel 64:**



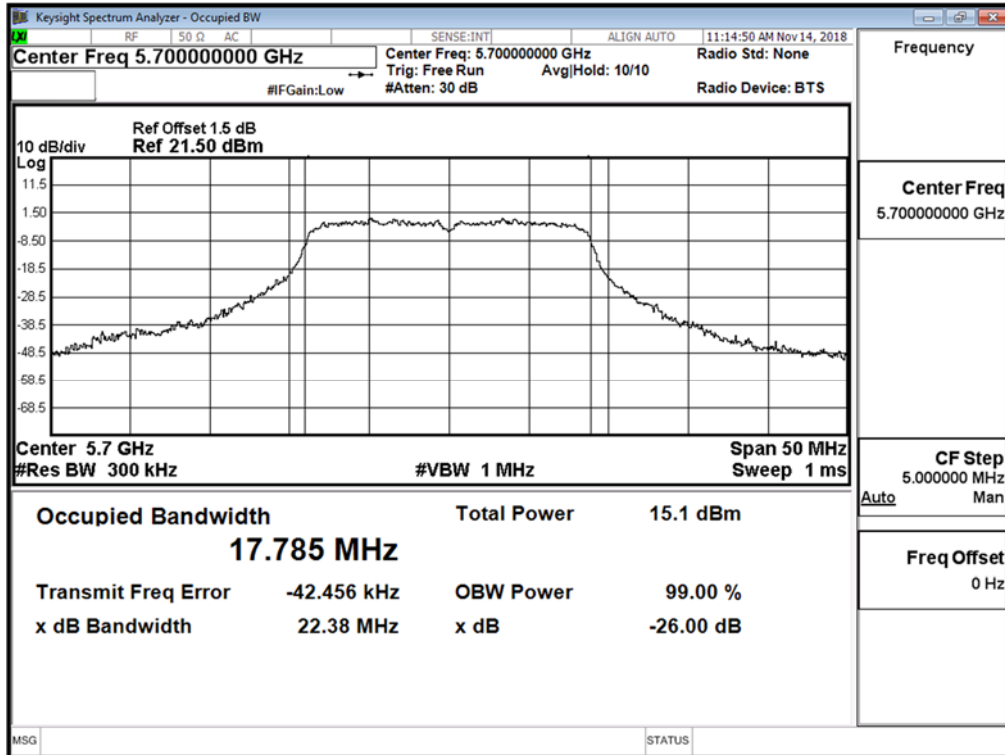
**Channel 100:**



**Channel 116:**



**Channel 140:**



Product : NPort Device Server  
 Test Item : Maximum conducted output power  
 Test Site : No.3 OATS  
 Test Date : 2018/11/26  
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)

Cable loss=1dB		Average Power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		15	30	45	60	90	120	135	150	
		Measurement Level (dBm)								
38	5190	12.97	--	--	--	--	--	--	--	<24dBm
46	5230	12.98	12.82	12.7	12.57	12.43	12.31	12.19	12.07	<24dBm
54	5270	12.98	--	--	--	--	--	--	--	<24dBm
62	5310	12.95	12.85	12.73	12.64	12.51	12.40	12.29	12.14	<24dBm
102	5510	12.13	--	--	--	--	--	--	--	<24dBm
110	5550	12.98	12.9	12.78	12.64	12.52	12.41	12.30	12.14	<24dBm
134	5670	12.96	--	--	--	--	--	--	--	<24dBm
151	5755	13.42	--	--	--	--	--	--	--	<30dBm
159	5795	12.59	12.46	12.32	12.24	12.12	12.01	11.92	11.80	<30dBm

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

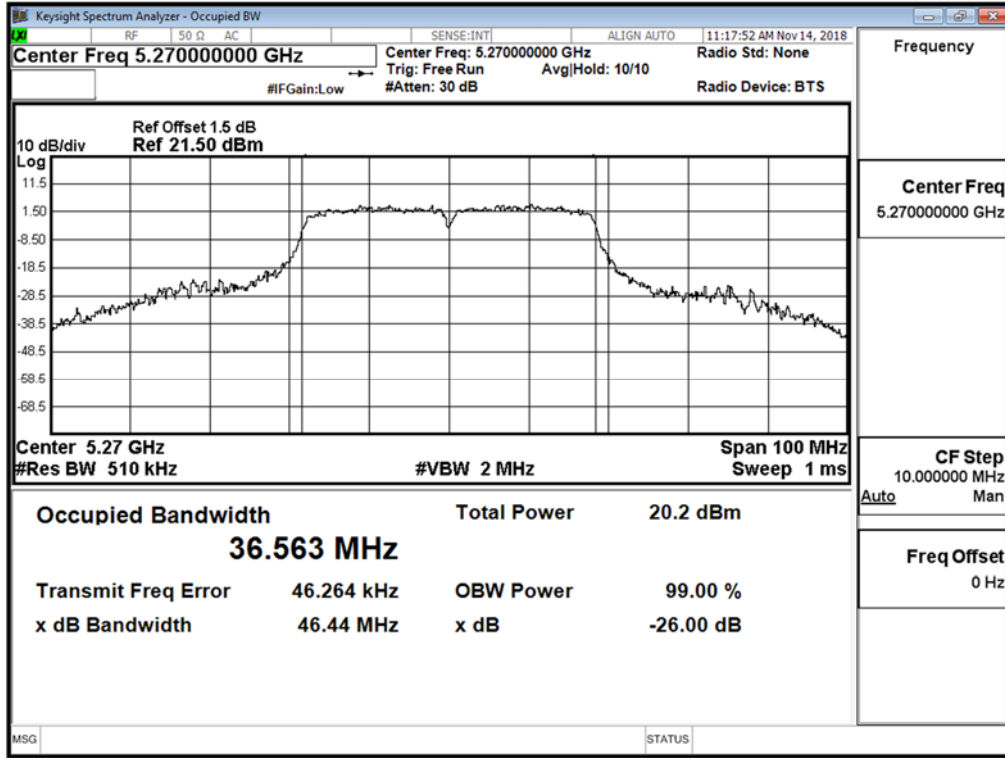
**Maximum conducted output power Measurement:**

Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Output Power (dBm)	Output Power Limit		Result
				(dBm)	dBm+10log(BW)	
38	5190	--	12.97	24	--	Pass
46	5230	--	12.98	24	--	Pass
54	5270	36.563	12.98	24	26.63	Pass
62	5310	36.544	12.95	24	26.63	Pass
102	5510	36.517	12.13	24	26.62	Pass
110	5550	36.918	12.98	24	26.67	Pass
134	5670	36.602	12.96	24	26.64	Pass
151	5755	--	13.42	30	--	Pass
159	5795	--	12.59	30	--	Pass

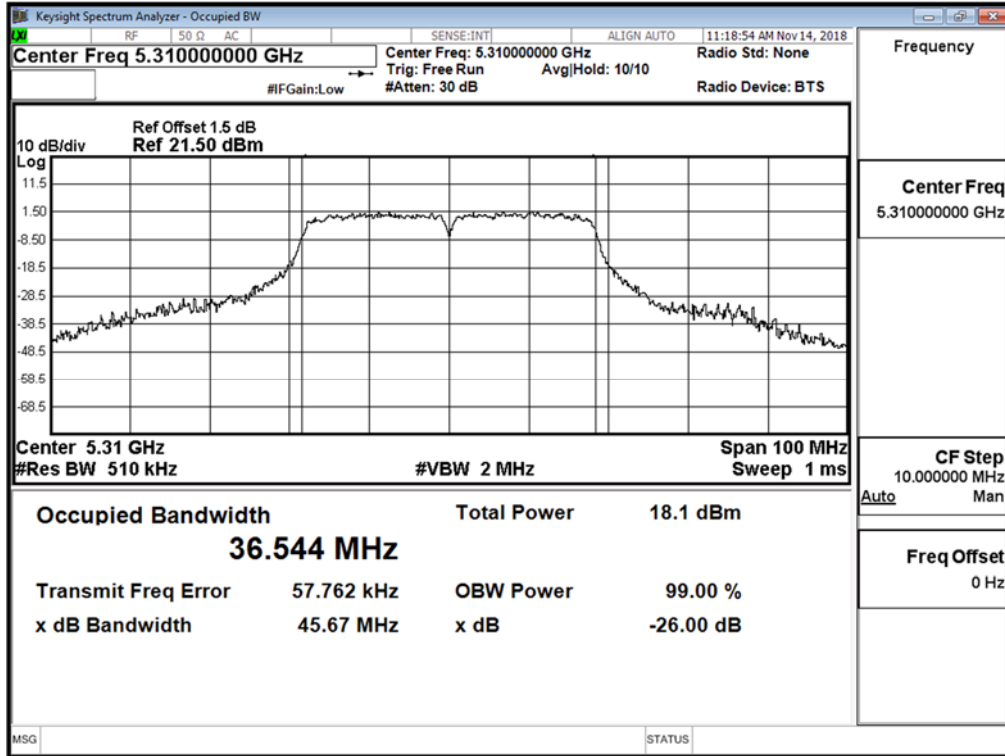
Note: Power Output Value = Reading value on average power meter + cable loss

99% Occupied Bandwidth:

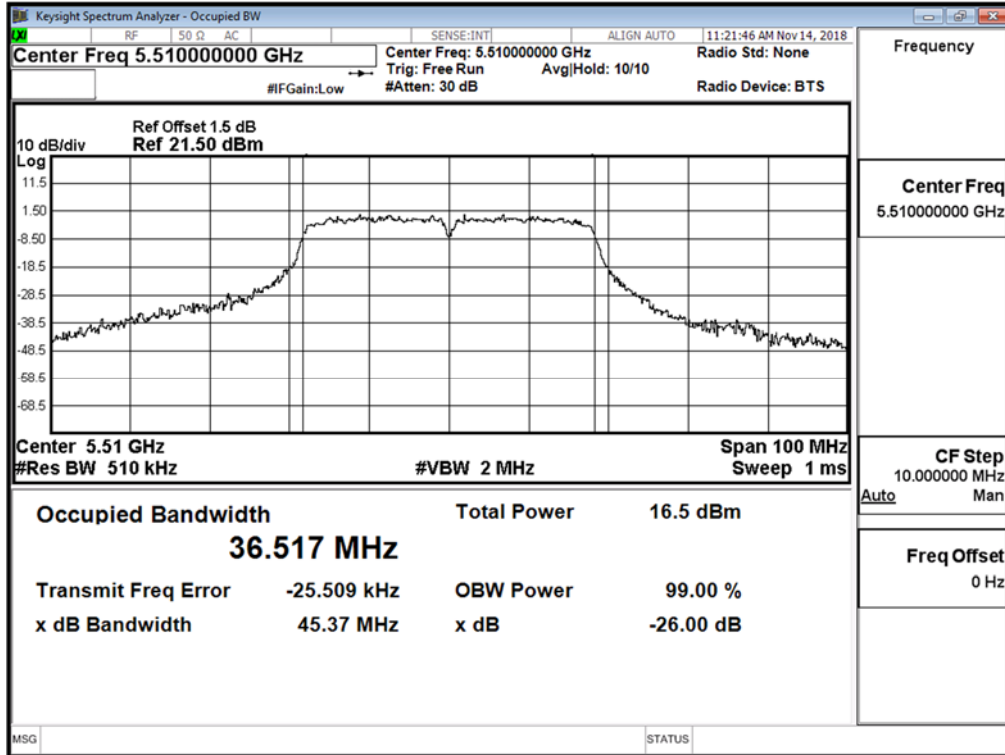
Channel 54



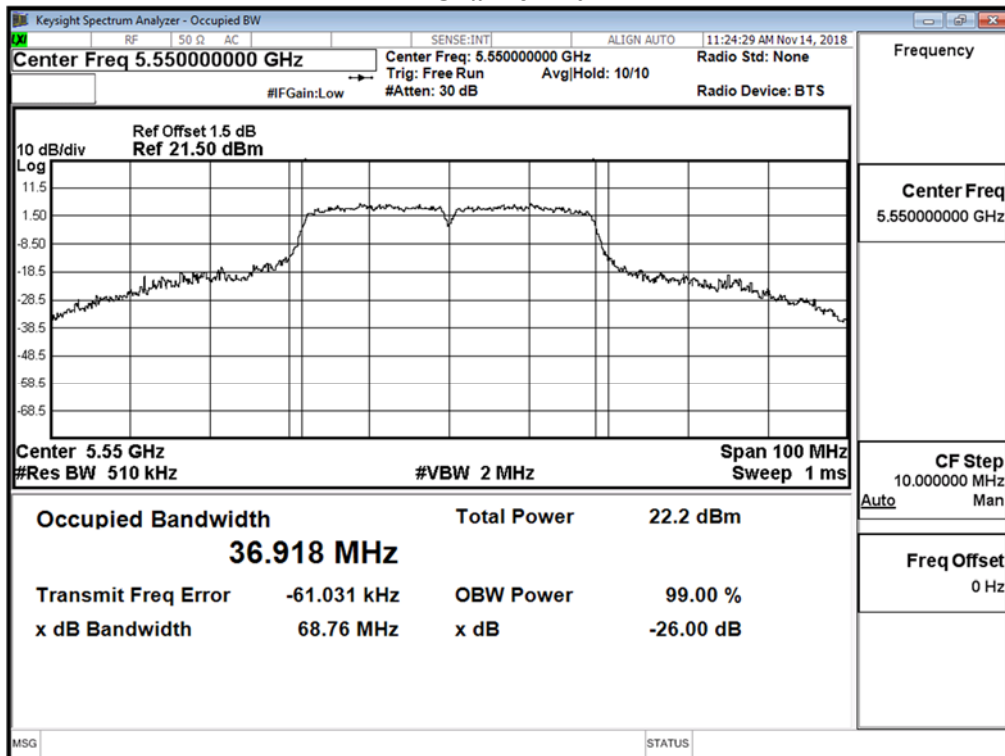
Channel 62



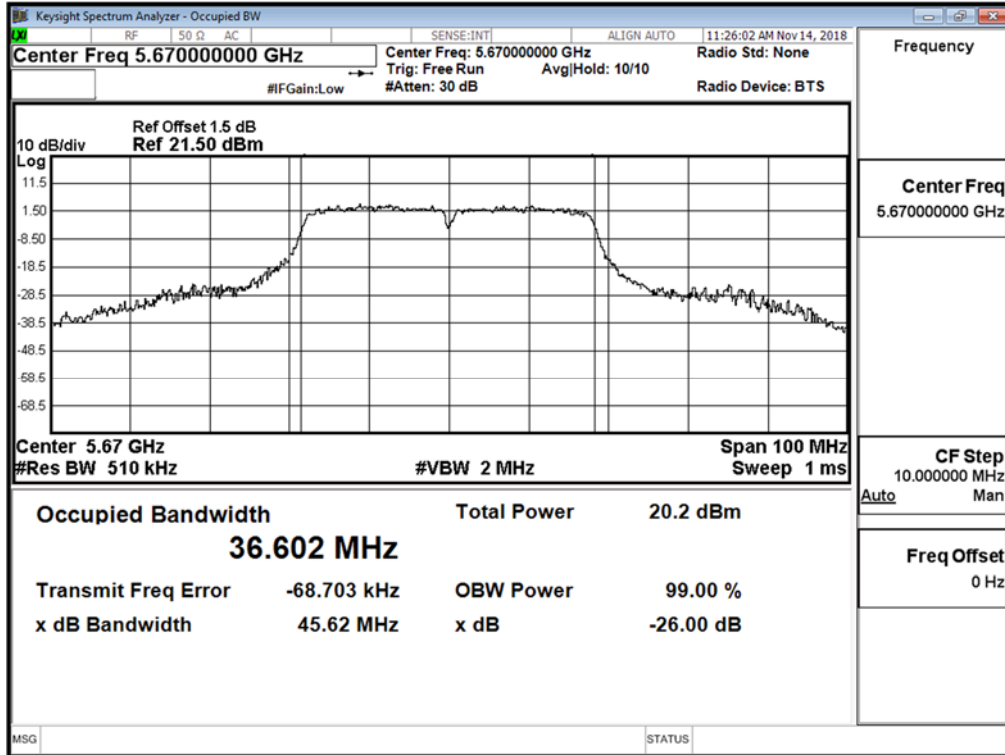
### Channel 102



### Channel 110



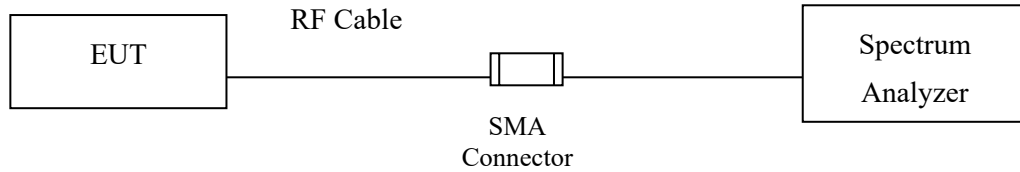
### Channel 134





## 4. Peak Power Spectral Density

### 4.1. Test Setup



### 4.2. Limits

- (1) For the band 5.15-5.25 GHz,
  - (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
  - (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
  - (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum 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 or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
  - (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.+
- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

- (3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density 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.

### 4.3. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.

SA-1 method is selected to run the test.

For the band 5.725-5.85 GHz, Scale the observed power level to an equivalent value in 500 kHz by adjusting (increase) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(500\text{ kHz}/100\text{ kHz}) = 6.98\text{ dB}$ .

### 4.4. Uncertainty

$\pm 1.62\text{ dB}$

#### 4.5. Test Result of Peak Power Spectral Density

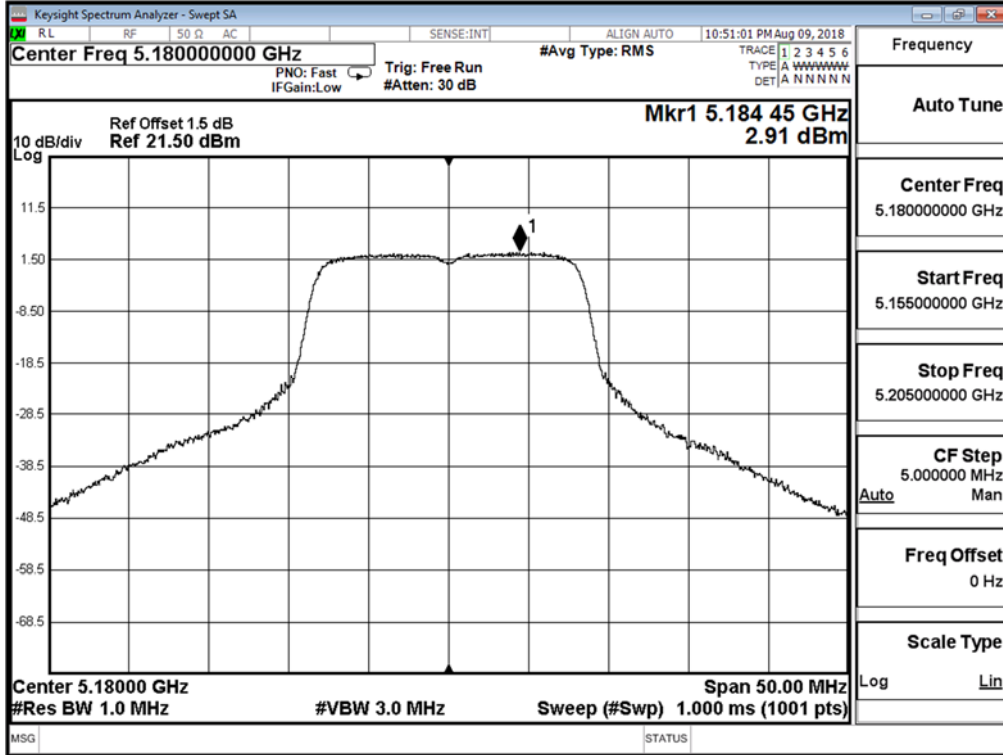
Product : NPort Device Server  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Date : 2018/08/24  
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	6	2.910	11	Pass
44	5220	6	3.550	11	Pass
48	5240	6	3.840	11	Pass
52	5260	6	3.940	11	Pass
60	5300	6	4.100	11	Pass
64	5320	6	3.860	11	Pass
100	5500	6	1.740	11	Pass
116	5580	6	2.180	11	Pass
140	5700	6	2.310	11	Pass

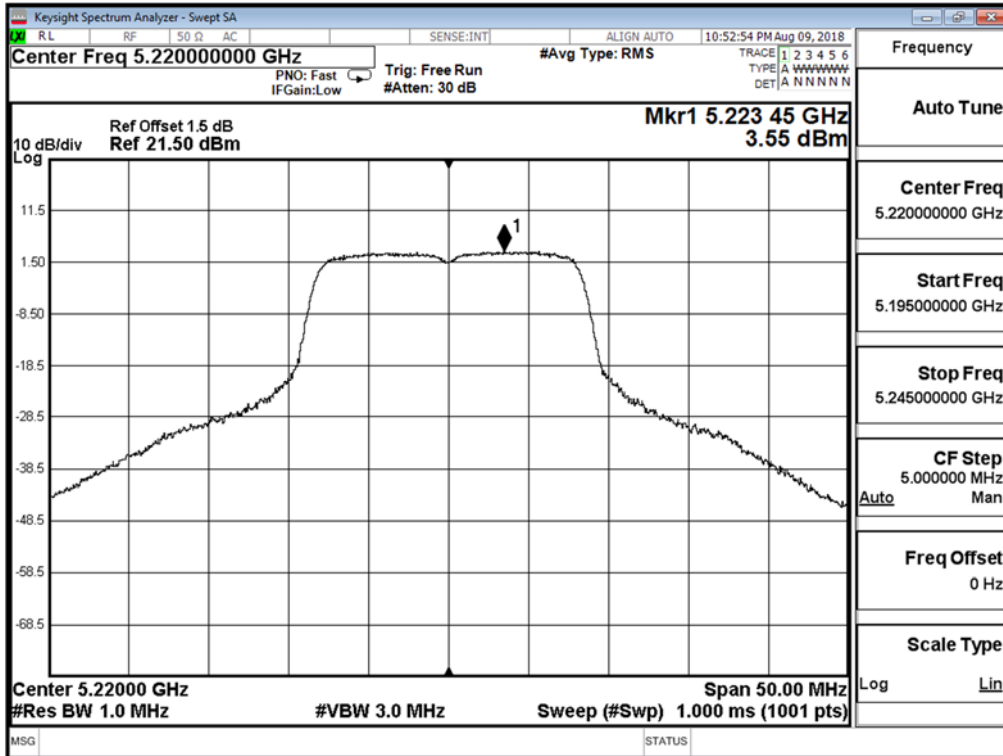
Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	6	-7.150	6.980	-0.170	<30	Pass
157	5785	6	-7.220	6.980	-0.240	<30	Pass
165	5825	6	-7.220	6.980	-0.240	<30	Pass

Note : The quantity  $10 \cdot \log 2$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

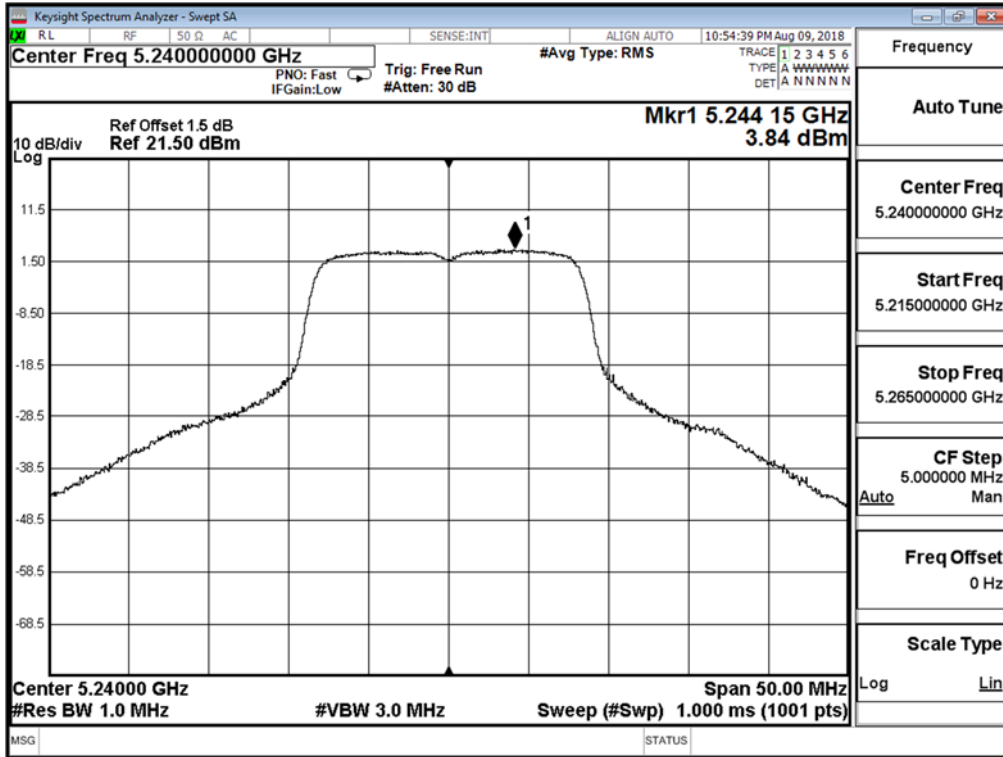
Channel 36:



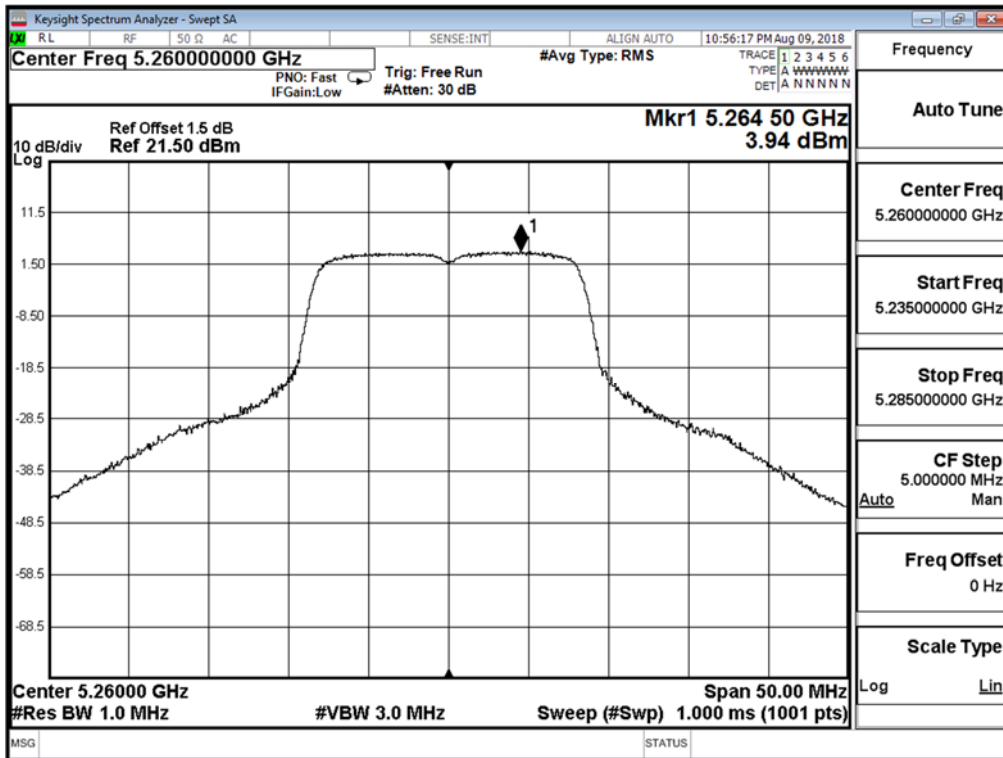
Channel 44:



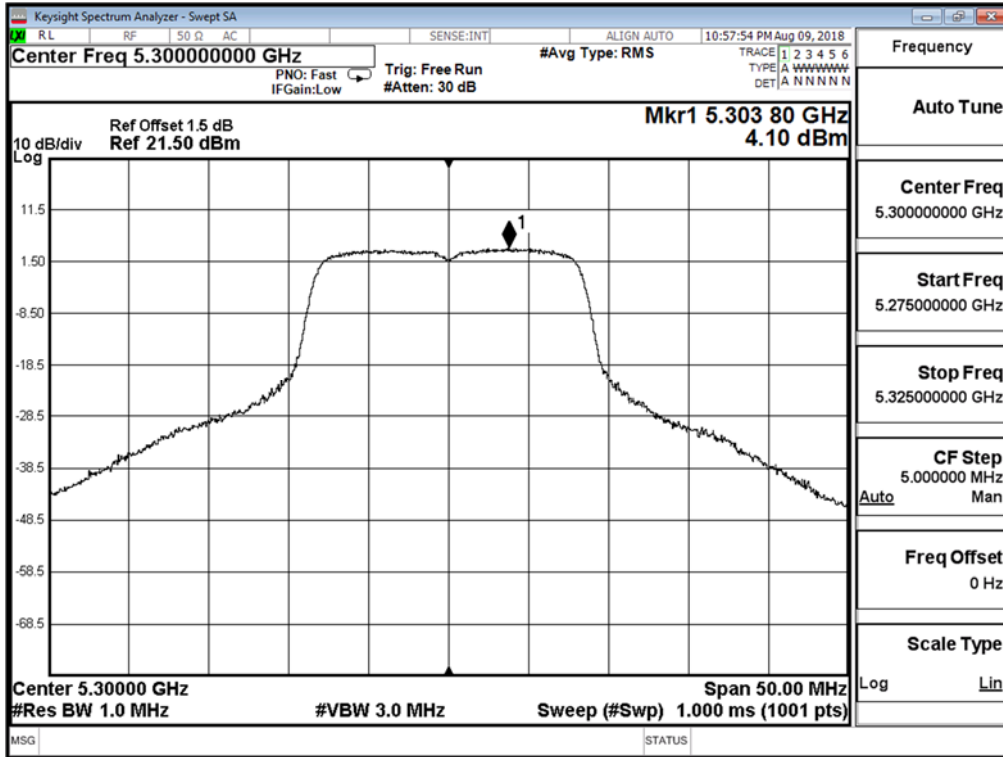
Channel 48:



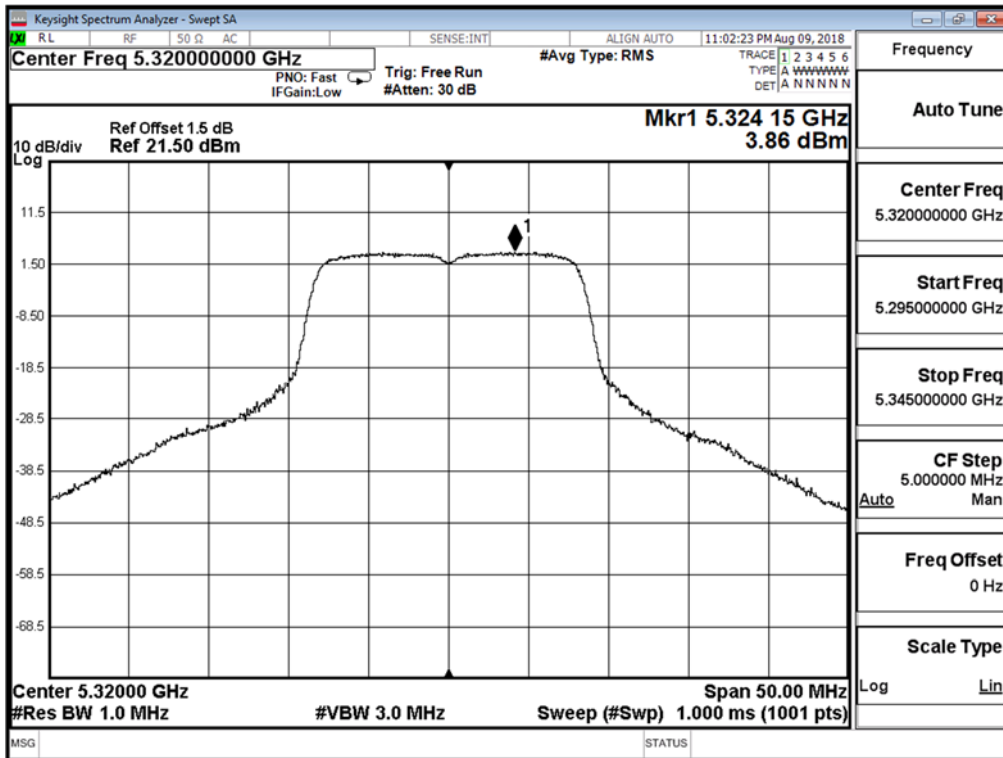
Channel 52:



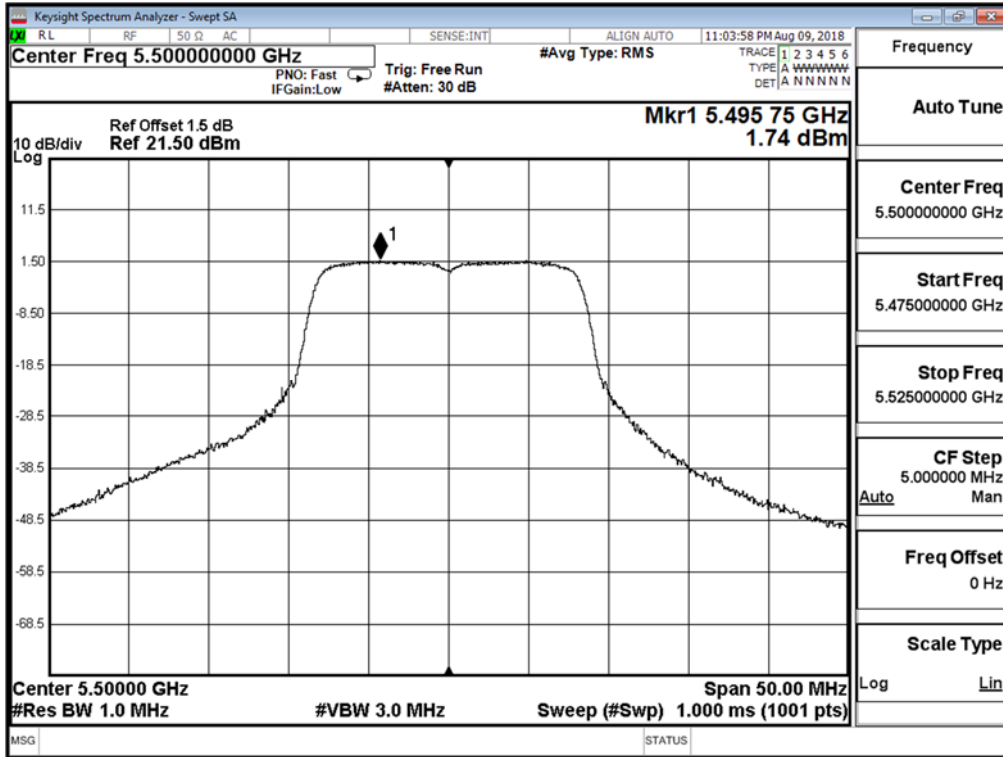
Channel 60:



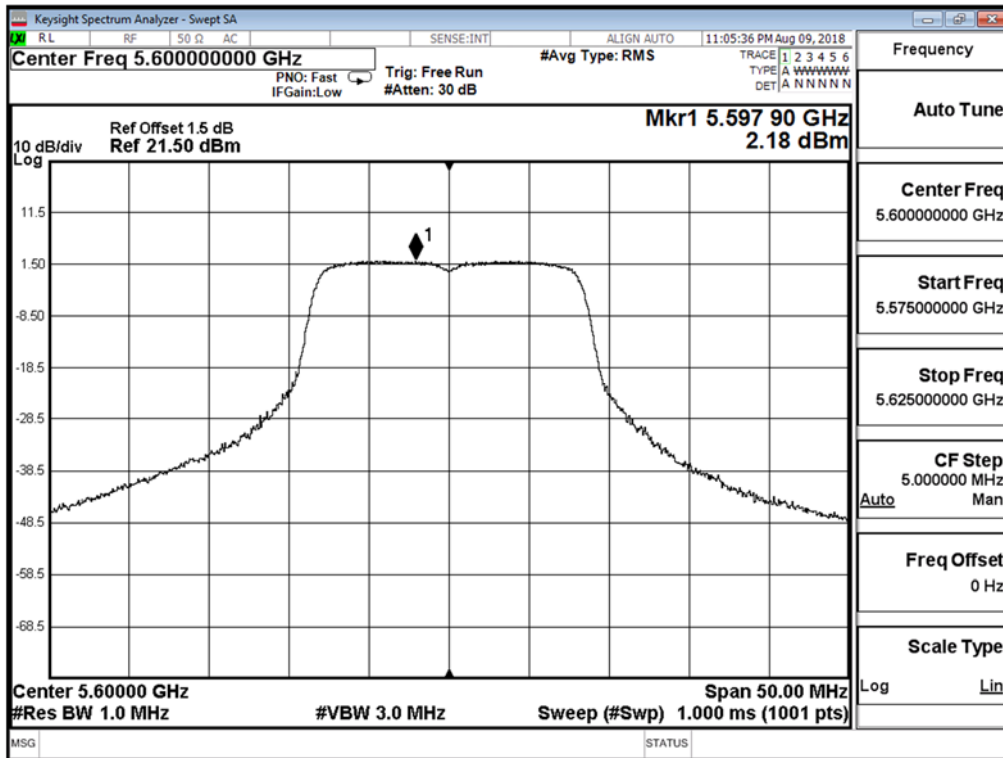
Channel 64:



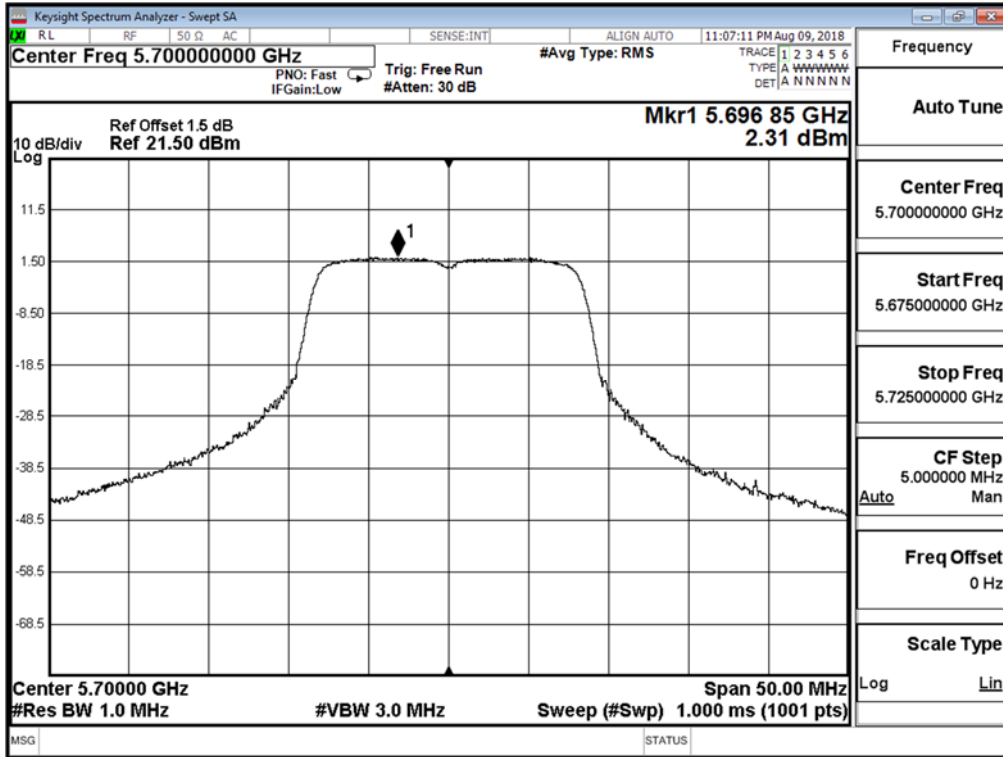
**Channel 100:**



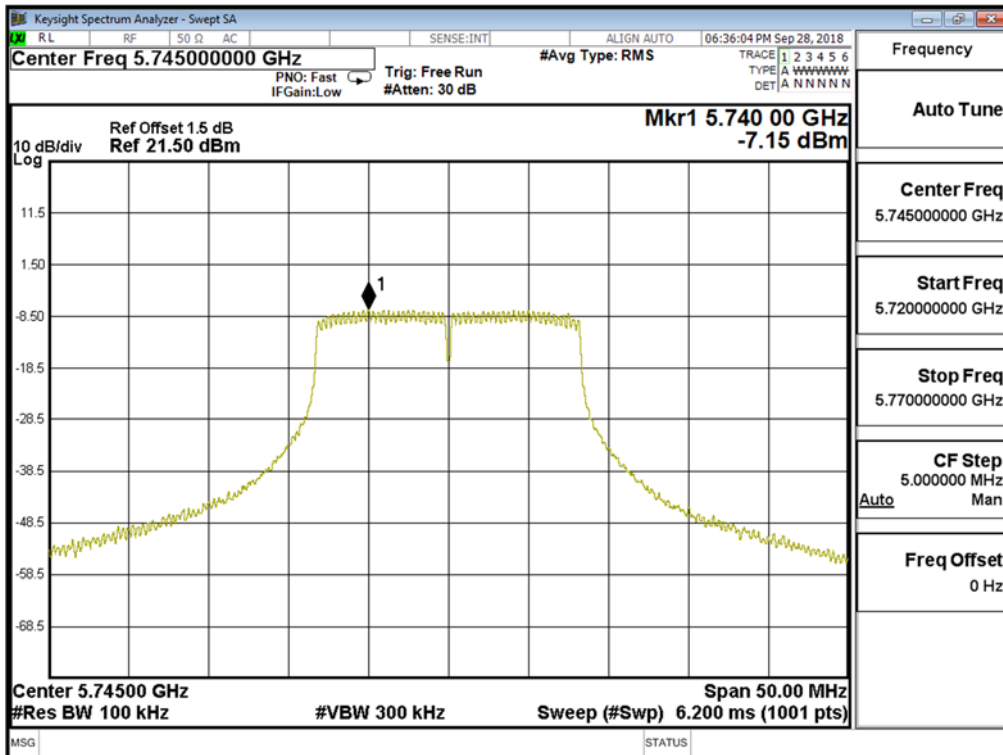
**Channel 116:**



Channel 140:

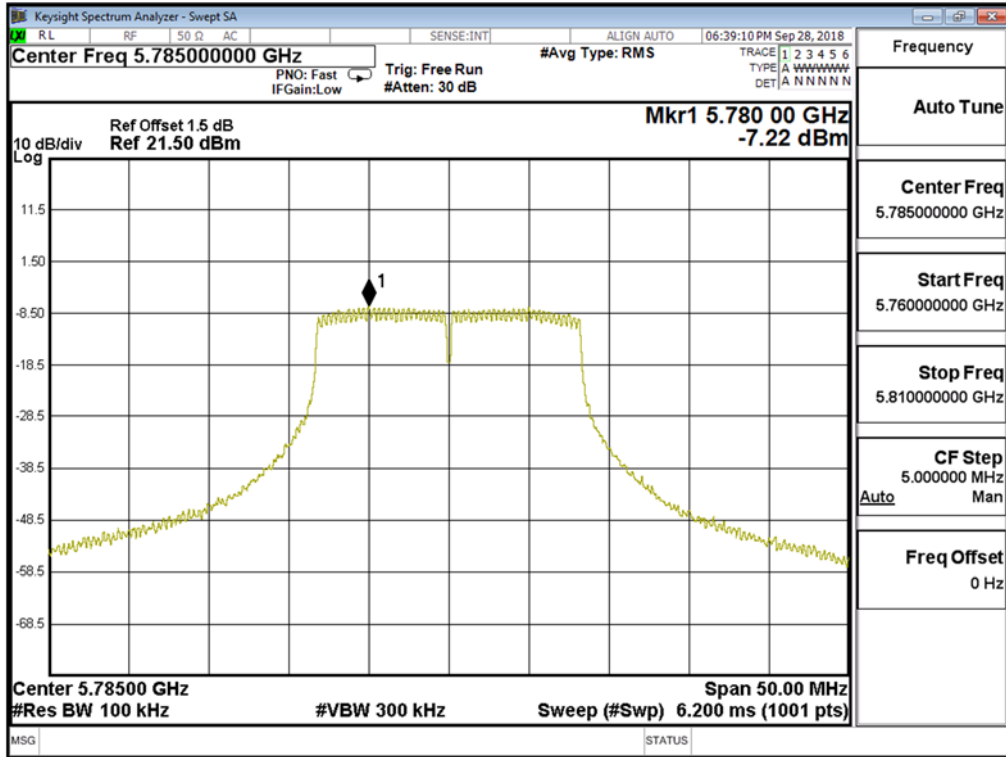


Channel 149

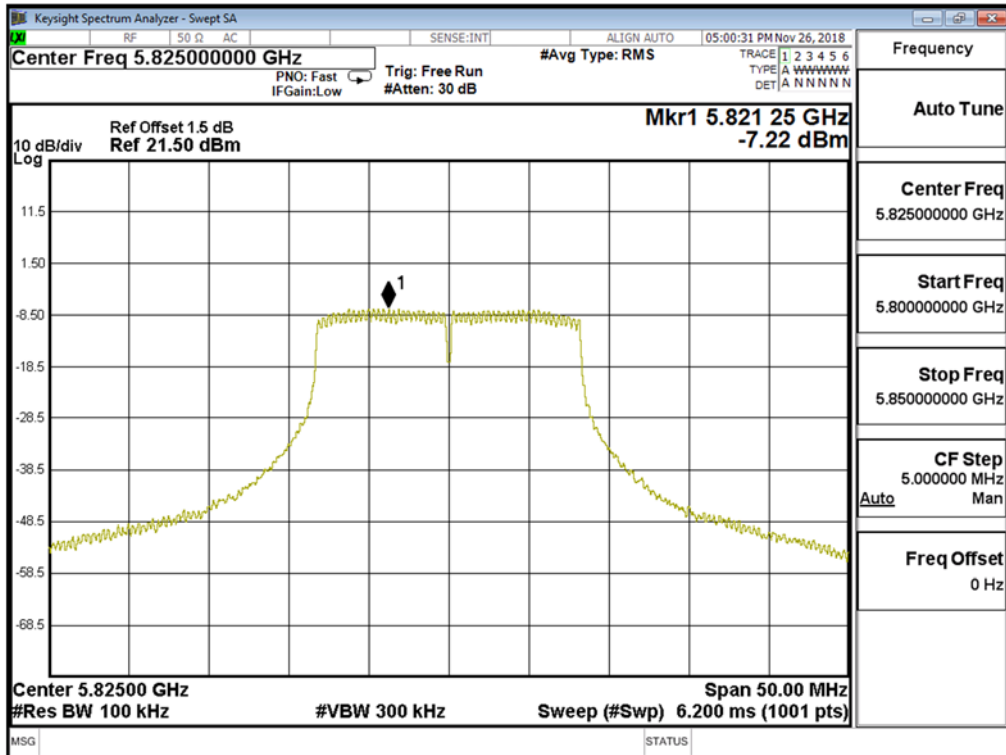




### Channel 157



### Channel 165



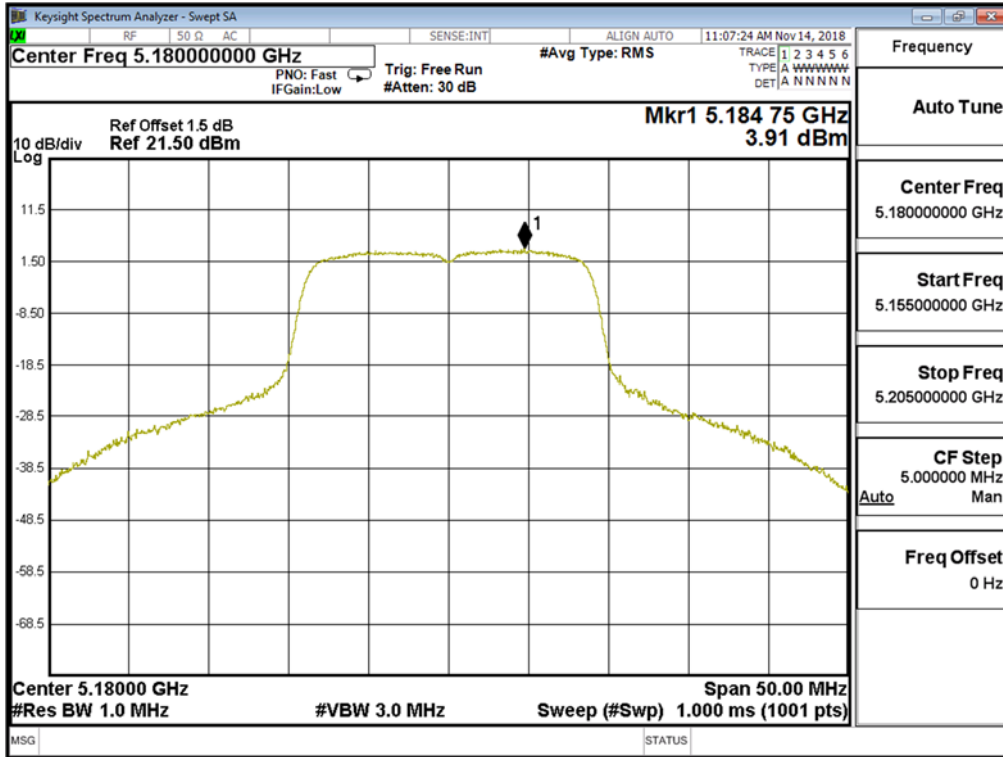
Product : NPort Device Server  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Date : 2018/11/26  
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	6	3.910	11	Pass
44	5220	6	3.780	11	Pass
48	5240	6	4.410	11	Pass
52	5260	6	3.780	11	Pass
60	5300	6	3.860	11	Pass
64	5320	6	3.230	11	Pass
100	5500	6	3.370	11	Pass
116	5580	6	4.860	11	Pass
140	5700	6	-3.030	11	Pass

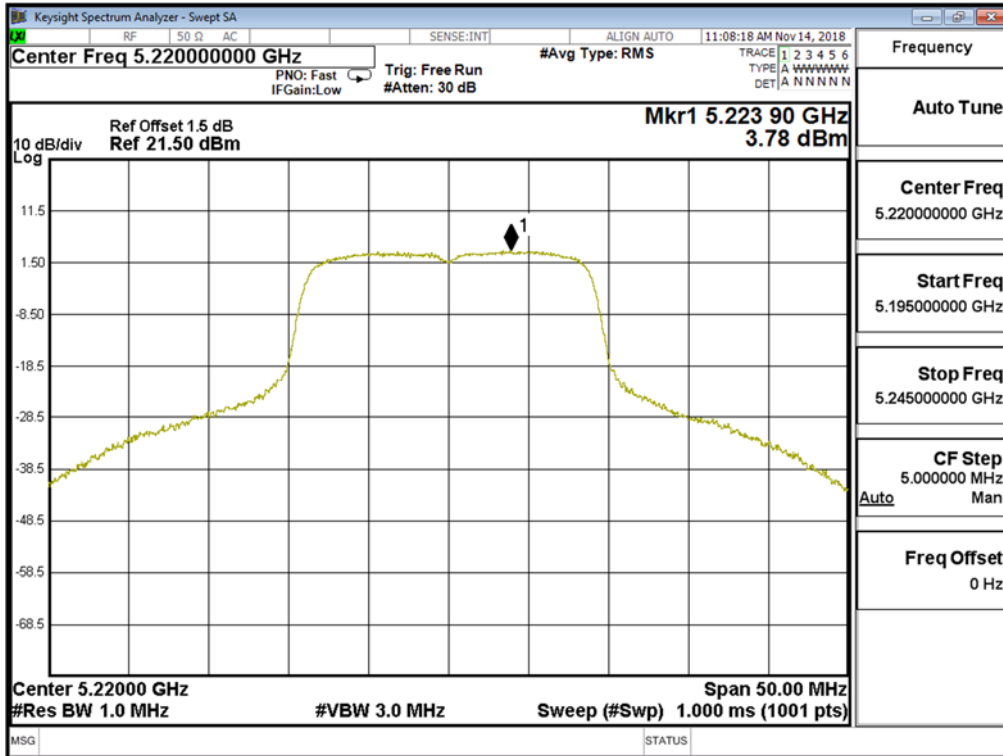
Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	6	-5.300	6.980	1.680	<30	Pass
157	5785	6	-7.060	6.980	-0.080	<30	Pass
165	5825	6	-6.300	6.980	0.680	<30	Pass

Note : The quantity  $10 \cdot \log 2$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

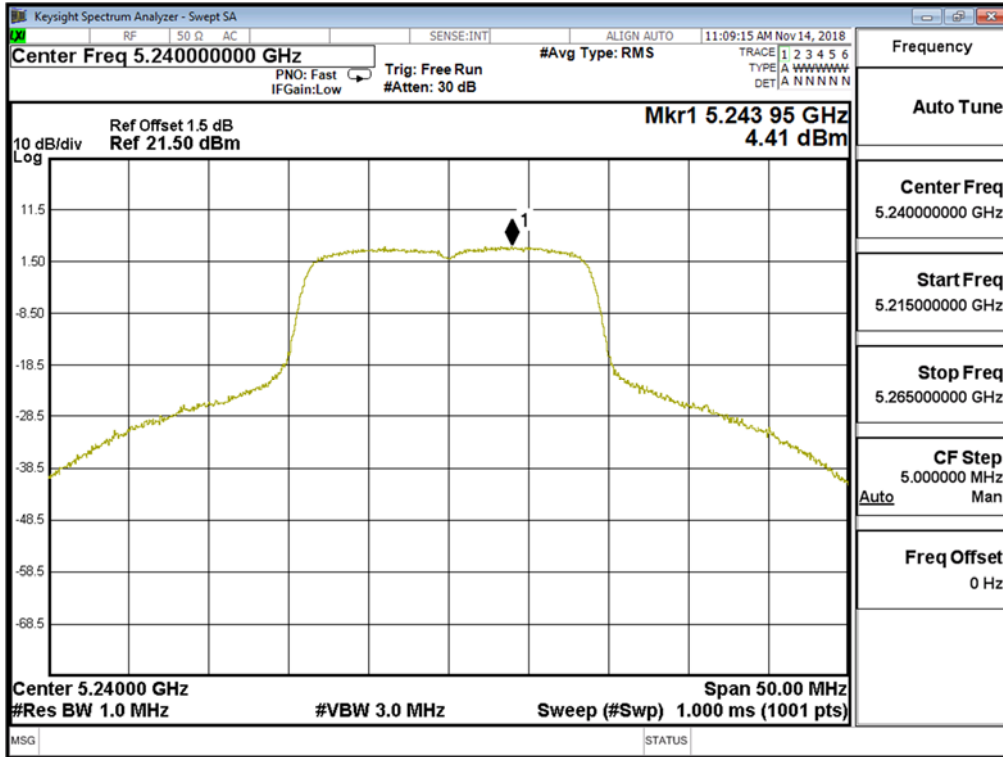
Channel 36:



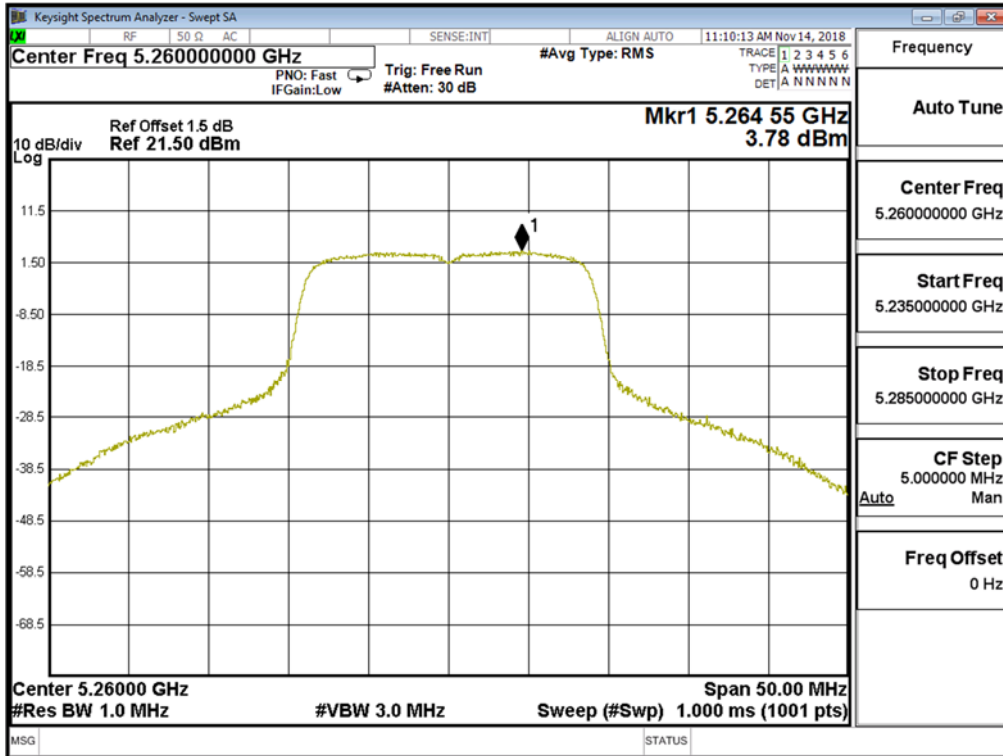
Channel 44:



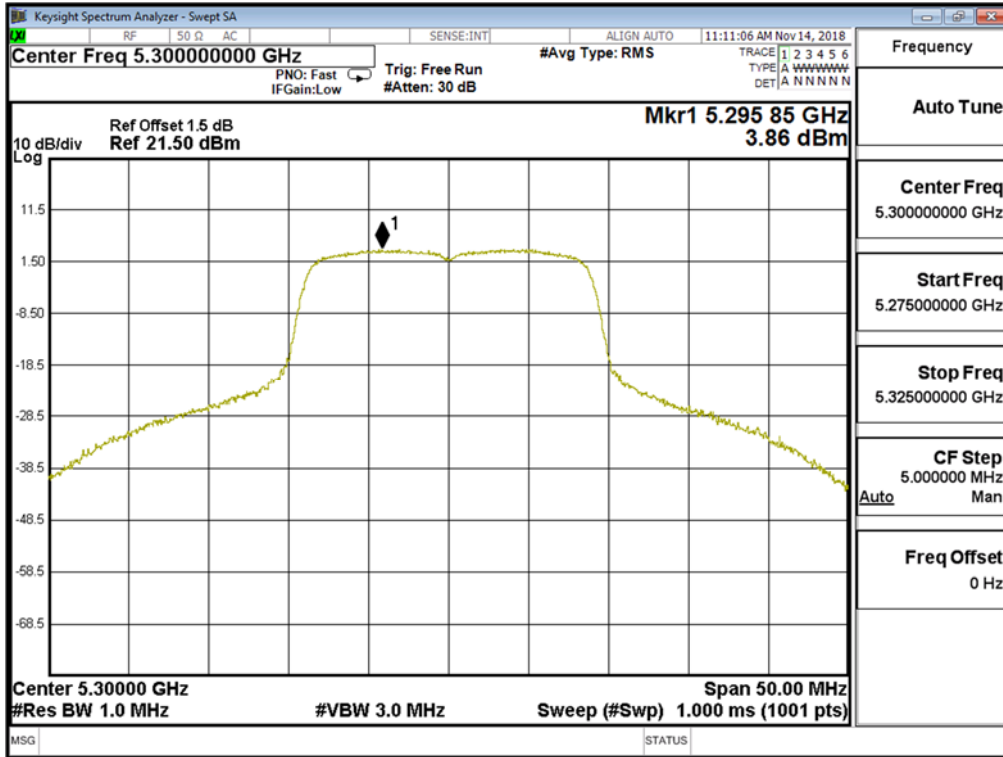
### Channel 48:



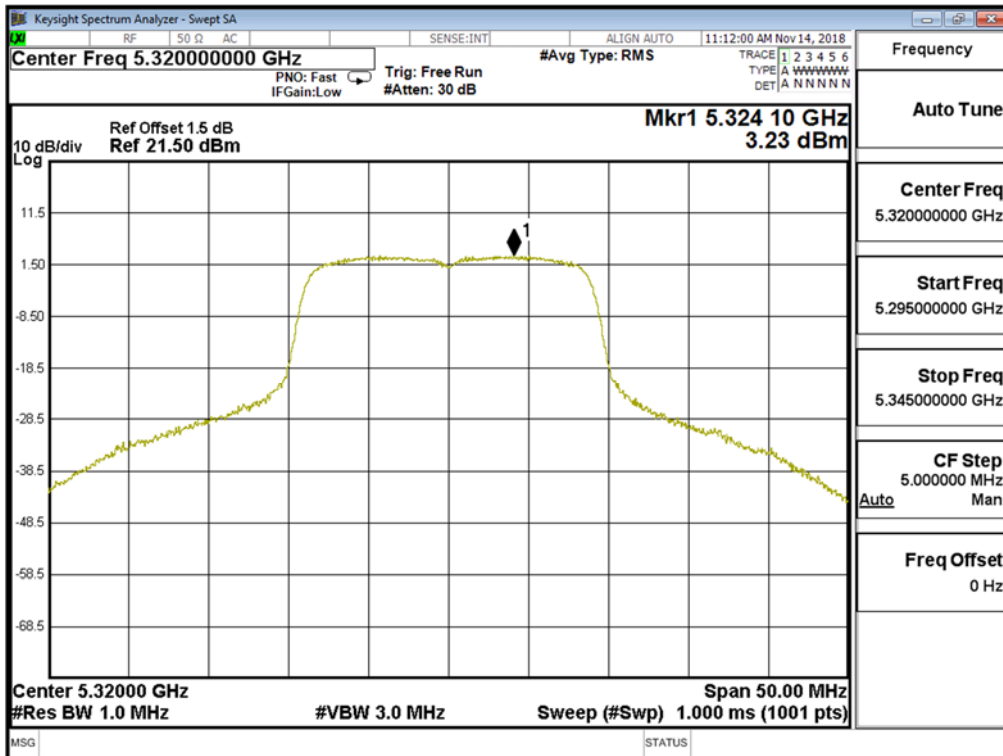
### Channel 52:



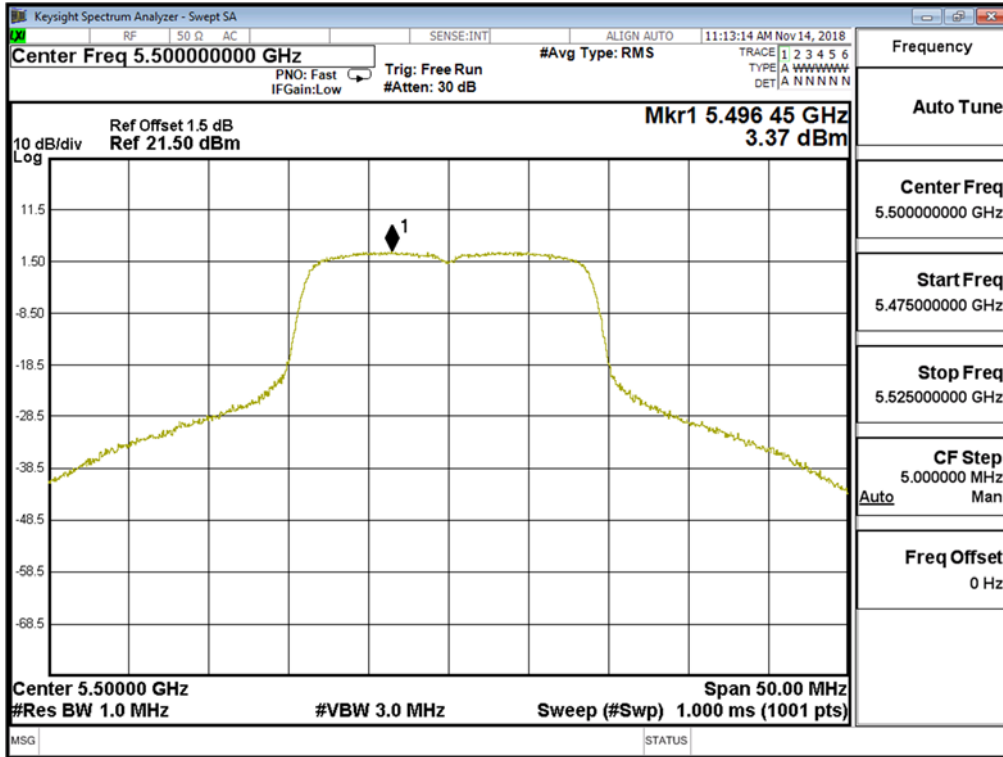
Channel 60:



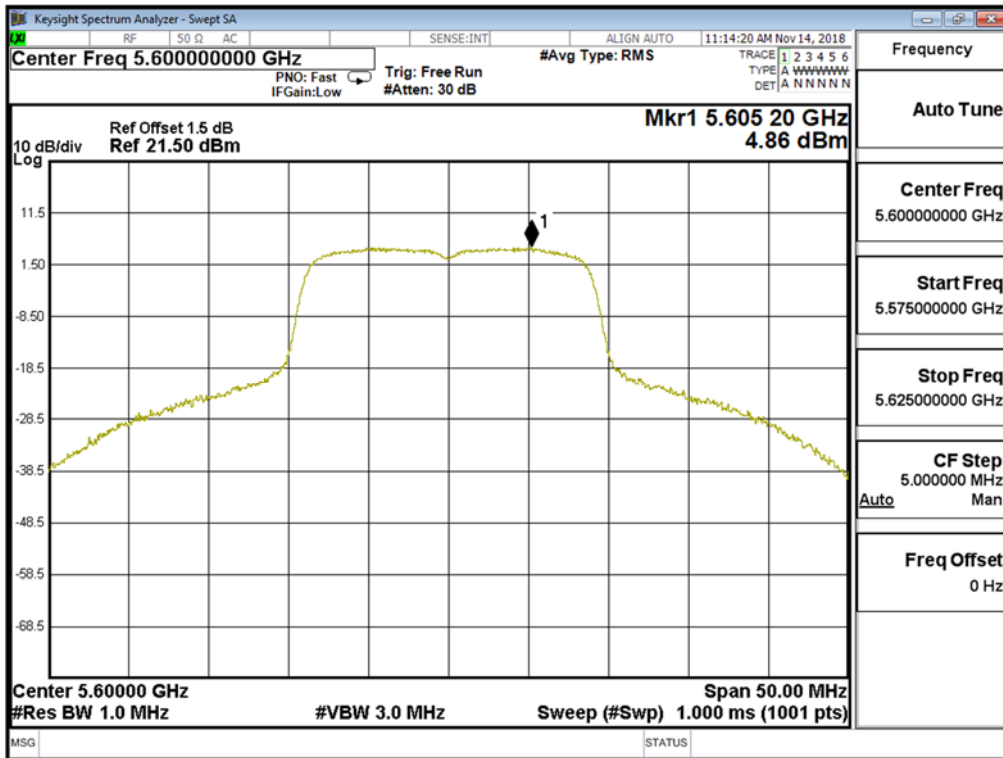
Channel 64:



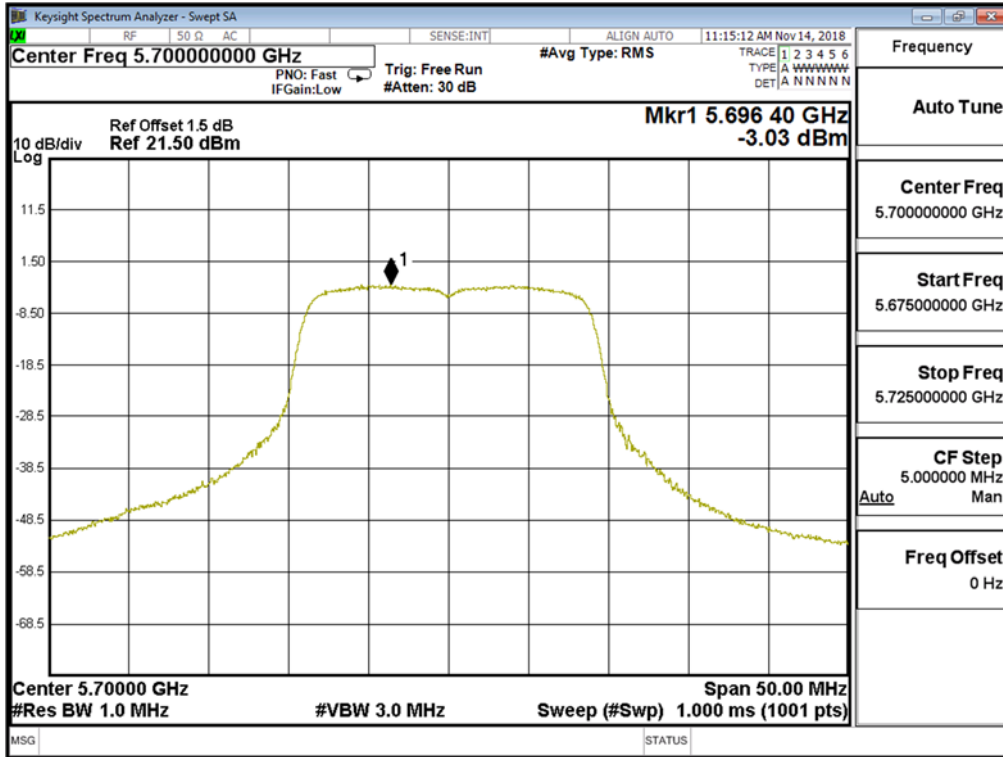
**Channel 100:**



**Channel 116:**



Channel 140:



Channel 149

