Certificate Number: 2861.01

TEST REPORT

Report No.:	**E20190305034301-3**	**Application No.:**	**E20190305034301**
Applicant:	GL Technologies (HongKong) Limited		
Address:	Unit 210D ,2/F Enterprise Place HongKong Science Park Shatin,N.T. Hong Kong, China		
Sample Description:	AC1300 Home Gateway		
Model:	GL-S1300		
Adding Model:	GL-S1300F16		
FCC ID:	2AFIW-S1300		
Test Specification:	FCC 47 CFR Part 15 Subpart E		
Test Date:	2019-03-24 to 2019-04-12		
Issue Date:	2019-04-25		
Test Result:	**PASS**		

Prepared By:	**Reviewed By:**	**Approved By:**
Darry Wu / Test Engineer	Eve Wang /Technical Manager	Tony Han / Manager
Date: 2019-04-25	Date: 2019-04-25	Date: 2019-04-25

Other Aspects:
/
Abbreviations: *ok / P = passed; fail / F = failed; n.a. / N = not applicable*

DIRECTIONS OF TEST

1. This company carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.

2. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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

TABLE OF CONTENTS

1. TEST RESULT SUMMARY

FCC 47 CFR Part 15 Subpart E：15.407			
Standard	**Item**	**Limit / Severity**	**Result**
FCC 47 CFR Part 15 Subpart E	Emission Bandwidth	§15.407 (e) §15.403 (i)	PASS
	Conducted Emissions	§15.207 (a)	PASS
	Radiated Spurious Emission	§15.407(b) §15.209(a)	PASS
	Output Power	§15.407(a)	PASS
	Power Spectral Density	§15.407(a)	PASS
	Restricted bands of operation	§15.407(g)	PASS

2. GENERAL DESCRIPTION OF EUT

2.1. APPLICANT

Name:	GL Technologies (HongKong) Limited
Address:	Unit 210D ,2/F Enterprise Place HongKong Science Park Shatin,N.T. Hong Kong, China

2.2. MANUFACTURER

Name:	GL Technologies (HongKong) Limited
Address:	Unit 210D ,2/F Enterprise Place HongKong Science Park Shatin,N.T. Hong Kong, China

2.3. FACTORY

Name:	Shenzhen Guanglianzhitong Tech Co.,Ltd
Address:	Room 305-306, Skyworth Digital Building , Shiyan Street, Baoan District, Shenzhen, China

2.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	AC1300 Home Gateway
Model No.:	GL-S1300
Adding Model:	GL-S1300F16
Model Discrepancy:	All models are identical except for model name and the flash capacity.
Trade Name:	GL.iNET
Power supply:	DC12V supplied by the adapter
Adapter 1 Specification:	Model:JZB024-120150X Input:100-240V , 50/60Hz , 0.7A Output: 12V, 1500mA DC Cable: Unshielded,1.20m
Adapter 2 Specification:	Model:ICP20-120-1500D Input:100-240V , 50/60Hz , 0.6A Output: 12V, 1500mA DC Cable: Unshielded,1.20m
Transmit Power:	UNII Band I(5180~5240MHz): 18.14dBm for IEEE 802.11a 21.10dBm for IEEE 802.11n HT20 19.01 dBm for IEEE 802.11n HT40 18.05dBm for IEEE 802.11ac 80 UNII Band IV (5745~5825MHz): 16.47dBm for IEEE 802.11a 19.39dBm for IEEE 802.11n HT20 17.00dBm for IEEE 802.11n HT40 15.99dBm for IEEE 802.11ac 80
Modulation	OFDM

type:	
Antenna Specification:	Internal antenna 0 with 5.98dBi gain (Max.) Internal antenna 1 with 4.97dBi gain (Max.)
Channels Spacing:	20MHz for IEEE 802.11a, IEEE 802.11n HT20 40MHz for IEEE 802.11n HT40 80MHz for IEEE 802.11 ac 80
Temperature Range:	-20℃ ~ +40℃
Hardware Version:	V1.2.2
Software Version:	V2.272
Note:	/

Frequency/Channel Information

Frequency Range(MHz)	Ch. Frequency(MHz)	Mode
5180MHz~5240MHz	5180MHz~5240MHz	802.11a; 802.11n(HT20)
	5190MHz~5230MHz	802.11n(HT40);
	5210MHz	802.11ac 80;
5745MHz~5825MHz	5745MHz~5825MHz	802.11a; 802.11n(HT20)
	5755MHz~5795MHz	802.11n(HT40);
	5775MHz	802.11ac 80;

2.5. TEST OPERATION MODE

Test Item	Mode No.	Description of the modes
Conducted Emission	1	Full system (adapter 1)
	2	Full system (adapter 2)
Radiated Emission	1	Continuously Transmitting

2.6. LOCAL SUPPORTIVE INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook 1	LENOVO	Thinkpad X270	/	/
Adapter (Notebook 1)	LENOVO	ADLX45NCC3A	5A10H03912	/
Notebook 2	LENOVO	Thinkpad S2	SL10K92342	/
Adapter (Notebook 2)	LENOVO	ADLX45NCC3A	5A11F14738	/
Notebook 3	LENOVO	Thinkpad E335	R9-WN0KH	/
Adapter (Notebook 3)	LENOVO	ADLX65NCT3A	36200292	/
Notebook 4	HP	ProBook 5310m	/	/
Adapter (Notebook 4)	HP	Series PPP012H-S	608428-002	/
GL BLE & ZigBee Module	GL.iNET	GL-EFR32H	/	/
USB to TTL adapter	SILABS	CP2102	/	/
GL-S1300	GL.iNET	GL-S1300	/	/
HDD3.0	WD	WDBUZG0010BBL-CESN	WXC1A176SC9Z	/
Cable				
AC Cable*2	/	/	/	Unshielded, 1.00m
AC Cable*2	/	/	/	Unshielded, 1.50m
DC Cable*4	/	/	/	Shielded, 1.80m
DC Cable*4	/	/	/	Unshielded, 1.50m
USB Cable	/	/	/	Shielded, 0.50m
RJ45 Cable*3	/	/	/	Unshielded, 2.00m
RJ45 Cable*2	/	/	/	Unshielded, 5.00m
Serial port Cable	/	/	/	Unshielded, 0.12m

Test software:

Software version	Test level
QCARCT	802.11a: 5 802.11n HT20: 5 802.11n HT40: 2 802.11ac 80: 1

3. LABORATORY AND ACCREDITATIONS

3.1. LABORATORY

The tests and measurements refer to this report were performed by EMC Laboratory of GRG METROLOGY & TEST (SHENZHEN) CO., LTD

Add. : No. 1301, Guanguang Road, Xinlan Community, Guanlan Street, Longhua District, Shenzhen, 518110, People's Republic of China

Telephone : +86-755-61180008

Fax : /

3.2. ACCREDITATIONS

A2LA	Certificate Number 2861.01

3.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	30MHz～1000MHz	4.8dB
		1GHz～26.5GHz	5.8dB
	Vertical	30MHz～1000MHz	4.8dB
		1GHz～26.5GHz	5.9dB
Conducted Emission		9kHz～30MHz	3.5dB

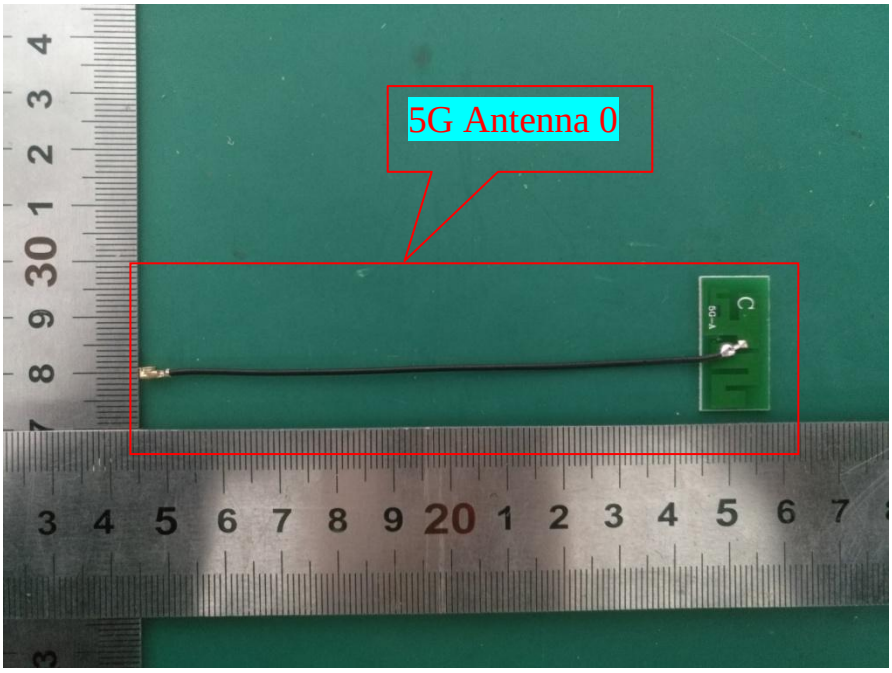
This uncertainty represents an expanded uncertainty factor of *k*=2.

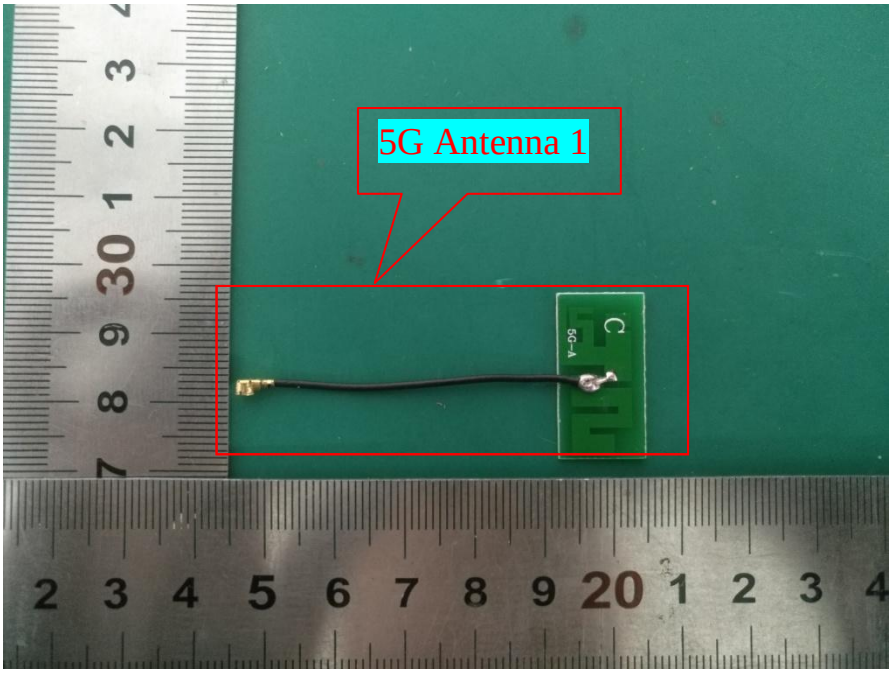
4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EMI TEST Receiver	ROHDE&SCHWARZ	ESCI	100783	2020-01-10
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543	2020-01-10
Hygrothermograph	VICTOR	HTC-1	N/A	2019-12-25
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE		
Radiated Spurious Emission & Restricted bands of operation				
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI	101026	2020-01-09
EXA signal analyzer	Agilent	N9010A	MY52221469	2020-01-10
Bilog Antenna	Schwarzbeck	VULB 9160	9160-3401	2019-12-21
Horn Antenna	Schwarzbeck	BBHA9120	D286	2019-12-21
Board-Band Horn Antenna	Schwarzbeck	BBHA9170	9170-497	2020-01-15
Active Loop Antenna	COM-POWER	AL-130	121044	2019-12-27
Amplifier	EM Electronics Corporation	EM330	060661	2019-12-21
High Noise Amplifier	Agilent	8449B	3008A02060	2019-12-21
Hygrothermograph	VICTOR	HTC-1	NA	2019-12-24
Test SW	FARAD	EZ-EMC/ CCS-3A1-CE		
Emission Bandwidth				
EXA signal analyzer	Agilent	N9010A	MY52221469	2020-01-10
Output Power				
EXA signal analyzer	Agilent	N9010A	MY52221469	2020-01-10
Frequency Stability				
EXA signal analyzer	Agilent	N9010A	MY52221469	2020-01-10
Power Spectral Density				
EXA signal analyzer	Agilent	N9010A	MY52221469	2020-01-10

5. ANTENNA REQUIREMENT

The EUT has two antennas. The antennas are internal antennas.
The max gain of antenna 0 is 5.98dBi and the max gain of antenna 1 is 4.97dBi. which accordance 15.203.is considered sufficient to comply with the provisions of this section





6. CONDUCTED EMISSION MEASUREMENT

6.1. LIMITS

Frequency range	Limits (dBμV)	
	Quasi-peak	Average
150kHz ～ 0.5MHz	66～56	56～46
0.5 MHz ～ 5 MHz	56	46
5 MHz ～ 30 MHz	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.

6.2. TEST PROCEDURES

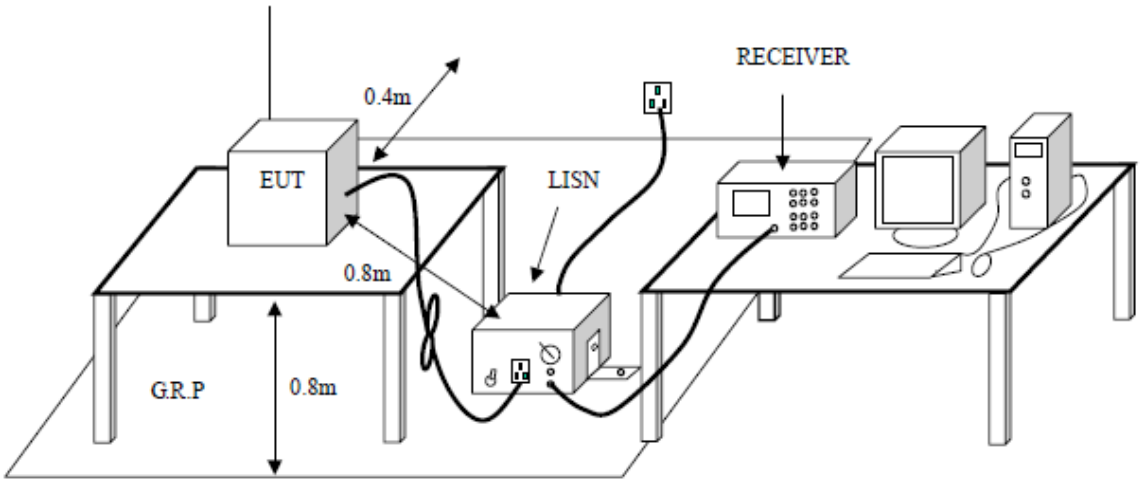
Procedure of Preliminary Test

Test procedures follow ANSI C63.4:2014.
For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:
– Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
1) place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;
– All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;
– The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;
– Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.
– I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

6.3. TEST SETUP



6.4. DATA SAMPLE

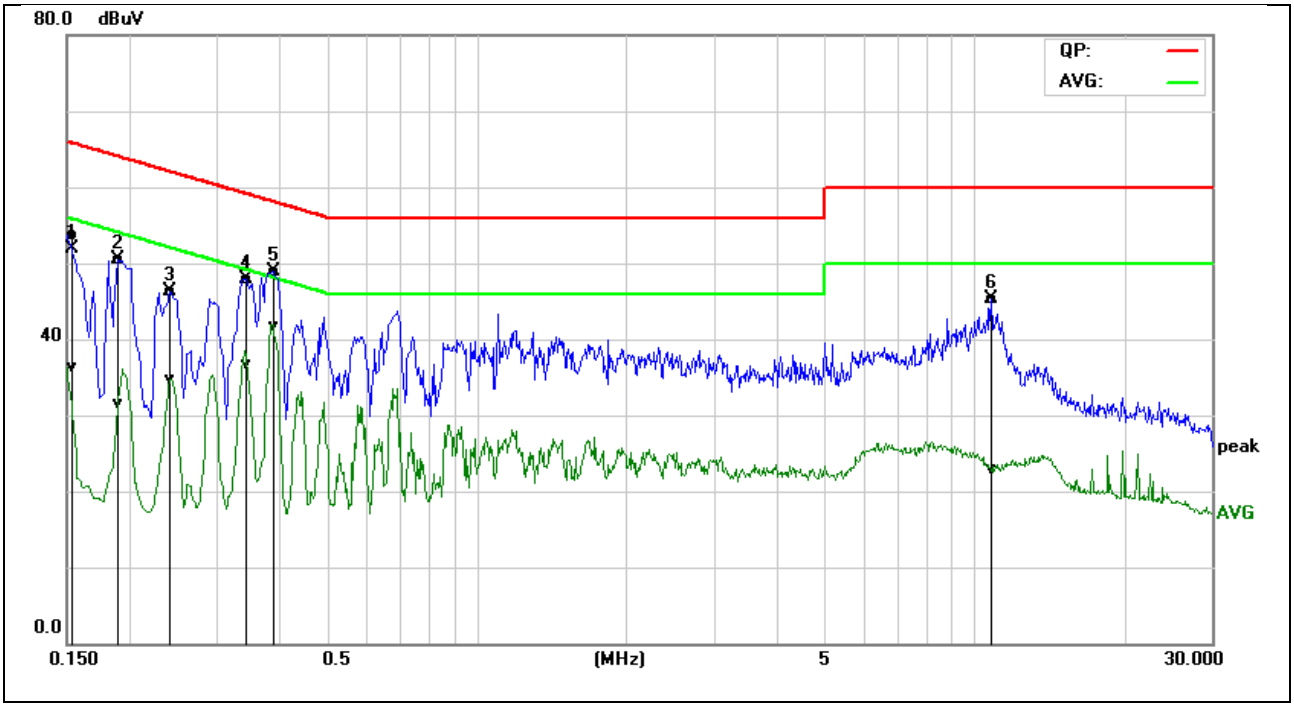
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

6.5. TEST RESULTS

Pre-test Mode 1 and Mode 2, found that Mode 2 are the worst case.

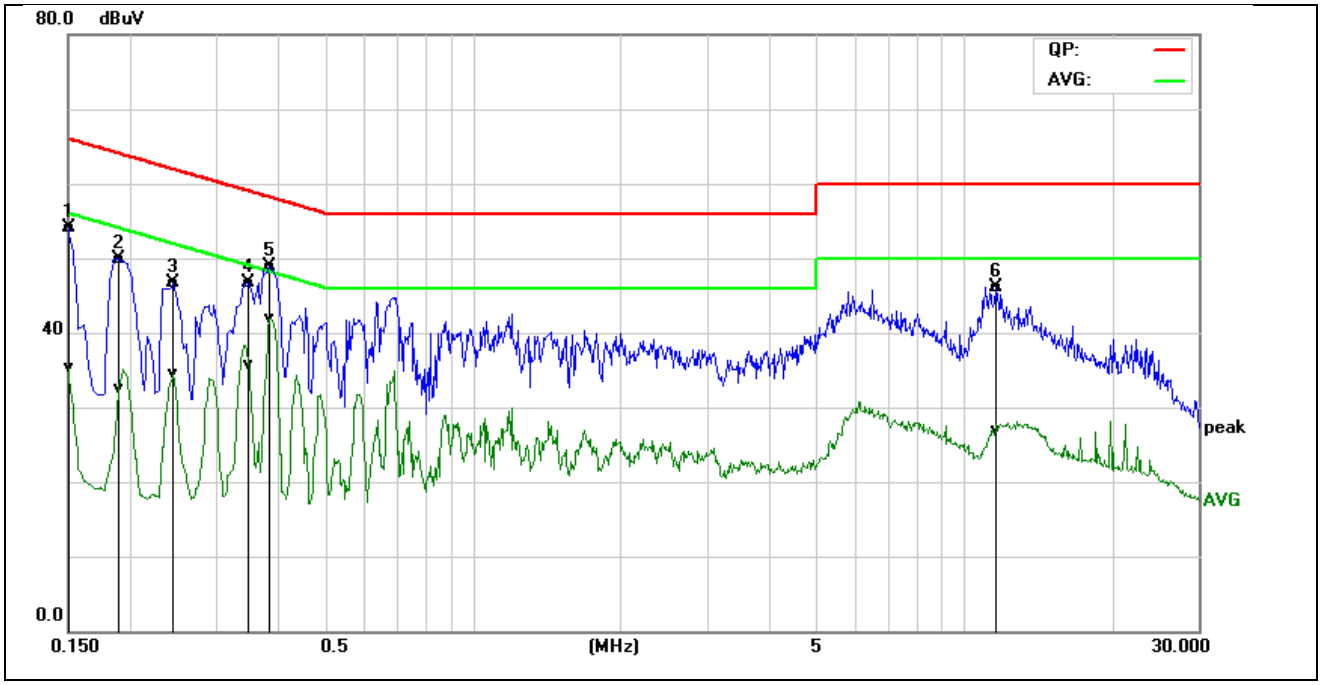
Model No.	GL-S1300	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 2
Tested by	Luja Huang	**Line**	L
Test Date	2019-03-24	**Test Voltage**	AC120V/60Hz



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1548	33.84	16.34	19.88	53.72	36.22	65.73	55.74	-12.01	-19.52	Pass
0.1900	30.66	11.72	19.87	50.53	31.59	64.03	54.04	-13.50	-22.45	Pass
0.2420	26.45	14.93	19.85	46.30	34.78	62.02	52.03	-15.72	-17.25	Pass
0.3460	28.15	16.83	19.84	47.99	36.67	59.06	49.06	-11.07	-12.39	Pass
0.3899	29.09	21.97	19.83	48.92	41.80	58.06	48.07	-9.14	-6.27	Pass
10.7940	25.04	2.75	20.17	45.21	22.92	60.00	50.00	-14.79	-27.08	Pass

REMARKS: *L= Live Line*

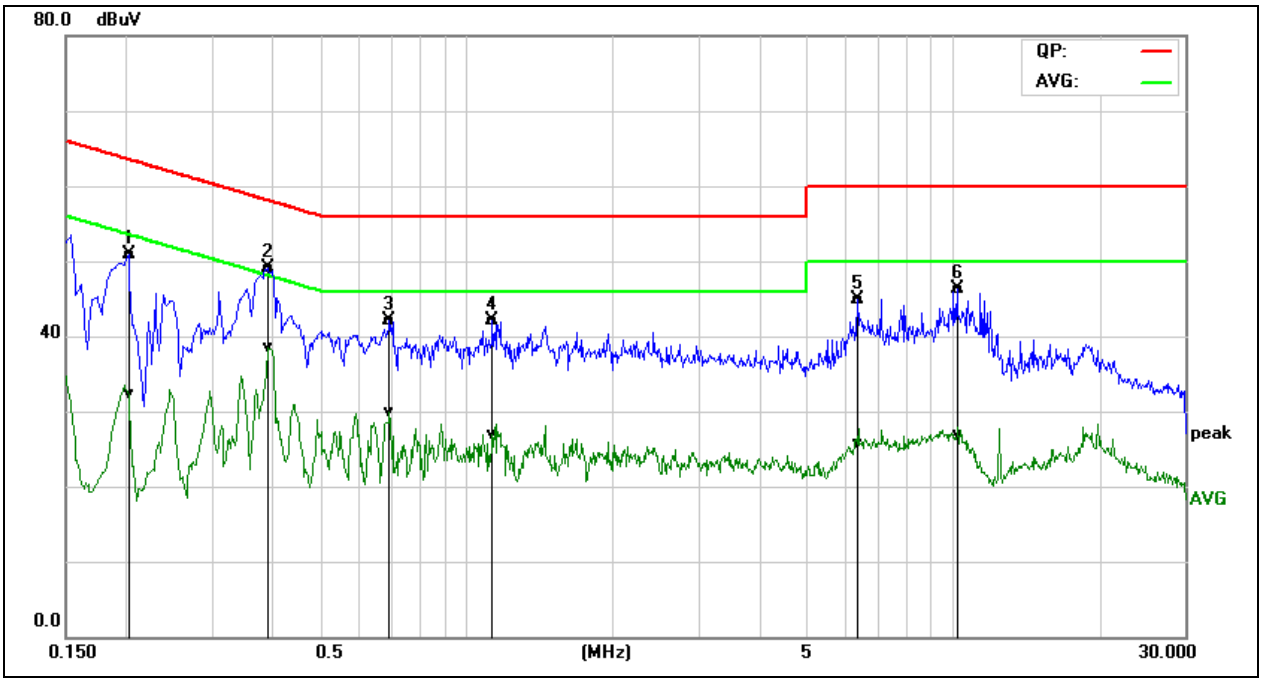
Model No.	GL-S1300	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 2
Tested by	Luja Huang	**Line**	N
Test Date	2019-03-24	**Test Voltage**	AC120V/60Hz



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1500	34.28	15.41	19.87	54.15	35.28	65.99	56.00	-11.84	-20.72	Pass
0.1900	30.12	12.73	19.85	49.97	32.58	64.03	54.04	-14.06	-21.46	Pass
0.2460	26.78	14.57	19.84	46.62	34.41	61.89	51.89	-15.27	-17.48	Pass
0.3500	26.93	15.90	19.83	46.76	35.73	58.96	48.96	-12.20	-13.23	Pass
0.3860	29.05	22.07	19.83	48.88	41.90	58.15	48.15	-9.27	-6.25	Pass
11.6140	25.95	6.72	20.13	46.08	26.85	60.00	50.00	-13.92	-23.15	Pass

REMARKS: *N= Neutral Line*

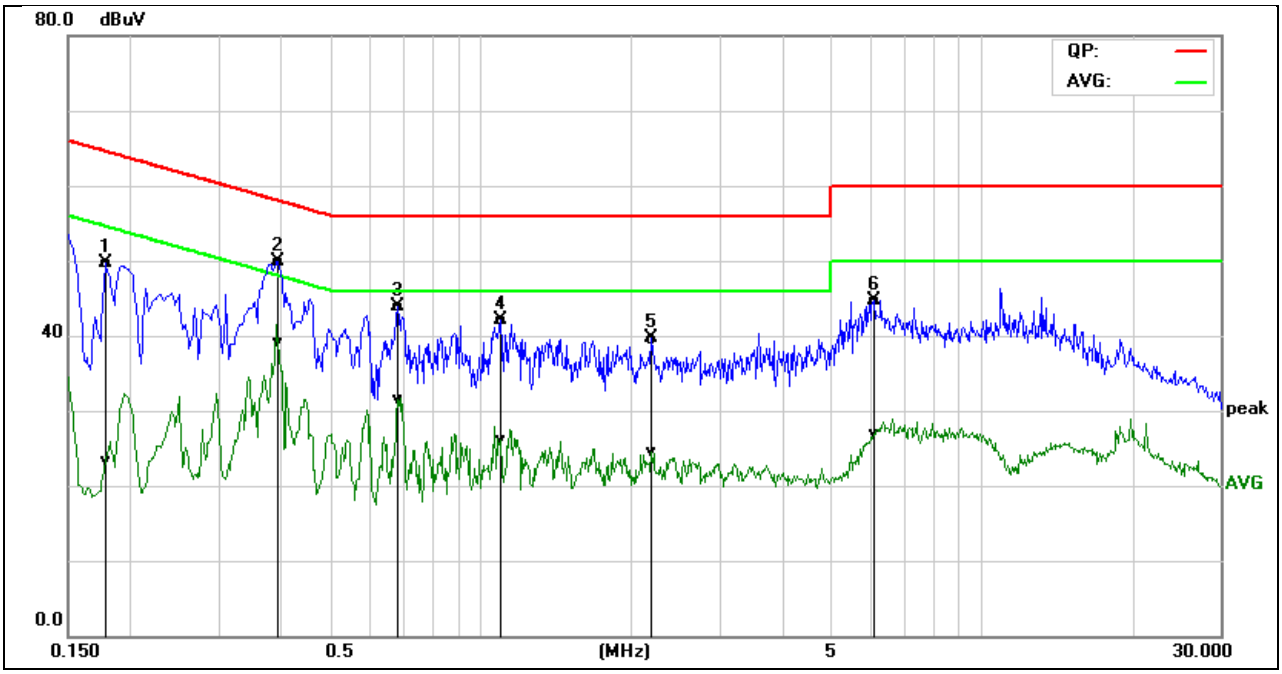
Model No.	GL-S1300	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 2
Tested by	Luja Huang	**Line**	L
Test Date	2019-04-12	**Test Voltage**	AC240V/50Hz



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.2020	31.09	12.52	19.86	50.95	32.38	63.52	53.53	-12.57	-21.15	Pass
0.3899	29.21	18.66	19.83	49.04	38.49	58.06	48.07	-9.02	-9.58	Pass
0.6940	22.20	10.07	19.90	42.10	29.97	56.00	46.00	-13.90	-16.03	Pass
1.1340	22.29	6.99	19.85	42.14	26.84	56.00	46.00	-13.86	-19.16	Pass
6.3620	24.96	5.68	19.93	44.89	25.61	60.00	50.00	-15.11	-24.39	Pass
10.2020	26.17	6.60	20.21	46.38	26.81	60.00	50.00	-13.62	-23.19	Pass

REMARKS: *L = Live Line*

Model No.	GL-S1300	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 2
Tested by	Luja Huang	**Line**	N
Test Date	2019-04-12	**Test Voltage**	AC240V/50Hz



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1780	29.87	3.49	19.85	49.72	23.34	64.57	54.58	-14.85	-31.24	Pass
0.3940	30.03	19.29	19.83	49.86	39.12	57.98	47.98	-8.12	-8.86	Pass
0.6860	23.95	11.52	19.89	43.84	31.41	56.00	46.00	-12.16	-14.59	Pass
1.0940	22.32	6.17	19.85	42.17	26.02	56.00	46.00	-13.83	-19.98	Pass
2.1900	19.69	4.62	19.91	39.60	24.53	56.00	46.00	-16.40	-21.47	Pass
6.1100	24.75	7.06	19.92	44.67	26.98	60.00	50.00	-15.33	-23.02	Pass

REMARKS: *N= Neutral Line*

7. RADIATED SPURIOUS EMISSIONS

7.1. LIMITS

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FCC 15.209			
Frequency (MHz)	**Quasi-peak(μV/m)**	**Measurement distance(m)**	**Quasi-peak(dBμV/m)@distance 3m**
0.009-0.490	2400/F(kHz)	300	53.8~88.5
0.490-1.705	24000/F(kHz)	30	43~53.8
1.705-30.0	30	30	49.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
4) For transmitters operating in the 5.725-5.85 GHz band:

All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

FCC 15.407			
Frequency Band (MHz)	Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
5150 - 5250	Outside of the 5.15~5.35 GHz	-27	68.2
5250 - 5350	Outside of the 5.15~5.35 GHz		
5470 -5725	Outside of the 5.47~5.725 GHz		
5725 - 5850	＜5650	-27	68.2
	5650~5700	-27~10	68.2~105.2
	5700~5720	10~15.6	105.2~110.8
	5720~5725	15.6~27	110.8~122.2
	5850~5855	27~15.6	122.2~110.8
	5855~5875	15.6~10	110.8~105.2
	5875~5925	10~-27	105.2~68.2
	＞5925	-27	68.2

7.2. TEST PROCEDURES

1) Sequence of testing 9 kHz to 30 MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0 °to 360 °) and by rotating the elevation axes (0 °to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (±45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (±45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz
Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Pre measurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE:The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).

7.3. TEST SETUP

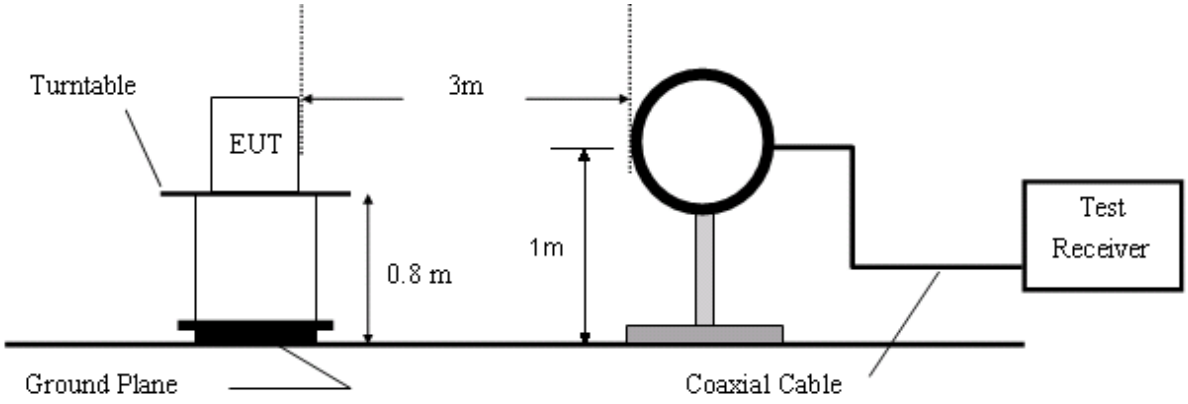


Figure 1. 9KHz to 30MHz radiated emissions test configuration

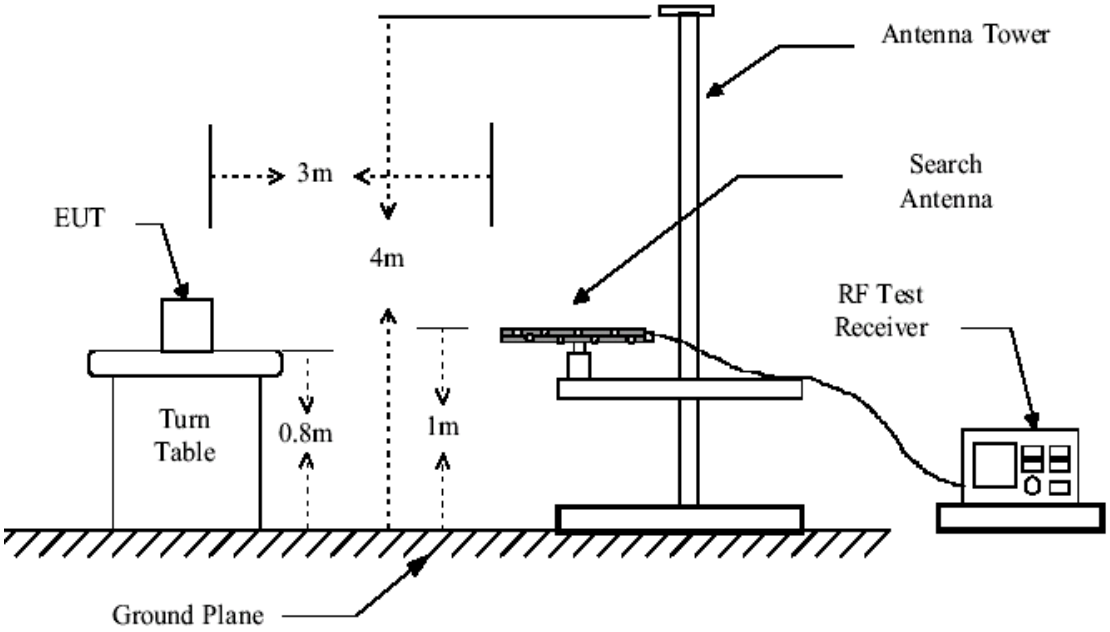


Figure 2. 30MHz to 1GHz radiated emissions test configuration

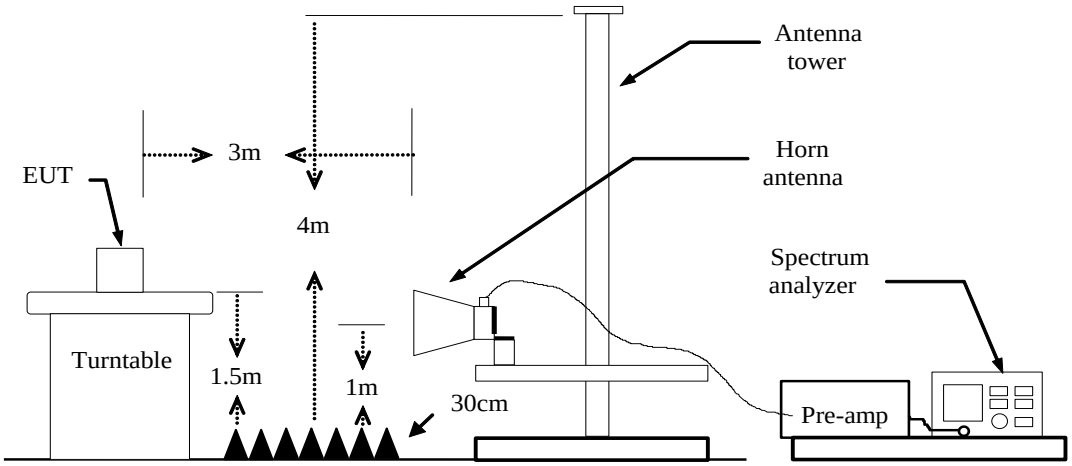


Figure 3. Above 1GHz radiated emissions test configuration

7.4. DATA SAMPLE

30MHz to 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	37.06	-15.48	21.58	40.00	-18.42	QP	Vertical

Above 1 GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical

Frequency (MHz)	= Emission frequency in MHz
Ant.Pol. (H/V)	= Antenna polarization
Reading (dBuV)	= Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m)	= Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m)	= Reading (dBuV) + Correction Factor (dB/m)
Limit (dBuV/m)	= Limit stated in standard
Margin (dB)	= Remark Result (dBuV/m) – Limit (dBuV/m)
Peak	= Peak Reading
QP	= Quasi-peak Reading
AVG	= Average Reading

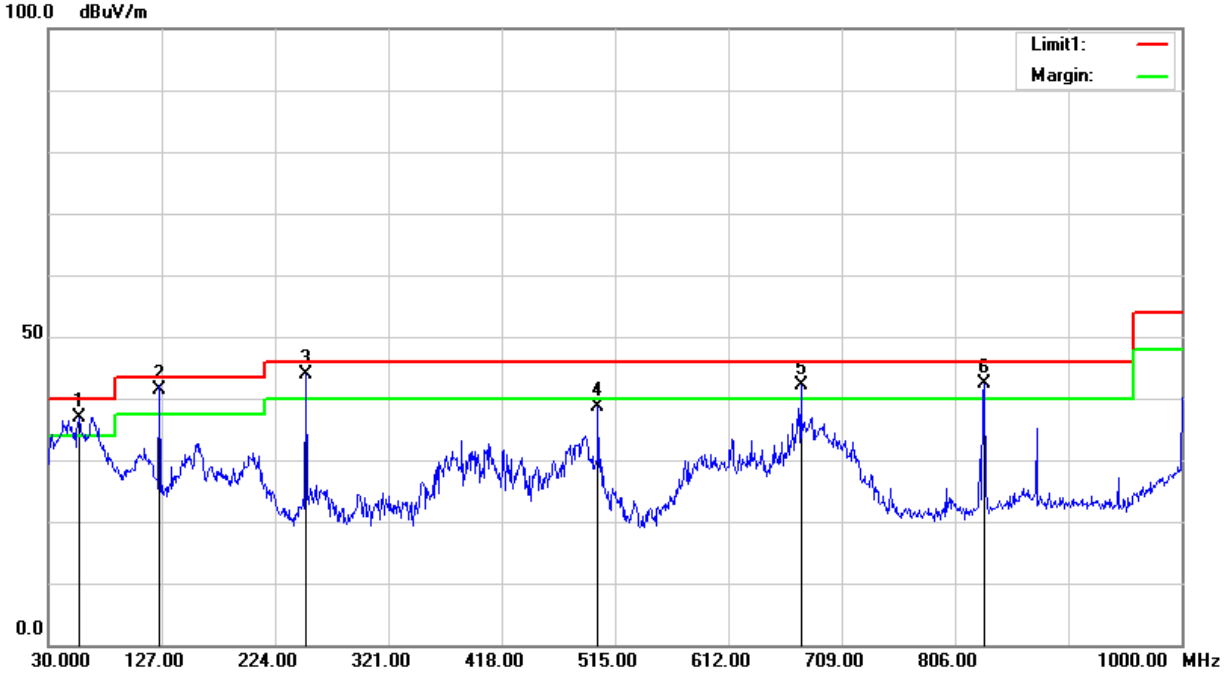
7.5. TEST RESULTS

30MHz to 1GHz

Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11a (Low Channel)

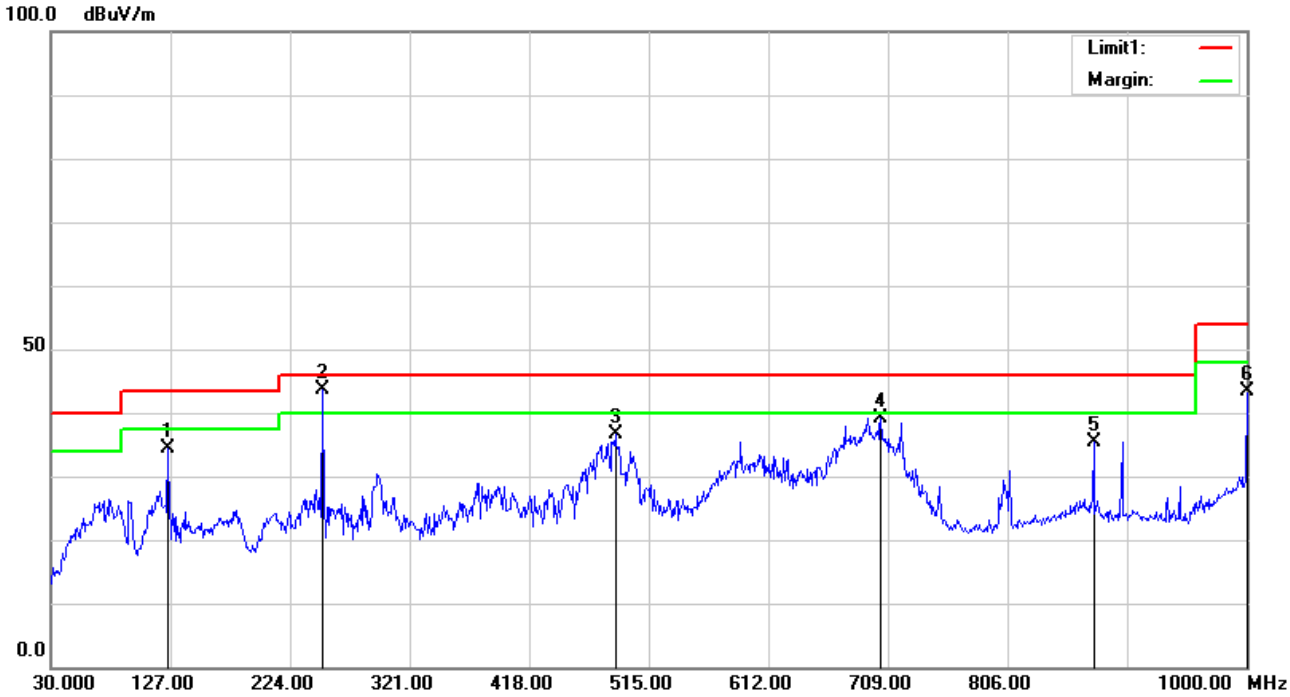
Mode: TX/ IEEE 802.11a

Lowest channel (5180MHz) Date: 2019-03-24



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	56.1900	55.75	-18.93	36.82	40.00	-3.18	QP	Vertical
2	125.0600	59.14	-17.74	41.40	43.50	-2.10	QP	Vertical
3	250.1900	60.02	-16.23	43.79	46.00	-2.21	QP	Vertical
4	500.4500	48.49	-9.91	38.58	46.00	-7.42	QP	Vertical
5	674.0800	47.16	-4.93	42.23	46.00	-3.77	QP	Vertical
6	831.2200	46.67	-4.29	42.38	46.00	-3.62	QP	Vertical

Mode: TX/ IEEE 802.11a
Lowest channel (5180MHz) Date: 2019-03-24



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	125.0600	52.13	-17.74	34.39	43.50	-9.11	QP	Horizontal
2	250.1900	59.94	-16.23	43.71	46.00	-2.29	QP	Horizontal
3	487.8400	46.61	-9.99	36.62	46.00	-9.38	QP	Horizontal
4	703.1800	44.04	-4.80	39.24	46.00	-6.76	QP	Horizontal
5	875.8400	38.96	-3.47	35.49	46.00	-10.51	QP	Horizontal
6	1000.0000	40.63	2.65	43.28	54.00	-10.72	QP	Horizontal

Above 1 GHz (1GHz~6GHz)

Mode: TX / IEEE 802.11a

Lowest channel (5180MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	2110.000	48.27	-2.11	46.16	74.00	-27.84	peak	Vertical
2	2665.000	44.05	-0.53	43.52	74.00	-30.48	peak	Vertical
3	3265.000	43.96	0.91	44.87	74.00	-29.13	peak	Vertical
4	3850.000	42.12	1.39	43.51	74.00	-30.49	peak	Vertical
5	4590.000	42.00	2.49	44.49	74.00	-29.51	peak	Vertical
6	5185.000	45.98	2.76	48.74	74.00	-25.26	peak	Vertical
7	1345.000	48.21	-5.74	42.47	74.00	-31.53	peak	Horizontal
8	1950.000	44.78	-2.65	42.13	74.00	-31.87	peak	Horizontal
9	2605.000	51.09	-0.79	50.30	74.00	-23.70	peak	Horizontal
10	3185.000	44.13	0.91	45.04	74.00	-28.96	peak	Horizontal
11	3940.000	42.45	1.51	43.96	74.00	-30.04	peak	Horizontal
12	5175.000	46.04	2.74	48.78	74.00	-25.22	peak	Horizontal

Above 6GHz

Mode: TX / IEEE 802.11a (antenna 0)

Lowest channel (5180MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6804.000	32.01	6.65	38.66	74.00	-35.34	peak	Vertical
2	8112.000	32.26	9.13	41.39	74.00	-32.61	peak	Vertical
3	9912.000	30.83	10.92	41.75	74.00	-32.25	peak	Vertical
4	11136.000	31.11	13.56	44.67	74.00	-29.33	peak	Vertical
5	11952.000	30.95	13.11	44.06	74.00	-29.94	peak	Vertical
6	12708.000	29.68	13.75	43.43	74.00	-30.57	peak	Vertical
7	7080.000	31.62	7.26	38.88	74.00	-35.12	peak	Horizontal
8	7560.000	31.03	8.39	39.42	74.00	-34.58	peak	Horizontal
9	8988.000	31.83	9.30	41.13	74.00	-32.87	peak	Horizontal
10	10680.000	30.02	12.71	42.73	74.00	-31.27	peak	Horizontal
11	11256.000	30.90	13.68	44.58	74.00	-29.42	peak	Horizontal
12	12636.000	30.32	13.63	43.95	74.00	-30.05	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 0)

middle channel (5200MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7380.000	31.16	7.99	39.15	74.00	-34.85	peak	Vertical
2	8016.000	31.67	9.18	40.85	74.00	-33.15	peak	Vertical
3	9816.000	30.29	10.78	41.07	74.00	-32.93	peak	Vertical
4	10740.000	30.38	12.85	43.23	74.00	-30.77	peak	Vertical
5	11328.000	31.27	13.76	45.03	74.00	-28.97	peak	Vertical
6	12612.000	30.20	13.59	43.79	74.00	-30.21	peak	Vertical
7	6696.000	31.95	6.42	38.37	74.00	-35.63	peak	Horizontal
8	7620.000	31.04	8.49	39.53	74.00	-34.47	peak	Horizontal
9	9024.000	31.14	9.36	40.50	74.00	-33.50	peak	Horizontal
10	10692.000	30.70	12.73	43.43	74.00	-30.57	peak	Horizontal
11	11604.000	29.91	13.73	43.64	74.00	-30.36	peak	Horizontal
12	13296.000	29.17	15.39	44.56	74.00	-29.44	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 0)
Highest channel (5240MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7632.000	31.01	8.51	39.52	74.00	-34.48	peak	Vertical
2	8376.000	32.10	8.97	41.07	74.00	-32.93	peak	Vertical
3	9324.000	31.09	9.95	41.04	74.00	-32.96	peak	Vertical
4	10800.000	30.33	12.97	43.30	74.00	-30.70	peak	Vertical
5	11604.000	30.10	13.73	43.83	74.00	-30.17	peak	Vertical
6	12636.000	30.15	13.63	43.78	74.00	-30.22	peak	Vertical
7	7320.000	31.41	7.83	39.24	74.00	-34.76	peak	Horizontal
8	8148.000	31.57	9.11	40.68	74.00	-33.32	peak	Horizontal
9	9312.000	30.88	9.92	40.80	74.00	-33.20	peak	Horizontal
10	10476.000	29.84	12.24	42.08	74.00	-31.92	peak	Horizontal
11	11172.000	31.40	13.60	45.00	74.00	-29.00	peak	Horizontal
12	12504.000	30.68	13.39	44.07	74.00	-29.93	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 0)
Lowest channel (5745MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7656.000	31.10	8.56	39.66	74.00	-34.34	peak	Vertical
2	8352.000	31.90	8.99	40.89	74.00	-33.11	peak	Vertical
3	9348.000	29.92	9.99	39.91	74.00	-34.09	peak	Vertical
4	10668.000	30.51	12.68	43.19	74.00	-30.81	peak	Vertical
5	11172.000	30.72	13.60	44.32	74.00	-29.68	peak	Vertical
6	12516.000	30.50	13.42	43.92	74.00	-30.08	peak	Vertical
7	7308.000	30.91	7.81	38.72	74.00	-35.28	peak	Horizontal
8	7848.000	31.09	8.92	40.01	74.00	-33.99	peak	Horizontal
9	8628.000	30.57	9.00	39.57	74.00	-34.43	peak	Horizontal
10	9360.000	31.01	10.01	41.02	74.00	-32.98	peak	Horizontal
11	11172.000	30.15	13.60	43.75	74.00	-30.25	peak	Horizontal
12	11820.000	30.47	13.35	43.82	74.00	-30.18	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 0)
middle channel (5785MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7548.000	30.97	8.37	39.34	74.00	-34.66	peak	Vertical
2	8424.000	31.84	8.95	40.79	74.00	-33.21	peak	Vertical
3	9360.000	30.62	10.01	40.63	74.00	-33.37	peak	Vertical
4	10548.000	30.85	12.41	43.26	74.00	-30.74	peak	Vertical
5	11160.000	30.89	13.60	44.49	74.00	-29.51	peak	Vertical
6	12504.000	30.14	13.39	43.53	74.00	-30.47	peak	Vertical
7	6552.000	31.53	6.11	37.64	74.00	-36.36	peak	Horizontal
8	7080.000	31.68	7.26	38.94	74.00	-35.06	peak	Horizontal
9	7992.000	32.04	9.18	41.22	74.00	-32.78	peak	Horizontal
10	9108.000	31.03	9.52	40.55	74.00	-33.45	peak	Horizontal
11	10596.000	30.37	12.50	42.87	74.00	-31.13	peak	Horizontal
12	12384.000	30.12	13.32	43.44	74.00	-30.56	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 0)
Highest channel (5825MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7332.000	31.48	7.87	39.35	74.00	-34.65	peak	Vertical
2	8076.000	31.72	9.14	40.86	74.00	-33.14	peak	Vertical
3	8976.000	31.64	9.29	40.93	74.00	-33.07	peak	Vertical
4	11160.000	30.98	13.60	44.58	74.00	-29.42	peak	Vertical
5	12012.000	30.53	13.03	43.56	74.00	-30.44	peak	Vertical
6	13188.000	28.87	14.98	43.85	74.00	-30.15	peak	Vertical
7	6756.000	31.83	6.55	38.38	74.00	-35.62	peak	Horizontal
8	8208.000	31.98	9.07	41.05	74.00	-32.95	peak	Horizontal
9	9360.000	31.27	10.01	41.28	74.00	-32.72	peak	Horizontal
10	10344.000	30.40	11.91	42.31	74.00	-31.69	peak	Horizontal
11	11184.000	30.89	13.61	44.50	74.00	-29.50	peak	Horizontal
12	12360.000	30.36	13.30	43.66	74.00	-30.34	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 1)
Lowest channel (5180MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7104.000	31.25	7.32	38.57	74.00	-35.43	peak	Vertical
2	7944.000	31.64	9.09	40.73	74.00	-33.27	peak	Vertical
3	8520.000	31.52	8.92	40.44	74.00	-33.56	peak	Vertical
4	9876.000	30.61	10.87	41.48	74.00	-32.52	peak	Vertical
5	11196.000	30.86	13.63	44.49	74.00	-29.51	peak	Vertical
6	12396.000	30.47	13.32	43.79	74.00	-30.21	peak	Vertical
7	7044.000	31.09	7.17	38.26	74.00	-35.74	peak	Horizontal
8	7968.000	31.65	9.13	40.78	74.00	-33.22	peak	Horizontal
9	8928.000	31.31	9.25	40.56	74.00	-33.44	peak	Horizontal
10	10284.000	30.31	11.76	42.07	74.00	-31.93	peak	Horizontal
11	11268.000	30.57	13.69	44.26	74.00	-29.74	peak	Horizontal
12	12504.000	30.39	13.39	43.78	74.00	-30.22	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 1)
middle channel (5200MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7260.000	31.10	7.69	38.79	74.00	-35.21	peak	Vertical
2	8172.000	31.57	9.09	40.66	74.00	-33.34	peak	Vertical
3	9888.000	30.45	10.89	41.34	74.00	-32.66	peak	Vertical
4	10968.000	30.33	13.36	43.69	74.00	-30.31	peak	Vertical
5	11508.000	30.26	13.91	44.17	74.00	-29.83	peak	Vertical
6	13224.000	29.04	15.12	44.16	74.00	-29.84	peak	Vertical
7	7164.000	31.04	7.46	38.50	74.00	-35.50	peak	Horizontal
8	7824.000	31.67	8.86	40.53	74.00	-33.47	peak	Horizontal
9	9384.000	30.81	10.06	40.87	74.00	-33.13	peak	Horizontal
10	10860.000	29.97	13.11	43.08	74.00	-30.92	peak	Horizontal
11	11424.000	30.22	13.84	44.06	74.00	-29.94	peak	Horizontal
12	12552.000	30.47	13.48	43.95	74.00	-30.05	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 1)
Highest channel (5240MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6252.000	32.97	5.63	38.60	74.00	-35.40	peak	Vertical
2	7728.000	31.88	8.68	40.56	74.00	-33.44	peak	Vertical
3	8400.000	31.98	8.96	40.94	74.00	-33.06	peak	Vertical
4	10056.000	30.98	11.19	42.17	74.00	-31.83	peak	Vertical
5	11028.000	29.88	13.46	43.34	74.00	-30.66	peak	Vertical
6	12648.000	30.58	13.65	44.23	74.00	-29.77	peak	Vertical
7	7164.000	31.33	7.46	38.79	74.00	-35.21	peak	Horizontal
8	7944.000	31.18	9.09	40.27	74.00	-33.73	peak	Horizontal
9	9372.000	30.65	10.04	40.69	74.00	-33.31	peak	Horizontal
10	10236.000	30.47	11.64	42.11	74.00	-31.89	peak	Horizontal
11	11148.000	31.20	13.58	44.78	74.00	-29.22	peak	Horizontal
12	11952.000	30.52	13.11	43.63	74.00	-30.37	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 1)
Lowest channel (5745MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7620.000	31.13	8.49	39.62	74.00	-34.38	peak	Vertical
2	8196.000	31.98	9.07	41.05	74.00	-32.95	peak	Vertical
3	9336.000	31.02	9.97	40.99	74.00	-33.01	peak	Vertical
4	10620.000	30.17	12.57	42.74	74.00	-31.26	peak	Vertical
5	11412.000	30.86	13.84	44.70	74.00	-29.30	peak	Vertical
6	12588.000	30.39	13.54	43.93	74.00	-30.07	peak	Vertical
7	7440.000	30.89	8.13	39.02	74.00	-34.98	peak	Horizontal
8	8388.000	31.94	8.97	40.91	74.00	-33.09	peak	Horizontal
9	9828.000	30.64	10.79	41.43	74.00	-32.57	peak	Horizontal
10	10332.000	29.88	11.88	41.76	74.00	-32.24	peak	Horizontal
11	11244.000	31.26	13.67	44.93	74.00	-29.07	peak	Horizontal
12	12144.000	30.55	13.13	43.68	74.00	-30.32	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 1)
middle channel (5785MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6252.000	33.48	5.63	39.11	74.00	-34.89	peak	Vertical
2	7452.000	31.37	8.15	39.52	74.00	-34.48	peak	Vertical
3	8388.000	31.58	8.97	40.55	74.00	-33.45	peak	Vertical
4	9900.000	30.36	10.91	41.27	74.00	-32.73	peak	Vertical
5	11184.000	30.70	13.61	44.31	74.00	-29.69	peak	Vertical
6	12456.000	30.15	13.37	43.52	74.00	-30.48	peak	Vertical
7	6696.000	31.65	6.42	38.07	74.00	-35.93	peak	Horizontal
8	7740.000	31.18	8.71	39.89	74.00	-34.11	peak	Horizontal
9	9324.000	31.03	9.95	40.98	74.00	-33.02	peak	Horizontal
10	10596.000	30.66	12.50	43.16	74.00	-30.84	peak	Horizontal
11	11460.000	30.15	13.89	44.04	74.00	-29.96	peak	Horizontal
12	13092.000	29.06	14.62	43.68	74.00	-30.32	peak	Horizontal

Mode: TX / IEEE 802.11a (antenna 1)
Highest channel (5825MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7164.000	31.02	7.46	38.48	74.00	-35.52	peak	Vertical
2	7992.000	31.01	9.18	40.19	74.00	-33.81	peak	Vertical
3	9336.000	30.93	9.97	40.90	74.00	-33.10	peak	Vertical
4	10272.000	30.10	11.74	41.84	74.00	-32.16	peak	Vertical
5	11076.000	30.00	13.51	43.51	74.00	-30.49	peak	Vertical
6	12396.000	30.41	13.32	43.73	74.00	-30.27	peak	Vertical
7	6768.000	31.47	6.58	38.05	74.00	-35.95	peak	Horizontal
8	7656.000	31.44	8.56	40.00	74.00	-34.00	peak	Horizontal
9	9036.000	31.11	9.38	40.49	74.00	-33.51	peak	Horizontal
10	10596.000	29.95	12.50	42.45	74.00	-31.55	peak	Horizontal
11	11592.000	30.30	13.76	44.06	74.00	-29.94	peak	Horizontal
12	12120.000	30.65	13.11	43.76	74.00	-30.24	peak	Horizontal

Mode: TX / IEEE 802.11n HT20(combine with antenna 0 and antenna 1)
Lowest channel (5180MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6252.000	33.20	5.63	38.83	74.00	-35.17	peak	Vertical
2	7320.000	31.83	7.83	39.66	74.00	-34.34	peak	Vertical
3	7956.000	32.17	9.11	41.28	74.00	-32.72	peak	Vertical
4	9348.000	31.16	9.99	41.15	74.00	-32.85	peak	Vertical
5	10692.000	30.58	12.73	43.31	74.00	-30.69	peak	Vertical
6	11136.000	31.15	13.56	44.71	74.00	-29.29	peak	Vertical
7	7212.000	31.29	7.57	38.86	74.00	-35.14	peak	Horizontal
8	8424.000	31.93	8.95	40.88	74.00	-33.12	peak	Horizontal
9	9876.000	30.54	10.87	41.41	74.00	-32.59	peak	Horizontal
10	11136.000	30.72	13.56	44.28	74.00	-29.72	peak	Horizontal
11	12228.000	31.09	13.19	44.28	74.00	-29.72	peak	Horizontal
12	13224.000	29.12	15.12	44.24	74.00	-29.76	peak	Horizontal

Mode: TX / IEEE 802.11n HT20(combine with antenna 0 and antenna 1)
middle channel (5200MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7224.000	30.95	7.60	38.55	74.00	-35.45	peak	Vertical
2	8448.000	31.48	8.93	40.41	74.00	-33.59	peak	Vertical
3	9564.000	29.88	10.39	40.27	74.00	-33.73	peak	Vertical
4	10608.000	30.10	12.54	42.64	74.00	-31.36	peak	Vertical
5	11160.000	30.53	13.60	44.13	74.00	-29.87	peak	Vertical
6	11928.000	30.60	13.15	43.75	74.00	-30.25	peak	Vertical
7	7488.000	31.27	8.24	39.51	74.00	-34.49	peak	Horizontal
8	8472.000	31.25	8.92	40.17	74.00	-33.83	peak	Horizontal
9	9432.000	30.71	10.15	40.86	74.00	-33.14	peak	Horizontal
10	10752.000	29.98	12.87	42.85	74.00	-31.15	peak	Horizontal
11	11904.000	30.28	13.20	43.48	74.00	-30.52	peak	Horizontal
12	12576.000	30.28	13.53	43.81	74.00	-30.19	peak	Horizontal

Mode: TX / IEEE 802.11n HT20(combine with antenna 0 and antenna 1)
Highest channel (5240MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7596.000	31.08	8.45	39.53	74.00	-34.47	peak	Vertical
2	8376.000	32.01	8.97	40.98	74.00	-33.02	peak	Vertical
3	10212.000	30.54	11.59	42.13	74.00	-31.87	peak	Vertical
4	11280.000	30.71	13.71	44.42	74.00	-29.58	peak	Vertical
5	12312.000	30.45	13.26	43.71	74.00	-30.29	peak	Vertical
6	13212.000	29.50	15.07	44.57	74.00	-29.43	peak	Vertical
7	7140.000	31.67	7.41	39.08	74.00	-34.92	peak	Horizontal
8	8052.000	31.78	9.16	40.94	74.00	-33.06	peak	Horizontal
9	9828.000	30.18	10.79	40.97	74.00	-33.03	peak	Horizontal
10	11220.000	31.13	13.65	44.78	74.00	-29.22	peak	Horizontal
11	11496.000	30.52	13.92	44.44	74.00	-29.56	peak	Horizontal
12	12624.000	29.86	13.60	43.46	74.00	-30.54	peak	Horizontal

Mode: TX / IEEE 802.11n HT20(combine with antenna 0 and antenna 1)
Lowest channel (5745MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6912.000	31.77	6.88	38.65	74.00	-35.35	peak	Vertical
2	8124.000	31.34	9.13	40.47	74.00	-33.53	peak	Vertical
3	9588.000	30.80	10.43	41.23	74.00	-32.77	peak	Vertical
4	11148.000	31.03	13.58	44.61	74.00	-29.39	peak	Vertical
5	12132.000	30.58	13.12	43.70	74.00	-30.30	peak	Vertical
6	13260.000	29.22	15.25	44.47	74.00	-29.53	peak	Vertical
7	7368.000	30.93	7.96	38.89	74.00	-35.11	peak	Horizontal
8	8160.000	31.26	9.10	40.36	74.00	-33.64	peak	Horizontal
9	8988.000	30.76	9.30	40.06	74.00	-33.94	peak	Horizontal
10	10812.000	30.64	13.01	43.65	74.00	-30.35	peak	Horizontal
11	11964.000	30.45	13.09	43.54	74.00	-30.46	peak	Horizontal
12	12480.000	30.11	13.39	43.50	74.00	-30.50	peak	Horizontal

Mode: TX / IEEE 802.11n HT20(combine with antenna 0 and antenna 1)
middle channel (5785MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6252.000	33.10	5.63	38.73	74.00	-35.27	peak	Vertical
2	7800.000	30.67	8.82	39.49	74.00	-34.51	peak	Vertical
3	8448.000	31.50	8.93	40.43	74.00	-33.57	peak	Vertical
4	10044.000	29.89	11.17	41.06	74.00	-32.94	peak	Vertical
5	11304.000	30.80	13.72	44.52	74.00	-29.48	peak	Vertical
6	12384.000	30.55	13.32	43.87	74.00	-30.13	peak	Vertical
7	6648.000	31.22	6.32	37.54	74.00	-36.46	peak	Horizontal
8	8388.000	31.21	8.97	40.18	74.00	-33.82	peak	Horizontal
9	9432.000	30.03	10.15	40.18	74.00	-33.82	peak	Horizontal
10	10452.000	29.66	12.17	41.83	74.00	-32.17	peak	Horizontal
11	11700.000	29.39	13.56	42.95	74.00	-31.05	peak	Horizontal
12	13116.000	28.21	14.70	42.91	74.00	-31.09	peak	Horizontal

Mode: TX / IEEE 802.11n HT20(combine with antenna 0 and antenna 1)
Highest channel (5825MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7200.000	30.85	7.55	38.40	74.00	-35.60	peak	Vertical
2	7884.000	31.19	8.98	40.17	74.00	-33.83	peak	Vertical
3	8964.000	31.31	9.28	40.59	74.00	-33.41	peak	Vertical
4	10848.000	29.54	13.09	42.63	74.00	-31.37	peak	Vertical
5	12156.000	30.65	13.14	43.79	74.00	-30.21	peak	Vertical
6	13212.000	28.34	15.07	43.41	74.00	-30.59	peak	Vertical
7	6384.000	31.74	5.83	37.57	74.00	-36.43	peak	Horizontal
8	7200.000	31.00	7.55	38.55	74.00	-35.45	peak	Horizontal
9	8160.000	30.88	9.10	39.98	74.00	-34.02	peak	Horizontal
10	9384.000	30.41	10.06	40.47	74.00	-33.53	peak	Horizontal
11	10476.000	29.56	12.24	41.80	74.00	-32.20	peak	Horizontal
12	11736.000	30.20	13.49	43.69	74.00	-30.31	peak	Horizontal

Mode: TX / IEEE 802.11n HT40(combine with antenna 0 and antenna 1)
Lowest channel (5190MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7296.000	30.60	7.78	38.38	74.00	-35.62	peak	Vertical
2	7992.000	31.22	9.18	40.40	74.00	-33.60	peak	Vertical
3	9348.000	30.06	9.99	40.05	74.00	-33.95	peak	Vertical
4	11160.000	30.05	13.60	43.65	74.00	-30.35	peak	Vertical
5	11748.000	29.56	13.47	43.03	74.00	-30.97	peak	Vertical
6	13320.000	27.76	15.48	43.24	74.00	-30.76	peak	Vertical
7	6420.000	30.69	5.89	36.58	74.00	-37.42	peak	Horizontal
8	7596.000	30.46	8.45	38.91	74.00	-35.09	peak	Horizontal
9	9456.000	29.76	10.20	39.96	74.00	-34.04	peak	Horizontal
10	10320.000	29.07	11.84	40.91	74.00	-33.09	peak	Horizontal
11	11172.000	30.00	13.60	43.60	74.00	-30.40	peak	Horizontal
12	12168.000	29.50	13.14	42.64	74.00	-31.36	peak	Horizontal

Mode: TX / IEEE 802.11n HT40(combine with antenna 0 and antenna 1)
Highest channel (5230MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7704.000	30.10	8.65	38.75	74.00	-35.25	peak	Vertical
2	8088.000	31.25	9.14	40.39	74.00	-33.61	peak	Vertical
3	9216.000	29.90	9.74	39.64	74.00	-34.36	peak	Vertical
4	10488.000	29.08	12.27	41.35	74.00	-32.65	peak	Vertical
5	11520.000	29.55	13.89	43.44	74.00	-30.56	peak	Vertical
6	12708.000	29.02	13.75	42.77	74.00	-31.23	peak	Vertical
7	6756.000	32.18	6.55	38.73	74.00	-35.27	peak	Horizontal
8	8064.000	30.76	9.15	39.91	74.00	-34.09	peak	Horizontal
9	9600.000	30.23	10.44	40.67	74.00	-33.33	peak	Horizontal
10	10692.000	29.98	12.73	42.71	74.00	-31.29	peak	Horizontal
11	11148.000	31.27	13.58	44.85	74.00	-29.15	peak	Horizontal
12	12480.000	29.02	13.39	42.41	74.00	-31.59	peak	Horizontal

Mode: TX / IEEE 802.11n HT40(combine with antenna 0 and antenna 1)
Lowest channel (5755MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6876.000	30.93	6.80	37.73	74.00	-36.27	peak	Vertical
2	8100.000	31.26	9.13	40.39	74.00	-33.61	peak	Vertical
3	9420.000	29.97	10.12	40.09	74.00	-33.91	peak	Vertical
4	11160.000	30.64	13.60	44.24	74.00	-29.76	peak	Vertical
5	11988.000	29.73	13.04	42.77	74.00	-31.23	peak	Vertical
6	13368.000	28.22	15.66	43.88	74.00	-30.12	peak	Vertical
7	6864.000	30.55	6.77	37.32	74.00	-36.68	peak	Horizontal
8	7992.000	30.19	9.18	39.37	74.00	-34.63	peak	Horizontal
9	9336.000	30.51	9.97	40.48	74.00	-33.52	peak	Horizontal
10	10332.000	29.24	11.88	41.12	74.00	-32.88	peak	Horizontal
11	11508.000	29.75	13.91	43.66	74.00	-30.34	peak	Horizontal
12	12984.000	28.30	14.24	42.54	74.00	-31.46	peak	Horizontal

Mode: TX / IEEE 802.11n HT40(combine with antenna 0 and antenna 1)
Highest channel (5795MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	6756.000	31.15	6.55	37.70	74.00	-36.30	peak	Vertical
2	8196.000	30.74	9.07	39.81	74.00	-34.19	peak	Vertical
3	9636.000	29.39	10.49	39.88	74.00	-34.12	peak	Vertical
4	11160.000	29.86	13.60	43.46	74.00	-30.54	peak	Vertical
5	11868.000	29.76	13.26	43.02	74.00	-30.98	peak	Vertical
6	13140.000	29.13	14.80	43.93	74.00	-30.07	peak	Vertical
7	7176.000	30.09	7.50	37.59	74.00	-36.41	peak	Horizontal
8	8556.000	30.75	8.94	39.69	74.00	-34.31	peak	Horizontal
9	9084.000	30.88	9.47	40.35	74.00	-33.65	peak	Horizontal
10	10284.000	29.37	11.76	41.13	74.00	-32.87	peak	Horizontal
11	11916.000	30.21	13.16	43.37	74.00	-30.63	peak	Horizontal
12	13092.000	27.88	14.62	42.50	74.00	-31.50	peak	Horizontal

Mode: TX / IEEE 802.11ac 80(combine with antenna 0 and antenna 1)
Lowest channel (5210MHz) Date: 2019-03-24

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark	Pole
	(MHz)	(dBuV/m)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	6348.000	30.71	5.79	36.50	74.00	-37.50	peak	Vertical
2	7980.000	30.90	9.16	40.06	74.00	-33.94	peak	Vertical
3	9444.000	30.69	10.18	40.87	74.00	-33.13	peak	Vertical
4	10464.000	29.35	12.20	41.55	74.00	-32.45	peak	Vertical
5	11136.000	30.44	13.56	44.00	74.00	-30.00	peak	Vertical
6	12012.000	29.69	13.03	42.72	74.00	-31.28	peak	Vertical
7	7020.000	30.72	7.10	37.82	74.00	-36.18	peak	Horizontal
8	8484.000	30.91	8.91	39.82	74.00	-34.18	peak	Horizontal
9	9900.000	29.05	10.91	39.96	74.00	-34.04	peak	Horizontal
10	10860.000	28.95	13.11	42.06	74.00	-31.94	peak	Horizontal
11	12132.000	29.60	13.12	42.72	74.00	-31.28	peak	Horizontal
12	13896.000	29.63	17.18	46.81	74.00	-27.19	peak	Horizontal

Mode: TX / IEEE 802.11ac 80 (combine with antenna 0 and antenna 1)
Lowest channel (5775MHz) Date: 2019-03-24

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
1	7308.000	30.54	7.81	38.35	74.00	-35.65	peak	Vertical
2	7872.000	29.88	8.96	38.84	74.00	-35.16	peak	Vertical
3	9336.000	29.61	9.97	39.58	74.00	-34.42	peak	Vertical
4	10596.000	29.82	12.50	42.32	74.00	-31.68	peak	Vertical
5	11904.000	29.52	13.20	42.72	74.00	-31.28	peak	Vertical
6	13188.000	28.60	14.98	43.58	74.00	-30.42	peak	Vertical
7	6564.000	31.32	6.14	37.46	74.00	-36.54	peak	Horizontal
8	8328.000	31.05	9.00	40.05	74.00	-33.95	peak	Horizontal
9	9372.000	31.00	10.04	41.04	74.00	-32.96	peak	Horizontal
10	10296.000	30.14	11.79	41.93	74.00	-32.07	peak	Horizontal
11	12348.000	29.75	13.28	43.03	74.00	-30.97	peak	Horizontal
12	13596.000	30.75	16.41	47.16	74.00	-26.84	peak	Horizontal

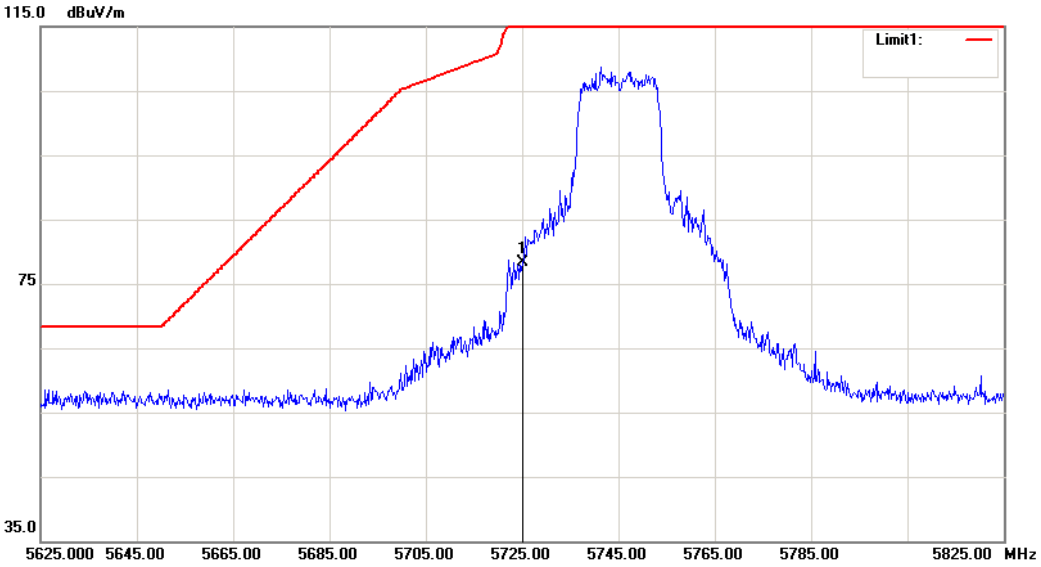
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

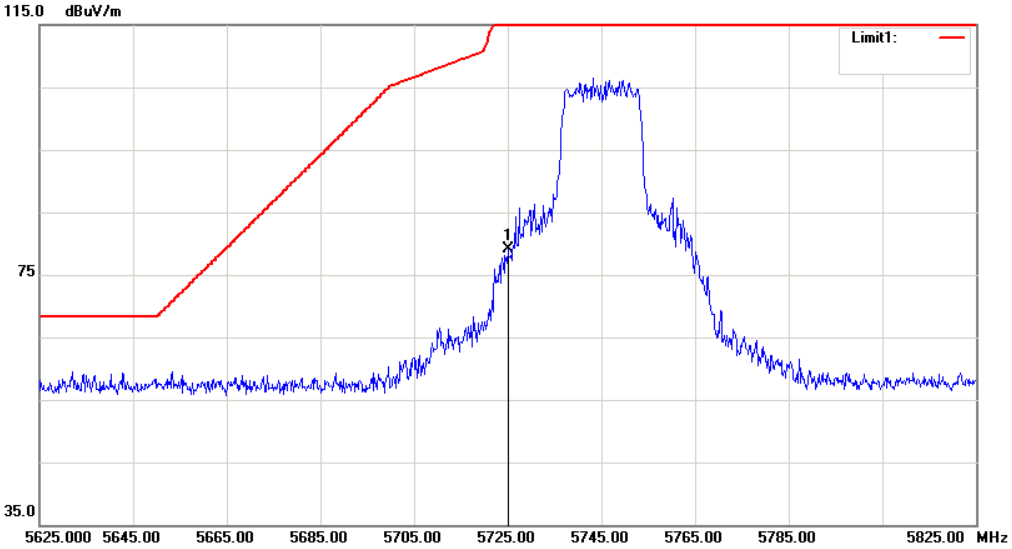
Conducted undesirable emission

IEEE 802.11a mode / 5745MHz (antenna 0)

Detector mode: Peak Polarity: Vertical



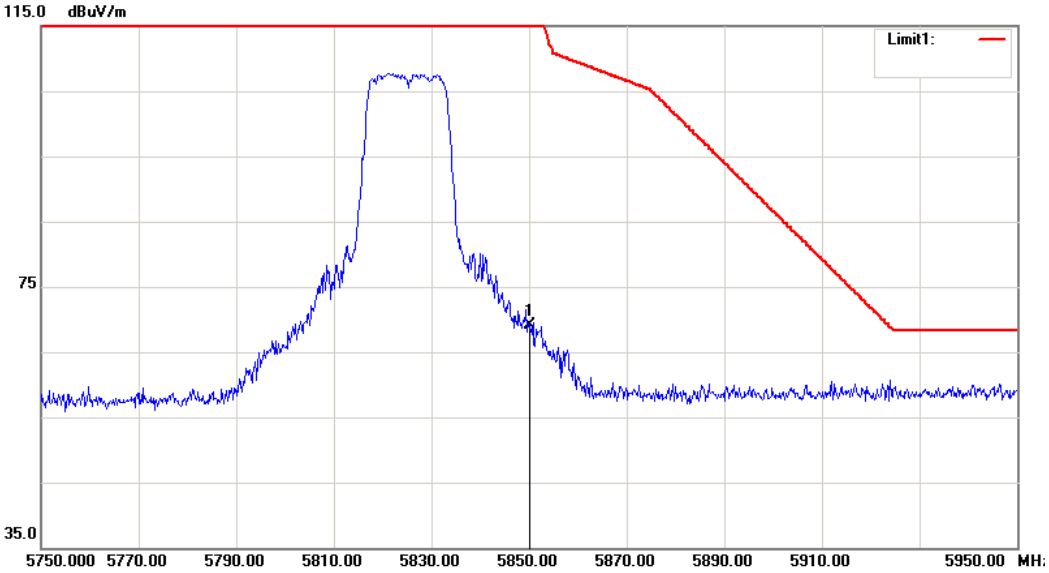
Detector mode: Peak Polarity: Horizontal



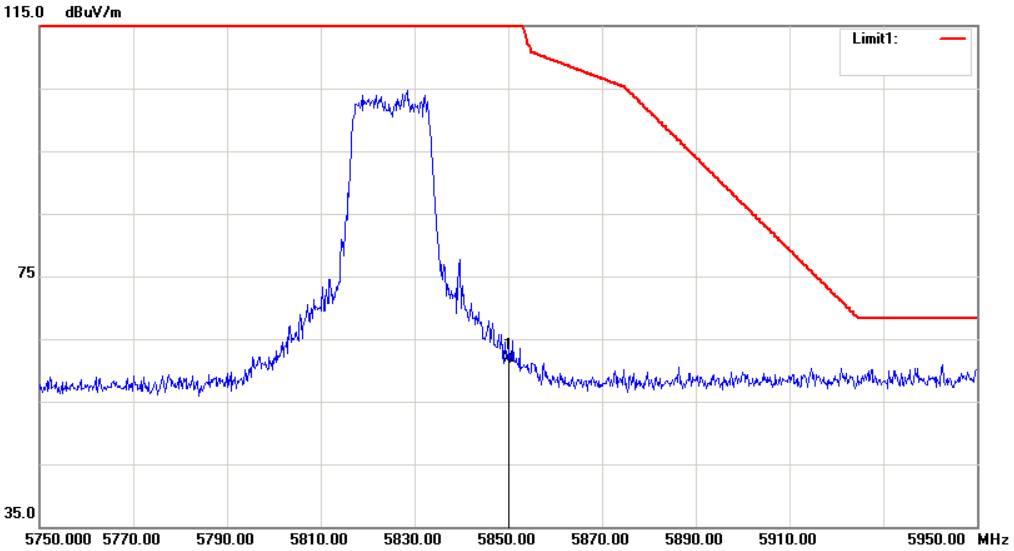
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5725.000	73.90	4.38	78.28	122.20	-43.92	Peak	Vertical
1	5725.000	74.78	4.38	79.16	122.20	-43.04	Peak	Horizontal

IEEE 802.11a mode / 5825MHz (antenna 0)

Detector mode: Peak Polarity: Vertical



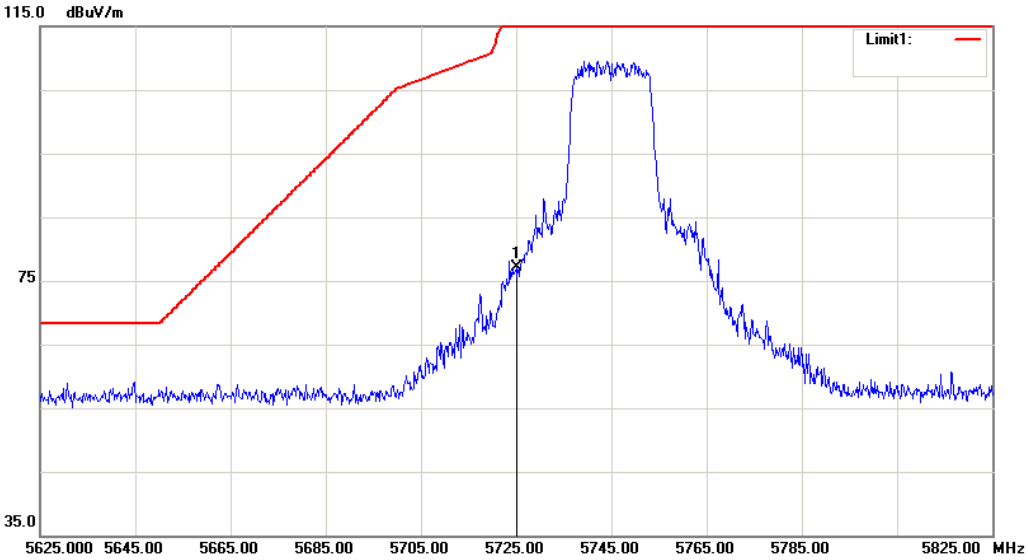
Detector mode: Peak Polarity: Horizontal



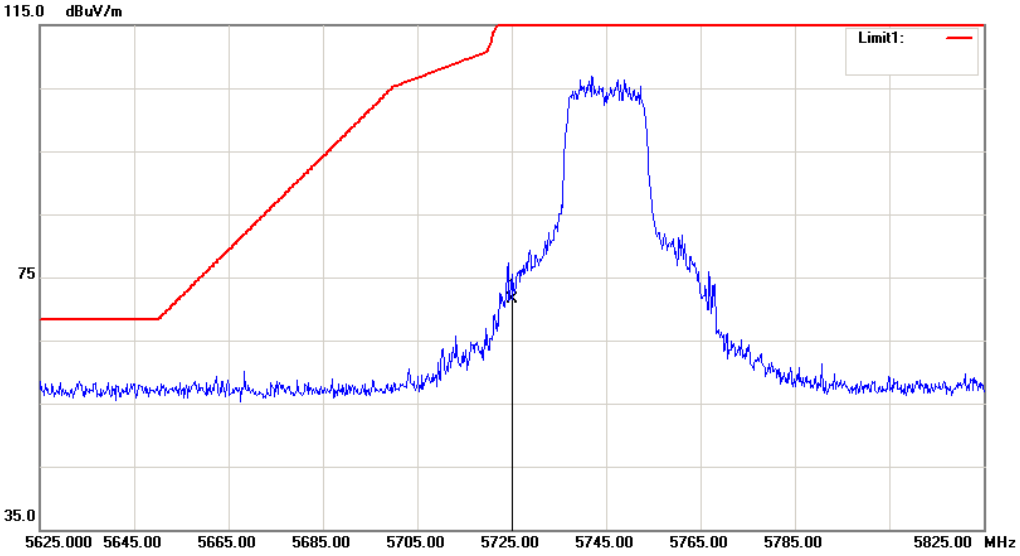
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5850.000	64.38	4.78	69.16	122.20	-53.04	Peak	Vertical
1	5850.000	57.12	4.78	61.90	122.20	-60.30	Peak	Horizontal

IEEE 802.11a mode / 5745MHz (antenna 1)

Detector mode: Peak Polarity: Vertical



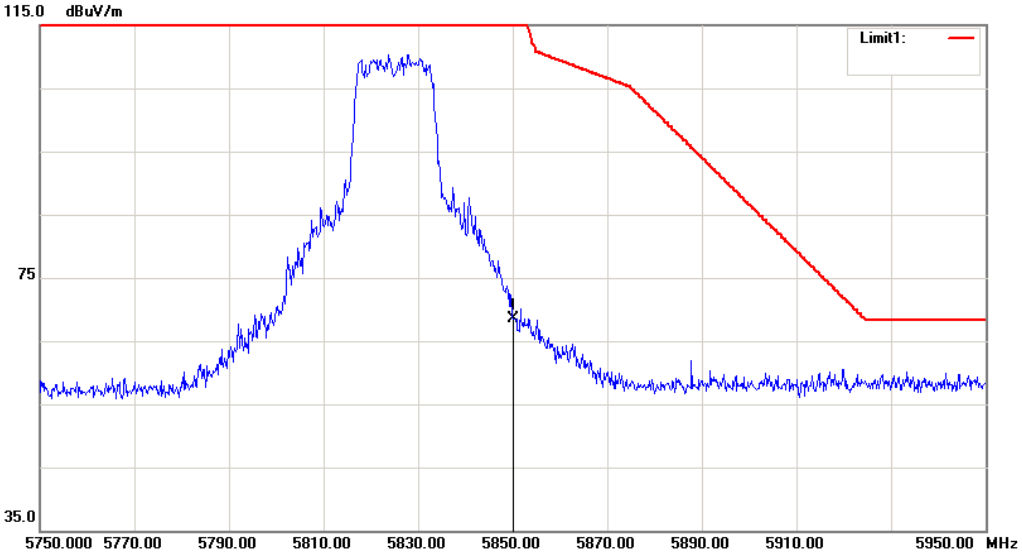
Detector mode: Peak Polarity: Horizontal



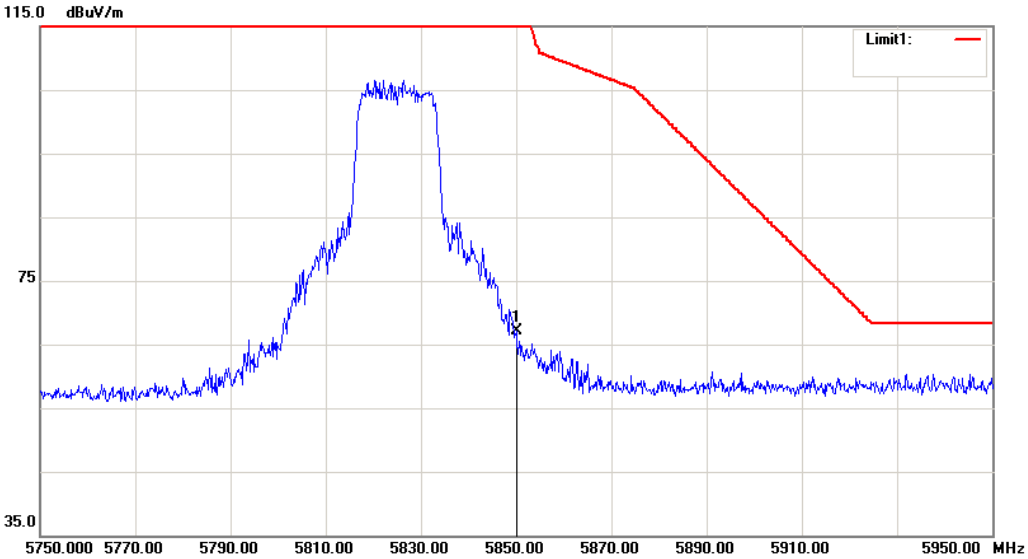
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5725.000	72.80	4.38	77.18	122.20	-45.02	Peak	Vertical
1	5725.000	67.05	4.38	71.43	122.20	-50.77	Peak	Horizontal

IEEE 802.11a mode / 5825MHz (antenna 1)

Detector mode: Peak Polarity: Vertical



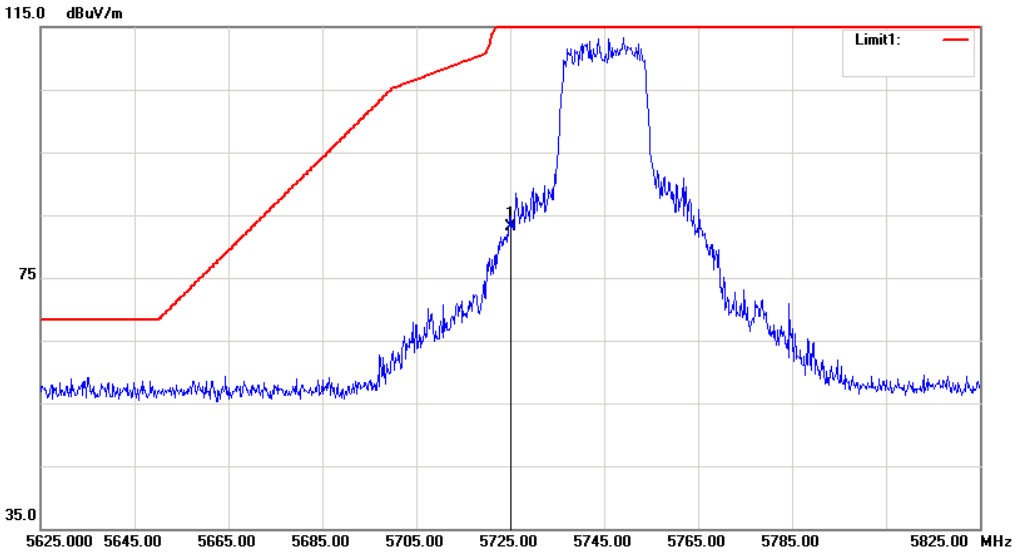
Detector mode: Peak Polarity: Horizontal



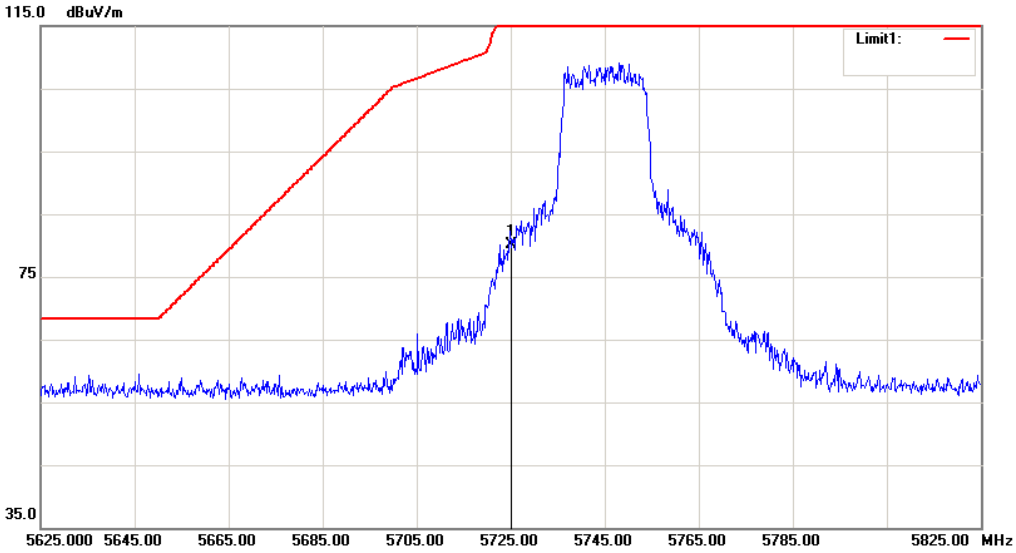
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5850.000	63.67	4.78	68.45	122.20	-53.75	Peak	Vertical
1	5850.000	62.41	4.78	67.19	122.20	-55.01	Peak	Horizontal

IEEE 802.11n HT 20 MHz mode / 5745MHz
(combine with antenna 0 and antenna 1)

Detector mode: Peak Polarity: Vertical



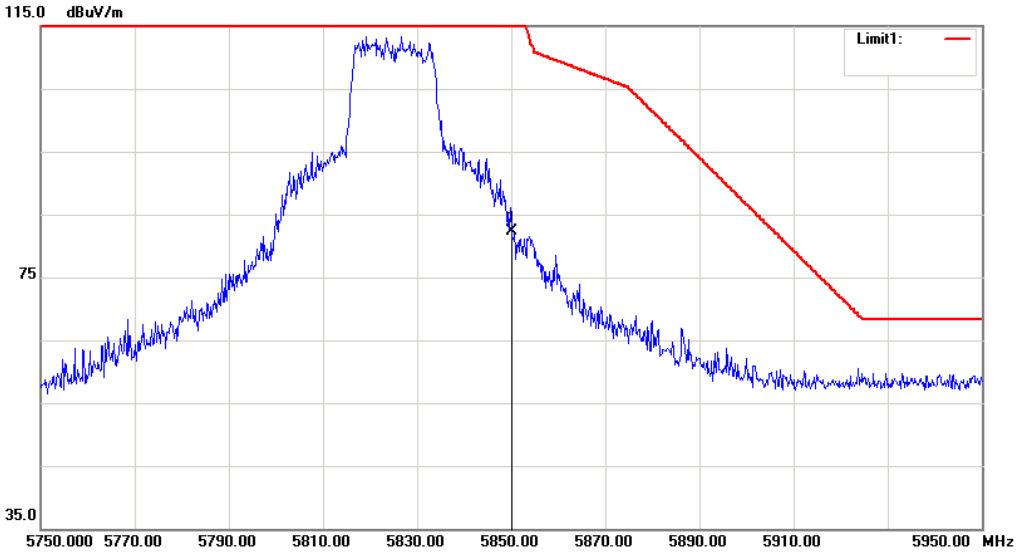
Detector mode: Peak Polarity: Horizontal



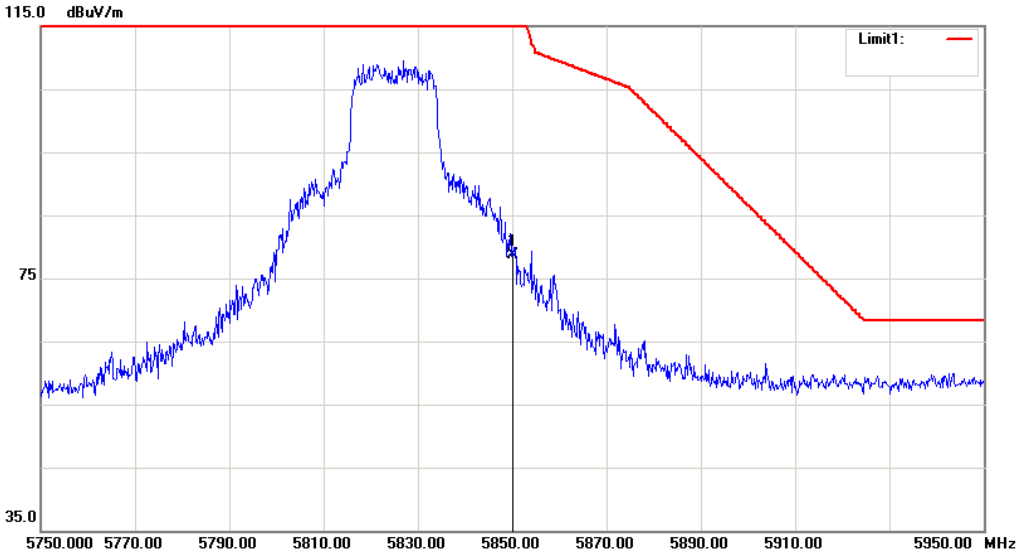
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5725.000	78.71	4.38	83.09	122.20	-39.11	Peak	Vertical
1	5725.000	75.81	4.38	80.19	122.20	-42.01	Peak	Horizontal

IEEE 802.11n HT 20 MHz mode/ 5825MHz
(combine with antenna 0 and antenna 1)
Highest channel (5825MHz)

Detector mode: Peak Polarity: Vertical



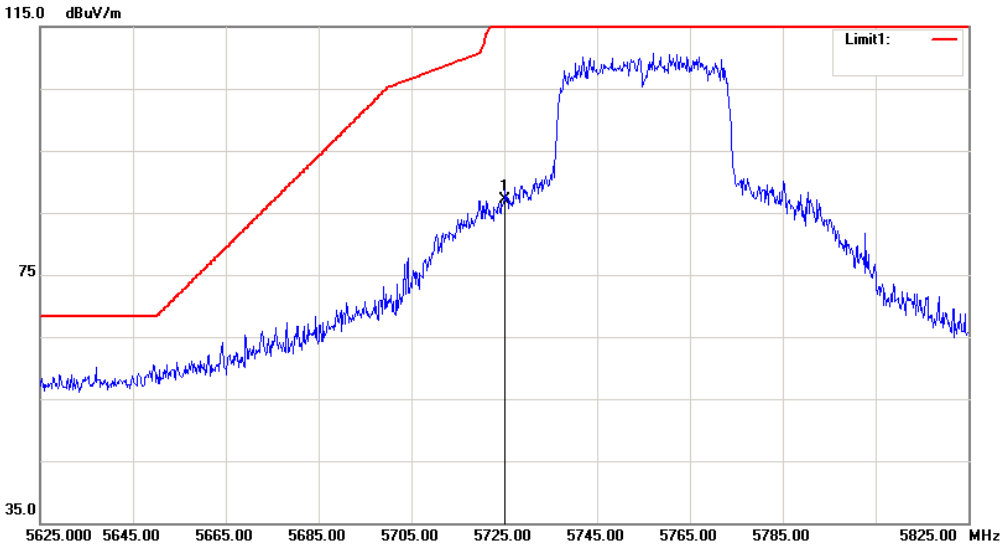
Detector mode: Peak Polarity: Horizontal



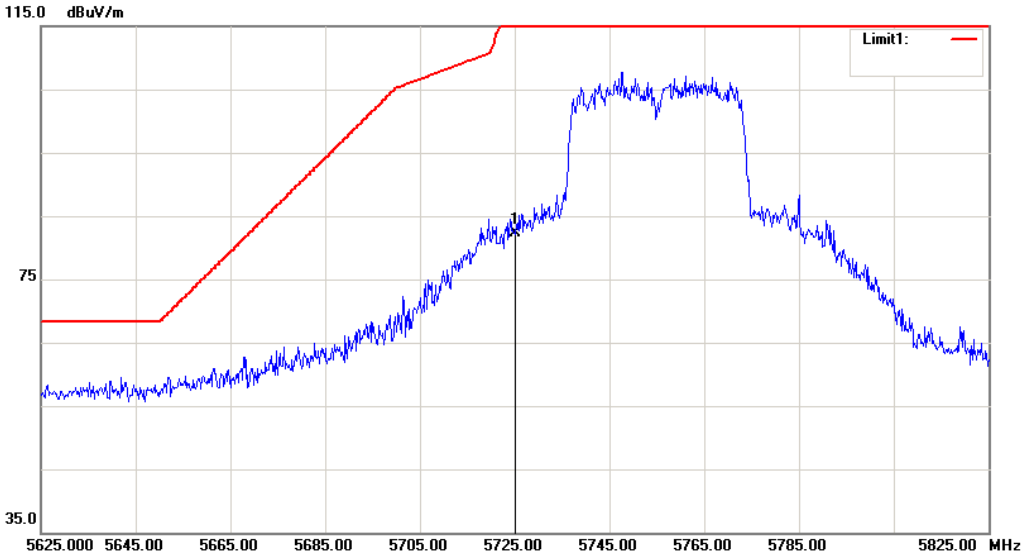
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5850.000	77.60	4.78	82.38	122.20	-39.82	Peak	Vertical
1	5850.000	73.83	4.78	78.61	122.20	-43.59	Peak	Horizontal

IEEE 802.11n HT 40 MHz mode/ 5755MHz
(combine with antenna 0 and antenna 1)

Detector mode: Peak Polarity: Vertical



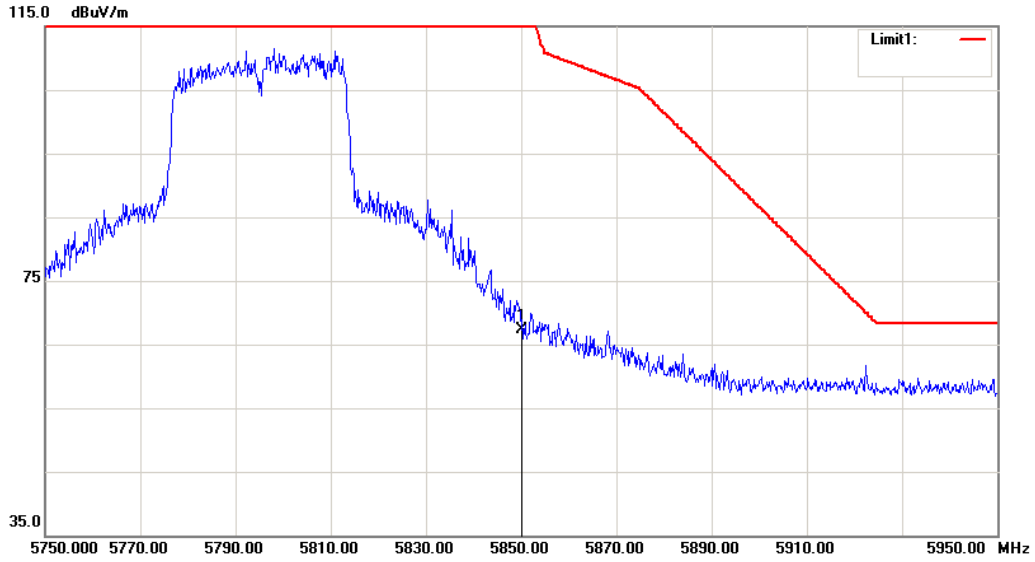
Detector mode: Peak Polarity: Horizontal



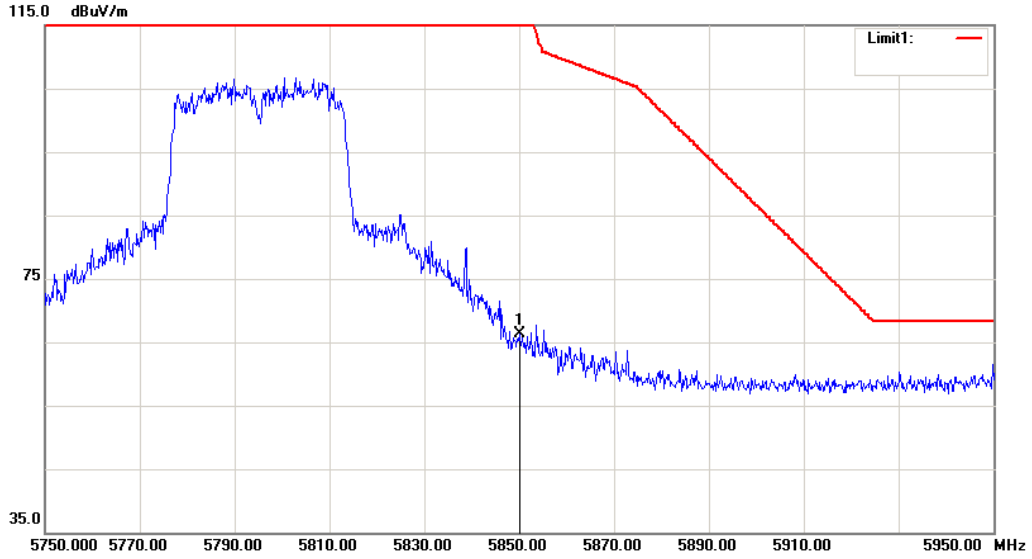
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5725.000	82.78	4.38	87.16	122.20	-35.04	Peak	Vertical
1	5725.000	77.87	4.38	82.25	122.20	-39.95	Peak	Horizontal

IEEE 802.11n HT 40 MHz mode / 5795MHz
(combine with antenna 0 and antenna 1)

Detector mode: Peak Polarity: Vertical



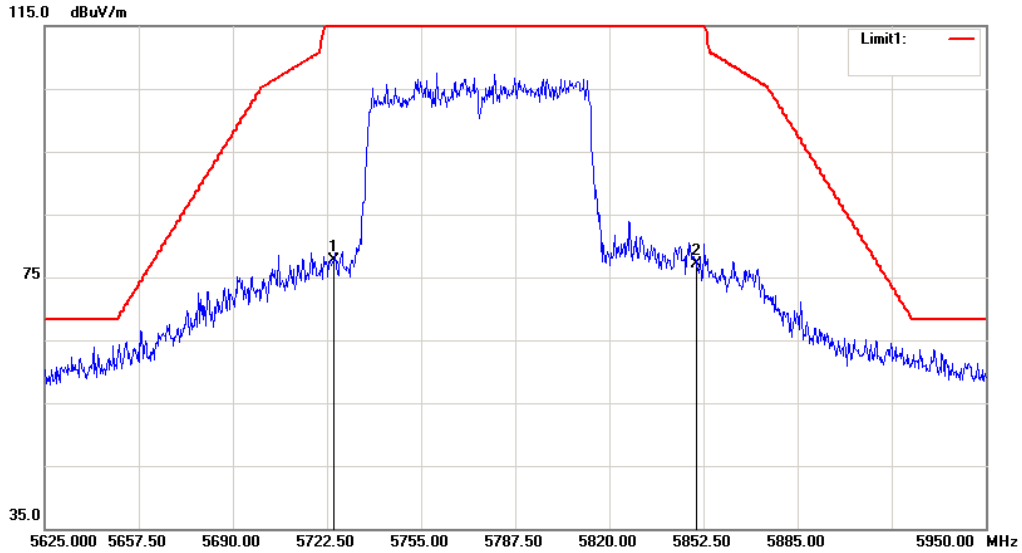
Detector mode: Peak Polarity: Horizontal



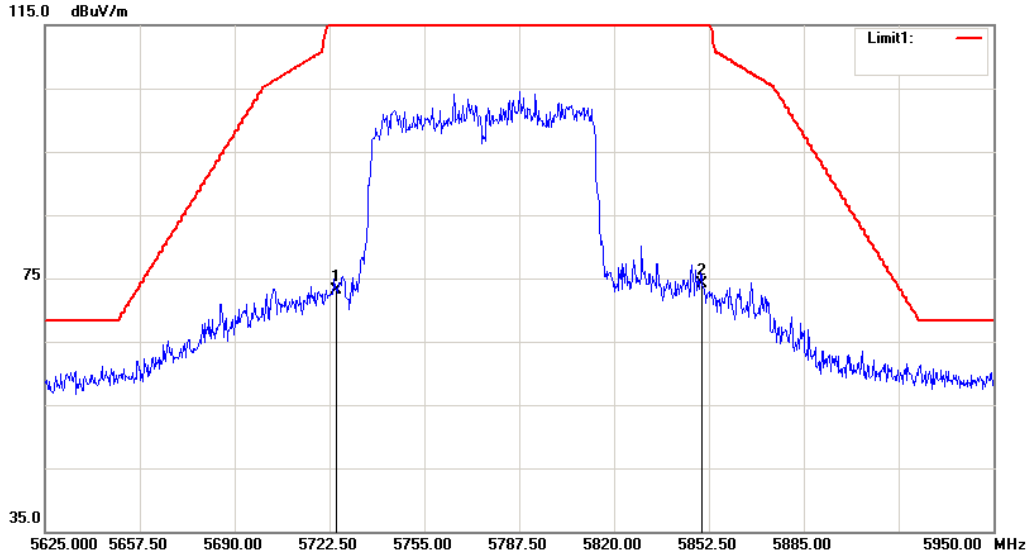
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5850.000	62.52	4.78	67.30	122.20	-54.90	Peak	Vertical
1	5850.000	61.53	4.78	66.31	122.20	-55.89	Peak	Horizontal

IEEE 802.11ac 80 mode / 5775MHz
(combine with antenna 0 and antenna 1)

Detector mode: Peak Polarity: Vertical



Detector mode: Peak Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Antenna Polar
1	5725.000	73.38	4.38	77.76	122.20	-44.44	Peak	Vertical
2	5850.000	72.29	4.78	77.07	122.20	-45.13	Peak	Vertical
1	5725.000	68.67	4.38	73.05	122.20	-49.15	Peak	Horizontal
2	5850.000	69.31	4.78	74.09	122.20	-48.11	Peak	Horizontal

8. EMISSION BANDWIDTH

8.1. LIMITS

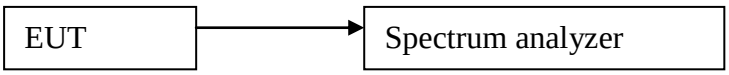
For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.2. TEST PROCEDURES

1) The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2) Set to the maximum power setting and enable the EUT transmit continuously.
3) For 26dB bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = approximately 1%EBW, VBW≥3RBW , Detector = Peak, Trace mode = max hold, Span ＞ 26 dB bandwidth and Sweep time = auto
4) Mark the peak frequency and -26dB (upper and lower) frequency.
5) For 6 Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) =100kHz VBW = 300 kHz, Detector = Peak, Trace mode = max hold.
6) Mark the peak frequency and -6dB (upper and lower) frequency.
7) For 99% Occupied Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) =1% to 5% of the OBW, VBW ≥3RBW, Detector = Peak, Trace mode = max hold，Span= 1.5 times to 5 times the OBW.
8) Measure and record the worst results in the test report.

8.3. TEST SETUP



8.4. TEST RESULTS

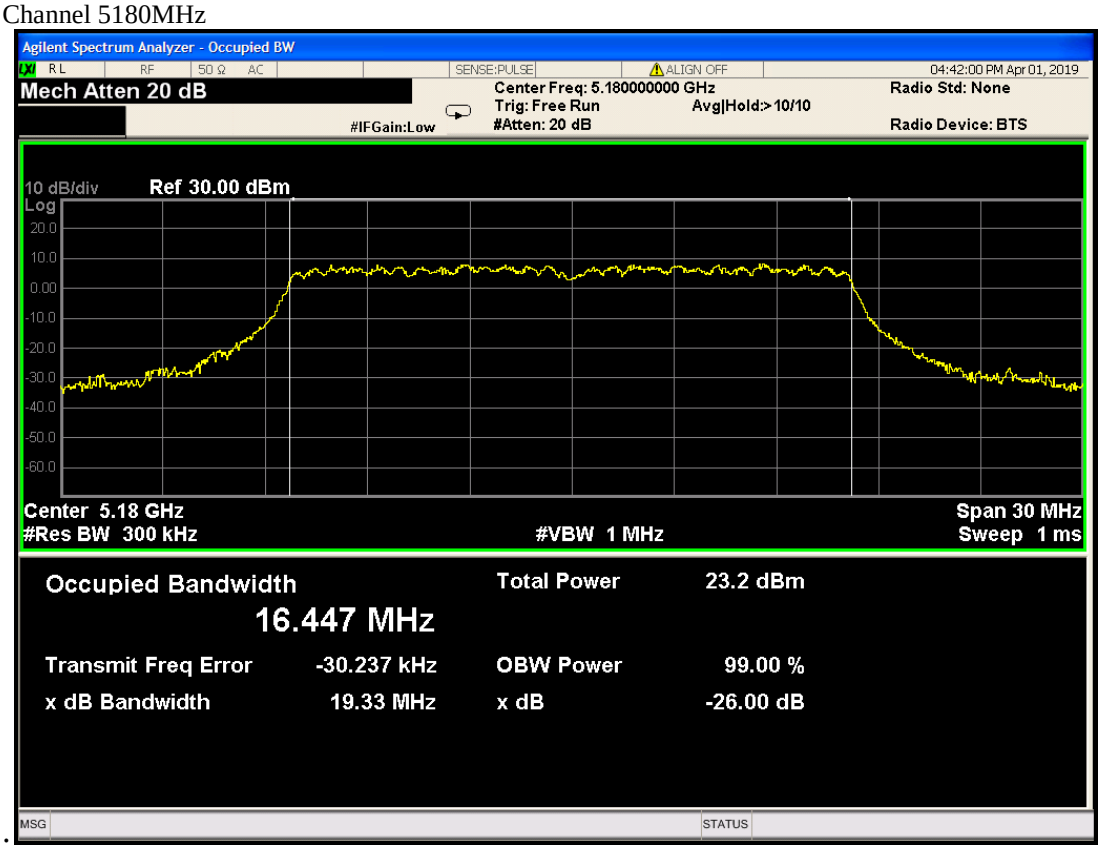
26dB Bandwidth

802.11a mode		
Test Frequency (MHz)	26dB Bandwidth (MHz)	
	Antenna 0	Antenna 1
5180	19.33	19.17
5200	19.21	19.17
5240	19.22	19.24
802.11n HT20 mode		
5180	20.25	20.28
5200	20.16	20.26
5240	20.19	20.25
802.11n HT40 mode		
5190	38.63	38.67
5230	38.57	38.90
802.11ac 80 mode		
5210	84.47	83.89

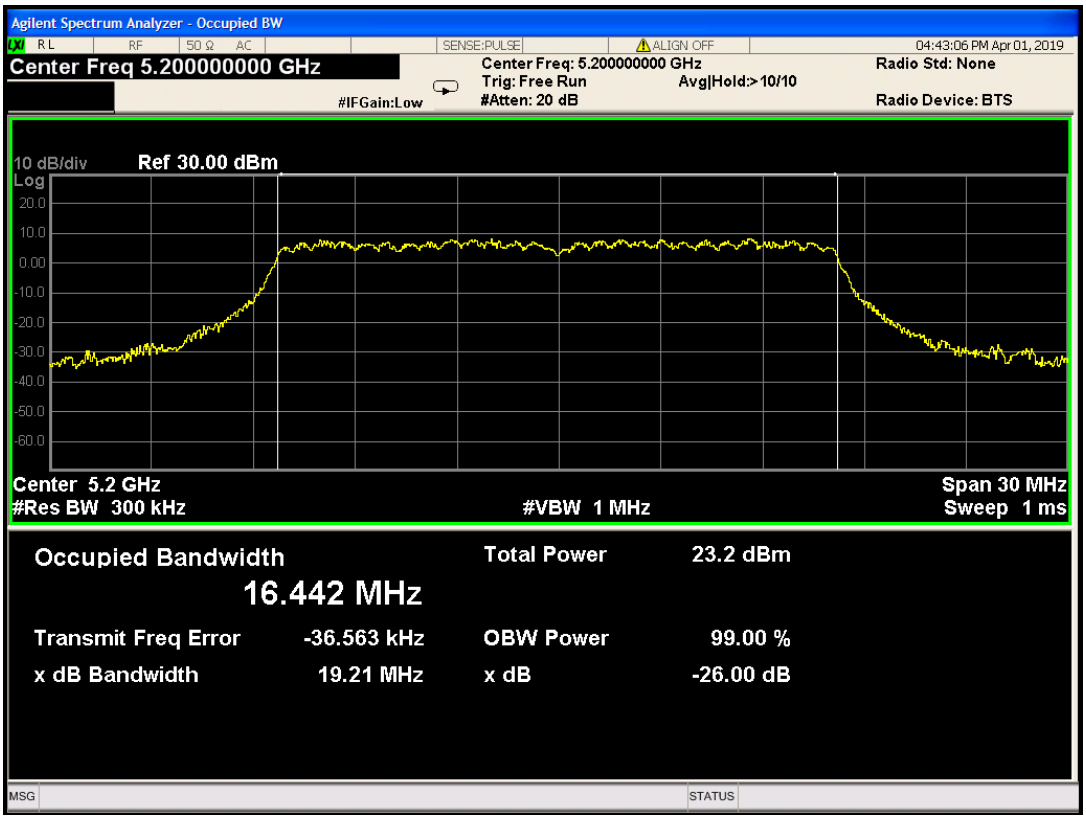
Test Results (plots) of Bandwidth

802.11a mode (Antenna 0):

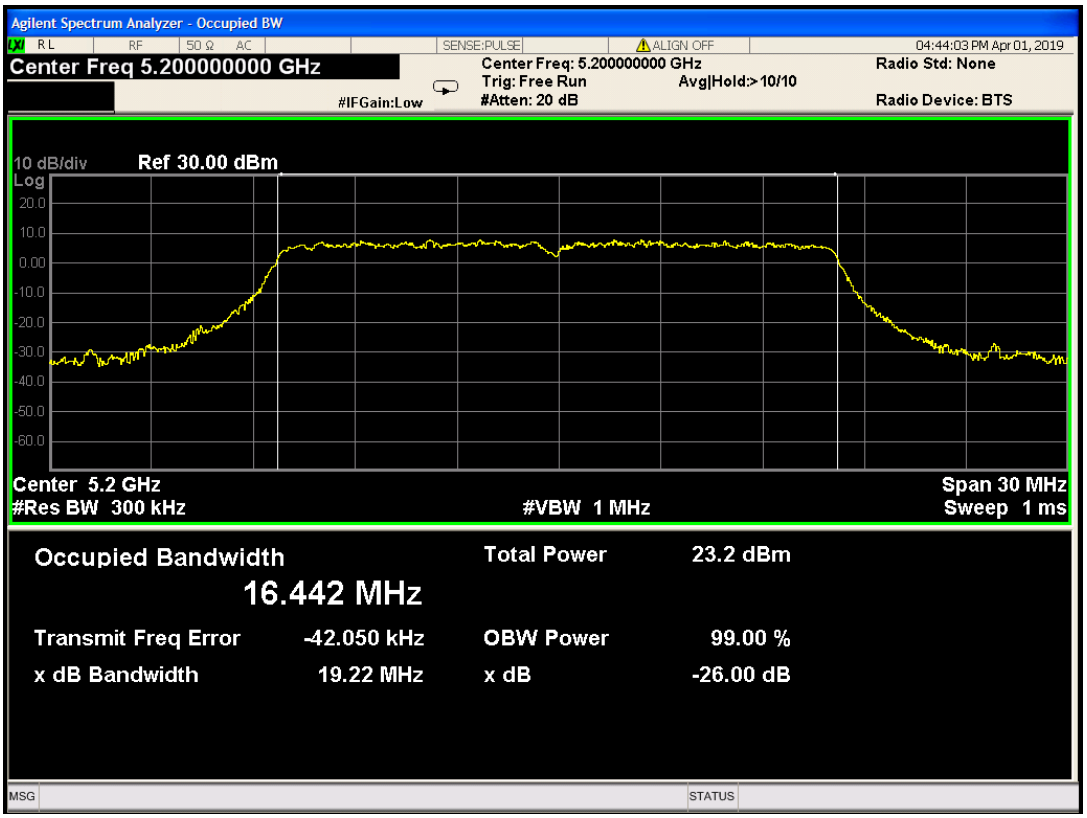
Channel 5180MHz



Channel 5200MHz

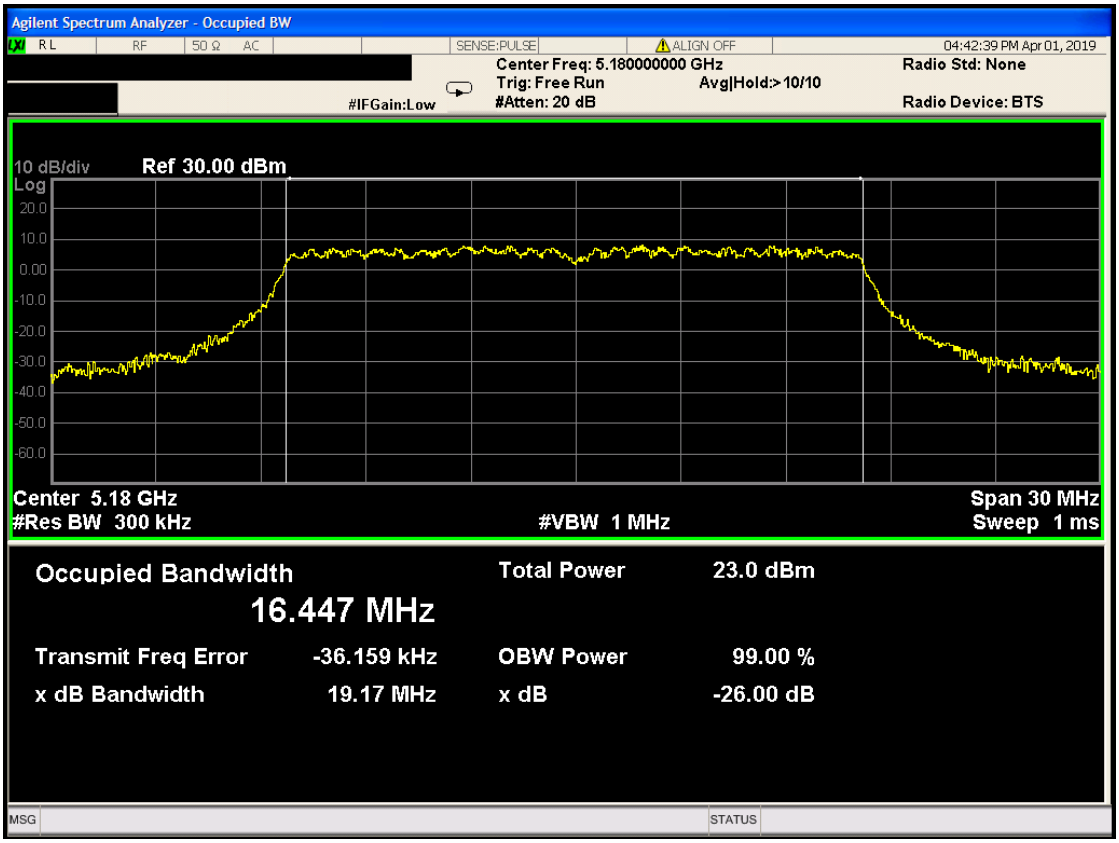


Channel 5240MHz

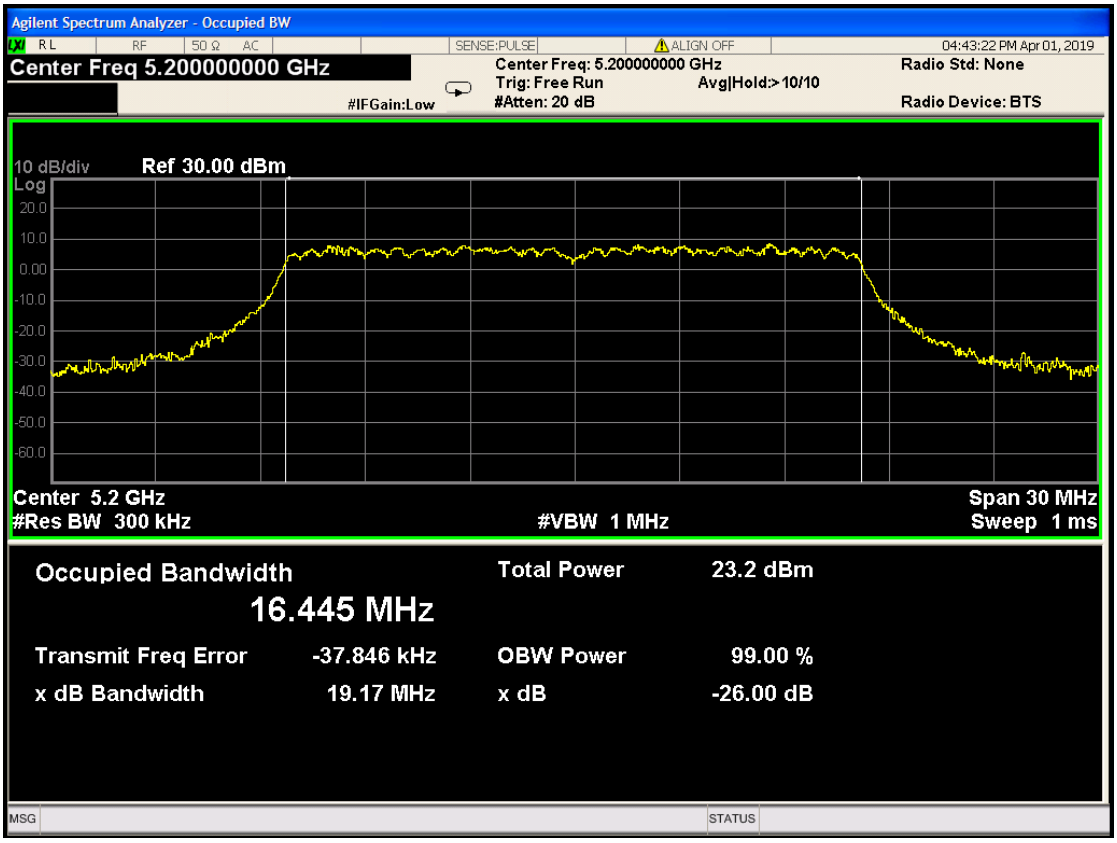


802.11a mode (Antenna 1):

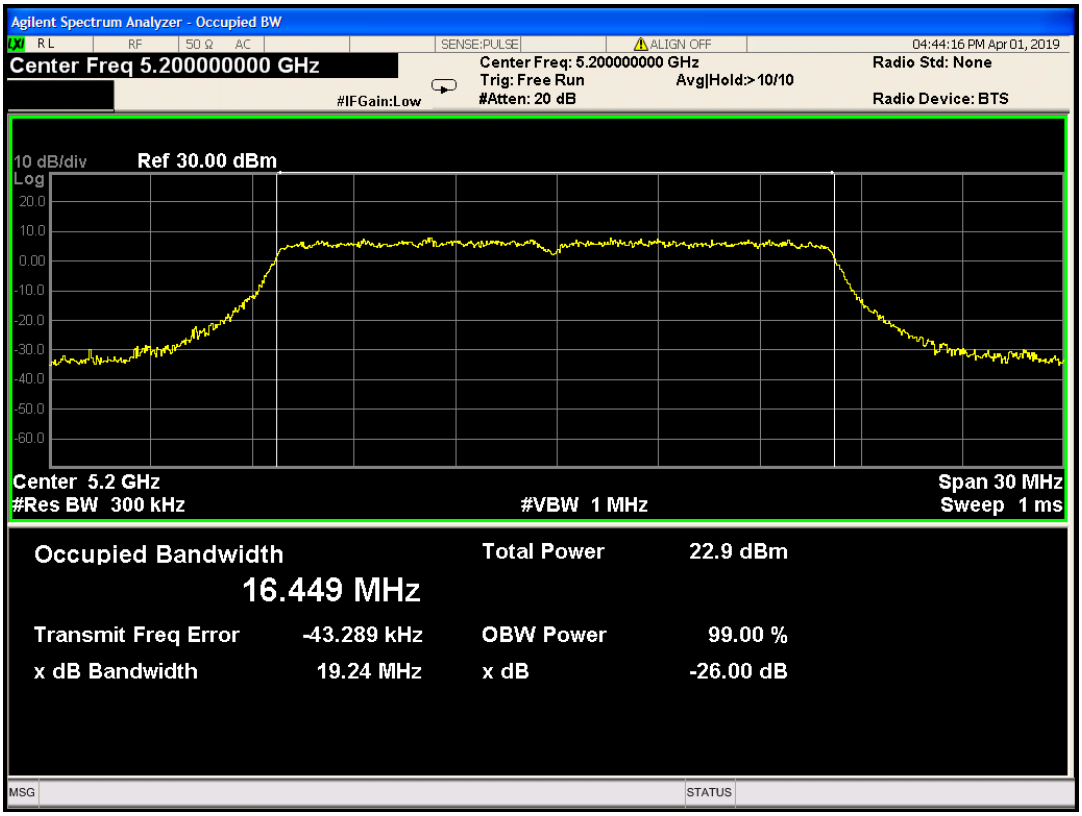
Channel 5180MHz



Channel 5200MHz

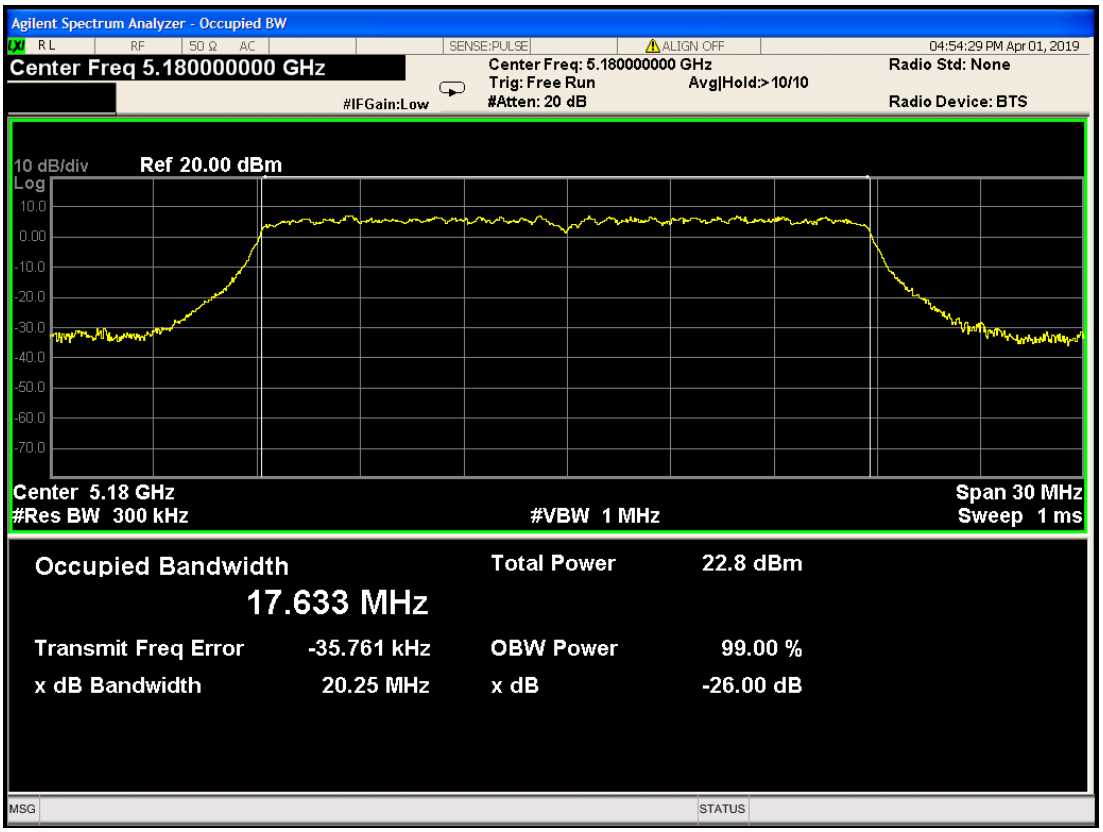


Channel 5240MHz

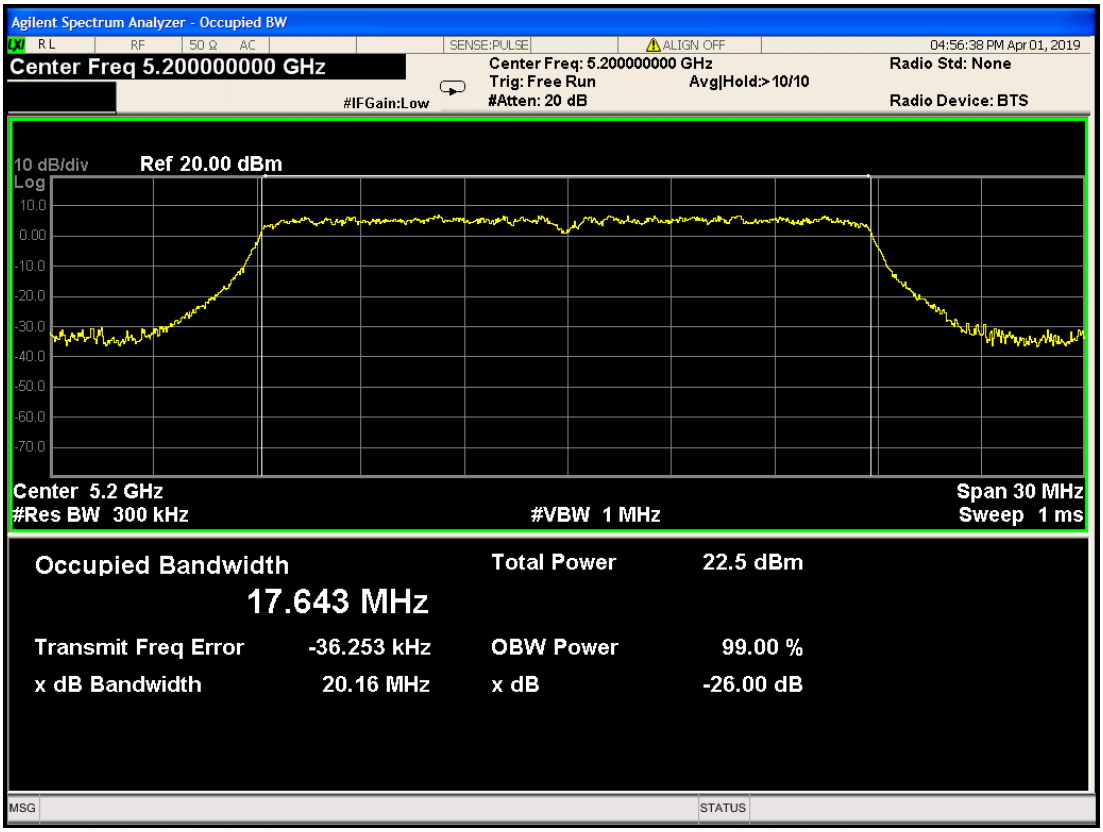


802.11n HT20 mode(Antenna 0):

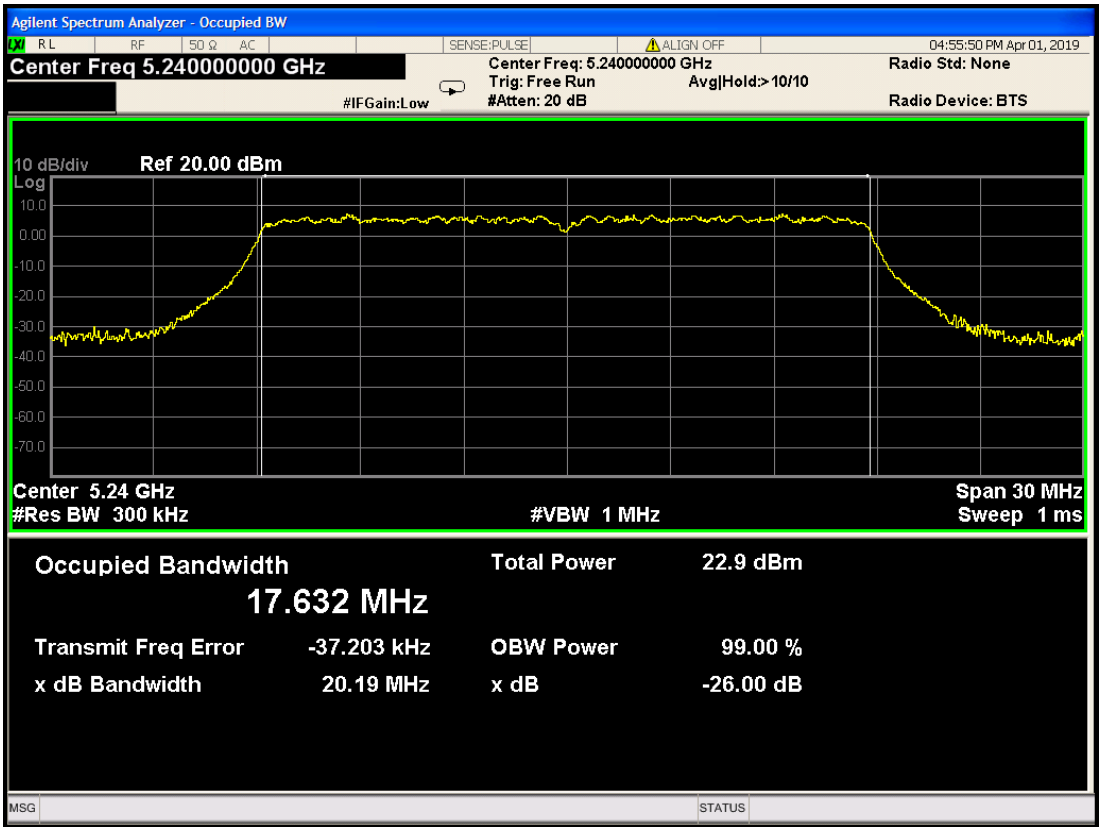
Channel 5180MHz



Channel 5200MHz

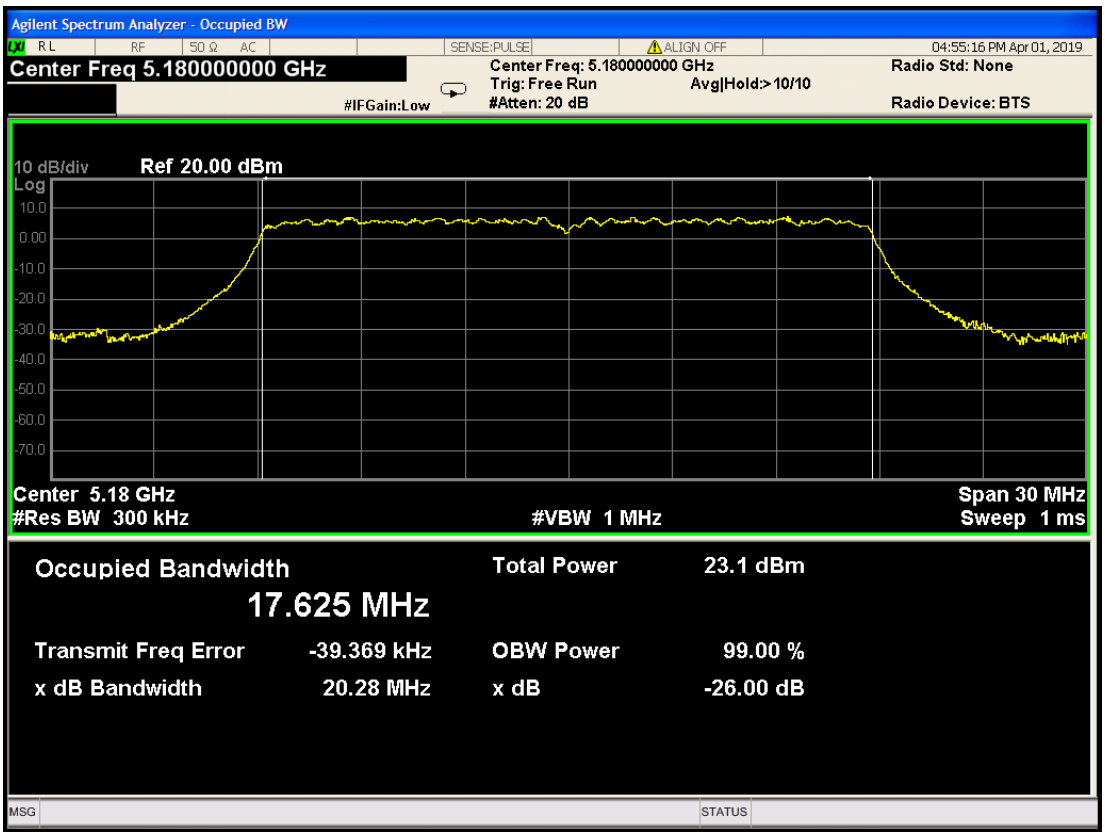


Channel 5240MHz

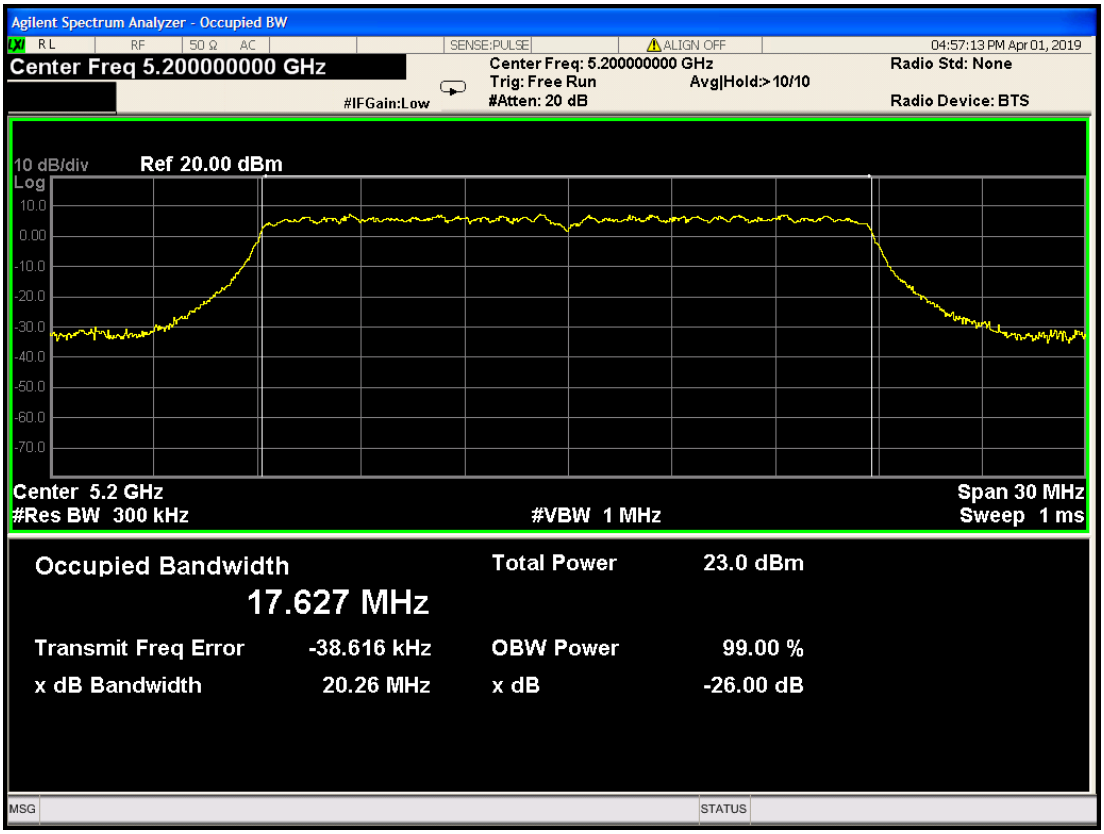


802.11n HT20 mode(Antenna 1):

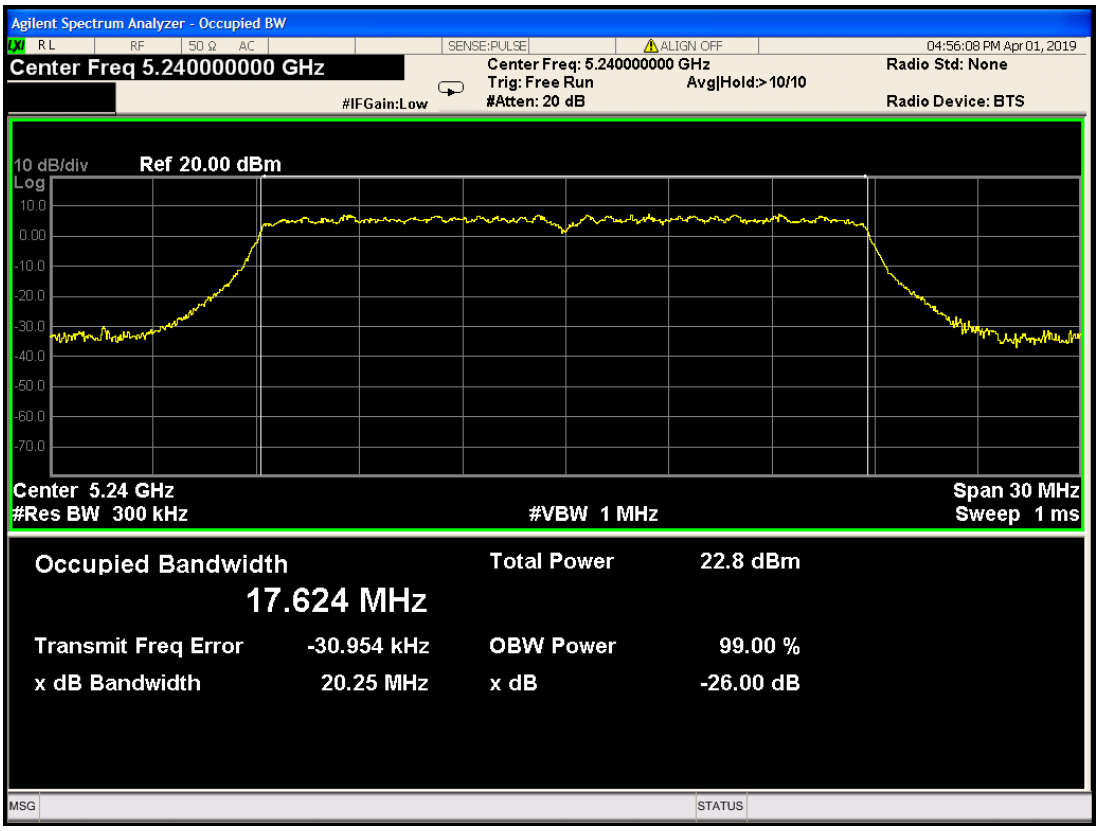
Channel 5180MHz



Channel 5200MHz

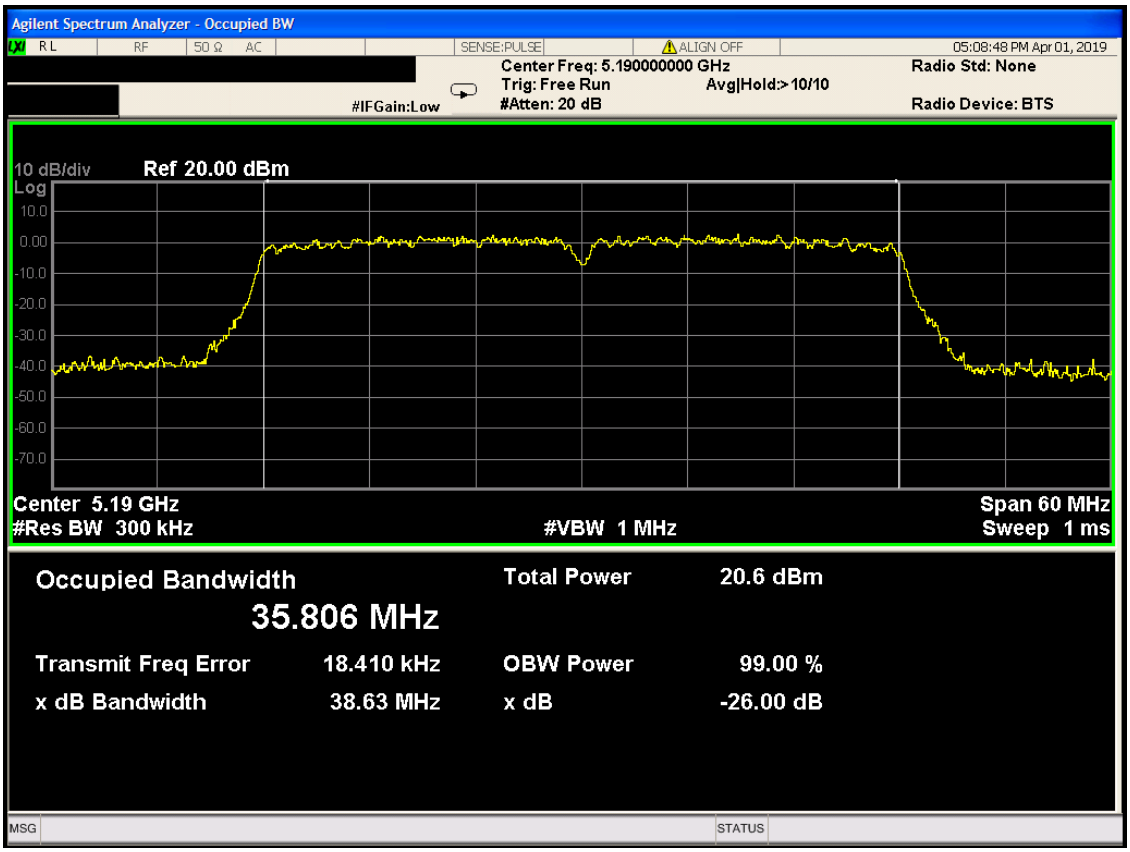


Channel 5240MHz

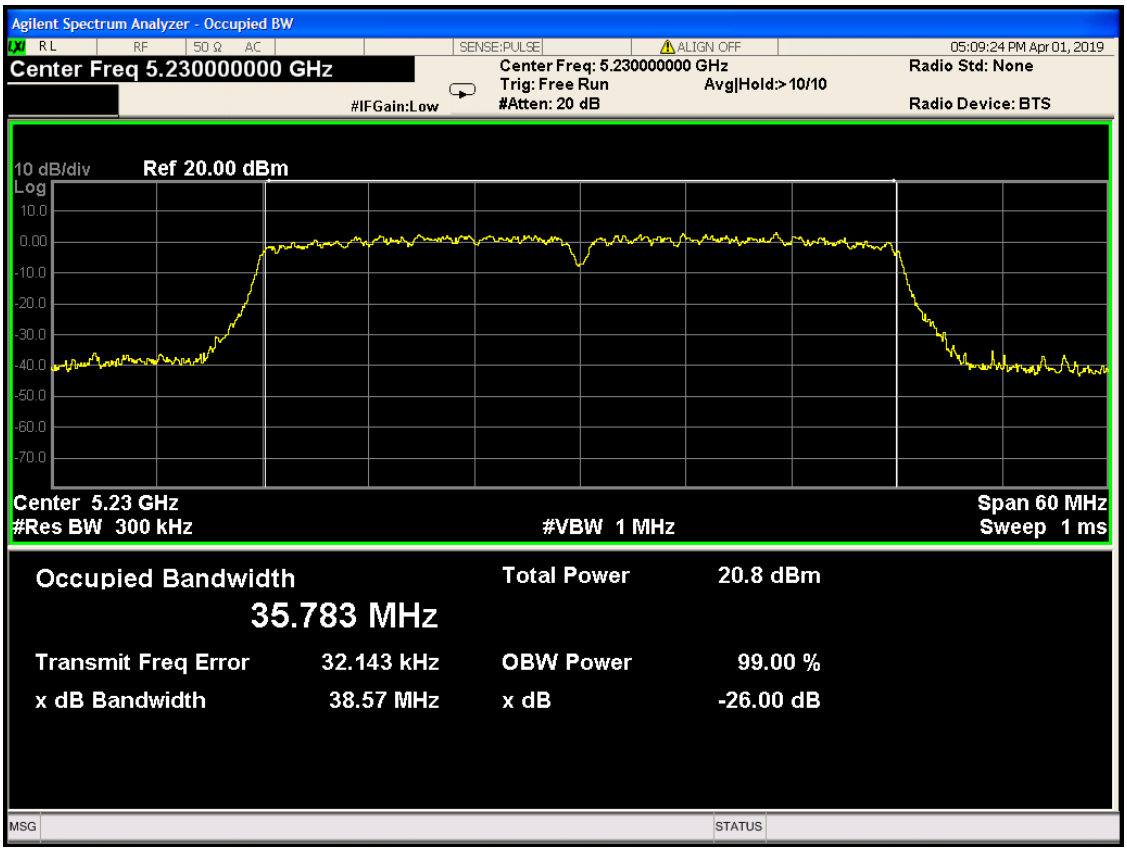


802.11n HT40 mode(Antenna 0):

Channel 5190MHz

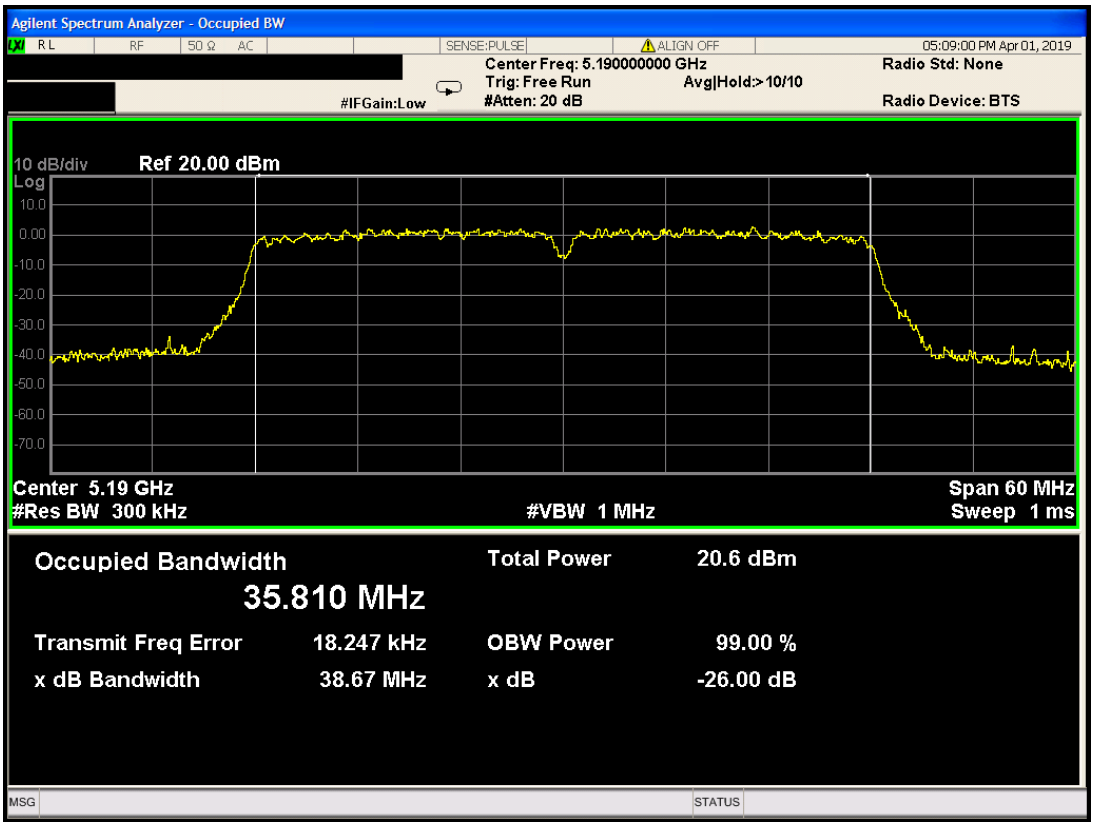


Channel 5230MHz

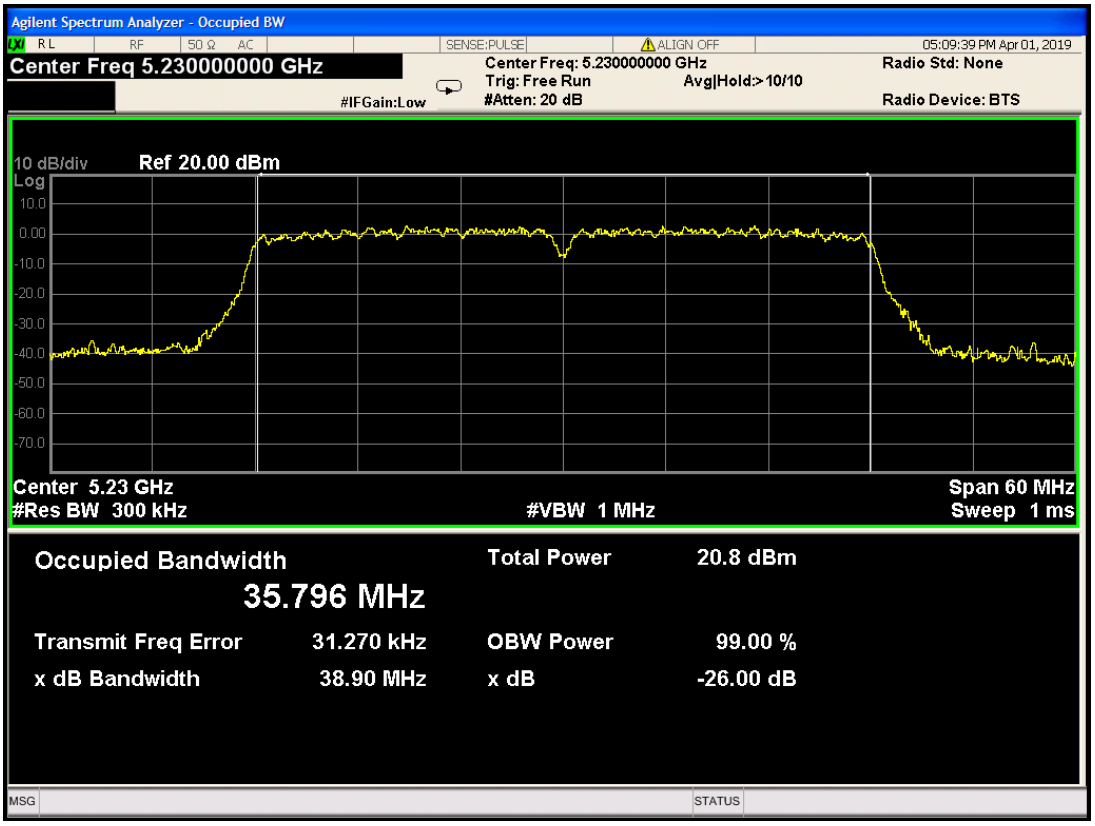


802.11n HT40 mode(Antenna 1):

Channel 5190MHz

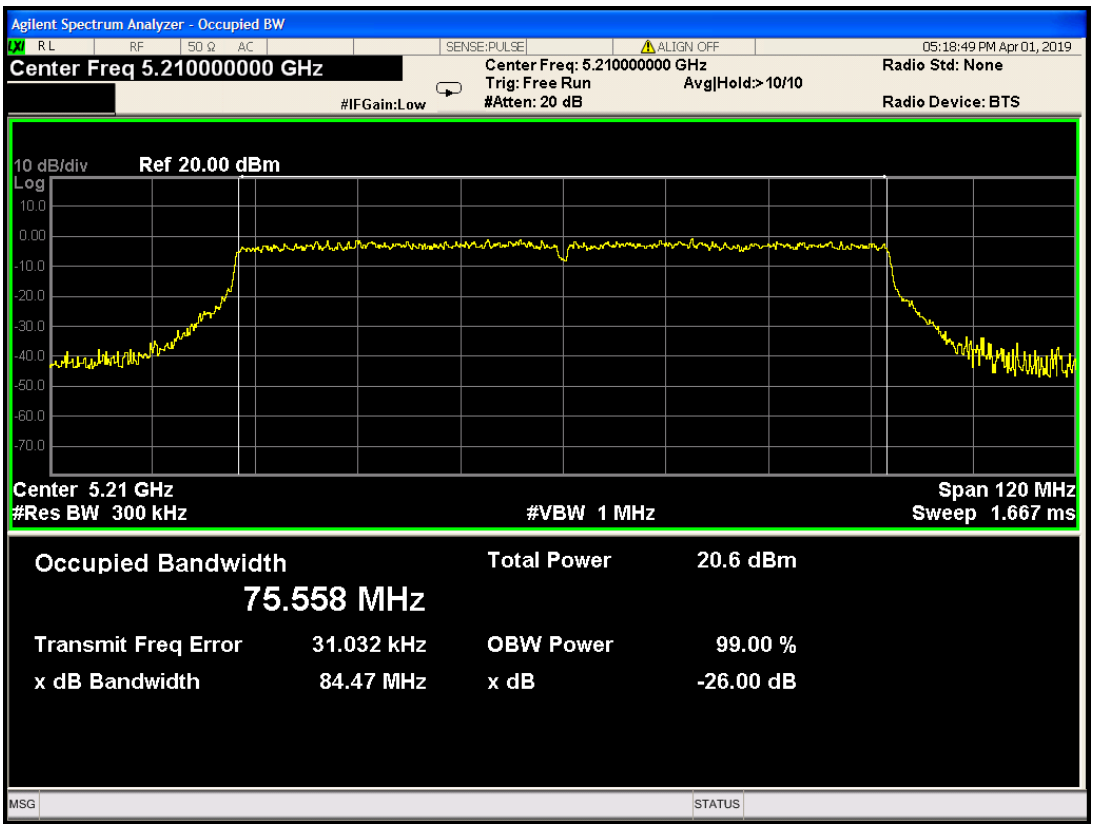


Channel 5230MHz



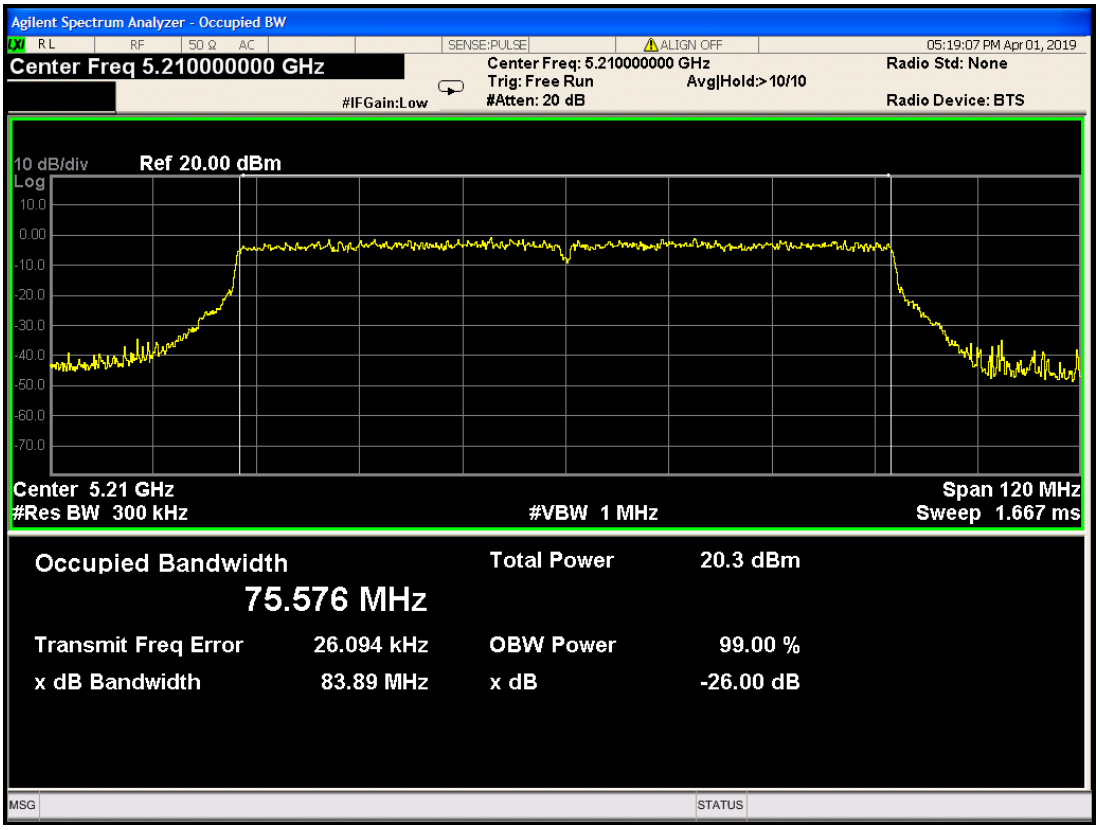
802.11ac 80 mode(Antenna 0):

Channel 5210MHz



802.11ac 80 mode(Antenna 1):

Channel 5210MHz

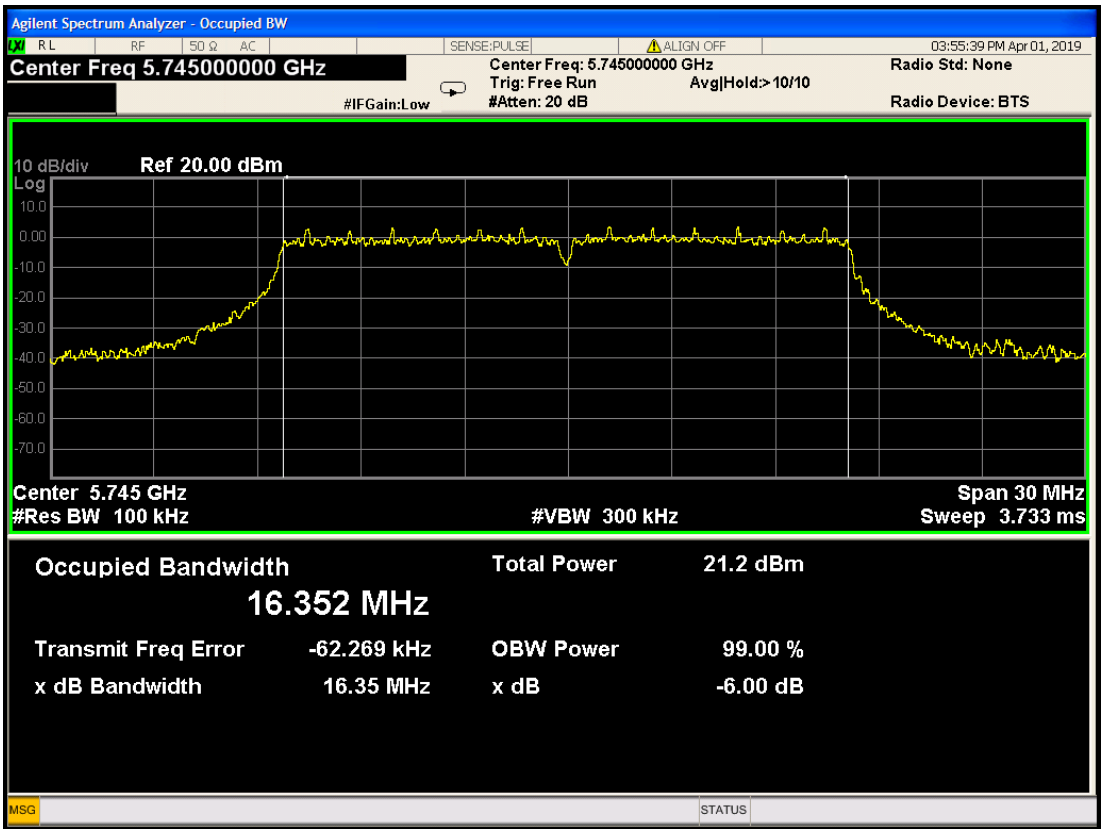


6dB Bandwidth

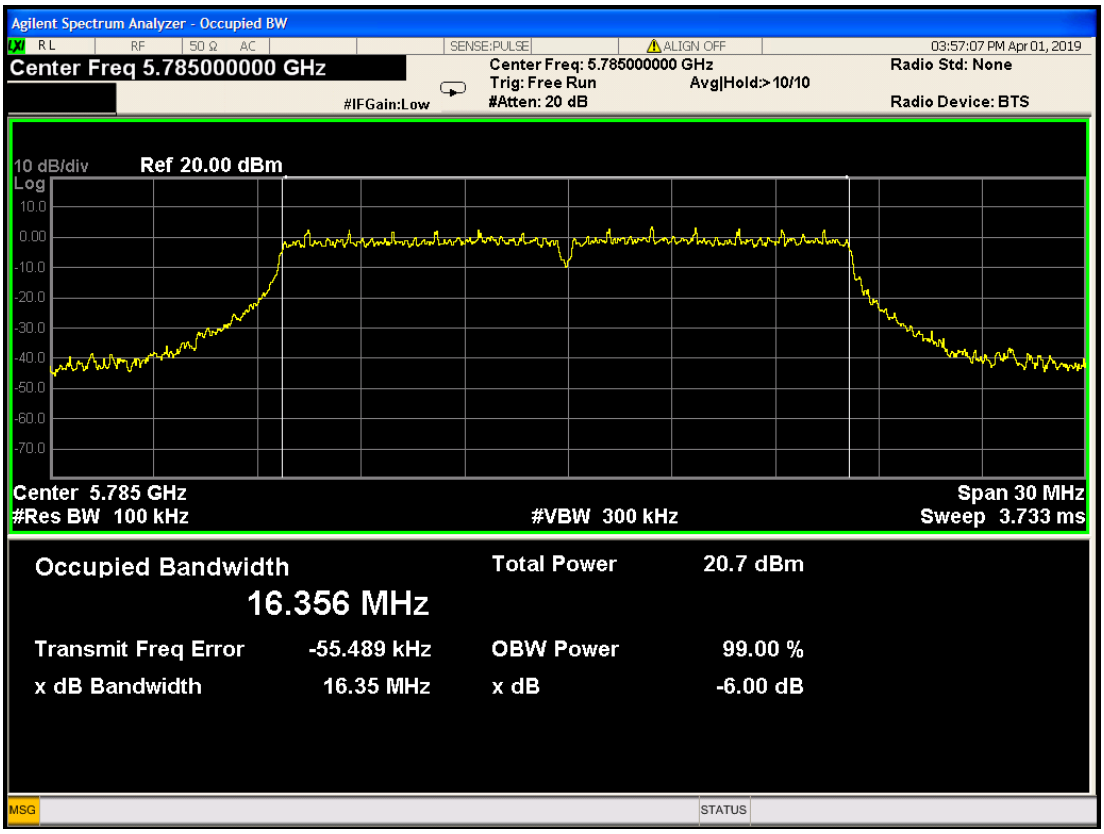
802.11a mode				
Frequency (MHz)	6dB Bandwidth (MHz)		Limit (kHz)	Result
	Antenna 0	Antenna 1		
5745	16.35	16.36	>500	PASS
5785	16.35	16.35		PASS
5825	16.36	16.36		PASS
802.11n HT20 mode				
5745	17.58	17.59	>500	PASS
5785	17.59	17.59		PASS
5825	17.60	17.60		PASS
802.11n HT40 mode				
5755	35.13	35.14	>500	PASS
5795	35.13	35.69		PASS
802.11ac 80 mode				
5775	76.43	76.42	>500	PASS

802.11a mode(Antenna 0)::

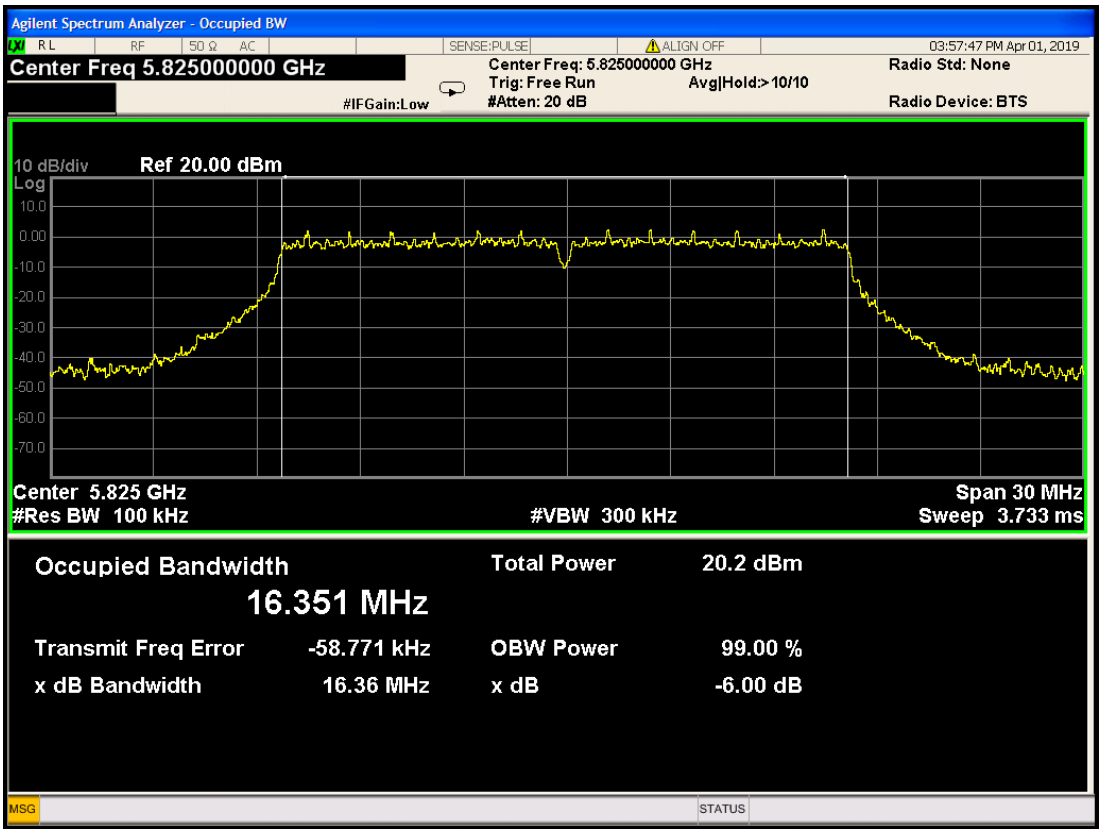
Channel 5745MHz



Channel 5785MHz

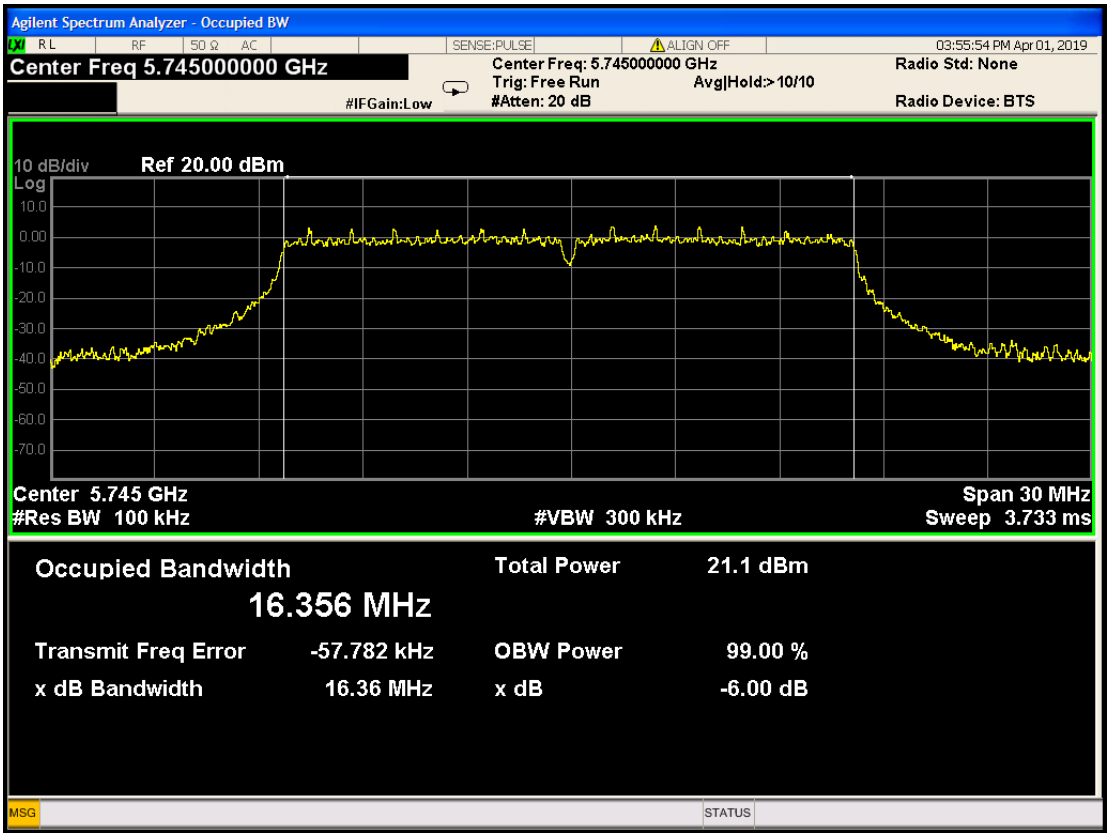


Channel 5825MHz

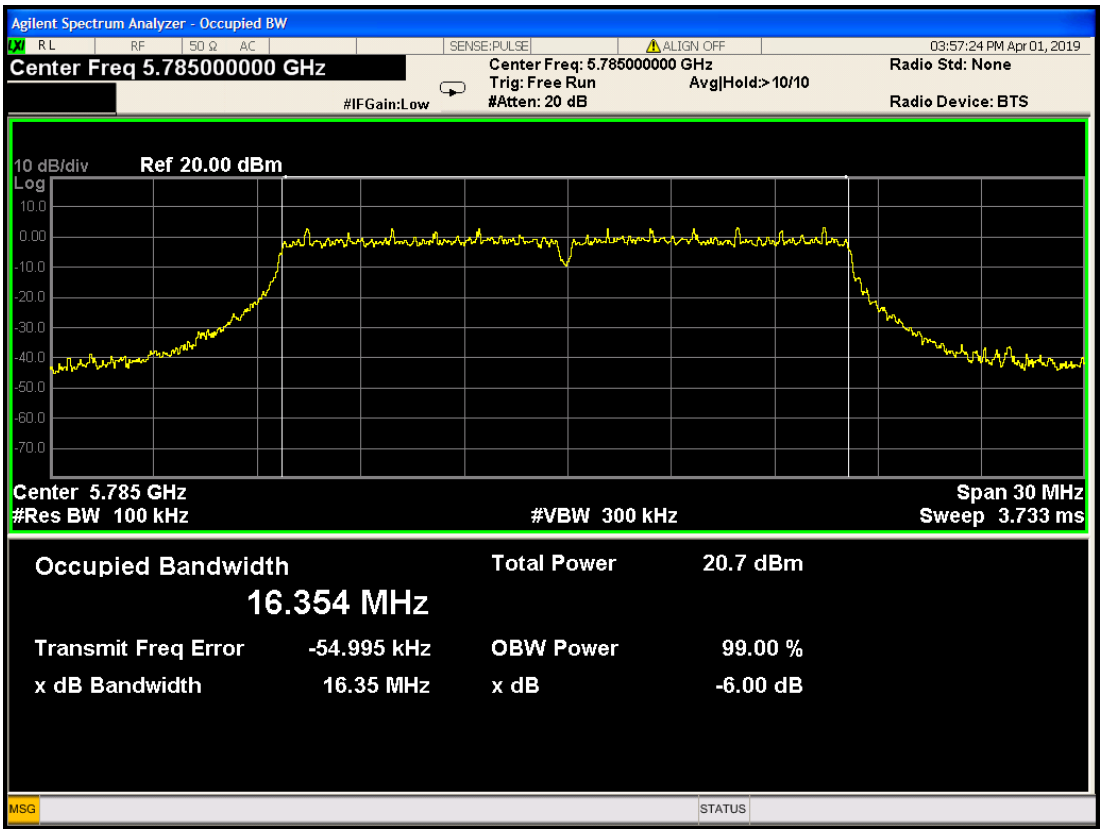


802.11a mode(Antenna 1)::

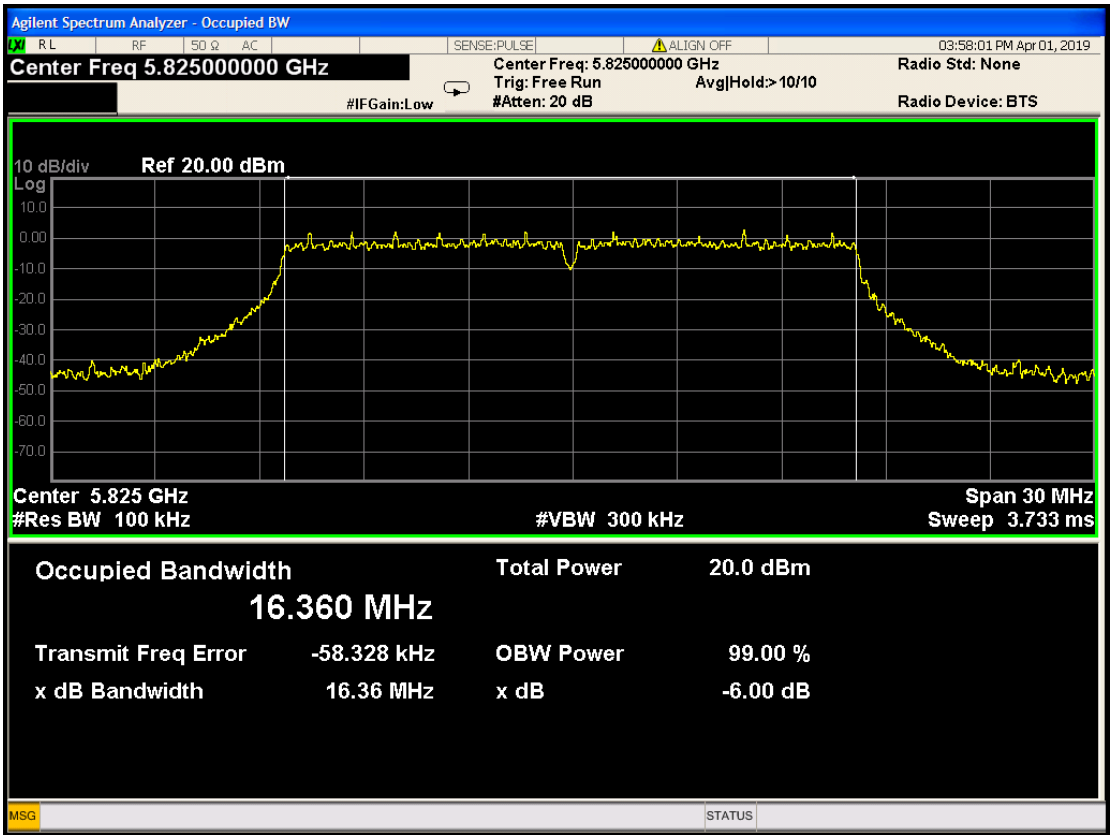
Channel 5745MHz



Channel 5785MHz

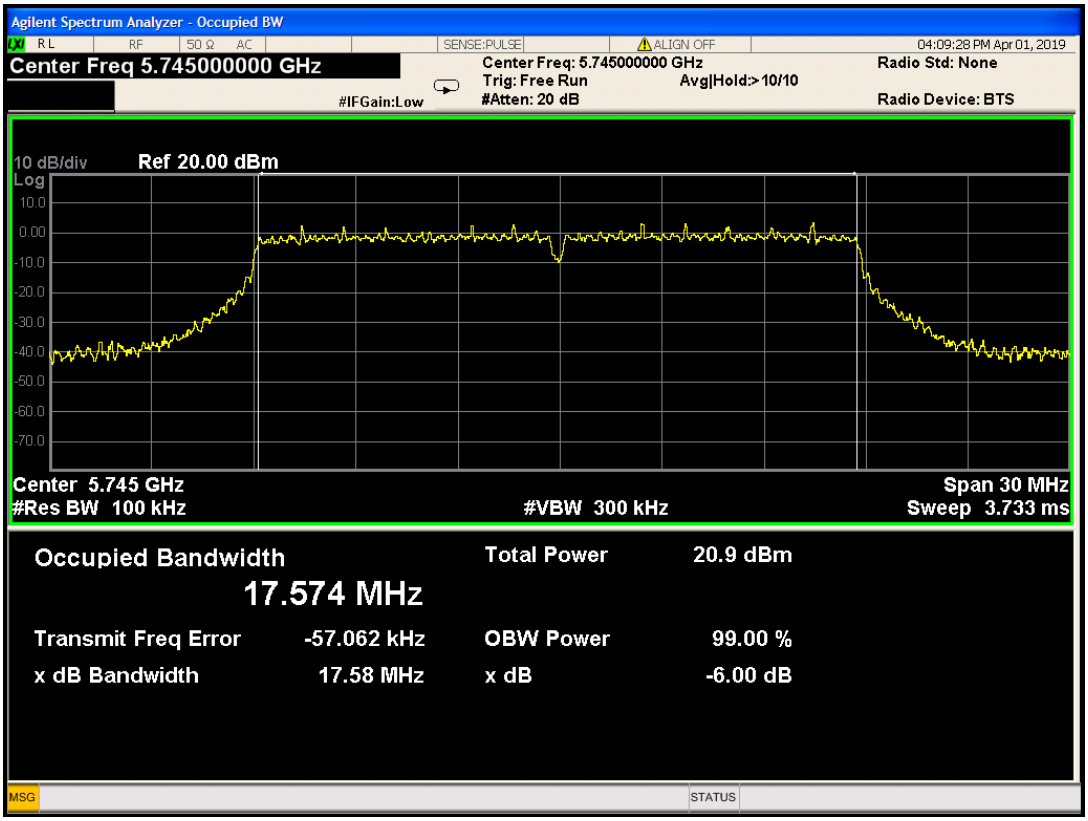


Channel 5825MHz

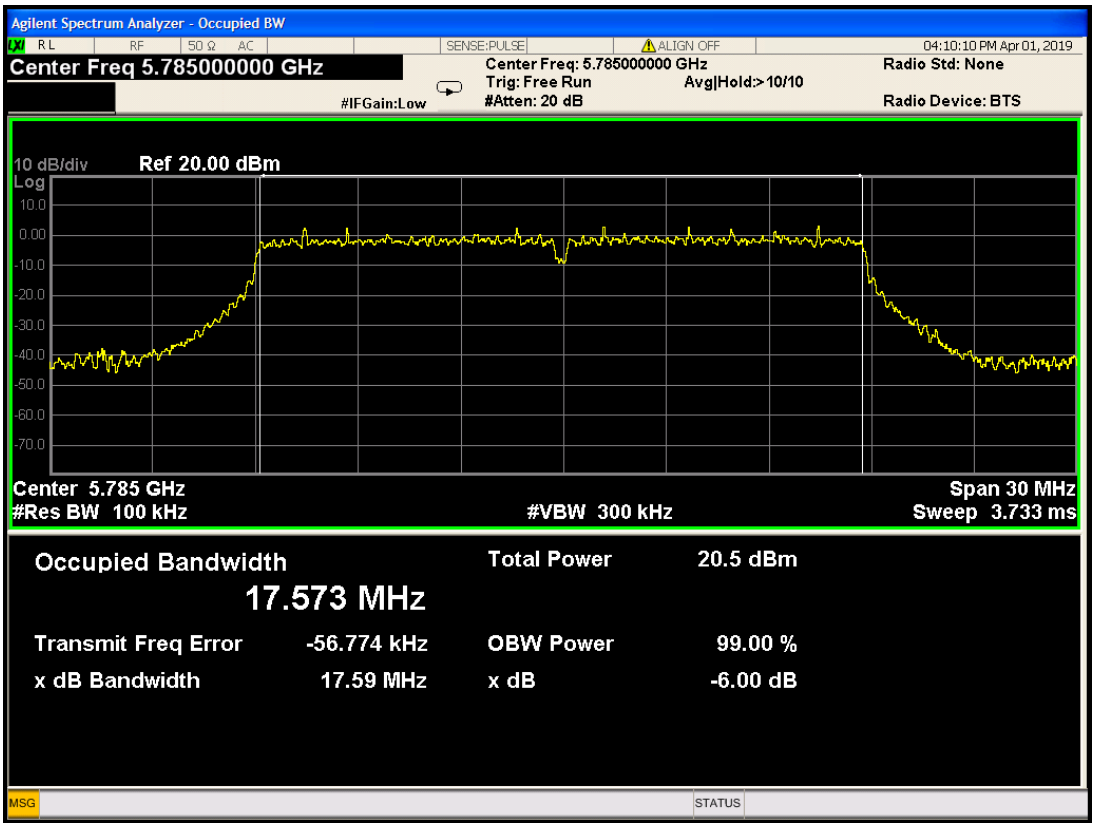


802.11n HT20 mode(Antenna 0)::

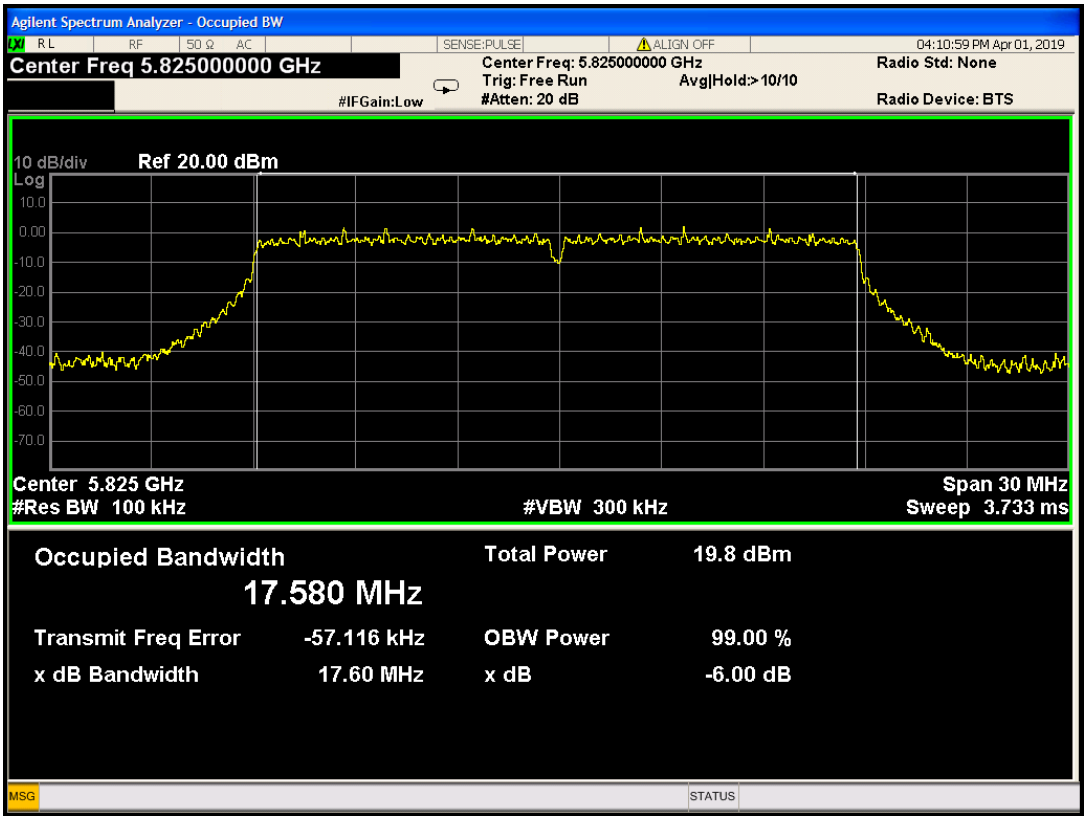
Channel 5745MHz



Channel 5785MHz

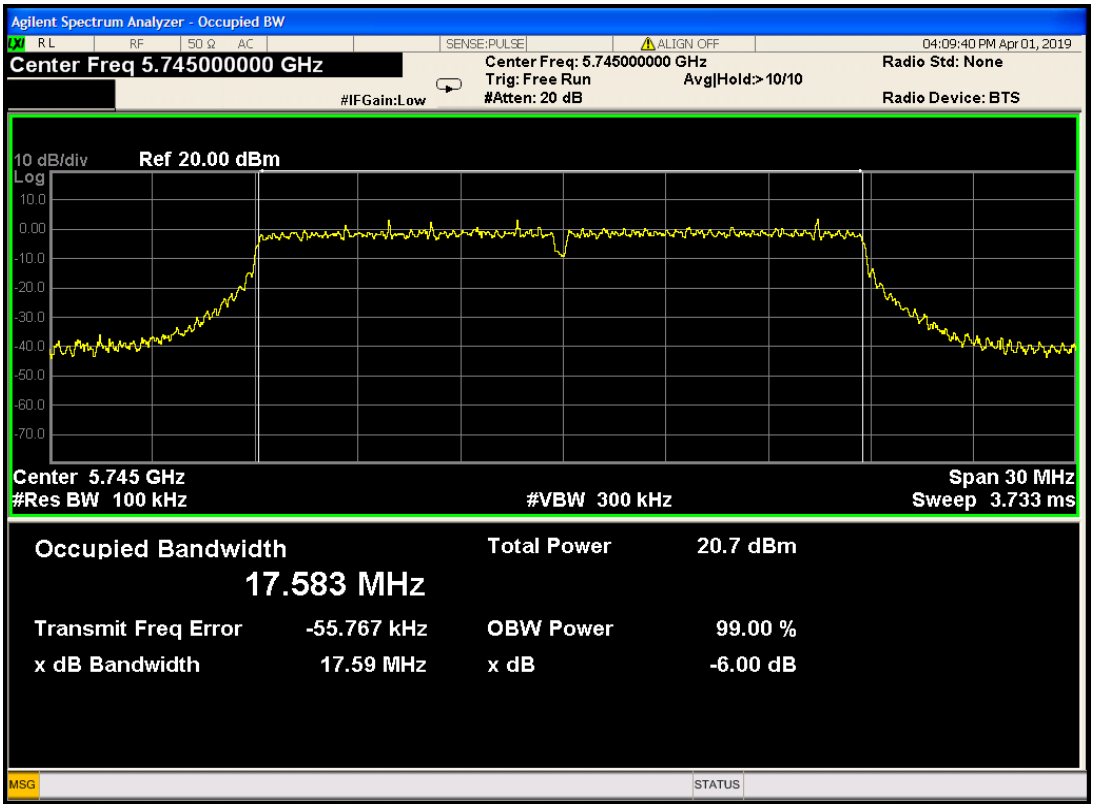


Channel 5825MHz

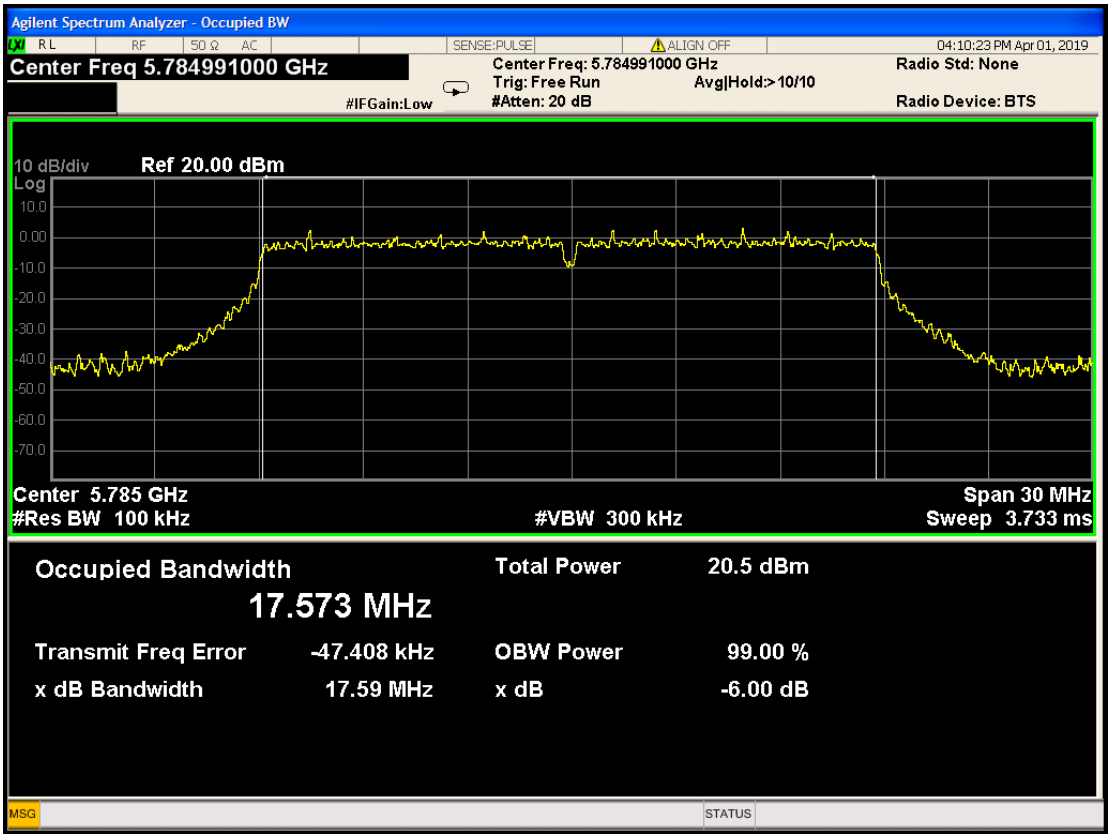


802.11n HT20 mode(Antenna 1)::

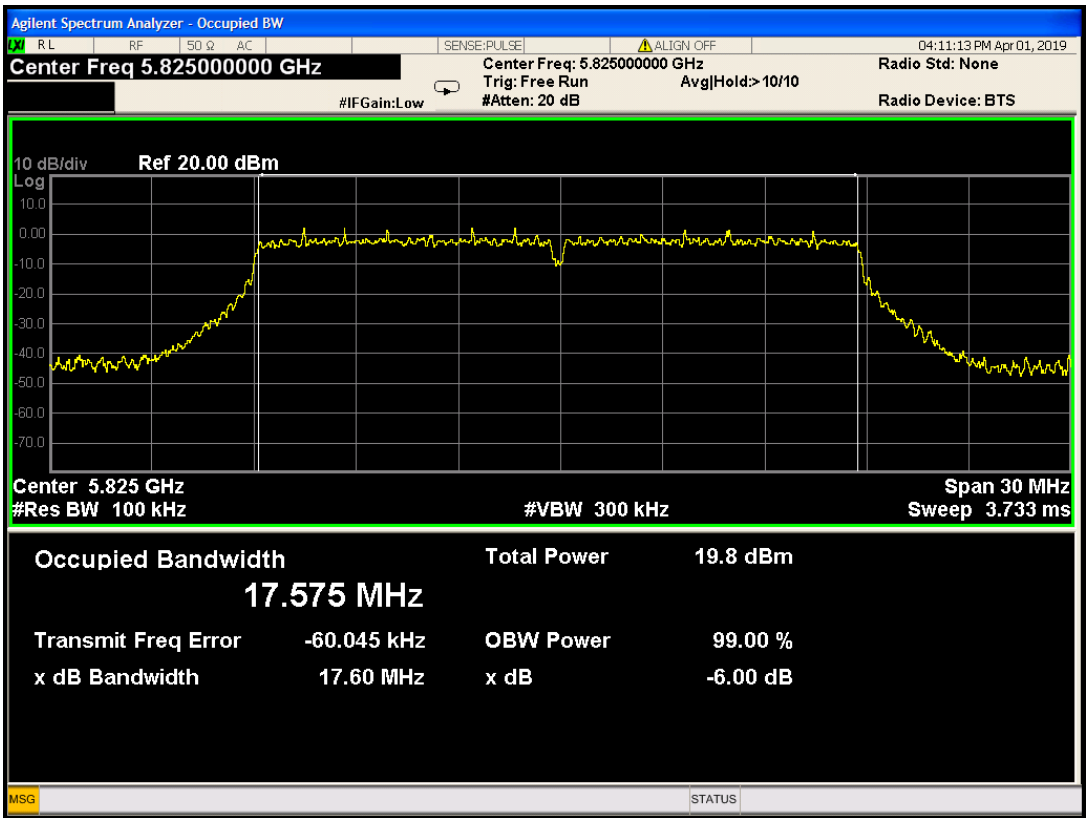
Channel 5745MHz



Channel 5785MHz

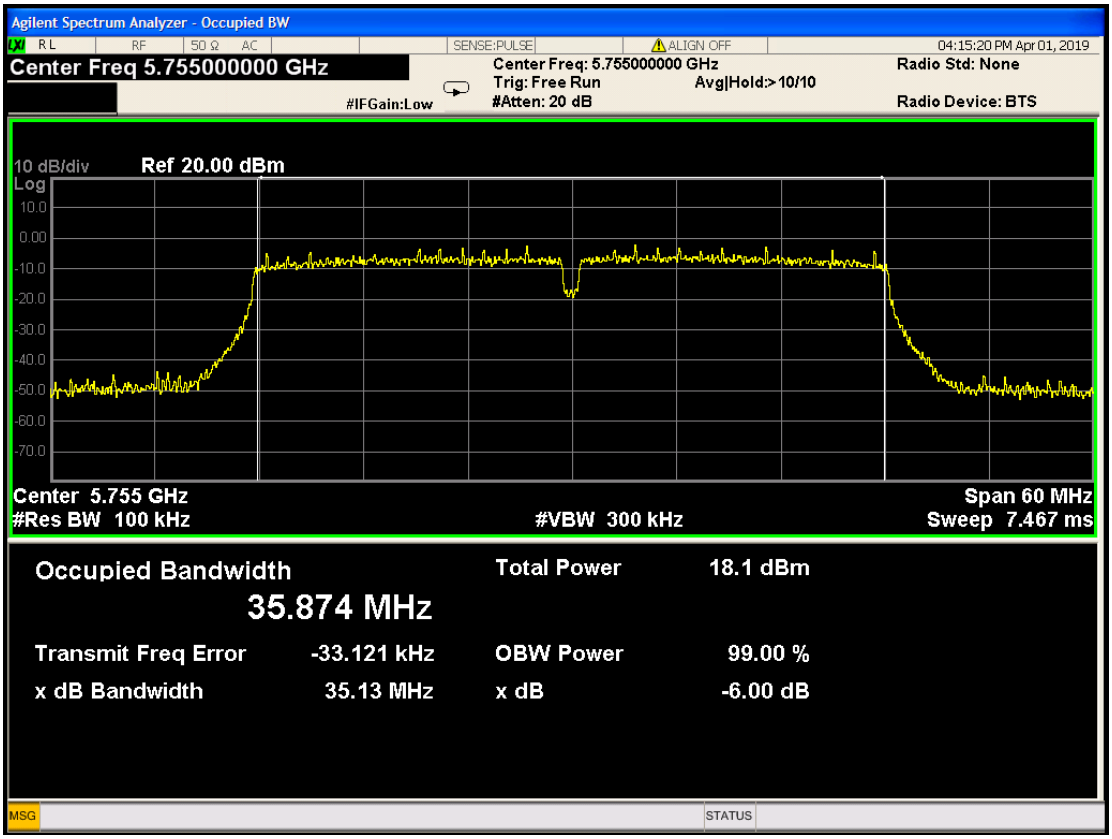


Channel 5825MHz

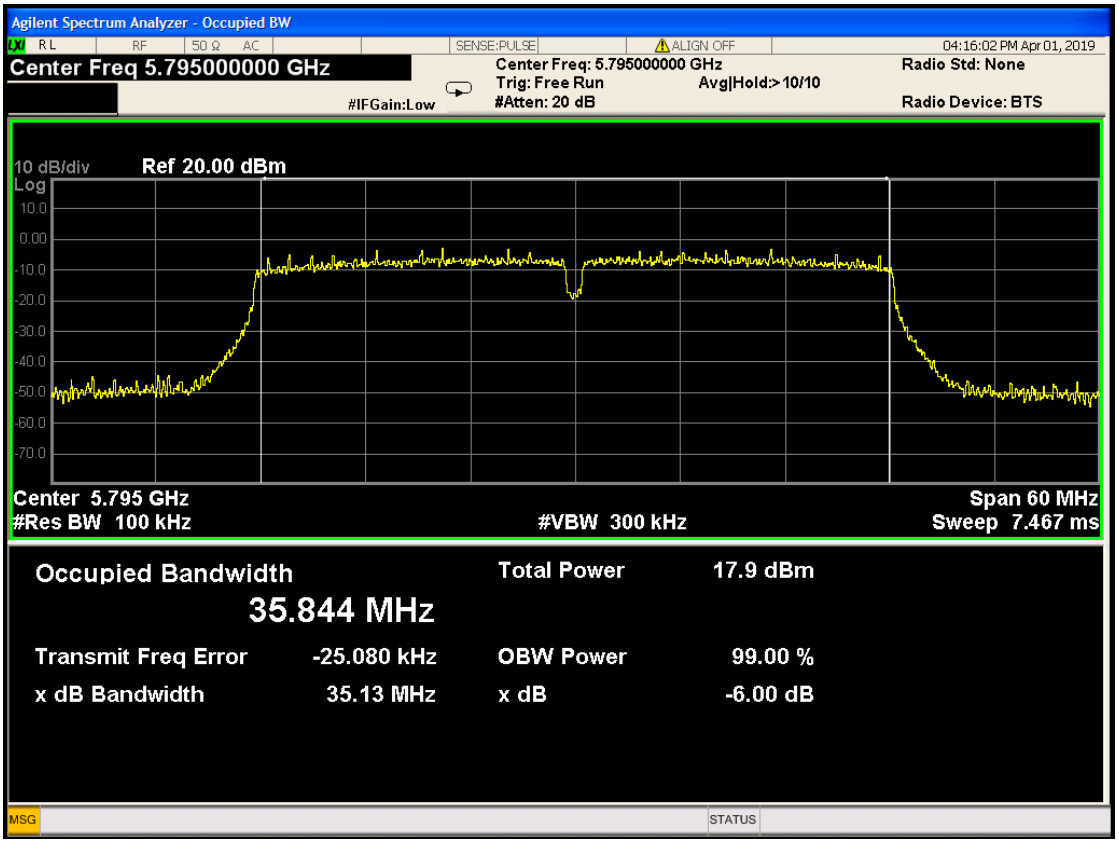


802.11n HT40 mode(Antenna 0)::

Channel 5755MHz

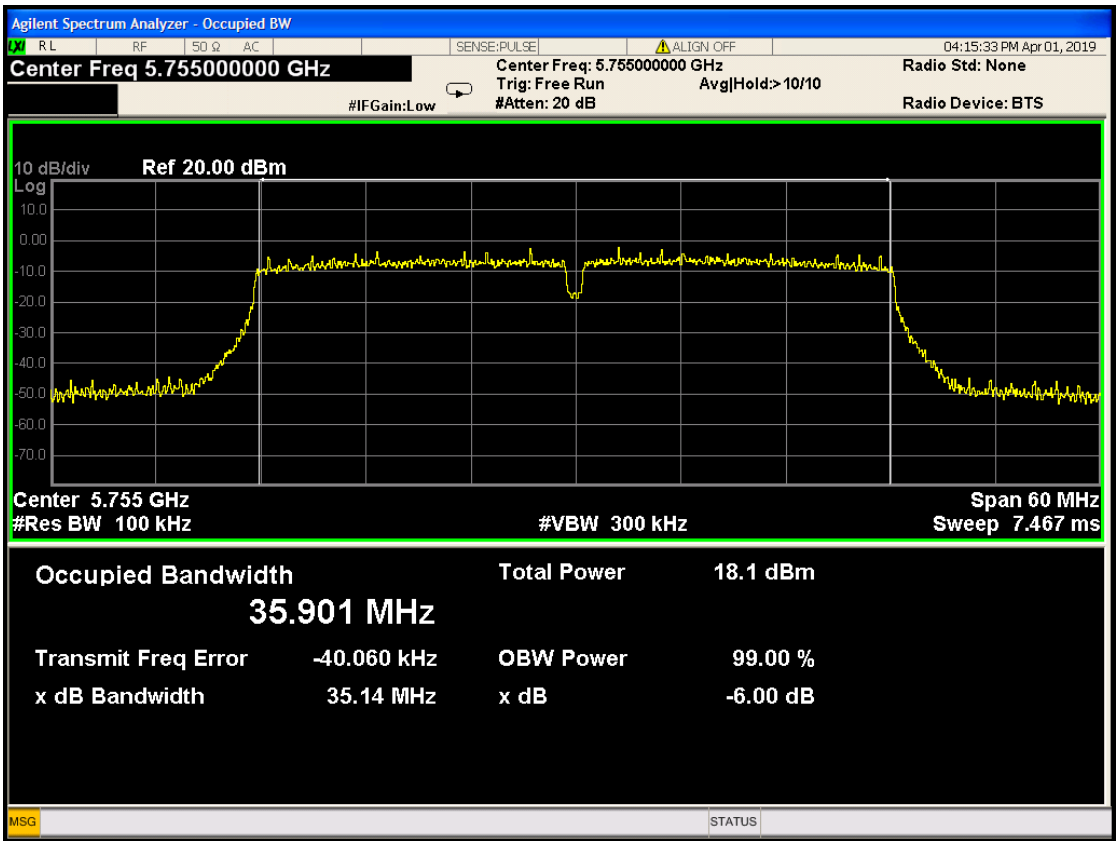


Channel 5795MHz

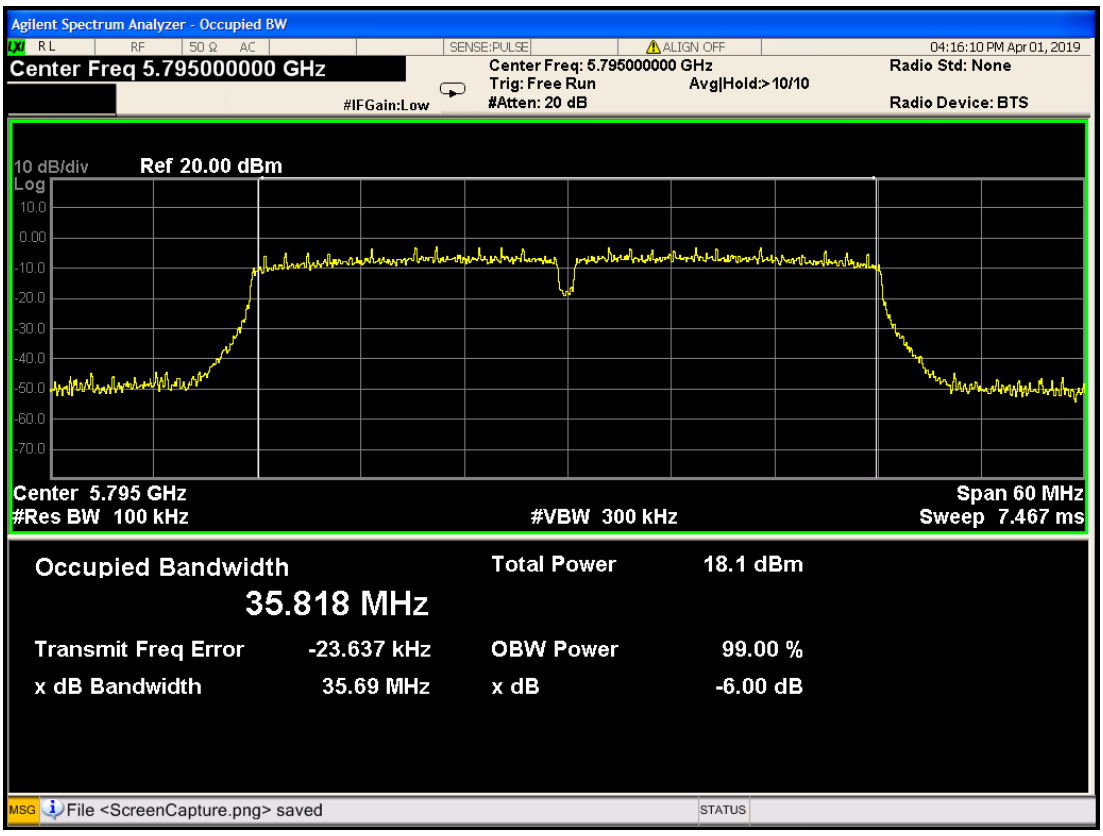


802.11n HT40 mode(Antenna 1)::

Channel 5755MHz

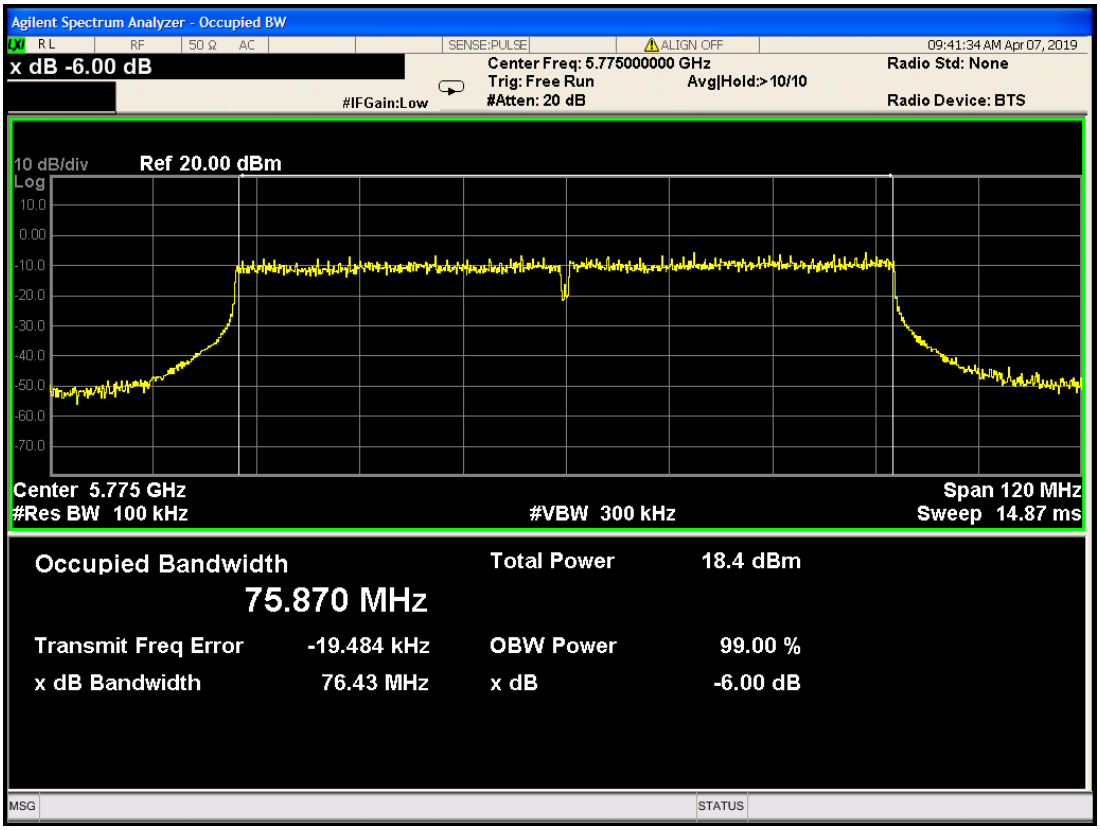


Channel 5795MHz



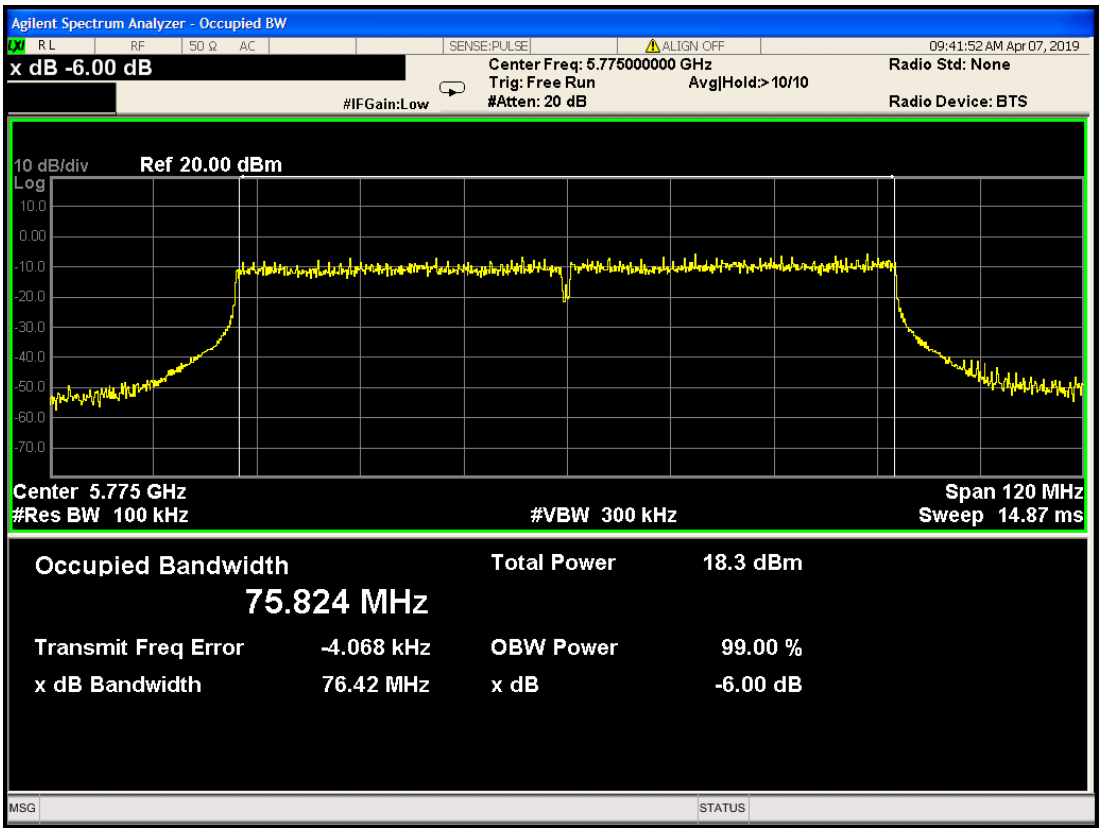
802.11ac 80 mode(Antenna 0)::

Channel 5775MHz



802.11ac 80 mode(Antenna 1)::

Channel 5775MHz



9. OUTPUT POWER

9.1. LIMITS

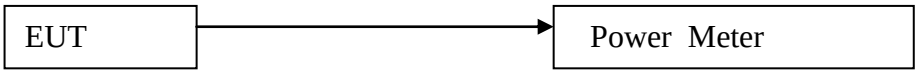
The FCC 15.407(a),The maximum conducted output power should not exceed:

Band	EUT Category	Limit
U-NII-1	☐Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≤ 125mW(21dBm) at any elevation angle above 30 degrees as measured from the horizon)
	☐Fixed point-to-point Access device	1 Watt (30 dBm)
	☒Indoor Access Point	1 Watt (30 dBm)
	☐Mobile and portable client device	250mW (24 dBm)
U-NII-2A	☐	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-2C	☐	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-3	☒	1 Watt (30 dBm)
Note: B* is the 26 dB emission bandwidth in MHz.		

9.2. TEST PROCEDURES

1) The RF output of EUT was connected to the broadband average RF power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2) Set to the maximum power setting and enable the EUT transmit continuously.
3) Measure the conducted output power and record the results in the test report.

9.3. TEST SETUP



9.4. TEST RESULTS

Output Power

802.11a mode				
Frequency (MHz)	AVG Conducted Output Power (dBm)		Limit (dBm)	Result
	Antenna 0	Antenna 1		
5180	17.80	18.05	30.00	PASS
5200	17.99	18.14		PASS
5240	17.66	18.11		PASS

802.11a mode				
Frequency (MHz)	AVG Conducted Output Power (dBm)		Limit (dBm)	Result
	Antenna 0	Antenna 1		
5745	16.47	16.00	30.00	PASS
5785	15.96	15.98		PASS
5825	15.19	15.74		PASS

802.11n HT20 mode					
Frequency (MHz)	AVG Output Power (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5180	18.05	18.07	21.07	30.00	PASS
5200	18.00	18.17	21.10		PASS
5240	17.73	18.11	20.93		PASS

802.11n HT20 mode					
Frequency (MHz)	AVG Output Power (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5745	16.59	16.16	19.39	30.00	PASS
5785	16.37	15.99	19.19		PASS
5825	15.59	15.81	18.71		PASS

802.11n HT40 mode					
Frequency (MHz)	AVG Output Power (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5190	16.28	15.69	19.01	30.00	PASS
5230	15.92	15.76	18.85		PASS

802.11n HT40 mode					
Frequency (MHz)	AVG Output Power (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5755	14.03	13.94	17.00	30.00	PASS
5795	13.62	13.81	16.73		PASS

802.11ac 80 mode					
Frequency (MHz)	AVG Output Power (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5210	15.20	14.87	18.05	30.00	PASS

802.11ac 80 mode					
Frequency (MHz)	AVG Output Power (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5775	13.17	12.79	15.99	30.00	PASS

10. POWER SPECTRAL DENSITY

10.1.LIMITS

FCC 15.407(a)
The maximum power spectral density should not exceed:

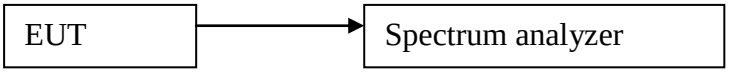
Band	EUT Category	Limit
5150-5250	☐Access Point (Master device)	17 dBm/MHz
	☐Fixed point-to-point Access device	
	☒Mobile and portable client device	11 dBm/MHz
5250-5350	☐	11 dBm/MHz
5470-5725	☐	11 dBm/MHz
5725-5850	☒	30dBm/500kHz

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmits power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2.TEST PROCEDURES

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. For devices operating in the bands 5.15-5.25 GHz,Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span >26dB bandwidth , Sweep=1ms
3. For devices operating in the bands 5.725-5.85 GHz, Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span >26dB bandwidth, Sweep=1ms
4. Record the max. reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.

10.3. TEST SETUP



10.4.TEST RESULTS

Test mode: IEEE 802.11a mode

802.11a mode				
Frequency (MHz)	PPSD (dBm)		Limit (dBm)	Result
	Antenna 0	Antenna 1		
5180	4.807	4.681	14.54	PASS
5200	4.726	5.537		PASS
5240	4.744	5.138		PASS

802.11a mode				
Frequency (MHz)	PPSD (dBm)		Limit (dBm)	Result
	Antenna 0	Antenna 1		
5745	0.585	0.050	27.54	PASS
5785	0.304	0.170		PASS
5825	-0.524	0.309		PASS

802.11n HT20 mode					
Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5180	4.43	4.35	7.40	14.54	PASS
5200	4.73	4.30	7.53		PASS
5240	4.44	4.49	7.47		PASS

802.11n HT20 mode					
Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5745	-0.03	0.18	3.09	27.54	PASS
5785	0.39	0.48	3.44		PASS
5825	-0.48	0.22	2.89		PASS

802.11n HT40 mode					
Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5190	-0.046	-0.036	2.97	14.54	PASS
5230	-0.062	0.303	3.13		PASS

802.11n HT40 mode					
Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5755	-5.087	-4.515	-1.78	27.54	PASS
5795	-4.974	-4.635	-1.79		PASS

802.11ac 80 mode					
Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5210	-4.006	-3.626	-0.80	14.54	PASS

802.11ac 80 mode					
Frequency (MHz)	PPSD (dBm)			Limit (dBm)	Result
	Antenna 0	Antenna 1	Total		
5775	-9.083	-8.585	-5.82	27.54	PASS

Remark:

Directional Gain=$10\log[(10^{\frac{G1}{20}}+10^{\frac{G2}{20}}+\ldots.+10^{\frac{Gn}{20}})^2/N_{ant}]$ dBi

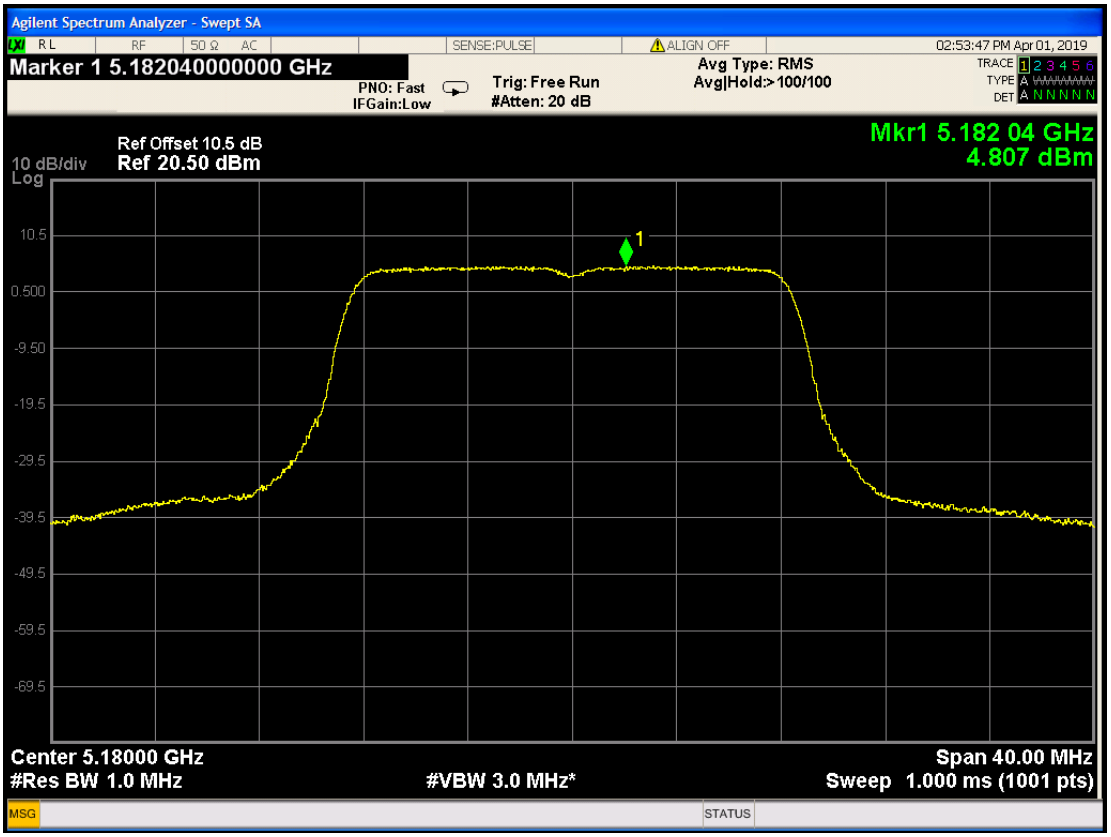
Limits= limits-(Directional Gain-6)

N_{ant}: Number of Transmit Antennas

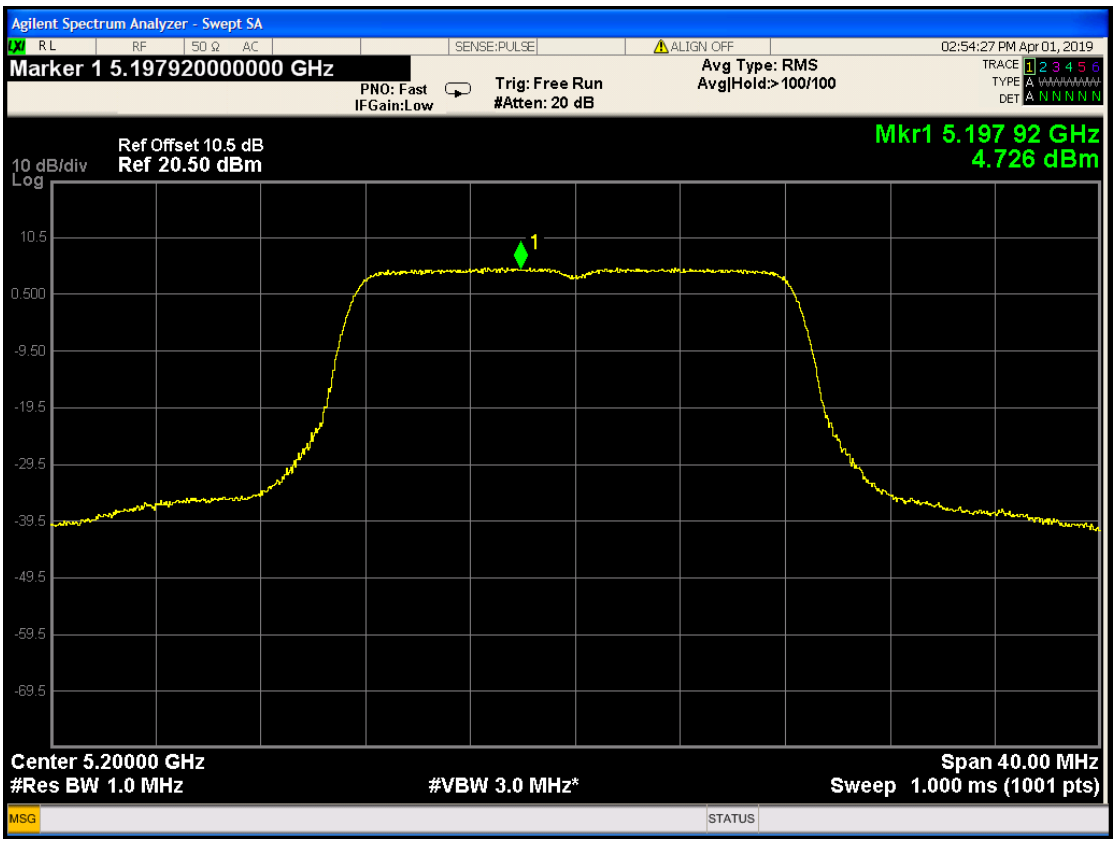
$G_1, G_2, \ldots.G_n$: Gain of Individual Antennas (Difference for Each Antenna)

802.11a mode(Antenna 0):

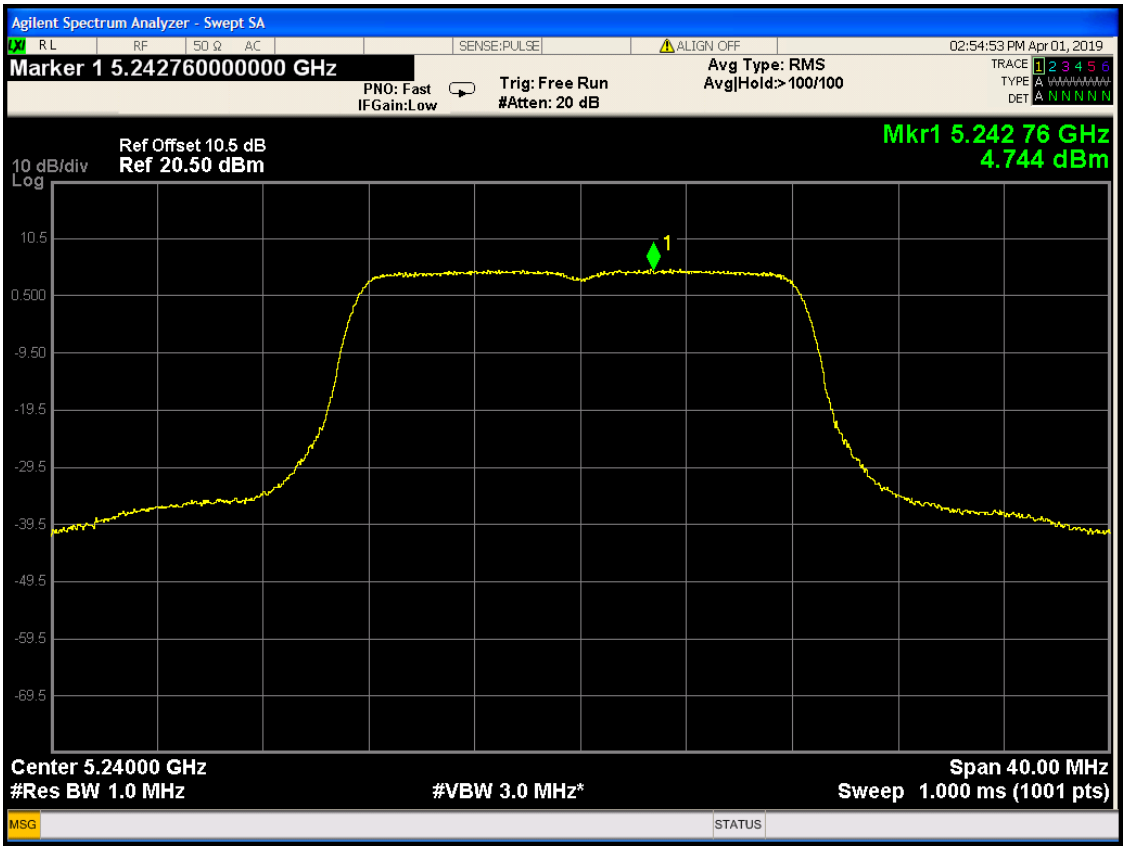
Channel 5180MHz



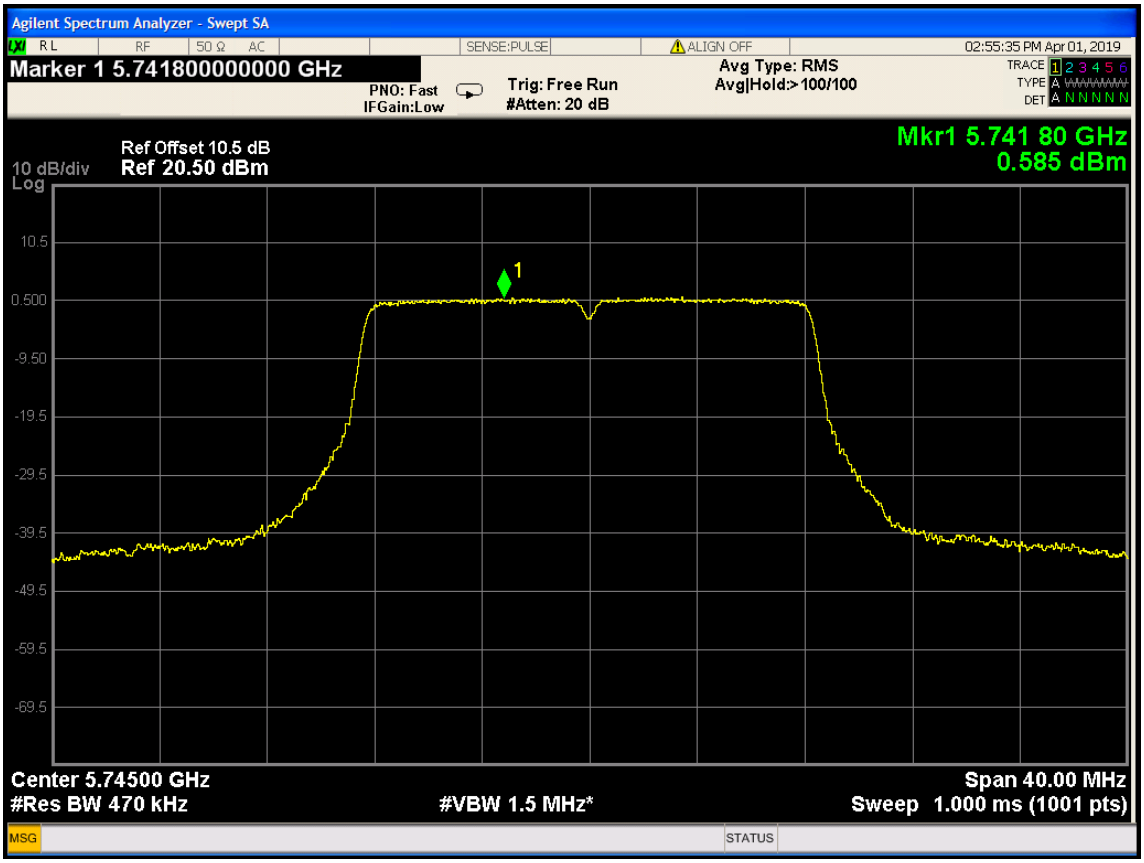
Channel 5200MHz



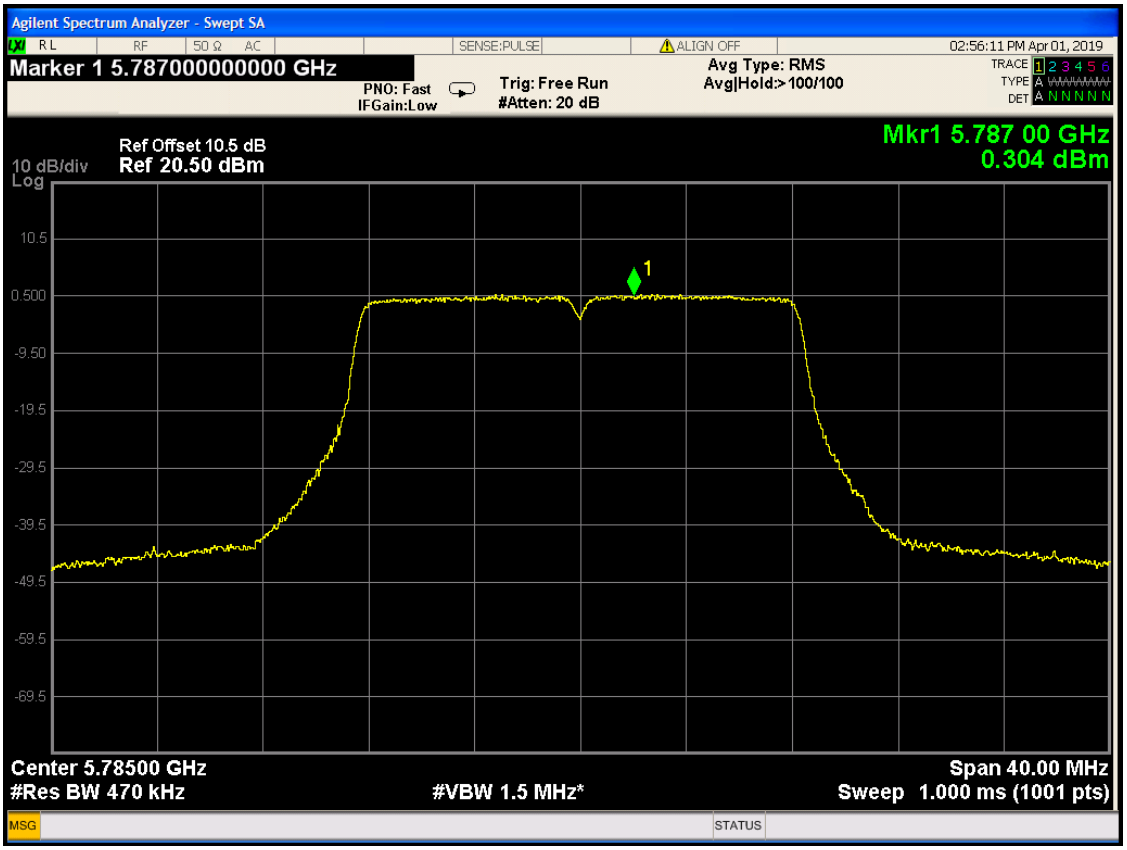
Channel 5240MHz



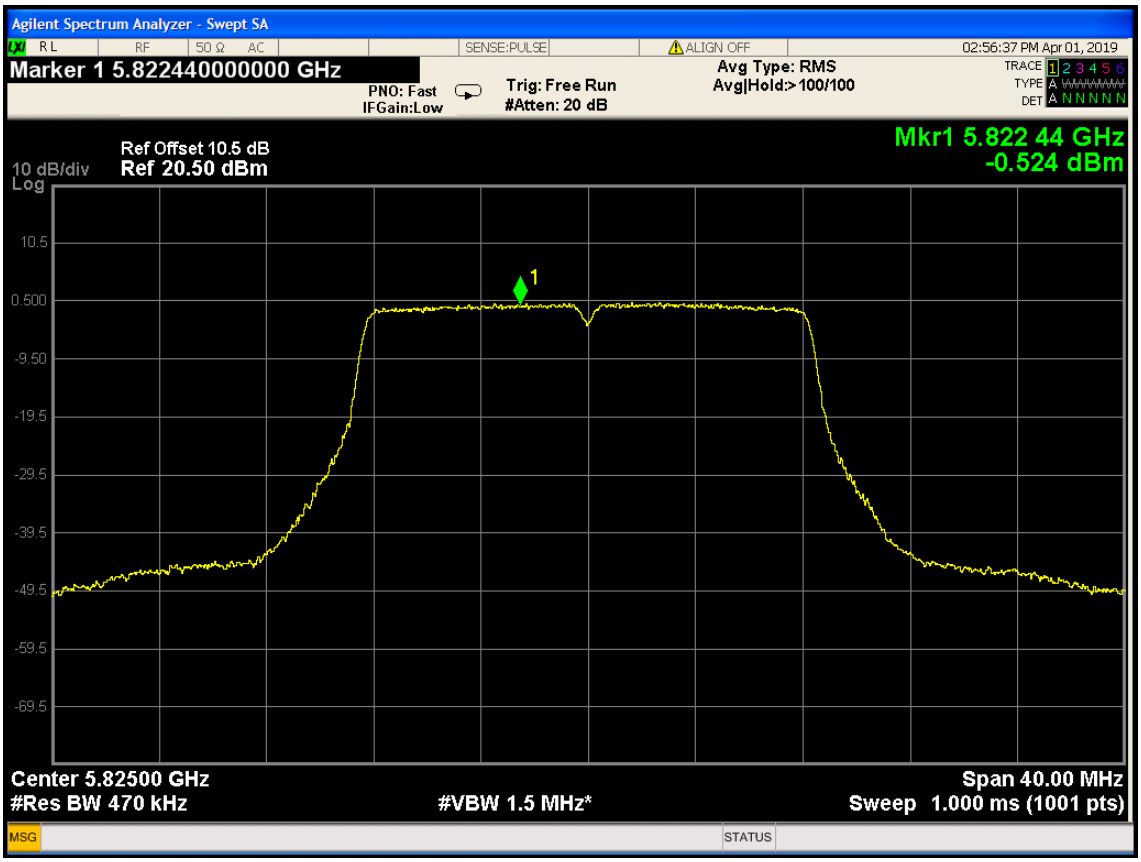
Channel 5745MHz



Channel 5785MHz

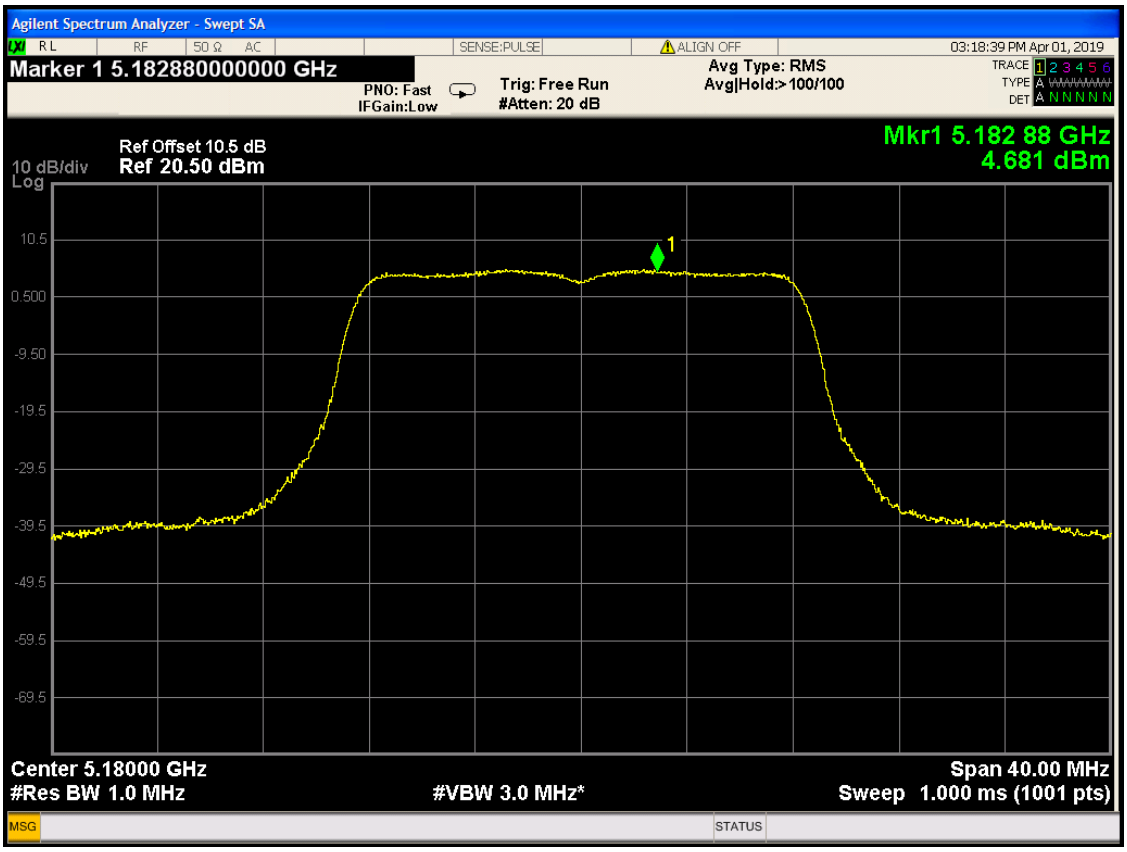


Channel 5825MHz

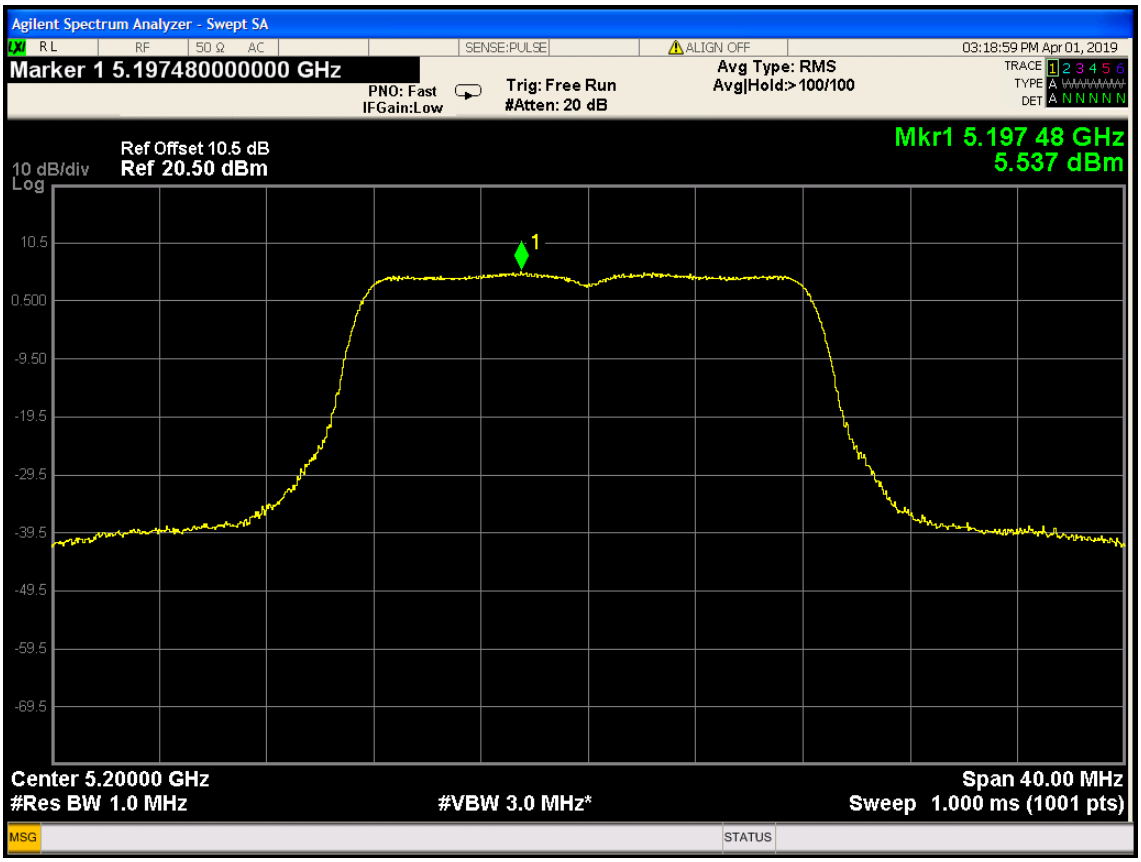


802.11a mode(Antenna 1):

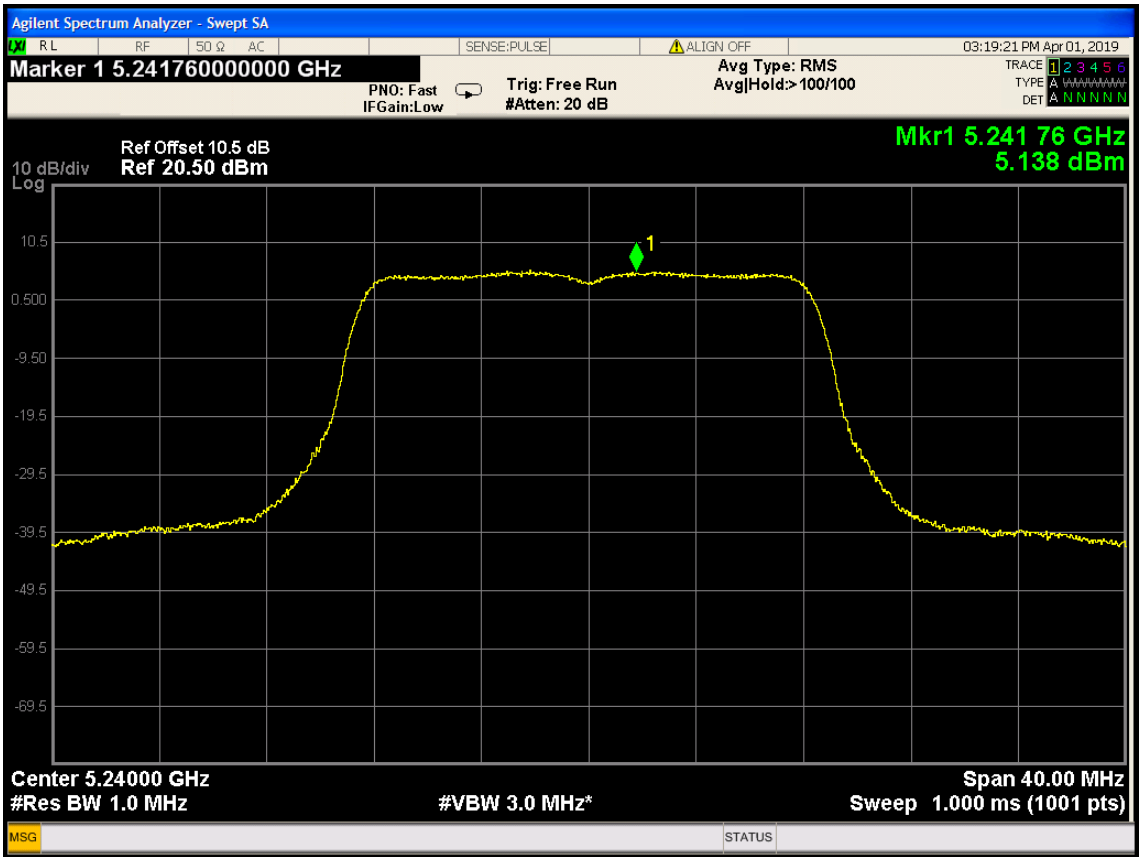
Channel 5180MHz



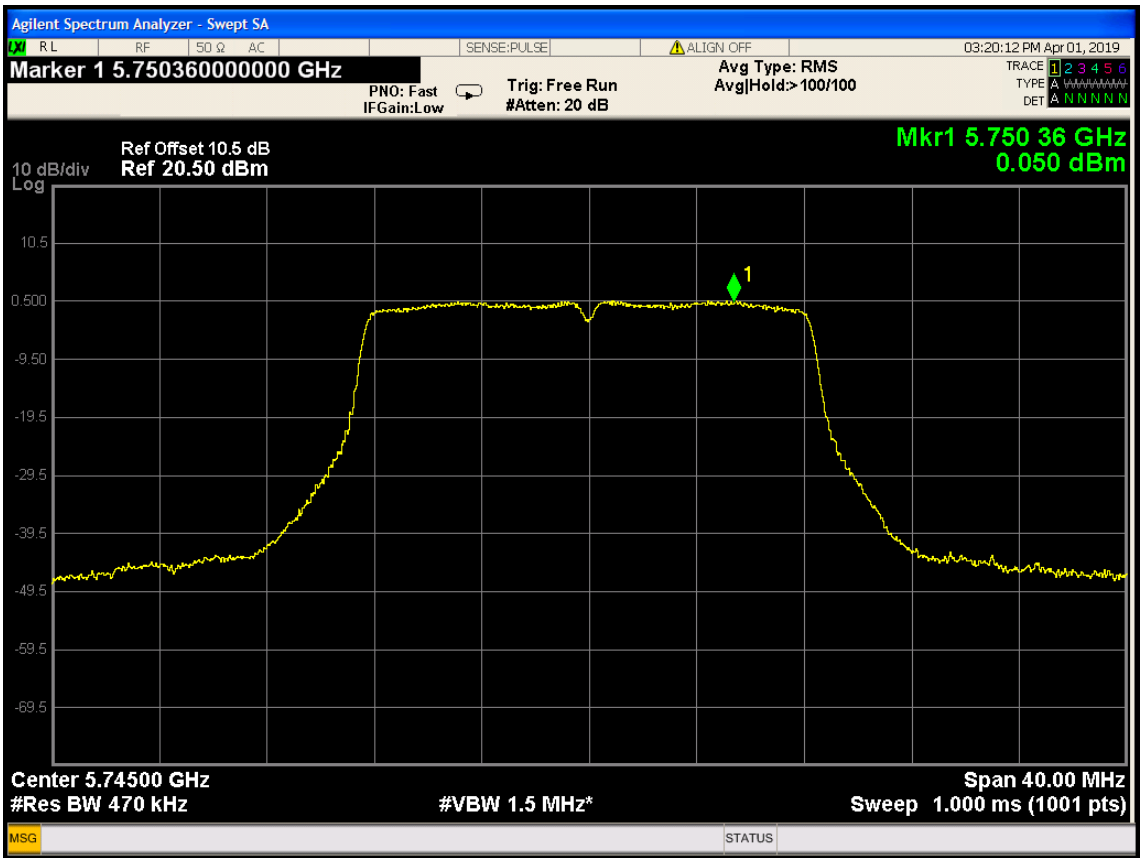
Channel 5200MHz



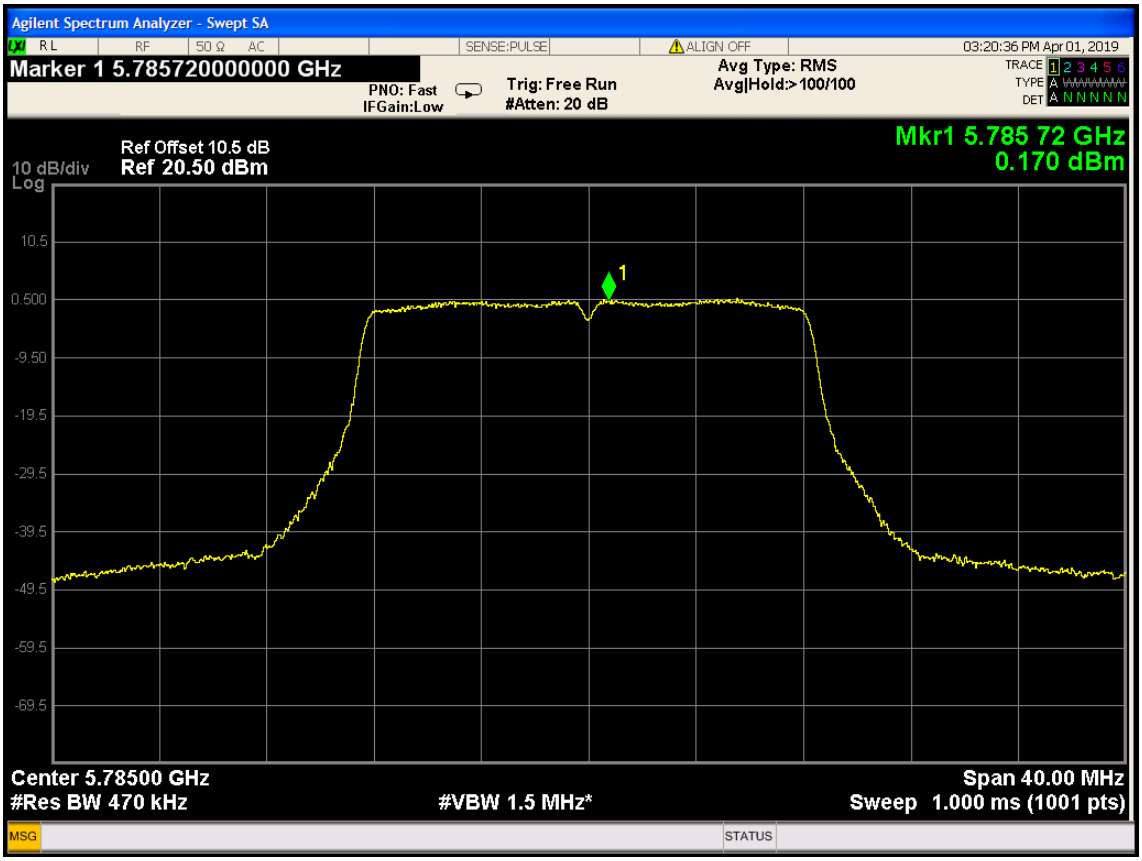
Channel 5240MHz



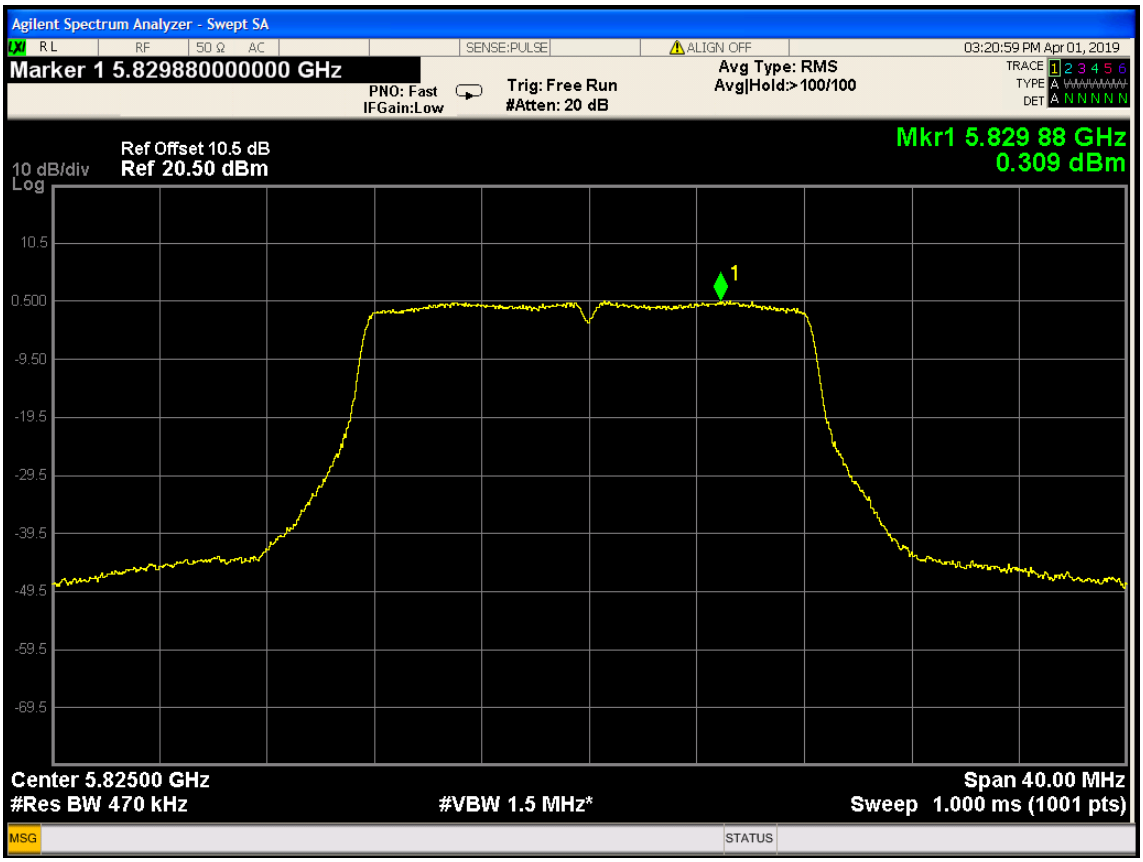
Channel 5745MHz



Channel 5785MHz

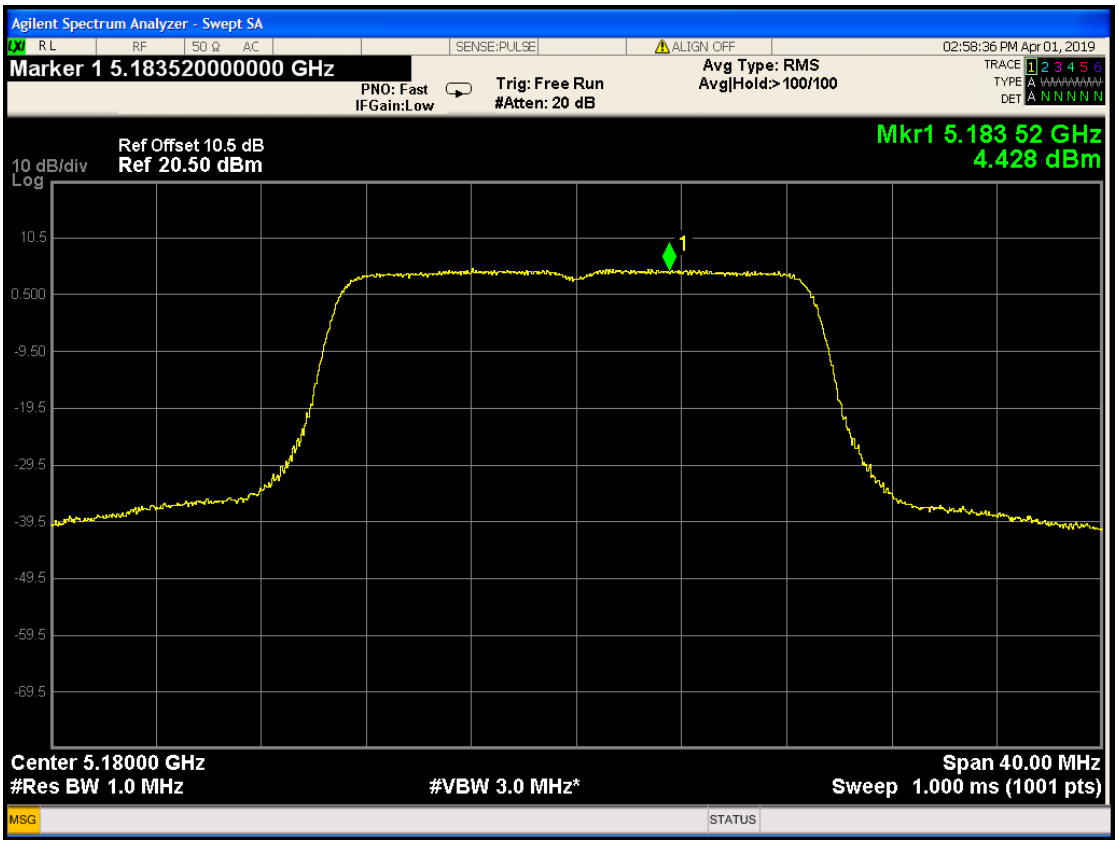


Channel 5825MHz

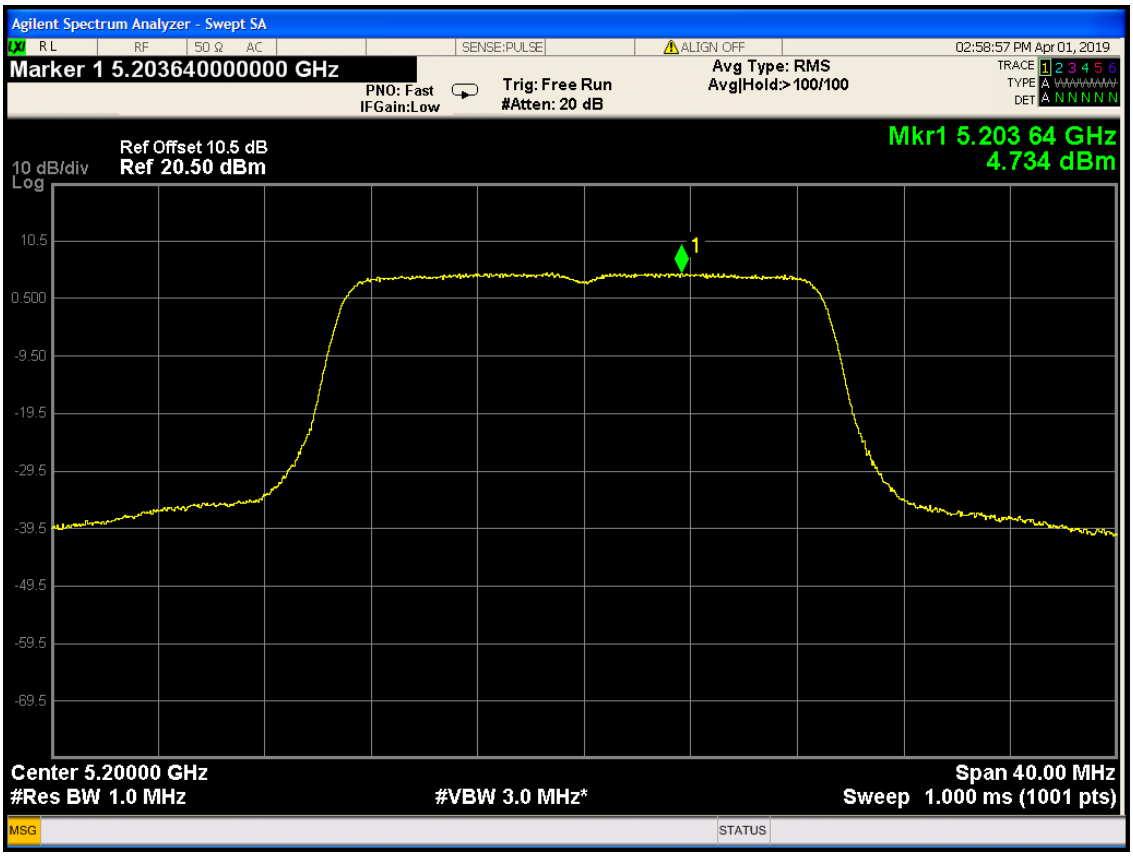


802.11HT 20 mode(Antenna 0):

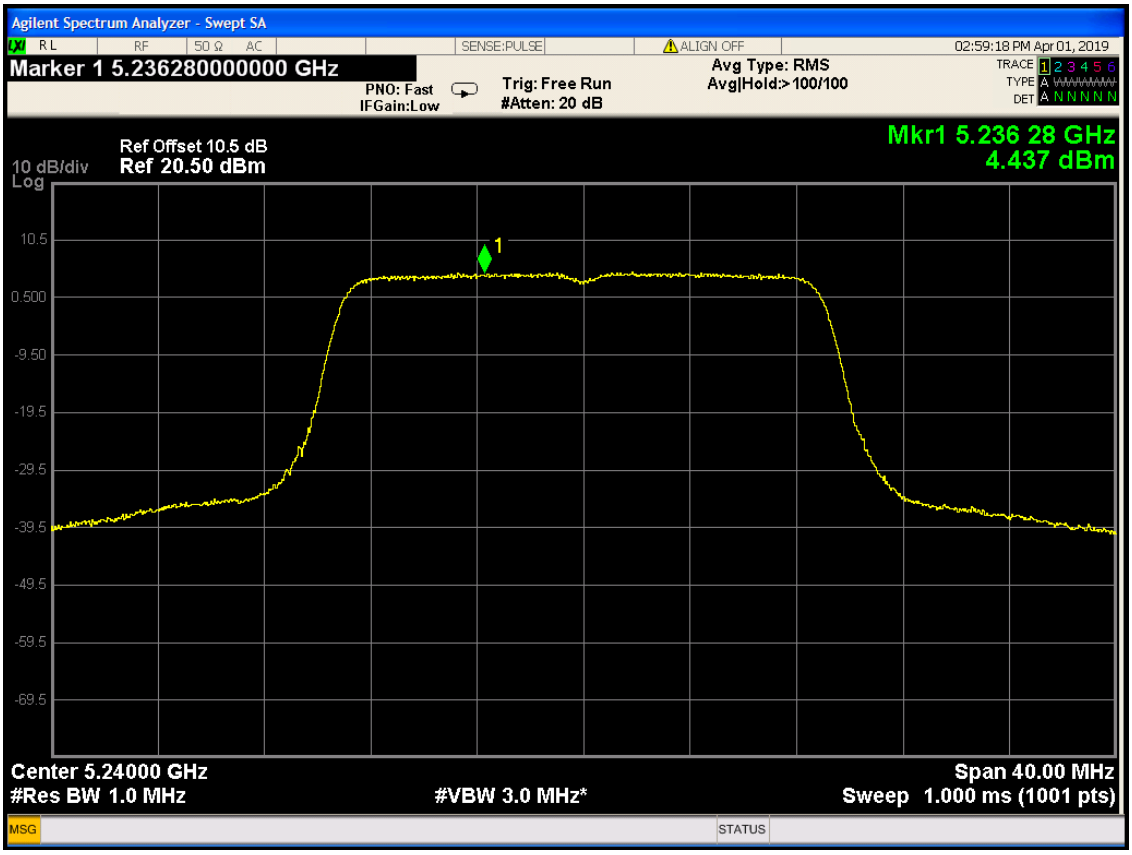
Channel 5180MHz



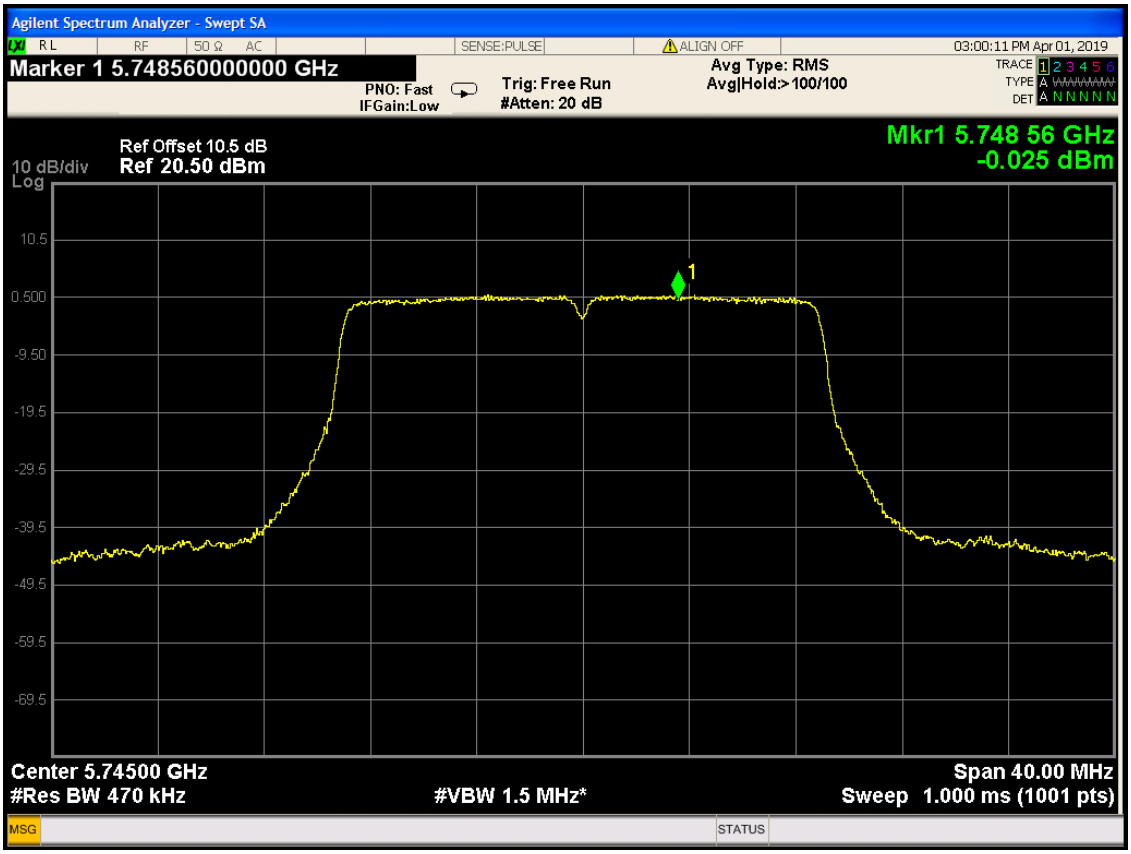
Channel 5200MHz



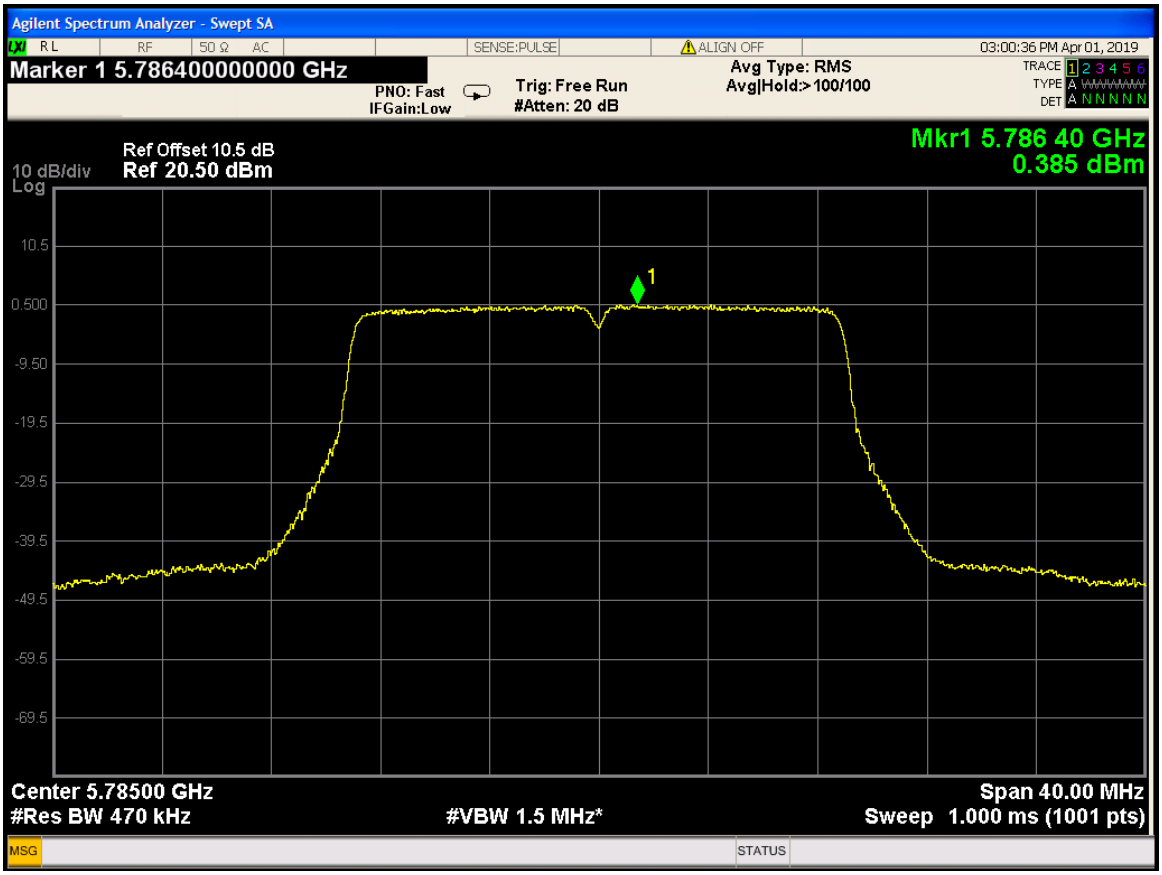
Channel 5240MHz



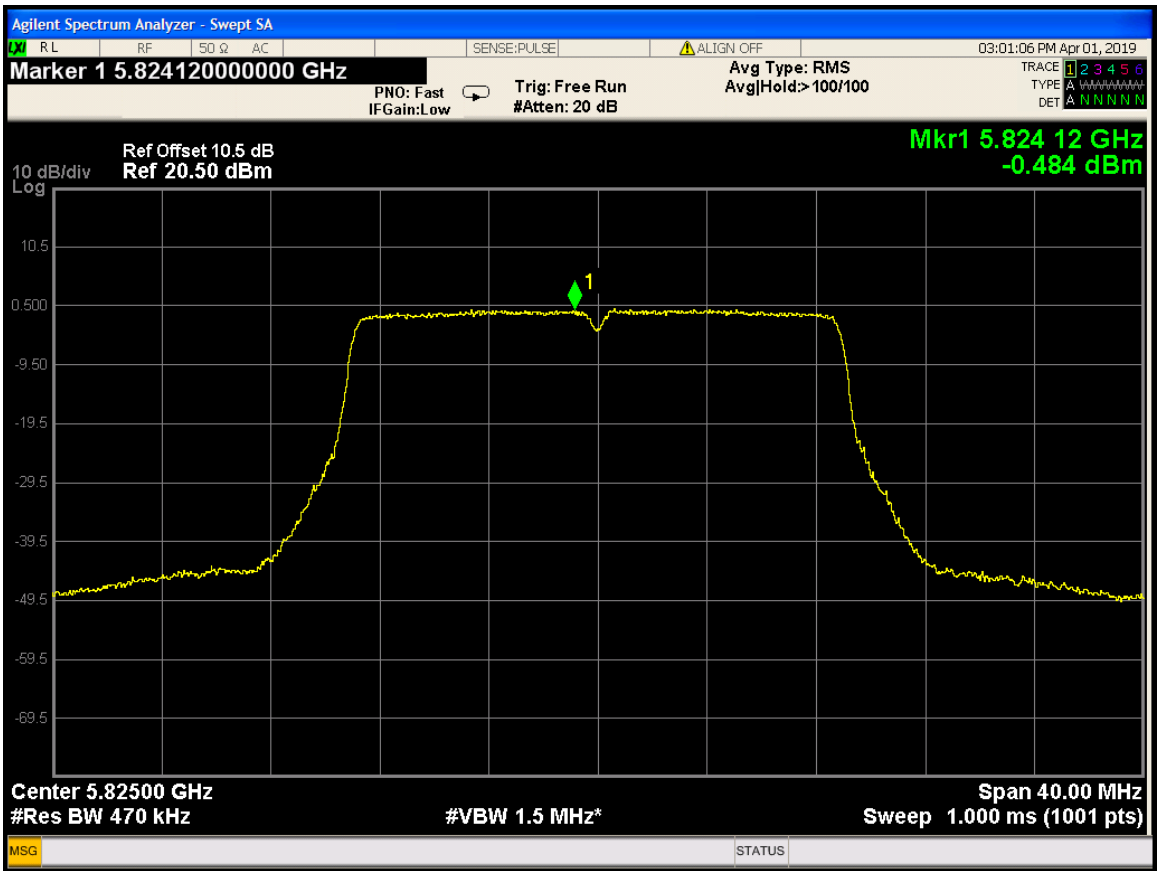
Channel 5745MHz



Channel 5785MHz

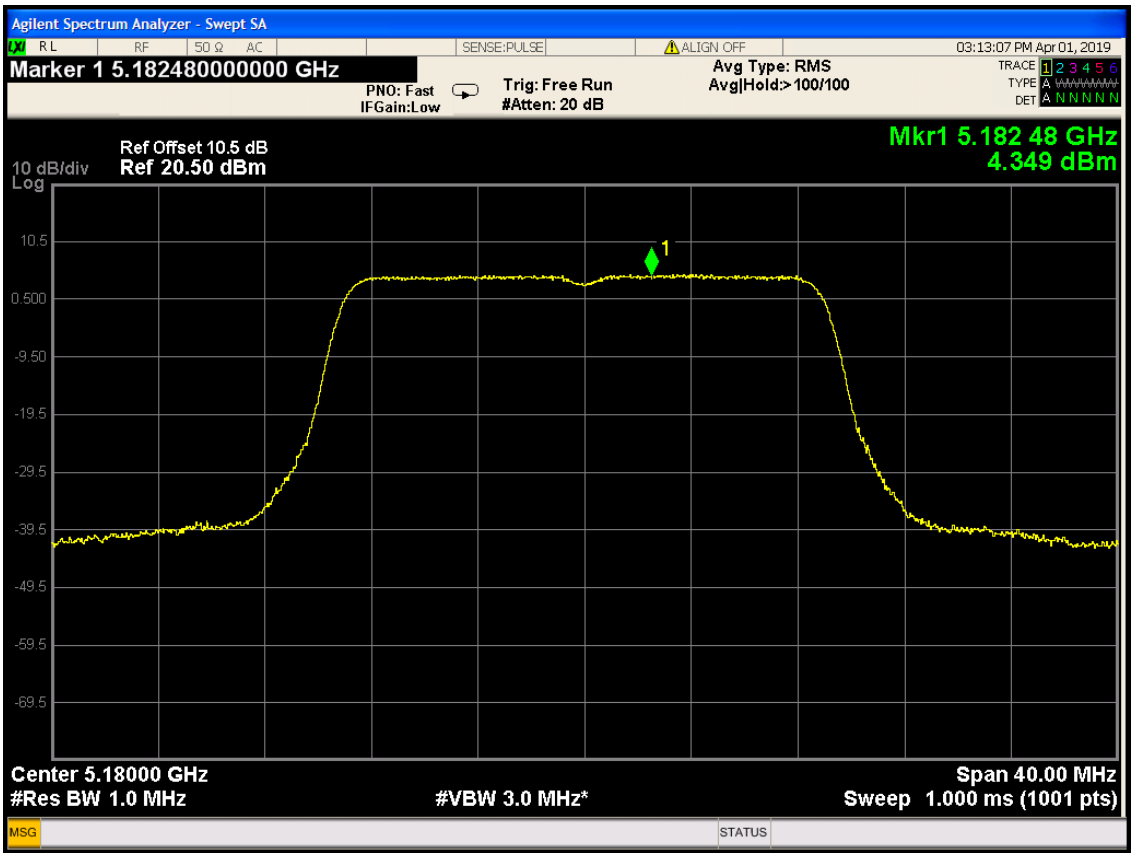


Channel 5825MHz

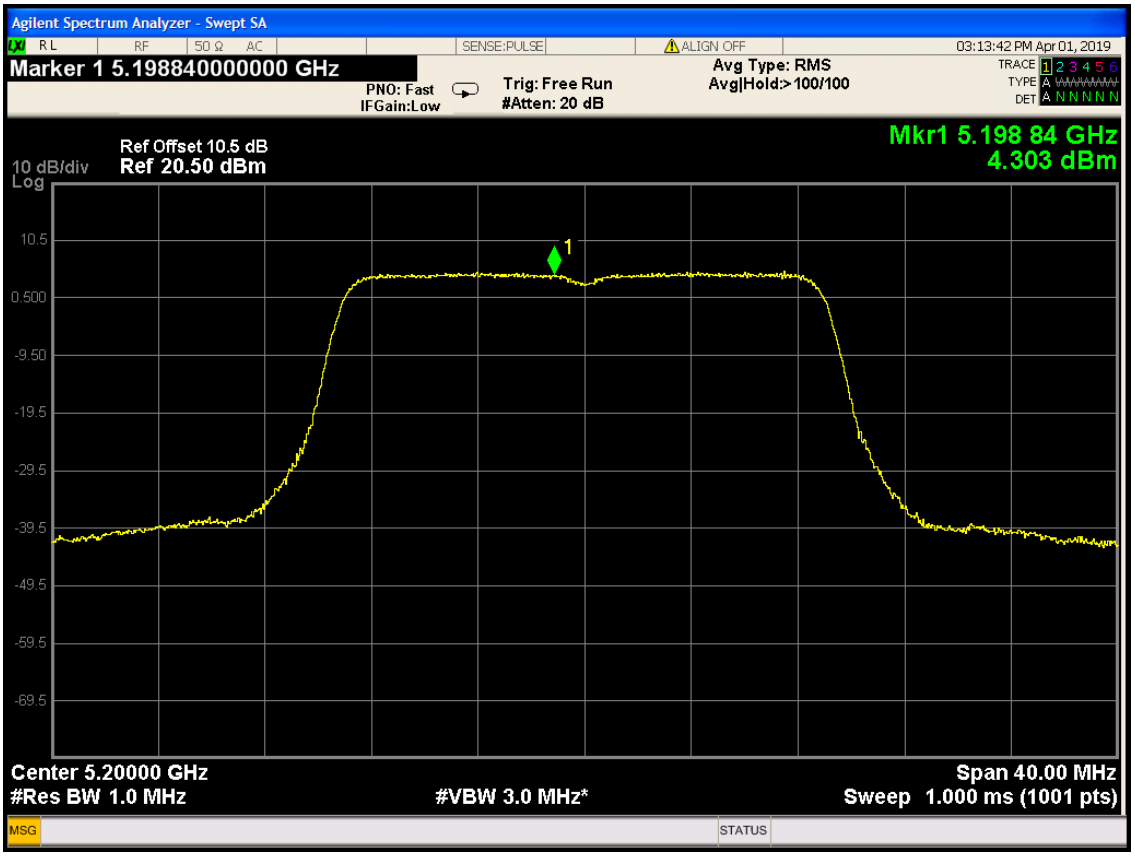


802.11HT 20 mode(Antenna 1):

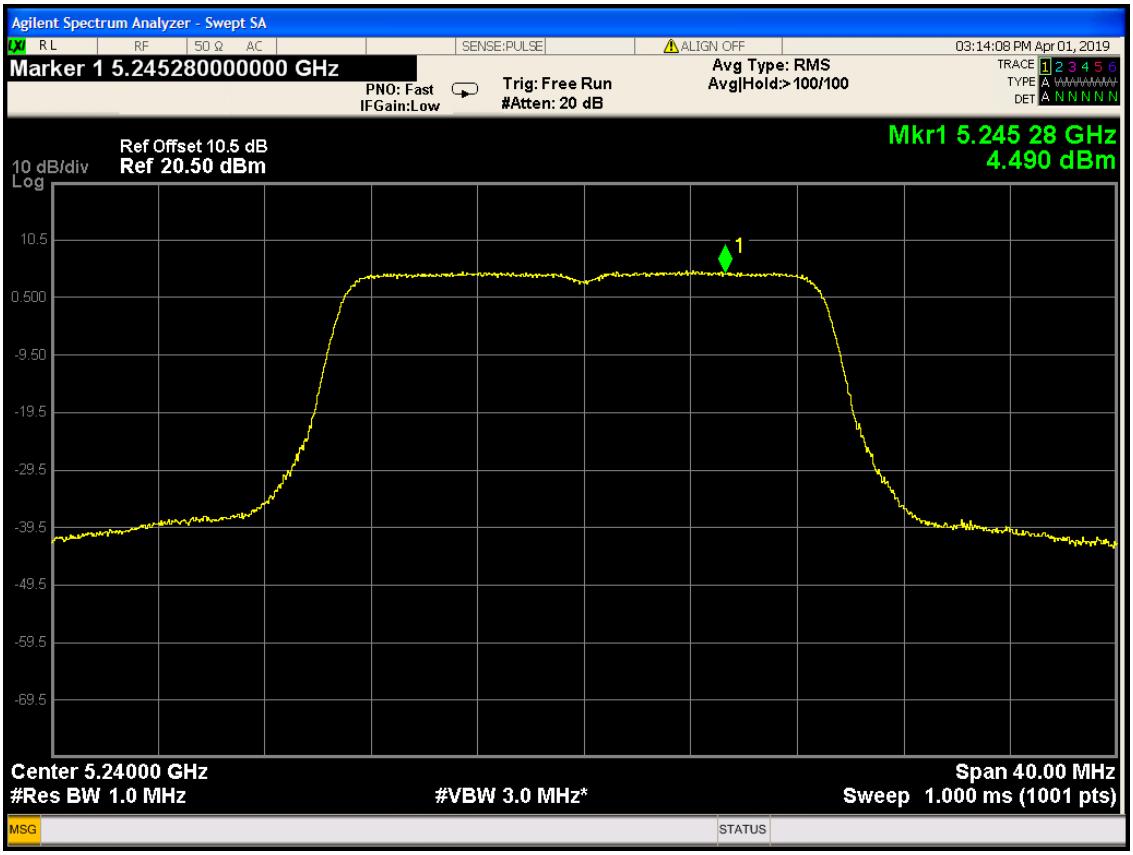
Channel 5180MHz



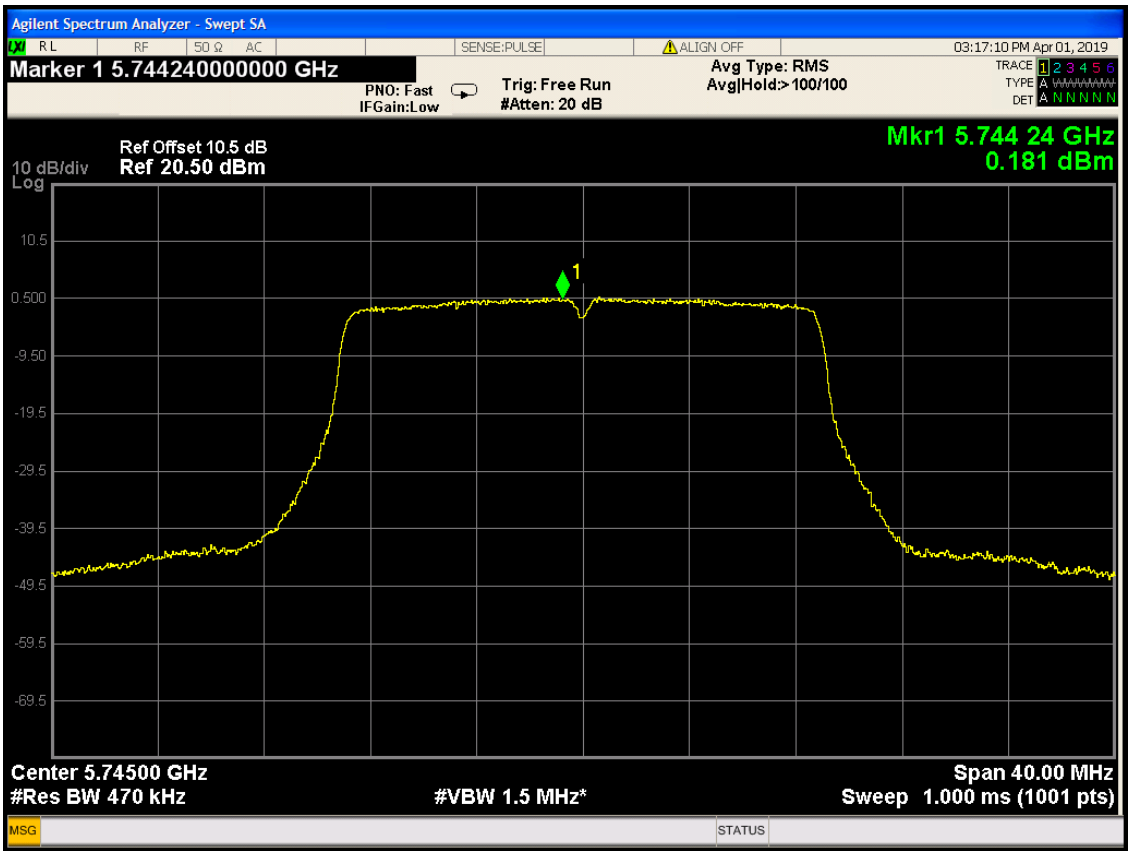
Channel 5200MHz



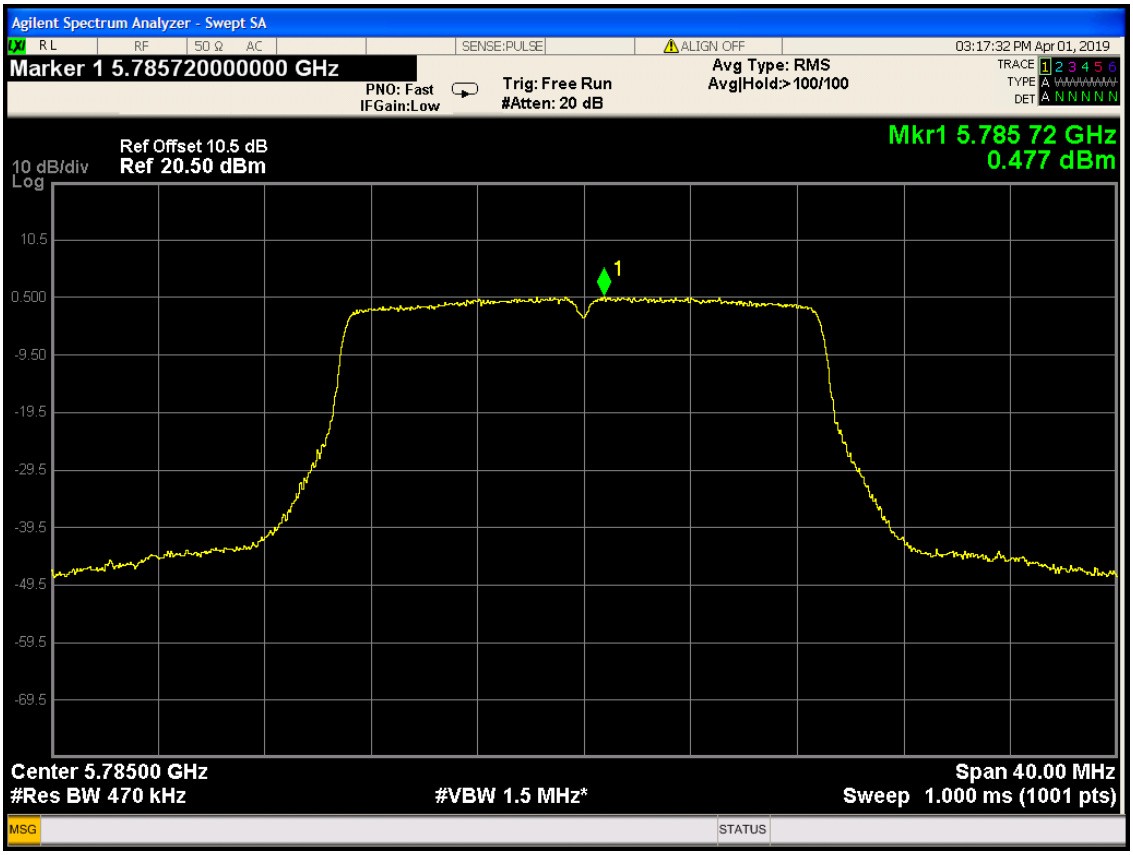
Channel 5240MHz



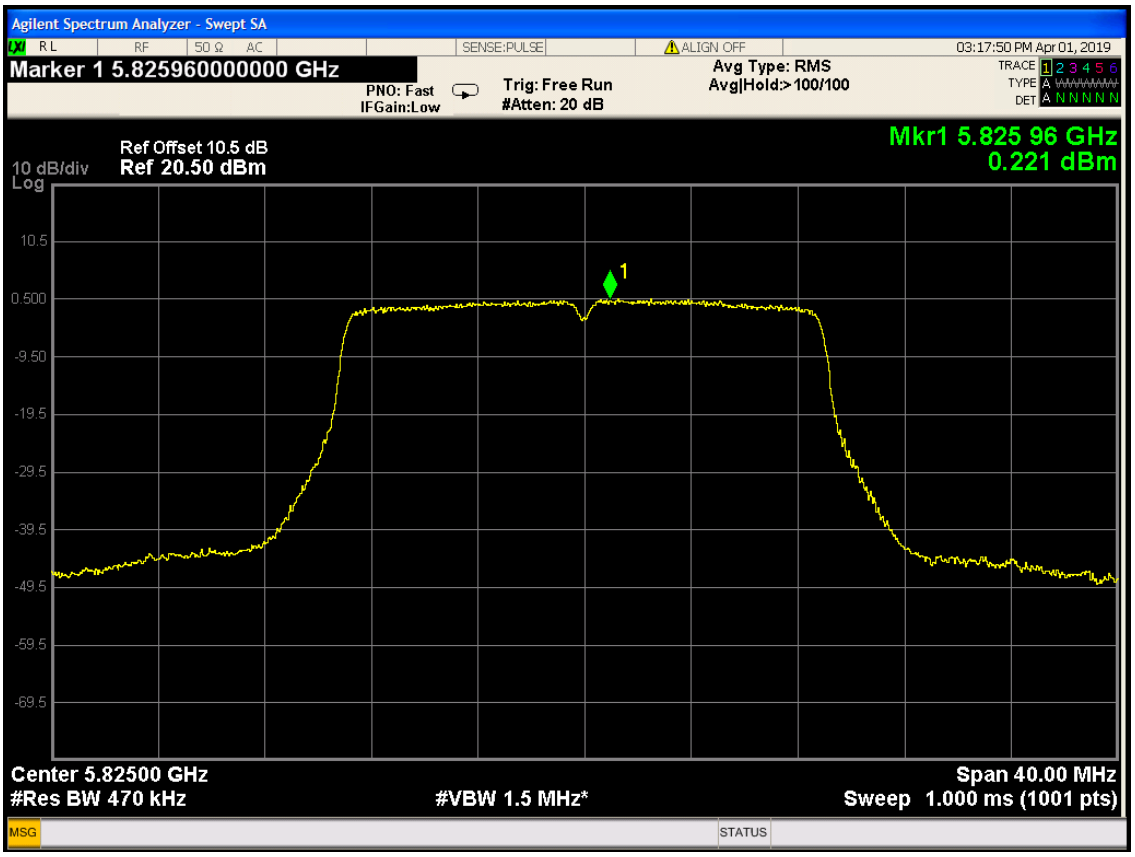
Channel 5745MHz



Channel 5785MHz

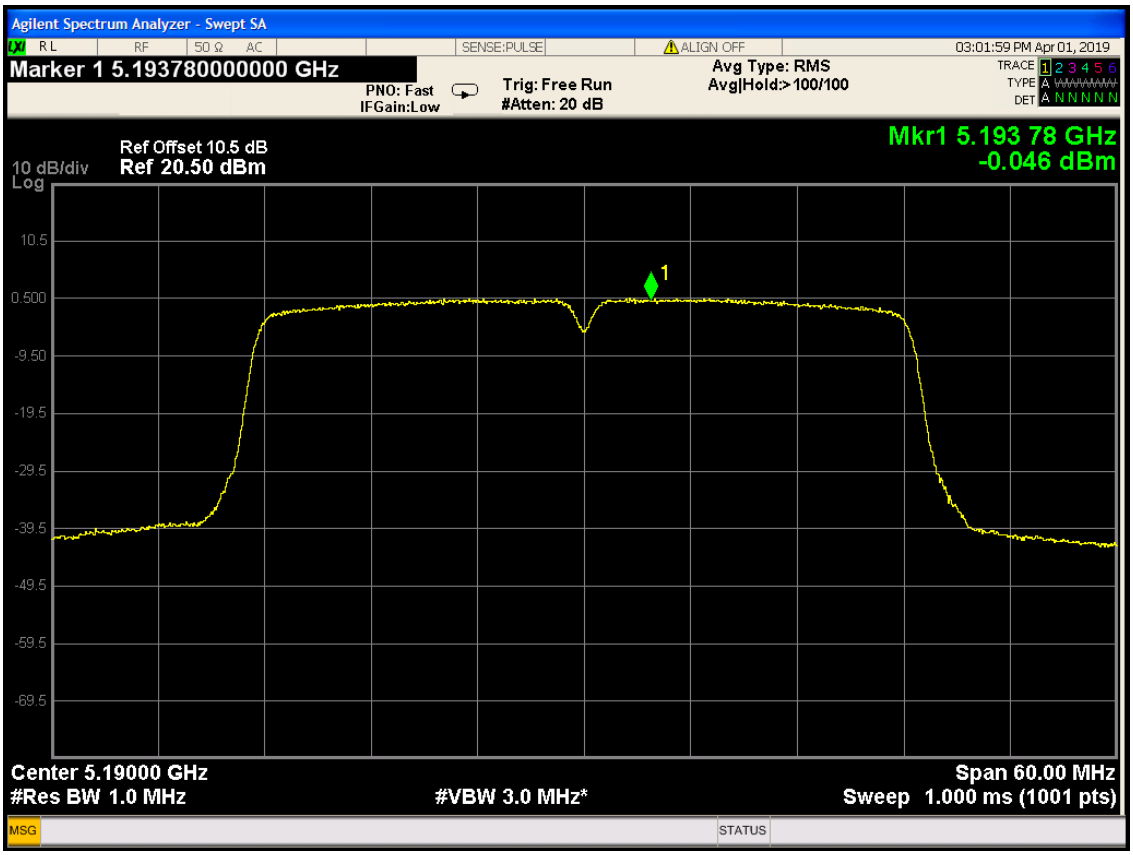


Channel 5825MHz

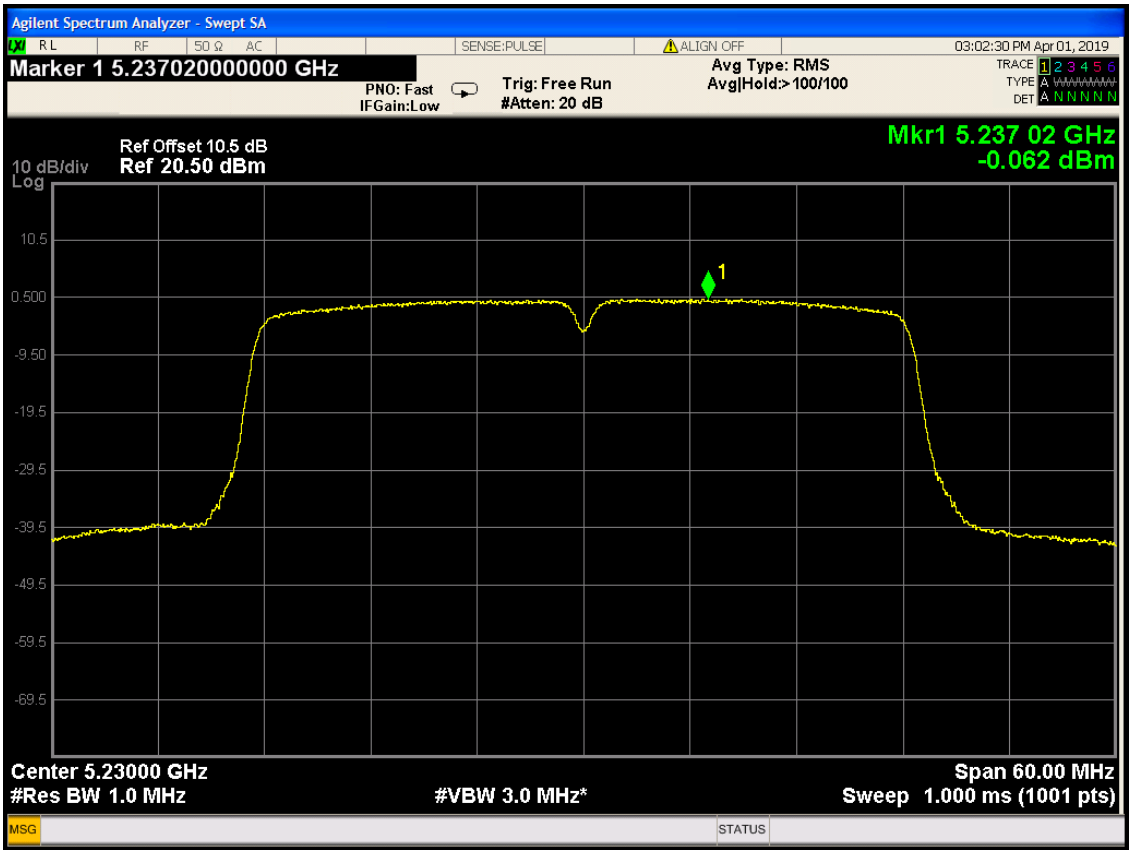


802.11HT 40 mode(Antenna 0):

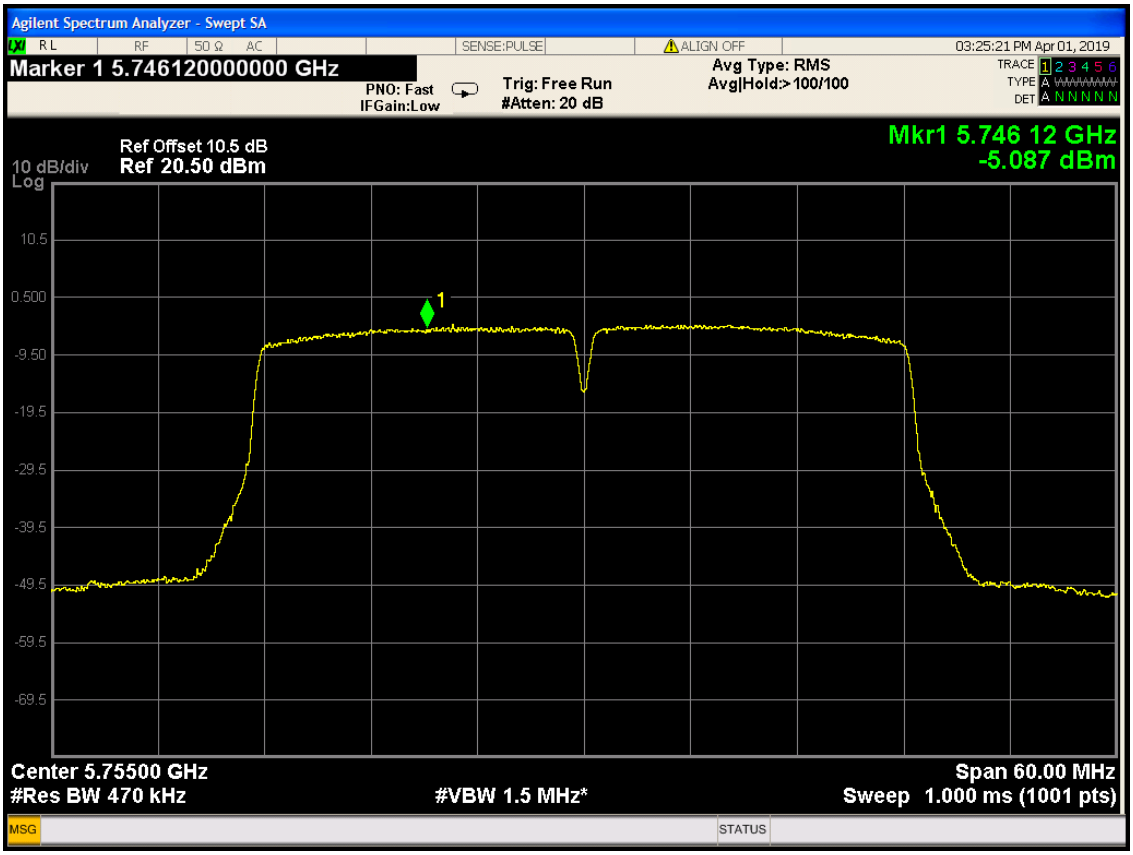
Channel 5190MHz



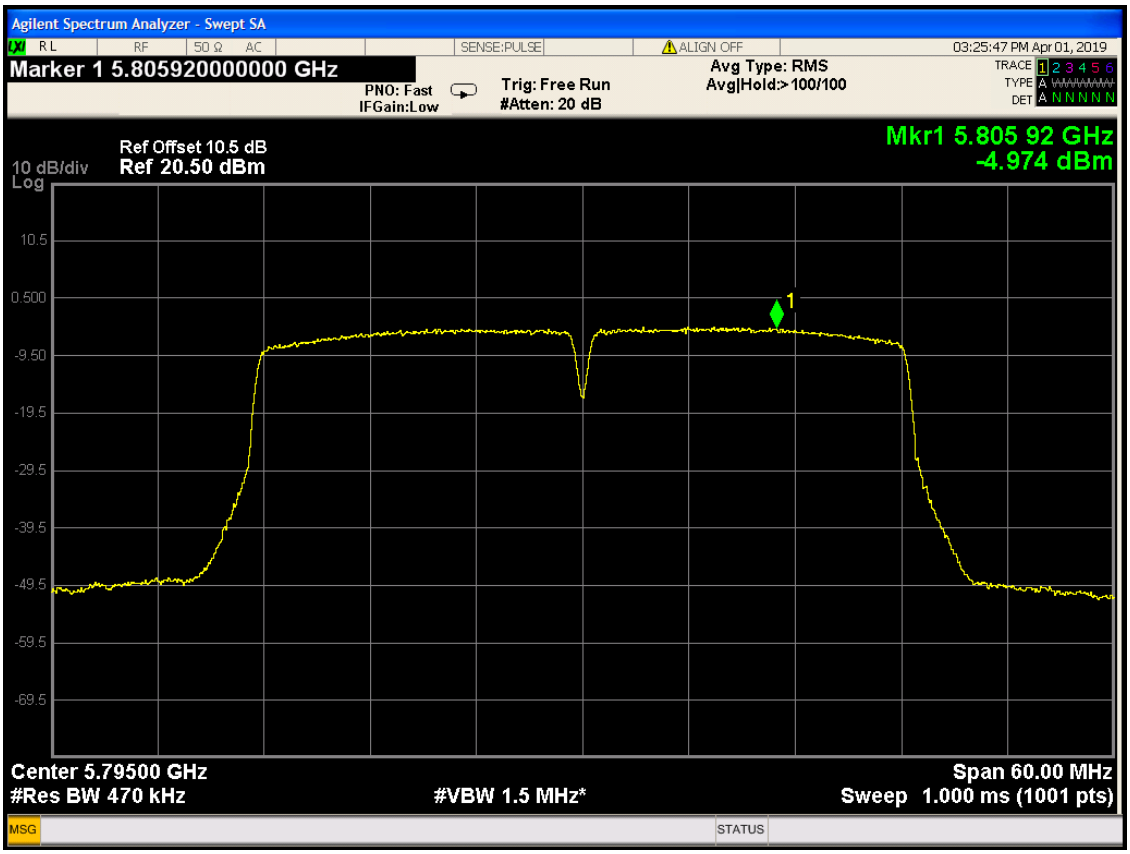
Channel 5230MHz



Channel 5755MHz

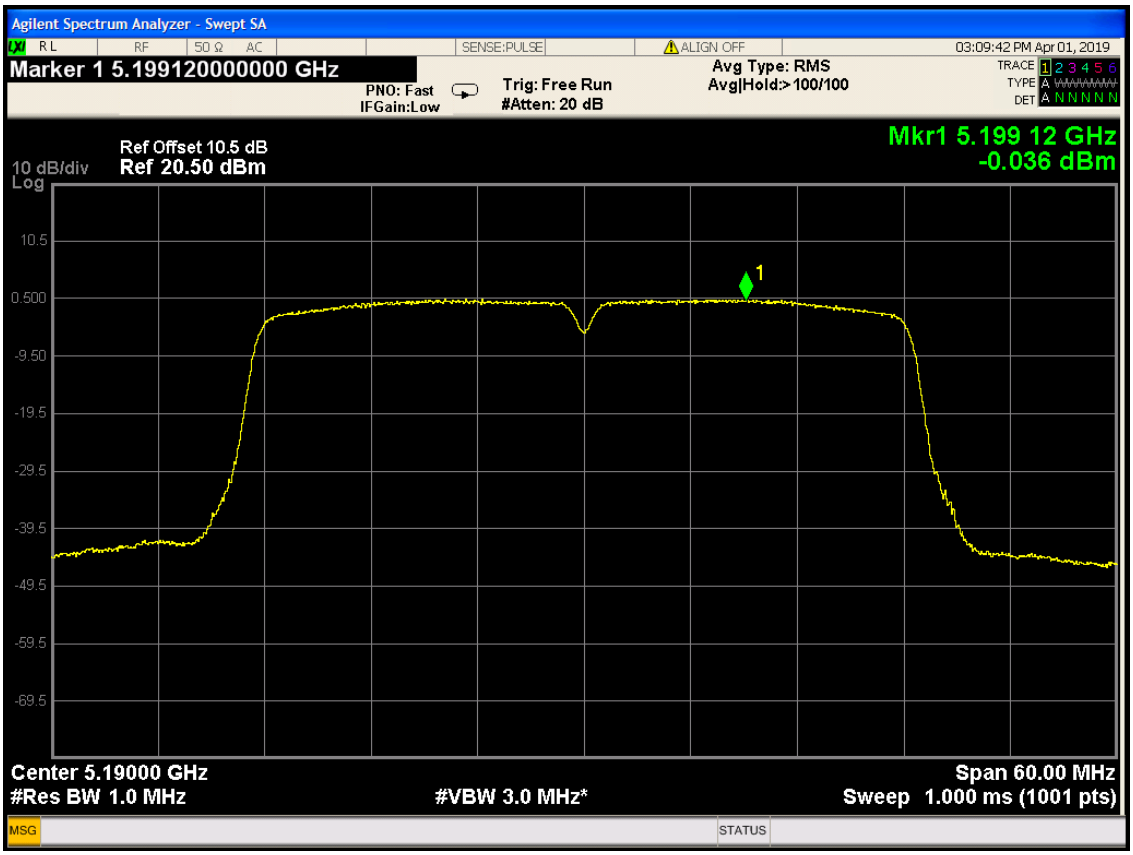


Channel 5795MHz

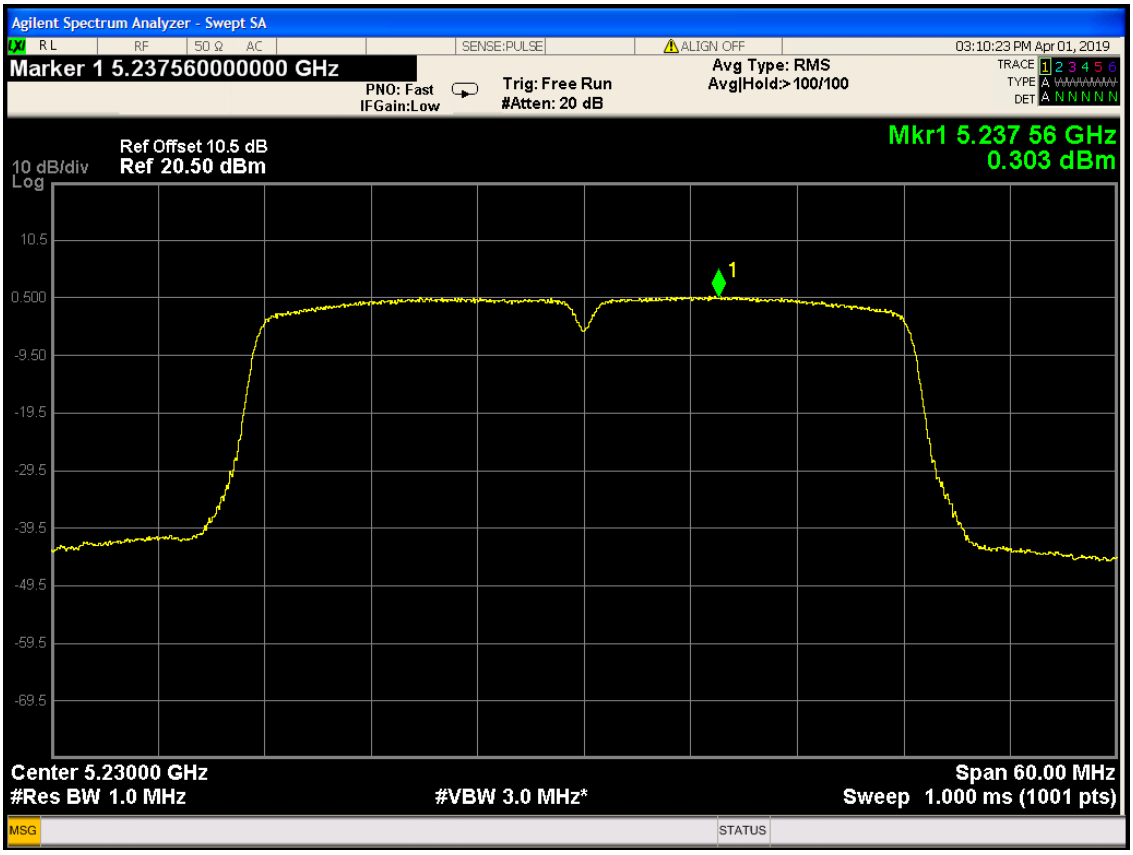


802.11HT 40 mode(Antenna 1):

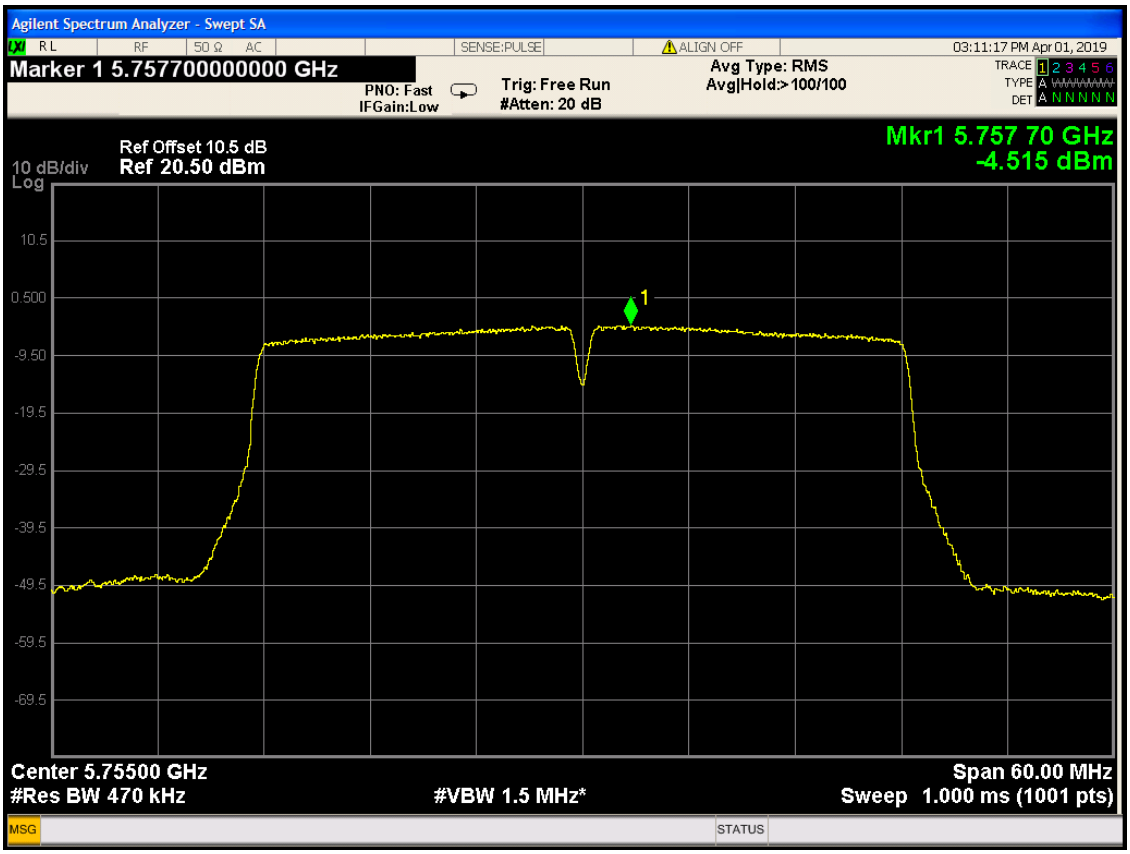
Channel 5190MHz



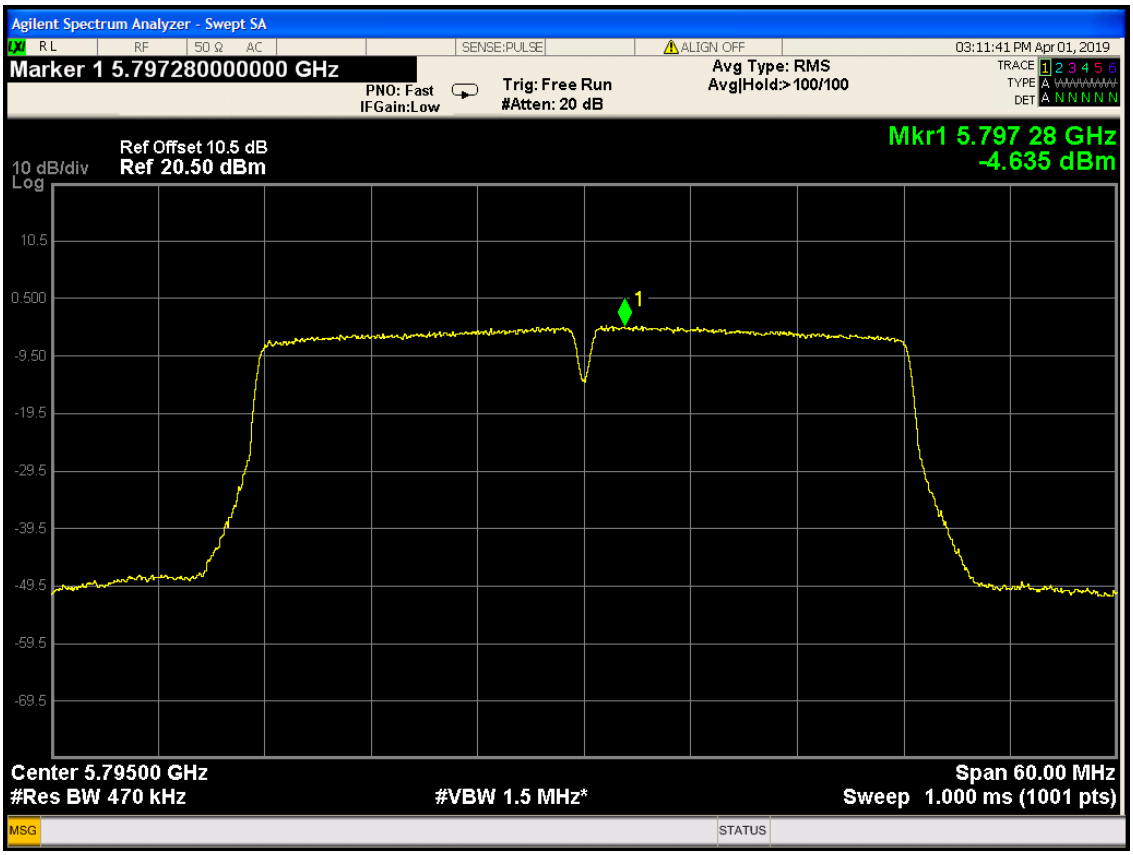
Channel 5230MHz



Channel 5755MHz

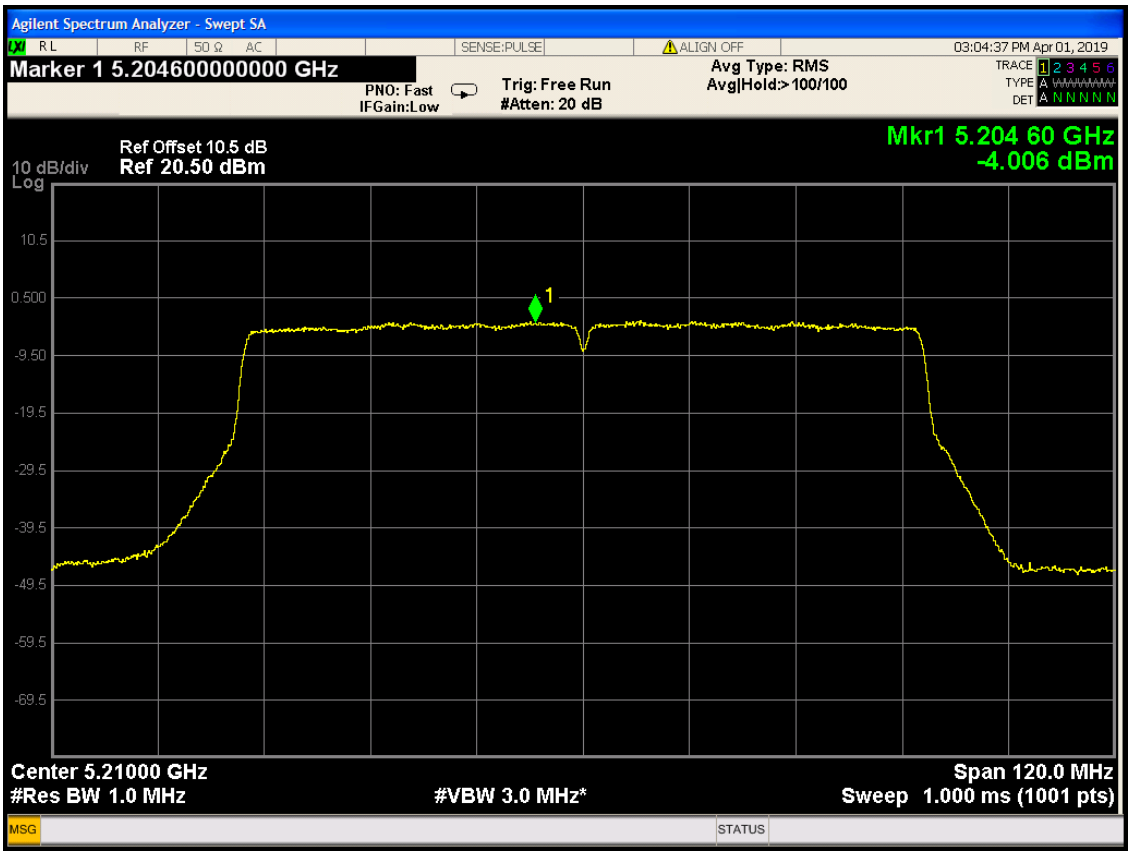


Channel 5795MHz

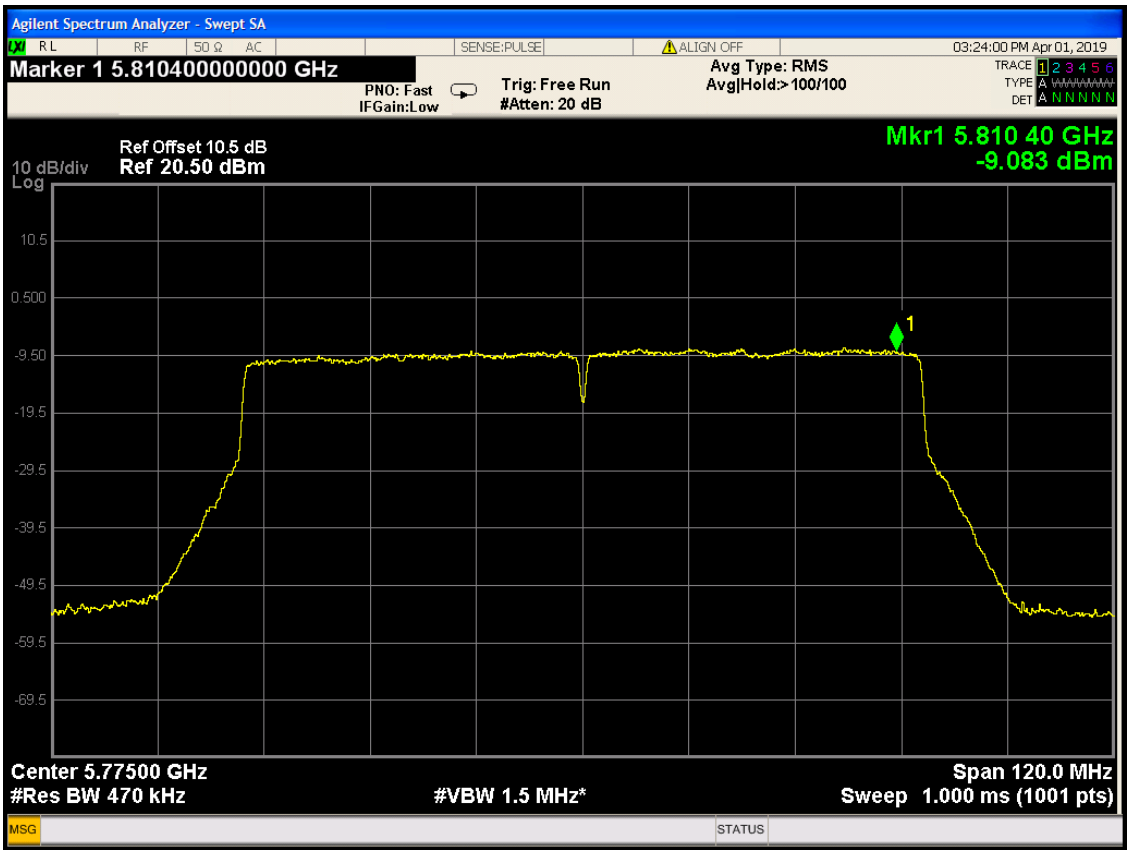


802.11ac 80 mode(Antenna 0):

Channel 5210MHz

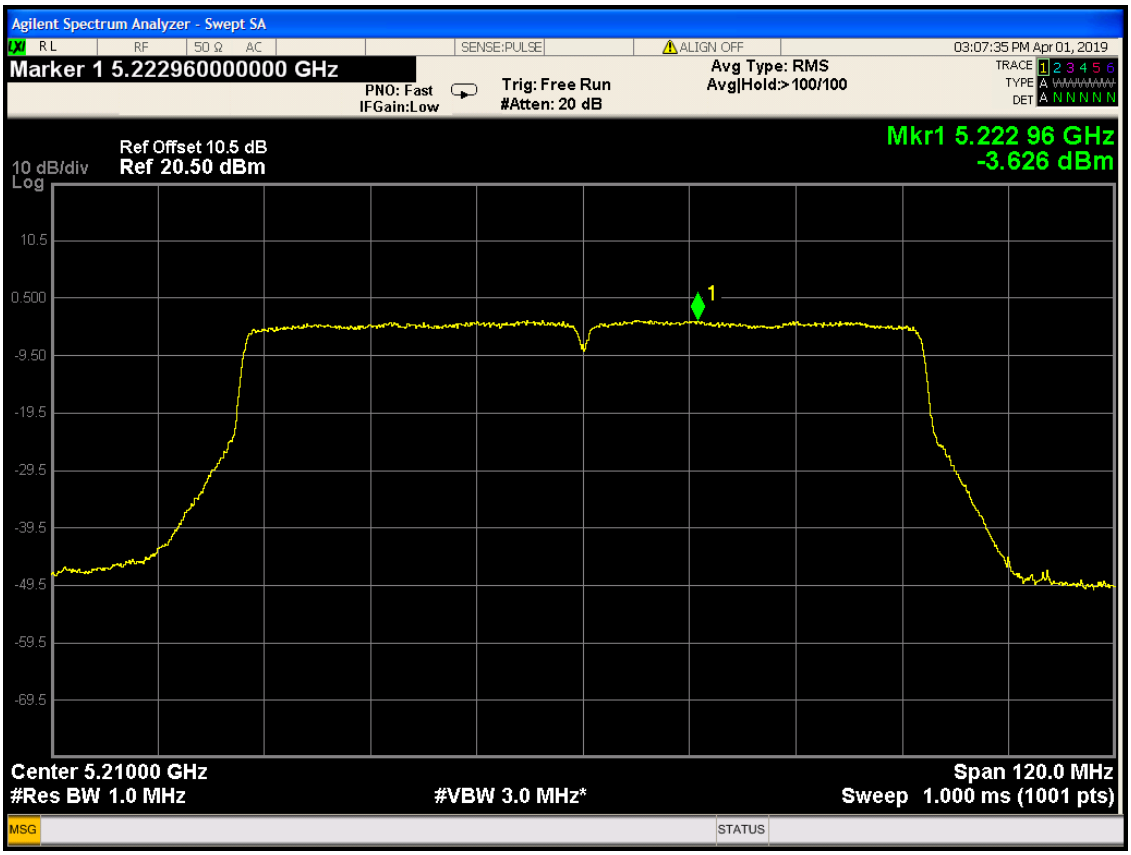


Channel 5775MHz

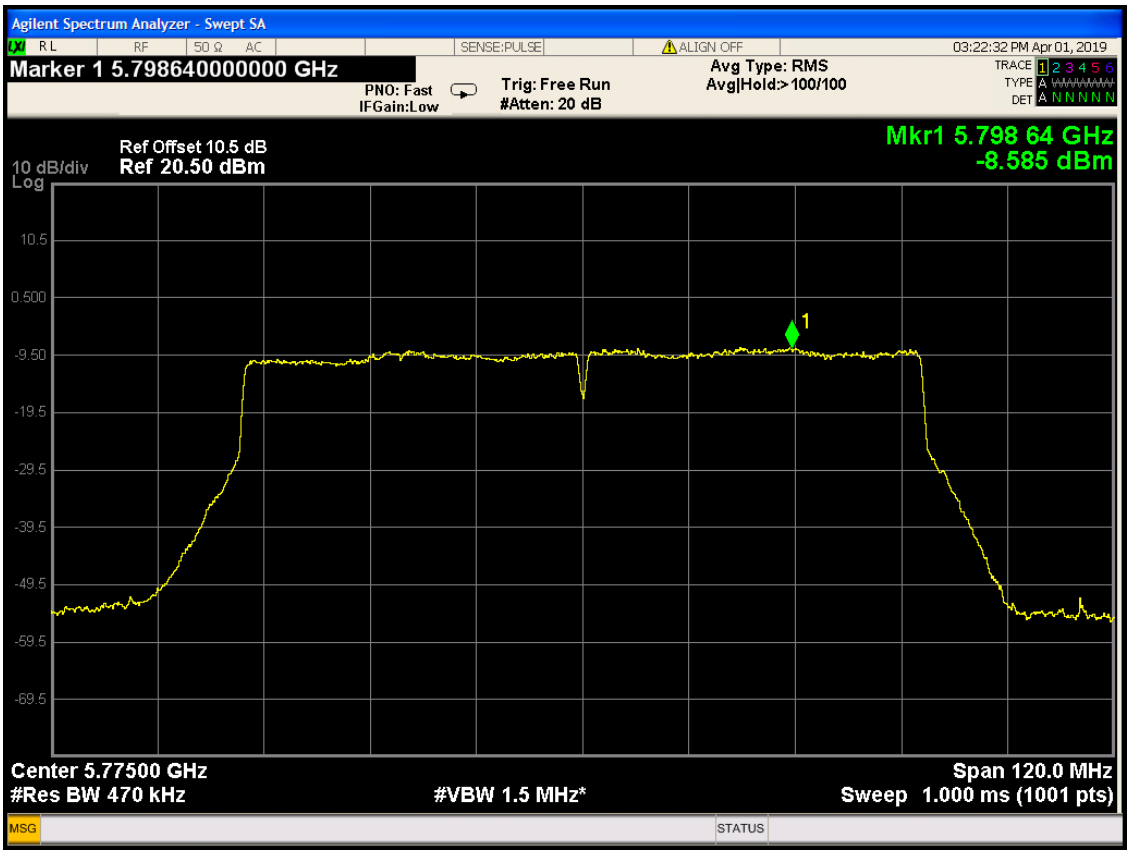


802.11ac 80 mode (Antenna 1):

Channel 5210MHz



Channel 5775MHz



11. FREQUENCY STABILITY

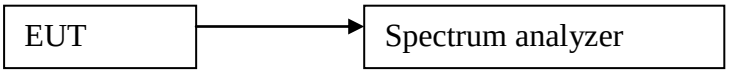
11.1.LIMITS

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

11.2.TEST PROCEDURES

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20^{o}C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –20^{o}C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10^{o}C increased per stage until the highest temperature of +50^{o}C reached.

11.3.TEST SETUP



11.4.TEST RESULTS

Antenna 0

IEEE 802.11a MHz mode / 5180 ~ 5240MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5179.966153	5150-5250	PASS
40	120	5179.974626	5150-5250	PASS
30	120	5179.968189	5150-5250	PASS
20	120	5179.997964	5150-5250	PASS
10	120	5179.957127	5150-5250	PASS
0	120	5179.999140	5150-5250	PASS
-10	120	5179.986690	5150-5250	PASS
-20	120	5179.995381	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5179.979662	5150-5250	PASS
	120	5179.991200	5150-5250	PASS
	132	5179.987045	5150-5250	PASS

IEEE 802.11a MHz mode / 5180 ~ 5240MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5239.952587	5150-5250	PASS
40	120	5239.989668	5150-5250	PASS
30	120	5239.957417	5150-5250	PASS
20	120	5239.992700	5150-5250	PASS
10	120	5239.993465	5150-5250	PASS
0	120	5239.999305	5150-5250	PASS
-10	120	5239.960112	5150-5250	PASS
-20	120	5239.953362	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5239.977587	5150-5250	PASS
	120	5239.996300	5150-5250	PASS
	132	5239.960516	5150-5250	PASS

IEEE 802.11a MHz mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.971601	5725-5850	PASS
40	120	5744.989782	5725-5850	PASS
30	120	5744.964321	5725-5850	PASS
20	120	5744.991800	5725-5850	PASS
10	120	5744.980708	5725-5850	PASS
0	120	5744.969930	5725-5850	PASS
-10	120	5744.972665	5725-5850	PASS
-20	120	5744.957790	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.987515	5725-5850	PASS
	120	5744.998270	5725-5850	PASS
	132	5744.993693	5725-5850	PASS

IEEE 802.11a MHz mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.997648	5725-5850	PASS
40	120	5824.988890	5725-5850	PASS
30	120	5824.986559	5725-5850	PASS
20	120	5824.996310	5725-5850	PASS
10	120	5824.976950	5725-5850	PASS
0	120	5824.971008	5725-5850	PASS
-10	120	5824.951823	5725-5850	PASS
-20	120	5824.983346	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.960649	5725-5850	PASS
	120	5824.996720	5725-5850	PASS
	132	5824.991900	5725-5850	PASS

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IEEE 802.11a MHz mode / 5180 ~ 5240MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5179.999153	5150-5250	PASS
40	120	5179.995819	5150-5250	PASS
30	120	5179.975895	5150-5250	PASS
20	120	5179.992900	5150-5250	PASS
10	120	5179.984665	5150-5250	PASS
0	120	5179.982412	5150-5250	PASS
-10	120	5179.968869	5150-5250	PASS
-20	120	5179.989424	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5179.963553	5150-5250	PASS
	120	5179.996100	5150-5250	PASS
	132	5179.980505	5150-5250	PASS

IEEE 802.11a MHz mode / 5180 ~ 5240MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5239.991756	5150-5250	PASS
40	120	5239.992038	5150-5250	PASS
30	120	5239.974266	5150-5250	PASS
20	120	5240.005000	5150-5250	PASS
10	120	5239.971933	5150-5250	PASS
0	120	5239.994271	5150-5250	PASS
-10	120	5239.961151	5150-5250	PASS
-20	120	5239.990407	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5239.969640	5150-5250	PASS
	120	5240.001300	5150-5250	PASS
	132	5239.988044	5150-5250	PASS

IEEE 802.11a MHz mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.952957	5725-5850	PASS
40	120	5744.985945	5725-5850	PASS
30	120	5744.970538	5725-5850	PASS
20	120	5744.998140	5725-5850	PASS
10	120	5744.987349	5725-5850	PASS
0	120	5744.993876	5725-5850	PASS
-10	120	5744.950920	5725-5850	PASS
-20	120	5744.953586	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.990847	5725-5850	PASS
	120	5744.996520	5725-5850	PASS
	132	5744.966093	5725-5850	PASS

IEEE 802.11a MHz mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.991583	5725-5850	PASS
40	120	5824.967036	5725-5850	PASS
30	120	5824.989152	5725-5850	PASS
20	120	5825.002200	5725-5850	PASS
10	120	5824.979392	5725-5850	PASS
0	120	5824.960638	5725-5850	PASS
-10	120	5824.990683	5725-5850	PASS
-20	120	5824.962496	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.981178	5725-5850	PASS
	120	5825.005000	5725-5850	PASS
	132	5824.982073	5725-5850	PASS

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IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5179.986502	5150-5250	PASS
40	120	5179.952926	5150-5250	PASS
30	120	5179.962615	5150-5250	PASS
20	120	5179.992500	5150-5250	PASS
10	120	5179.949501	5150-5250	PASS
0	120	5179.967801	5150-5250	PASS
-10	120	5179.968404	5150-5250	PASS
-20	120	5179.966635	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5179.980986	5150-5250	PASS
	120	5179.983700	5150-5250	PASS
	132	5179.996577	5150-5250	PASS

IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5239.986037	5150-5250	PASS
40	120	5239.984284	5150-5250	PASS
30	120	5239.984194	5150-5250	PASS
20	120	5239.997130	5150-5250	PASS
10	120	5239.978863	5150-5250	PASS
0	120	5239.950643	5150-5250	PASS
-10	120	5239.990534	5150-5250	PASS
-20	120	5239.984555	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5239.998783	5150-5250	PASS
	120	5239.992900	5150-5250	PASS
	132	5239.986684	5150-5250	PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.964297	5725-5850	PASS
40	120	5744.991517	5725-5850	PASS
30	120	5744.983511	5725-5850	PASS
20	120	5744.995280	5725-5850	PASS
10	120	5744.990683	5725-5850	PASS
0	120	5744.952148	5725-5850	PASS
-10	120	5744.964256	5725-5850	PASS
-20	120	5744.987948	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.994134	5725-5850	PASS
	120	5744.995240	5725-5850	PASS
	132	5744.988159	5725-5850	PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.954651	5725-5850	PASS
40	120	5824.961382	5725-5850	PASS
30	120	5824.963745	5725-5850	PASS
20	120	5824.997633	5725-5850	PASS
10	120	5824.967256	5725-5850	PASS
0	120	5824.981091	5725-5850	PASS
-10	120	5824.999480	5725-5850	PASS
-20	120	5824.995303	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.974079	5725-5850	PASS
	120	5824.992900	5725-5850	PASS
	132	5824.966054	5725-5850	PASS

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IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5179.960113	5150-5250	PASS
40	120	5179.980374	5150-5250	PASS
30	120	5179.962002	5150-5250	PASS
20	120	5179.994620	5150-5250	PASS
10	120	5179.962793	5150-5250	PASS
0	120	5179.981725	5150-5250	PASS
-10	120	5179.963544	5150-5250	PASS
-20	120	5179.982169	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5179.974175	5150-5250	PASS
	120	5179.997300	5150-5250	PASS
	132	5179.976976	5150-5250	PASS

IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5239.998020	5150-5250	PASS
40	120	5239.961936	5150-5250	PASS
30	120	5239.991214	5150-5250	PASS
20	120	5240.006100	5150-5250	PASS
10	120	5239.986610	5150-5250	PASS
0	120	5239.962854	5150-5250	PASS
-10	120	5239.978334	5150-5250	PASS
-20	120	5239.953235	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5239.968637	5150-5250	PASS
	120	5240.003000	5150-5250	PASS
	132	5239.998031	5150-5250	PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.996475	5725-5850	PASS
40	120	5744.964168	5725-5850	PASS
30	120	5744.981142	5725-5850	PASS
20	120	5744.991700	5725-5850	PASS
10	120	5744.978048	5725-5850	PASS
0	120	5744.971199	5725-5850	PASS
-10	120	5744.977246	5725-5850	PASS
-20	120	5744.989441	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.968187	5725-5850	PASS
	120	5744.993500	5725-5850	PASS
	132	5744.980181	5725-5850	PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.949139	5725-5850	PASS
40	120	5824.990832	5725-5850	PASS
30	120	5824.986784	5725-5850	PASS
20	120	5824.997620	5725-5850	PASS
10	120	5824.975926	5725-5850	PASS
0	120	5824.999253	5725-5850	PASS
-10	120	5824.951979	5725-5850	PASS
-20	120	5824.976452	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.981165	5725-5850	PASS
	120	5824.993700	5725-5850	PASS
	132	5824.984787	5725-5850	PASS

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IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5189.997260	5150-5250	PASS
40	120	5189.984705	5150-5250	PASS
30	120	5189.949175	5150-5250	PASS
20	120	5189.994280	5150-5250	PASS
10	120	5189.954260	5150-5250	PASS
0	120	5189.970875	5150-5250	PASS
-10	120	5189.999754	5150-5250	PASS
-20	120	5189.979505	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5189.966808	5150-5250	PASS
	120	5189.998610	5150-5250	PASS
	132	5189.960039	5150-5250	PASS

IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5229.969548	5150-5250	PASS
40	120	5229.998640	5150-5250	PASS
30	120	5229.961084	5150-5250	PASS
20	120	5230.006300	5150-5250	PASS
10	120	5229.956923	5150-5250	PASS
0	120	5229.960742	5150-5250	PASS
-10	120	5229.979936	5150-5250	PASS
-20	120	5229.958717	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5229.972651	5150-5250	PASS
	120	5230.005100	5150-5250	PASS
	132	5229.980790	5150-5250	PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5754.967870	5725-5850	PASS
40	120	5754.963605	5725-5850	PASS
30	120	5754.961574	5725-5850	PASS
20	120	5754.996380	5725-5850	PASS
10	120	5754.968767	5725-5850	PASS
0	120	5754.969778	5725-5850	PASS
-10	120	5754.969475	5725-5850	PASS
-20	120	5754.976739	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5754.995040	5725-5850	PASS
	120	5754.997260	5725-5850	PASS
	132	5754.994803	5725-5850	PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5794.966955	5725-5850	PASS
40	120	5794.991593	5725-5850	PASS
30	120	5794.980509	5725-5850	PASS
20	120	5794.992200	5725-5850	PASS
10	120	5794.973487	5725-5850	PASS
0	120	5794.967883	5725-5850	PASS
-10	120	5794.987158	5725-5850	PASS
-20	120	5794.997931	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5794.962076	5725-5850	PASS
	120	5794.997410	5725-5850	PASS
	132	5794.966745	5725-5850	PASS

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IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5189.998520	5150-5250	PASS
40	120	5189.998205	5150-5250	PASS
30	120	5189.966941	5150-5250	PASS
20	120	5190.003000	5150-5250	PASS
10	120	5189.957598	5150-5250	PASS
0	120	5189.964636	5150-5250	PASS
-10	120	5189.964259	5150-5250	PASS
-20	120	5189.982251	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5189.968547	5150-5250	PASS
	120	5190.005000	5150-5250	PASS
	132	5189.984779	5150-5250	PASS

IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5229.977855	5150-5250	PASS
40	120	5229.989980	5150-5250	PASS
30	120	5229.982064	5150-5250	PASS
20	120	5230.001800	5150-5250	PASS
10	120	5229.990234	5150-5250	PASS
0	120	5229.998768	5150-5250	PASS
-10	120	5229.995379	5150-5250	PASS
-20	120	5229.966987	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5229.953886	5150-5250	PASS
	120	5230.003700	5150-5250	PASS
	132	5229.955000	5150-5250	PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5754.950043	5725-5850	PASS
40	120	5754.964630	5725-5850	PASS
30	120	5754.985295	5725-5850	PASS
20	120	5754.998370	5725-5850	PASS
10	120	5754.995850	5725-5850	PASS
0	120	5754.991405	5725-5850	PASS
-10	120	5754.965856	5725-5850	PASS
-20	120	5754.970075	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5754.983312	5725-5850	PASS
	120	5754.998260	5725-5850	PASS
	132	5754.955057	5725-5850	PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5794.953925	5725-5850	PASS
40	120	5794.990356	5725-5850	PASS
30	120	5794.984456	5725-5850	PASS
20	120	5794.992900	5725-5850	PASS
10	120	5794.982544	5725-5850	PASS
0	120	5794.965821	5725-5850	PASS
-10	120	5794.967787	5725-5850	PASS
-20	120	5794.978796	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5794.979468	5725-5850	PASS
	120	5794.993300	5725-5850	PASS
	132	5794.992421	5725-5850	PASS

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IEEE 802.11ac 80 mode / 5210MHz

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5209.980989	5150-5250	PASS
40	120	5209.992411	5150-5250	PASS
30	120	5209.997992	5150-5250	PASS
20	120	5209.993300	5150-5250	PASS
10	120	5209.957837	5150-5250	PASS
0	120	5209.987333	5150-5250	PASS
-10	120	5209.949964	5150-5250	PASS
-20	120	5209.960231	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5209.972911	5150-5250	PASS
	120	5209.995200	5150-5250	PASS
	132	5209.965376	5150-5250	PASS

IEEE 802.11ac 80 mode / 5775MHz

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5774.999073	5725-5850	PASS
40	120	5774.993274	5725-5850	PASS
30	120	5774.984461	5725-5850	PASS
20	120	5774.991300	5725-5850	PASS
10	120	5774.975797	5725-5850	PASS
0	120	5774.950469	5725-5850	PASS
-10	120	5774.970748	5725-5850	PASS
-20	120	5774.989936	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5774.992573	5725-5850	PASS
	120	5774.995730	5725-5850	PASS
	132	5774.997521	5725-5850	PASS

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IEEE 802.11ac 80 mode / 5210MHz

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5209.963189	5150-5250	PASS
40	120	5209.969354	5150-5250	PASS
30	120	5209.981433	5150-5250	PASS
20	120	5209.992600	5150-5250	PASS
10	120	5209.974107	5150-5250	PASS
0	120	5209.950828	5150-5250	PASS
-10	120	5209.990900	5150-5250	PASS
-20	120	5209.955107	5150-5250	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5209.994931	5150-5250	PASS
	120	5209.995300	5150-5250	PASS
	132	5209.950104	5150-5250	PASS

IEEE 802.11ac 80 mode / 5775MHz

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5774.971591	5725-5850	PASS
40	120	5774.990913	5725-5850	PASS
30	120	5774.964796	5725-5850	PASS
20	120	5774.992500	5725-5850	PASS
10	120	5774.954984	5725-5850	PASS
0	120	5774.953175	5725-5850	PASS
-10	120	5774.978178	5725-5850	PASS
-20	120	5774.971427	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5774.996580	5725-5850	PASS
	120	5774.993100	5725-5850	PASS
	132	5774.959180	5725-5850	PASS

12. RESTRICTED BANDS OF OPERATION

12.1. LIMITS

Section 15.407(b)(7) The provisions of §15.205 apply to intentional radiators operating under this section.

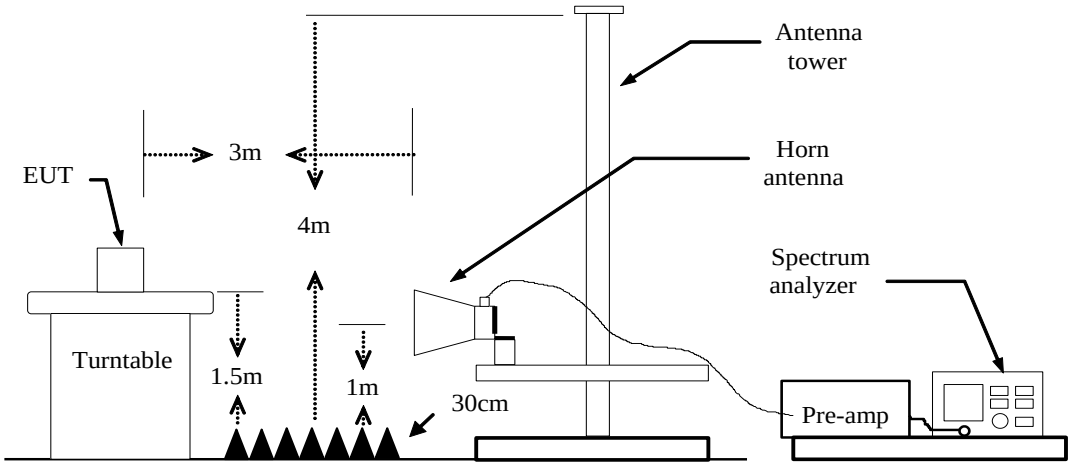
15.205(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 -	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.69525	960 - 1240	7.25 - 7.75
4.125 - 4.128	16.80425 -	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	16.80475	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	25.5 - 25.67	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	37.5 - 38.25	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	73 - 74.6	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	74.8 - 75.2	2200 - 2300	14.47 - 14.5
8.291 - 8.294	108 - 121.94	2310 - 2390	15.35 - 16.2
8.362 - 8.366	123 - 138	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	149.9 - 150.05	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.52475 -	3260 - 3267	23.6 - 24.0
12.29 - 12.293	156.52525	3332 - 3339	31.2 - 31.8
12.51975 -	156.7 - 156.9	3345.8 - 3358	36.43 - 36.5
12.52025	162.0125 - 167.17	3600 - 4400	
12.57675 -	167.72 - 173.2		
12.57725	240 - 285		
13.36 - 13.41	322 - 335.4		

12.2. TEST PROCEDURES

1) The EUT is placed on a turntable, which is 1.5m above the ground plane.
2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4) Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   a) PEAK: RBW=1MHz / VBW=1MHz / Sweep=AUTO
   b) AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO
5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

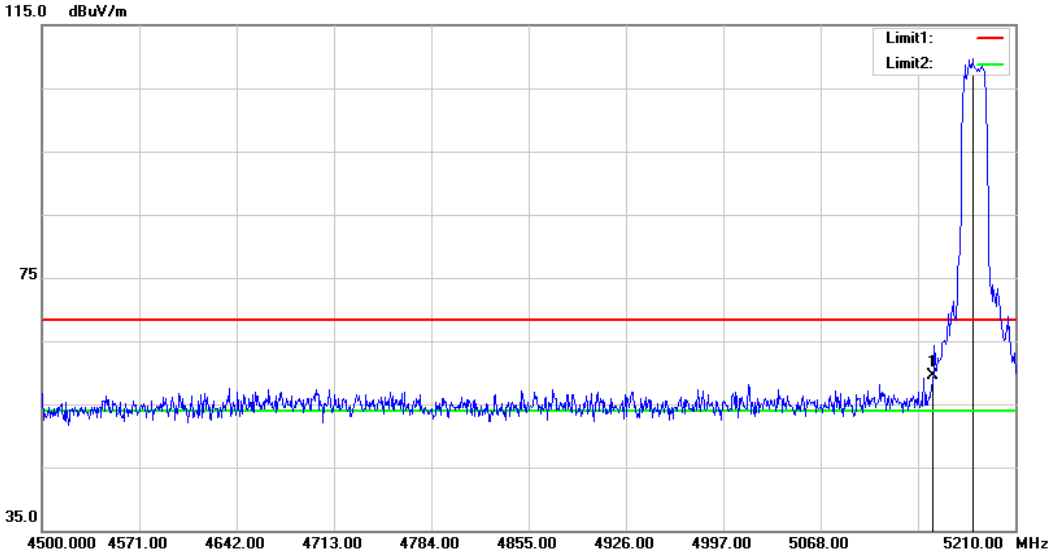
12.3. TEST SETUP



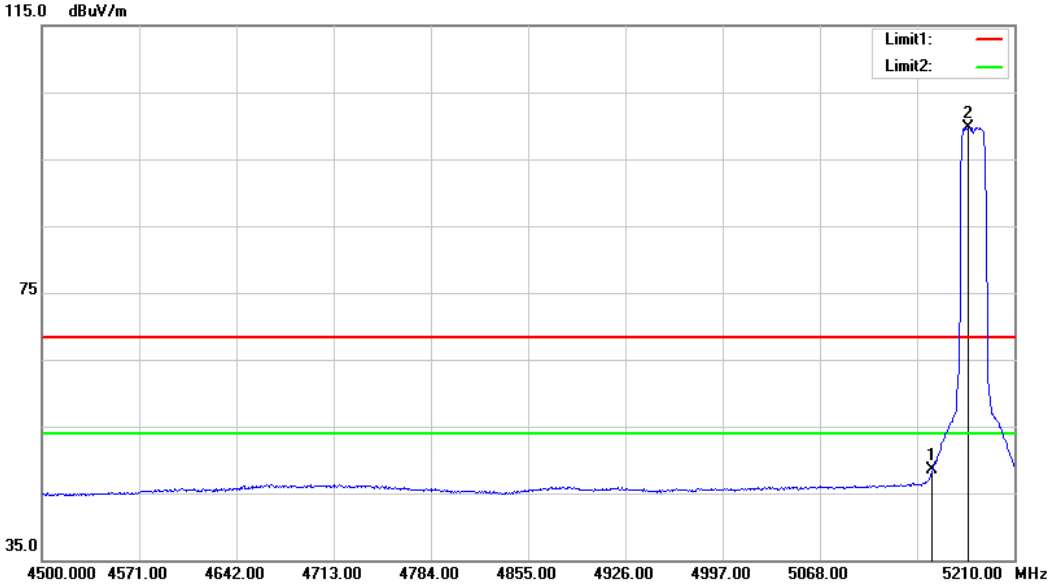
12.4. TEST RESULTS

802.11a mode/5180MHz(antenna 0)

Detector mode: Peak Polarity: Vertical

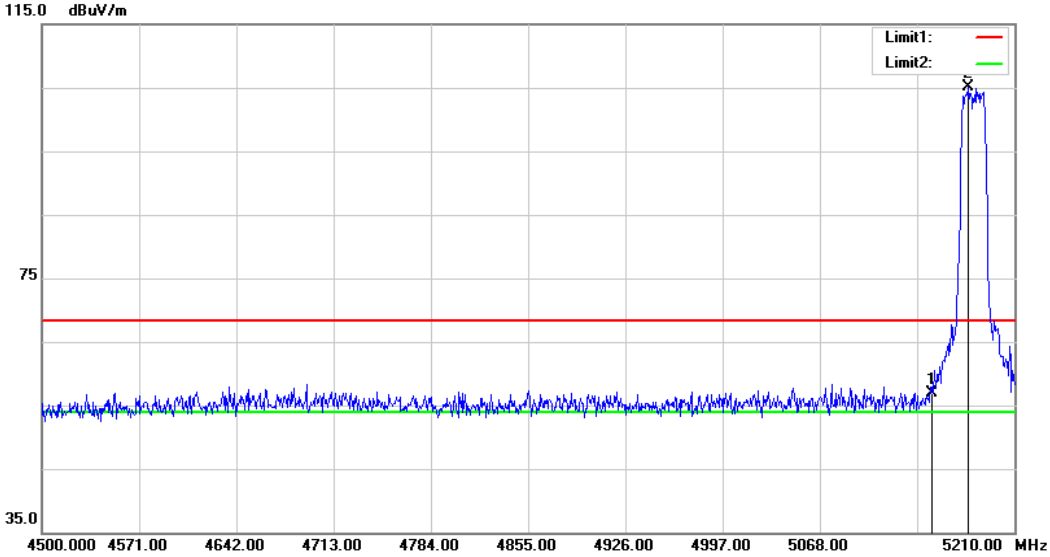


Detector mode: Average Polarity: Vertical

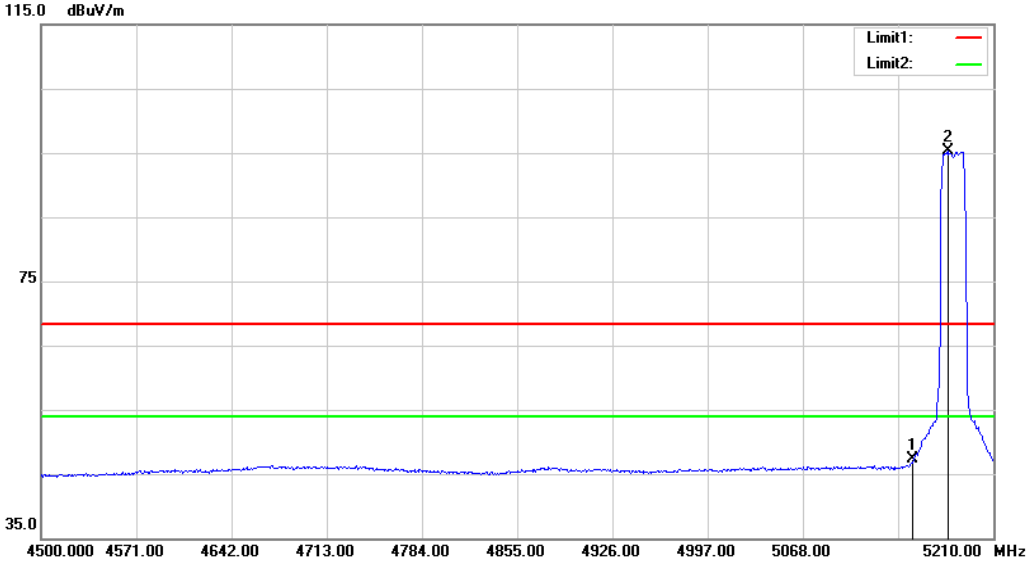


No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	56.89	2.66	59.55	68.20	-8.65	Peak	Vertical
2	5178.760	106.89	2.74	---	68.20	---	Peak	Vertical
1	5150.000	45.80	2.66	48.46	54.00	-5.54	Average	Vertical
2	5176.630	97.04	2.74	---	54.00	---	Average	Vertical

Detector mode: Peak Polarity: Horizontal



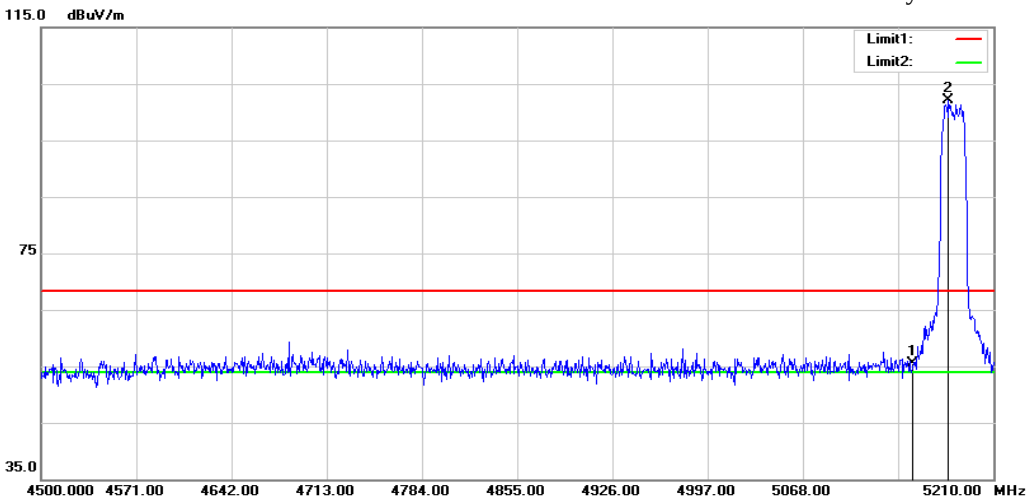
Detector mode: Average Polarity: Horizontal



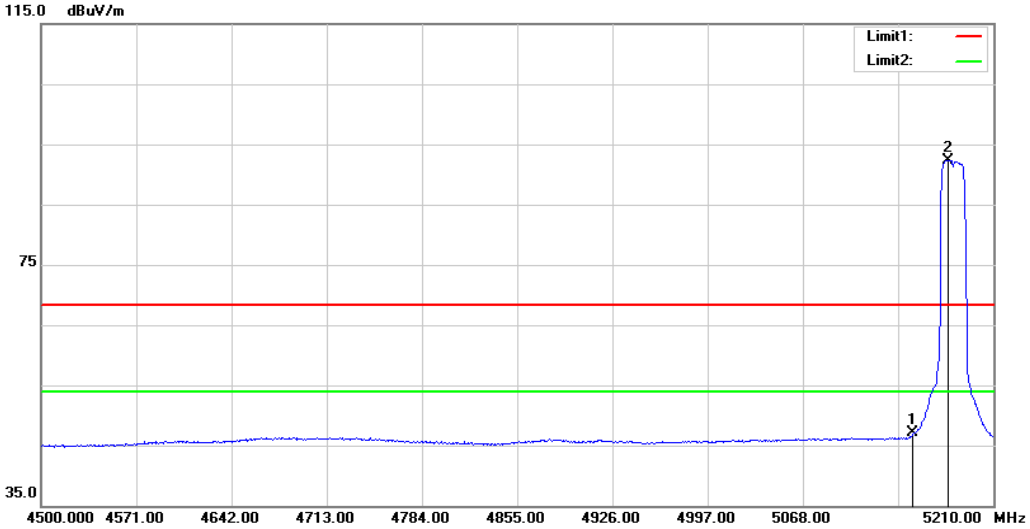
No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	54.21	2.66	56.87	68.20	-11.33	Peak	Horizontal
2	5176.630	102.29	2.74	---	68.20	---	Peak	Horizontal
1	5150.000	44.57	2.66	47.23	54.00	-6.77	Average	Horizontal
2	5176.630	92.51	2.74	---	54.00	---	Average	Horizontal

802.11a mode/5180MHz(antenna 1)

Detector mode: Peak Polarity: Vertical

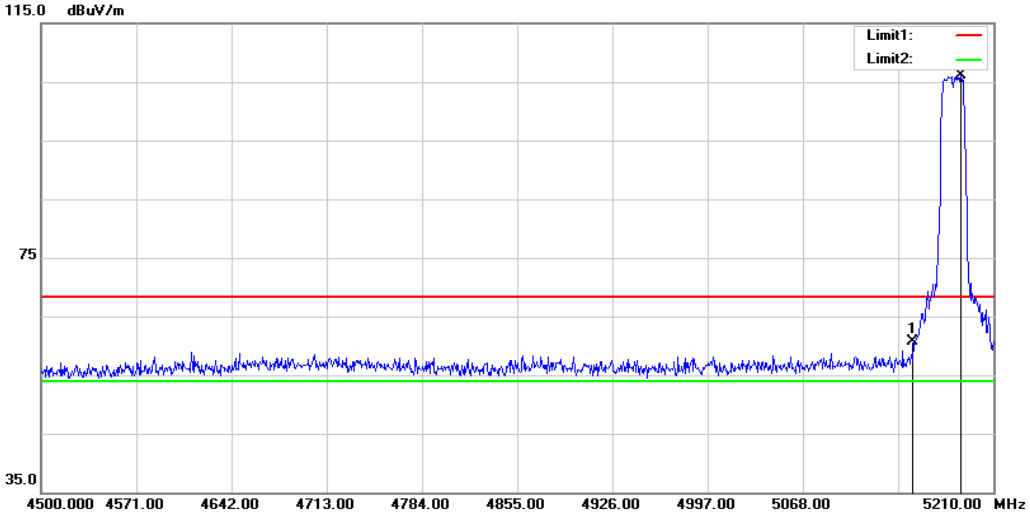


Detector mode: Average Polarity: Vertical

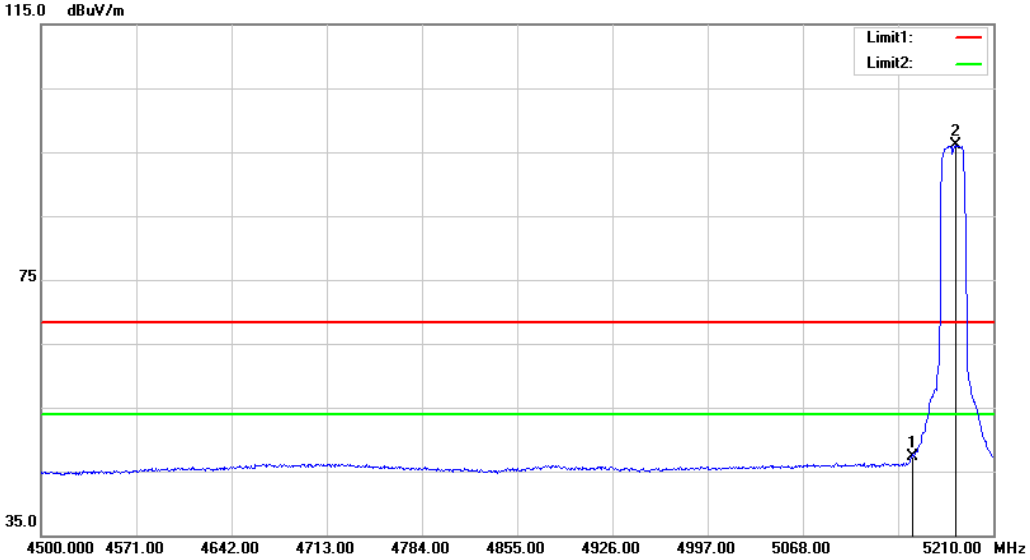


No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	52.90	2.66	55.56	68.20	-12.64	Peak	Vertical
2	5176.630	99.45	2.74	---	68.20	---	Peak	Vertical
1	5150.000	44.41	2.66	47.07	54.00	-6.93	Average	Vertical
2	5176.630	89.54	2.74	---	54.00	---	Average	Vertical

Detector mode: Peak Polarity: Horizontal



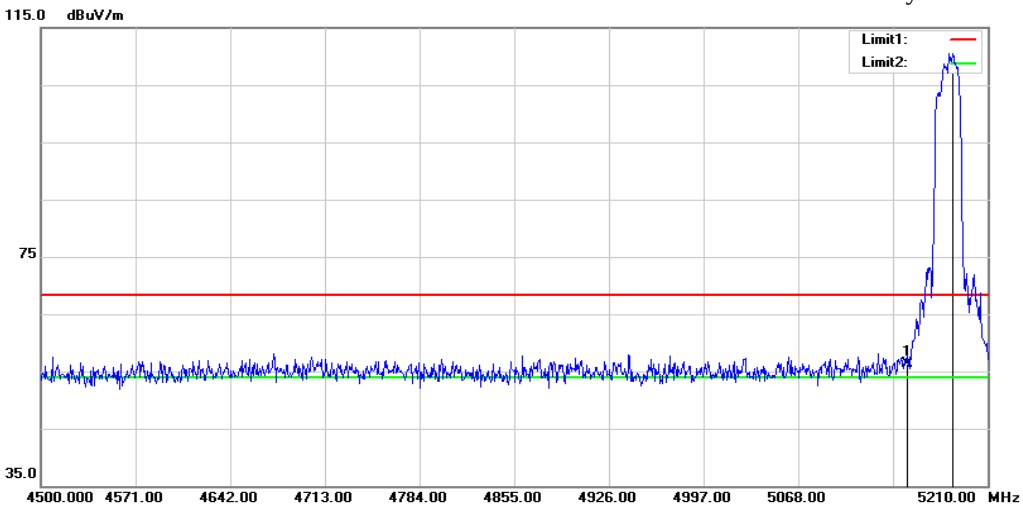
Detector mode: Average Polarity: Horizontal



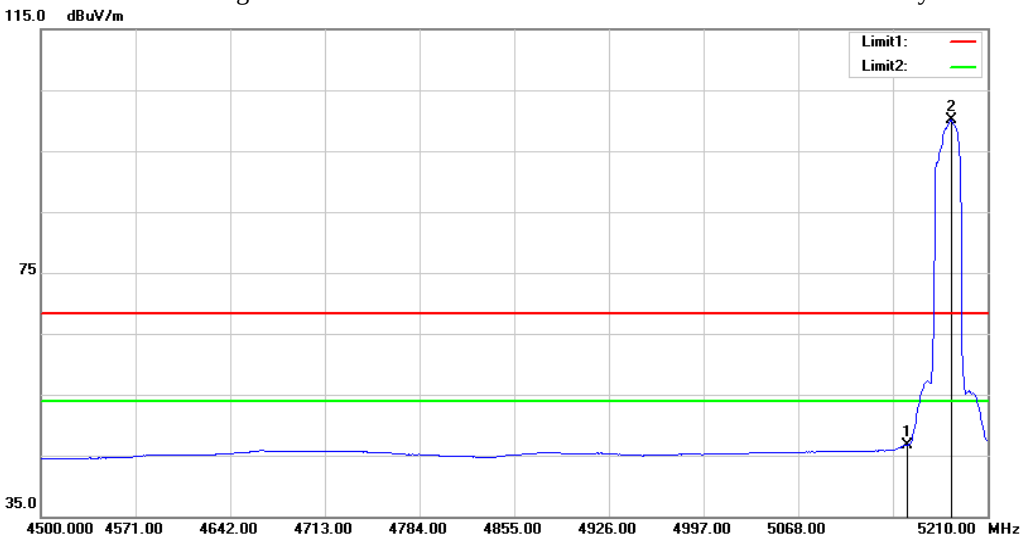
No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	58.00	2.66	60.66	68.20	-7.54	Peak	Horizontal
2	5185.860	103.30	2.76	---	68.20	---	Peak	Horizontal
1	5150.000	44.71	2.66	47.37	54.00	-6.63	Average	Horizontal
2	5181.600	93.39	2.75	---	54.00	---	Average	Horizontal

802.11n HT20 mode/5180MHz (combine with antenna 0 and antenna 1)

Detector mode: Peak Polarity: Vertical



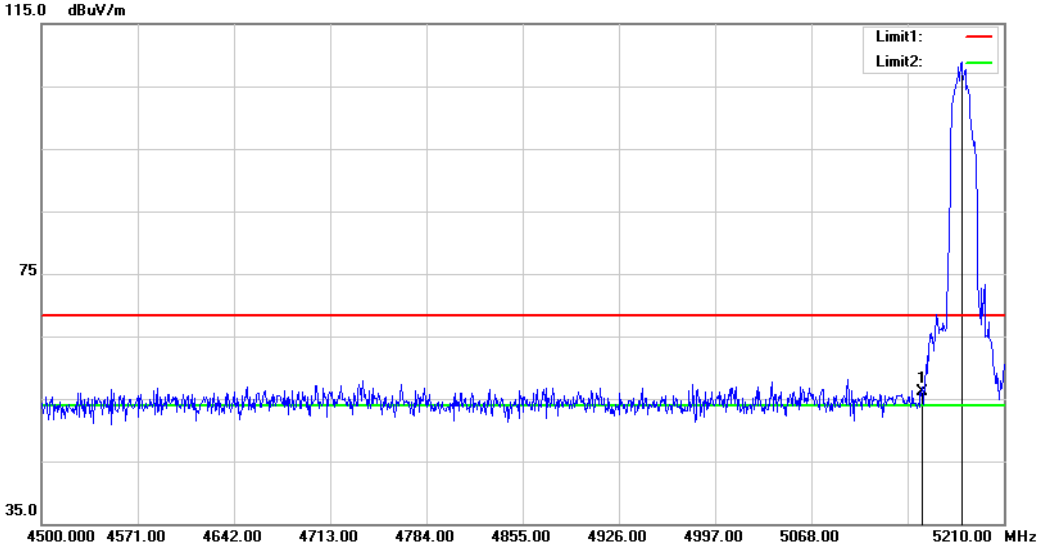
Detector mode: Average Polarity: Vertical



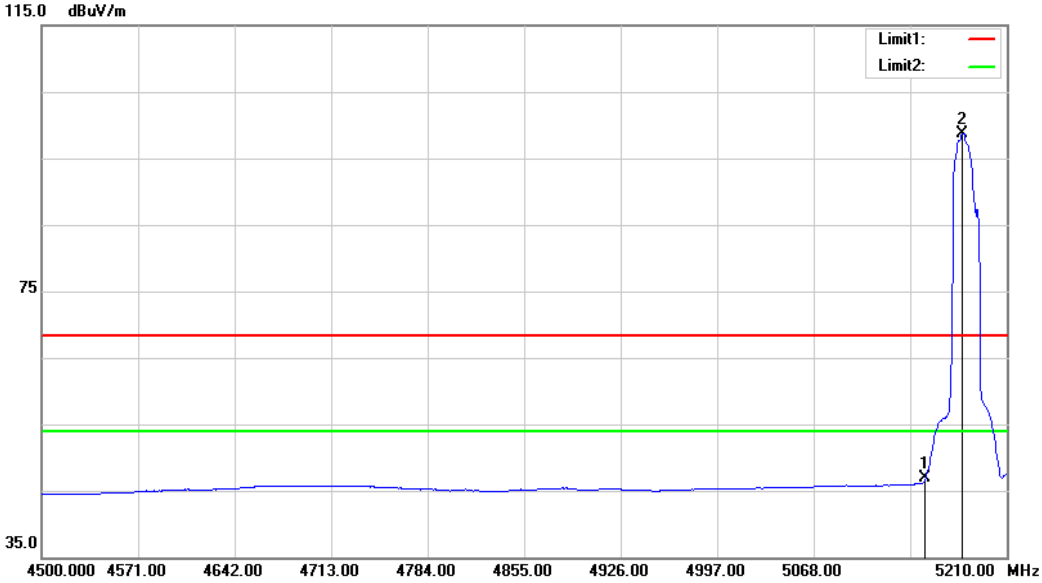
No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	53.65	2.66	56.31	68.20	-11.89	Peak	Vertical
2	5183.730	107.72	2.75	---	68.20	---	Peak	Vertical
1	5150.000	44.07	2.66	46.73	54.00	-7.27	Average	Vertical
2	5183.020	97.29	2.75	---	54.00	---	Average	Vertical

Channel Low

Detector mode: Peak Polarity: Horizontal



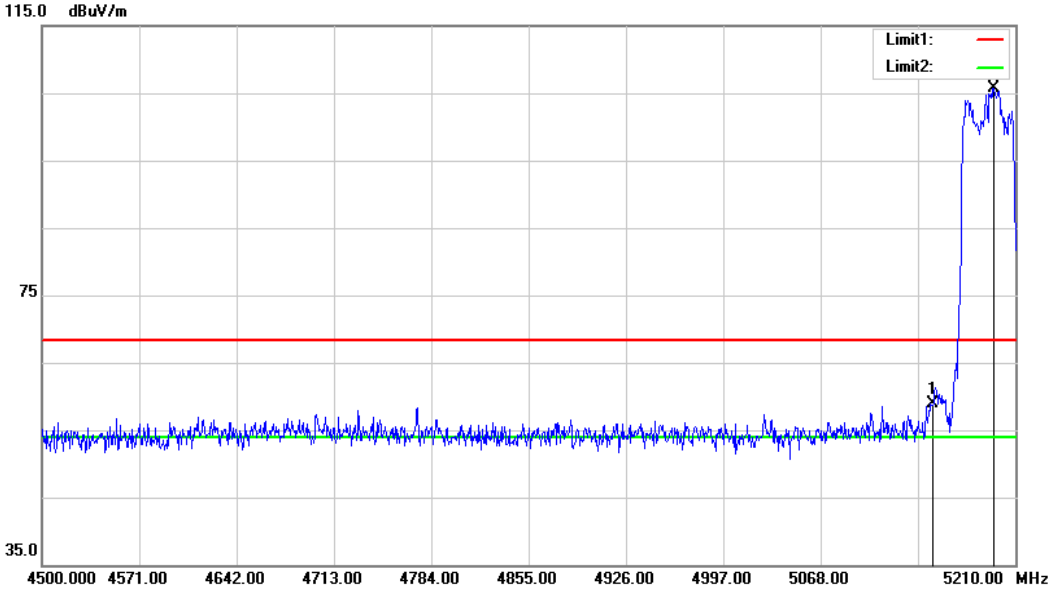
Detector mode: Average Polarity: Horizontal



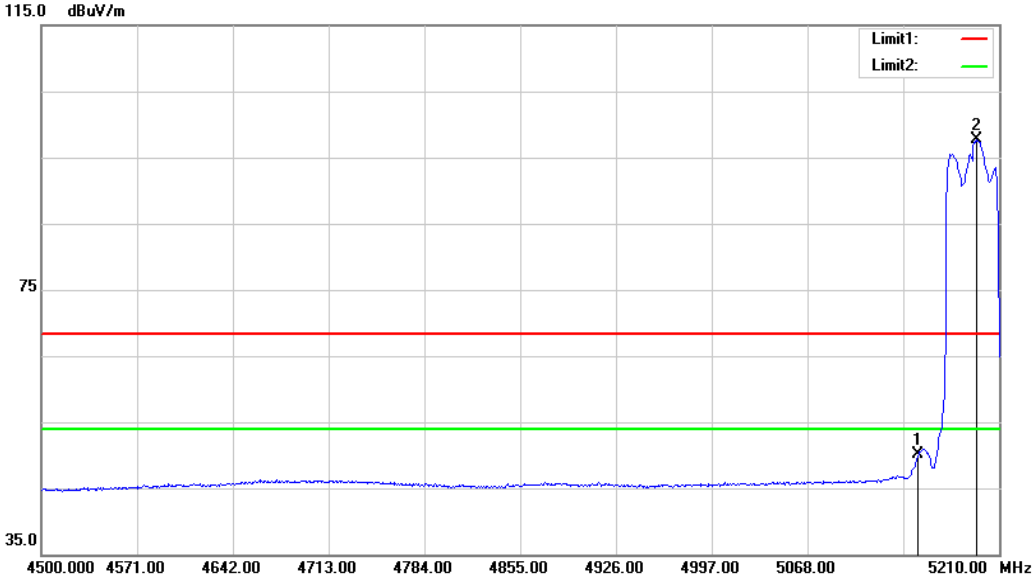
No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	53.47	2.66	56.13	68.20	-12.07	Peak	Horizontal
2	5178.760	106.21	2.74	---	68.20	---	Peak	Horizontal
1	5150.000	44.20	2.66	46.86	54.00	-7.14	Average	Horizontal
2	5177.340	95.94	2.74	---	54.00	---	Average	Horizontal

802.11n HT40 mode/5190MHz (combine with antenna 0 and antenna 1)

Detector mode: Peak Polarity: Vertical

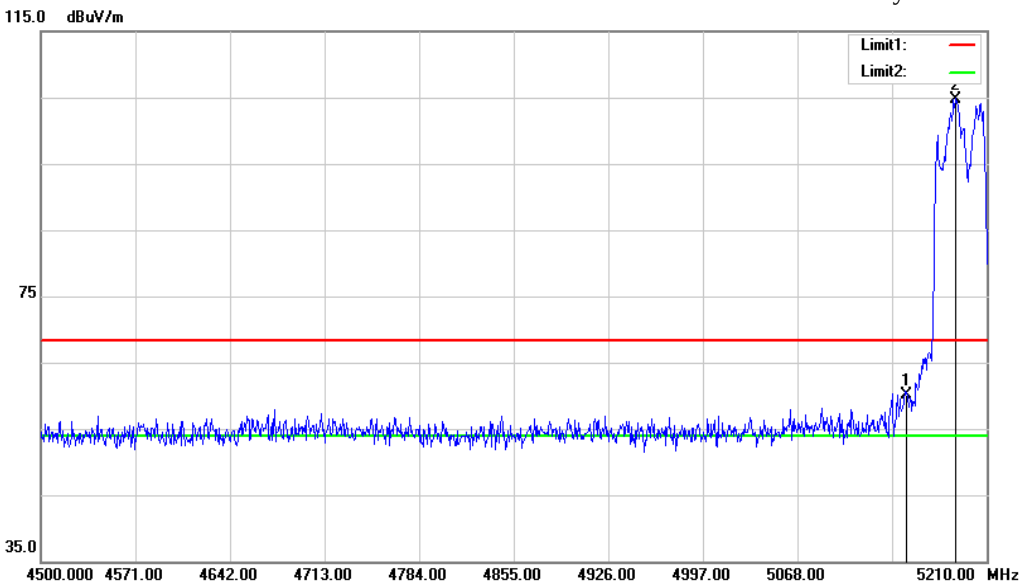


Detector mode: Average Polarity: Vertical

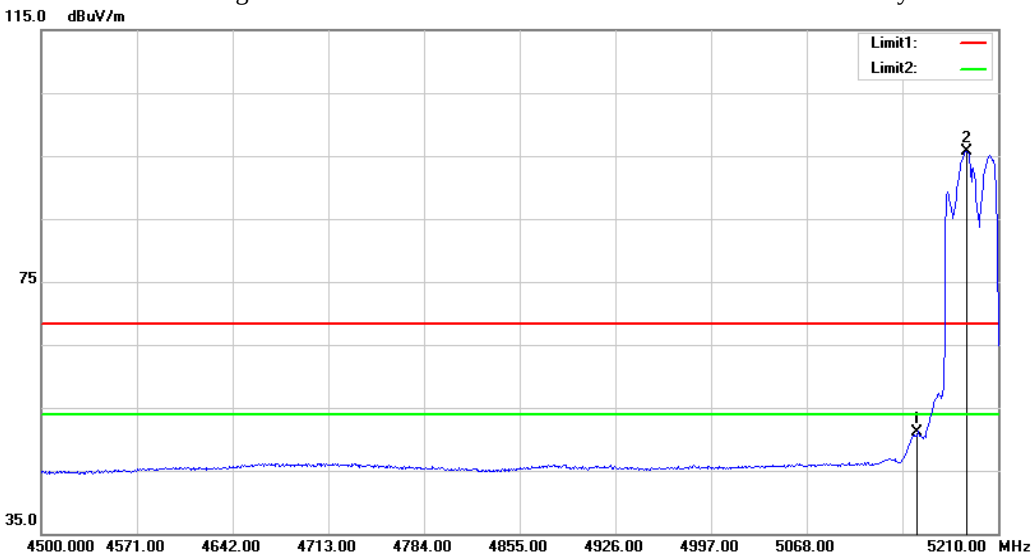


No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	56.24	2.66	58.90	68.20	-9.30	Peak	Vertical
2	5194.380	103.01	2.79	---	68.20	---	Peak	Vertical
1	5150.000	47.51	2.66	50.17	54.00	-3.83	Average	Vertical
2	5192.960	94.86	2.78	---	54.00	---	Average	Vertical

Detector mode: Peak Polarity: Horizontal



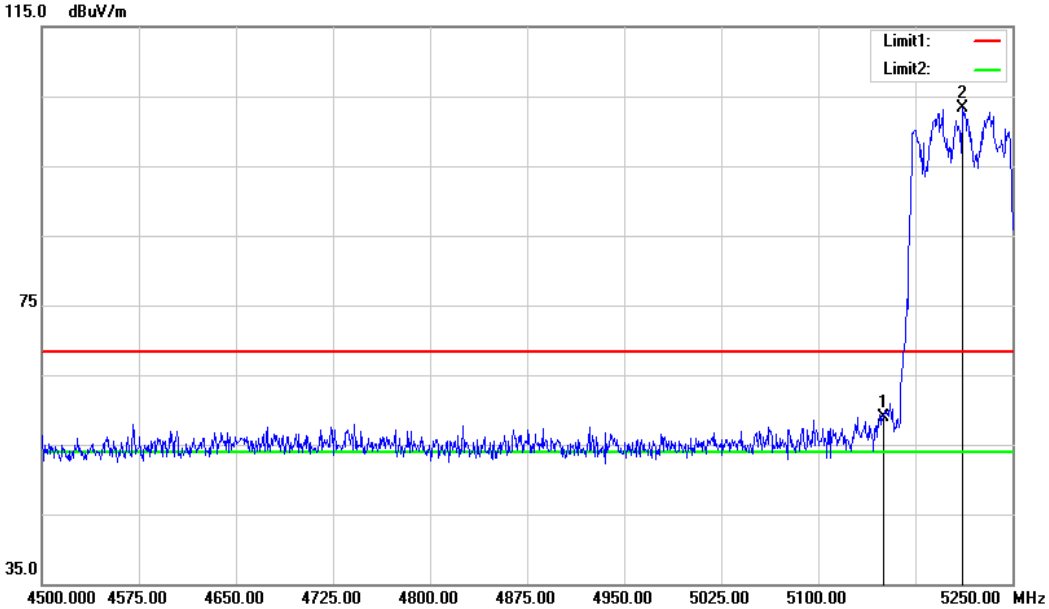
Detector mode: Average Polarity: Horizontal



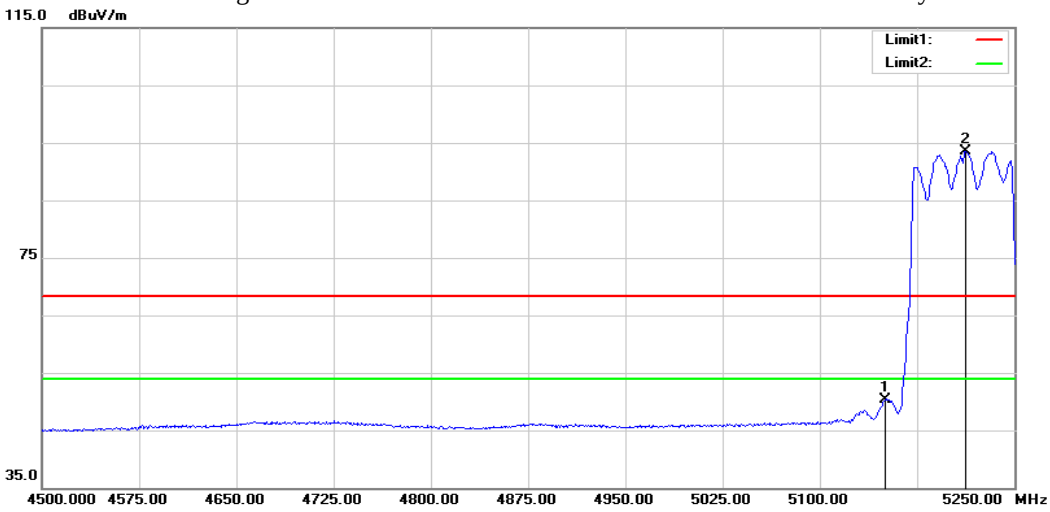
No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	57.47	2.66	60.13	68.20	-8.07	Peak	Horizontal
2	5186.570	102.04	2.76	---	68.20	---	Peak	Horizontal
1	5150.000	48.41	2.66	51.07	54.00	-2.93	Average	Horizontal
2	5186.570	92.97	2.76	---	54.00	---	Average	Horizontal

802.11ac 80 mode/5210MHz (combine with antenna 0 and antenna 1)

Detector mode: Peak Polarity: Vertical

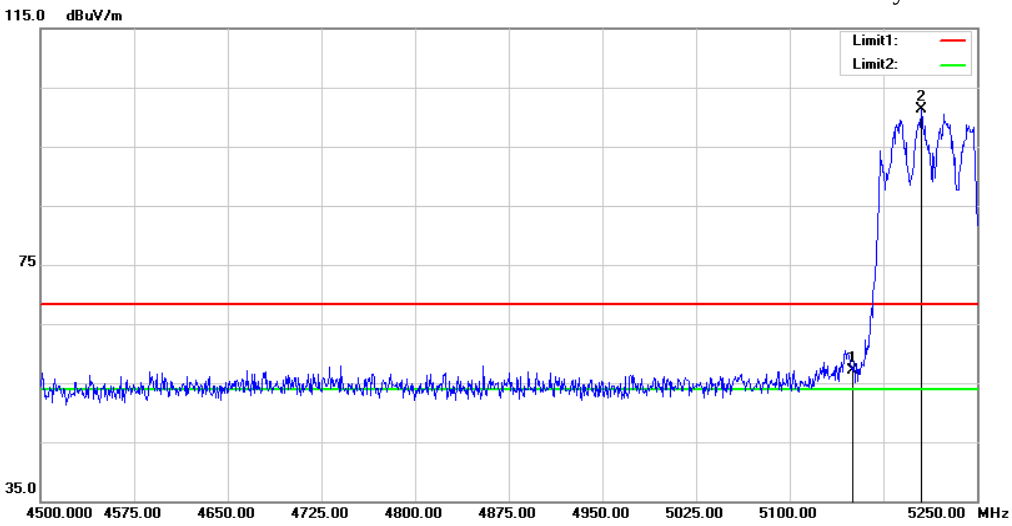


Detector mode: Average Polarity: Vertical

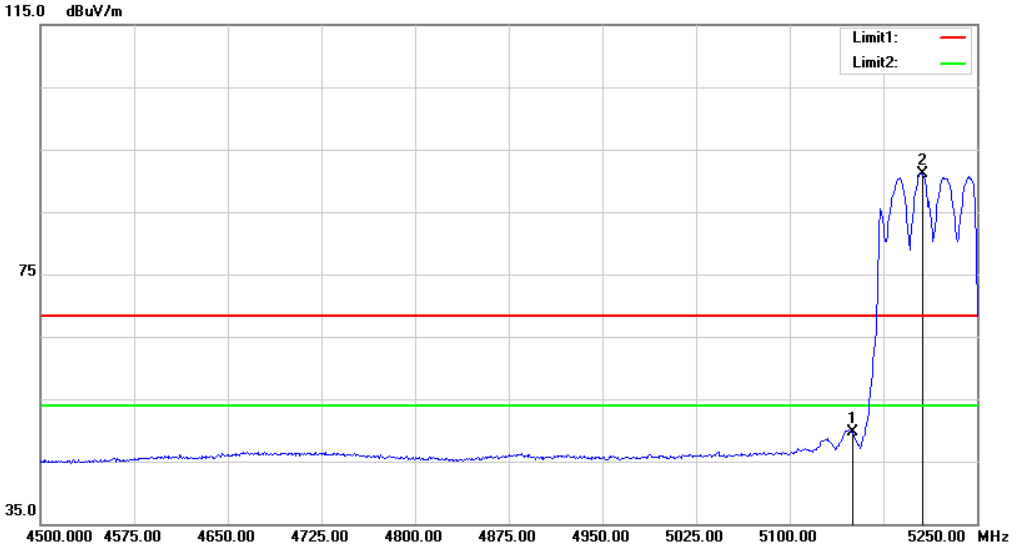


No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	56.17	2.66	58.83	68.20	-9.37	Peak	Vertical
2	5211.750	100.40	2.85	---	68.20	---	Peak	Vertical
1	5150.000	47.63	2.66	50.29	54.00	-3.71	Average	Vertical
2	5212.500	90.64	2.85	---	54.00	---	Average	Vertical

Detector mode: Peak Polarity: Horizontal



Detector mode: Average Polarity: Horizontal



No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pole
1	5150.000	54.38	2.66	57.04	68.20	-11.16	Peak	Horizontal
2	5205.750	98.44	2.81	---	68.20	---	Peak	Horizontal
1	5150.000	46.99	2.66	49.65	54.00	-4.35	Average	Horizontal
2	5206.500	88.35	2.82	---	54.00	---	Average	Horizontal

Remark: Max field strength in 3m distance. No any other emission which falls in restricted bands can be detected and be reported.