FCC Part 15E
Measurement and Test Report

For

Shenzhen Vastking Electronic Co.,LTD.

2/F, Building 6, ZhengZhong Industrial Park, Qiaotou Community, Fuyong,

Baoan, Shenzhen, China

FCC ID: 2AFA3-TM133WH710CE

FCC Rule(s):	FCC Part 15E
Product Description:	13.3'' Yoga Notebook
Tested Model:	TM133WH710CE
Report No.:	STR17068482I-1
Tested Date:	2017-06-28 to 2017-07-11
Issued Date:	2017-07-11
Tested By:	Iven Guo / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager

Prepared By:

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Shenzhen Vastking Electronic Co.,LTD.
Address of applicant:	2/F, Building 6, ZhengZhong Industrial Park, Qiaotou Community, Fuyong, Baoan, Shenzhen, China
Manufacturer:	Shenzhen Vastking Electronic Co.,LTD.
Address of manufacturer:	2/F, Building 6, ZhengZhong Industrial Park, Qiaotou Community, Fuyong, Baoan, Shenzhen, China

General Description of EUT	
Product Name:	13.3'' Yoga Notebook
Trade Name:	/
Model No.:	TM133WH710CE
Adding Model:	/
Rated Voltage:	DC 7.4V by battery
Battery capacity:	4600mAh
Power Adapter Model:	JHD-AP036U-120200BA
	Input:100V-240V, 50/60Hz,0.6A ; Output:12V,2A
Hardware Version:	EM_IA116_V2.0
Software Version:	Windows 10
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20/40), 802.11ac
Frequency Range:	5150-5250MHz, 5725-5850MHz
RF Output Power:	7.71dBm (Conducted)
Type of Modulation:	QPSK, 16QAM, 64QAM
Data Rate:	6-54Mbps, up to 867Mbps
Type of Antenna:	Integral
Antenna Gain:	Antenna A&B: 1.28dBi

1.2 Test Standards

The following report is prepared on behalf of the Shenzhen Vastking Electronic Co.,LTD. in accordance with FCC Part 15, Subpart C&E, and section 15.203, 15.205, 15.207, 15.209 and 15.407 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C&E, and section 15.203, 15.205, 15.207, 15.209 and 15.407 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The measurement guide KDB 789033 D02 v01r02 for Unlicensed National Information Infrastructure (U-NII) Devices and KDB 662911 D01 Multiple Transmitter Output v02r01 shall be performed also.

1.4 Table for parameters of Test Software setting

The test utility software used during testing was “RPTA1-71W.M4300.01.GD.2015Sep1”. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180	5200	5240	5260	5300	5320	5500	5580	5700	5720	5745	5785	5825
802.11a 6Mbps	19	19	19	/	/	/	/	/	/	/	15	15	15
802.11n-HT20 MCS0	19	19	19	/	/	/	/	/	/	/	15	15	15
Mode	NCB: 40MHz												
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795			
802.11n-HT40 MCS0	19	19	/	/	/	/	/	/	15	15			
Mode	NCB: 80MHz												
	5210		5290		5530		5610		5690		5775		
802.11ac-VT80 MCS0/Nss2	19		/		/		/		/		15		

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Windows 10 were executed.

1.6 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5180MHz,5200MHz,5240MHz, 5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz, 5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5755MHz,5795MHz
TM4	802.11ac-VT80	5210MHz, 5775MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Core
Car charging Cable	4.0	Shielded	Without Core
Adapter Cable	1.0	Shielded	Without Core

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	LR-63C8R

1.8 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

1.9 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-12	2018-06-11
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-12	2018-06-11
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-12	2018-06-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-12	2018-06-11
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.203; § 15.405	Antenna Requirement	Compliant
§ 15.207; § 15.407(b)(6)	Conducted Emission	Compliant
§ 15.407(a)(1),(2)	Power Spectral Density	Compliant
§ 15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§ 15.407(a)(1),(2)	Maximum Conducted Output Power	Compliant
§ 15.407(b)(1),(2),(3)	Conducted Spurious Emission	Compliant
§ 15.205; § 15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§ 15.407(g)	Frequency Stability	Compliant
§ 15.407(h)	Dynamic Frequency Selection (DFS)	N/A

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the SAR Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

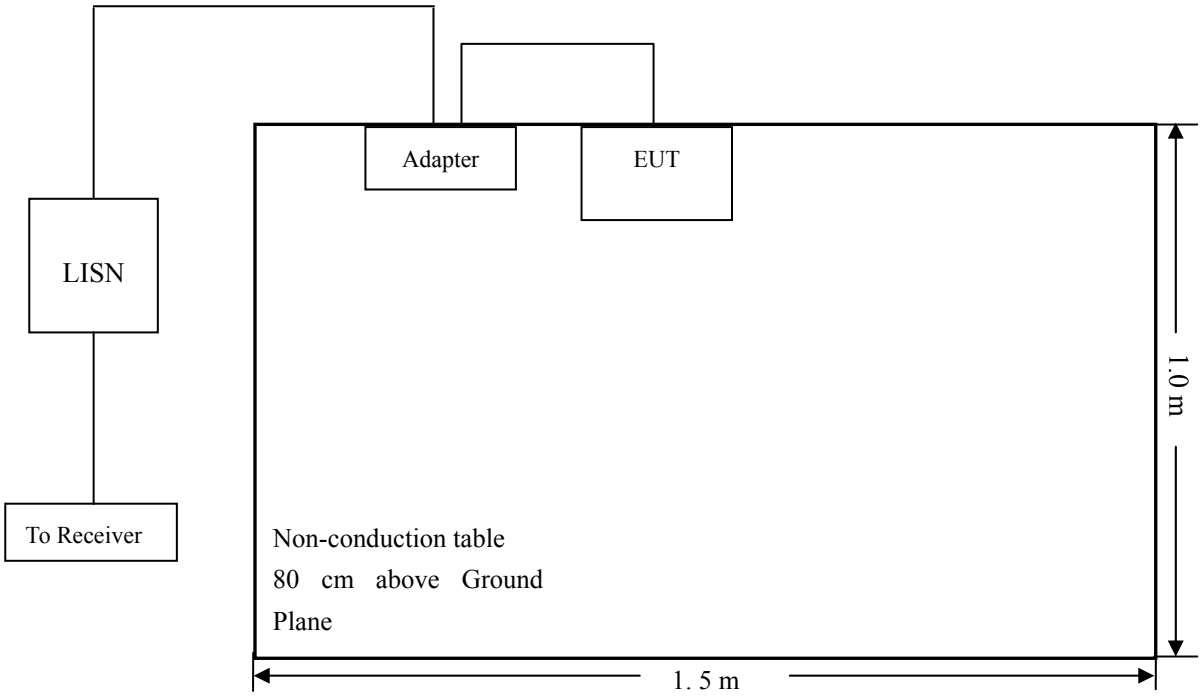
This product has two integral antennas, fulfill the requirement of this section.

5. Conducted Emissions

5.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.

5.3 Basic Test Setup Block Diagram



5.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

5.5 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

5.6 Summary of Test Results/Plots

According to the data in section 5.7, the EUT complied with the FCC Part 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

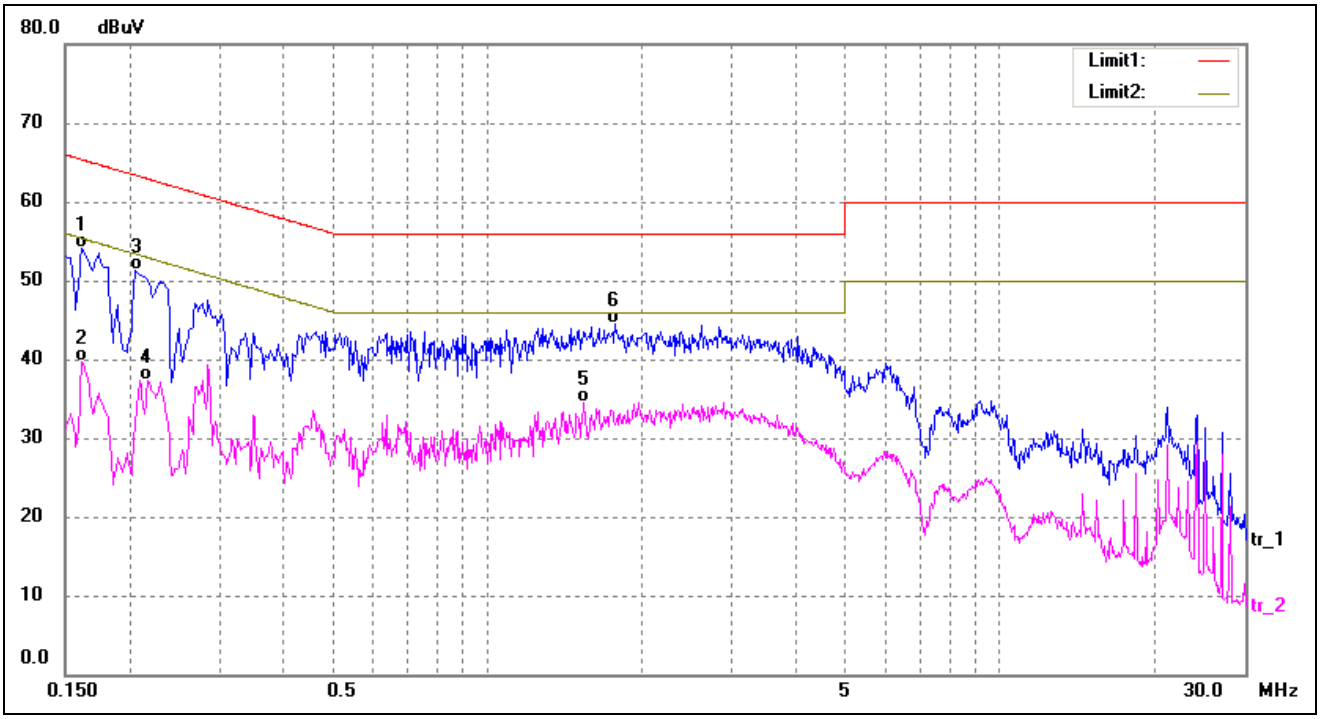
-8.67 dB at **0.1580 MHz** in the **Line**, **QP** detector, 0.15-30MHz

5.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

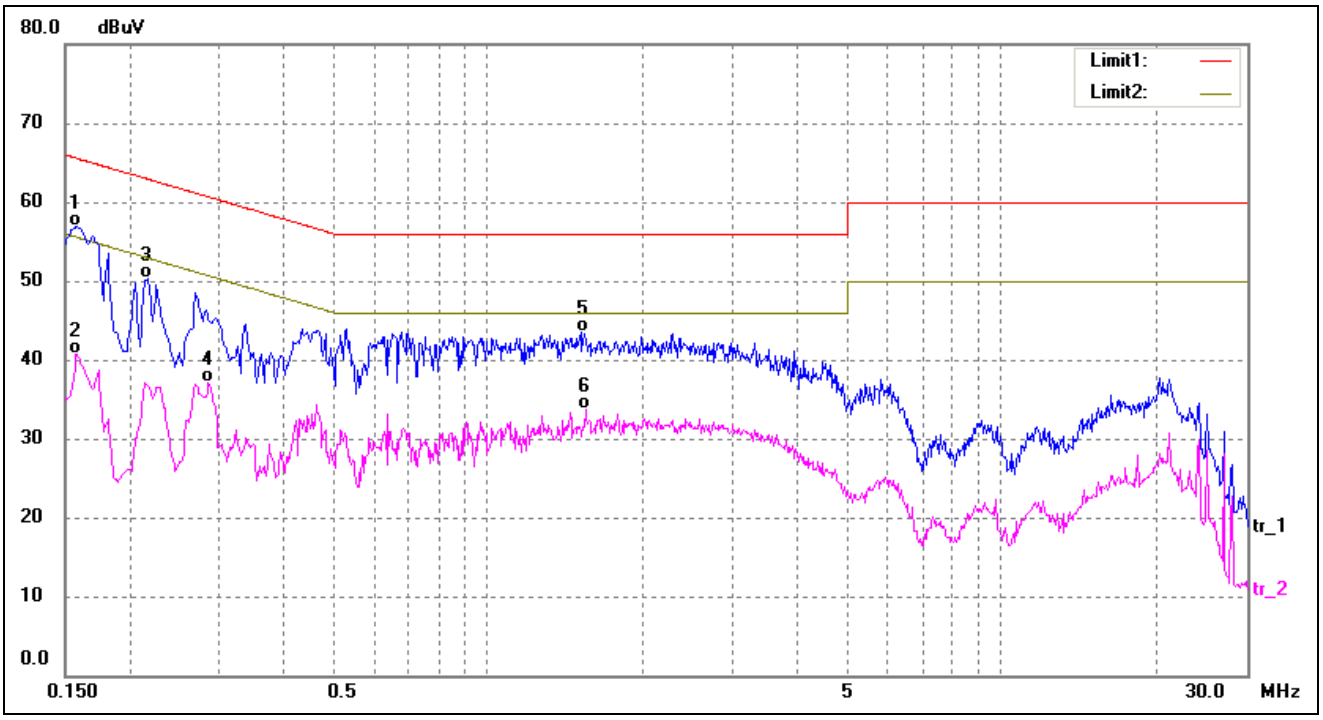
EUT: *13.3" Yoga Notebook*
Tested Model: *TM133WH710CE*
Operating Condition: *Transmitting*
Comment: *AC 120V/60Hz; Adapter DC 12V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1620	44.34	9.84	54.18	65.36	-11.18	QP
2	0.1620	29.92	9.84	39.76	55.36	-15.60	AVG
3	0.2060	41.47	9.80	51.27	63.37	-12.10	QP
4	0.2180	27.57	9.80	37.37	52.89	-15.52	AVG
5	1.5420	24.75	9.75	34.50	46.00	-11.50	AVG
6	1.7740	34.70	9.74	44.44	56.00	-11.56	QP

Test Specification: *Line*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1580	47.06	9.84	56.90	65.57	-8.67	QP
2	0.1580	30.88	9.84	40.72	55.57	-14.85	AVG
3	0.2180	40.41	9.80	50.21	62.89	-12.68	QP
4	0.2860	27.31	9.80	37.11	50.64	-13.53	AVG
5	1.5140	33.69	9.75	43.44	56.00	-12.56	QP
6	1.5460	24.03	9.75	33.78	46.00	-12.22	AVG

6. Power Spectral Density

6.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.
(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2 Test Procedure

According to 789033 D02 General UNII Test Procedures New Rules v01, the following is the measurement procedure.
For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

6.3 Environmental Conditions

Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

6.4 Summary of Test Results/Plots

Antenna A:

5150-5250MHz

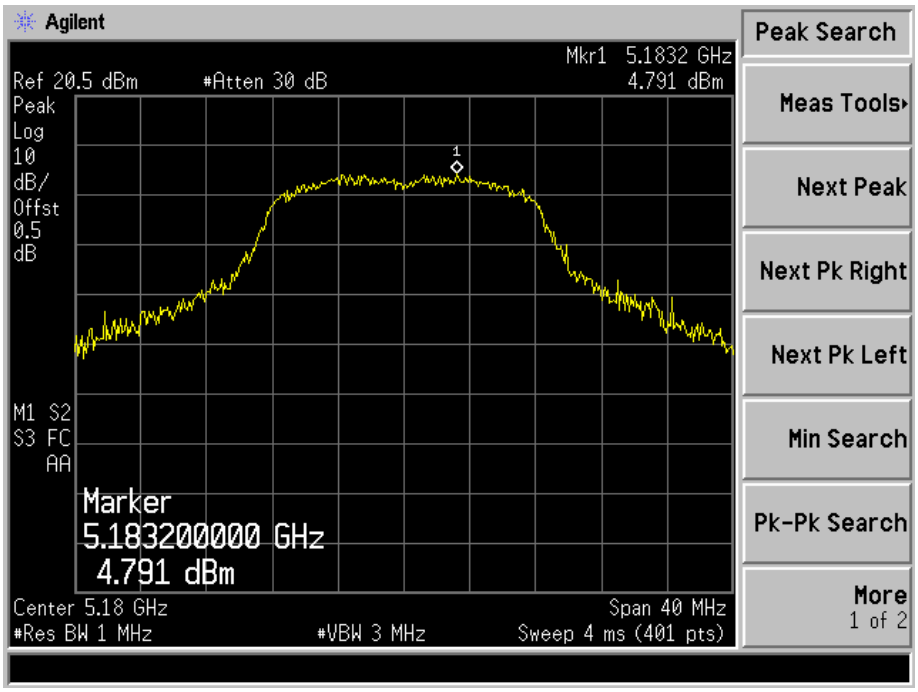
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	4.791	11
	5200	5.558	11
	5240	5.694	11
802.11n-HT20	5180	5.342	11
	5200	5.101	11
	5240	5.588	11
802.11n-HT40	5190	1.223	11
	5230	1.42	11
802.11ac	5210	-5.324	11

5725-5850MHz

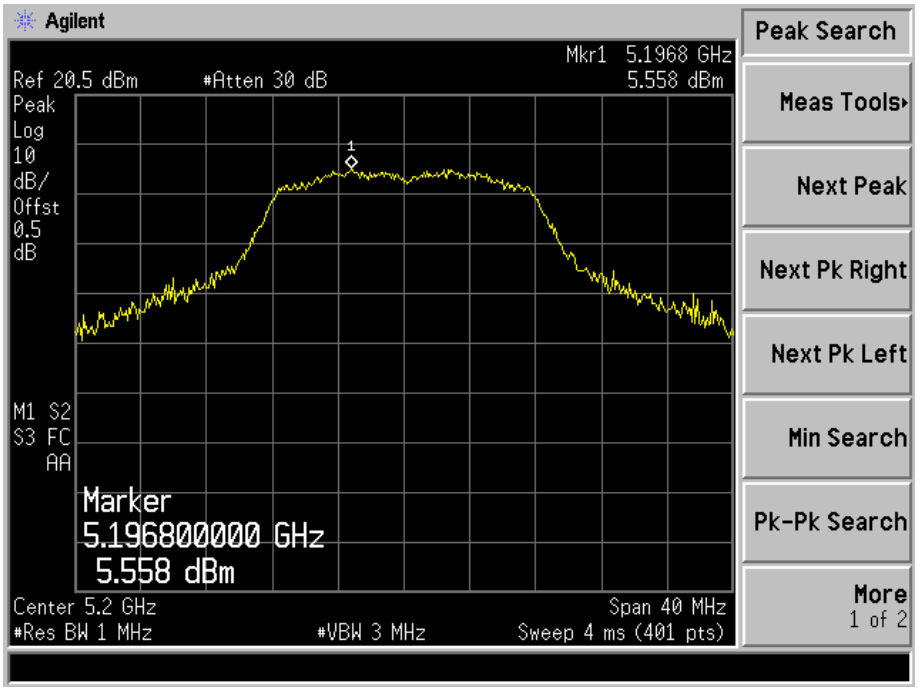
Operating mode	Test Channel	Power Spectral Density dBm/500kHz	Limit (dBm/500kHz)
802.11a	5745	5.504	30
	5785	5.085	30
	5825	4.454	30
802.11n-HT20	5745	5.621	30
	5785	4.854	30
	5825	4.745	30
802.11n-HT40	5755	2.687	30
	5795	1.959	30
802.11ac	5775	-0.401	30

Test Mode: 802.11a

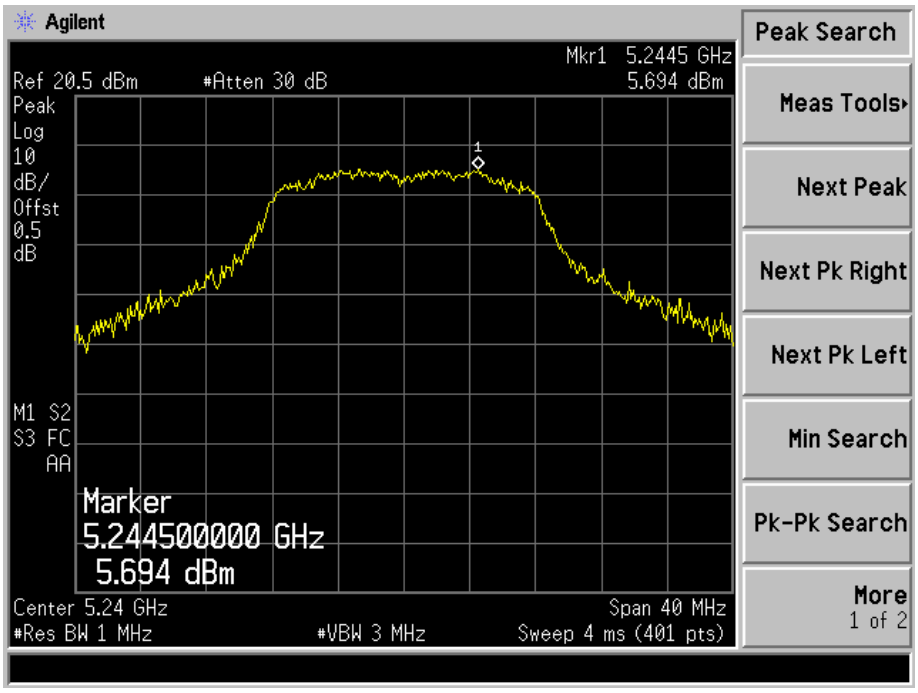
5180MHz



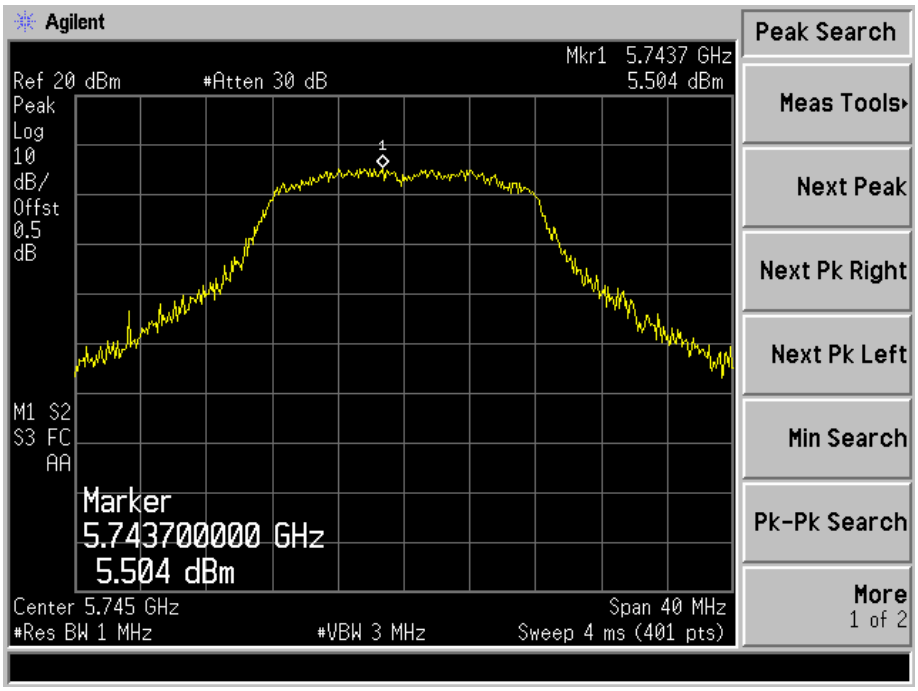
5200MHz



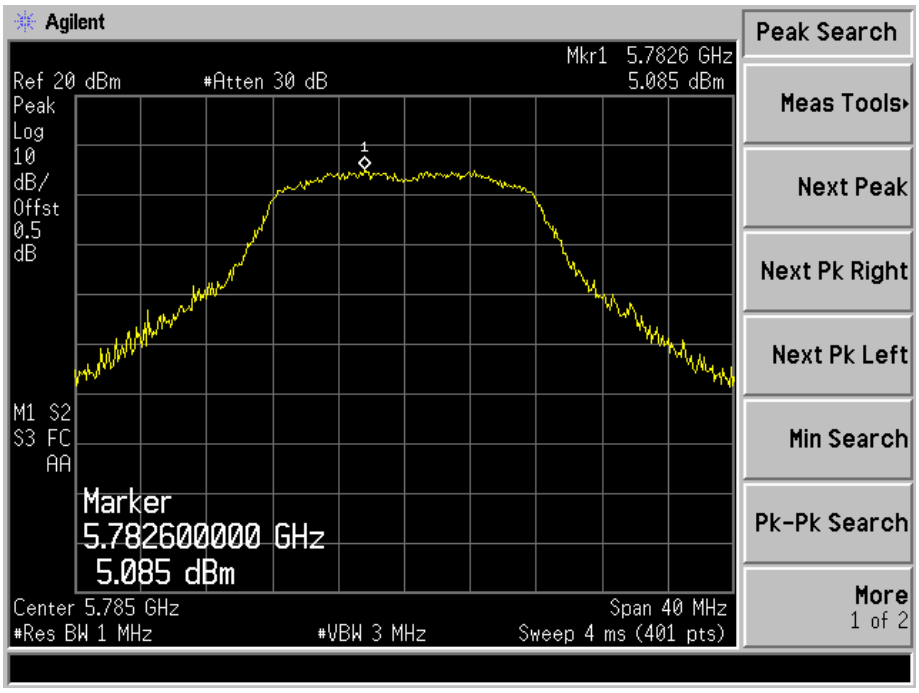
5240MHz



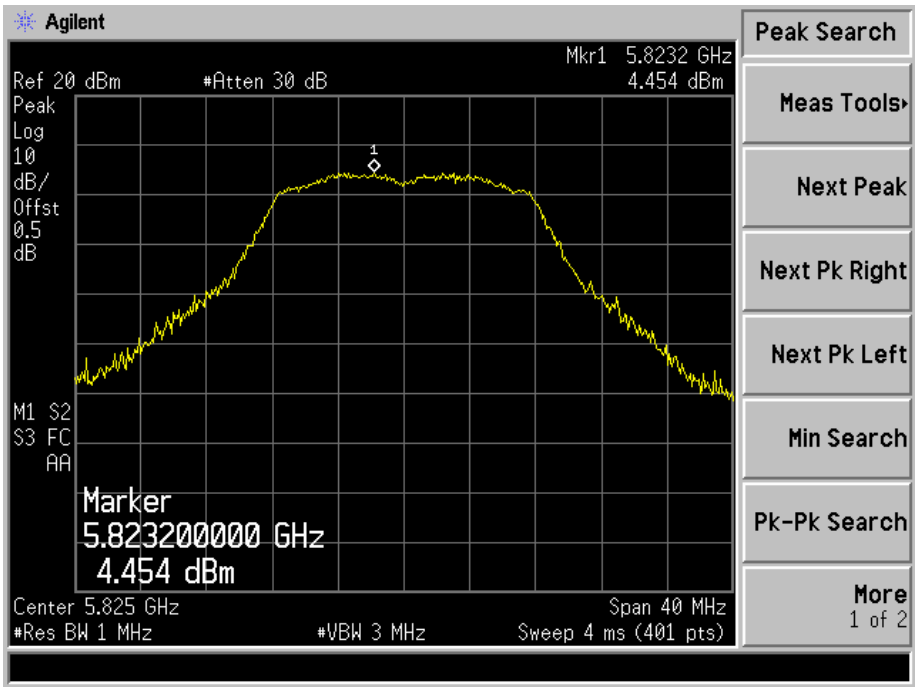
5745MHz



5785MHz

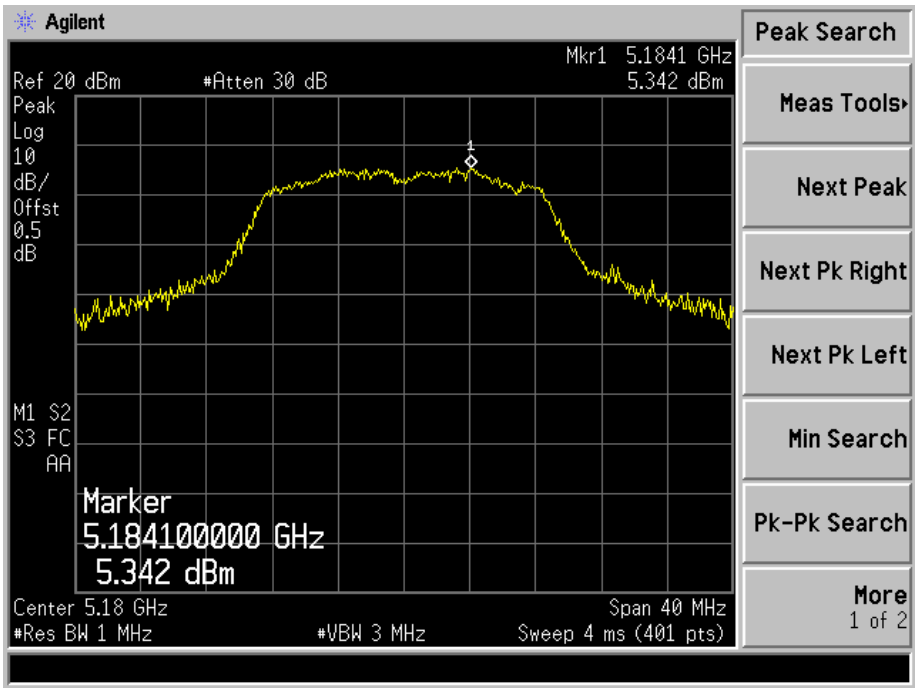


5825MHz

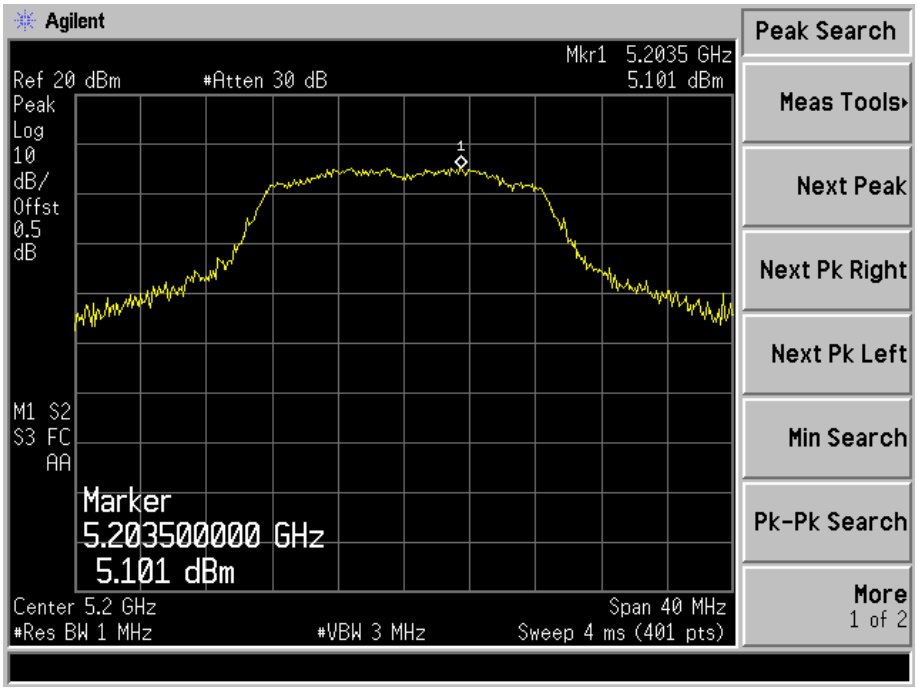


Test Mode: 802.11n-HT20

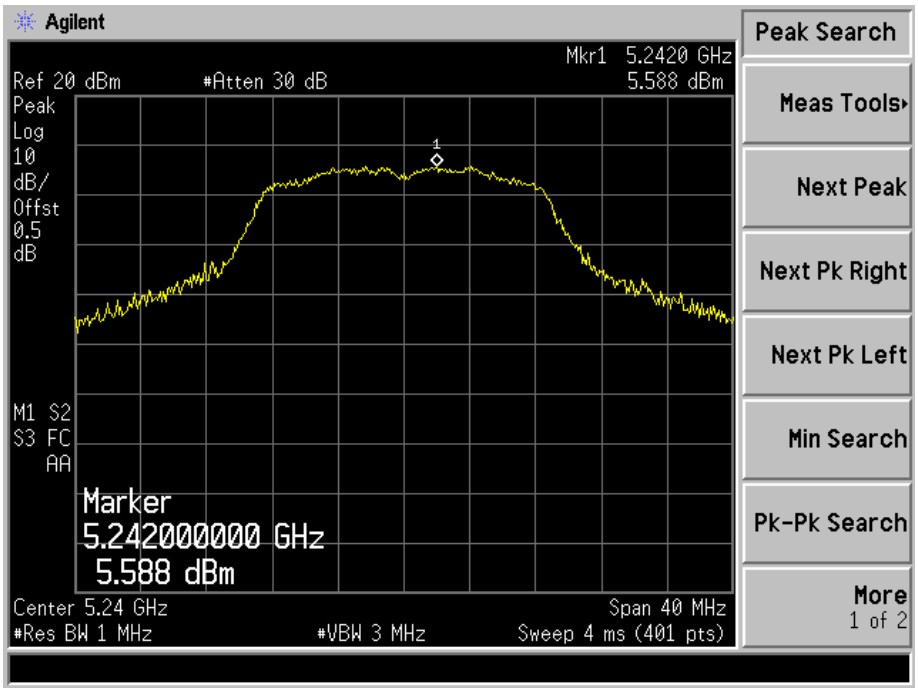
5180MHz



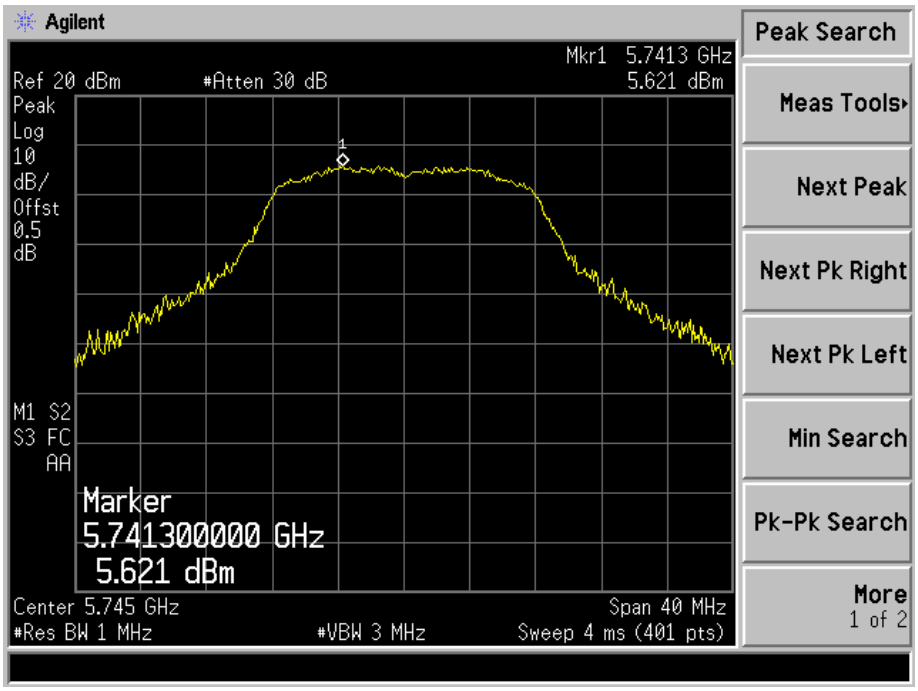
5200MHz



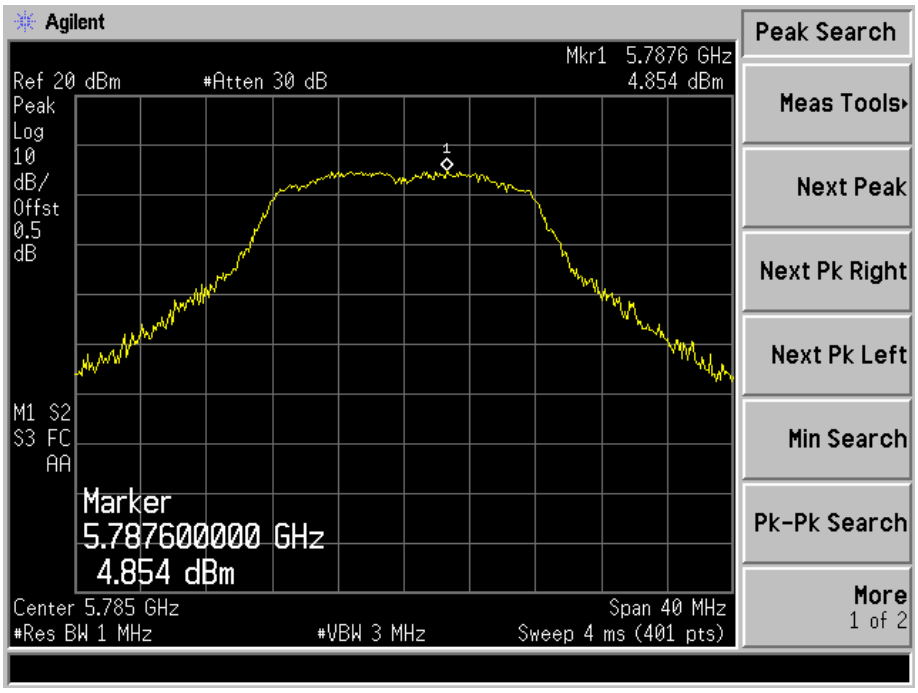
5240MHz



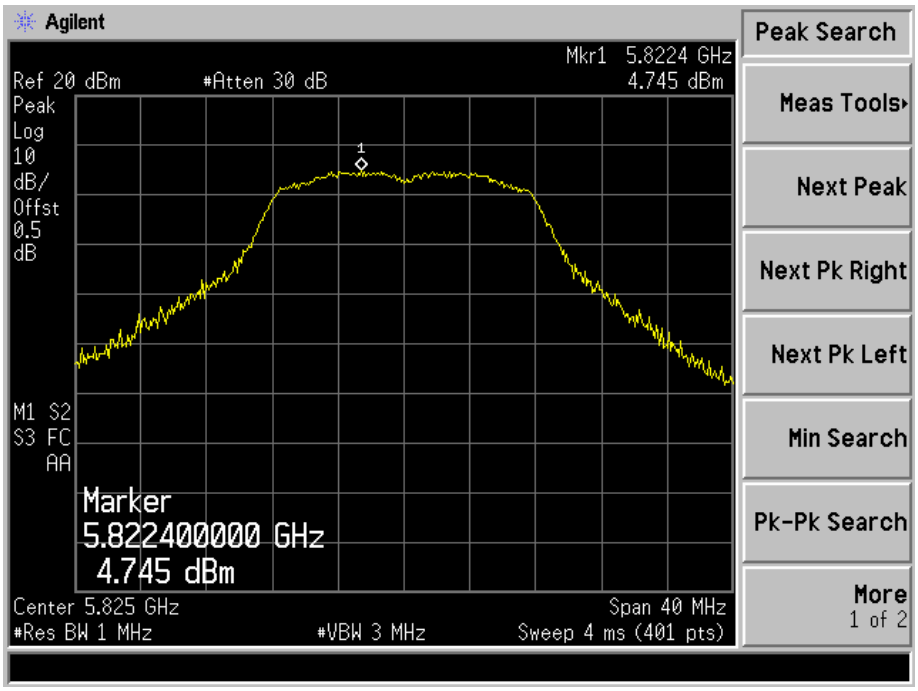
5745MHz



5785MHz

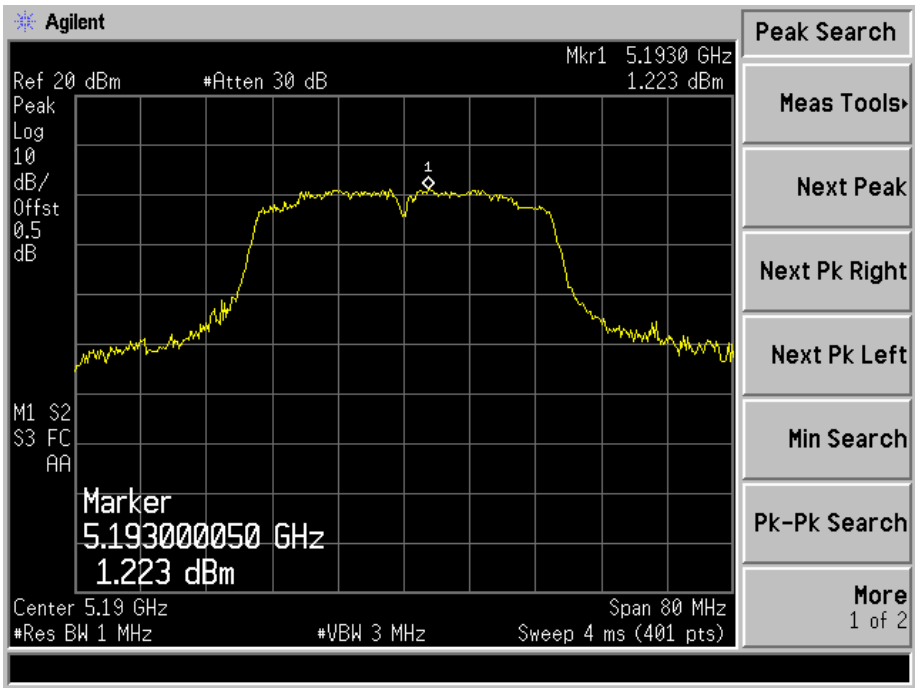


5805MHz

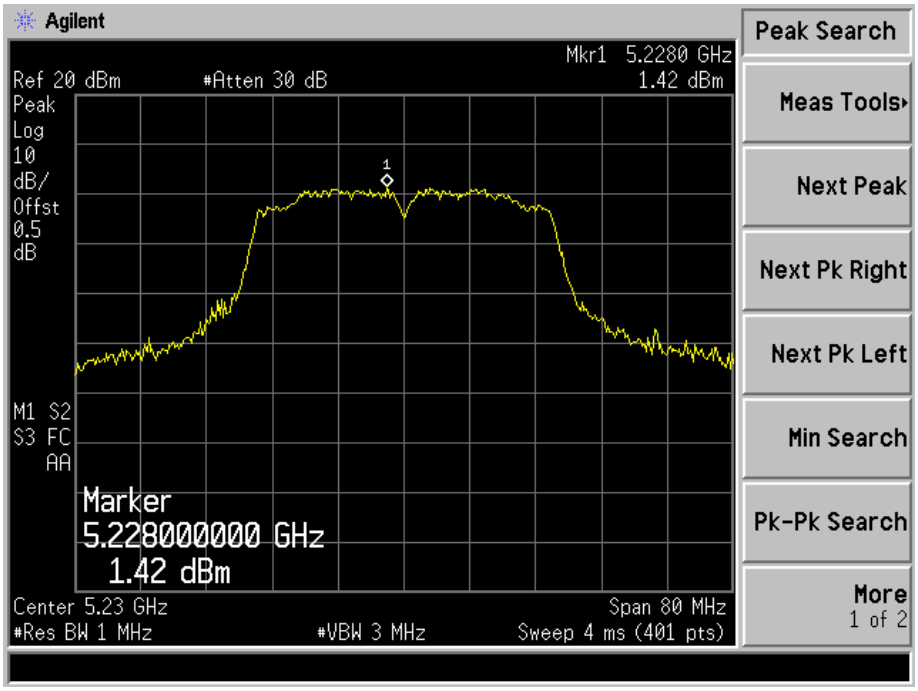


Test Mode: 802.11n-HT40

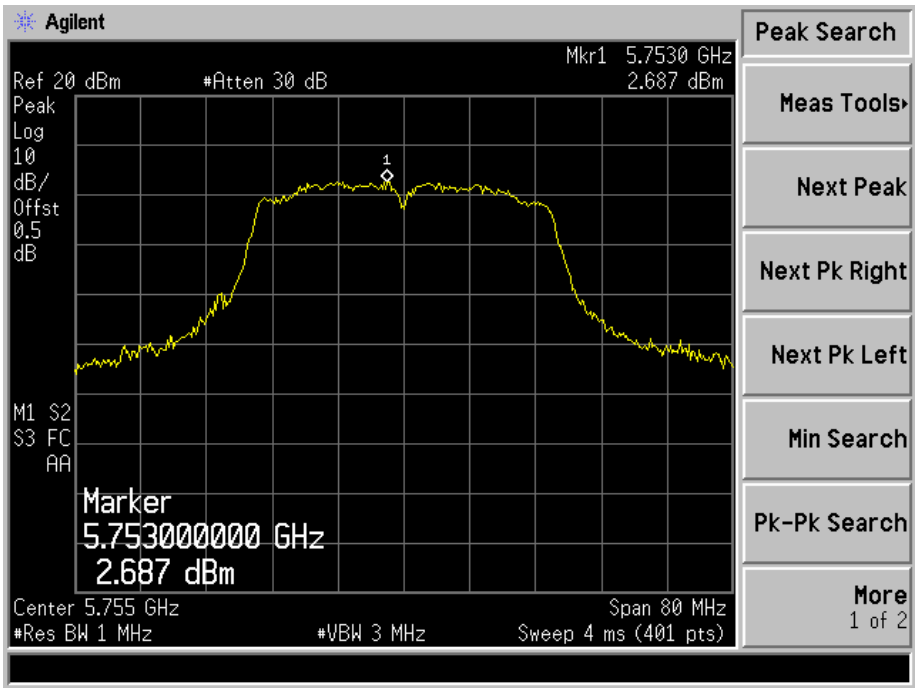
5190MHz



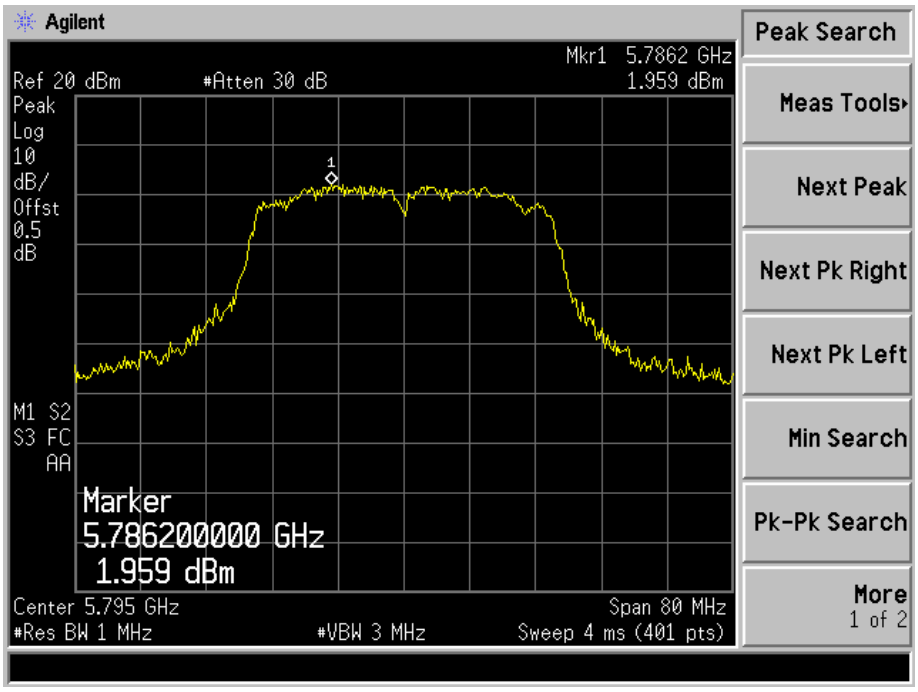
5230MHz



5755MHz

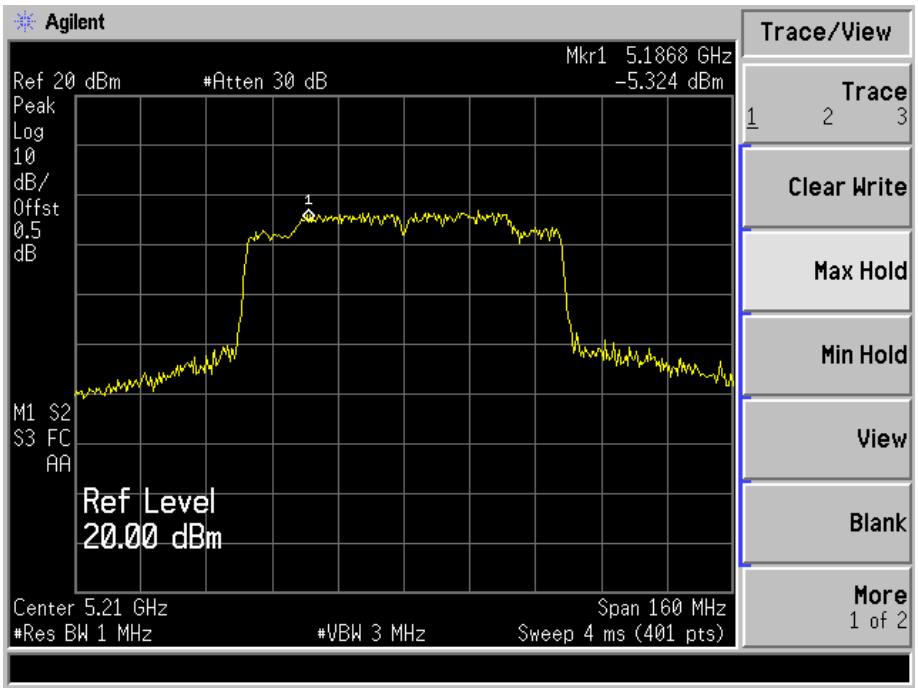


5795MHz

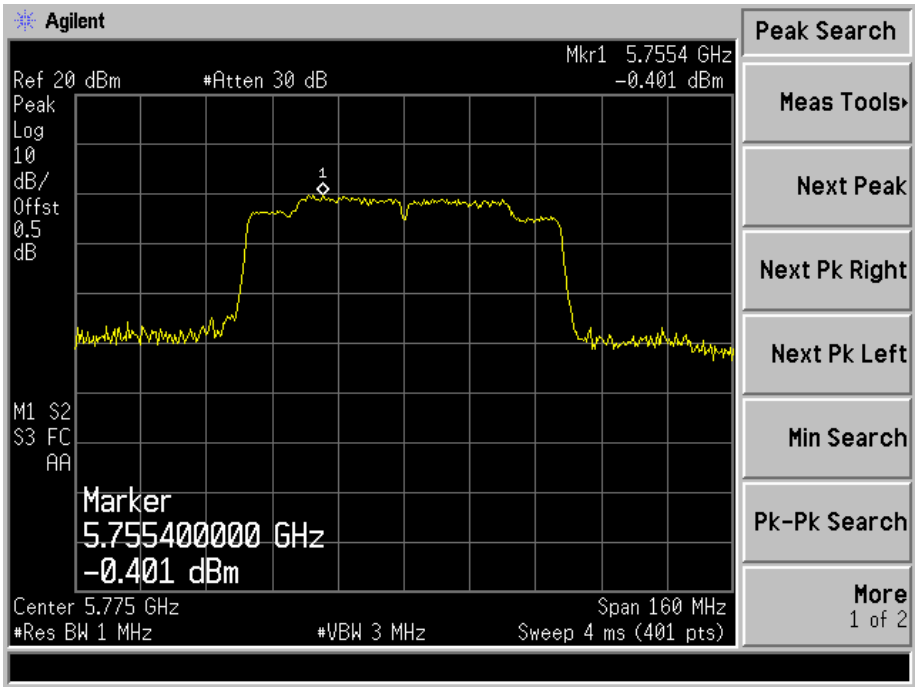


Test Mode: 802.11ac

5210MHz



5775MHz



Antenna B:

5150-5250MHz

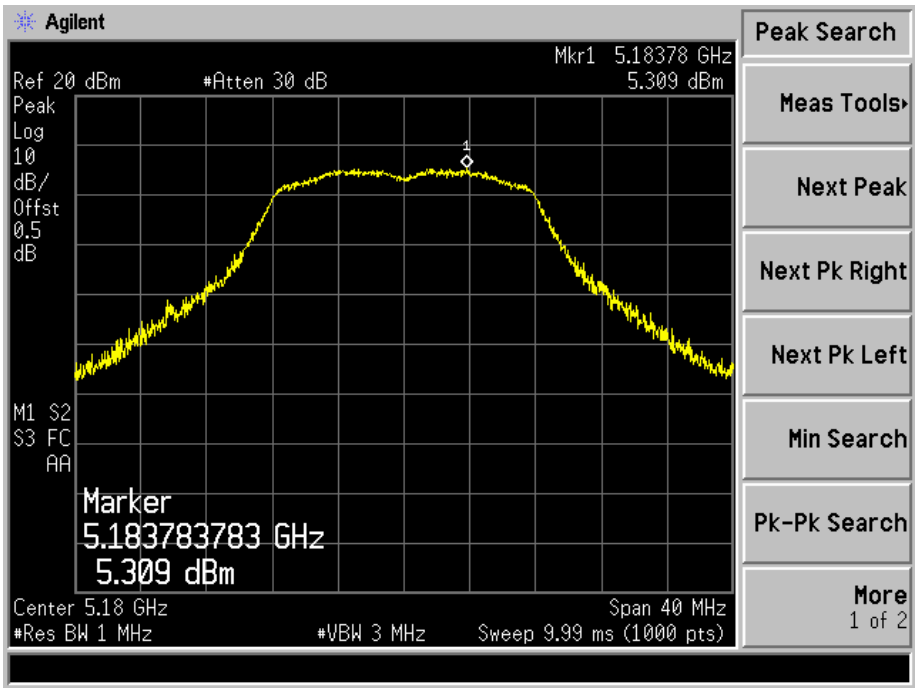
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	5.309	11
	5200	3.818	11
	5240	5.736	11
802.11n-HT20	5180	4.64	11
	5200	5.484	11
	5240	6.148	11
802.11n-HT40	5190	0.924	11
	5230	3.606	11
802.11ac	5210	-2.407	11

5725-5850MHz

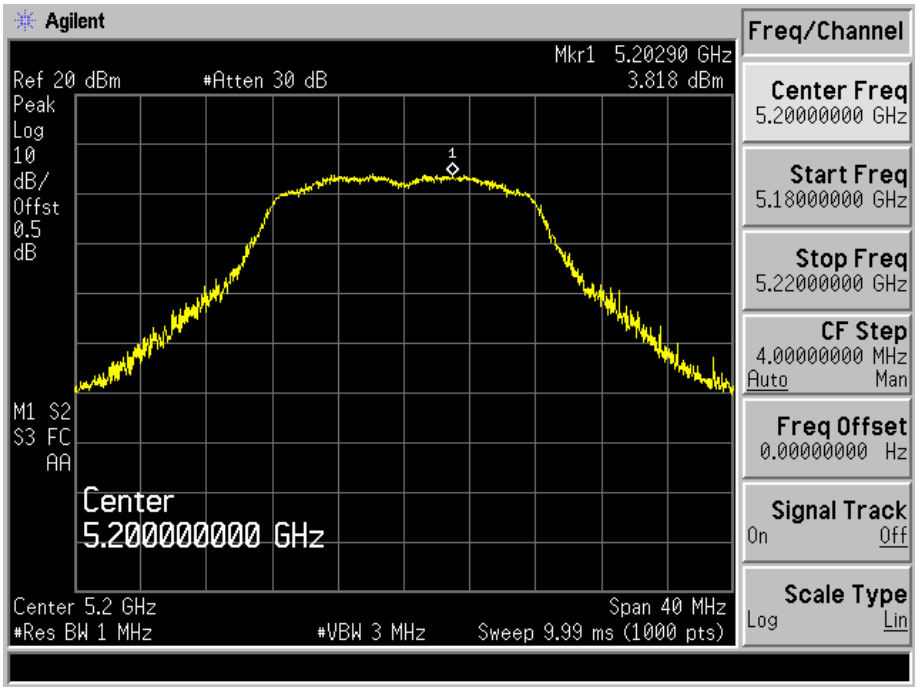
Operating mode	Test Channel	Power Spectral Density dBm/500kHz	Limit (dBm/500kHz)
802.11a	5745	5.79	30
	5785	4.494	30
	5825	4.629	30
802.11n-HT20	5745	4.412	30
	5785	3.321	30
	5825	3.365	30
802.11n-HT40	5755	1.027	30
	5795	1.354	30
802.11ac	5775	-0.38	30

Test Mode: 802.11a

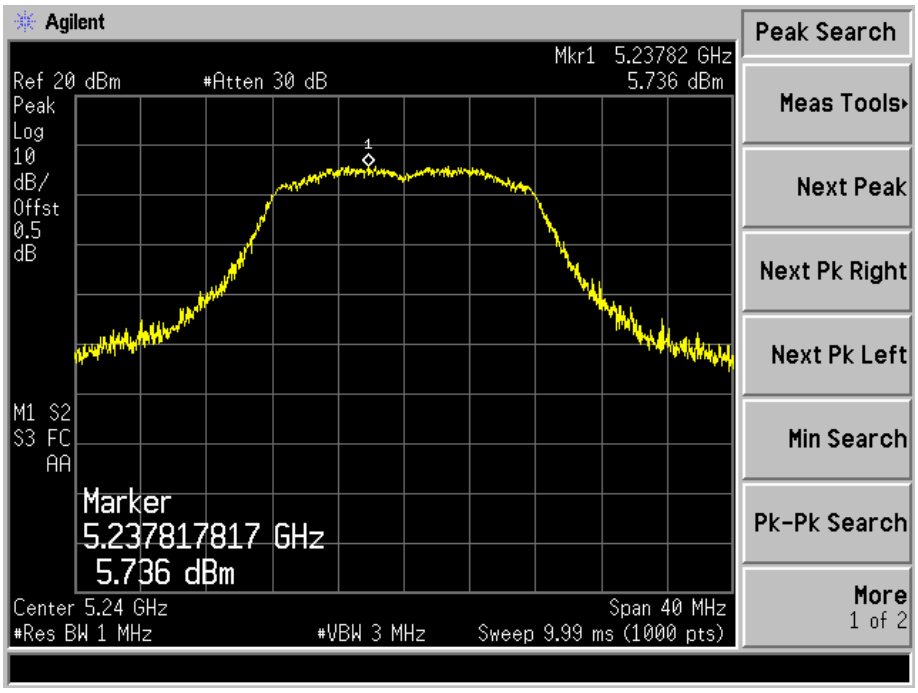
5180MHz



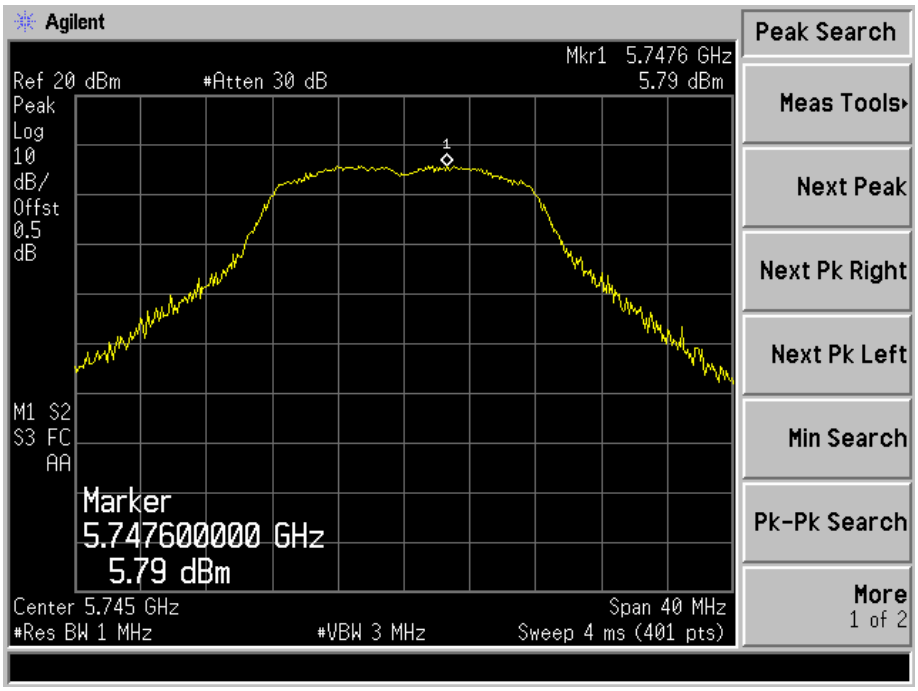
5200MHz



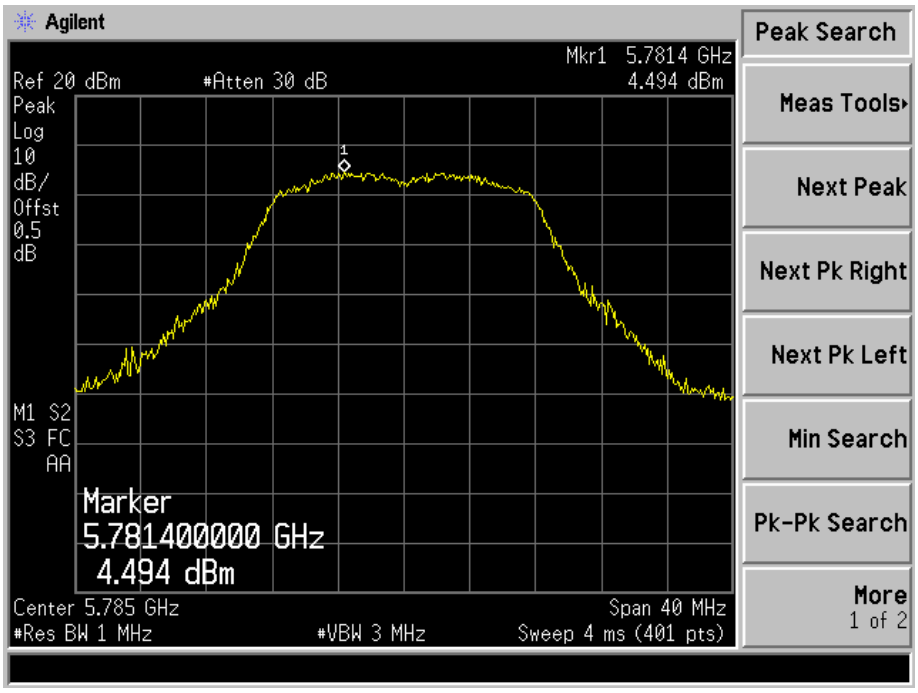
5240MHz



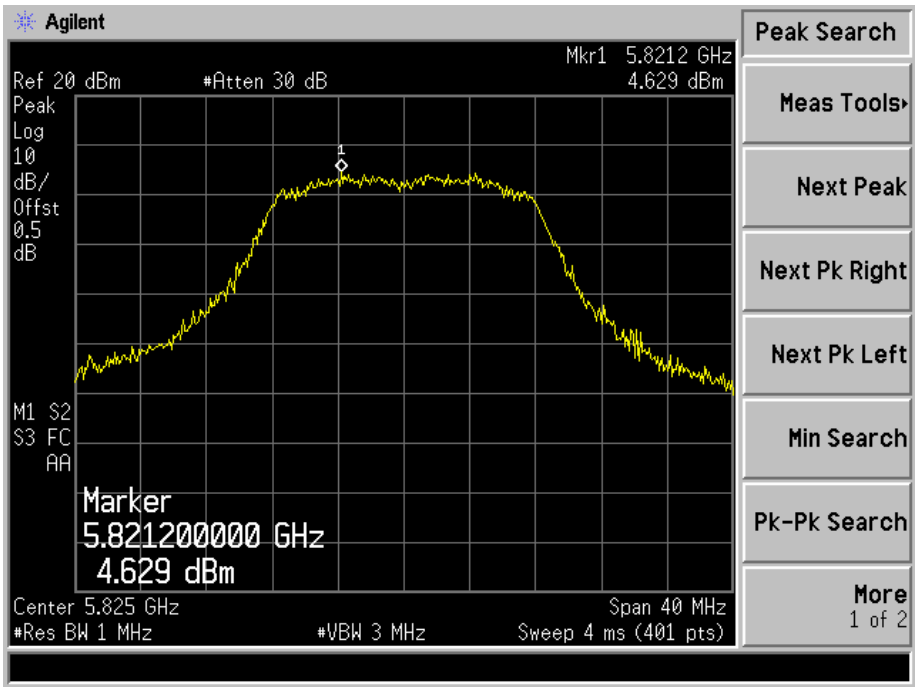
5745MHz



5785MHz

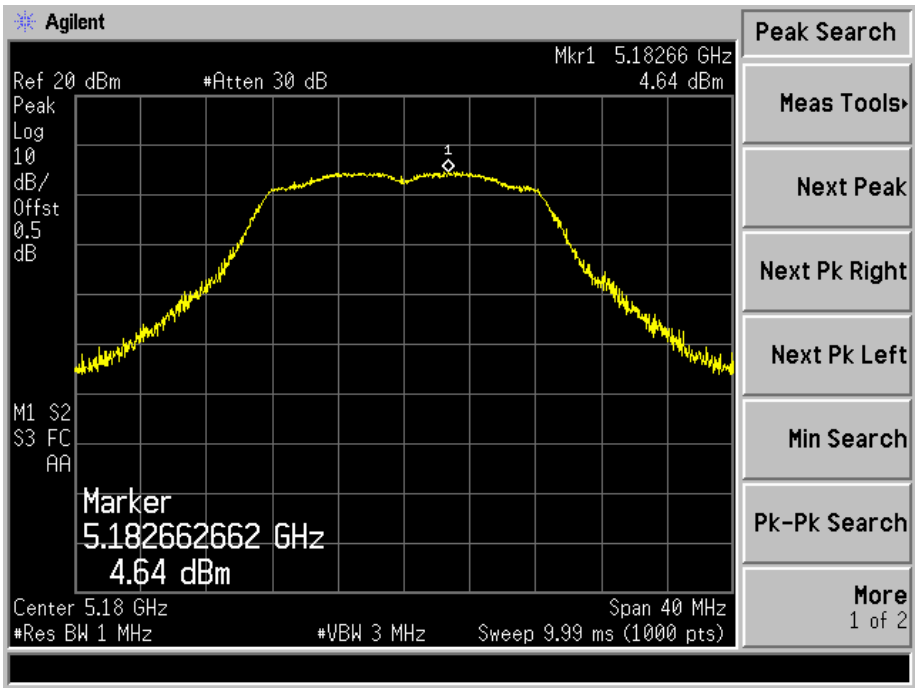


5825MHz

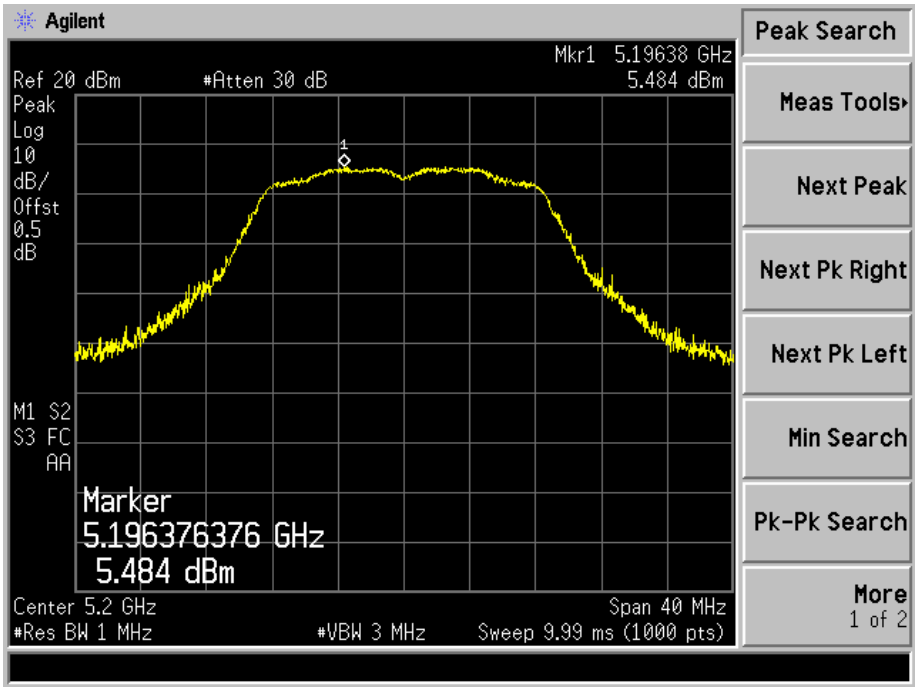


Test Mode: 802.11n-HT20

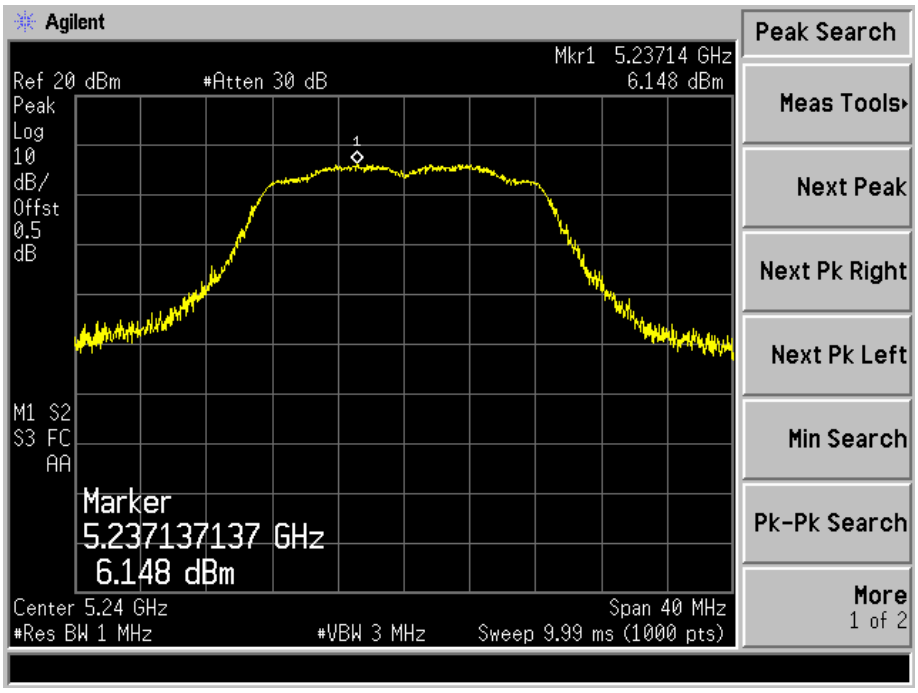
5180MHz



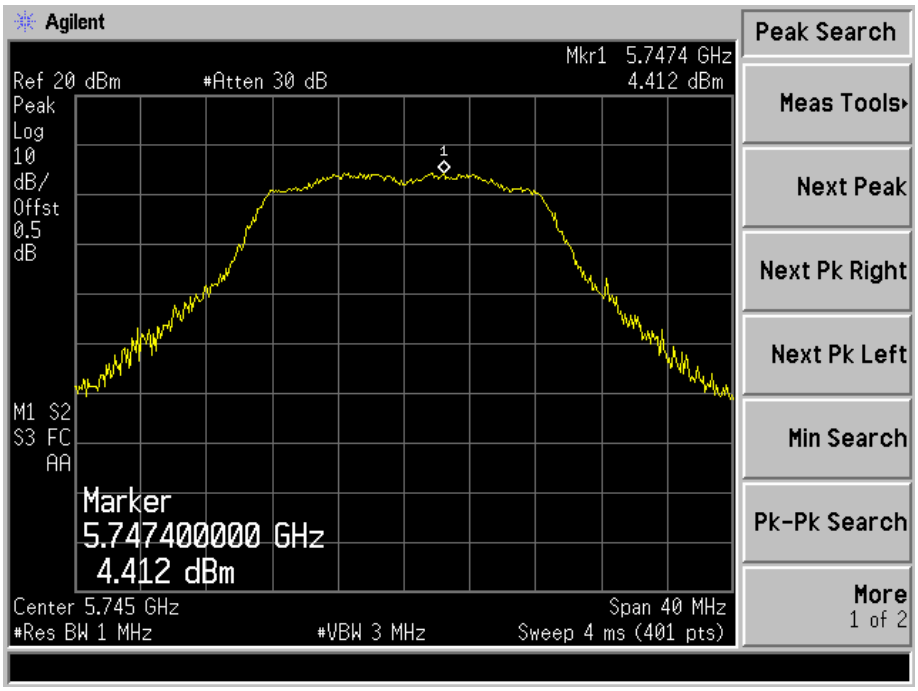
5200MHz



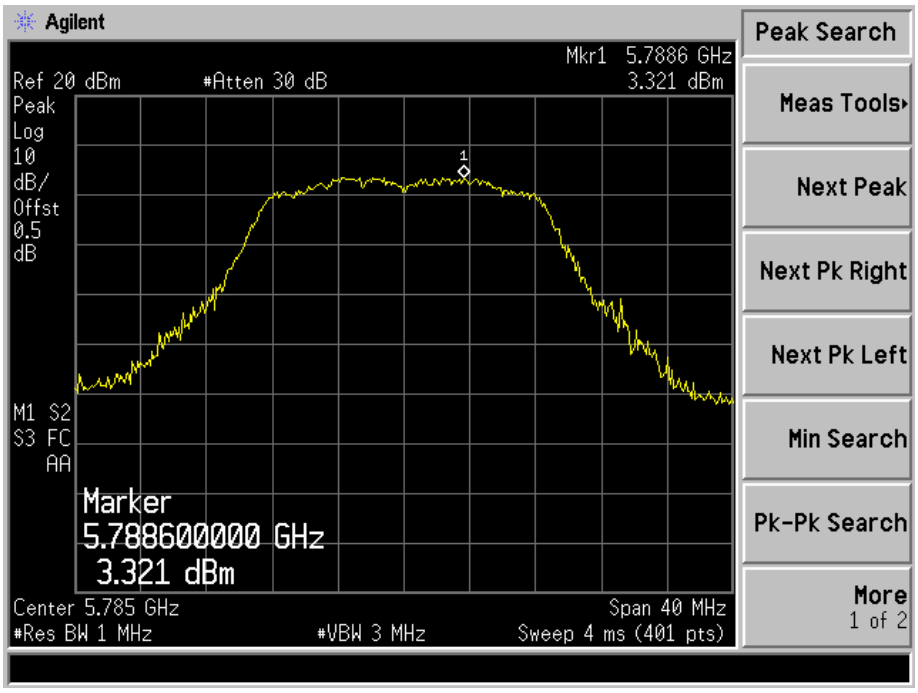
5240MHz



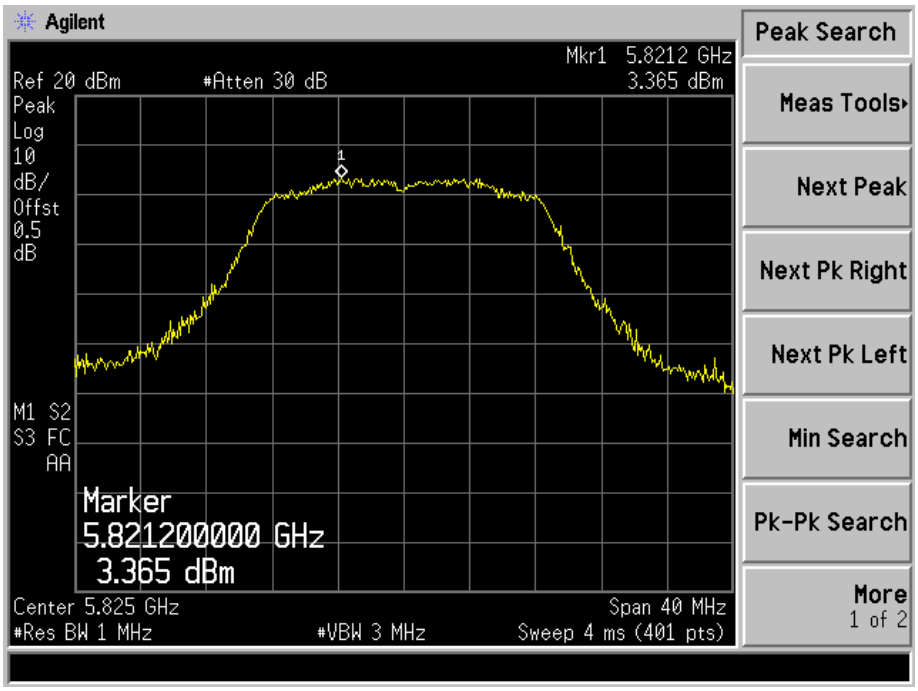
5745MHz



5785MHz

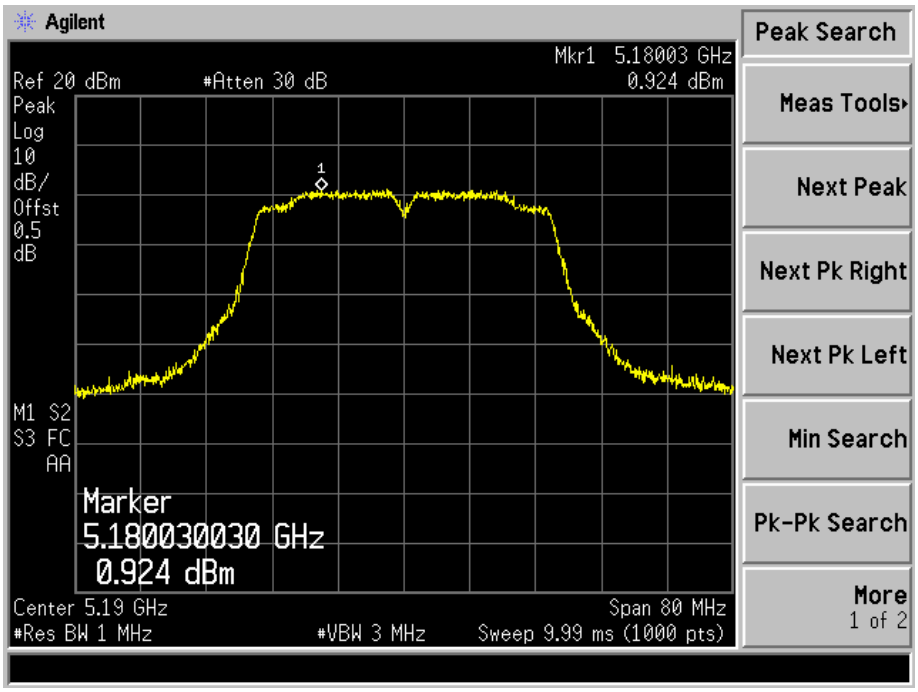


5805MHz

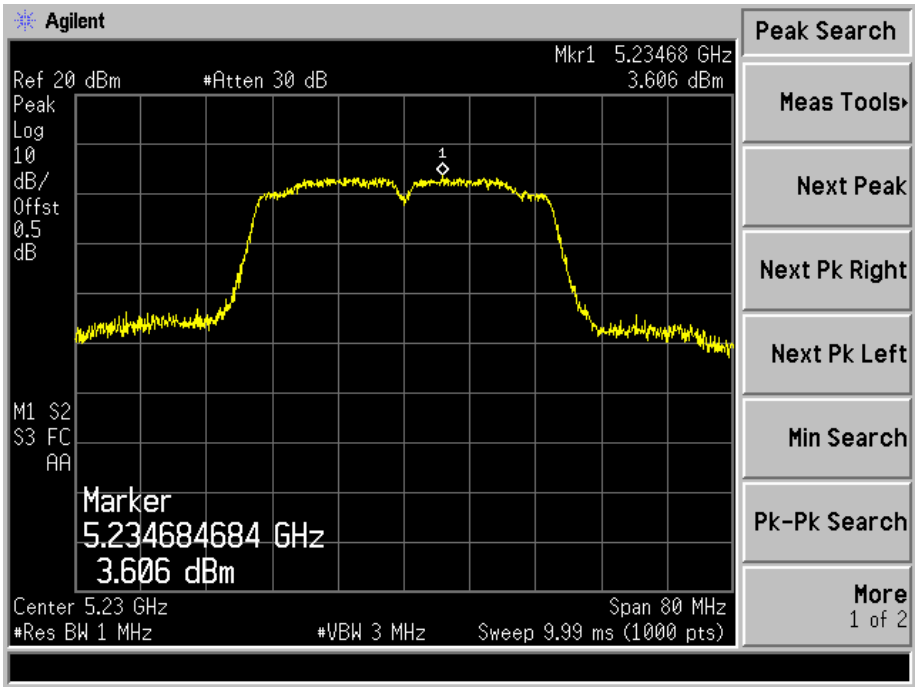


Test Mode: 802.11n-HT40

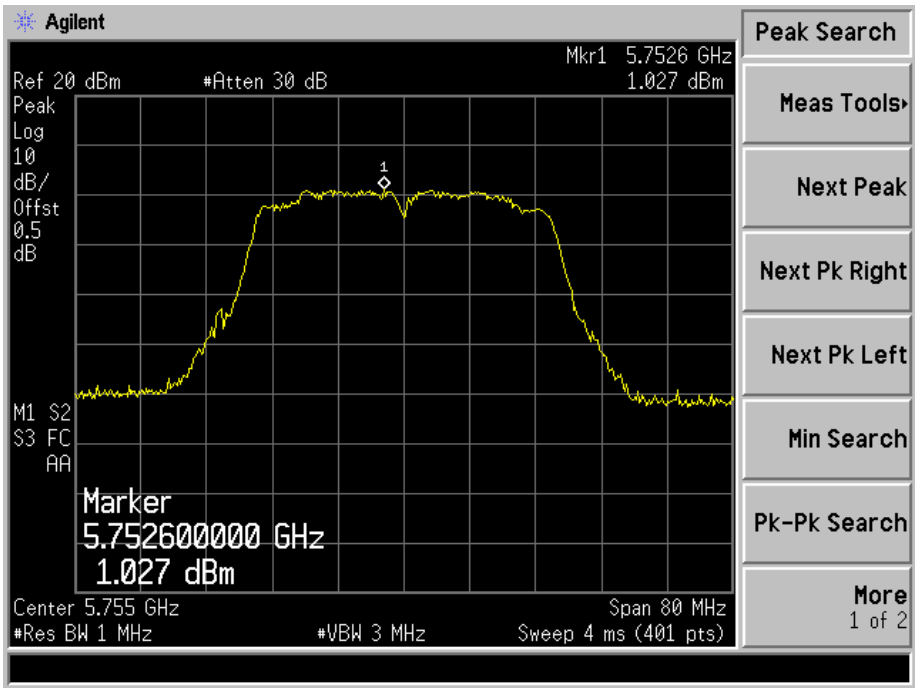
5190MHz



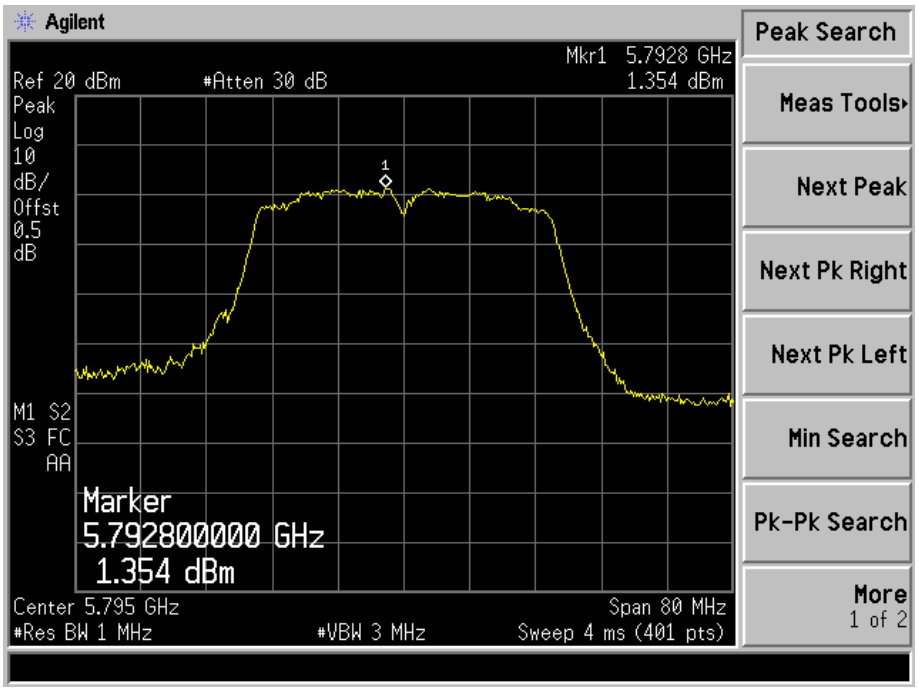
5230MHz



5755MHz

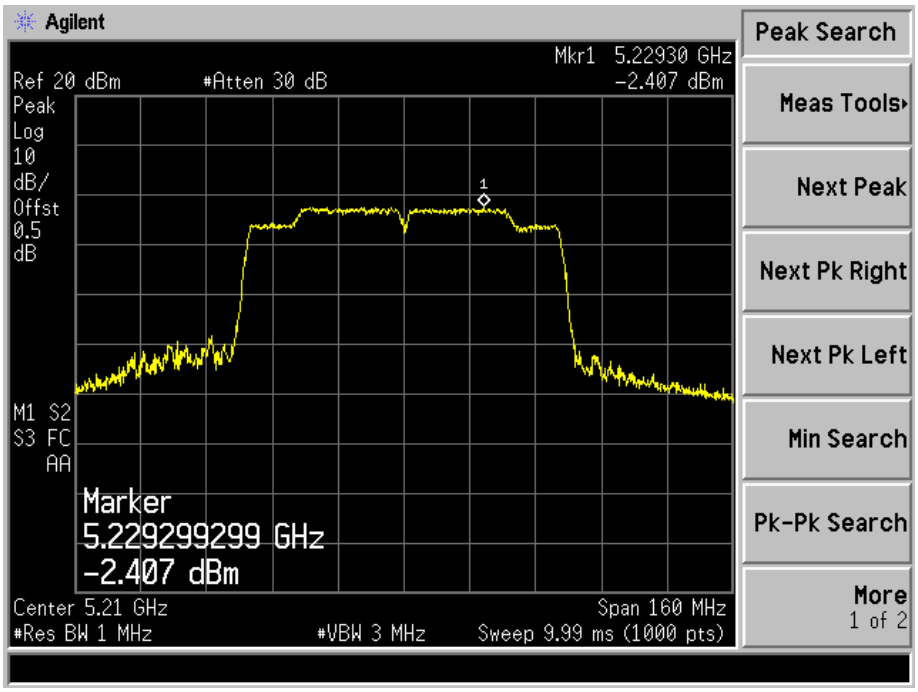


5795MHz

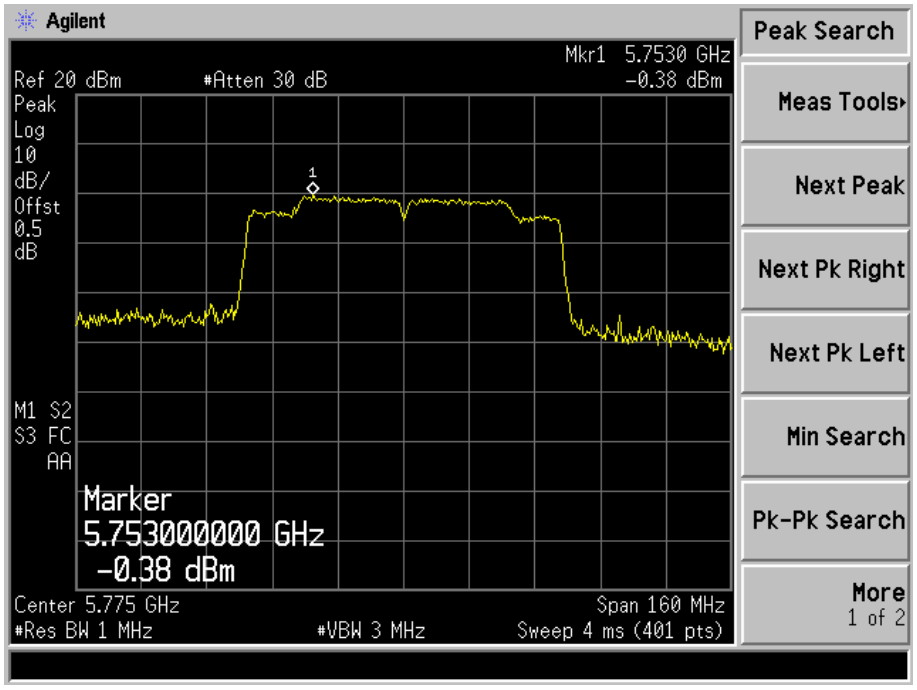


Test Mode: 802.11ac

5210MHz



5775MHz



7. Emission Bandwidth and Occupied Bandwidth

7.1 Standard Applicable

According to 15.407 (a) and (e)

(1) For the band 5.15-5.25 GHz.
(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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

7.2 Test Procedure

According to 789033 D02 v01r02 section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare

this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v01r02 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1 % to 5 % of the OBW

4. Set VBW ≥ 3 • RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6. Use the 99 % power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

7.3 Environmental Conditions

Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

7.4 Summary of Test Results/Plots

Antenna A:

5150-5250MHz

Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5180	23.733	16.5417	Pass
	5200	23.066	16.6140	Pass
	5240	24.398	16.6544	Pass
802.11n-HT20	5180	24.183	17.7686	Pass
	5200	24.559	17.7825	Pass
	5240	22.786	17.7625	Pass
802.11n-HT40	5190	43.97	36.174	Pass
	5230	46.98	36.277	Pass
802.11ac	5210	82.099	75.2158	Pass

5725-5850MHz

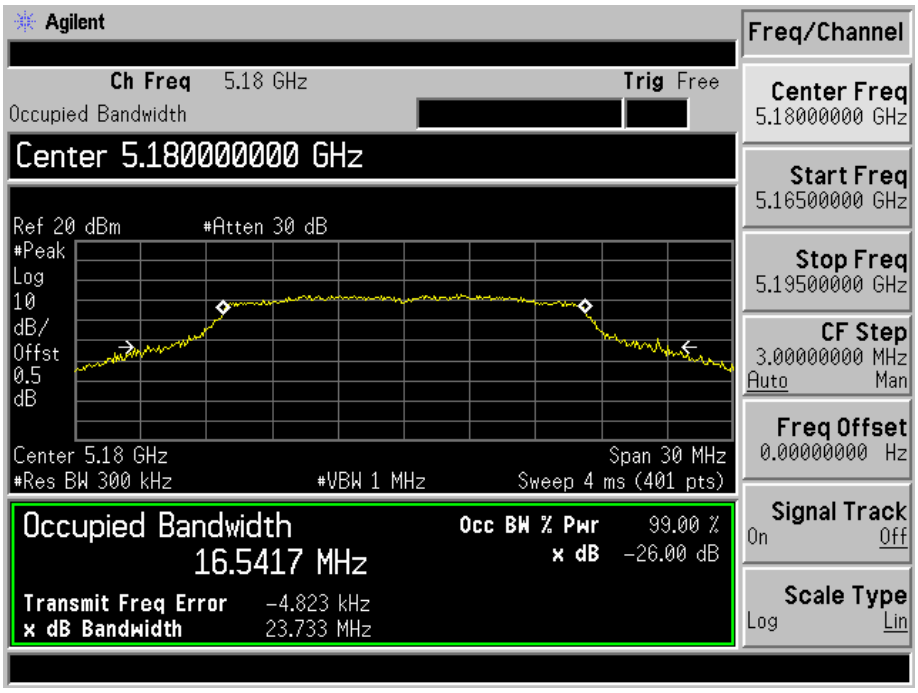
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
802.11a	5745	16.286	16.9767	≥500
	5785	16.210	16.7426	≥500
	5825	16.120	16.7017	≥500
802.11n-HT20	5745	17.516	18.0439	≥500
	5785	17.275	17.8186	≥500
	5825	17.270	17.8099	≥500
802.11n-HT40	5755	36.28	36.290	≥500
	5795	36.11	36.200	≥500
802.11ac	5775	75.841	75.3156	≥500

Antenna A:

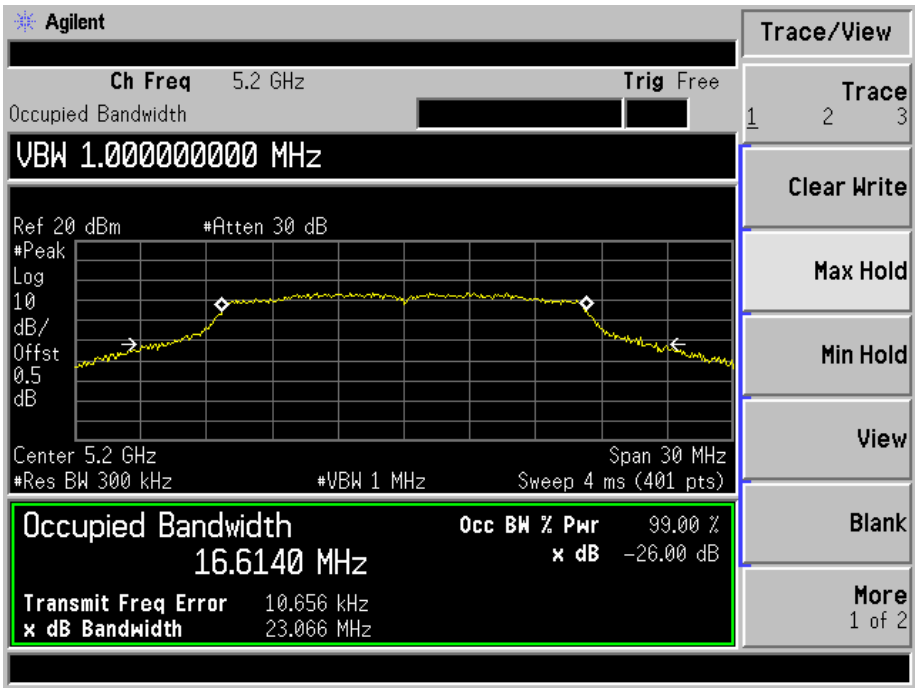
5150-5250MHz

Test mode：802.11a

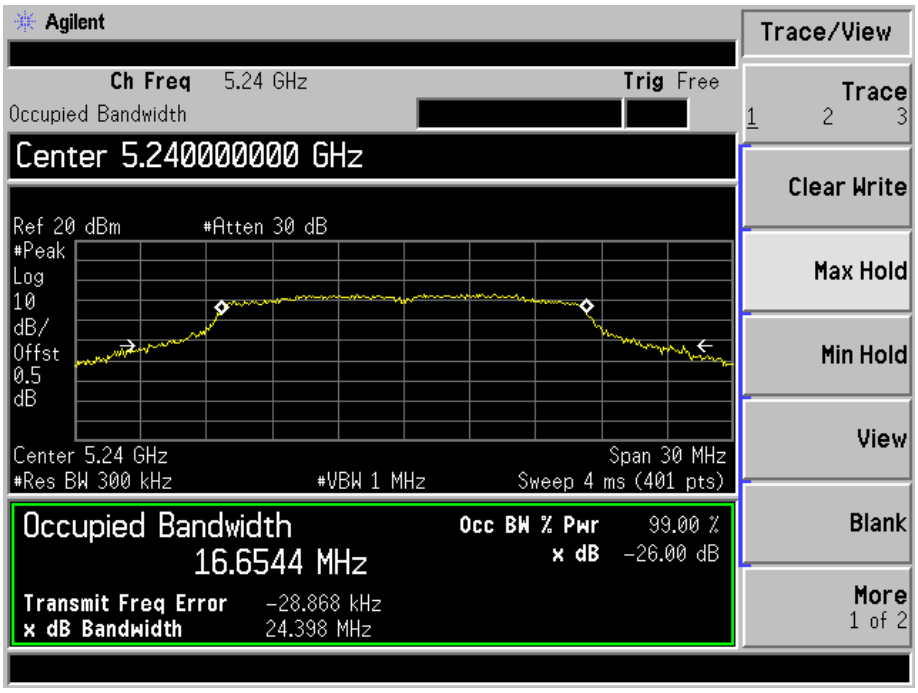
5180MHz



5200MHz

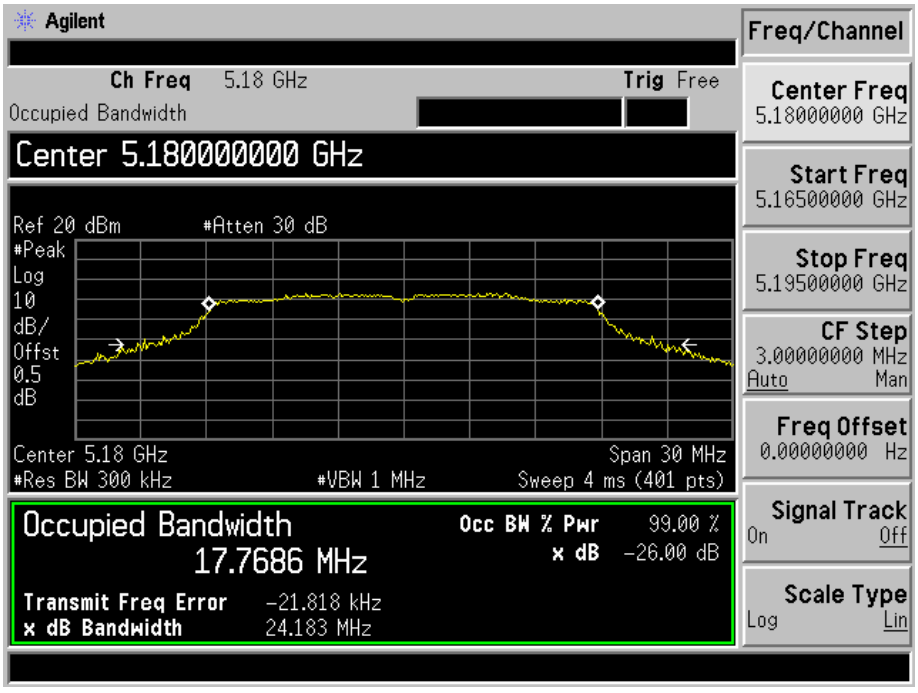


5240MHz

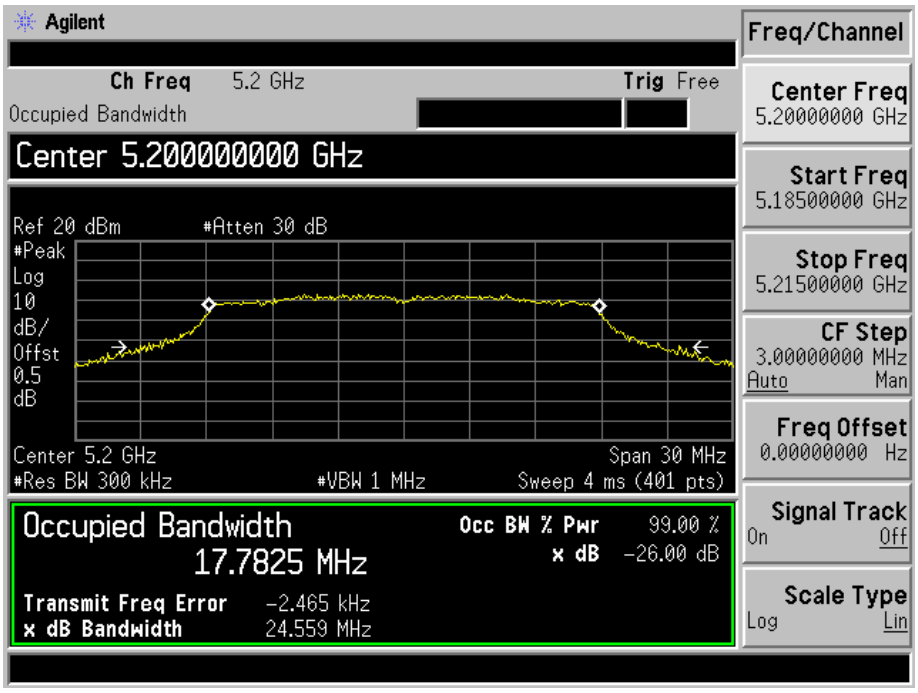


Test mode：802.11n-HT20

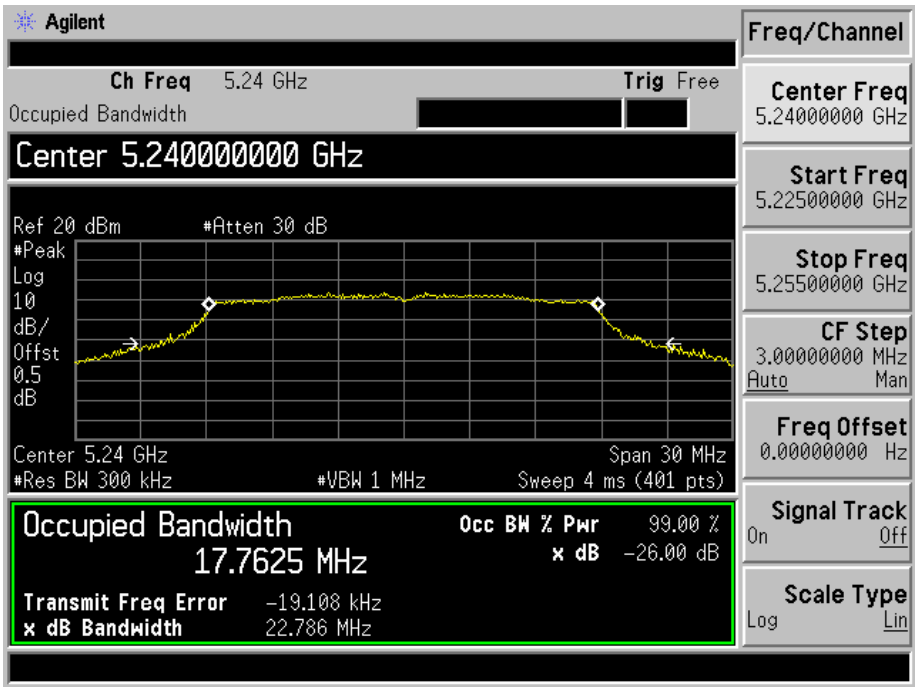
5180MHz



5200MHz



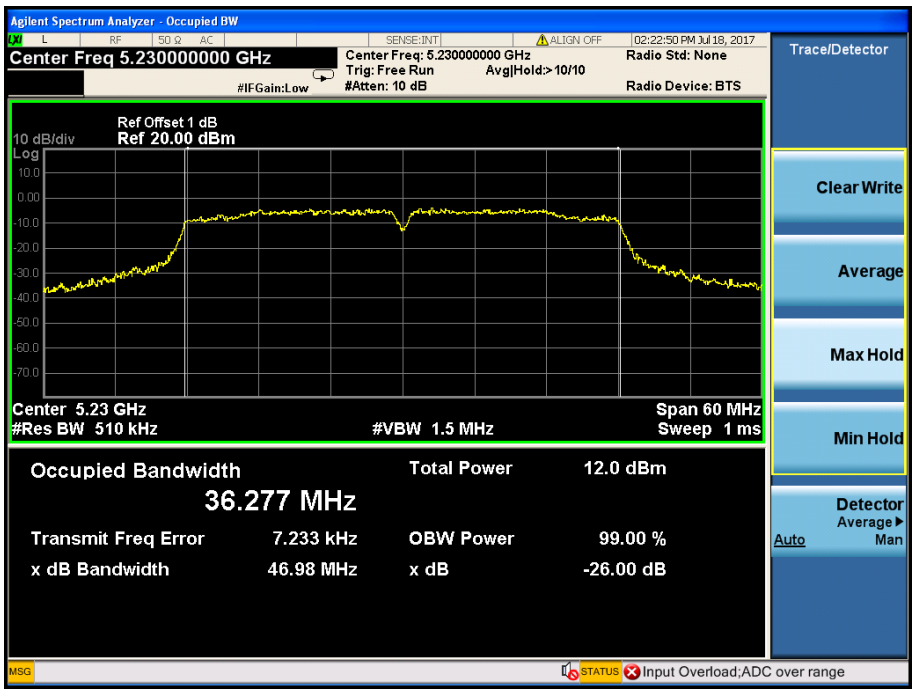
5240MHz



Test mode：802.11n-HT40

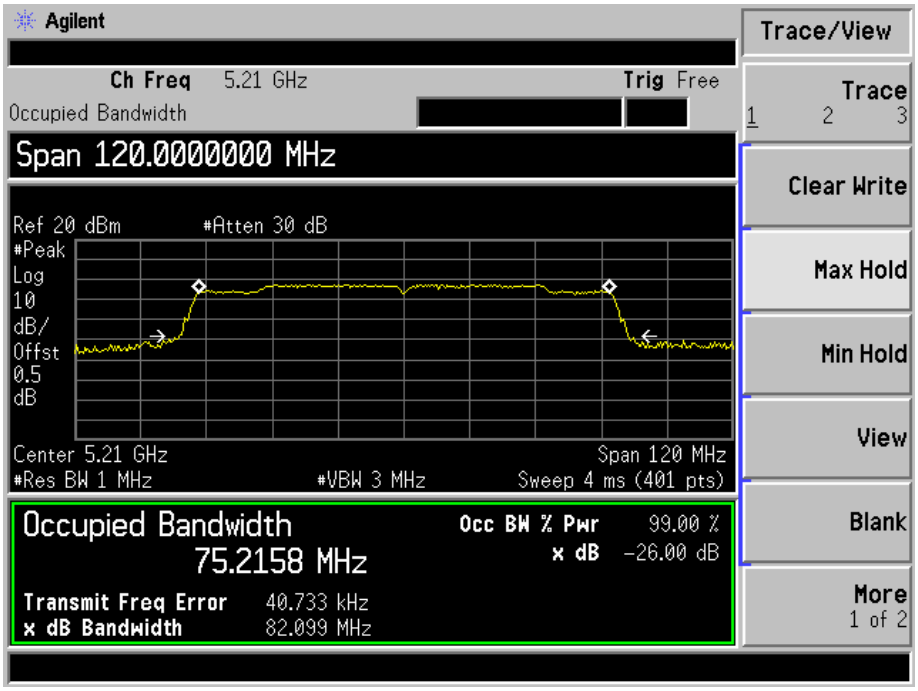
5190MHz

5230MHz



Test mode：802.11ac

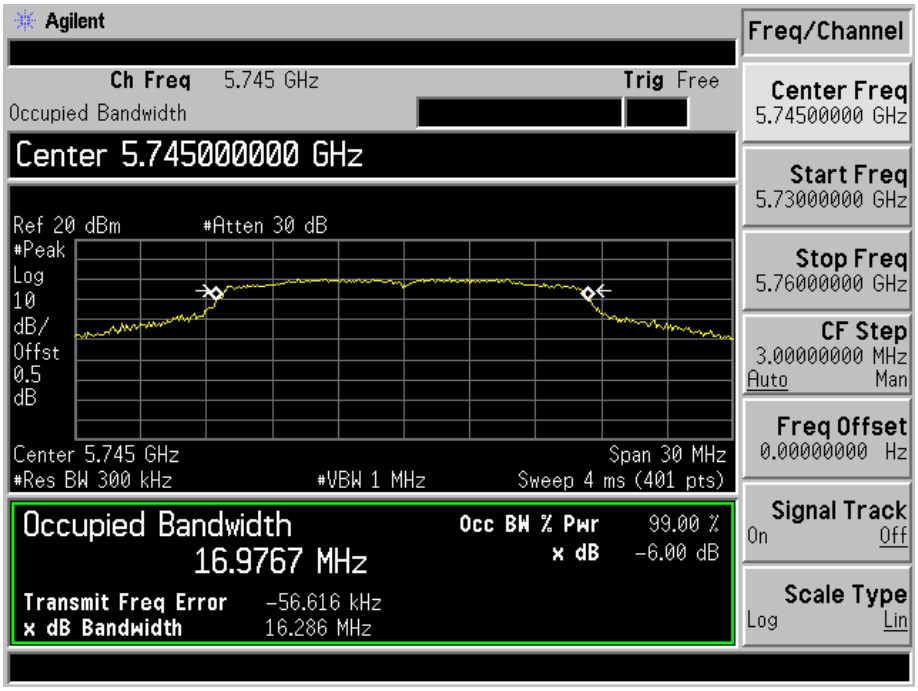
5210MHz



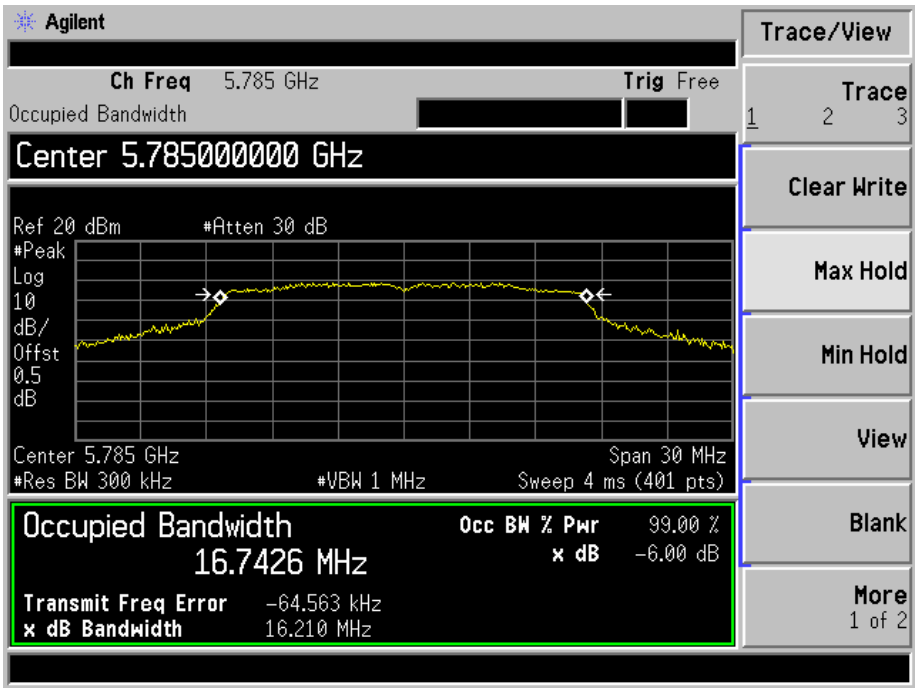
5725-5850MHz

Test mode：802.11a

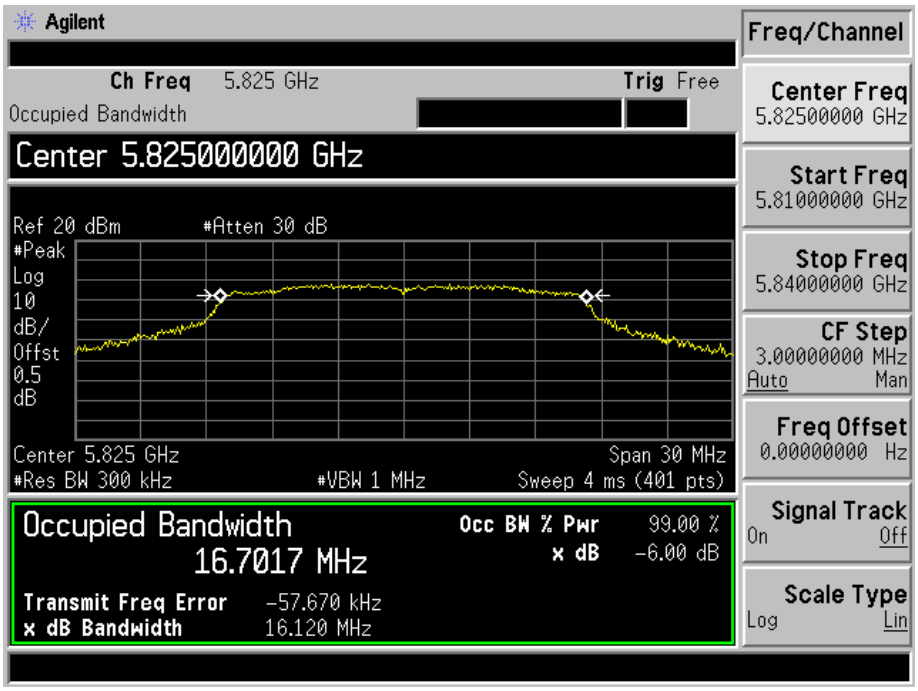
5745MHz



5785MHz

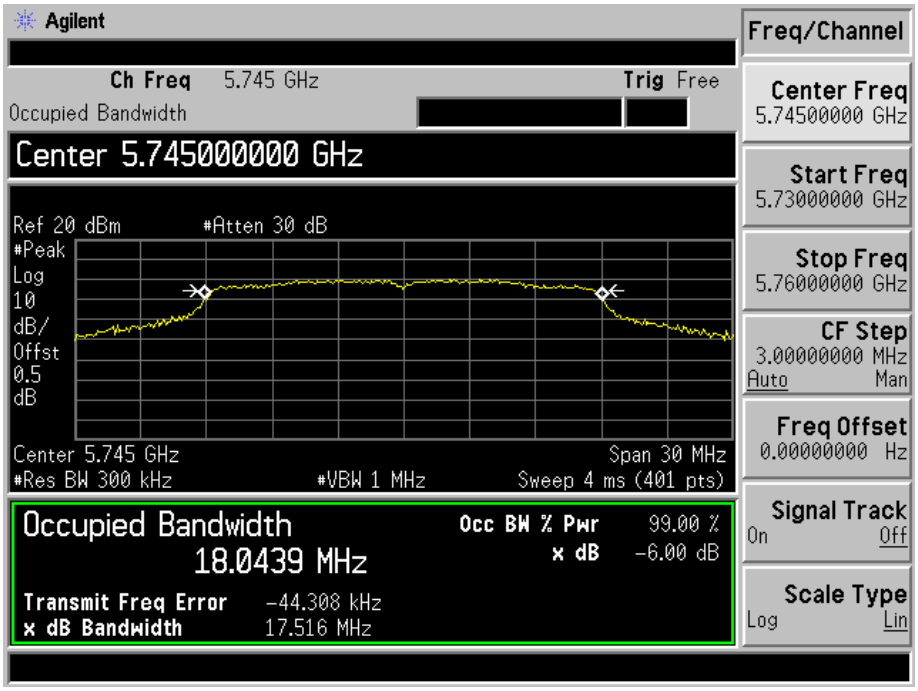


5825MHz

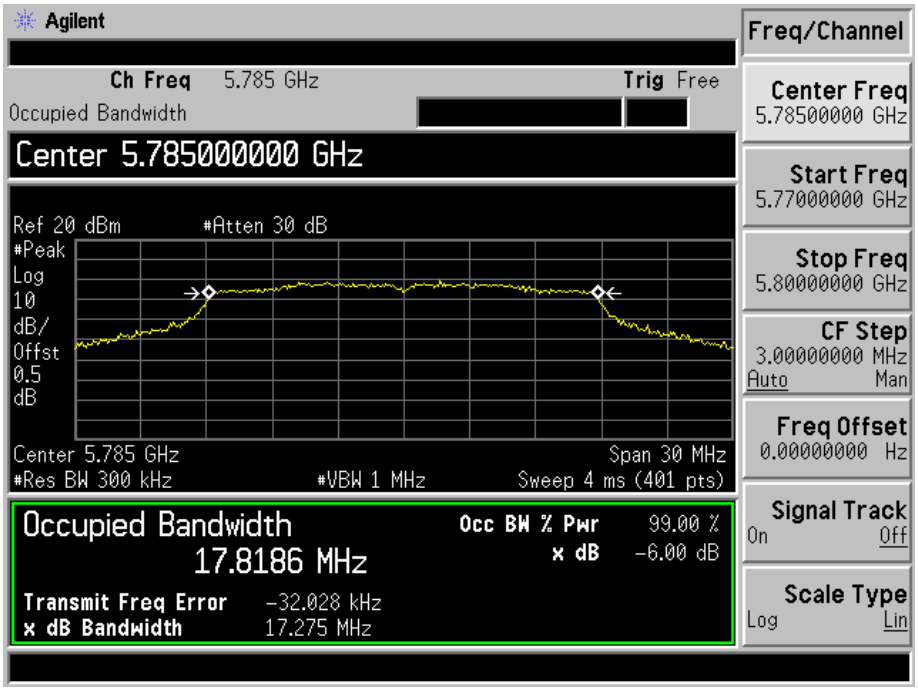


Test mode：802.11-HT20

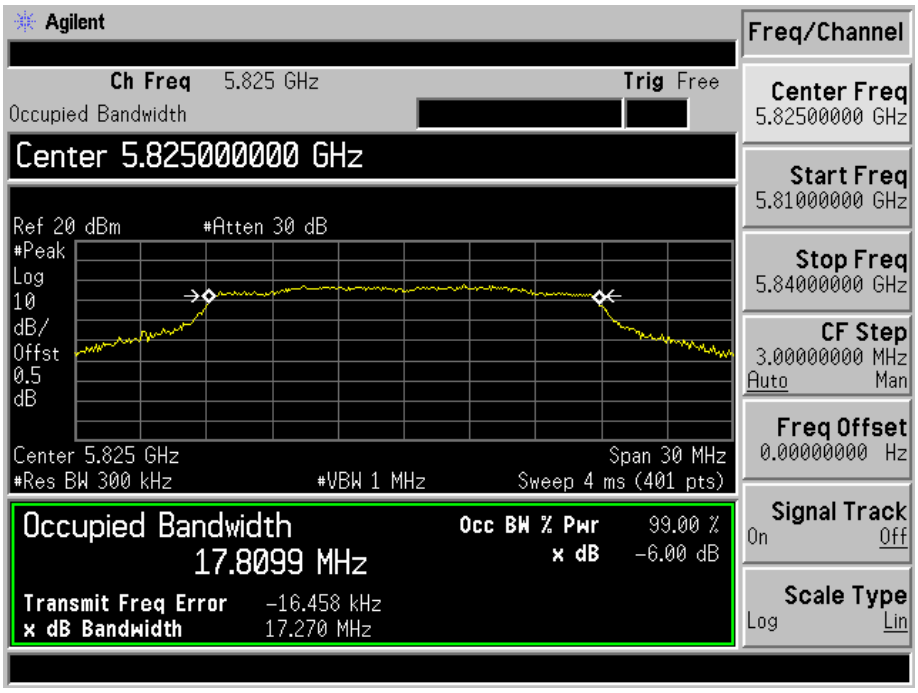
5745MHz



5785MHz

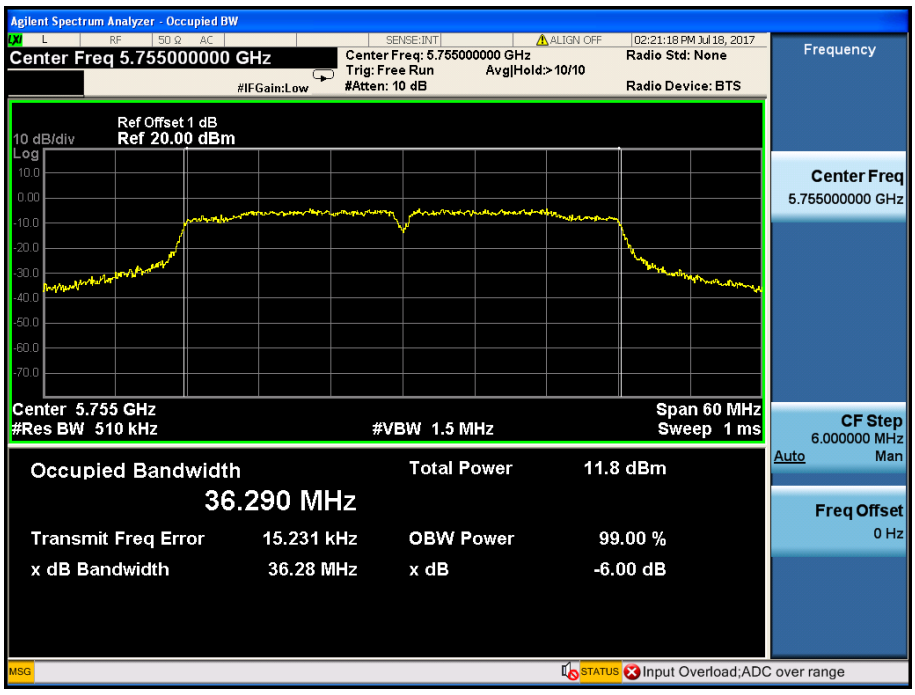


5825MHz

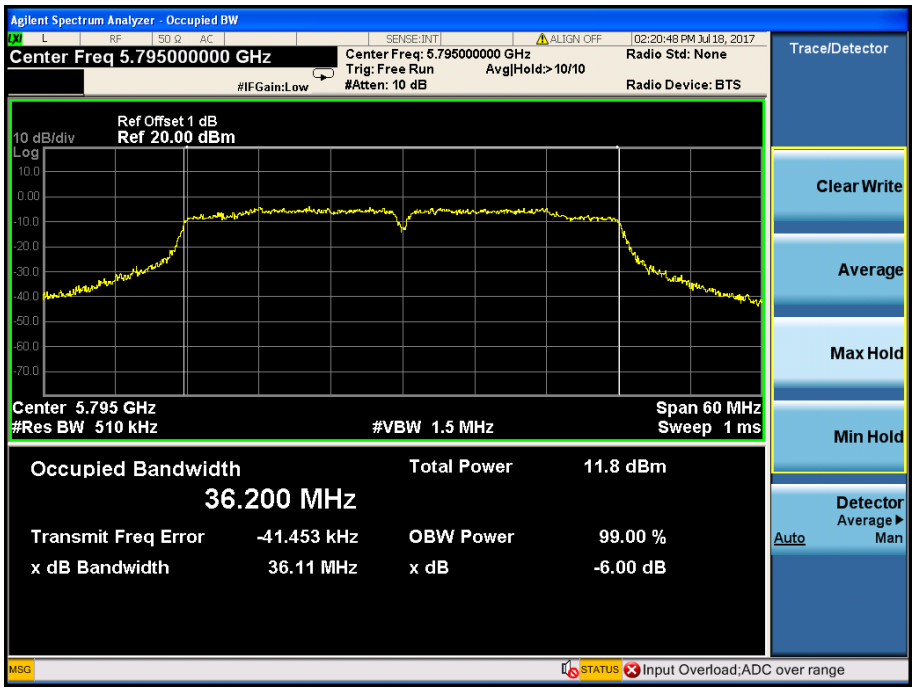


Test mode：802.11-HT40

5755MHz

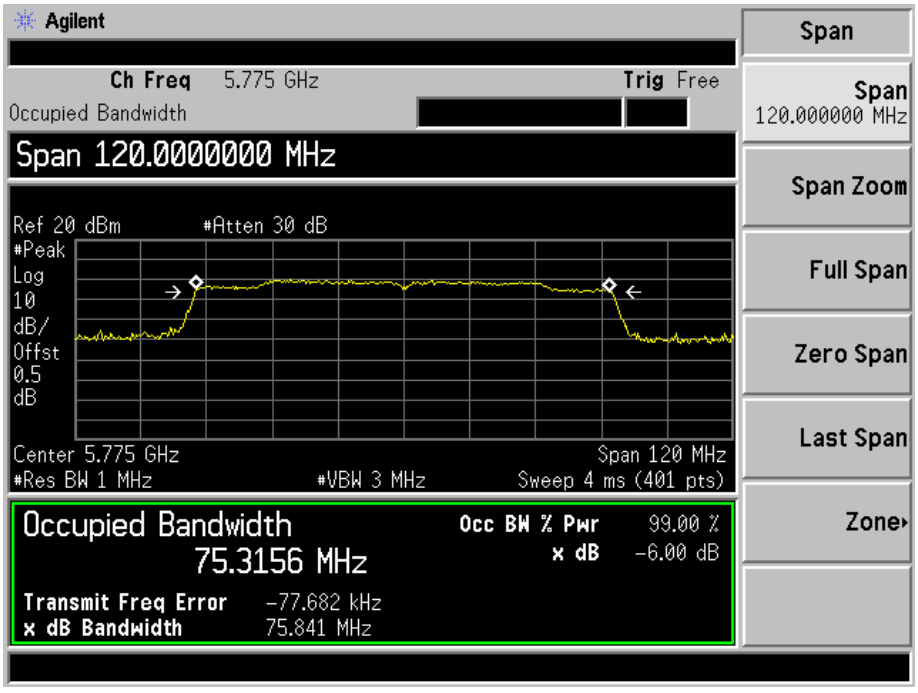


5795MHz



Test mode：802.11ac

5775MHz



Antenna B:

5150-5250MHz

Test Mode	Test Channel MHz	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz
802.11a	5180	24.027	16.7216	Pass
	5200	23.562	16.7136	Pass
	5240	22.904	16.6137	Pass
802.11n-HT20	5180	25.472	17.8933	Pass
	5200	24.302	17.8329	Pass
	5240	23.167	17.7601	Pass
802.11n-HT40	5190	48.22	36.306	Pass
	5230	47.67	36.270	Pass
802.11ac	5210	81.256	75.1628	Pass

5725-5850MHz

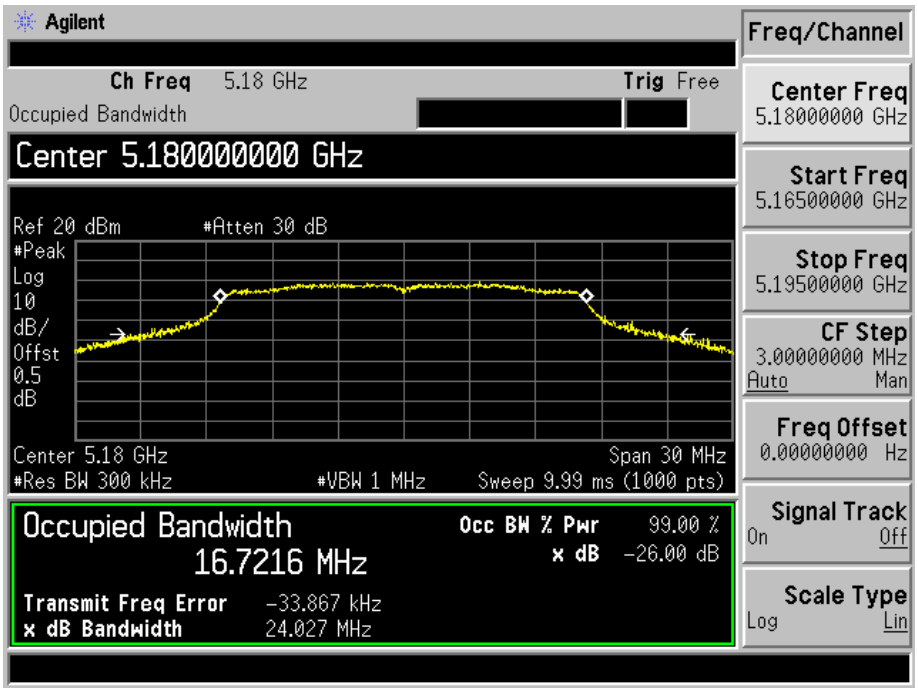
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
802.11a	5745	15.982	16.6831	≥500
	5785	16.161	16.6559	≥500
	5825	16.004	16.6744	≥500
802.11n-HT20	5745	17.332	17.7752	≥500
	5785	17.471	17.7578	≥500
	5825	17.309	17.7675	≥500
802.11n-HT40	5755	36.23	36.179	≥500
	5795	36.19	36.123	≥500
802.11ac-HV80	5775	75.899	75.52	≥500

Antenna B:

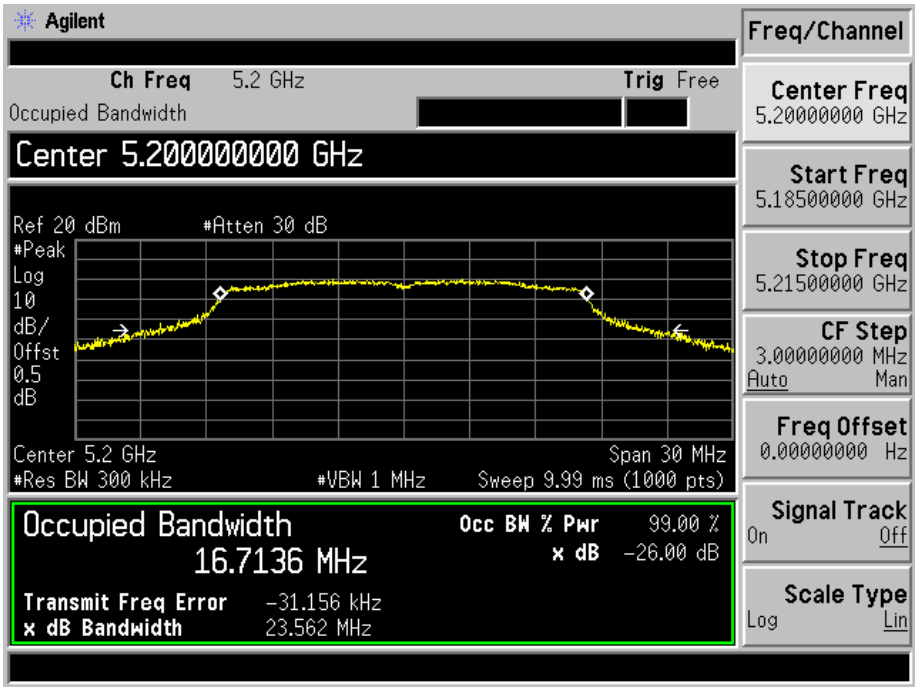
5150-5250MHz

Test mode：802.11a

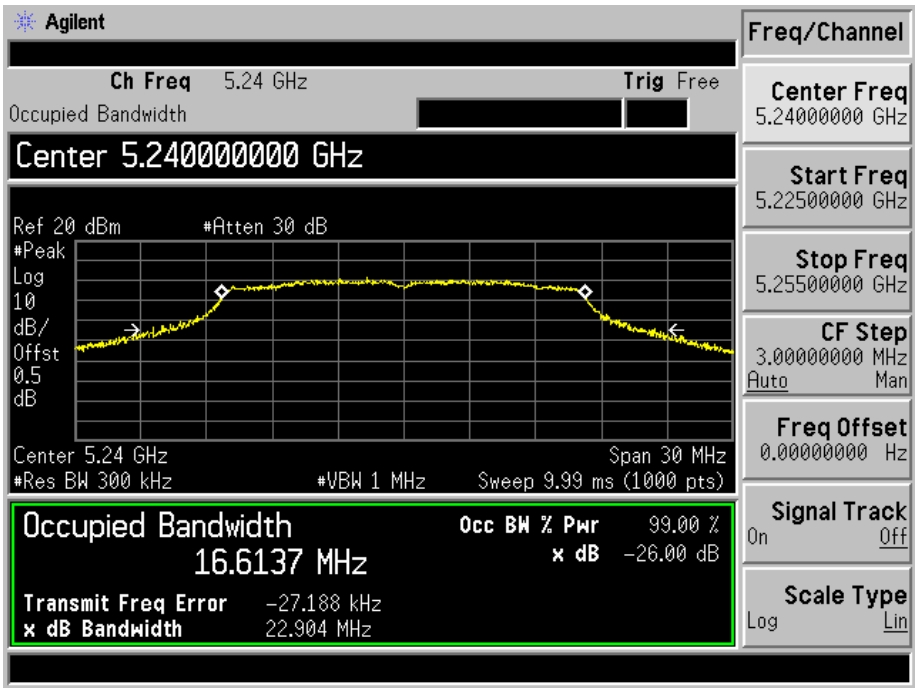
5180MHz



5200MHz

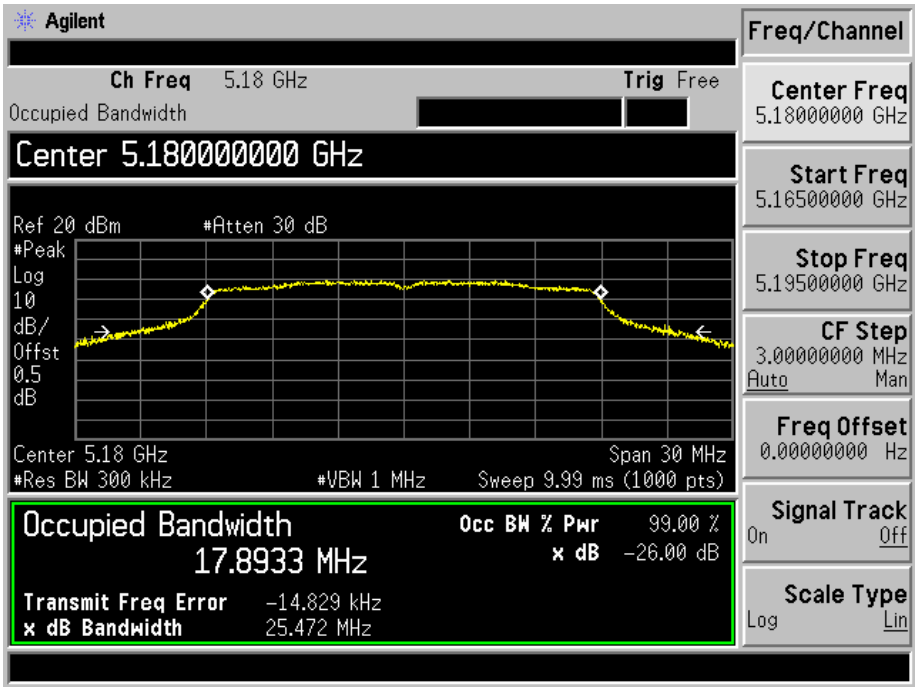


5240MHz

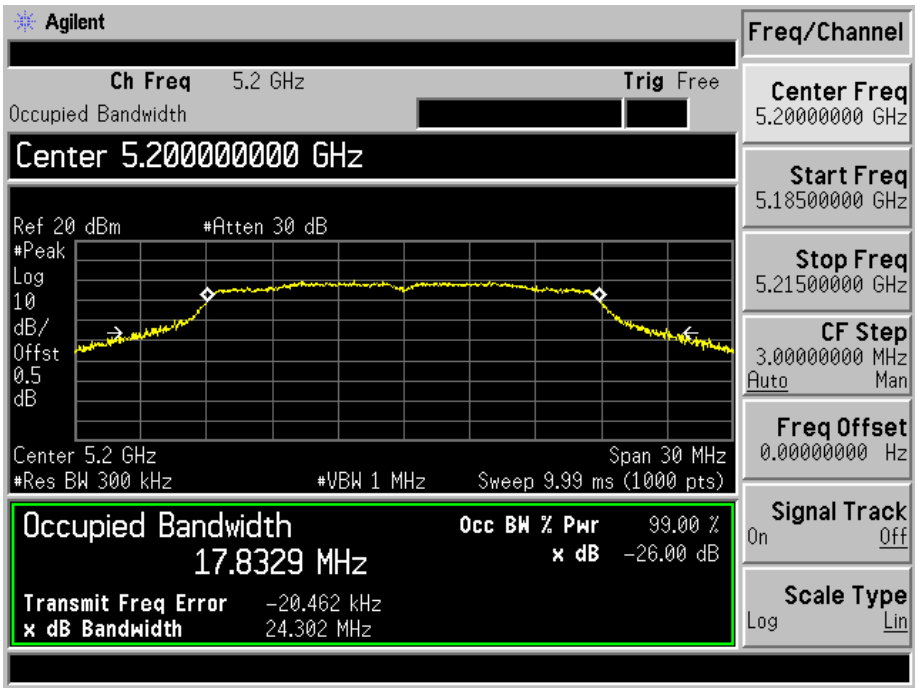


Test mode：802.11n-HT20

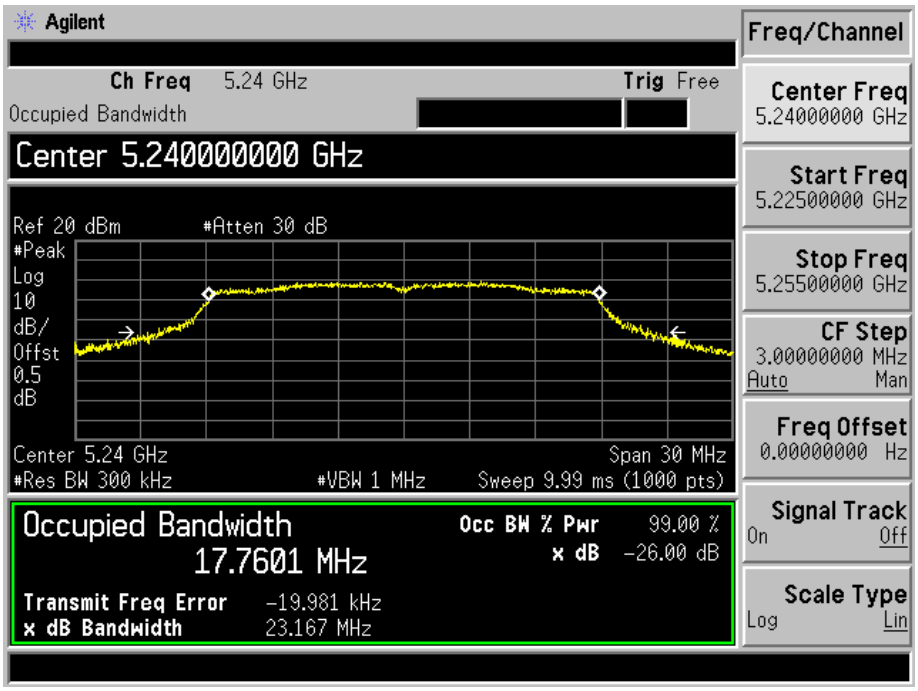
5180MHz



5200MHz

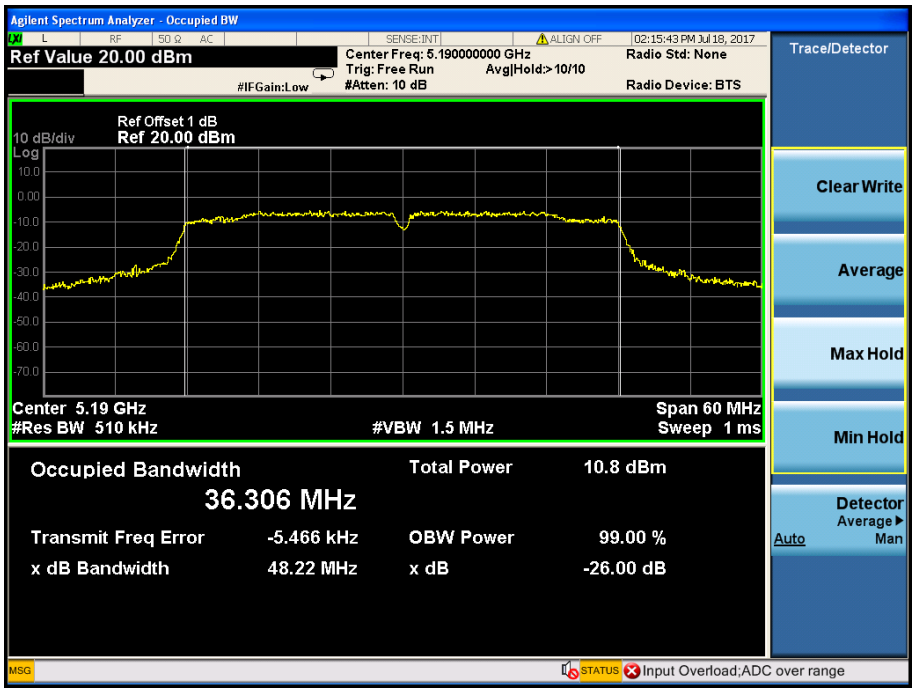


5240MHz

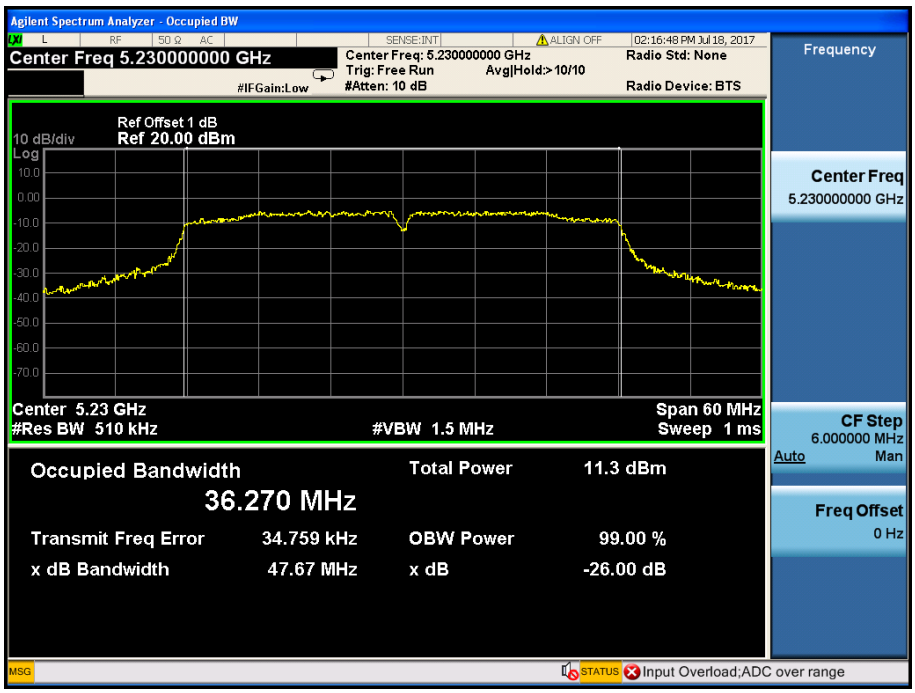


Test mode：802.11n-HT40

5190MHz

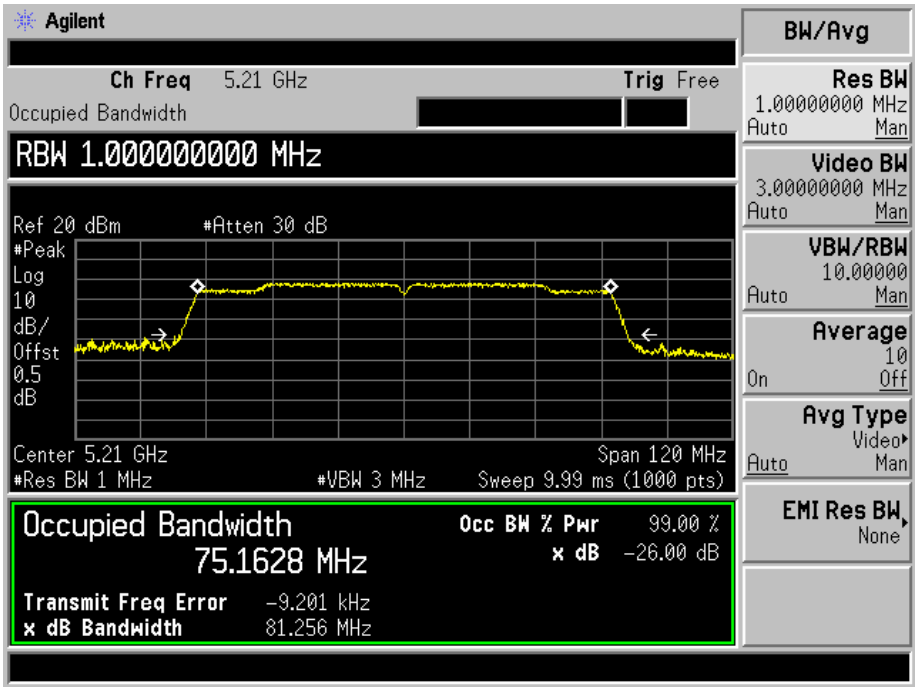


5230MHz



Test mode：802.11ac

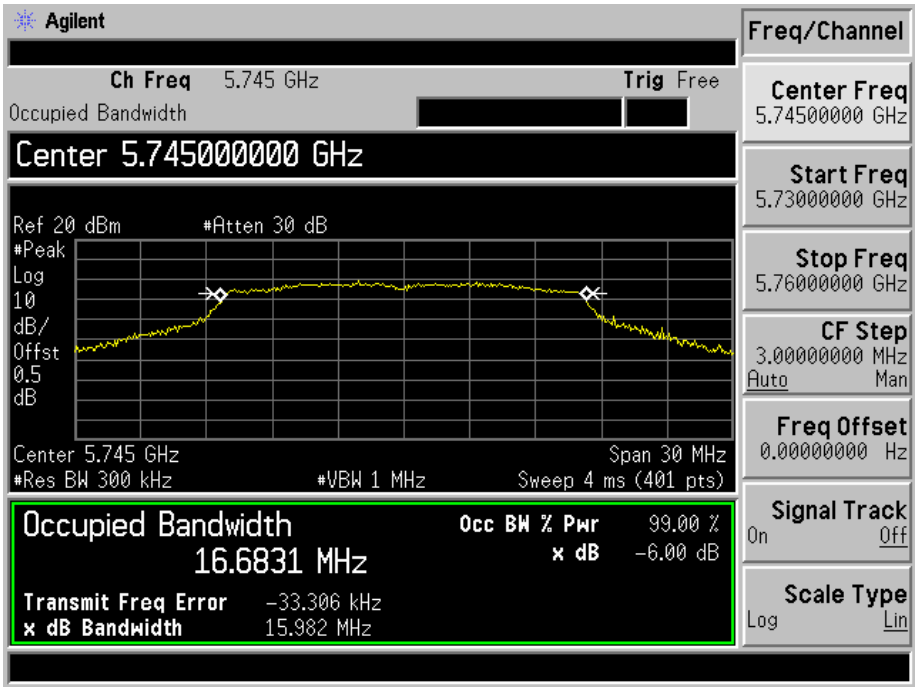
5210MHz



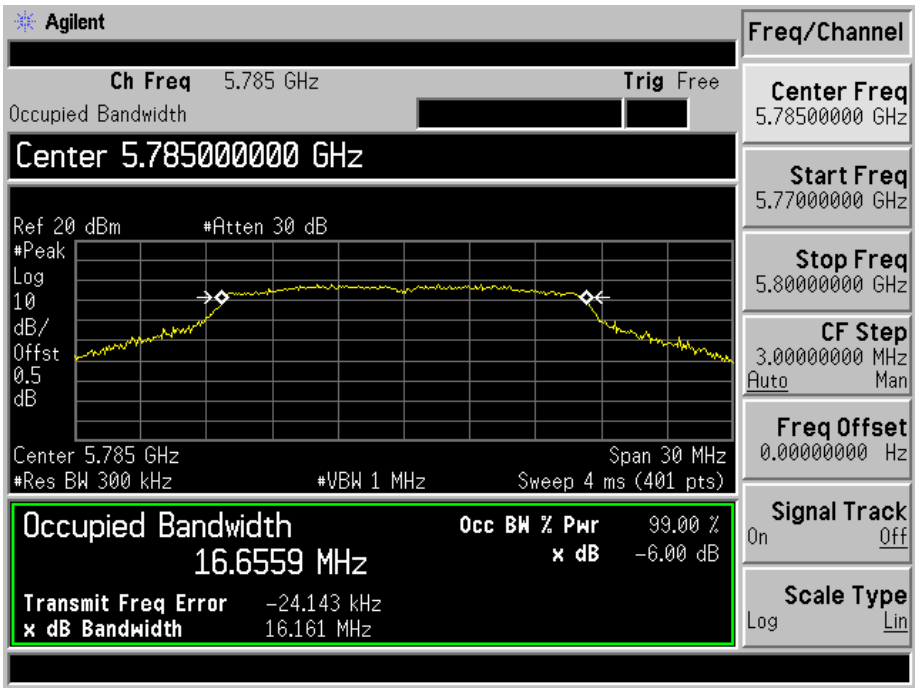
5725-5850MHz

Test mode：802.11a

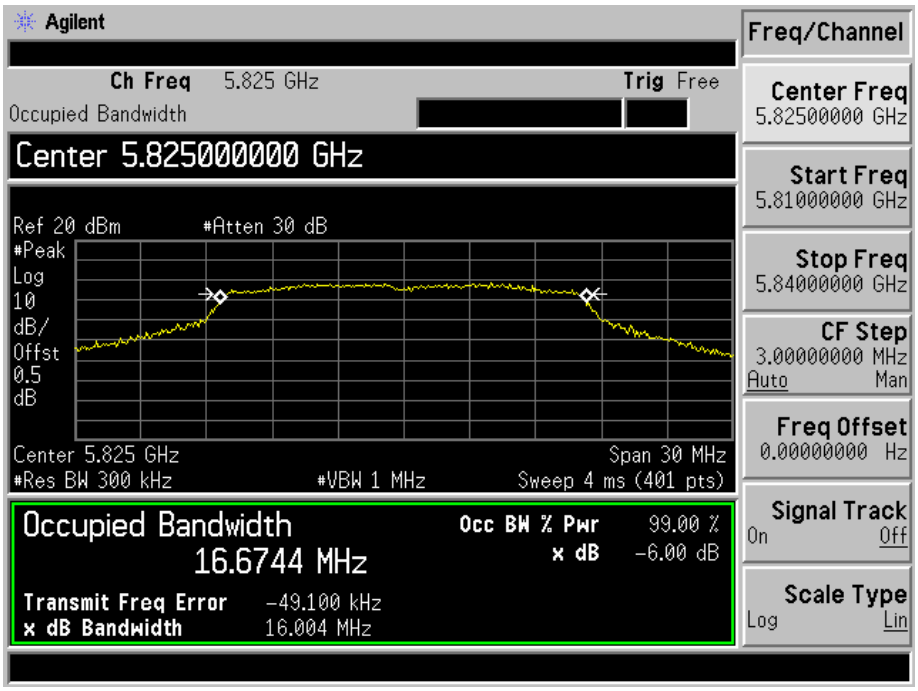
5745MHz



5785MHz

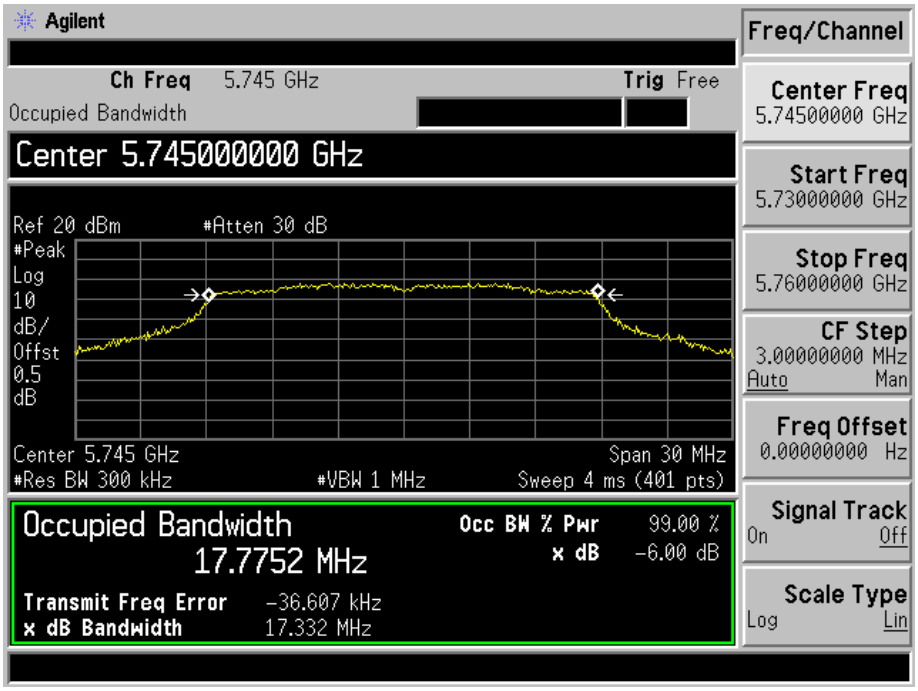


5825MHz

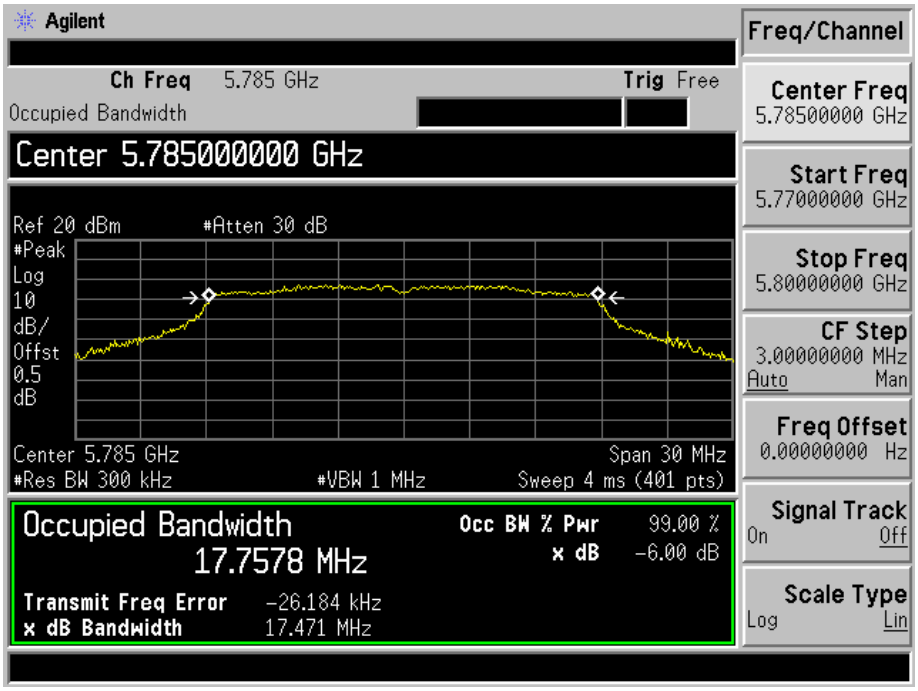


Test mode：802.11-HT20

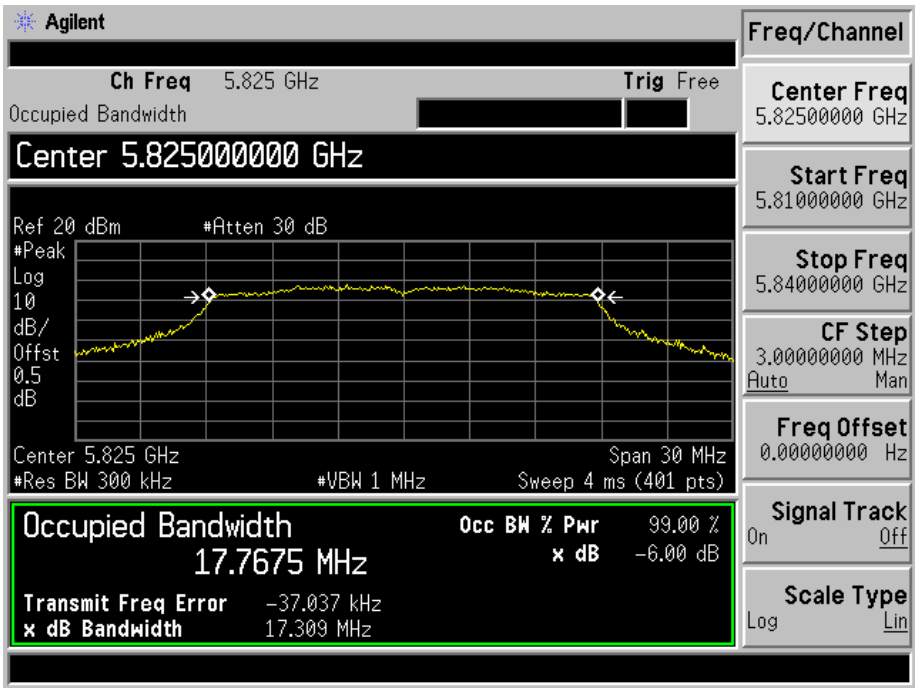
5745MHz



5785MHz

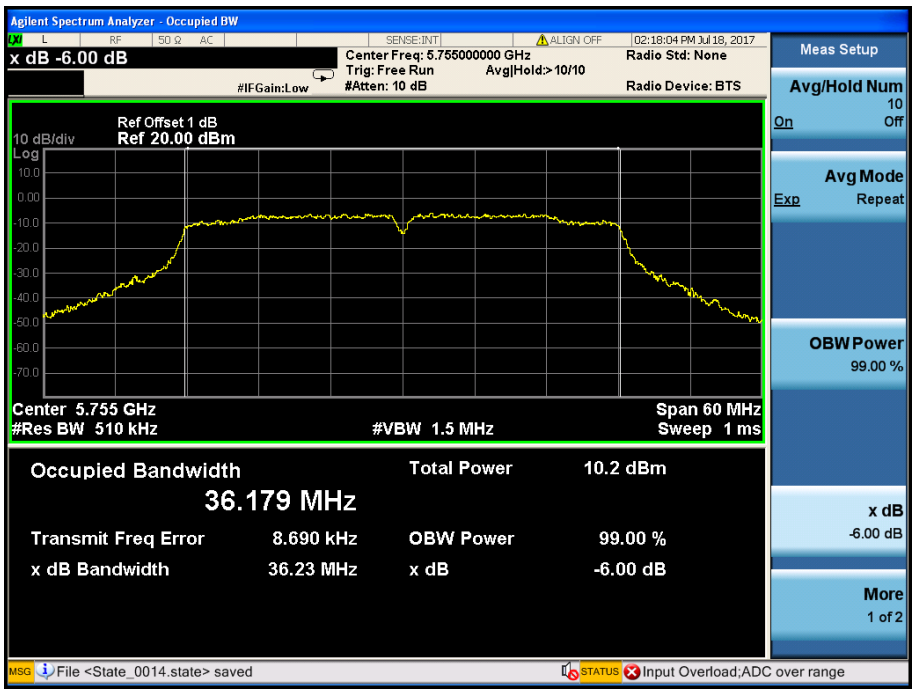


5825MHz

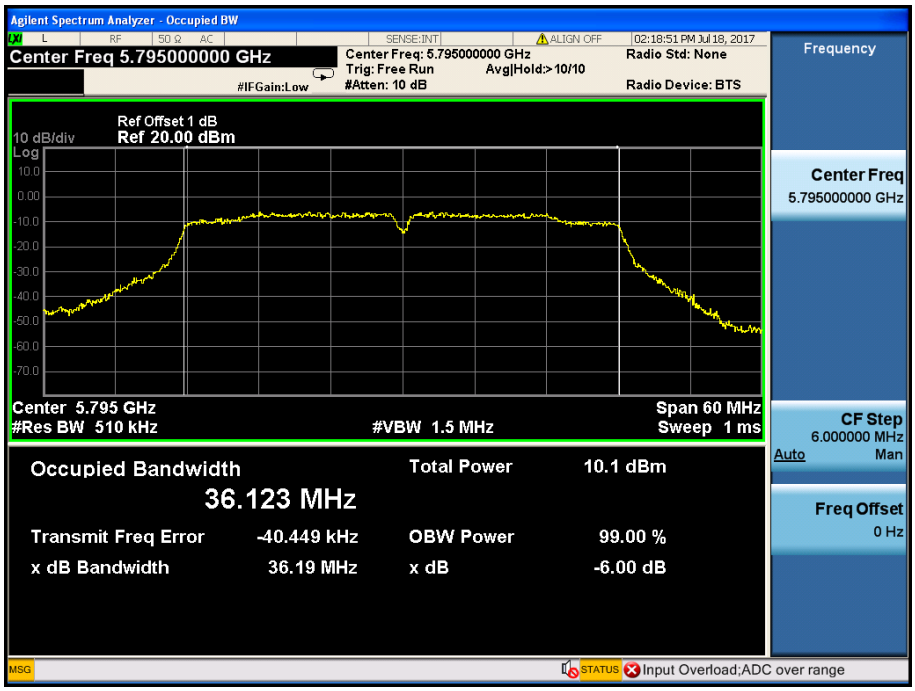


Test mode：802.11-HT40

5755MHz

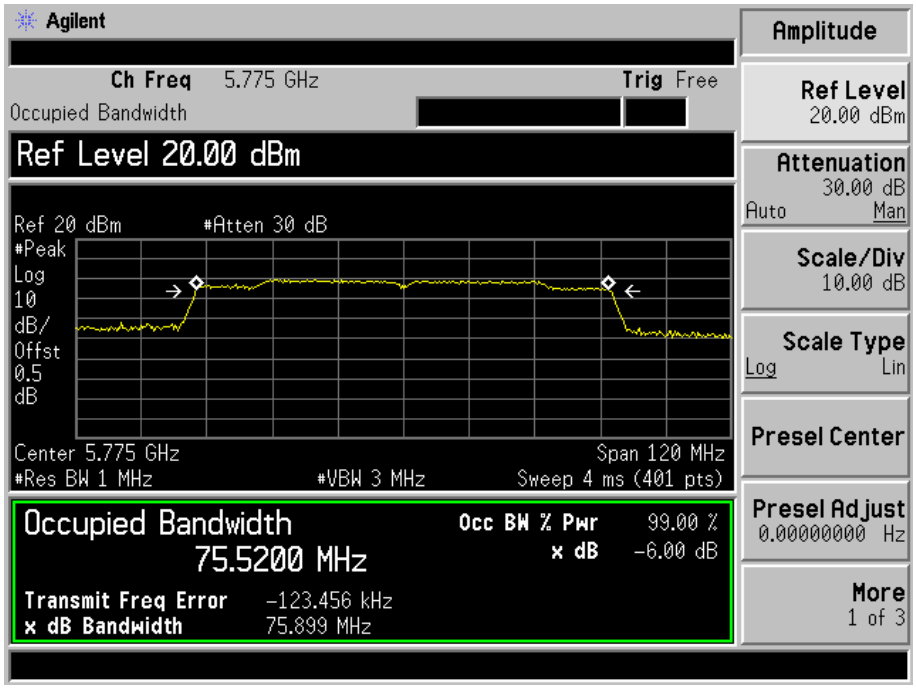


5795MHz



Test mode：802.11ac

5775MHz



8. Maximum Conducted Output Power

8.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.
(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

8.2 Test Procedure

According to KDB789033 D02 v01r02 section E, the following is the measurement procedure.

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

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

(v) Sweep time = auto.

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

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

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

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

8.3 Environmental Conditions

Temperature:	26° C
Relative Humidity:	65%
ATM Pressure:	1011 mbar

8.4 Summary of Test Results/Plots

Antenna A:

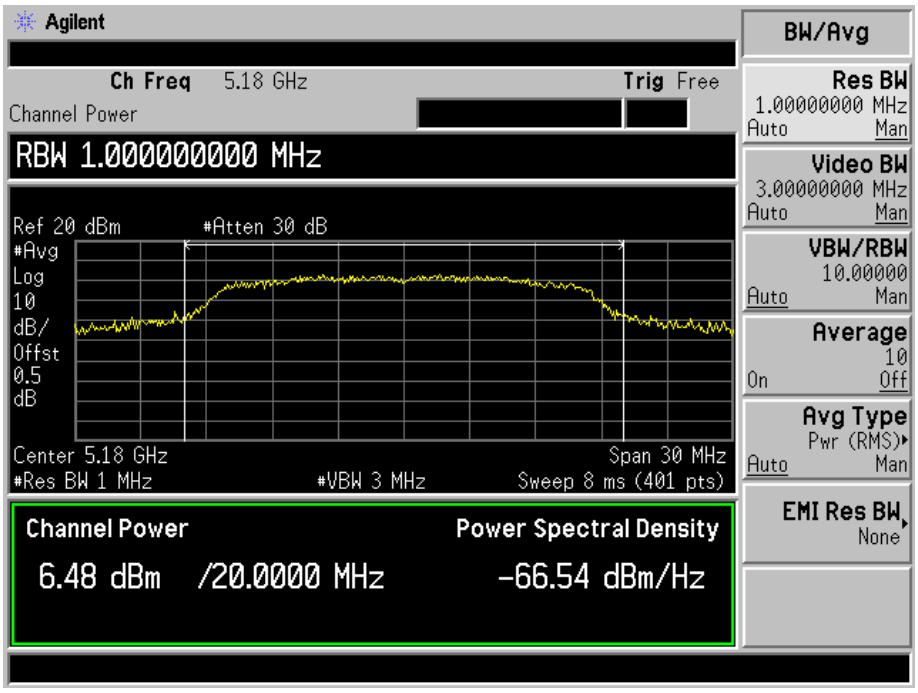
For the frequency band 5.15-5.25GHz, 5725-5850GHz

Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5180	6.48	4.45	250
	5200	6.53	4.50	250
	5240	6.65	4.62	250
	5745	6.45	4.42	1000
	5785	6.04	4.02	1000
	5825	5.98	3.96	1000
802.11n-HT20	5180	5.53	3.57	250
	5200	6.50	4.47	250
	5240	6.75	4.73	250
	5745	6.50	4.47	1000
	5785	5.74	3.75	1000
	5825	5.81	3.81	1000
802.11n-HT40	5190	4.63	2.90	250
	5230	4.77	3.00	250
	5755	6.67	4.65	1000
	5795	6.29	4.26	1000
802.11ac	5210	5.52	3.56	250
	5775	6.83	4.82	1000

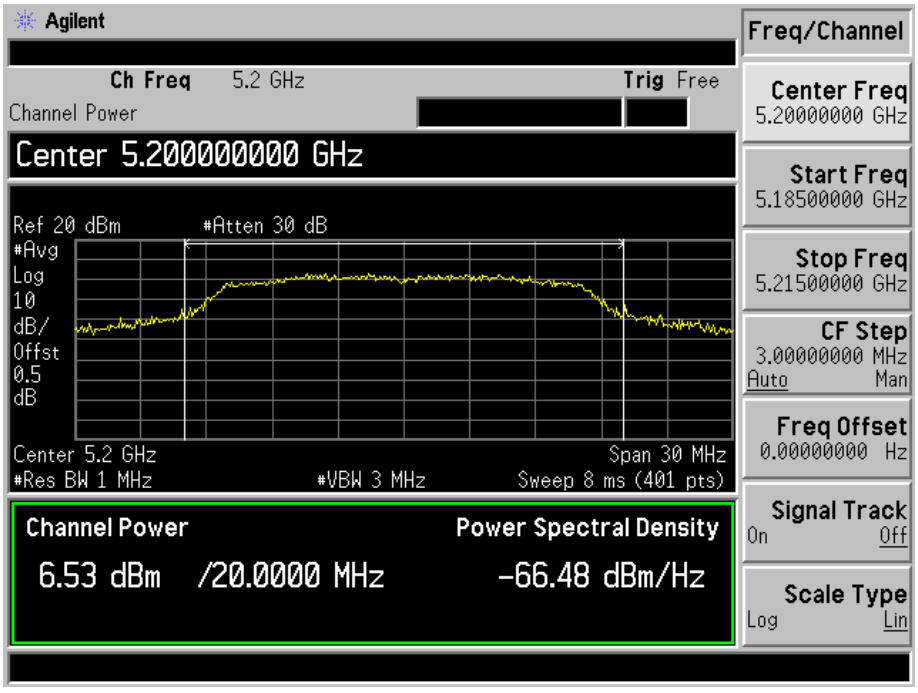
Antenna A:

Test Mode: 802.11a

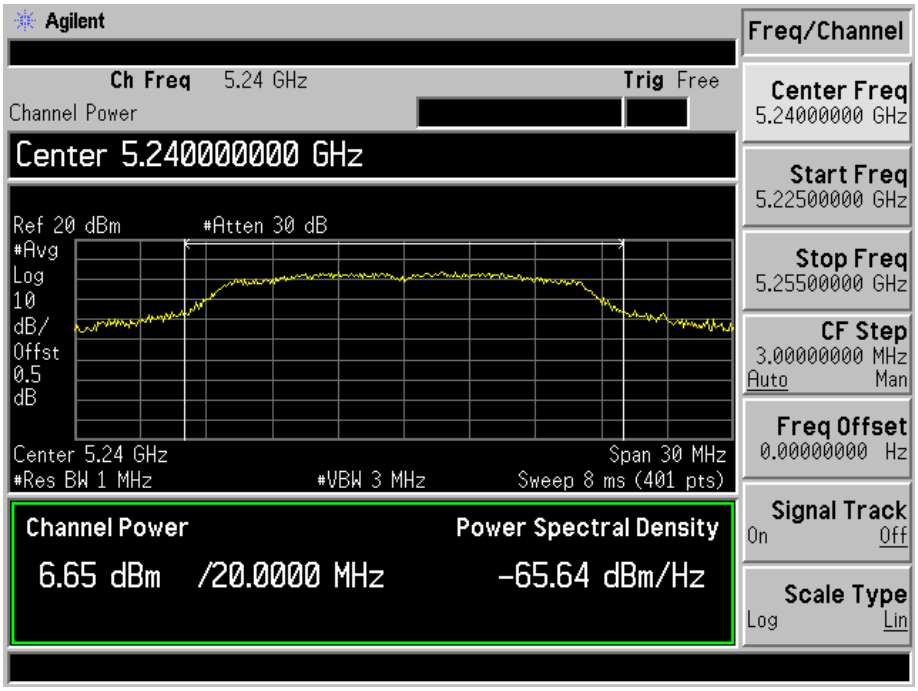
5180MHz



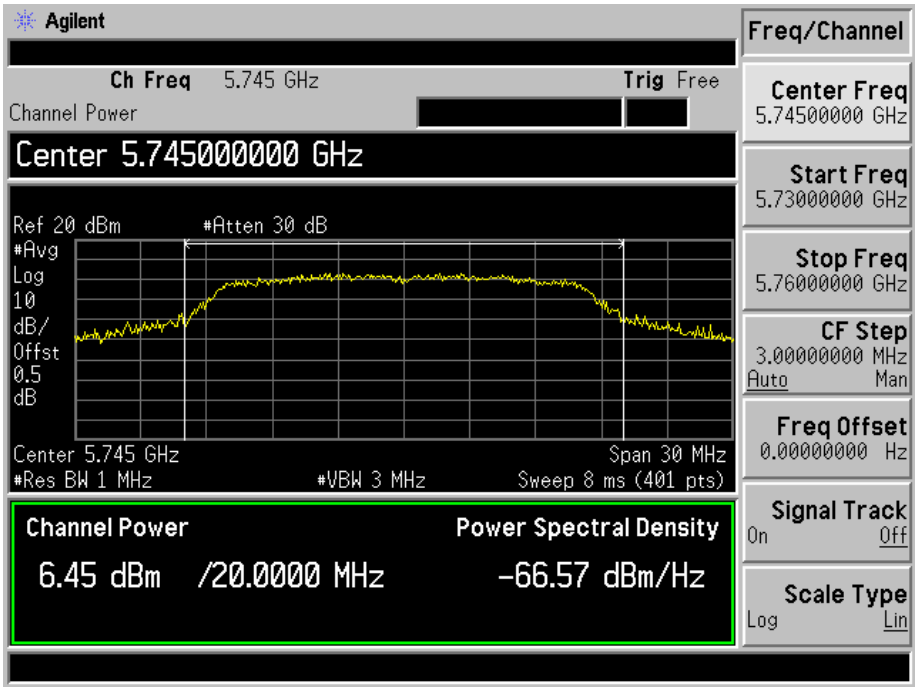
5200MHz



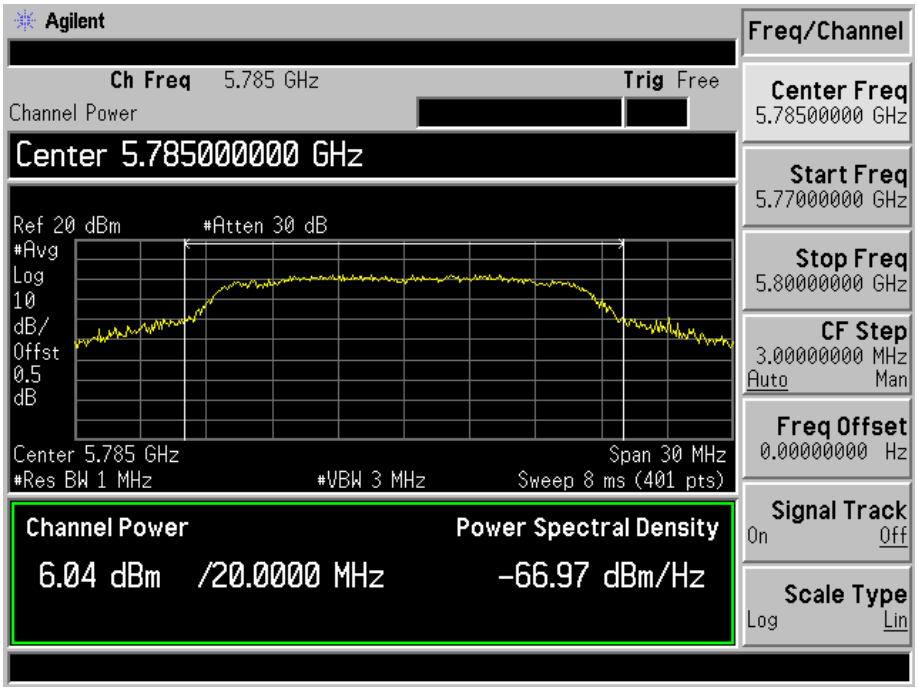
5240MHz



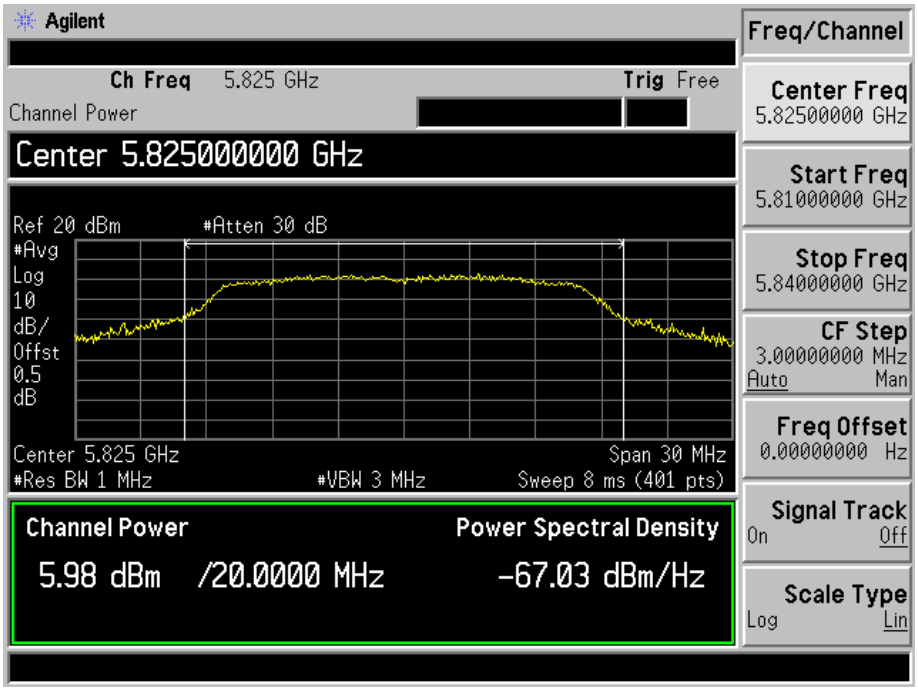
5745MHz



5785MHz

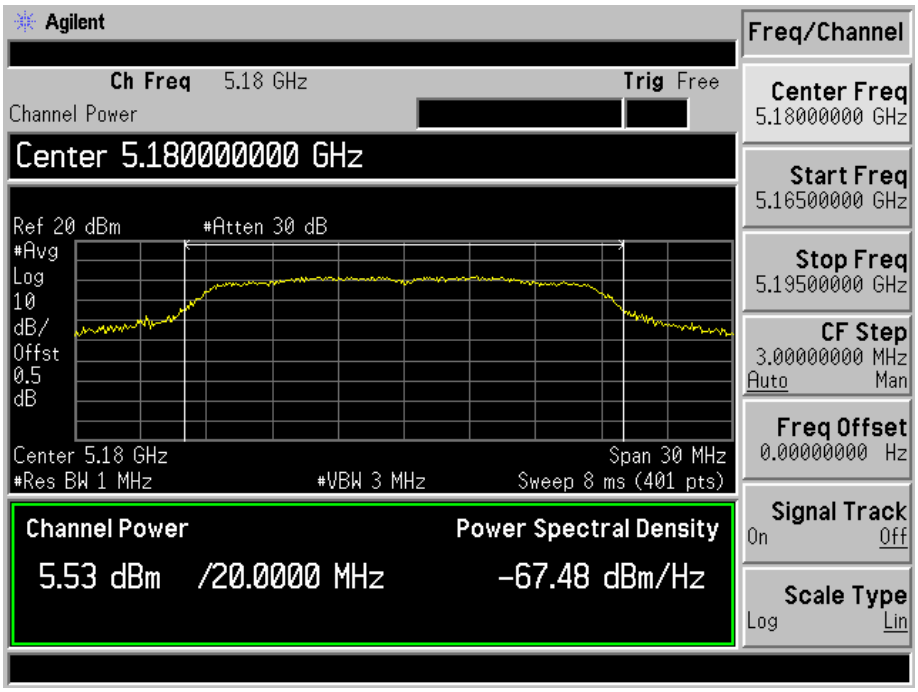


5825MHz

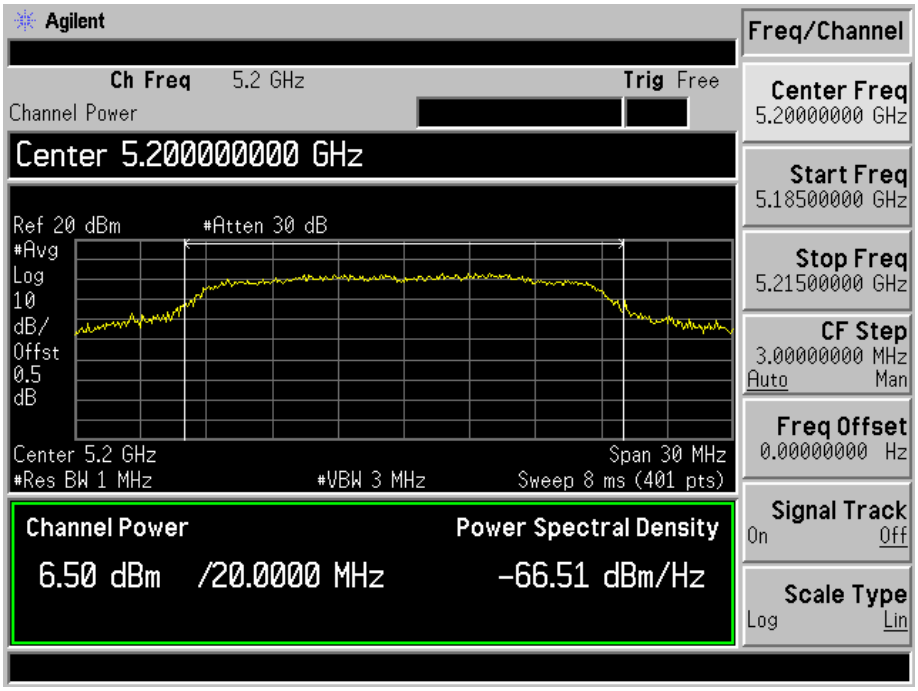


Test Mode: 802.11n-HT20

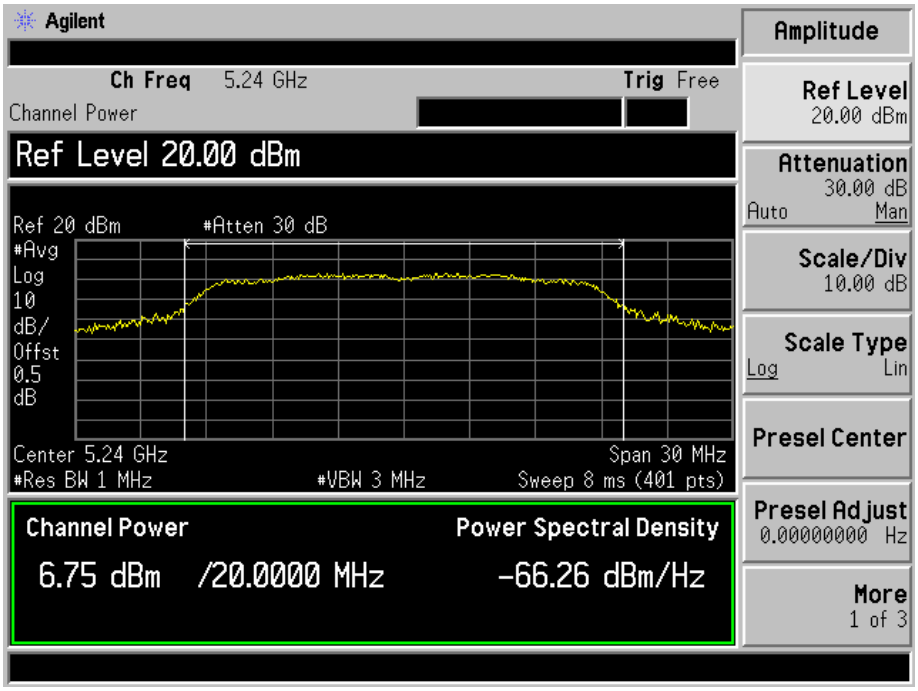
5180MHz



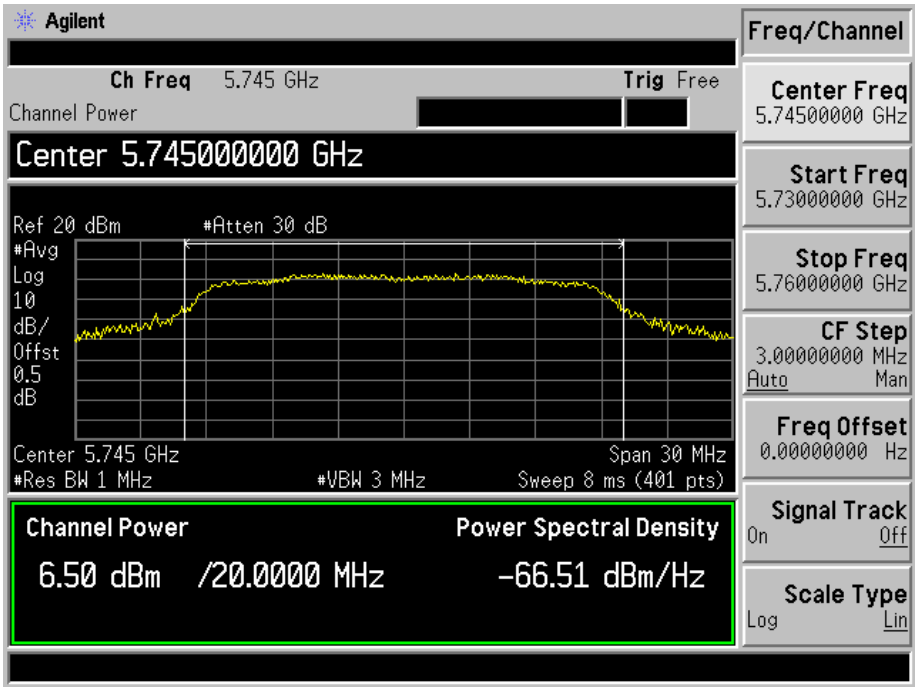
5200MHz



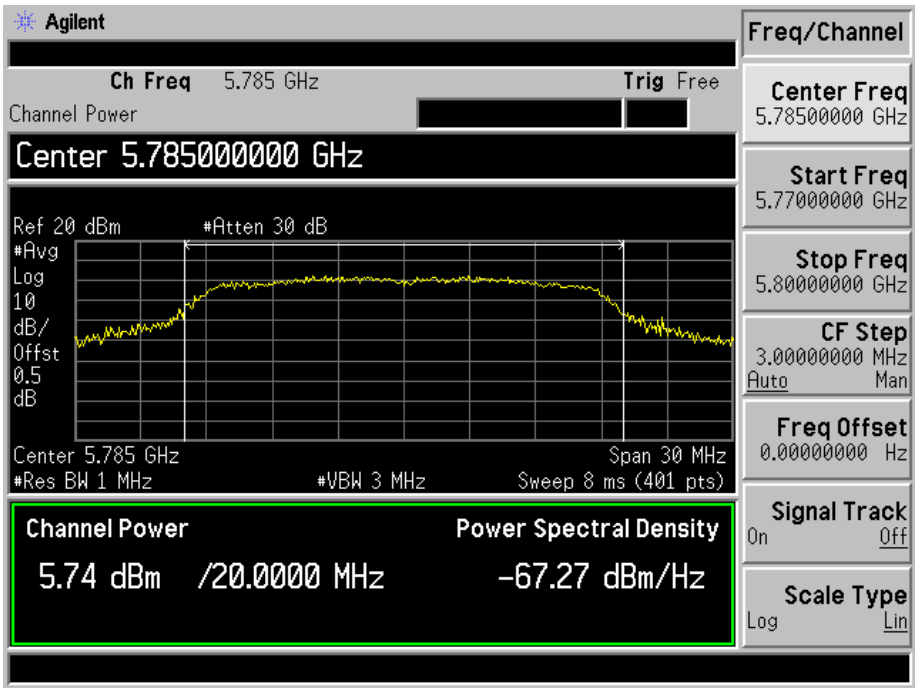
5240MHz



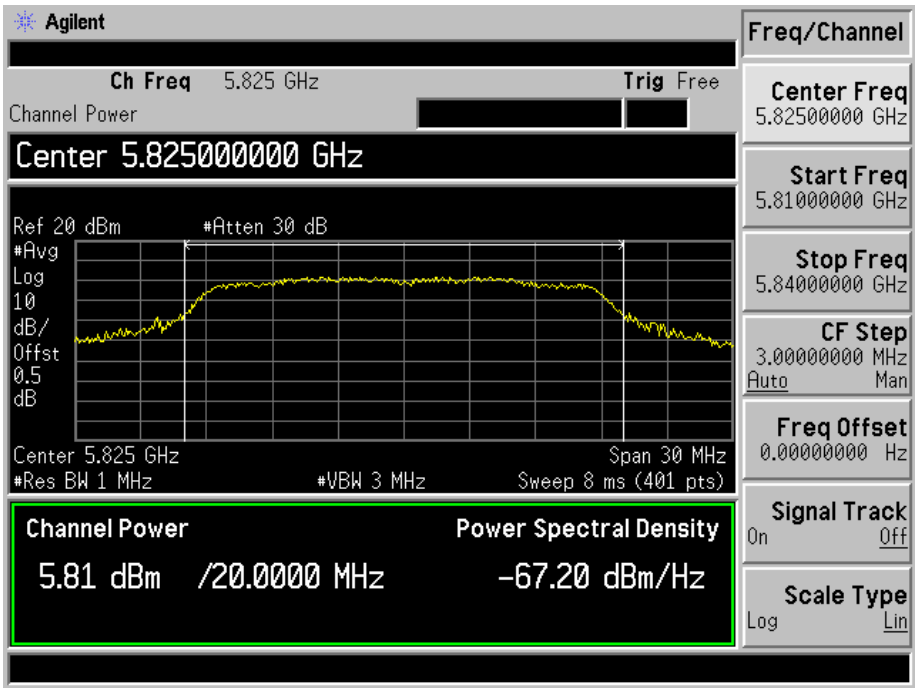
5745MHz



5785MHz

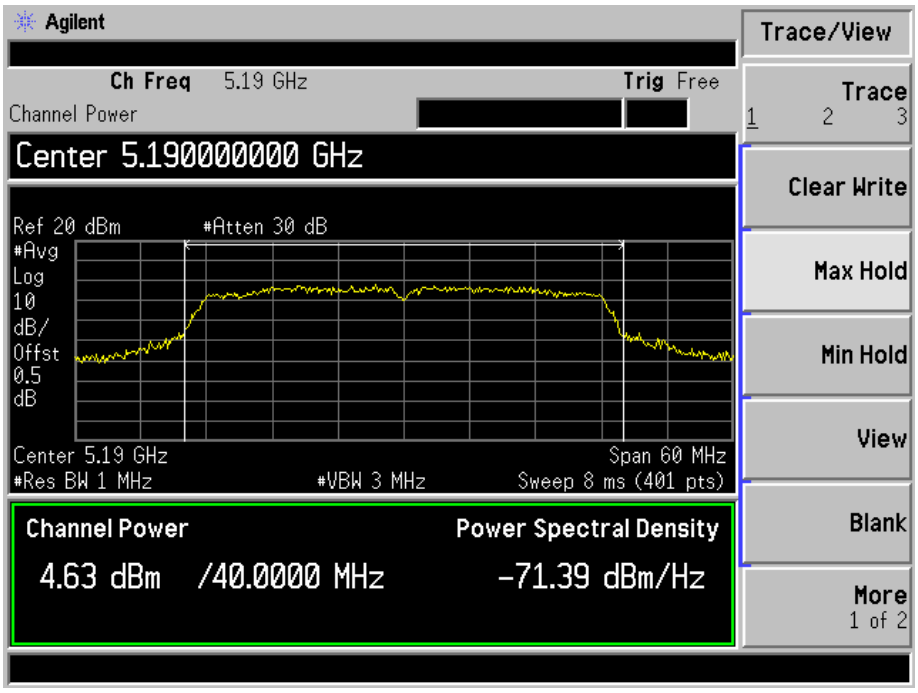


5825MHz

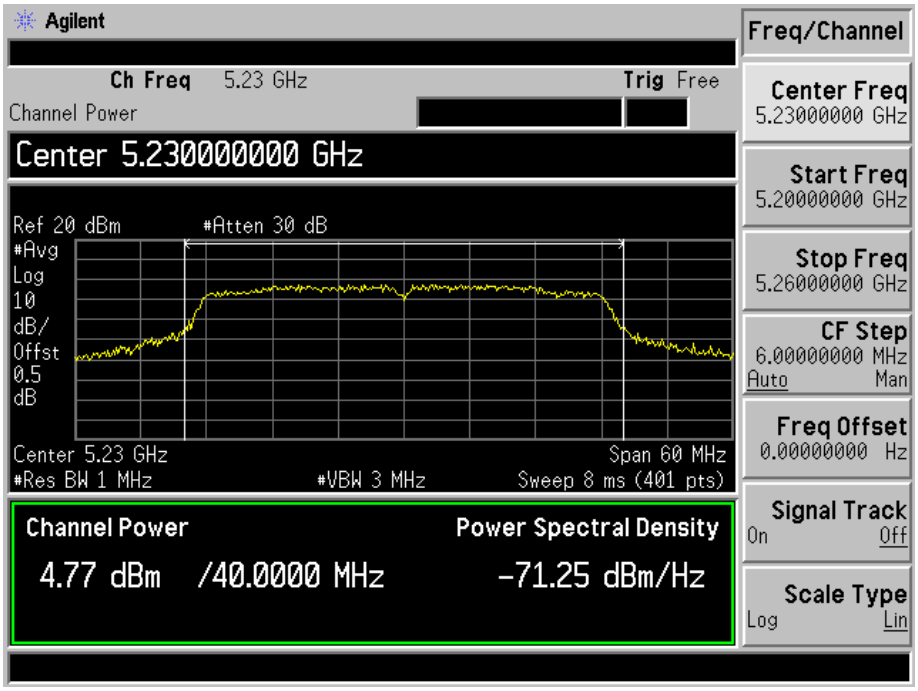


Test Mode: 802.11n-HT40

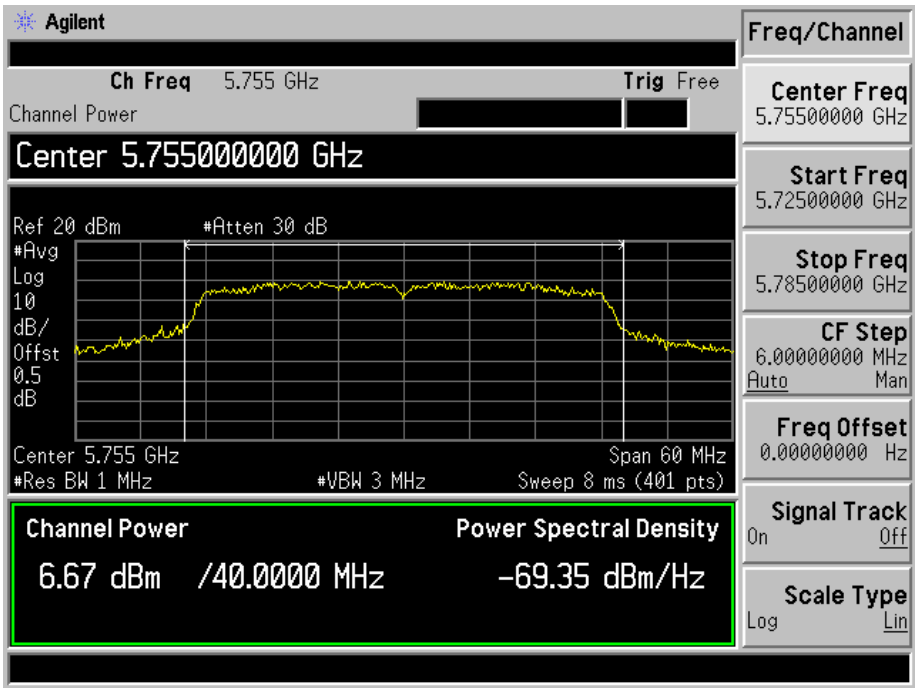
5190MHz



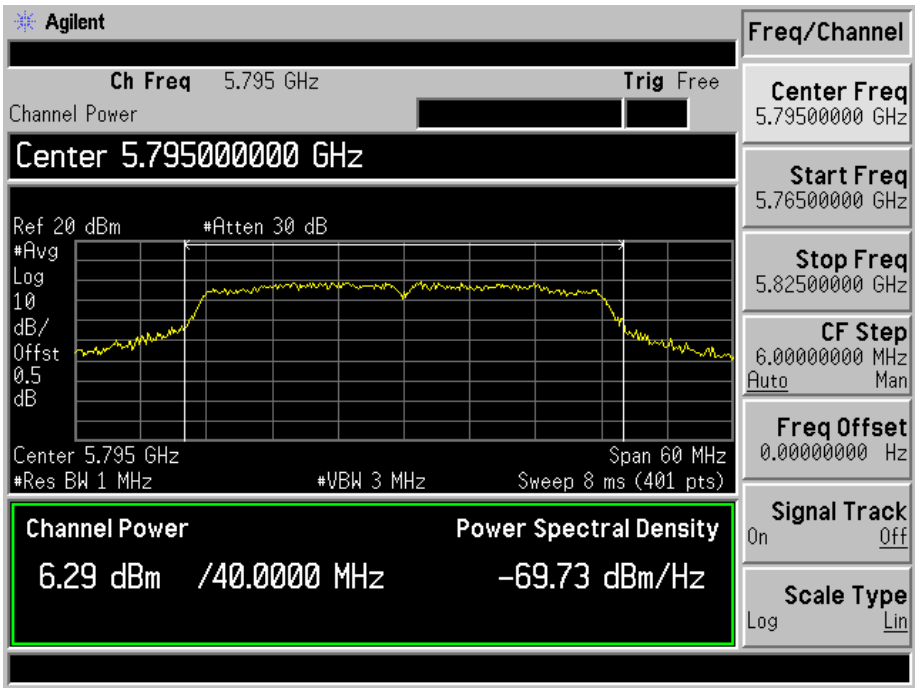
5230MHz



5755MHz

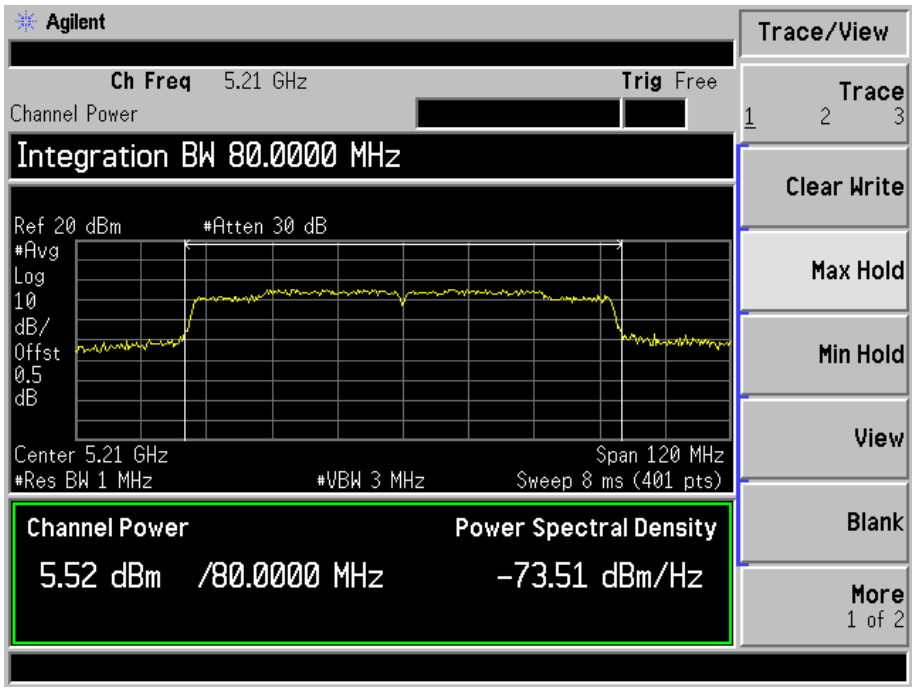


5795MHz

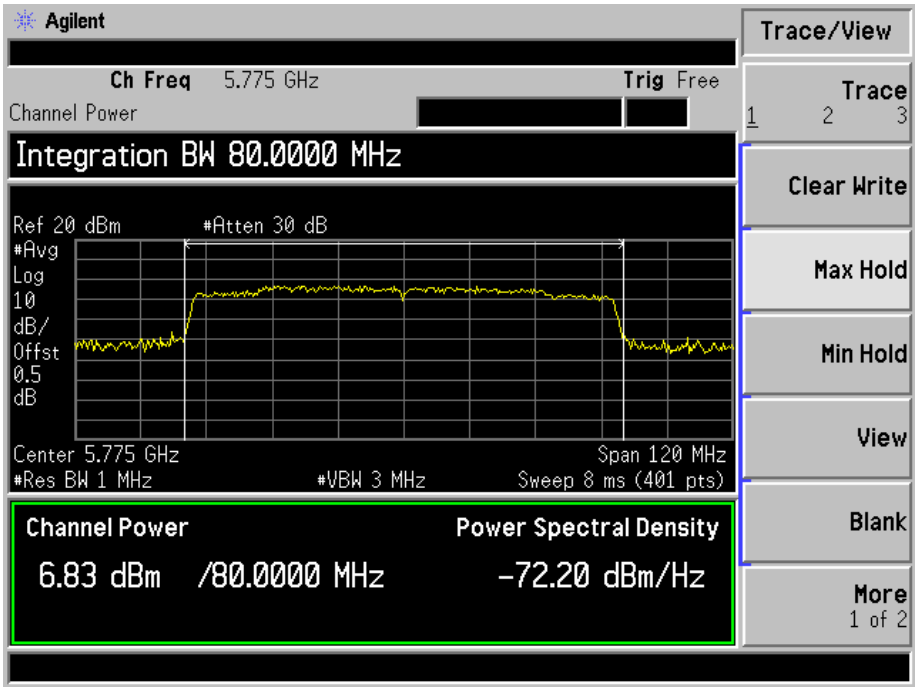


Test Mode: 802.11ac

5210MHz



5775MHz



Antenna B:

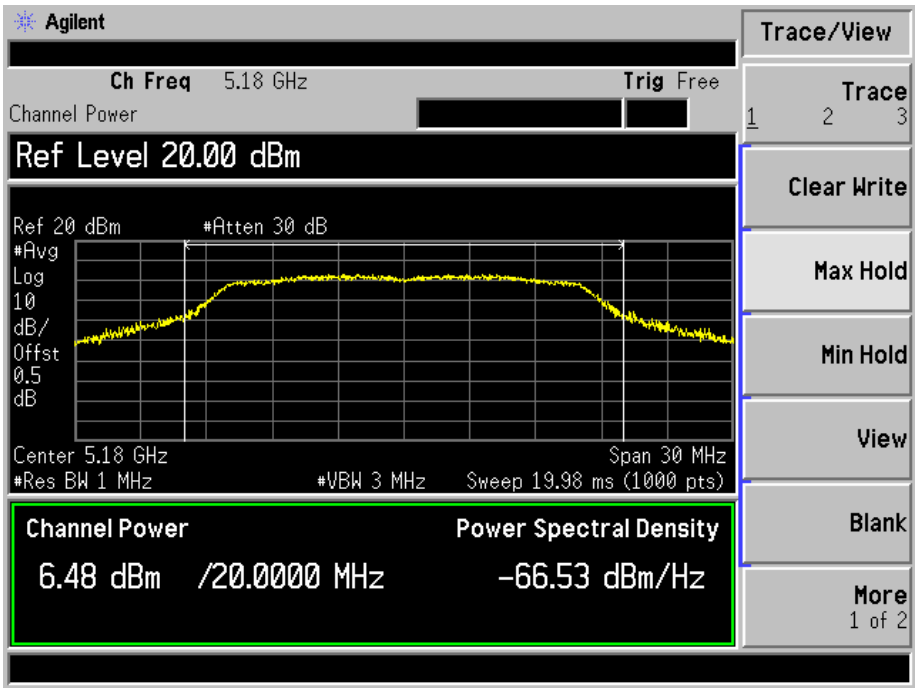
For the frequency band 5.15-5.25GHz, 5725-5850GHz

Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5180	6.48	4.45	250
	5200	6.48	4.45	250
	5240	6.54	4.51	250
	5745	5.79	3.79	1000
	5785	4.79	3.01	1000
	5825	5.02	3.18	1000
802.11n-HT20	5180	5.25	3.35	250
	5200	6.59	4.56	250
	5240	6.46	4.43	250
	5745	5.27	3.37	1000
	5785	4.47	2.80	1000
	5825	5.06	3.21	1000
802.11n-HT40	5190	5.19	3.30	250
	5230	7.71	5.90	250
	5755	5.31	3.40	1000
	5795	5.00	3.16	1000
802.11ac	5210	5.47	3.52	250
	5775	6.07	4.05	1000

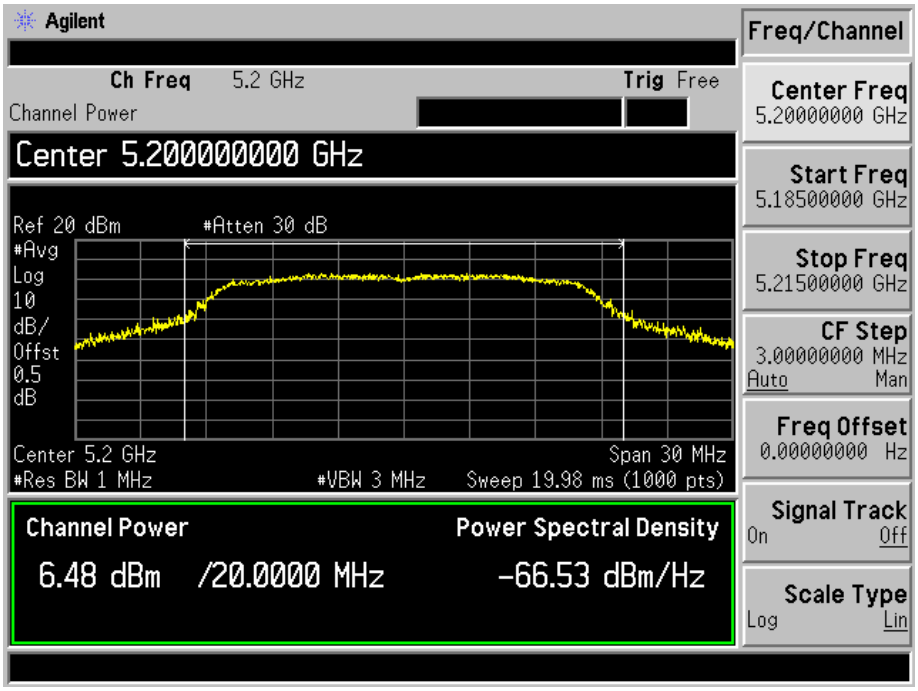
Antenna B:

Test Mode: 802.11a

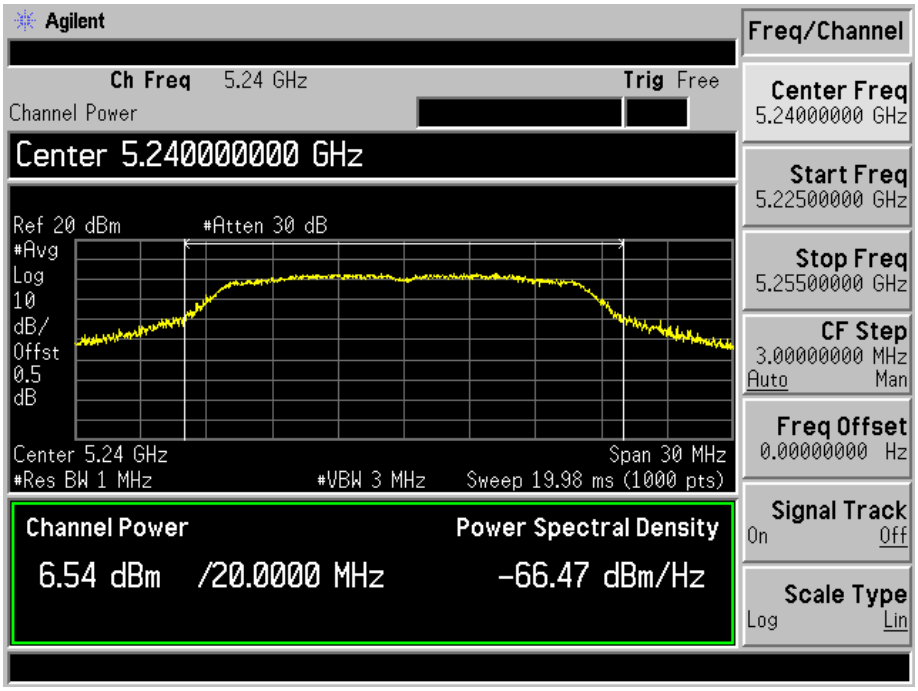
5180MHz



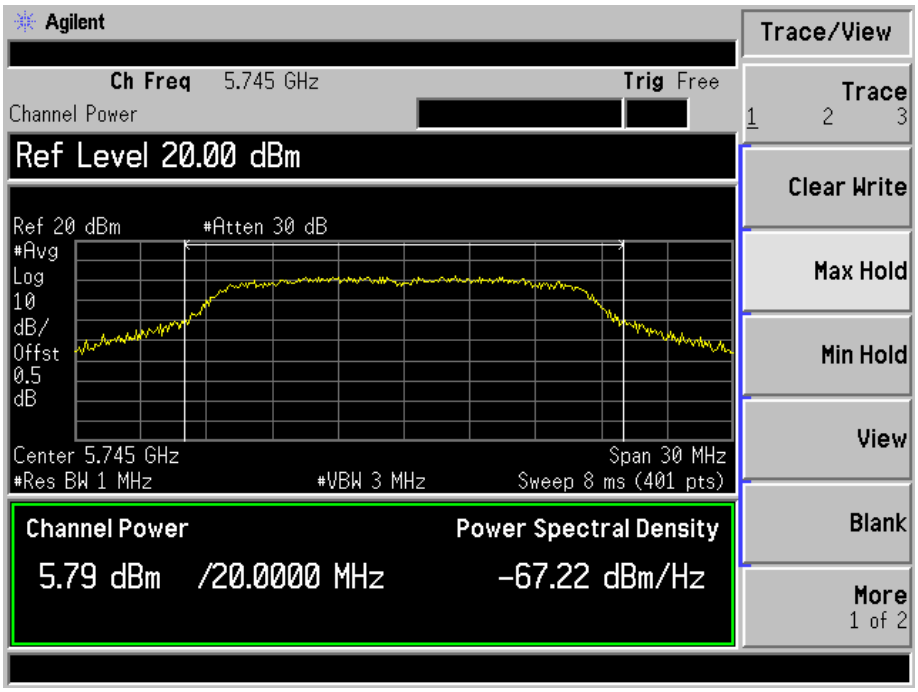
5200MHz



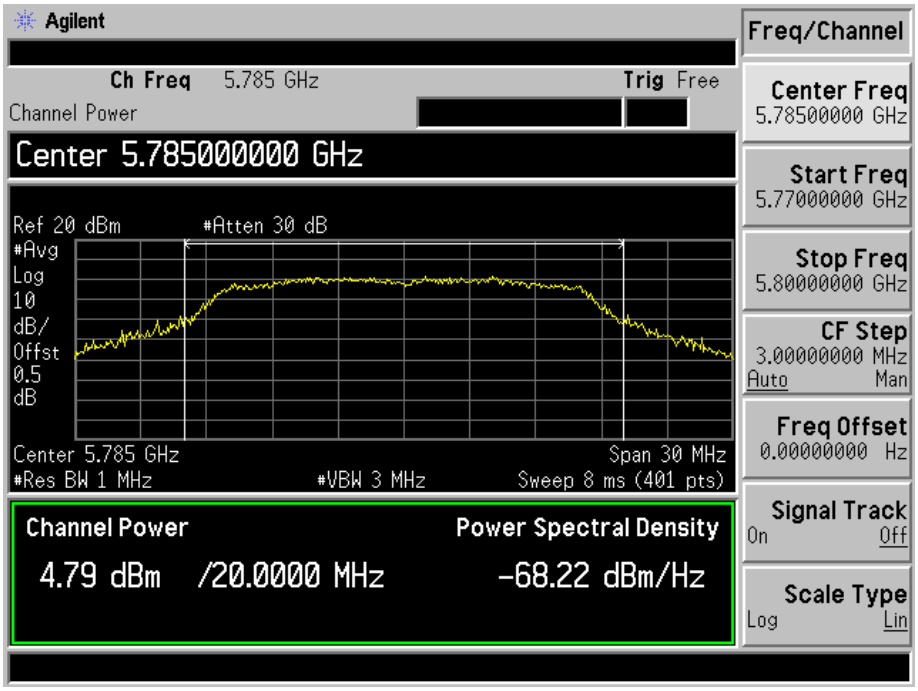
5240MHz



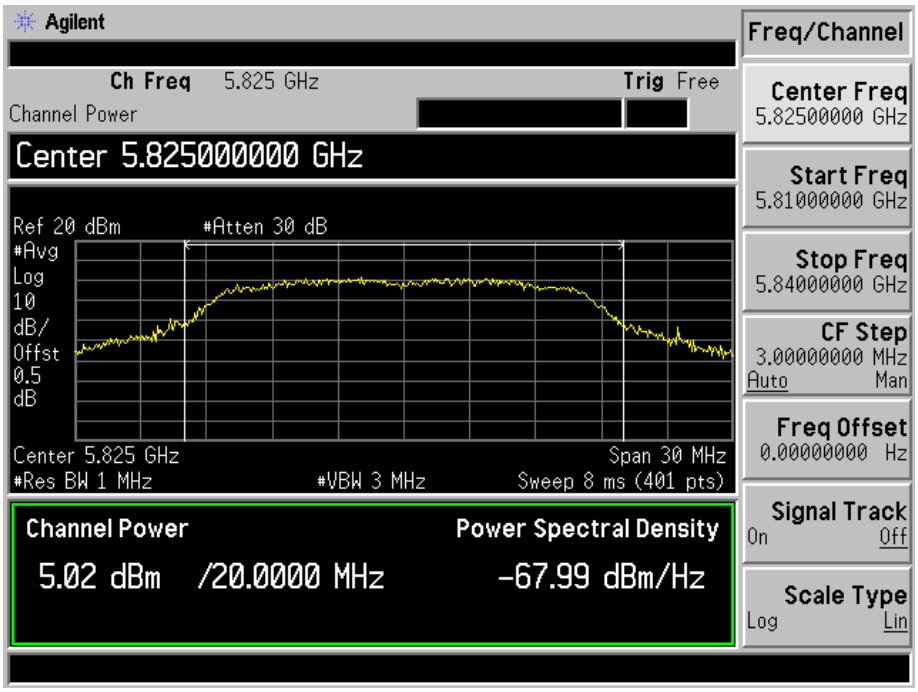
5745MHz



5785MHz

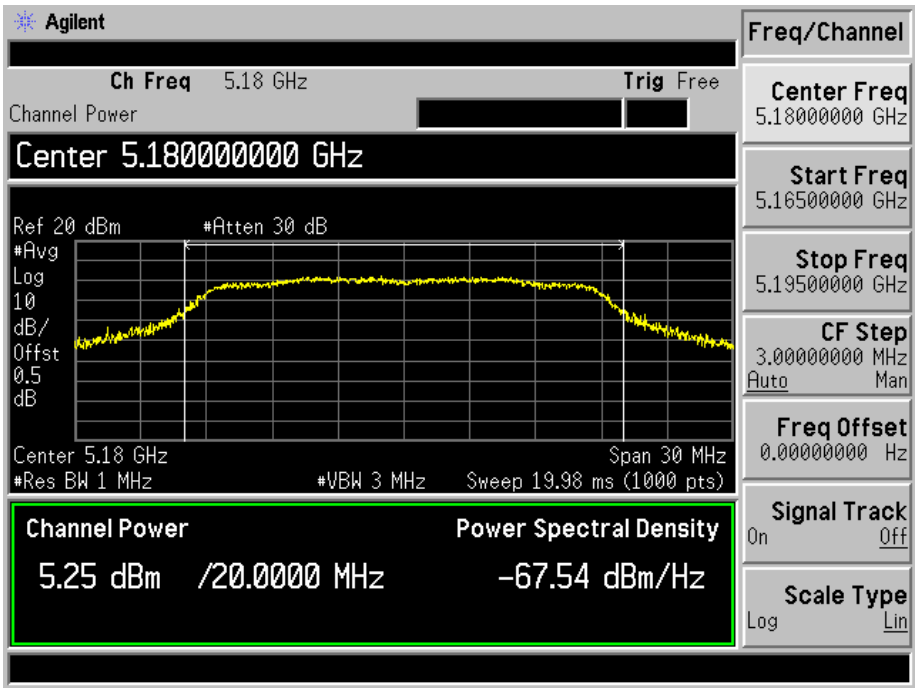


5825MHz

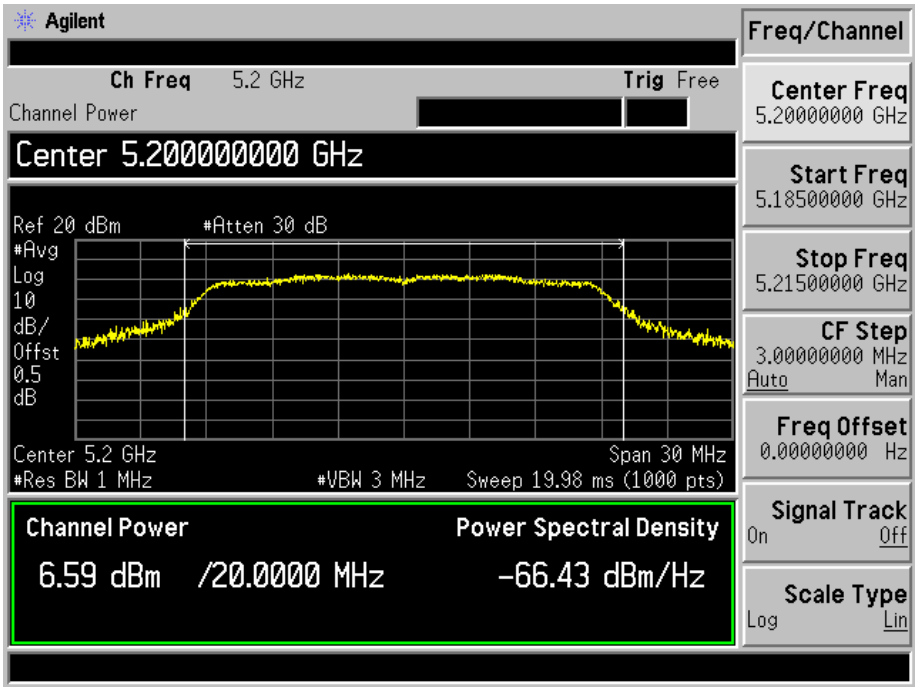


Test Mode: 802.11n-HT20

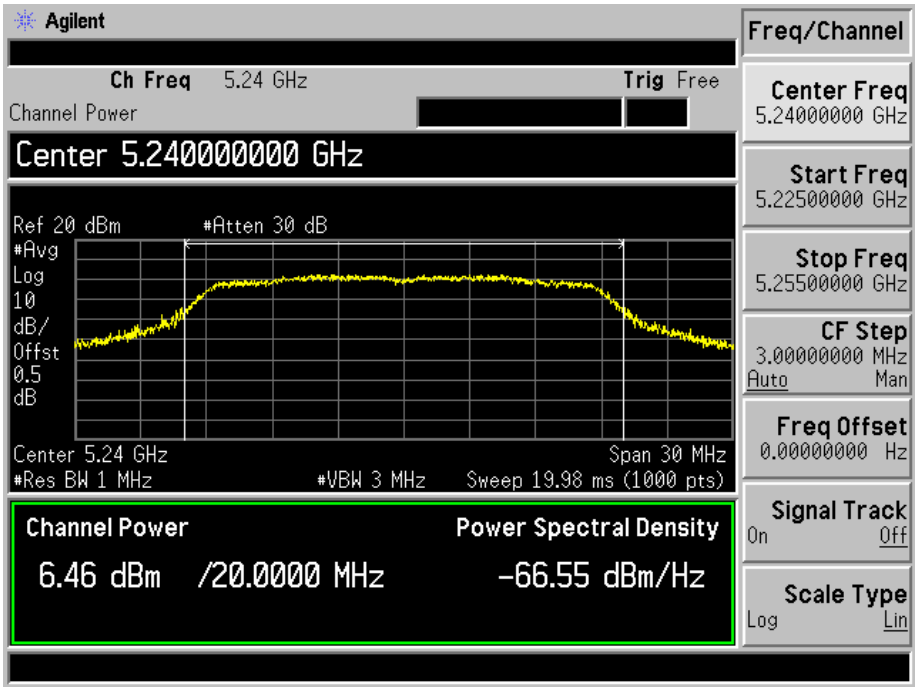
5180MHz



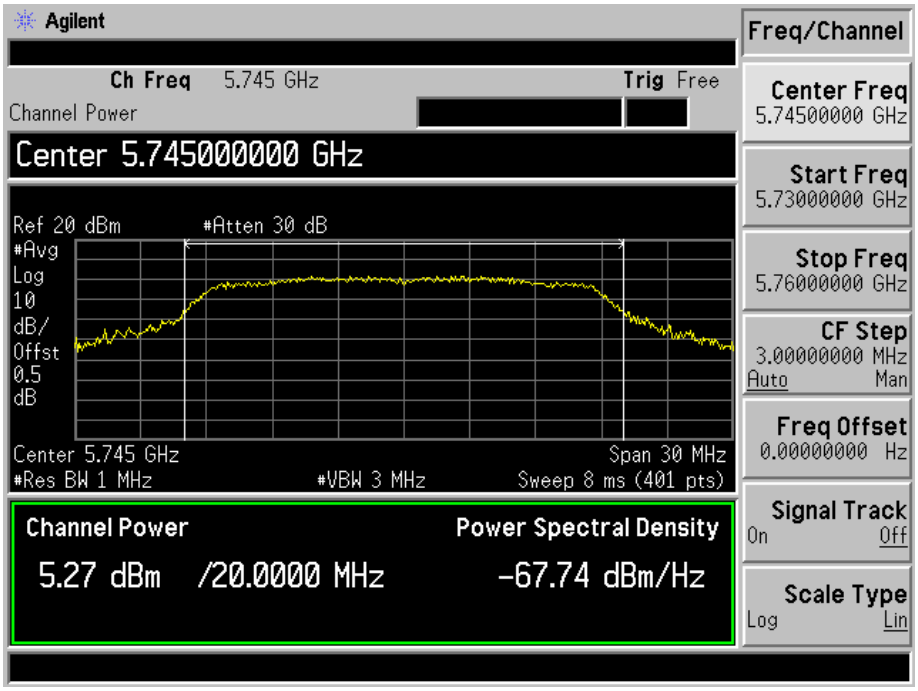
5200MHz



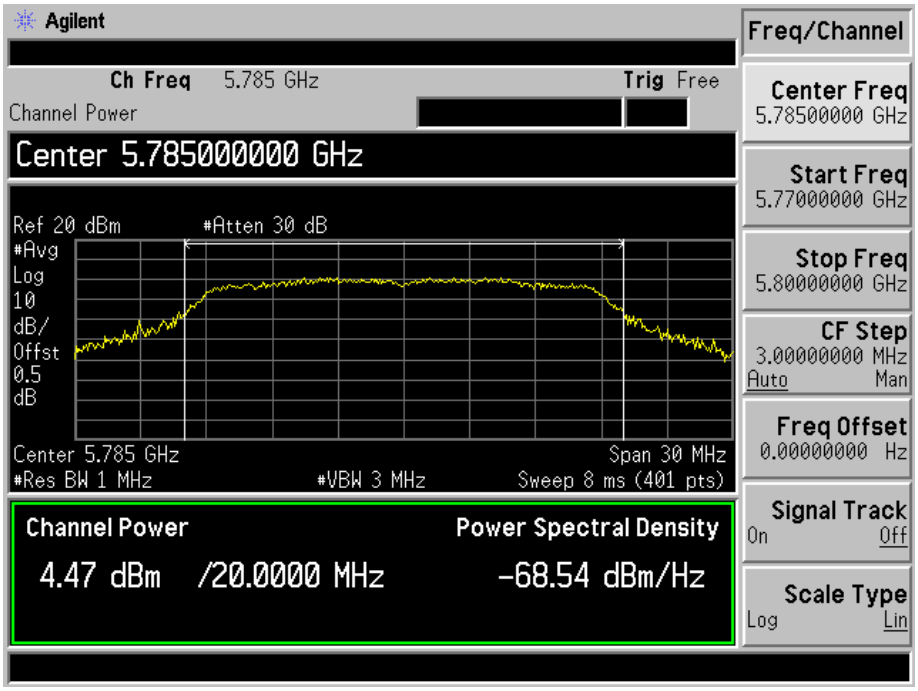
5240MHz



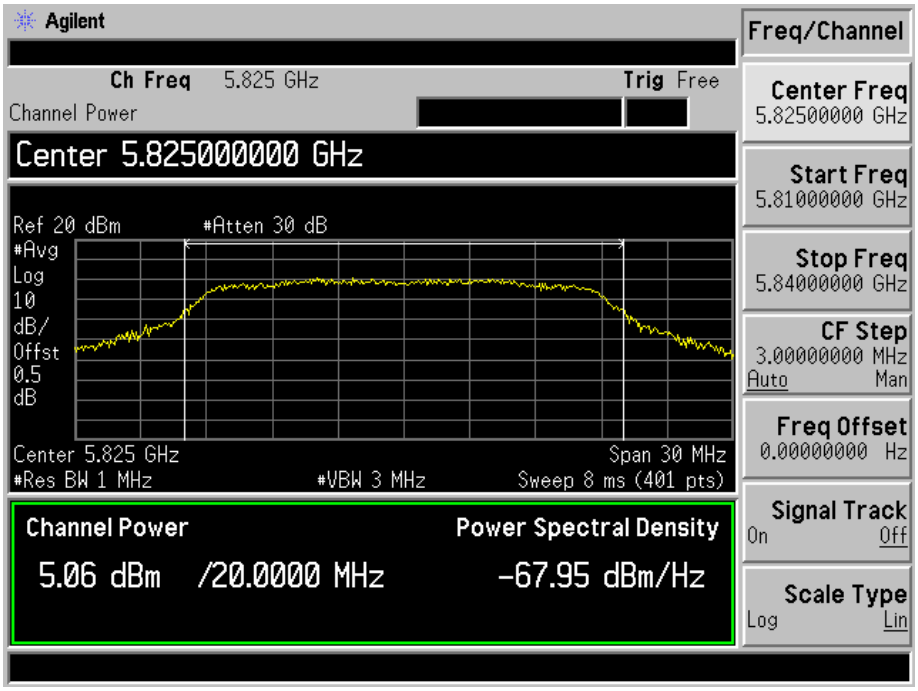
5745MHz



5785MHz

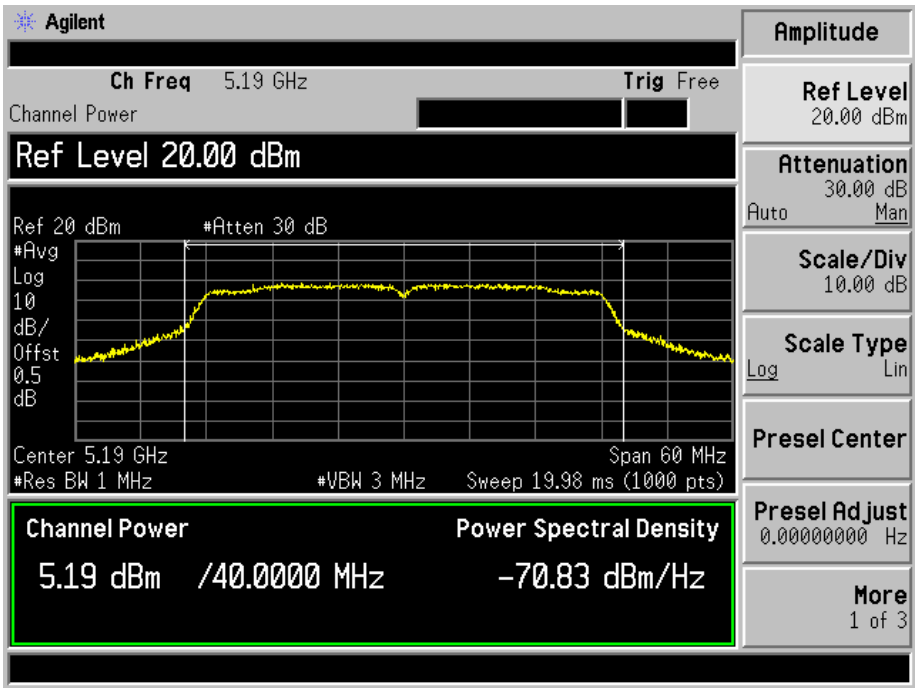


5825MHz

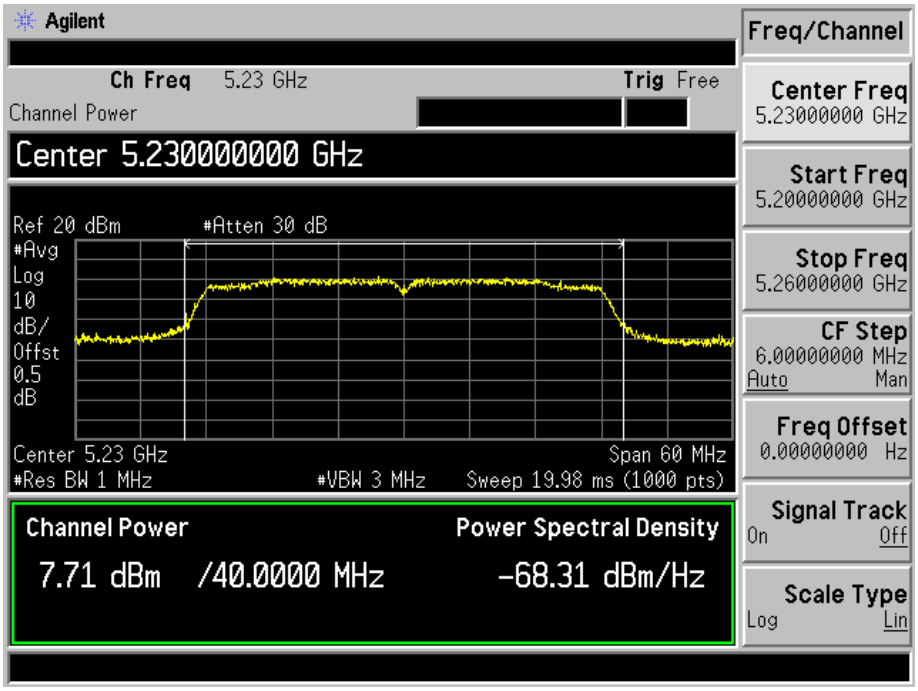


Test Mode: 802.11n-HT40

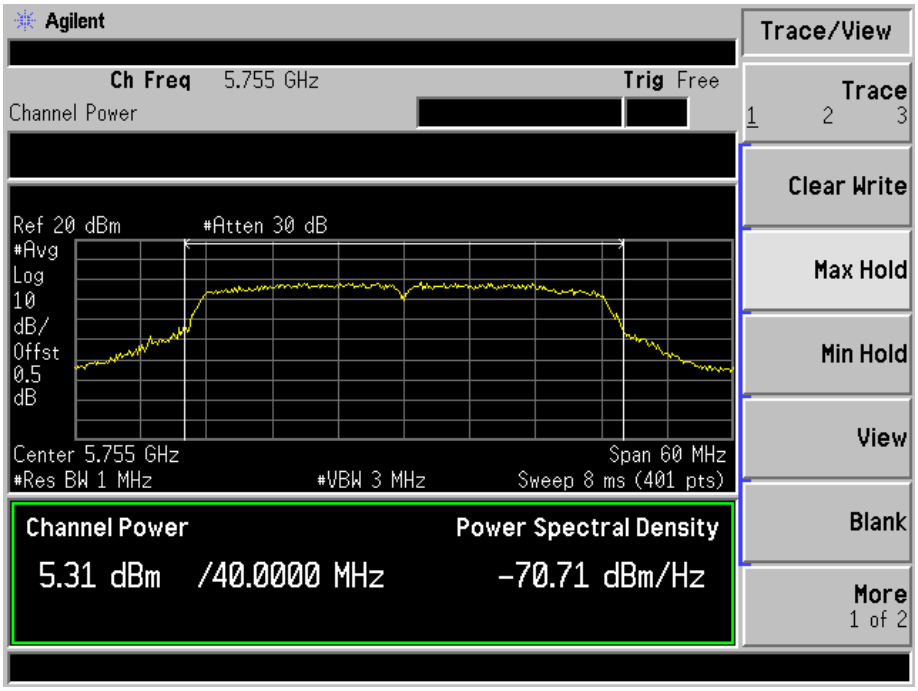
5190MHz



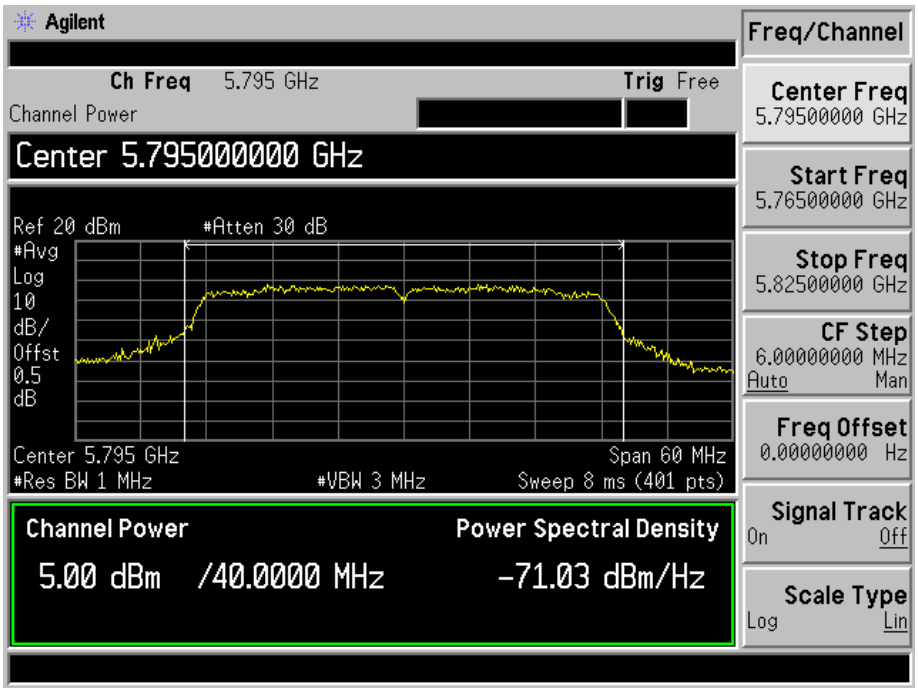
5230MHz



5755MHz

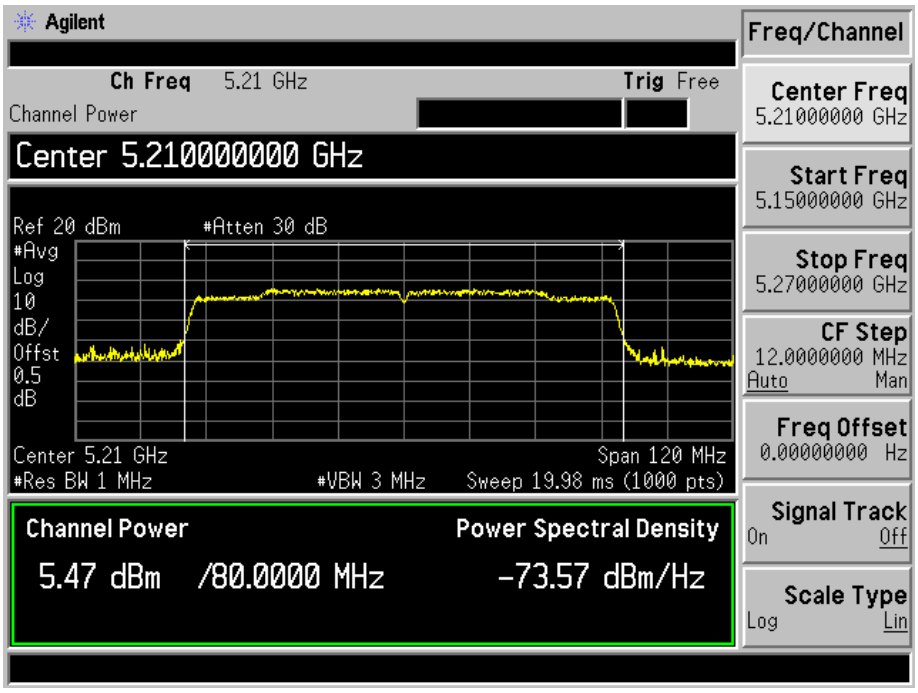


5795MHz

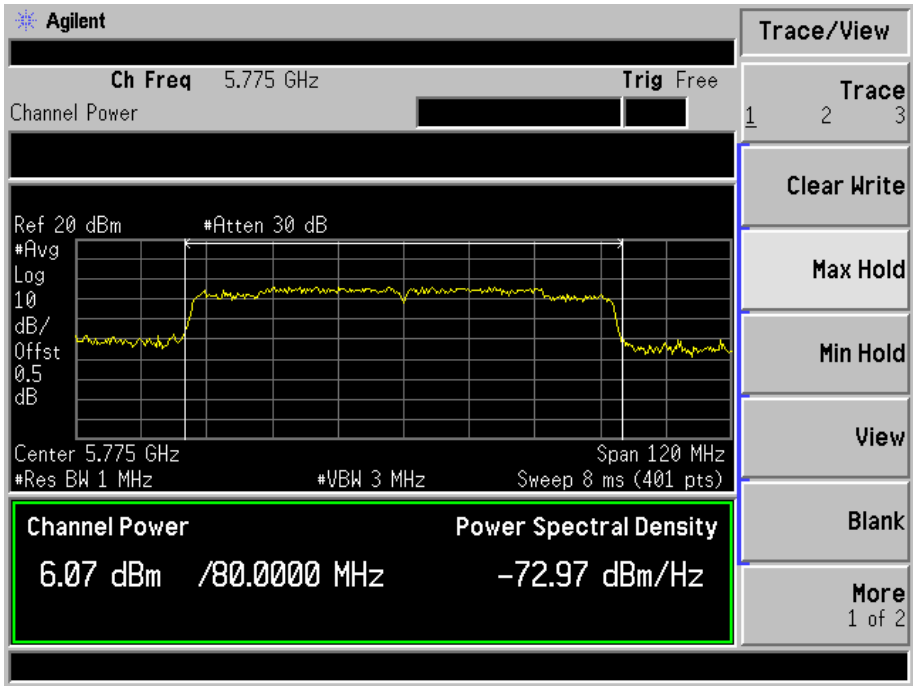


Test Mode: 802.11ac

5210MHz



5775MHz



9. Conducted Spurious Emissions

9.1 Standard Applicable

According to §15.407 (b) (b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) 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 within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

9.2 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer via a RF combiner.
2. Set the spectrum analyzer as RBW = 100kHz/1MHz, VBW=300kHz/3MHz, Sweep = auto
3. Set the Lowest, Middle and Highest Transmitting Channel, observed the outside band of 30MHz to 40GHz, then mark the higher-level emission for comparing with the FCC rules.

9.3 Environmental Conditions

Temperature:	21° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

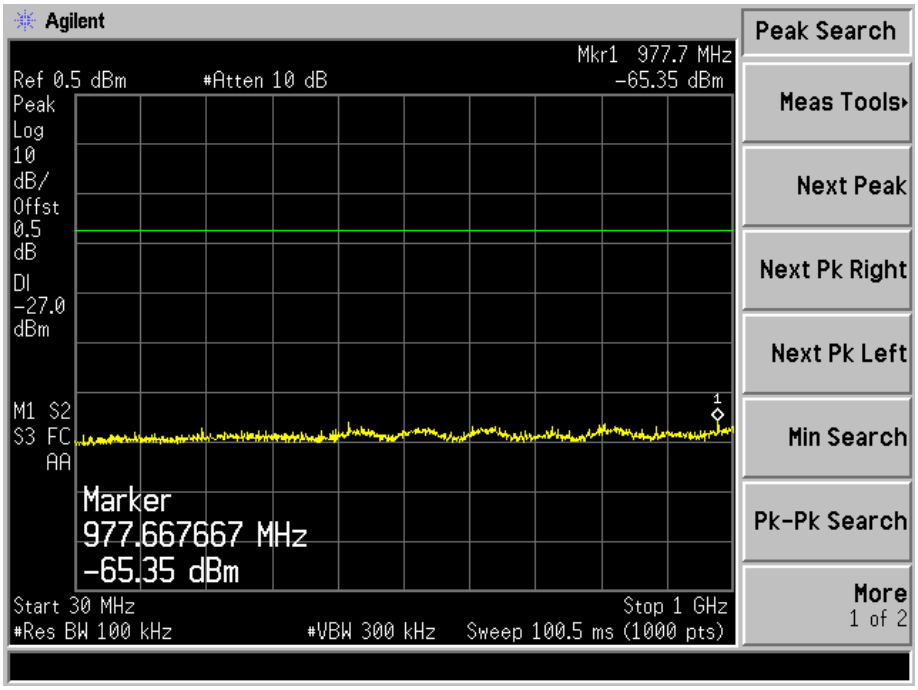
10.4 Summary of Test Results/Plots

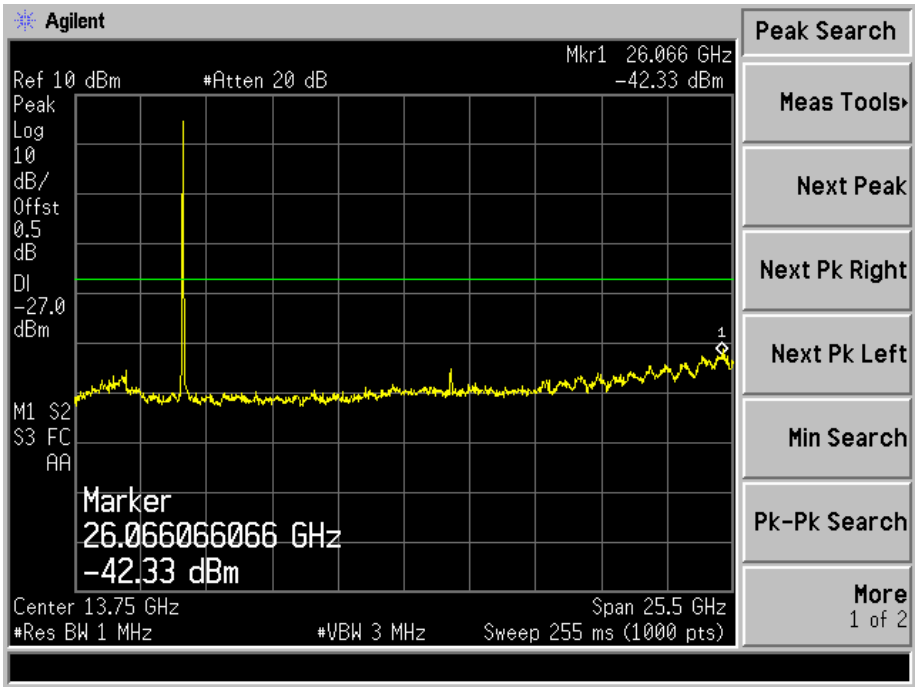
Emissions below 30MHz and above 26.5GHz are attenuated more than 20dB below the permissible limits and test data are not reported.

Antenna A:

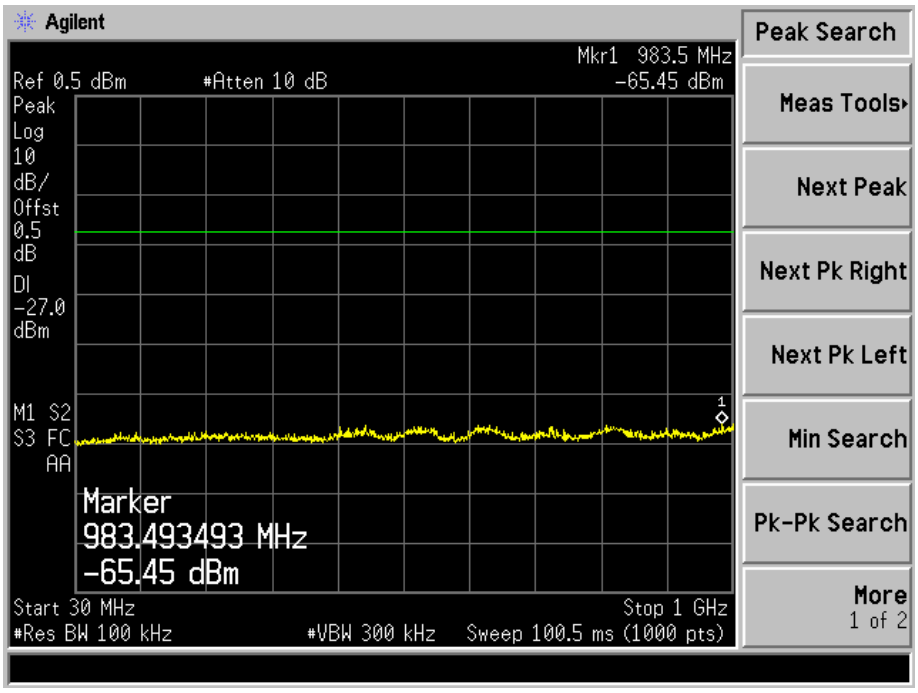
802.11a

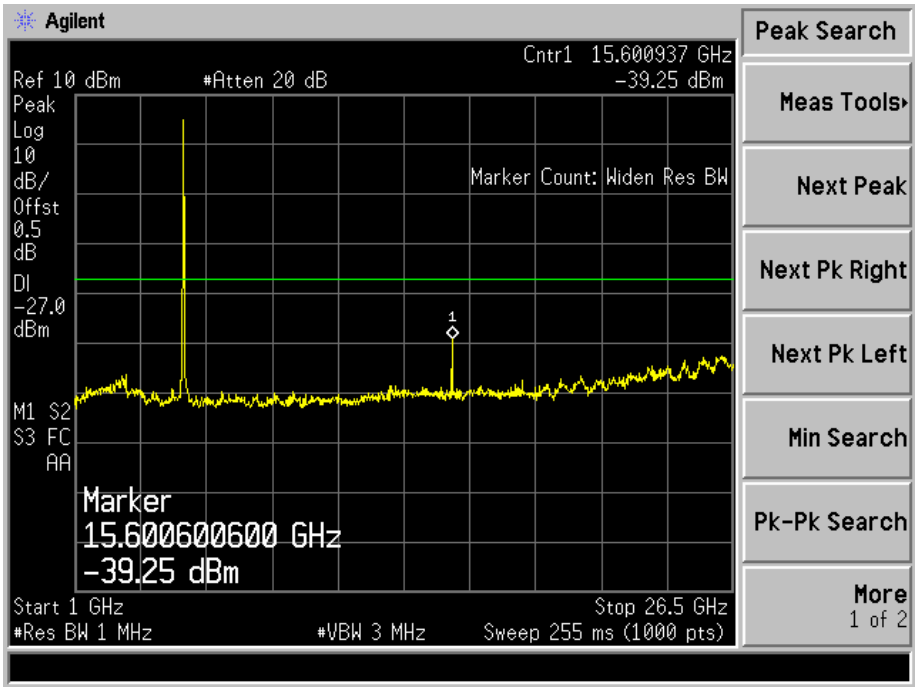
5180MHz



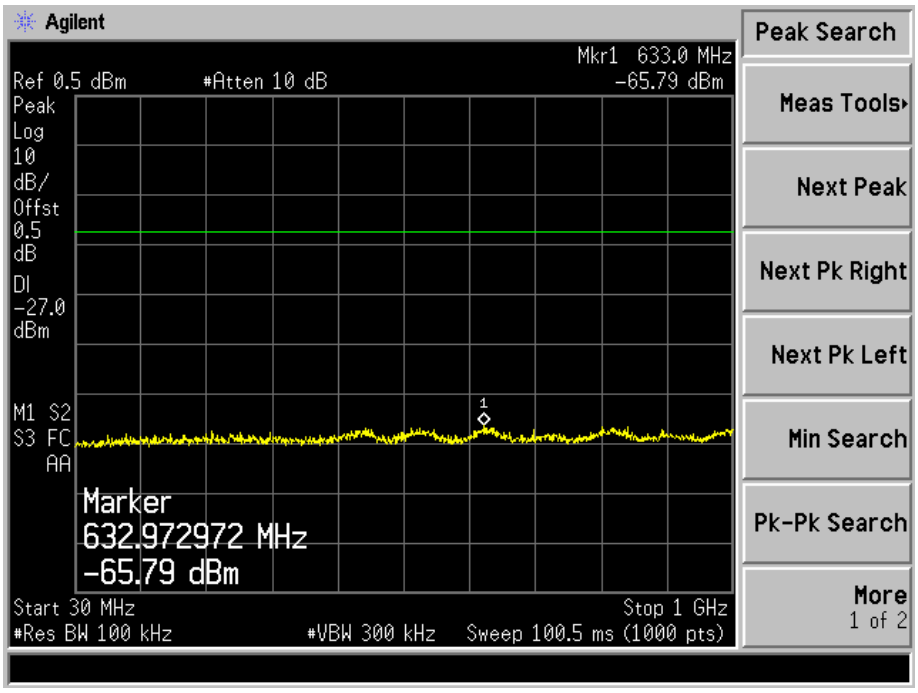


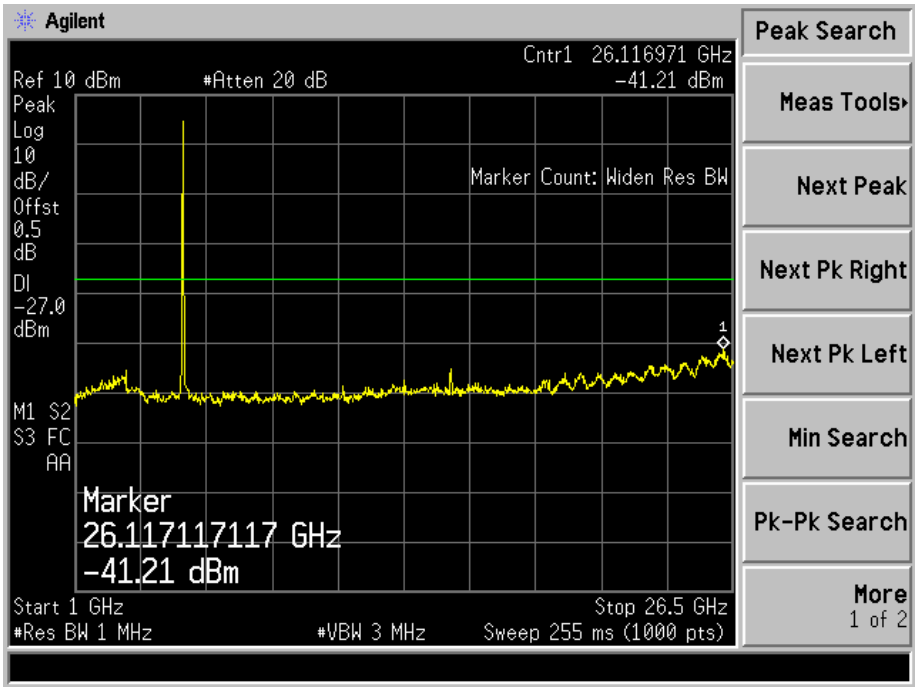
5200MHz


Agilent
Mkr1 983.5 MHz
Ref 0.5 dBm
#Atten 10 dB
-65.45 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
983.493493 MHz
-65.45 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

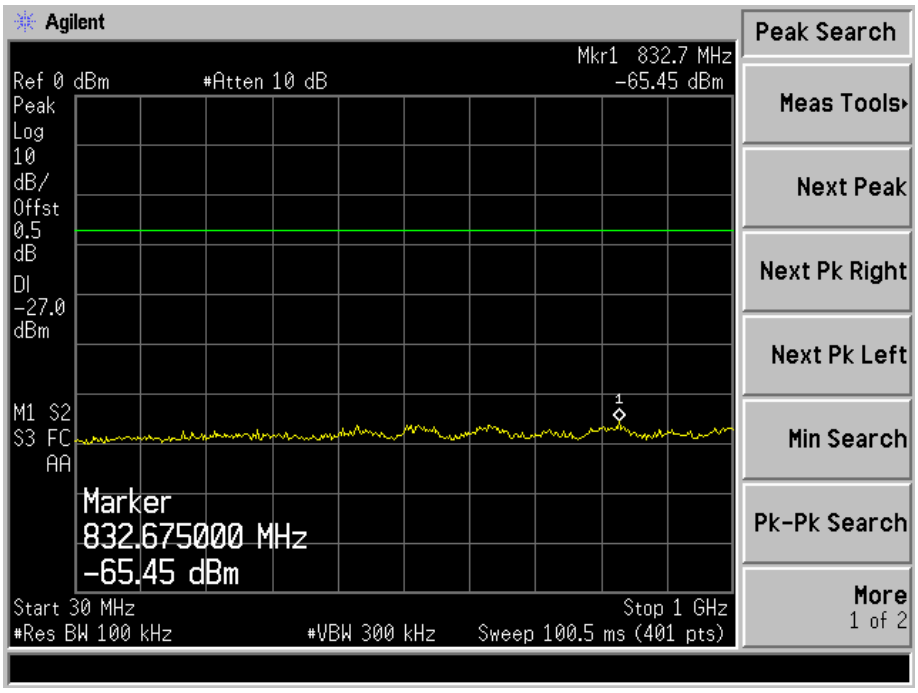

Agilent
Cntr1 15.600937 GHz
Ref 10 dBm
#Atten 20 dB
-39.25 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
Marker Count: Widen Res BW
M1 S2
S3 FC
AA
Marker
15.600600600 GHz
-39.25 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

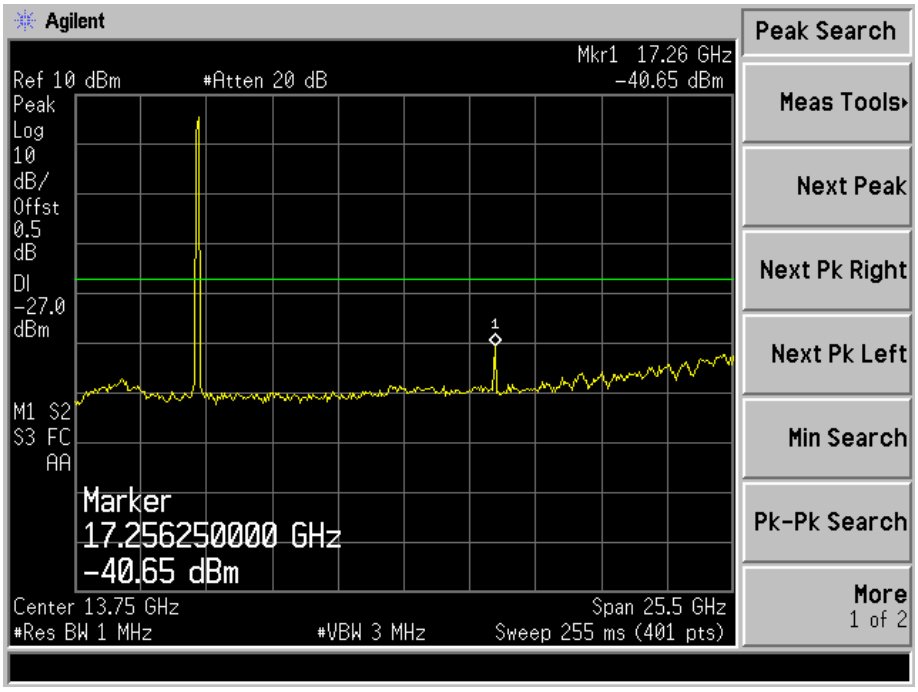
5240MHz


Agilent
Mkr1 633.0 MHz
Ref 0.5 dBm
#Atten 10 dB
-65.79 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
632.972972 MHz
-65.79 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

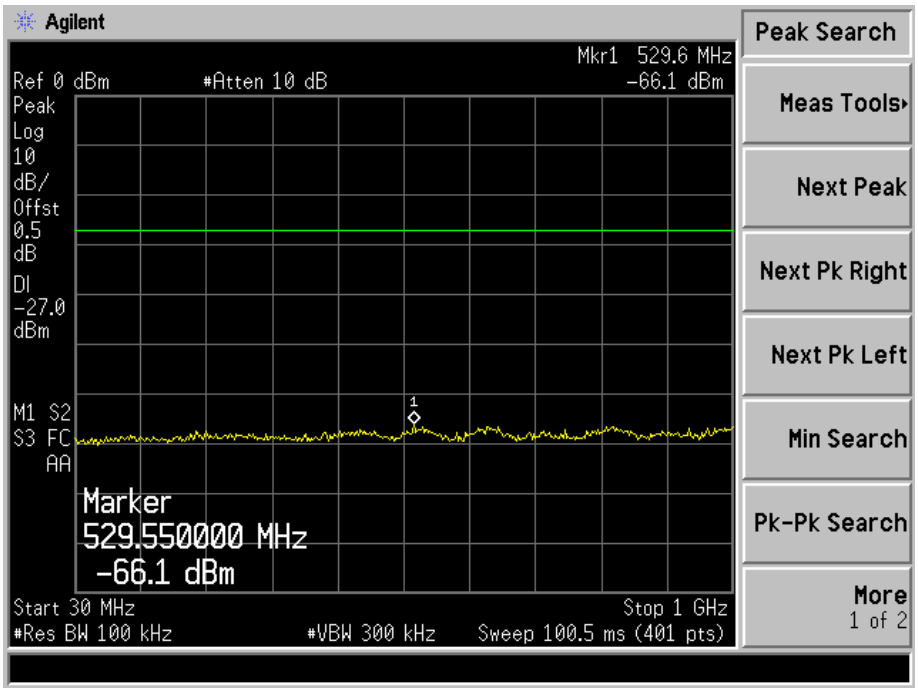

Agilent
Cntr1 26.116971 GHz
Ref 10 dBm
#Atten 20 dB
-41.21 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
Marker Count: Widen Res BW
M1 S2
S3 FC
AA
Marker
26.117117117 GHz
-41.21 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

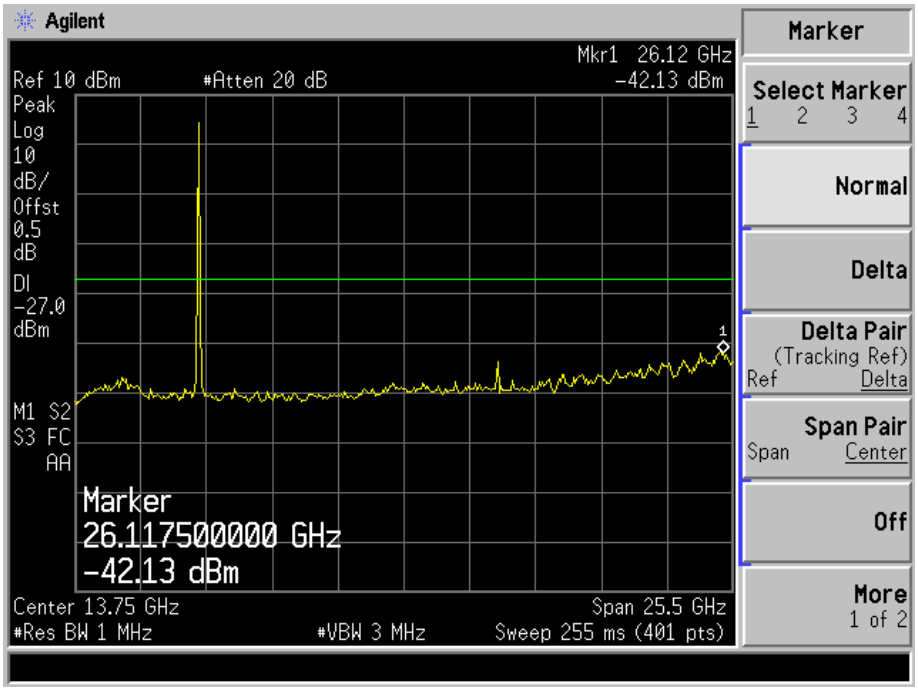
5745MHz


Agilent
Mkr1 832.7 MHz
Ref 0 dBm
#Atten 10 dB
-65.45 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
832.675000 MHz
-65.45 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

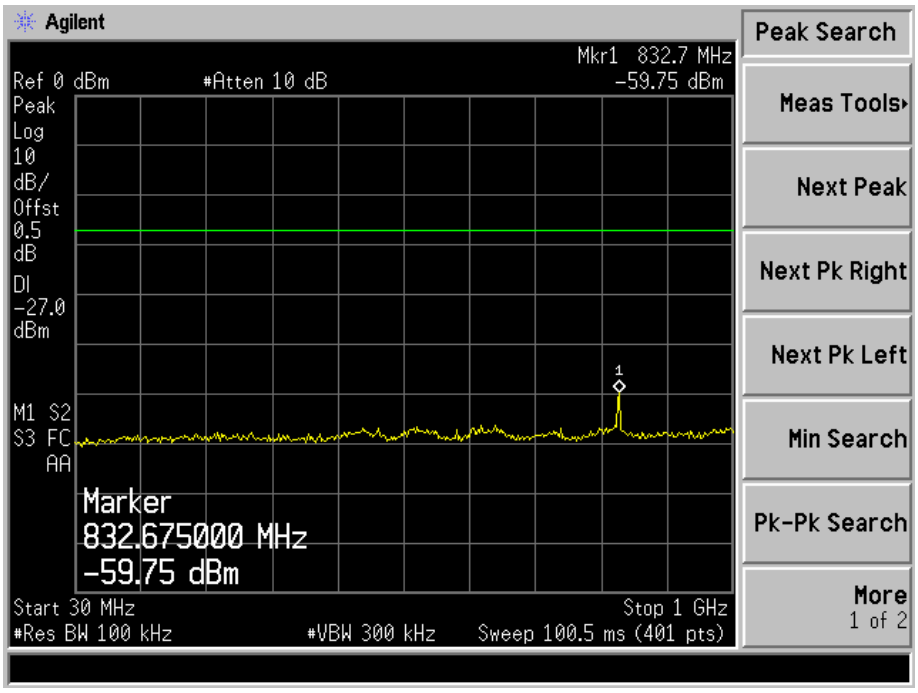

Agilent
Mkr1 17.26 GHz
Ref 10 dBm
#Atten 20 dB
-40.65 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
17.256250000 GHz
-40.65 dBm
Center 13.75 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 25.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

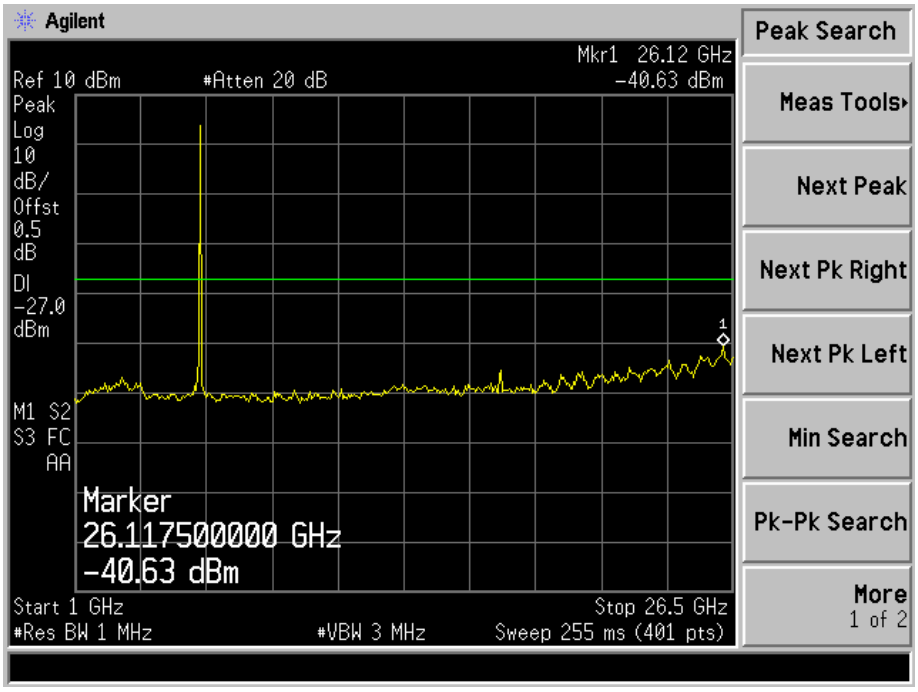
5785MHz


Agilent
Mkr1 529.6 MHz
Ref 0 dBm
#Atten 10 dB
-66.1 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
529.550000 MHz
-66.1 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

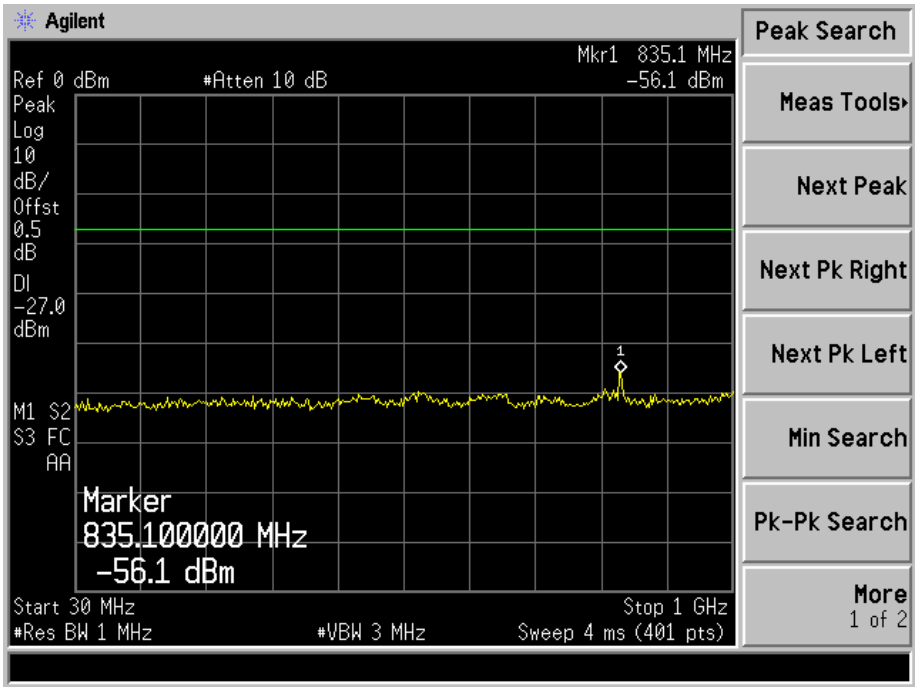

Agilent
Mkr1 26.12 GHz
Ref 10 dBm
#Atten 20 dB
-42.13 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.117500000 GHz
-42.13 dBm
Center 13.75 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 25.5 GHz
Sweep 255 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

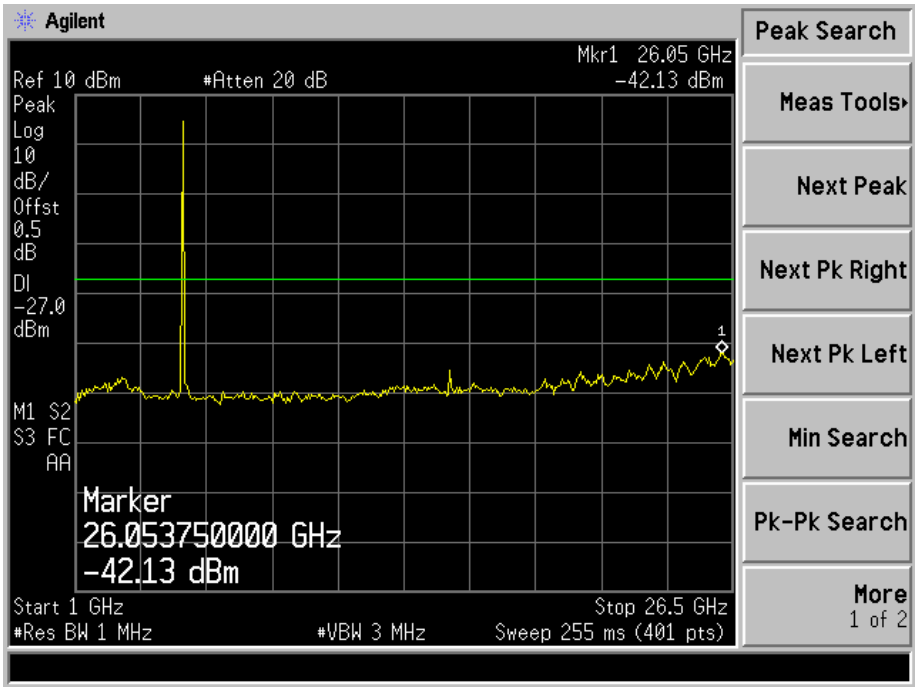
5825MHz


Agilent
Mkr1 832.7 MHz
Ref 0 dBm
#Atten 10 dB
-59.75 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
832.675000 MHz
-59.75 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

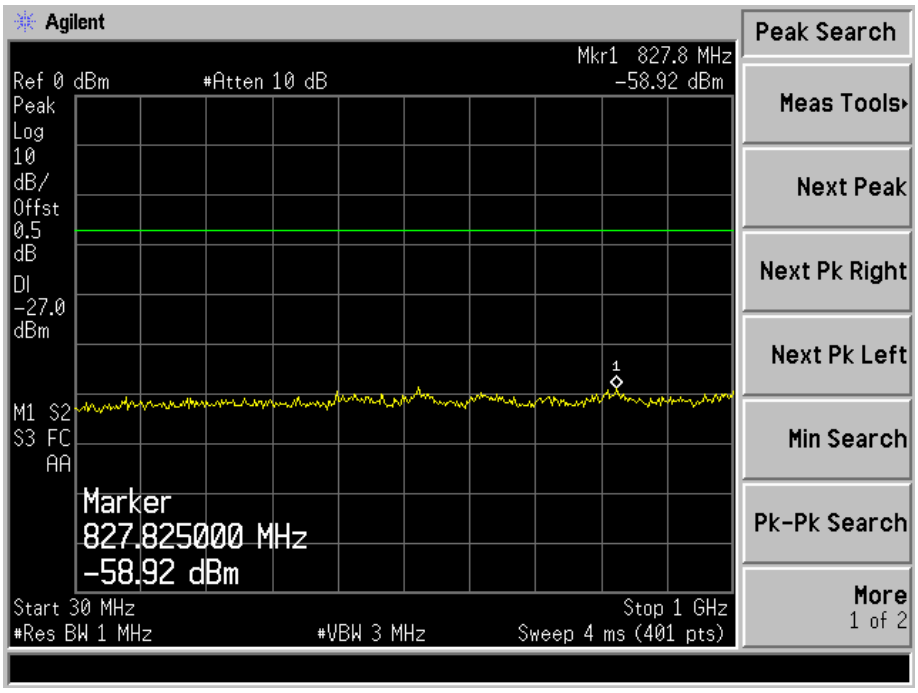

Agilent
Mkr1 26.12 GHz
Ref 10 dBm
#Atten 20 dB
-40.63 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.117500000 GHz
-40.63 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

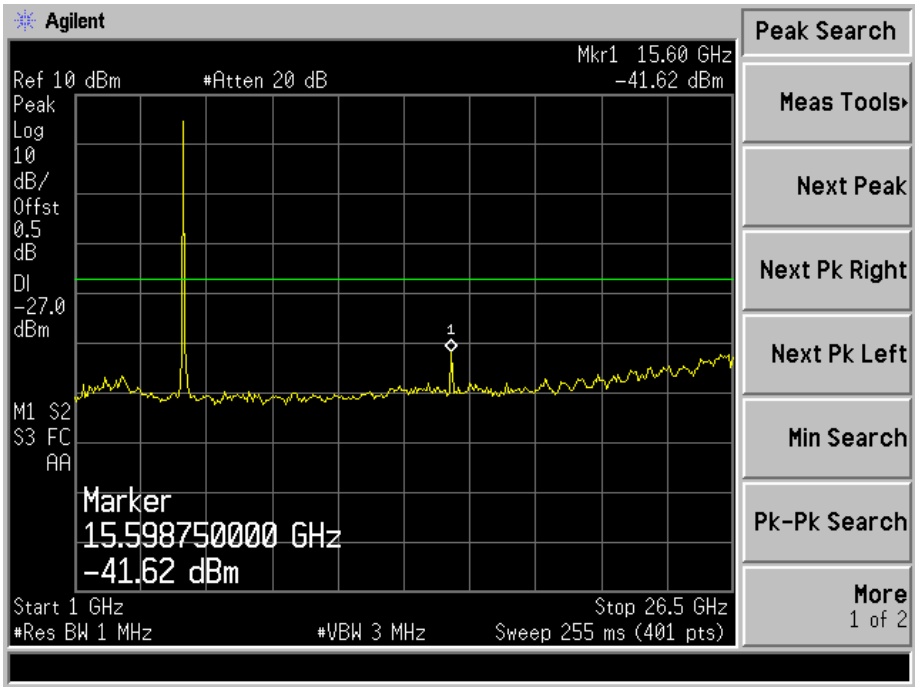
802.11n HT20
5180MHz



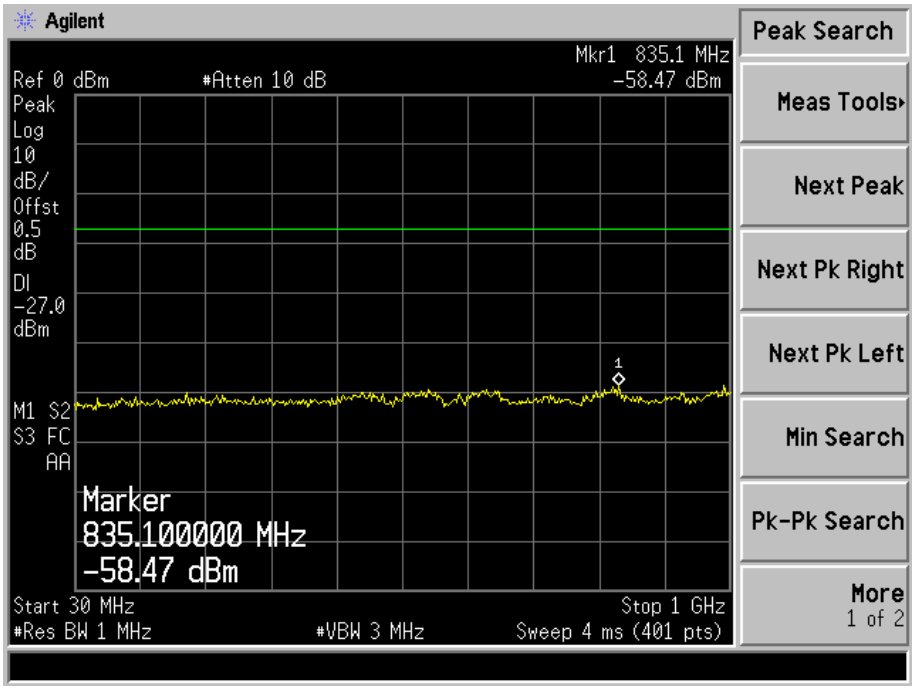


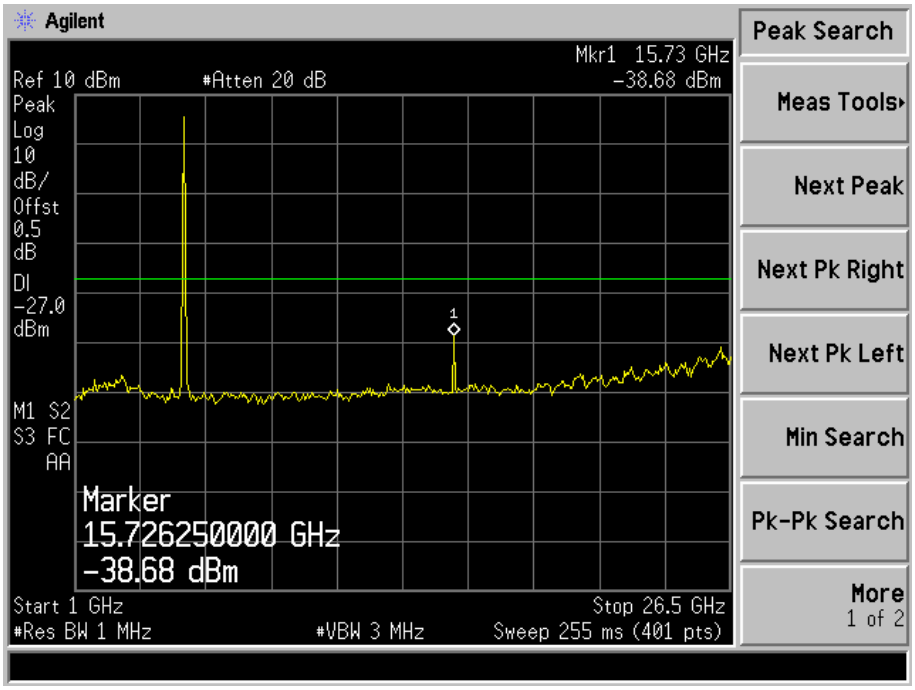
5200MHz


Agilent
Mkr1 827.8 MHz
Ref 0 dBm
#Atten 10 dB
-58.92 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
827.825000 MHz
-58.92 dBm
Start 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 1 GHz
Sweep 4 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

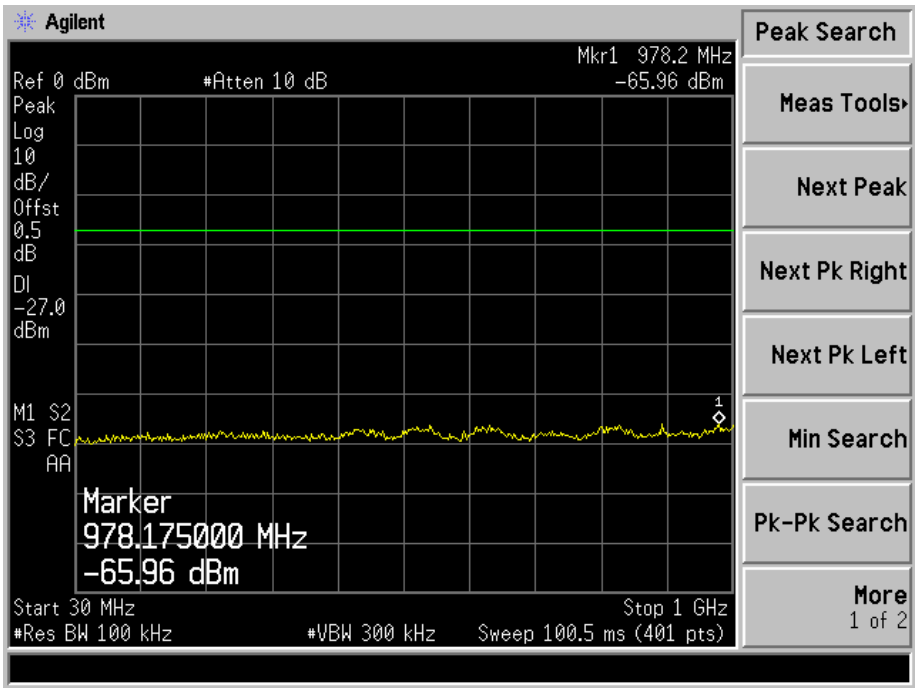

Agilent
Mkr1 15.60 GHz
Ref 10 dBm
#Atten 20 dB
-41.62 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
15.598750000 GHz
-41.62 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

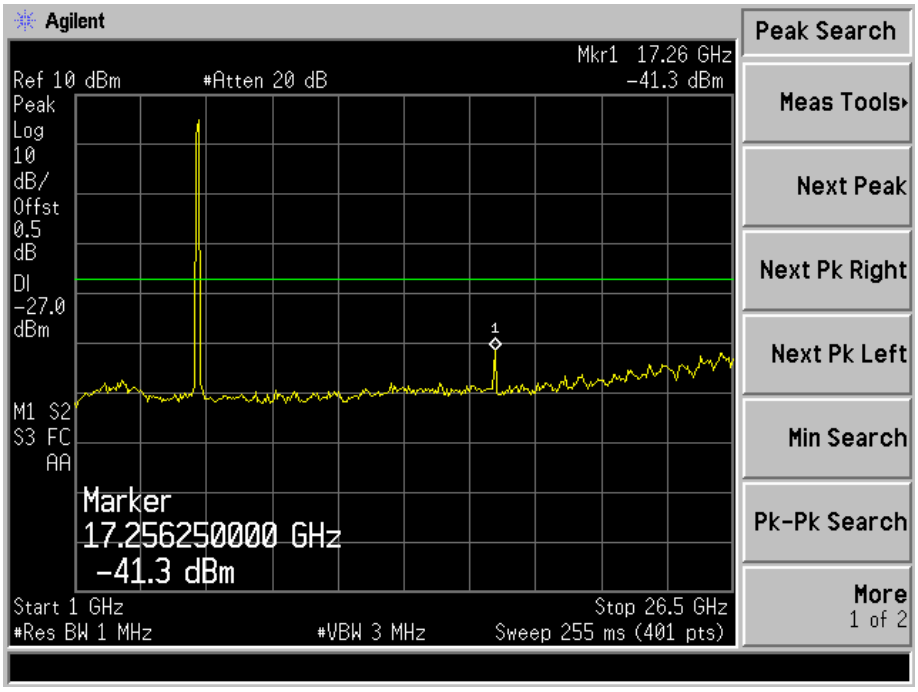
5240MHz


Agilent
Mkr1 835.1 MHz
-58.47 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
835.100000 MHz
-58.47 dBm
Start 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 1 GHz
Sweep 4 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

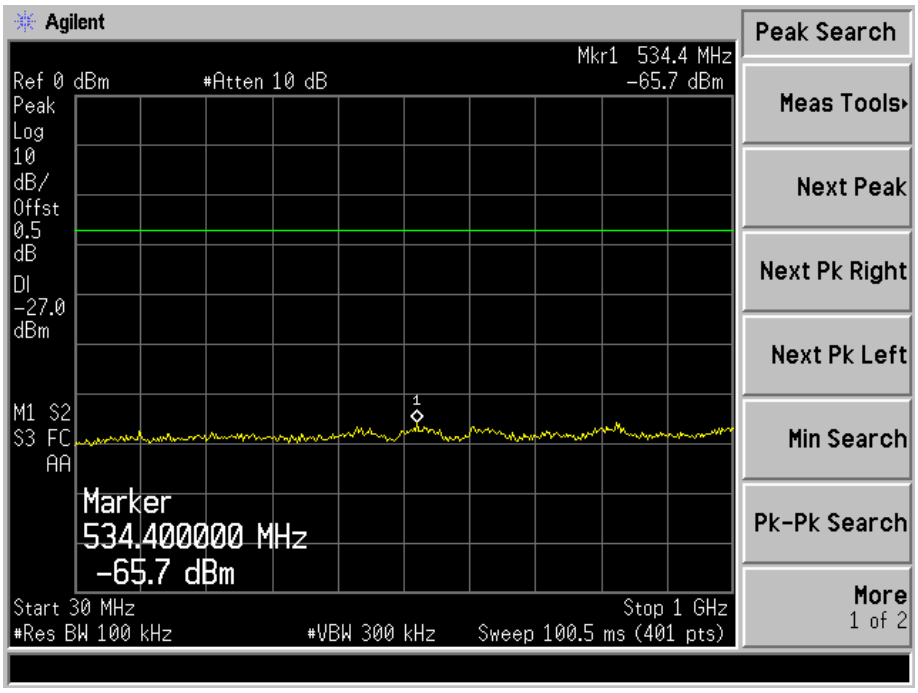

Agilent
Mkr1 15.73 GHz
-38.68 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
15.726250000 GHz
-38.68 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

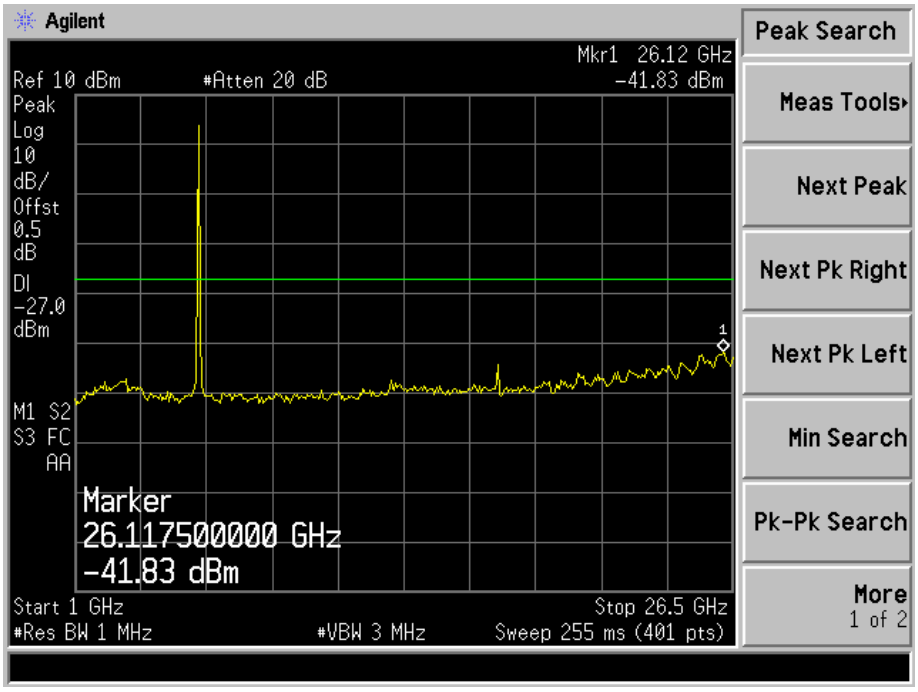
5745MHz


Agilent
Mkr1 978.2 MHz
Ref 0 dBm
#Atten 10 dB
-65.96 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
978.175000 MHz
-65.96 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

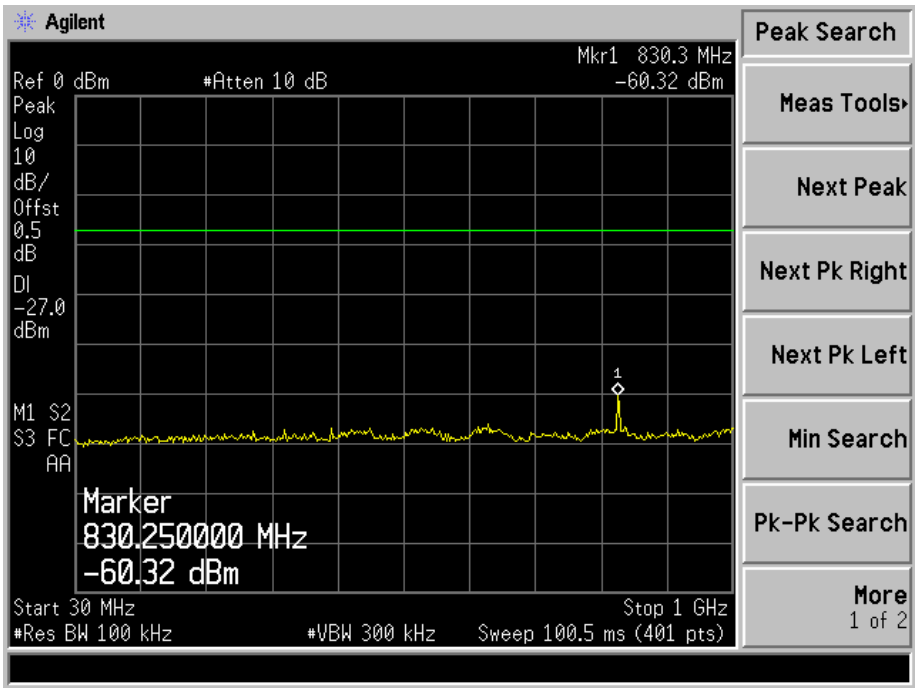

Agilent
Mkr1 17.26 GHz
Ref 10 dBm
#Atten 20 dB
-41.3 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
17.256250000 GHz
-41.3 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

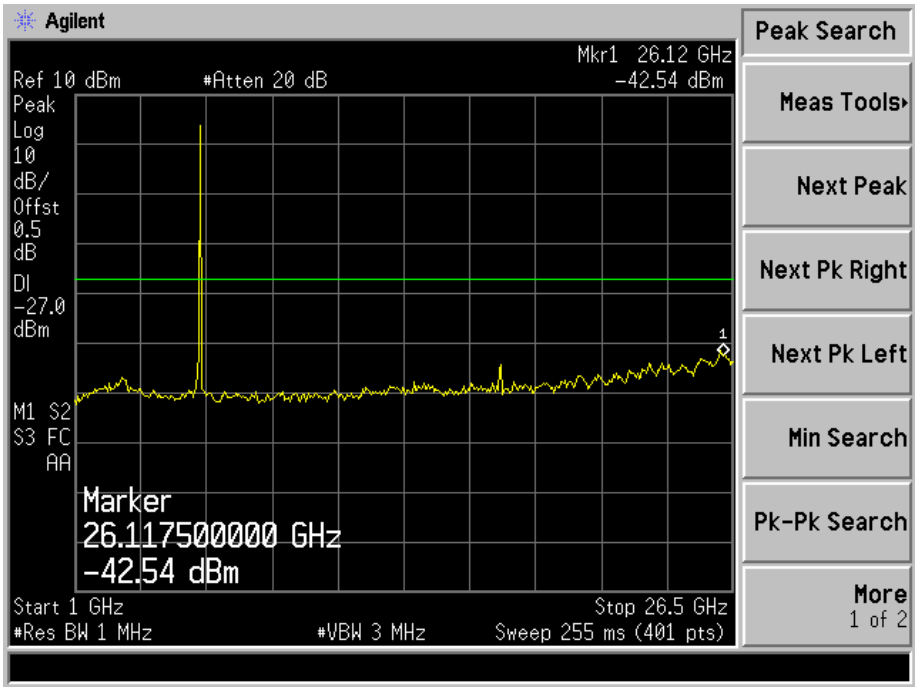
5785MHz


Agilent
Mkr1 534.4 MHz
-65.7 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
534.400000 MHz
-65.7 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

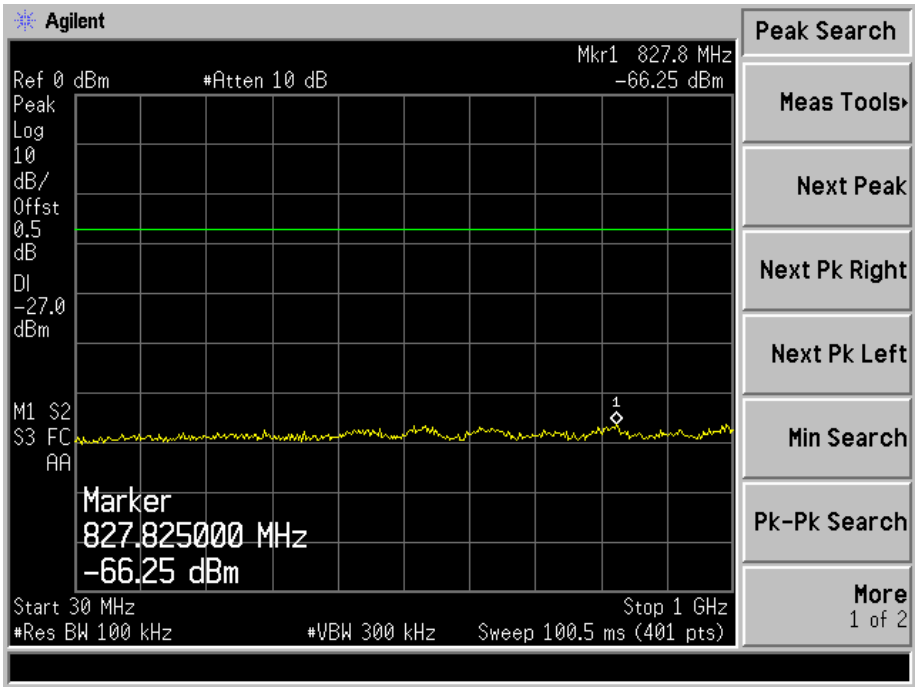

Agilent
Mkr1 26.12 GHz
-41.83 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.117500000 GHz
-41.83 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

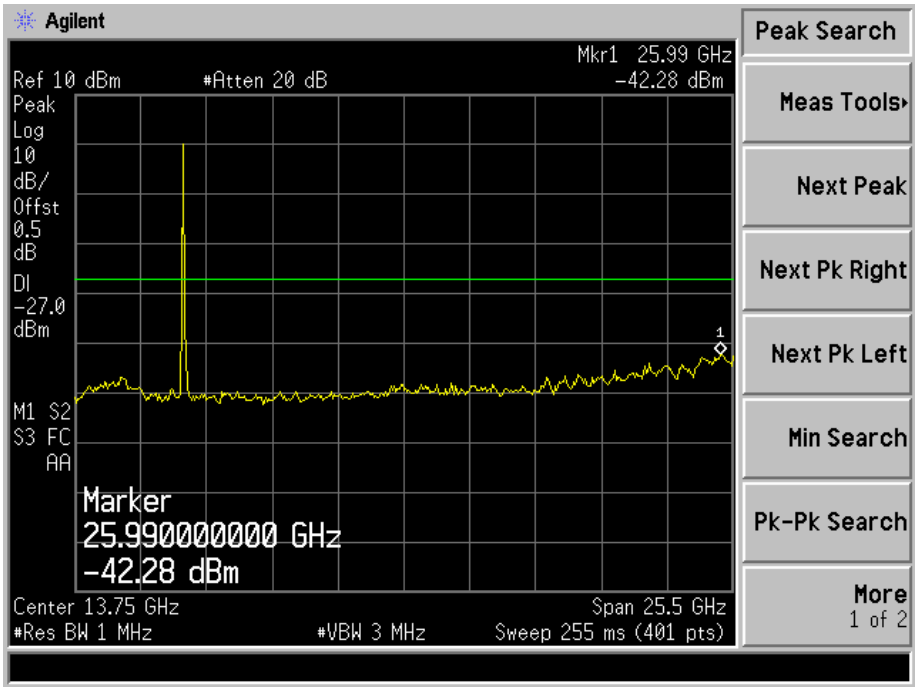
5825MHz


Agilent
Mkr1 830.3 MHz
Ref 0 dBm
#Atten 10 dB
-60.32 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
830.250000 MHz
-60.32 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

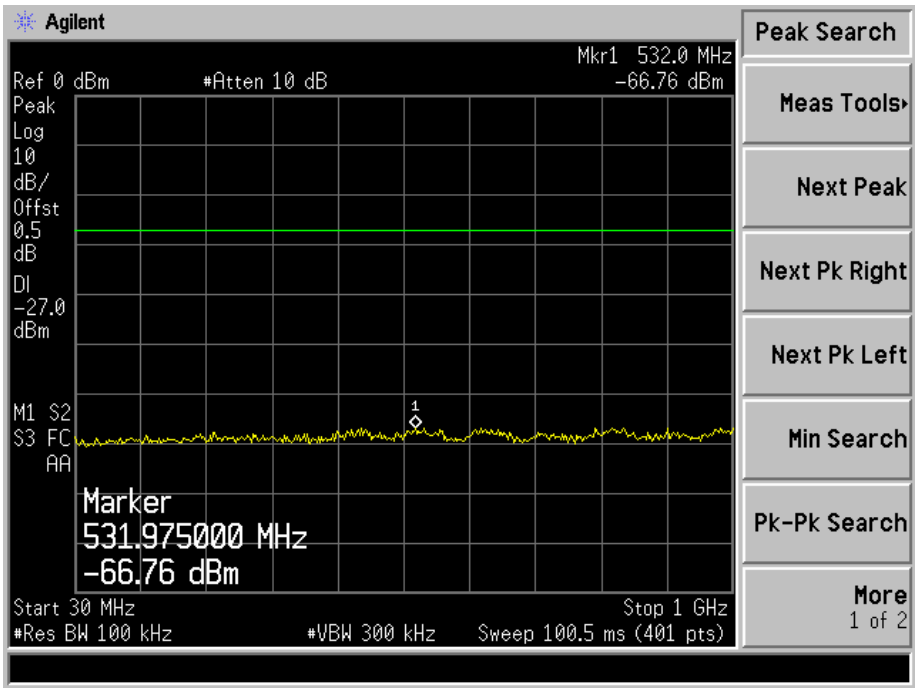

Agilent
Mkr1 26.12 GHz
Ref 10 dBm
#Atten 20 dB
-42.54 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.117500000 GHz
-42.54 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

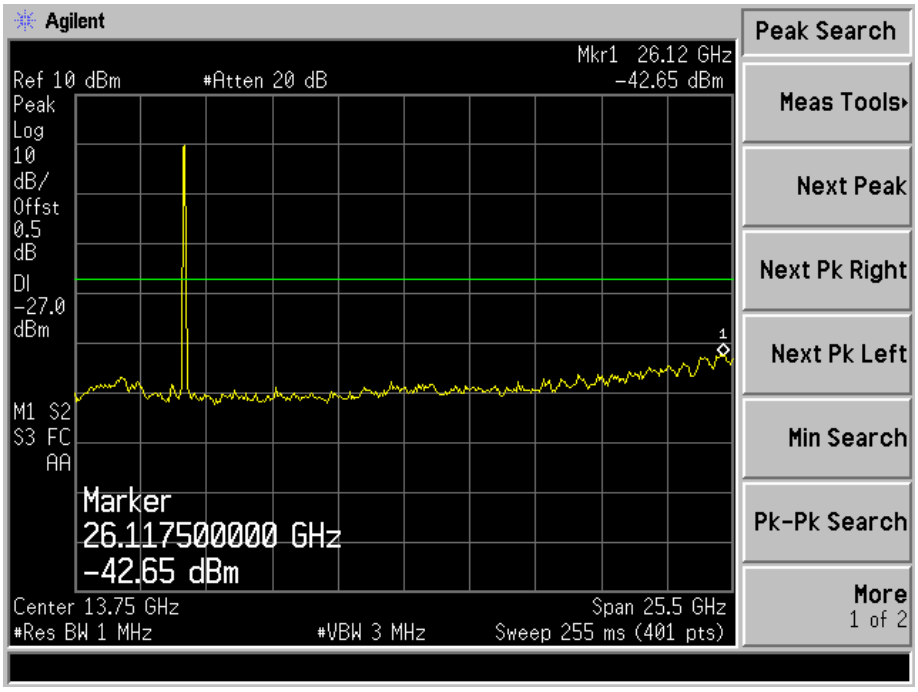
802.11n HT40
5190MHz



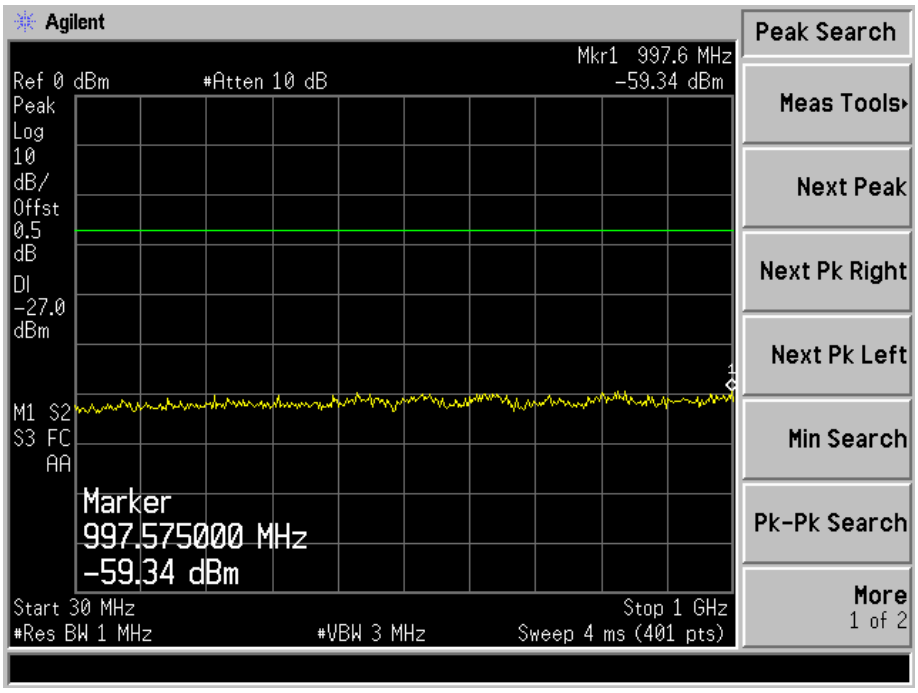


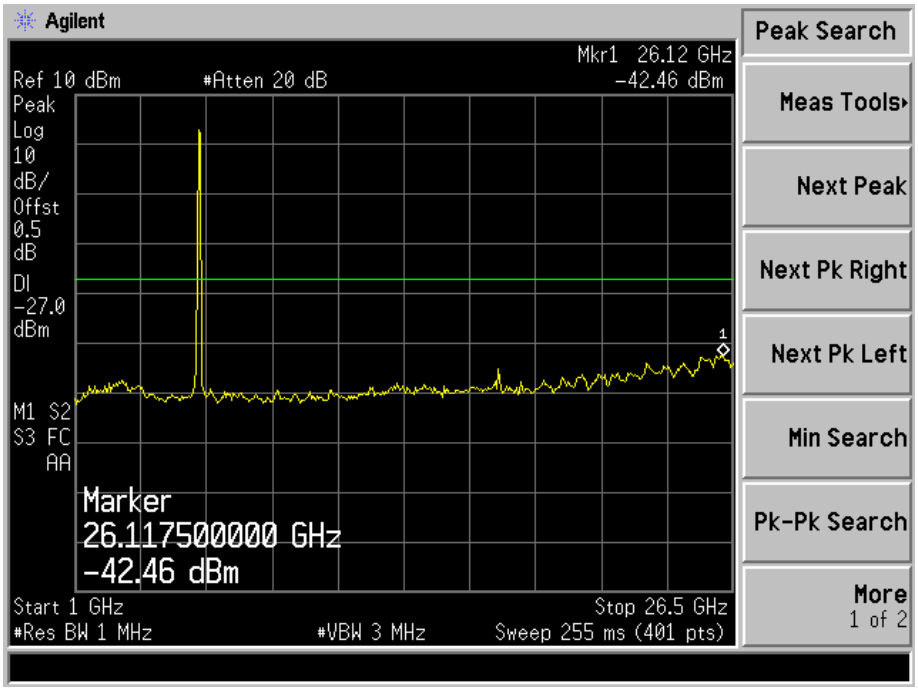
5230MHz


Agilent
Mkr1 532.0 MHz
Ref 0 dBm
#Atten 10 dB
-66.76 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
531.975000 MHz
-66.76 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

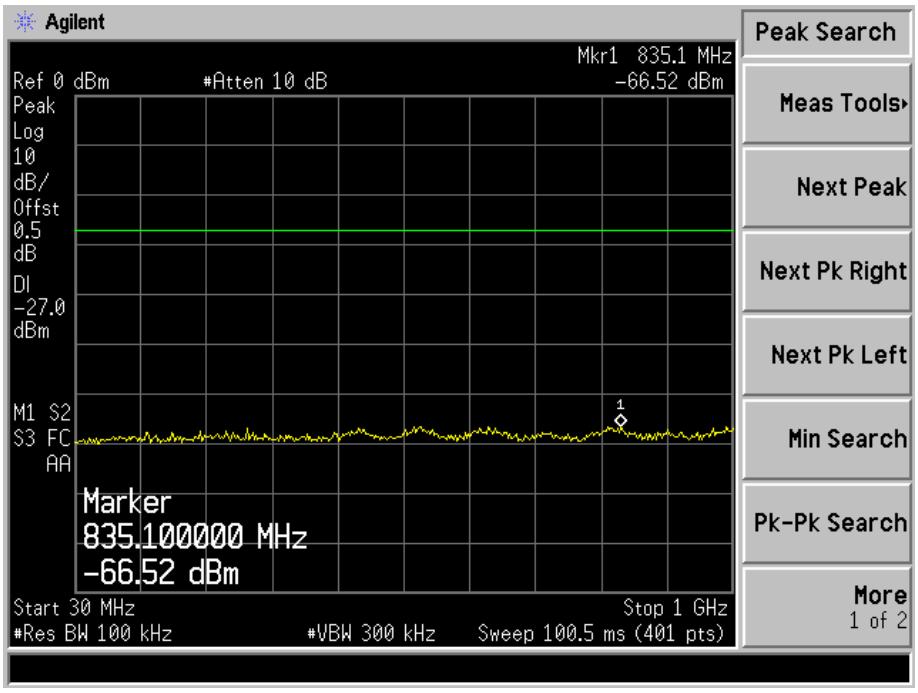

Agilent
Mkr1 26.12 GHz
Ref 10 dBm
#Atten 20 dB
-42.65 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.117500000 GHz
-42.65 dBm
Center 13.75 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 25.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

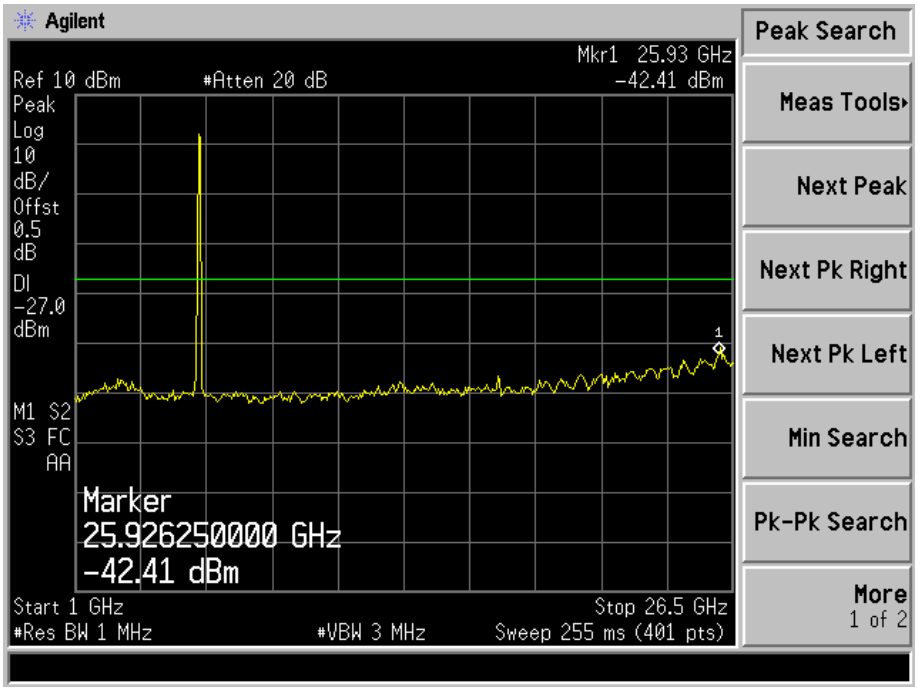
5755MHz


Agilent
Mkr1 997.6 MHz
-59.34 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
997.575000 MHz
-59.34 dBm
Start 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 1 GHz
Sweep 4 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

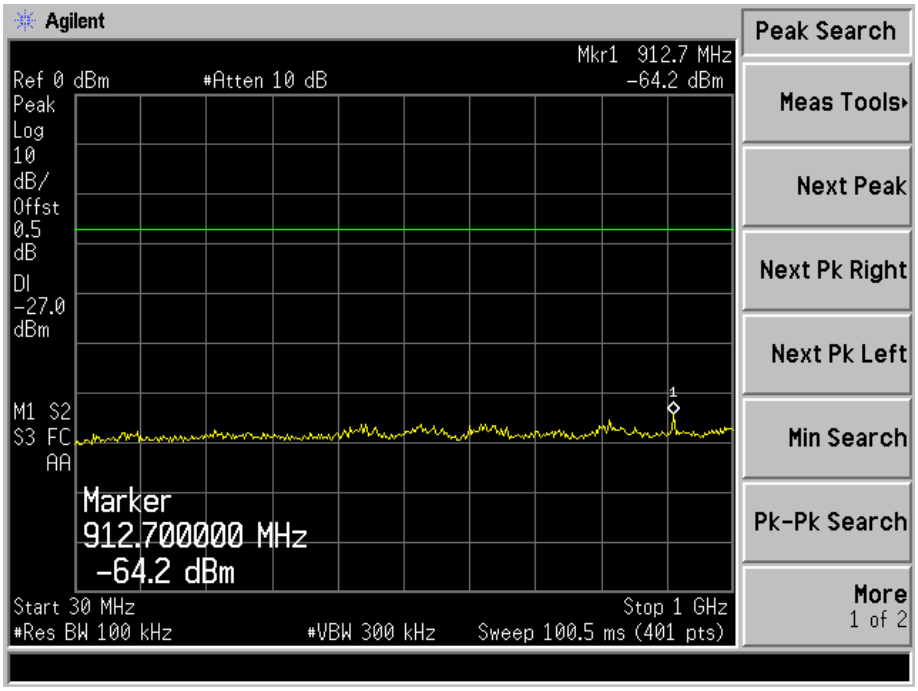

Agilent
Mkr1 26.12 GHz
-42.46 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.117500000 GHz
-42.46 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

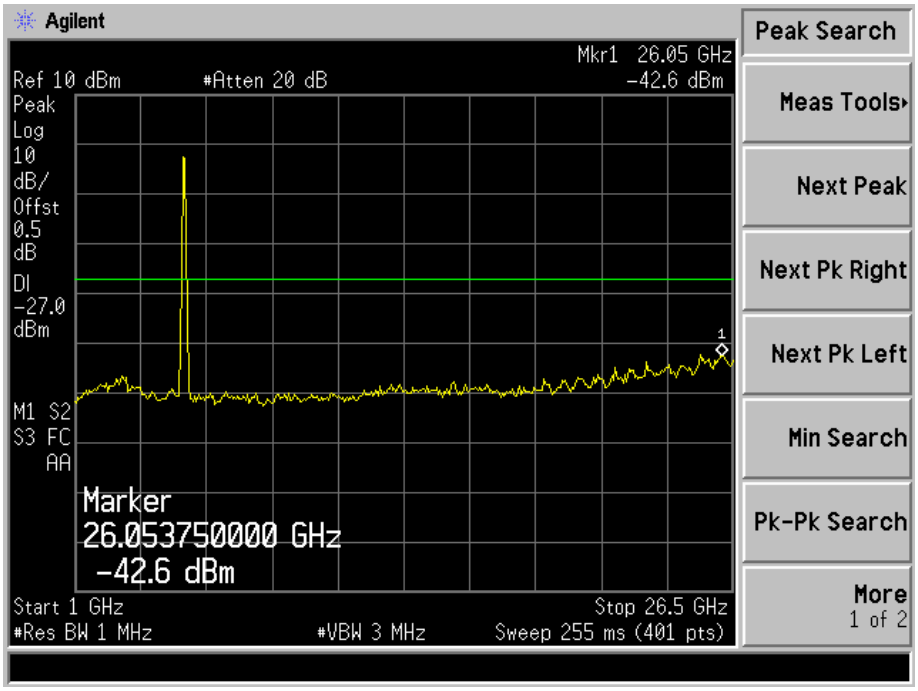
5795MHz


Agilent
Mkr1 835.1 MHz
Ref 0 dBm
#Atten 10 dB
-66.52 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
835.100000 MHz
-66.52 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

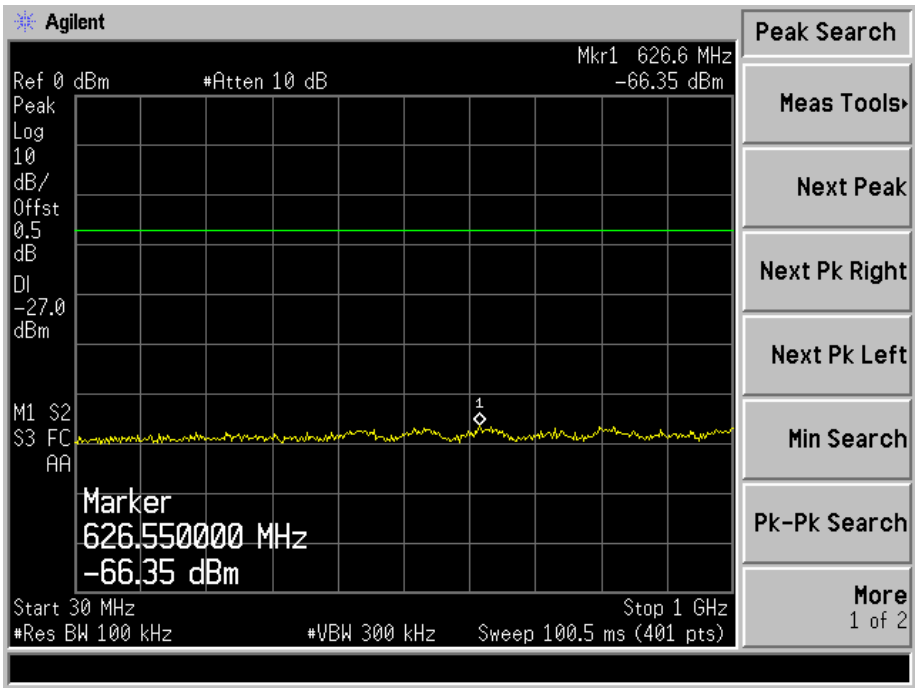

Agilent
Mkr1 25.93 GHz
Ref 10 dBm
#Atten 20 dB
-42.41 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
25.926250000 GHz
-42.41 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

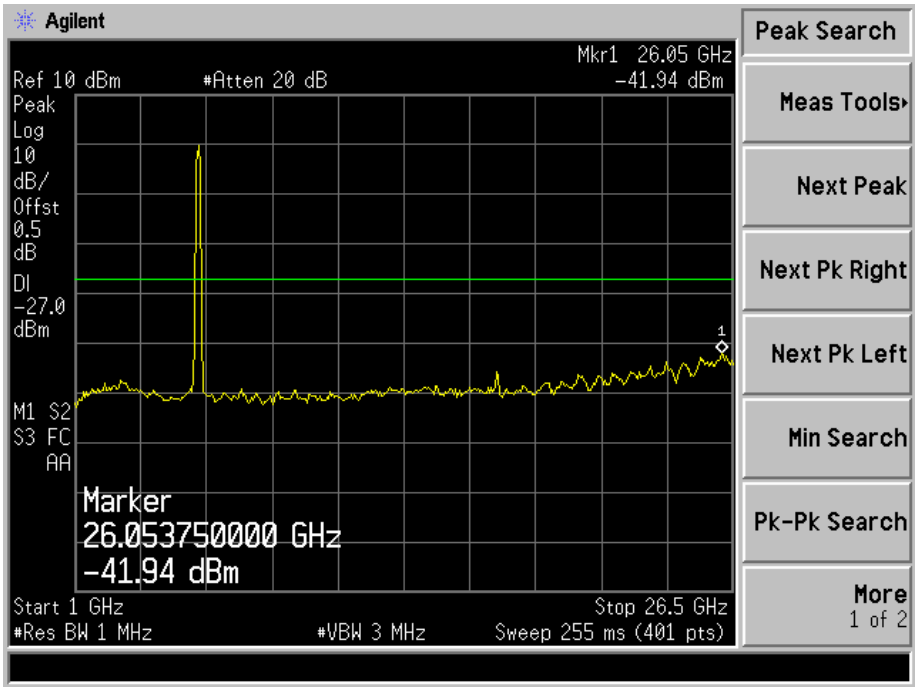
802.11ac
5210MHz



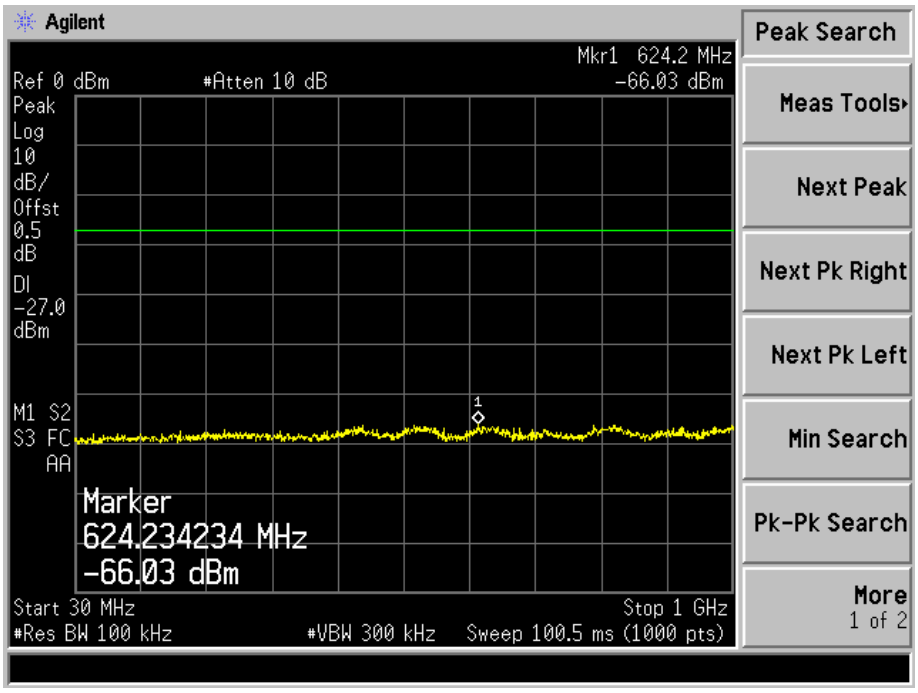


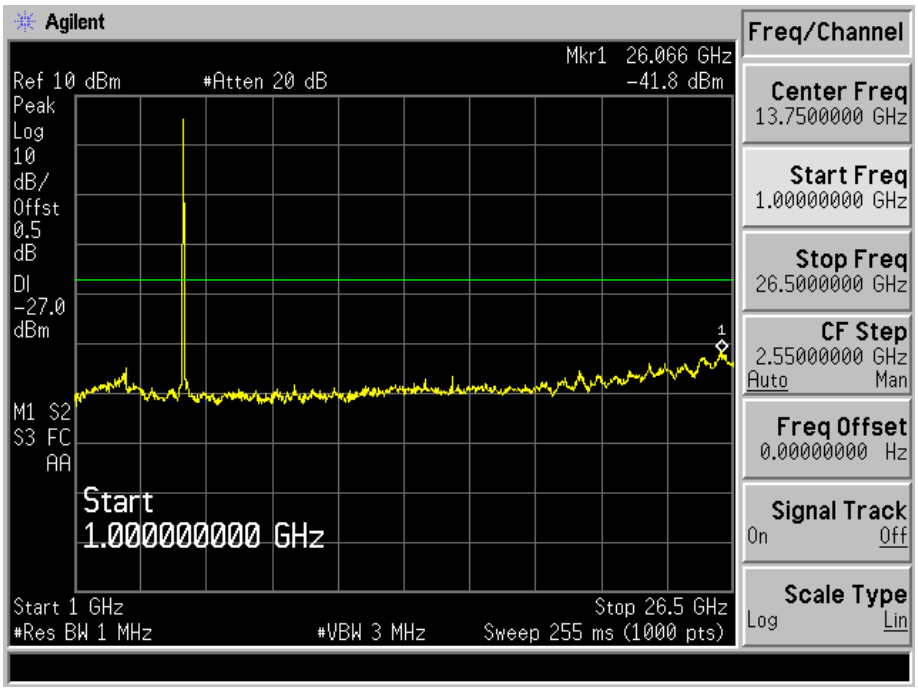
5775MHz


Agilent
Mkr1 626.6 MHz
Ref 0 dBm
#Atten 10 dB
-66.35 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
626.550000 MHz
-66.35 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

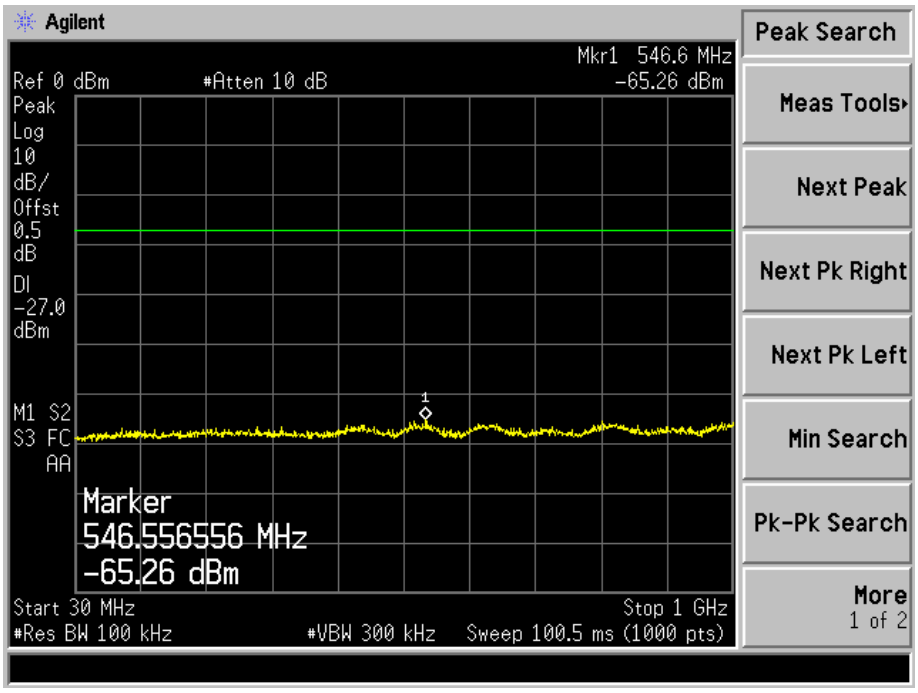

Agilent
Mkr1 26.05 GHz
Ref 10 dBm
#Atten 20 dB
-41.94 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.053750000 GHz
-41.94 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

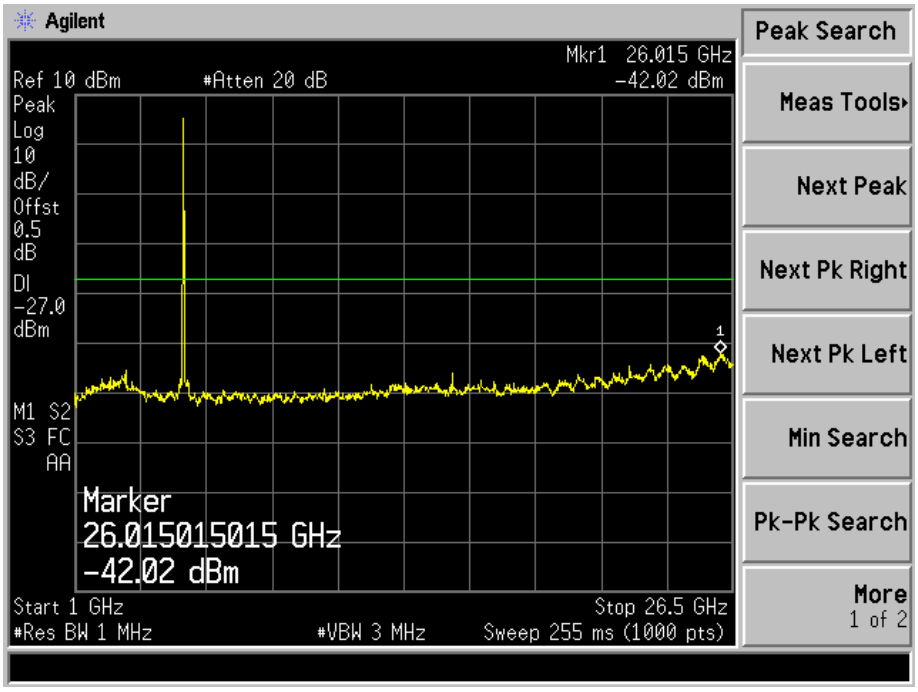
Antenna B:
802.11a
5180MHz



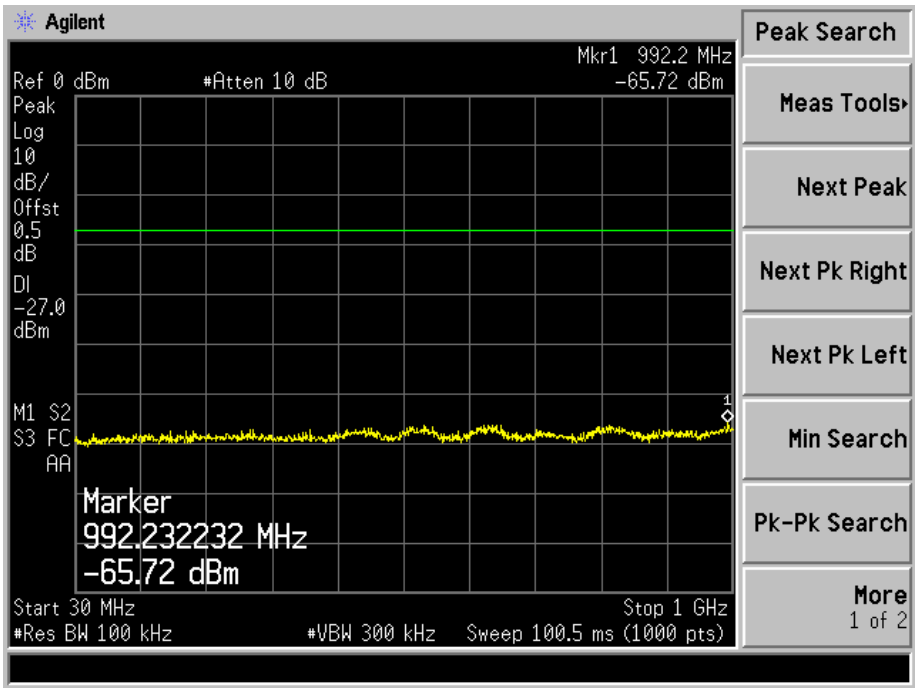


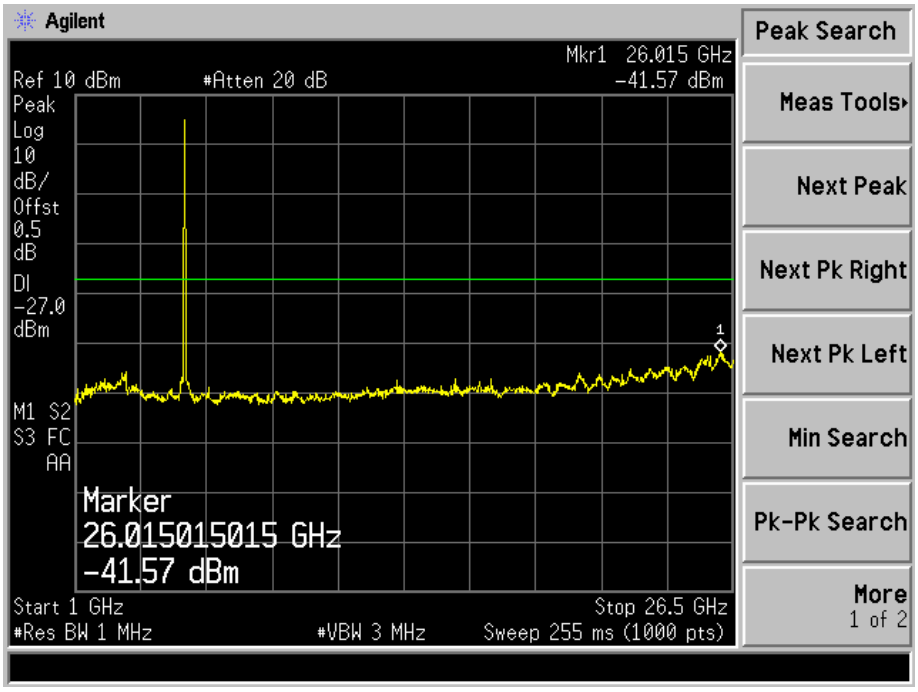
5200MHz


Agilent
Mkr1 546.6 MHz
Ref 0 dBm
#Atten 10 dB
-65.26 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
546.556556 MHz
-65.26 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

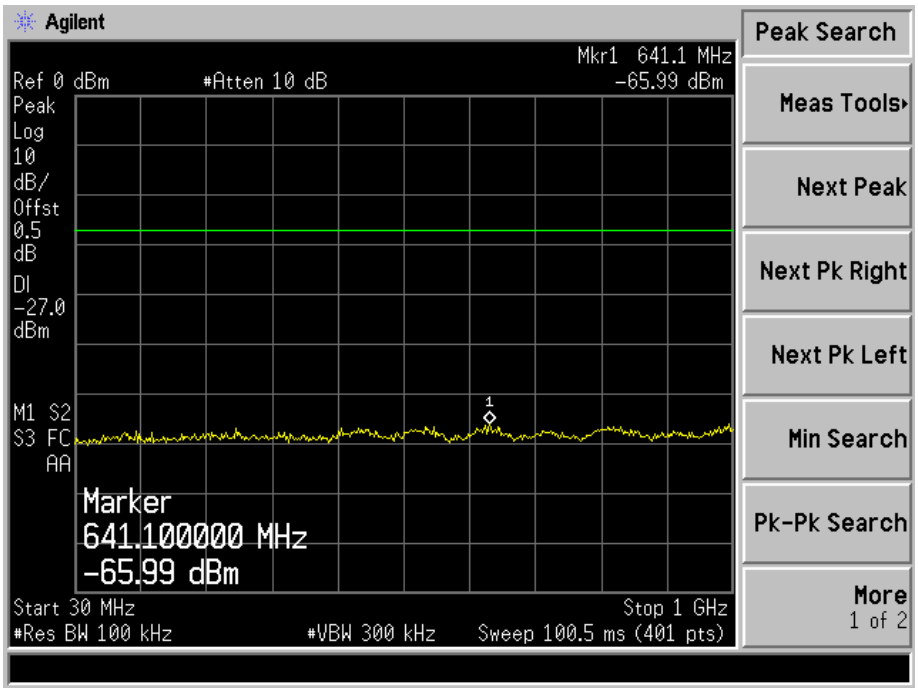

Agilent
Mkr1 26.015 GHz
Ref 10 dBm
#Atten 20 dB
-42.02 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.015015015 GHz
-42.02 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

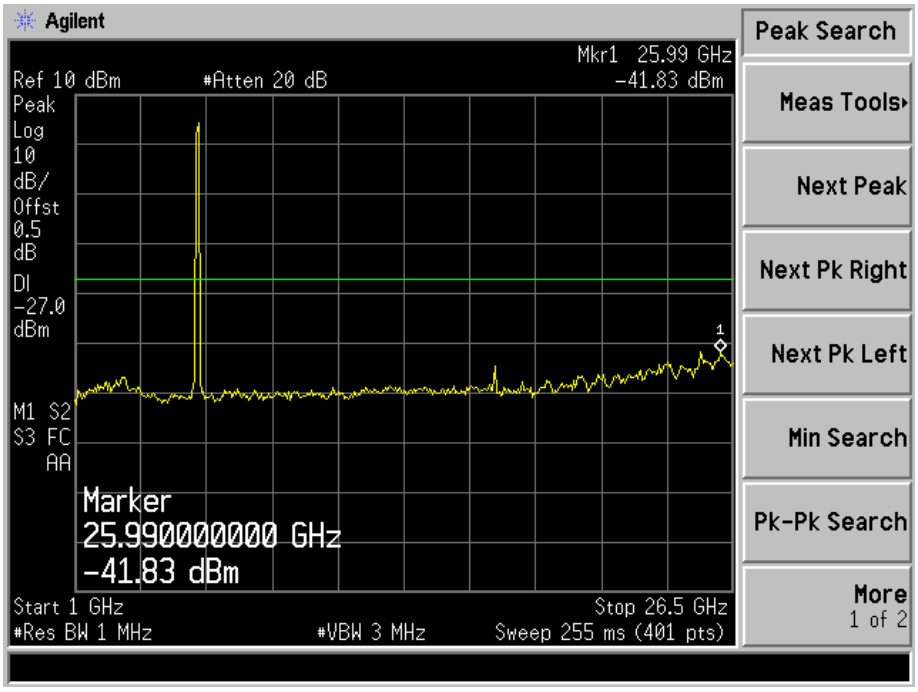
5240MHz


Agilent
Mkr1 992.2 MHz
Ref 0 dBm
#Atten 10 dB
-65.72 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
992.232232 MHz
-65.72 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

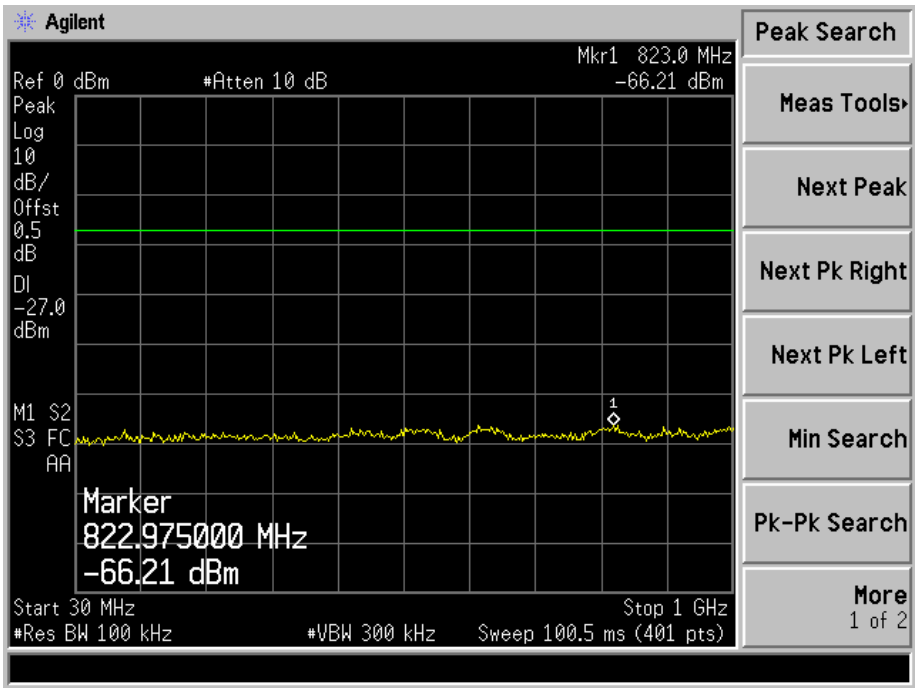

Agilent
Mkr1 26.015 GHz
Ref 10 dBm
#Atten 20 dB
-41.57 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.015015015 GHz
-41.57 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

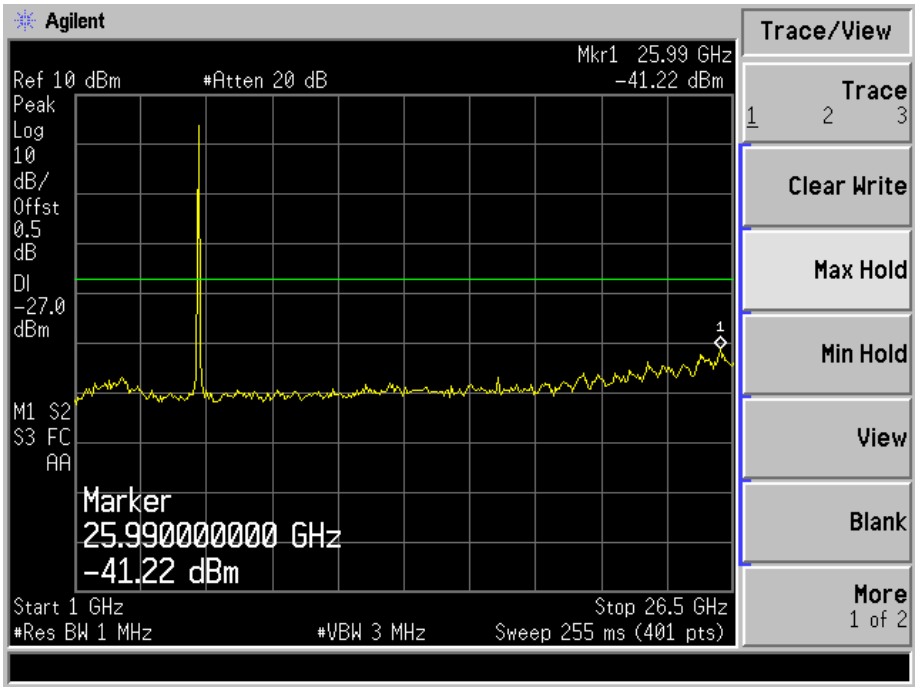
5745MHz


Agilent
Mkr1 641.1 MHz
Ref 0 dBm
#Atten 10 dB
-65.99 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
641.100000 MHz
-65.99 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

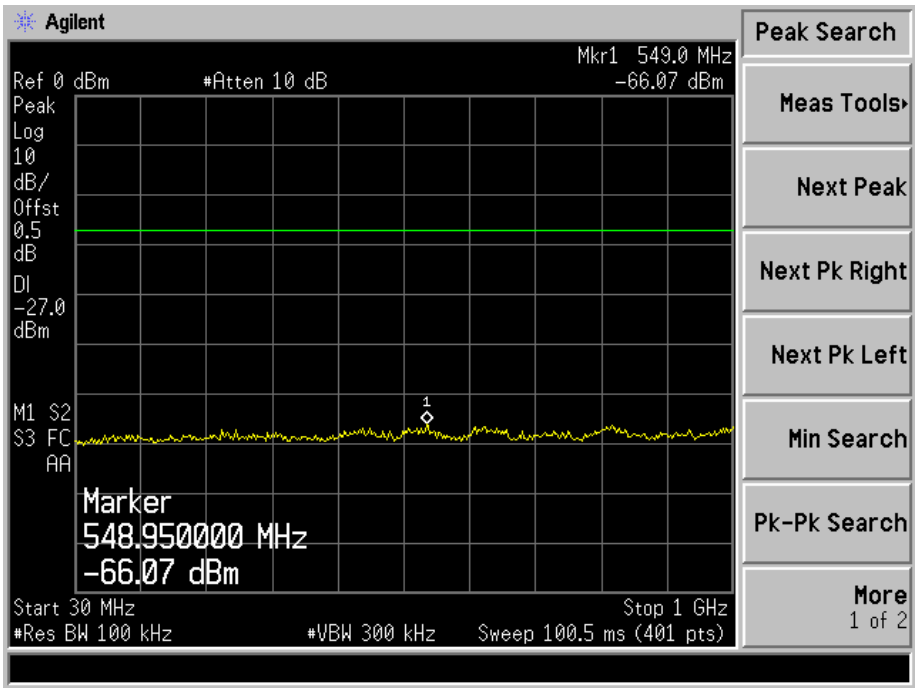

Agilent
Mkr1 25.99 GHz
Ref 10 dBm
#Atten 20 dB
-41.83 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
25.990000000 GHz
-41.83 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

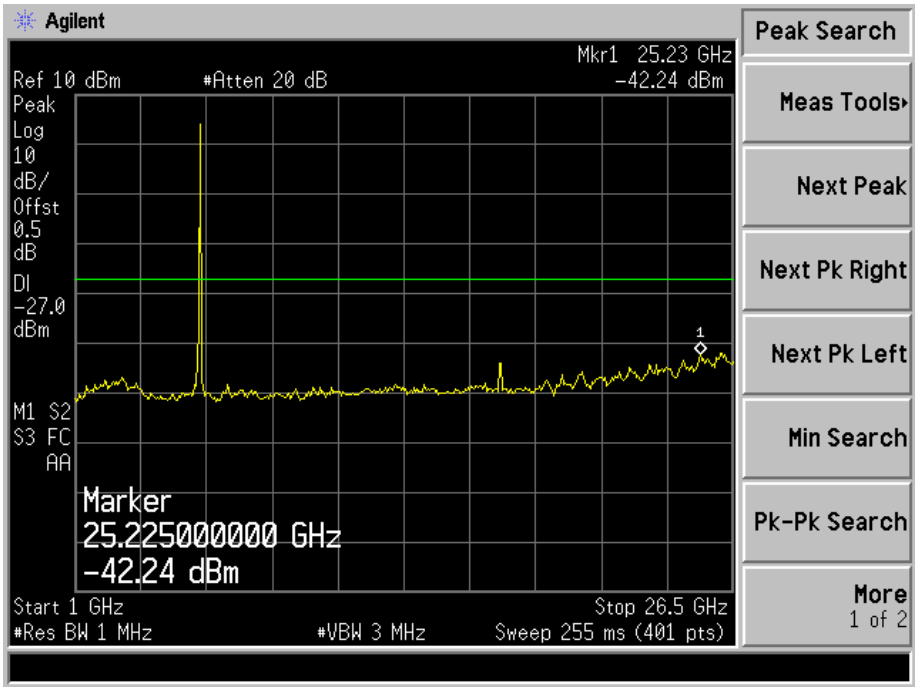
5785MHz


Agilent
Mkr1 823.0 MHz
Ref 0 dBm
#Atten 10 dB
-66.21 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
822.975000 MHz
-66.21 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

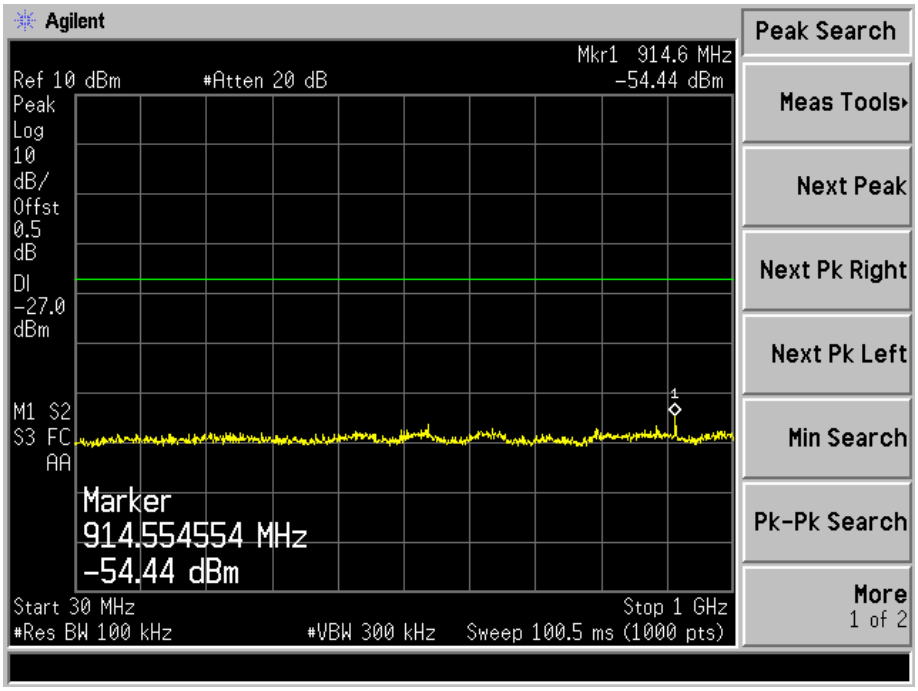

Agilent
Mkr1 25.99 GHz
Ref 10 dBm
#Atten 20 dB
-41.22 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
25.990000000 GHz
-41.22 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

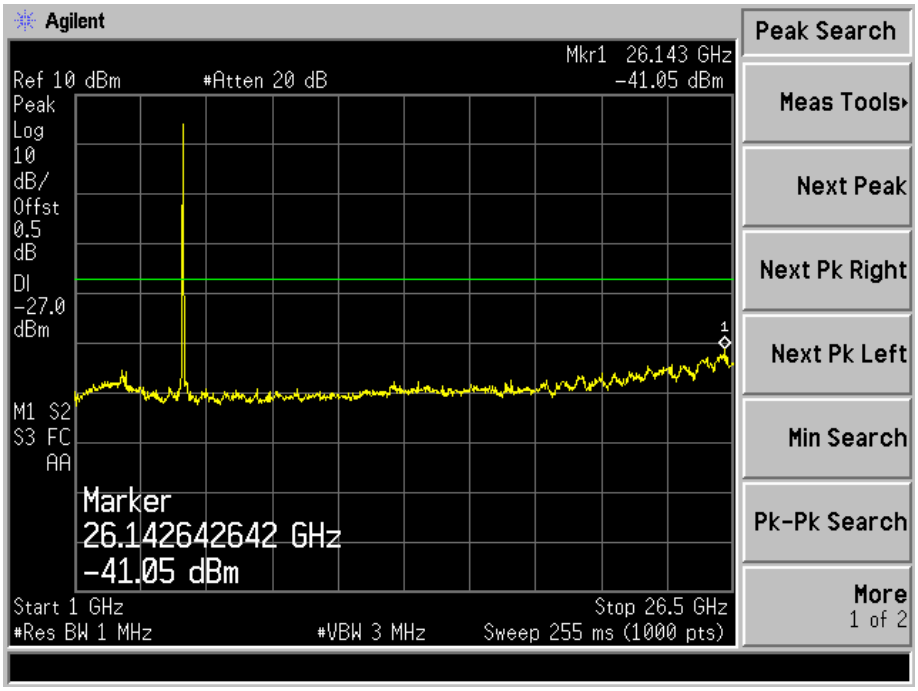
5825MHz


Agilent
Mkr1 549.0 MHz
Ref 0 dBm
#Atten 10 dB
-66.07 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
548.950000 MHz
-66.07 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

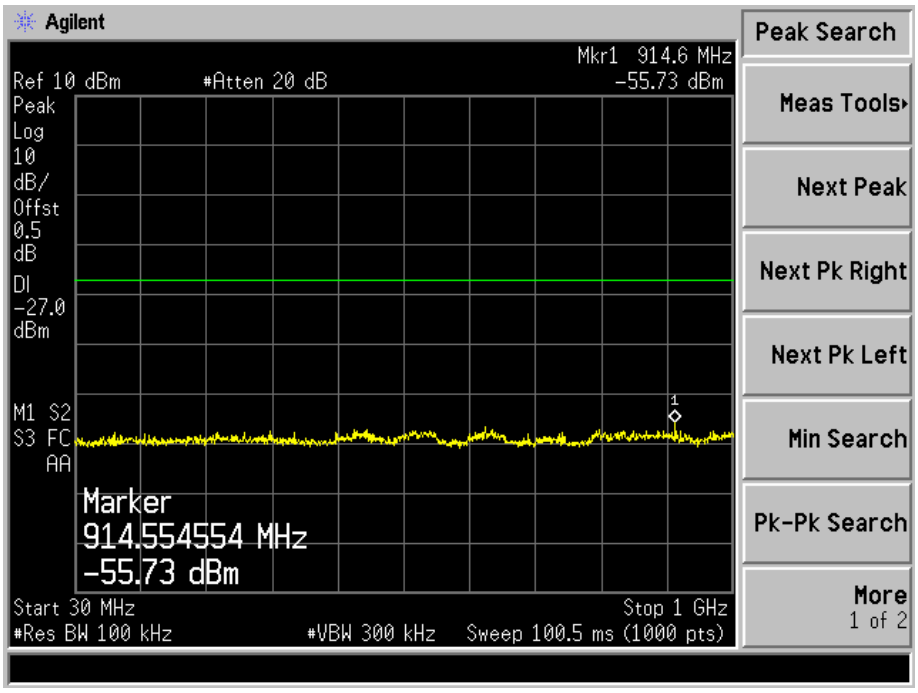

Agilent
Mkr1 25.23 GHz
Ref 10 dBm
#Atten 20 dB
-42.24 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
25.225000000 GHz
-42.24 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

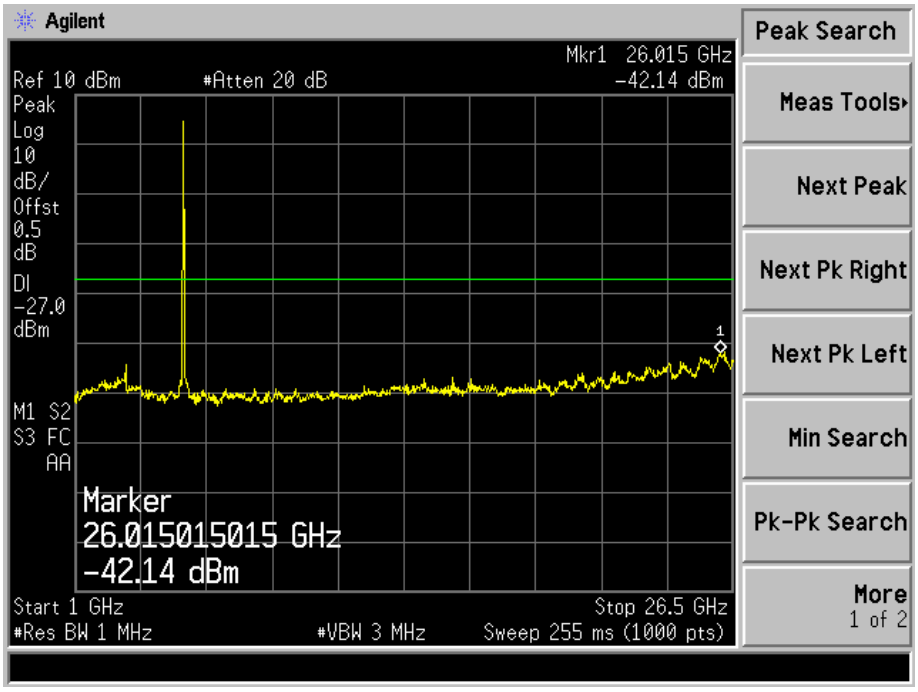
802.11n HT20
5180MHz



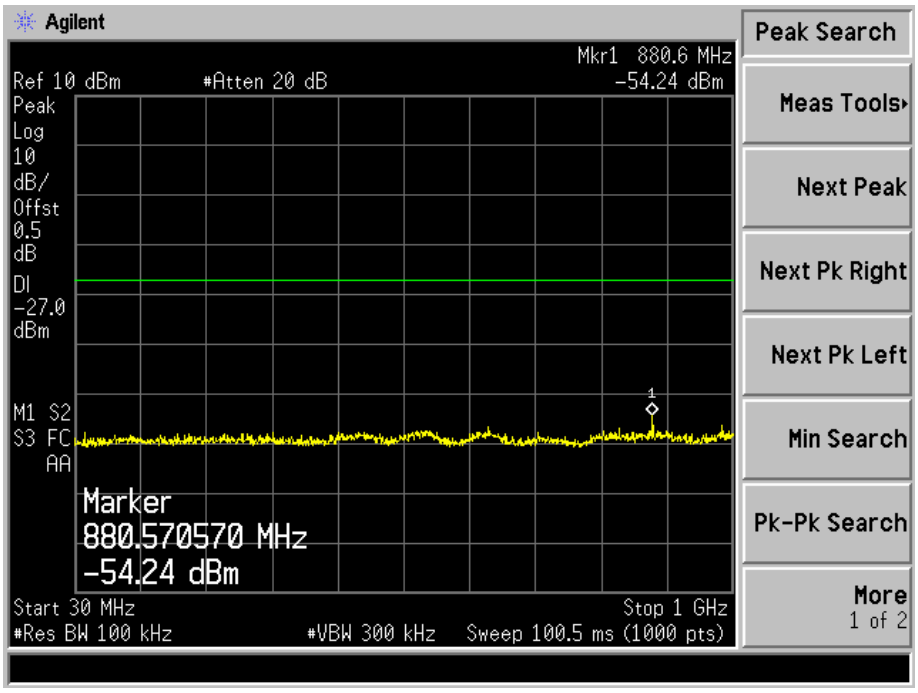


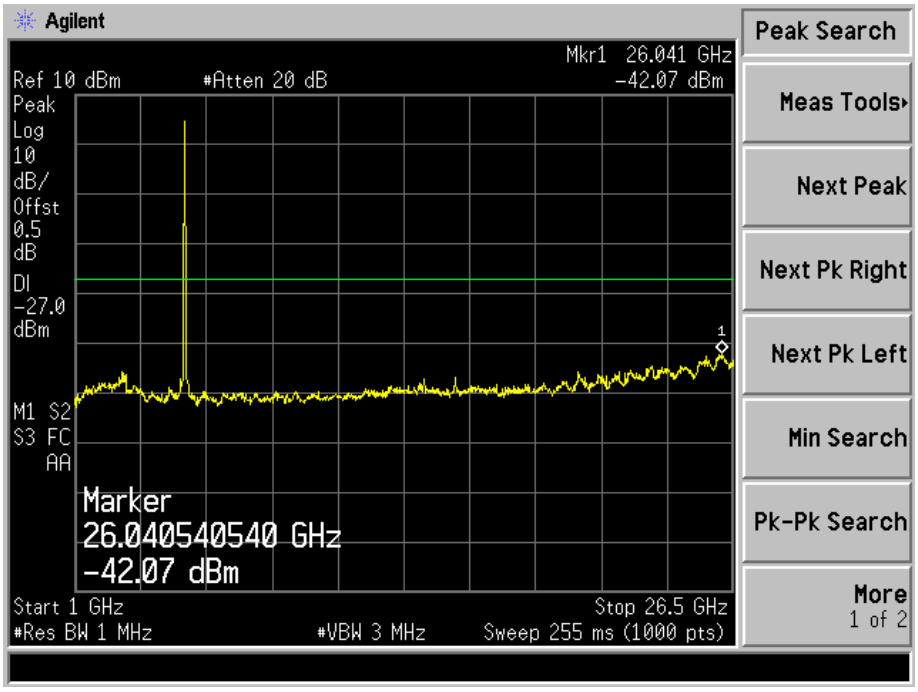
5200MHz


Agilent
Mkr1 914.6 MHz
-55.73 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
914.554554 MHz
-55.73 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

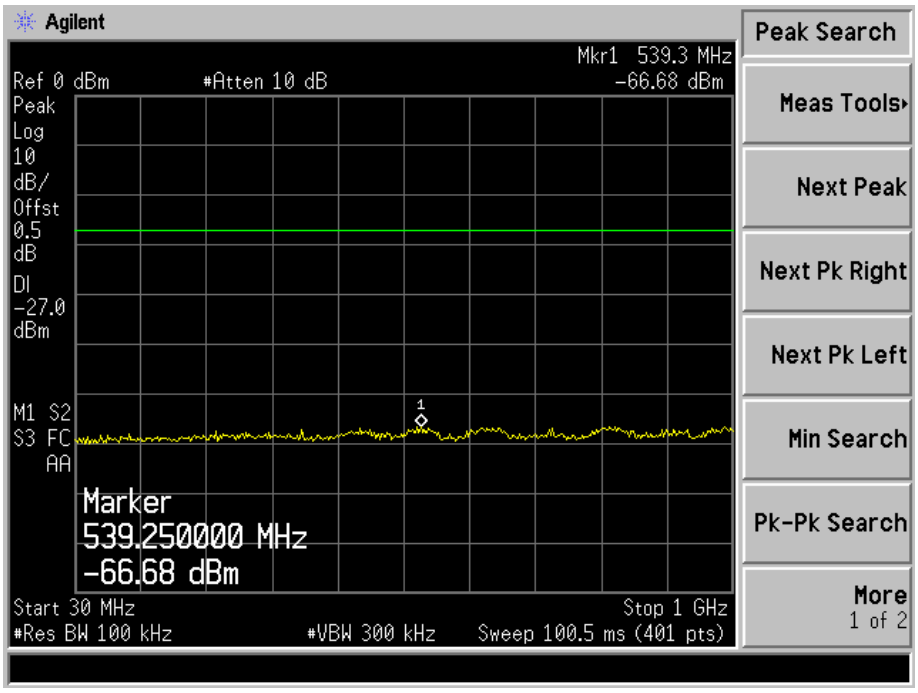

Agilent
Mkr1 26.015 GHz
-42.14 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.015015015 GHz
-42.14 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

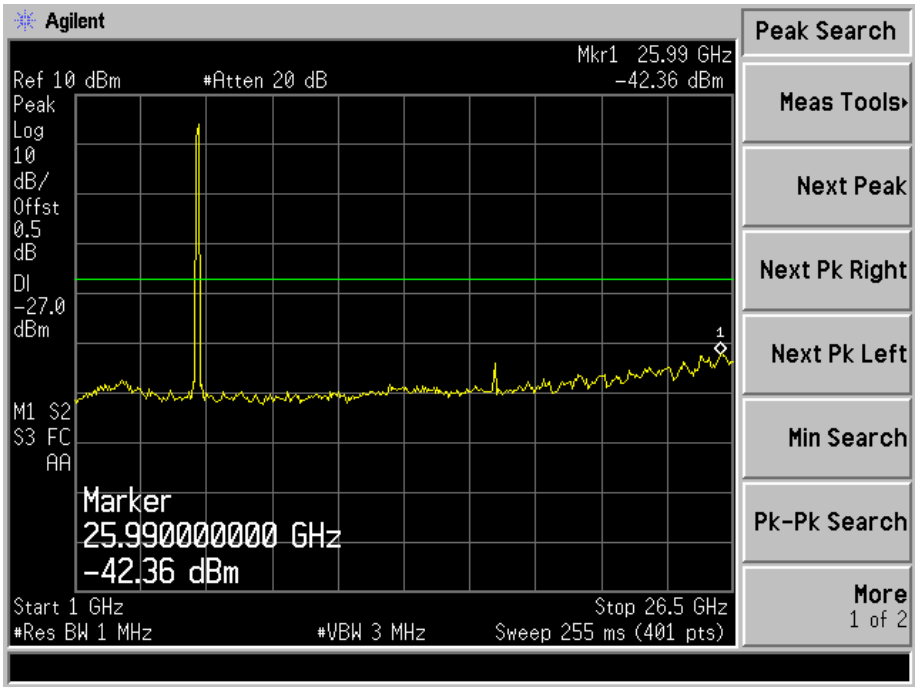
5240MHz


Agilent
Mkr1 880.6 MHz
-54.24 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
880.570570 MHz
-54.24 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

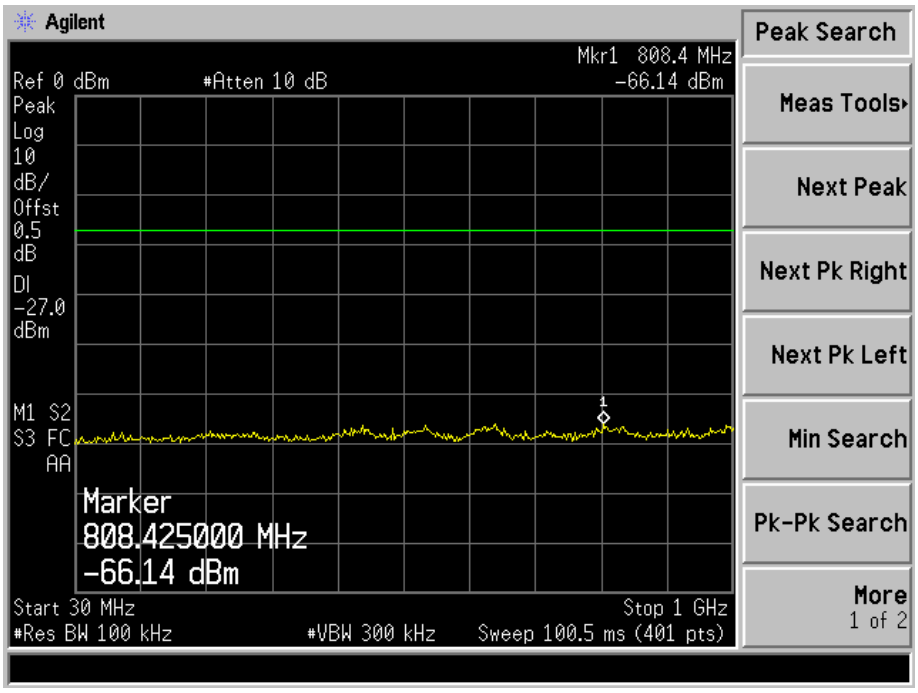

Agilent
Mkr1 26.041 GHz
-42.07 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.040540540 GHz
-42.07 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

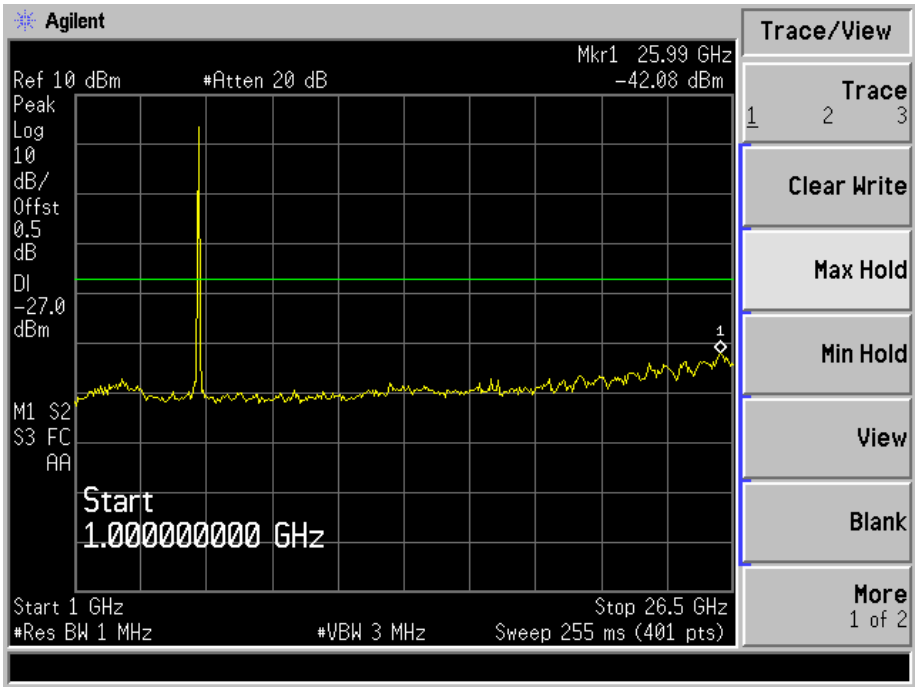
5745MHz


Agilent
Mkr1 539.3 MHz
Ref 0 dBm
#Atten 10 dB
-66.68 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
539.250000 MHz
-66.68 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

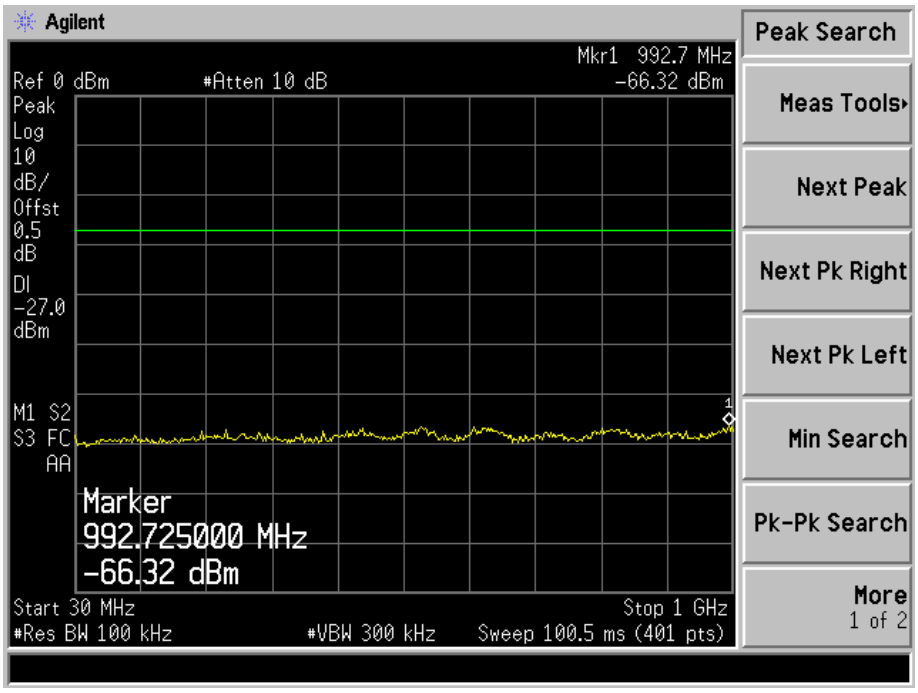

Agilent
Mkr1 25.99 GHz
Ref 10 dBm
#Atten 20 dB
-42.36 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
25.990000000 GHz
-42.36 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

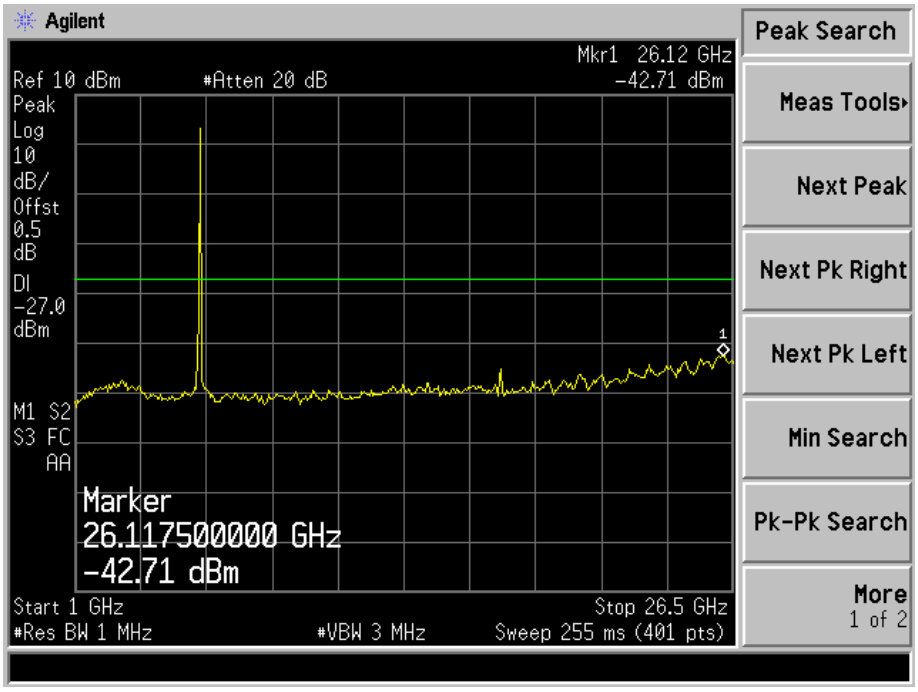
5785MHz


Agilent
Mkr1 808.4 MHz
Ref 0 dBm
#Atten 10 dB
-66.14 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
808.425000 MHz
-66.14 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

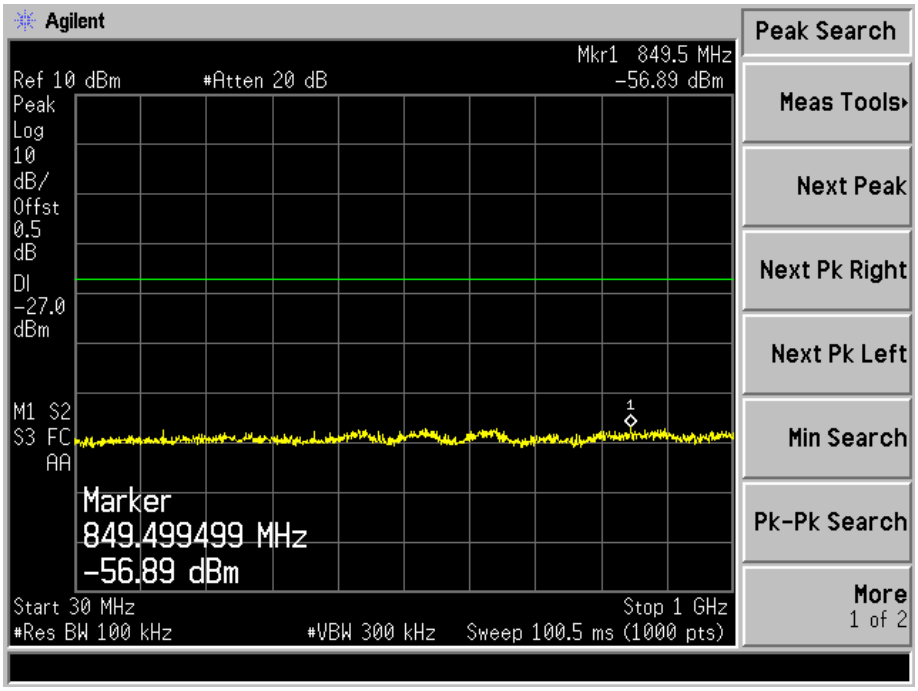

Agilent
Mkr1 25.99 GHz
Ref 10 dBm
#Atten 20 dB
-42.08 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Start
1.000000000 GHz
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

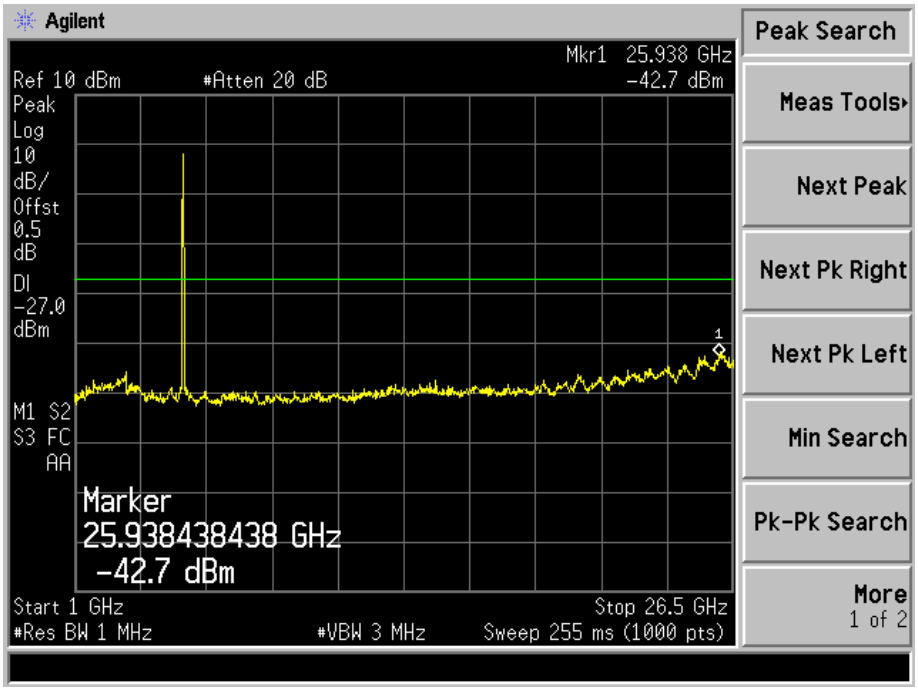
5825MHz


Agilent
Mkr1 992.7 MHz
Ref 0 dBm
#Atten 10 dB
-66.32 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
992.725000 MHz
-66.32 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

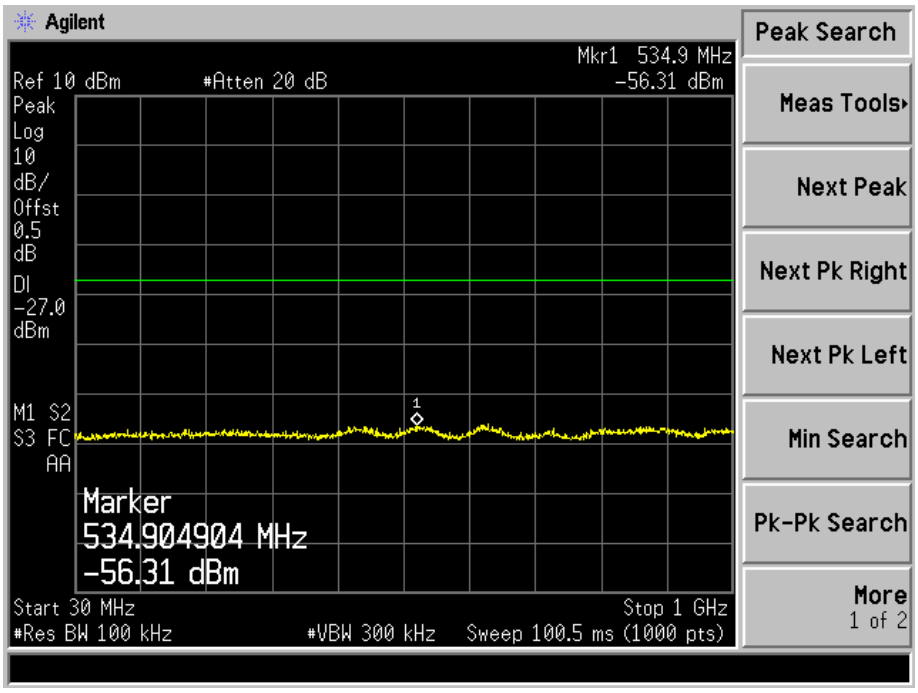

Agilent
Mkr1 26.12 GHz
Ref 10 dBm
#Atten 20 dB
-42.71 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.117500000 GHz
-42.71 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

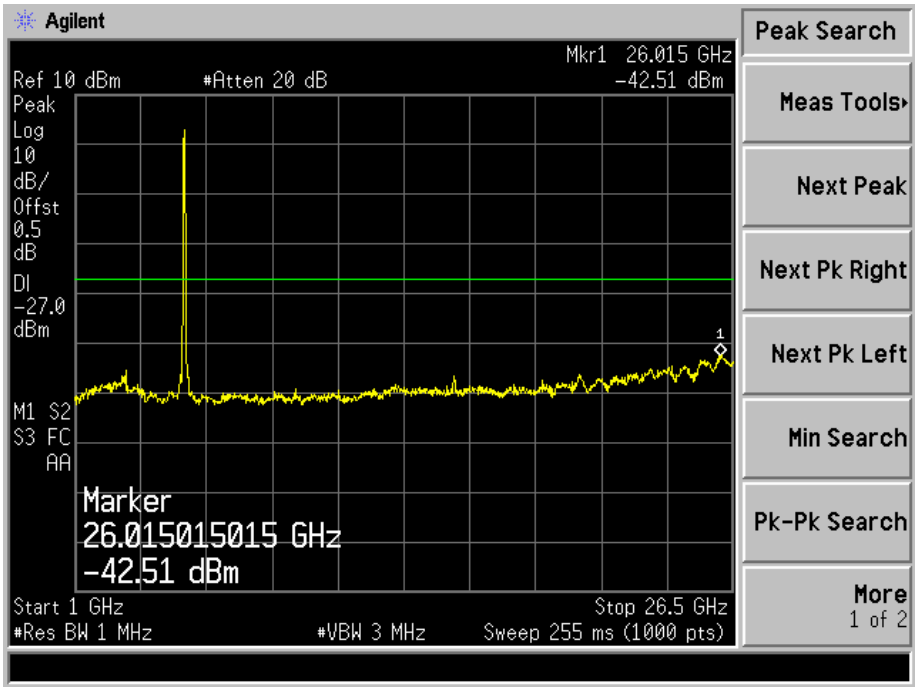
802.11n HT40
5190MHz



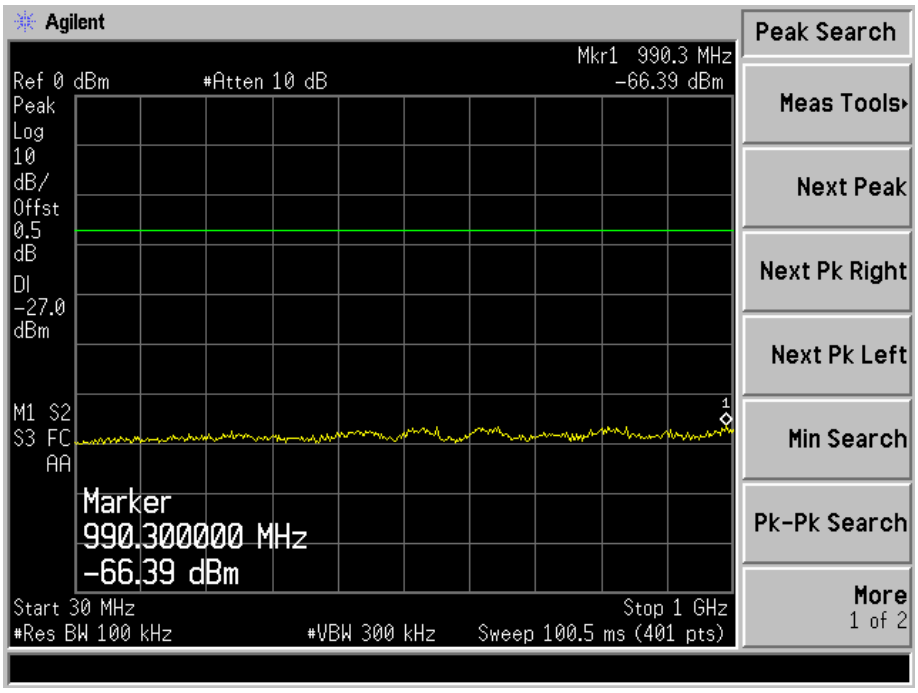


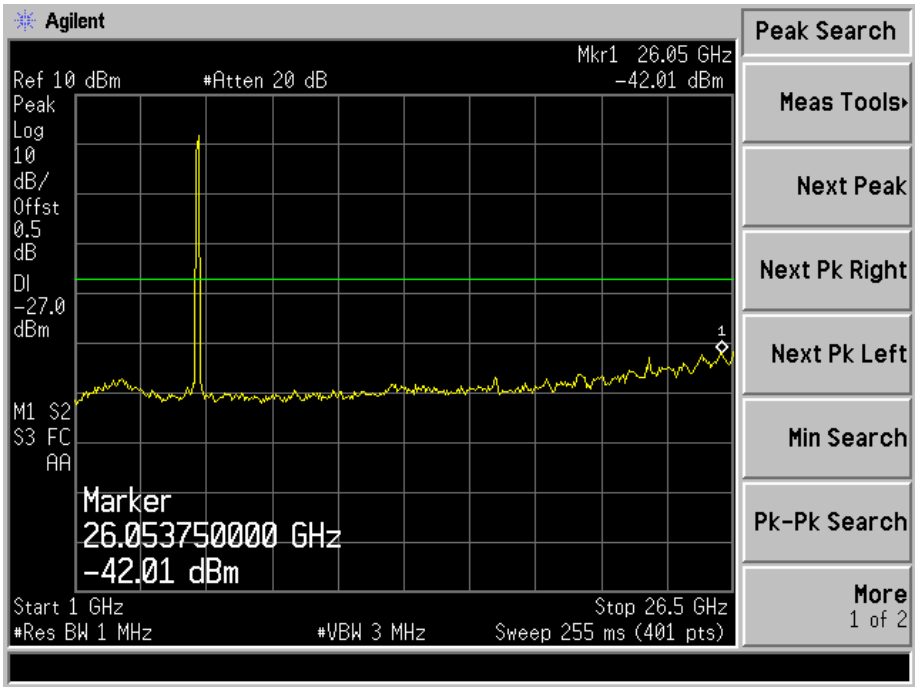
5230MHz


Agilent
Mkr1 534.9 MHz
Ref 10 dBm
#Atten 20 dB
-56.31 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
534.904904 MHz
-56.31 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

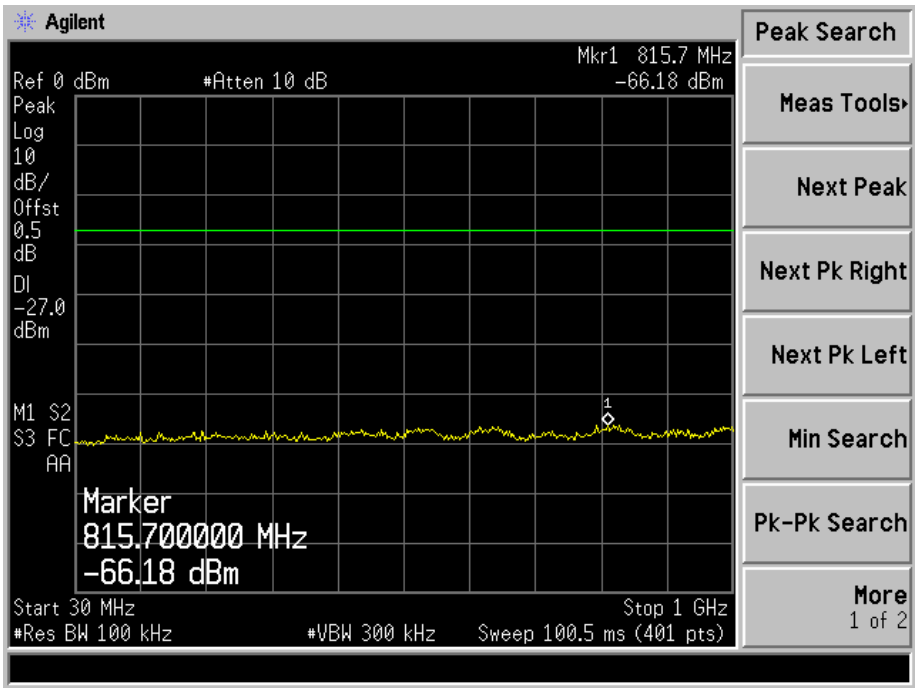

Agilent
Mkr1 26.015 GHz
Ref 10 dBm
#Atten 20 dB
-42.51 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.015015015 GHz
-42.51 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (1000 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

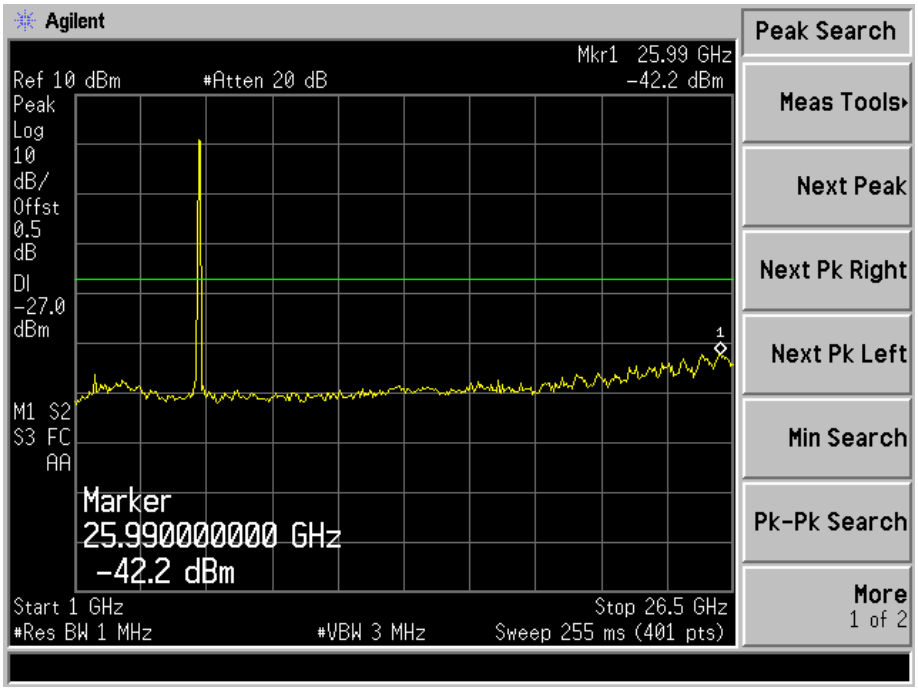
5755MHz


Agilent
Mkr1 990.3 MHz
Ref 0 dBm
#Atten 10 dB
-66.39 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
990.300000 MHz
-66.39 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

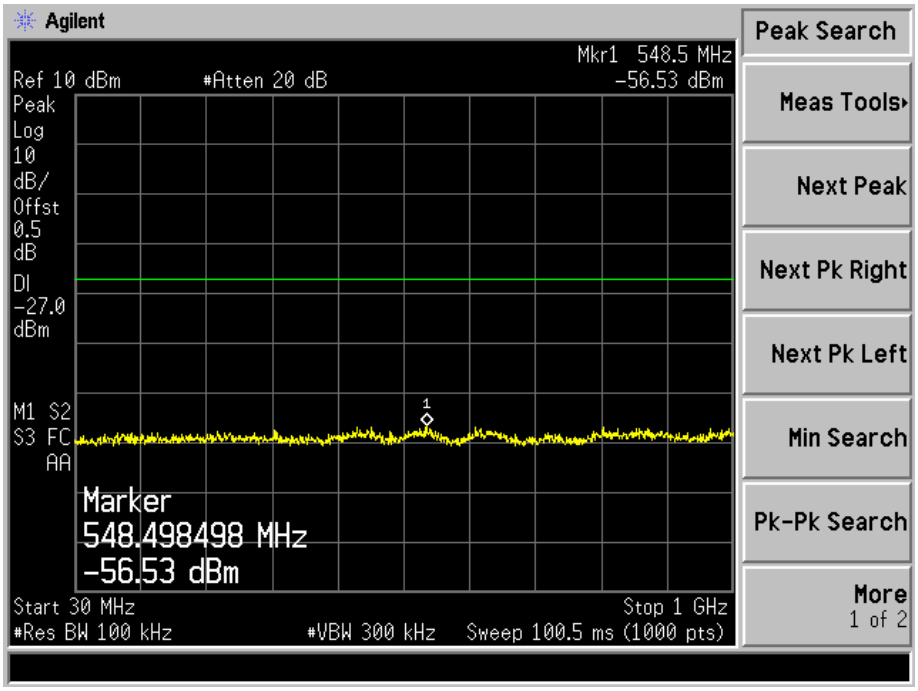

Agilent
Mkr1 26.05 GHz
Ref 10 dBm
#Atten 20 dB
-42.01 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
26.053750000 GHz
-42.01 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

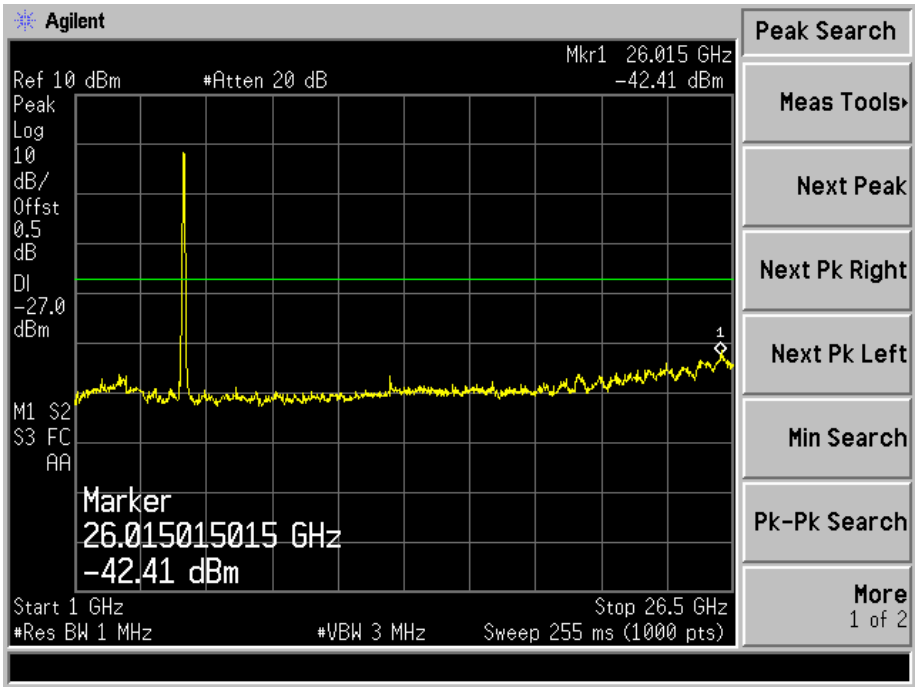
5795MHz


Agilent
Mkr1 815.7 MHz
Ref 0 dBm
#Atten 10 dB
-66.18 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
815.700000 MHz
-66.18 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1 GHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

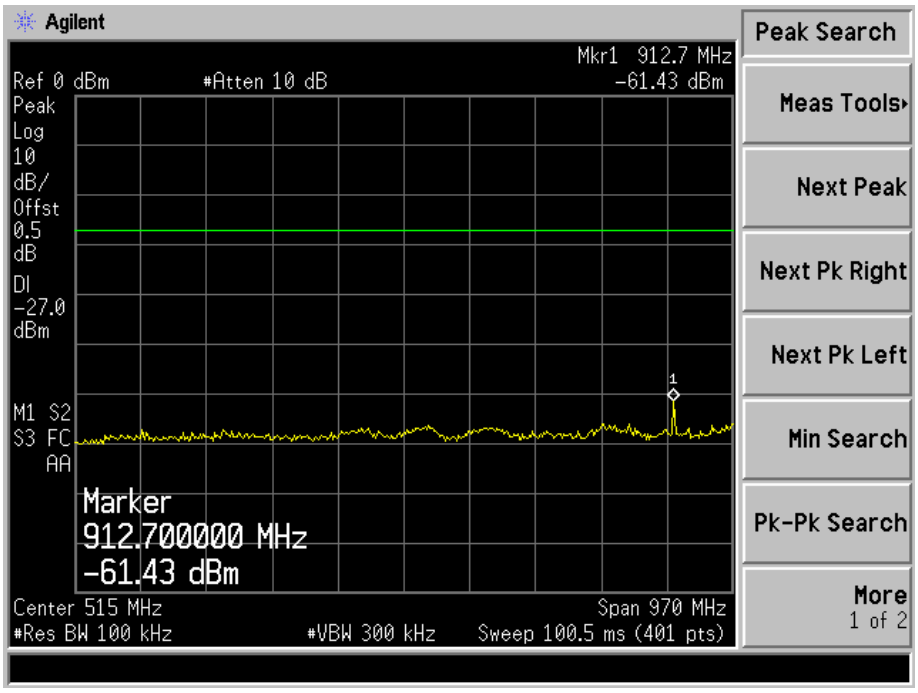

Agilent
Mkr1 25.99 GHz
Ref 10 dBm
#Atten 20 dB
-42.2 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
25.990000000 GHz
-42.2 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26.5 GHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

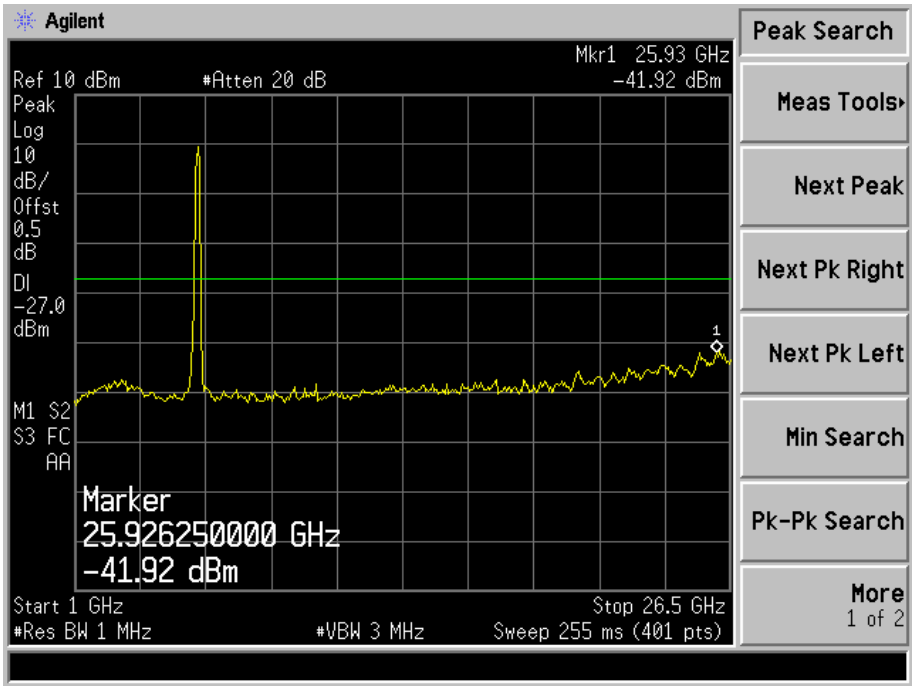
802.11ac
5210MHz





5775MHz


Agilent
Mkr1 912.7 MHz
Ref 0 dBm
#Atten 10 dB
-61.43 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
912.700000 MHz
-61.43 dBm
Center 515 MHz
Span 970 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 100.5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2


Agilent
Mkr1 25.93 GHz
Ref 10 dBm
#Atten 20 dB
-41.92 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-27.0
dBm
M1 S2
S3 FC
AA
Marker
25.926250000 GHz
-41.92 dBm
Start 1 GHz
Stop 26.5 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 255 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

11. Radiated Spurious Emissions

11.1 Standard Applicable

According to §15.407(b)(6), Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209.
According to §15.407(b)(7),The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
789033 D02 v01r02 General UNII Test Procedures New Rules v01
If radiated measurements are performed, field strength is then converted to EIRP as follows:

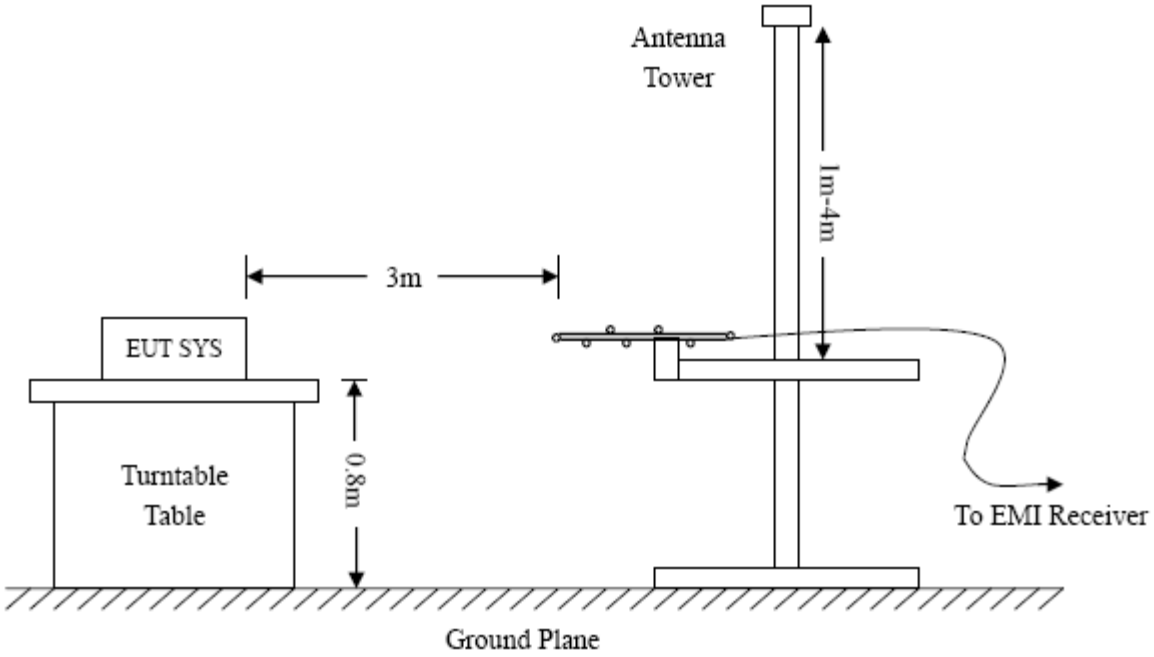
EIRP = ((E*d)^2) / 30

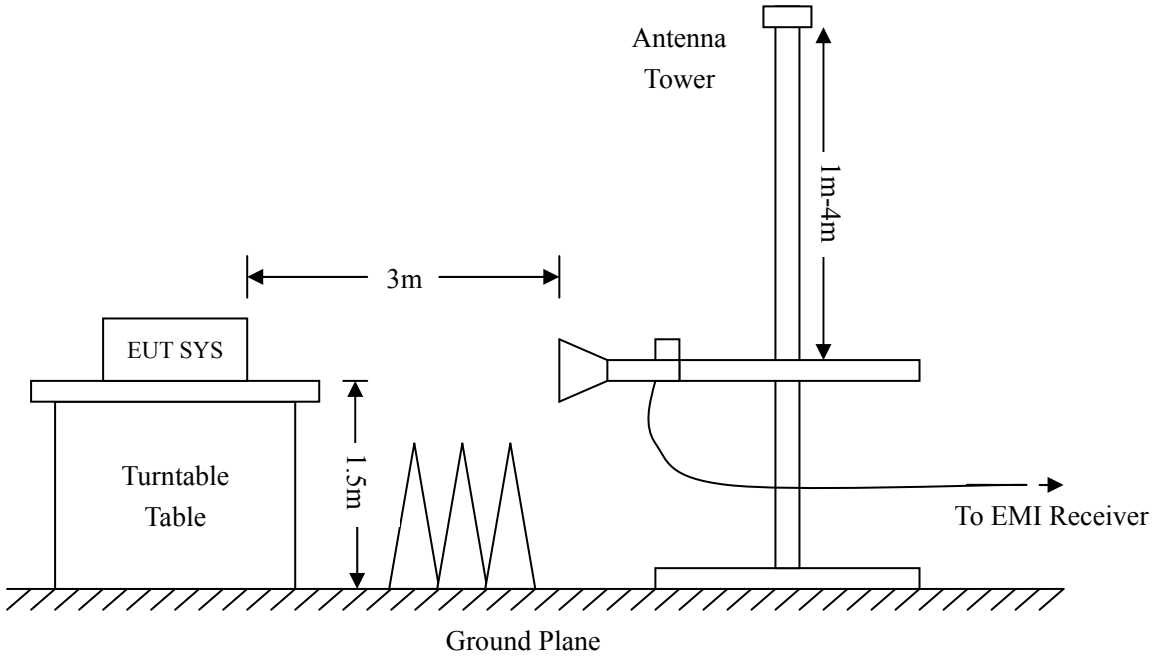
where:

- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

11.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.





11.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

11.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

11.5 Environmental Conditions

Temperature:	22° C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

11.6 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.407(b)(6) standards, and had the worst margin of:

Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

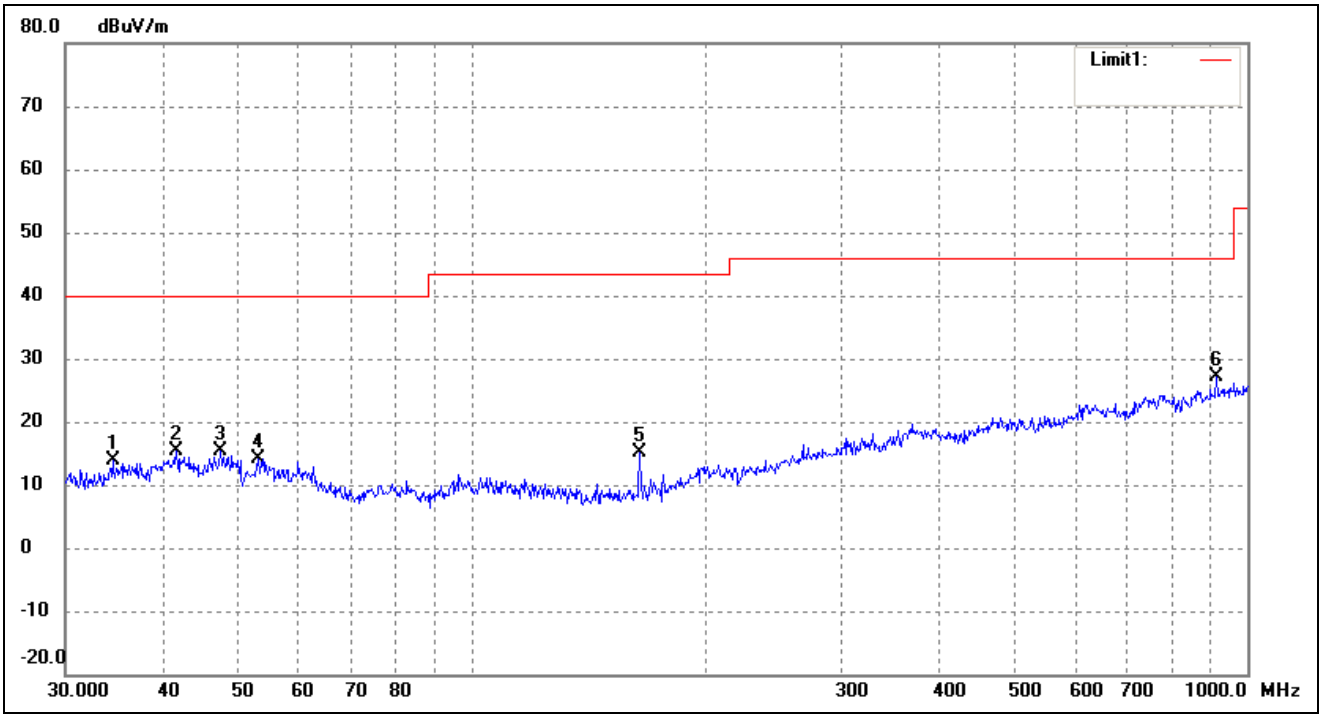
For Antenna A (Worst case)

For 802.11a

Spurious Emission From 30 MHz to 1 GHz

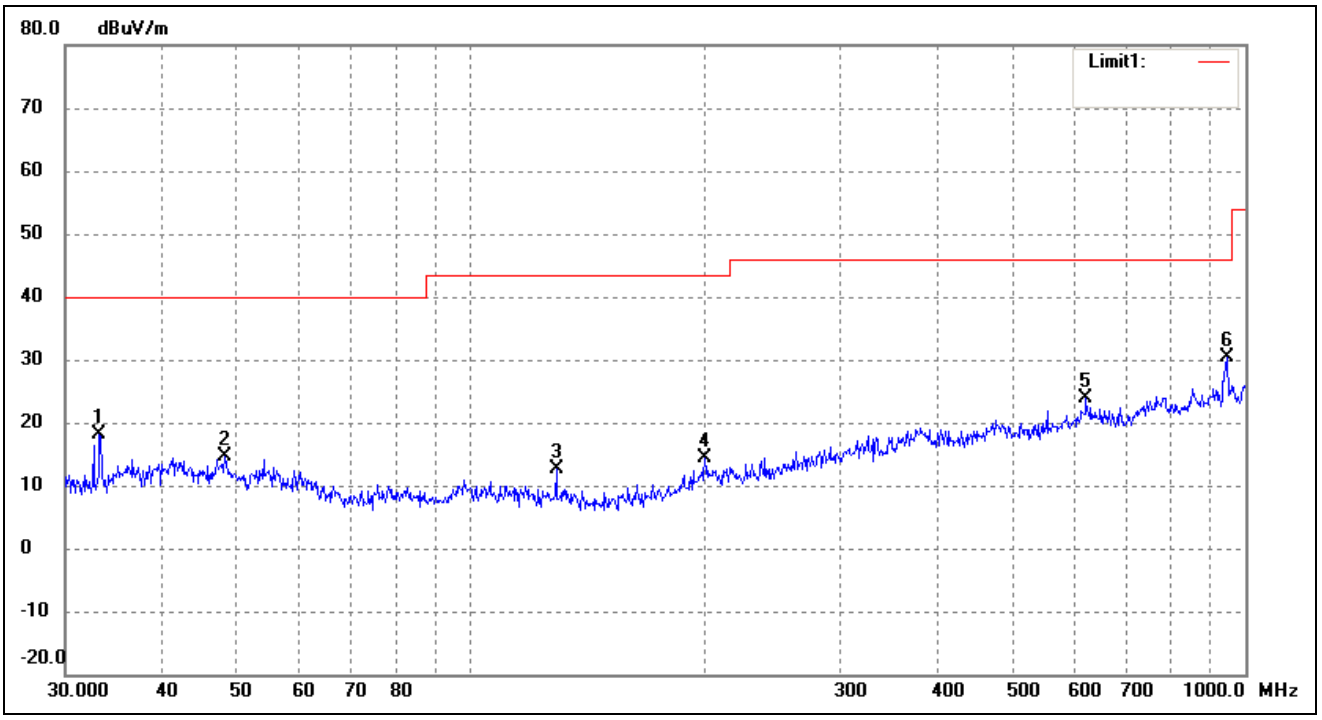
Test mode: Transmitting

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	34.5173	23.02	-9.17	13.85	40.00	-26.15	256	100	peak
2	41.7130	23.17	-7.78	15.39	40.00	-24.61	98	100	peak
3	47.4918	23.42	-8.16	15.26	40.00	-24.74	52	100	peak
4	53.1313	22.94	-8.72	14.22	40.00	-25.78	106	100	peak
5	164.9075	27.13	-12.04	15.09	43.50	-28.41	52	100	peak
6	912.8620	23.68	3.49	27.17	46.00	-18.83	275	100	peak

Test Specification: *Vertical*

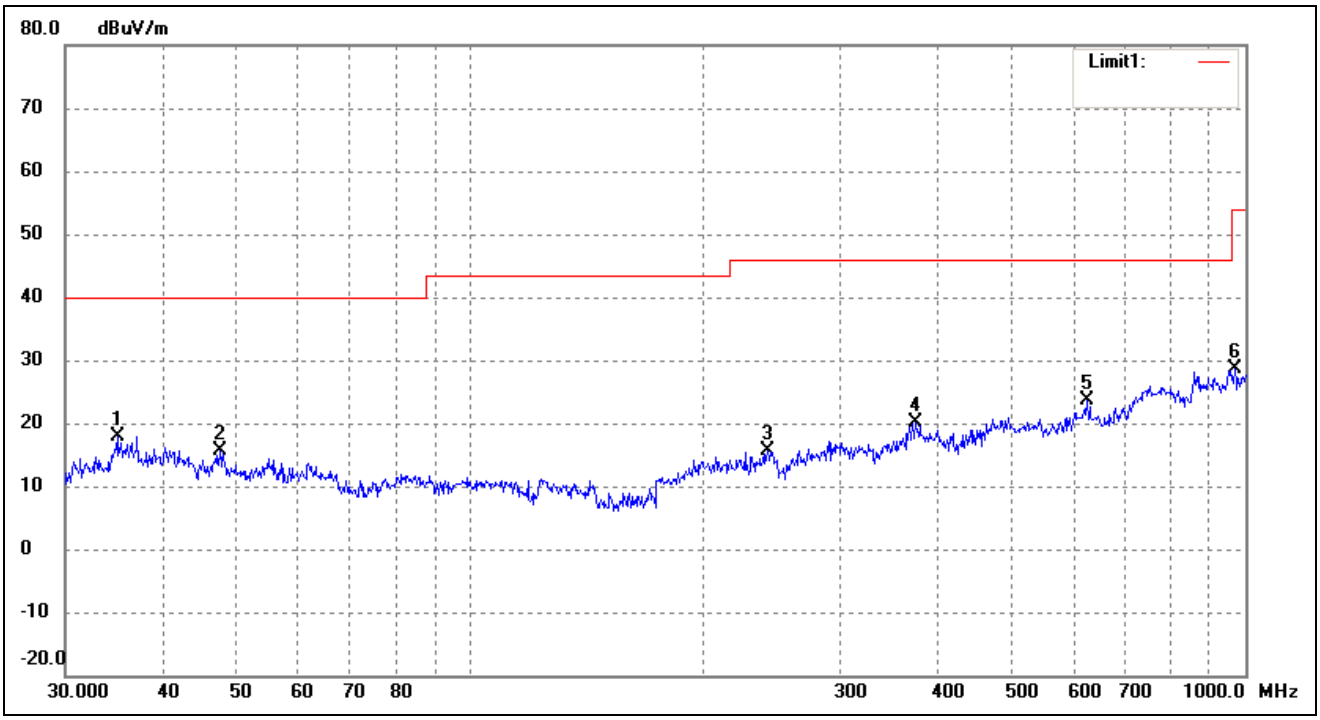


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	33.2112	27.58	-9.50	18.08	40.00	-21.92	340	100	peak
2	48.1626	22.72	-8.20	14.52	40.00	-25.48	95	100	peak
3	129.0146	24.53	-11.94	12.59	43.50	-30.91	213	100	peak
4	200.6881	23.07	-8.66	14.41	43.50	-29.09	115	100	peak
5	622.8900	22.67	1.16	23.83	46.00	-22.17	198	100	peak
6	948.7610	26.46	3.97	30.43	46.00	-15.57	184	100	peak

For 802.11n-HT20

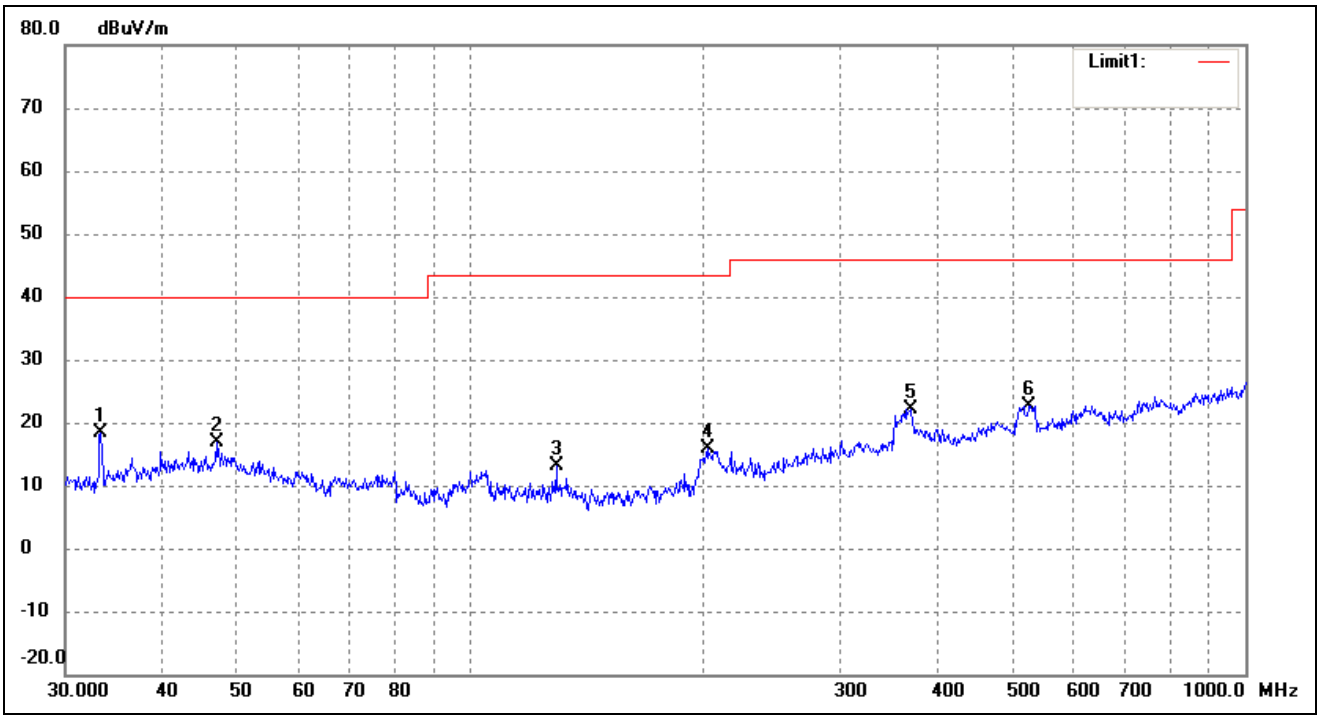
Test mode: Transmitting

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	35.0048	26.99	-9.04	17.95	40.00	-22.05	59	100	peak
2	47.4918	23.90	-8.16	15.74	40.00	-24.26	102	100	peak
3	241.6763	23.79	-8.20	15.59	46.00	-30.41	81	100	peak
4	374.6226	22.43	-2.41	20.02	46.00	-25.98	291	100	peak
5	625.0780	22.64	1.11	23.75	46.00	-22.25	102	100	peak
6	968.9338	24.89	3.72	28.61	54.00	-25.39	117	100	peak

Test Specification: *Vertical*

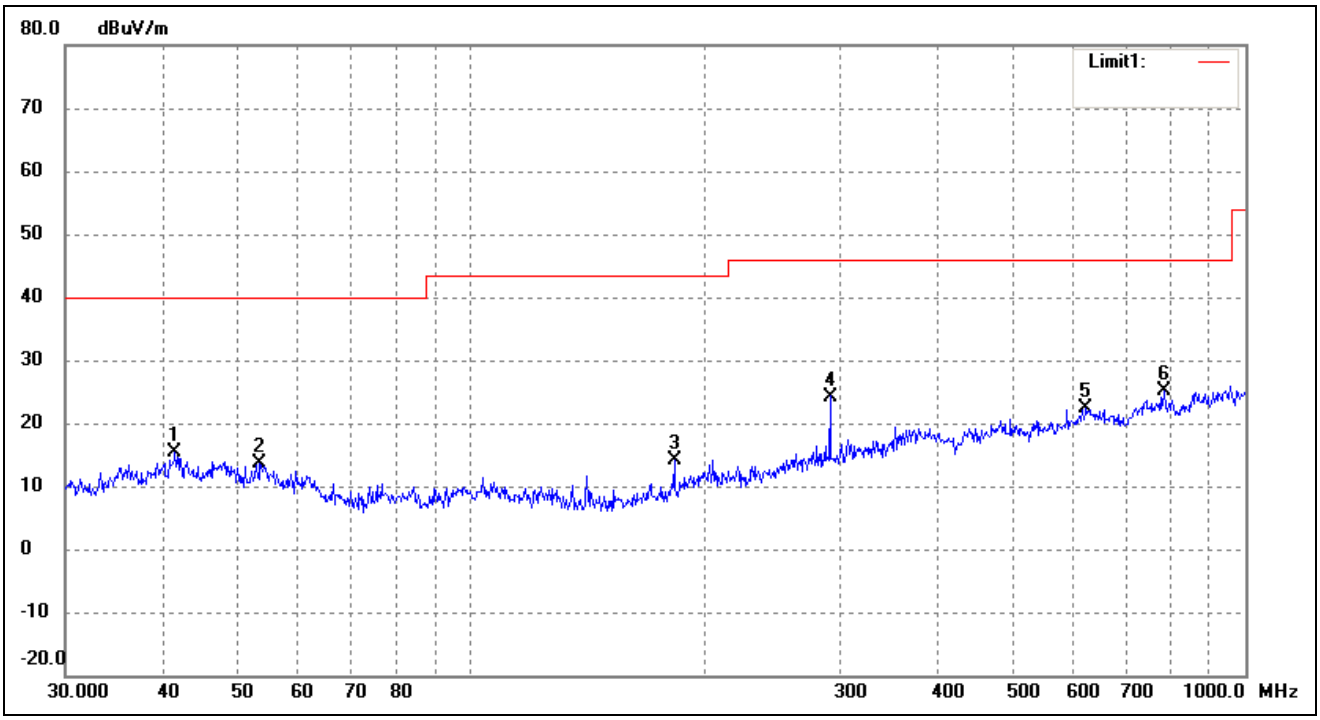


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	33.3279	27.92	-9.46	18.46	40.00	-21.54	342	100	peak
2	46.9948	25.01	-8.13	16.88	40.00	-23.12	217	100	peak
3	129.0146	25.13	-11.94	13.19	43.50	-30.31	58	100	peak
4	202.8104	24.63	-8.68	15.95	43.50	-27.55	208	100	peak
5	369.4047	24.87	-2.71	22.16	46.00	-23.84	113	100	peak
6	526.3967	24.57	-1.86	22.71	46.00	-23.29	338	100	peak

For 802.11n-HT40

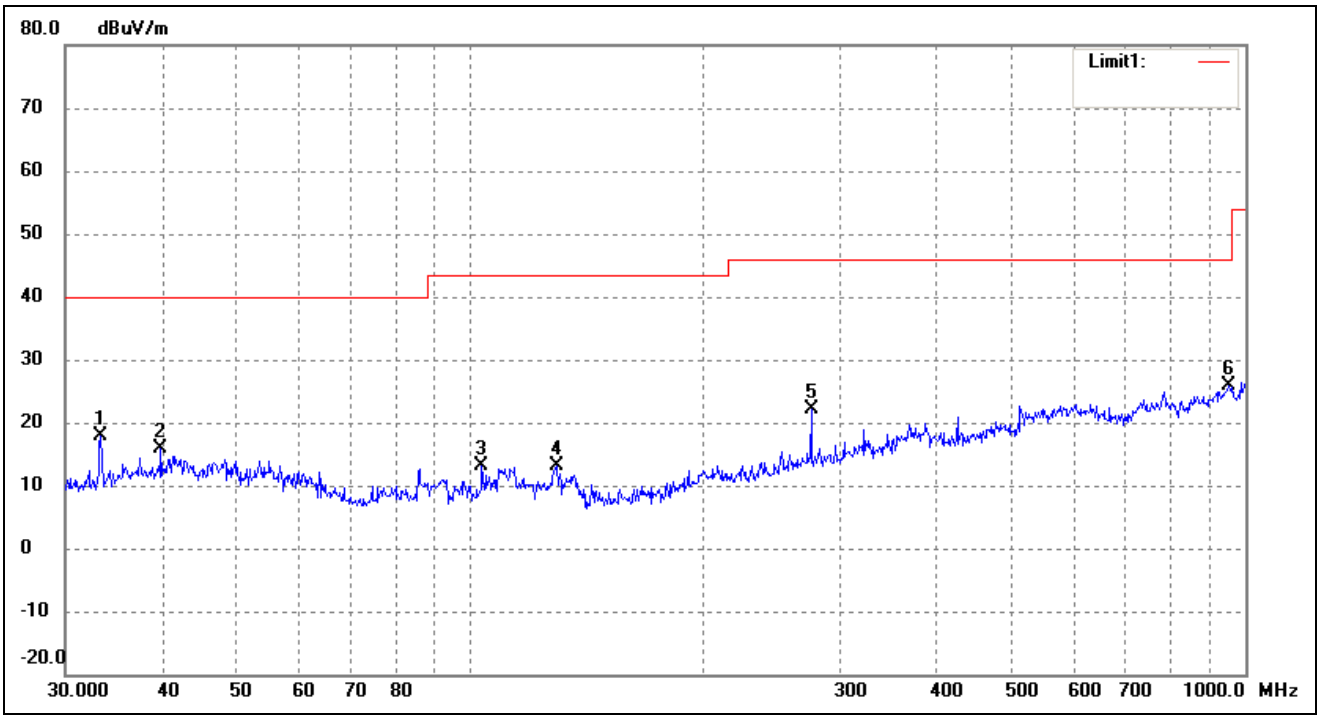
Test mode: Transmitting

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	41.5670	23.08	-7.77	15.31	40.00	-24.69	122	100	peak
2	53.5052	22.40	-8.76	13.64	40.00	-26.36	132	100	peak
3	183.2005	25.03	-10.93	14.10	43.50	-29.40	107	100	peak
4	291.0360	30.10	-5.85	24.25	46.00	-21.75	121	100	peak
5	622.8900	21.22	1.16	22.38	46.00	-23.62	302	100	peak
6	785.0935	22.46	2.65	25.11	46.00	-20.89	99	100	peak

Test Specification: *Vertical*

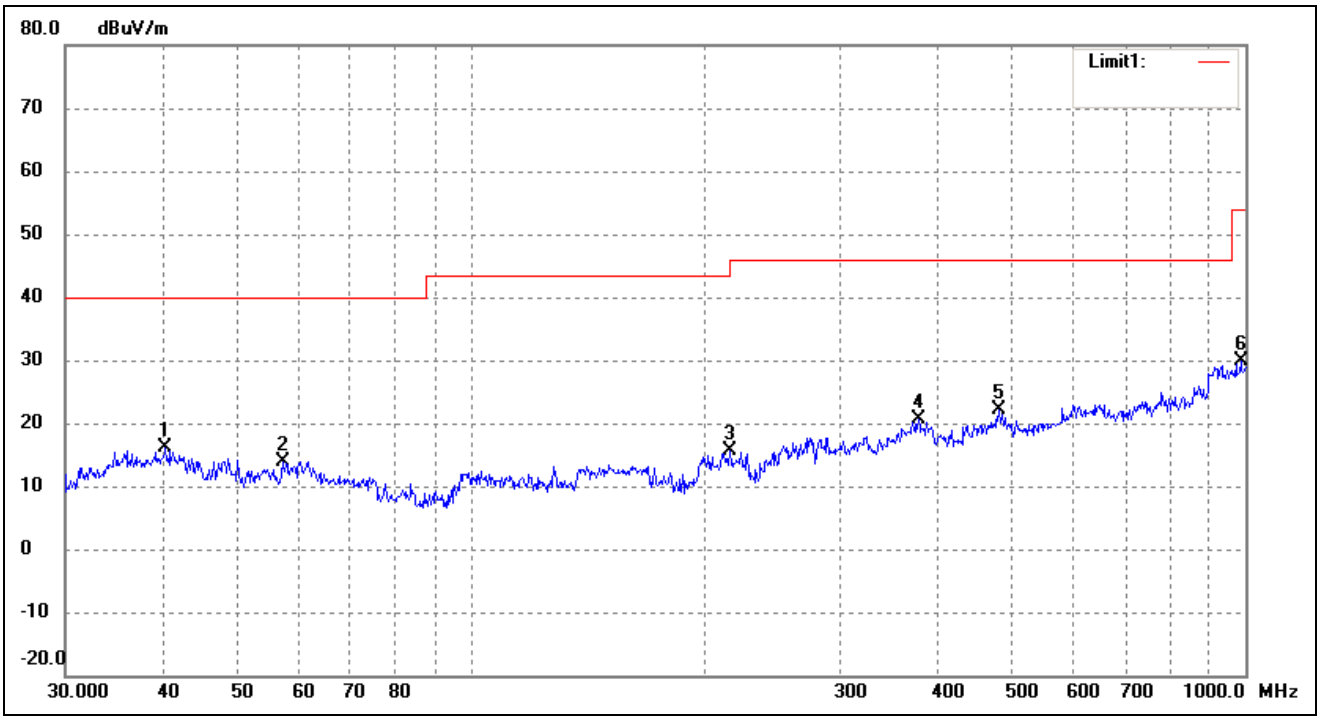


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	33.3279	27.27	-9.46	17.81	40.00	-22.19	55	100	peak
2	39.8542	23.58	-7.71	15.87	40.00	-24.13	106	100	peak
3	103.4421	24.16	-10.99	13.17	43.50	-30.33	128	100	peak
4	129.4678	24.98	-11.97	13.01	43.50	-30.49	127	100	peak
5	275.1570	28.44	-6.30	22.14	46.00	-23.86	275	100	peak
6	952.0937	22.07	3.85	25.92	46.00	-20.08	180	100	peak

For 802.11ac-HT80

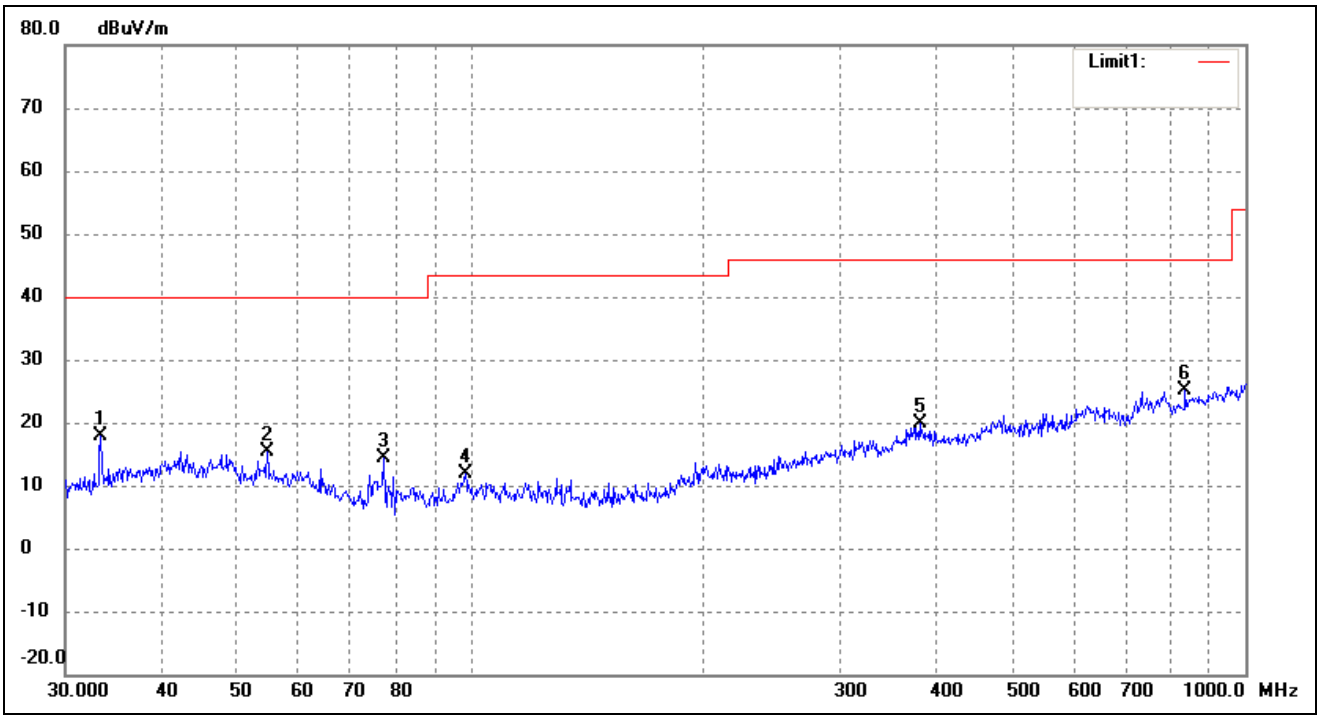
Test mode: Transmitting

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.4172	23.89	-7.70	16.19	40.00	-23.81	165	100	peak
2	57.1914	23.21	-9.22	13.99	40.00	-26.01	90	100	peak
3	216.0240	24.55	-8.81	15.74	46.00	-30.26	80	100	peak
4	378.5843	22.70	-2.17	20.53	46.00	-25.47	150	100	peak
5	480.5276	23.15	-1.08	22.07	46.00	-23.93	164	100	peak
6	986.0717	25.80	4.16	29.96	54.00	-24.04	240	100	peak

Test Specification: *Vertical*



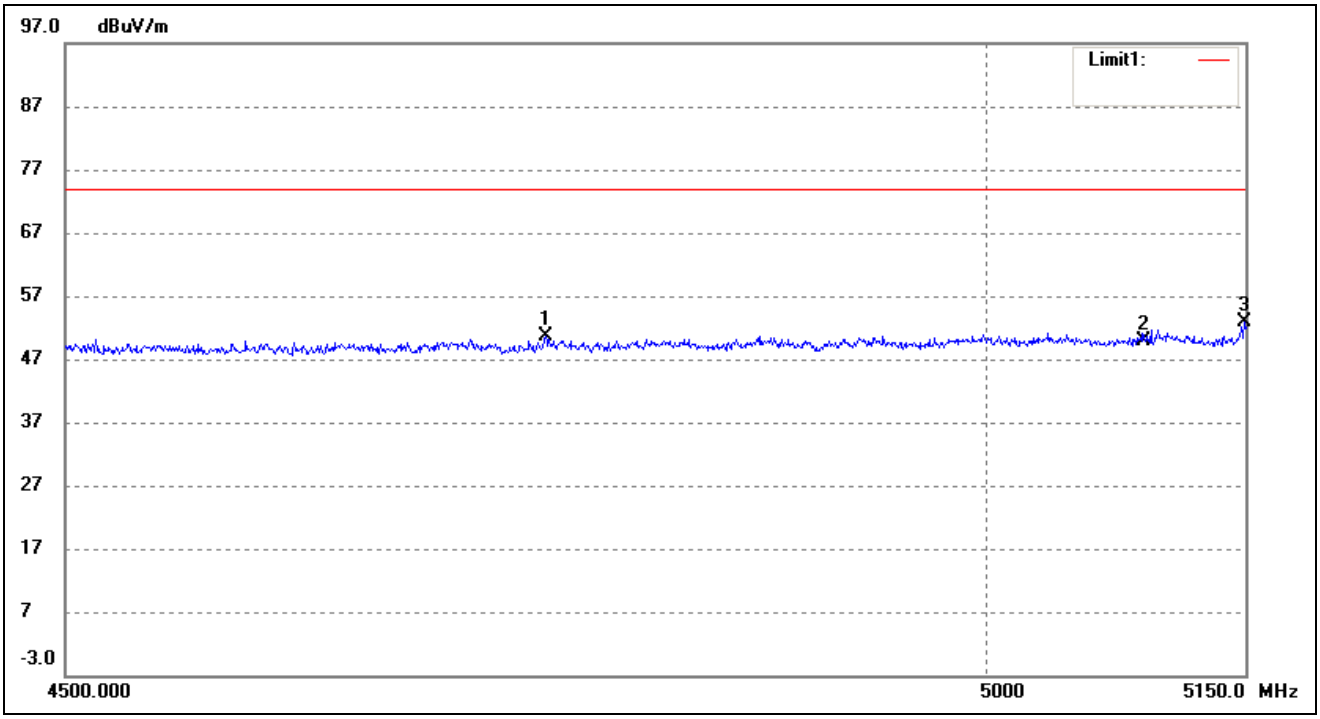
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	33.3279	27.24	-9.46	17.78	40.00	-22.22	192	100	peak
2	54.6429	24.23	-8.91	15.32	40.00	-24.68	140	100	peak
3	77.3212	26.57	-12.21	14.36	40.00	-25.64	59	100	peak
4	98.4866	23.13	-11.21	11.92	43.50	-31.58	311	100	peak
5	379.9141	22.08	-2.11	19.97	46.00	-26.03	315	100	peak
6	836.2443	23.25	1.84	25.09	46.00	-20.91	98	100	peak

For 802.11a

Spurious Emission above 1GHz

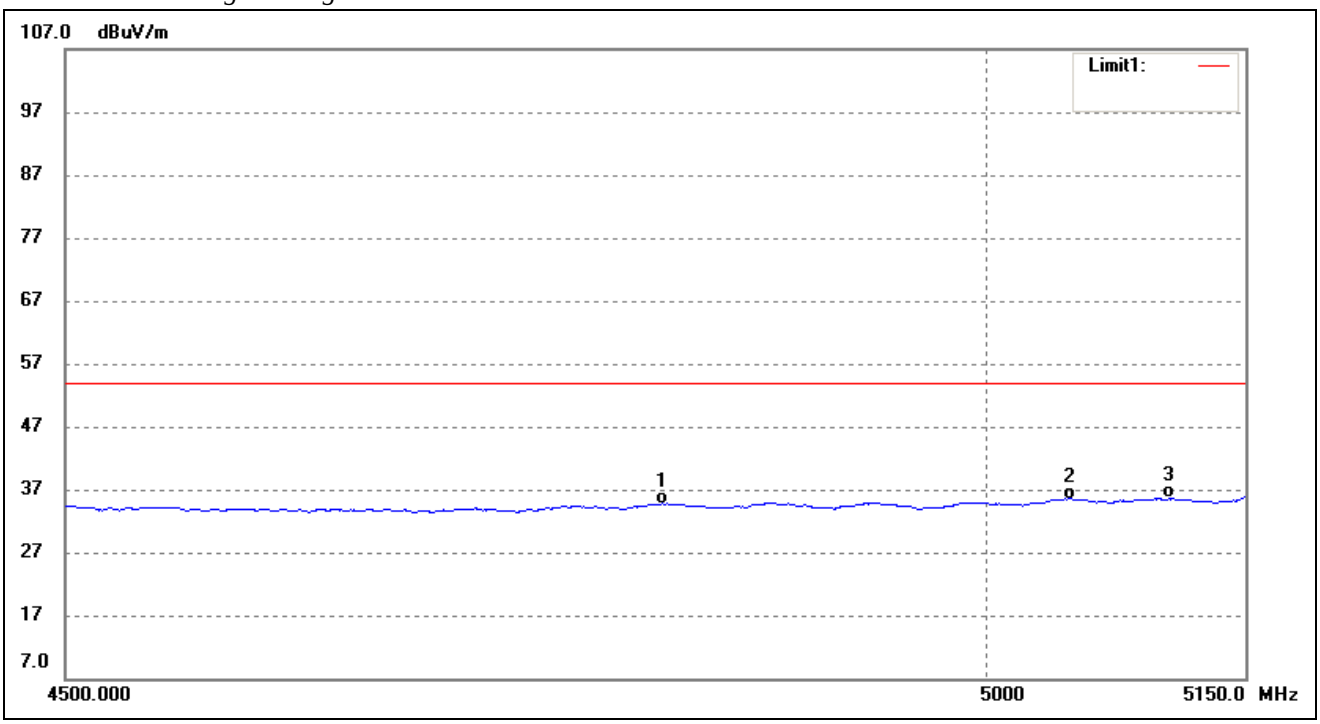
For the frequency band 5.15-5.25GHz(802.11a)

Restricted Bandedge Peak



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4754.015	51.67	-1.12	50.55	74.00	-23.45	212	100	peak
2	5091.276	50.22	-0.27	49.95	74.00	-24.05	92	100	peak
3	5149.305	53.12	-0.13	52.99	74.00	-21.01	241	100	peak

Restricted Bandedge Average



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4817.291	35.55	-0.96	34.59	54.00	-19.41	331	100	AVG
2	5047.503	35.87	-0.37	35.50	54.00	-18.50	99	100	AVG
3	5105.033	35.79	-0.24	35.55	54.00	-18.45	245	100	AVG

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

Hormonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5180MHz)										
15540	PK	48.34	185	V	40.7	10.9	39.6	60.34	74	-13.66
15540	PK	47.42	235	H	40.7	10.9	39.6	59.42	74	-14.58
15540	AV	35.62	119	V	40.7	10.9	39.6	47.62	54	-6.38
15540	AV	36.22	170	H	40.7	10.9	39.6	48.22	54	-5.78
High Channel (5240MHz)										
15720	PK	46.69	285	V	40.7	10.9	39.6	58.69	74	-15.31
15720	PK	45.74	132	H	40.7	10.9	39.6	57.74	74	-16.26
15720	AV	39.98	121	V	40.7	10.9	39.6	51.98	54	-2.02
15720	AV	35.82	206	H	40.7	10.9	39.6	47.82	54	-6.18

Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5150	-41.27	-27
Highest	Above 5350	-43.69	-27
Note: the data just list the worst cases			

For the frequency band 5.725-5.850GHz (802.11a)

Harmonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5745MHz)										
11490	PK	46.52	155	V	38.9	9.8	40.1	55.12	74	-18.88
11490	PK	49.52	171	H	38.9	9.8	40.1	58.12	74	-15.88
11490	AV	36.37	151	V	38.9	9.8	40.1	44.97	54	-9.03
11490	AV	37.64	216	H	38.9	9.8	40.1	46.24	54	-7.76
High Channel (5825MHz)										
11610	PK	49.68	158	V	38.9	9.8	40.1	58.28	74	-15.72
11610	PK	47.6	308	H	38.9	9.8	40.1	56.2	74	-17.8
11610	AV	35.9	285	V	38.9	9.8	40.1	44.5	54	-9.5
11610	AV	38.15	246	H	38.9	9.8	40.1	46.75	54	-7.25

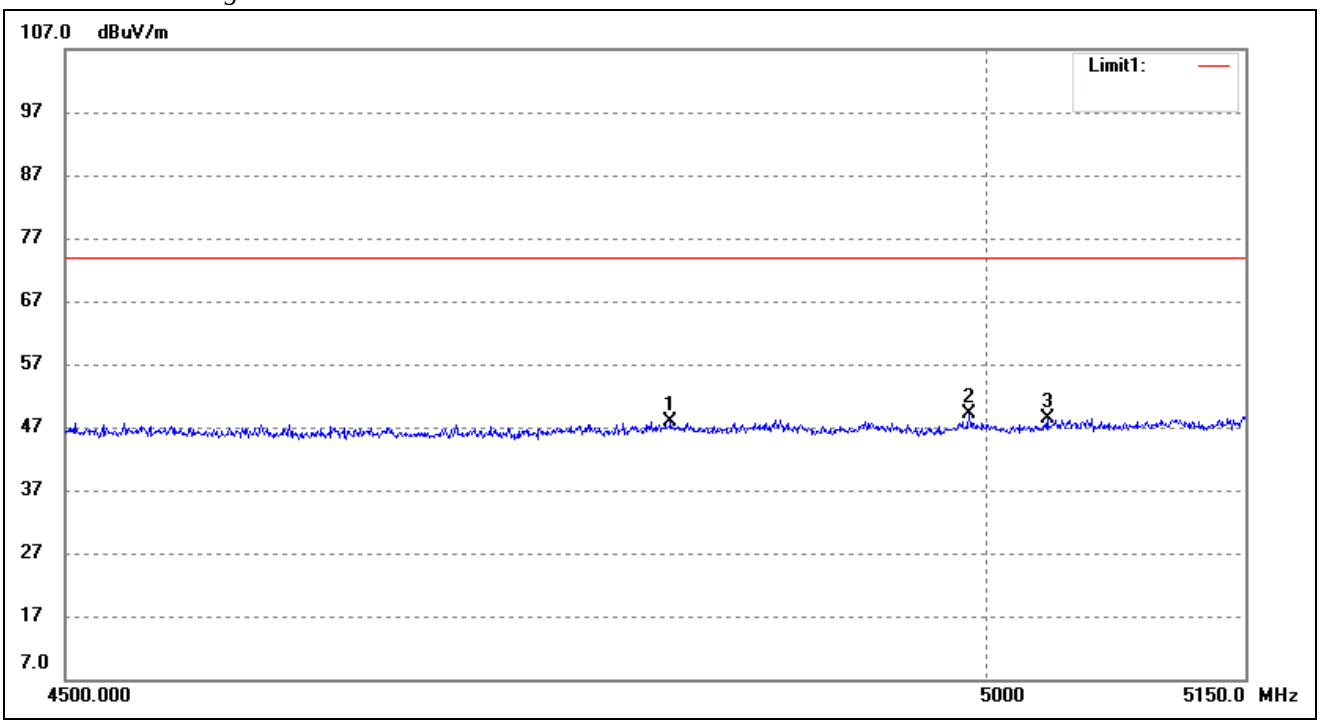
Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5715	-45.69	-27
	5715 to 5725	-43.18	-17
Highest	5850 to 5860	-43.23	-17
	Above 5860	-48.25	-27
Note: the data just list the worst cases			

802.11n HT20

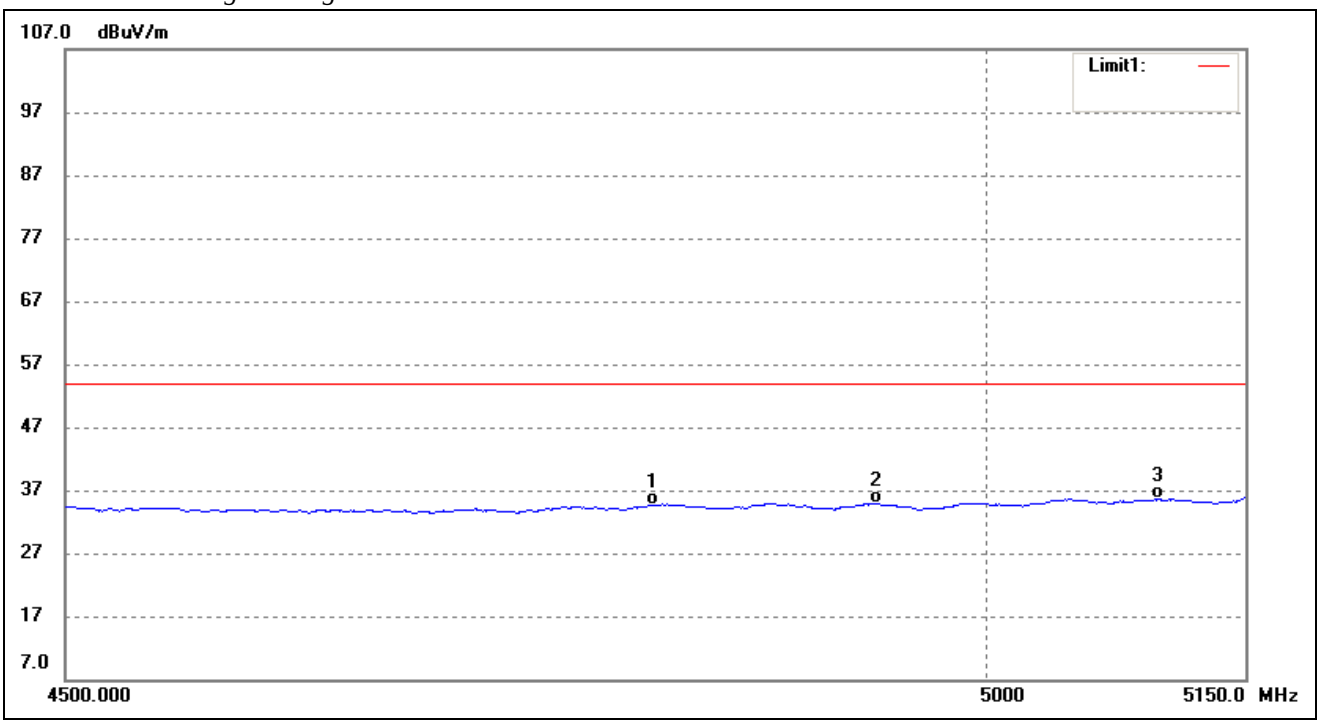
For the frequency band 5.15-5.25GHz(802.11n HT20)

Restricted Bandedge Peak



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4822.493	48.76	-0.94	47.82	74.00	-26.18	208	100	peak
2	4989.949	49.68	-0.51	49.17	74.00	-24.83	304	100	peak
3	5034.581	48.72	-0.40	48.32	74.00	-25.68	83	100	peak

Restricted Bandedge Average



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4812.094	35.55	-0.97	34.58	54.00	-19.42	221	100	AVG
2	4937.045	35.53	-0.65	34.88	54.00	-19.12	317	100	AVG
3	5099.526	35.78	-0.25	35.53	54.00	-18.47	71	100	AVG

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

Hormonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5180MHz)										
15540	PK	48.69	185	V	40.7	10.9	39.6	60.69	74	-13.31
15540	PK	47.38	235	H	40.7	10.9	39.6	59.38	74	-14.62
15540	AV	35.86	119	V	40.7	10.9	39.6	47.86	54	-6.14
15540	AV	35.93	170	H	40.7	10.9	39.6	47.93	54	-6.07
High Channel (5240MHz)										
15720	PK	47.02	285	V	40.7	10.9	39.6	59.02	74	-14.98
15720	PK	46.03	132	H	40.7	10.9	39.6	58.03	74	-15.97
15720	AV	39.82	121	V	40.7	10.9	39.6	51.82	54	-2.18
15720	AV	35.73	206	H	40.7	10.9	39.6	47.73	54	-6.27

Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5150	-45.44	-27
Highest	Above 5350	-43.01	-27
Note: the data just list the worst cases			

For the frequency band 5.725-5.850GHz (802.11n HT20)

Harmonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5725MHz)										
11490	PK	47.62	155	V	38.9	9.8	40.1	56.22	74	-17.78
11490	PK	48.87	171	H	38.9	9.8	40.1	57.47	74	-16.53
11490	AV	36.62	151	V	38.9	9.8	40.1	45.22	54	-8.78
11490	AV	38.51	216	H	38.9	9.8	40.1	47.11	54	-6.89
High Channel (5825MHz)										
11610	PK	49.03	158	V	38.9	9.8	40.1	57.63	74	-16.37
11610	PK	47.89	308	H	38.9	9.8	40.1	56.49	74	-17.51
11610	AV	35.63	285	V	38.9	9.8	40.1	44.23	54	-9.77
11610	AV	38.12	246	H	38.9	9.8	40.1	46.72	54	-7.28

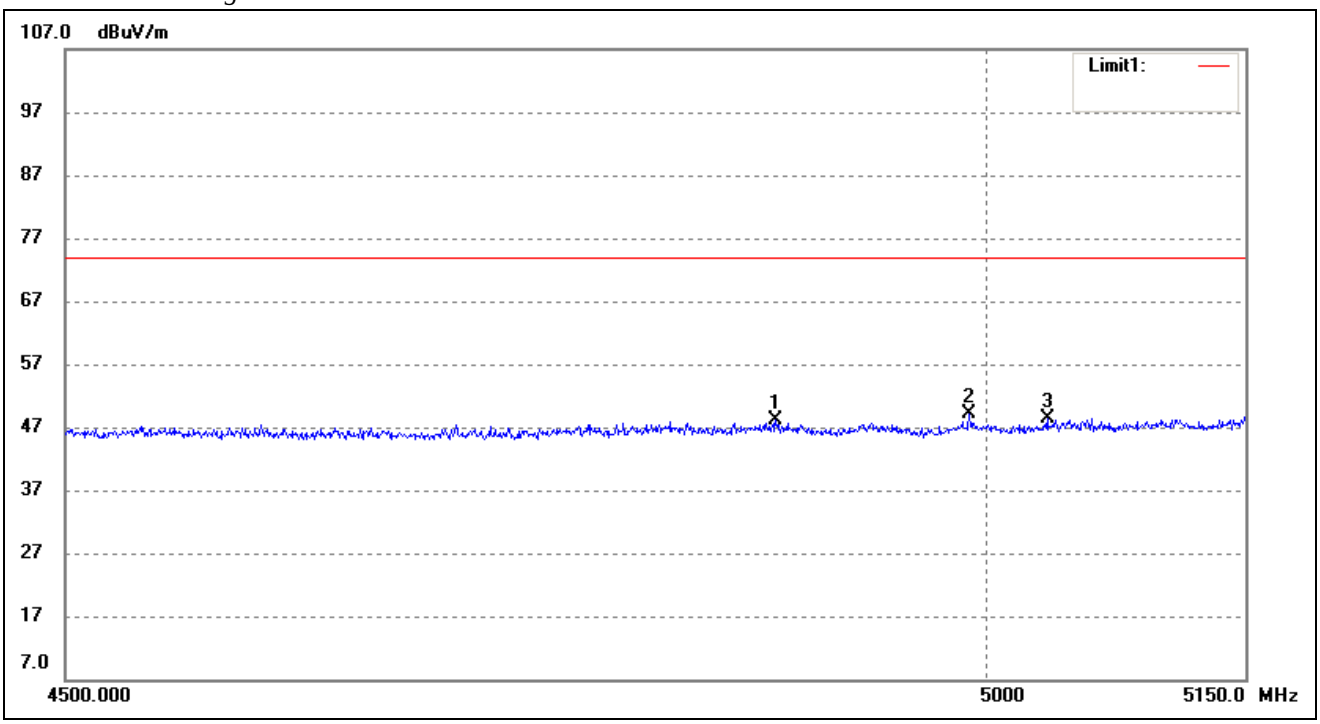
Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5715	-47.15	-27
	5715 to 5725	-43.16	-17
Highest	5850 to 5860	-44.02	-17
	Above 5860	-49.01	-27
Note: the data just list the worst cases			

802.11n HT40

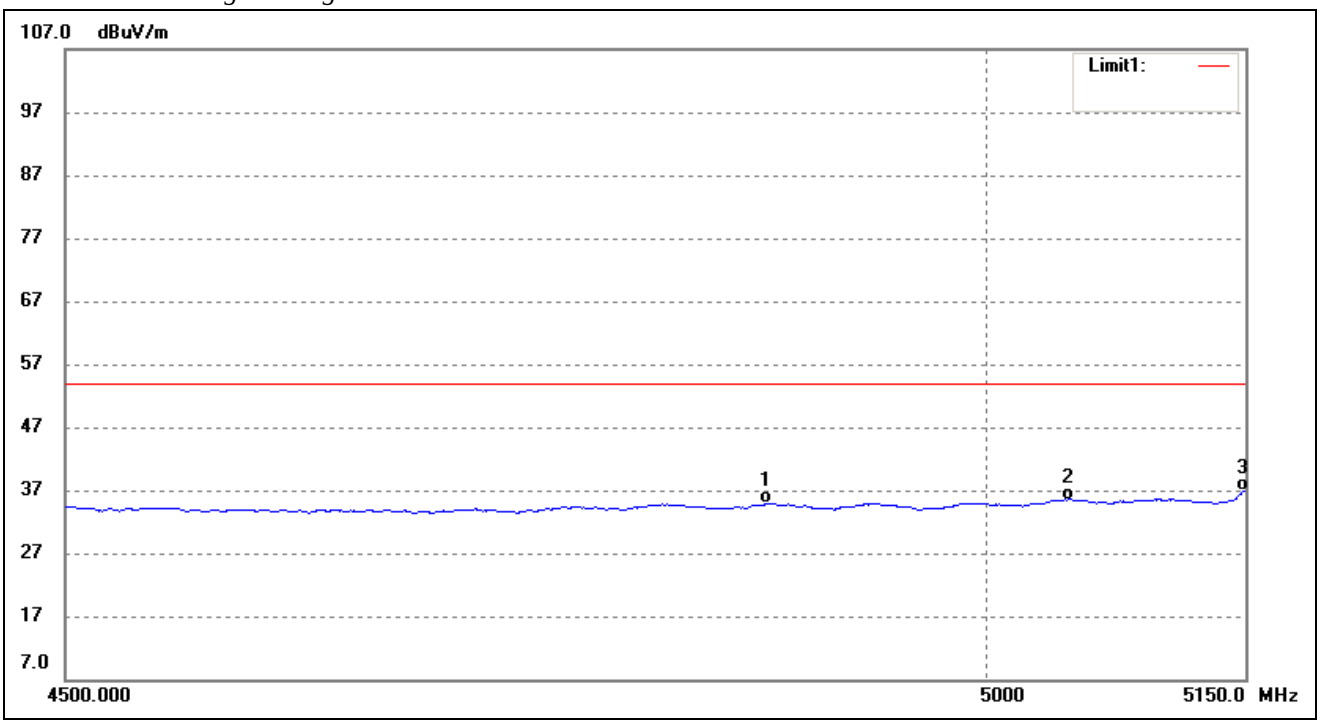
For the frequency band 5.15-5.25GHz(802.11n HT40)

Restricted Bandedge Peak



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4880.750	48.84	-0.80	48.04	74.00	-25.96	110	100	peak
2	4989.949	49.68	-0.51	49.17	74.00	-24.83	138	100	peak
3	5034.581	48.72	-0.40	48.32	74.00	-25.68	119	100	peak

Restricted Bandedge Average



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4875.484	35.57	-0.81	34.76	54.00	-19.24	58	100	AVG
2	5046.822	35.87	-0.37	35.50	54.00	-18.50	174	100	AVG
3	5149.305	37.09	-0.13	36.96	54.00	-17.04	130	100	AVG

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

Hormonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5190MHz)										
15570	PK	48.95	185	V	40.7	10.9	39.6	60.95	74	-13.05
15570	PK	47.56	235	H	40.7	10.9	39.6	59.56	74	-14.44
15570	AV	36.03	119	V	40.7	10.9	39.6	48.03	54	-5.97
15570	AV	35.88	170	H	40.7	10.9	39.6	47.88	54	-6.12
High Channel (5230MHz)										
15690	PK	47.82	285	V	40.7	10.9	39.6	59.82	74	-14.18
15690	PK	46.33	132	H	40.7	10.9	39.6	58.33	74	-15.67
15690	AV	38.66	121	V	40.7	10.9	39.6	50.66	54	-3.34
15690	AV	35.67	206	H	40.7	10.9	39.6	47.67	54	-6.33

Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5150	-44.92	-27
Highest	Above 5350	-44.90	-27
Note: the data just list the worst cases			

For the frequency band 5.725-5.850GHz (802.11n HT40)

Harmonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (5755MHz)										
11510	PK	47.62	155	V	38.9	9.8	40.1	56.22	74	-17.78
11510	PK	48.33	171	H	38.9	9.8	40.1	56.93	74	-17.07
11510	AV	36.91	151	V	38.9	9.8	40.1	45.51	54	-8.49
11510	AV	38.67	216	H	38.9	9.8	40.1	47.27	54	-6.73
High Channel (5795MHz)										
11590	PK	49.03	158	V	38.9	9.8	40.1	57.63	74	-16.37
11590	PK	47.89	308	H	38.9	9.8	40.1	56.49	74	-17.51
11590	AV	35.63	285	V	38.9	9.8	40.1	44.23	54	-9.77
11590	AV	38.12	246	H	38.9	9.8	40.1	46.72	54	-7.28

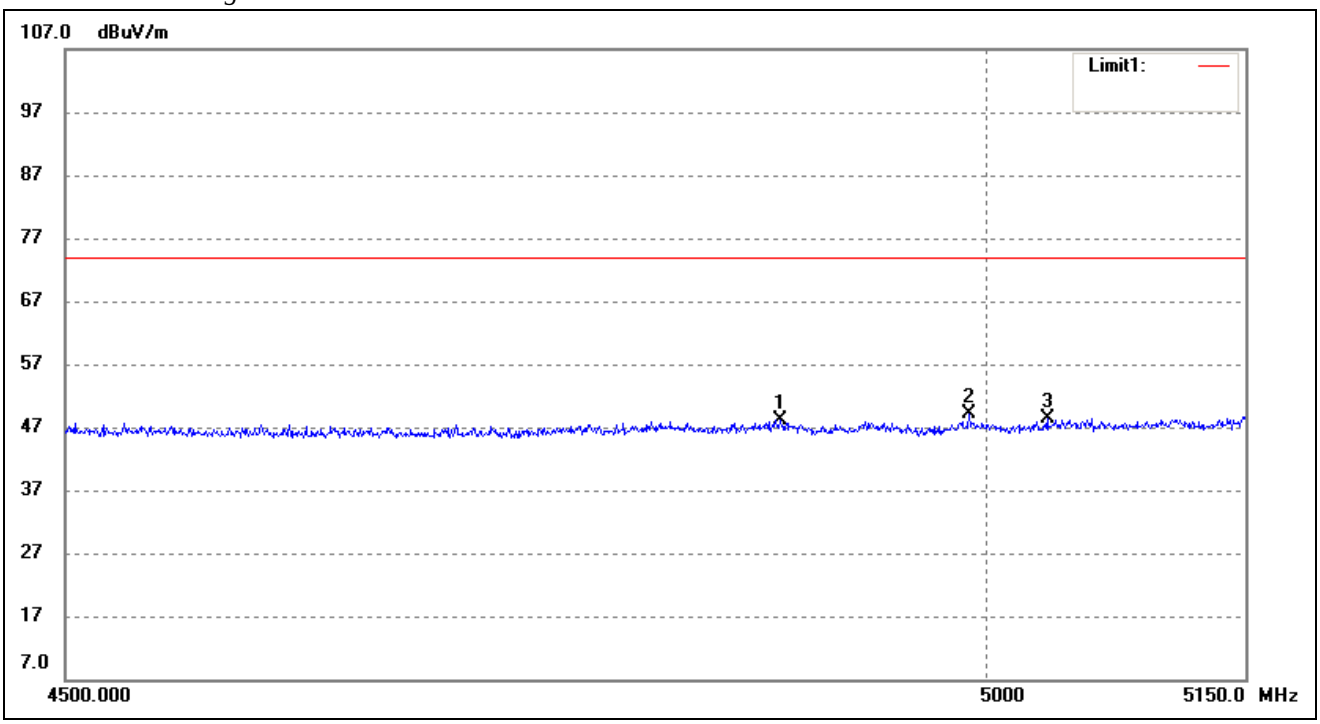
Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5715	-47.51	-27
	5715 to 5725	-43.96	-17
Highest	5850 to 5860	-44.92	-17
	Above 5860	-49.08	-27
Note: the data just list the worst cases			

802.11ac-HT80

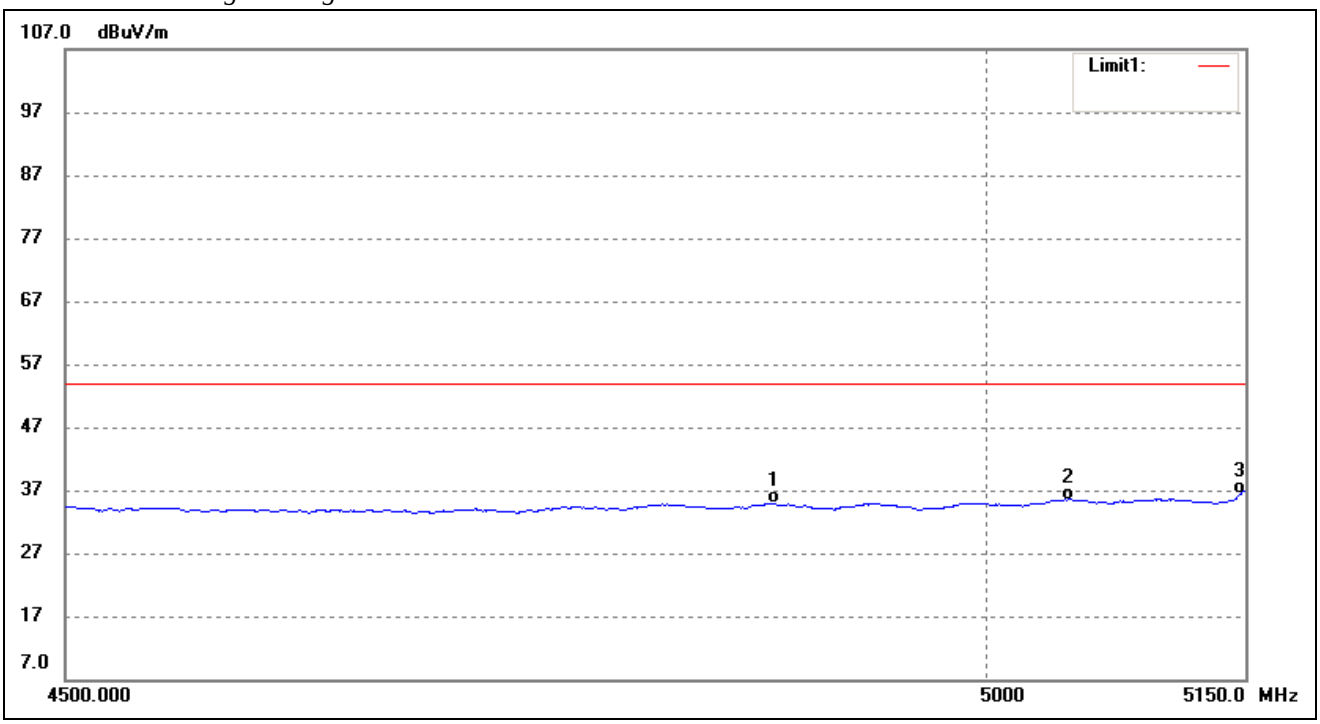
For the frequency band 5.15-5.25GHz(802.11ac-HT80)

Restricted Bandedge Peak



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4883.384	48.85	-0.78	48.07	74.00	-25.93	160	100	peak
2	4989.949	49.68	-0.51	49.17	74.00	-24.83	152	100	peak
3	5034.581	48.72	-0.40	48.32	74.00	-25.68	76	100	peak

Restricted Bandedge Average



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4880.091	35.58	-0.80	34.78	54.00	-19.22	170	100	AVG
2	5046.822	35.87	-0.37	35.50	54.00	-18.50	110	100	AVG
3	5146.527	36.40	-0.14	36.26	54.00	-17.74	98	100	AVG

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

Hormonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Channel (5210MHz)										
15630	PK	48.62	185	V	40.7	10.9	39.6	60.62	74	-13.38
15630	PK	47.23	235	H	40.7	10.9	39.6	59.23	74	-14.77
15630	AV	36.36	119	V	40.7	10.9	39.6	48.36	54	-5.64
15630	AV	35.92	170	H	40.7	10.9	39.6	47.92	54	-6.08

Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5150	-45.81	-27
Highest	Above 5350	-44.07	-27
Note: the data just list the worst cases			

For the frequency band 5.725-5.850GHz (802.11ac-HT80)

Harmonics And Spurious Emissions

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Channel (5775MHz)										
11550	PK	47.06	155	V	38.9	9.8	40.1	55.66	74	-18.34
11550	PK	48.07	171	H	38.9	9.8	40.1	56.67	74	-17.33
11550	AV	37.02	151	V	38.9	9.8	40.1	45.62	54	-8.38
11550	AV	38.31	216	H	38.9	9.8	40.1	46.91	54	-7.09

Out of Band edge

Test CH.	**Test Segment**	**Result**	**Limit**
	MHz	**dBm/MHz**	**dBm/MHz**
Lowest	Below 5715	-48.01	-27
	5715 to 5725	-45.12	-17
Highest	5850 to 5860	-46.29	-17
	Above 5860	-47.81	-27
Note: the data just list the worst cases			

Note: Testing is carried out with frequency rang 9kHz to 40GHz, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz.

12. Frequency Stability

12.1 Standard Applicable

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.

12.2 Test Procedure

According to §2.1055, the following test procedure was performed.
The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.
The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

Temperature:	Supply Voltage
20°C	DC 6.3-8.2 of declared nominal voltage
-30°C to +50°C	Normal

12.3 Environmental Conditions

Temperature:	20°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

12.4 Summary of Test Results/Plots

Antenna A:

5150-5250MHz

802.11a

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	177	0.0340
40	7.4	185	0.0356
30	7.4	132	0.0254
20	7.4	132	0.0254
10	7.4	155	0.0298
0	7.4	137	0.0263
-10	7.4	153	0.0294
-20	7.4	179	0.0344
-30	7.4	144	0.0277

802.11n_HT20

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	156	0.0300
40	7.4	151	0.0290
30	7.4	106	0.0204
20	7.4	105	0.0202
10	7.4	130	0.0250
0	7.4	142	0.0273
-10	7.4	157	0.0302
-20	7.4	86	0.0165
-30	7.4	115	0.0221

802.11n_HT40

Reference Frequency(Middle Channel): 5190 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	153	0.0295
40	7.4	159	0.0306
30	7.4	113	0.0218
20	7.4	117	0.0225
10	7.4	133	0.0256
0	7.4	148	0.0285
-10	7.4	157	0.0303
-20	7.4	89	0.0171
-30	7.4	111	0.0214

802.11ac

Reference Frequency(Middle Channel): 5210 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	151	0.0290
40	7.4	169	0.0324
30	7.4	132	0.0253
20	7.4	119	0.0228
10	7.4	138	0.0265
0	7.4	147	0.0282
-10	7.4	157	0.0301
-20	7.4	113	0.0217
-30	7.4	117	0.0225

5725-5850MHz

802.11a

Reference Frequency(Middle Channel): 5785MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	146	0.0252
40	7.4	122	0.0211
30	7.4	95	0.0164
20	7.4	125	0.0216
10	7.4	181	0.0313
0	7.4	147	0.0254
-10	7.4	164	0.0283
-20	7.4	103	0.0178
-30	7.4	128	0.0221

802.11n_HT20

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	162	0.0280
40	7.4	150	0.0259
30	7.4	152	0.0263
20	7.4	142	0.0245
10	7.4	118	0.0204
0	7.4	108	0.0187
-10	7.4	161	0.0278
-20	7.4	102	0.0176
-30	7.4	178	0.0308

802.11n_HT40

Reference Frequency(Middle Channel): 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	168	0.0292
40	7.4	126	0.0219
30	7.4	111	0.0193
20	7.4	125	0.0217
10	7.4	181	0.0315
0	7.4	149	0.0259
-10	7.4	137	0.0238
-20	7.4	182	0.0316
-30	7.4	133	0.0231

802.11ac

Reference Frequency(Middle Channel): 5775MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	169	0.0293
40	7.4	138	0.0239
30	7.4	117	0.0203
20	7.4	128	0.0222
10	7.4	181	0.0313
0	7.4	151	0.0261
-10	7.4	132	0.0229
-20	7.4	185	0.0320
-30	7.4	124	0.0215

So, Frequency Stability Versus Input Voltage is:

Antenna A:

5150-5250MHz

802.11a

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	135	0.0260
	7.4	132	0.0254
	8.2	138	0.0265

802.11n_HT20

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	139	0.0267
	7.4	132	0.0254
	8.2	141	0.0271

802.11n_HT40

Reference Frequency(Middle Channel): 5190 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	118	0.0227
	7.4	117	0.0225
	8.2	126	0.0243

802.11ac

Reference Frequency(Middle Channel): 5210 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	126	0.0242
	7.4	119	0.0228
	8.2	123	0.0236

5725-5850MHz

802.11a

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	134	0.0232
	7.4	125	0.0216
	8.2	132	0.0228

802.11n_HT20

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	150	0.0259
	7.4	142	0.0245
	8.2	150	0.0259

802.11n_HT40

Reference Frequency(Middle Channel): 5755 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	124	0.0215
	7.4	125	0.0217
	8.2	126	0.0219

802.11ac

Reference Frequency(Middle Channel): 5775 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	139	0.0241
	7.4	125	0.0216
	8.2	131	0.0227

Antenna B:

5150-5250MHz

802.11a

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	177	0.0340
40	7.4	185	0.0355
30	7.4	132	0.0253
20	7.4	132	0.0253
10	7.4	155	0.0298
0	7.4	137	0.0263
-10	7.4	153	0.0294
-20	7.4	179	0.0344
-30	7.4	144	0.0276

802.11n_HT20

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	156	0.0299
40	7.4	151	0.0290
30	7.4	106	0.0203
20	7.4	105	0.0202
10	7.4	130	0.0250
0	7.4	142	0.0273
-10	7.4	157	0.0301
-20	7.4	86	0.0165
-30	7.4	115	0.0221

802.11n_HT40

Reference Frequency(Middle Channel): 5190 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	159	0.0306
40	7.4	153	0.0295
30	7.4	108	0.0208
20	7.4	104	0.0200
10	7.4	136	0.0262
0	7.4	141	0.0272
-10	7.4	159	0.0306
-20	7.4	93	0.0179
-30	7.4	117	0.0225

802.11ac

Reference Frequency(Middle Channel): 5210 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	159	0.0305
40	7.4	152	0.0292
30	7.4	113	0.0217
20	7.4	102	0.0196
10	7.4	131	0.0251
0	7.4	144	0.0276
-10	7.4	158	0.0303
-20	7.4	119	0.0228
-30	7.4	111	0.0213

5725-5850MHz

802.11a

Reference Frequency(Middle Channel): 5785MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	146	0.0252
40	7.4	122	0.0211
30	7.4	95	0.0164
20	7.4	125	0.0216
10	7.4	181	0.0313
0	7.4	147	0.0254
-10	7.4	164	0.0283
-20	7.4	103	0.0178
-30	7.4	128	0.0221

802.11n_HT20

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	162	0.0280
40	7.4	150	0.0259
30	7.4	152	0.0263
20	7.4	142	0.0245
10	7.4	118	0.0204
0	7.4	108	0.0187
-10	7.4	161	0.0278
-20	7.4	102	0.0176
-30	7.4	178	0.0308

802.11 n_HT40

Reference Frequency(Middle Channel): 5755MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	149	0.0259
40	7.4	123	0.0214
30	7.4	102	0.0177
20	7.4	127	0.0221
10	7.4	180	0.0313
0	7.4	143	0.0248
-10	7.4	165	0.0287
-20	7.4	102	0.0177
-30	7.4	127	0.0221

802.11ac

Reference Frequency(Middle Channel): 5775MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	7.4	145	0.0251
40	7.4	129	0.0223
30	7.4	123	0.0213
20	7.4	168	0.0291
10	7.4	172	0.0298
0	7.4	143	0.0248
-10	7.4	164	0.0284
-20	7.4	99	0.0171
-30	7.4	128	0.0222

So, Frequency Stability Versus Input Voltage is:

Antenna B:

5150-5250MHz

802.11a

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	135	0.0260
	7.4	132	0.0254
	8.2	138	0.0265

802.11n_HT20

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	119	0.0229
	7.4	105	0.0202
	8.2	111	0.0213

802.11n_HT40

Reference Frequency(Middle Channel): 5190 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	108	0.0208
	7.4	104	0.0200
	8.2	105	0.0202

802.11ac

Reference Frequency(Middle Channel): 5210 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	116	0.0223
	7.4	102	0.0196
	8.2	117	0.0225

5725-5850MHz

802.11a

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	124	0.0214
	7.4	125	0.0216
	8.2	132	0.0228

802.11n_HT20

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	150	0.0259
	7.4	142	0.0245
	8.2	150	0.0259

802.11n_HT40

Reference Frequency(Middle Channel): 5755 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	127	0.0221
	7.4	127	0.0221
	8.2	133	0.0231

802.11ac

Reference Frequency(Middle Channel): 5775 MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	6.3	163	0.0282
	7.4	168	0.0291
	8.2	169	0.0293

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