FCC Part 15E
Measurement and Test Report

For

Hui Zhou Gaoshengda Technology Co.,LTD

NO.75 Zhongkai Development Area, Huizhou, Guangdong, China

FCC ID: 2AC23- WC0FR2601

FCC Rule(s):	FCC Part 15E	
Product Description:	WIFI Module	
Tested Model:	WC0FR2601	
Report No.:	FCC-ATL20161118887-2	
Issued Date:	2016-11-23	
Tested By:	Si feifei / Engineer	Sifeifei
Reviewed By:	Xie Lingling / EMC Manager	XieLingling
Approved & Authorized By:	Xu Peng / PSQ Manager	Xu Peng
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of applicant:	NO.75 Zhongkai Development Area, Huizhou, Guangdong, China
Manufacturer:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of manufacturer:	NO.75 Zhongkai Development Area, Huizhou, Guangdong, China

General Description of EUT	
Product Name:	WIFI Module
Trade Name:	GSD
Model No.:	WC0FR2601
Adding Model(s):	/
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Wi-Fi(5G)	
Support Standards:	802.11a, 802.11n (20MHz,40MHz,80MHz)
Frequency Range:	5180-5240MHz, 5745-5825MHz
RF Output Power:	15.08 dBm (Conducted)
Type of Modulation:	64QAM, 16QAM, QPSK, BPSK
Data Rate:	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to MCS7
Quantity of Channels:	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz), 1 for2 for 802.11n (80MHz) 5745 ~ 5805MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz),1 for2 for 802.11n (80MHz)
Channel Separation:	20MHz/40MHz/80MHz
Type of Antenna:	PIFA Antenna
Antenna Gain:	Antenna 1:3dBi, Antenna 2: 3dBi

1.2 Test Standards

The following report is prepared on behalf of the Hui Zhou Gaoshengda Technology Co.,LTD in accordance with FCC Part 15, Subpart C, 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, 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 v01 for Unlicensed National Information Infrastructure (U-NII) Devices and KDB 662911 D01 Multiple Transmitter Output v02r01 shall be performed also.

1.4 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, 5745 MHz,5785 MHz,5825 MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz, 5745MHz,5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5755 MHz,5795 MHz
TM4	802.11n-HT80	5210 MHz,5755 MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Core
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
DC Cable	1.0	Unshielded	Without Core

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.5 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

1.6 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2016-06-04	2017-06-03
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2016-06-04	2017-06-03
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2016-06-04	2017-06-03
Amplifier	Agilent	8447F	3113A06717	2016-06-04	2017-06-03
Amplifier	C&D	PAP-1G18	2002	2016-06-04	2017-06-03
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2016-06-04	2017-06-03
Horn Antenna	ETS	3117	00086197	2016-06-04	2017-06-03
Horn Antenna	ETS	3116B	00088203	2016-06-04	2017-06-03
Loop Antenna	Schwarz beck	FMZB 1516	9773	2016-06-04	2017-06-03
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2016-06-04	2017-06-03
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2016-06-04	2017-06-03
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2016-06-04	2017-06-03
Power Meter	R&S	NRVS	100444	2016-06-18	2017-06-17

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 RF Exposure 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. Power Spectral Density

5.1 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.

5.2 Test Procedure

According to 789033 D02 v01 section F, 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.

5.3 Environmental Conditions

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

5.4 Summary of Test Results/Plots

802.11a

5180-5240:

Channel	Channel frequency(MHz)	Chain 1 dBm/MHz	Chain 2 dBm/MHz	Total dBm/MHz	Limit (dBm/MHz)
36	5180	5.335	4.863	8.12	11
40	5200	5.615	5.665	8.65	11
48	5240	4.686	4.059	7.40	11

5745-5825:

Channel	Channel frequency(MHz)	Chain 1 dBm/500KHz	Chain 2 dBm/500KHz	Total dBm/500KHz	Limit (dBm/500KHz)
149	5745	-3.014	-2.107	0.49	30
157	5785	-2.833	-2.219	0.49	30
165	5825	-2.036	-3.574	0.25	30

802.11n20

5180-5240:

Channel	Channel frequency(MHz)	Chain 1 dBm/MHz	Chain 2 dBm/MHz	Total dBm/MHz	Limit (dBm/MHz)
36	5180	5.004	5.824	8.44	11
40	5200	5.051	4.975	8.02	11
48	5240	4.158	4.126	7.15	11

5745-5825:

Channel	Channel frequency(MHz)	Chain 1 dBm/500KHz	Chain 2 dBm/500KHz	Total dBm/500KHz	Limit (dBm/500KHz)
149	5745	-2.595	-3.865	-0.18	30
157	5785	-2.037	-3.305	0.37	30
165	5825	-1.761	-1.767	1.24	30

802.11n40

5180-5240:

Channel	Channel frequency(MHz)	Chain 1 dBm/MHz	Chain 2 dBm/MHz	Total dBm/MHz	Limit (dBm/MHz)
38	5190	4.998	4.489	7.76	11
46	5230	5.394	3.969	7.75	11

5745-5825:

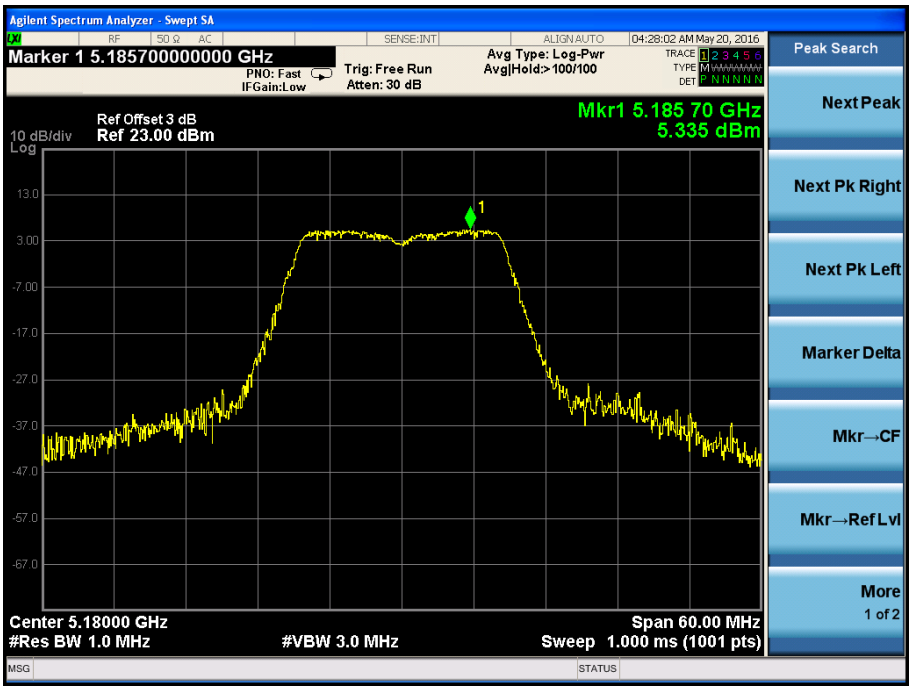
Channel	Channel frequency(MHz)	Chain 1 dBm/500KHz	Chain 2 dBm/500KHz	Total dBm/500KHz	Limit (dBm/500KHz)
151	5755	-7.667	-8.471	-5.09	30
159	5795	-7.895	-8.789	-5.38	30

Note: 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.

Antenna 1

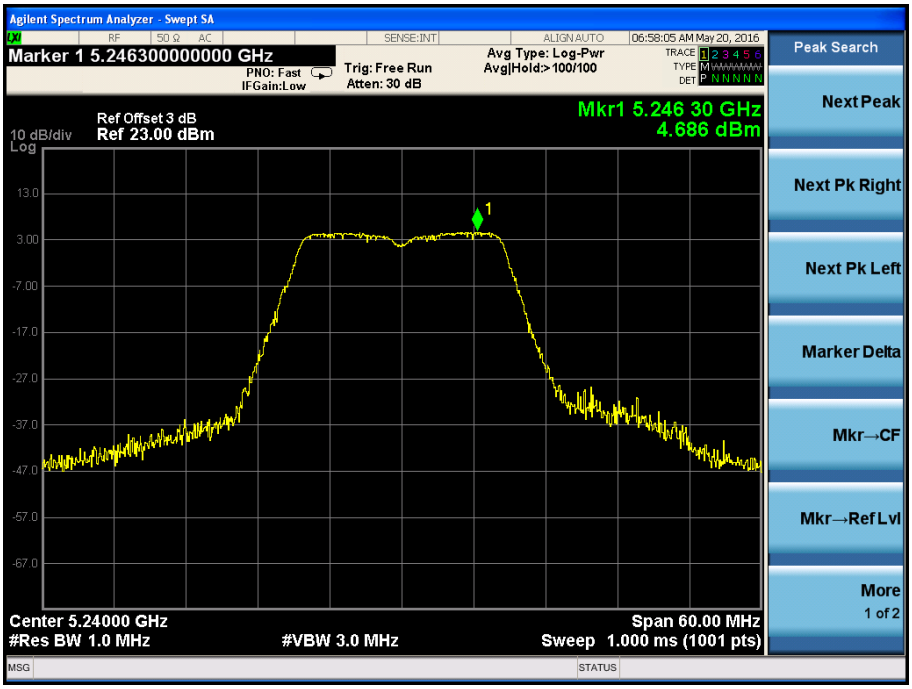
Test Mode: 802.11a

5180MHz

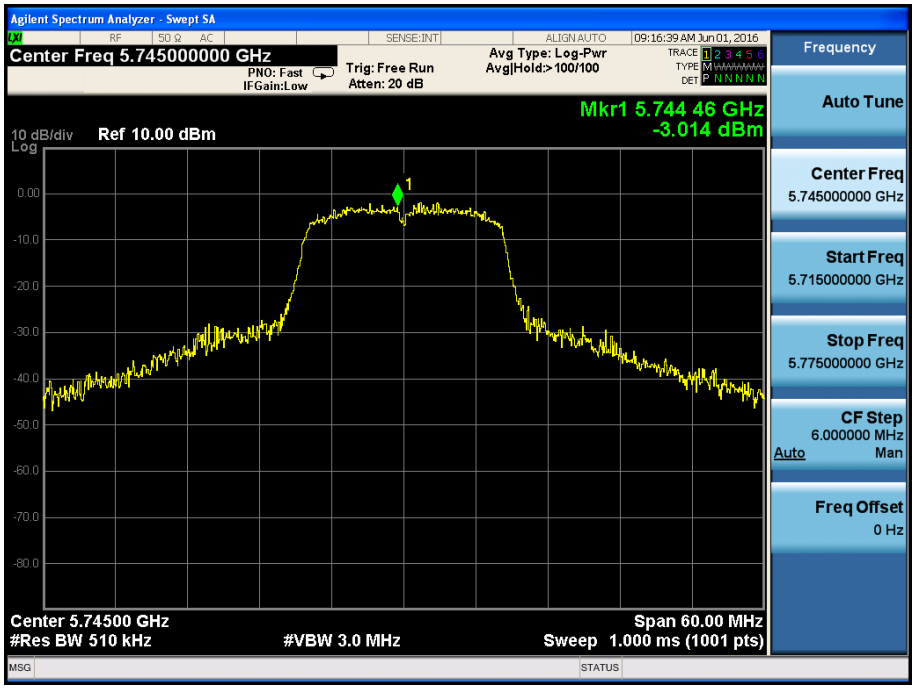


5200MHz

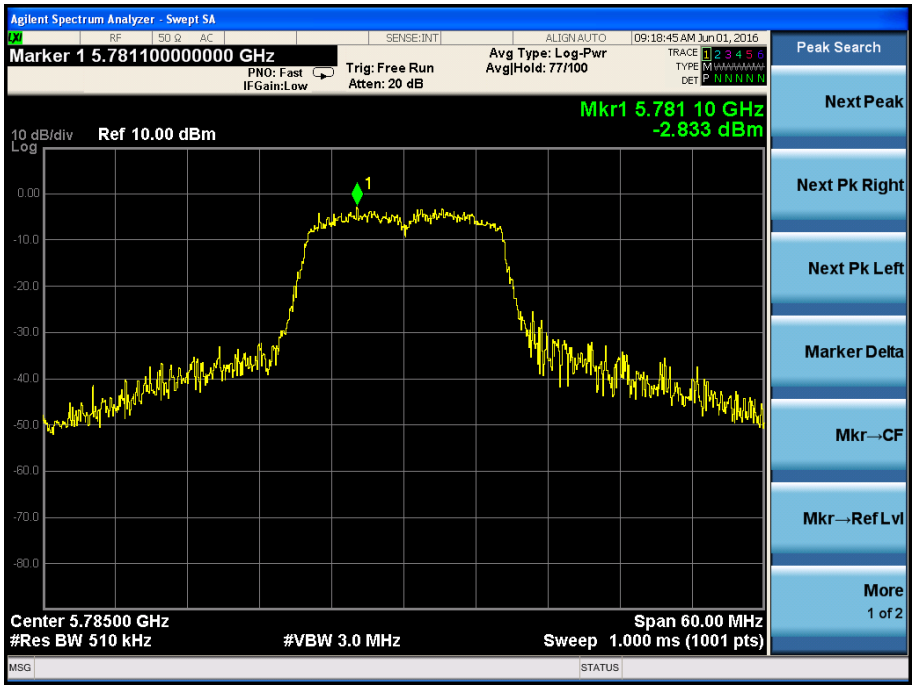
5240MHz



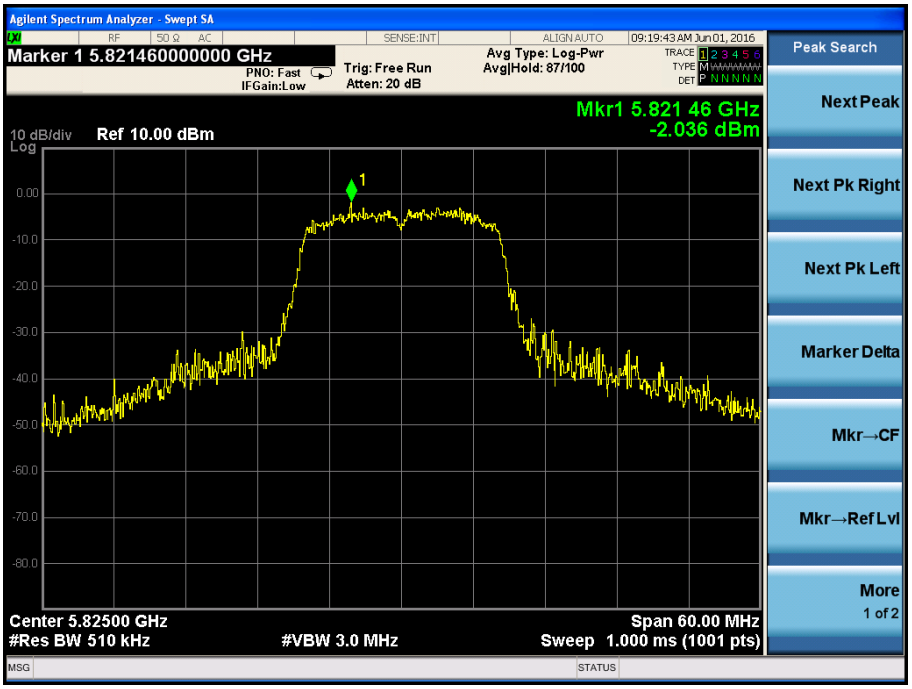
5745MHz



5785MHz

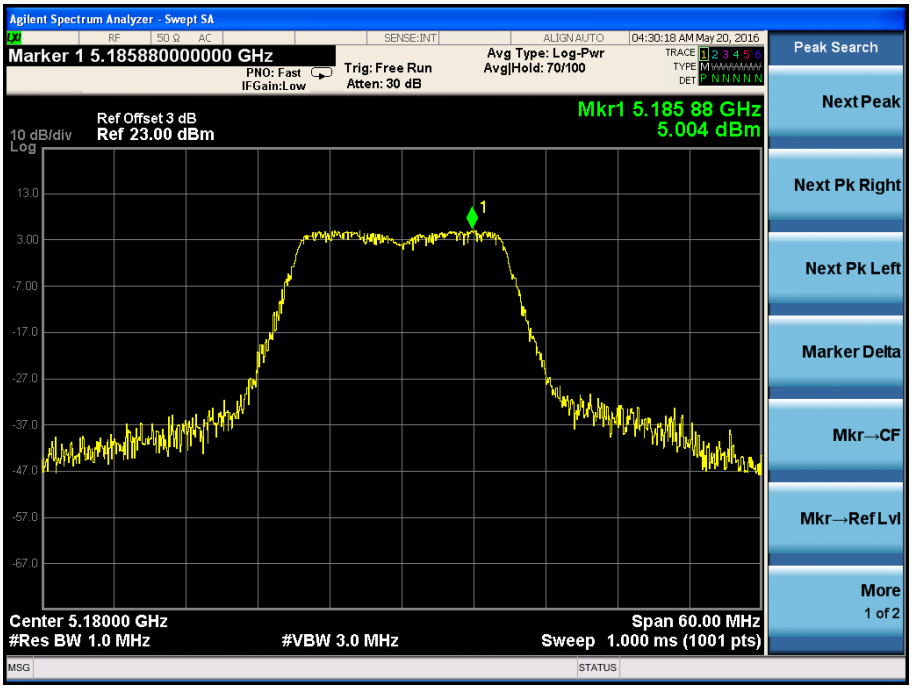


5825MHz

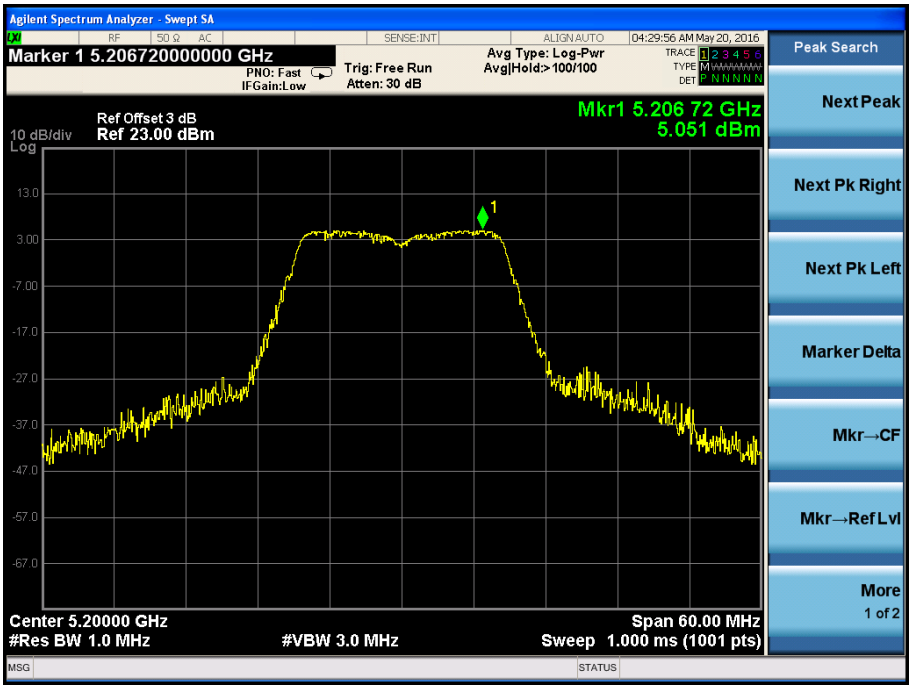


Test Mode: 802.11n20

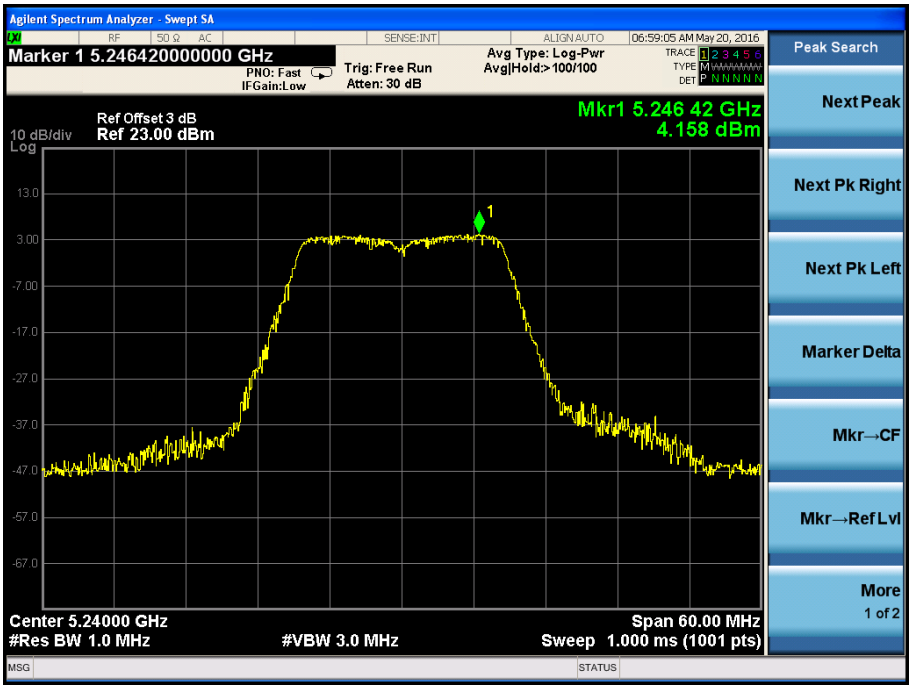
5180MHz



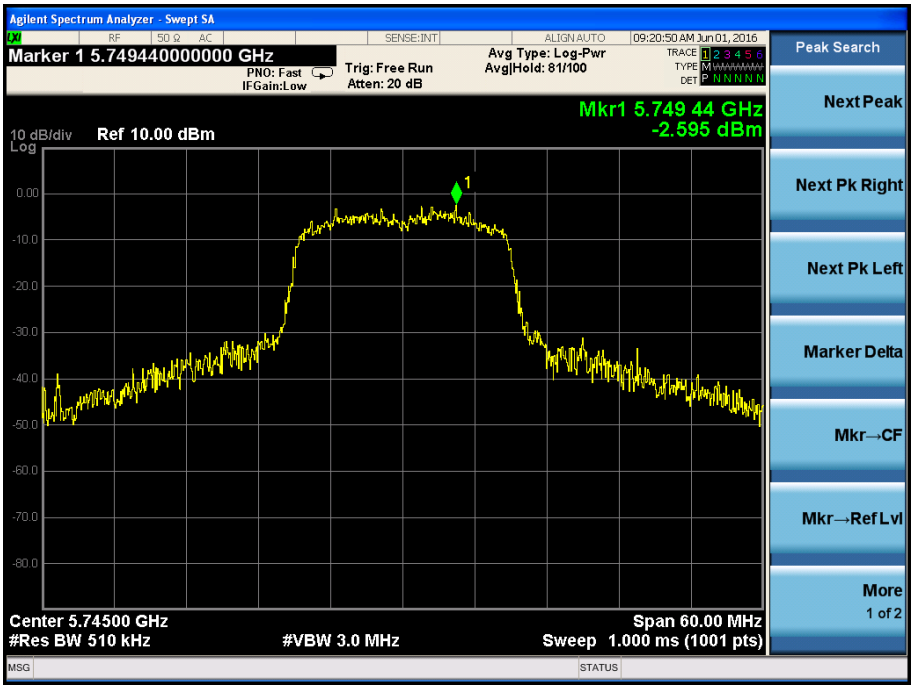
5200MHz



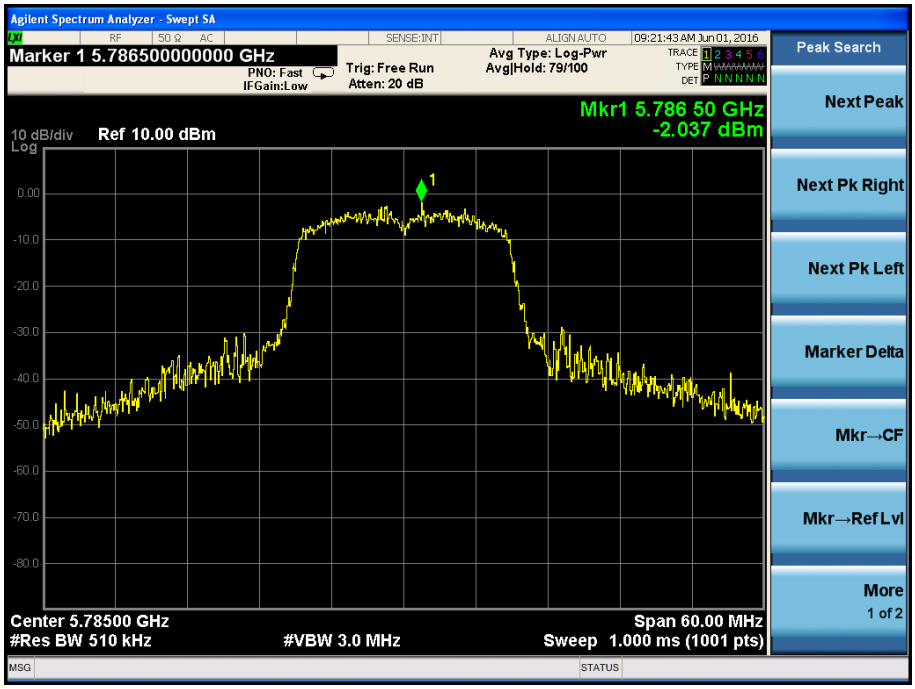
5240MHz



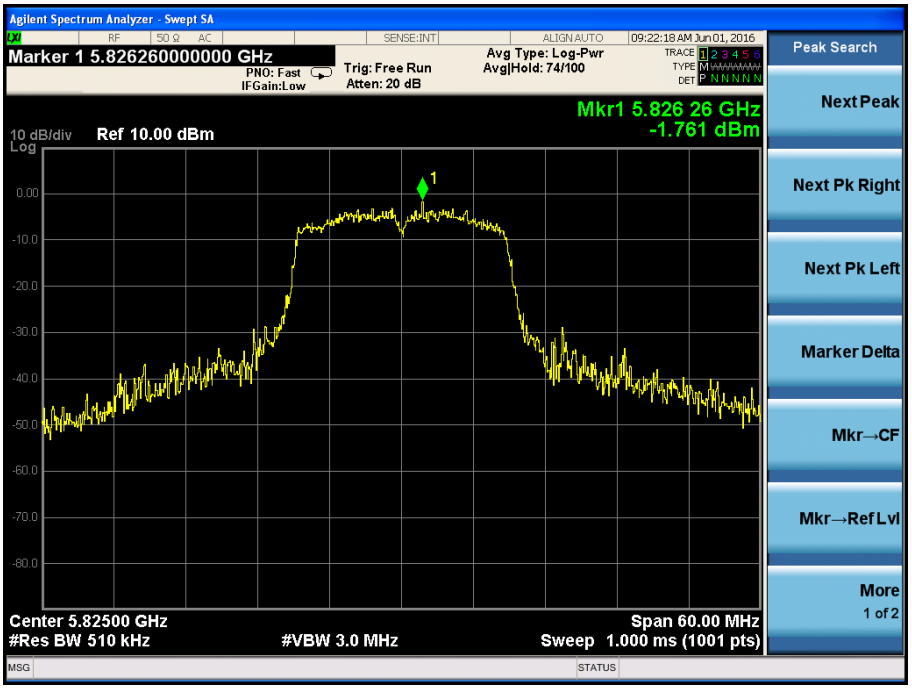
5745MHz



5785MHz



5825MHz



Test Mode: 802.11n-HT40

5190MHz

5230MHz

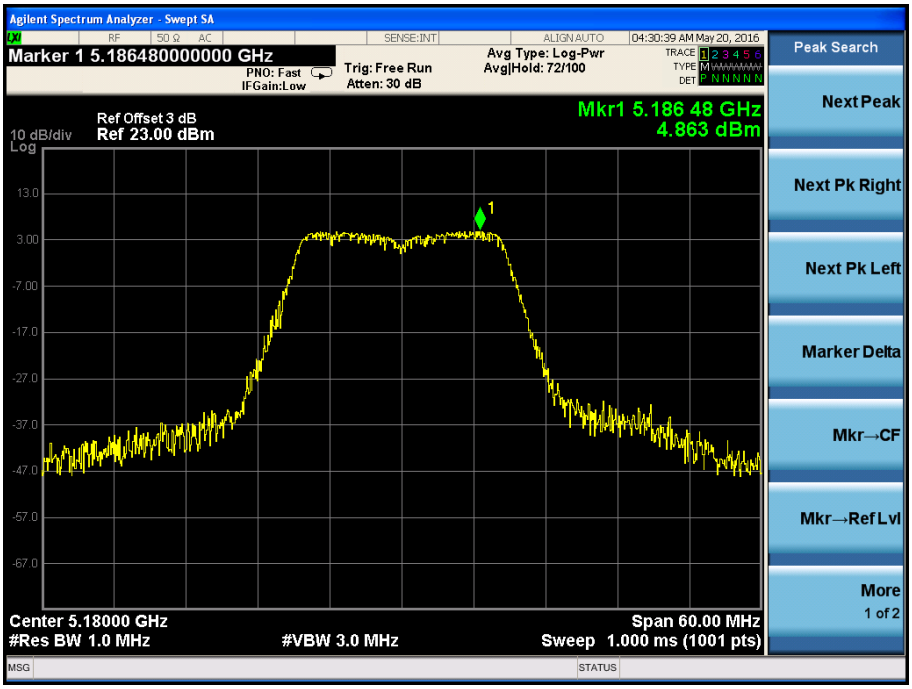
5755MHz

5795MHz

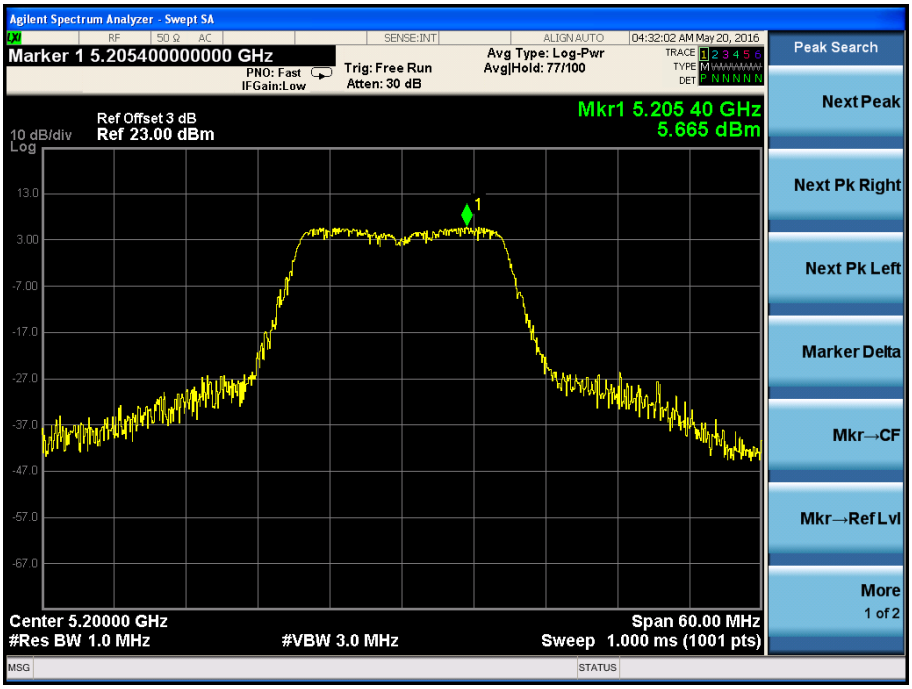
Antenna 2

Test Mode: 802.11a

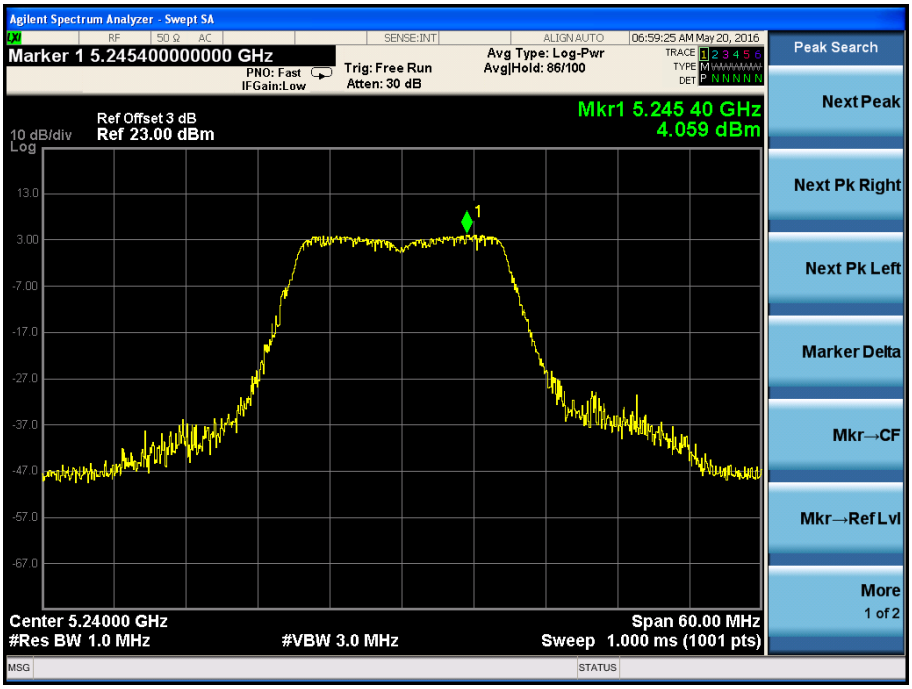
5180MHz



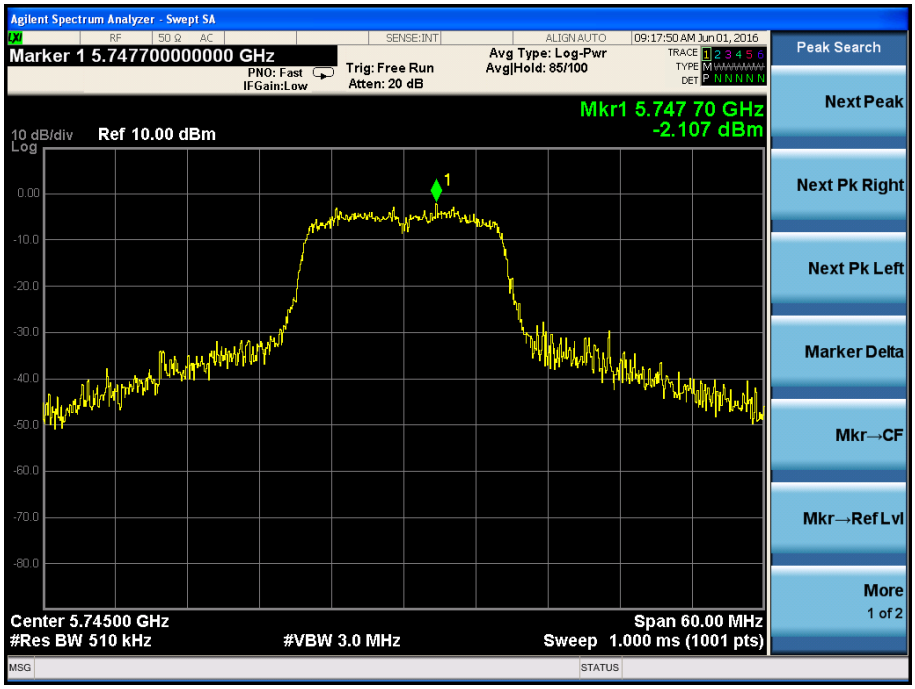
5200MHz



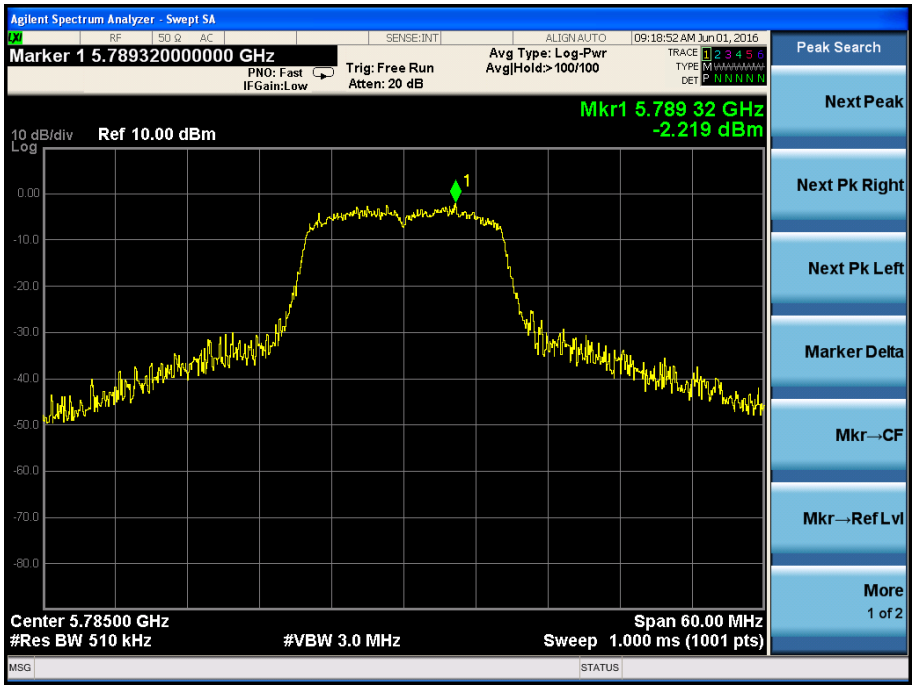
5240MHz



5745MHz



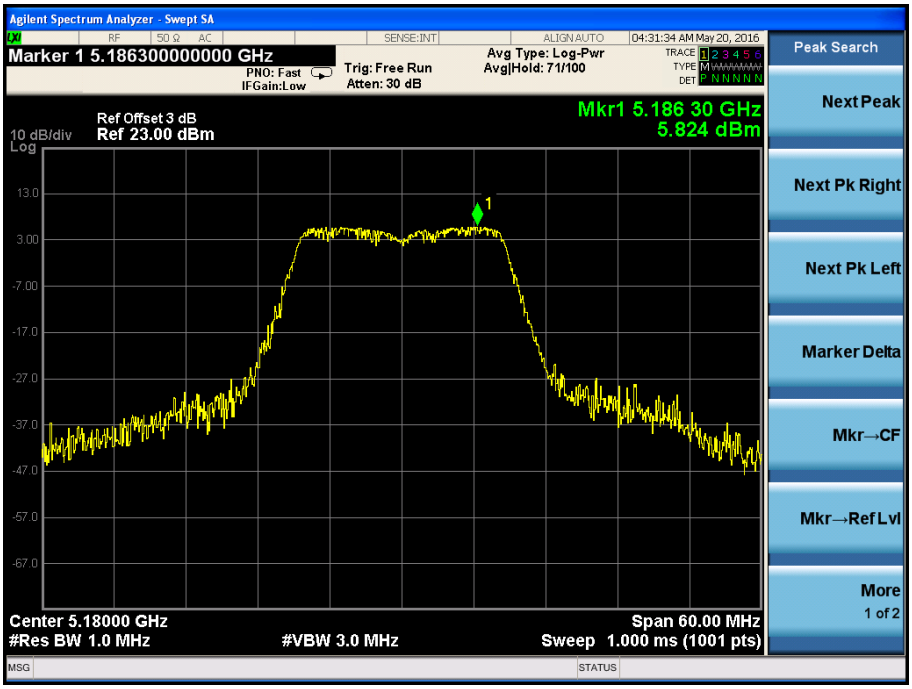
5785MHz



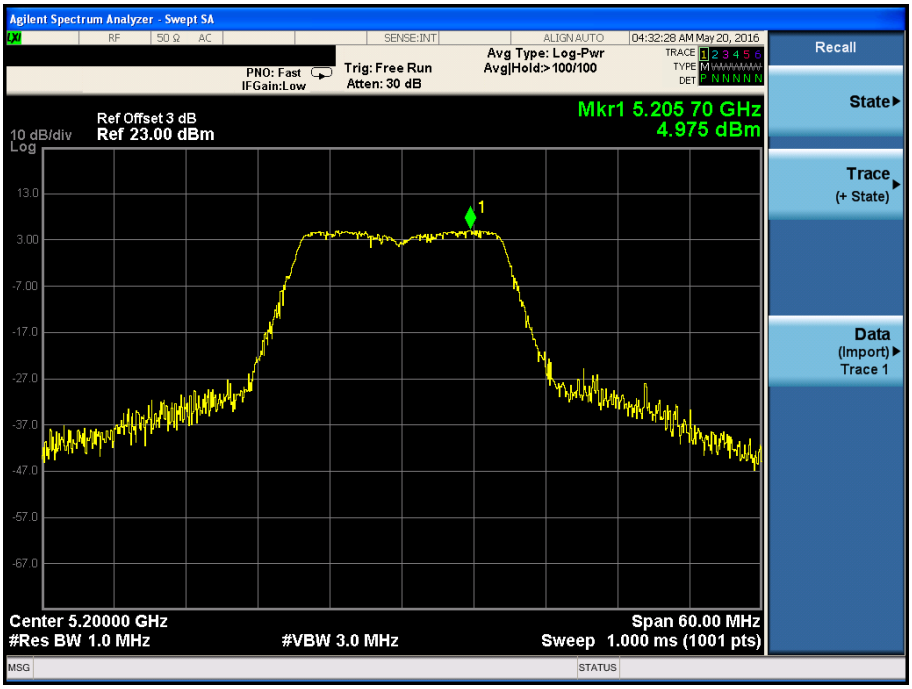
5825MHz

Test Mode: 802.11n20

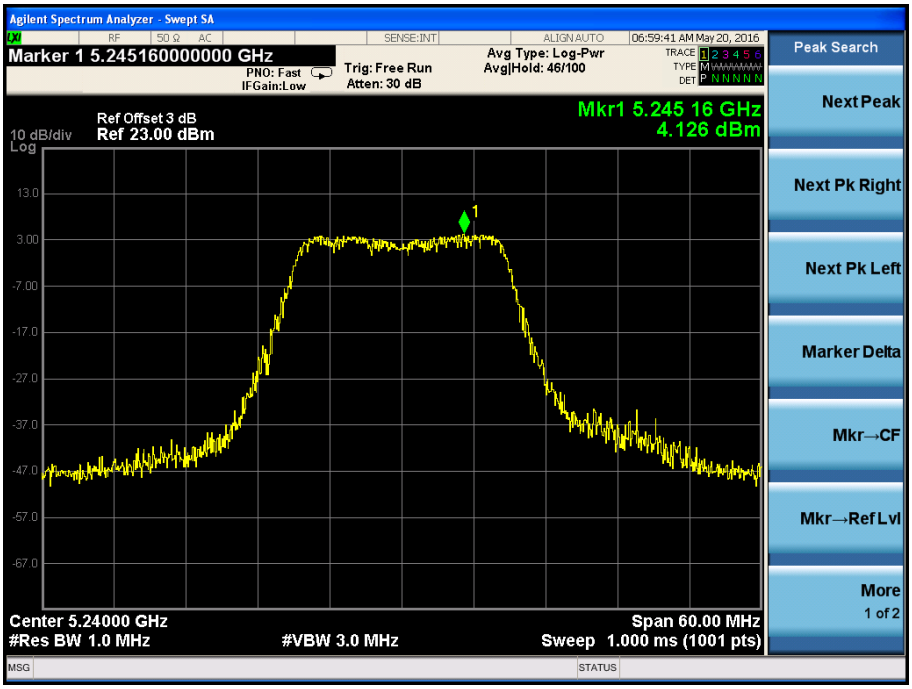
5180MHz



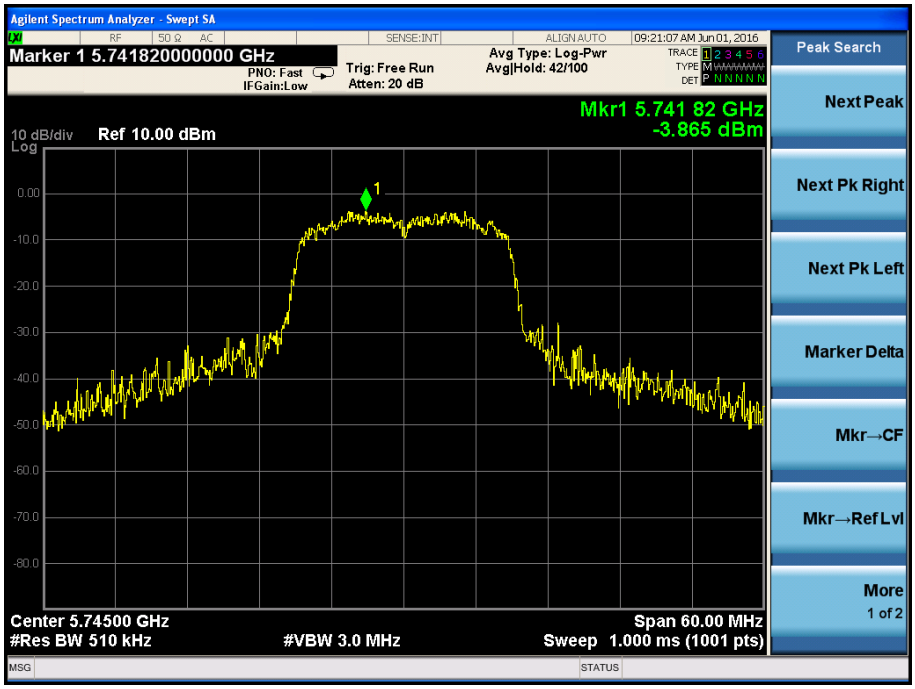
5200MHz



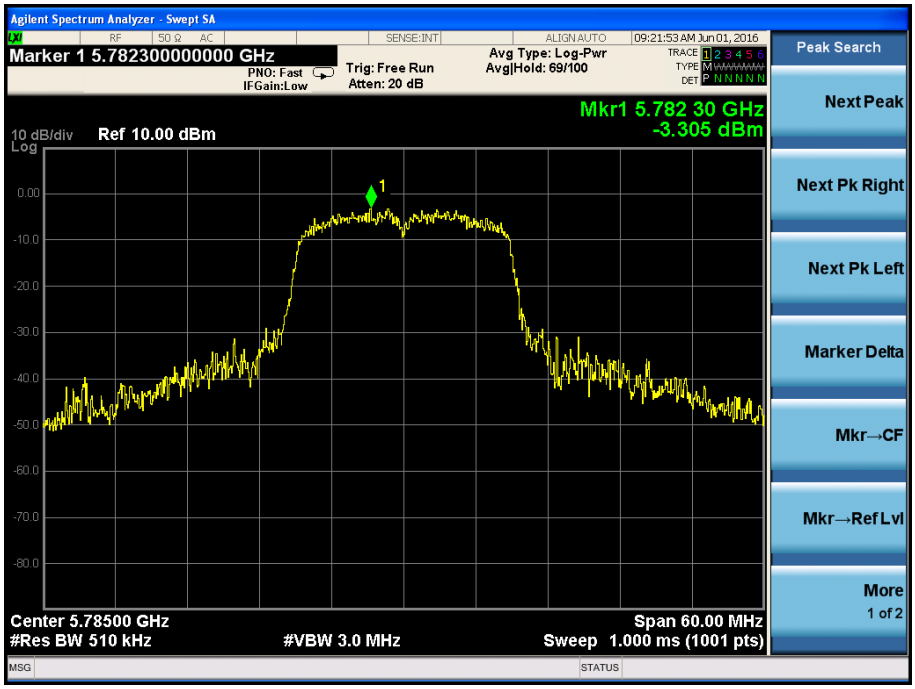
5240MHz



5745MHz



5785MHz



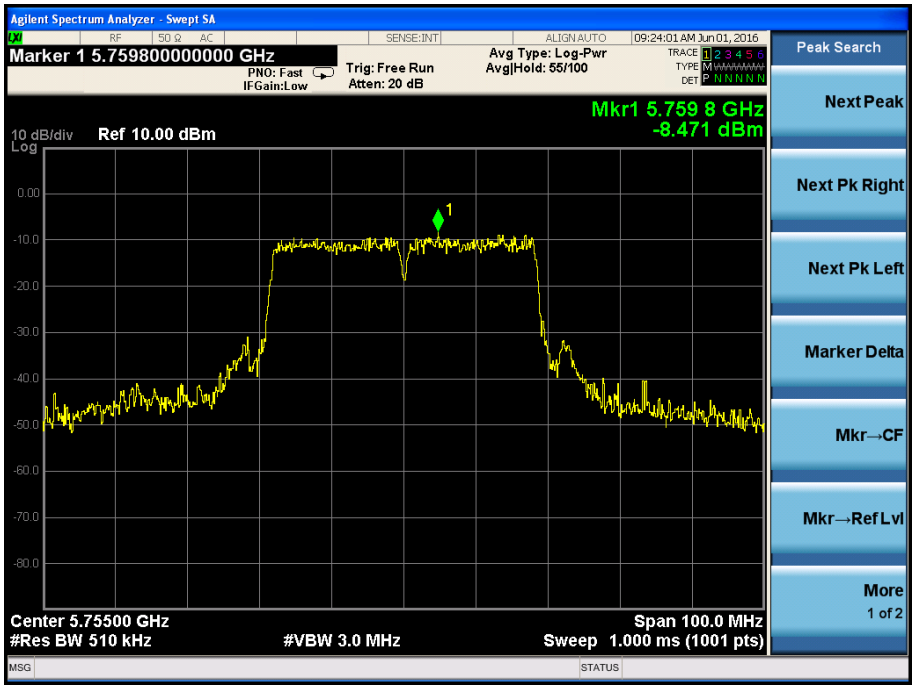
5825MHz

Test Mode: 802.11n-HT40

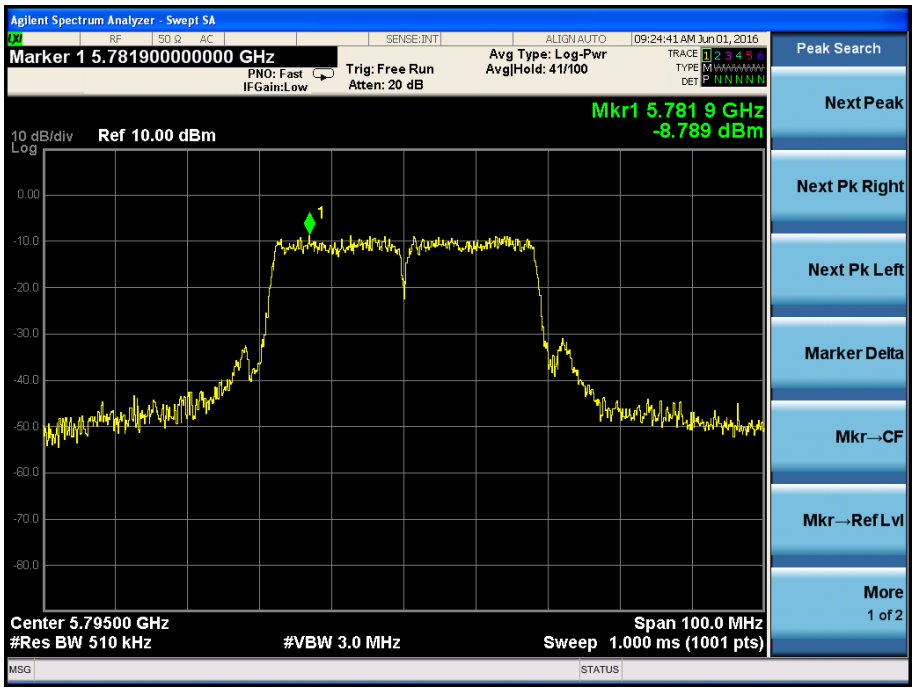
5190MHz

5230MHz

5755MHz



5795MHz



6. Emission Bandwidth and Occupied Bandwidth

6.1 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.

6.2 Test Procedure

According to 789033 D02 v01 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 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.

6.3 Environmental Conditions

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

6.4 Summary of Test Results/Plots

Antenna 1

802.11a

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit (dBm/MHz)
36	5180	24.60	16.603	--
40	5200	22.57	16.527	--
48	5240	22.24	16.595	--

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
149	5745	19.12	15.22	16.44	≥500
157	5785	19.46	15.98	16.46	≥500
161	5805	21.10	16.03	16.46	≥500

802.11n20

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit (dBm/MHz)
36	5180	27.67	17.59	--
40	5200	25.37	17.55	--
48	5240	23.32	17.56	--

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
149	5745	23.18	17.16	17.52	≥500
157	5785	19.84	16.66	17.47	≥500
161	5805	20.96	16.50	17.50	≥500

802.11n40

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit (dBm/MHz)
38	5190	47.26	36.54	--
46	5230	48.65	36.56	--

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
151	5755	45.83	36.61	36.41	≥500
159	5795	46.06	36.58	36.45	≥500

Antenna 2

802.11a

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit (dBm/MHz)
36	5180	18.81	16.34	--
40	5200	18.69	16.35	--
48	5240	19.10	16.35	--

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
149	5745	18.78	15.22	16.44	≥500
157	5785	18.79	15.98	16.46	≥500
161	5805	18.91	16.03	16.46	≥500

802.11n20

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit (dBm/MHz)
36	5180	19.36	17.41	--
40	5200	19.37	17.38	--
48	5240	21.39	17.50	--

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
149	5745	19.30	17.24	17.44	≥500
157	5785	19.09	17.08	17.41	≥500
161	5805	19.22	16.56	17.42	≥500

802.11n40

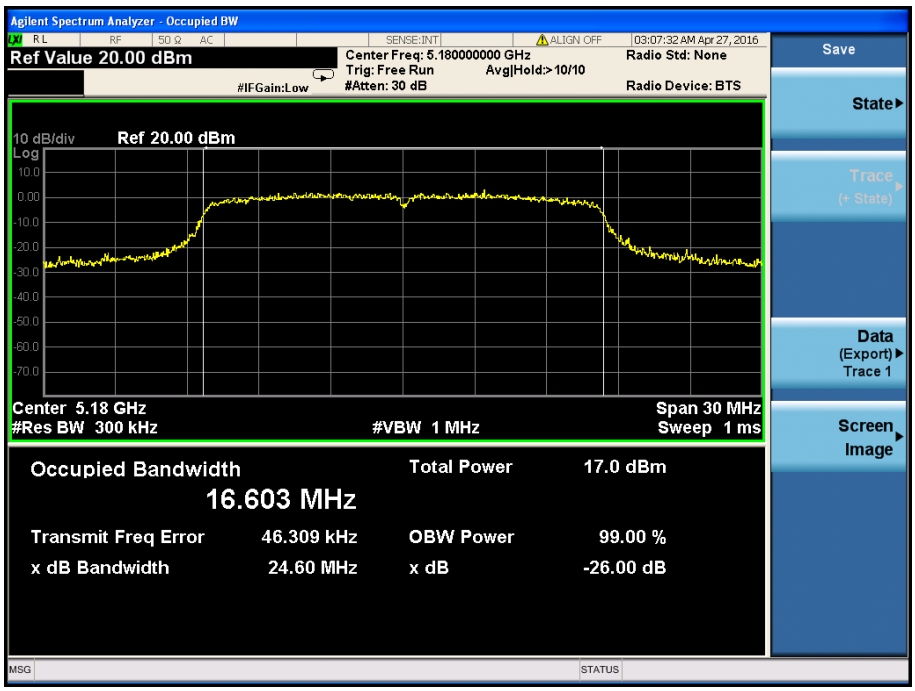
Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	99% Bandwidth MHz	Limit (dBm/MHz)
38	5190	45.78	36.45	--
46	5230	46.38	36.54	--

Channel	Channel frequency(MHz)	26 dB Bandwidth MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
151	5755	45.53	36.72	36.46	≥500
159	5795	45.28	36.64	36.49	≥500

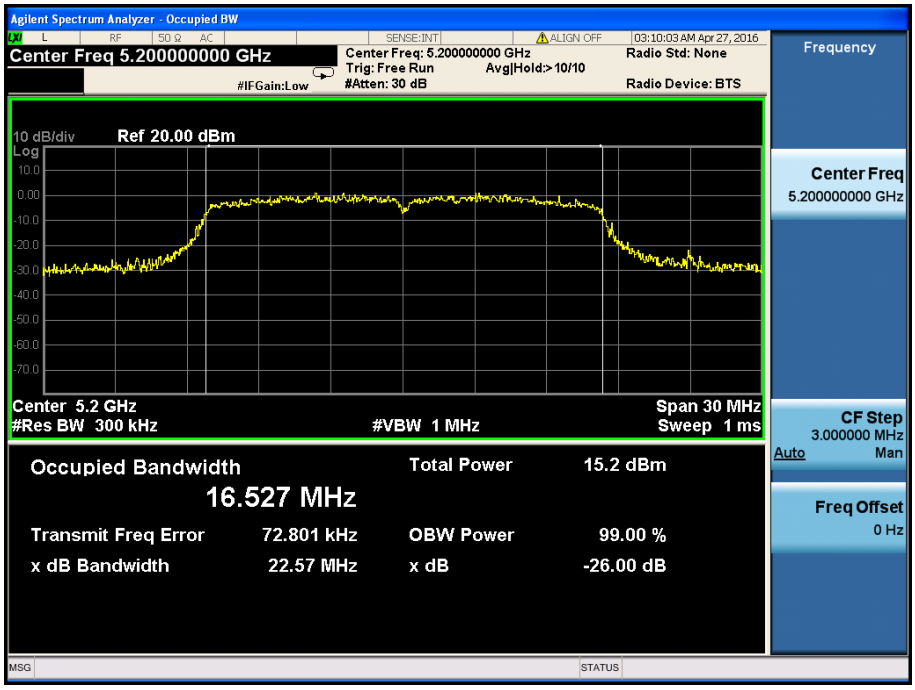
Antenna 1

Test Mode: 802.11a

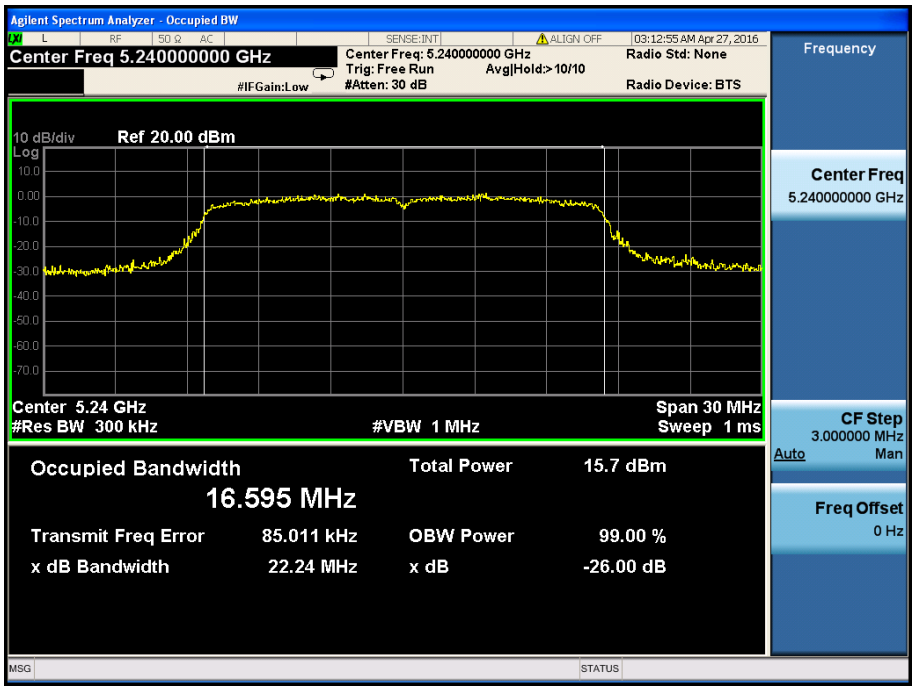
5180MHz



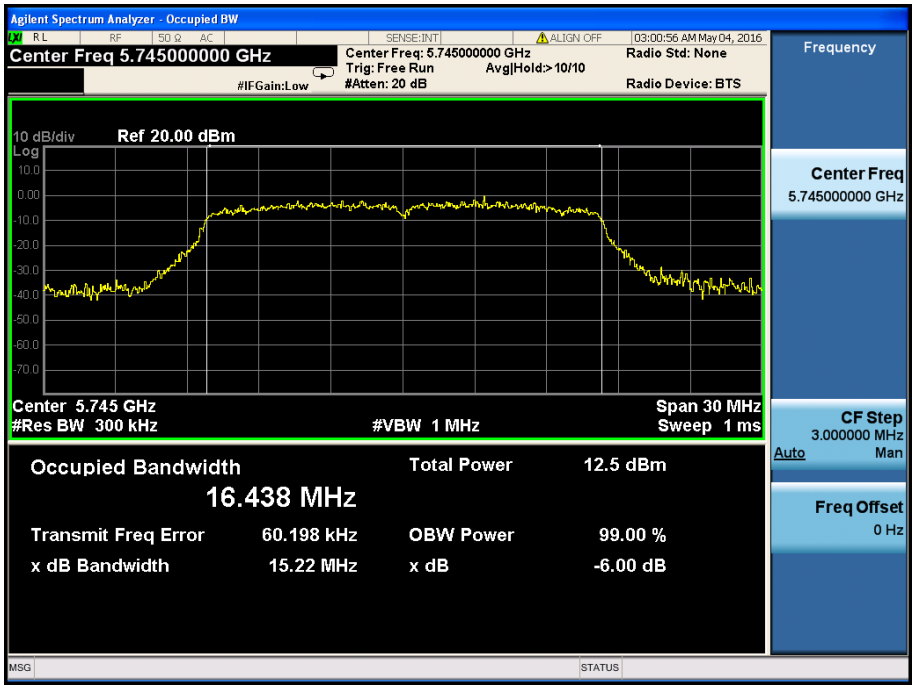
5200MHz

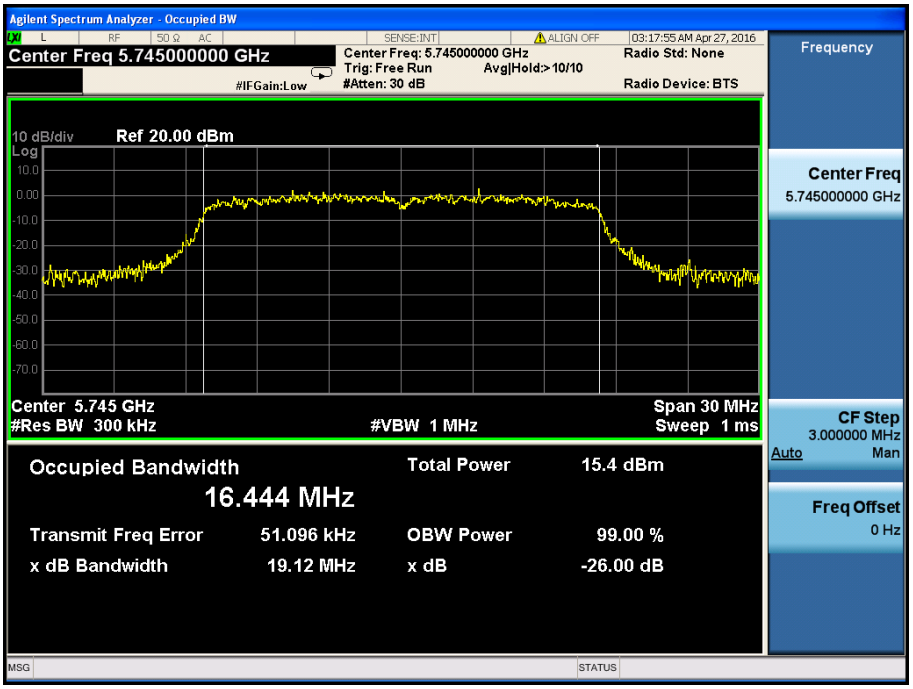


5240MHz

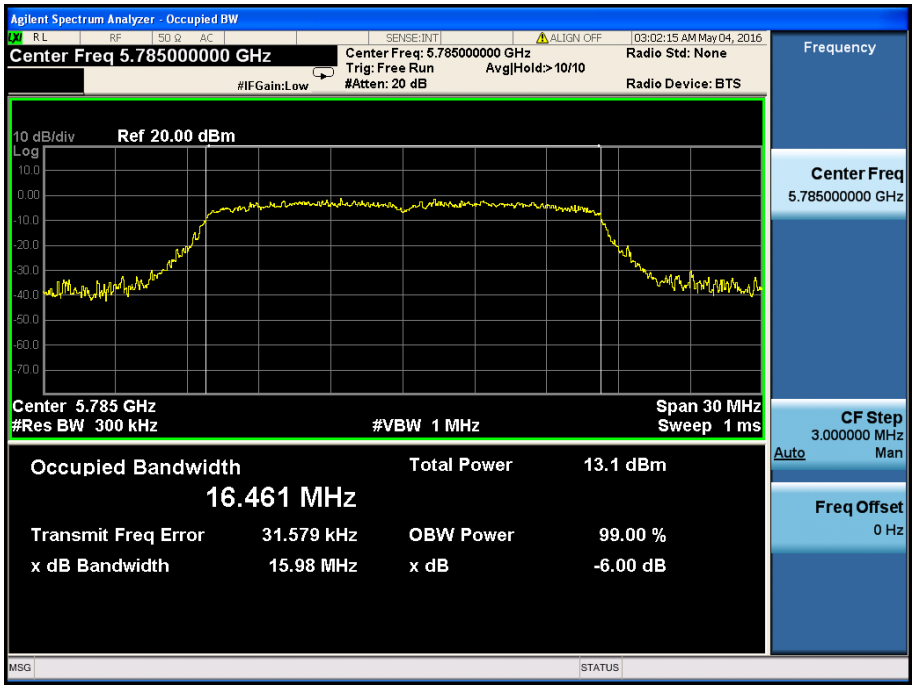


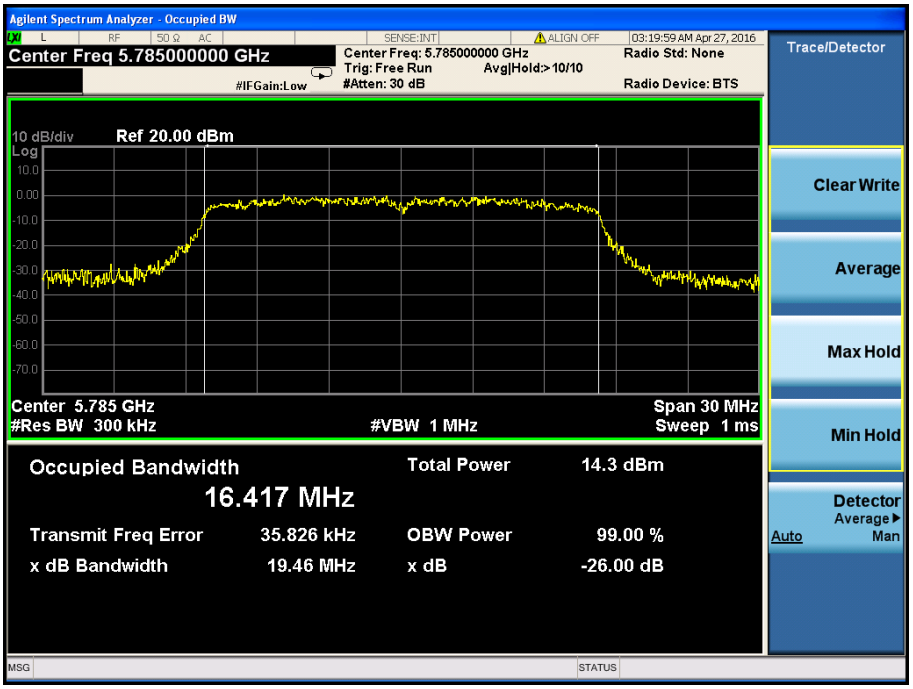
5745MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.745000000 GHz
Center Freq: 5.745000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:00:56 AM May 04, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.745 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.438 MHz
Total Power
12.5 dBm
Transmit Freq Error
60.198 kHz
OBW Power
99.00 %
x dB Bandwidth
15.22 MHz
x dB
-6.00 dB
Center Freq
5.745000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

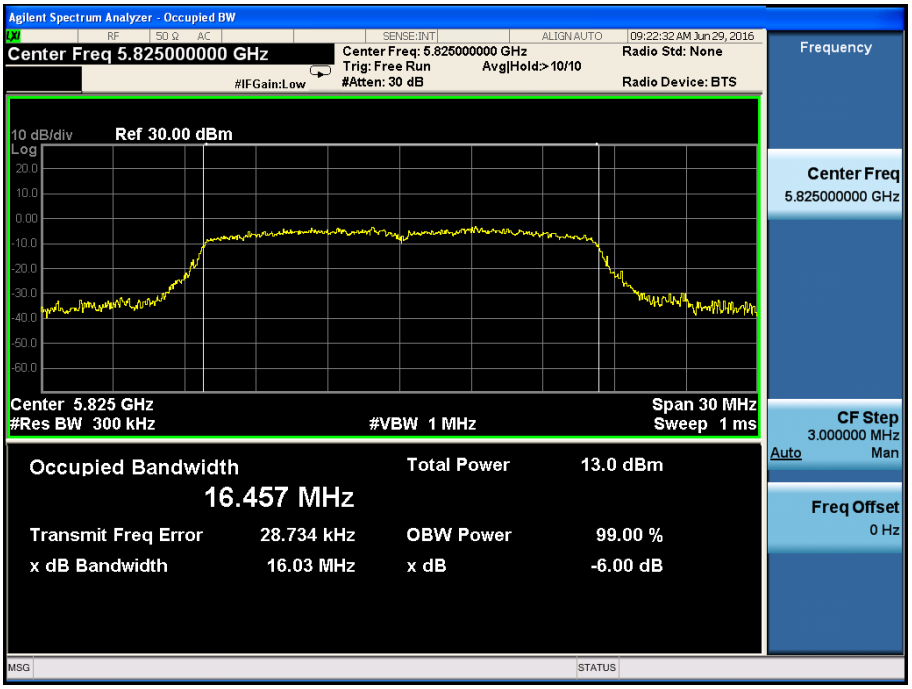

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.745000000 GHz
Center Freq: 5.745000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:17:55 AM Apr 27, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.745 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.444 MHz
Total Power
15.4 dBm
Transmit Freq Error
51.096 kHz
OBW Power
99.00 %
x dB Bandwidth
19.12 MHz
x dB
-26.00 dB
Center Freq
5.745000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

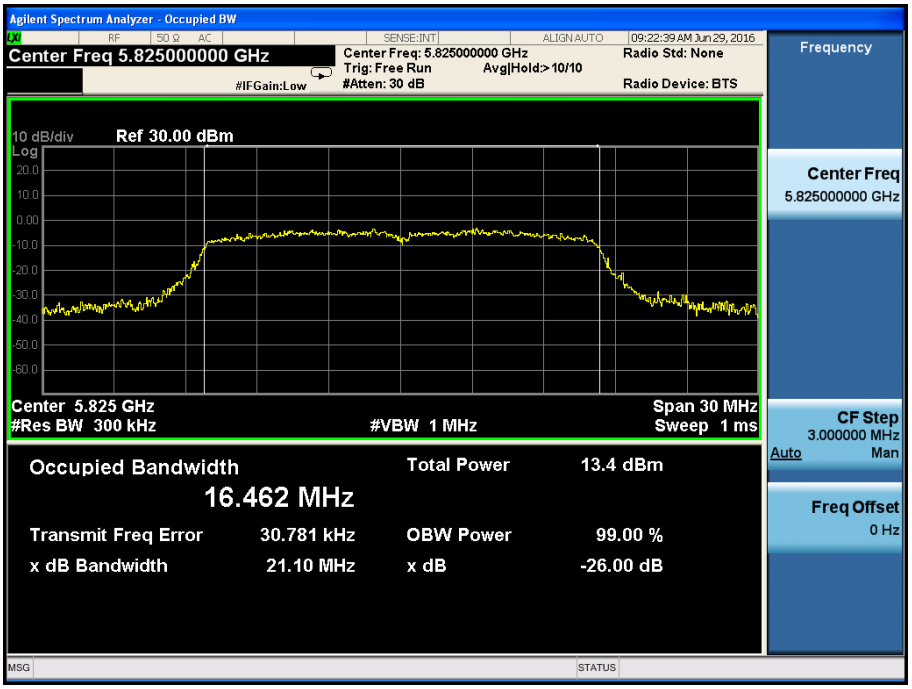
5785MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:02:15 AM May 04, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.461 MHz
Total Power
13.1 dBm
Transmit Freq Error
31.579 kHz
OBW Power
99.00 %
x dB Bandwidth
15.98 MHz
x dB
-6.00 dB
Center Freq
5.785000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:19:59 AM Apr 27, 2016
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.417 MHz
Total Power
14.3 dBm
Transmit Freq Error
35.826 kHz
OBW Power
99.00 %
x dB Bandwidth
19.46 MHz
x dB
-26.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Average
Auto
Man
MSG
STATUS

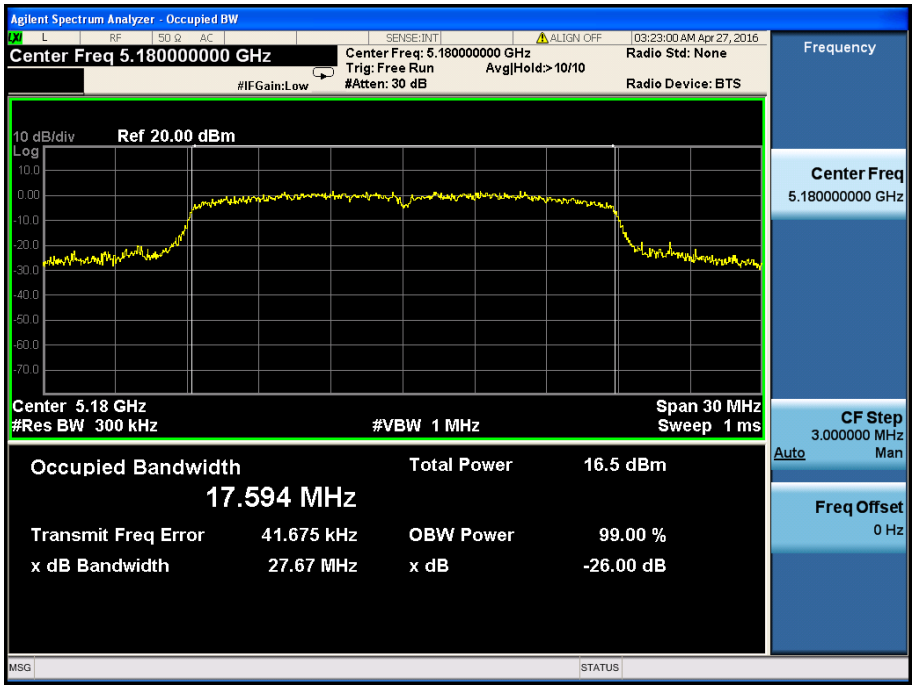
5825MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
09:22:32 AM Jun 29, 2016
Frequency
10 dB/div
Log
Ref 30.00 dBm
Center 5.825 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.457 MHz
Total Power
13.0 dBm
Transmit Freq Error
28.734 kHz
OBW Power
99.00 %
x dB Bandwidth
16.03 MHz
x dB
-6.00 dB
Center Freq
5.825000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

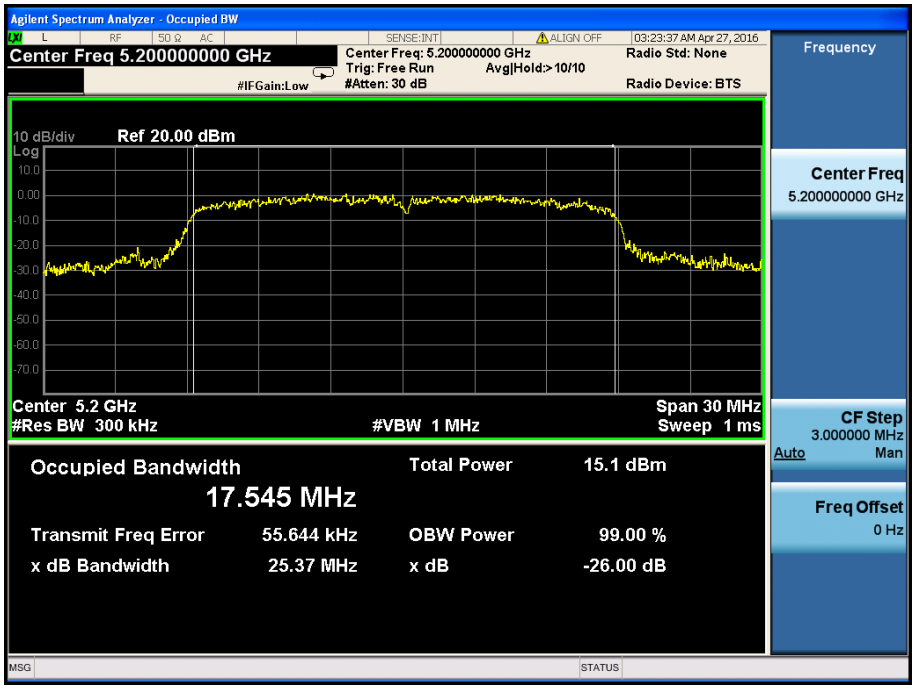

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
09:22:39 AM Jun 29, 2016
Frequency
10 dB/div
Log
Ref 30.00 dBm
Center 5.825 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.462 MHz
Total Power
13.4 dBm
Transmit Freq Error
30.781 kHz
OBW Power
99.00 %
x dB Bandwidth
21.10 MHz
x dB
-26.00 dB
Center Freq
5.825000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Test Mode: 802.11n20

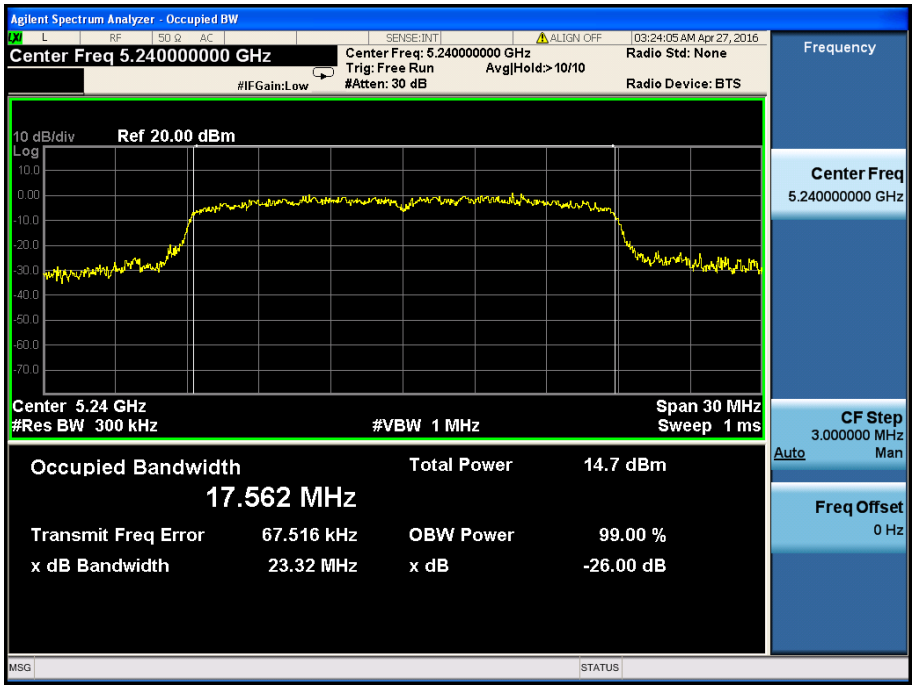
5180MHz



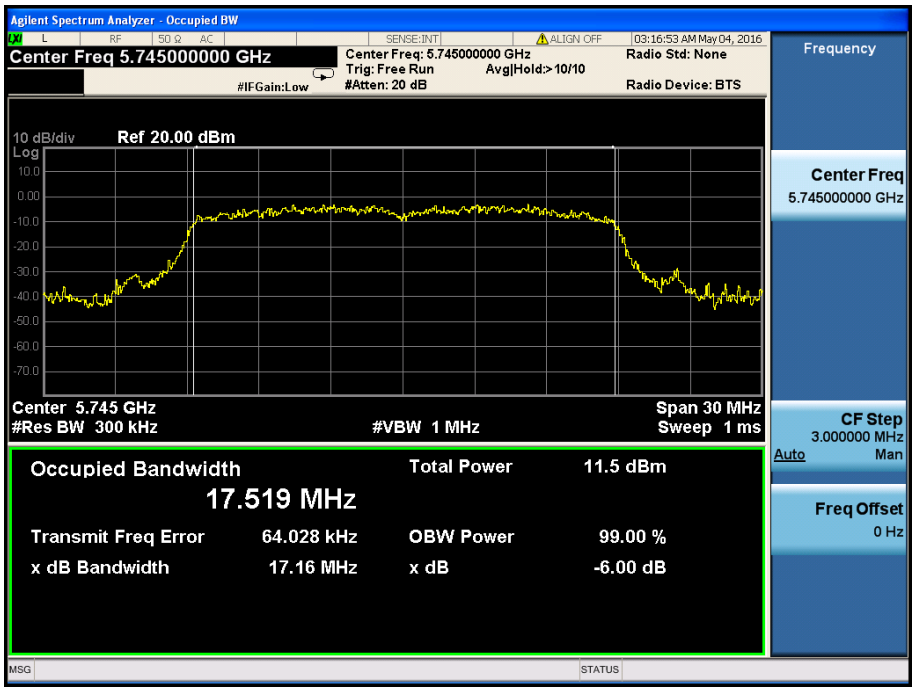
5200MHz

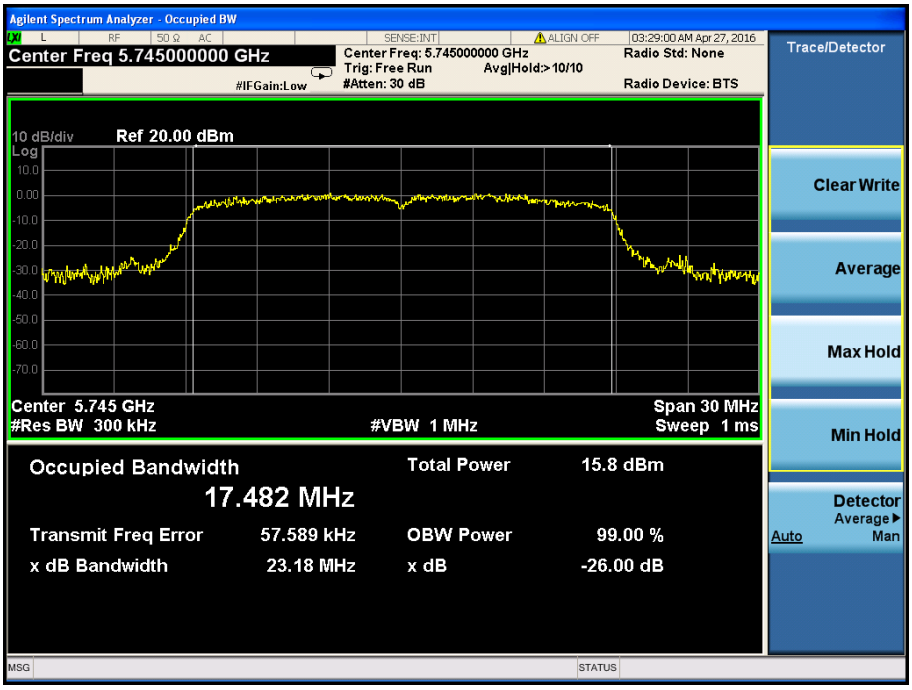


5240MHz

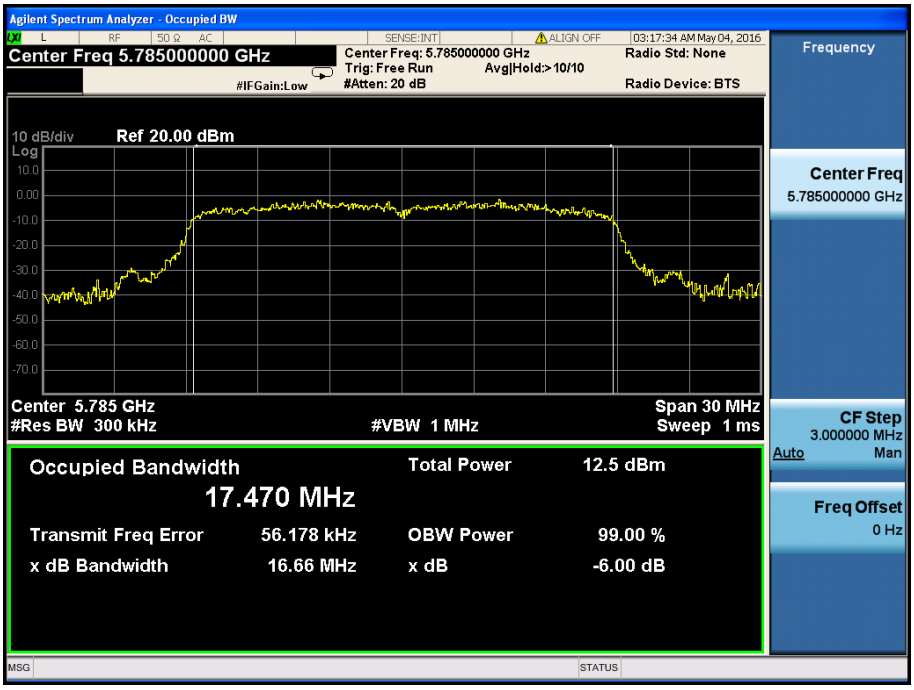


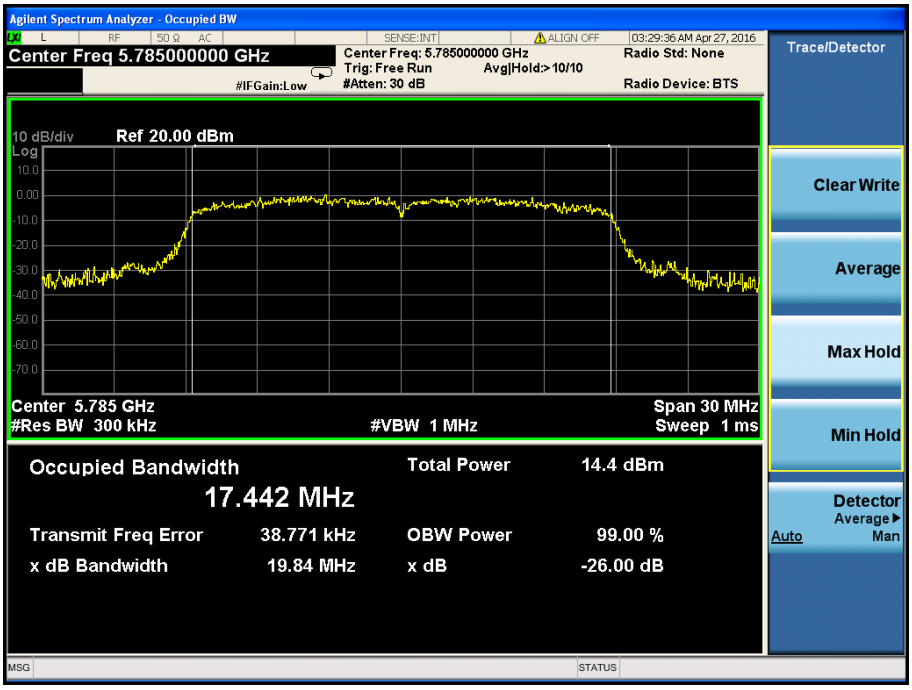
5745MHz




Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.745000000 GHz
Center Freq: 5.745000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:29:00 AM Apr 27, 2016
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
Center 5.745 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.482 MHz
Total Power
15.8 dBm
Transmit Freq Error
57.589 kHz
OBW Power
99.00 %
x dB Bandwidth
23.18 MHz
x dB
-26.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Average
Auto
Man
MSG
STATUS

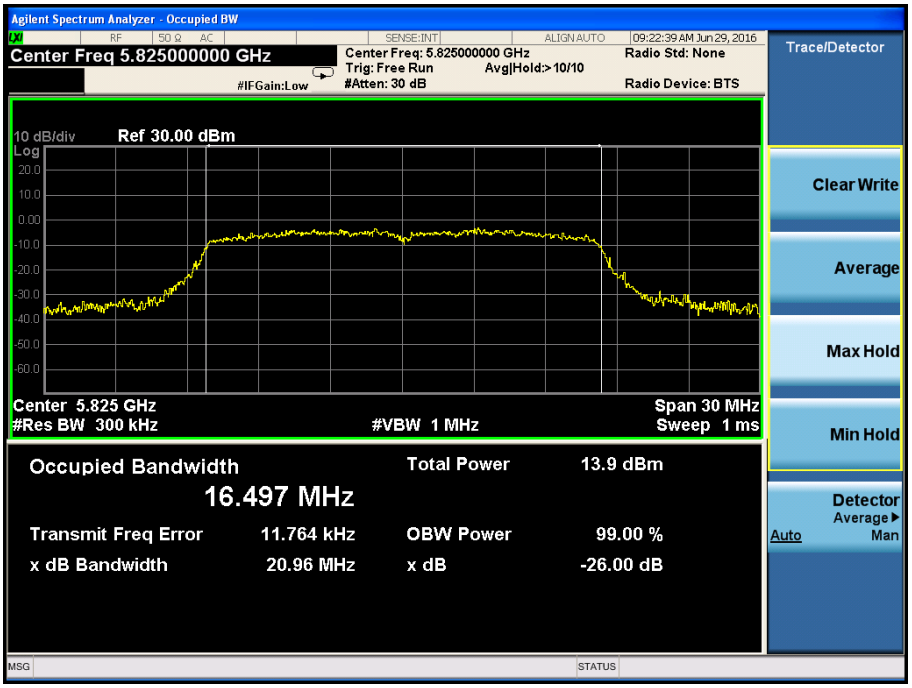
5785MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:17:34 AM May 04, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.470 MHz
Total Power
12.5 dBm
Transmit Freq Error
56.178 kHz
OBW Power
99.00 %
x dB Bandwidth
16.66 MHz
x dB
-6.00 dB
Center Freq
5.785000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:29:36 AM Apr 27, 2016
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.442 MHz
Total Power
14.4 dBm
Transmit Freq Error
38.771 kHz
OBW Power
99.00 %
x dB Bandwidth
19.84 MHz
x dB
-26.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Average
Auto
Man
MSG
STATUS

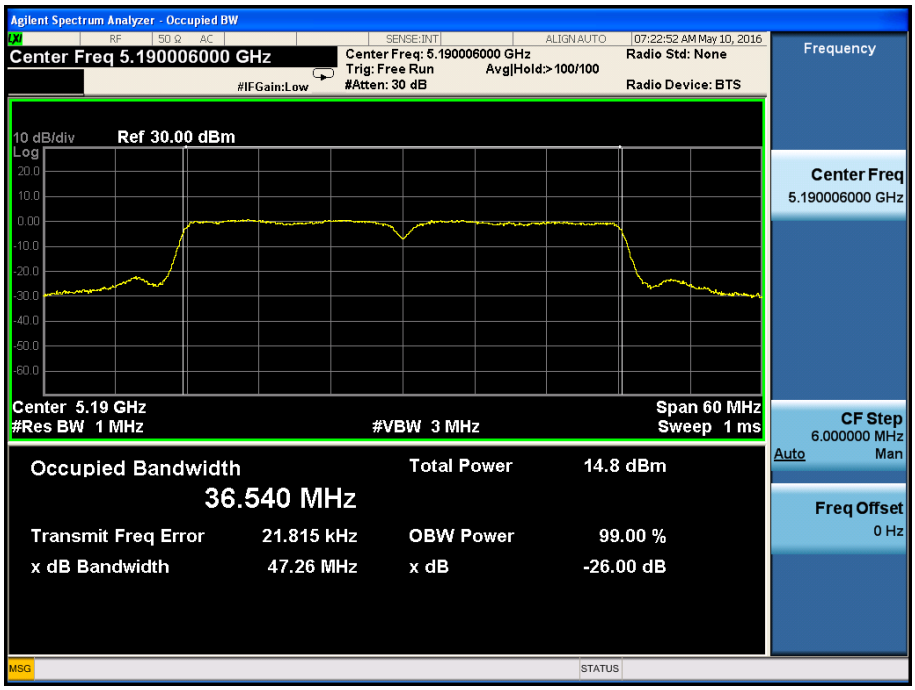
5825MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
09:22:39 AM Jun 29, 2016
Frequency
10 dB/div
Log
Ref 30.00 dBm
Center 5.825 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.508 MHz
Total Power
12.6 dBm
Transmit Freq Error
4.779 kHz
OBW Power
99.00 %
x dB Bandwidth
16.50 MHz
x dB
-6.00 dB
Center Freq
5.825000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

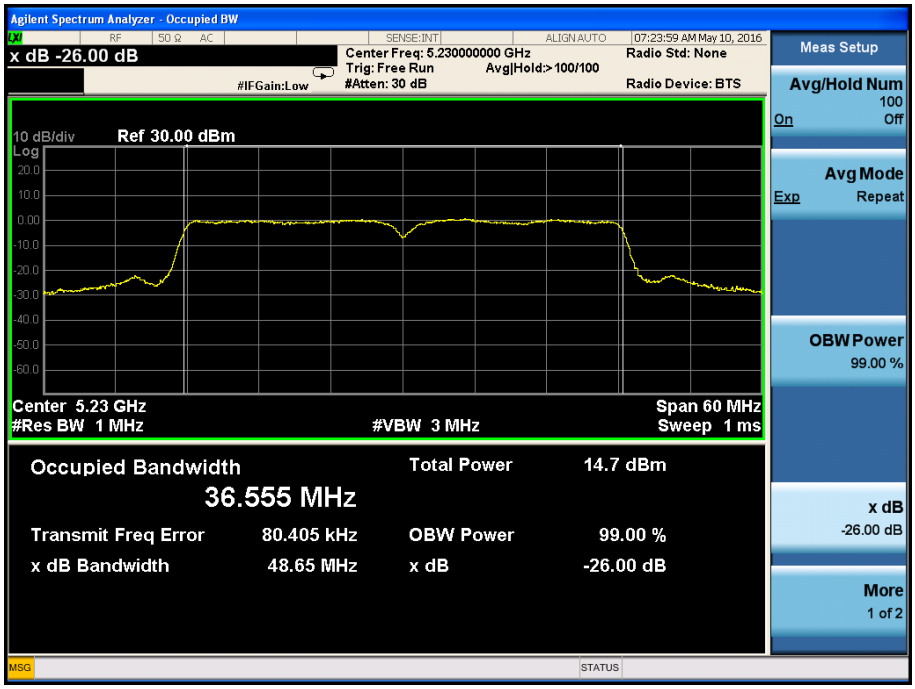


Test Mode: 802.11n-HT40

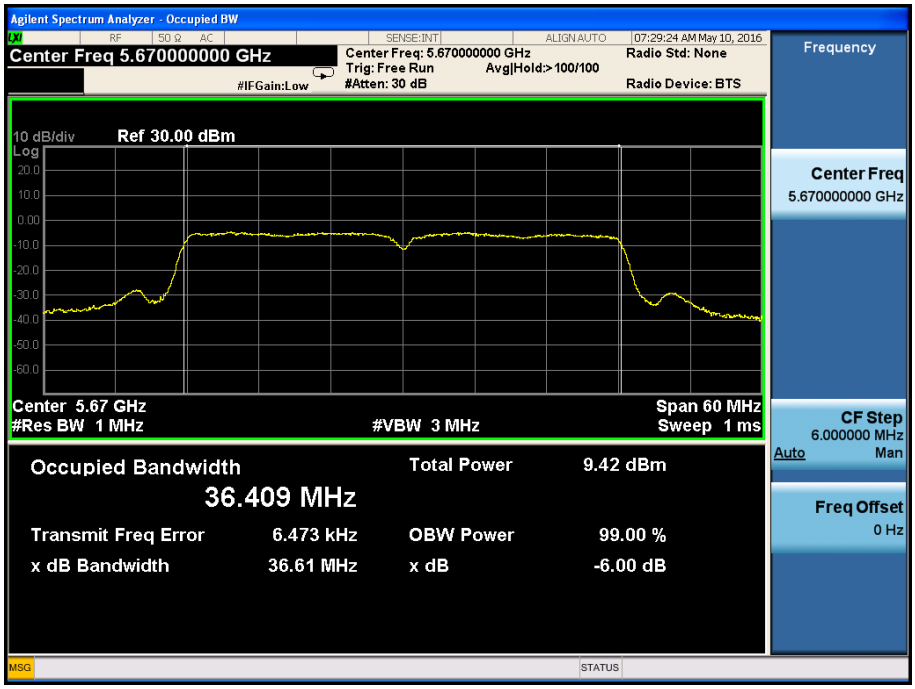
5190MHz

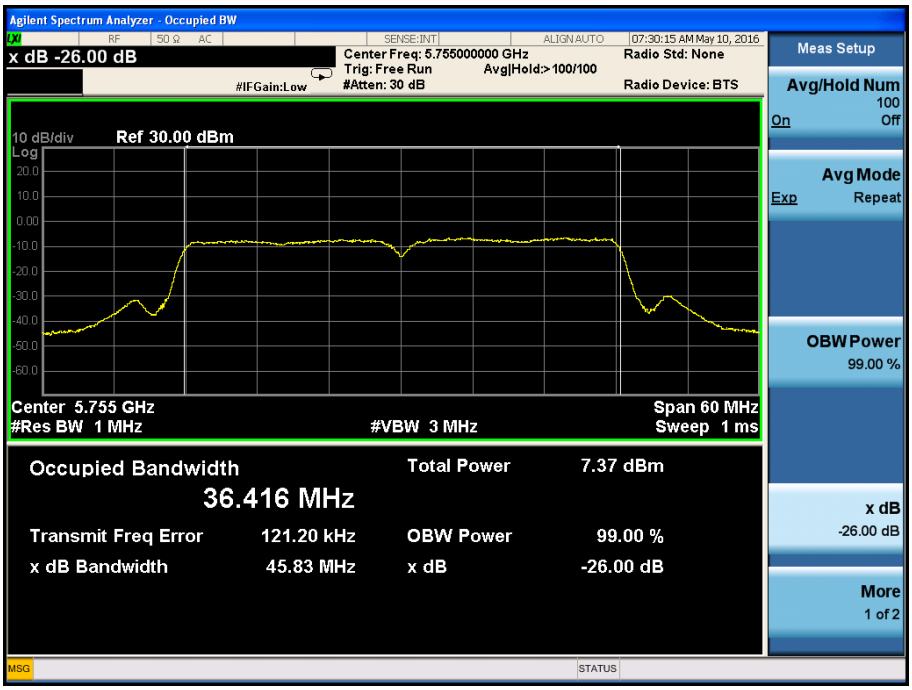


5230MHz

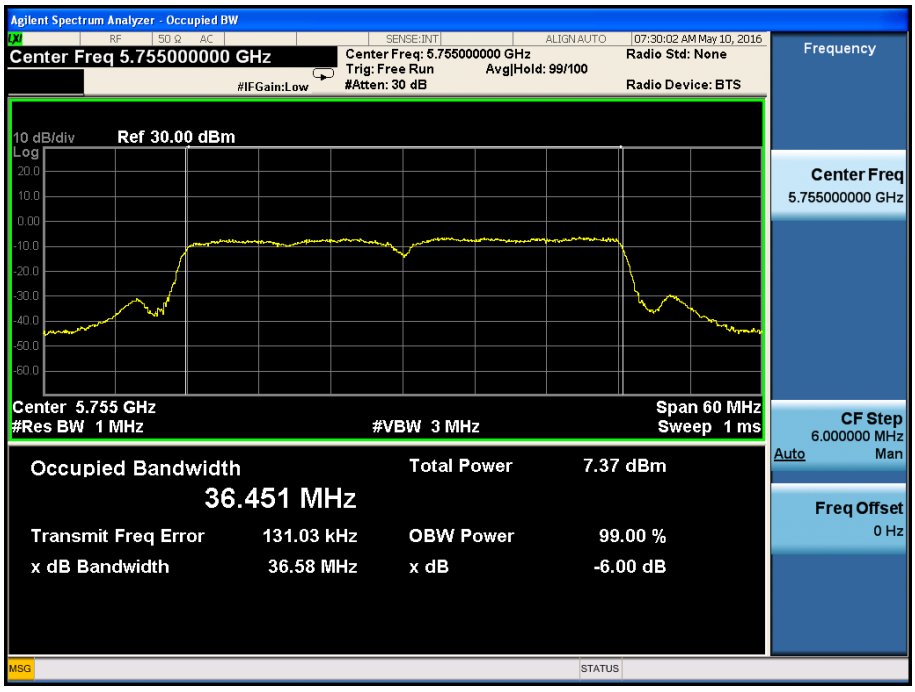


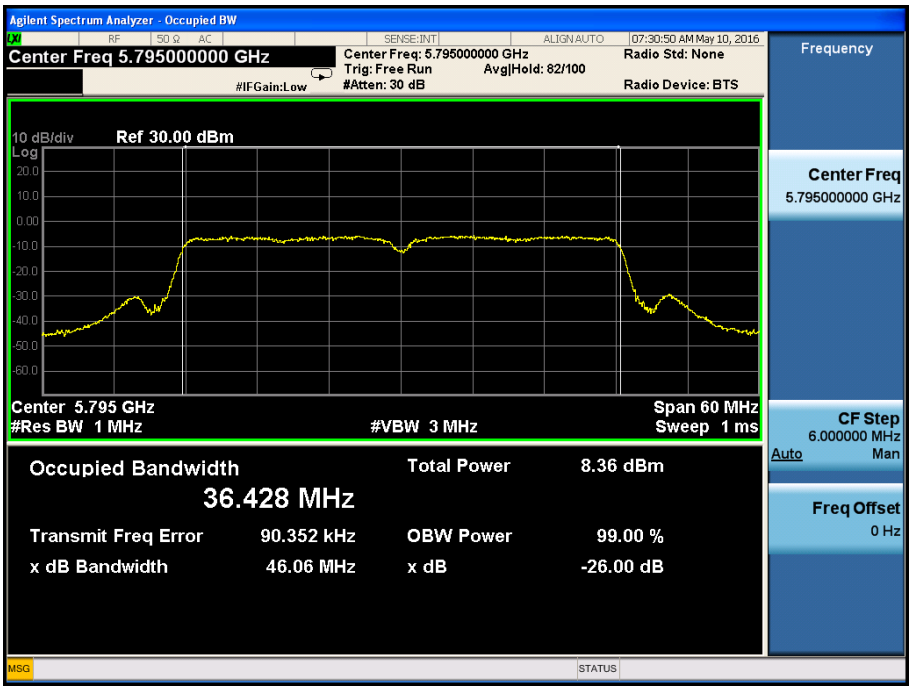
5755MHz




Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
07:30:15 AM May 10, 2016
x dB -26.00 dB
Center Freq: 5.755000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Meas Setup
Avg/Hold Num
100
On
Off
Avg Mode
Exp
Repeat
OBW Power
99.00 %
x dB
-26.00 dB
More
1 of 2
10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 5.755 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.416 MHz
Total Power
7.37 dBm
Transmit Freq Error
121.20 kHz
OBW Power
99.00 %
x dB Bandwidth
45.83 MHz
x dB
-26.00 dB
MSG
STATUS

5795MHz

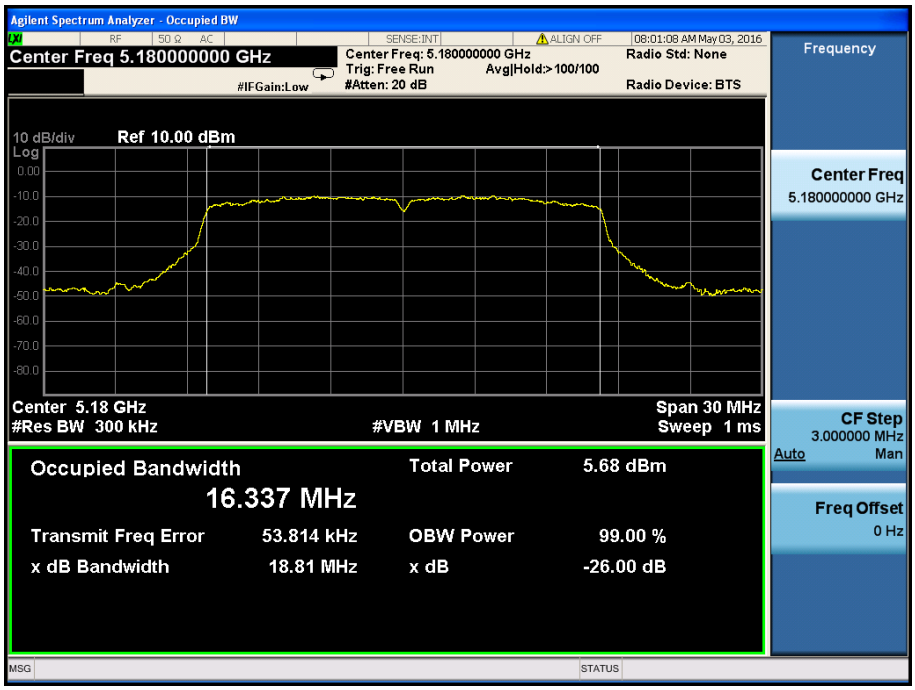

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
07:30:02 AM May 10, 2016
Center Freq 5.755000000 GHz
Center Freq: 5.755000000 GHz
Trig: Free Run
Avg|Hold: 99/100
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Center Freq
5.755000000 GHz
CF Step
6.000000 MHz
Auto
Man
Freq Offset
0 Hz
10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 5.755 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.451 MHz
Total Power
7.37 dBm
Transmit Freq Error
131.03 kHz
OBW Power
99.00 %
x dB Bandwidth
36.58 MHz
x dB
-6.00 dB
MSG
STATUS



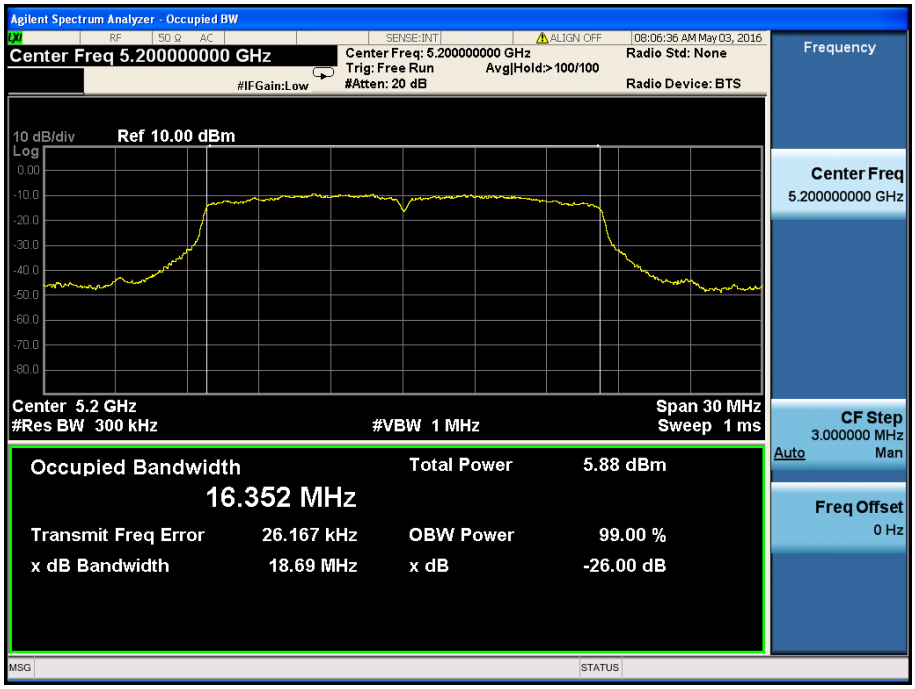
Antenna 2

Test Mode: 802.11a

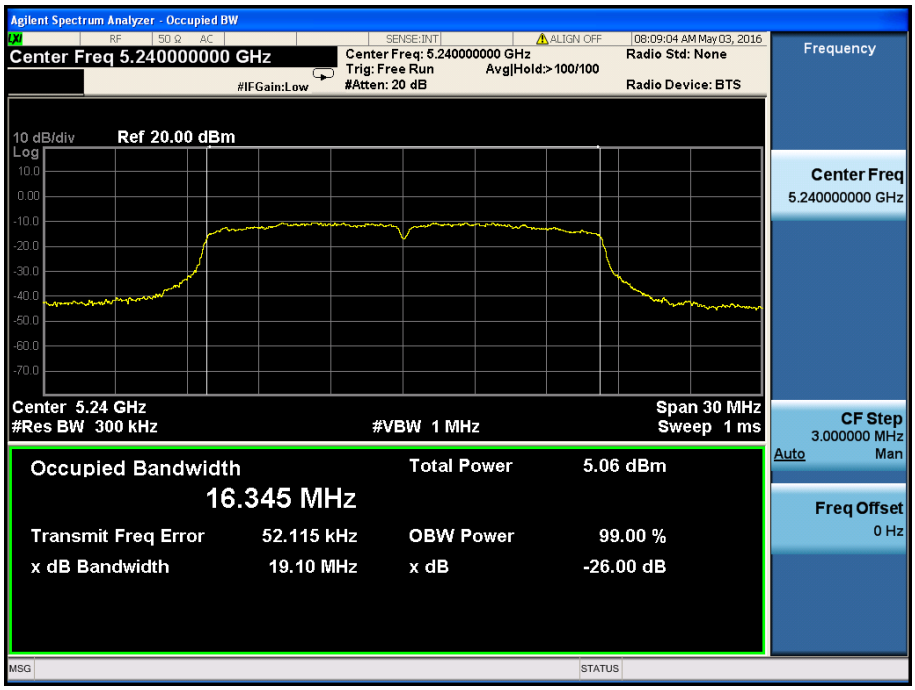
5180MHz



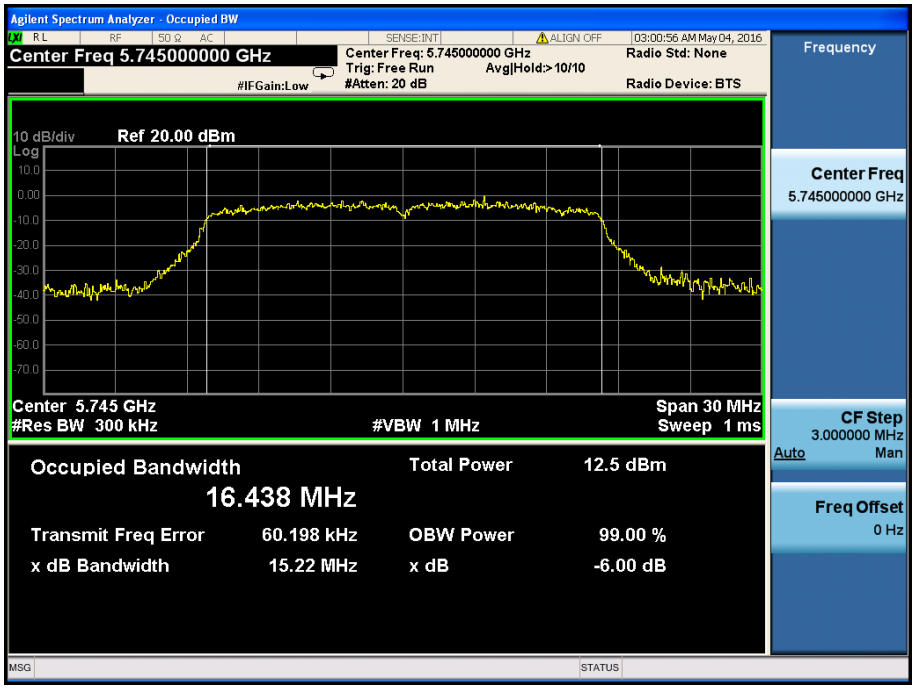
5200MHz



5240MHz

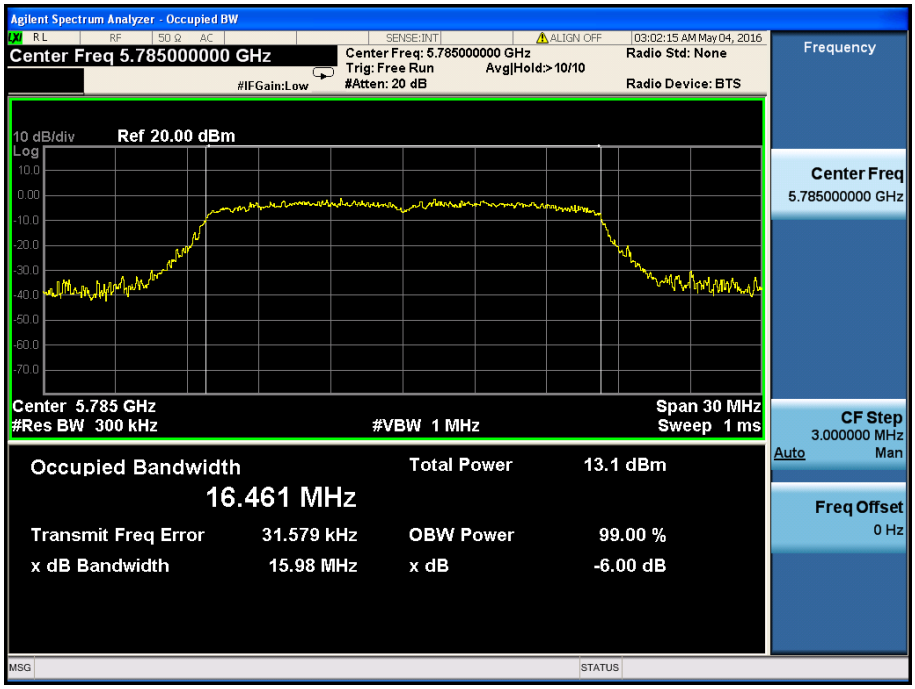


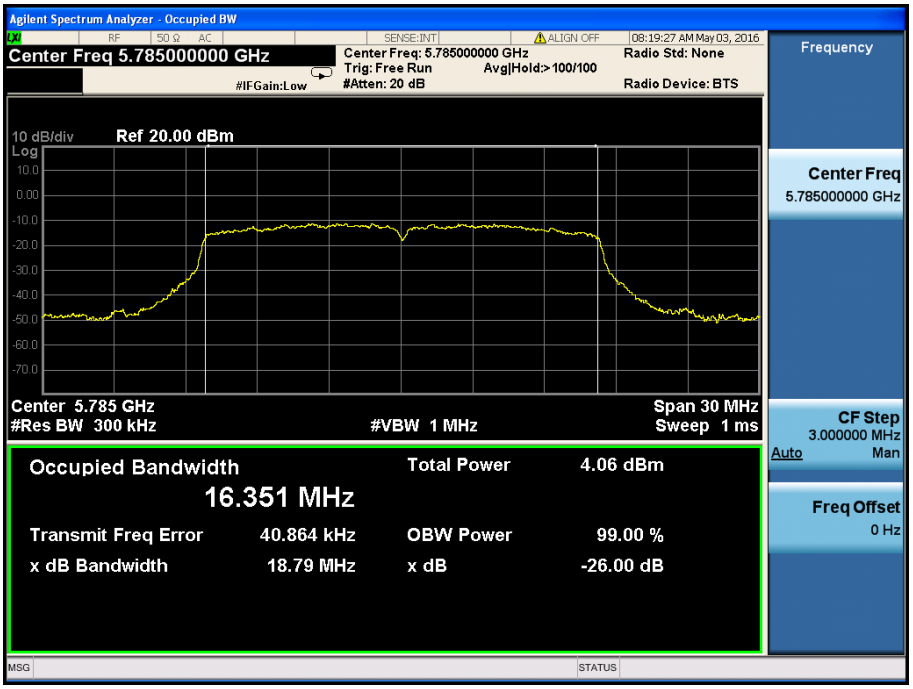
5745MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.745000000 GHz
Center Freq: 5.745000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:00:56 AM May 04, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.745 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.438 MHz
Total Power
12.5 dBm
Transmit Freq Error
60.198 kHz
OBW Power
99.00 %
x dB Bandwidth
15.22 MHz
x dB
-6.00 dB
Center Freq
5.745000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

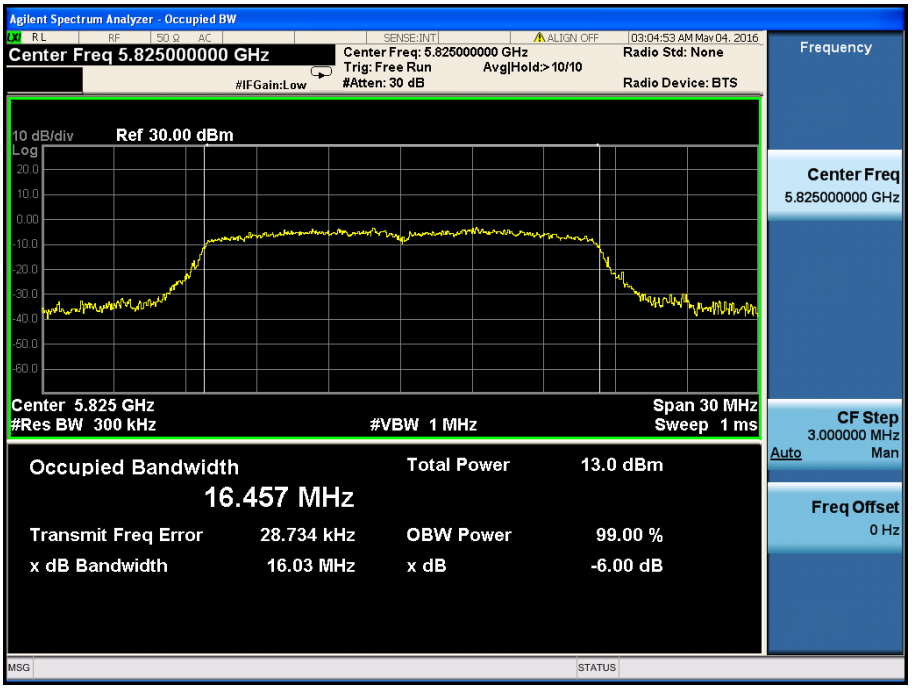

Agilent Spectrum Analyzer - Occupied BW
x dB -26.00 dB
Center Freq: 5.745000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:18:13 AM May 03, 2016
Meas Setup
10 dB/div
Log
Ref 20.00 dBm
Center 5.745 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.337 MHz
Total Power
5.01 dBm
Transmit Freq Error
66.332 kHz
OBW Power
99.00 %
x dB Bandwidth
18.78 MHz
x dB
-26.00 dB
Avg/Hold Num
100
On
Off
Avg Mode
Exp
Repeat
OBW Power
99.00 %
x dB
-26.00 dB
More
1 of 2
MSG
STATUS

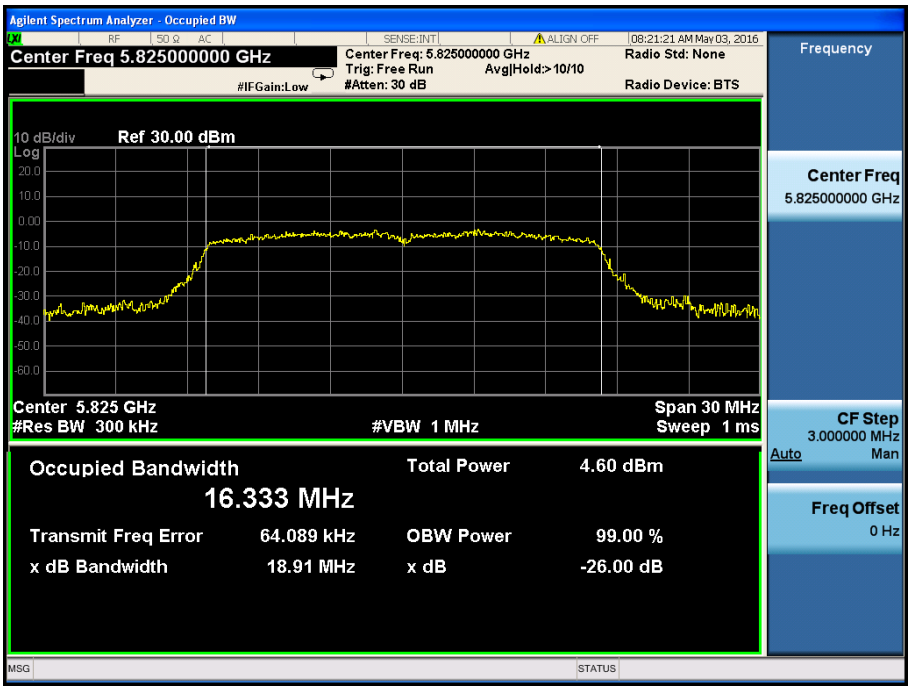
5785MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:02:15 AM May 04, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.461 MHz
Total Power
13.1 dBm
Transmit Freq Error
31.579 kHz
OBW Power
99.00 %
x dB Bandwidth
15.98 MHz
x dB
-6.00 dB
Center Freq
5.785000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:19:27 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.351 MHz
Total Power
4.06 dBm
Transmit Freq Error
40.864 kHz
OBW Power
99.00 %
x dB Bandwidth
18.79 MHz
x dB
-26.00 dB
Center Freq
5.785000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

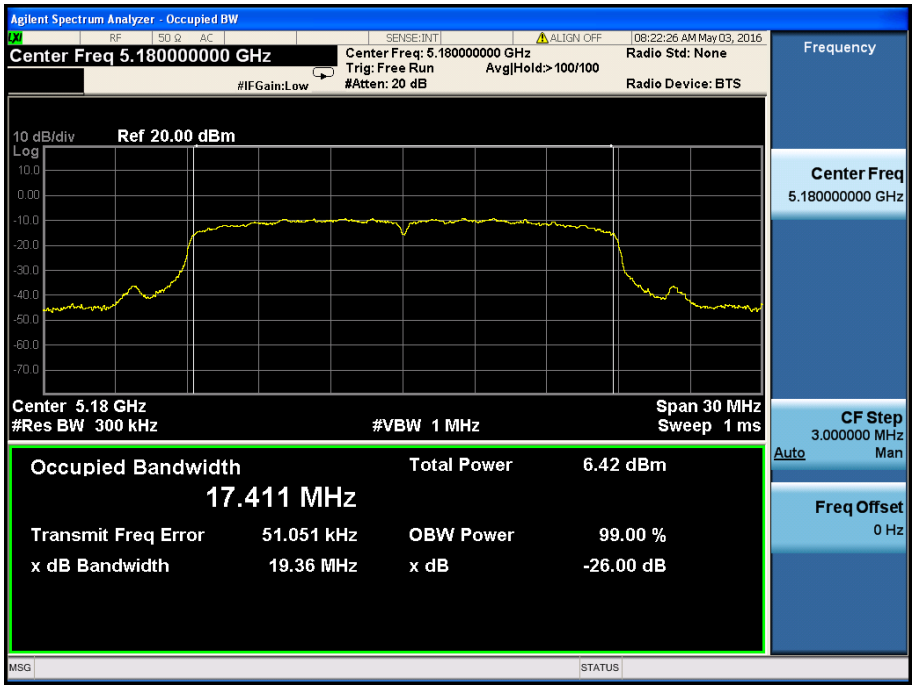
5825MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
03:04:53 AM May 04, 2016
Frequency
10 dB/div
Log
Ref 30.00 dBm
Center 5.825 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.457 MHz
Total Power
13.0 dBm
Transmit Freq Error
28.734 kHz
OBW Power
99.00 %
x dB Bandwidth
16.03 MHz
x dB
-6.00 dB
Center Freq
5.825000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
08:21:21 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 30.00 dBm
Center 5.825 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
16.333 MHz
Total Power
4.60 dBm
Transmit Freq Error
64.089 kHz
OBW Power
99.00 %
x dB Bandwidth
18.91 MHz
x dB
-26.00 dB
Center Freq
5.825000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Test Mode: 802.11n20

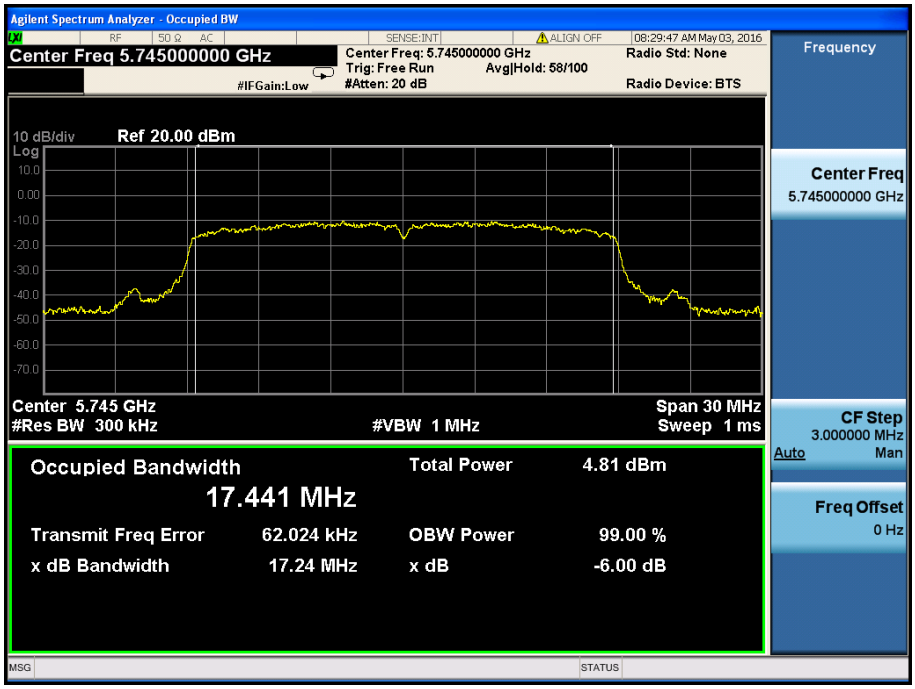
5180MHz

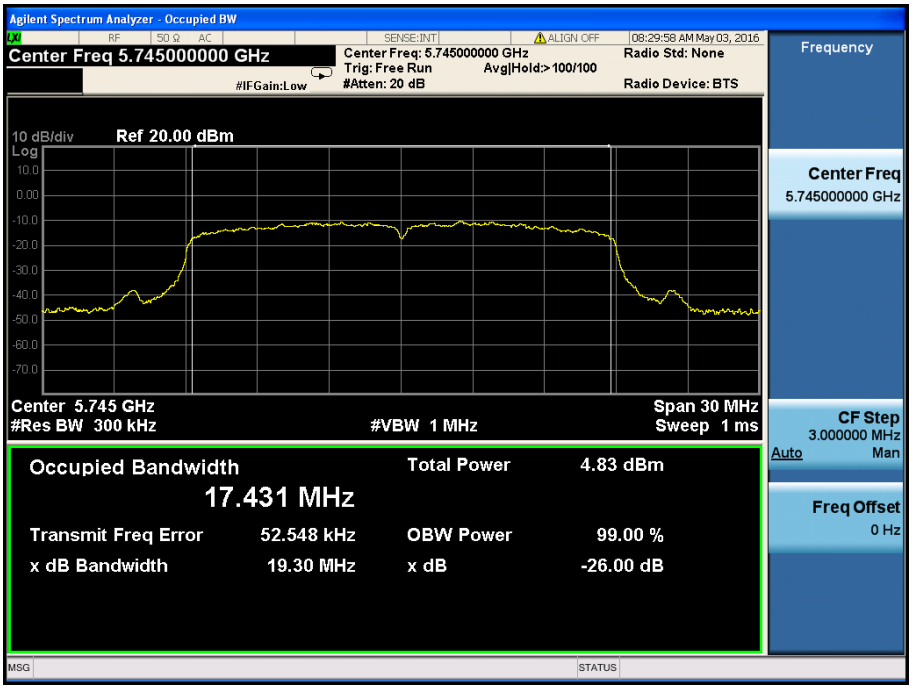


5200MHz

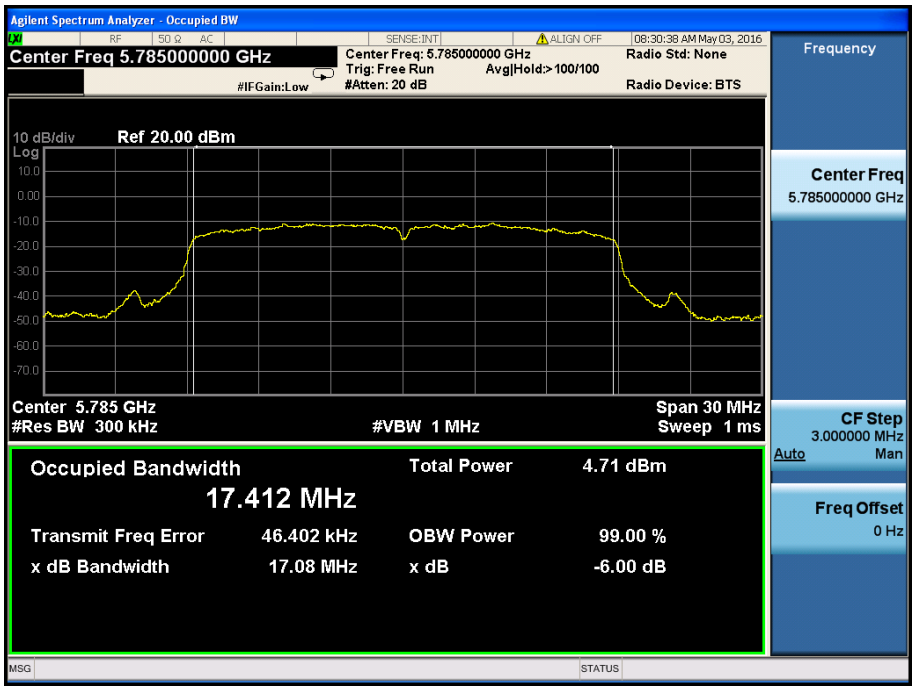
5240MHz

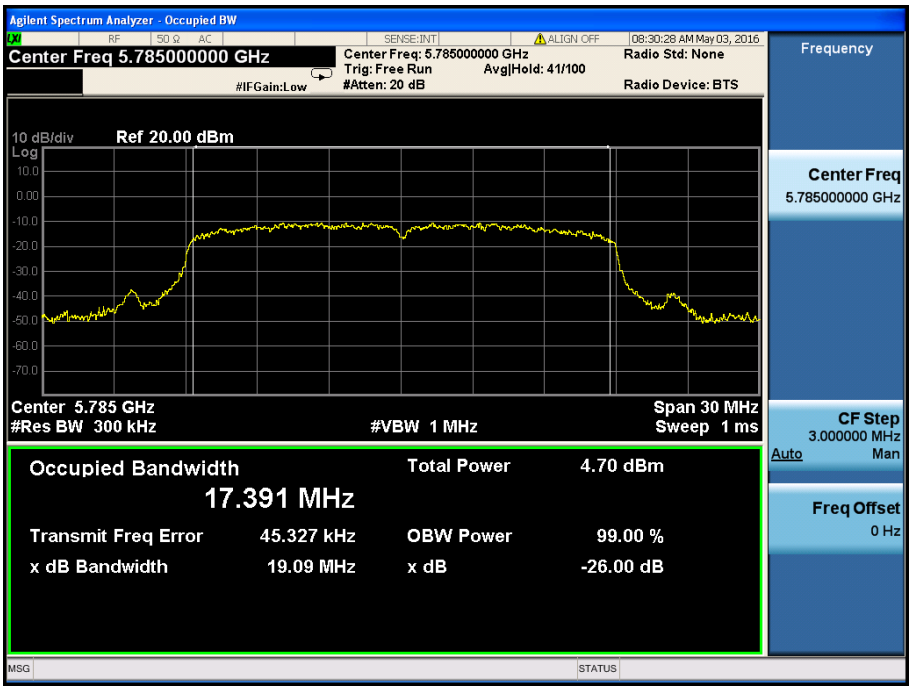
5745MHz



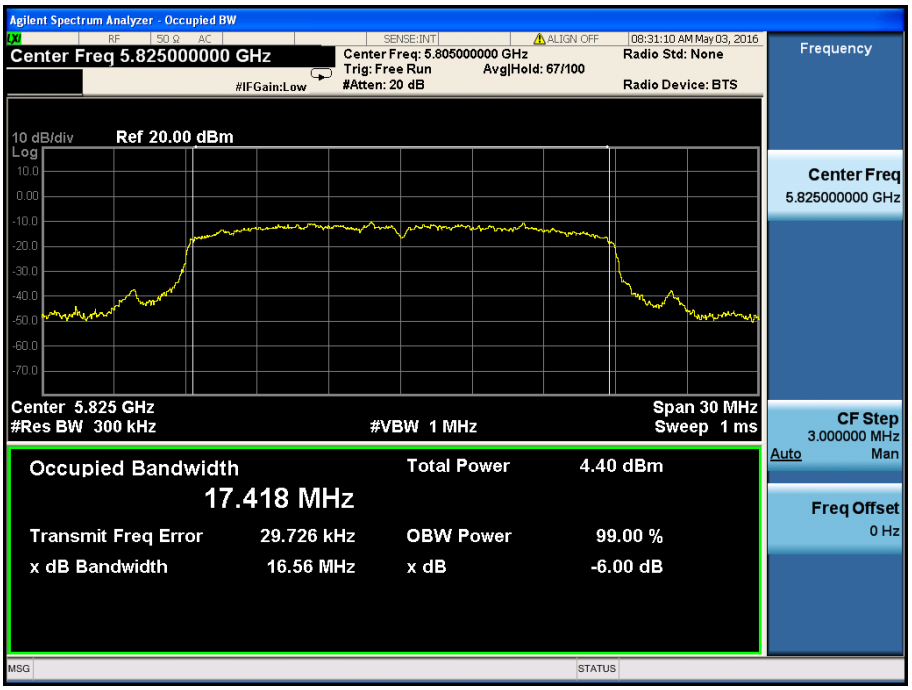

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.745000000 GHz
Center Freq: 5.745000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:29:58 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.745 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.431 MHz
Total Power 4.83 dBm
Transmit Freq Error 52.548 kHz
OBW Power 99.00 %
x dB Bandwidth 19.30 MHz
x dB -26.00 dB
Center Freq
5.745000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

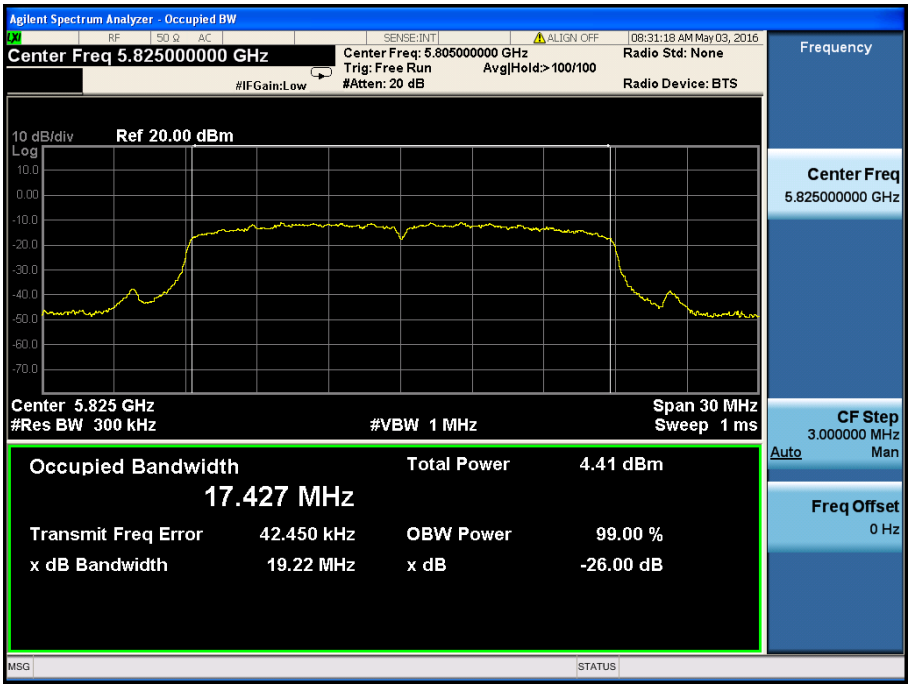
5785MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:30:38 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
17.412 MHz
Total Power 4.71 dBm
Transmit Freq Error 46.402 kHz
OBW Power 99.00 %
x dB Bandwidth 17.08 MHz
x dB -6.00 dB
Center Freq
5.785000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold: 41/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:30:28 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center Freq
5.785000000 GHz
Center 5.785 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
CF Step
3.000000 MHz
Auto
Man
Occupied Bandwidth
17.391 MHz
Total Power
4.70 dBm
Transmit Freq Error
45.327 kHz
OBW Power
99.00 %
x dB Bandwidth
19.09 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

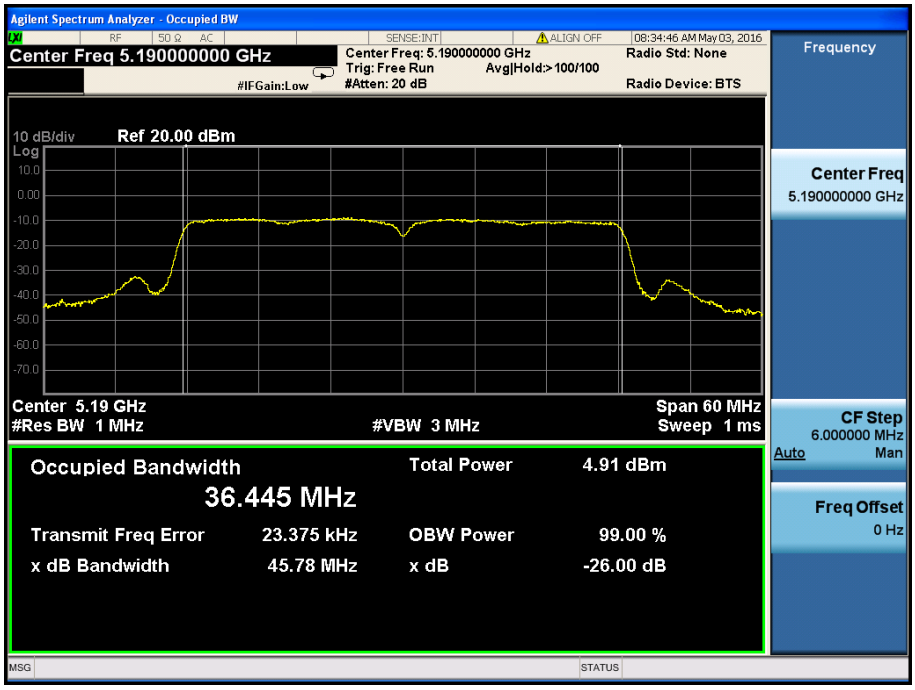
5825MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.805000000 GHz
Trig: Free Run
Avg|Hold: 67/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:31:10 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center Freq
5.825000000 GHz
Center 5.825 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
CF Step
3.000000 MHz
Auto
Man
Occupied Bandwidth
17.418 MHz
Total Power
4.40 dBm
Transmit Freq Error
29.726 kHz
OBW Power
99.00 %
x dB Bandwidth
16.56 MHz
x dB
-6.00 dB
Freq Offset
0 Hz
MSG
STATUS

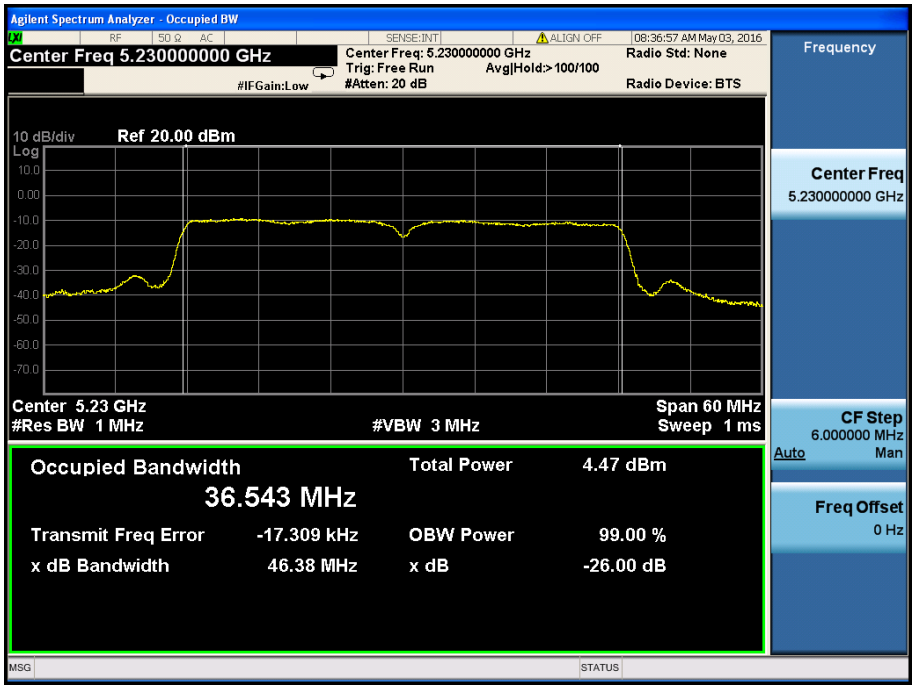

Agilent Spectrum Analyzer - Occupied BW
RF
50 Ω
AC
SENSE:INT
ALIGN OFF
08:31:18 AM May 03, 2016
Center Freq 5.825000000 GHz
Center Freq: 5.805000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#IFGain:Low
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center Freq
5.825000000 GHz
Center 5.825 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
CF Step
3.000000 MHz
Auto
Man
Occupied Bandwidth
17.427 MHz
Total Power
4.41 dBm
Transmit Freq Error
42.450 kHz
OBW Power
99.00 %
x dB Bandwidth
19.22 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

Test Mode: 802.11n-HT40

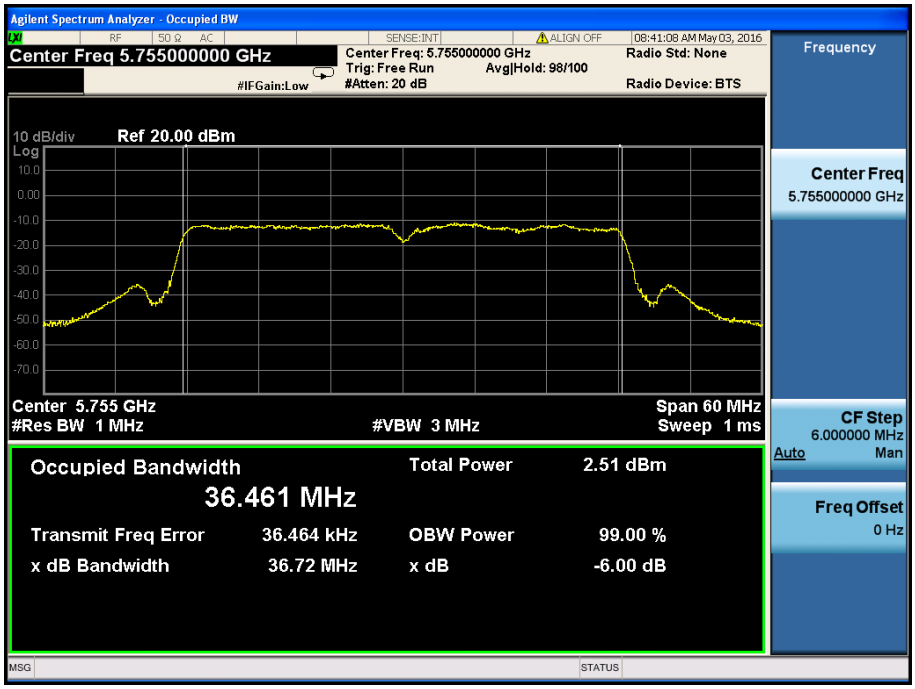
5190MHz

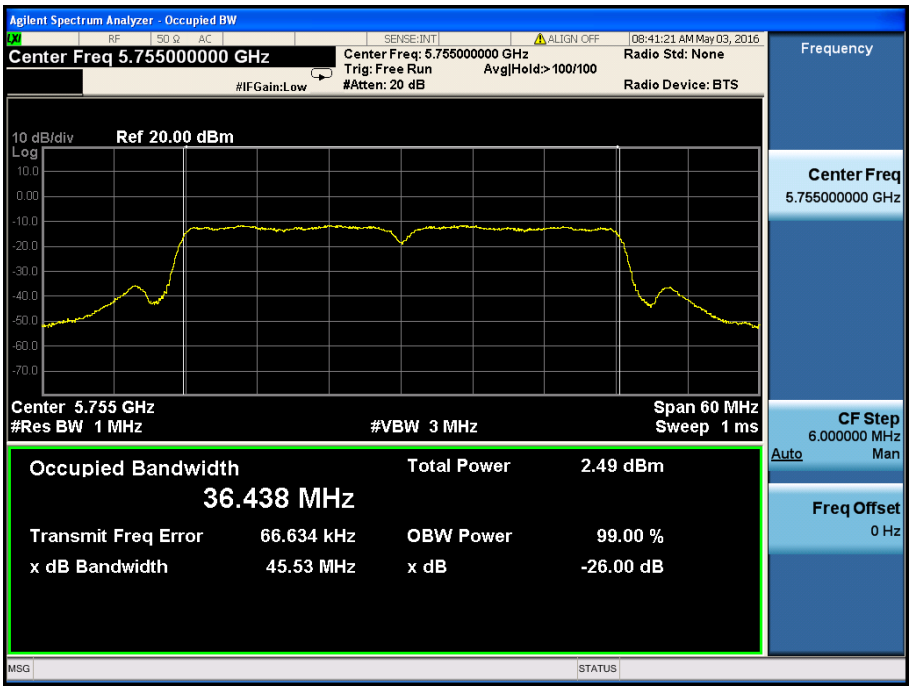


5230MHz

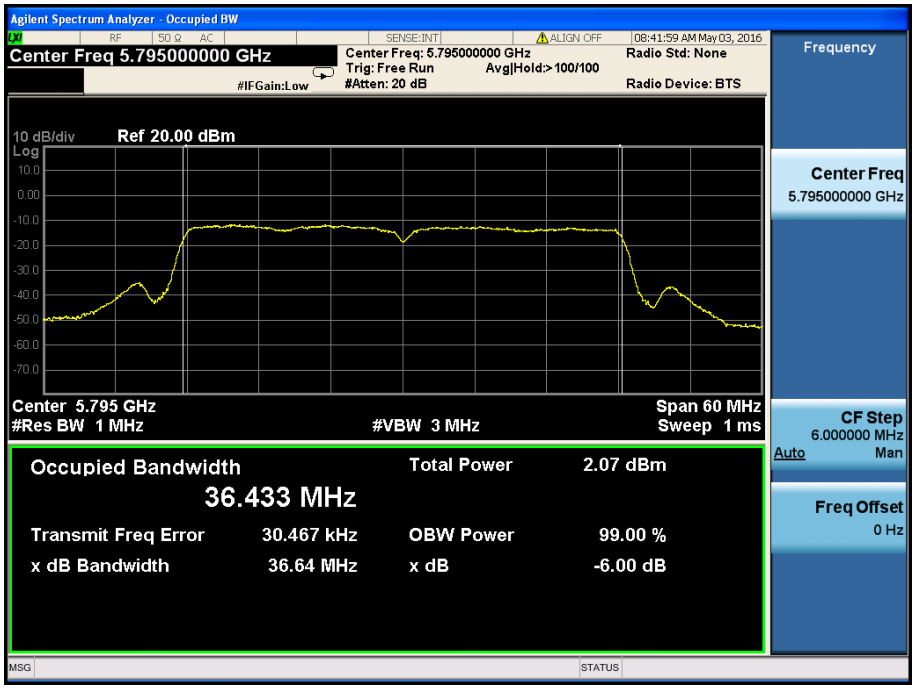


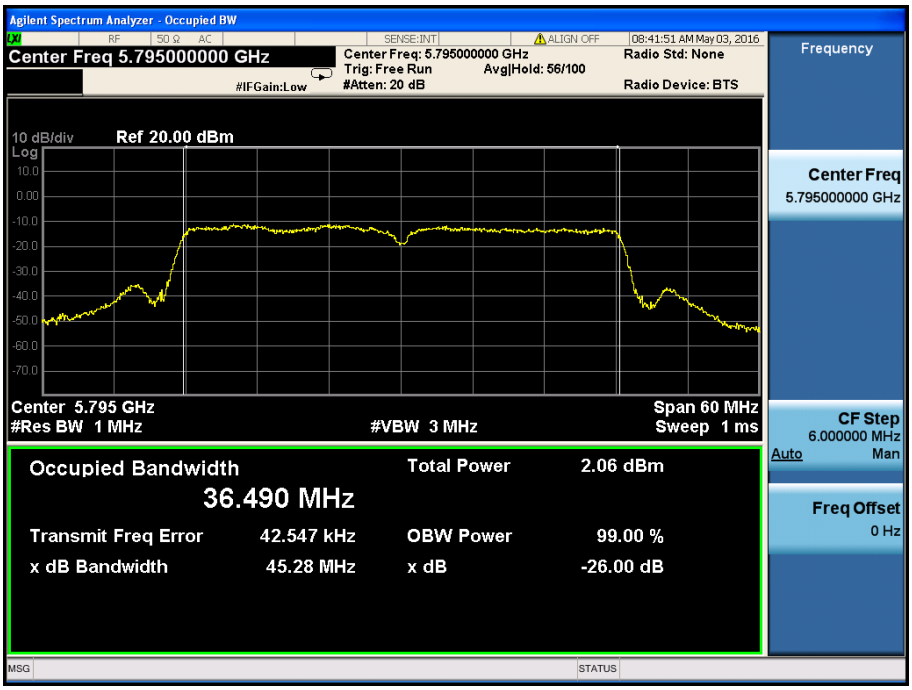
5755MHz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.755000000 GHz
Center Freq: 5.755000000 GHz
Trig: Free Run
Avg|Hold: 98/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:41:08 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.755 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.461 MHz
Total Power
2.51 dBm
Transmit Freq Error
36.464 kHz
OBW Power
99.00 %
x dB Bandwidth
36.72 MHz
x dB
-6.00 dB
Center Freq
5.755000000 GHz
CF Step
6.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.755000000 GHz
Center Freq: 5.755000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:41:21 AM May 03, 2016
Frequency
10 dB/div
Log
Ref 20.00 dBm
Center 5.755 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.438 MHz
Total Power
2.49 dBm
Transmit Freq Error
66.634 kHz
OBW Power
99.00 %
x dB Bandwidth
45.53 MHz
x dB
-26.00 dB
Center Freq
5.755000000 GHz
CF Step
6.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

5795MHz


Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
08:41:59 AM May 03, 2016
Center Freq 5.795000000 GHz
Center Freq: 5.795000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#IFGain:Low
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.795 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.433 MHz
Total Power
2.07 dBm
Transmit Freq Error
30.467 kHz
OBW Power
99.00 %
x dB Bandwidth
36.64 MHz
x dB
-6.00 dB
Center Freq
5.795000000 GHz
CF Step
6.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
08:41:51 AM May 03, 2016
Center Freq 5.795000000 GHz
Center Freq: 5.795000000 GHz
Trig: Free Run
Avg|Hold: 56/100
#IFGain:Low
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.795 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Occupied Bandwidth
36.490 MHz
Total Power
2.06 dBm
Transmit Freq Error
42.547 kHz
OBW Power
99.00 %
x dB Bandwidth
45.28 MHz
x dB
-26.00 dB
Center Freq
5.795000000 GHz
CF Step
6.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

7. Maximum Conducted Output Power

7.1 Standard Applicable

According to 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.

7.2 Test Procedure

According to KDB789033 D02 v01 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.

7.3 Environmental Conditions

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

7.4 Summary of Test Results/Plots

Power output:

802.11a

channel	Frequency MHz	Power 1 dBm	Power 2 dBm	Total Power dBm	Total Power mW	Limit mW
36	5180	15.08	14.42	17.77	59.88	250
40	5200	14.29	13.17	16.78	47.6	250
48	5240	13.87	13.20	16.56	45.27	250
149	5745	14.83	12.54	16.84	48.36	1000
157	5785	14.06	13.55	16.82	48.12	1000
165	5825	14.14	13.02	16.63	45.98	1000

802.11n20

channel	Frequency MHz	Power 1 dBm	Power 2 dBm	Total Power dBm	Total Power mW	Limit mW
36	5180	14.95	14.69	17.83	60.7	250
40	5200	14.55	13.36	17.01	50.19	250
48	5240	14.43	14.16	17.31	53.79	250
149	5745	14.75	13.96	17.38	54.74	1000
157	5785	14.02	13.09	16.59	45.6	1000
165	5825	13.63	13.05	16.36	43.25	1000

802.11n40

channel	Frequency MHz	Power 1 dBm	Power 2 dBm	Total Power dBm	Total Power mW	Limit mW
38	5190	13.65	12.37	16.07	40.43	250
46	5230	14.03	13.68	16.87	48.62	250
151	5755	13.18	11.68	15.50	35.52	1000
159	5795	12.83	12.32	15.30	33.91	1000

8. Conducted Spurious Emissions

8.1 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.

8.2 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.

8.3 Environmental Conditions

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

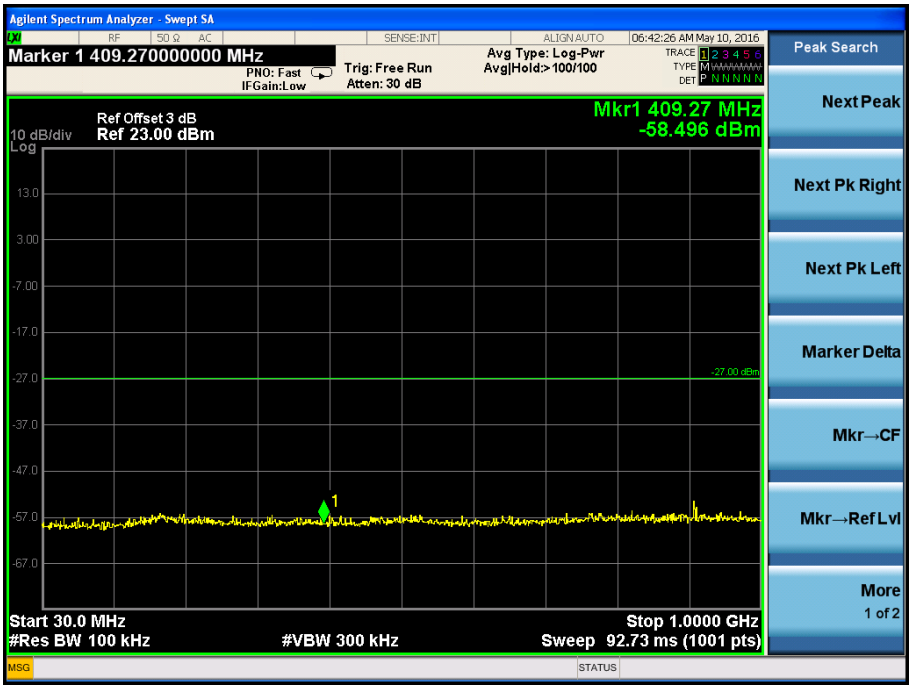
8.4 Summary of Test Results/Plots

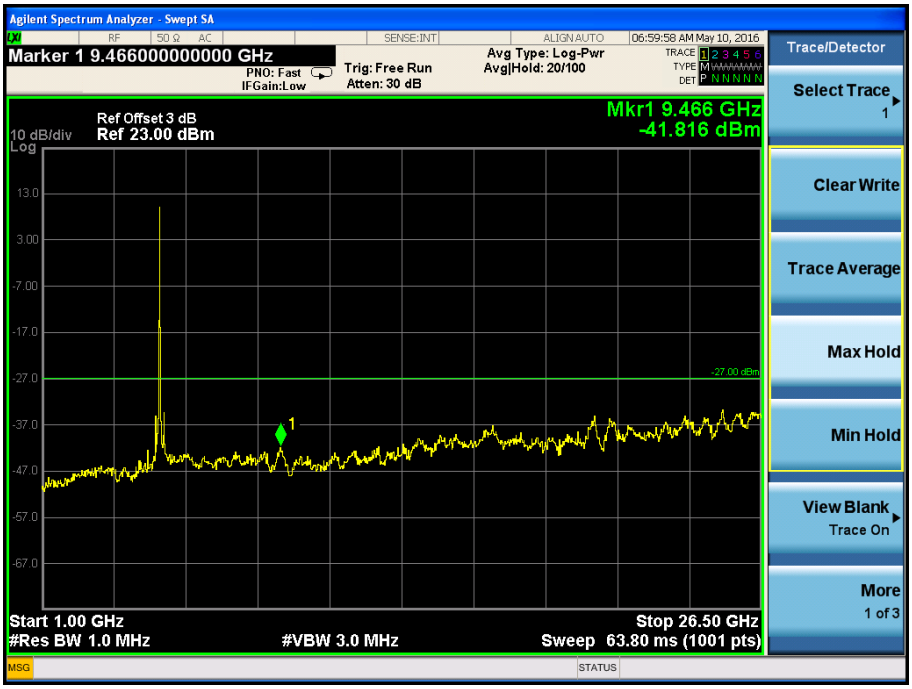
Emissions above 26.5GHz are attenuated more than 20dB below the permissible limits and test data are not reported.

Antenna 1

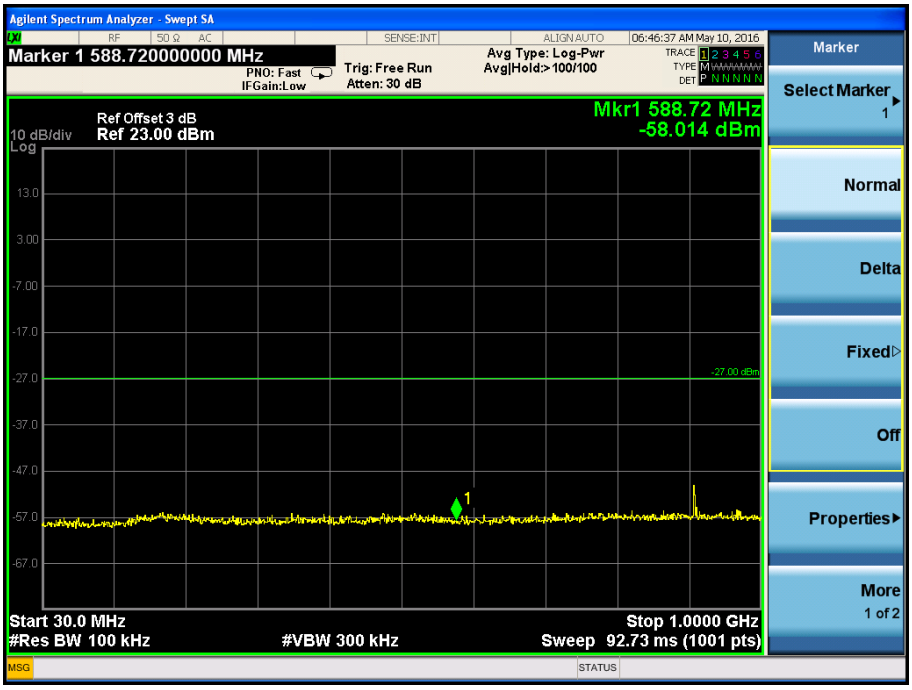
802.11a

5180MHz



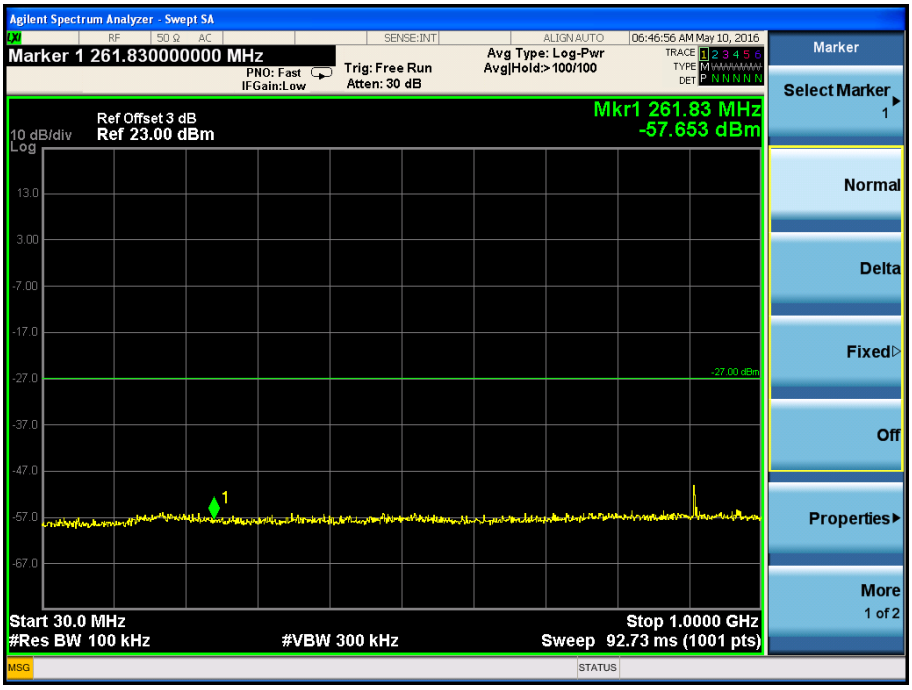


5200MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 588.720000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
06:46:37 AM May 10, 2016
Ref Offset 3 dB
10 dB/div
Log
Ref 23.00 dBm
Mkr1 588.72 MHz
-58.014 dBm
-27.00 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.73 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS

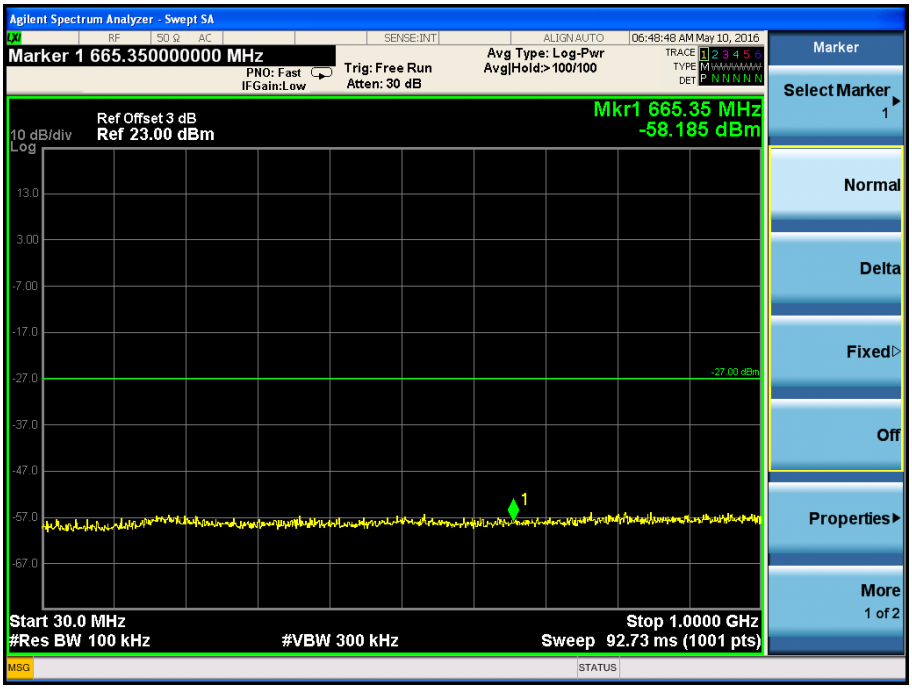

Agilent Spectrum Analyzer - Swept SA
Marker 1 21.247000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 83/100
07:01:24 AM May 10, 2016
Ref Offset 3 dB
10 dB/div
Log
Ref 23.00 dBm
Mkr1 21.247 GHz
-33.619 dBm
-27.00 dBm
Start 1.00 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 26.50 GHz
Sweep 63.80 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
File <2.png> saved
STATUS

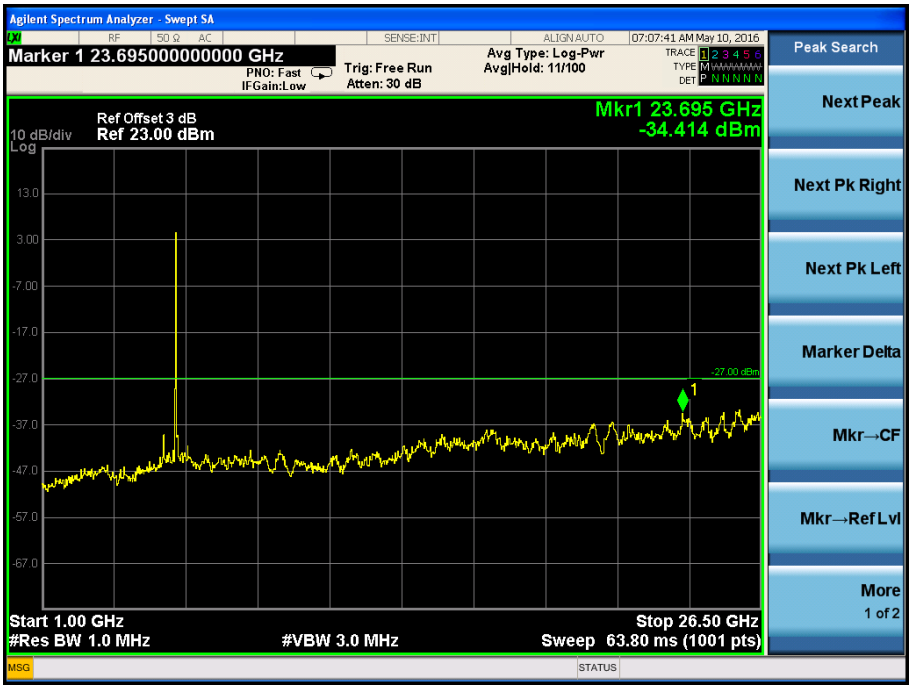
5240MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 261.830000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
06:46:56 AM May 10, 2016
Ref Offset 3 dB
10 dB/div
Ref 23.00 dBm
Log
Mkr1 261.83 MHz
-57.653 dBm
-27.00 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.73 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 1 9.466000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 73/100
07:02:26 AM May 10, 2016
Ref Offset 3 dB
10 dB/div
Ref 23.00 dBm
Log
Mkr1 9.466 GHz
-41.916 dBm
-27.00 dBm
Start 1.00 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 26.50 GHz
Sweep 63.80 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS

5745MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 665.350000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
06:48:48 AM May 10, 2016
Ref Offset 3 dB
10 dB/div
Ref 23.00 dBm
Log
Mkr1 665.35 MHz
-58.185 dBm
-27.00 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.73 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 23.695000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 11/100
07:07:41 AM May 10, 2016
Ref Offset 3 dB
10 dB/div
Ref 23.00 dBm
Log
Mkr1 23.695 GHz
-34.414 dBm
-27.00 dBm
Start 1.00 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 26.50 GHz
Sweep 63.80 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2