FCC Part 15E
Measurement and Test Report

For

Tempered Networks, Inc.

3101 Western Ave, Suite 550, Seattle, Washington, USA 98121

FCC ID: 2AE4M-HS75W

FCC Rule(s):	FCC Part 15.407
Product Description:	HIPswitch 75 series Tempered Networks
Tested Model:	Tempered Networks HS75w
Report No.:	WTX19X08060321W-1
Sample Receipt Date:	2019-08-29
Tested Date:	2019-08-29 to 2019-09-11
Issued Date:	2019-09-11
Tested By:	Mike Shi / Engineer
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.

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Report version

Version No.	Date of issue	Description
Rev.00	2019-09-11	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Tempered Networks, Inc.
Address of applicant:	3101 Western Ave, Suite 550, Seattle, Washington, USA 98121
Manufacturer:	Globalscale Technologies
Address of manufacturer:	6F, No.C Building, No.4, First Rd., Shangxue Technology Industrial City, Bantian Steet, Longgang District, Shenzhen, China

General Description of EUT	
Product Name:	HIPswitch 75 series Tempered Networks
Brand Name:	TEMPERED NETWORKS
Model No.:	Tempered Networks HS75w
Adding Model(s):	/
Rated Voltage:	DC12V
Battery Capacity:	/
Power Adapter:	/
Software Version:	/
Hardware Version:	/
The EUT is only support slave without radar Detection function,and does not support TPC.	
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) , 802.11n-HT40, 802.11ac-HT20, 802.11ac-HT40, 802.11ac-HT80,
Frequency Range:	5250-5350MHz, 5470-5725MHz
RF Output Power:	13.11dBm (Conducted)
Type of Modulation:	BPSK, QPSK,16QAM,64QAM, 256QAM
Data Rate:	6-54Mbps, up to 200Mbps
Type of Antenna:	PIFA Antenna
Antenna Gain:	2.7dBi

Frequency list

Band	20MHz		40MHz		80MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII-2A	52	5260	54	5270	-	-
	56	5280	-	-	58	5290
	60	5300	62	5310	-	-
	64	5320	-	-	-	-
U-NII-2C	100	5500	102	5510	106	5530
	104	5520	-	-	-	-
	108	5540	110	5550	-	-
	112	5560	-	-	-	-
	116	5580	-	-	-	-
	120	5600	118	5590	122	5610
	124	5620	-	-	-	-
	128	5640	126	5630	-	-
	132	5660	-	-	-	-
	136	5680	-	-	-	-
	140	5700	134	5670	138	5690

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
KDB789033 D02 v02r01: GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E

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 C63.10-2013, KDB789033 D02 v02r01
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Enter “putty_xp.exe” into the calculator to enter the engineer mode, you can start to test. 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	/	/	/	10	10	10	10	10	10	/	/	/	/
802.11n-HT20 MCS0	/	/	/	10	10	10	10	10	10	/	/	/	/
802.11ac-HT20 MCS0/Nss2	/	/	/	10	10	10	10	10	10	/	/	/	/

Mode	NCB: 40MHz									
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795
802.11n-HT40 MCS0	/	/	10	10	10	10	10	/	/	/
802.11ac-HT40 MCS0/Nss2	/	/	10	10	10	10	10	/	/	/

Mode	NCB: 80MHz					
	5210	5290	5530	5610	5690	5775
802.11ac-HT80 MCS0/Nss2	/	10	10	10	/	/

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 Android were executed.

1.6 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

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.

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, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5260MHz,5280MHz,5320MHz,5500MHz,5600MHz,5700MHz,
TM2	802.11n-HT20	5260MHz,5280MHz,5320MHz,5500MHz,5600MHz,5700MHz
TM3	802.11ac-HT20	5260MHz,5280MHz,5320MHz,5500MHz,5600MHz,5700MHz
TM4	802.11n-HT40	5270MHz,5310MHz,5510MHz,5590MHz,5670MHz
TM5	802.11ac-HT40	5270MHz,5310MHz,5510MHz,5590MHz,5670MHz
TM6	802.11ac-HT80	5290MHz,5530 MHz,5610 MHz

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	50~55 %.
ATM Pressure:	1019 mbar

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

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
DC Cable	1.2	Shielded	With Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Adapter	/	YCL-D120200EU	/

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	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.9 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2019-04-30	2020-04-29
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
SEMT-1042	Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2019-05-05	2021-05-04
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2019-04-30	2020-04-29
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2019-04-30	2020-04-29
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2019-04-30	2020-04-29
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2019-04-30	2020-04-29
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2019-04-30	2020-04-29
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2019-04-30	2020-04-29
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2019-04-30	2020-04-29
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2019-04-30	2020-04-29
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2019-03-18	2020-03-17
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2019-03-18	2020-03-17
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2019-03-18	2020-03-17
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2019-03-18	2020-03-17
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

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) (2)	Power Spectral Density	Compliant
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§15.407(a) (2)	Maximum Conducted Output Power	Compliant
§15.407(b) (2),(3),(4)	Undesirable emission	Compliant
§15.205; §15.407(b) (2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliant

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 MPE 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

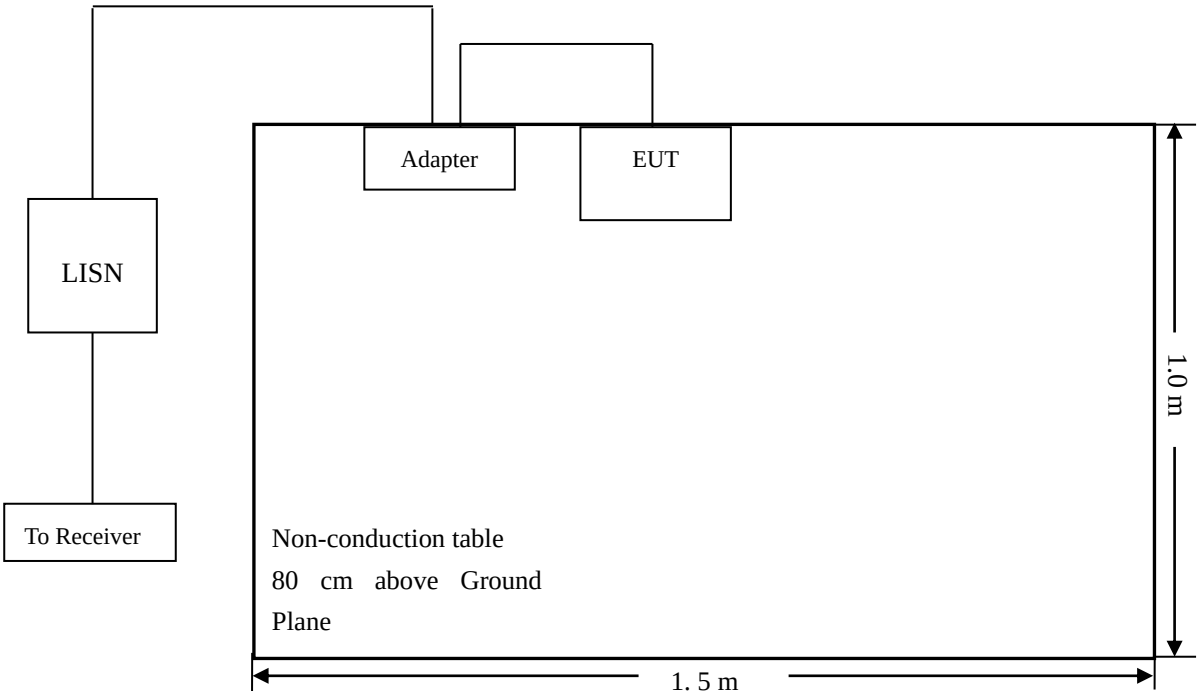
This product has two PIFA antenna, fulfill the requirement of this section.

5. Conducted Emissions

5.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 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.

5.2 Basic Test Setup Block Diagram



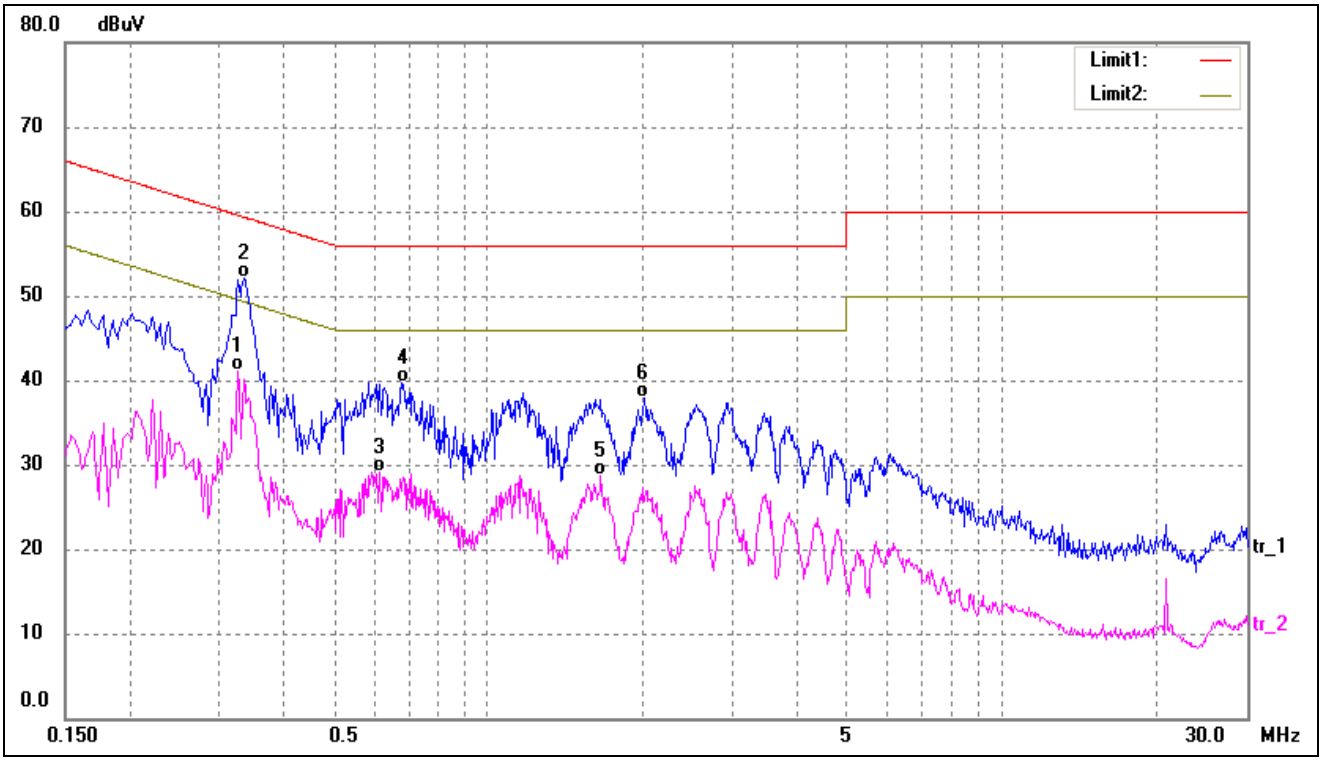
5.3 Test Receiver Setup

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

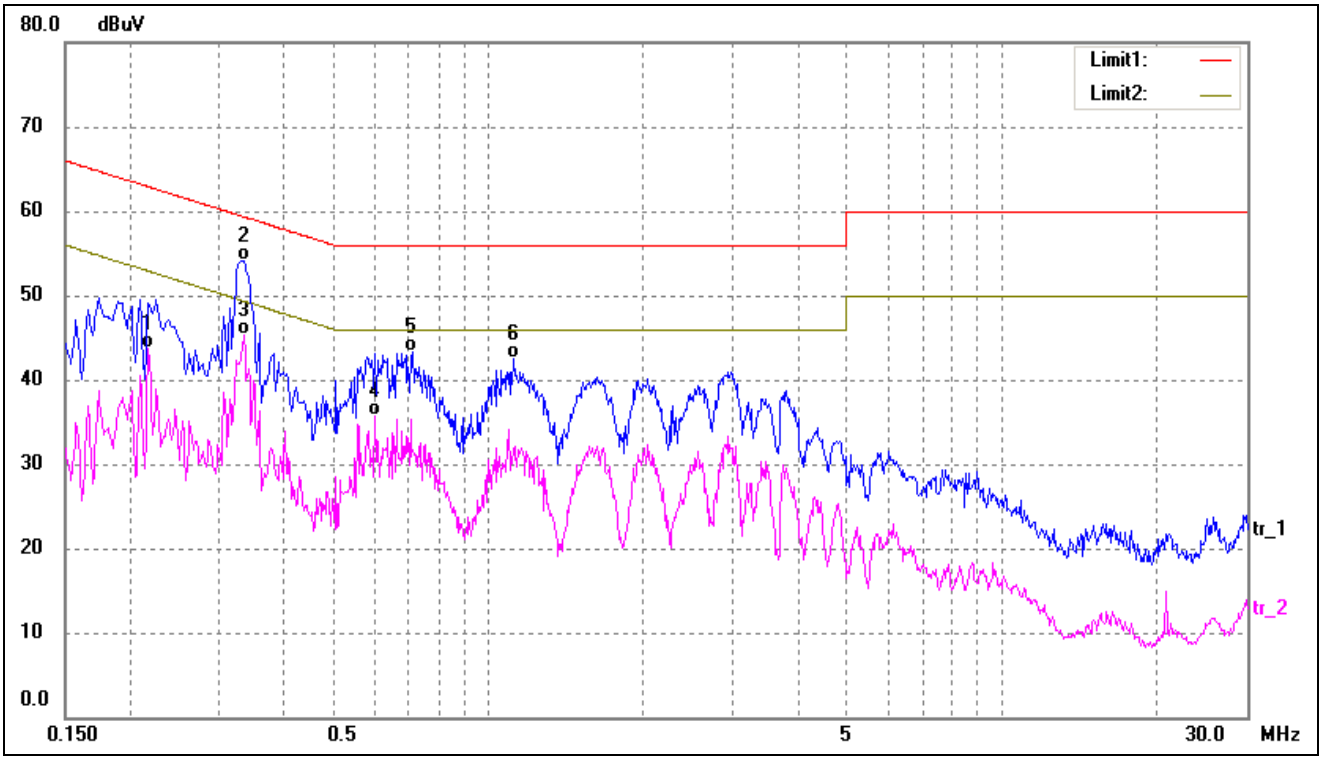
5.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.3260	31.17	10.02	41.19	49.55	-8.36	AVG
2*	0.3340	42.11	10.02	52.13	59.35	-7.22	QP
3	0.6140	19.05	10.05	29.10	46.00	-16.90	AVG
4	0.6780	29.73	10.05	39.78	56.00	-16.22	QP
5	1.6540	18.24	10.37	28.61	46.00	-17.39	AVG
6	2.0180	27.60	10.37	37.97	56.00	-18.03	QP

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.2180	33.75	9.98	43.73	52.89	-9.16	AVG
2	0.3340	44.01	10.02	54.03	59.35	-5.32	QP
3*	0.3340	35.21	10.02	45.23	49.35	-4.12	AVG
4	0.6020	25.72	10.05	35.77	46.00	-10.23	AVG
5	0.7140	33.21	10.07	43.28	56.00	-12.72	QP
6	1.1180	32.19	10.38	42.57	56.00	-13.43	QP

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 v02r01 General UNII Test Procedures New Rules v02, 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 500kHz 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.

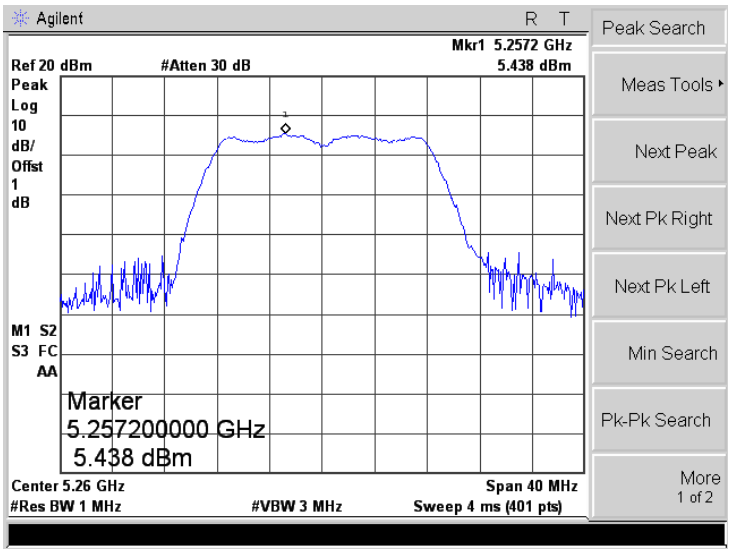
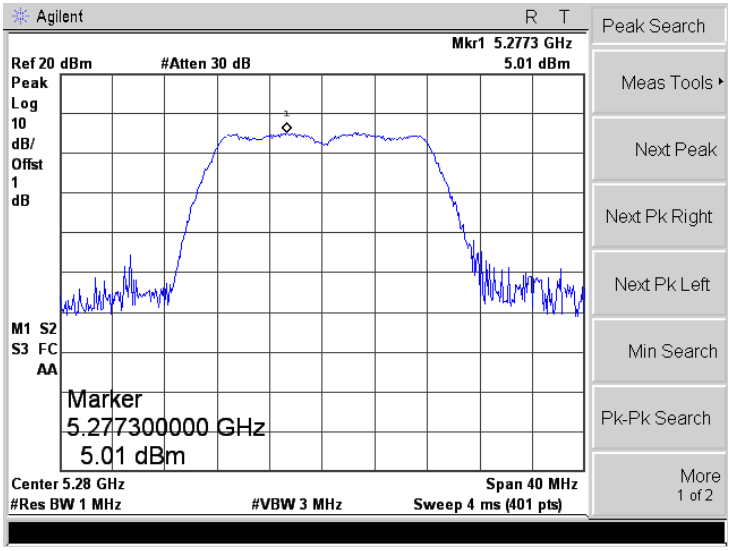
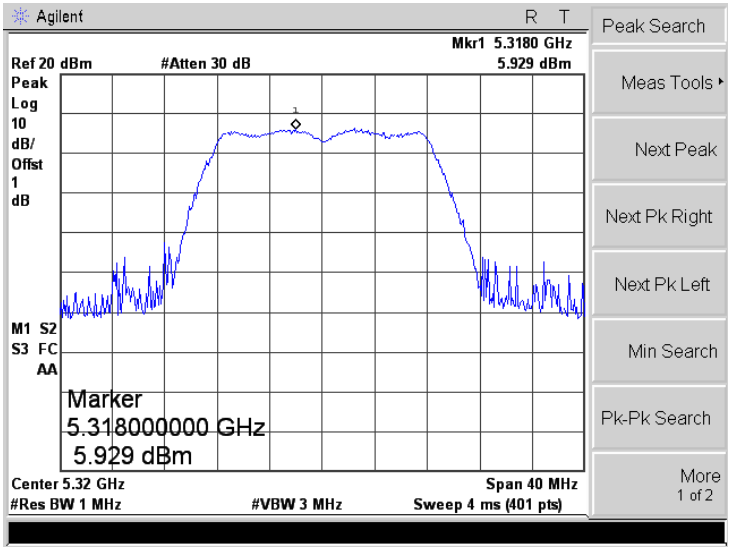
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW=100 kHZ is available on nearly all spectrum analyzers.

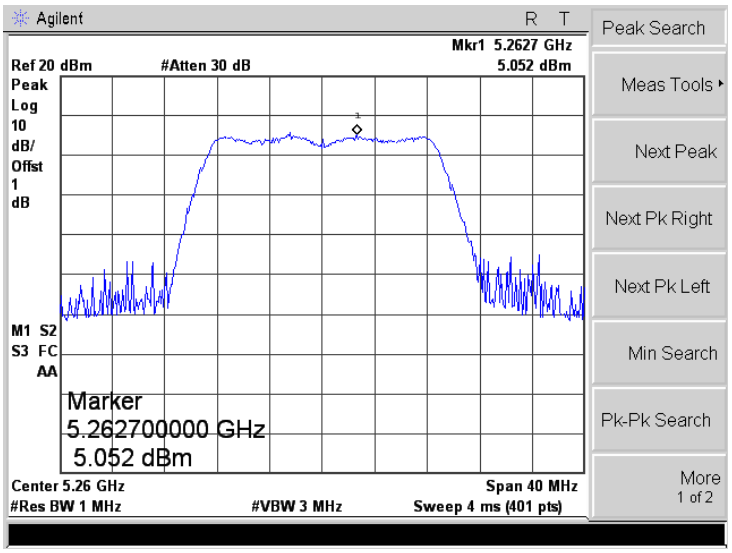
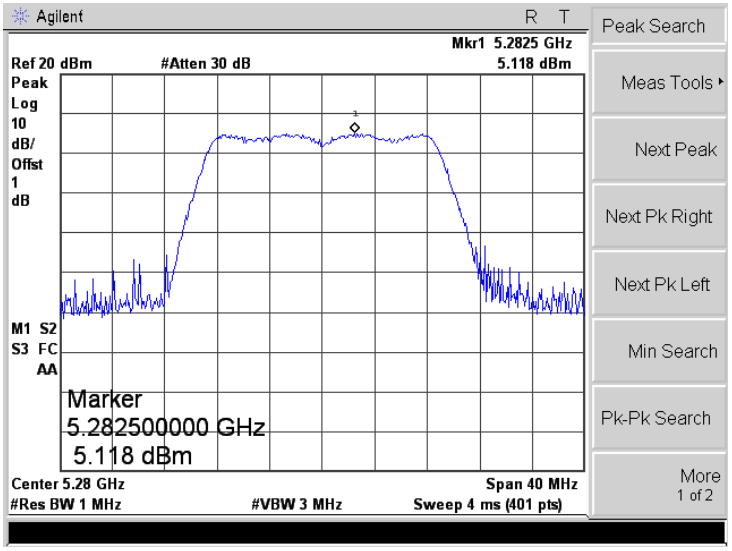
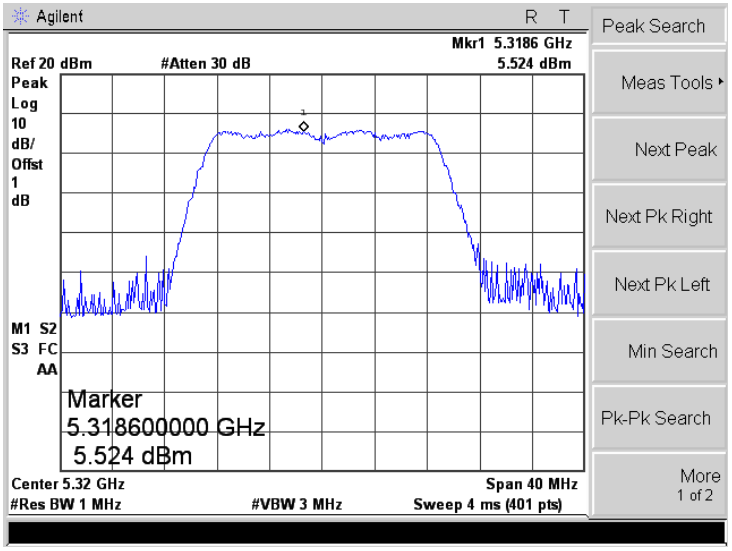
6.3 Summary of Test Results/Plots

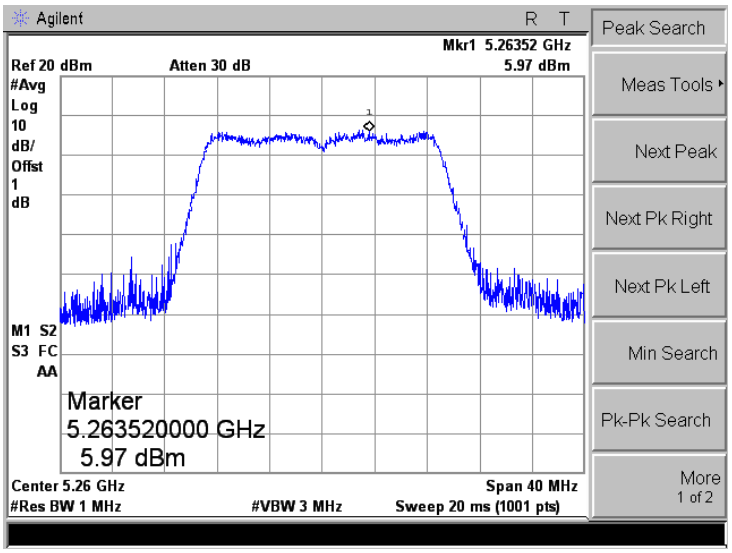
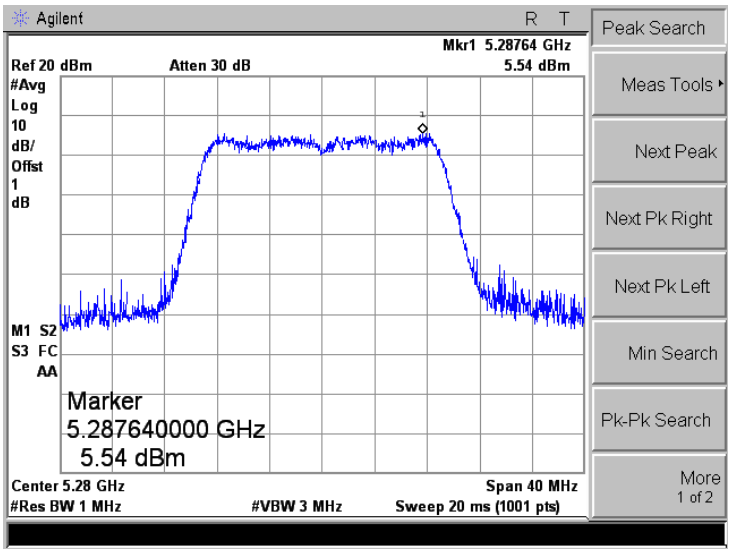
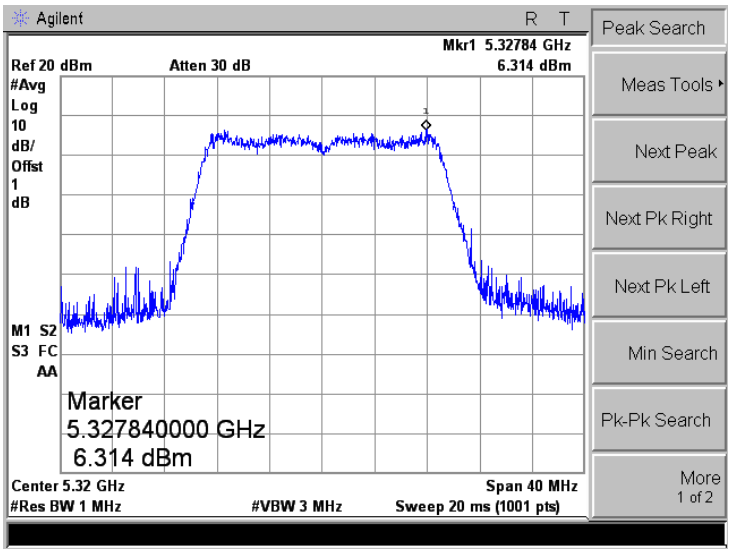
U-NII-2A: 5250-5350MHz					
Operating mode	Test Channel	Power Spectral Density dBm/MHz		Total dBm/MHz	Limit (dBm/MHz)
		ANT A	ANT B		
802.11a	5260	5.44	4.78	/	11
	5280	5.01	5.06	/	11
	5320	5.93	5.66	/	11
802.11n-HT20	5260	5.05	5.41	8.24	11
	5280	5.12	4.68	7.92	11
	5320	5.52	5.77	8.66	11
802.11ac-HT20	5260	5.97	4.42	8.27	11
	5280	5.54	5.97	8.77	11
	5320	6.31	4.74	8.61	11
802.11n-HT40	5270	2.50	2.52	5.52	11
	5310	3.04	2.96	6.01	11
802.11ac-HT40	5270	4.61	3.89	7.28	11
	5310	4.43	3.10	6.83	11
802.11ac-HT80	5290	-0.40	-0.85	2.39	11

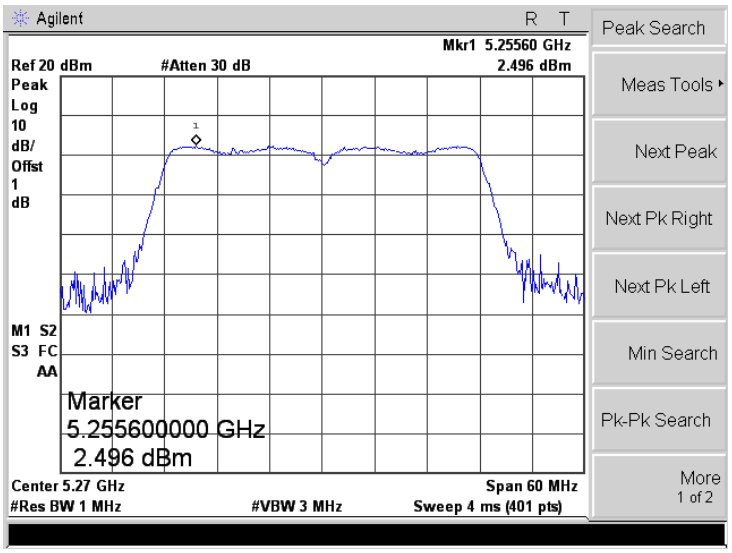
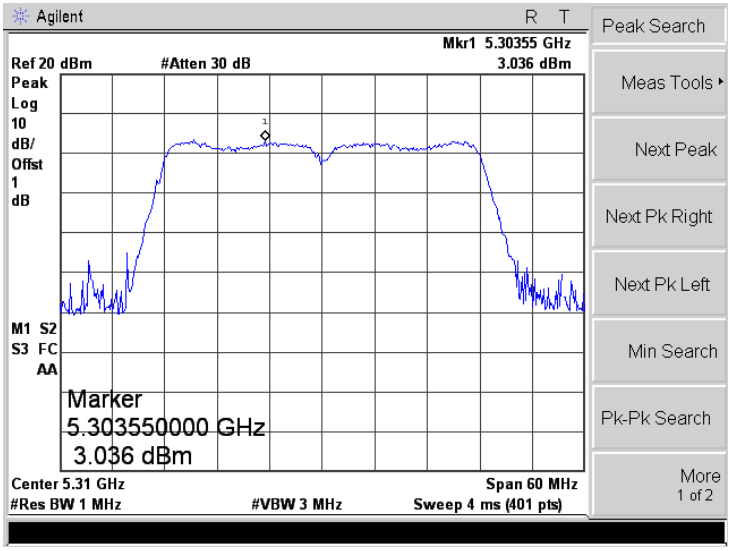
U-NII-2C: 5470-5725MHz					
Operating mode	Test Channel	Power Spectral Density dBm/MHz		Total dBm/MHz	Limit (dBm/MHz)
		ANT A	ANT B		
802.11a	5500	3.59	3.40	/	11
	5600	3.39	3.69	/	11
	5700	1.89	2.24	/	11
802.11n-HT20	5500	3.25	3.48	6.38	11
	5600	3.03	3.73	6.40	11
	5700	2.23	2.13	5.19	11
802.11ac-HT20	5500	3.78	5.13	7.52	11
	5600	3.52	5.79	7.81	11
	5700	3.53	5.25	7.48	11
802.11n-HT40	5510	0.76	0.68	3.73	11
	5590	0.35	0.67	3.52	11
	5670	-0.10	0.16	3.04	11
802.11ac-HT40	5510	1.87	4.40	6.33	11
	5590	1.76	3.27	5.59	11
	5670	1.25	3.74	5.68	11
802.11ac-HT80	5530	-2.70	-2.18	0.58	11
	5610	-1.99	-2.65	0.70	11

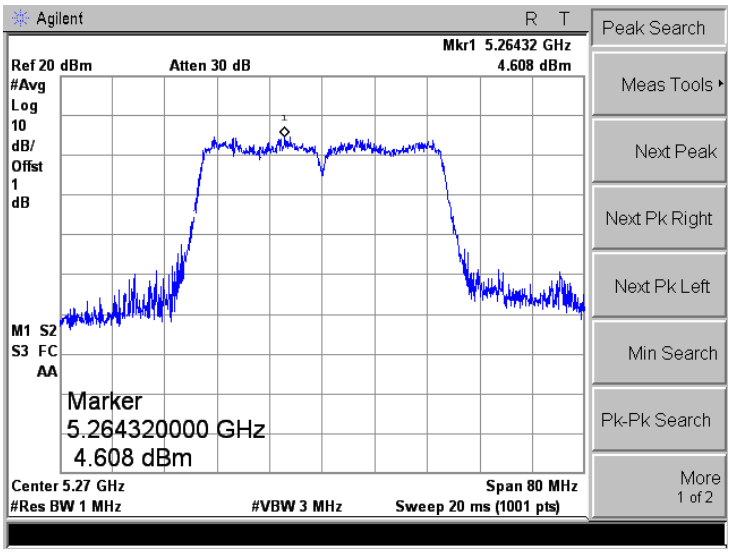
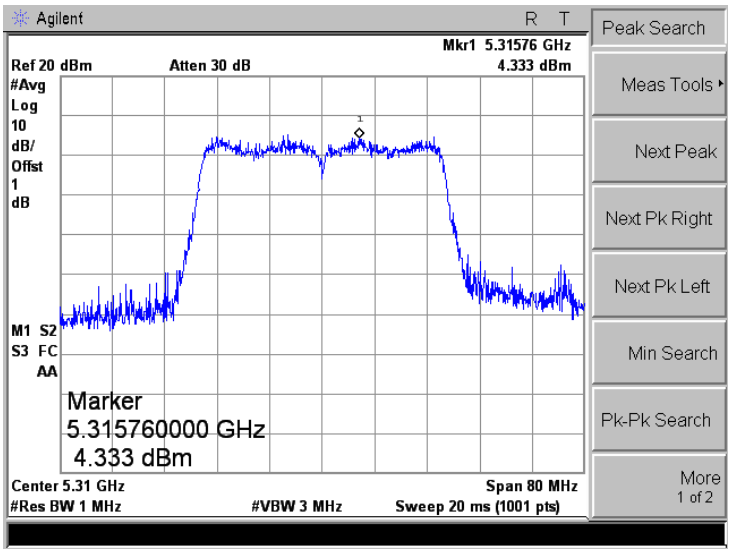
➢ 5250-5350MHz (Antenna A)

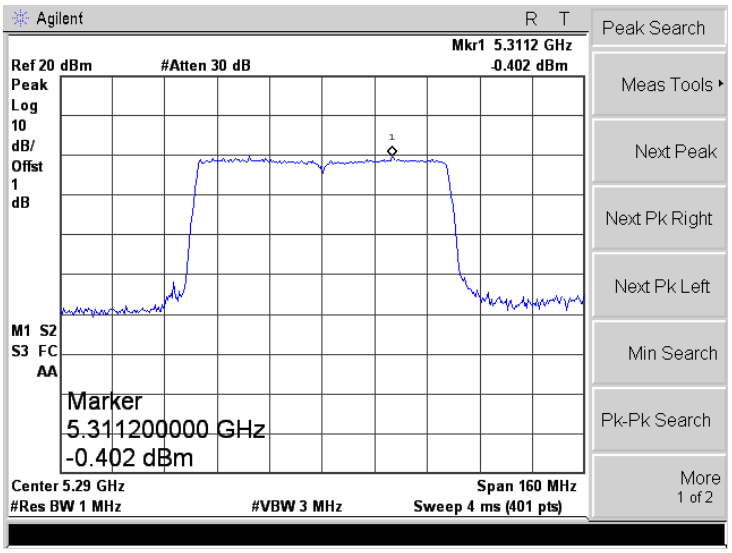
Mode:	**802.11a**
5260MHz	
5280MHz	
5320MHz	

Mode:	802.11n-HT20
5260MHz	
5280MHz	
5320MHz	

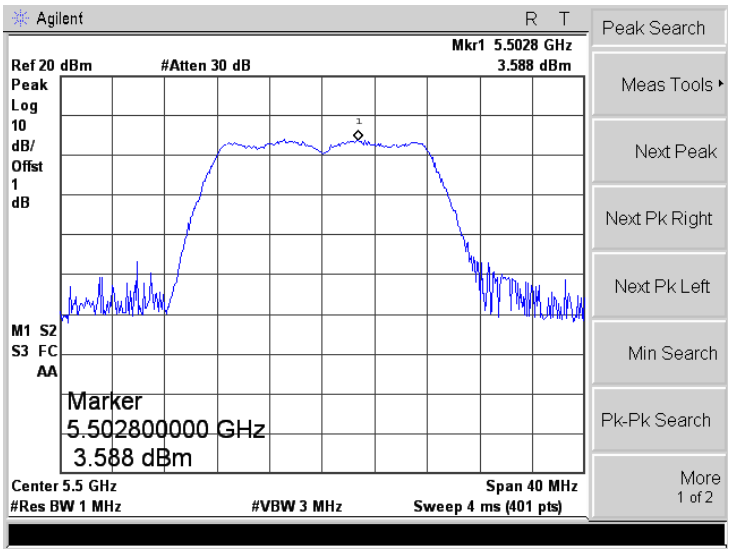
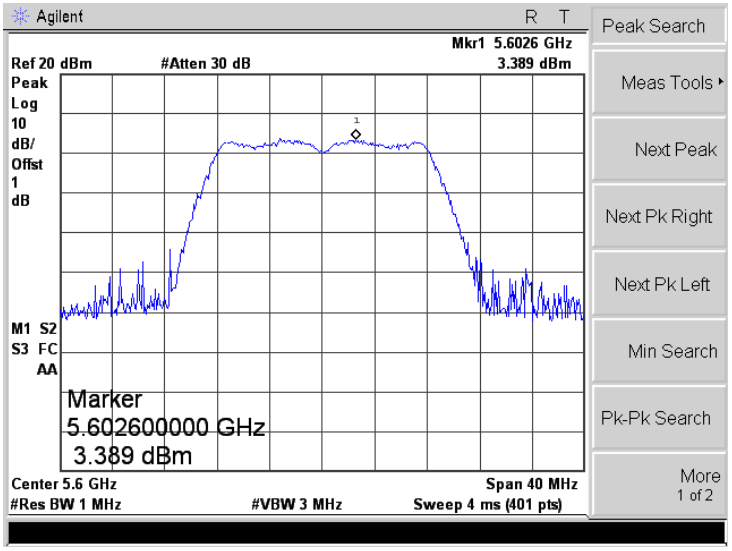
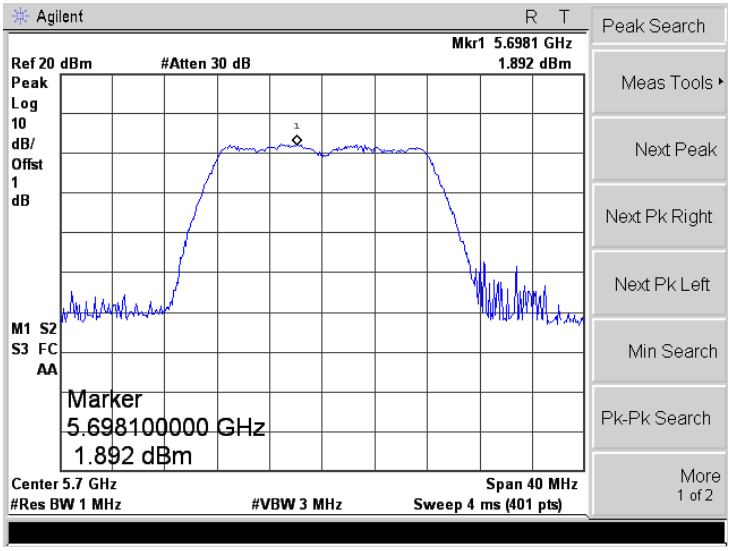
Mode:	802.11ac-HT20
5260MHz	
5280MHz	
5320MHz	

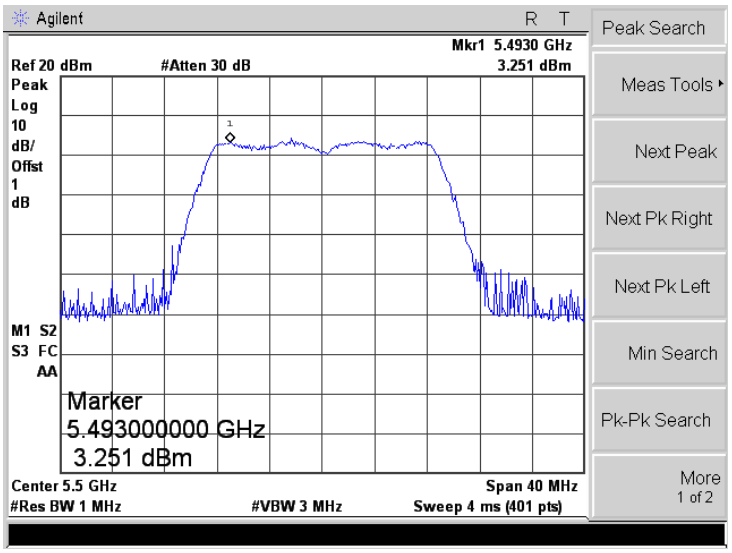
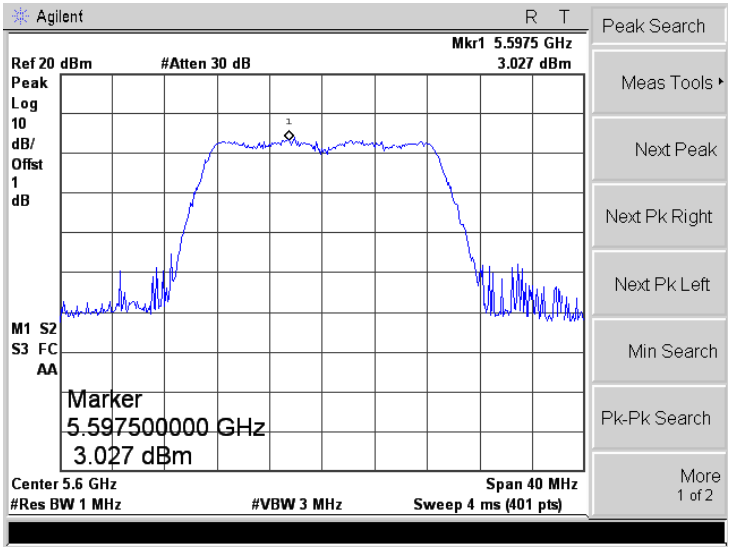
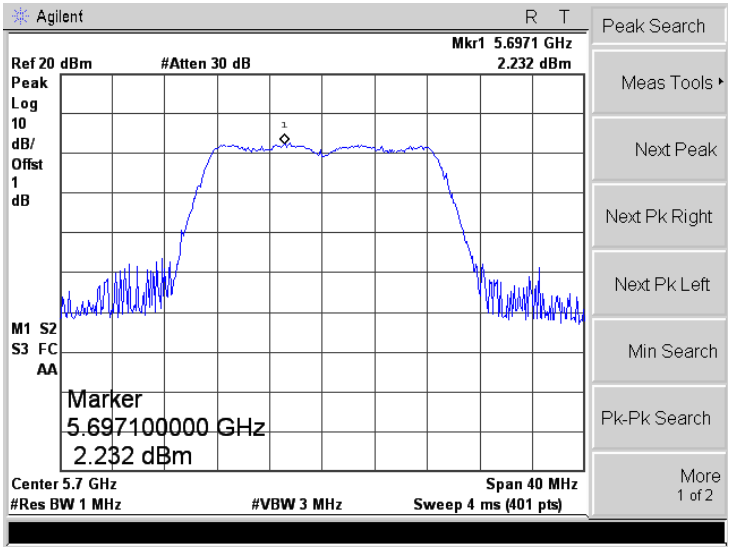
Mode:	802.11n-HT40
5270MHz	
5310MHz	

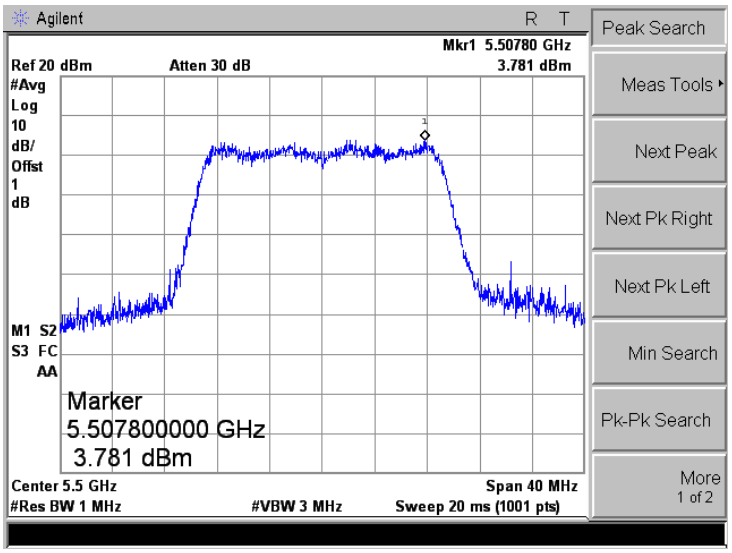
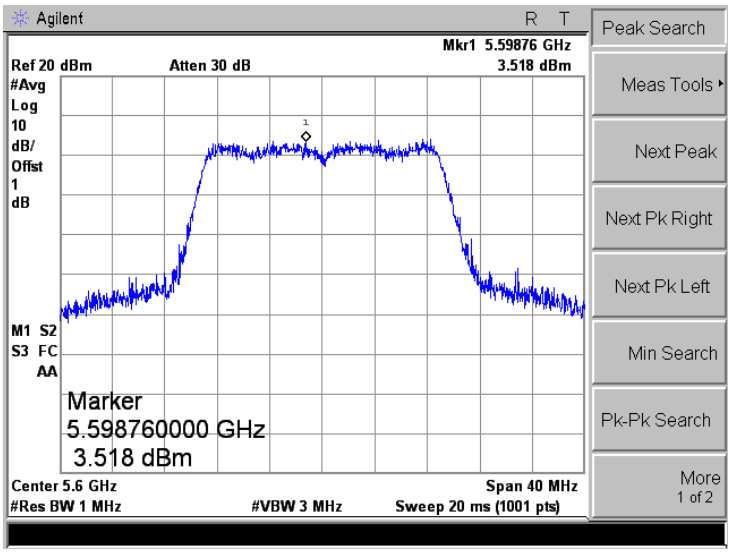
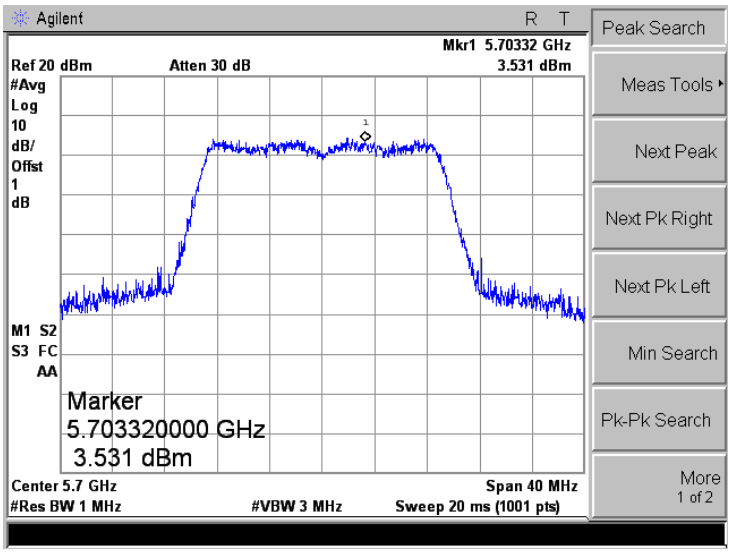
Mode:	**802.11ac-HT40**
5270MHz	
5310MHz	

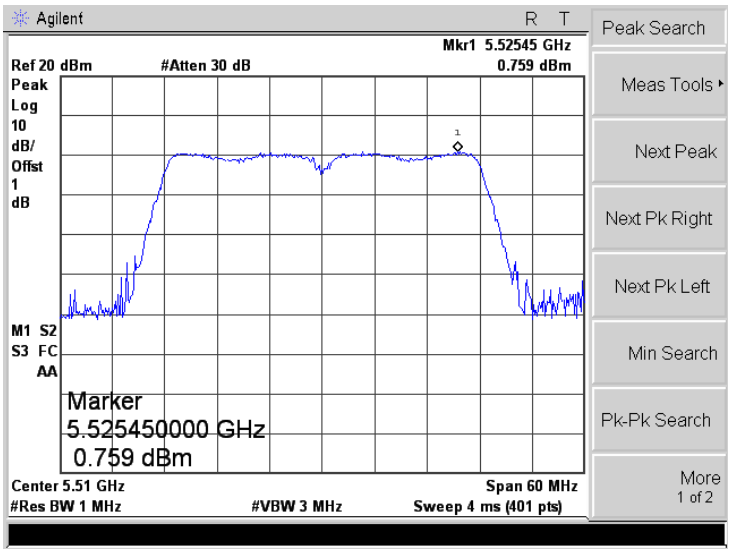
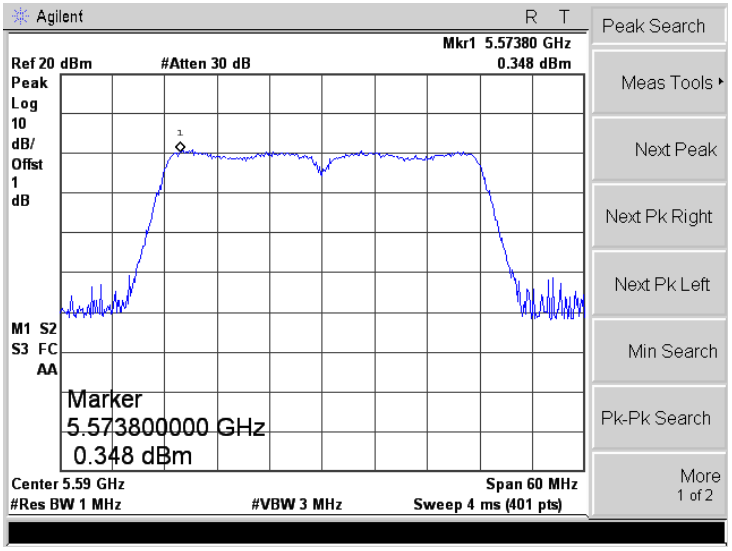
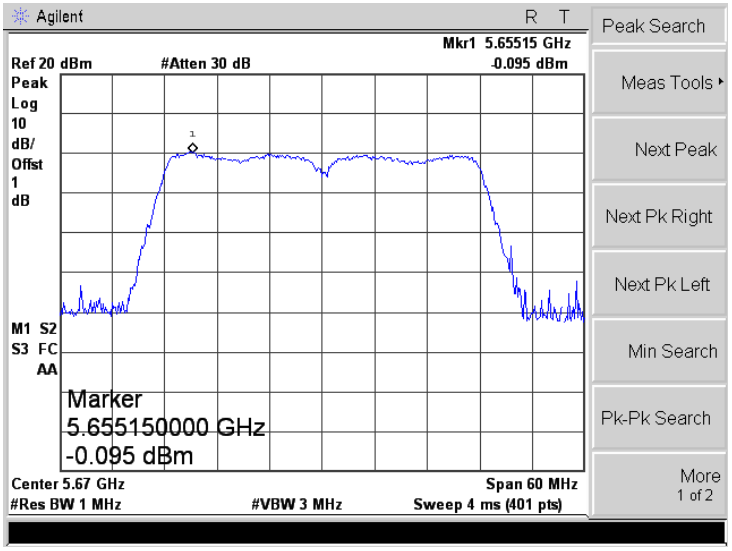
Mode:	802.11ac H80
5290MHz	

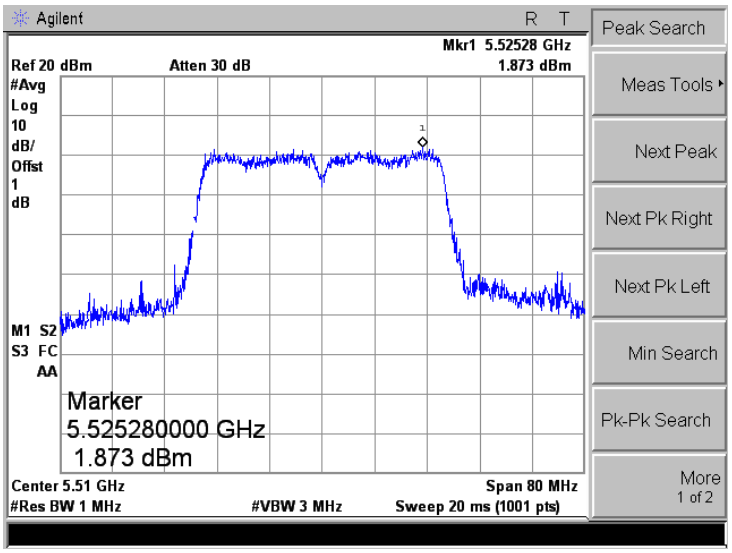
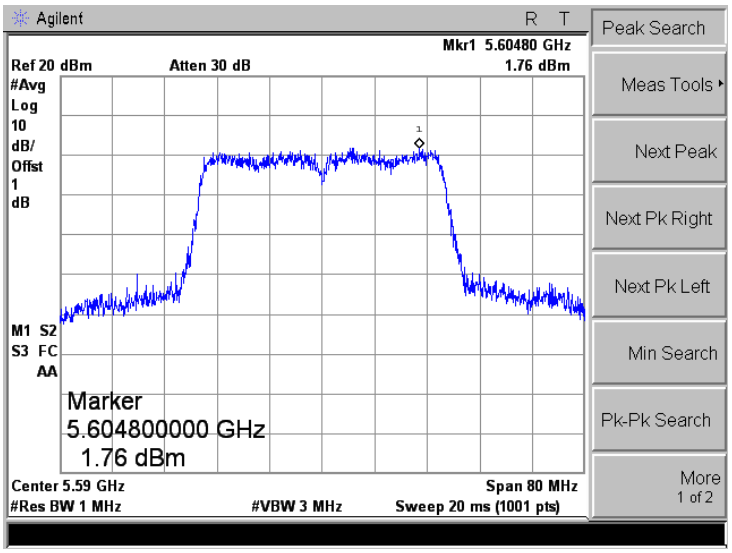
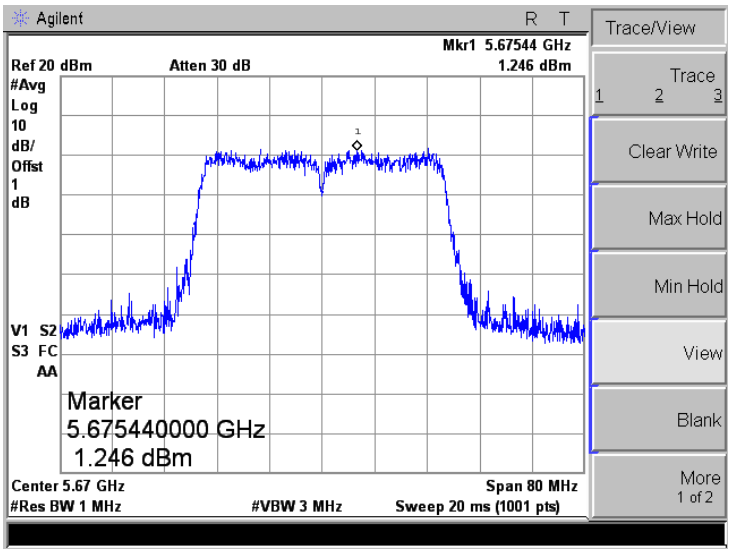
➢ 5470-5725MHz(Antenna A)

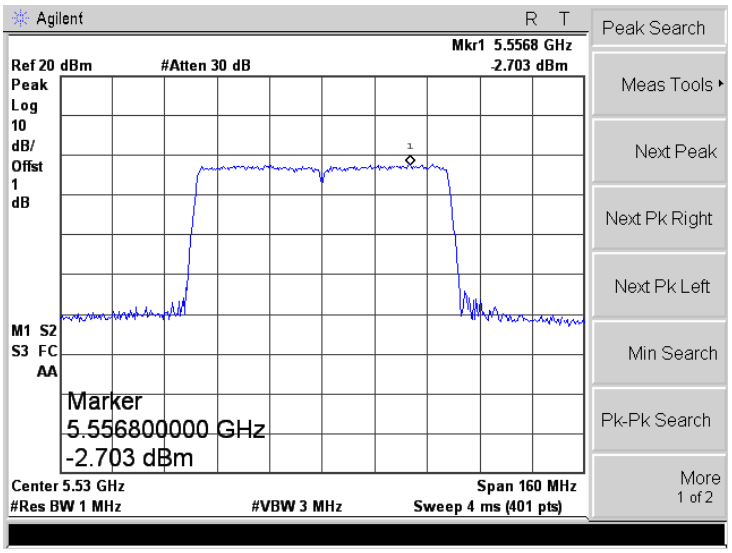
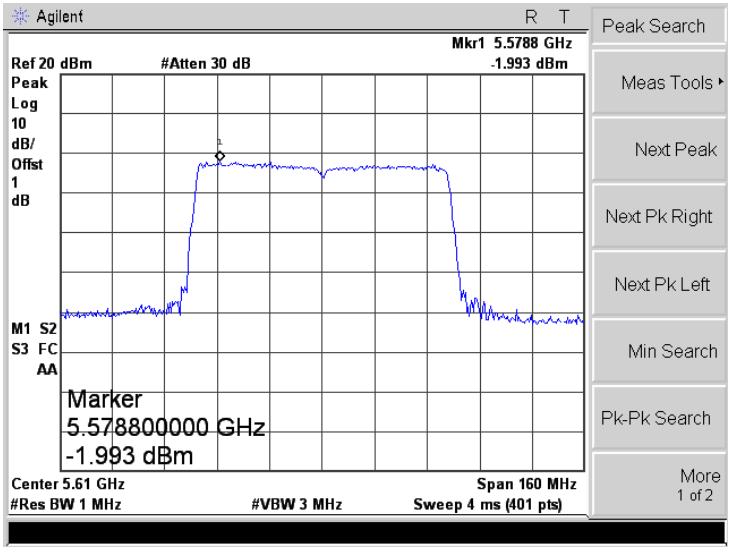
Mode:	**802.11a**
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT20
5500MHz	
5600MHz	
5700MHz	

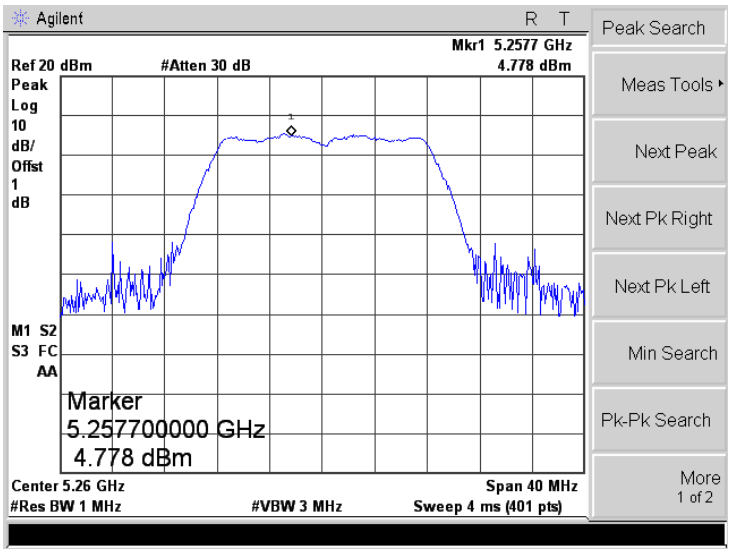
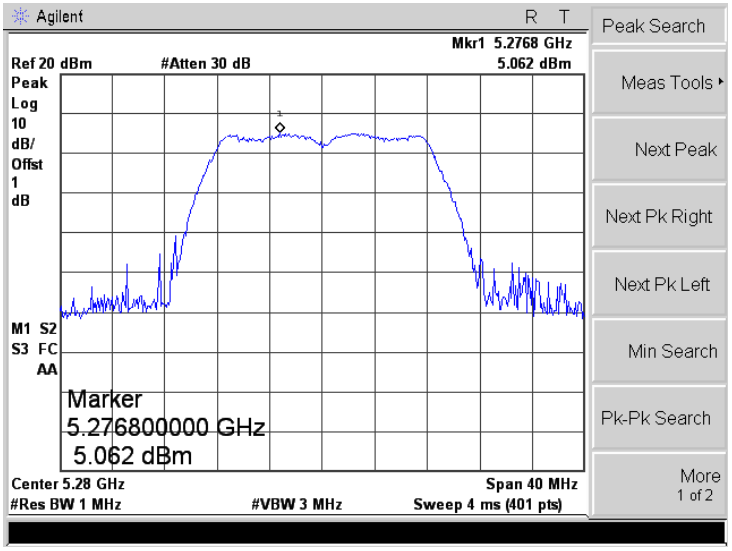
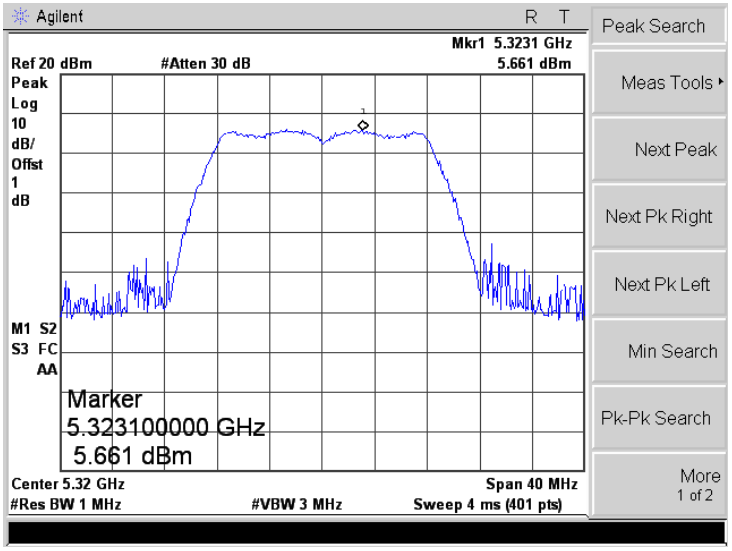
Mode:	802.11ac-HT20
5500MHz	
5600MHz	
5700MHz	

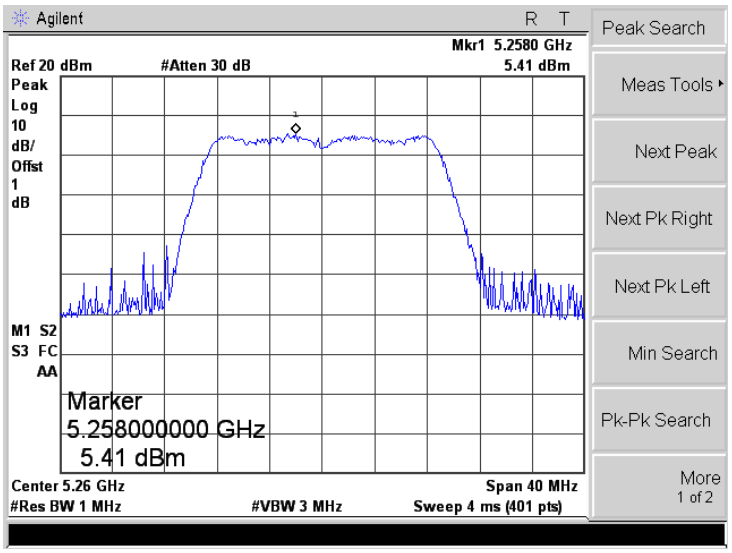
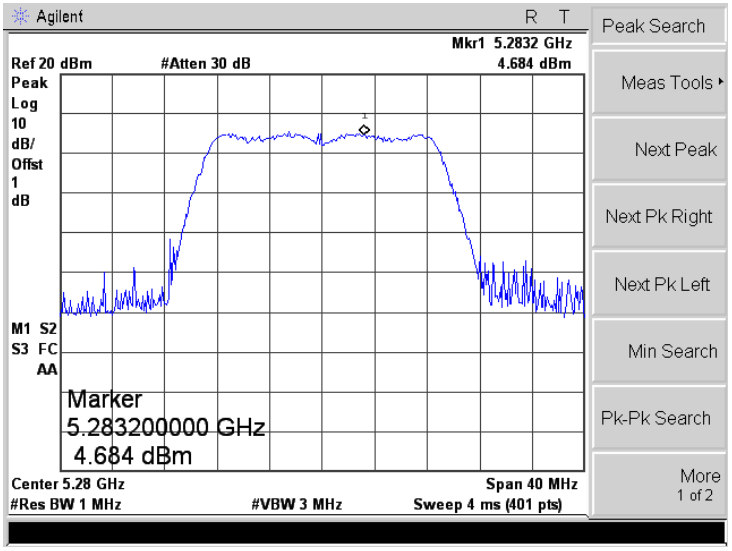
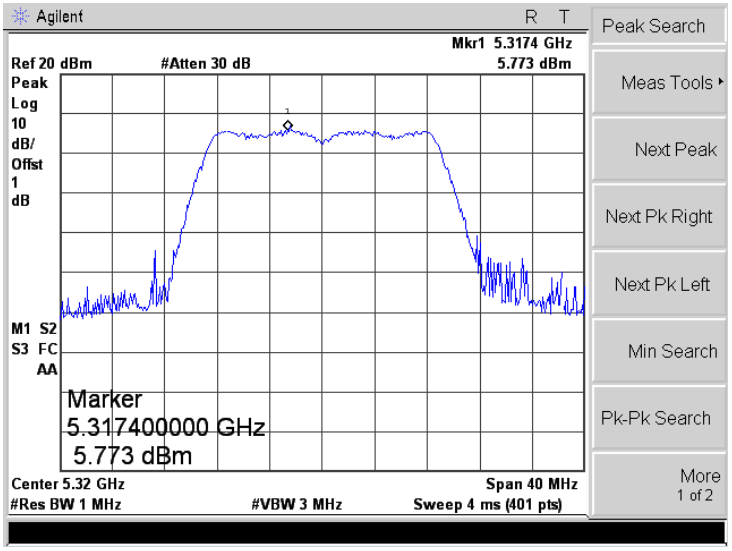
Mode:	802.11n-HT40
5510MHz	
5590MHz	
5670MHz	

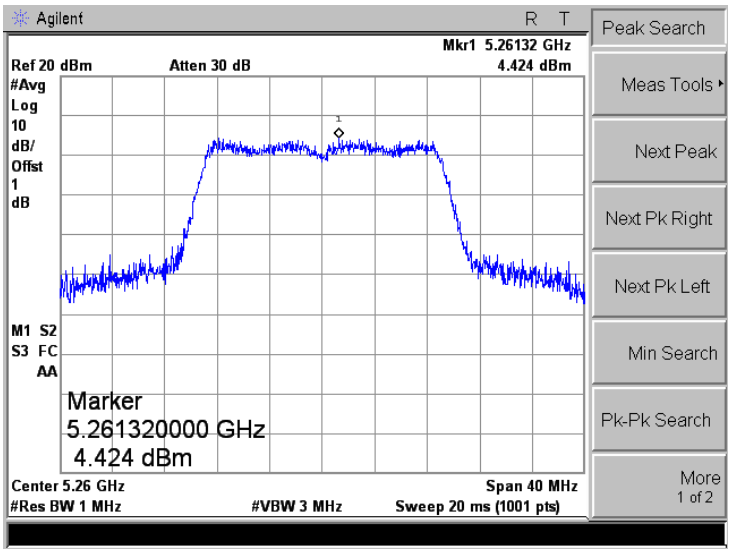
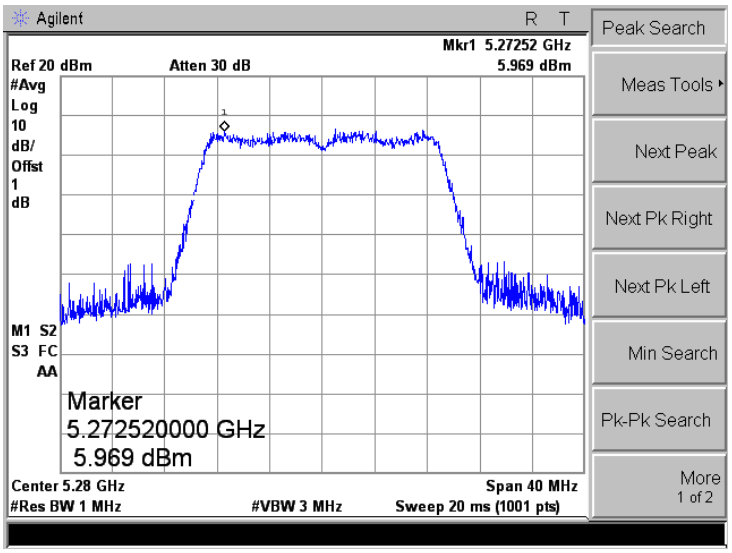
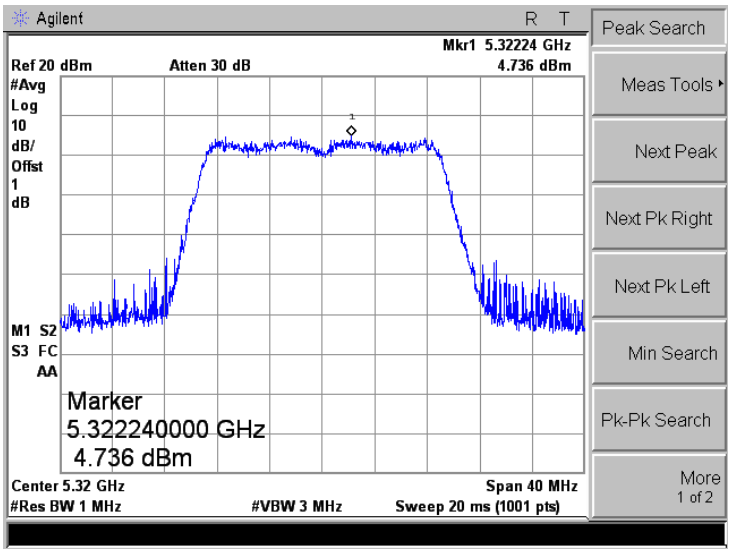
Mode:	**802.11ac-HT40**
5510MHz	
5590MHz	
5670MHz	

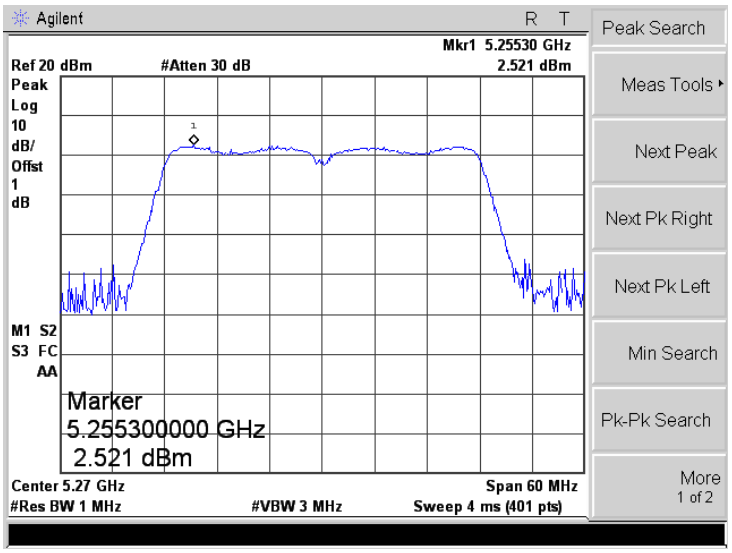
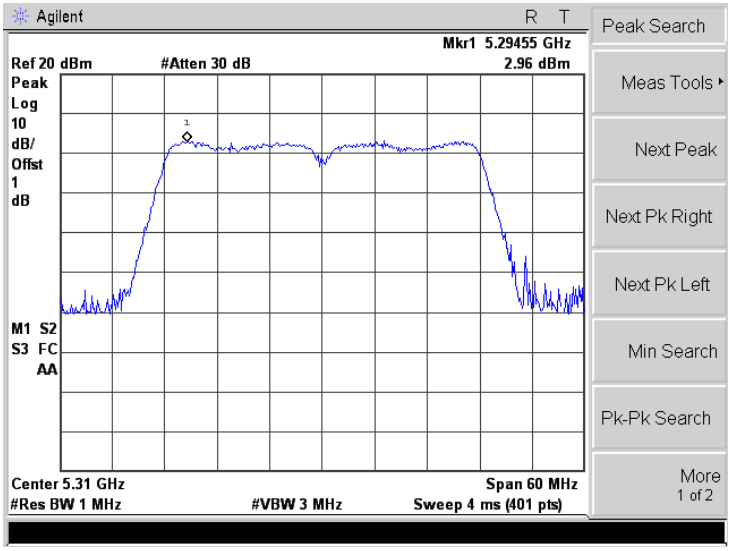
Mode:	802.11ac H80
5530MHz	
5610MHz	

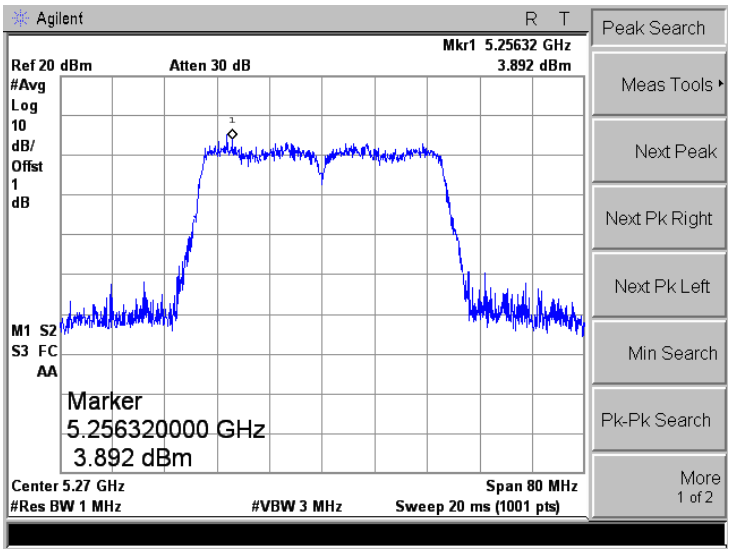
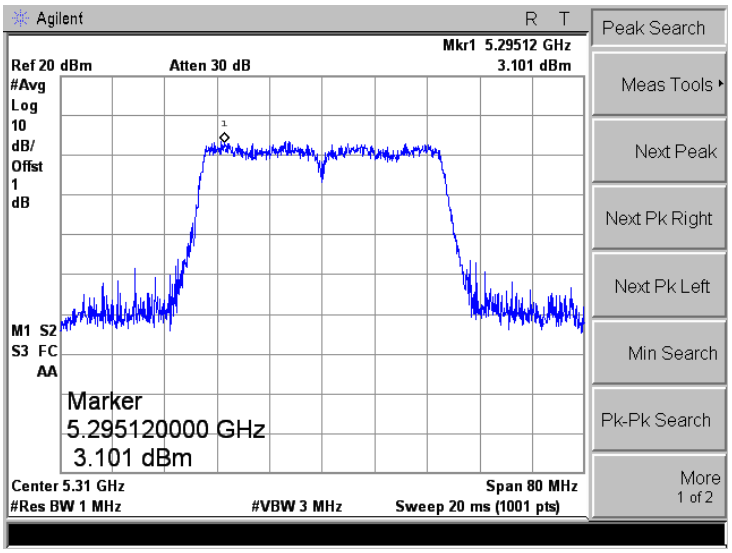
➢ 5250-5350MHz (Antenna B)

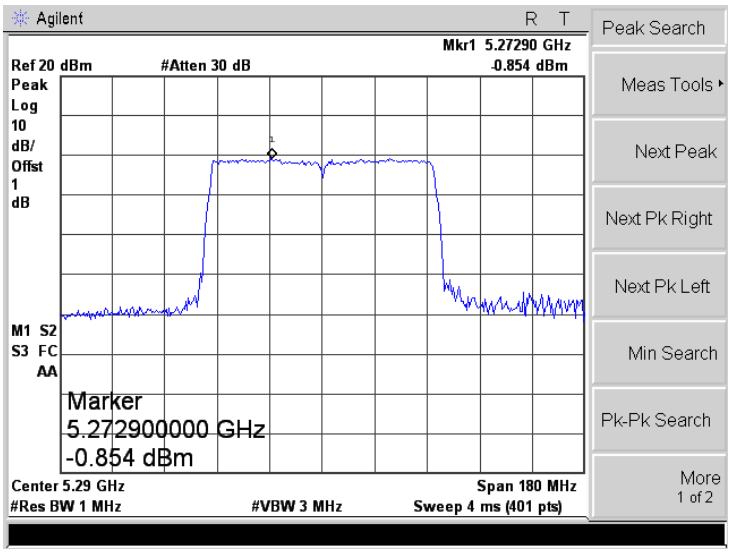
Mode:	**802.11a**
5260MHz	
5280MHz	
5320MHz	

Mode:	802.11n-HT20
5260MHz	
5280MHz	
5320MHz	

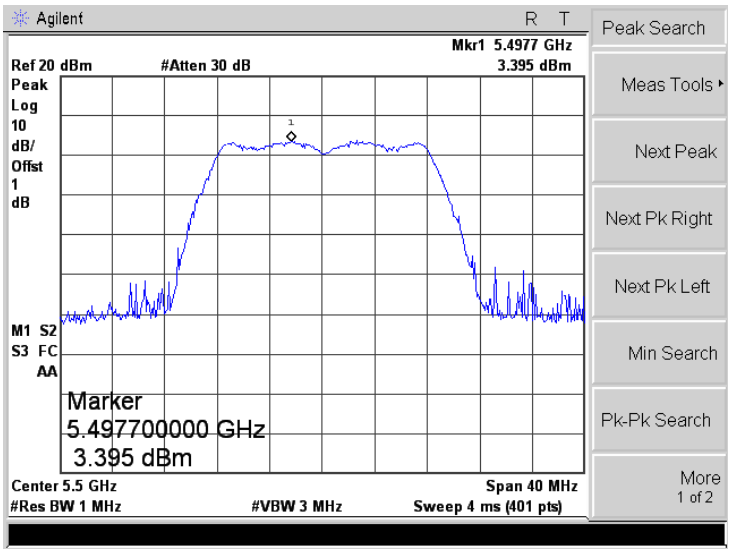
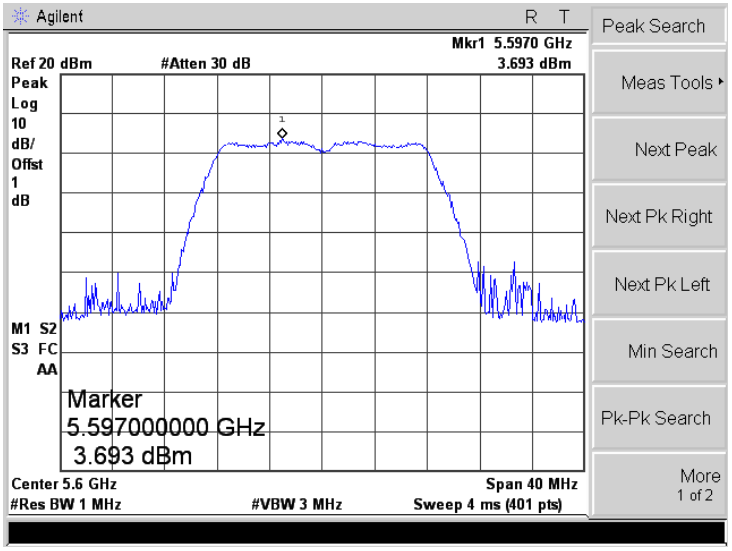
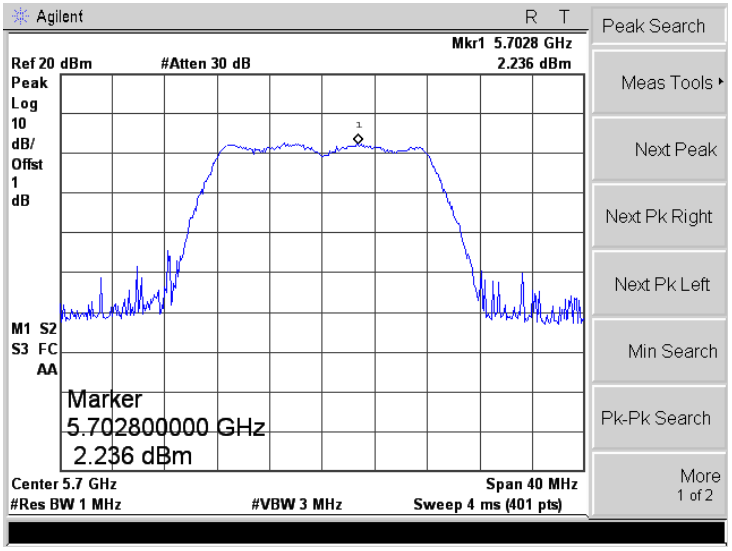
Mode:	802.11ac-HT20
5260MHz	
5280MHz	
5320MHz	

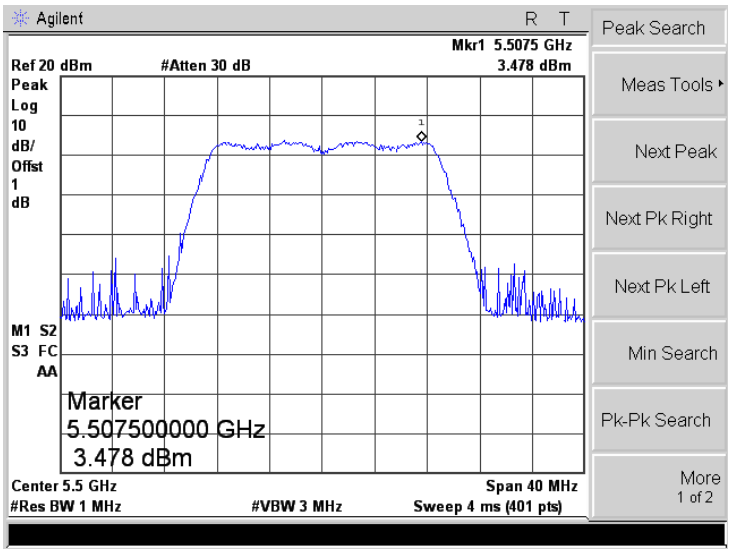
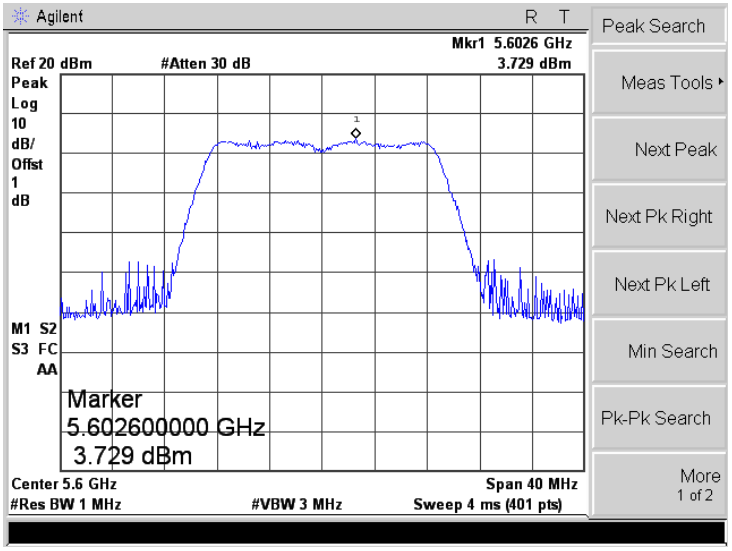
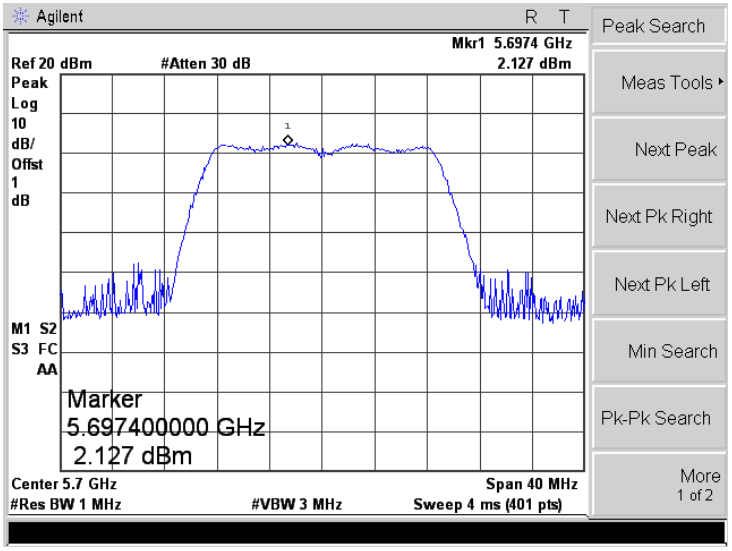
Mode:	802.11n-HT40
5270MHz	
5310MHz	

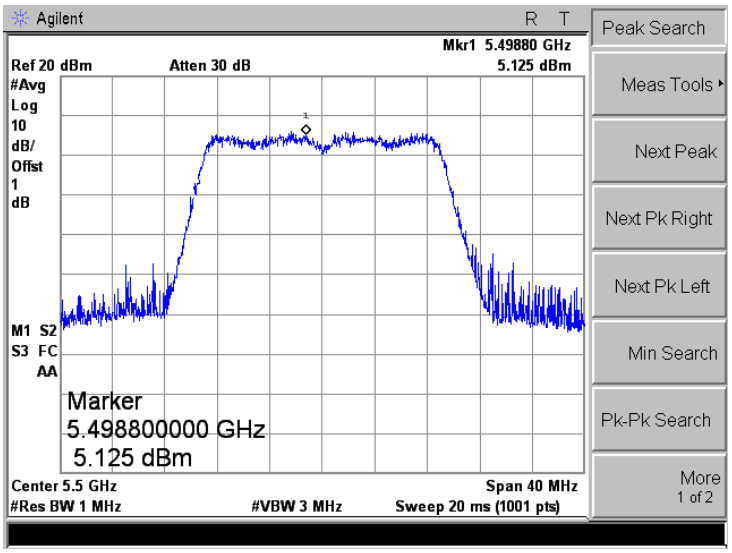
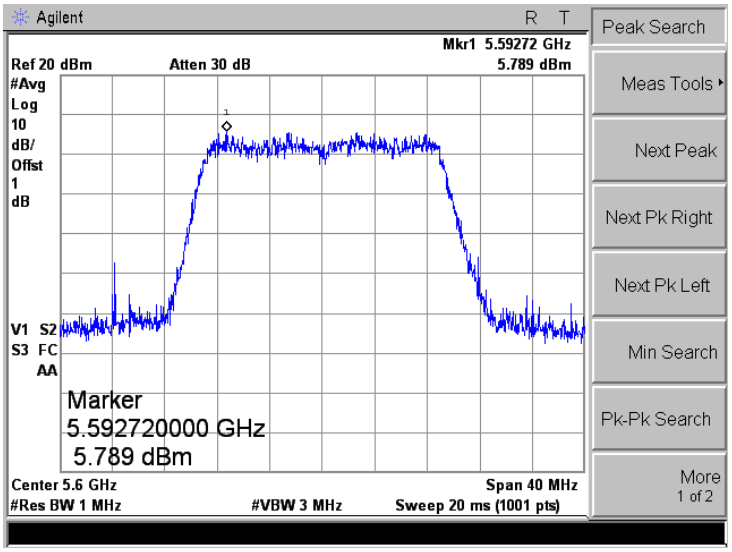
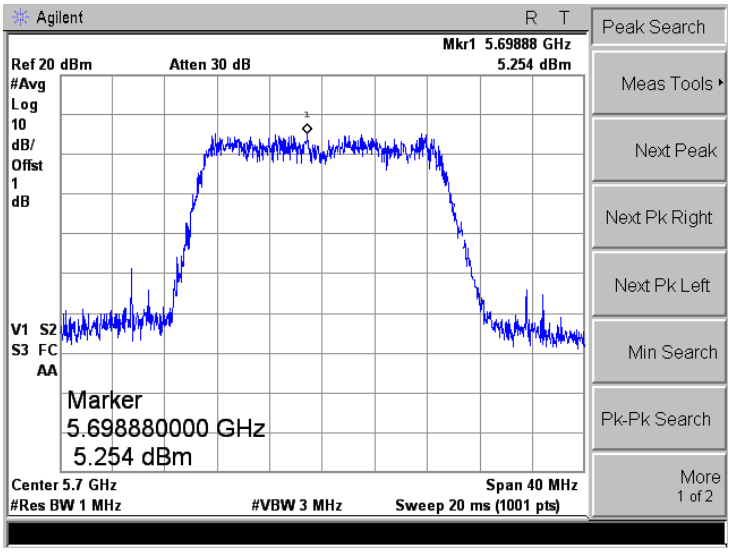
Mode:	802.11ac-HT40
5270MHz	
5310MHz	

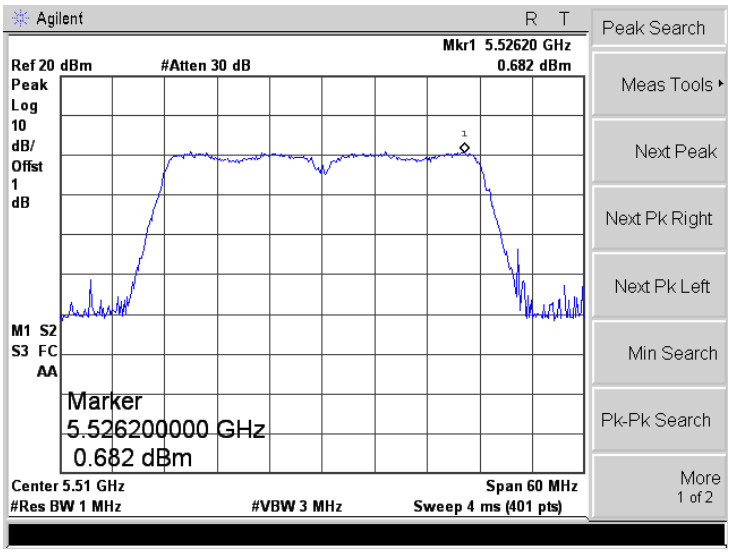
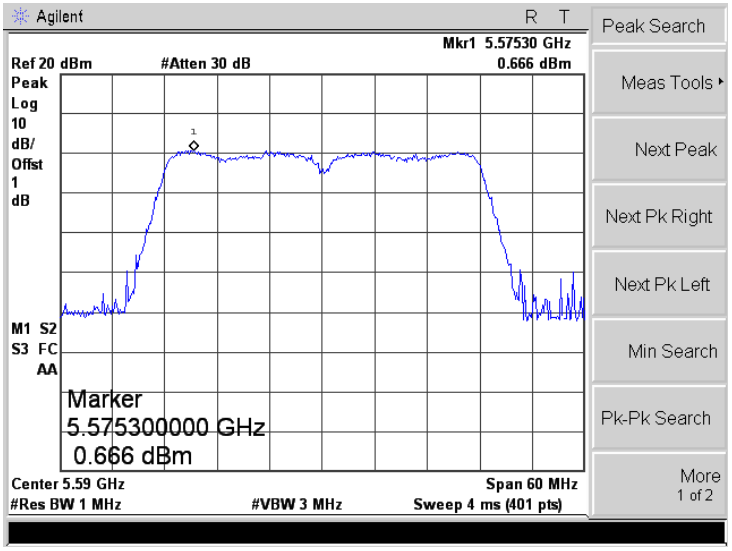
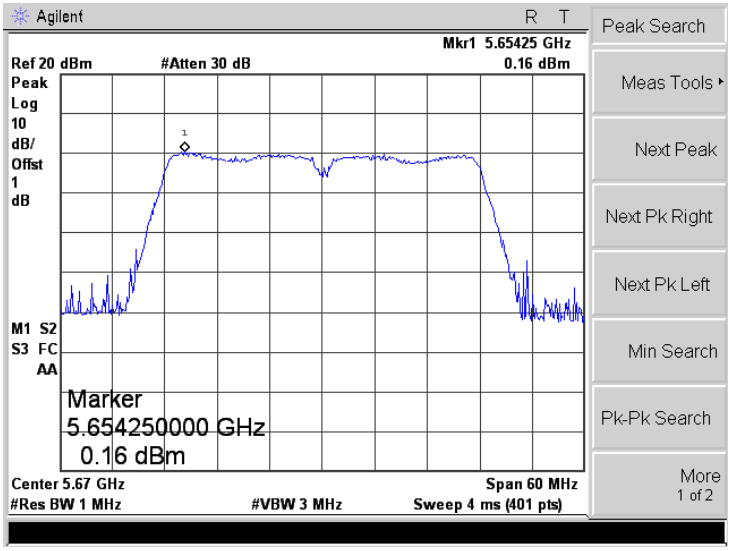
Mode:	802.11ac HT80
5290MHz	

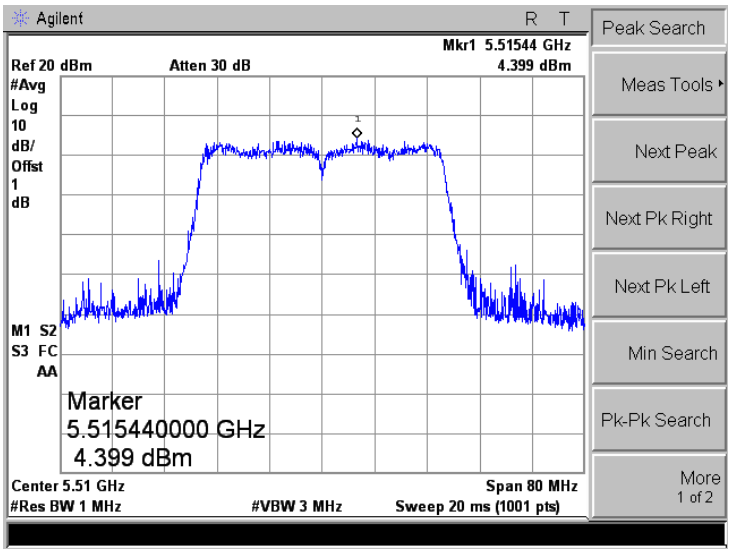
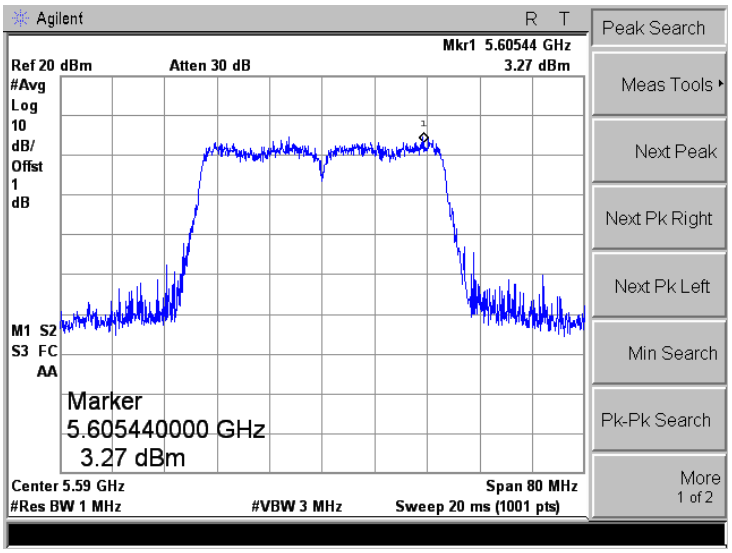
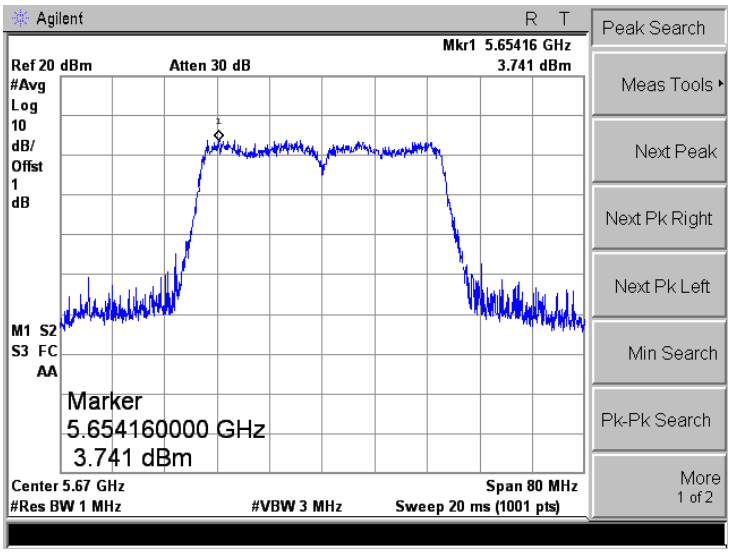
➢ 5470-5725MHz(Antenna B)

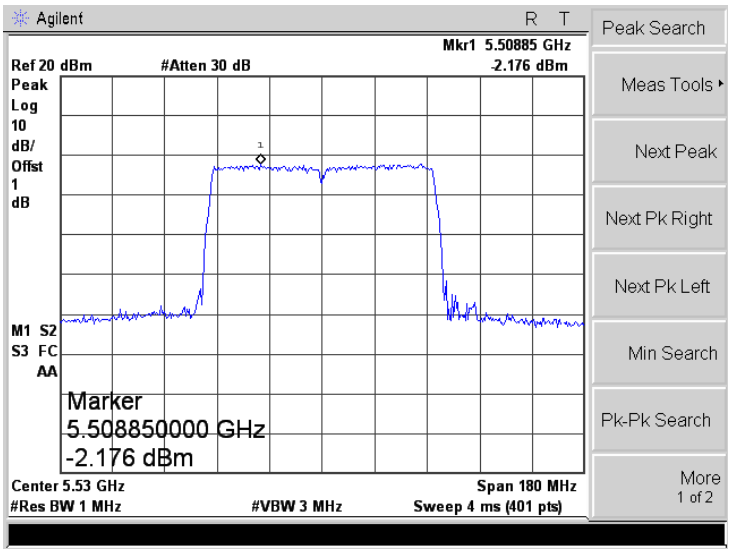
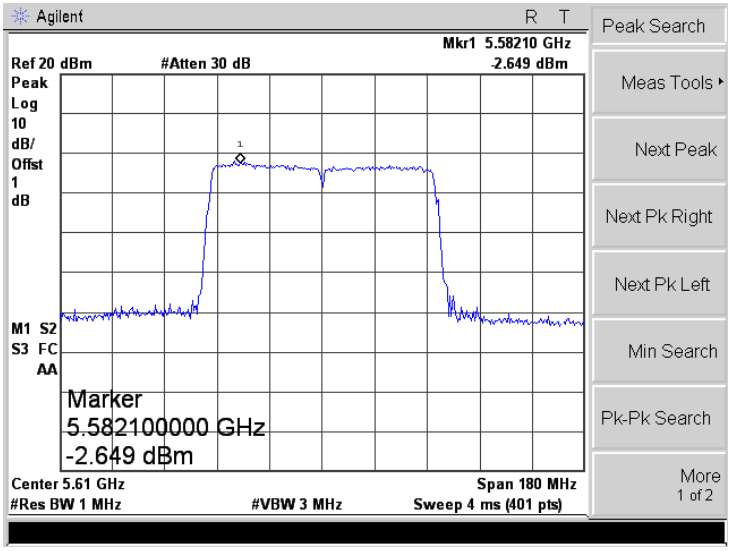
Mode:	**802.11a**
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT20
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11ac-HT20
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT40
5510MHz	
5590MHz	
5670MHz	

Mode:	802.11ac-HT40
5510MHz	
5590MHz	
5670MHz	

Mode:	802.11ac HT80
5530MHz	
5610MHz	

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 v02r0r 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 v02r01 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:

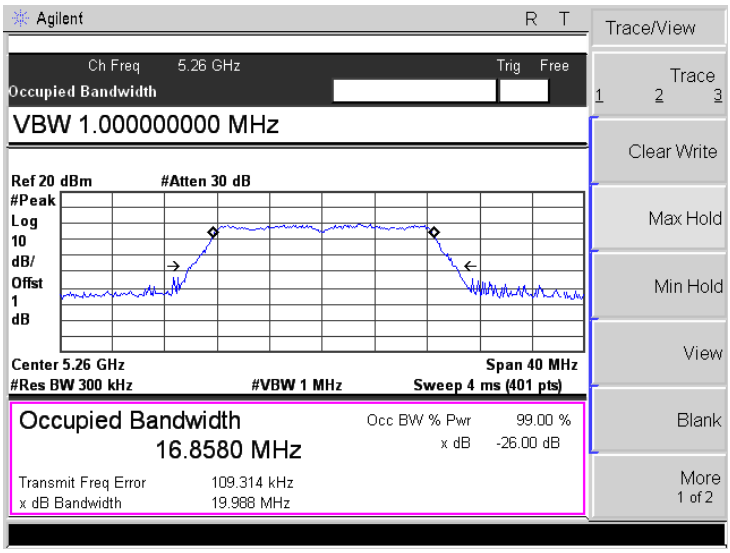
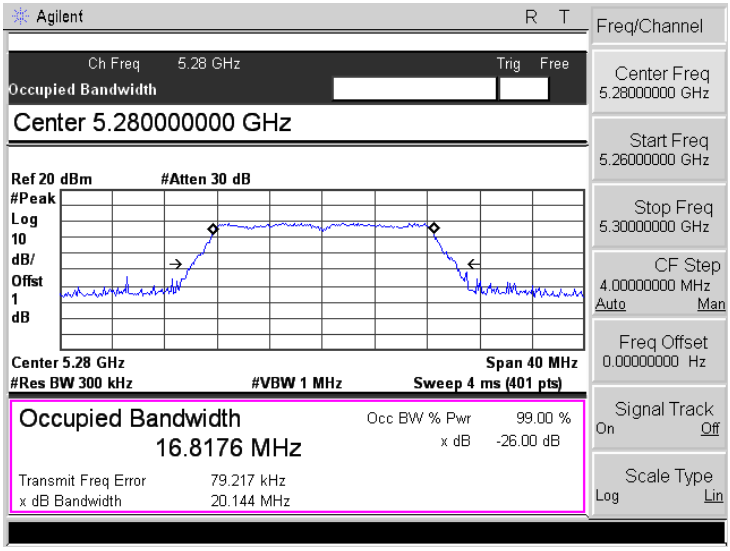
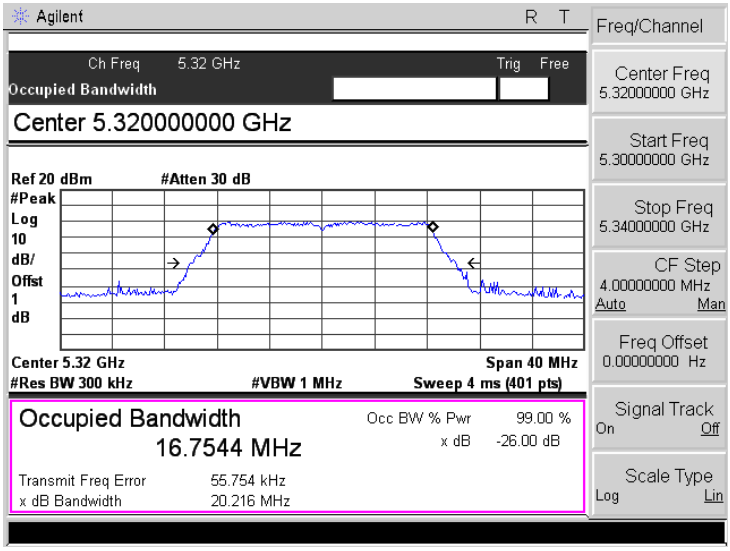
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ⩾ 3 * RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection 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 Summary of Test Results/Plots

U-NII-2A: 5250-5350MHz						
Test Mode	Test Channel MHz	26 dB Bandwidth MHz		99% Bandwidth MHz		Limit MHz
		ANT A	ANT B	ANT A	ANT B	
802.11a	5260	19.988	20.161	16.8580	16.8457	Pass
	5280	20.144	20.099	16.8176	16.7843	Pass
	5320	20.216	19.907	16.7544	16.8148	Pass
802.11n-HT20	5260	20.471	20.374	17.7546	17.7170	Pass
	5280	20.431	20.475	17.7483	17.6977	Pass
	5320	20.424	20.314	17.7521	17.7459	Pass
802.11ac-HT20	5260	20.325	26.932	17.8040	17.9046	Pass
	5280	20.309	20.511	17.7751	17.7606	Pass
	5320	20.133	20.390	17.7531	17.7455	Pass
802.11n-HT40	5270	41.505	41.851	36.4540	36.6129	Pass
	5310	41.805	41.692	36.4811	36.5231	Pass
802.11ac-HT40	5270	42.081	41.342	36.6560	36.6585	Pass
	5310	41.219	42.286	36.6190	36.6969	Pass
802.11ac-HT80	5290	82.096	81.923	75.9591	76.0293	Pass

U-NII-2C: 5470-5725MHz						
Test Mode	Test Channel MHz	26 dB Bandwidth MHz		99% Bandwidth MHz		Limit MHz
		ANT A	ANT B	ANT A	ANT B	
802.11a	5500	19.811	20.005	16.7721	16.8403	Pass
	5600	20.078	19.733	16.7881	16.8050	Pass
	5700	19.915	20.062	16.7511	16.7978	Pass
802.11n-HT20	5500	20.361	20.184	17.6922	17.7226	Pass
	5600	20.331	20.548	17.7051	17.7510	Pass
	5700	20.493	20.357	17.7552	17.7303	Pass
802.11ac-HT20	5500	20.719	20.738	17.7861	17.7696	Pass
	5600	20.971	20.334	17.7809	17.7399	Pass
	5700	20.629	20.066	17.7728	17.7571	Pass
802.11n-HT40	5510	42.354	41.599	36.4833	36.5010	Pass
	5590	41.700	42.055	36.4785	36.4582	Pass
	5670	41.529	41.523	36.6338	36.5181	Pass
802.11ac-HT40	5510	41.343	41.630	36.7558	36.6257	Pass
	5590	41.412	42.688	36.7087	36.6672	Pass
	5670	41.180	42.727	36.6684	36.6938	Pass
802.11ac-HT80	5530	83.313	82.020	76.1192	75.8702	Pass
	5610	82.295	81.972	76.2049	75.9753	Pass

➢ 5250-5350MHz (Antenna A)

Mode:	**802.11a**
5260MHz	
5280MHz	
5320MHz	

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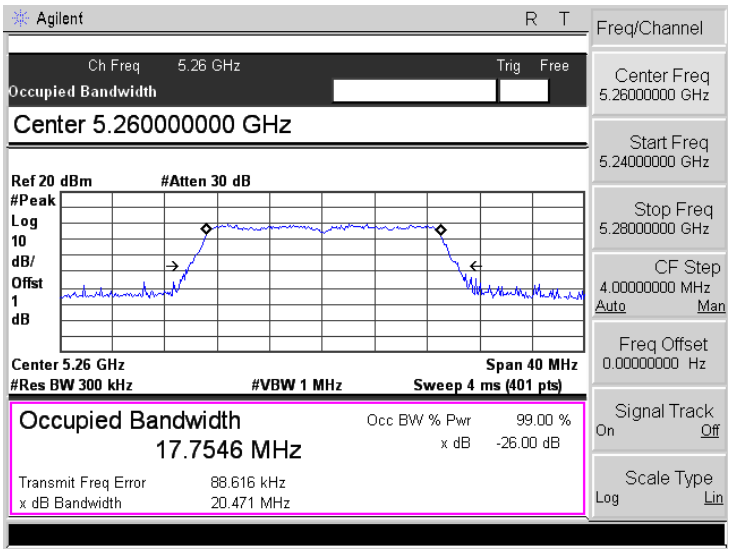
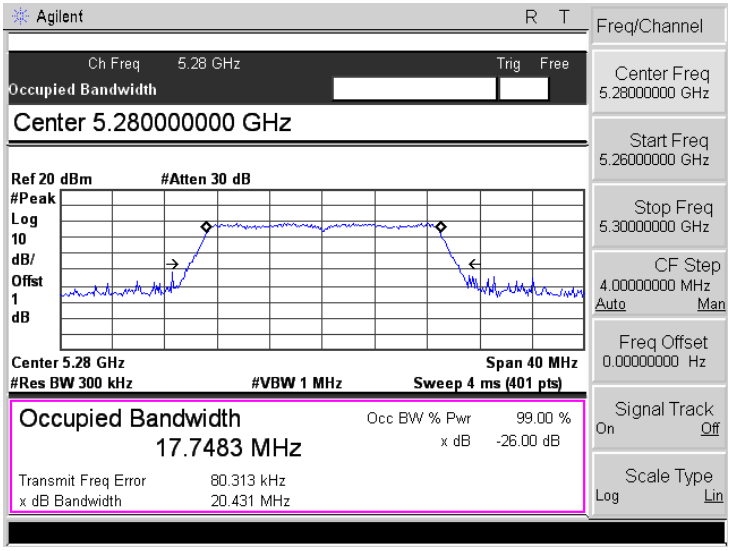
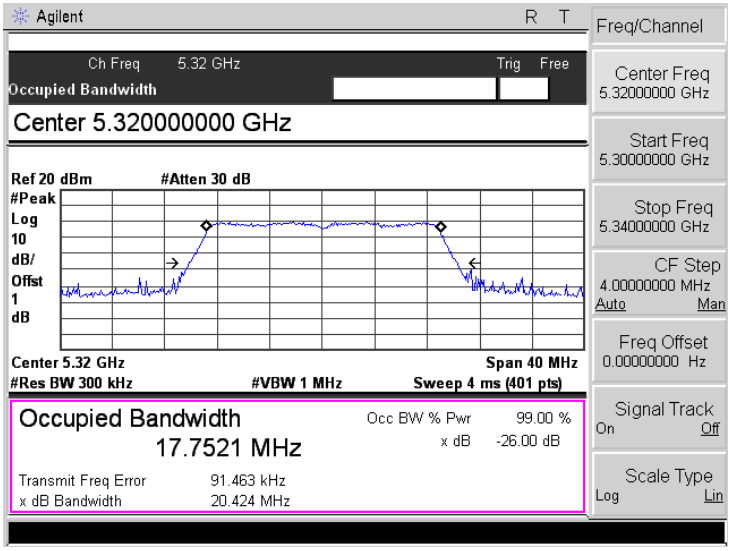
5260MHz	
5280MHz	
5320MHz	

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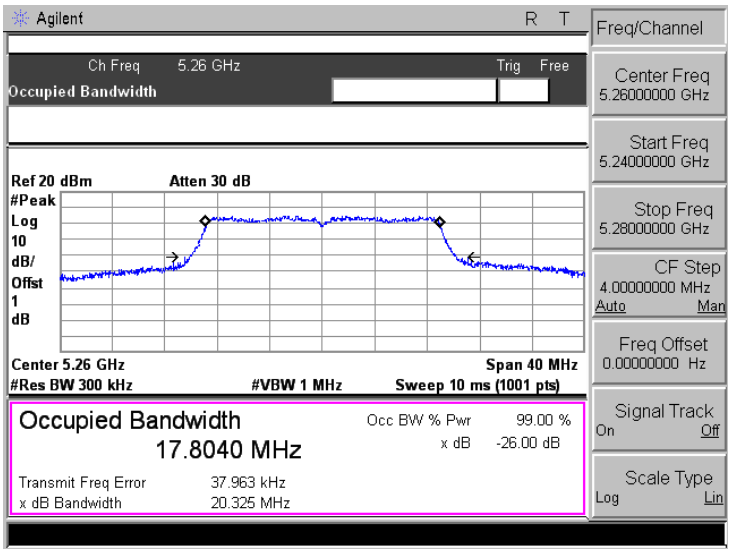
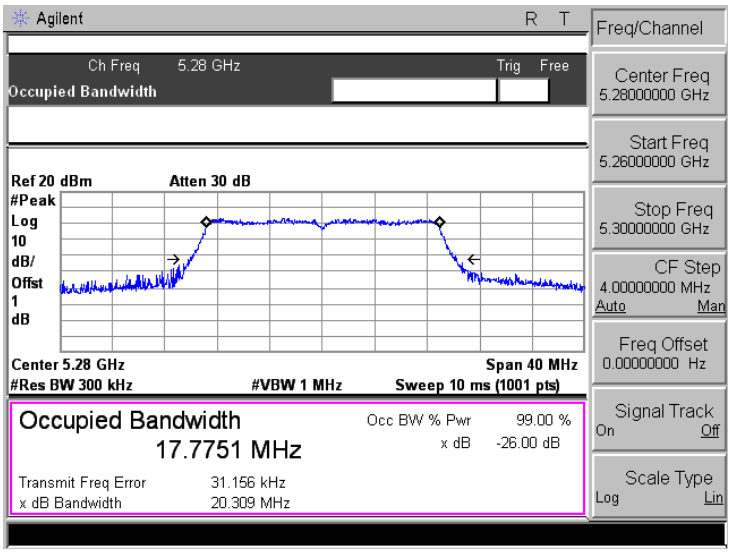
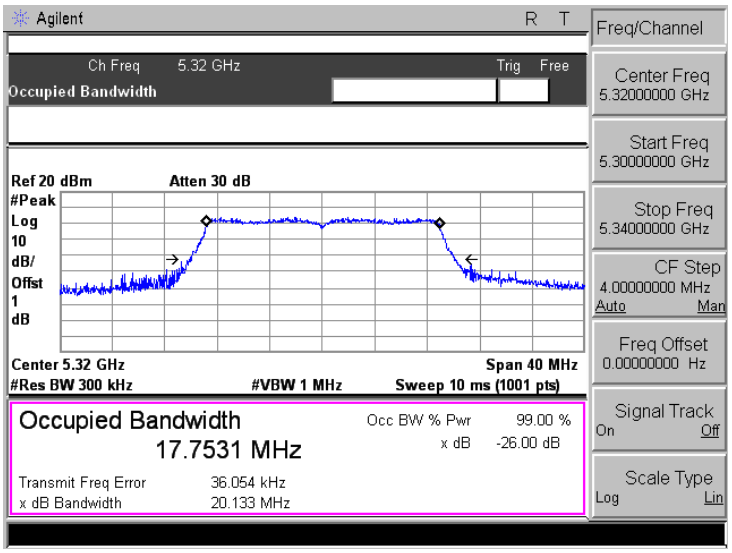
5260MHz	
5280MHz	
5320MHz	

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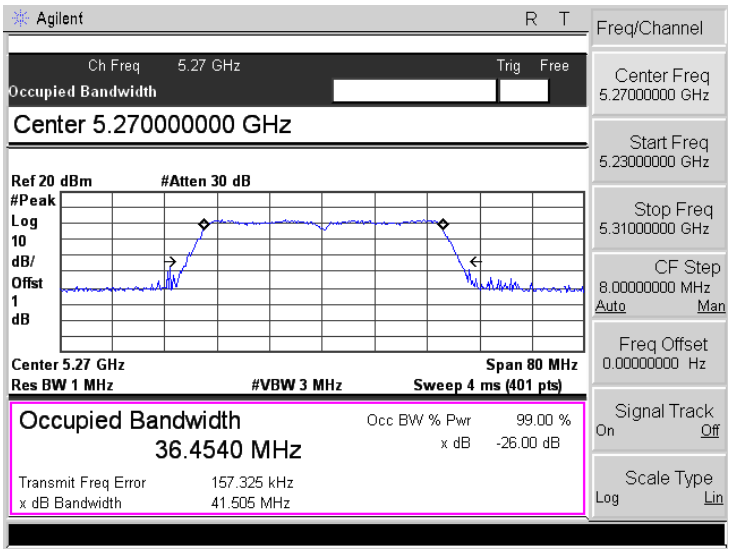
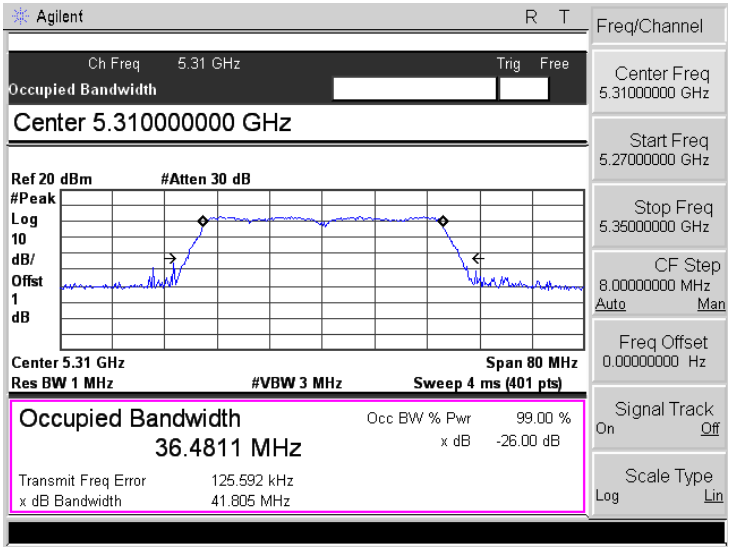
5270MHz	
5310MHz	

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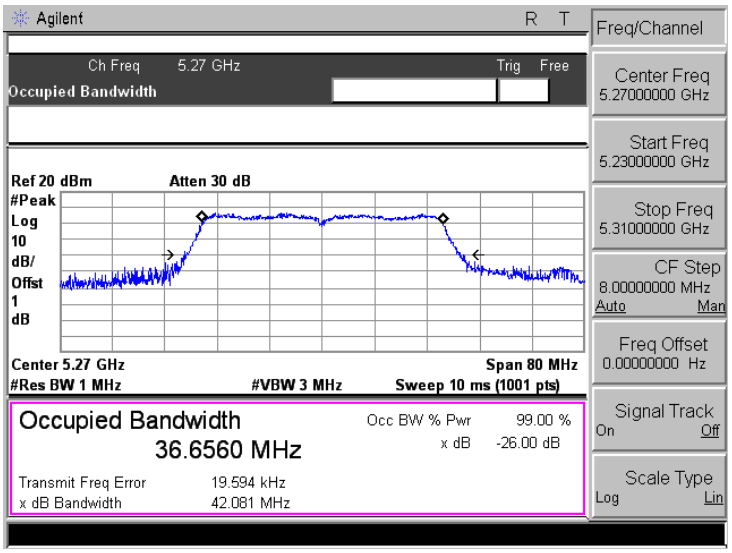
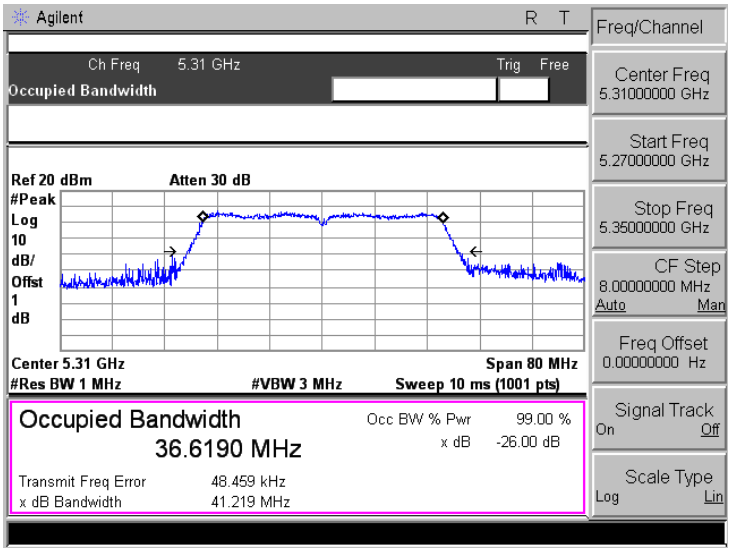
5270MHz	
5310MHz	

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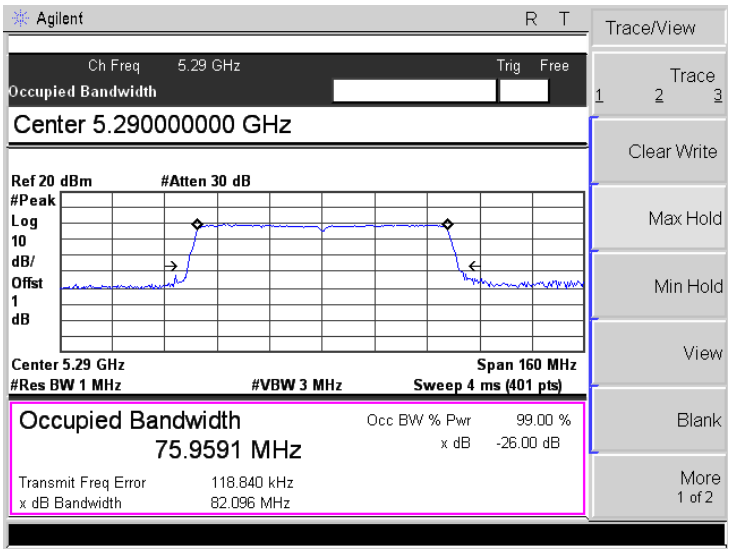
5290MHz	

➢ 5470-5725MHz (Antenna A)

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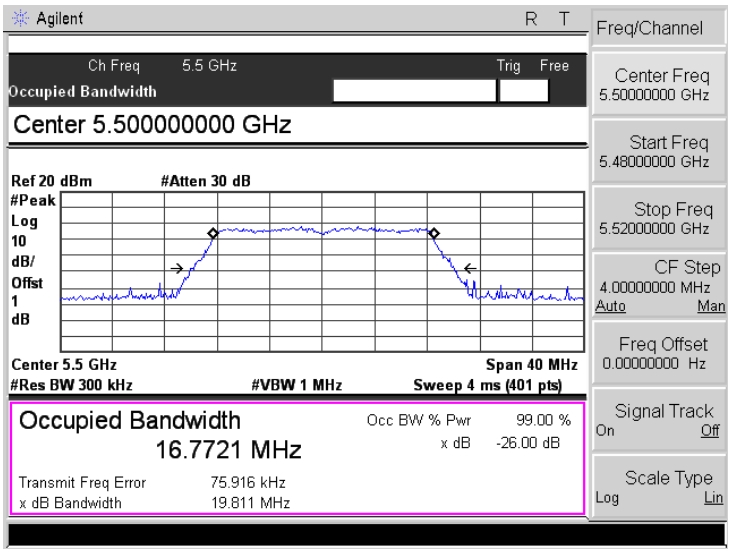
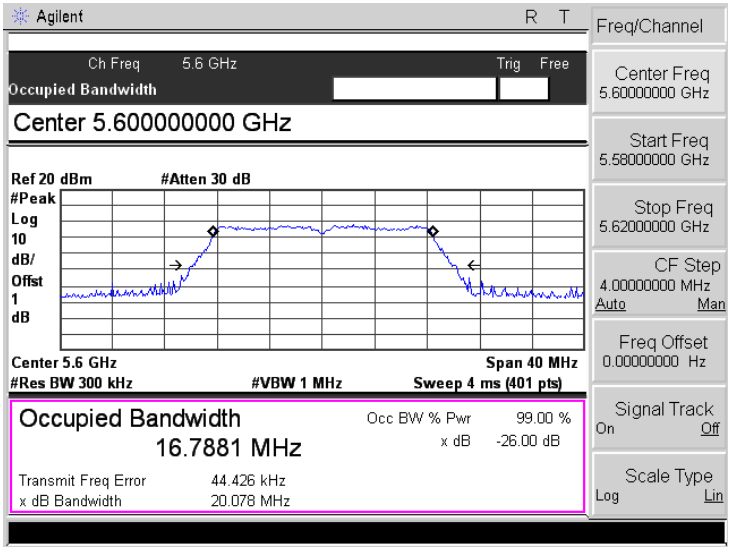
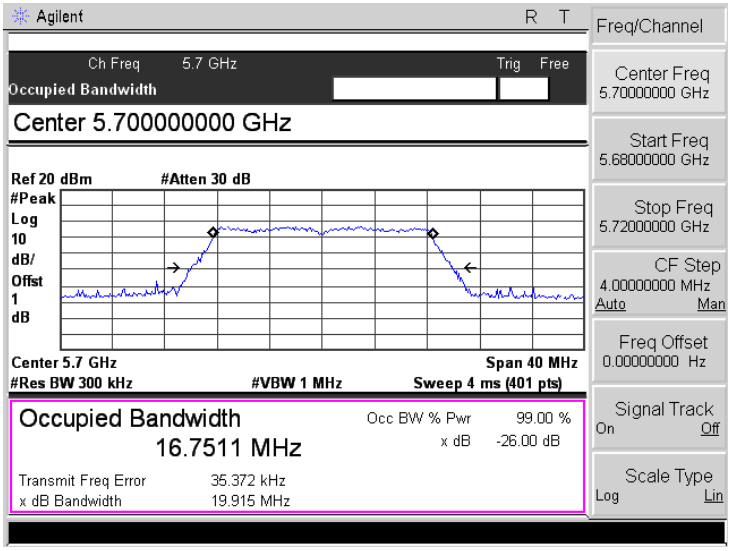
5500MHz	
5600MHz	
5700MHz	

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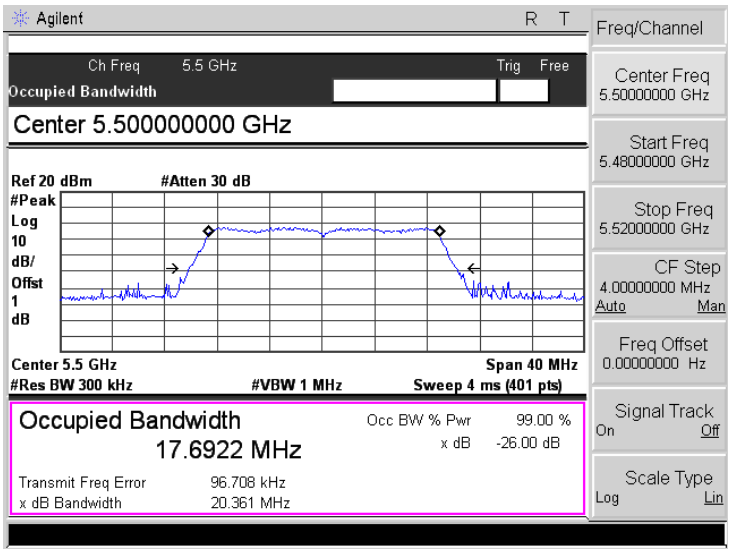
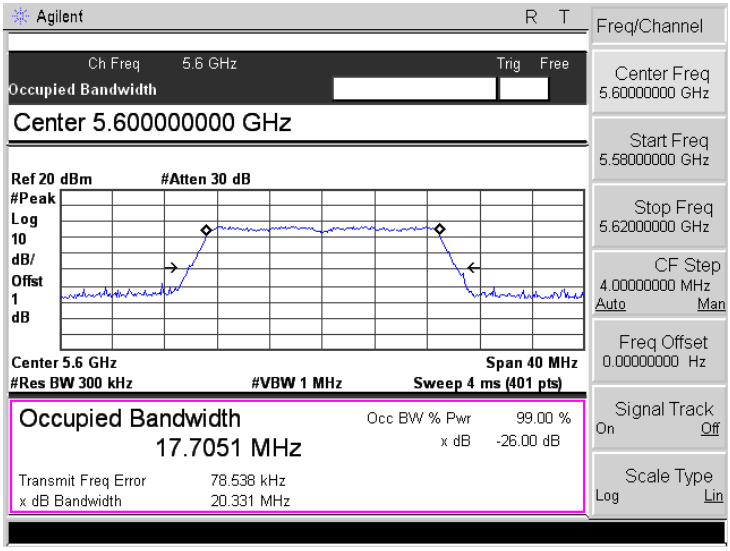
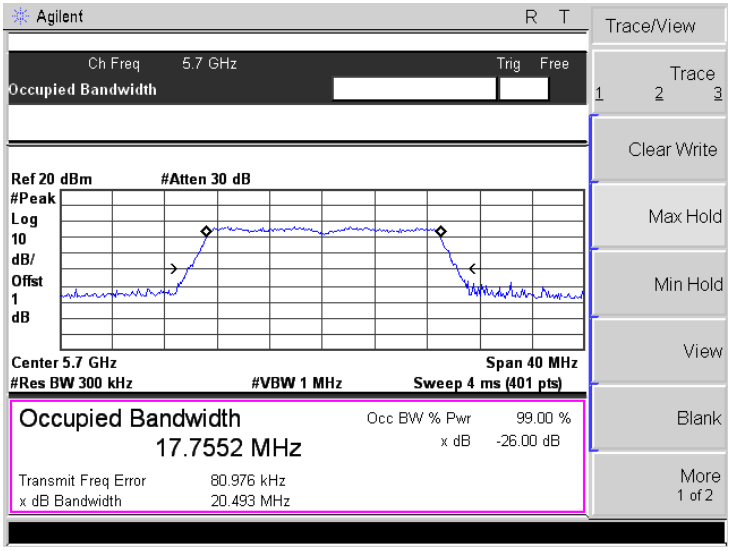
5500MHz	
5600MHz	
5700MHz	

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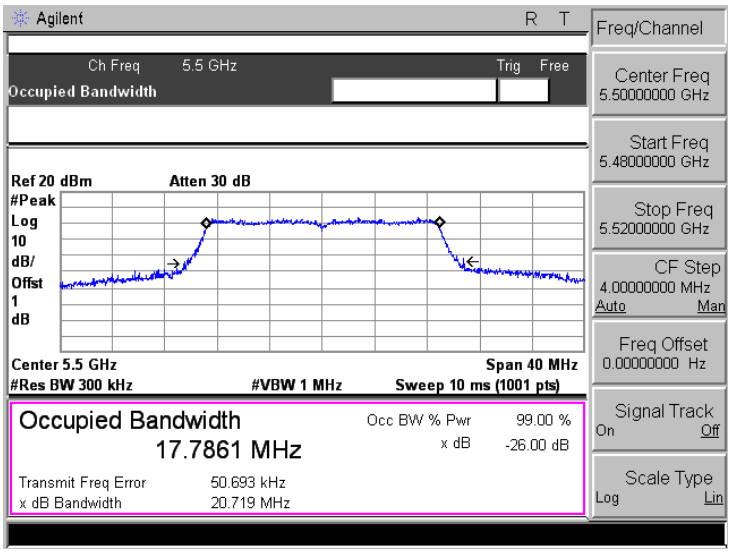
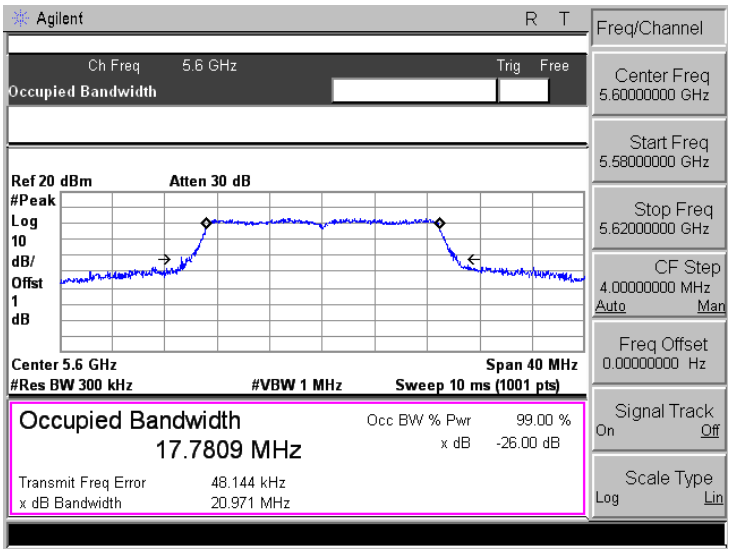
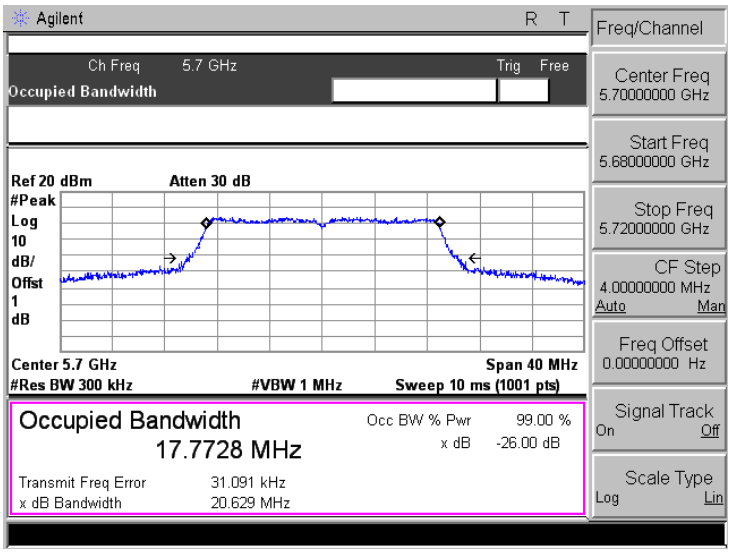
5500MHz	
5600MHz	
5700MHz	

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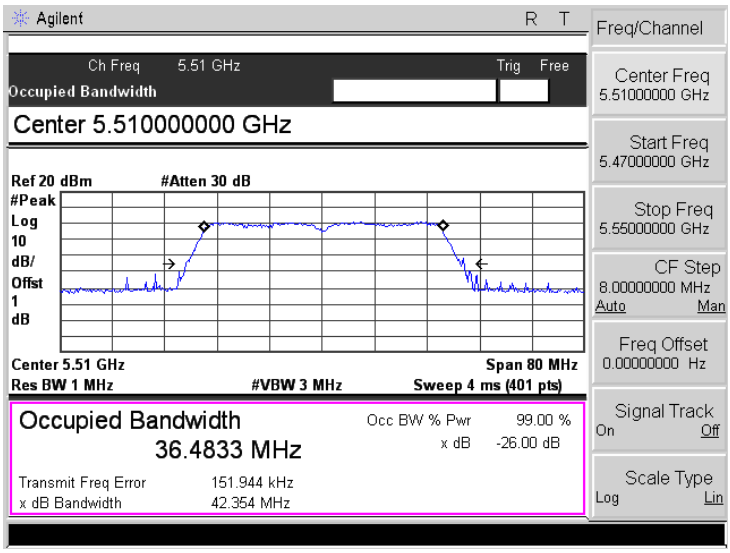
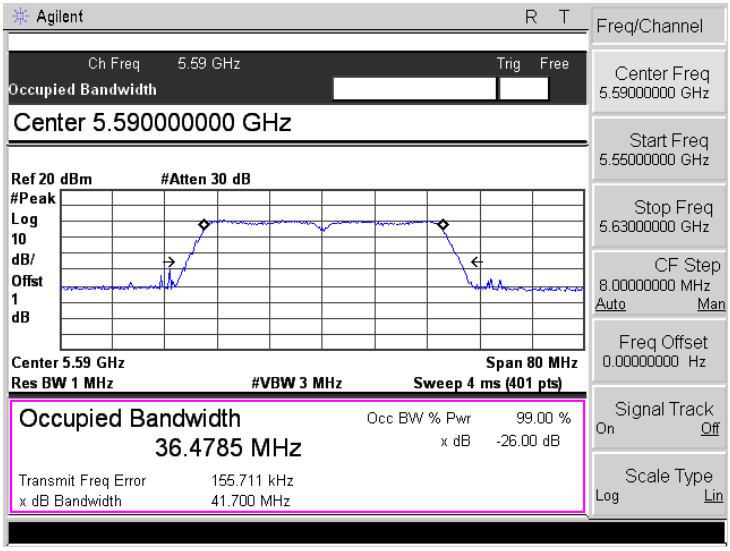
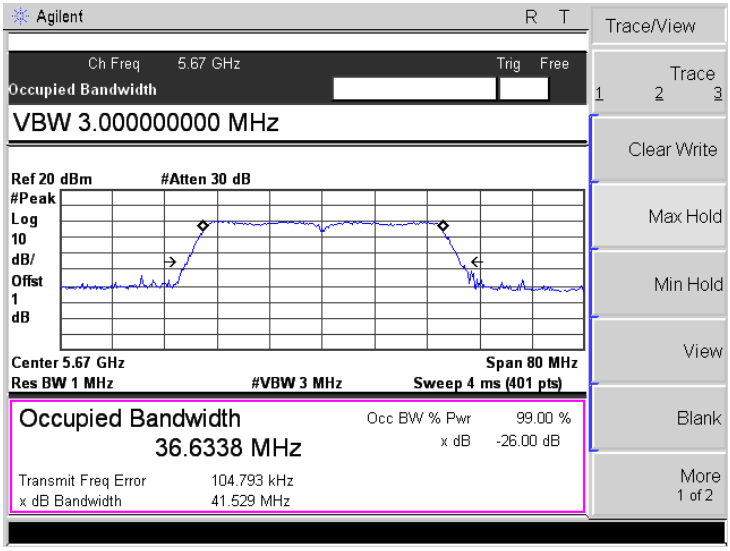
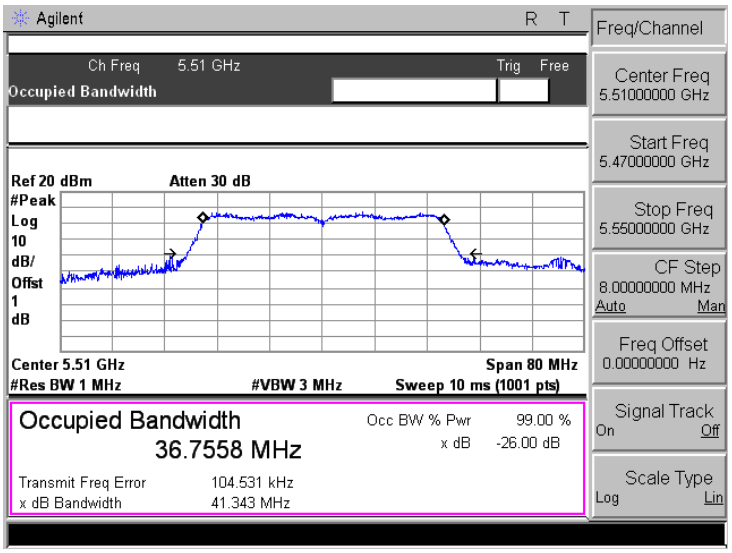
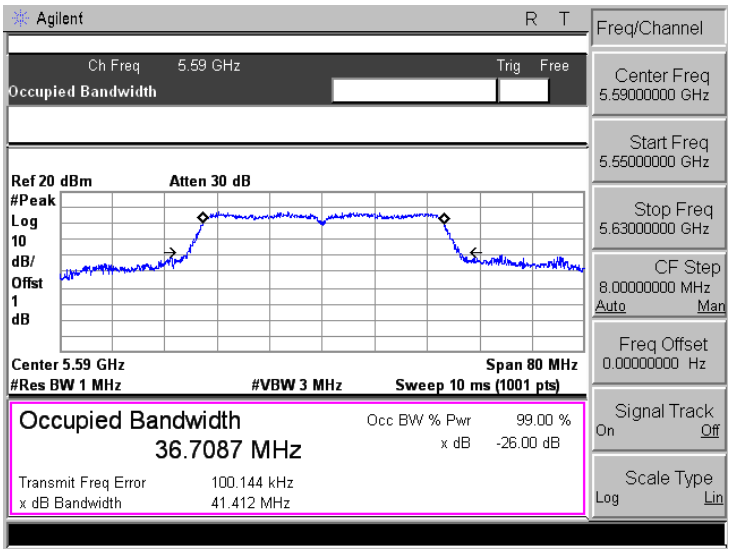
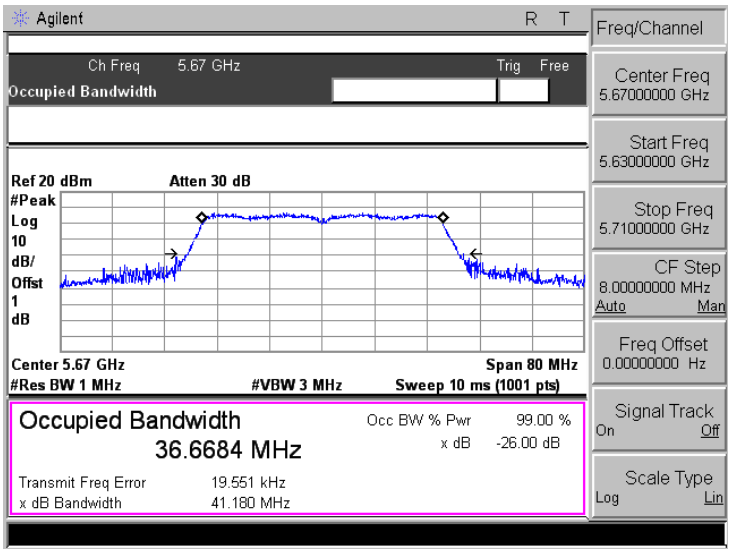
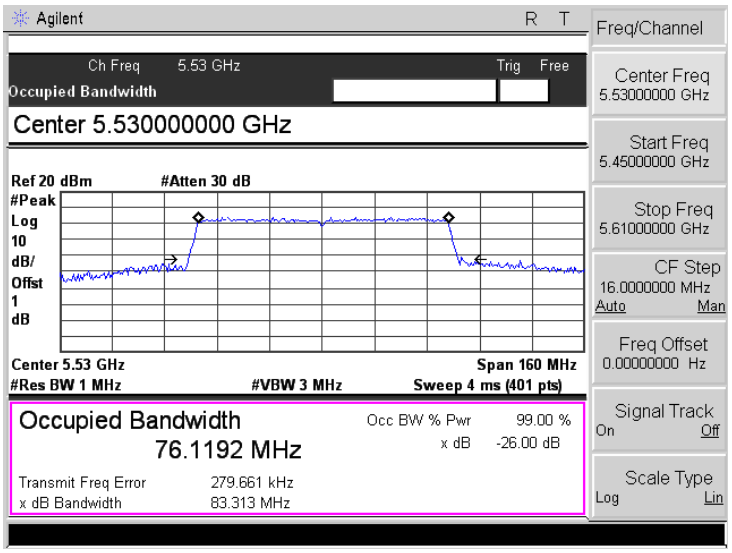
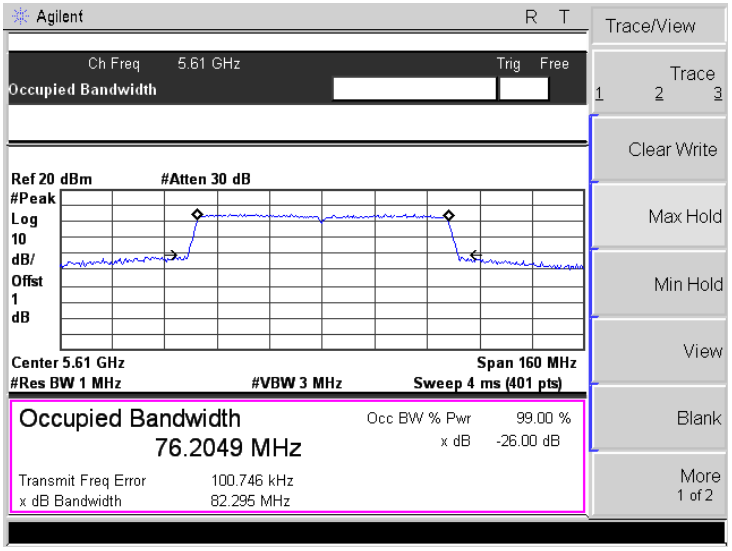
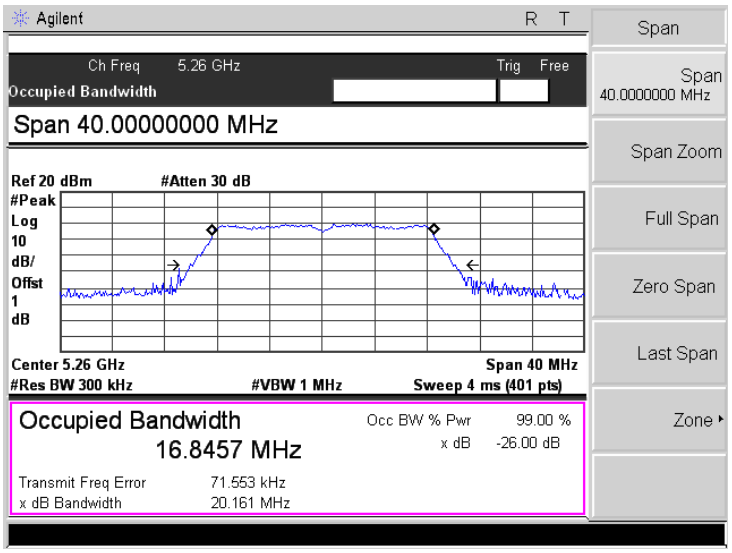
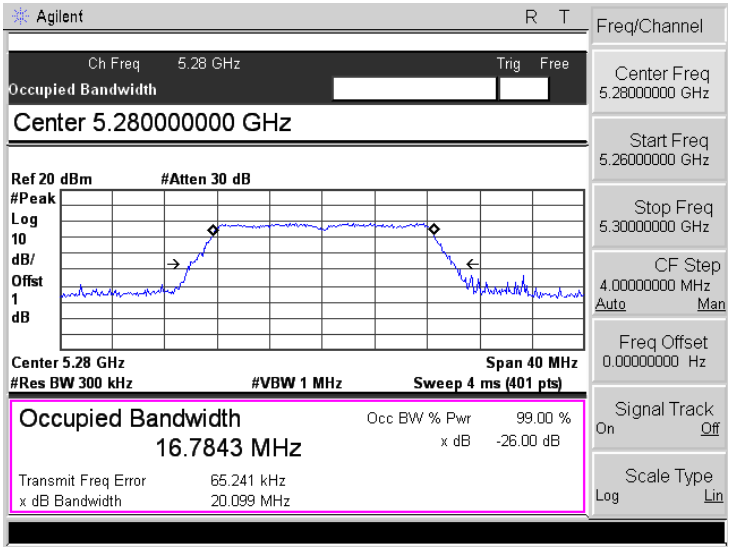
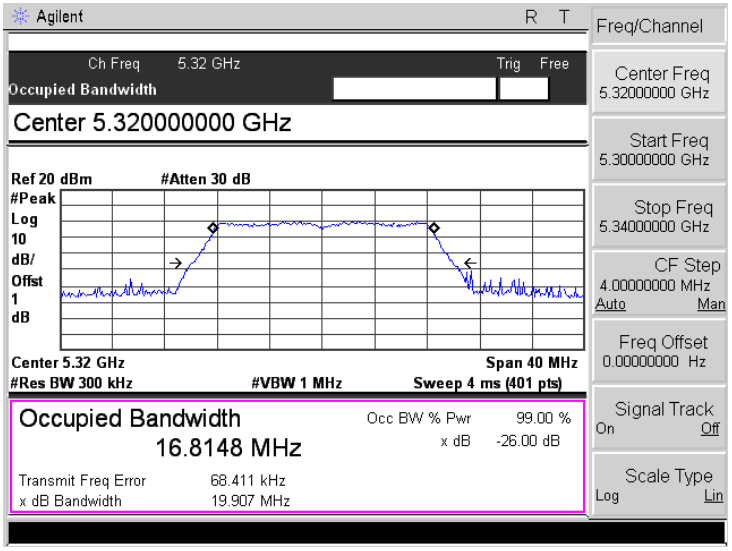
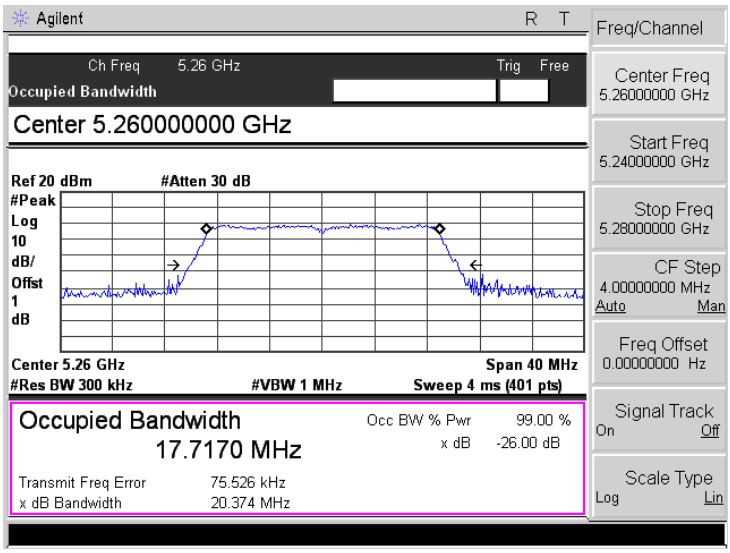
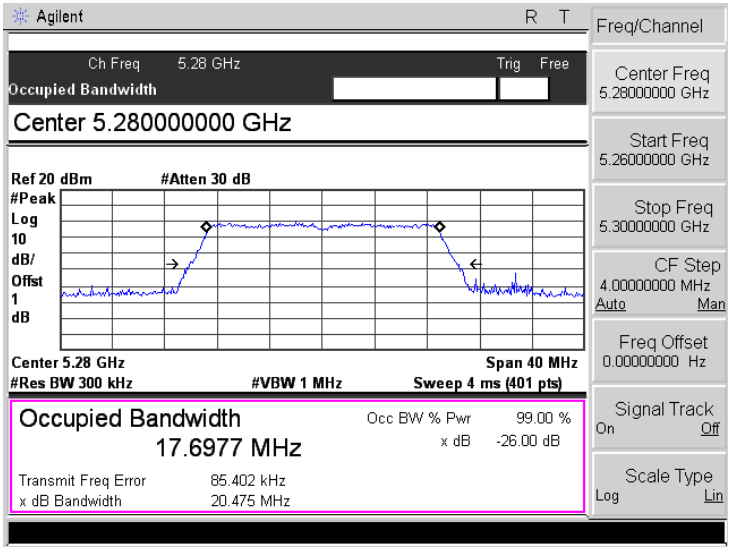
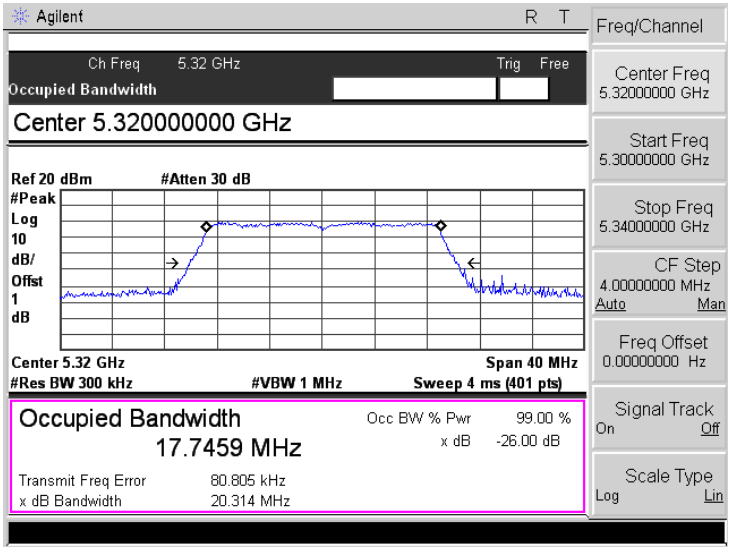
5510MHz	
5590MHz	
5670MHz	

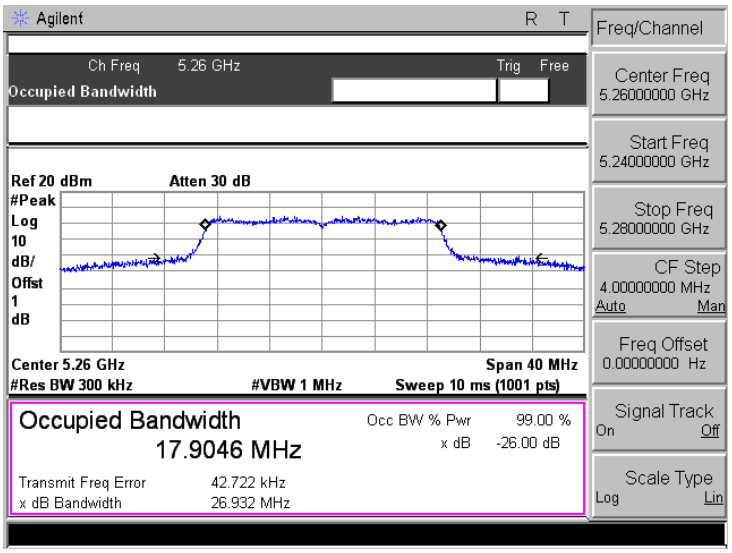
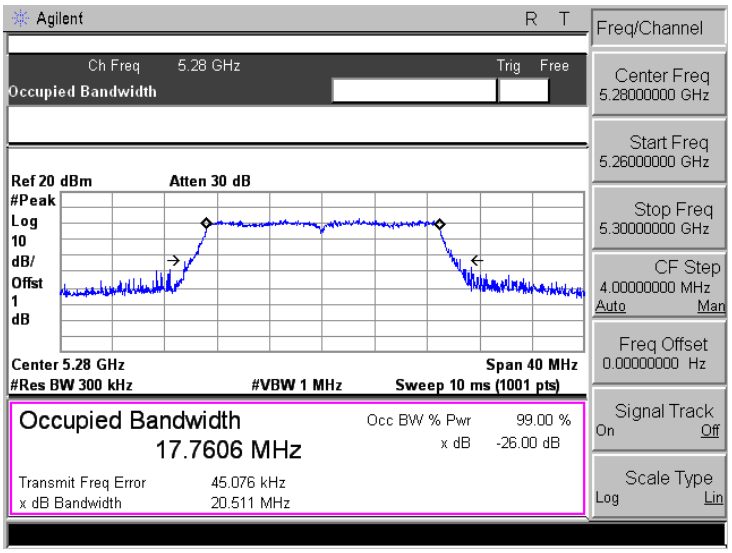
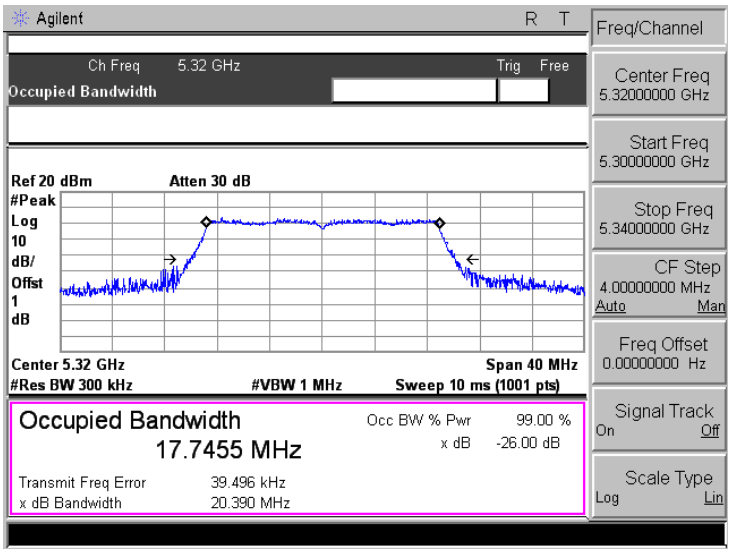
Mode:	802.11ac-HT40
5510MHz	
5590MHz	
5670MHz	

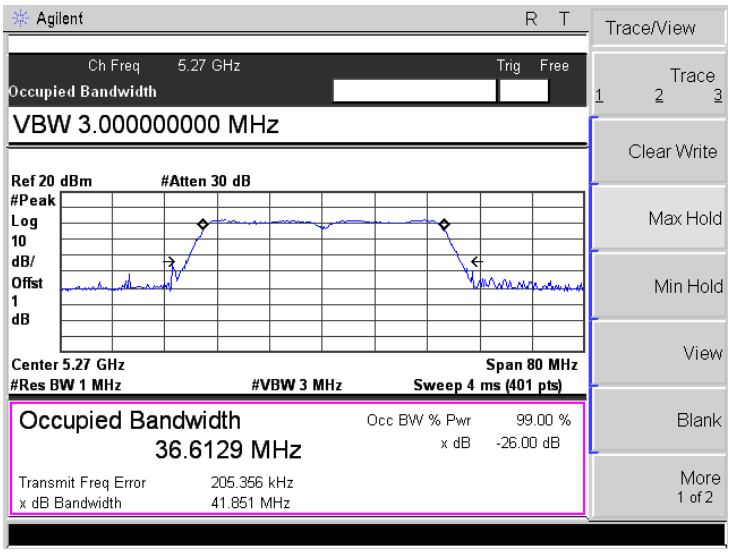
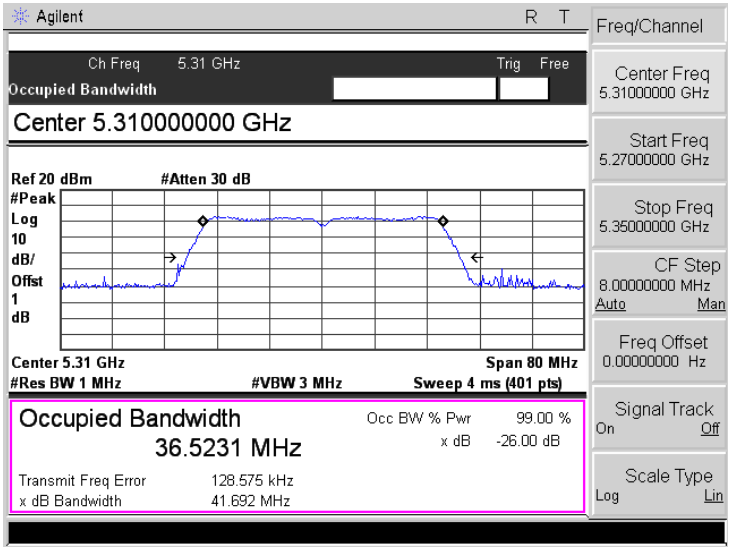
Mode:	802.11ac HT80
5530MHz	
5610MHz	

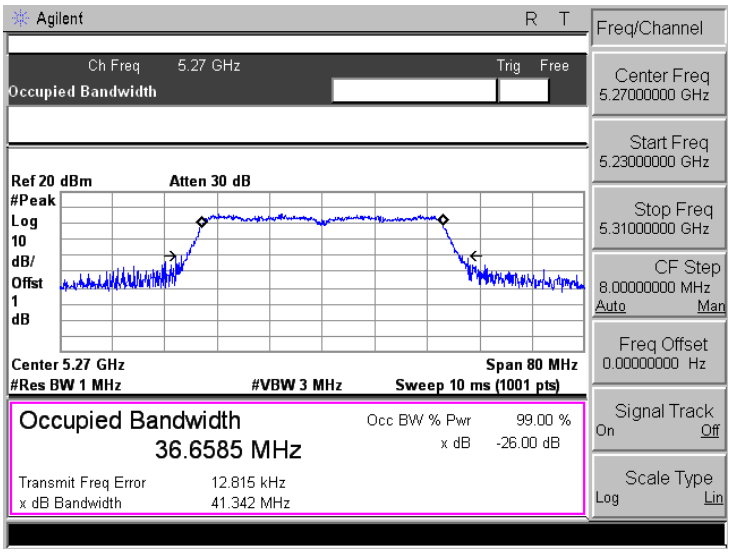
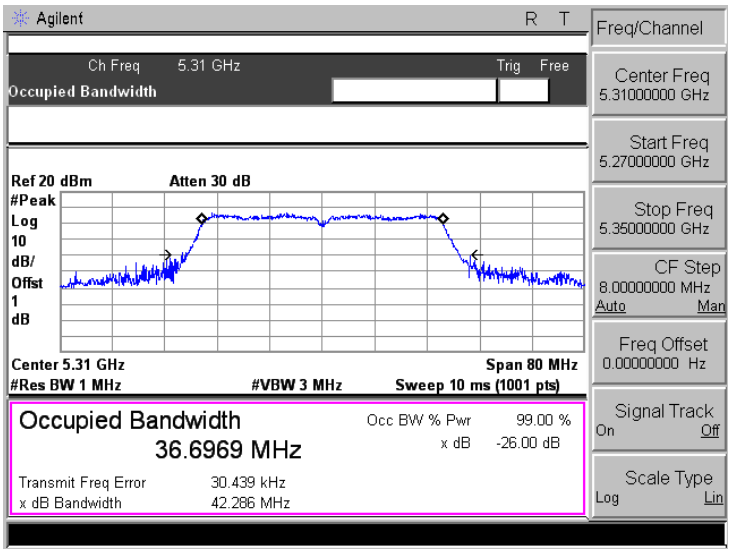
➢ 5250-5350MHz (Antenna B)

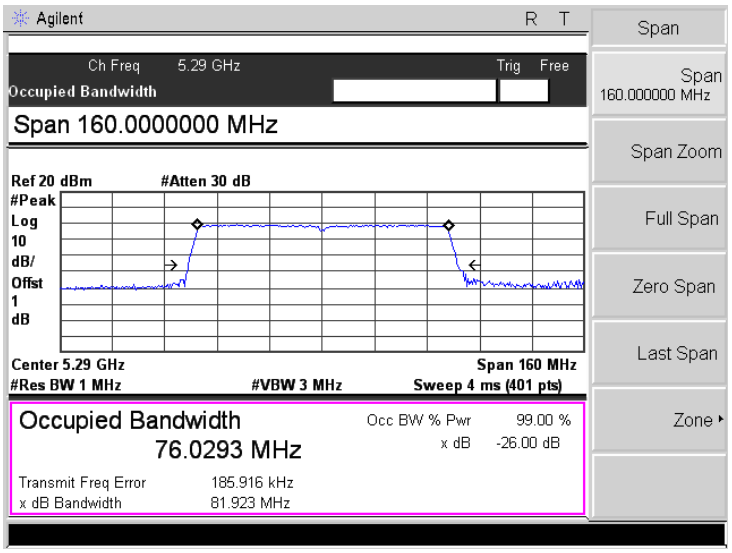
Mode:	**802.11a**
5260MHz	
5280MHz	
5320MHz	

Mode:	802.11n-HT20
5260MHz	
5280MHz	
5320MHz	

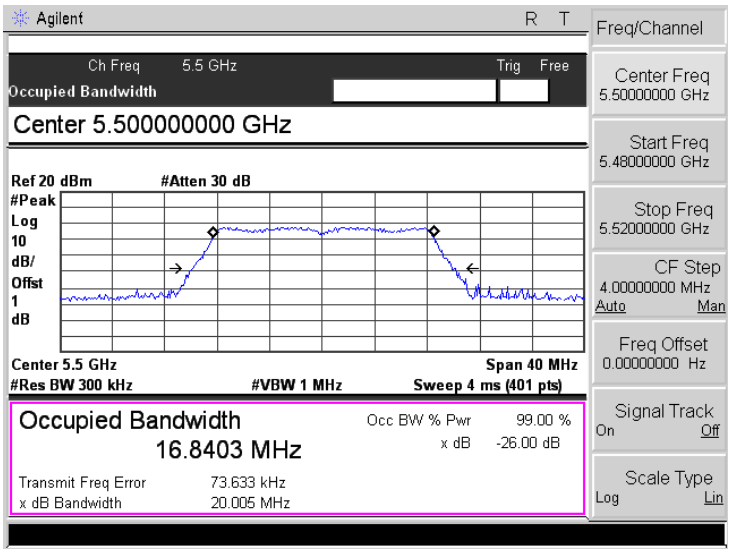
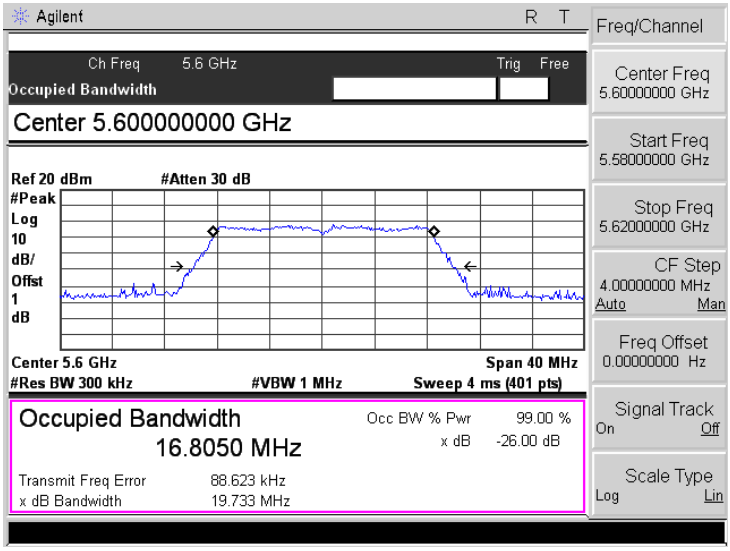
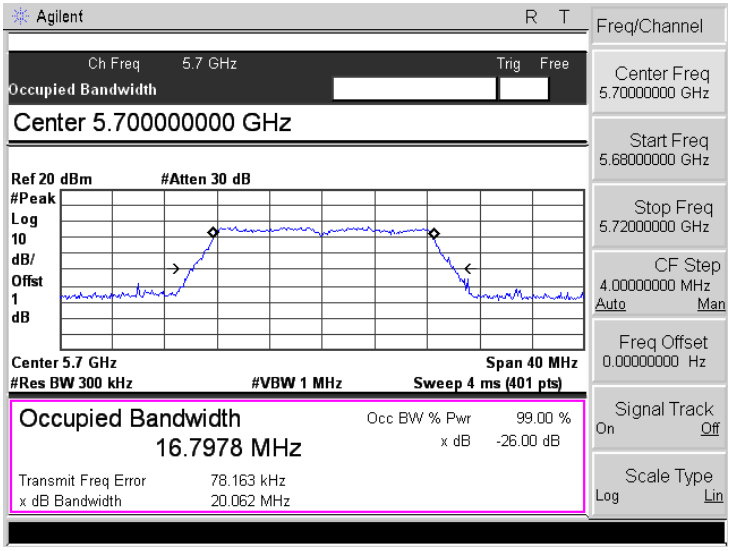
Mode:	802.11ac-HT20
5260MHz	
5280MHz	
5320MHz	

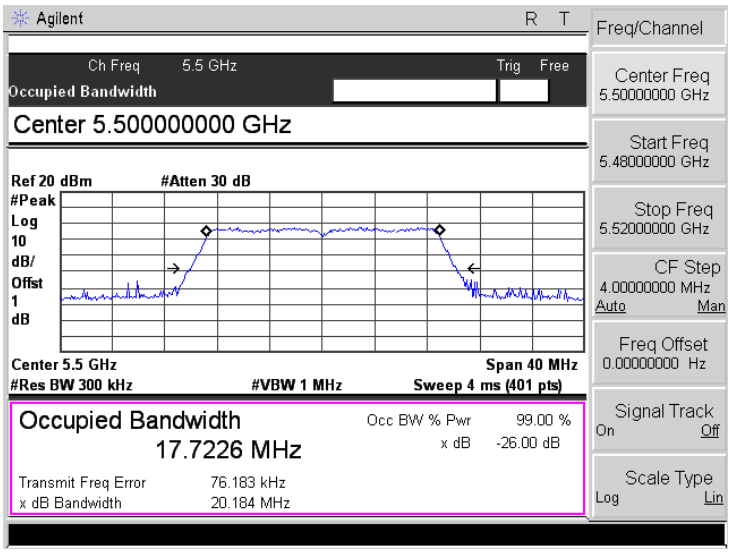
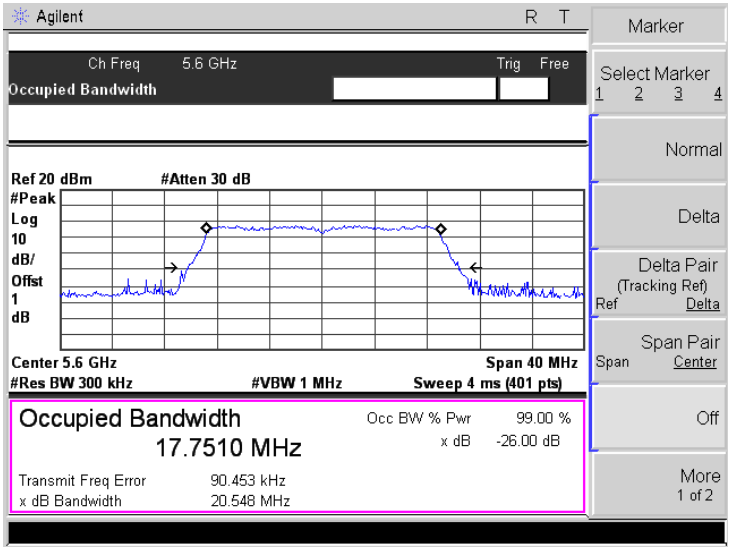
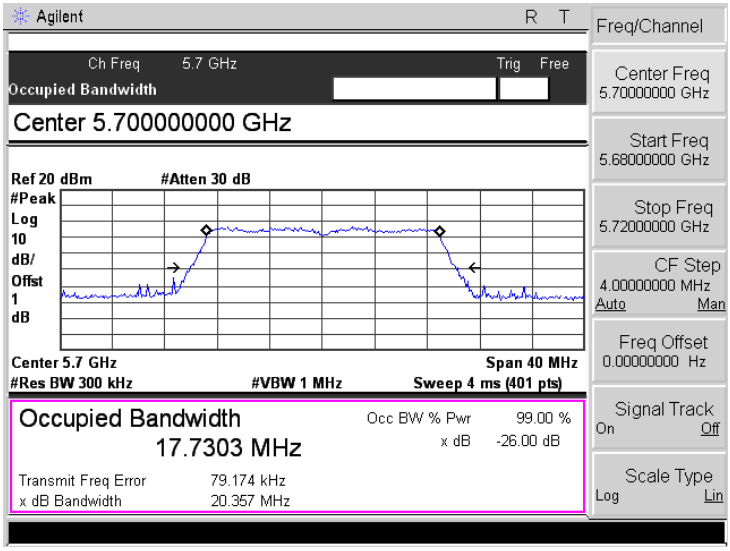
Mode:	802.11n-HT40
5270MHz	
5310MHz	

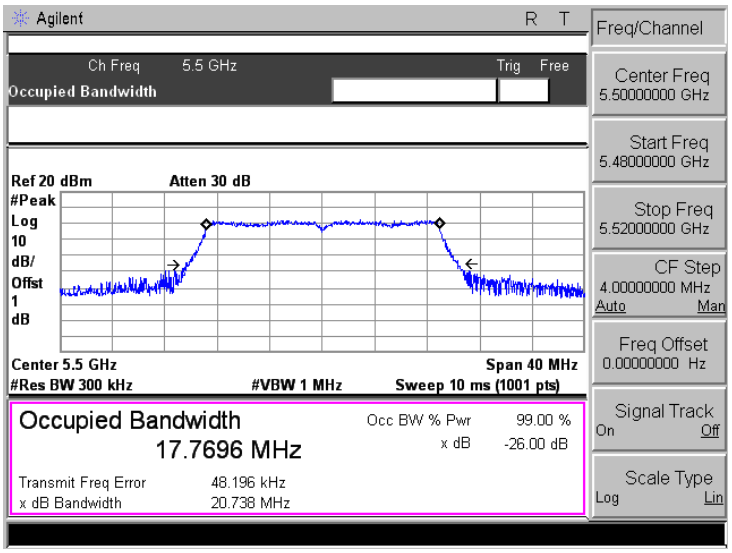
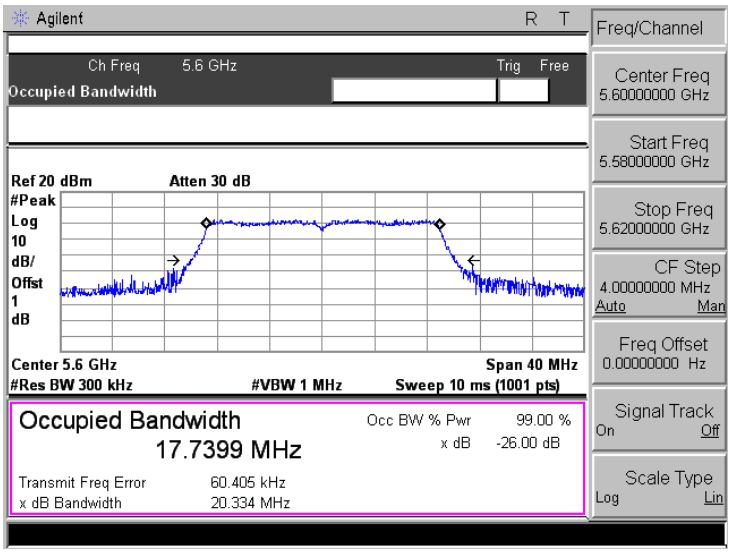
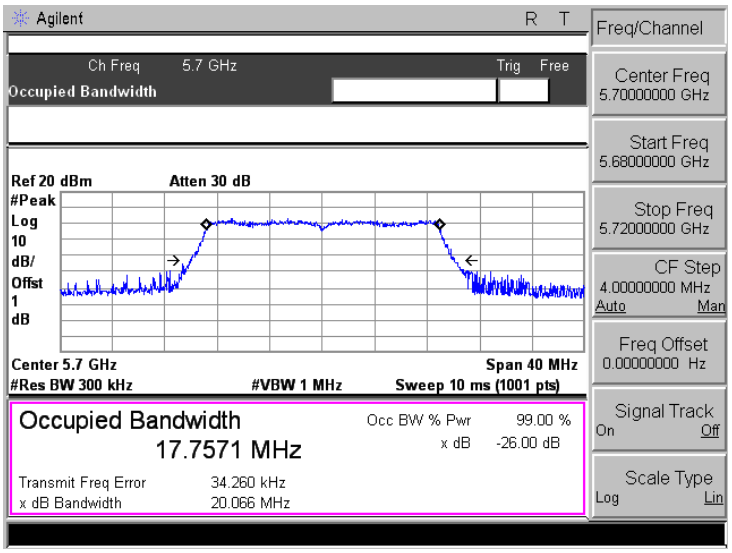
Mode:	802.11ac-HT40
5270MHz	
5310MHz	

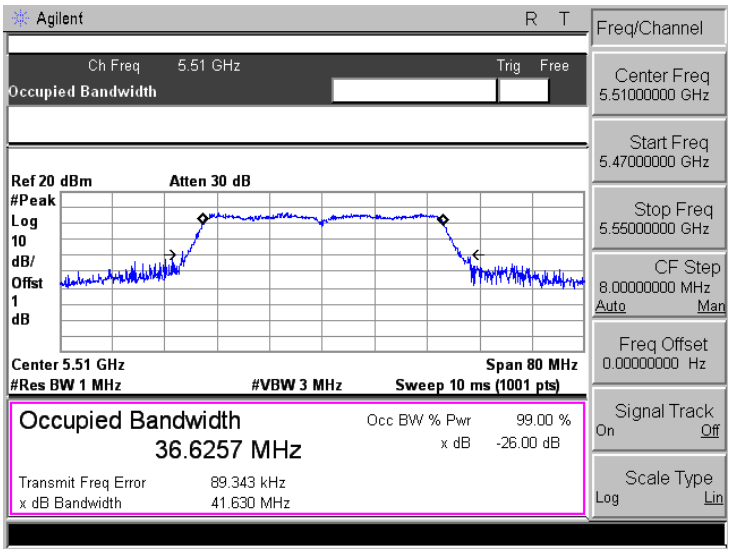
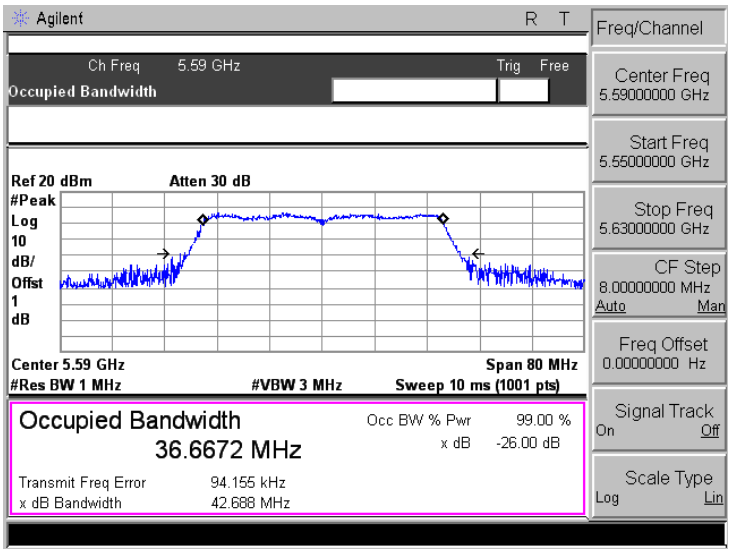
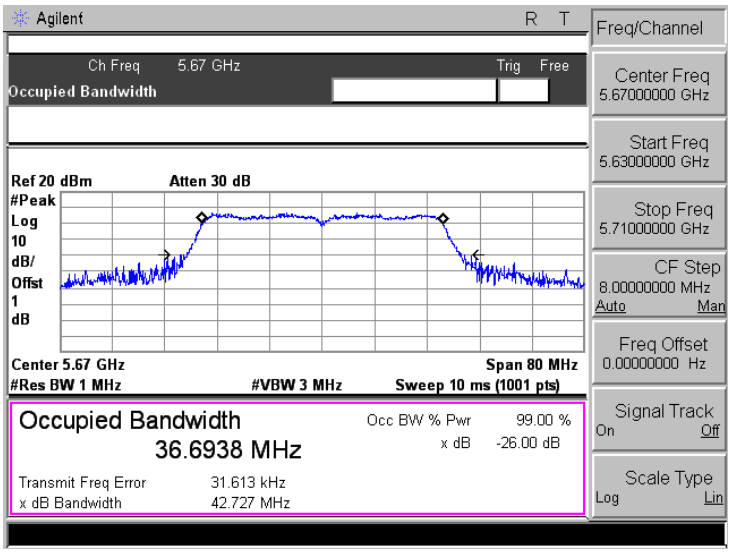
Mode:	802.11ac HT80
5290MHz	

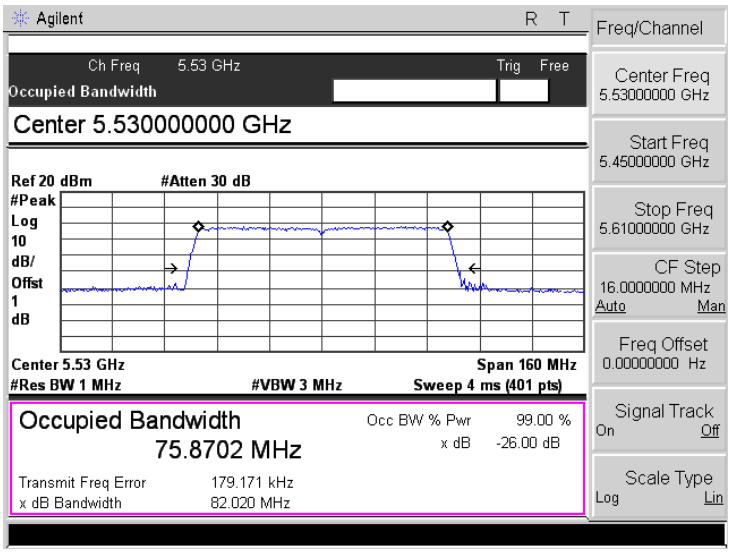
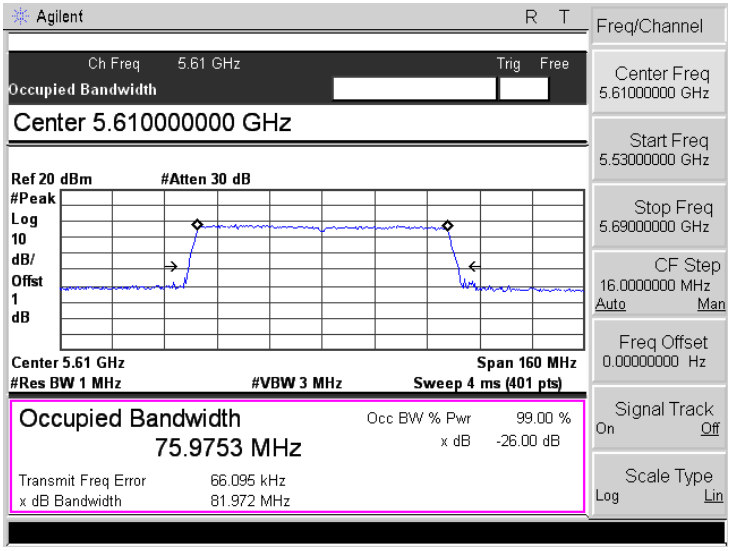
➢ 5470-5725MHz (Antenna B)

Mode:	**802.11a**
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT20
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11ac-HT20
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT40
5510MHz	
5590MHz	
5670MHz	

Mode:	802.11ac HT80
5530MHz	
5610MHz	

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 v02r01 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.

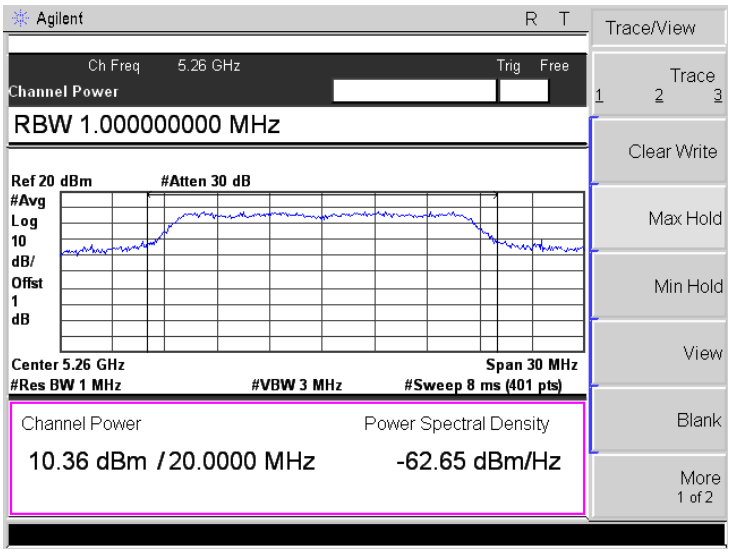
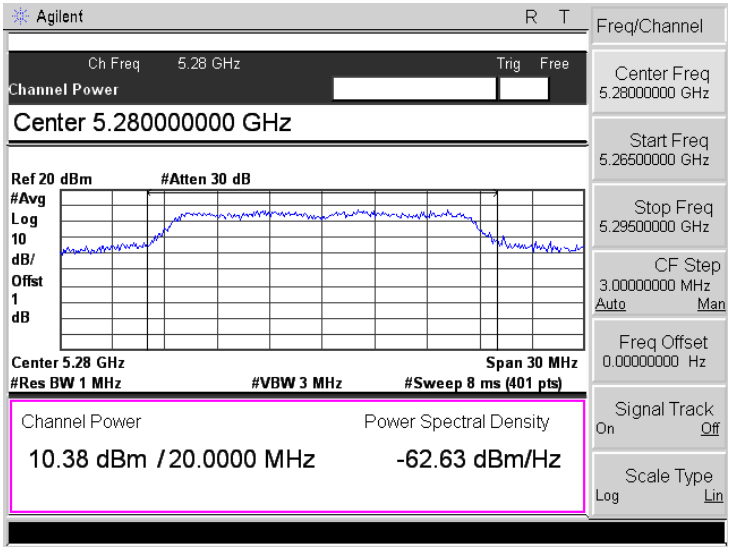
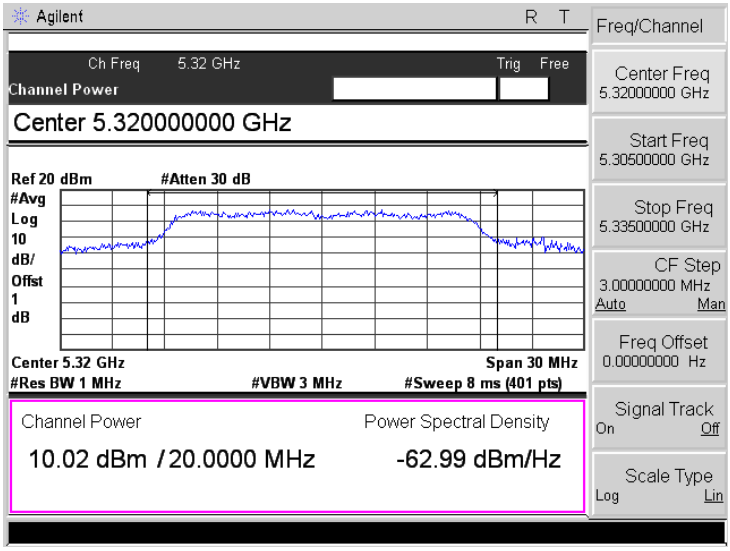
(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power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

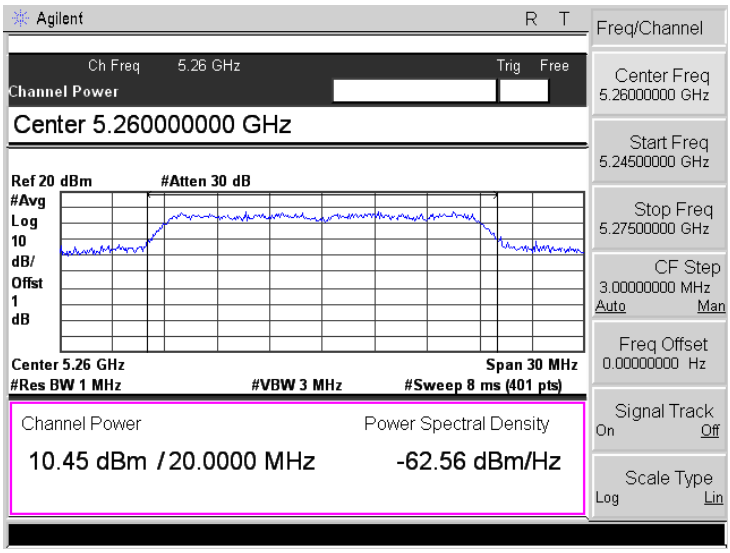
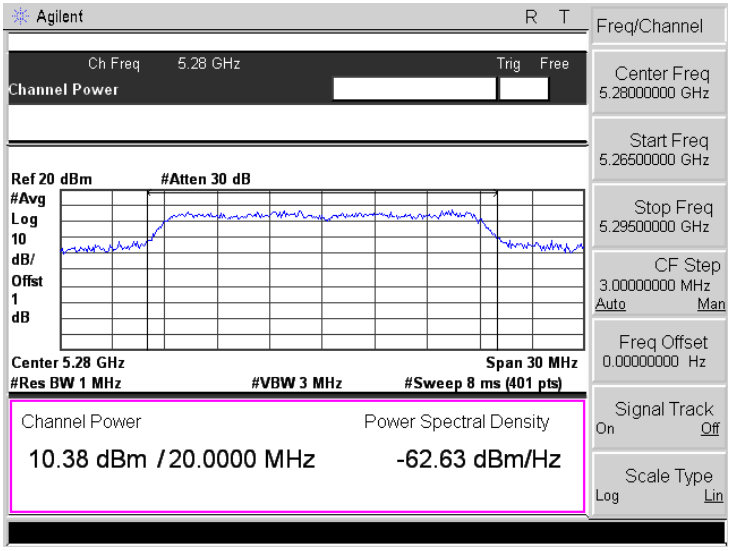
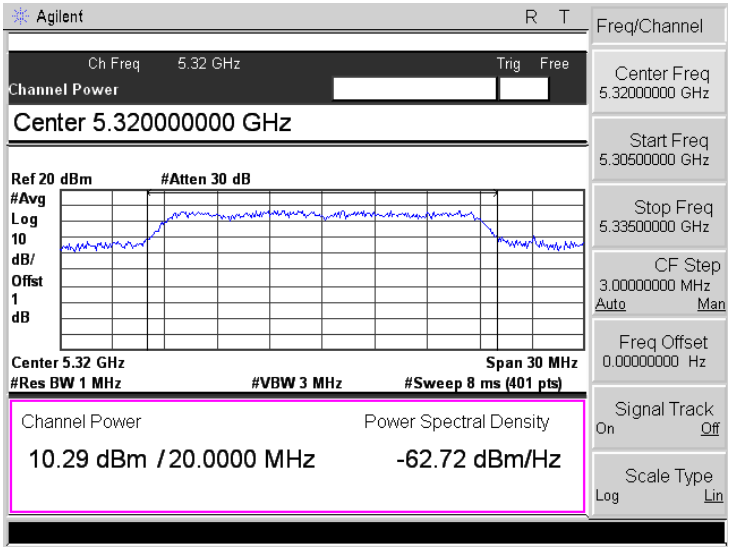
8.3 Summary of Test Results/Plots

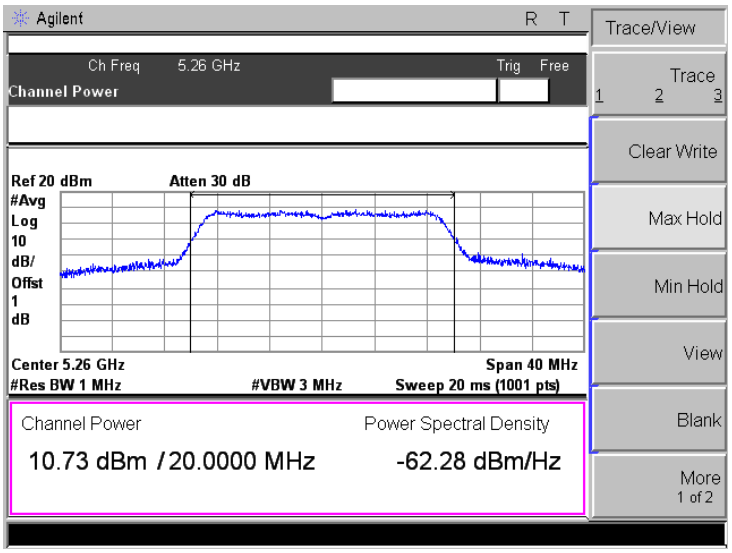
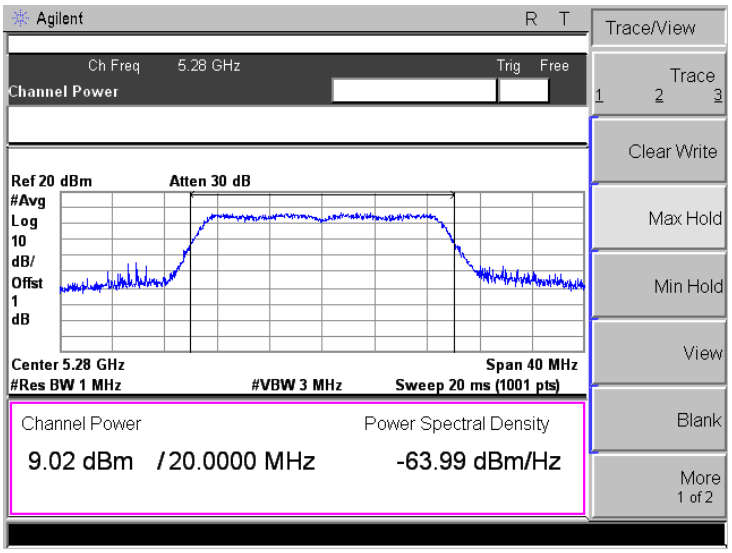
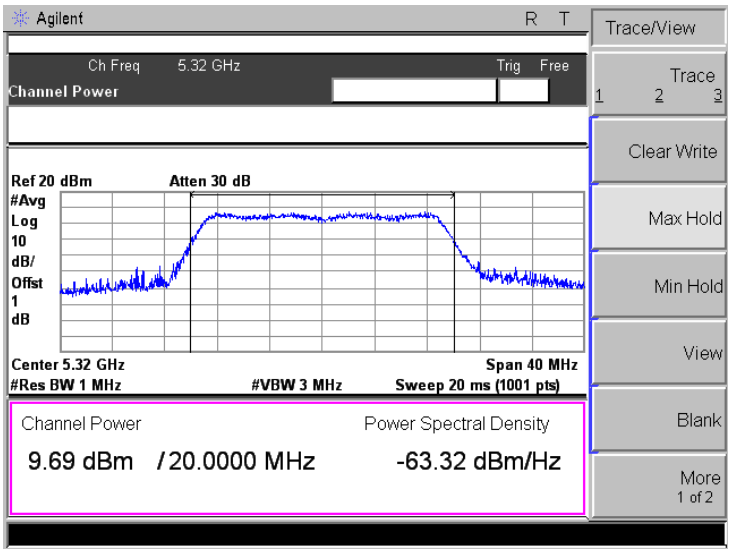
U-NII-2A: 5250-5350MHz					
Test mode	Frequency MHz	Output Power dBm		Total Output Power mW	Limit mW
		ANT A	ANT B		
802.11a	5260	10.36	11.57	/	250
	5280	10.38	12.54	/	250
	5320	10.02	13.11	/	250
802.11n-HT20	5260	10.45	12.44	28.63	250
	5280	10.38	12.14	27.28	250
	5320	10.29	13.03	30.78	250
802.11ac-HT20	5260	10.73	10.11	22.09	250
	5280	9.02	8.90	15.74	250
	5320	9.69	9.04	17.33	250
802.11n-HT40	5270	9.73	10.64	20.99	250
	5310	9.30	11.96	24.22	250
802.11ac-HT40	5270	8.91	8.314	14.56	250
	5310	8.91	8.32	14.57	250
802.11ac-HT80	5290	8.07	10.62	17.95	250

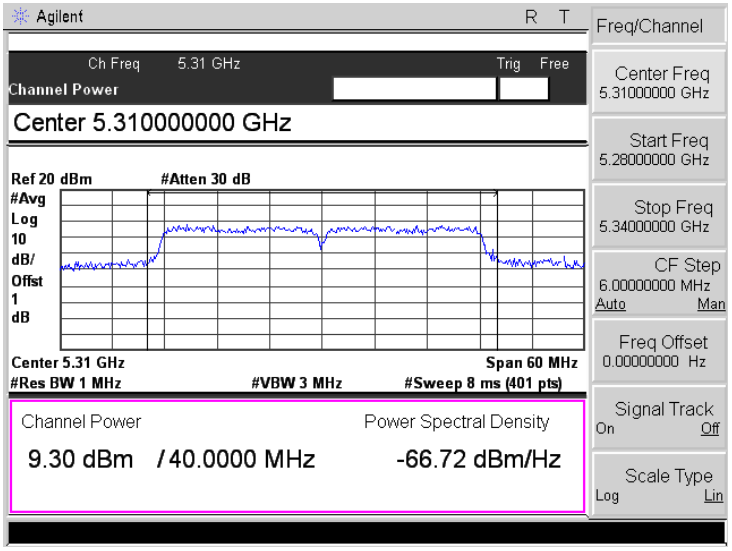
U-NII-2C: 5470-5725MHz					
Test mode	Frequency MHz	Output Power dBm		Total Output Power mW	Limit mW
		ANT A	ANT B		
802.11a	5500	11.13	11.17	/	250
	5600	12.28	10.78	/	250
	5700	10.55	9.26	/	250
802.11n-HT20	5500	11.56	11.94	29.95	250
	5600	12.68	10.61	30.04	250
	5700	10.23	9.41	19.27	250
802.11ac-HT20	5500	9.55	8.60	16.26	250
	5600	9.36	8.67	15.99	250
	5700	9.90	9.38	18.44	250
802.11n-HT40	5510	11.24	10.27	23.95	250
	5590	12.37	10.57	28.66	250
	5670	11.06	8.94	20.60	250
802.11ac-HT40	5510	8.37	8.98	14.78	250
	5590	9.36	8.49	15.69	250
	5670	9.43	8.37	15.64	250
802.11ac-HT80	5530	10.52	9.99	21.25	250
	5610	10.84	9.13	20.32	250

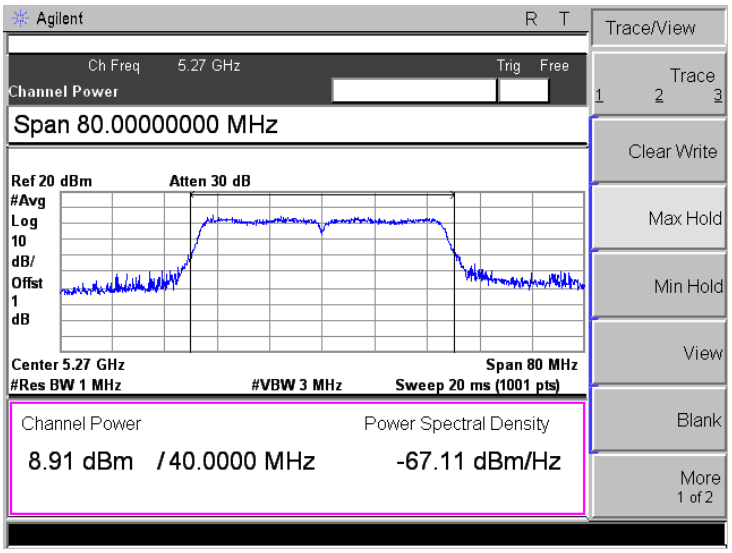
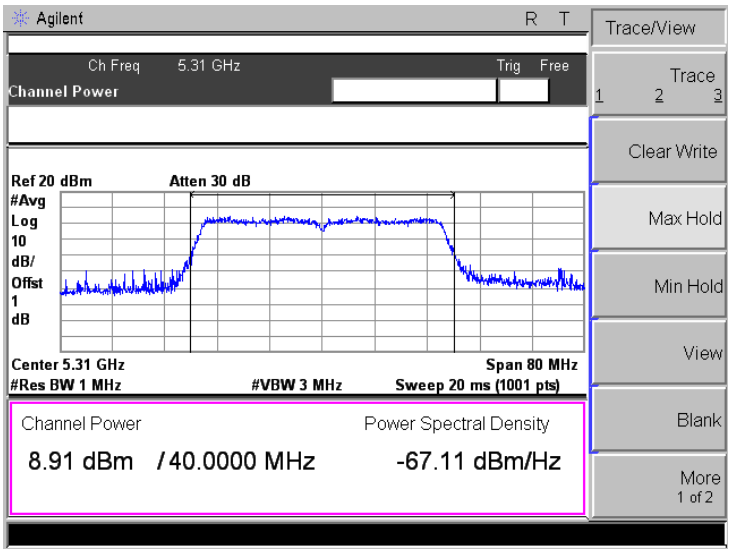
➢ 5250-5350MHz (Antenna A)

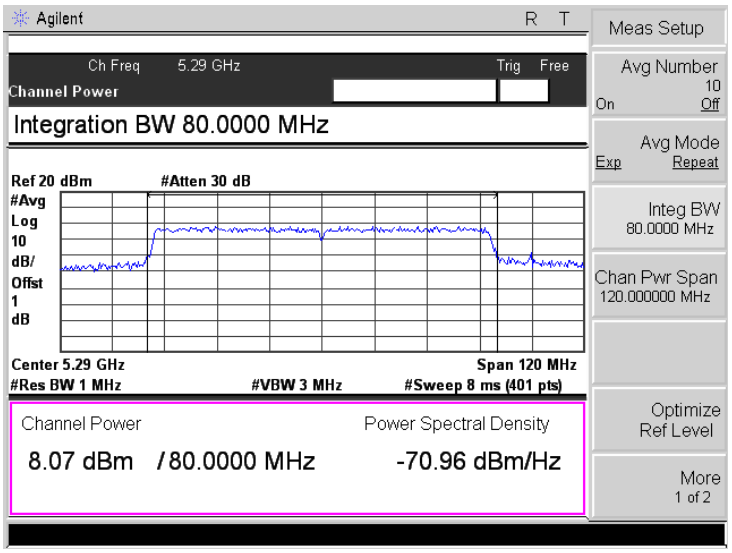
Mode:	**802.11a**
5260MHz	
5280MHz	
5320MHz	

Mode:	802.11n-HT20
5260MHz	
5280MHz	
5320MHz	

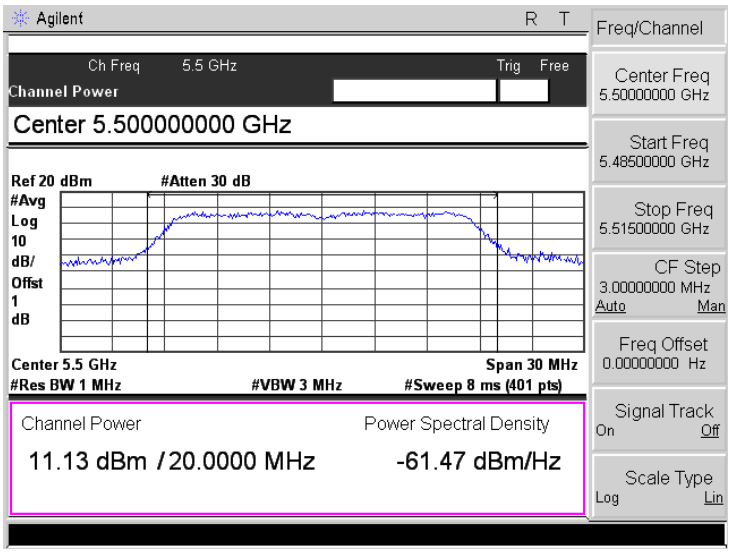
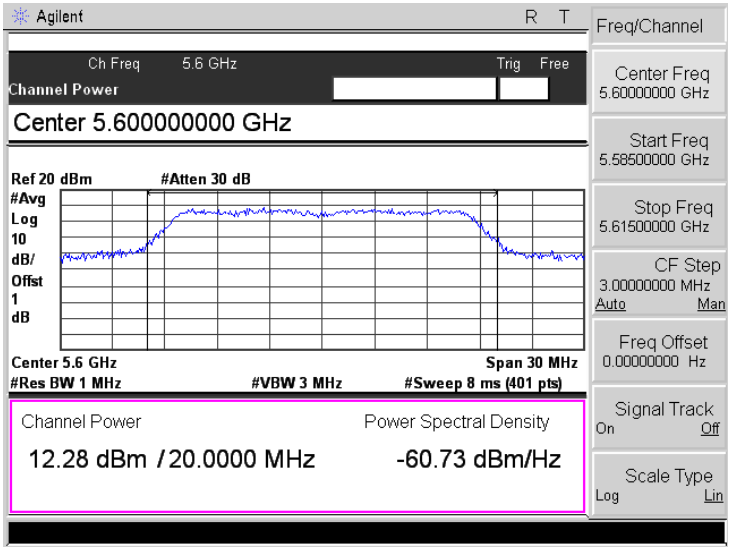
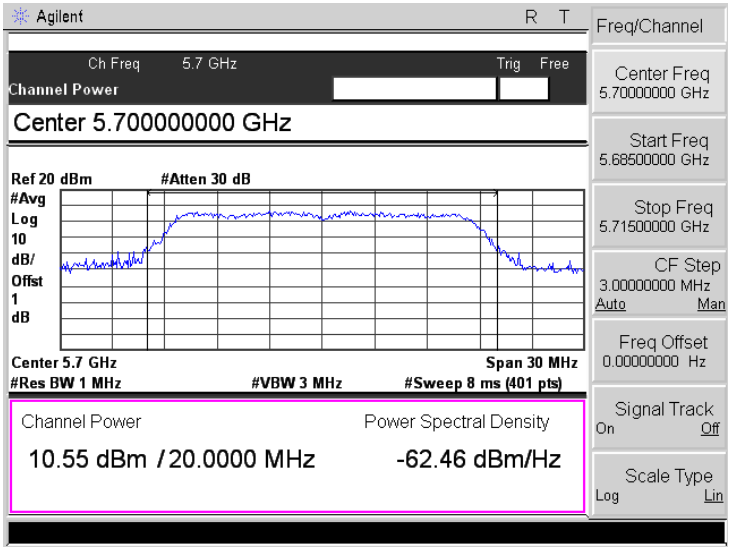
Mode:	802.11ac-HT20
5260MHz	
5280MHz	
5320MHz	

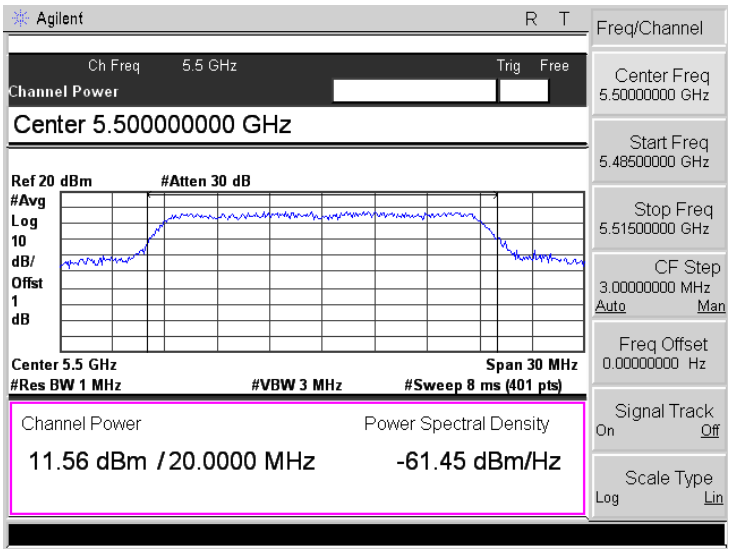
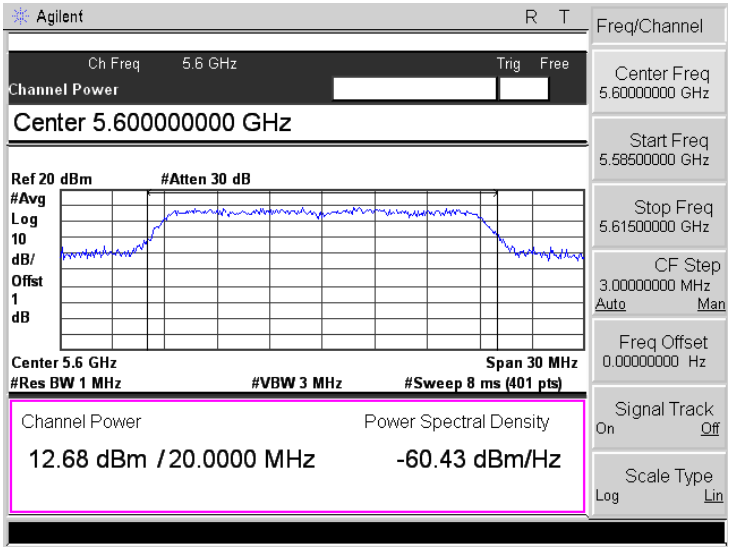
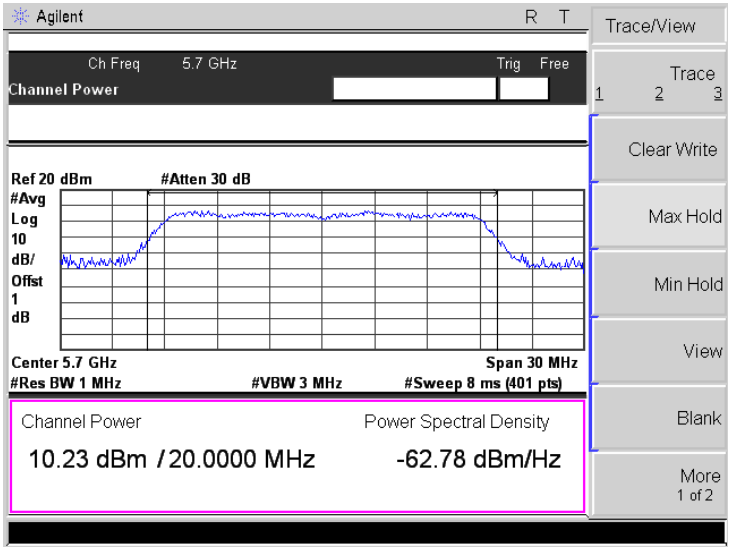
Mode:	802.11n-HT40
5270MHz	
5310MHz	

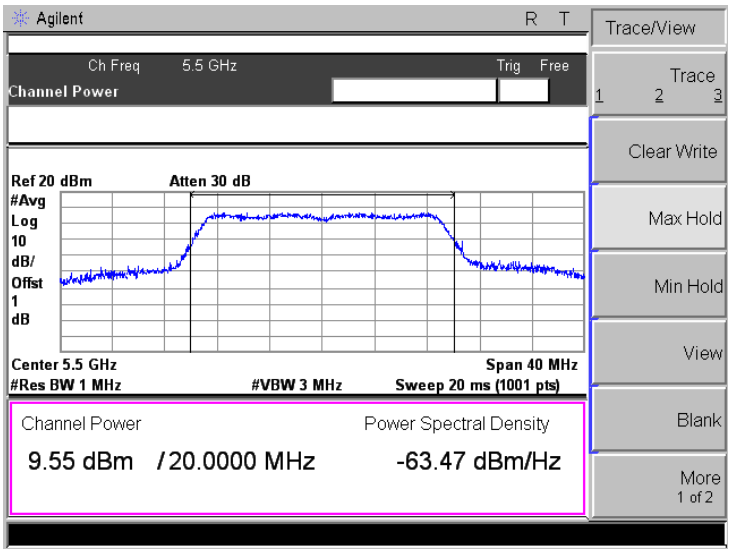
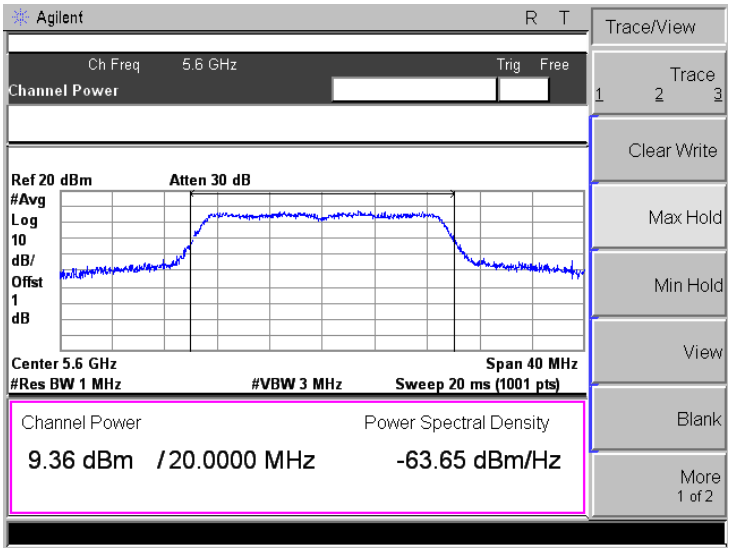
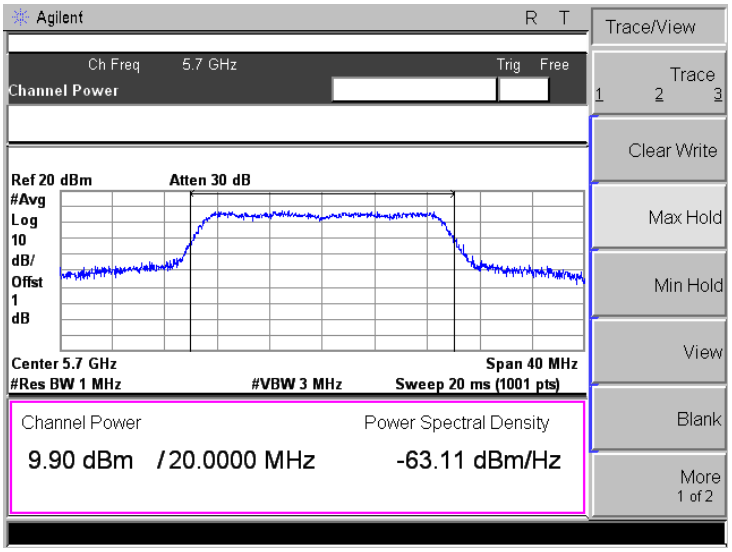
Mode:	802.11ac-HT40
5270MHz	
5310MHz	

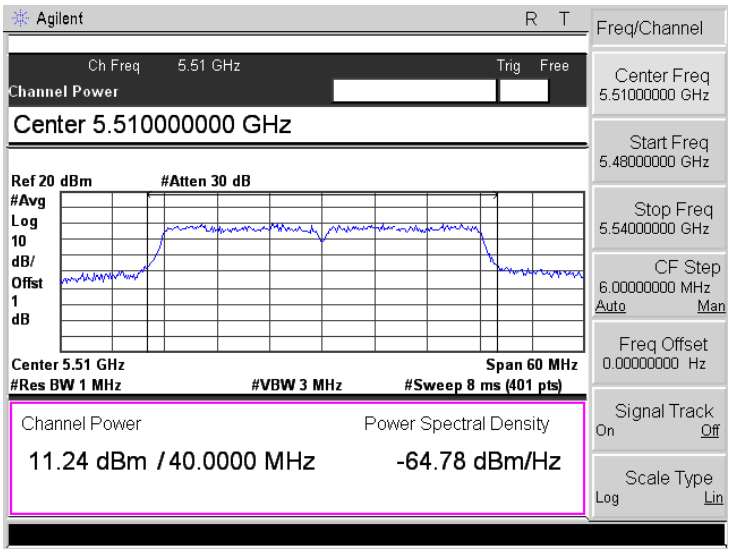
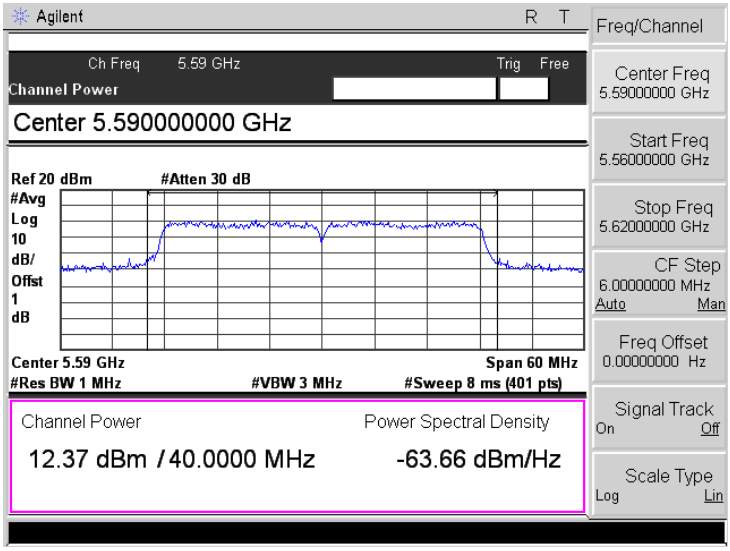
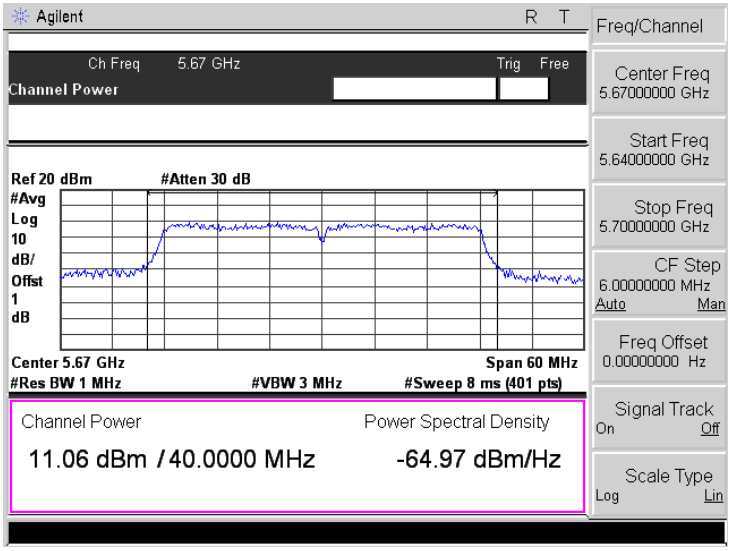
Mode:	802.11ac HT80
5290MHz	

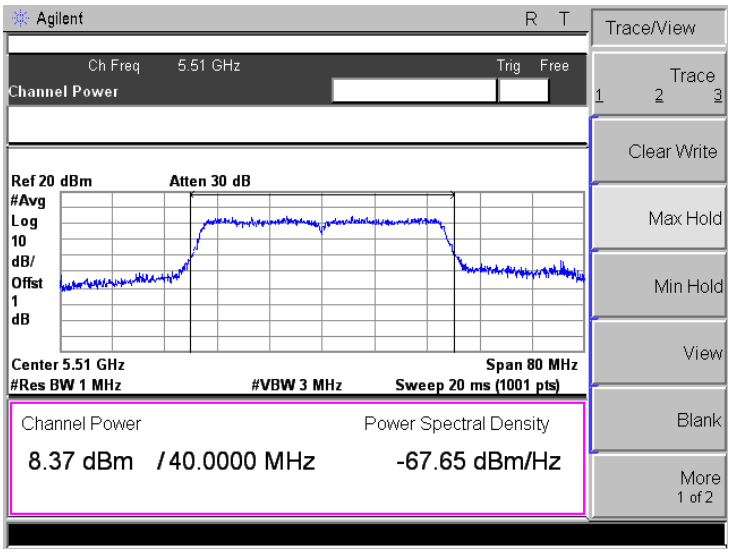
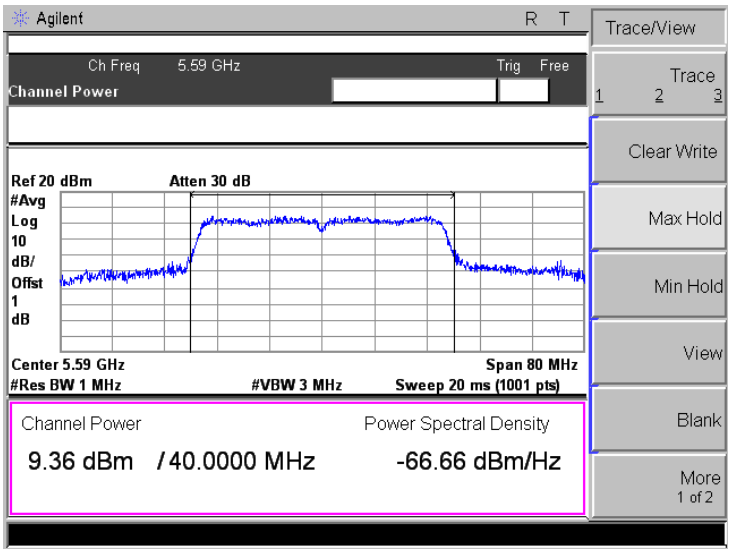
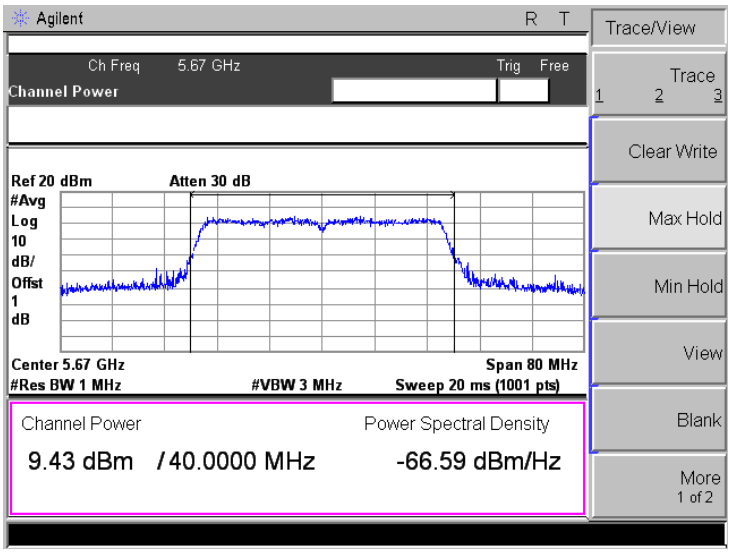
➢ 5470-5725MHz (Antenna A)

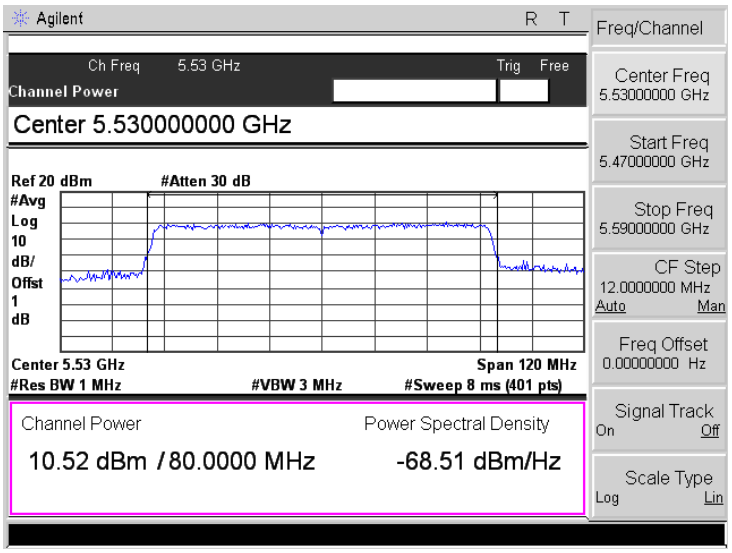
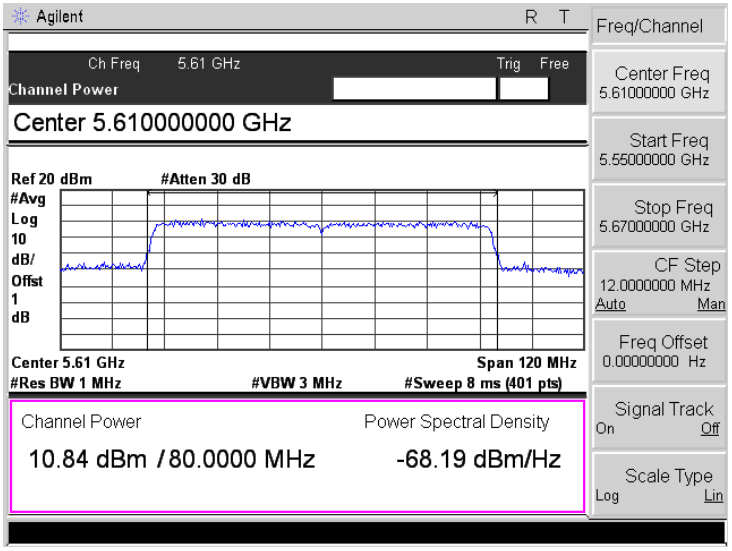
Mode:	**802.11a**
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT20
5500MHz	
5600MHz	
5700MHz	

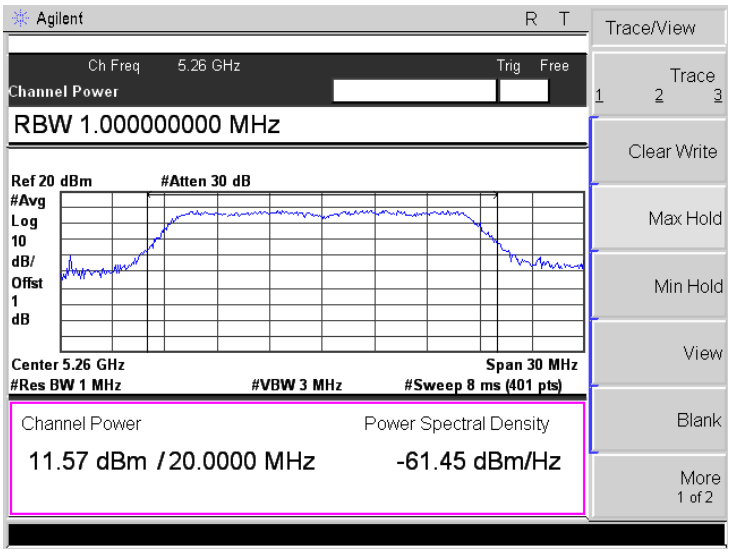
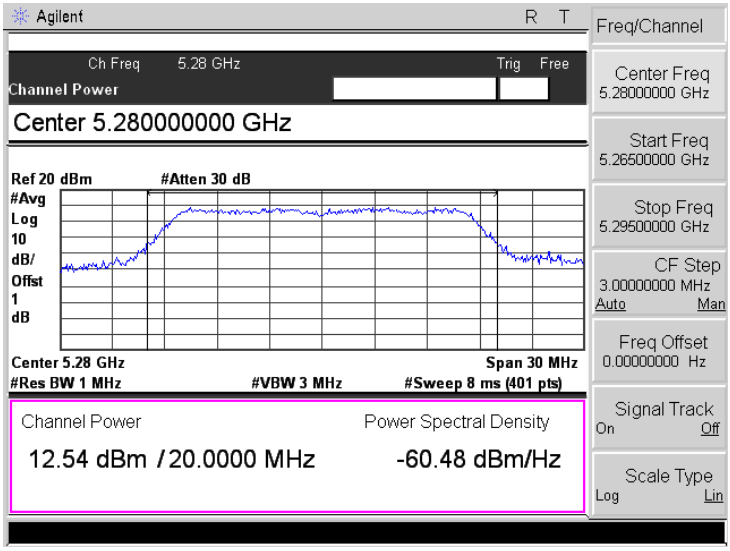
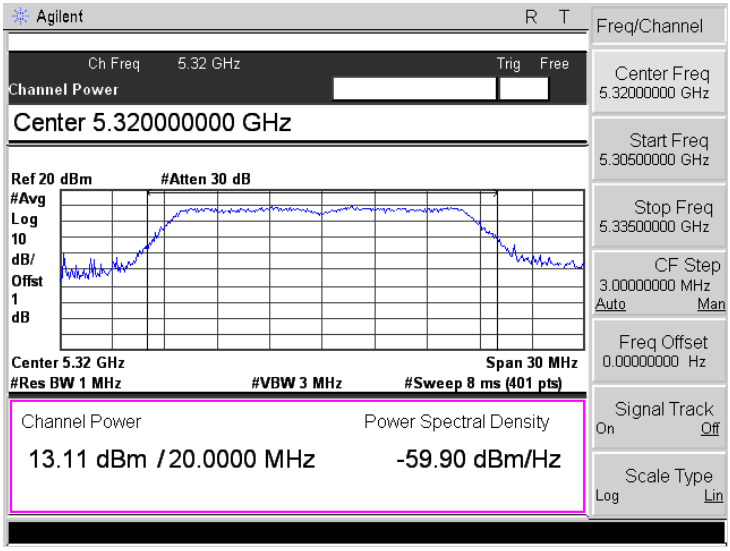
Mode:	802.11ac-HT20
5500MHz	
5600MHz	
5700MHz	

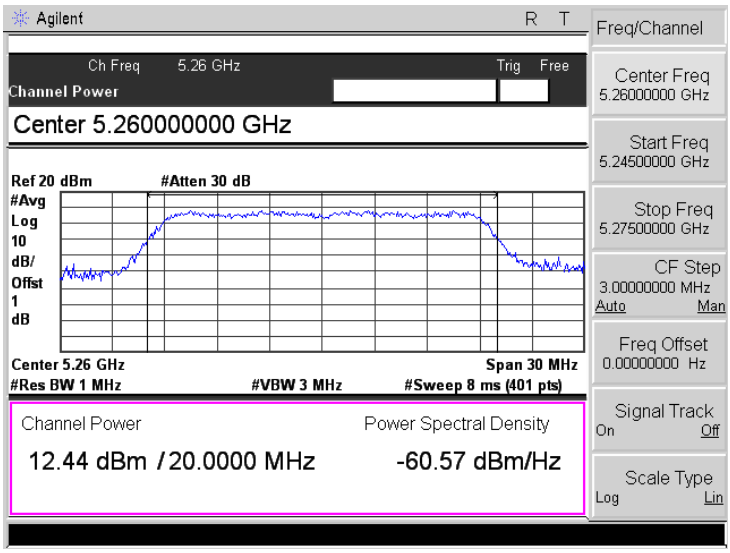
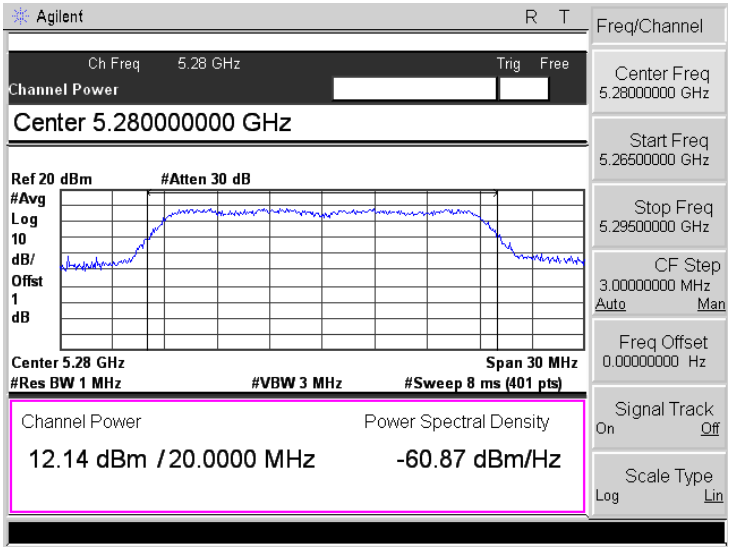
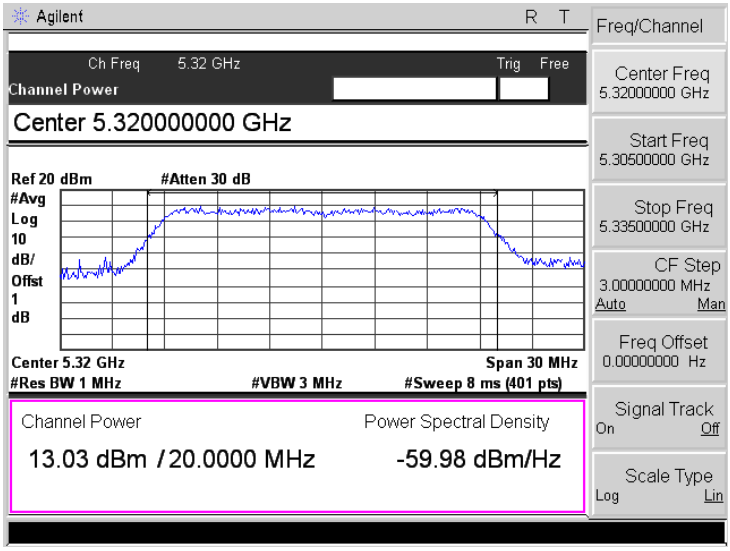
Mode:	802.11n-HT40
5510MHz	
5590MHz	
5670MHz	

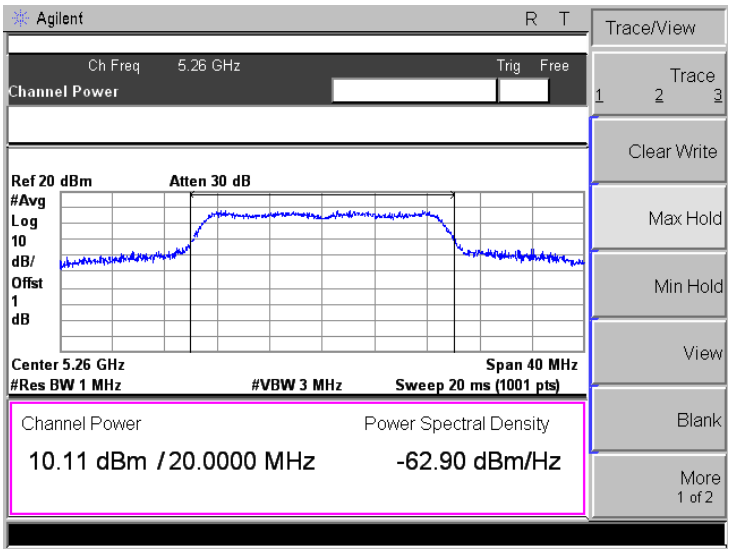
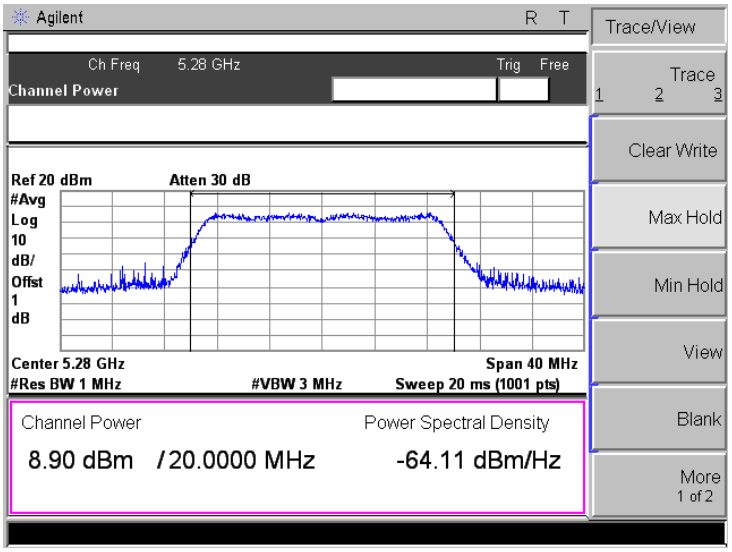
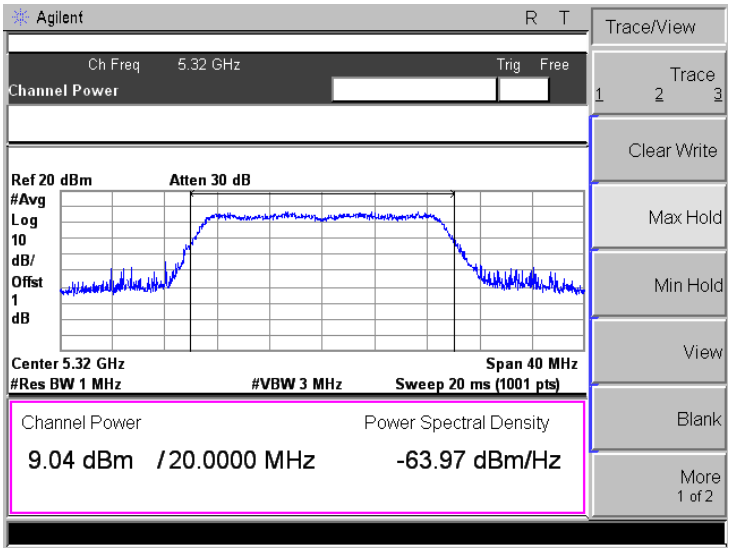
Mode:	802.11ac-HT40
5510MHz	
5590MHz	
5670MHz	

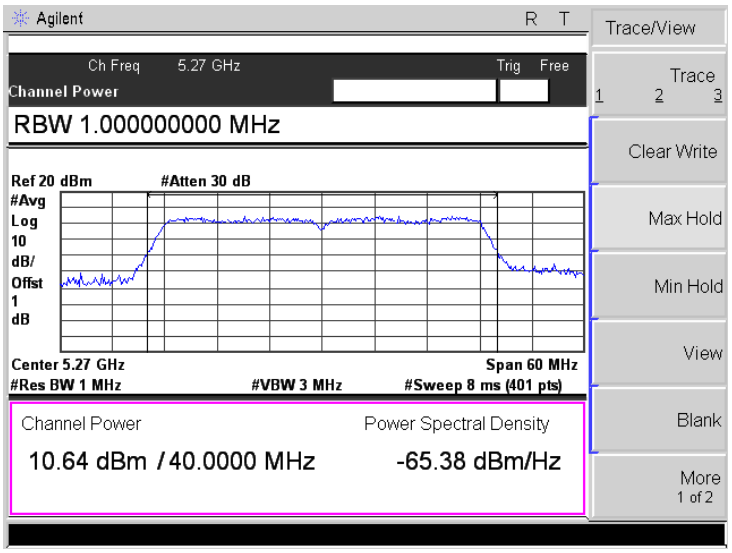
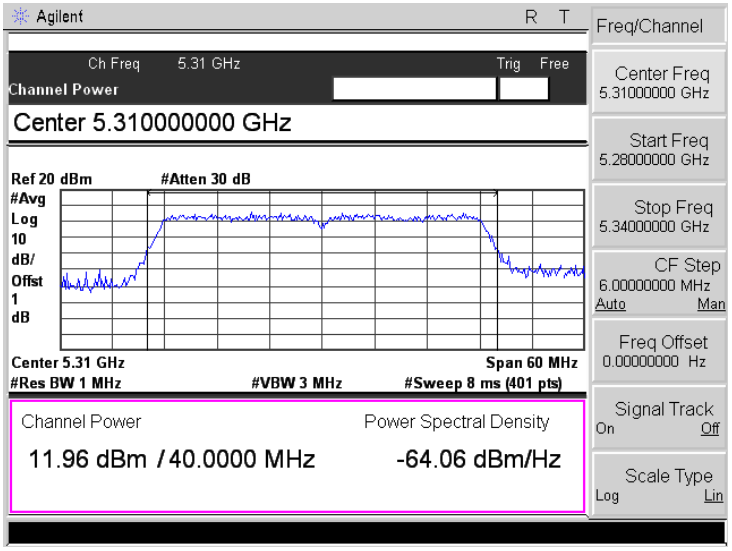
Mode:	802.11ac HT80
5530MHz	
5610MHz	

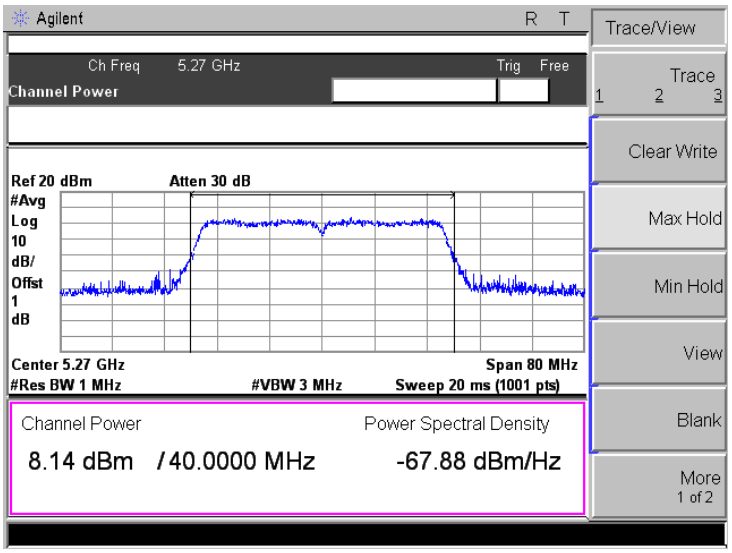
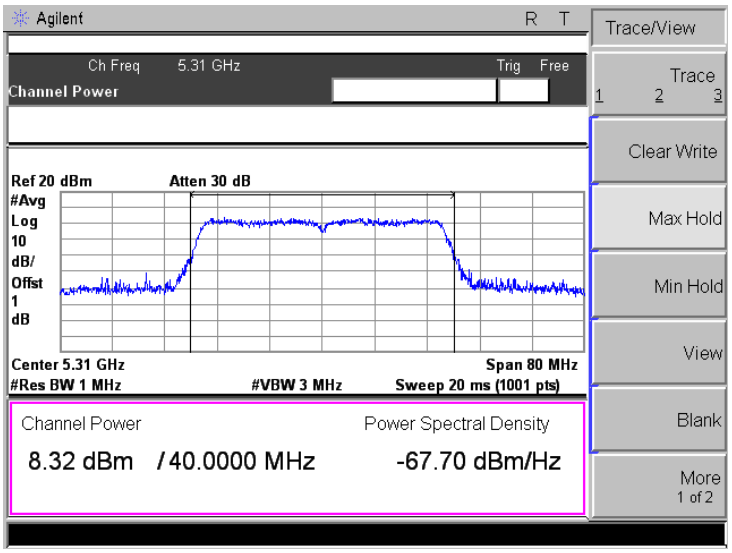
➢ 5250-5350MHz (Antenna B)

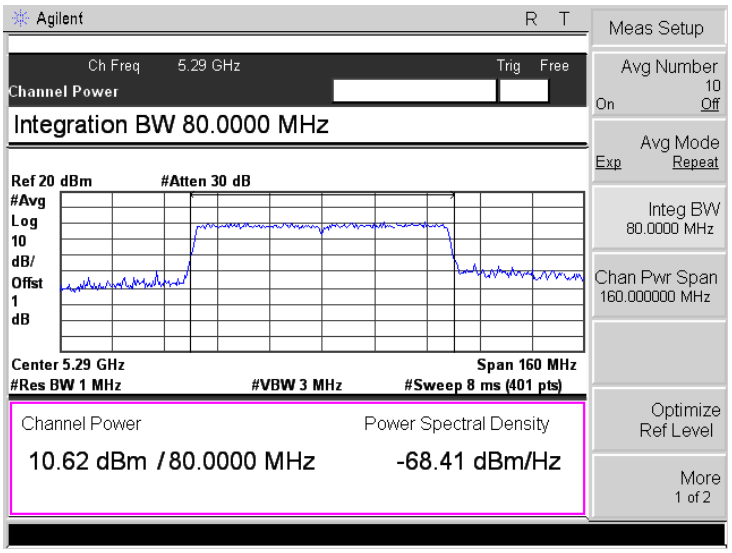
Mode:	**802.11a**
5260MHz	
5280MHz	
5320MHz	

Mode:	802.11n-HT20
5260MHz	
5280MHz	
5320MHz	

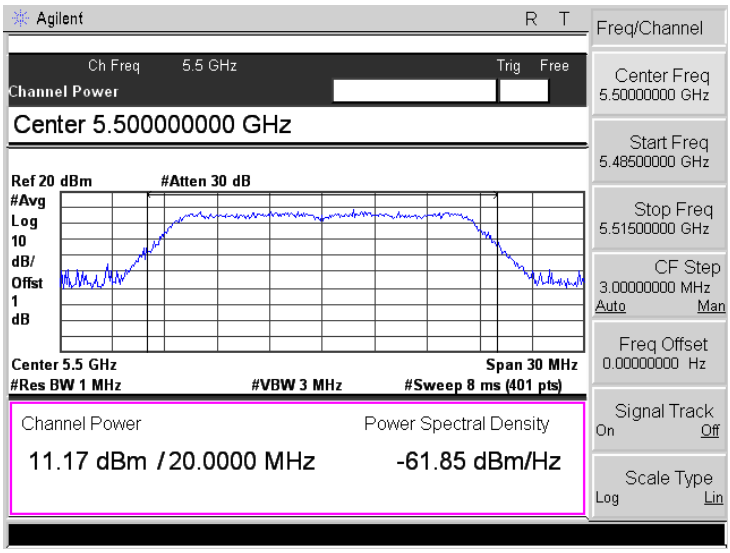
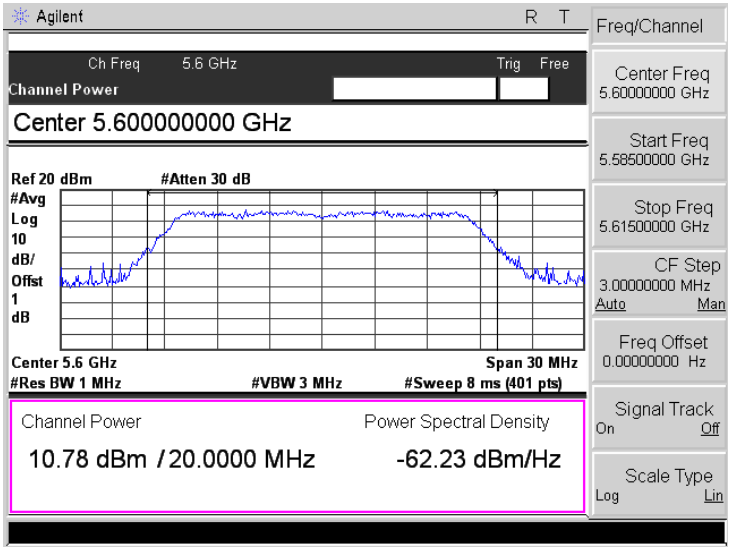
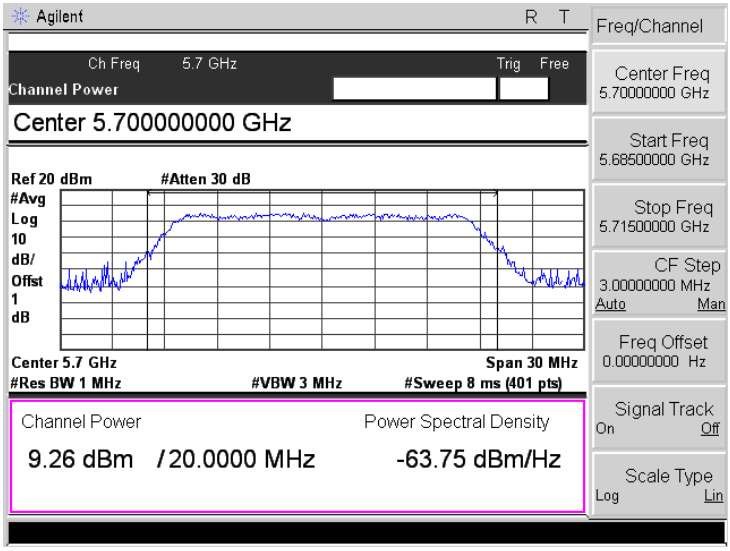
Mode:	802.11ac-HT20
5260MHz	
5280MHz	
5320MHz	

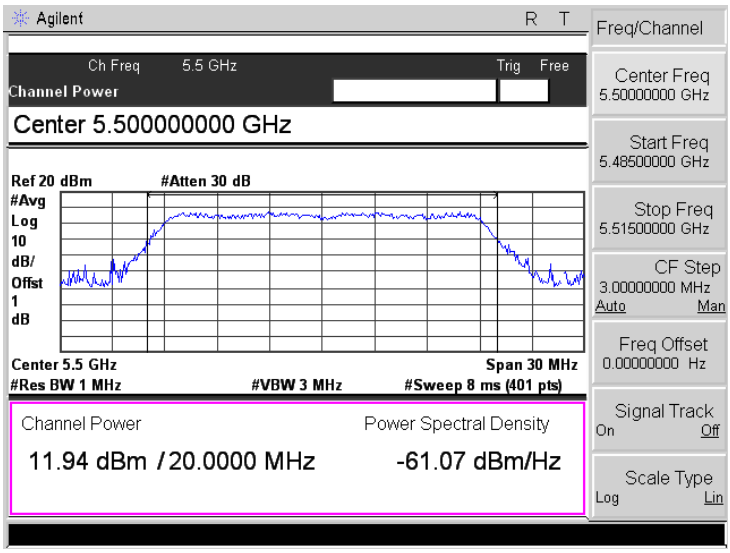
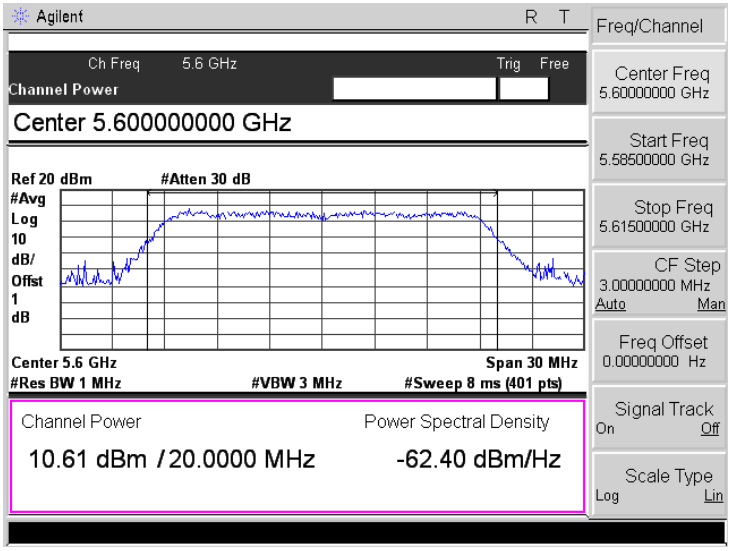
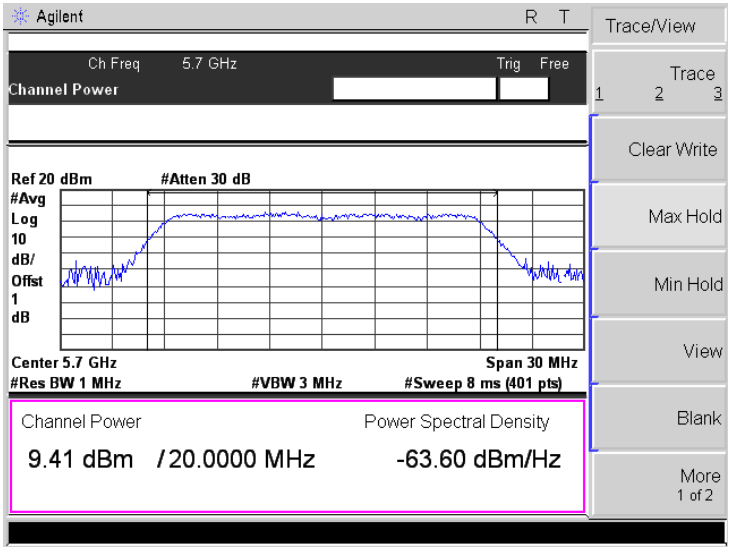
Mode:	802.11n-HT40
5270MHz	
5310MHz	

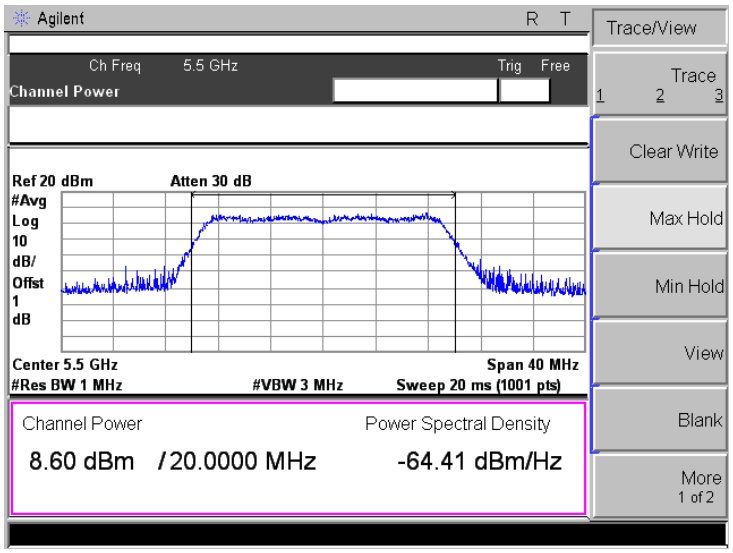
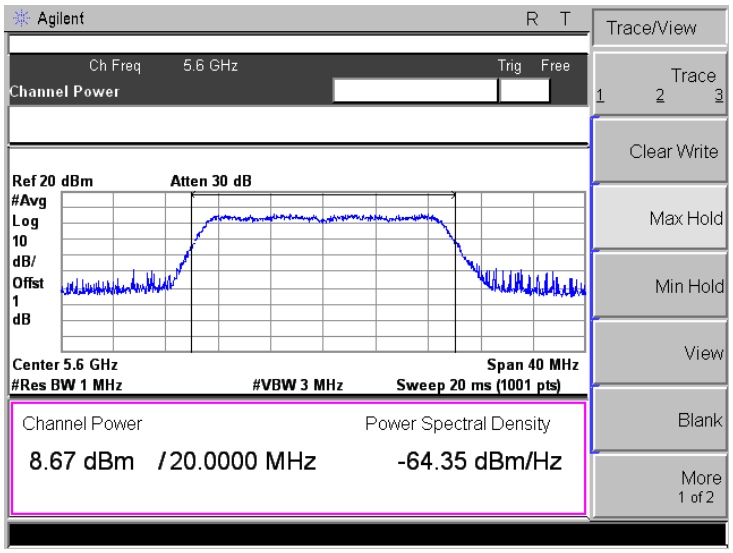
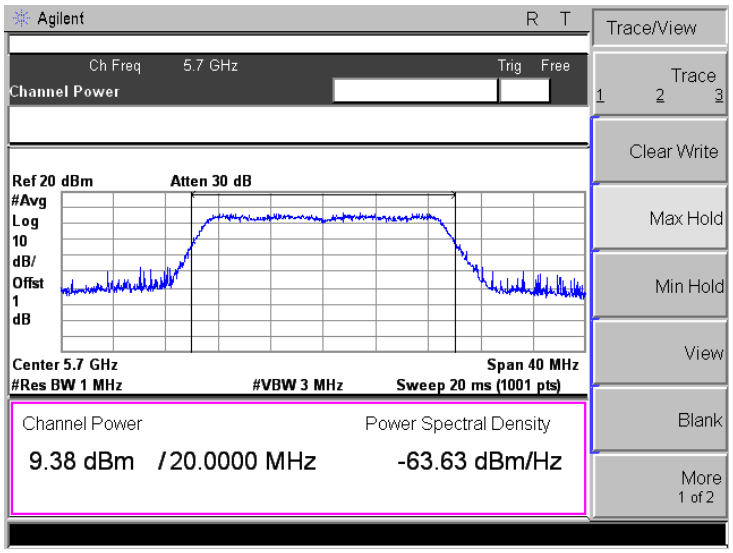
Mode:	802.11ac-HT40
5270MHz	
5310MHz	

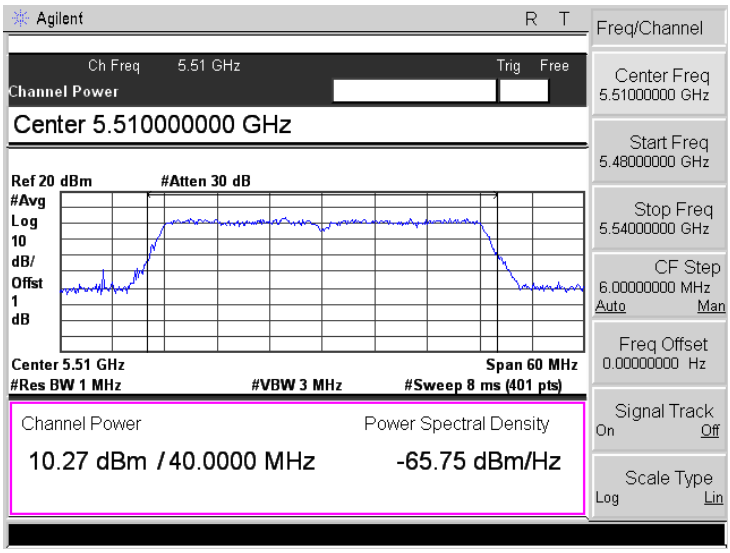
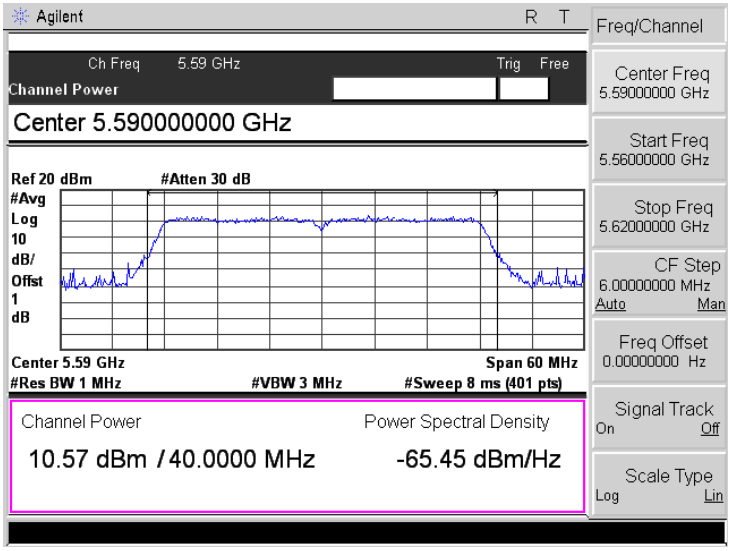
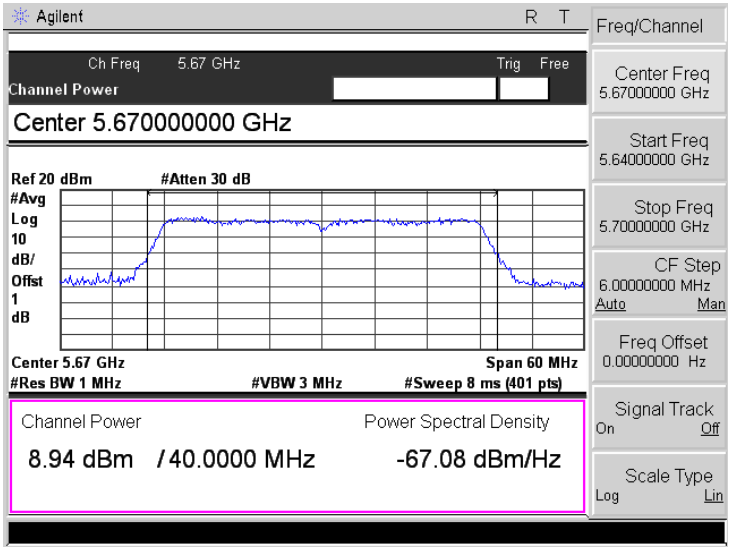
Mode:	802.11ac-HT80
5290MHz	

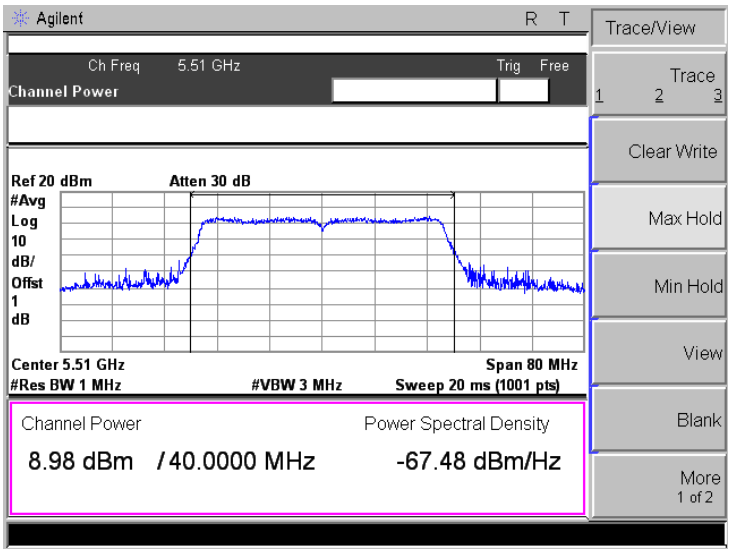
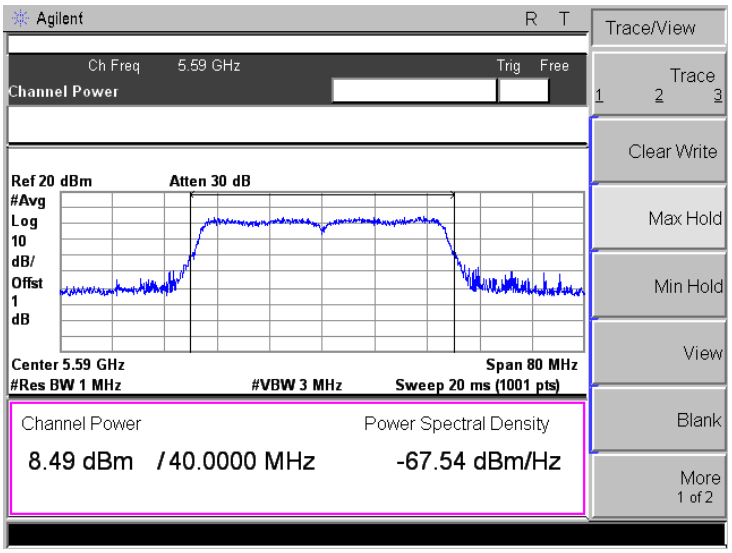
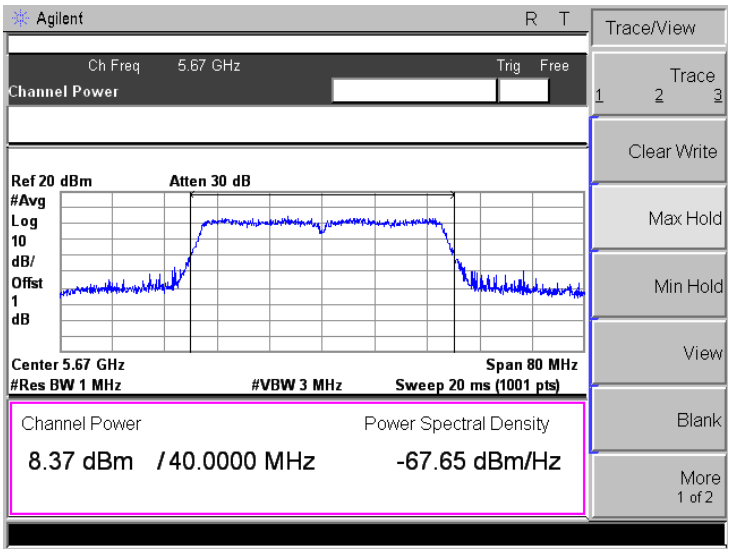
➢ 5470-5725MHz (Antenna B)

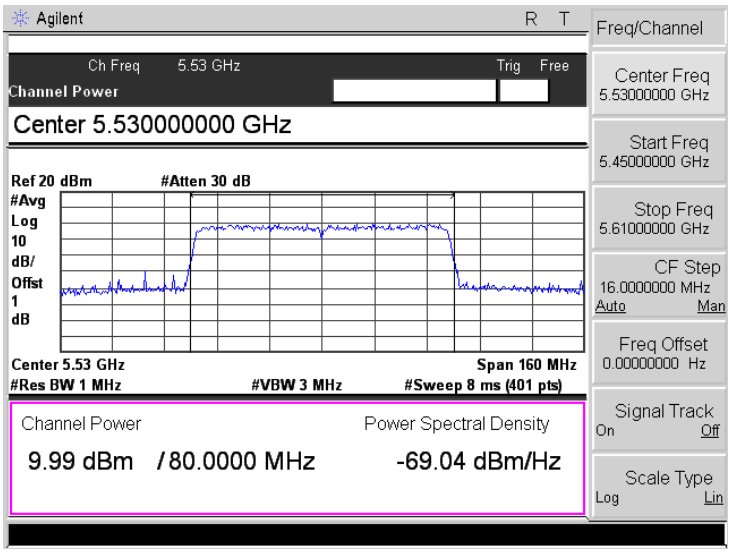
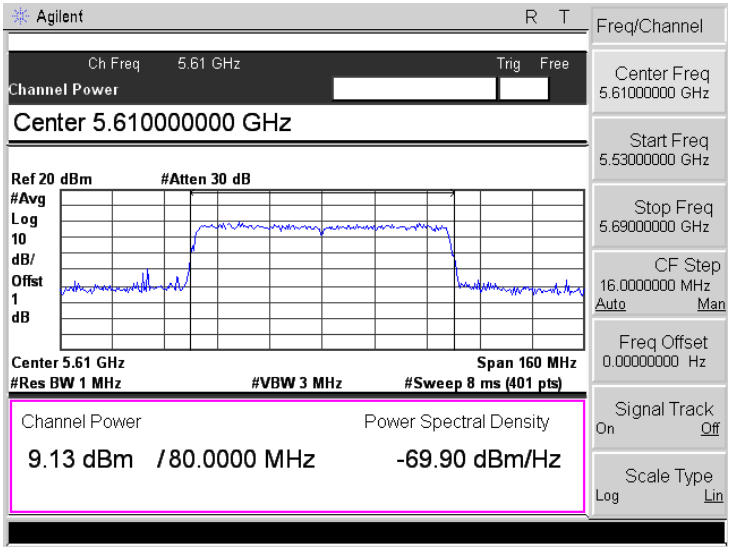
Mode:	**802.11a**
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT20
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11ac-HT20
5500MHz	
5600MHz	
5700MHz	

Mode:	802.11n-HT40
5510MHz	
5590MHz	
5670MHz	

Mode:	802.11ac-HT40
5510MHz	
5590MHz	
5670MHz	

Mode:	802.11ac-HT80
5530MHz	
5610MHz	

9. Radiated Spurious Emissions

9.1 Standard Applicable

According to §15.407(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:

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

According to §15.407(b)(6), Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

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

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If radiated measurements are performed, field strength is then converted to EIRP as follows:

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

where:

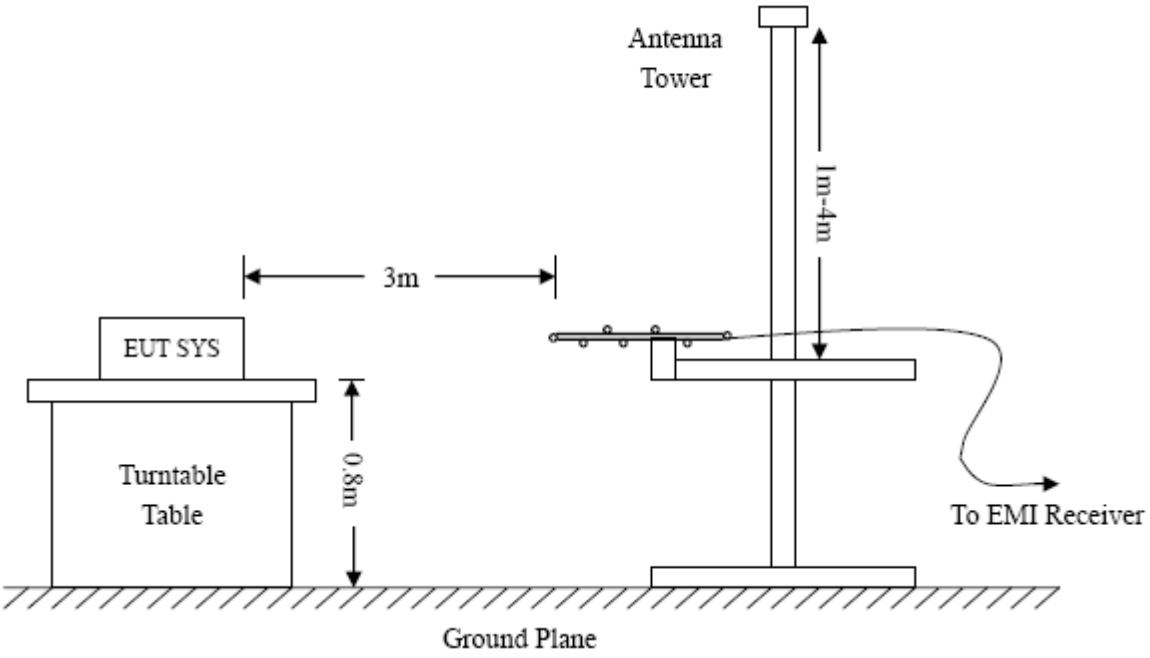
- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

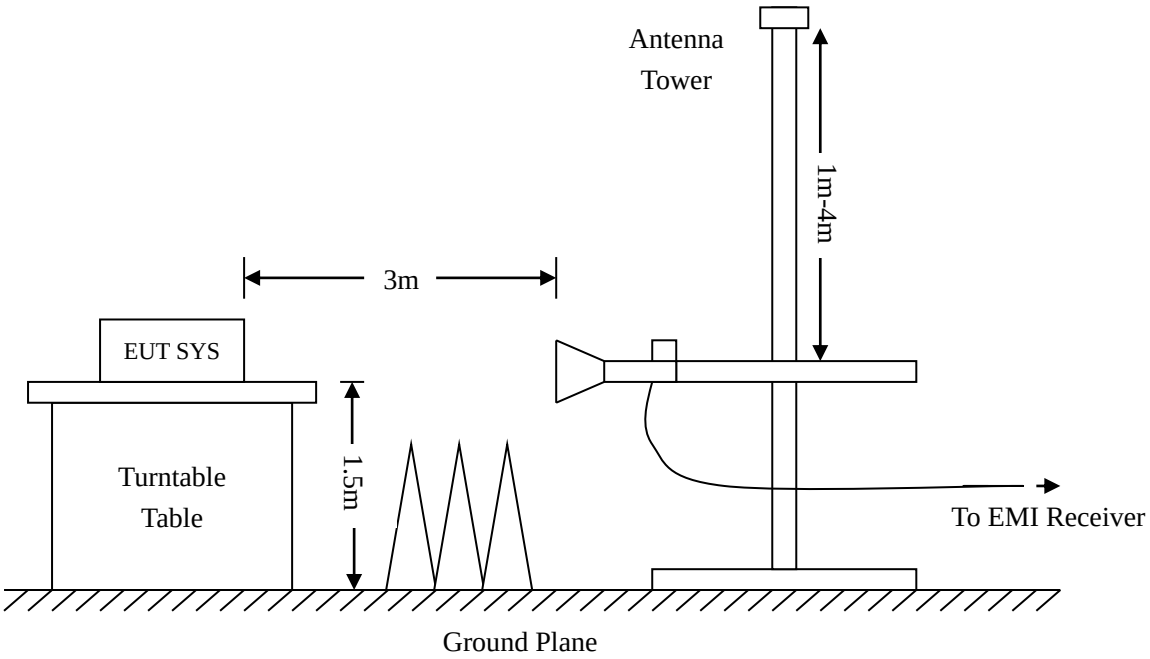
9.2 Test Procedure

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.


Antenna
Tower
1m-4m
3m
EUT SYS
Turntable
Table
0.8m
To EMI Receiver
Ground Plane


Antenna
Tower
1m-4m
3m
EUT SYS
Turntable
Table
1.5m
To EMI Receiver
Ground Plane

9.3 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

9.4 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:

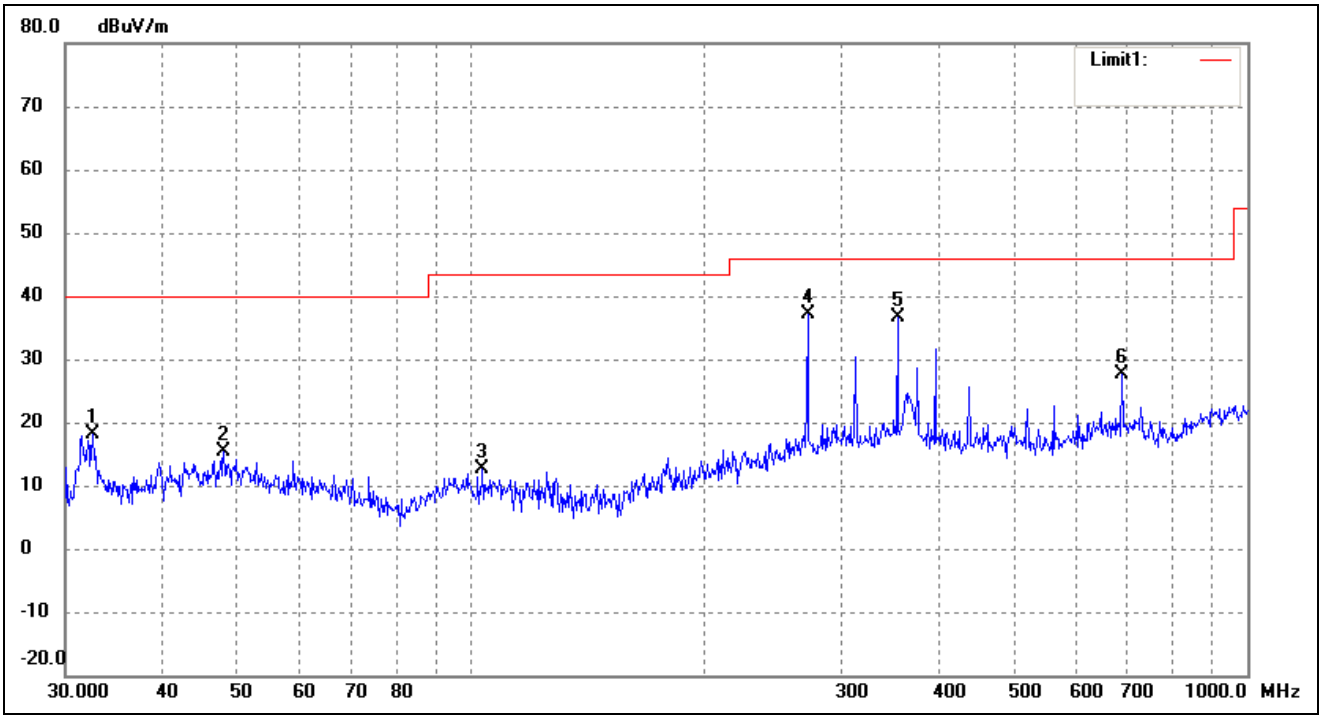
Margin = Corr. Ampl. – FCC Part 15 Limit

9.5 Summary of Test Results/Plots

Note: 1. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.
2. Pre-scan all the test mode and channel, only show the worst case in the test report.

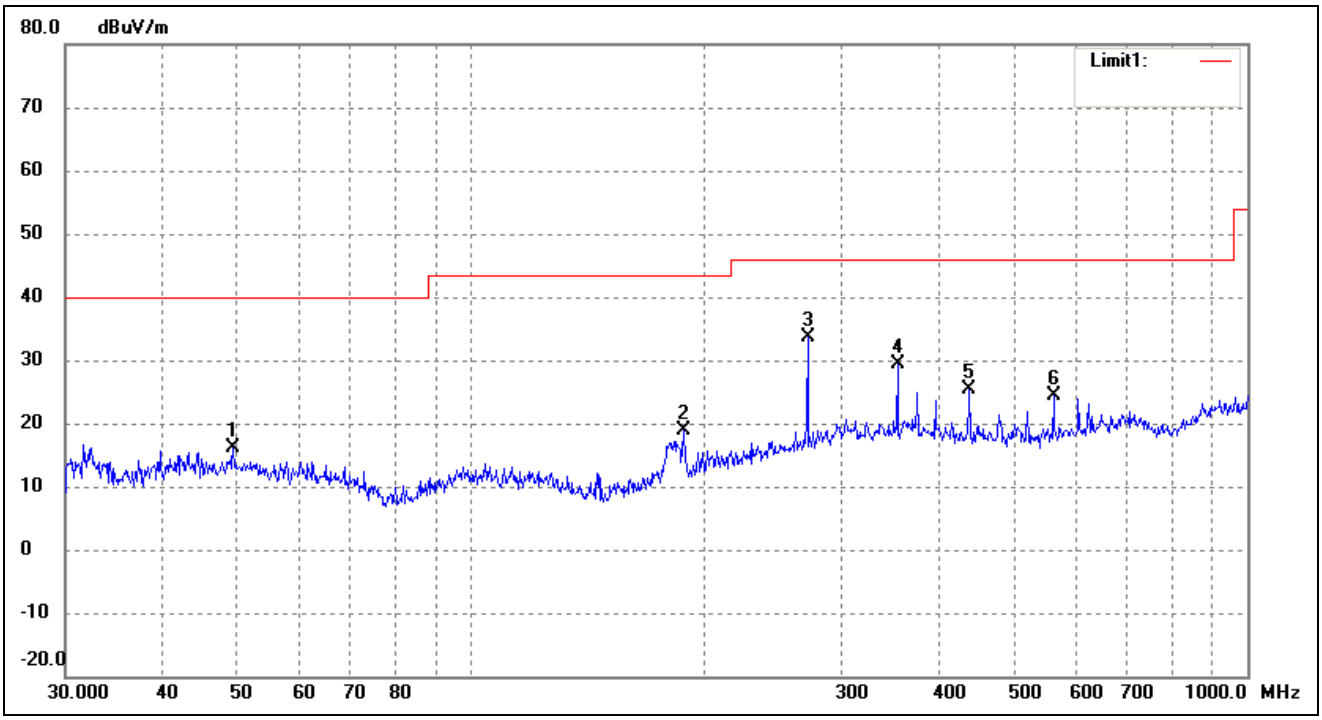
- Spurious Emission From 30 MHz to 1 GHz
- Antenna A (worst case)
- 5250-5350MHz

802.11a(worst case)			
Test Channel	5260	Polarity:	Horizontal



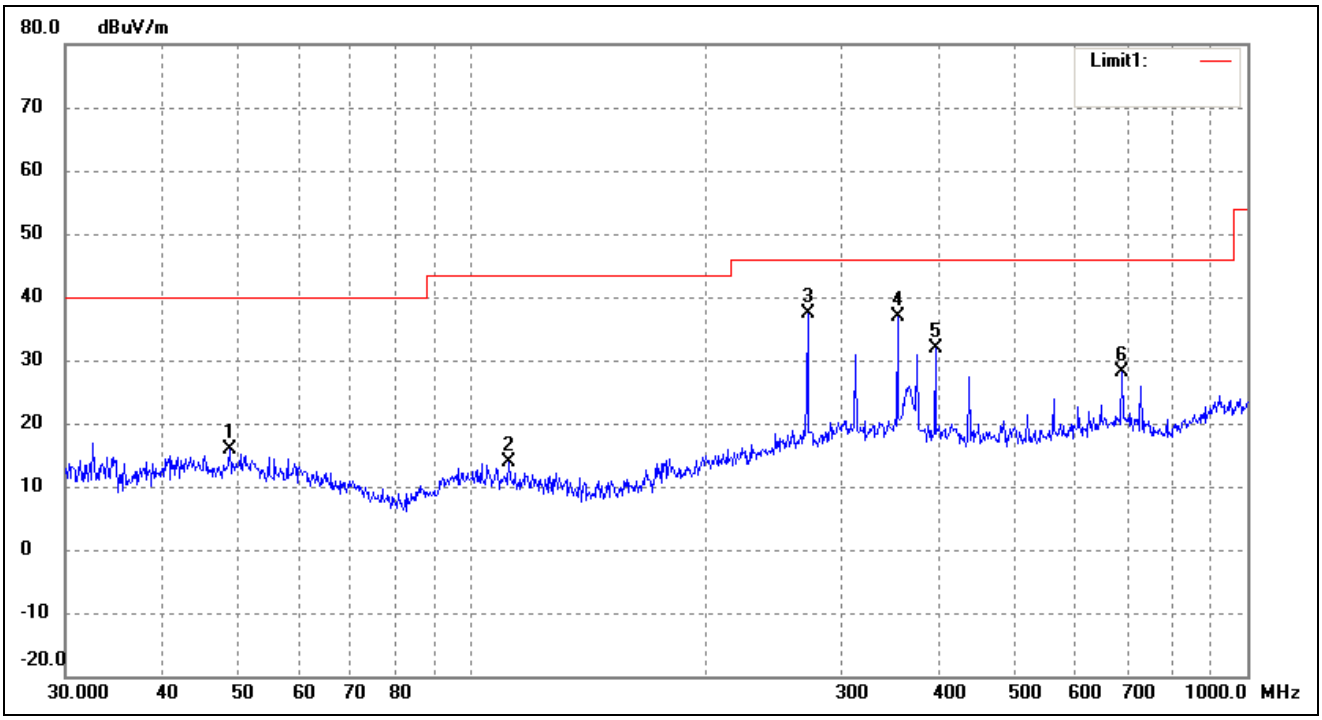
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	32.5198	34.33	-16.24	18.09	40.00	-21.91	127	100	peak
2	47.9940	29.12	-13.75	15.37	40.00	-24.63	269	100	peak
3	103.4421	27.61	-14.86	12.75	43.50	-30.75	91	100	peak
4	271.3246	47.08	-10.07	37.01	46.00	-8.99	250	100	peak
5	354.1831	44.37	-7.65	36.72	46.00	-9.28	165	100	peak
6	689.5644	33.06	-5.32	27.74	46.00	-18.26	320	100	peak

802.11a(worst case)			
Test Channel	5260	Polarity:	Vertical



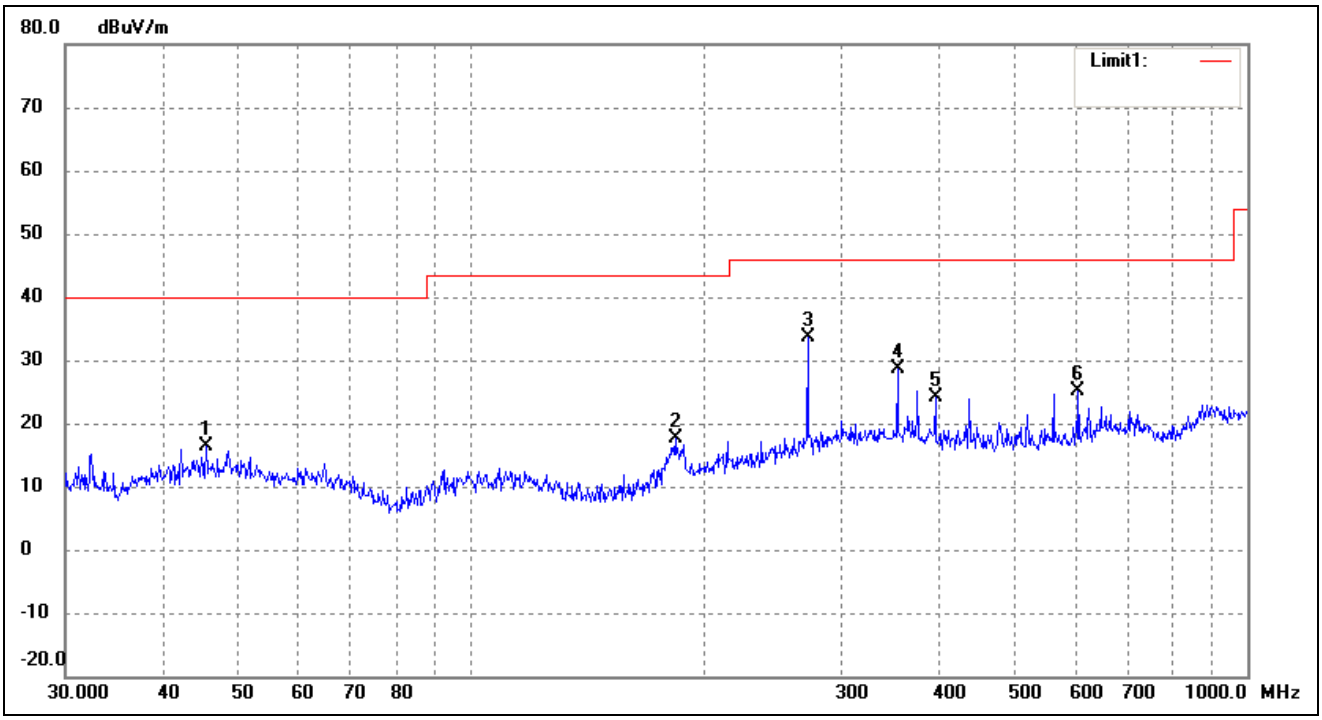
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	49.3594	29.72	-13.67	16.05	40.00	-23.95	80	100	peak
2	187.7530	32.72	-13.80	18.92	43.50	-24.58	184	100	peak
3	271.3246	43.72	-10.07	33.65	46.00	-12.35	113	100	peak
4	354.1831	36.92	-7.65	29.27	46.00	-16.73	138	100	peak
5	438.6554	33.38	-8.09	25.29	46.00	-20.71	107	100	peak
6	562.6624	31.36	-6.92	24.44	46.00	-21.56	100	100	peak

802.11a(worst case)			
Test Channel	5280	Polarity:	Horizontal



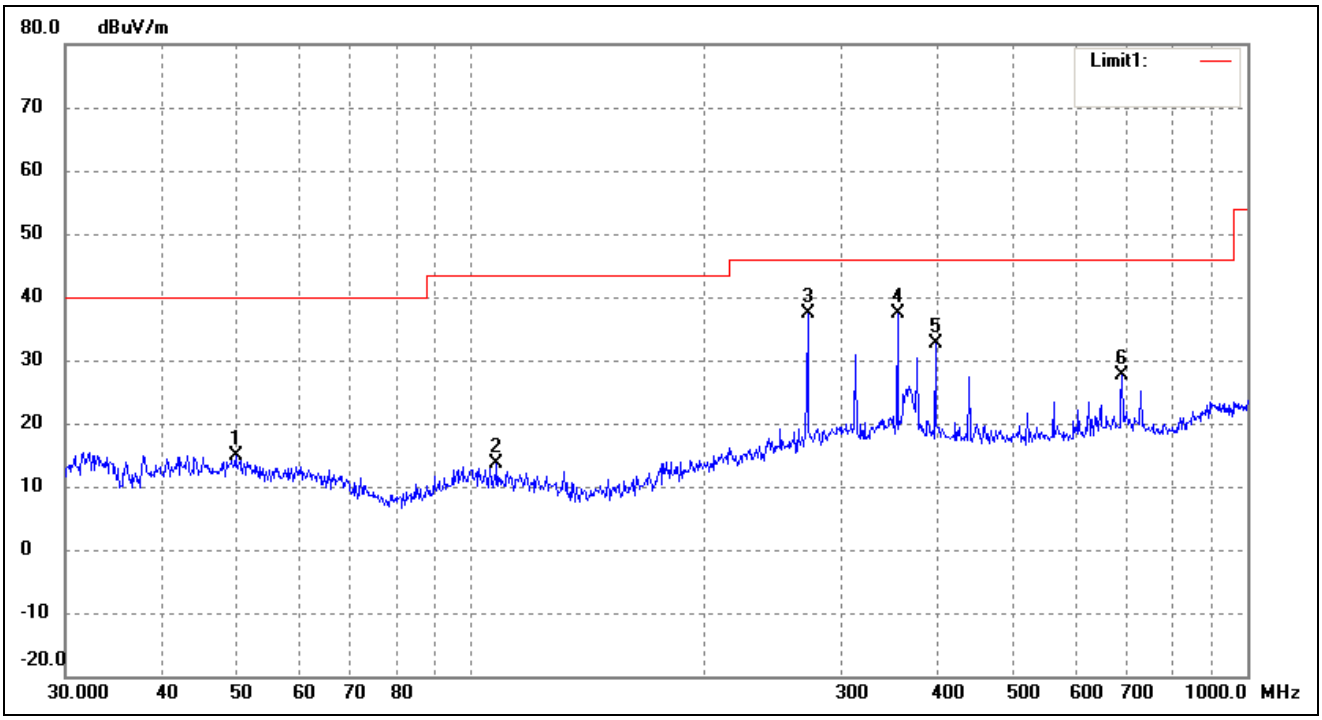
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	48.8429	29.70	-13.71	15.99	40.00	-24.01	51	100	peak
2	111.7380	28.70	-14.93	13.77	43.50	-29.73	139	100	peak
3	271.3246	47.49	-10.07	37.42	46.00	-8.58	64	100	peak
4	354.1831	44.58	-7.65	36.93	46.00	-9.07	139	100	peak
5	396.2415	39.64	-7.88	31.76	46.00	-14.24	200	100	peak
6	689.5644	33.57	-5.32	28.25	46.00	-17.75	225	100	peak

802.11a(worst case)			
Test Channel	5280	Polarity:	Vertical



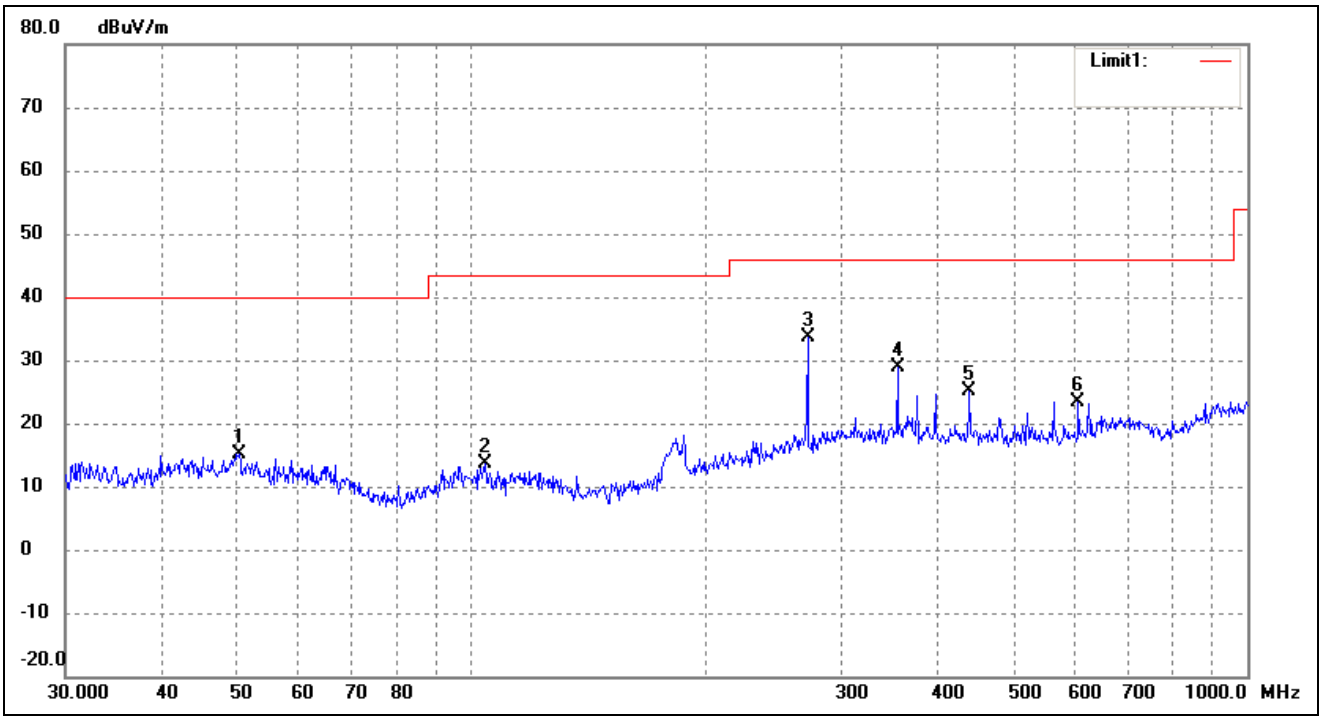
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	45.5348	30.16	-13.90	16.26	40.00	-23.74	342	100	peak
2	183.2005	32.04	-14.41	17.63	43.50	-25.87	157	100	peak
3	271.3246	43.74	-10.07	33.67	46.00	-12.33	71	100	peak
4	354.1831	36.20	-7.65	28.55	46.00	-17.45	280	100	peak
5	396.2415	32.07	-7.88	24.19	46.00	-21.81	64	100	peak
6	605.6592	30.88	-5.64	25.24	46.00	-20.76	100	100	peak

802.11a(worst case)			
Test Channel	5320	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	49.7068	28.53	-13.65	14.88	40.00	-25.12	228	100	peak
2	107.8877	28.33	-14.80	13.53	43.50	-29.97	95	100	peak
3	271.3246	47.40	-10.07	37.33	46.00	-8.67	357	100	peak
4	354.1831	45.10	-7.65	37.45	46.00	-8.55	93	100	peak
5	396.2415	40.39	-7.88	32.51	46.00	-13.49	104	100	peak
6	689.5644	32.87	-5.32	27.55	46.00	-18.45	306	100	peak

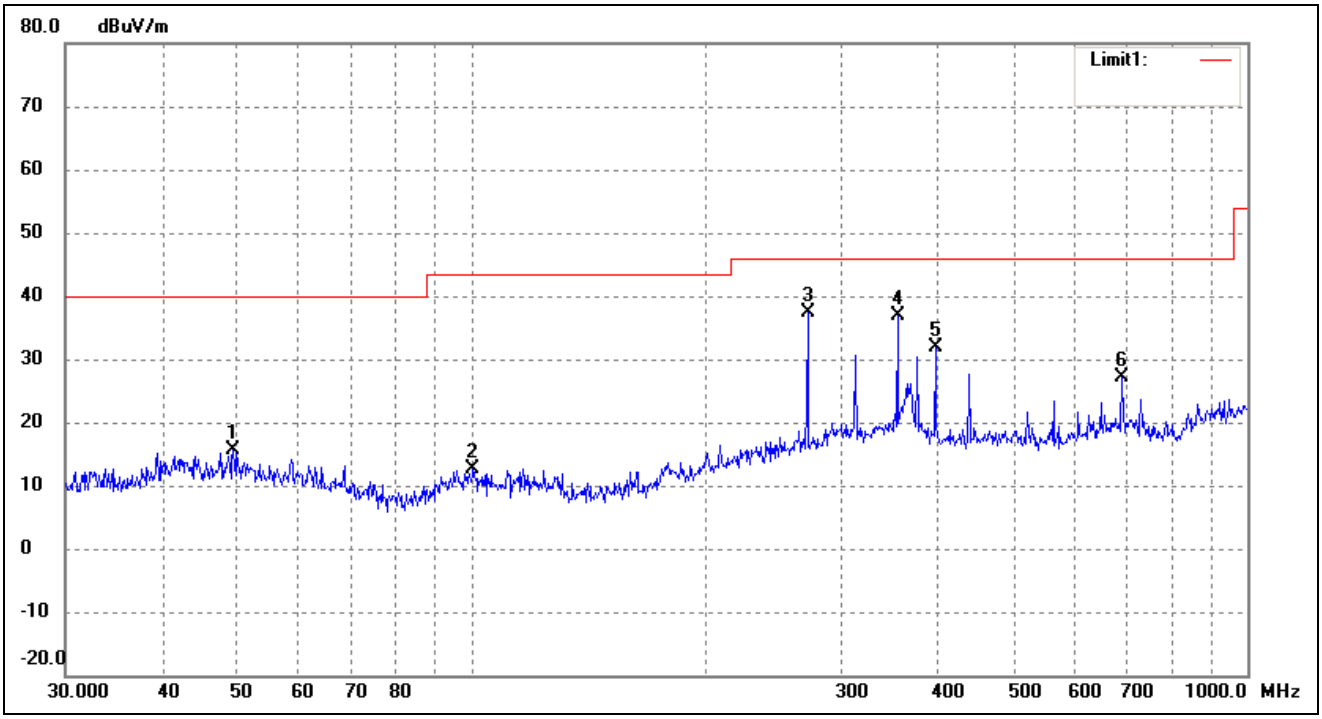
802.11a(worst case)			
Test Channel	5320	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	50.2325	28.91	-13.70	15.21	40.00	-24.79	55	100	peak
2	104.1701	28.55	-14.86	13.69	43.50	-29.81	163	100	peak
3	271.3246	43.65	-10.07	33.58	46.00	-12.42	97	100	peak
4	354.1831	36.59	-7.65	28.94	46.00	-17.06	120	100	peak
5	438.6554	33.28	-8.09	25.19	46.00	-20.81	350	100	peak
6	605.6592	29.14	-5.64	23.50	46.00	-22.50	135	100	peak

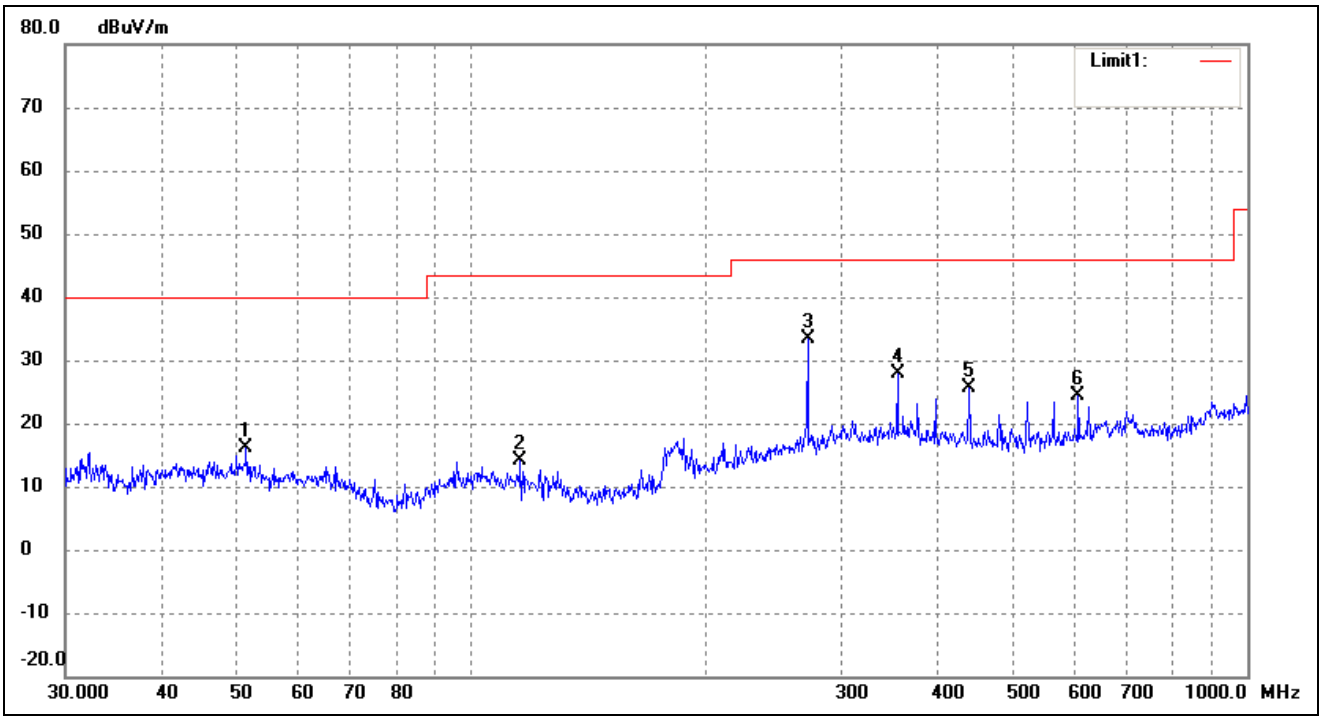
➢ 5470-5725MHz

802.11a(worst case)			
Test Channel	5500	Polarity:	Horizontal



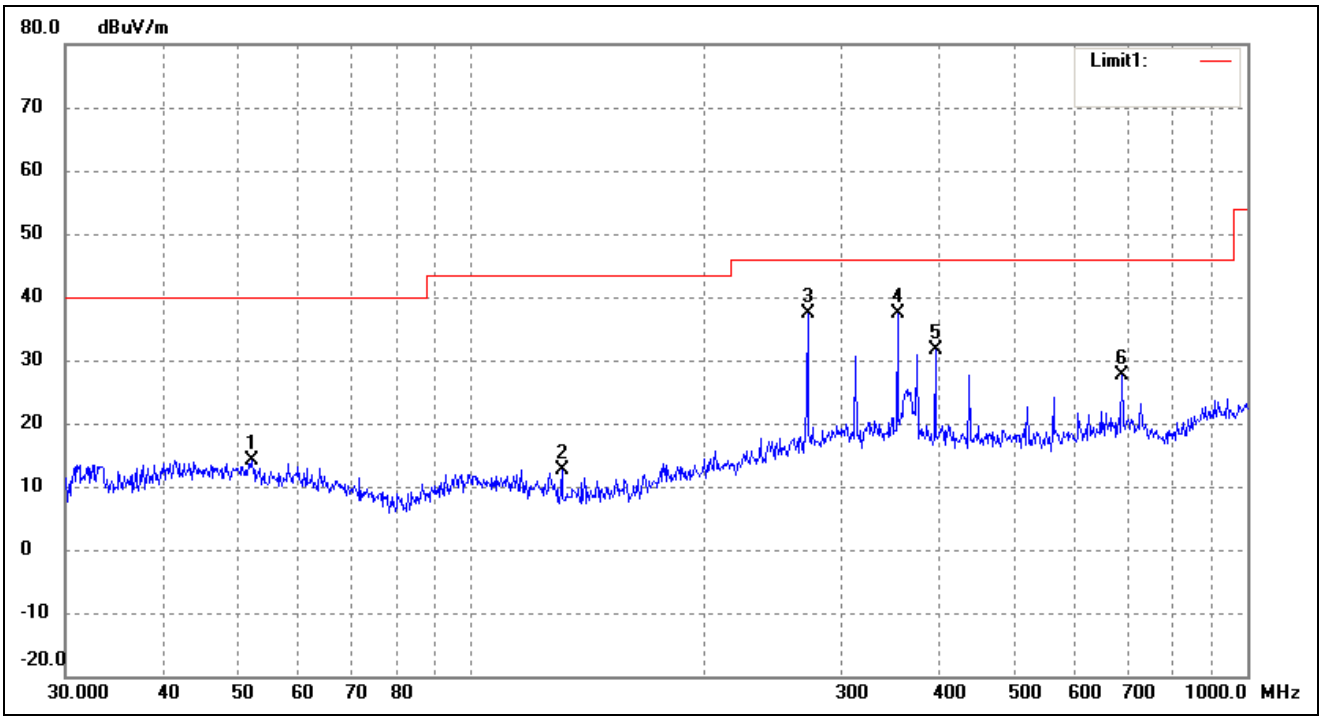
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	49.3594	29.25	-13.67	15.58	40.00	-24.42	72	100	peak
2	100.5806	27.44	-14.92	12.52	43.50	-30.98	165	100	peak
3	271.3246	47.38	-10.07	37.31	46.00	-8.69	78	100	peak
4	354.1831	44.51	-7.65	36.86	46.00	-9.14	119	100	peak
5	396.2415	39.85	-7.88	31.97	46.00	-14.03	103	100	peak
6	689.5644	32.54	-5.32	27.22	46.00	-18.78	257	100	peak

802.11a(worst case)			
Test Channel	5500	Polarity:	Vertical



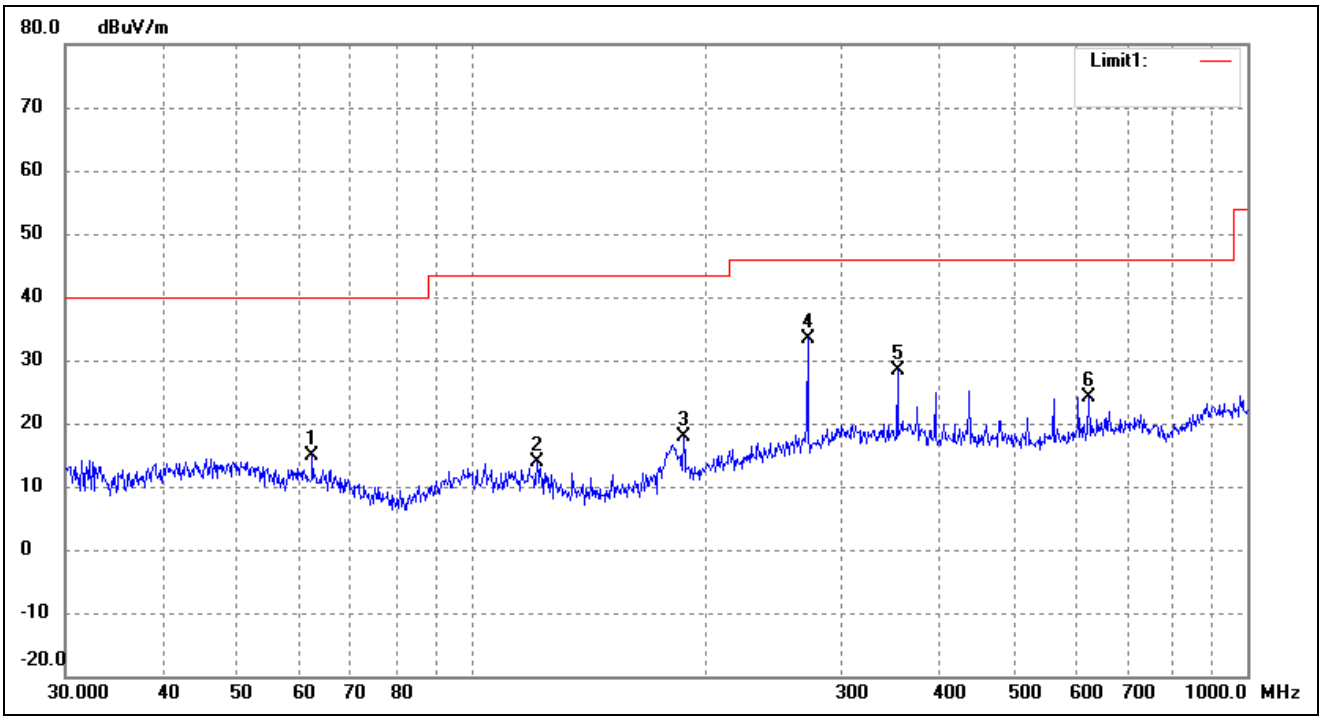
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	51.3005	30.22	-14.00	16.22	40.00	-23.78	109	100	peak
2	115.7256	29.37	-15.27	14.10	43.50	-29.40	293	100	peak
3	271.3246	43.54	-10.07	33.47	46.00	-12.53	57	100	peak
4	354.1831	35.62	-7.65	27.97	46.00	-18.03	318	100	peak
5	438.6554	33.72	-8.09	25.63	46.00	-20.37	95	100	peak
6	605.6592	30.09	-5.64	24.45	46.00	-21.55	217	100	peak

802.11a(worst case)			
Test Channel	5600	Polarity:	Horizontal



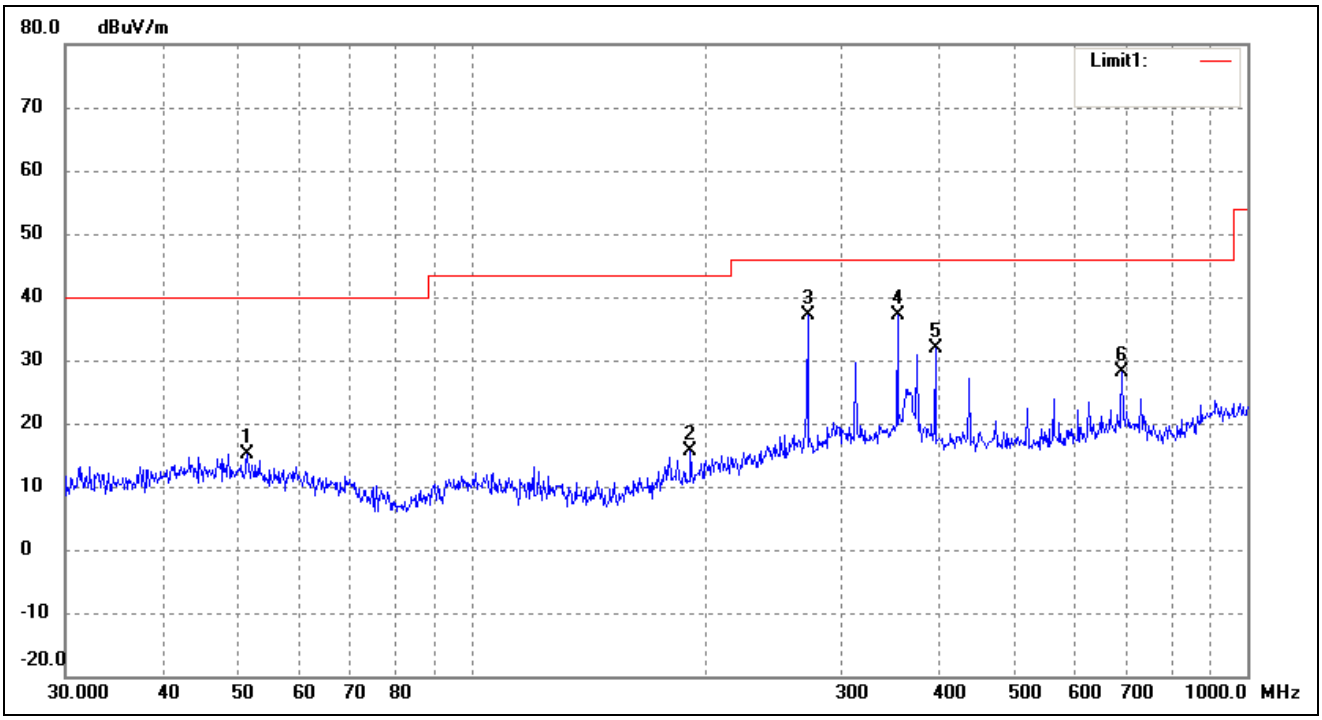
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	52.2079	28.48	-14.27	14.21	40.00	-25.79	221	100	peak
2	130.8369	30.67	-18.09	12.58	43.50	-30.92	95	100	peak
3	271.3246	47.41	-10.07	37.34	46.00	-8.66	50	100	peak
4	354.1831	45.02	-7.65	37.37	46.00	-8.63	106	100	peak
5	396.2415	39.54	-7.88	31.66	46.00	-14.34	60	100	peak
6	689.5644	32.96	-5.32	27.64	46.00	-18.36	155	100	peak

802.11a(worst case)			
Test Channel	5600	Polarity:	Vertical



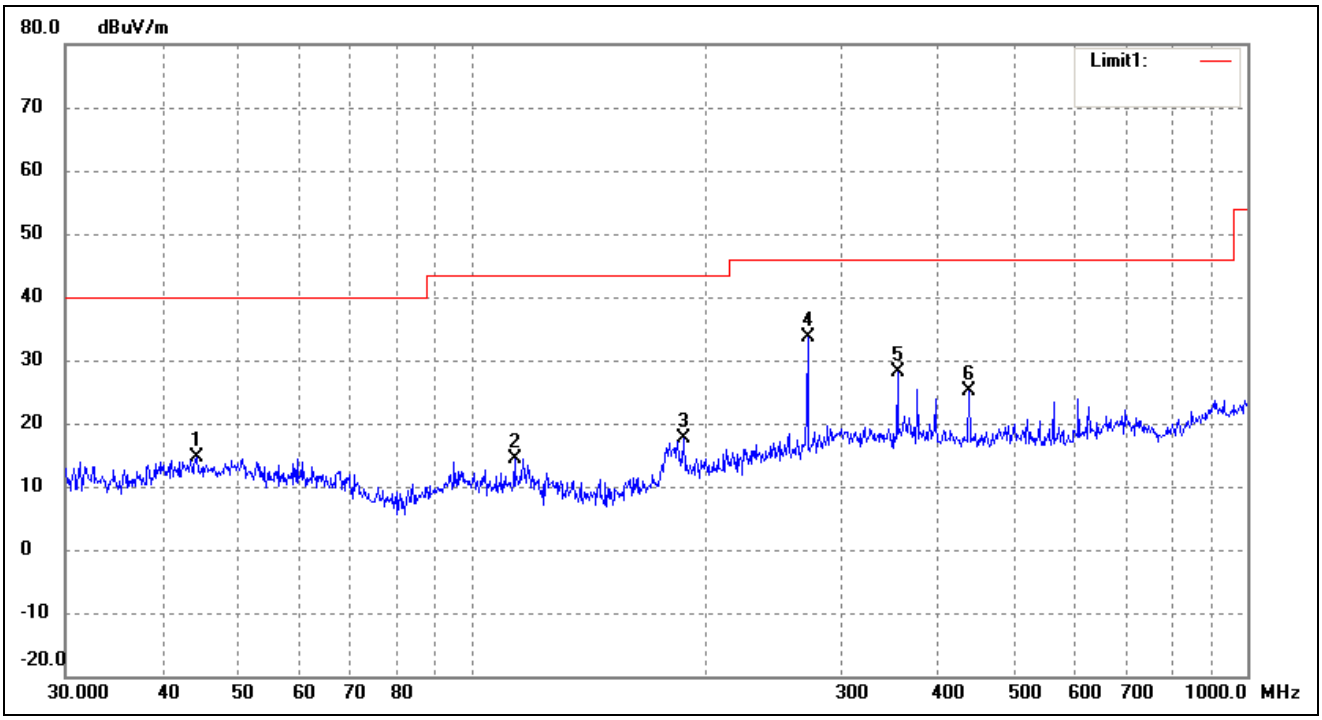
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	62.4314	30.47	-15.63	14.84	40.00	-25.16	108	100	peak
2	121.5486	29.78	-16.02	13.76	43.50	-29.74	170	100	peak
3	187.7530	31.76	-13.80	17.96	43.50	-25.54	120	100	peak
4	271.3246	43.45	-10.07	33.38	46.00	-12.62	90	100	peak
5	354.1831	35.96	-7.65	28.31	46.00	-17.69	142	100	peak
6	625.0780	30.01	-5.76	24.25	46.00	-21.75	199	100	peak

802.11a(worst case)			
Test Channel	5700	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	51.4807	29.30	-14.06	15.24	40.00	-24.76	213	100	peak
2	191.7450	29.08	-13.36	15.72	43.50	-27.78	98	100	peak
3	271.3246	47.14	-10.07	37.07	46.00	-8.93	128	100	peak
4	354.1831	44.72	-7.65	37.07	46.00	-8.93	92	100	peak
5	396.2415	39.77	-7.88	31.89	46.00	-14.11	74	100	peak
6	689.5644	33.42	-5.32	28.10	46.00	-17.90	326	100	peak

802.11a(worst case)			
Test Channel	5700	Polarity:	Vertical

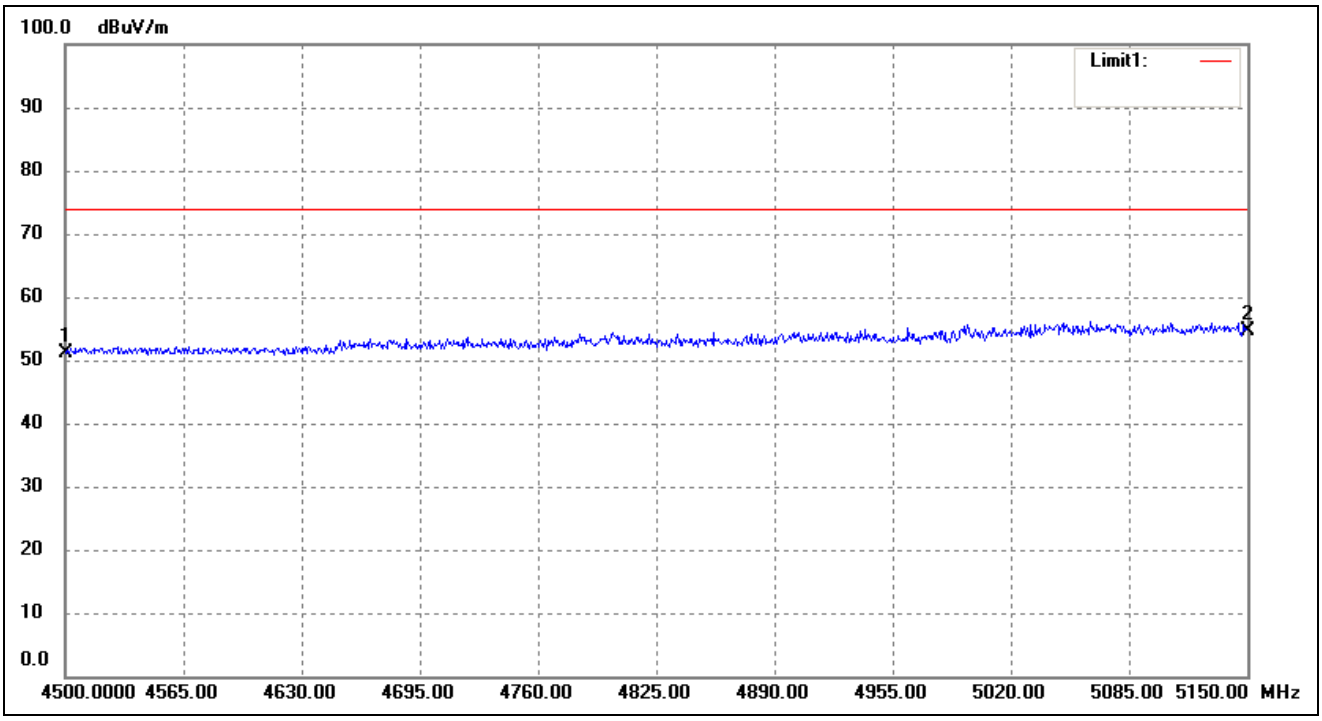


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	44.2752	28.51	-13.97	14.54	40.00	-25.46	252	100	peak
2	113.7143	29.44	-15.10	14.34	43.50	-29.16	310	100	peak
3	187.7530	31.42	-13.80	17.62	43.50	-25.88	58	100	peak
4	271.3246	43.58	-10.07	33.51	46.00	-12.49	318	100	peak
5	354.1831	35.66	-7.65	28.01	46.00	-17.99	93	100	peak
6	438.6554	33.17	-8.09	25.08	46.00	-20.92	126	100	peak

- Spurious Emission above 1GHz
- Antenna A

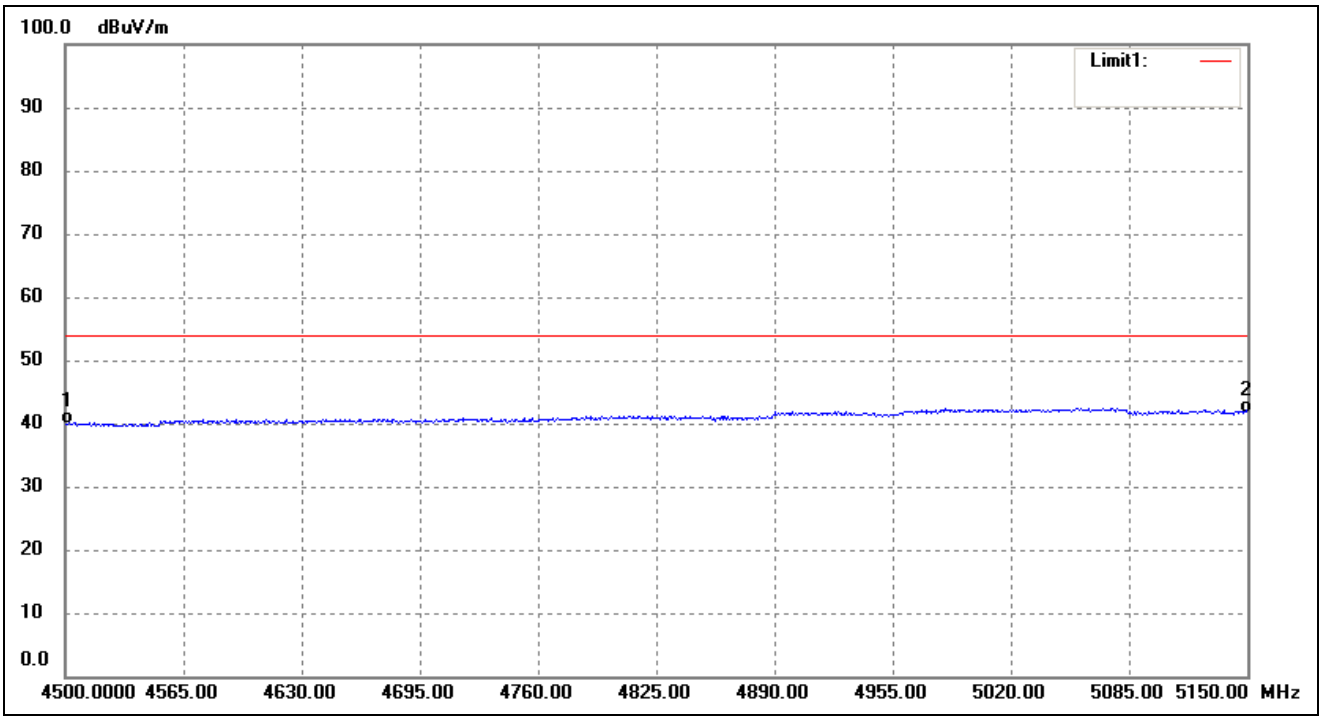
BAND 2

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.5-5.15GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	51.89	-0.65	51.24	74.00	-22.76	303	100	peak
2	5150.000	54.01	0.69	54.70	74.00	-19.30	91	100	peak

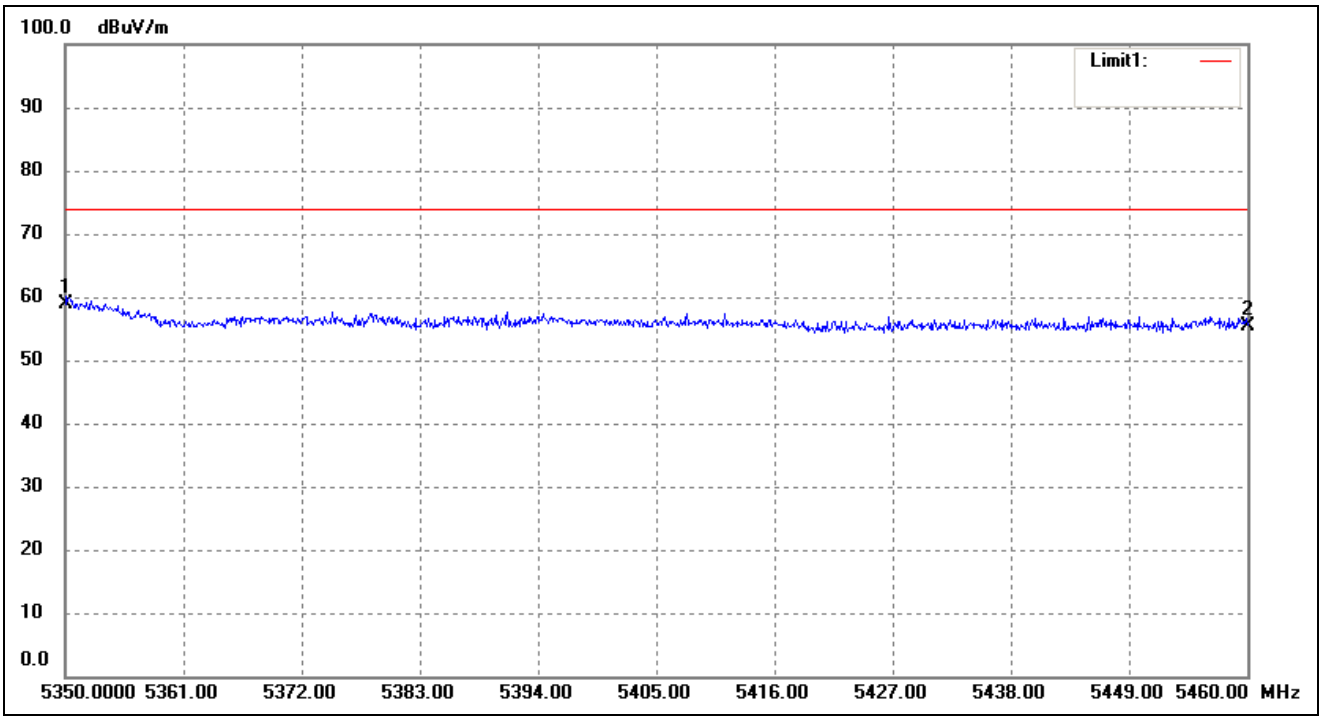
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.5-5.15GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	40.63	-0.65	39.98	54.00	-14.02	69	100	AVG
2	5150.000	41.01	0.69	41.70	54.00	-12.30	326	100	AVG

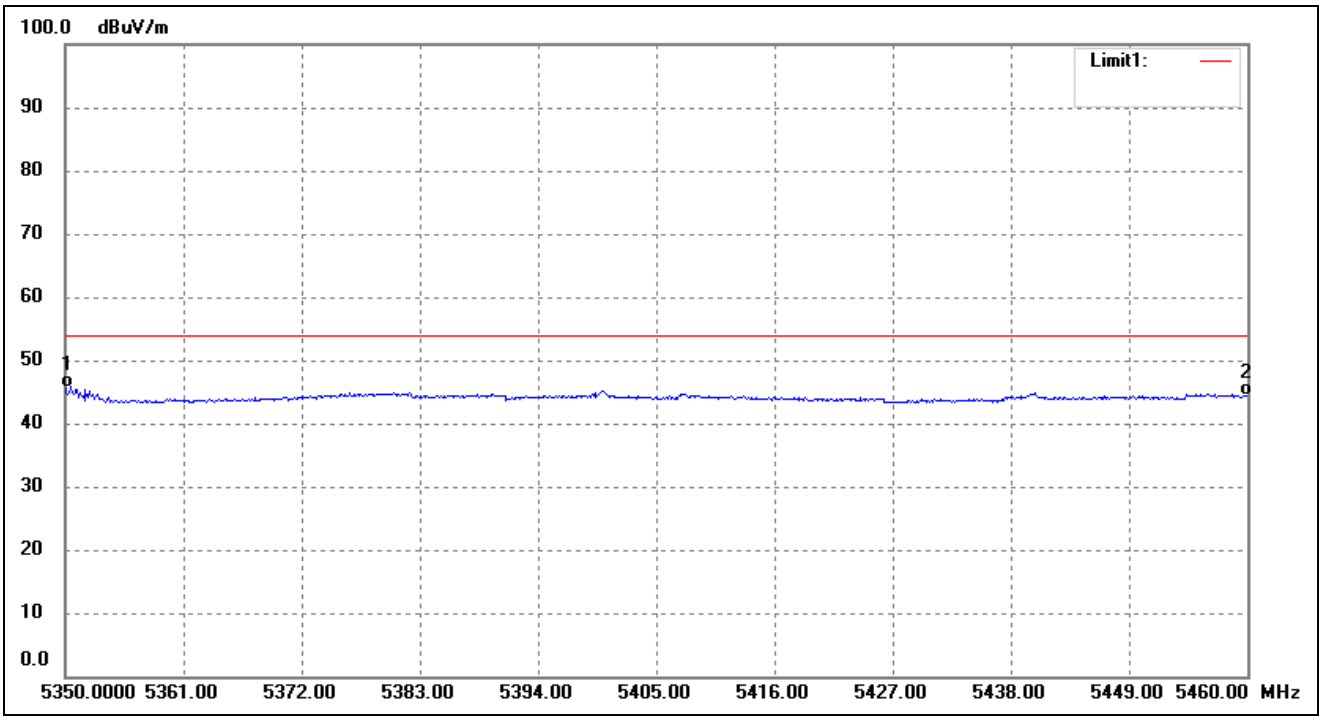
BAND 2

802.11a- Restricted Bandedge(worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	57.78	1.19	58.97	74.00	-15.03	91	100	peak
2	5460.000	53.98	1.47	55.45	74.00	-18.55	170	100	peak

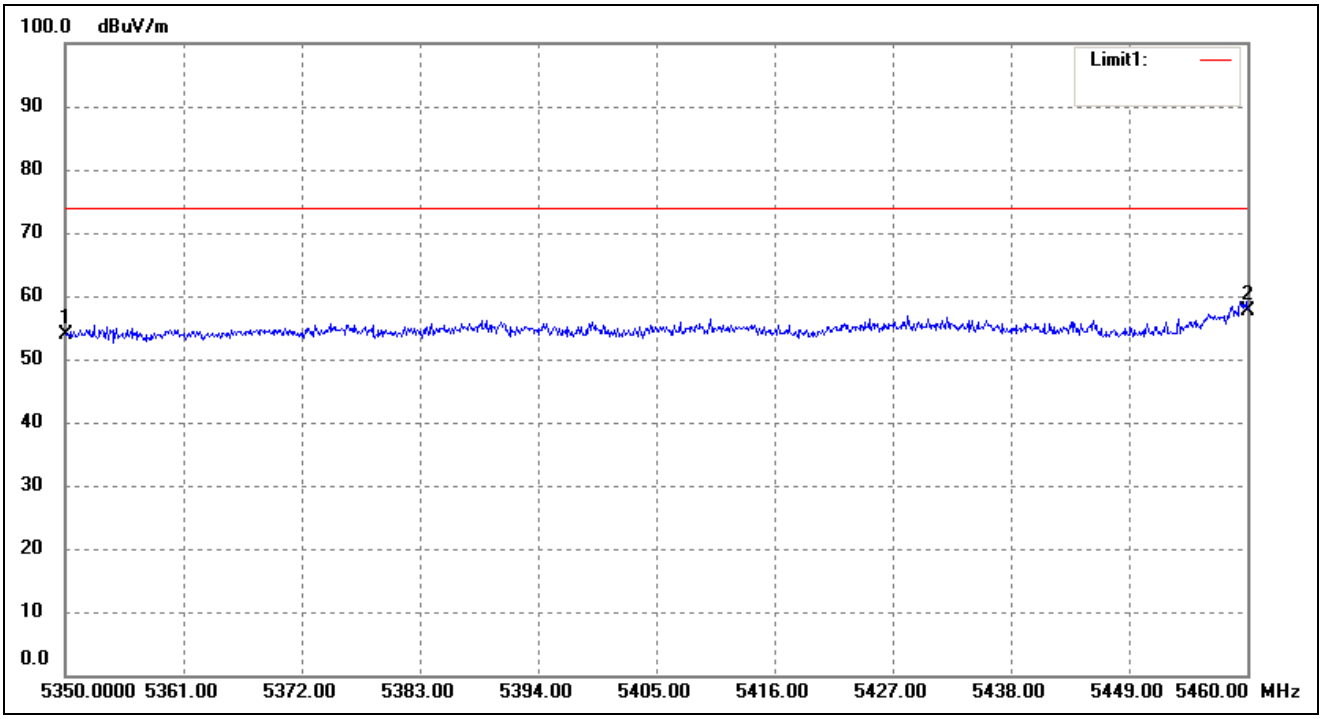
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	44.34	1.19	45.53	54.00	-8.47	329	100	AVG
2	5460.000	42.90	1.47	44.37	54.00	-9.63	82	100	AVG

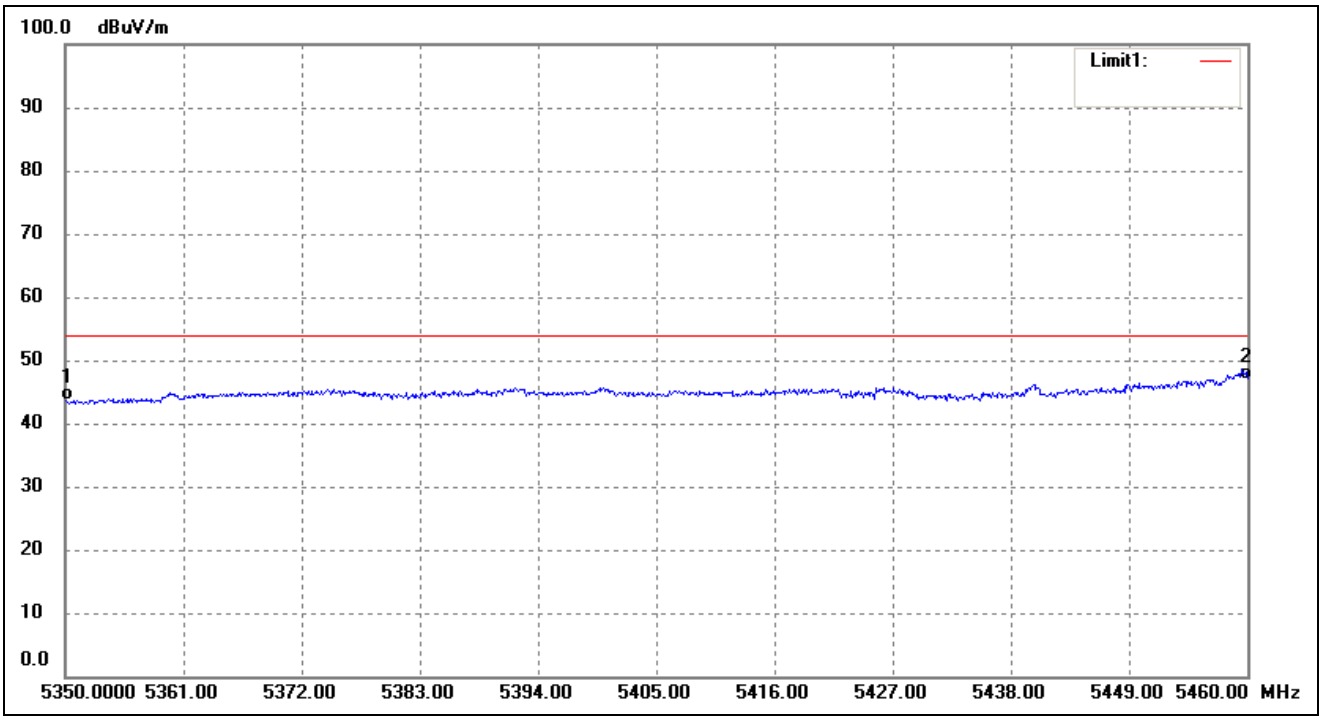
BAND 3

802.11a- Restricted Bandedge(worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	52.62	1.19	53.81	74.00	-20.19	173	100	peak
2	5460.000	56.05	1.47	57.52	74.00	-16.48	123	100	peak

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)

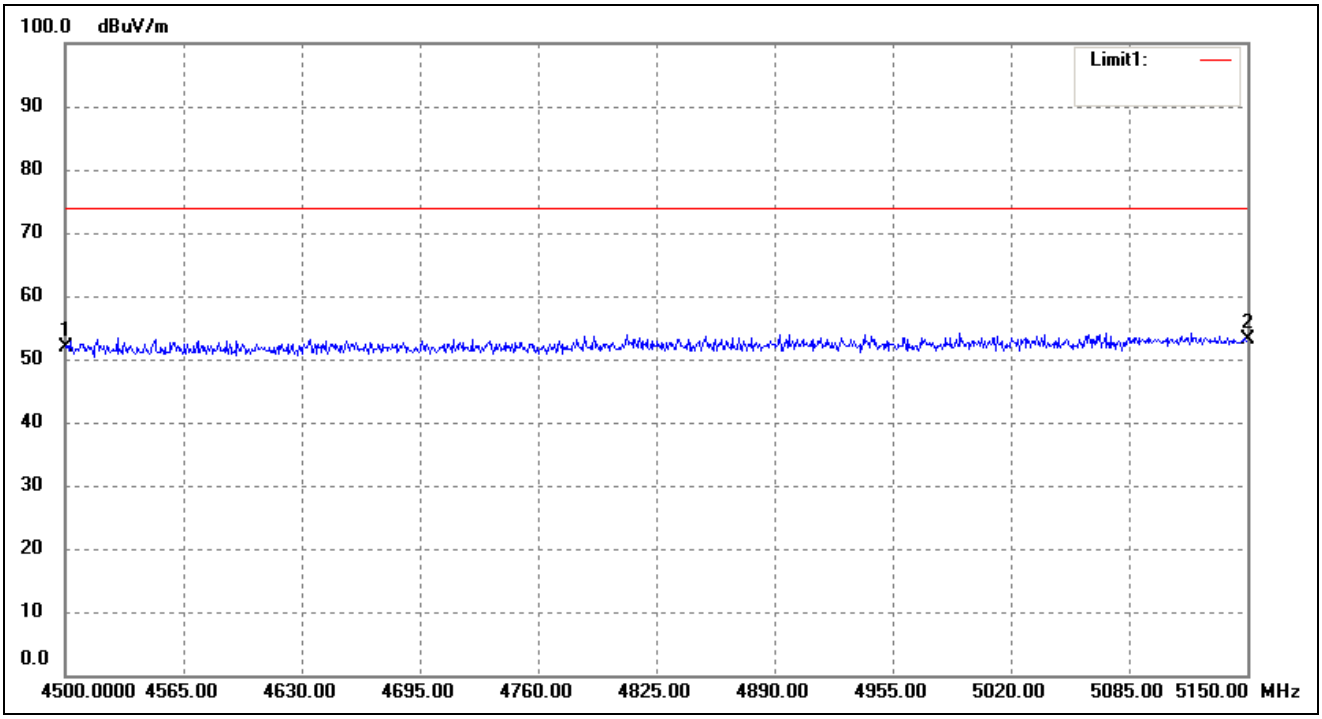


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	42.44	1.19	43.63	54.00	-10.37	192	100	AVG
2	5460.000	45.36	1.47	46.83	54.00	-7.17	116	100	AVG

➢ Antenna B

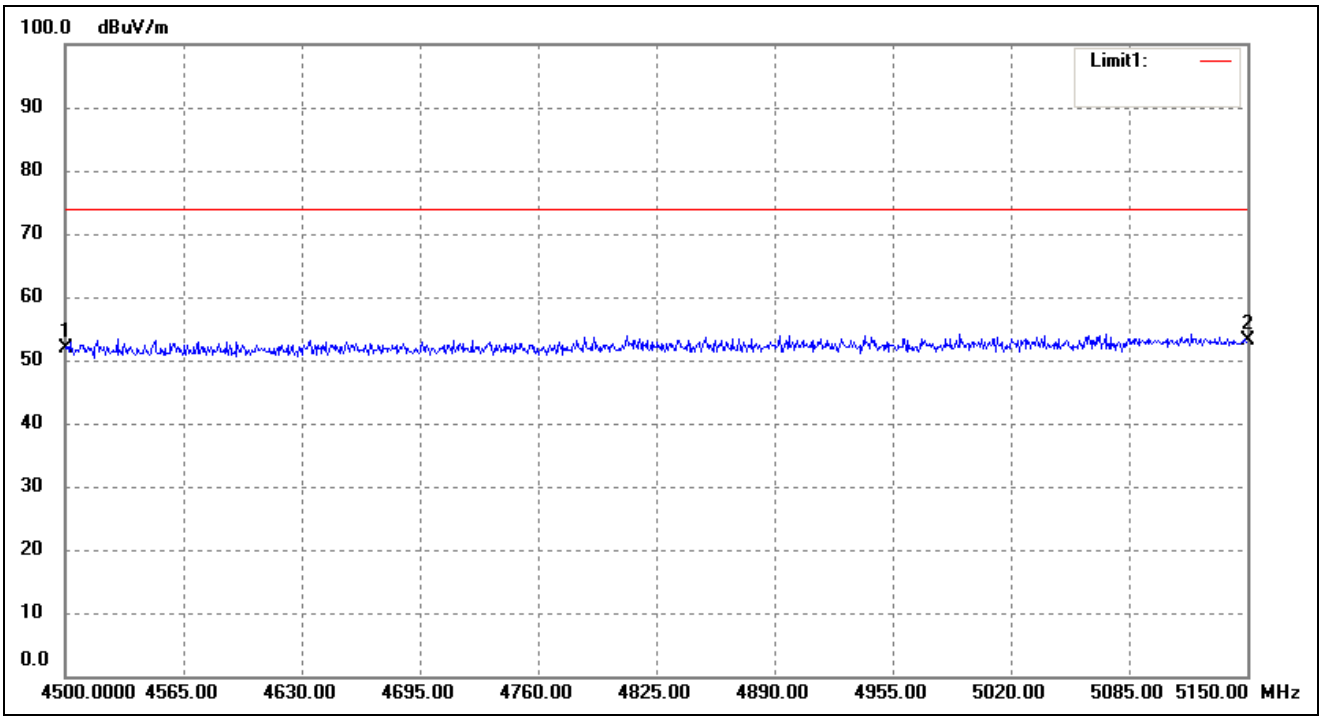
BAND 2

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.5-5.15GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	52.51	-0.65	51.86	74.00	-22.14	169	100	peak
2	5150.000	52.40	0.69	53.09	74.00	-20.91	76	100	peak

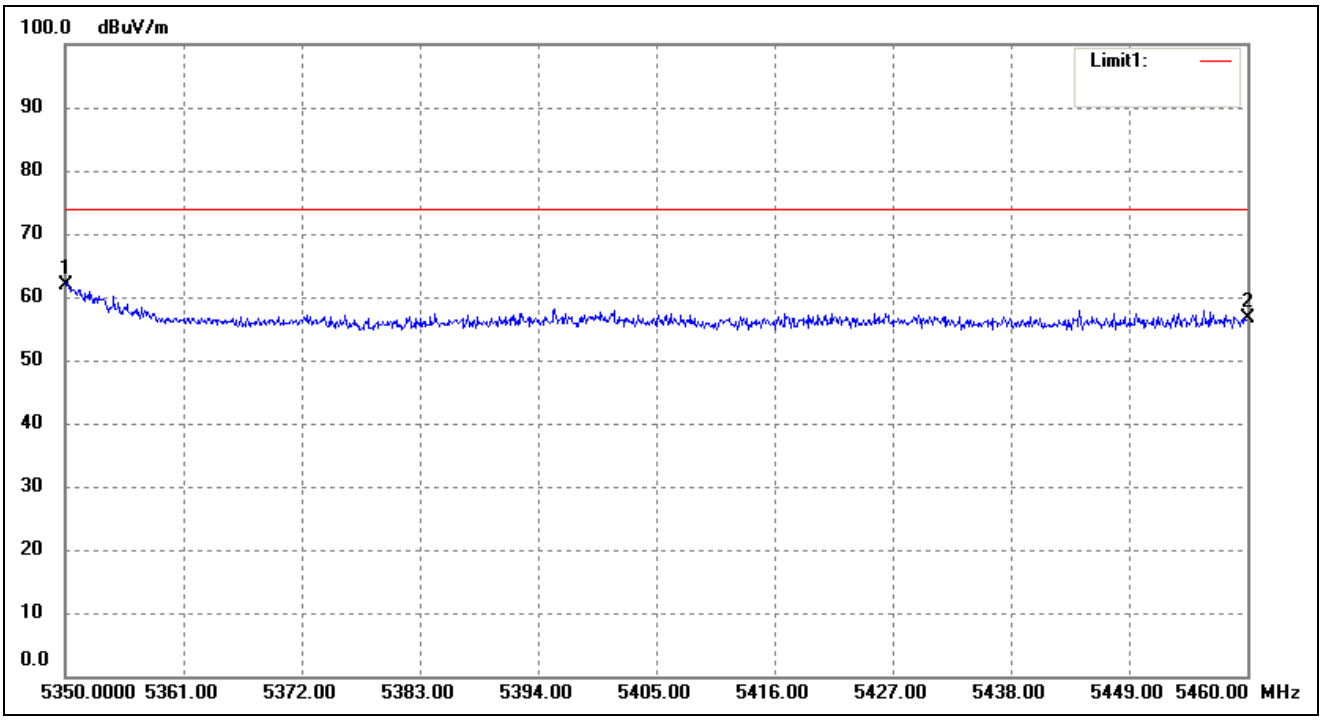
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.5-5.15GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	52.51	-0.65	51.86	74.00	-22.14	100	100	peak
2	5150.000	52.40	0.69	53.09	74.00	-20.91	91	100	peak

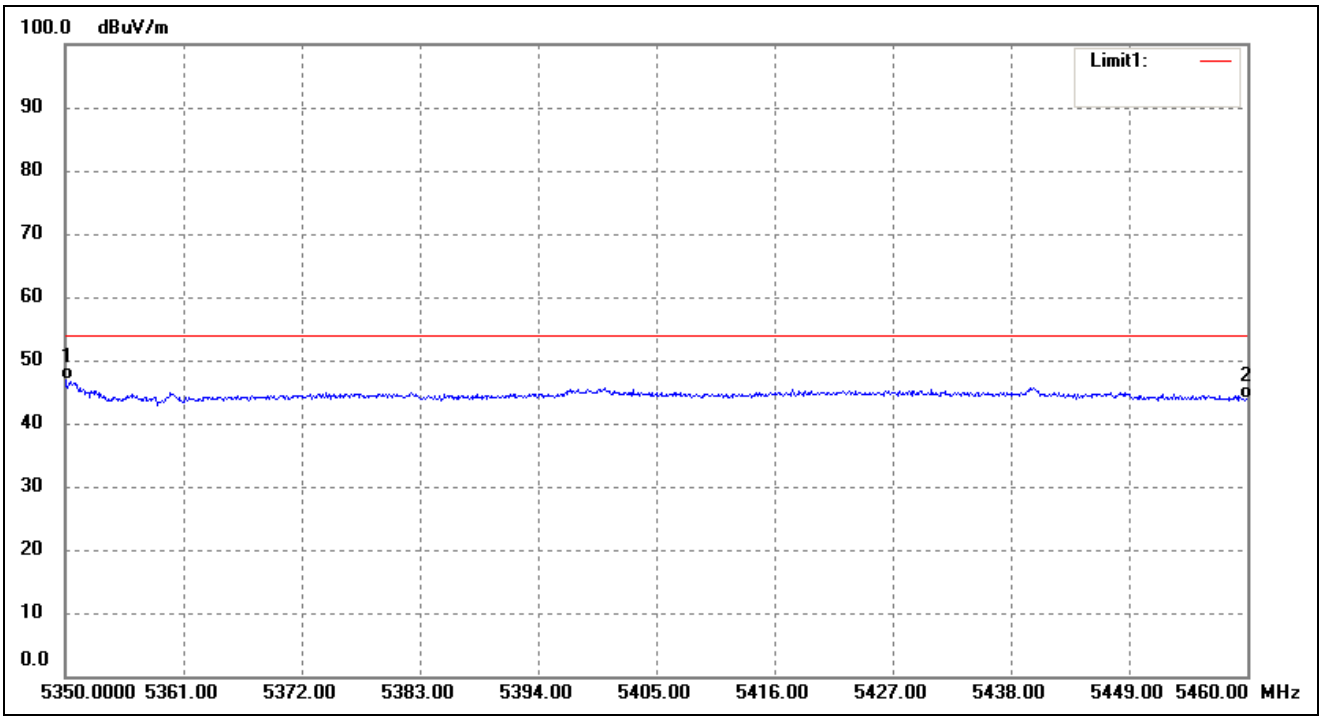
BAND 2

802.11a- Restricted Bandedge(worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	60.81	1.19	62.00	74.00	-12.00	295	100	peak
2	5460.000	55.18	1.47	56.65	74.00	-17.35	99	100	peak

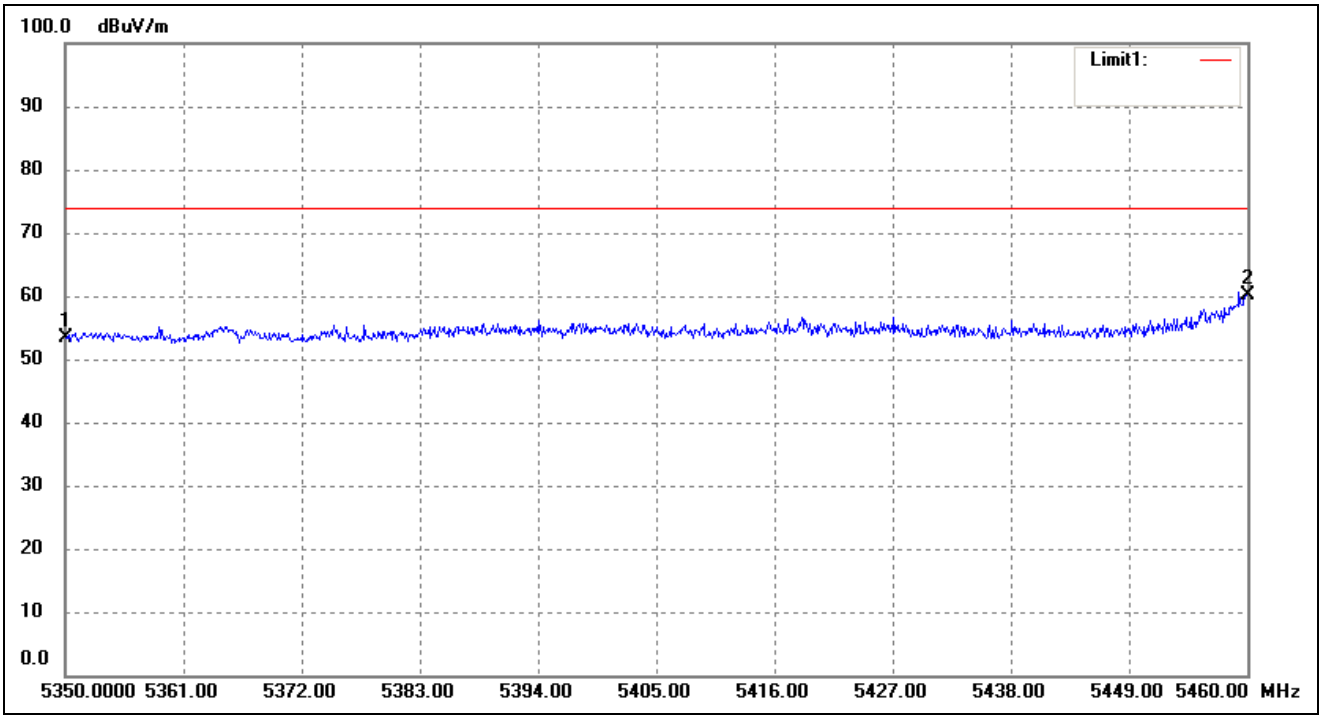
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	45.80	1.19	46.99	54.00	-7.01	202	100	AVG
2	5460.000	42.29	1.47	43.76	54.00	-10.24	90	100	AVG

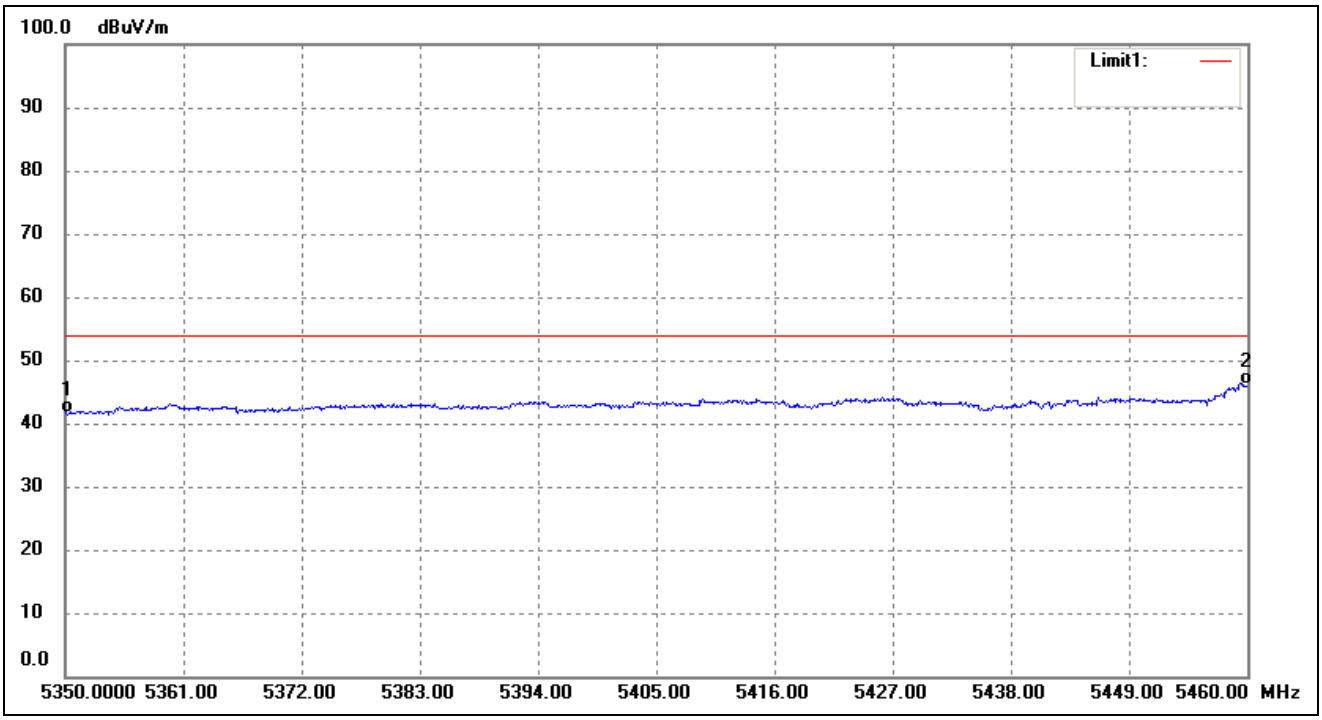
BAND 3

802.11a- Restricted Bandedge(worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	52.21	1.19	53.40	74.00	-20.60	128	100	peak
2	5460.000	58.69	1.47	60.16	74.00	-13.84	128	100	peak

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	40.32	1.19	41.51	54.00	-12.49	283	100	AVG
2	5460.000	44.54	1.47	46.01	54.00	-7.99	163	100	AVG

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

- The worse mode
- For the frequency band 5.250-5.350GHz, 5.470-5.725GHz (802.11a)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5260MHz)							
10520	50.96	7.12	58.08	68.2	-10.12	H	PK
10520	36.37	7.12	43.49	54	-10.51	H	AV
10520	51.68	7.12	58.80	68.2	-9.4	V	PK
10520	33.77	7.12	40.89	54	-13.11	V	AV
Middle Channel (5280MHz)							
10560	49.25	7.16	56.41	68.2	-11.79	H	PK
10560	36.24	7.16	43.4	54	-10.6	H	AV
10560	50.68	7.16	57.84	68.2	-10.36	V	PK
10560	33.18	7.16	40.34	54	-13.66	V	AV
High Channel (5320MHz)							
10640	49.93	7.24	57.17	74	-16.83	H	PK
10640	31.48	7.24	38.72	54	-15.28	H	AV
10640	52.45	7.24	59.69	74	-14.31	V	PK
10640	30.99	7.24	38.23	54	-15.77	V	AV

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5500MHz)							
11000	49.42	7.57	56.99	74	-17.01	H	PK
11000	33.31	7.57	40.88	54	-13.12	H	AV
11000	54.27	7.57	61.84	74	-12.16	V	PK
11000	35.17	7.57	42.74	54	-11.26	V	AV
Middle Channel (5600MHz)							
11200	49.15	8.16	57.31	74	-16.69	H	PK
11200	33.26	8.16	41.42	54	-12.58	H	AV
11200	53.64	8.16	61.8	74	-12.2	V	PK
11200	34.78	8.16	42.94	54	-11.06	V	AV
High Channel (5700MHz)							
11400	49.85	8.75	58.60	74	-15.40	H	PK
11400	35.14	8.75	43.89	54	-10.11	H	AV
11400	49.68	8.75	58.43	74	-15.57	V	PK
11400	32.52	8.75	41.27	54	-12.73	V	AV

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz

Lowest	Below 5150	-33.84	-27
Highest	Above 5350	-34.14	-27
Note: the data just list the worst cases			

➢ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-35.45	-27
Highest	Above 5725	-39.60	-27
Note: the data just list the worst cases			

➢ For the frequency band 5.250-5.350GHz, 5.470-5.725GHz (802.11n HT20)

➢ Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5260MHz)							
10520	51.99	7.12	59.11	68.2	-9.09	H	PK
10520	33.40	7.12	40.52	54	-13.48	H	AV
10520	49.72	7.12	56.84	68.2	-11.36	V	PK
10520	34.75	7.12	41.87	54	-12.13	V	AV
Middle Channel (5280MHz)							
10560	51.24	7.16	58.4	68.2	-9.8	H	PK
10560	33.18	7.16	40.34	54	-13.66	H	AV
10560	49.82	7.16	56.98	68.2	-11.22	V	PK
10560	35.04	7.16	42.2	54	-11.8	V	AV
High Channel (5320MHz)							
10640	51.45	7.24	58.69	74	-15.31	H	PK
10640	35.39	7.24	42.63	54	-11.37	H	AV
10640	52.25	7.24	59.49	74	-14.51	V	PK
10640	35.34	7.24	42.58	54	-11.42	V	AV

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5500MHz)							
11000	52.30	7.57	59.87	74	-14.13	H	PK
11000	33.73	7.57	41.30	54	-12.70	H	AV
11000	49.87	7.57	57.44	74	-16.56	V	PK
11000	32.19	7.57	39.76	54	-14.24	V	AV
Middle Channel (5600MHz)							
11200	51.65	8.16	59.81	74	-14.19	H	PK
11200	33.08	8.16	41.24	54	-12.76	H	AV
11200	49.14	8.16	57.3	74	-16.7	V	PK
11200	32.23	8.16	40.39	54	-13.61	V	AV

High Channel (5700MHz)							
11400	50.68	8.75	59.43	74	-14.57	H	PK
11400	33.46	8.75	42.21	54	-11.79	H	AV
11400	52.12	8.75	60.87	74	-13.13	V	PK
11400	33.44	8.75	42.19	54	-11.81	V	AV

➢ Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-34.23	-27
Highest	Above 5350	-36.19	-27
Note: the data just list the worst cases			

➢ Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-36.43	-27
Highest	Above 5725	-39.34	-27
Note: the data just list the worst cases			

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

➢ For the frequency band 5.250-5.350GHz, 5.470-5.725GHz (802.11ac-HT20)

➢ Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5260MHz)							
10520	52.86	7.12	59.98	68.2	-8.22	H	PK
10520	33.28	7.12	40.40	54	-13.6	H	AV
10520	51.22	7.12	58.34	68.2	-9.86	V	PK
10520	33.63	7.12	40.75	54	-13.25	V	AV
Middle Channel (5280MHz)							
10560	51.32	7.16	58.48	68.2	-9.72	H	PK
10560	33.13	7.16	40.29	54	-13.71	H	AV
10560	50.25	7.16	57.41	68.2	-10.79	V	PK
10560	33.16	7.16	40.32	54	-13.68	V	AV
High Channel (5320MHz)							
10640	52.50	7.24	59.74	74	-14.26	H	PK
10640	35.68	7.24	42.92	54	-11.08	H	AV
10640	52.67	7.24	59.91	74	-14.09	V	PK
10640	36.14	7.24	43.38	54	-10.62	V	AV

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5500MHz)							
11000	52.97	7.57	60.54	74	-13.46	H	PK
11000	32.52	7.57	40.09	54	-13.91	H	AV
11000	48.84	7.57	56.41	74	-17.59	V	PK
11000	31.57	7.57	39.14	54	-14.86	V	AV
Middle Channel (5600MHz)							
11200	50.25	8.16	58.41	74	-15.59	H	PK
11200	32.08	8.16	40.24	54	-13.76	H	AV
11200	50.43	8.16	58.59	74	-15.41	V	PK
11200	33.05	8.16	41.21	54	-12.79	V	AV
High Channel (5700MHz)							
11400	51.64	8.75	60.39	74	-13.61	H	PK
11400	32.64	8.75	41.39	54	-12.61	H	AV
11400	50.89	8.75	59.64	74	-14.36	V	PK
11400	33.77	8.75	42.52	54	-11.48	V	AV

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-33.21	-27
Highest	Above 5350	-35.10	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-36.40	-27
Highest	Above 5725	-40.24	-27
Note: the data just list the worst cases			

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

- For the frequency band 5.250-5.350GHz, 5.470-5.725GHz (802.11n HT40)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5270MHz)							
10540	52.79	7.15	59.94	68.2	-8.26	H	PK
10540	34.44	7.15	41.59	54	-12.41	H	AV
10540	51.41	7.15	58.56	68.2	-9.64	V	PK
10540	32.08	7.15	39.23	54	-14.77	V	AV
High Channel (5310MHz)							

10620	51.74	7.22	58.96	74	-15.04	H	PK
10620	34.06	7.22	41.28	54	-12.72	H	AV
10620	51.66	7.22	58.88	74	-15.12	V	PK
10620	36.68	7.22	43.90	54	-10.10	V	AV

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5510MHz)							
11020	52.42	7.63	60.05	74	-13.95	H	PK
11020	32.78	7.63	40.41	54	-13.59	H	AV
11020	50.77	7.63	58.40	74	-15.60	V	PK
11020	35.48	7.63	43.11	54	-10.89	V	AV
Middle Channel (5590MHz)							
11180	49.65	7.71	57.36	74	-16.64	H	PK
11180	34.84	7.71	42.55	54	-11.45	H	AV
11180	50.21	7.71	57.92	74	-16.08	V	PK
11180	35.14	7.71	42.85	54	-11.15	V	AV
High Channel (5670MHz)							
11340	48.86	8.58	57.44	74	-16.56	H	PK
11340	34.33	8.58	42.91	54	-11.09	H	AV
11340	48.67	8.58	57.25	74	-16.75	V	PK
11340	35.23	8.58	43.81	54	-10.19	V	AV

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-35.60	-27
Highest	Above 5350	-36.69	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-35.55	-27
Highest	Above 5725	-38.68	-27
Note: the data just list the worst cases			

- For the frequency band 5.250-5.350GHz, 5.470-5.725GHz (802.11ac-HT40)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5270MHz)							

10540	52.67	7.15	59.82	68.2	-8.38	H	PK
10540	34.55	7.15	41.7	54	-12.3	H	AV
10540	52.70	7.15	59.85	68.2	-8.35	V	PK
10540	33.18	7.15	40.33	54	-13.67	V	AV
High Channel (5310MHz)							
10620	53.10	7.22	60.32	74	-13.68	H	PK
10620	33.66	7.22	40.88	54	-13.12	H	AV
10620	50.52	7.22	57.74	74	-16.26	V	PK
10620	33.69	7.22	40.91	54	-13.09	V	AV

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5510MHz)							
11020	52.68	7.63	60.31	74	-13.69	H	PK
11020	33.44	7.63	41.07	54	-12.93	H	AV
11020	50.91	7.63	58.54	74	-15.46	V	PK
11020	34.15	7.63	41.78	54	-12.22	V	AV
Middle Channel (5590MHz)							
11180	49.67	7.71	57.38	74	-16.62	H	PK
11180	33.25	7.71	40.96	54	-13.04	H	AV
11180	50.24	7.71	57.95	74	-16.05	V	PK
11180	33.78	7.71	41.49	54	-12.51	V	AV
High Channel (5670MHz)							
11340	48.53	8.58	57.11	74	-16.89	H	PK
11340	33.17	8.58	41.75	54	-12.25	H	AV
11340	49.26	8.58	57.84	74	-16.16	V	PK
11340	32.92	8.58	41.50	54	-12.50	V	AV

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.52	-27
Highest	Above 5350	-36.72	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-36.02	-27
Highest	Above 5725	-38.60	-27
Note: the data just list the worst cases			

- For the frequency band 5.250-5.350GHz, 5.470-5.725GHz (802.11ac HT80)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
5290MHz							
10580	50.24	7.20	57.44	68.2	-10.76	H	PK
10580	33.30	7.20	40.50	54	-13.5	H	AV
10580	49.67	7.20	56.87	68.2	-11.33	V	PK
10580	32.06	7.20	39.26	54	-14.74	V	AV

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5530MHz)							
11060	52.61	7.82	60.43	74	-13.57	H	PK
11060	36.09	7.82	43.91	54	-10.09	H	AV
11060	51.57	7.82	59.39	74	-14.61	V	PK
11060	36.64	7.82	44.46	54	-9.54	V	AV
Low Channel (5610MHz)							
11220	53.13	8.34	61.47	74	-12.53	H	PK
11220	33.61	8.34	41.95	54	-12.05	H	AV
11220	50.78	8.34	59.12	74	-14.88	V	PK
11220	36.02	8.34	44.36	54	-9.64	V	AV

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-35.25	-27
Highest	Above 5350	-36.14	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-36.01	-27
Highest	Above 5725	-38.77	-27
Note: the data just list the worst cases			

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

10. Frequency Stability

10.1 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.

10.2 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.

10.3 Summary of Test Results/Plots

Antenna A

U-NII-1: 5250-5350MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	12	-30	156	0.0294
100%		-20	176	0.0334
100%		-10	154	0.0292
100%		0	135	0.0255
100%		+10	186	0.0352
100%		+20	138	0.0262
100%		+30	130	0.0246
100%		+40	161	0.0304
100%		+50	126	0.0239
Low Battery power	10.8	+20	132	0.0249
High Battery power	13.2	+20	185	0.0350

Antenna A

U-NII-1: 5470-5725MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	12	-30	160	0.0287
100%		-20	175	0.0313
100%		-10	154	0.0275
100%		0	129	0.0230
100%		+10	176	0.0315
100%		+20	138	0.0248
100%		+30	130	0.0233
100%		+40	166	0.0297
100%		+50	128	0.0229
Low Battery power	10.8	+20	138	0.0246
High Battery power	13.2	+20	130	0.0232

Antenna B

U-NII-1: 5250-5350MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	12	-30	165	0.0311
100%		-20	173	0.0326
100%		-10	158	0.0300
100%		0	123	0.0233
100%		+10	175	0.0330
100%		+20	131	0.0248
100%		+30	128	0.0241
100%		+40	171	0.0324
100%		+50	128	0.0241
Low Battery power	10.8	+20	125	0.0237
High Battery power	13.2	+20	170	0.0322

Antenna B

U-NII-1: 5470-5725MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	12	-30	160	0.0286
100%		-20	172	0.0308
100%		-10	159	0.0285
100%		0	121	0.0217
100%		+10	173	0.0310
100%		+20	130	0.0233
100%		+30	138	0.0247
100%		+40	160	0.0286
100%		+50	123	0.0219
Low Battery power	10.8	+20	164	0.0294
High Battery power	13.2	+20	121	0.0216

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