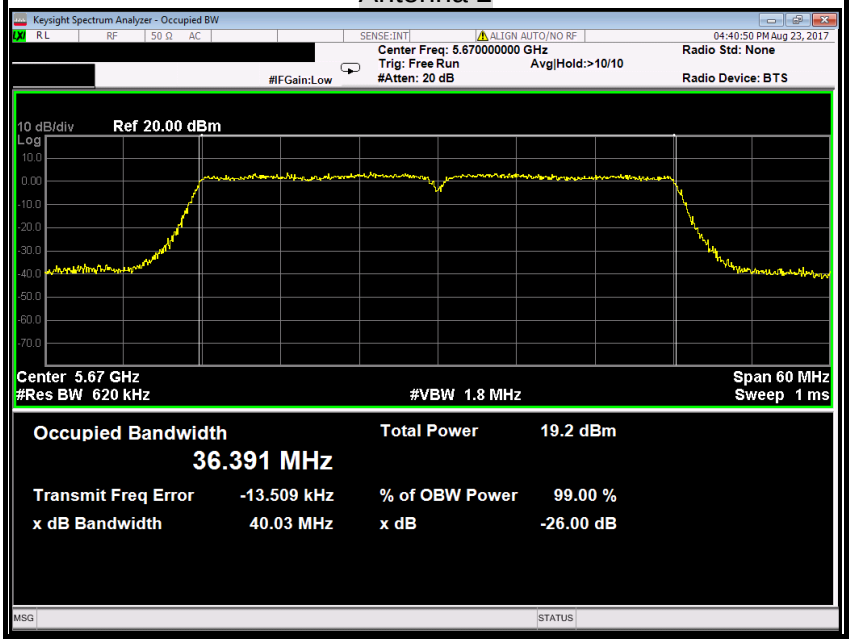
26dB Bandwidth (CH High)

Antenna 2

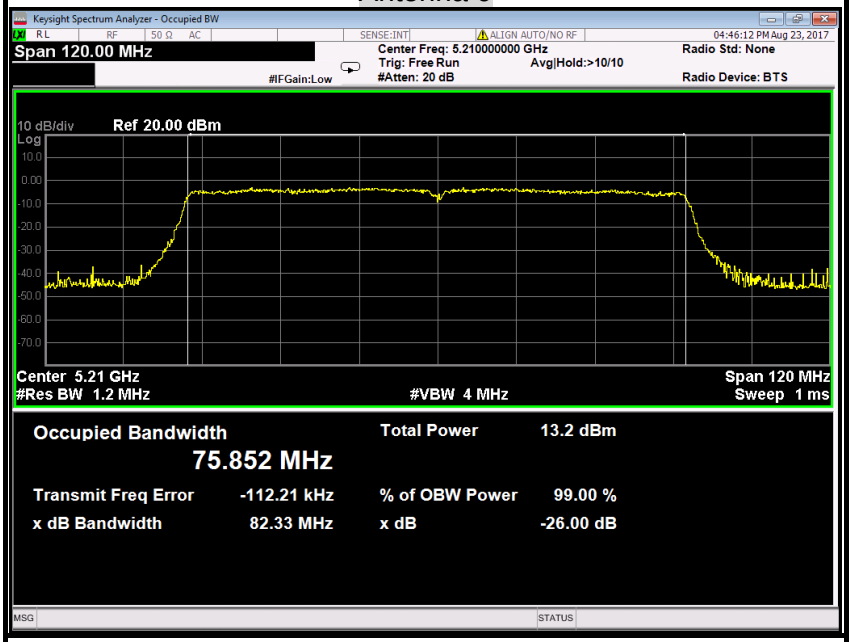


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11ac 80 mode / 5210MHz

26dB Bandwidth

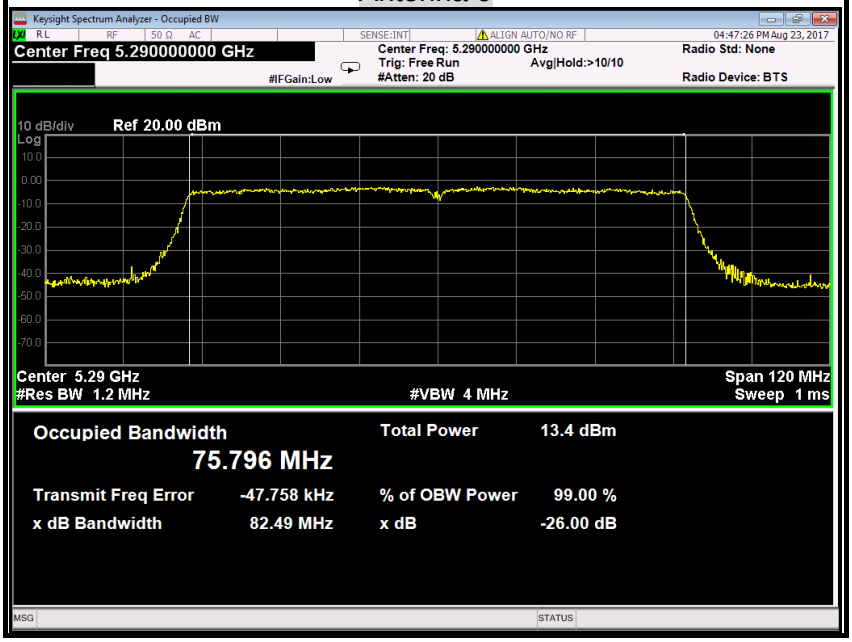
Antenna 0



IEEE 802.11ac 80 mode / 5290MHz

26dB Bandwidth

Antenna 0

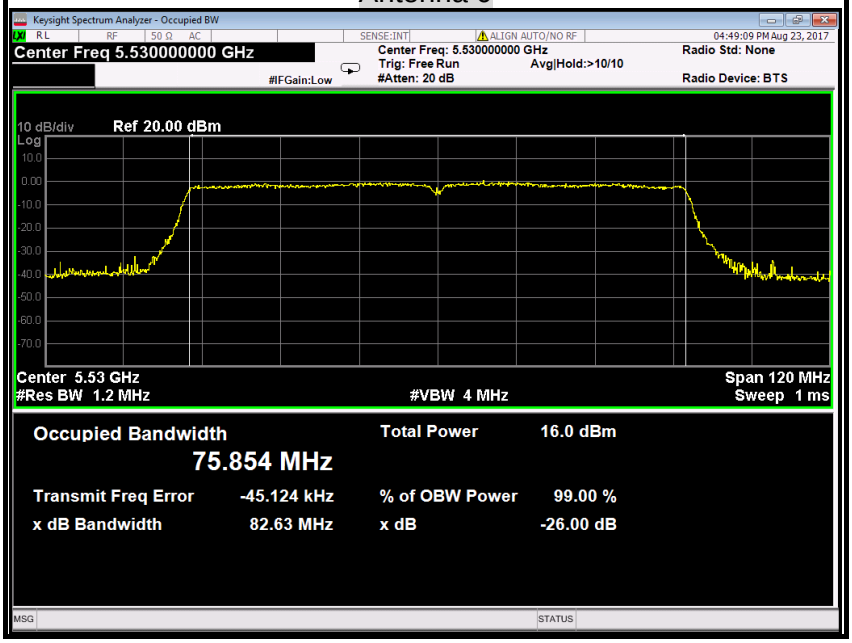


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11ac 80 mode / 5530MHz

26dB Bandwidth

Antenna 0

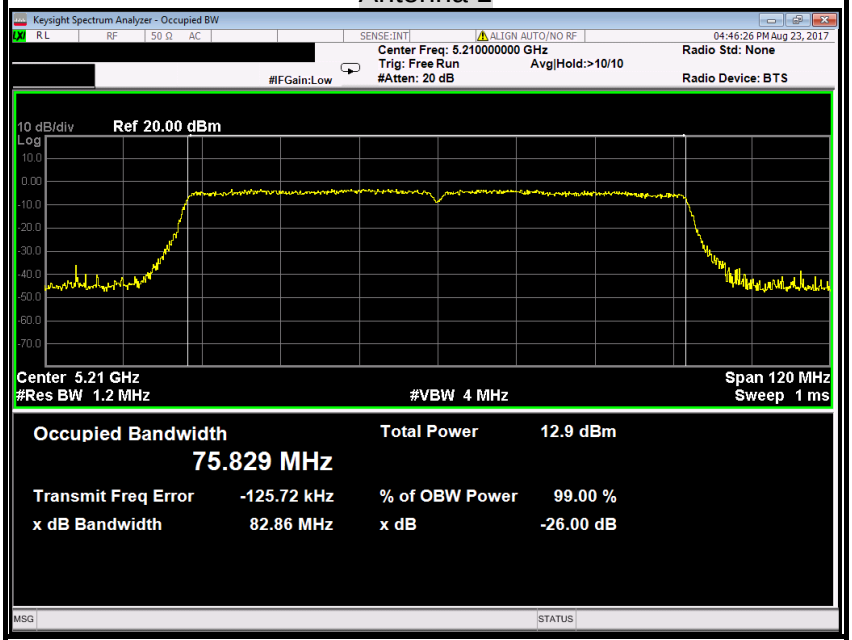


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11ac 80 mode / 5210MHz

26dB Bandwidth

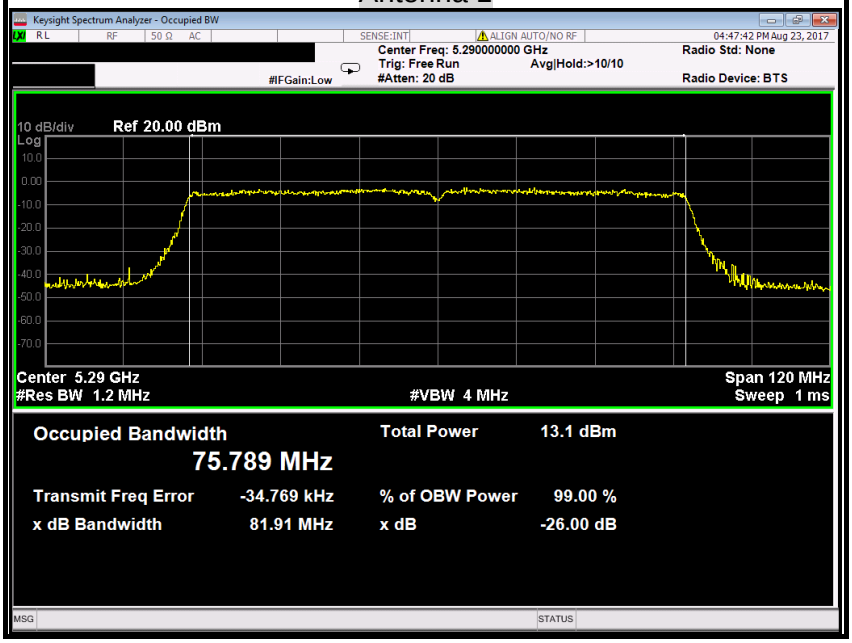
Antenna 1



IEEE 802.11ac 80 mode / 5290MHz

26dB Bandwidth

Antenna 1

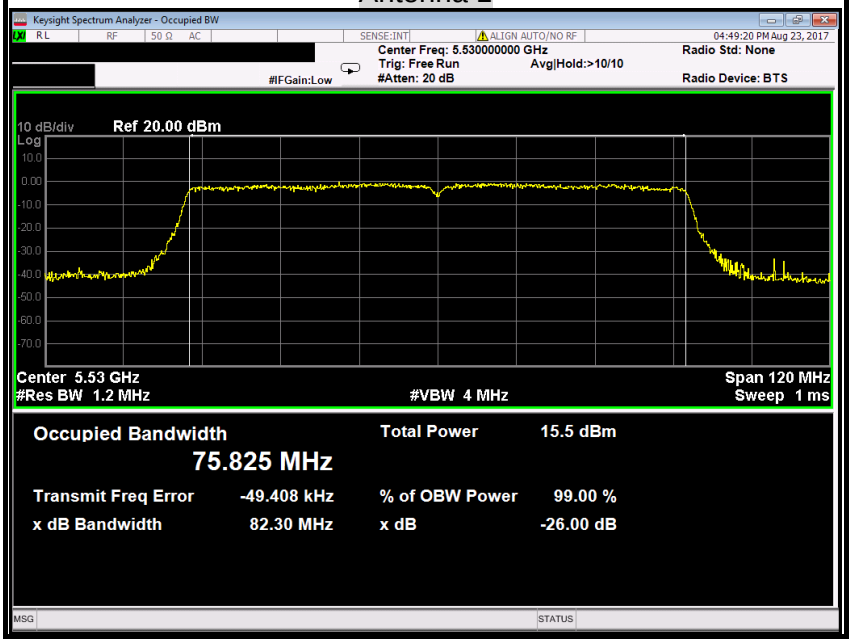


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11ac 80 mode / 5530MHz

26dB Bandwidth

Antenna 1

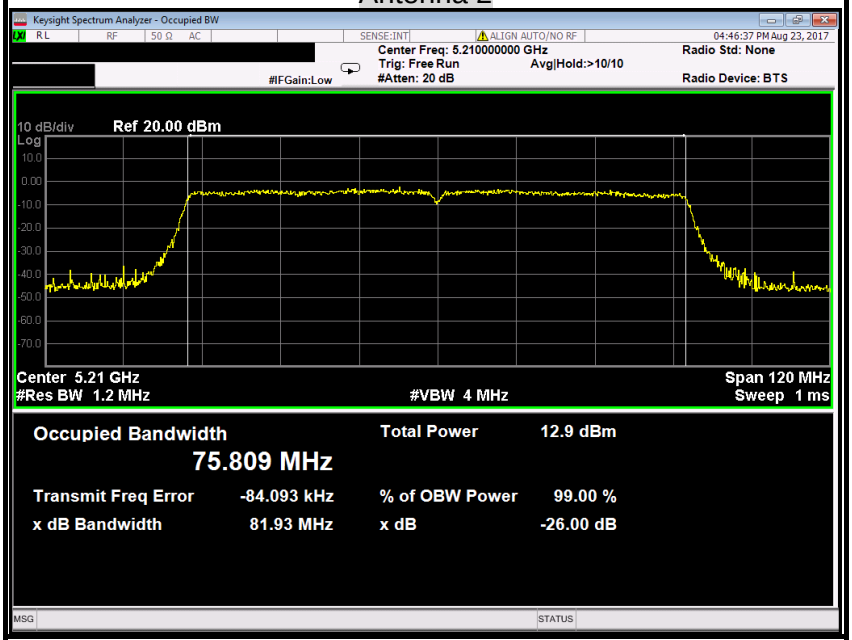


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11ac 80 mode / 5210MHz

26dB Bandwidth

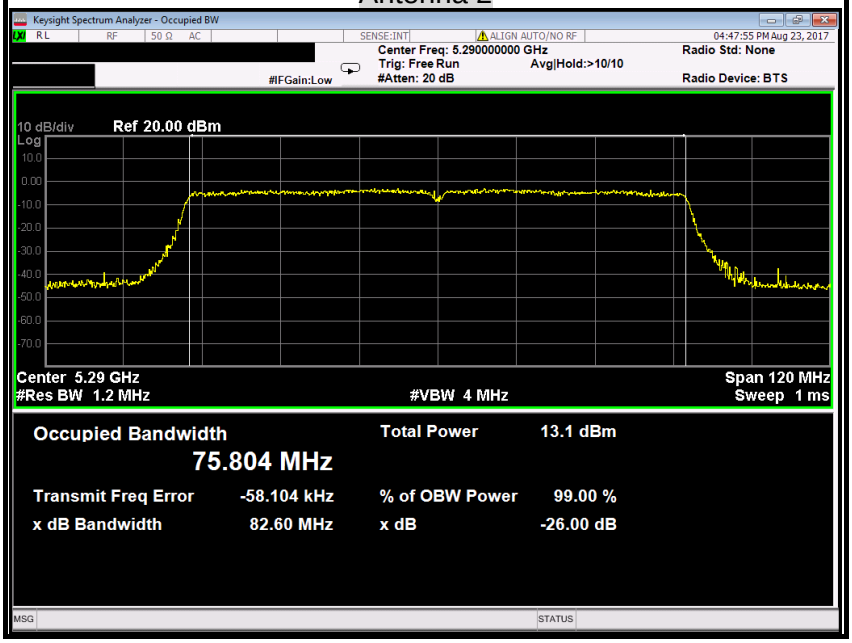
Antenna 2



IEEE 802.11ac 80 mode / 5290MHz

26dB Bandwidth

Antenna 2

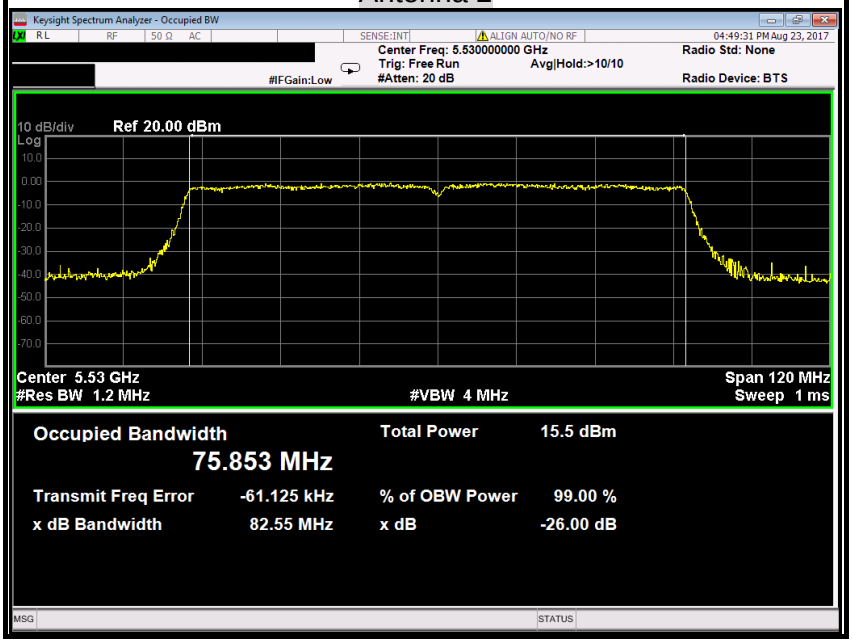


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11ac 80 mode / 5530MHz

26dB Bandwidth

Antenna 2



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6.2 6dB BANDWIDTH MEASUREMENT

6.2.1 LIMITS

According to §15.407(e), Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

6.2.2 TEST INSTRUMENTS

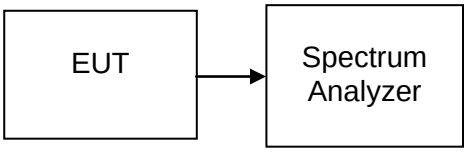
Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2017	02/20/2018

6.2.3 TEST PROCEDURES (please refer to measurement standard)

8.1 Option 2:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW ≥ 3 RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

6.2.4 TEST SETUP



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6.2.5 TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	6dB Bandwidth(B) (MHz)			Limit (kHz)	Test Result
		Antenna 0	Antenna 1	Antenna 2		
Low	5745	16.35	16.35	16.34	>500	PASS
Mid	5785	16.34	16.34	16.33		PASS
High	5825	16.35	16.34	16.35		PASS

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	6dB Bandwidth(B) (MHz)			Limit (kHz)	Test Result
		Antenna 0	Antenna 1	Antenna 2		
Low	5745	17.59	17.59	17.58	>500	PASS
Mid	5785	17.57	17.56	17.60		PASS
High	5825	17.59	17.59	17.60		PASS

Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	6dB Bandwidth(B) (MHz)			Limit (kHz)	Test Result
		Antenna 0	Antenna 1	Antenna 2		
Low	5755	36.36	36.36	36.36	>500	PASS
High	5795	36.37	36.36	36.38		PASS

Test mode: IEEE 802.11ac 80 mode / 5775MHz

Channel	Frequency (MHz)	6dB Bandwidth(B) (MHz)			Limit (kHz)	Test Result
		Antenna 0	Antenna 1	Antenna 2		
	5775	76.25	76.07	76.07	>500	PASS

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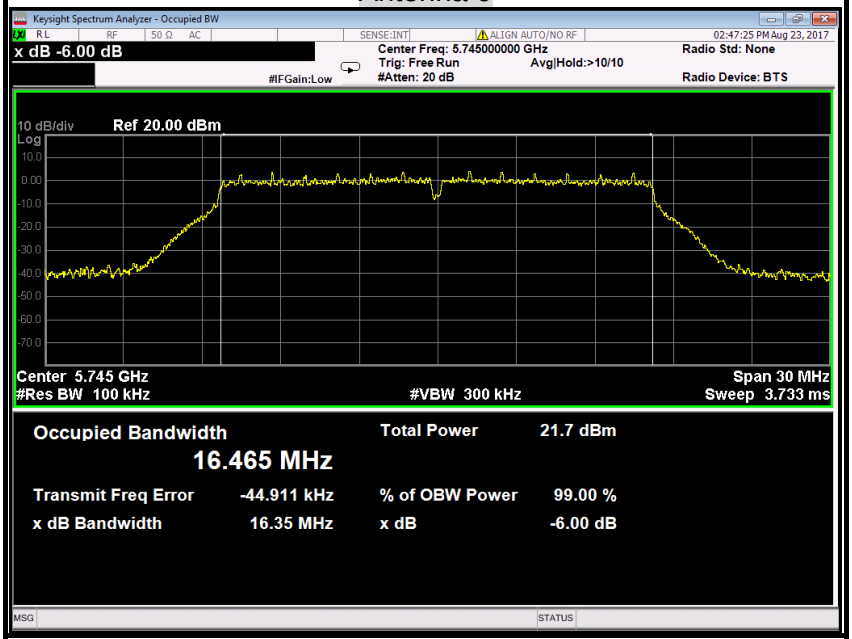
Test Plot

IEEE 802.11a mode / 5745 ~ 5825MHz

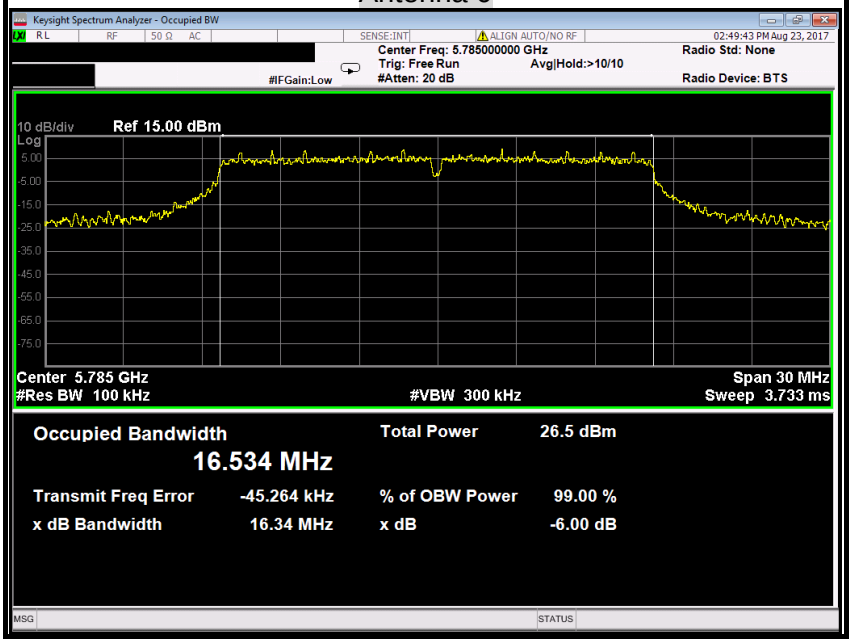
6dB Bandwidth (CH Low)

Antenna 0



6dB Bandwidth (CH Mid)

Antenna 0



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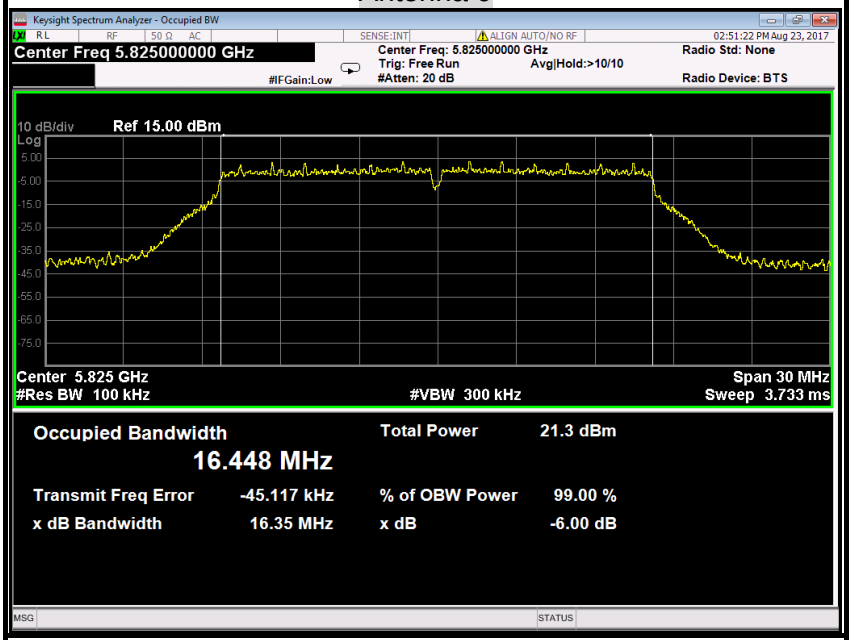
6dB Bandwidth (CH High)

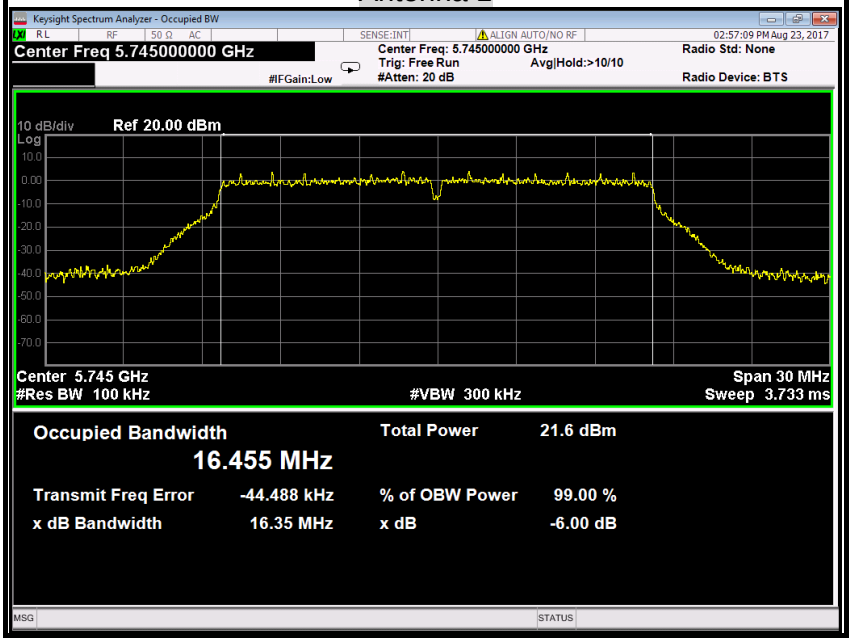
Antenna 0



IEEE 802.11a mode / 5745 ~ 5825MHz

6dB Bandwidth (CH Low)

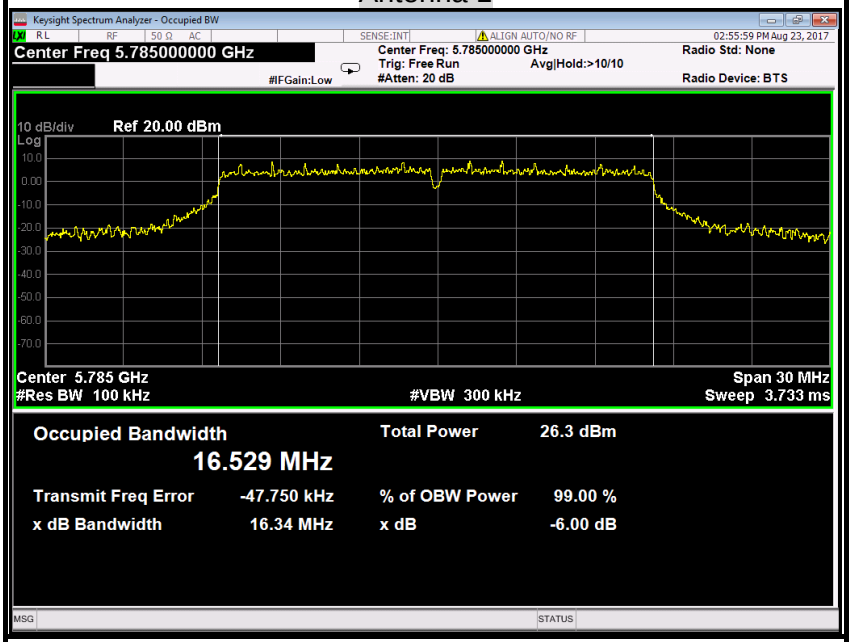
Antenna 1



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

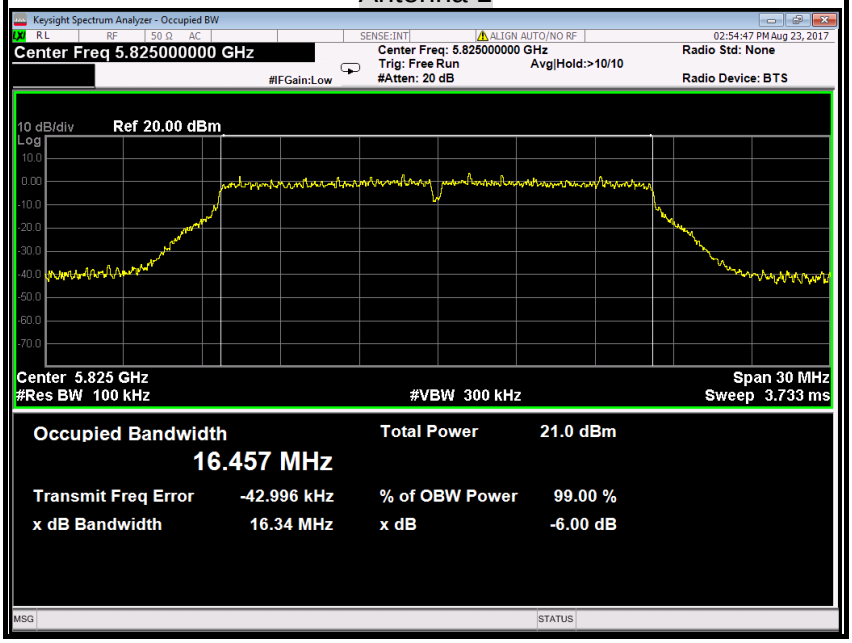
6dB Bandwidth (CH Mid)

Antenna 1



6dB Bandwidth (CH High)

Antenna 1



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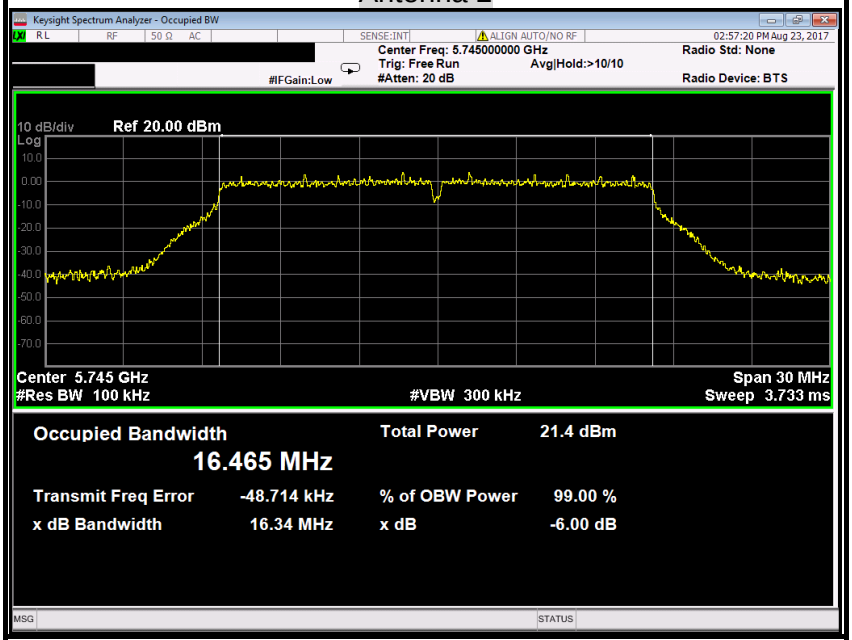
IEEE 802.11a mode / 5745 ~ 5825MHz

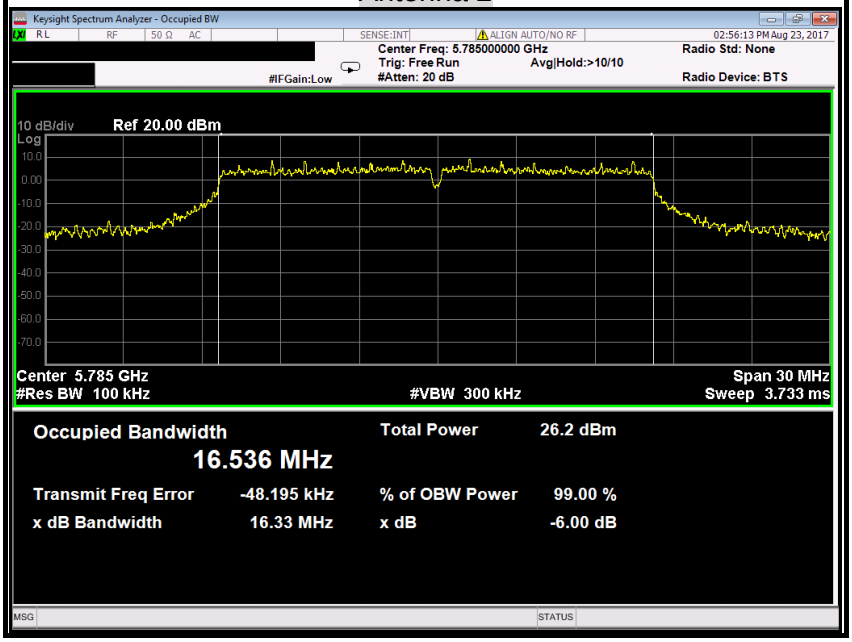
6dB Bandwidth (CH Low)

Antenna 2



6dB Bandwidth (CH Mid)

Antenna 2



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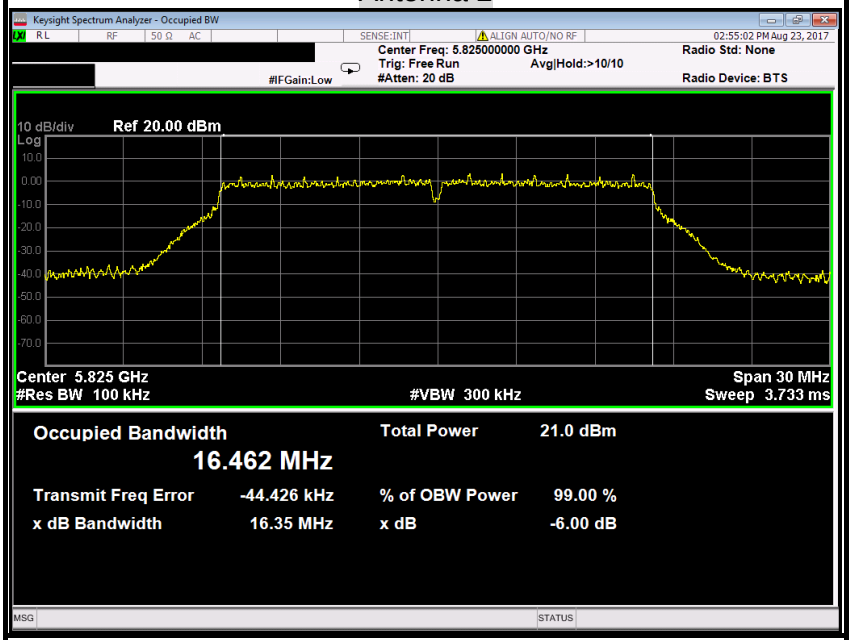
6dB Bandwidth (CH High)

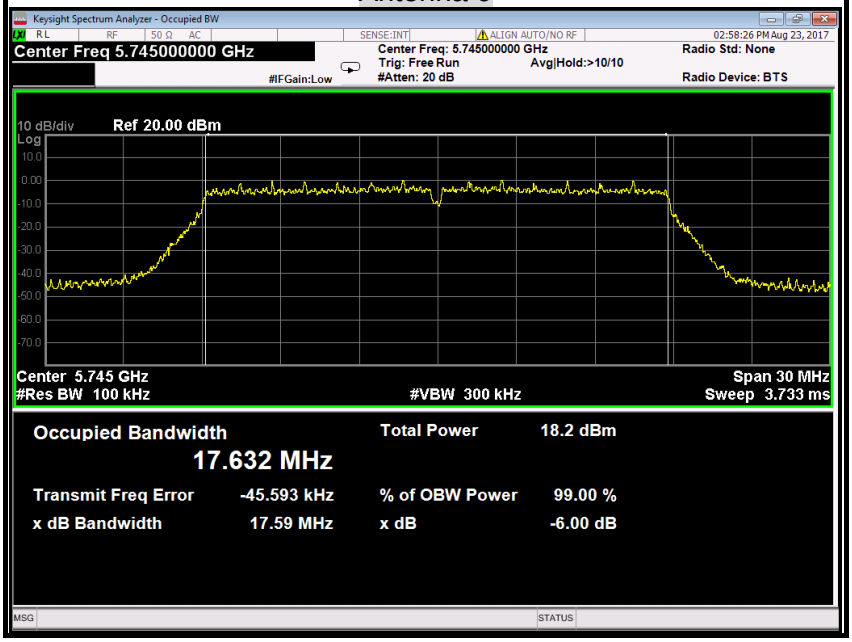
Antenna 2



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

6dB Bandwidth (CH Low)

Antenna 0



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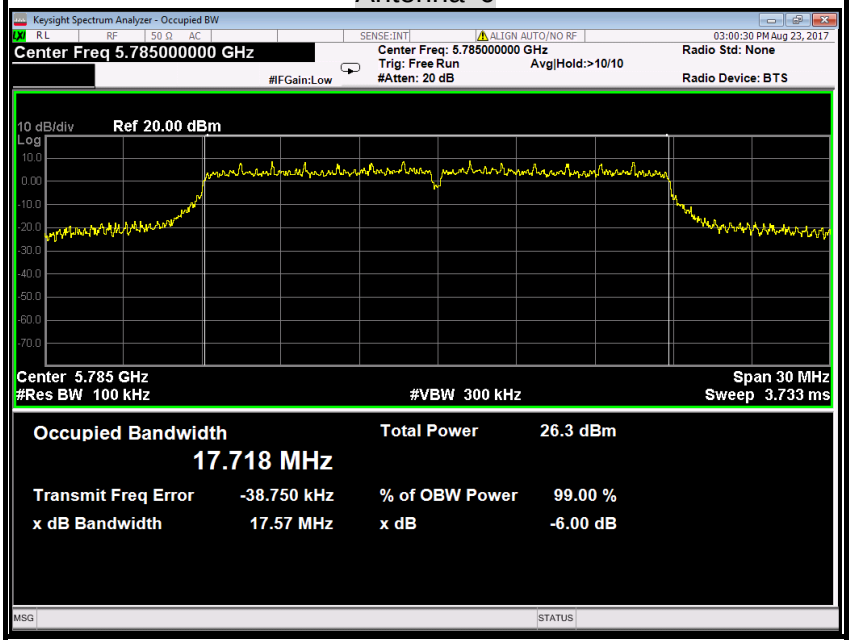
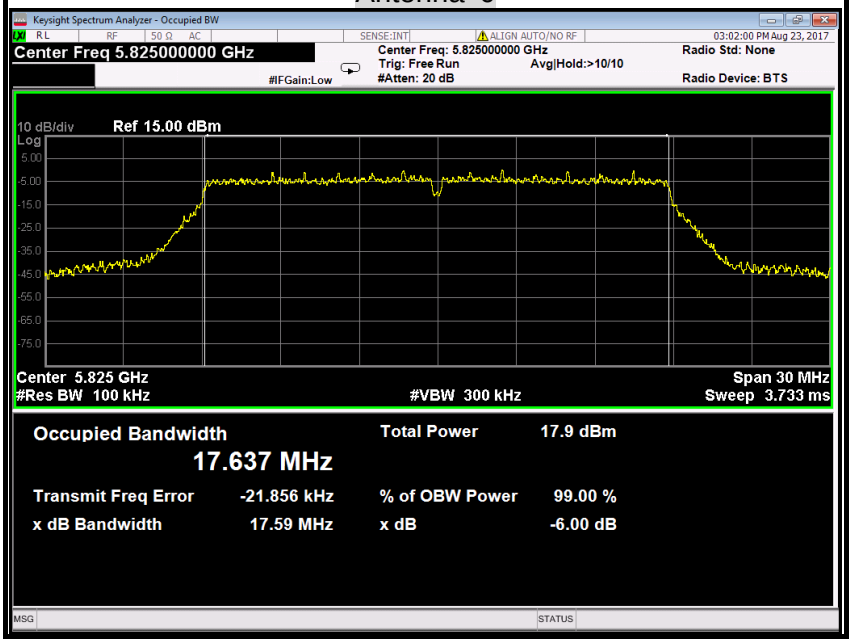
6dB Bandwidth (CH Mid)

Antenna 0



6dB Bandwidth (CH High)

Antenna 0



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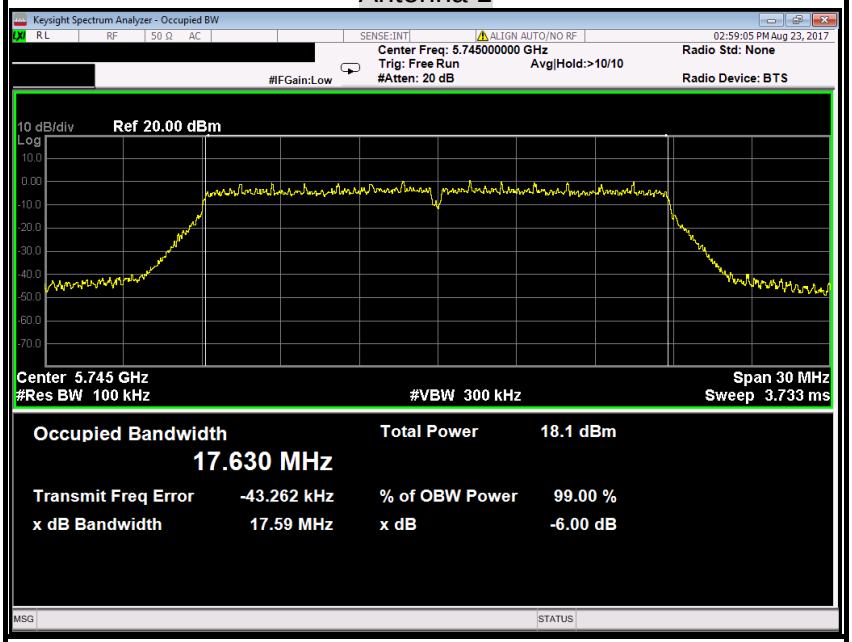
IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

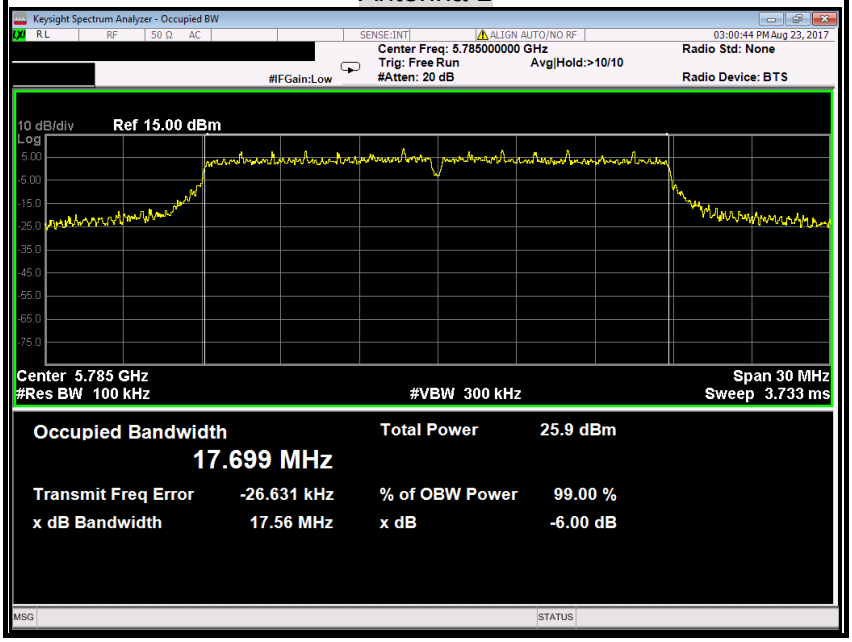
6dB Bandwidth (CH Low)

Antenna 1



6dB Bandwidth (CH Mid)

Antenna 1



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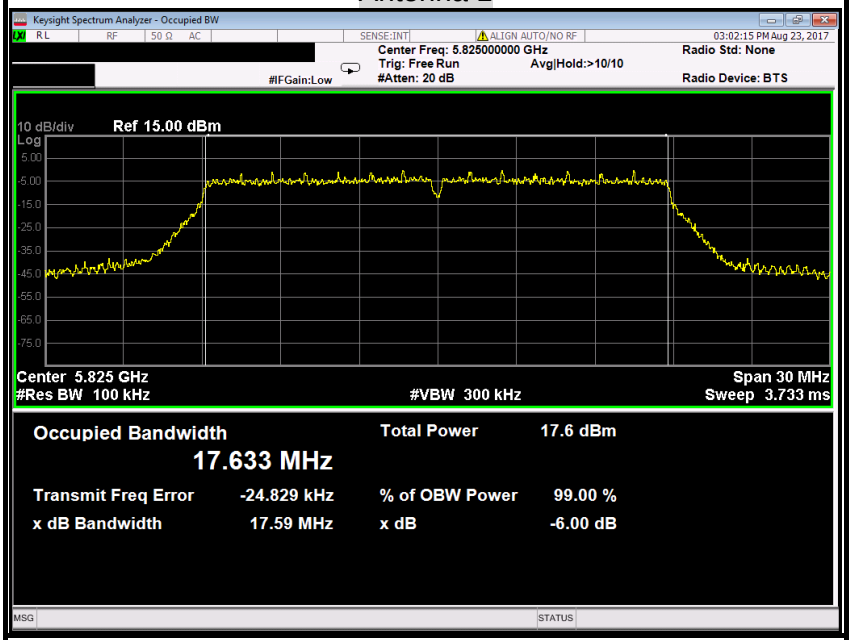
6dB Bandwidth (CH High)

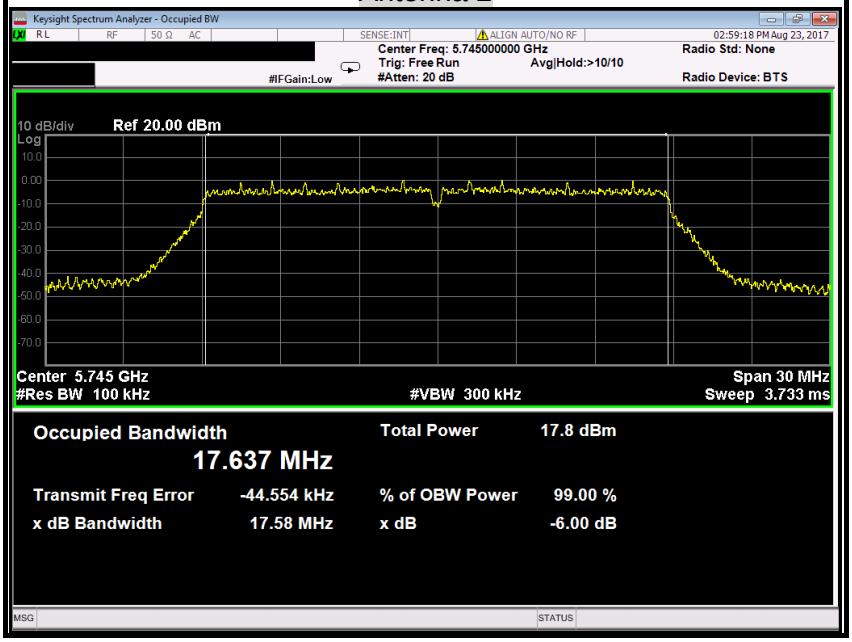
Antenna 1



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

6dB Bandwidth (CH Low)

Antenna 2



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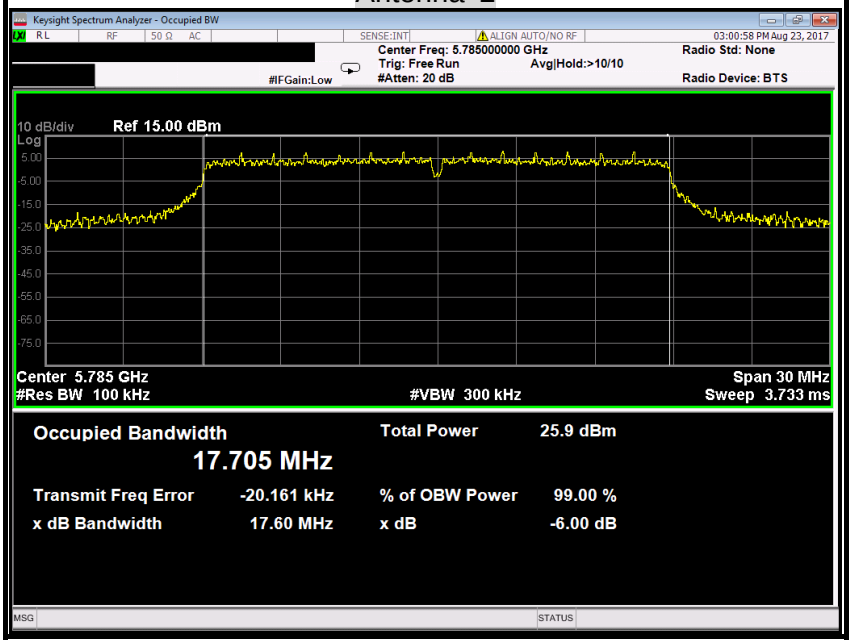
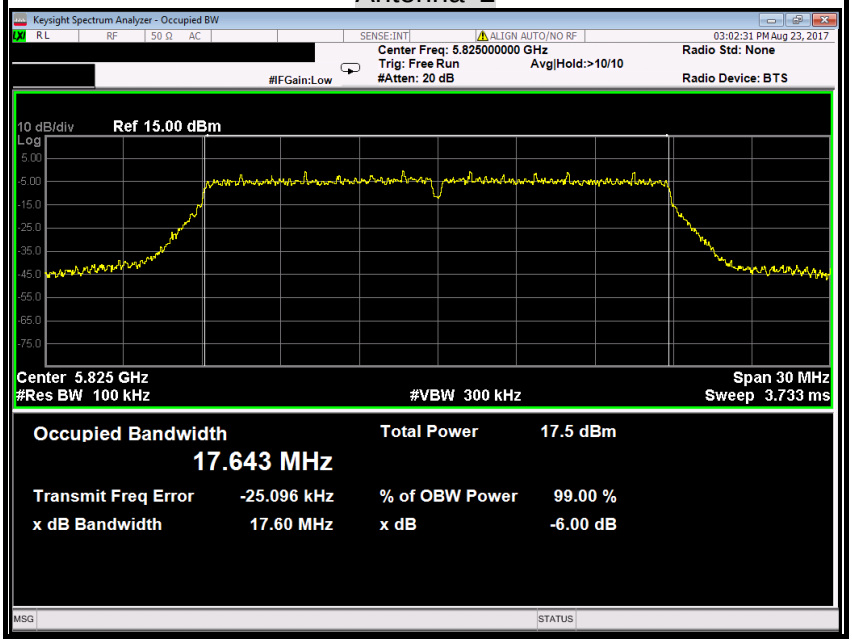
6dB Bandwidth (CH Mid)

Antenna 2



6dB Bandwidth (CH High)

Antenna 2



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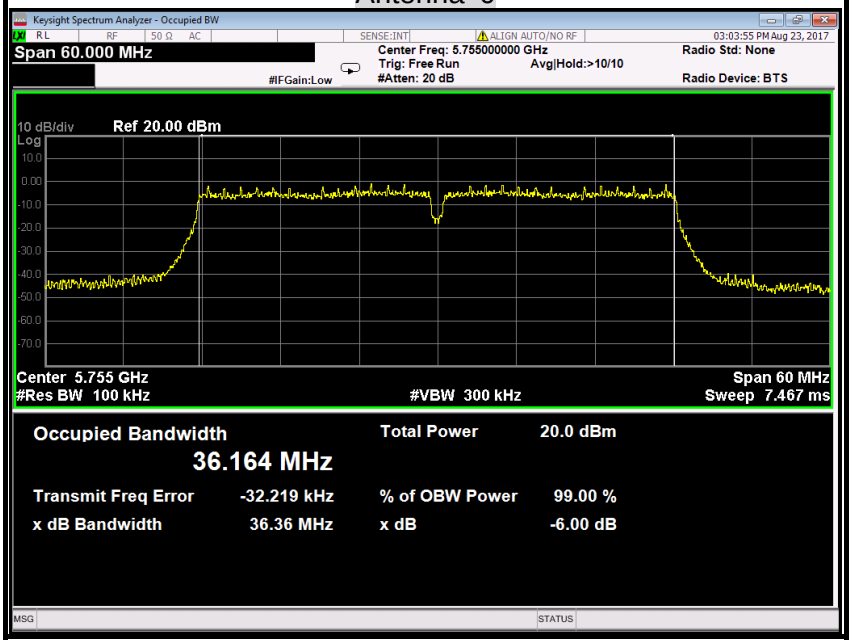
IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

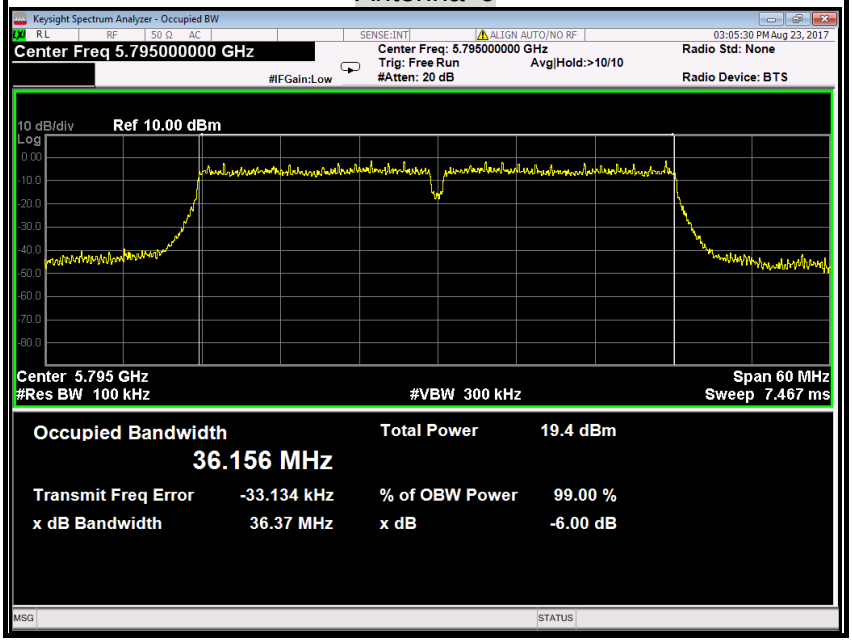
6dB Bandwidth (CH Low)

Antenna 0



6dB Bandwidth (CH High)

Antenna 0

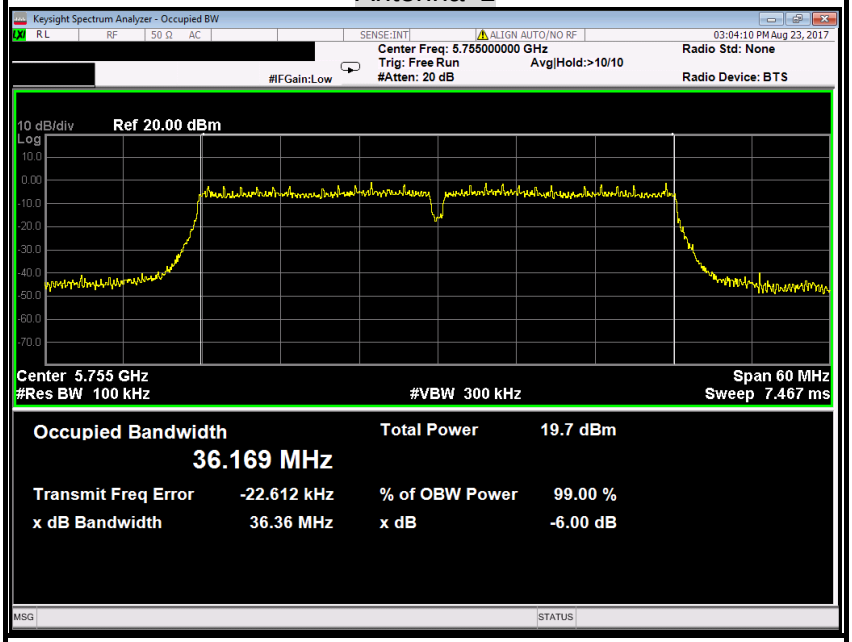


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

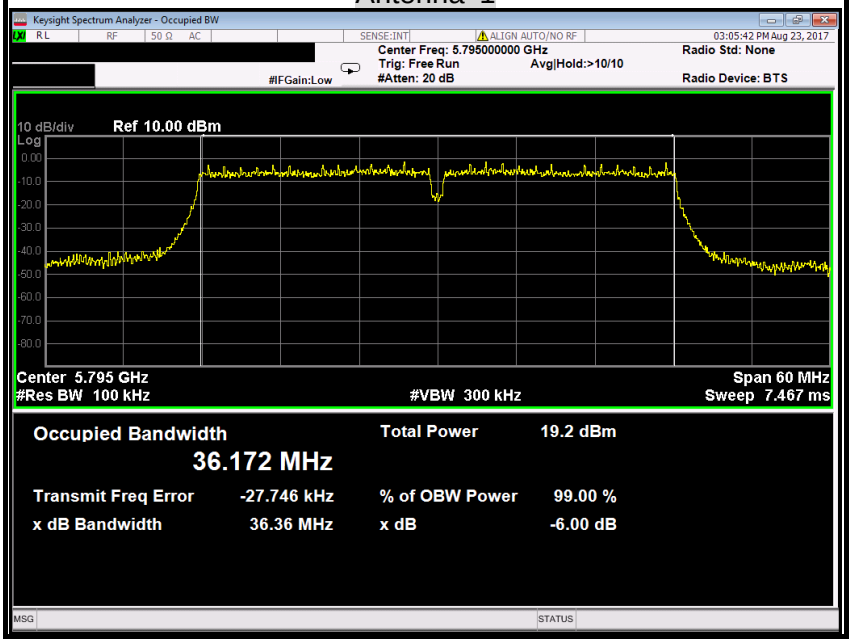
6dB Bandwidth (CH Low)

Antenna 1



6dB Bandwidth (CH High)

Antenna 1



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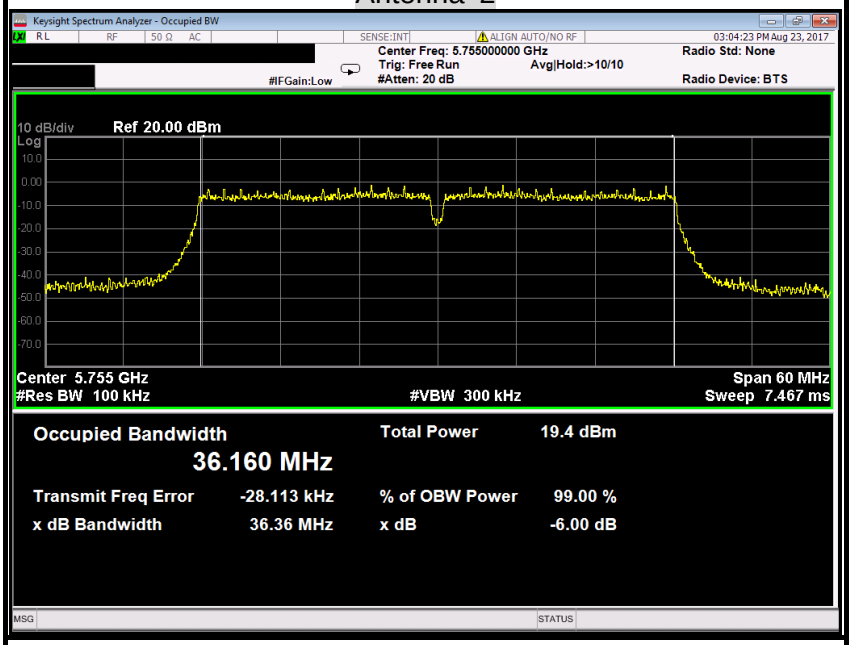
IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

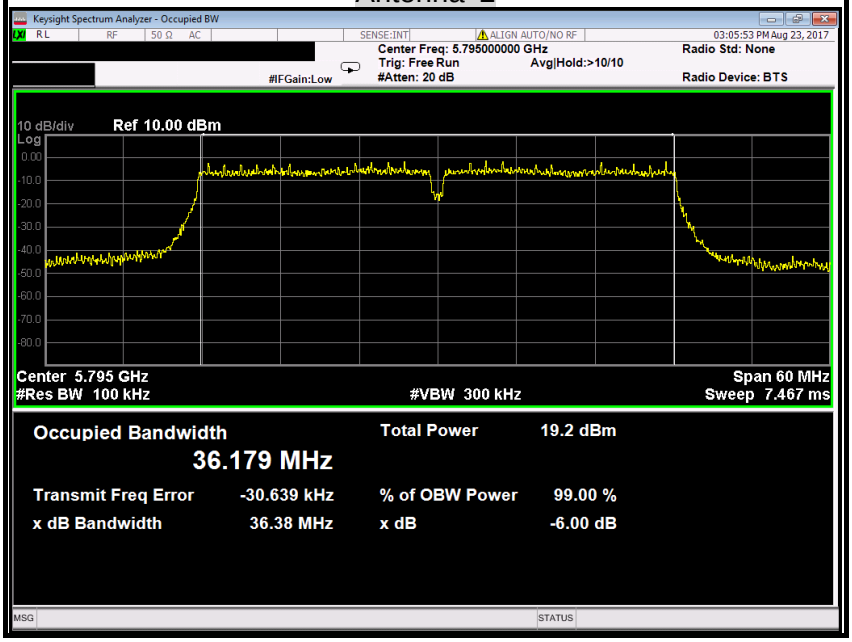
6dB Bandwidth (CH Low)

Antenna 2



6dB Bandwidth (CH High)

Antenna 2

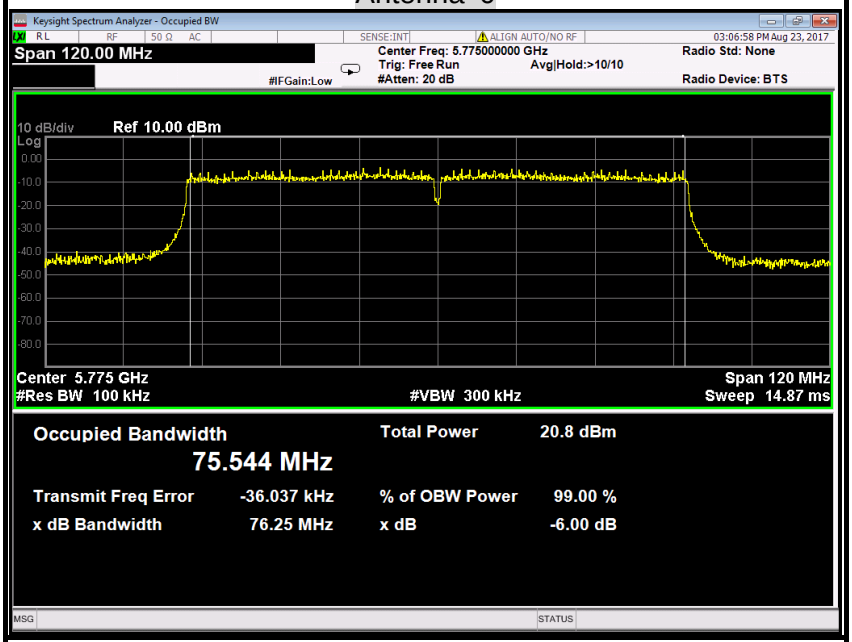


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

IEEE 802.11ac 80 MHz mode / 5775MHz

6dB Bandwidth

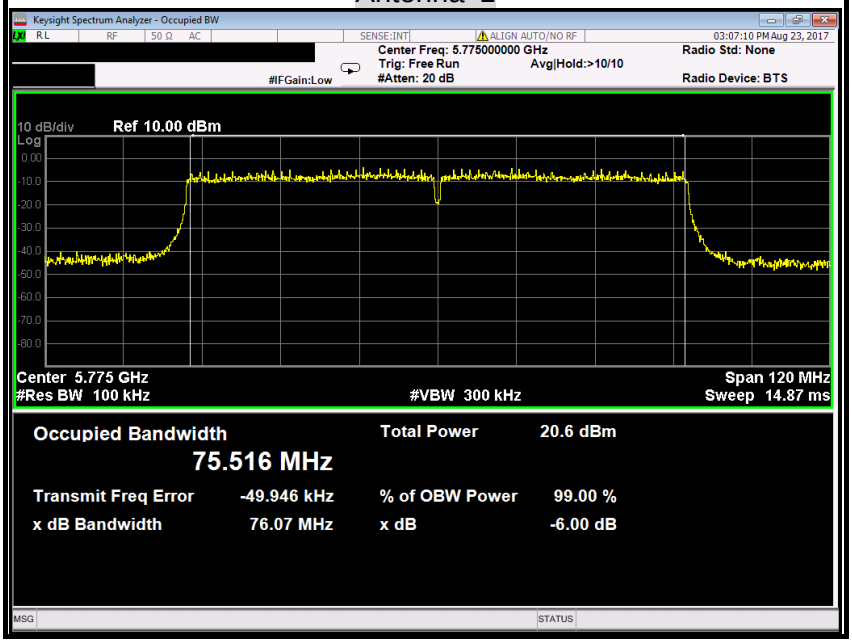
Antenna 0



IEEE 802.11ac 80 MHz mode / 5775MHz

6dB Bandwidth

Antenna 1



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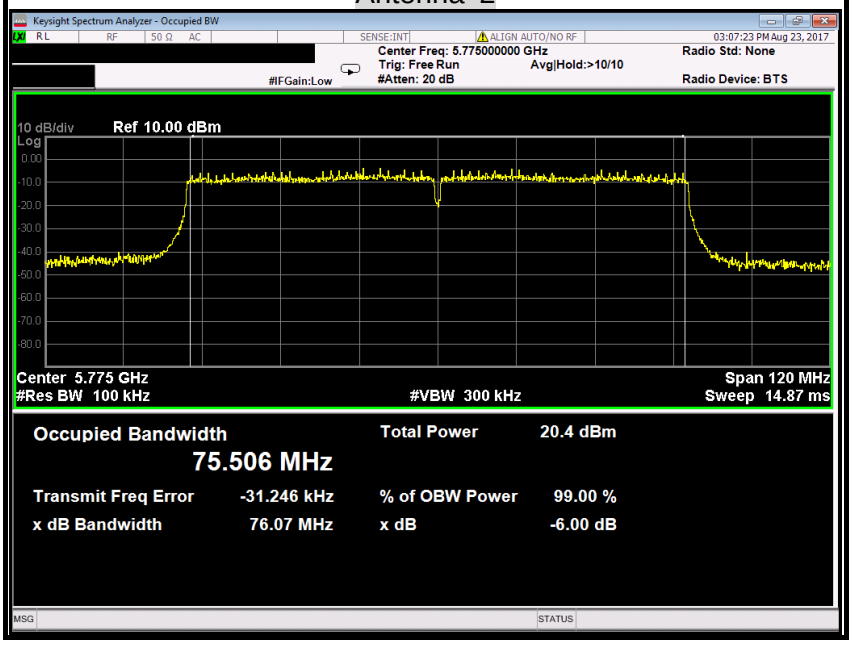
IEEE 802.11ac 80 MHz mode / 5775MHz

6dB Bandwidth

Antenna 2



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6.3 ANTENNA GAIN

MEASUREMENT

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For UNII devices, the IEEE 802.11a mode is used.

MEASUREMENT PARAMETERS

Measurement parameter	
Detector	Peak
Sweep time	Auto
Resolution bandwidth	3 MHz
Video bandwidth	3 MHz
Trace-Mode	Max hold

LIMITS

FCC	IC
Antenna Gain	
6 dBi	

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TEST RESULTS

IEEE 802.11a mode

Antenna 0

IEEE 802.11a mode / 5180 ~ 5240MHz

T_{nom}	V_{nom}	Lowest channel 5180MHz	Highest channel 5240MHz
Conducted power [dBm] Measured with OFDM modulation		5.19	5.03
Radiated power [dBm] Measured with OFDM modulation		7.26	7.81
Gain [dBi] Calculated		2.07	2.78
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5260 ~ 5320MHz

T_{nom}	V_{nom}	Lowest channel 5260MHz	Highest channel 5320MHz
Conducted power [dBm] Measured with OFDM modulation		7.57	3.75
Radiated power [dBm] Measured with OFDM modulation		10.21	6.51
Gain [dBi] Calculated		2.64	2.76
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5500 ~ 5700MHz

T_{nom}	V_{nom}	Lowest channel 5500MHz	Highest channel 5700MHz
Conducted power [dBm] Measured with OFDM modulation		2.46	5.87
Radiated power [dBm] Measured with OFDM modulation		5.23	8.15
Gain [dBi] Calculated		2.77	2.28
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5745 ~ 5825MHz

T_{nom}	V_{nom}	Lowest channel 5745MHz	Highest channel 5825MHz
Conducted power [dBm] Measured with OFDM modulation		5.14	4.64
Radiated power [dBm] Measured with OFDM modulation		7.23	7.31
Gain [dBi] Calculated		2.09	2.67
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

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Antenna 1

IEEE 802.11a mode / 5180 ~ 5240MHz

T_{nom}	V_{nom}	Lowest channel 5180MHz	Highest channel 5240MHz
Conducted power [dBm] Measured with OFDM modulation		4.75	4.75
Radiated power [dBm] Measured with OFDM modulation		7.15	7.26
Gain [dBi] Calculated		2.40	2.51
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5260 ~ 5320MHz

T_{nom}	V_{nom}	Lowest channel 5260MHz	Highest channel 5320MHz
Conducted power [dBm] Measured with OFDM modulation		7.74	2.62
Radiated power [dBm] Measured with OFDM modulation		10.42	5.18
Gain [dBi] Calculated		2.68	2.56
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5500 ~ 5700MHz

T_{nom}	V_{nom}	Lowest channel 5500MHz	Highest channel 5700MHz
Conducted power [dBm] Measured with OFDM modulation		1.69	4.67
Radiated power [dBm] Measured with OFDM modulation		4.19	7.26
Gain [dBi] Calculated		2.50	2.59
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5745 ~ 5825MHz

T_{nom}	V_{nom}	Lowest channel 5745MHz	Highest channel 5825MHz
Conducted power [dBm] Measured with OFDM modulation		4.99	4.83
Radiated power [dBm] Measured with OFDM modulation		7.15	7.26
Gain [dBi] Calculated		2.16	2.43
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

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Antenna 2

IEEE 802.11a mode / 5180 ~ 5240MHz

T_{nom}	V_{nom}	Lowest channel 5180MHz	Highest channel 5240MHz
Conducted power [dBm] Measured with OFDM modulation		4.63	4.69
Radiated power [dBm] Measured with OFDM modulation		7.28	7.18
Gain [dBi] Calculated		2.65	2.49
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5260 ~ 5320MHz

T_{nom}	V_{nom}	Lowest channel 5260MHz	Highest channel 5320MHz
Conducted power [dBm] Measured with OFDM modulation		6.12	2.34
Radiated power [dBm] Measured with OFDM modulation		8.53	4.89
Gain [dBi] Calculated		2.41	2.55
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5500 ~ 5700MHz

T_{nom}	V_{nom}	Lowest channel 5500MHz	Highest channel 5700MHz
Conducted power [dBm] Measured with OFDM modulation		0.63	4.38
Radiated power [dBm] Measured with OFDM modulation		3.16	7.26
Gain [dBi] Calculated		2.53	2.88
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode / 5745 ~ 5825MHz

T_{nom}	V_{nom}	Lowest channel 5745MHz	Highest channel 5825MHz
Conducted power [dBm] Measured with OFDM modulation		4.81	4.65
Radiated power [dBm] Measured with OFDM modulation		7.15	7.26
Gain [dBi] Calculated		2.34	2.61
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

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6.4 OUTPUT POWER

6.4.1 LIMIT

According to §15.407(a)& FCC R&O FCC 14 - 30,

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum 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.

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(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.

Note to paragraph (a)(3): The Commission strongly recommends that parties employing U-NII devices to provide critical communications services should determine if there are any nearby Government radar systems that could affect their operation.

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Specified Limit of the Output Power

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
Low	5260	20.33	20.27	20.30	13.08	13.07	13.07	24.08	24.07	24.07	24.00	24.00	24.00
Mid	5300	20.42	20.38	20.33	13.10	13.09	13.08	24.10	24.09	24.08	24.00	24.00	24.00
High	5320	20.09	20.22	20.25	13.03	13.06	13.06	24.03	24.06	24.06	24.00	24.00	24.00

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
Low	5500	20.06	20.07	20.32	13.02	13.03	13.08	24.02	24.03	24.08	24.00	24.00	24.00
Mid	5580	20.13	20.27	20.21	13.04	13.07	13.06	24.04	24.07	24.06	24.00	24.00	24.00
High	5700	20.23	20.13	20.27	13.06	13.04	13.07	24.06	24.04	24.07	24.00	24.00	24.00

Test mode: IEEE 802.11n HT 20 MHz mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
Low	5260	20.60	20.47	20.50	13.14	13.11	13.12	24.14	24.11	24.12	24.00	24.00	24.00
Mid	5300	20.53	20.54	20.42	13.12	13.13	13.10	24.12	24.13	24.10	24.00	24.00	24.00
High	5320	20.72	20.66	20.65	13.16	13.15	13.15	24.16	24.15	24.15	24.00	24.00	24.00

Test mode: IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
Low	5500	20.63	20.42	20.60	13.14	13.10	13.14	24.14	24.10	24.14	24.00	24.00	24.00
Mid	5580	20.46	20.64	20.52	13.11	13.15	13.12	24.11	24.15	24.12	24.00	24.00	24.00
High	5700	20.50	20.59	20.69	13.12	13.14	13.16	24.12	24.14	24.16	24.00	24.00	24.00

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IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
Low	5270	40.10	39.96	39.96	16.03	16.02	16.02	27.03	27.02	27.02	24.00	24.00	24.00
High	5310	39.95	39.91	40.10	16.02	16.01	16.03	27.02	27.01	27.03	24.00	24.00	24.00

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
Low	5510	40.17	40.00	40.05	16.04	16.02	16.03	27.04	27.02	27.03	24.00	24.00	24.00
Mid	5550	39.91	40.32	39.94	16.01	16.06	16.01	27.01	27.06	27.01	24.00	24.00	24.00
High	5670	40.36	39.96	40.03	16.06	16.02	16.02	27.06	27.02	27.02	24.00	24.00	24.00

IEEE 802.11ac 80 mode / 5290MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
	5290	82.49	81.91	82.60	19.16	19.13	19.17	30.16	30.13	30.17	24.00	24.00	24.00

IEEE 802.11ac 80 mode / 5530MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz) Antenna			10*Log(B) (dB) Antenna			11 + 10*Log(B) (dBm) Antenna			Maximum Conducted Output Power Limit (dBm) Antenna		
		0	1	2	0	1	2	0	1	2	0	1	2
	5530	82.63	82.30	82.55	19.17	19.15	19.17	30.17	30.15	30.17	24.00	24.00	24.00

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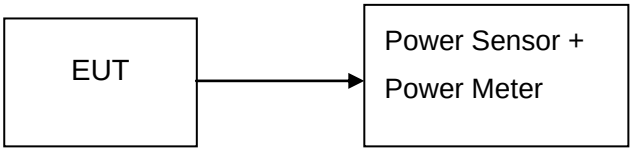
6.4.2 MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Power Meter	Anritsu	ML2495A	1204003	02/21/2017	02/20/2018
Power Sensor	Anritsu	MA2411B	1126150	02/21/2017	02/20/2018

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.4.3 TEST CONFIGURATIONS



6.4.4 TEST PROCEDURE

The EUT was connected to a Power Meter through a 50Ω RF cable.

6.4.5 TEST RESULTS

No non-compliance noted

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6.4.6 TEST DATA

IEEE 802.11a mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)			AVG Output Power (W)			Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 0	Antenna 1	Antenna 2		
Low	5180	18.25	17.80	17.70	0.06683	0.06026	0.05888	30.00	PASS
Mid	5200	18.10	17.72	17.70	0.06457	0.05916	0.05888		PASS
High	5240	18.10	17.79	17.77	0.06457	0.06012	0.05984		PASS

IEEE 802.11a mode / 5260~ 5320MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)			AVG Output Power (W)			Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 0	Antenna 1	Antenna 2		
Low	5260	20.65	20.81	19.19	0.11614	0.12050	0.08299	24.00	PASS
Mid	5300	20.08	19.05	18.94	0.10186	0.08035	0.07834		PASS
High	5320	16.78	15.68	15.40	0.04764	0.03698	0.03467		PASS

IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)			AVG Output Power (W)			Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 0	Antenna 1	Antenna 2		
Low	5500	15.48	14.72	13.71	0.03532	0.02965	0.02350	24.00	PASS
Mid	5580	20.01	19.52	19.14	0.10023	0.08954	0.08204		PASS
High	5700	18.93	17.71	17.45	0.07816	0.05902	0.05559		PASS

IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)			AVG Output Power (W)			Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 0	Antenna 1	Antenna 2		
Low	5745	18.21	18.06	17.87	0.06622	0.06397	0.06124	30.00	PASS
Mid	5785	22.06	22.34	22.46	0.16069	0.17140	0.17620		PASS
High	5825	17.71	17.89	17.68	0.05902	0.06152	0.05861		PASS

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IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5180	8.36	11.90	11.89	15.77	0.03780	28.23	PASS
Mid	5200	8.98	12.01	11.88	15.93	0.03921		PASS
High	5240	7.63	11.97	11.59	15.56	0.03596		PASS

IEEE 802.11n HT 20 MHz mode / 5260~ 5320MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5260	16.13	16.44	16.00	20.97	0.12489	22.23	PASS
Mid	5300	15.78	16.36	15.53	20.68	0.11682		PASS
High	5320	9.45	9.23	8.57	13.87	0.02438		PASS

IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5500	10.96	8.22	13.42	16.14	0.04109	22.23	PASS
Mid	5580	15.42	15.41	14.64	19.94	0.09869		PASS
High	5700	15.36	13.91	13.75	19.17	0.08267		PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5745	14.20	14.97	13.92	19.16	0.08237	28.23	PASS
Mid	5785	22.55	22.48	22.61	27.32	0.53929		PASS
High	5825	14.03	14.21	14.13	18.90	0.07754		PASS

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IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5190	11.96	11.56	11.65	16.50	0.04465	28.23	PASS
High	5230	11.88	11.70	11.59	16.50	0.04463		PASS

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5270	17.45	17.02	16.49	21.78	0.15051	22.23	PASS
High	5310	13.17	11.32	14.01	17.74	0.05948		PASS

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5510	13.15	12.03	10.97	16.91	0.04912	22.23	PASS
Mid	5550	17.01	16.53	16.92	21.60	0.14442		PASS
High	5670	15.96	15.07	14.48	19.98	0.09964		PASS

CC

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
Low	5775	16.69	16.70	16.62	21.44	0.13936	28.23	PASS
High	5795	16.41	16.76	16.68	21.39	0.13774		PASS

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IEEE 802.11ac 80 mode / 5210MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
	5210	9.72	9.48	9.14	14.22	0.02645	28.23	PASS

IEEE 802.11ac 80 mode / 5290MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
	5290	9.65	7.35	8.19	13.27	0.02125	22.23	PASS

IEEE 802.11ac 80 mode / 5530MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
	5530	12.27	11.34	11.36	16.45	0.04416	22.23	PASS

IEEE 802.11ac 80 mode / 5775MHz

Channel	Frequency (MHz)	AVG Output Power (dBm)				AVG Output Power (W)	Limit (dBm)	Result
		Antenna 0	Antenna 1	Antenna 2	Total			
	5775	18.09	17.77	17.70	22.63	0.18314	28.23	PASS

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6.5 BAND EDGES MEASUREMENT

6.5.1 LIMIT

According to §15.407(b)

(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

6.5.2 MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site 966（2）					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2017	02/20/2018
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2017	02/20/2018
Amplifier	EMEC	EM330	060661	03/18/2017	03/17/2018
High Noise Amplifier	Agilent	8449B	3008A01838	02/21/2017	02/20/2018
Loop Antenna	COM-POWER	AL-130	121044	09/25/2016	09/24/2017
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/21/2017	02/20/2018
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/27/2017	02/27/2018
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/27/2017	02/27/2018
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2017	02/20/2018
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

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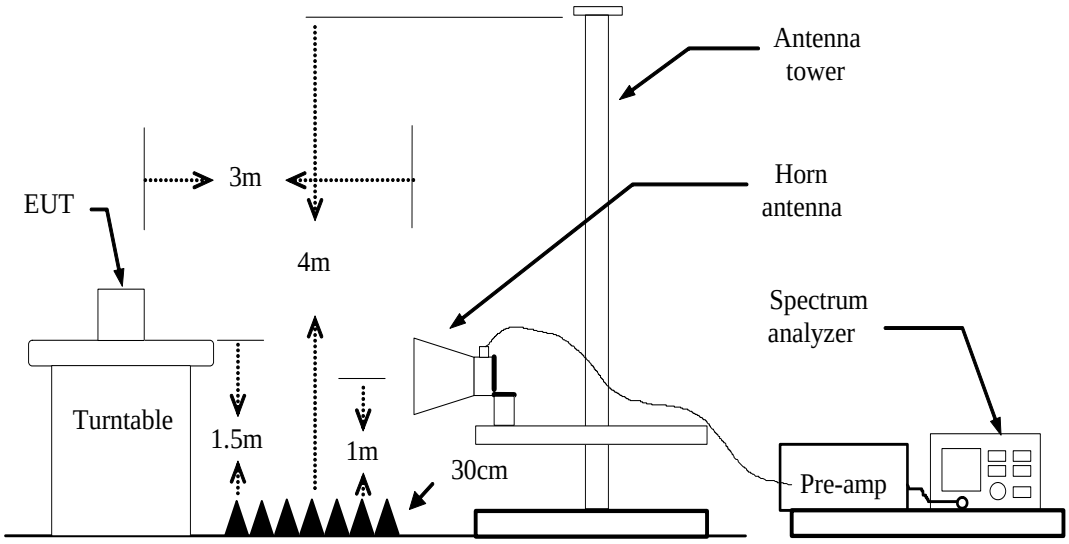
6.5.3 TEST CONFIGURATION



6.5.4 TEST PROCEDURE

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

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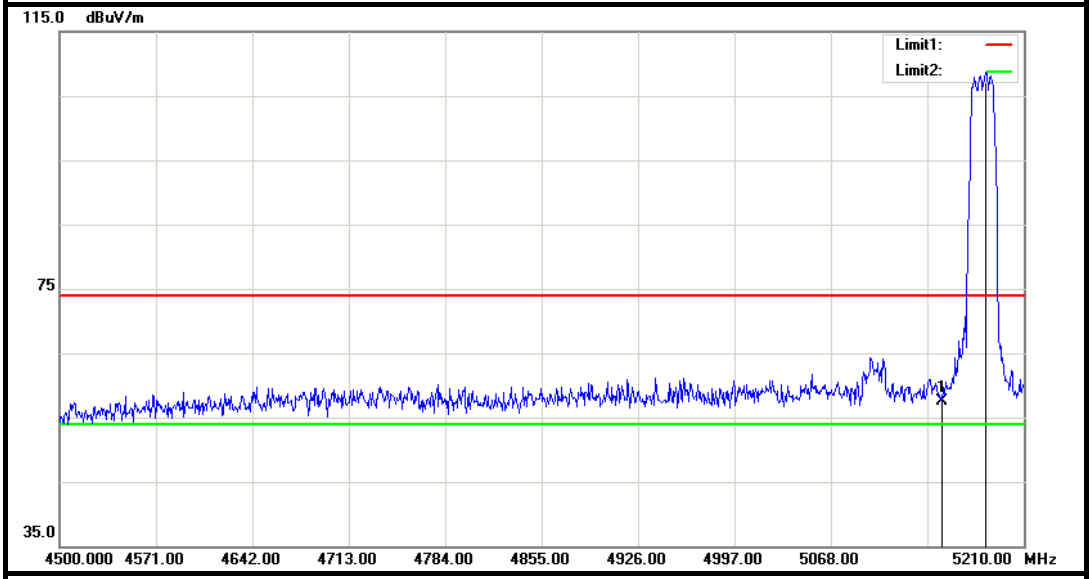
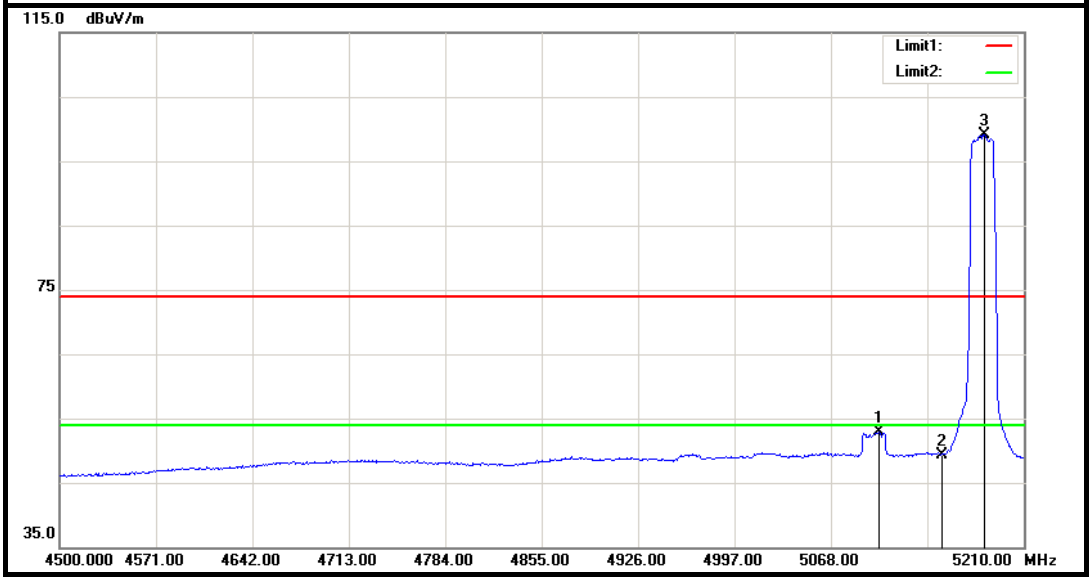
6.5.5 TEST RESULT

Test Plot
IEEE 802.11a mode / 5180MHz (Antenna 0)

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.34	5.25	57.59	74.00	-16.41	Peak	Vertical
2	5181.979	103.31	5.30	108.61	---	---	Peak	Vertical
1	5103.835	47.65	5.16	52.81	54.00	-1.19	Average	Vertical
2	5150.000	44.15	5.25	49.40	54.00	-4.60	Average	Vertical
3	5181.190	93.81	5.30	99.11	---	---	Average	Vertical

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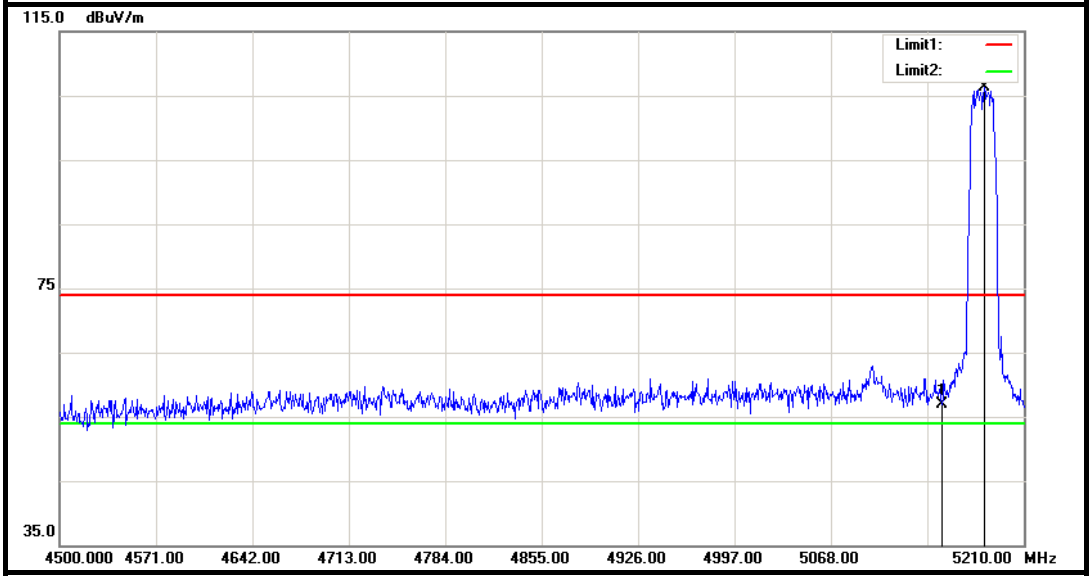
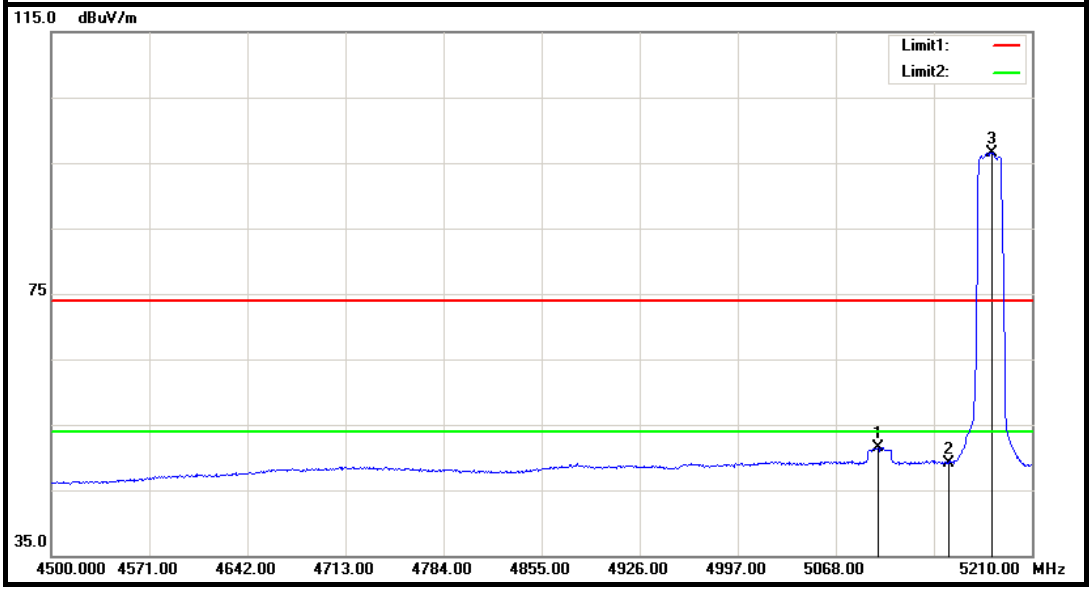
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	51.60	5.25	56.85	74.00	-17.15	Peak	Horizontal
2	5181.584	101.03	5.30	106.33	---	---	Peak	Horizontal
1	5099.100	46.40	5.16	51.56	54.00	-2.44	Average	Horizontal
2	5150.000	43.92	5.25	49.17	54.00	-4.83	Average	Horizontal
3	5180.795	91.25	5.30	96.55	---	---	Average	Horizontal

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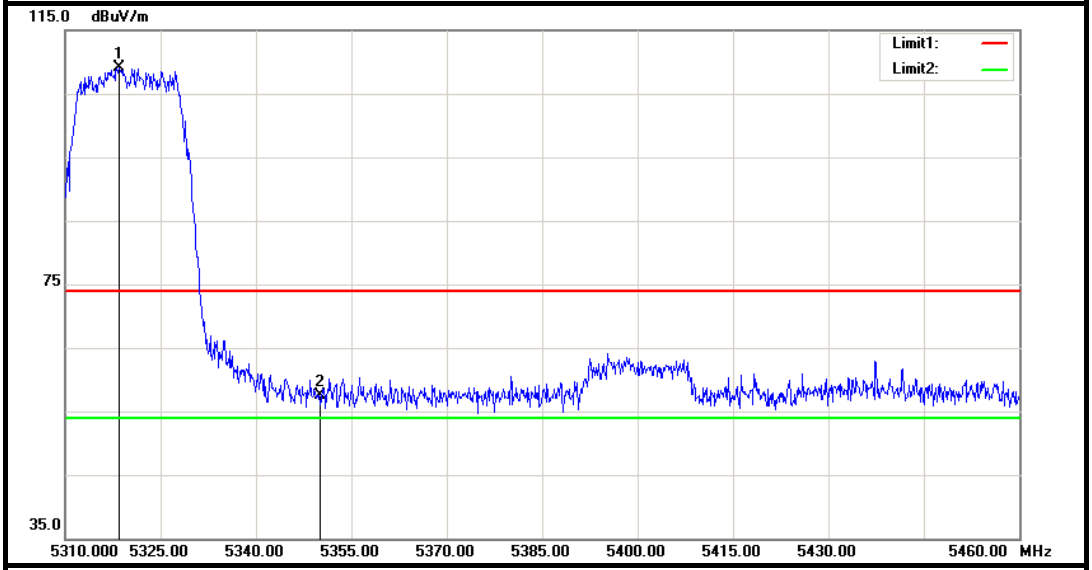
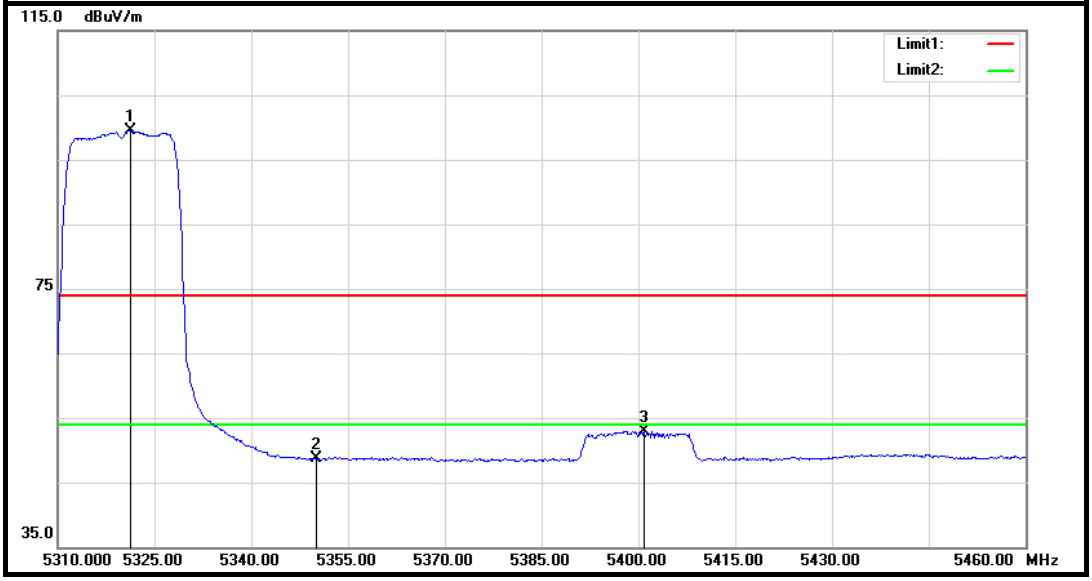
IEEE 802.11a mode / 5320MHz (Antenna 0)

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5318.421	103.46	5.55	109.01	---	---	Peak	Vertical
2	5350.000	51.94	5.60	57.54	74.00	-16.46	Peak	Vertical
1	5321.256	94.00	5.55	99.55	---	---	Average	Vertical
2	5350.000	43.09	5.60	48.69	54.00	-5.31	Average	Vertical
3	5400.967	47.24	5.69	52.93	54.00	-1.07	Average	Vertical

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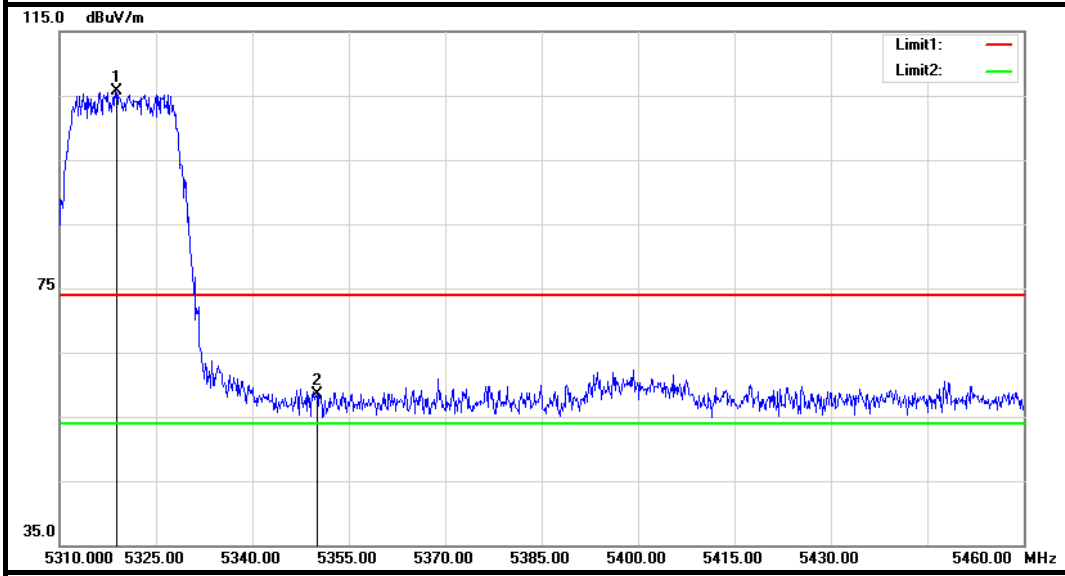
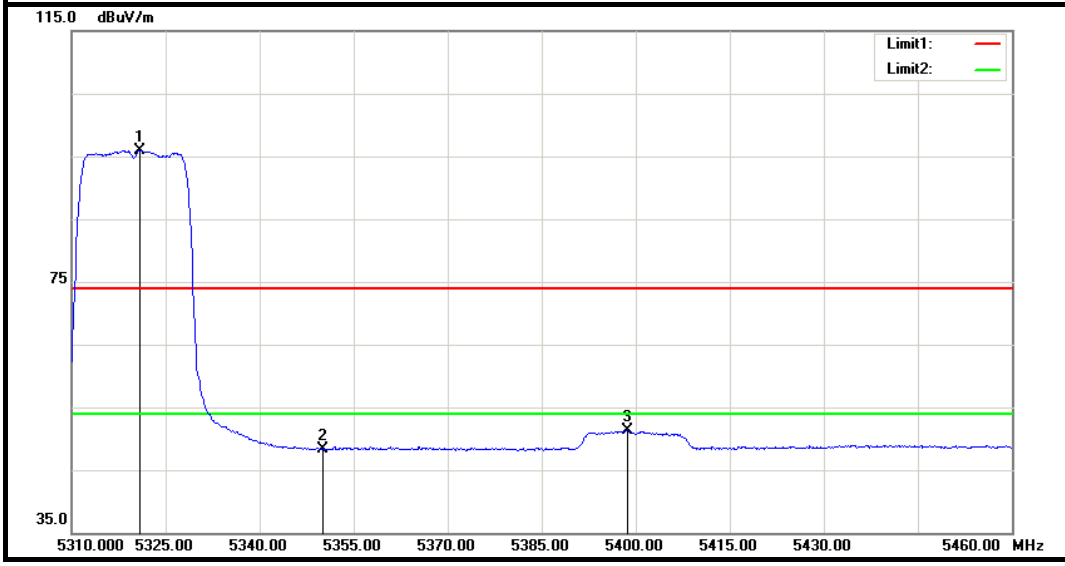
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5318.838	100.10	5.55	105.65	---	---	Peak	Horizontal
2	5350.000	52.99	5.60	58.59	74.00	-15.41	Peak	Horizontal
1	5321.006	90.44	5.55	95.99	---	---	Average	Horizontal
2	5350.000	42.80	5.60	48.40	54.00	-5.60	Average	Horizontal
3	5398.632	45.54	5.69	51.23	54.00	-2.77	Average	Horizontal

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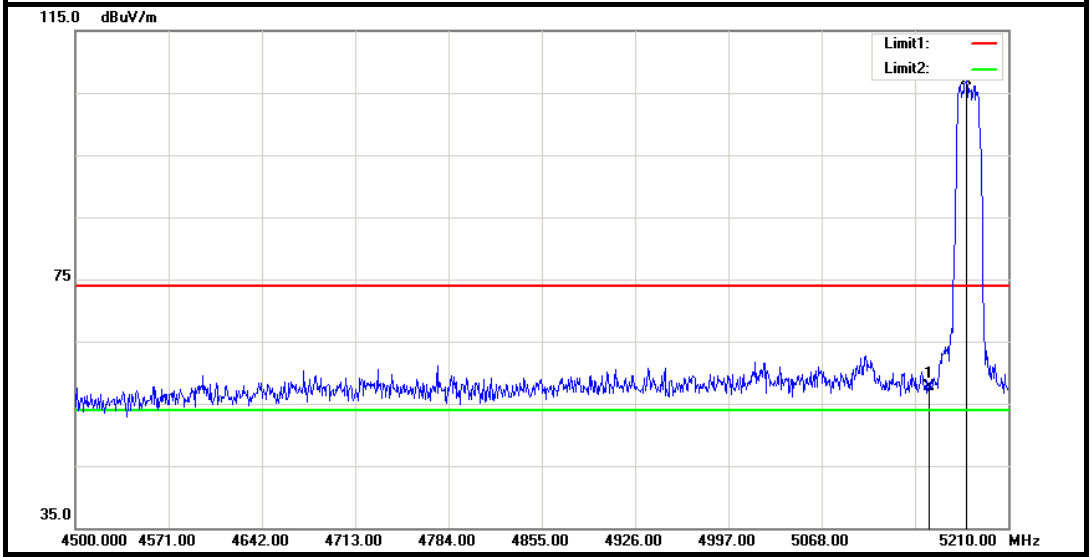
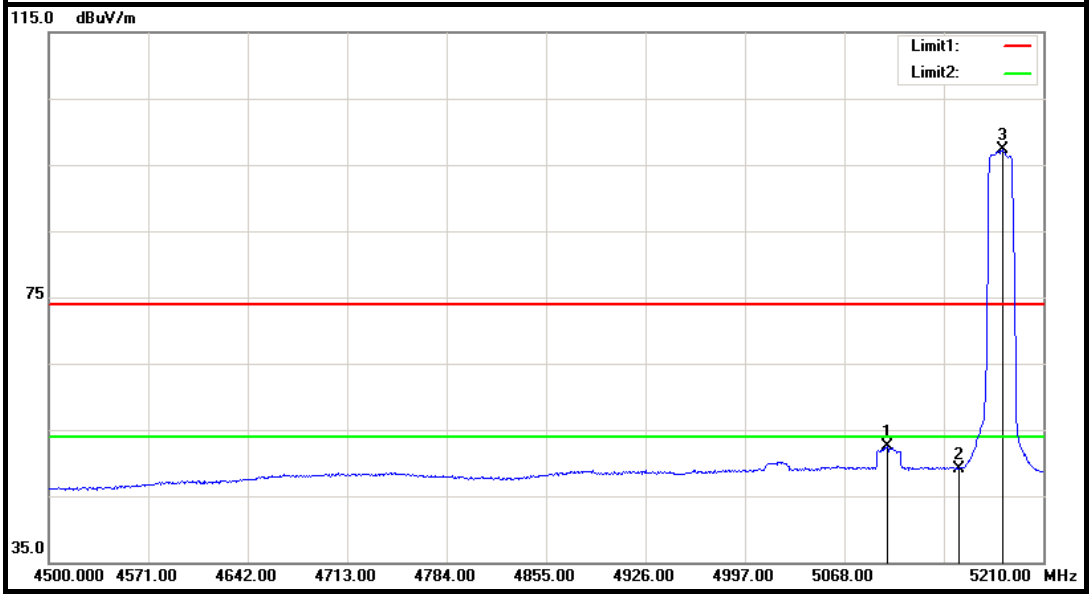
IEEE 802.11a mode / 5180MHz (Antenna 1)

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.46	5.25	57.71	74.00	-16.29	Peak	Vertical
2	5178.427	101.56	5.30	106.86	---	---	Peak	Vertical
1	5099.100	47.29	5.16	52.45	54.00	-1.55	Average	Vertical
2	5150.000	43.91	5.25	49.16	54.00	-4.84	Average	Vertical
3	5181.190	91.94	5.30	97.24	---	---	Average	Vertical

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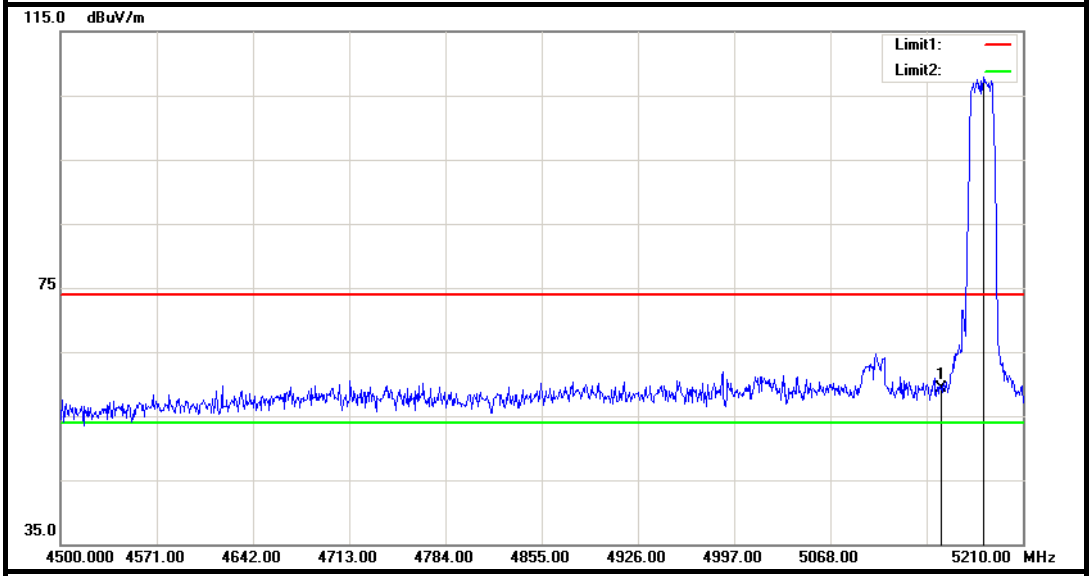
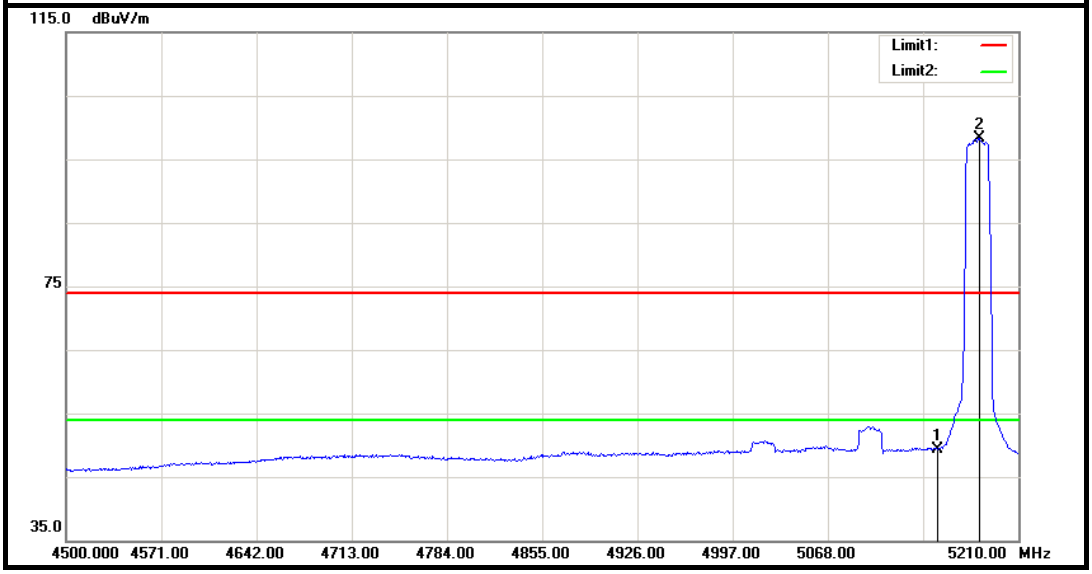
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	54.06	5.25	59.31	74.00	-14.69	Peak	Horizontal
2	5181.584	102.64	5.30	107.94	---	---	Peak	Horizontal
1	5150.000	44.06	5.25	49.31	54.00	-4.69	Average	Horizontal
2	5181.190	93.04	5.30	98.34	---	---	Average	Horizontal

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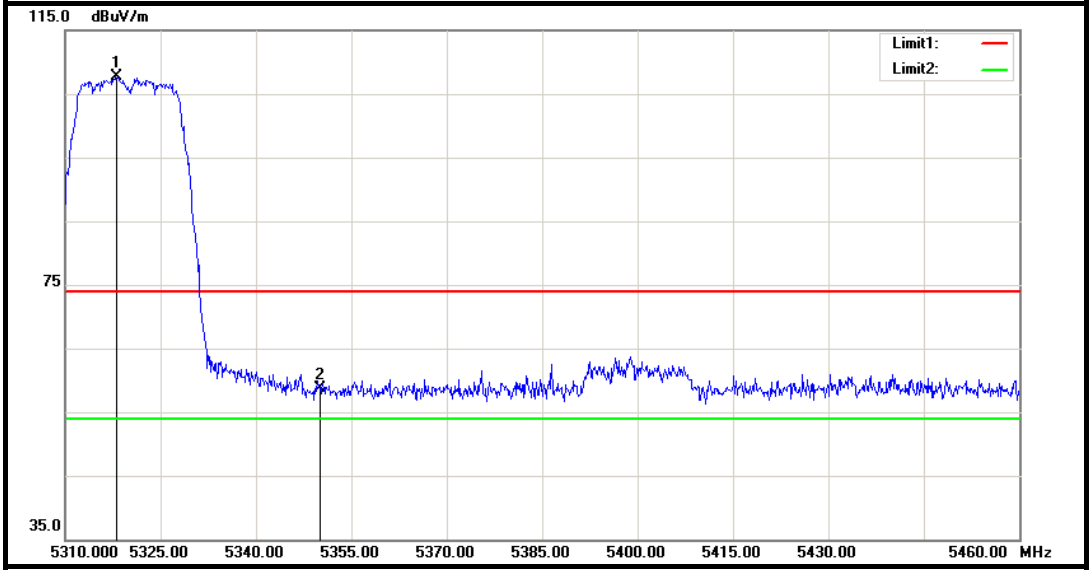
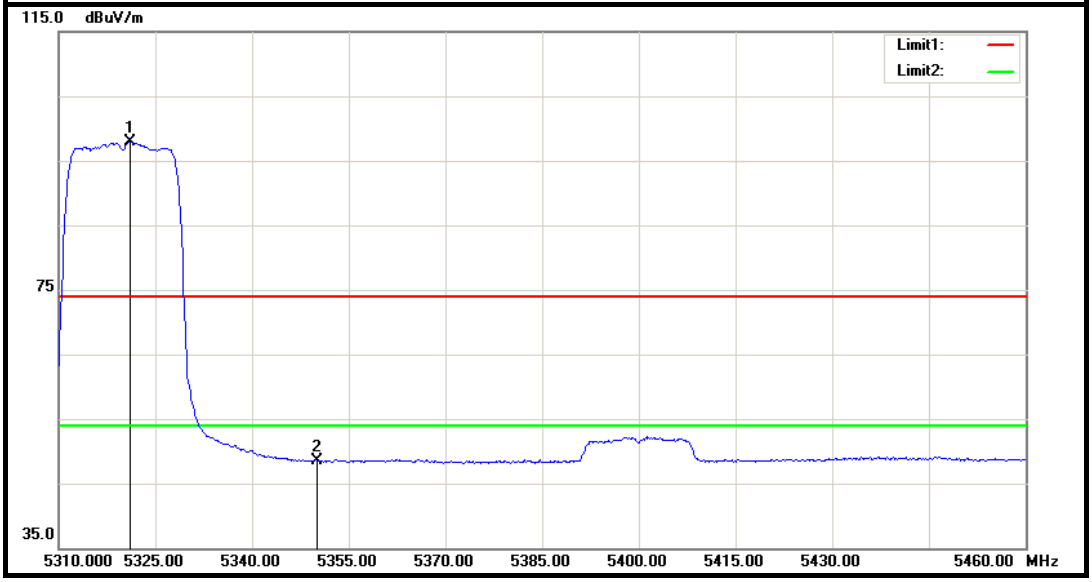
IEEE 802.11a mode / 5320MHz (Antenna 1)

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5318.004	102.13	5.55	107.68	---	---	Peak	Vertical
2	5350.000	53.08	5.60	58.68	74.00	-15.32	Peak	Vertical
1	5321.089	92.37	5.55	97.92	---	---	Average	Vertical
2	5350.000	42.86	5.60	48.46	54.00	-5.54	Average	Vertical

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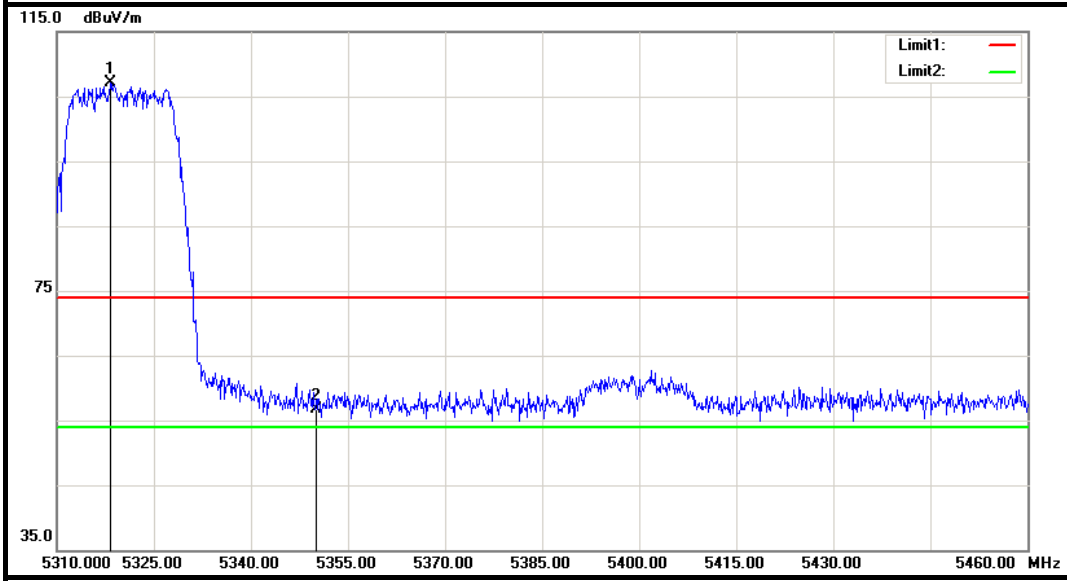
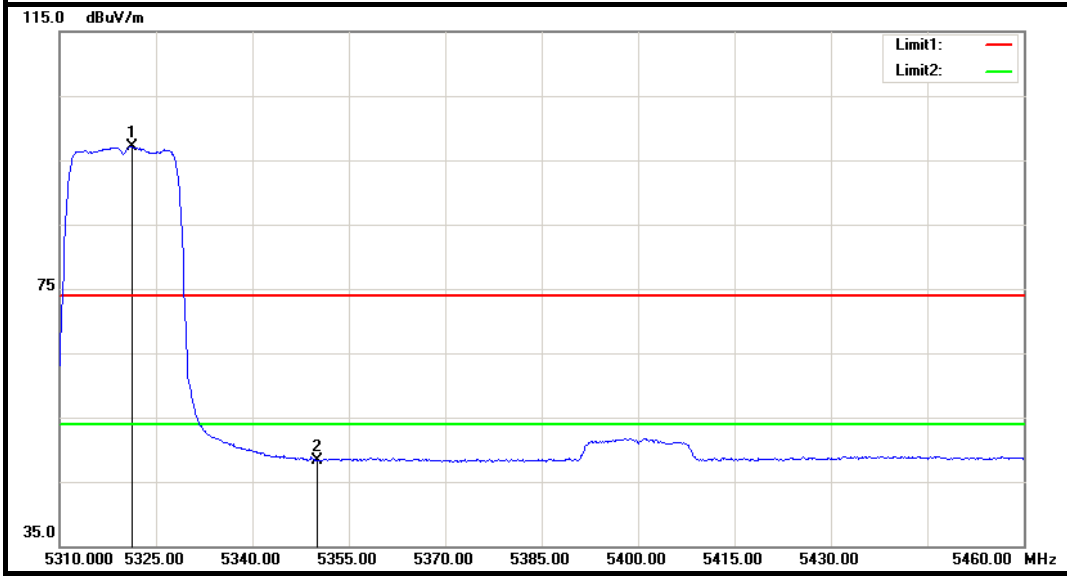
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5318.338	101.53	5.55	107.08	---	---	Peak	Horizontal
2	5350.000	51.01	5.60	56.61	74.00	-17.39	Peak	Horizontal
1	5321.256	91.59	5.55	97.14	---	---	Average	Horizontal
2	5350.000	42.74	5.60	48.34	54.00	-5.66	Average	Horizontal

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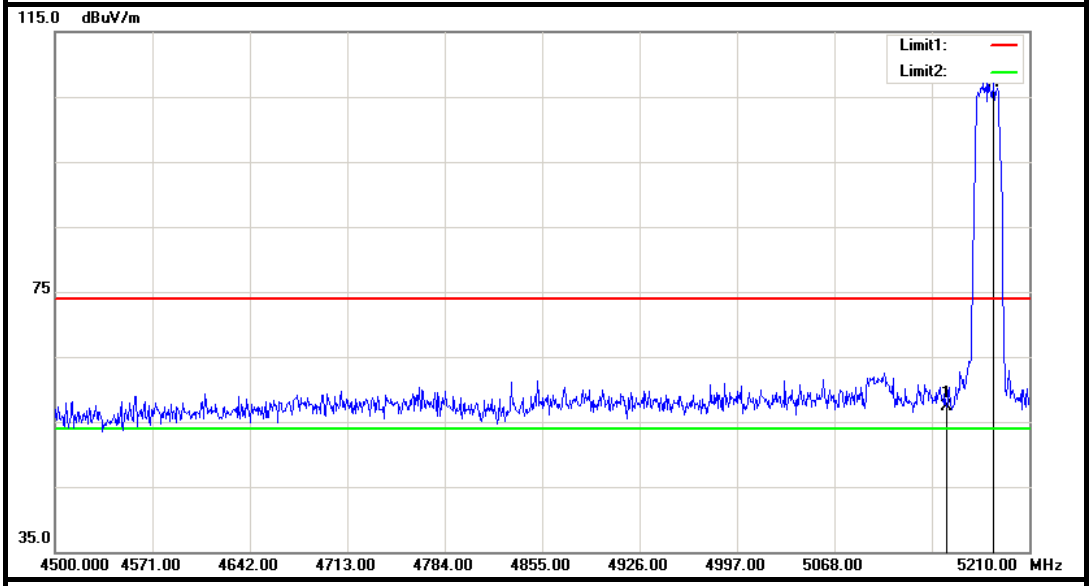
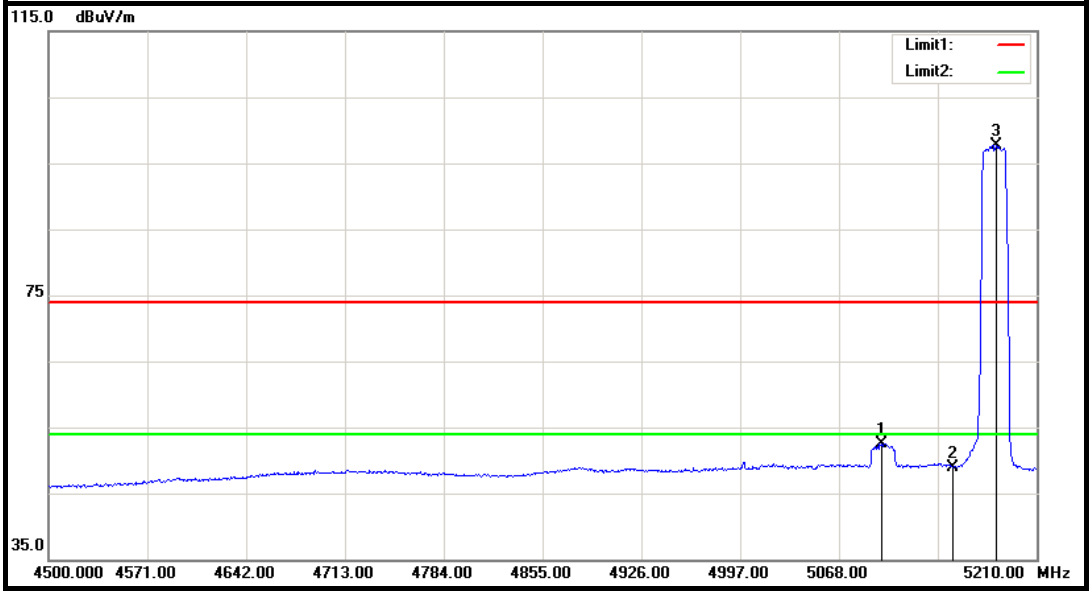
IEEE 802.11a mode / 5180MHz (Antenna 2)

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.03	5.25	57.28	74.00	-16.72	Peak	Vertical
2	5183.952	101.86	5.31	107.17	---	---	Peak	Vertical
1	5099.100	47.34	5.16	52.50	54.00	-1.50	Average	Vertical
2	5150.000	43.56	5.25	48.81	54.00	-5.19	Average	Vertical
3	5181.584	92.48	5.30	97.78	---	---	Average	Vertical

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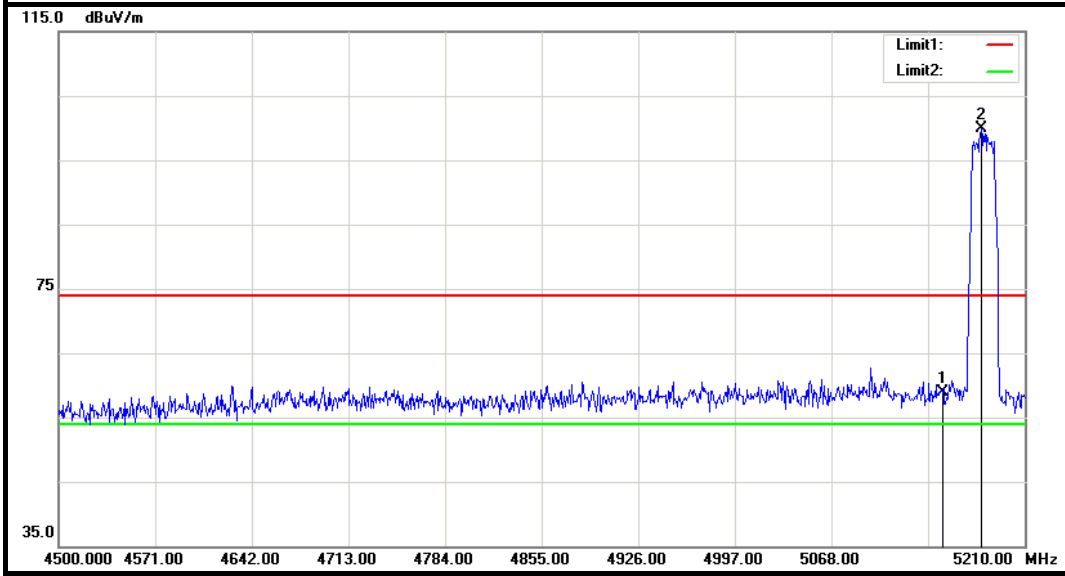
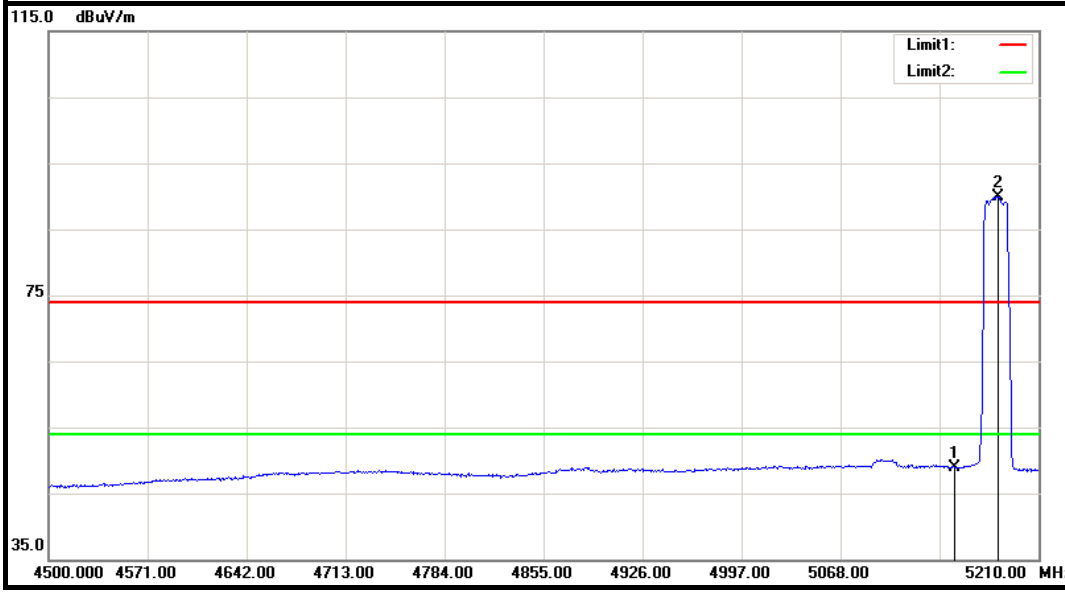
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	53.56	5.25	58.81	74.00	-15.19	Peak	Horizontal
2	5178.427	94.63	5.30	99.93	---	---	Peak	Horizontal
1	5150.000	43.61	5.25	48.86	54.00	-5.14	Average	Horizontal
2	5180.795	84.62	5.30	89.92	---	---	Average	Horizontal

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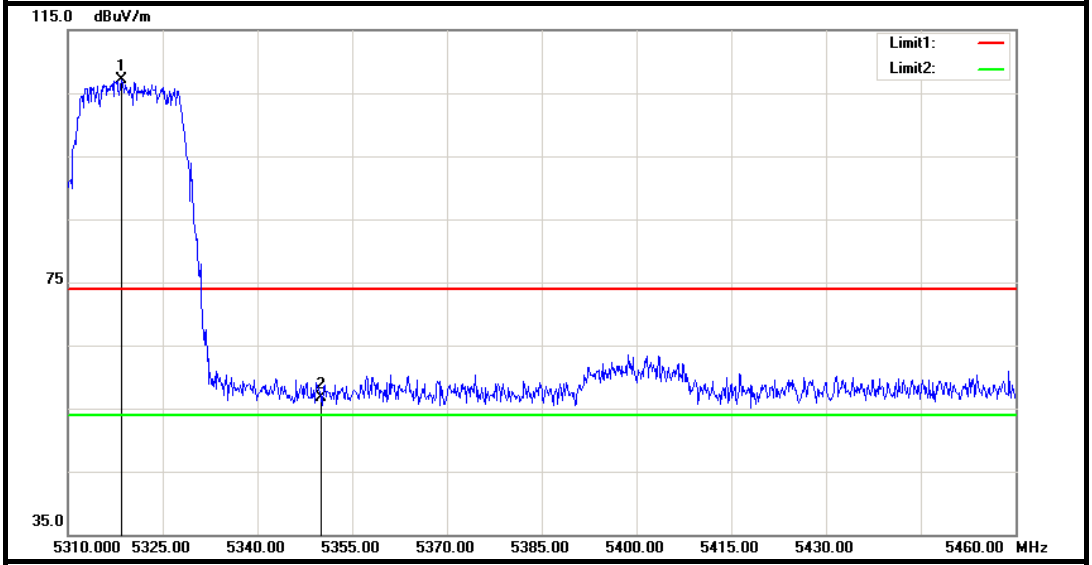
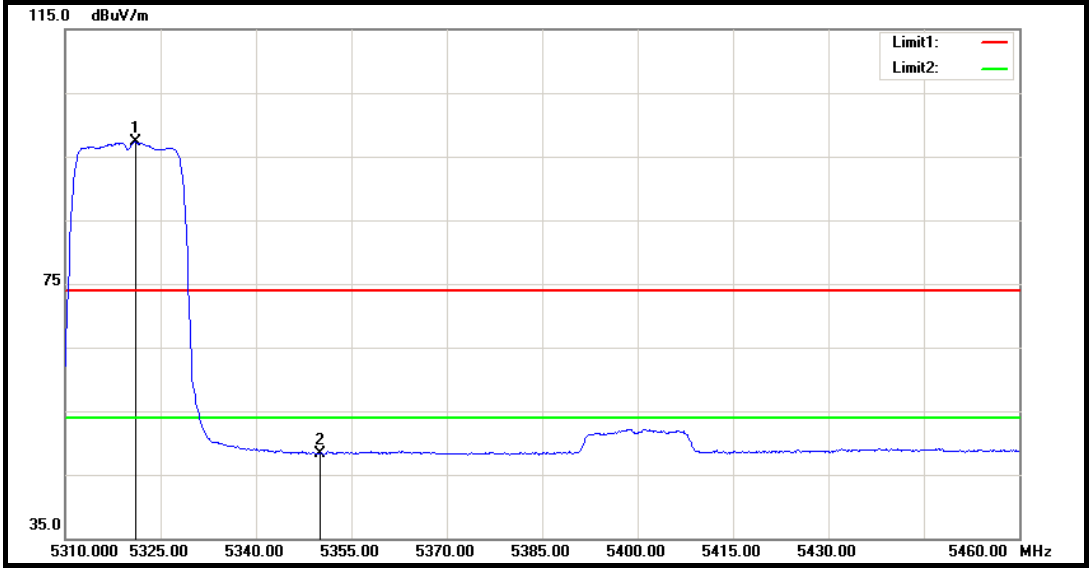
IEEE 802.11a mode / 5320MHz (Antenna 2)

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5318.505	101.47	5.55	107.02	---	---	Peak	Vertical
2	5350.000	51.01	5.60	56.61	74.00	-17.39	Peak	Vertical
1	5321.173	91.74	5.55	97.29	---	---	Average	Vertical
2	5350.000	42.70	5.60	48.30	54.00	-5.70	Average	Vertical

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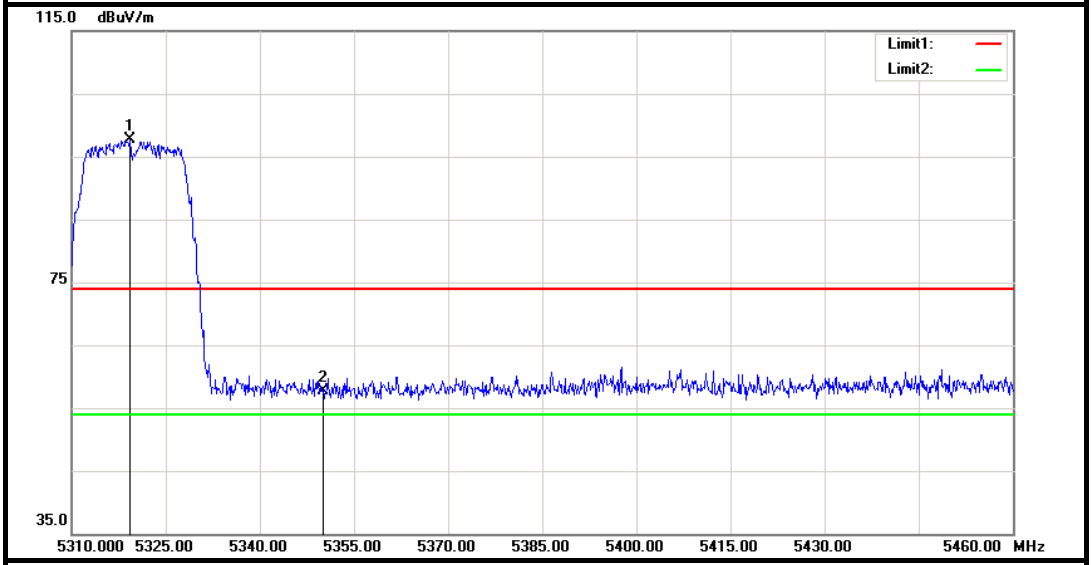
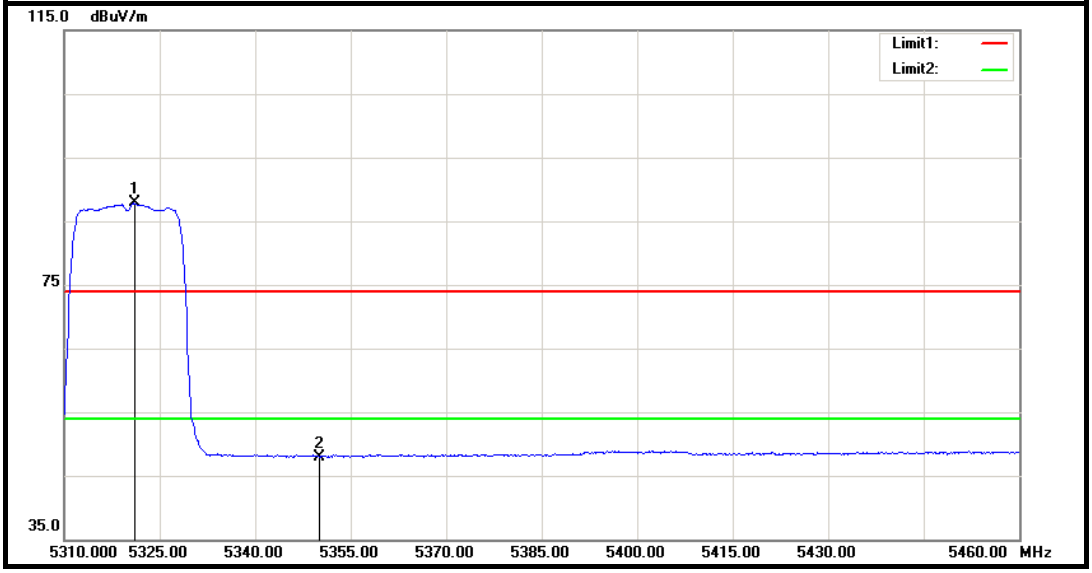
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5321.089	82.29	5.55	87.84	---	---	Peak	Horizontal
2	5350.000	42.36	5.60	47.96	54.00	-6.04	Peak	Horizontal
1	5319.339	92.13	5.55	97.68	---	---	Average	Horizontal
2	5350.000	52.14	5.60	57.74	74.00	-16.26	Average	Horizontal

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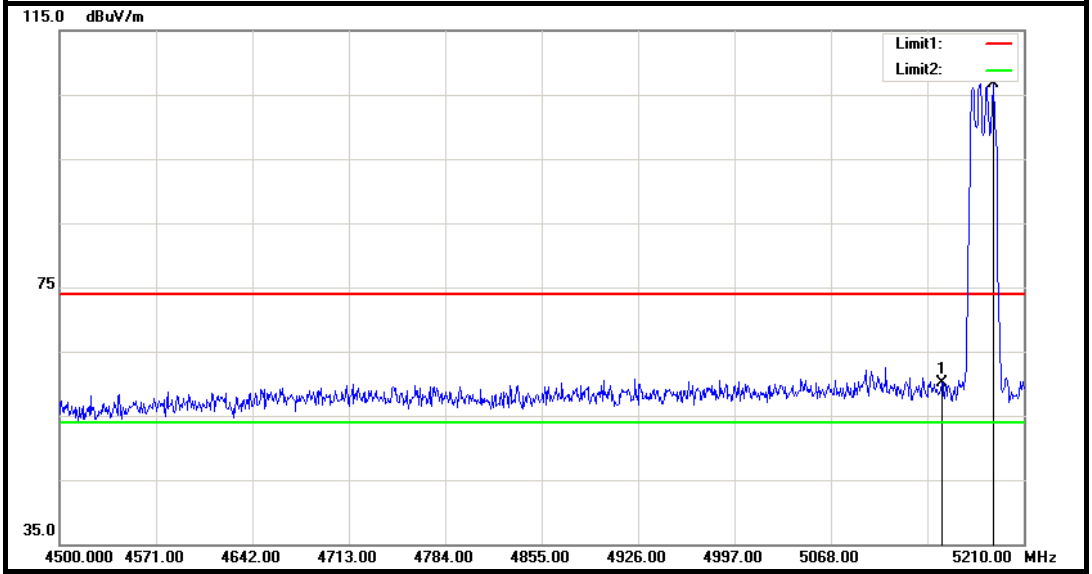
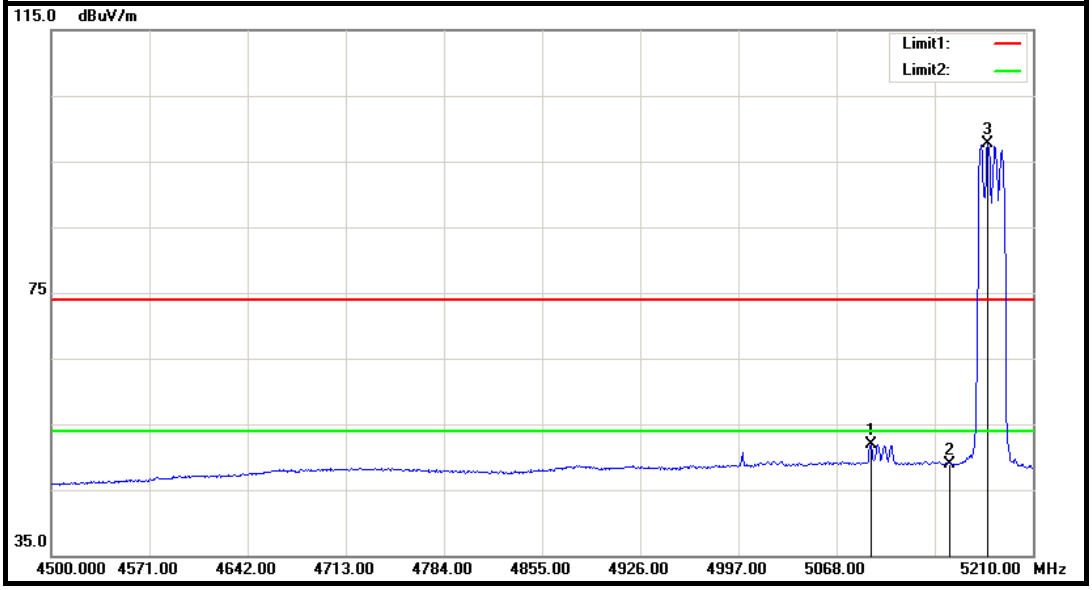
Combine with Antenna 0 and Antenna 1 and Antenna 2
IEEE 802.11n HT 20 MHz mode / 5180 MHz

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	54.94	5.25	60.19	74.00	-13.81	Peak	Vertical
2	5187.990	101.32	5.31	106.63	---	---	Peak	Vertical
1	5092.850	46.68	5.15	51.83	54.00	-2.17	Average	Vertical
2	5150.000	43.62	5.25	48.87	54.00	-5.13	Average	Vertical
3	5177.340	92.42	5.30	97.72	---	---	Average	Vertical

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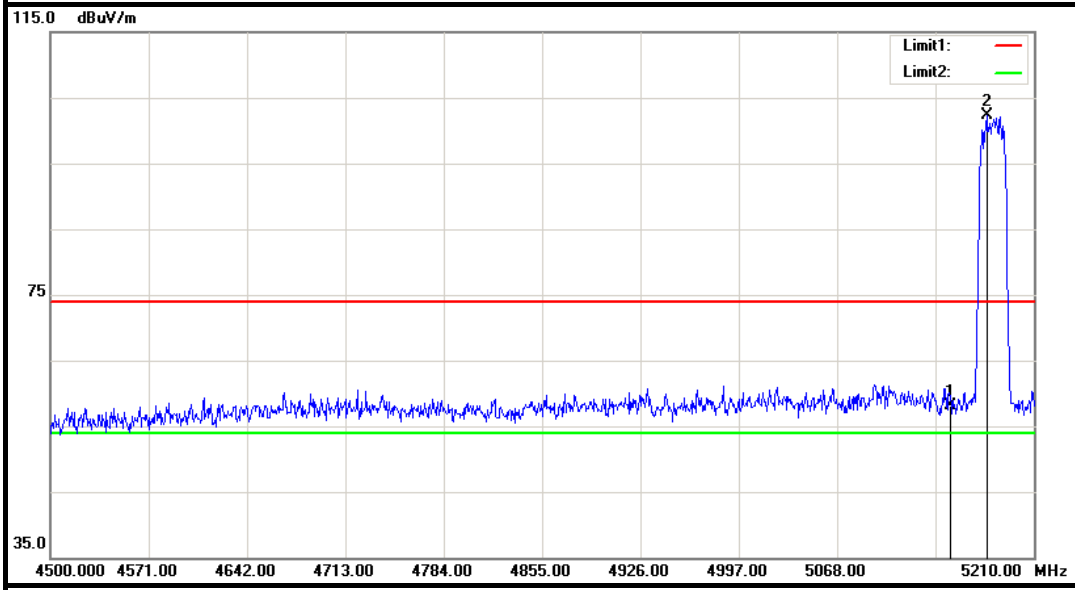
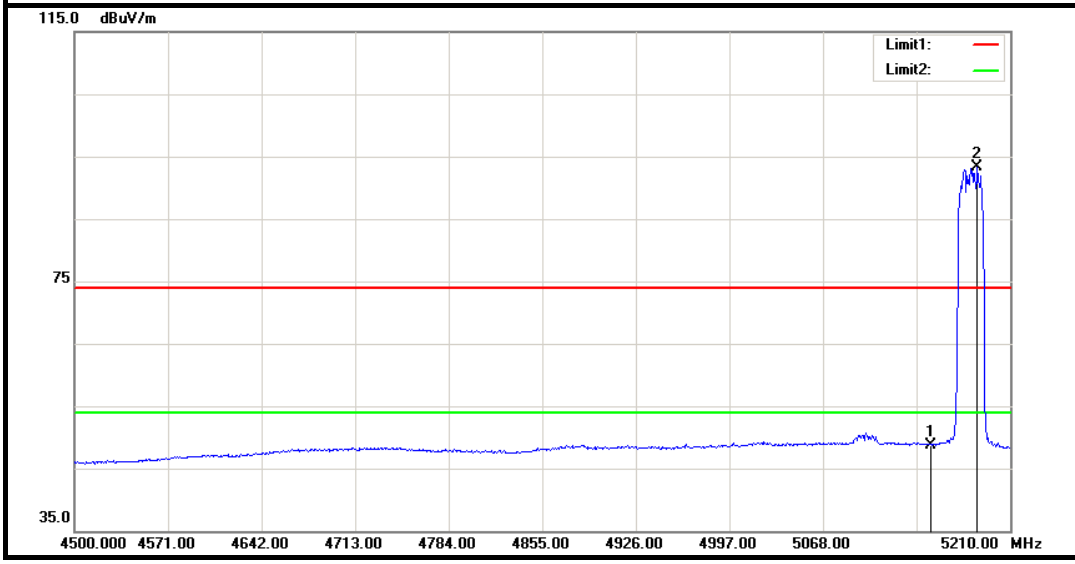
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.83	5.25	58.08	74.00	-15.92	Peak	Horizontal
2	5175.920	97.06	5.29	102.35	---	---	Peak	Horizontal
1	5150.000	43.50	5.25	48.75	54.00	-5.25	Average	Horizontal
2	5185.150	87.92	5.31	93.23	---	---	Average	Horizontal

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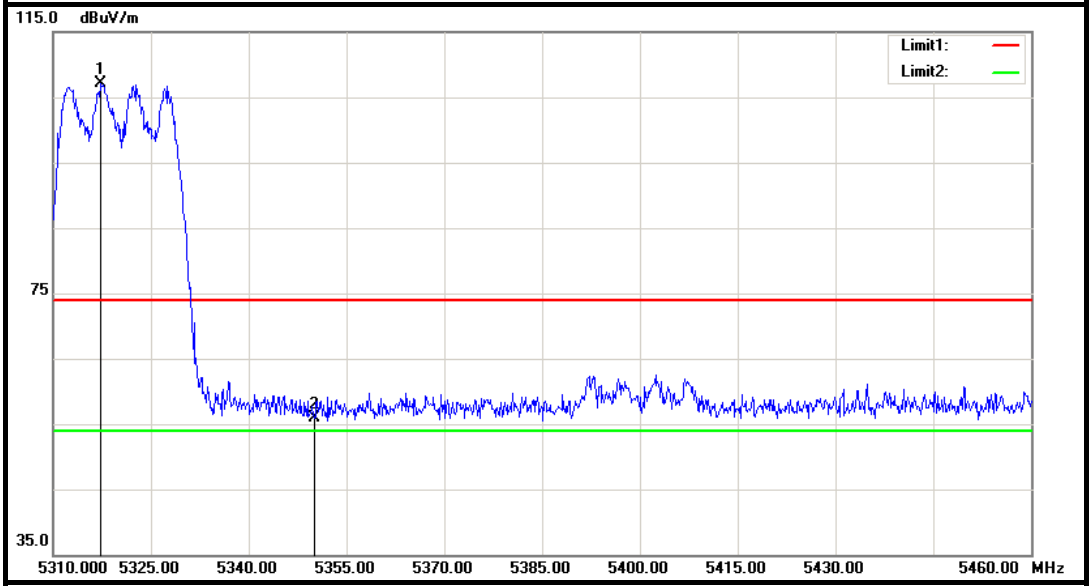
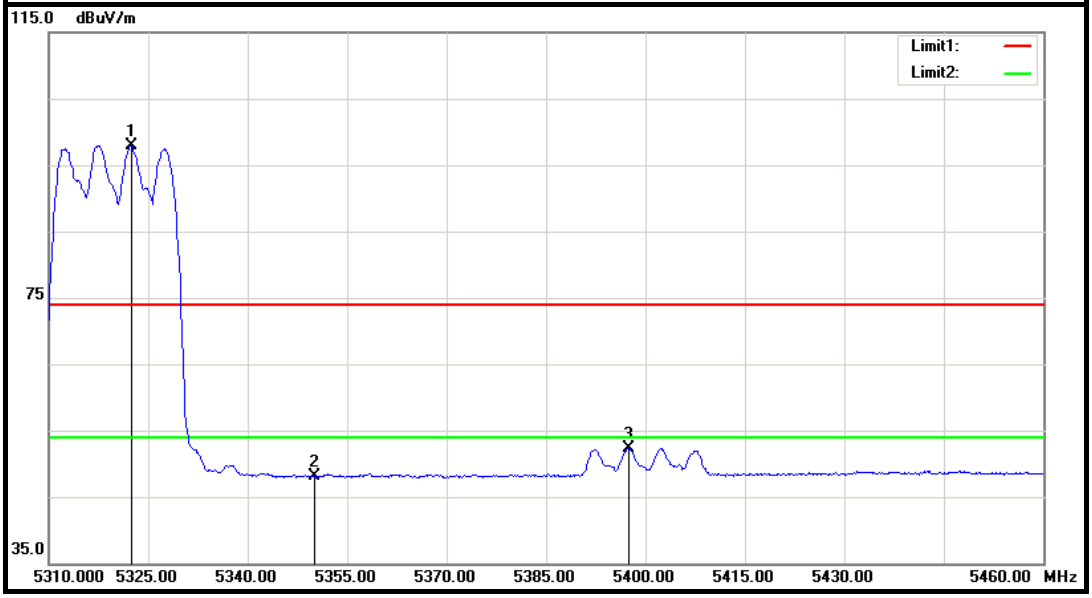
IEEE 802.11n HT 20 MHz mode / 5320 MHz

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5317.350	101.54	5.54	107.08	---	---	Peak	Vertical
2	5350.000	50.40	5.60	56.00	74.00	-18.00	Peak	Vertical
1	5322.450	92.45	5.55	98.00	---	---	Average	Vertical
2	5350.000	42.49	5.60	48.09	54.00	-5.91	Average	Vertical
3	5397.450	46.64	5.69	52.33	54.00	-1.67	Average	Vertical

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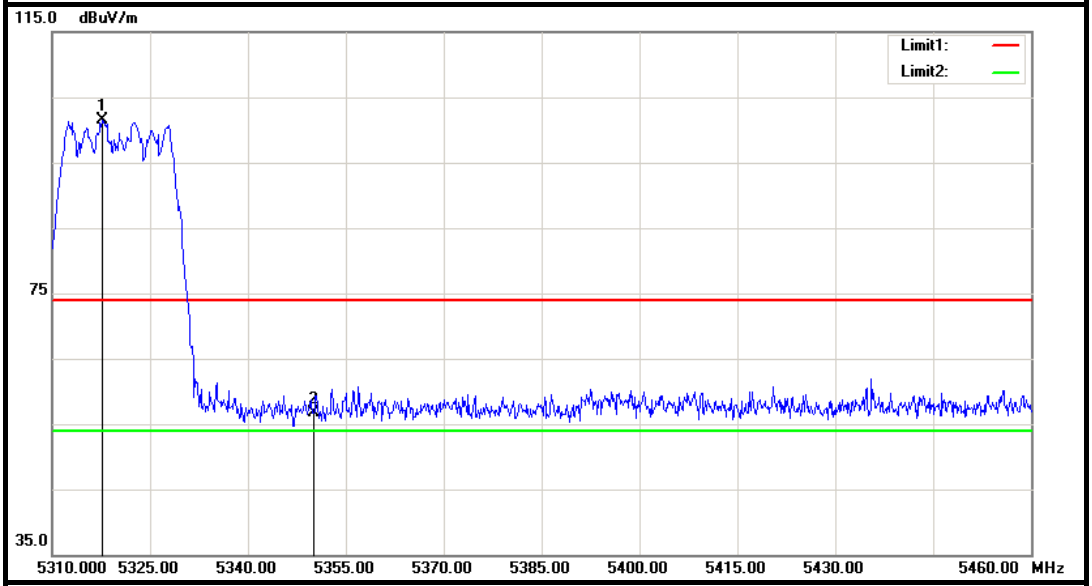
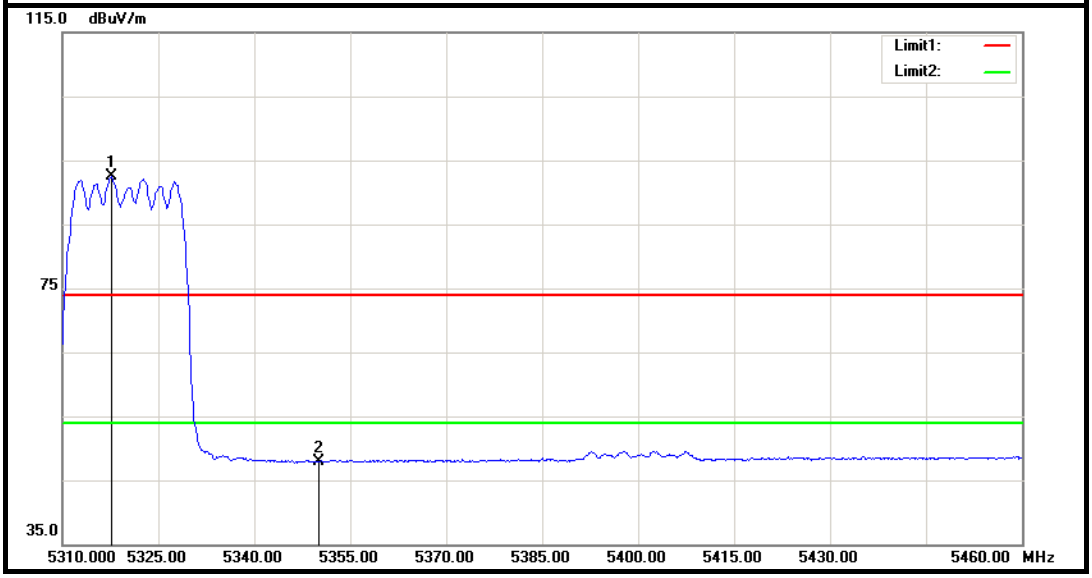
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5317.650	96.01	5.55	101.56	---	---	Peak	Horizontal
2	5350.000	51.09	5.60	56.69	74.00	-17.31	Peak	Horizontal
1	5317.650	86.87	5.55	92.42	---	---	Average	Horizontal
2	5350.000	42.31	5.60	47.91	54.00	-6.09	Average	Horizontal

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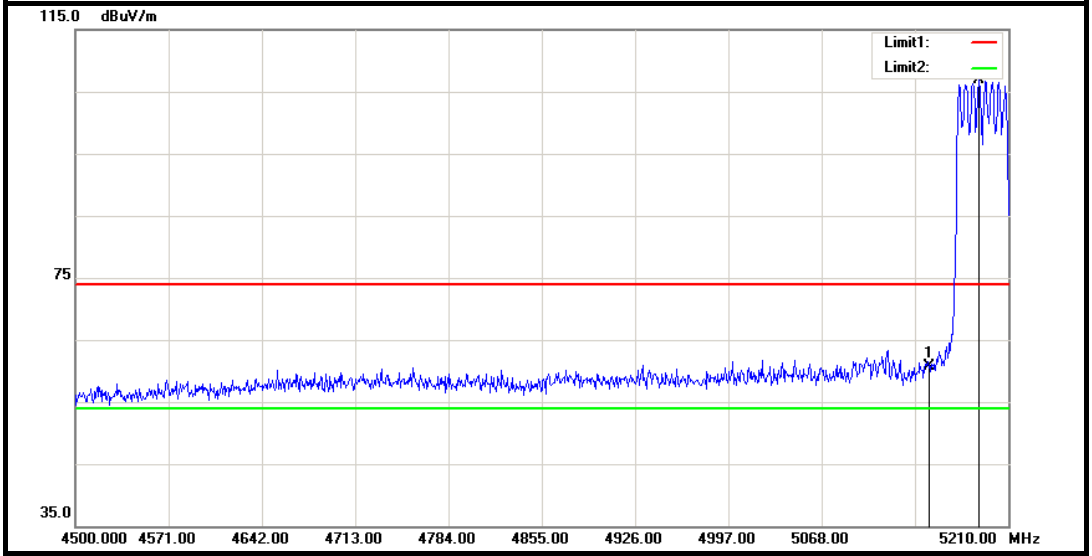
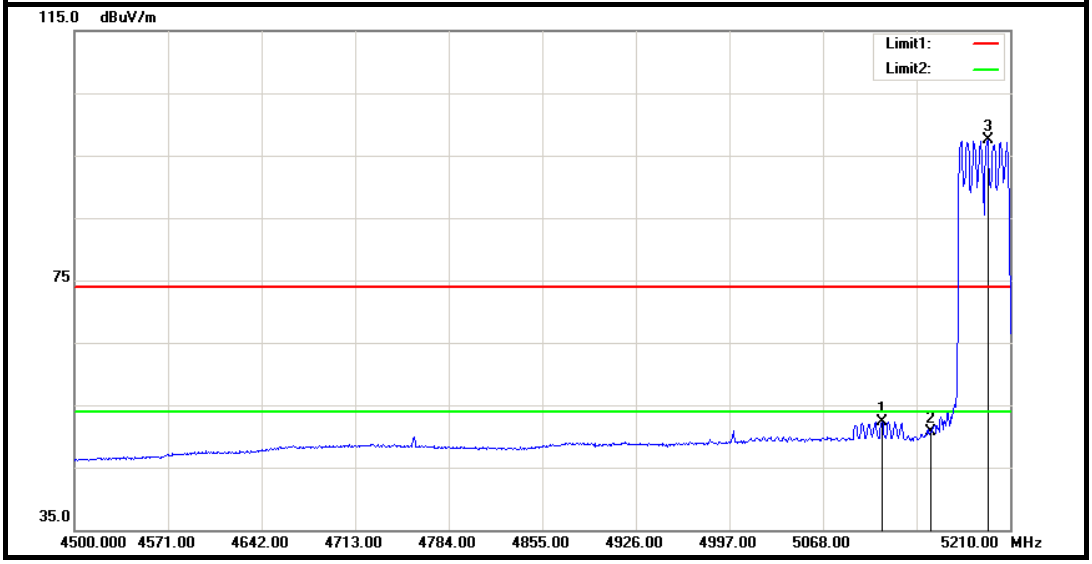
IEEE 802.11n HT 40 MHz mode / 5190 MHz

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	55.45	5.25	60.70	74.00	-13.30	Peak	Vertical
2	5187.990	101.67	5.31	106.98	---	---	Peak	Vertical
1	5112.730	47.11	5.18	52.29	54.00	-1.71	Average	Vertical
2	5150.000	45.48	5.25	50.73	54.00	-3.27	Average	Vertical
3	5192.960	92.11	5.32	97.43	---	---	Average	Vertical

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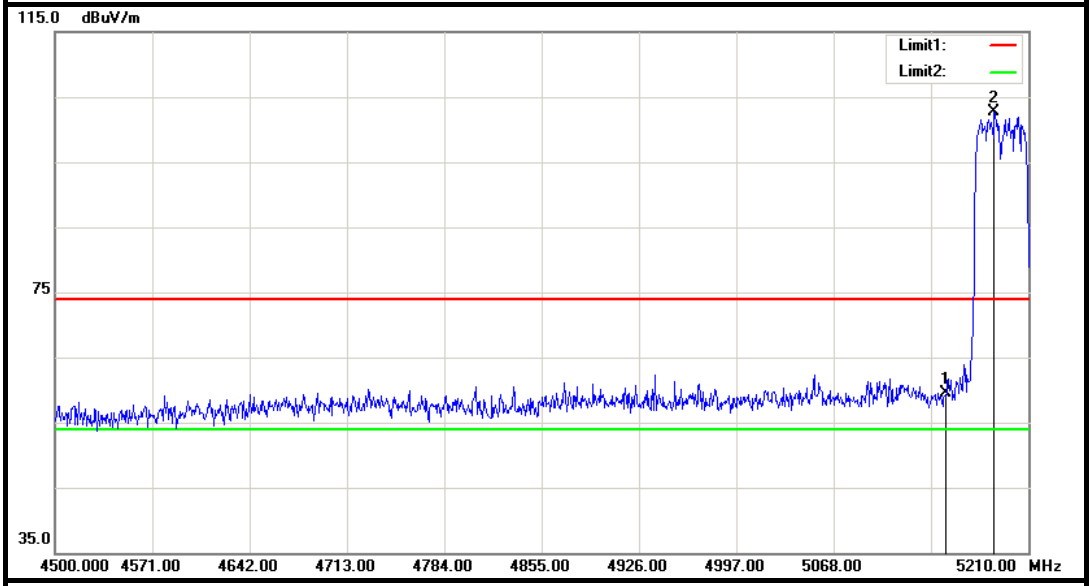
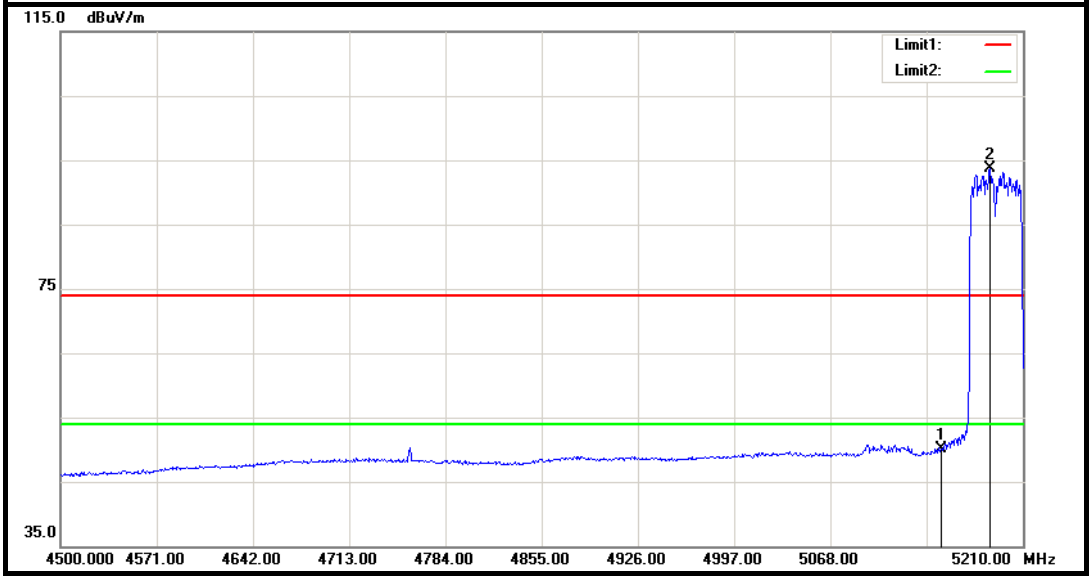
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	44.91	5.25	50.16	74.00	-23.84	Peak	Horizontal
2	5185.860	88.44	5.31	93.75	---	---	Peak	Horizontal
1	5150.000	54.25	5.25	59.50	74.00	-14.50	Average	Horizontal
2	5185.150	97.36	5.31	102.67	---	---	Average	Horizontal

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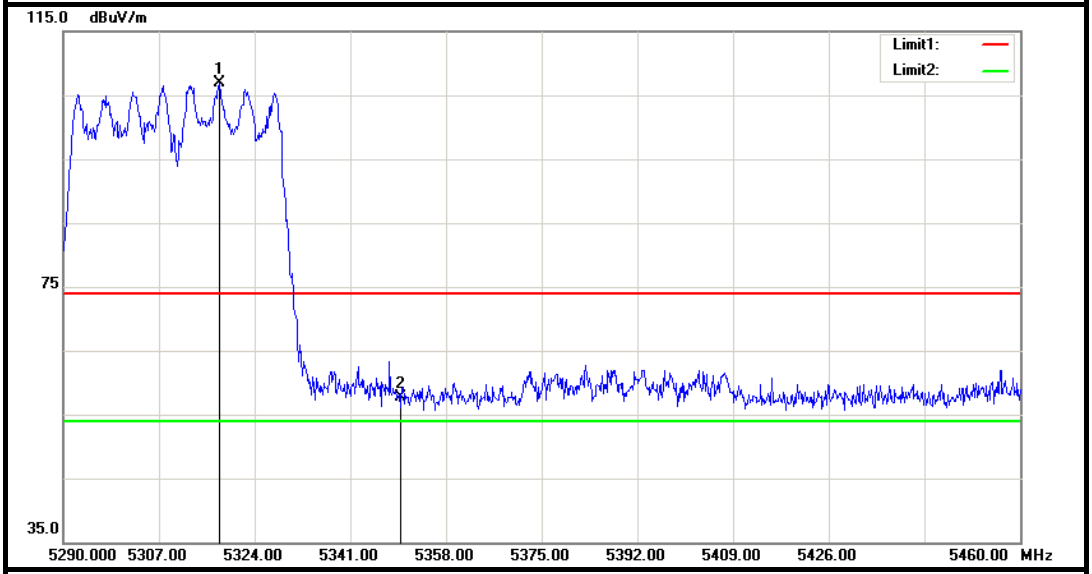
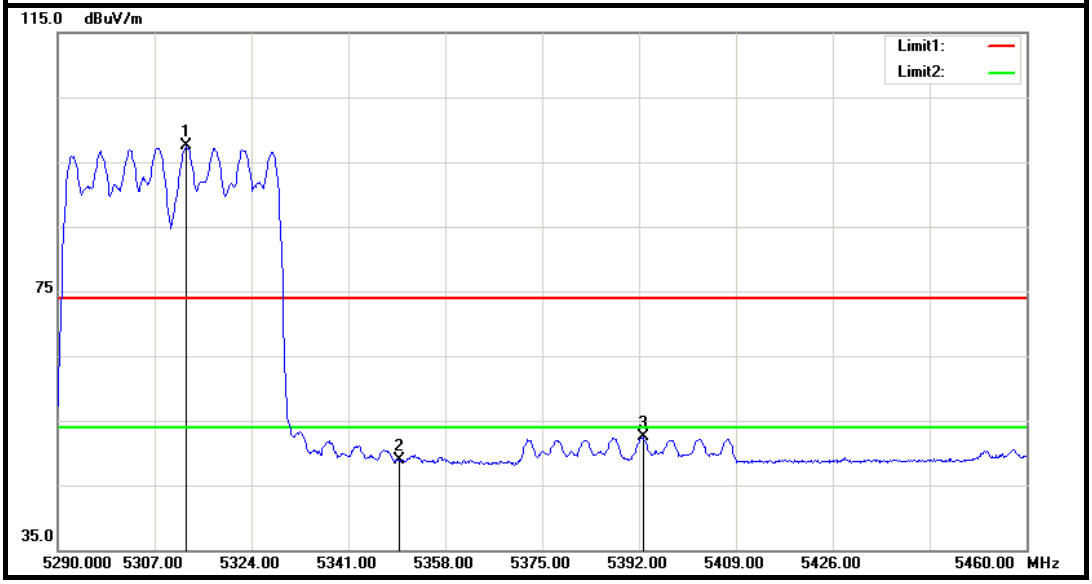
IEEE 802.11n HT 40 MHz mode / 5310 MHz

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5317.710	101.42	5.55	106.97	---	---	Peak	Vertical
2	5350.000	52.04	5.60	57.64	74.00	-16.36	Peak	Vertical
1	5312.610	91.94	5.54	97.48	---	---	Average	Vertical
2	5350.000	43.34	5.60	48.94	54.00	-5.06	Average	Vertical
3	5392.680	46.81	5.68	52.49	54.00	-1.51	Average	Vertical

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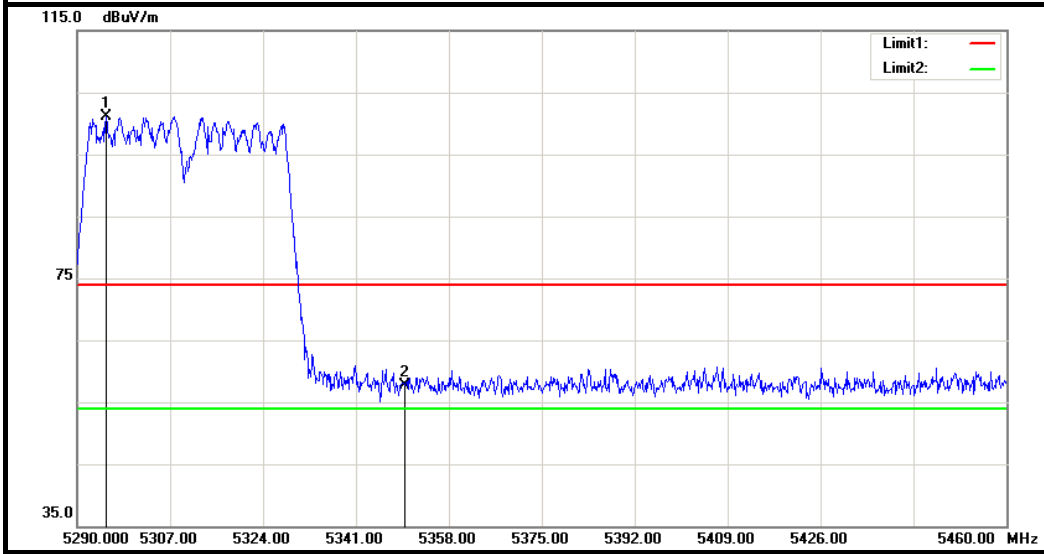
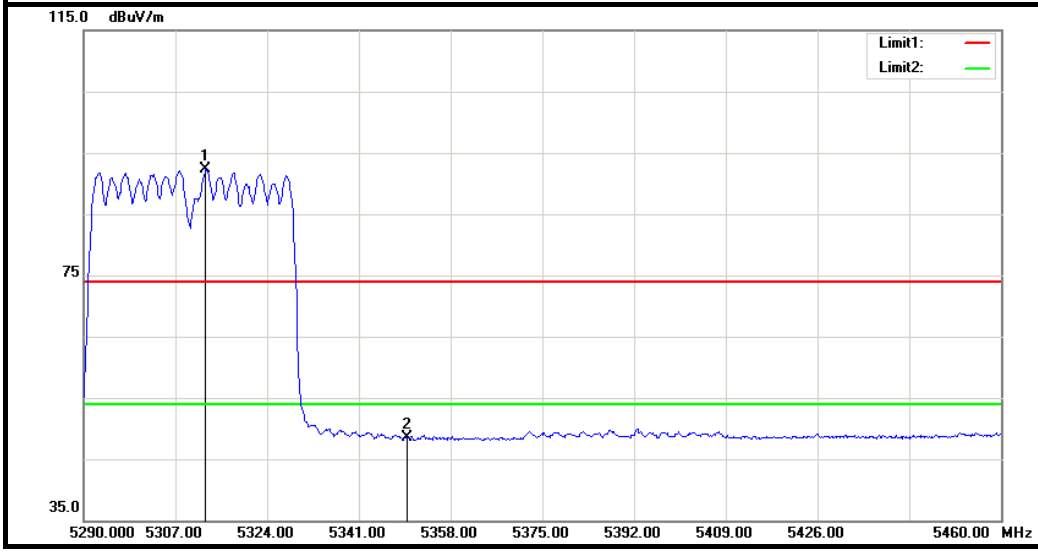
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5295.270	95.56	5.51	101.07	---	---	Peak	Horizontal
2	5350.000	52.05	5.60	57.65	74.00	-16.35	Peak	Horizontal
1	5312.610	86.77	5.54	92.31	---	---	Average	Horizontal
2	5350.000	42.96	5.60	48.56	54.00	-5.44	Average	Horizontal

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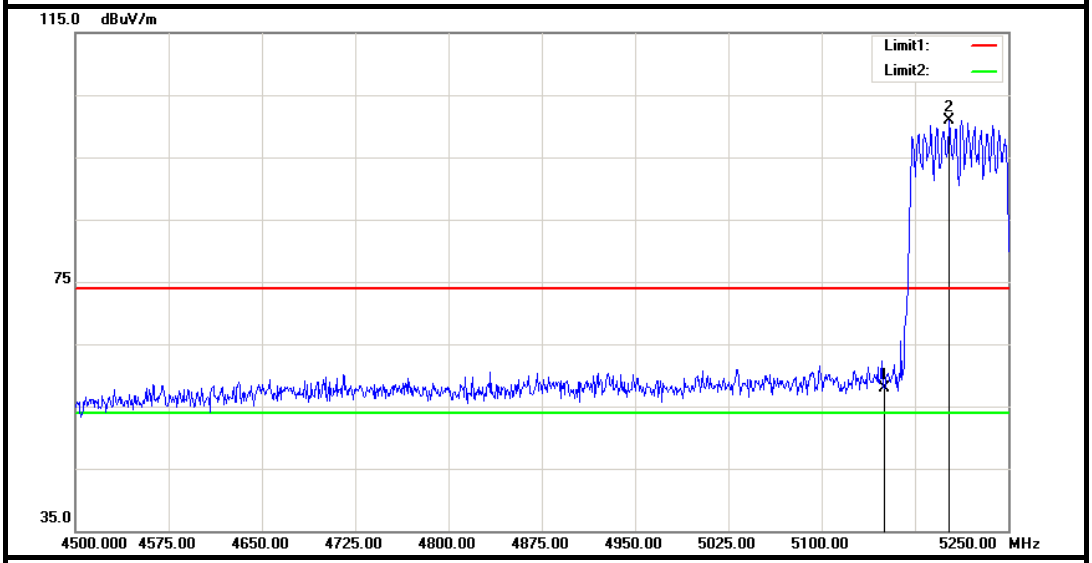
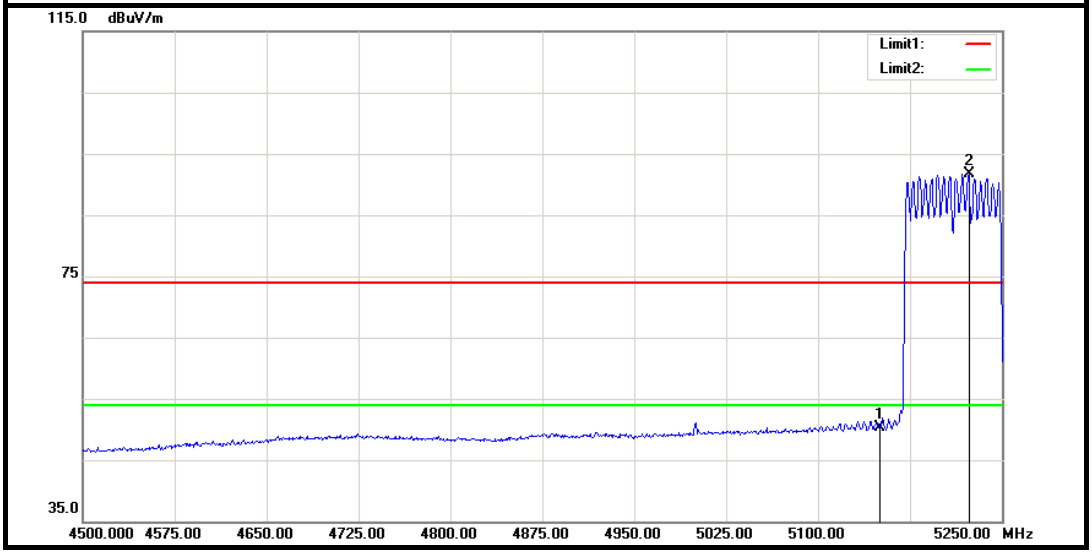
IEEE 802.11ac 80 mode / 5210 MHz

Detector mode: Peak **Polarity: Vertical**



Detector mode: Average **Polarity: Vertical**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.73	5.25	57.98	74.00	-16.02	Peak	Vertical
2	5202.000	95.48	5.34	100.82	---	---	Peak	Vertical
1	5150.000	45.13	5.25	50.38	54.00	-3.62	Average	Vertical
2	5223.000	86.23	5.38	91.61	---	---	Average	Vertical

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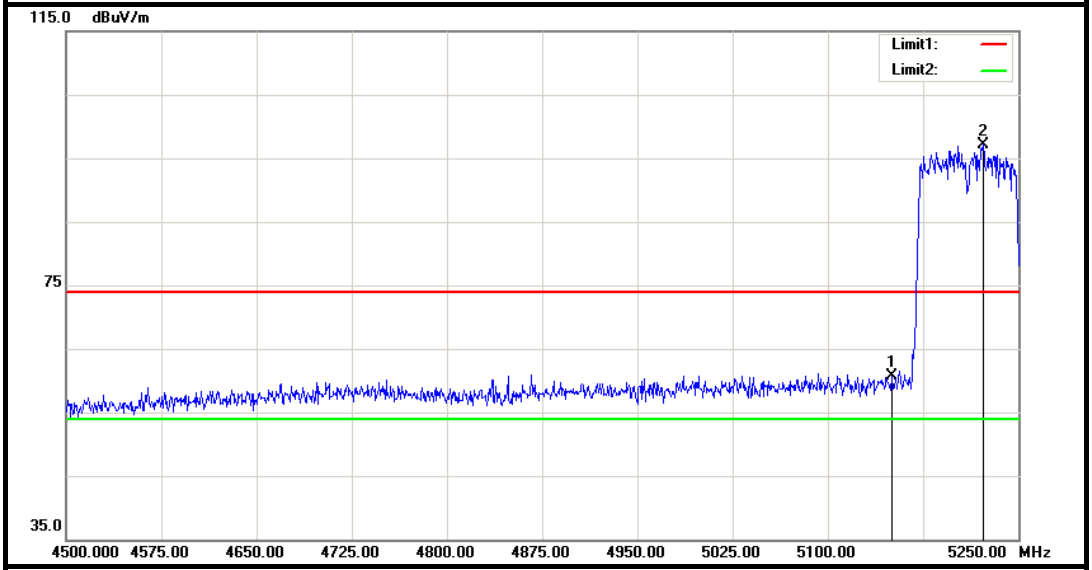
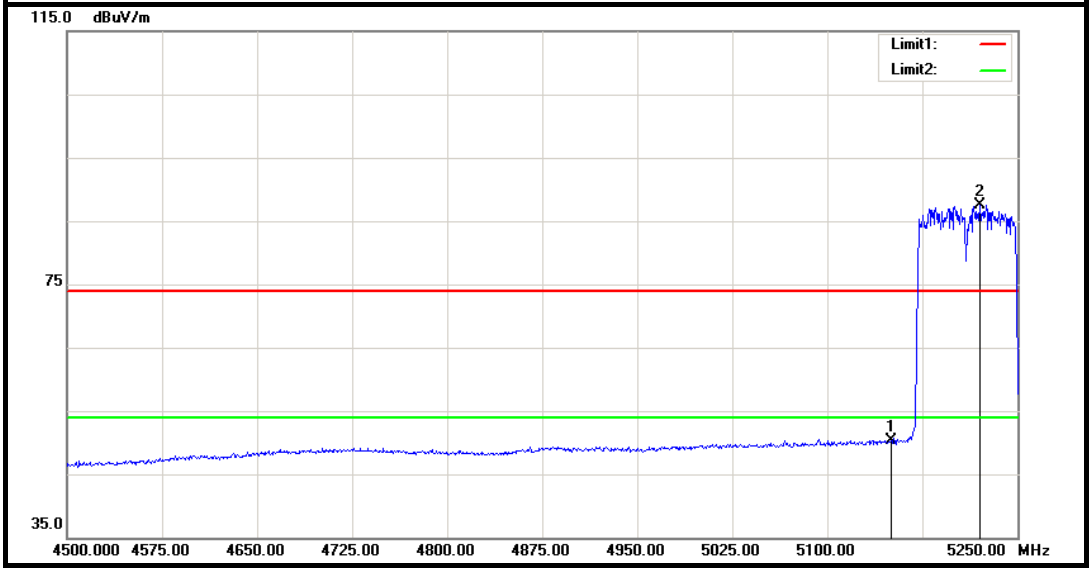
Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	55.40	5.25	60.65	74.00	-13.35	Peak	Horizontal
2	5222.250	91.82	5.38	97.20	---	---	Peak	Horizontal
1	5150.000	45.02	5.25	50.27	54.00	-3.73	Average	Horizontal
2	5220.000	82.16	5.37	87.53	---	---	Average	Horizontal

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