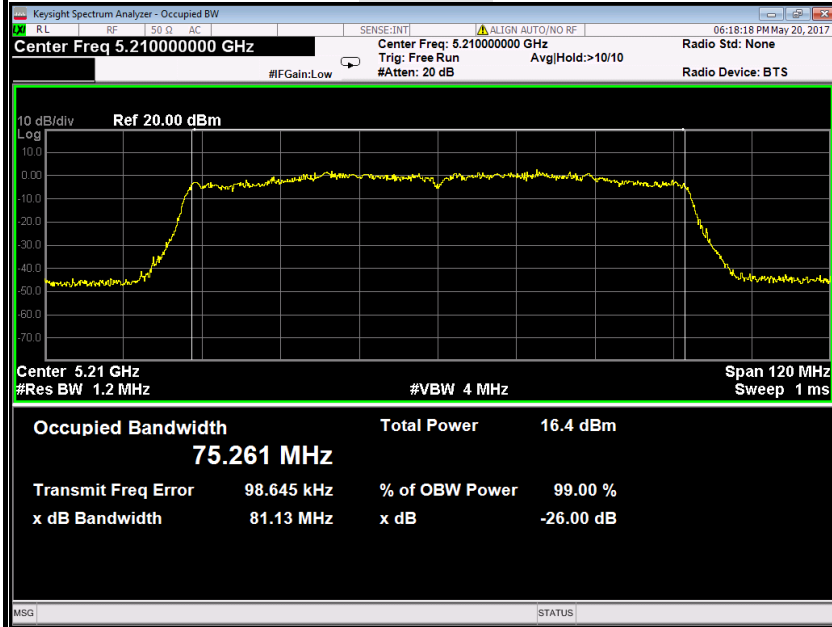




IEEE 802.11ac 80 mode / 5210MHz

26dB Bandwidth

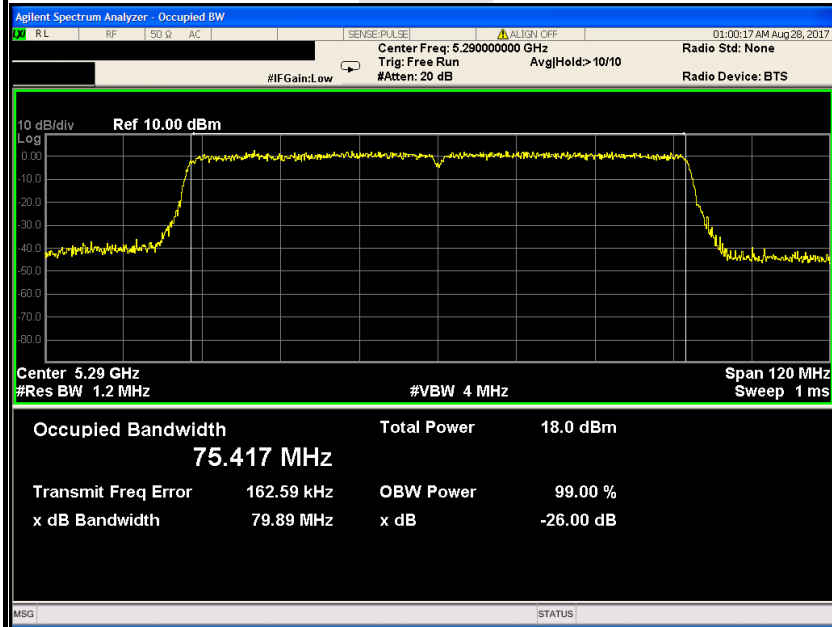
Antenna 2

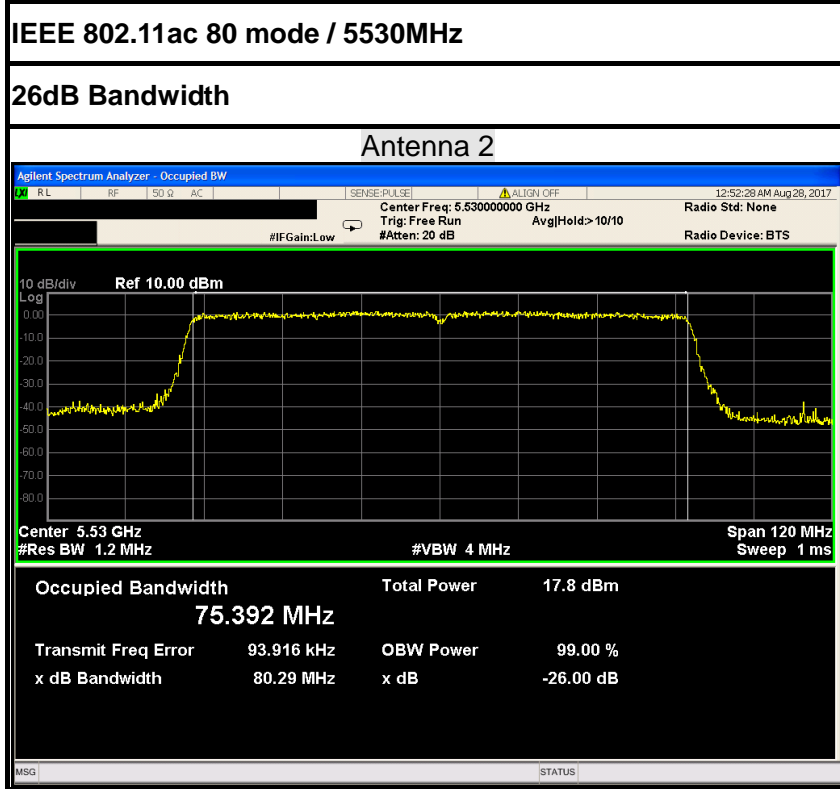


IEEE 802.11ac 80 mode / 5290MHz

26dB Bandwidth

Antenna 2



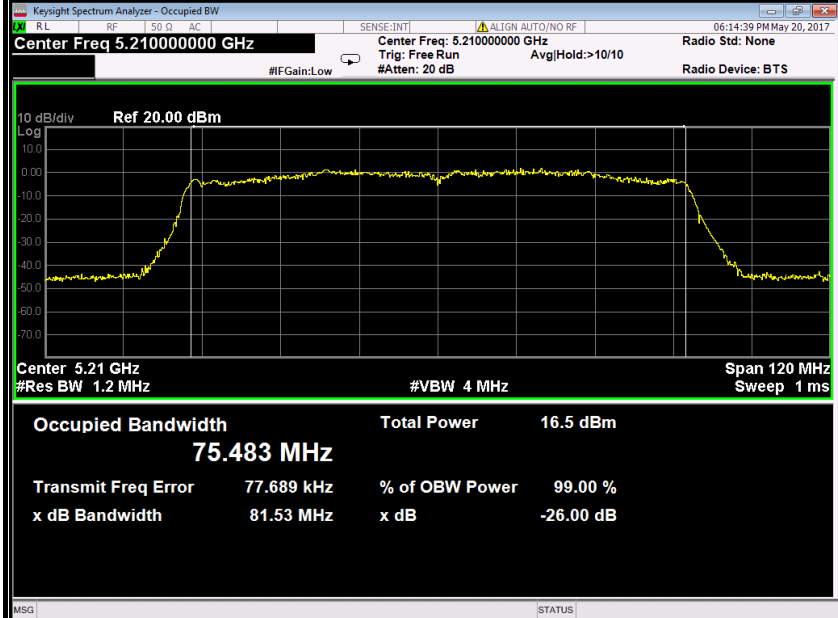




IEEE 802.11ac 80 mode / 5210MHz

26dB Bandwidth

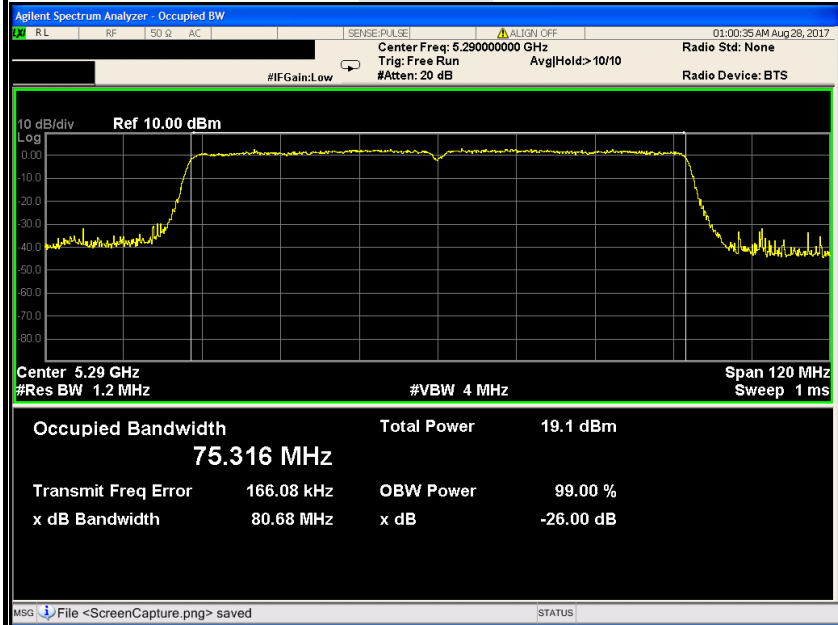
Antenna 3

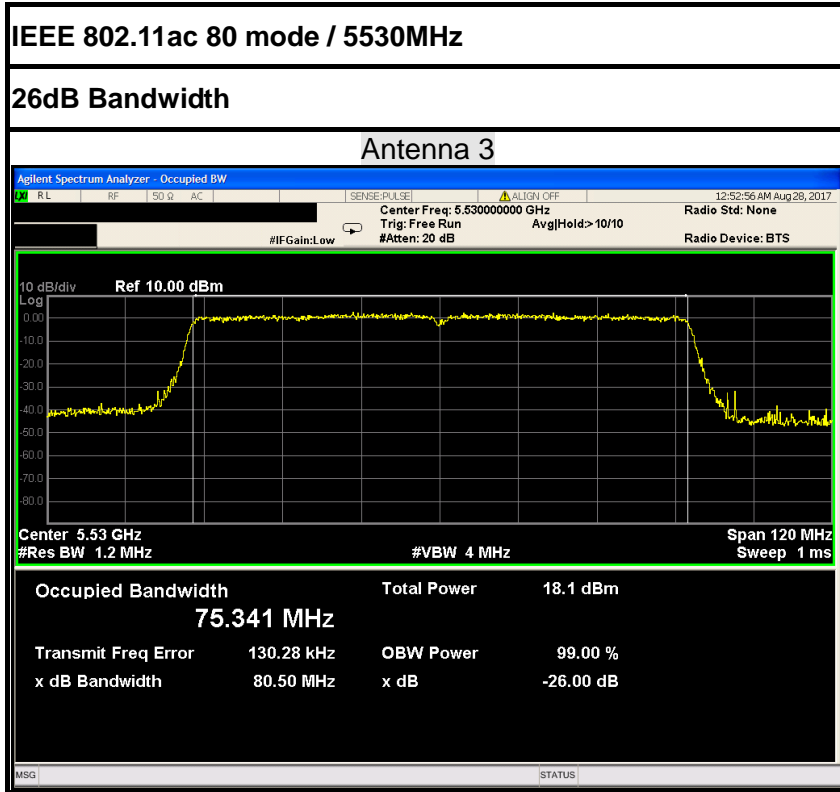


IEEE 802.11ac 80 mode / 5290MHz

26dB Bandwidth

Antenna 3







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

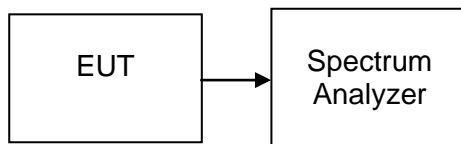
Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2017	02/20/2018

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 \geq 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 \geq 6 dB.

6.2.4 TEST SETUP





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	Antenna 3		
Low	5745	16.36	16.36	16.38	16.37	>500	PASS
Mid	5785	16.39	16.37	16.35	16.37		PASS
High	5825	16.38	16.37	16.36	16.36		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	Antenna 3		
Low	5745	17.61	17.64	17.62	17.59	>500	PASS
Mid	5785	17.59	17.63	17.62	17.59		PASS
High	5825	17.58	17.63	17.61	17.59		PASS

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

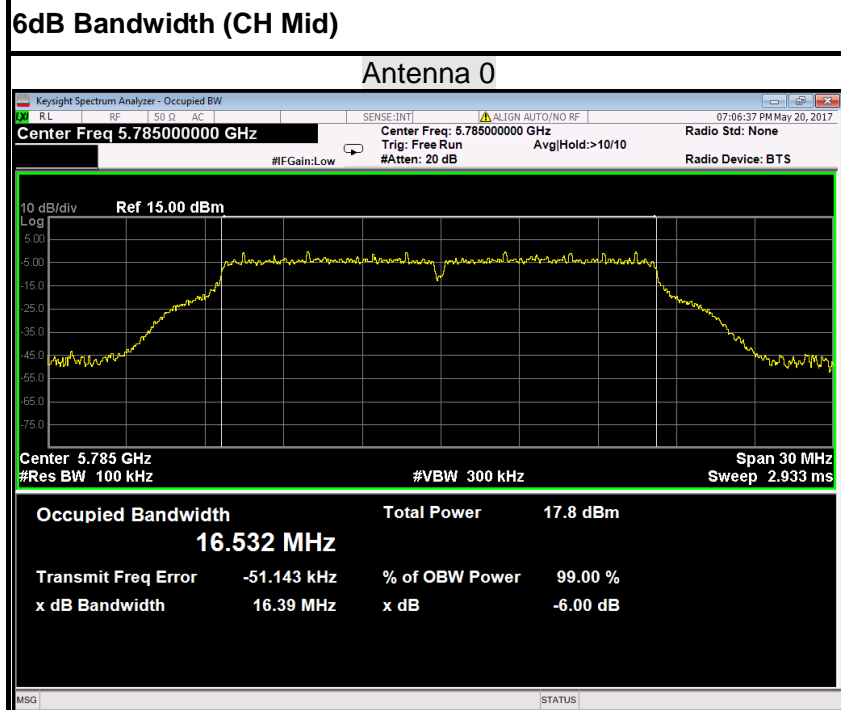
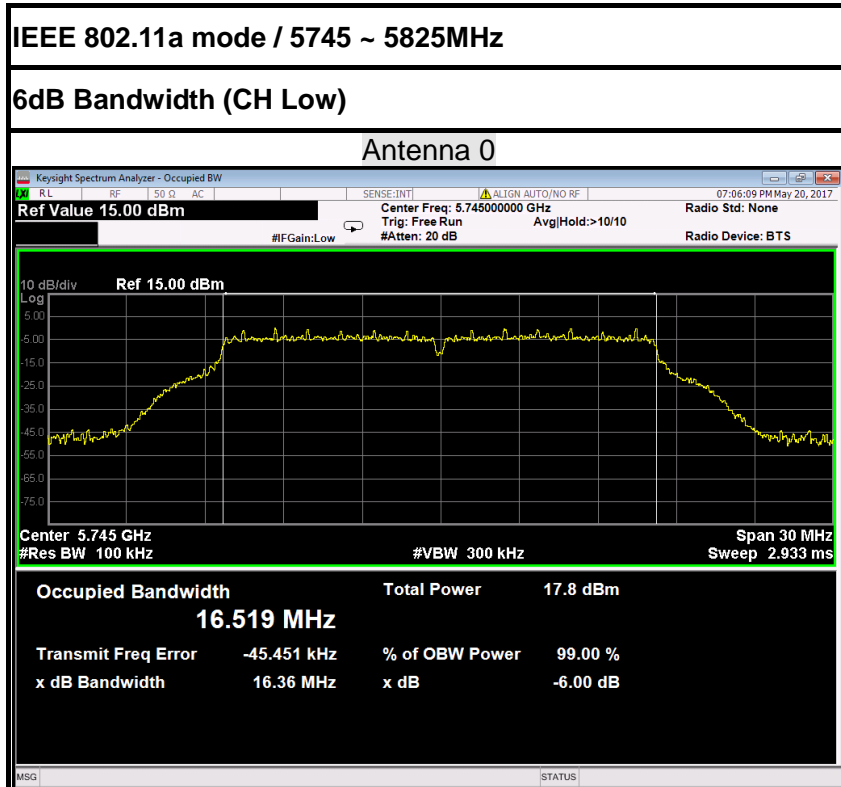
Channel	Frequency (MHz)	6dB Bandwidth(B) (MHz)				Limit (kHz)	Test Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 3		
Low	5755	36.33	36.35	36.33	36.34	>500	PASS
High	5795	36.35	36.37	36.04	35.83		PASS

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	Antenna 3		
	5775	76.44	76.36	76.45	76.13	>500	PASS



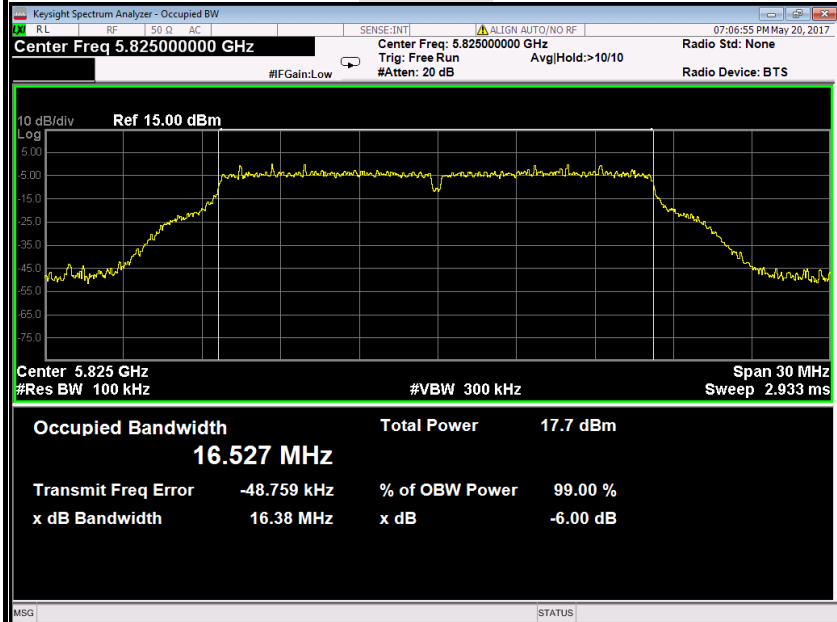
Test Plot





6dB Bandwidth (CH High)

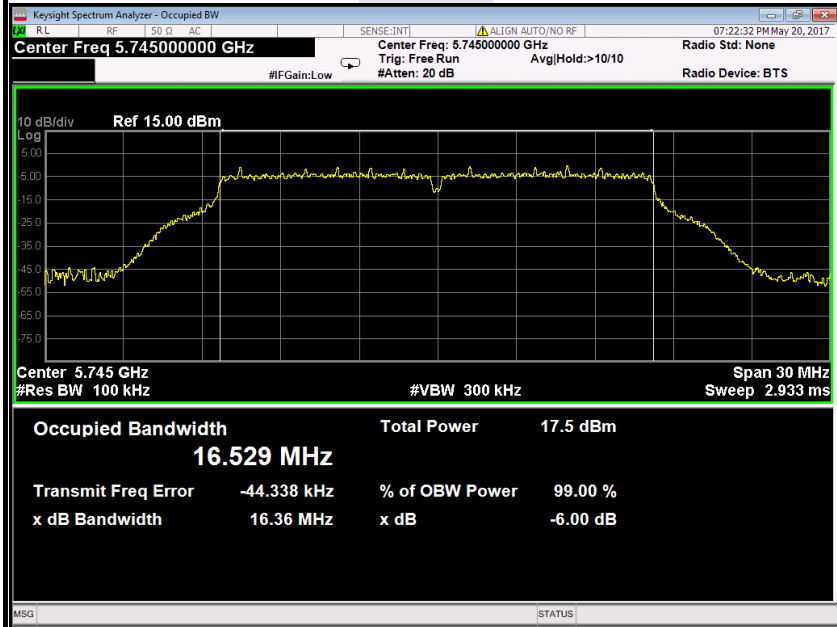
Antenna 0

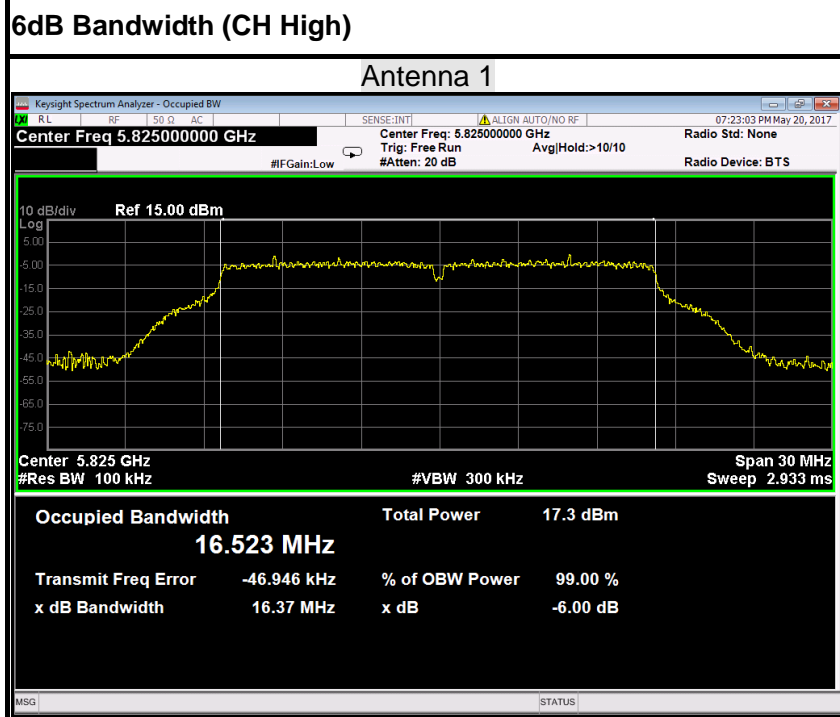
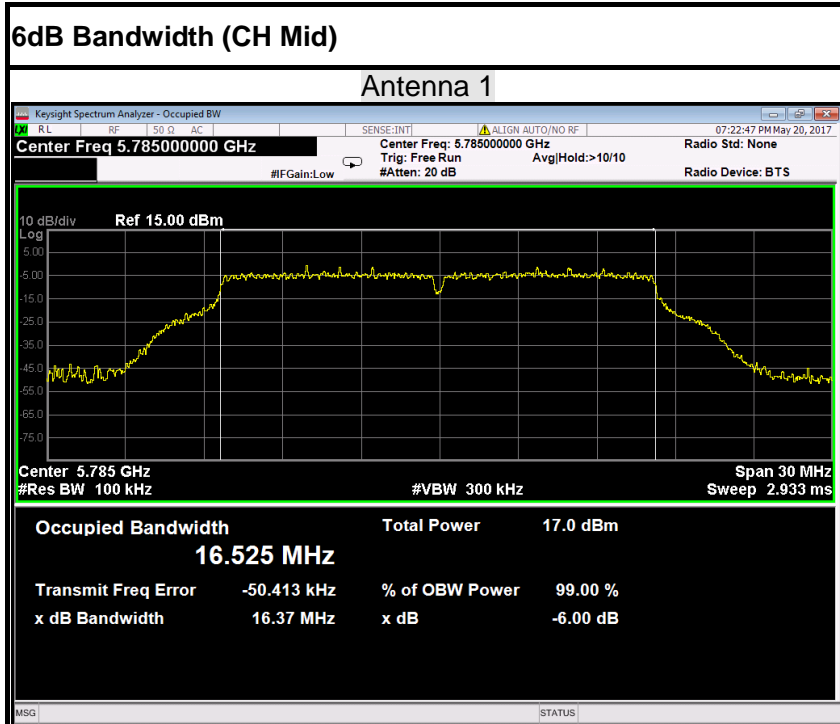


IEEE 802.11a mode / 5745 ~ 5825MHz

6dB Bandwidth (CH Low)

Antenna 1

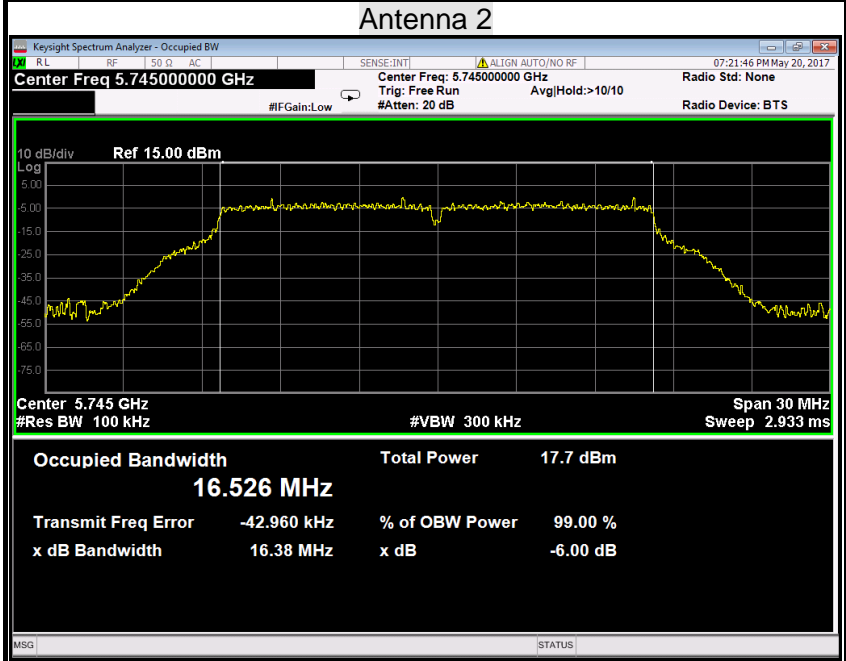




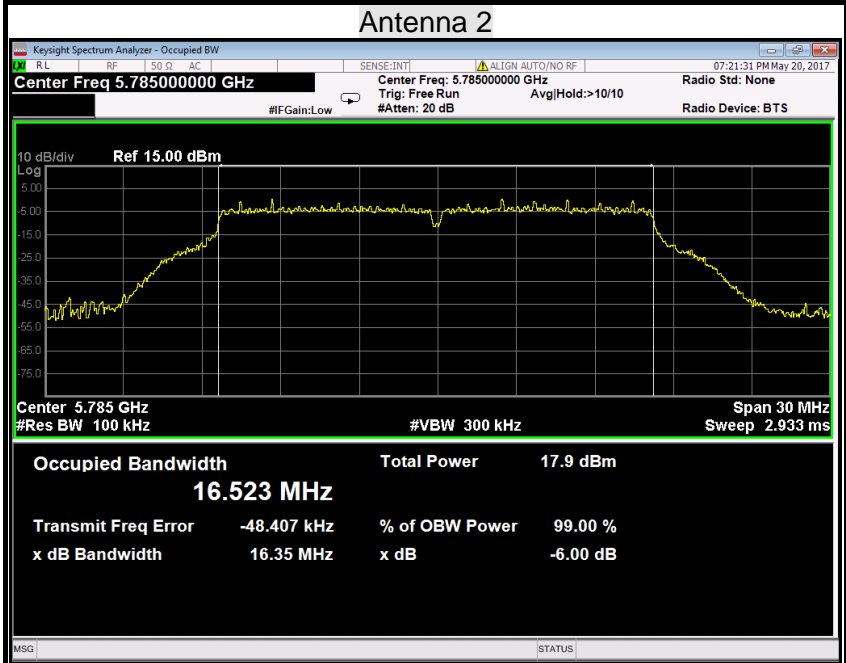


IEEE 802.11a mode / 5745 ~ 5825MHz

6dB Bandwidth (CH Low)

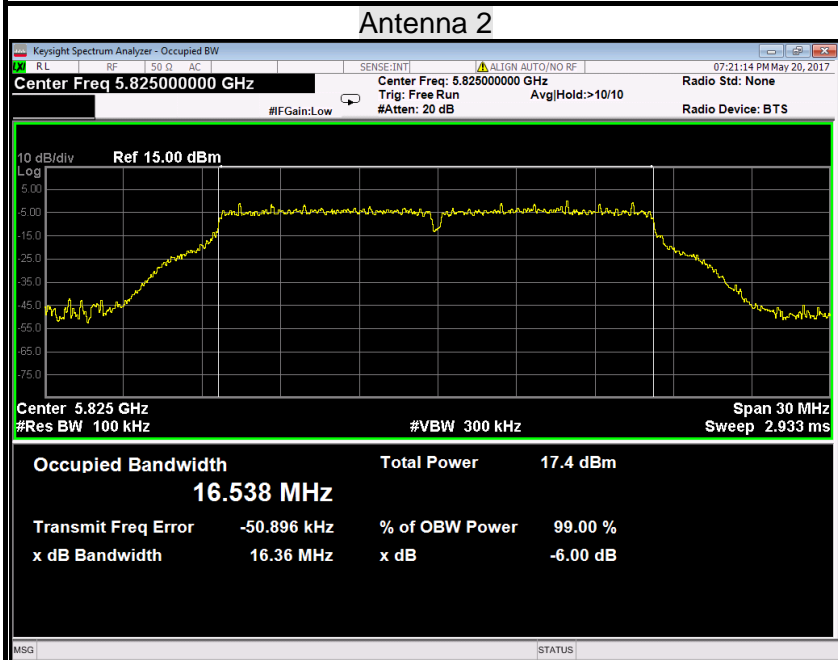


6dB Bandwidth (CH Mid)



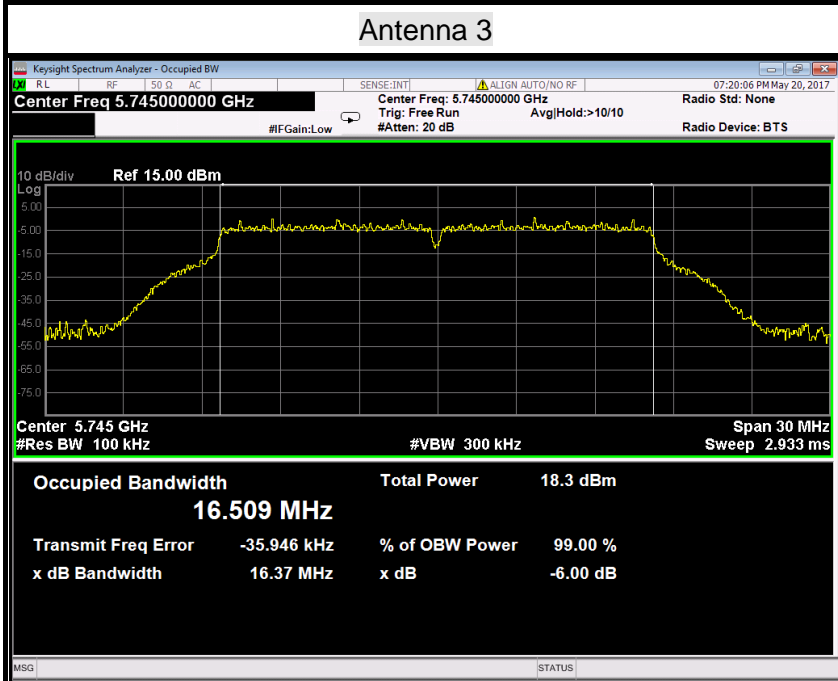


6dB Bandwidth (CH High)



IEEE 802.11a mode / 5745 ~ 5825MHz

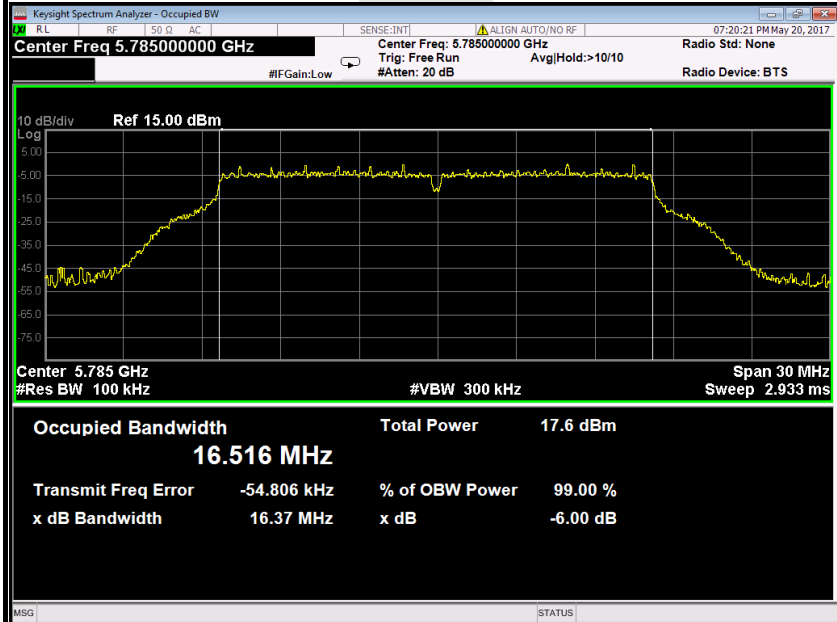
6dB Bandwidth (CH Low)





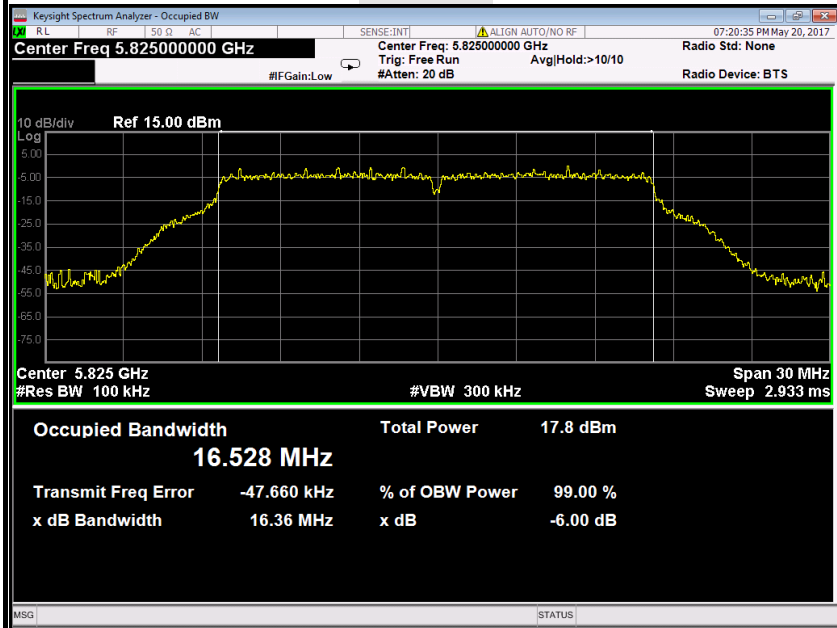
6dB Bandwidth (CH Mid)

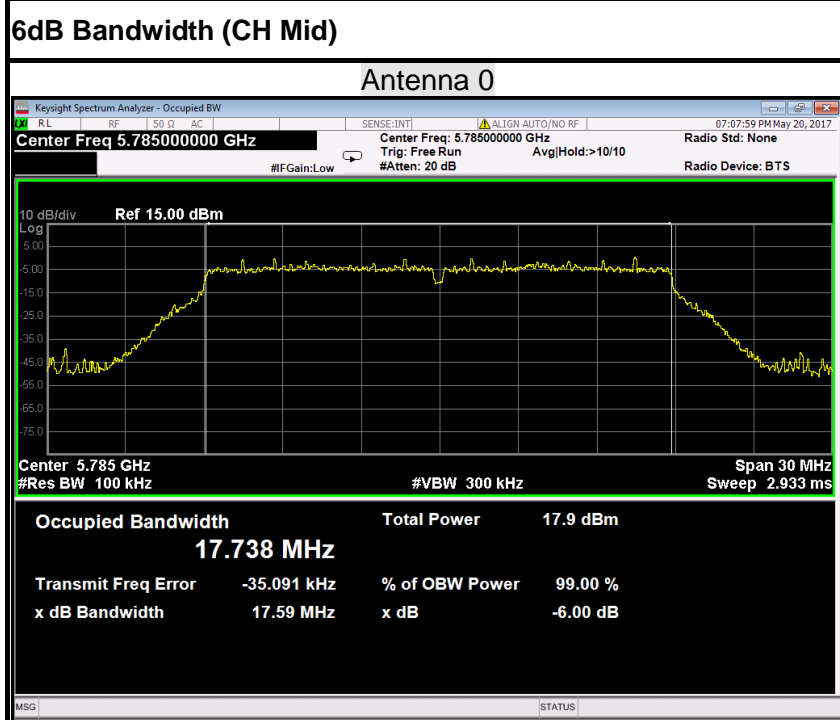
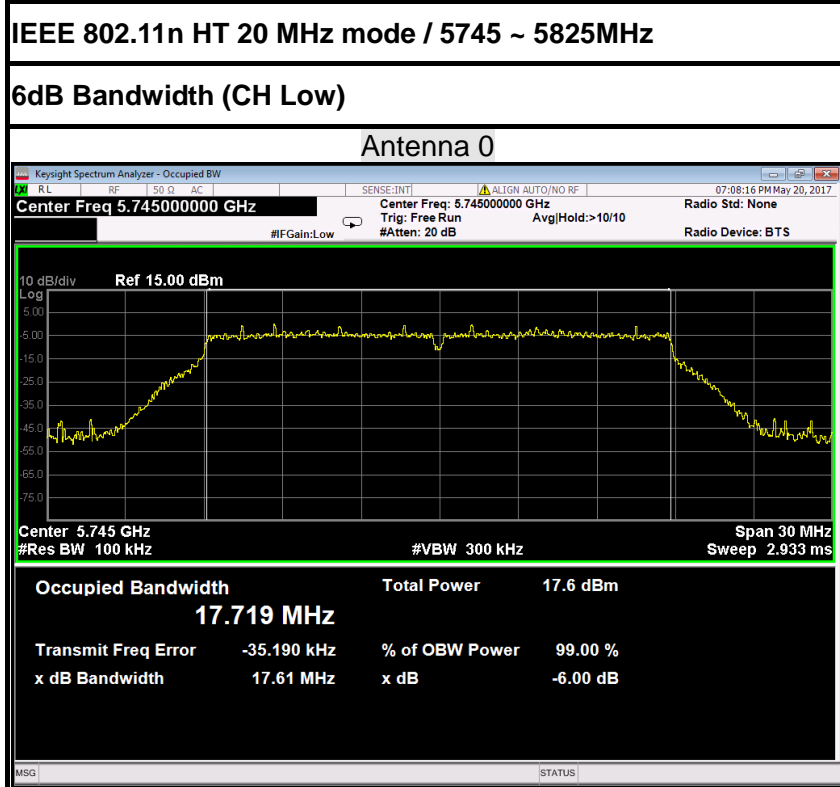
Antenna 3



6dB Bandwidth (CH High)

Antenna 3

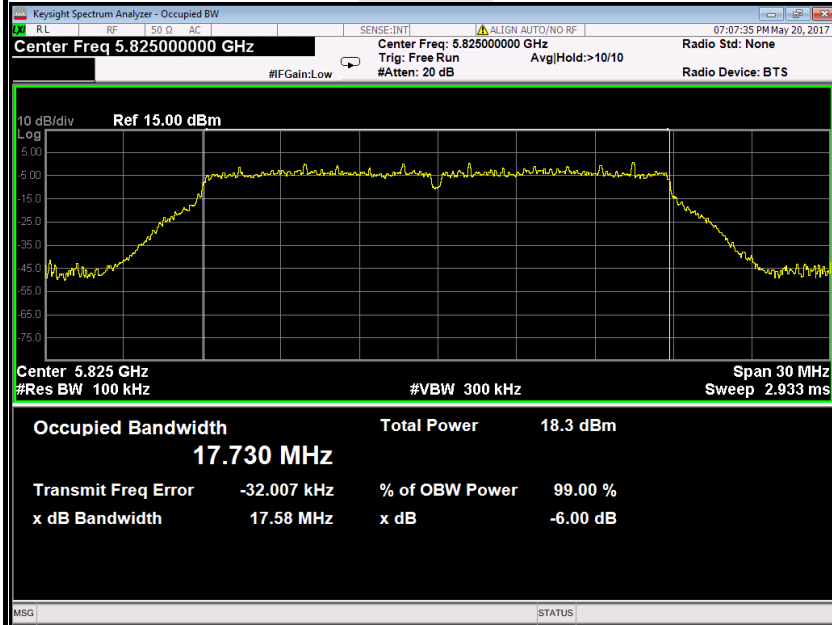






6dB Bandwidth (CH High)

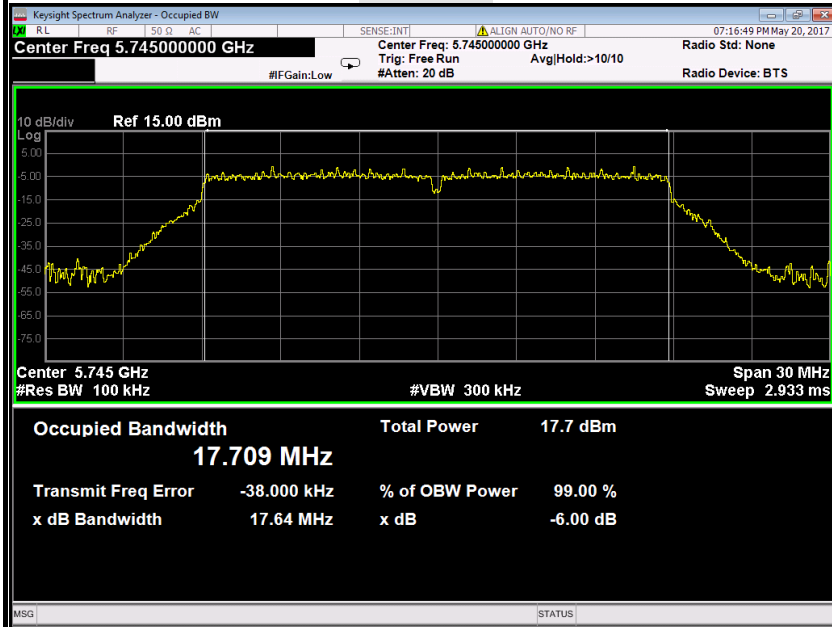
Antenna 0



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

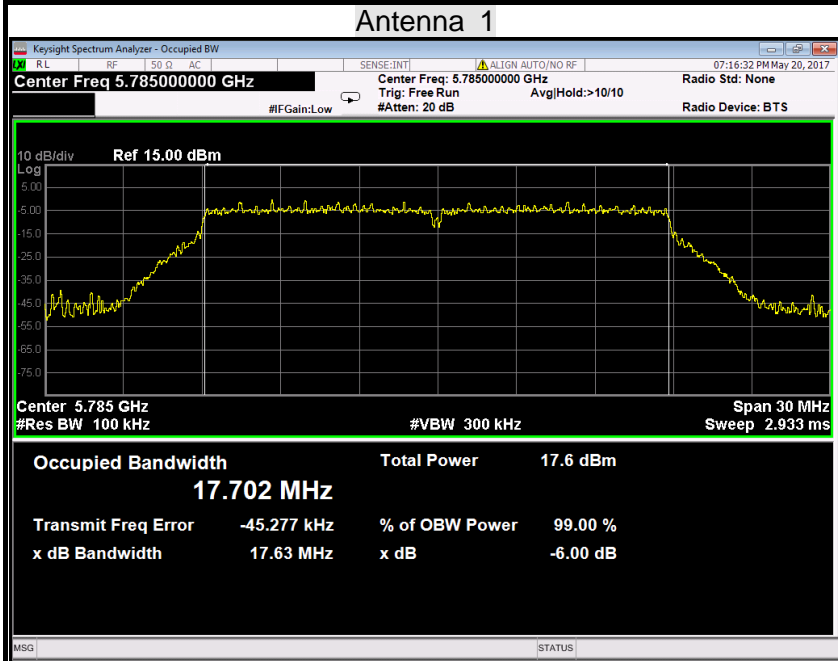
6dB Bandwidth (CH Low)

Antenna 1

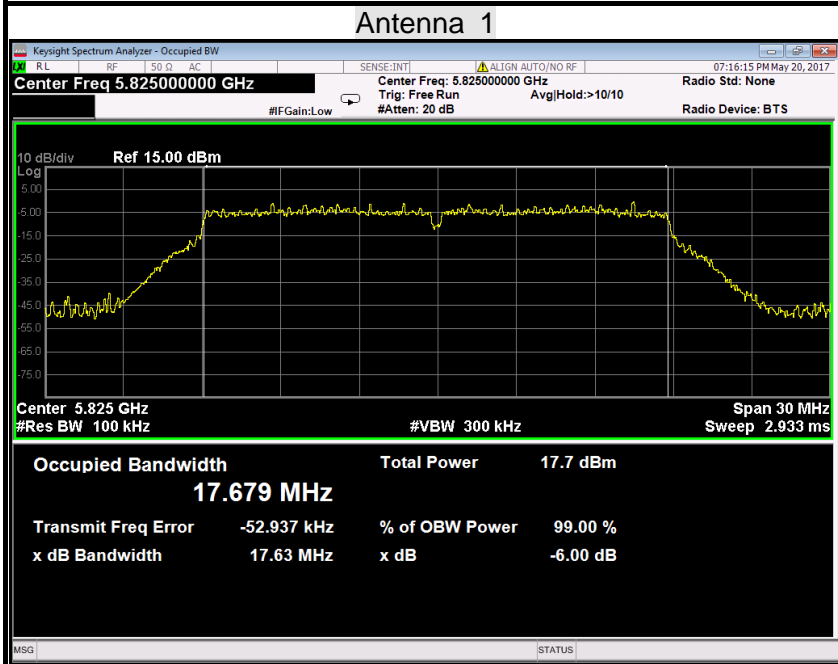


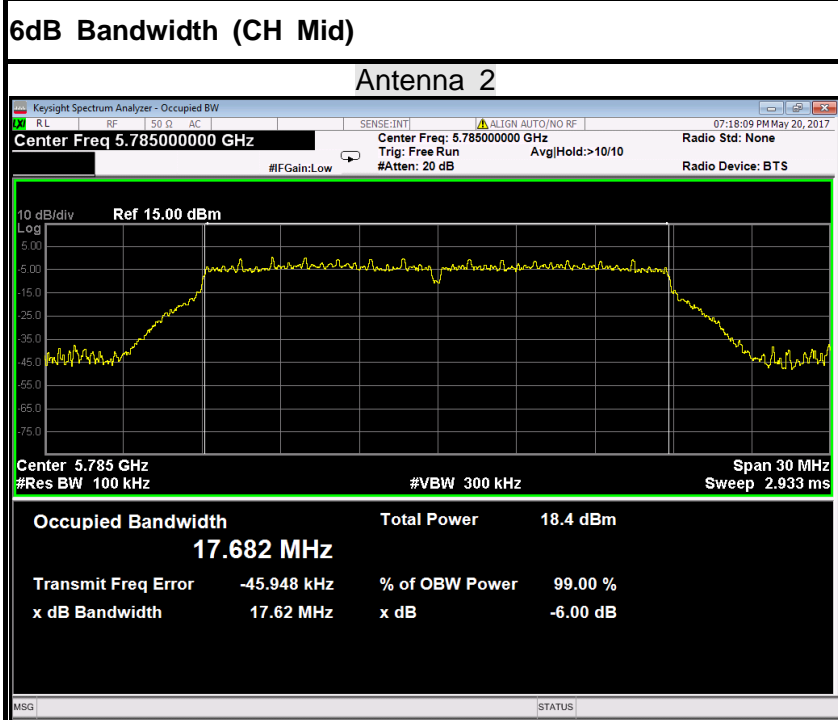
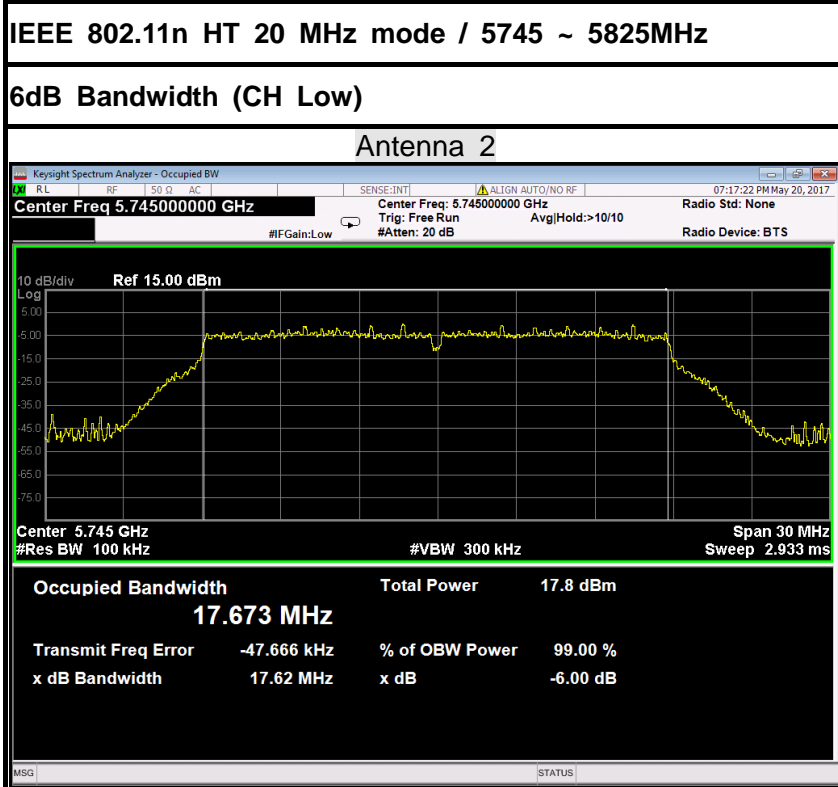


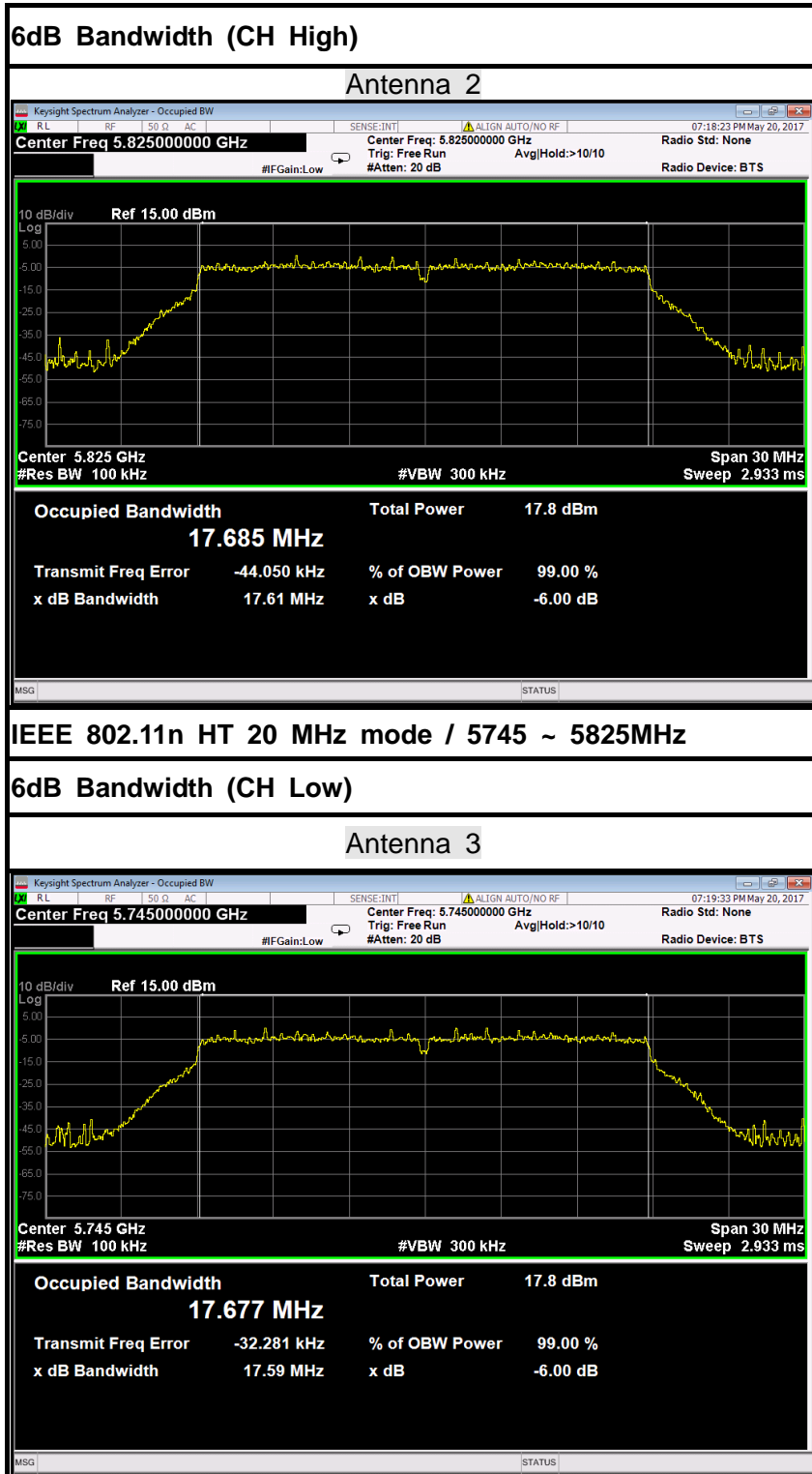
6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



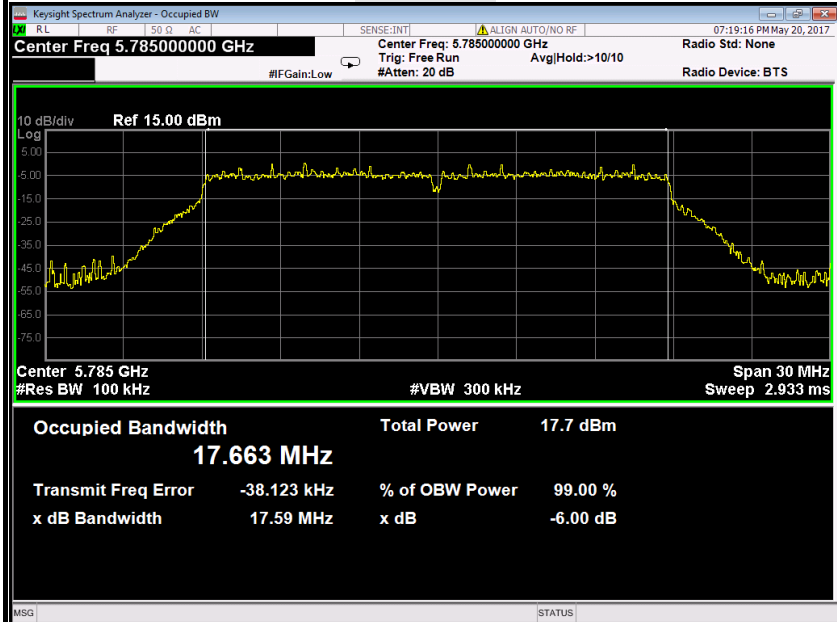






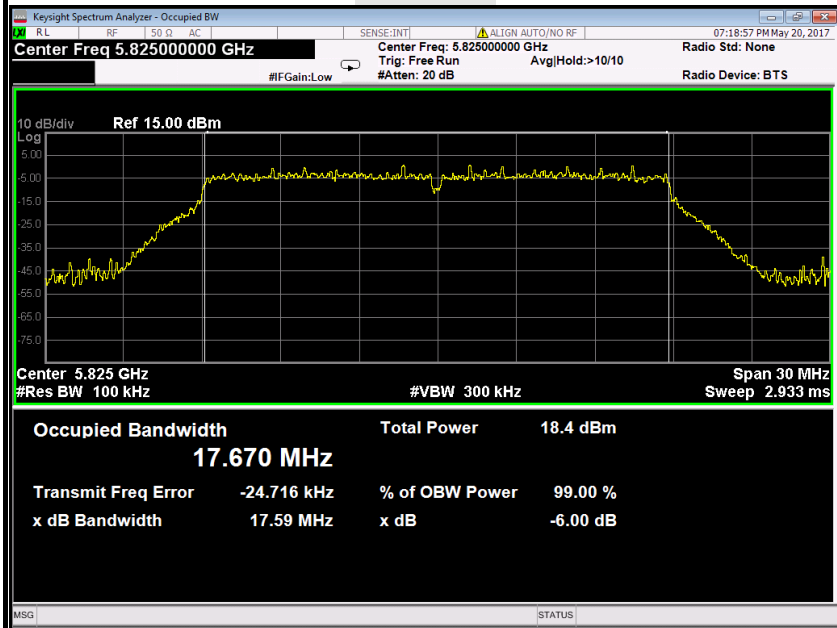
6dB Bandwidth (CH Mid)

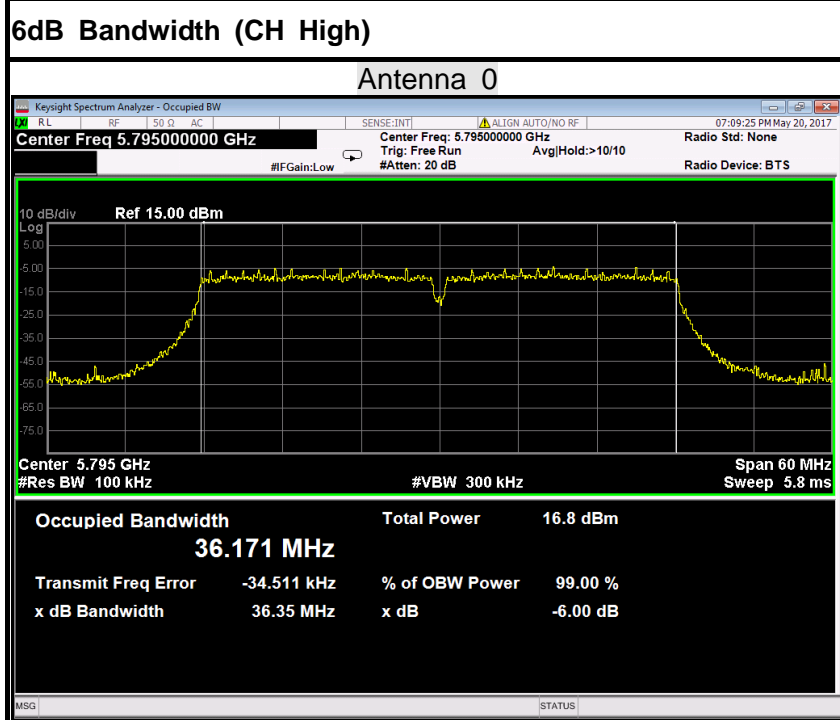
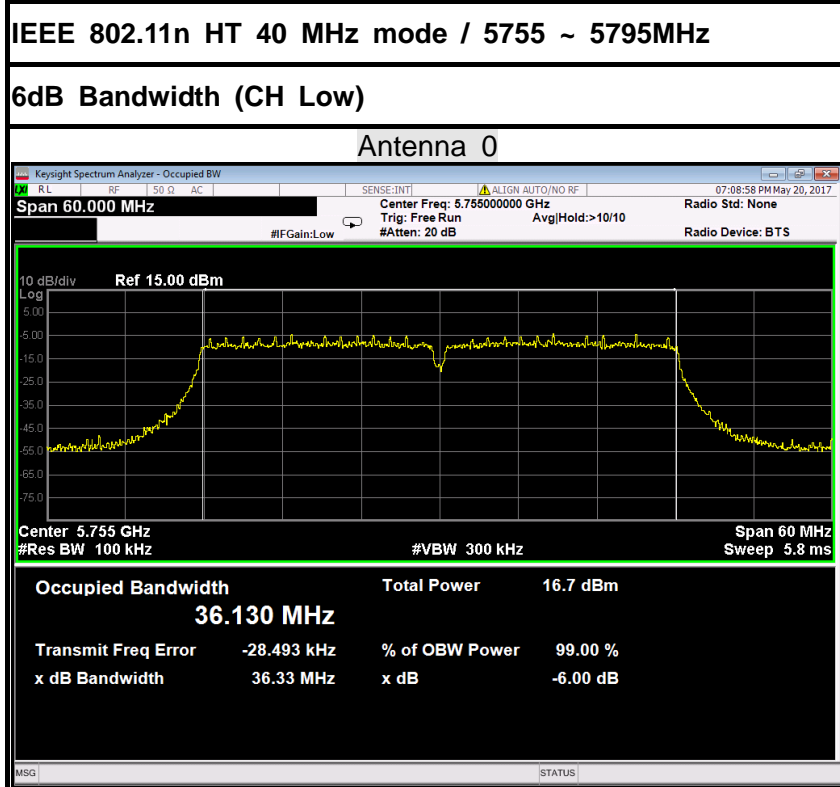
Antenna 3

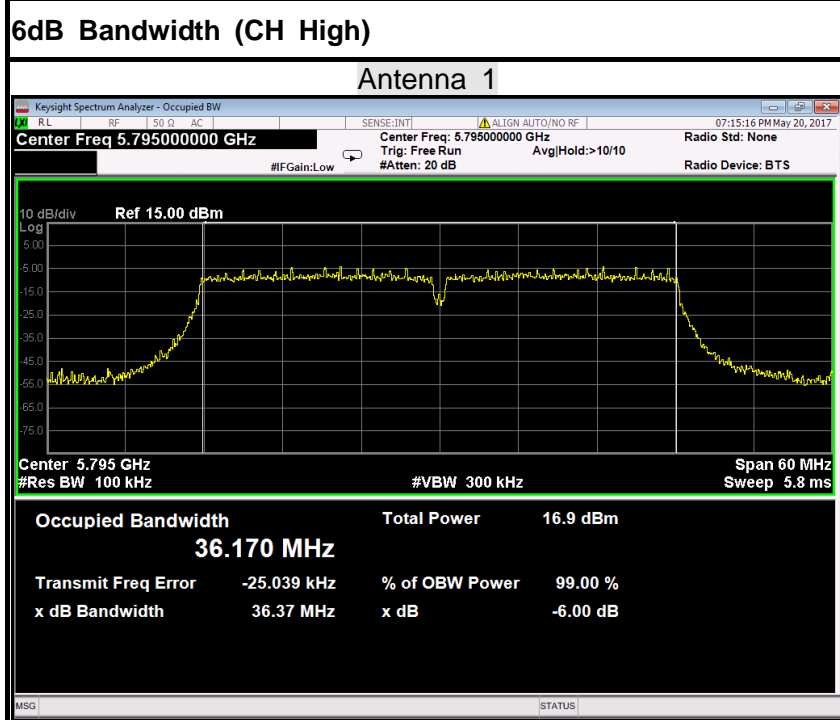
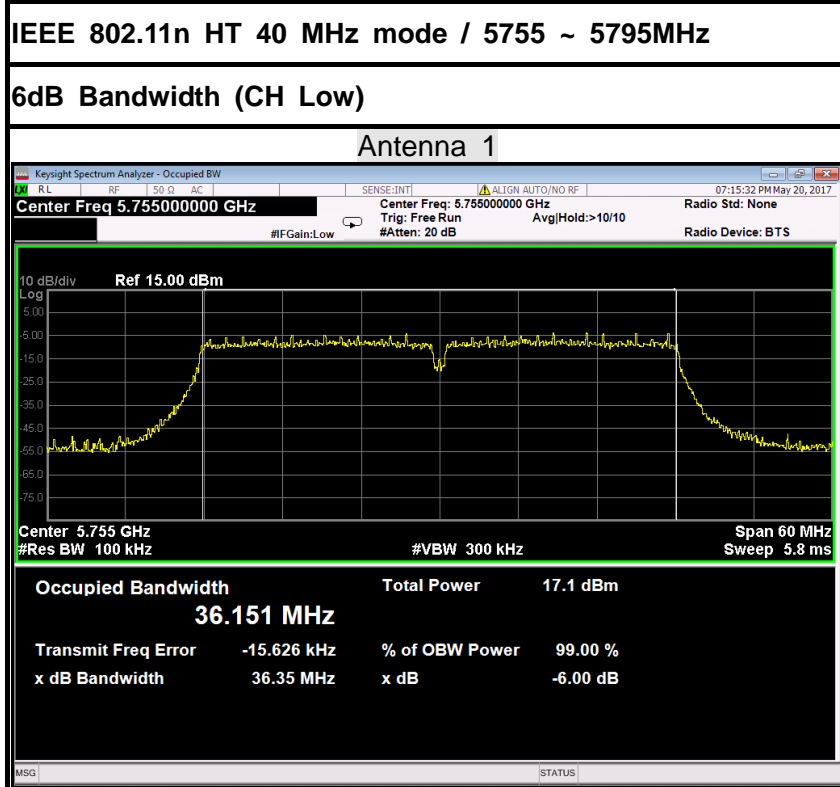


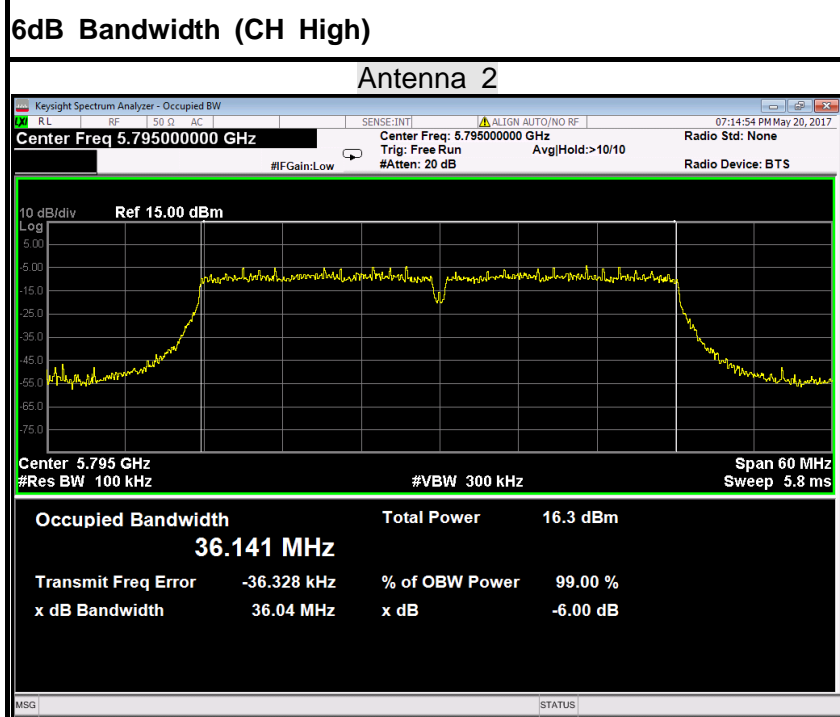
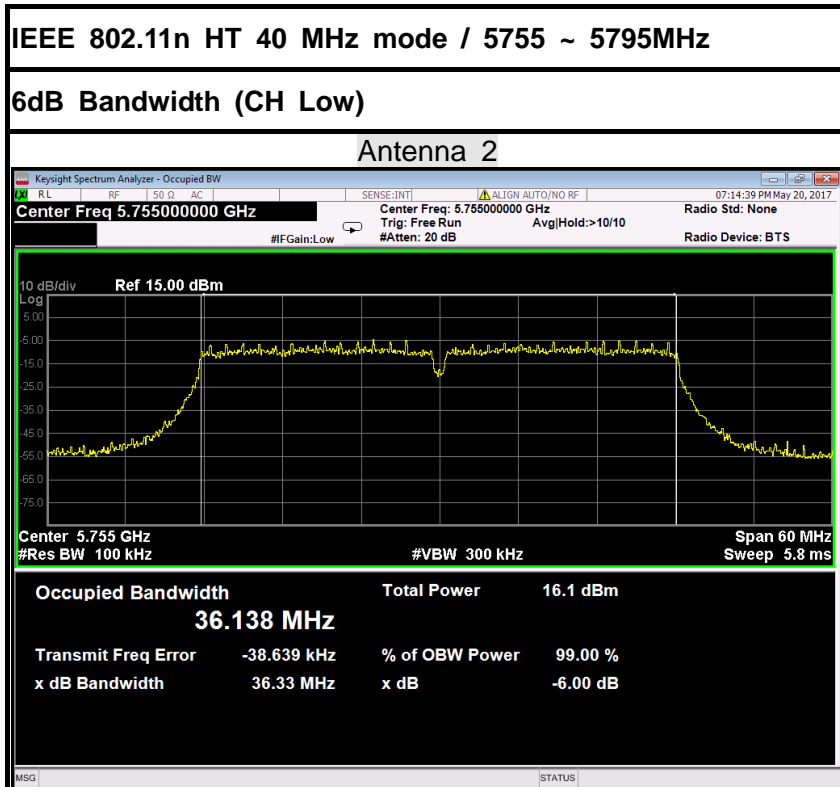
6dB Bandwidth (CH High)

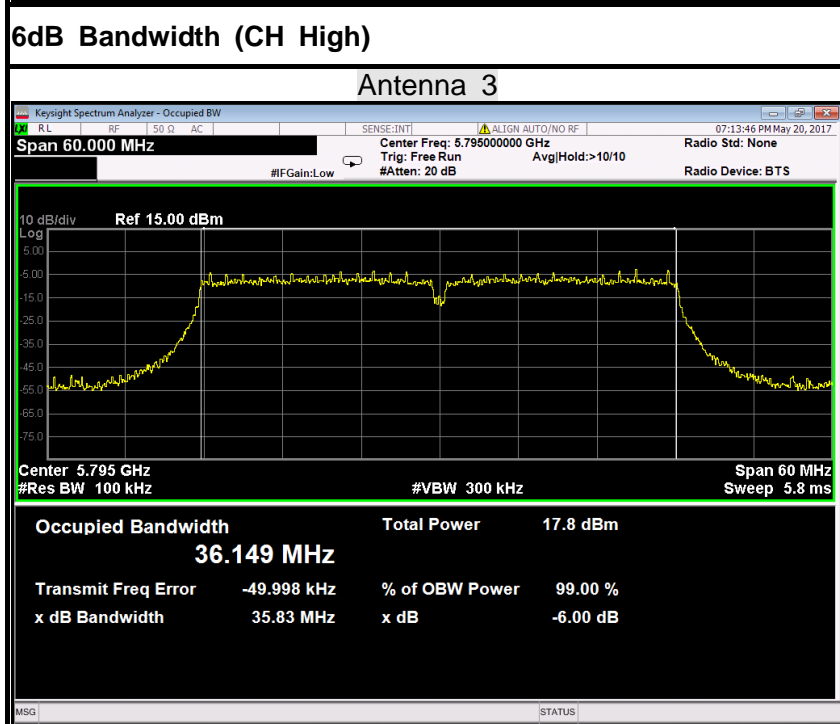
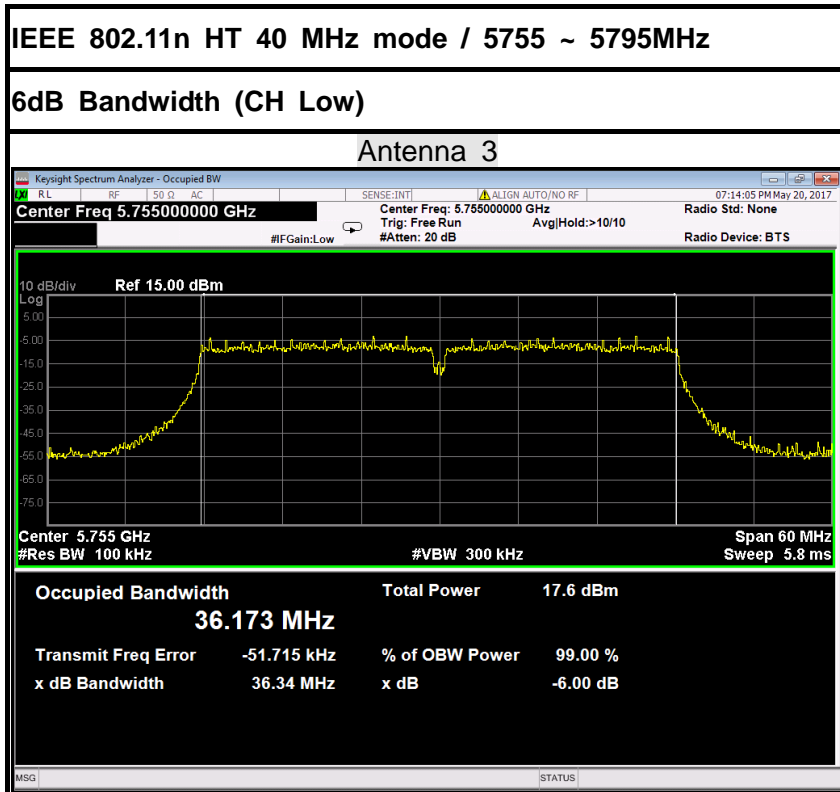
Antenna 3

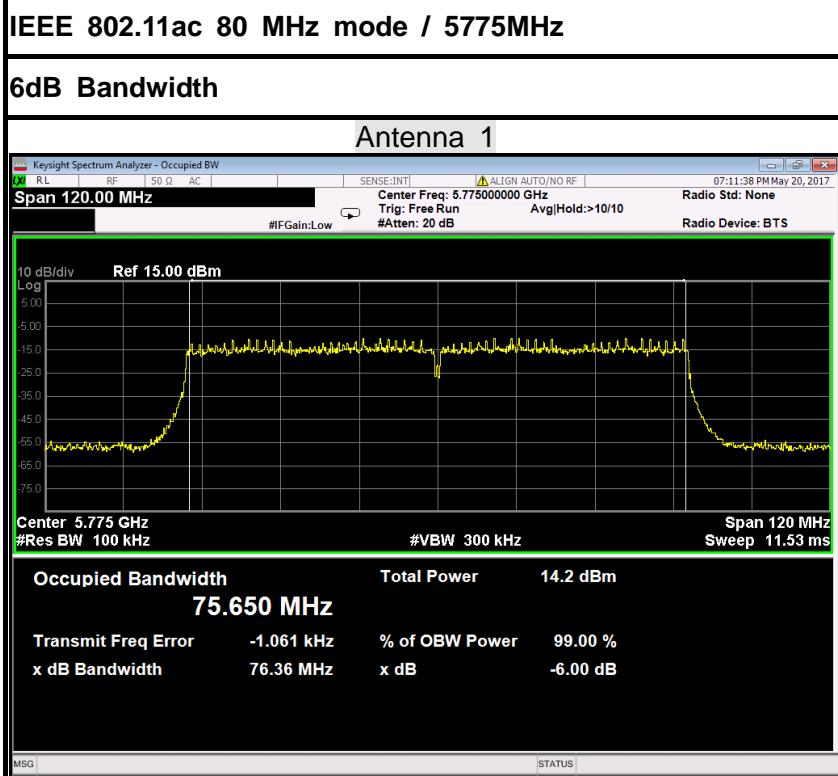
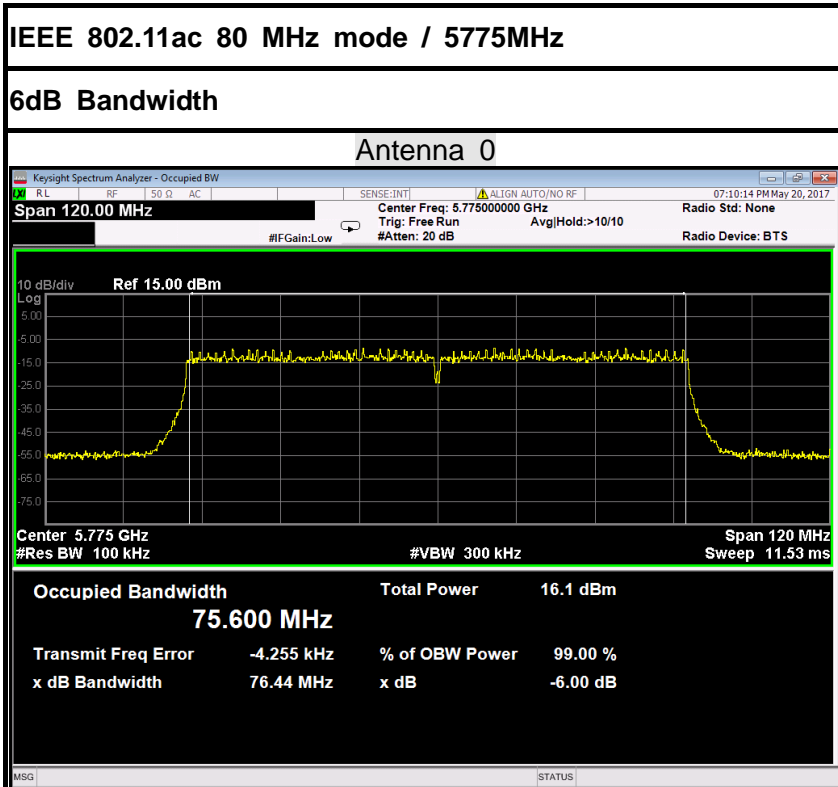


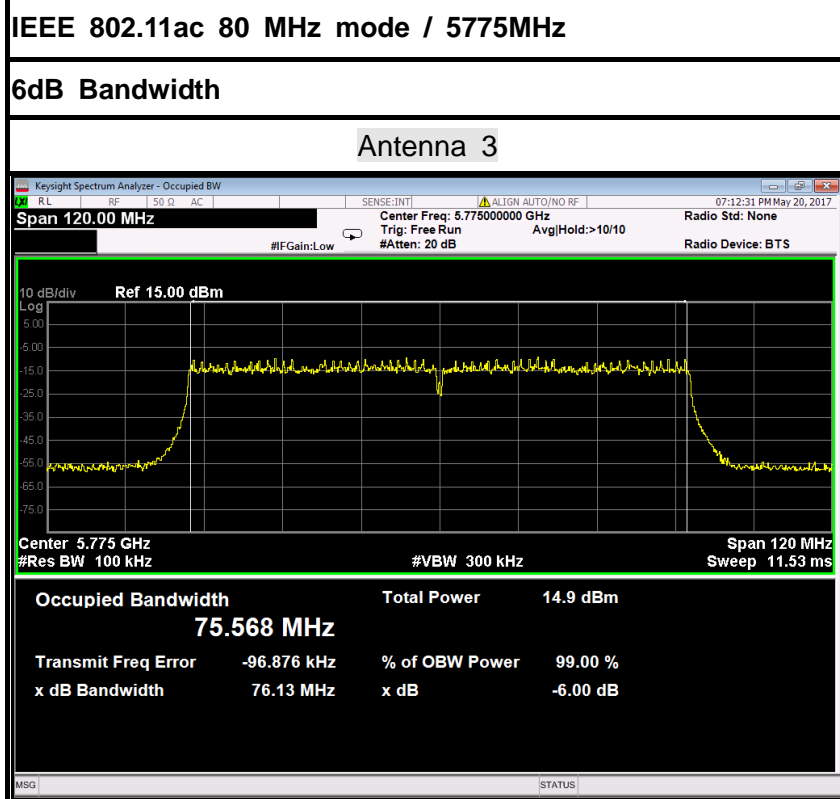
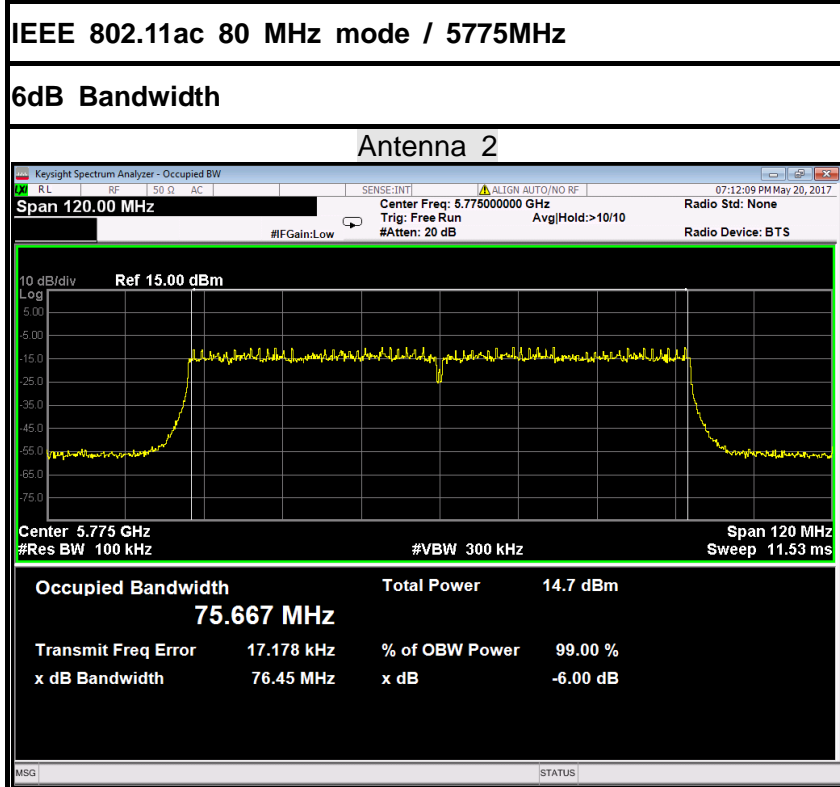














6.3 ANTENNA GAIN

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	



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		5.52	5.20
Radiated power [dBm] Measured with OFDM modulation		7.31	6.75
Gain [dBi] Calculated		1.79	1.55
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		5.03	5.49
Radiated power [dBm] Measured with OFDM modulation		6.92	7.27
Gain [dBi] Calculated		1.89	1.78
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		6.07	7.49
Radiated power [dBm] Measured with OFDM modulation		8.06	9.07
Gain [dBi] Calculated		1.99	1.58
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		7.55	7.78
Radiated power [dBm] Measured with OFDM modulation		9.14	9.48
Gain [dBi] Calculated		1.59	1.7
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	



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		5.22	7.11
Radiated power [dBm] Measured with OFDM modulation		7.10	8.85
Gain [dBi] Calculated		1.88	1.74
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		5.16	5.57
Radiated power [dBm] Measured with OFDM modulation		6.98	7.3
Gain [dBi] Calculated		1.82	1.73
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		6.01	7.24
Radiated power [dBm] Measured with OFDM modulation		7.81	8.92
Gain [dBi] Calculated		1.80	1.68
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		6.54	5.98
Radiated power [dBm] Measured with OFDM modulation		8.33	7.86
Gain [dBi] Calculated		1.79	1.88
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

**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		5.21	6.76
Radiated power [dBm] Measured with OFDM modulation		7.60	8.42
Gain [dBi] Calculated		1.39	1.66
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		4.94	5.25
Radiated power [dBm] Measured with OFDM modulation		6.95	7.13
Gain [dBi] Calculated		2.01	1.88
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		6.24	7.33
Radiated power [dBm] Measured with OFDM modulation		8.05	9.31
Gain [dBi] Calculated		1.81	1.98
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		7.37	6.59
Radiated power [dBm] Measured with OFDM modulation		9.36	8.59
Gain [dBi] Calculated		1.99	2
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	



Antenna 3

IEEE 802.11a mode / 5180 ~ 5240MHz

T _{nom}	V _{nom}	Lowest channel 5180MHz	Highest channel 5240MHz
Conducted power [dBm] Measured with OFDM modulation		5.67	7.24
Radiated power [dBm] Measured with OFDM modulation		7.47	8.95
Gain [dBi] Calculated		1.80	1.61
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		5.11	5.21
Radiated power [dBm] Measured with OFDM modulation		6.8	7.08
Gain [dBi] Calculated		1.69	1.87
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		6.12	6.82
Radiated power [dBm] Measured with OFDM modulation		8.01	8.67
Gain [dBi] Calculated		1.89	1.85
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		7.34	6.79
Radiated power [dBm] Measured with OFDM modulation		9.25	8.88
Gain [dBi] Calculated		1.91	2.09
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	



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 $11 \text{ dBm} + 10 \log B$, 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.

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.



Specified Limit of the Output Power

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

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
Low	5260	21.48	21.50	21.49	21.46	13.32	13.32	13.32	13.32	24.32	24.32	24.32	24.32	24.00	24.00	24.00	24.00
Mid	5300	21.63	21.56	21.54	21.38	13.35	13.34	13.33	13.30	24.35	24.34	24.33	24.33	24.00	24.00	24.00	24.00
High	5320	21.56	21.61	21.47	21.59	13.34	13.35	13.32	13.34	24.34	24.35	24.32	24.32	24.00	24.00	24.00	24.00

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

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
Low	5500	21.45	21.55	21.39	21.23	13.31	13.33	13.30	13.27	24.31	24.33	24.30	24.27	24.00	24.00	24.00	24.00
Mid	5580	21.37	21.44	21.64	21.61	13.30	13.31	13.35	13.35	24.30	24.31	24.35	24.35	24.00	24.00	24.00	24.00
High	5700	21.34	21.44	21.42	21.40	13.29	13.31	13.31	13.30	24.29	24.31	24.31	24.30	24.00	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)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
Low	5260	21.70	21.44	21.50	21.62	13.36	13.31	13.32	13.35	24.36	24.31	24.32	24.32	24.00	24.00	24.00	24.00
Mid	5300	21.76	21.44	21.70	21.36	13.38	13.31	13.36	13.30	24.38	24.31	24.36	24.36	24.00	24.00	24.00	24.00
High	5320	21.82	21.60	21.45	21.55	13.39	13.34	13.31	13.33	24.39	24.34	24.31	24.31	24.00	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)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
Low	5500	21.32	21.41	21.13	21.41	13.29	13.31	13.25	13.31	24.29	24.31	24.25	24.31	24.00	24.00	24.00	24.00
Mid	5580	20.93	21.36	21.43	21.52	13.21	13.30	13.31	13.33	24.21	24.30	24.31	24.33	24.00	24.00	24.00	24.00
High	5700	21.35	21.39	21.38	21.46	13.29	13.30	13.30	13.32	24.29	24.30	24.30	24.32	24.00	24.00	24.00	24.00



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

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
Low	5270	40.12	40.05	40.22	39.96	16.03	16.03	16.04	16.02	27.03	27.03	27.04	27.02	24.00	24.00	24.00	24.00
High	5310	39.92	40.41	40.08	40.27	16.01	16.06	16.03	16.05	27.01	27.06	27.03	27.05	24.00	24.00	24.00	24.00

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

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
Low	5510	39.79	40.19	40.30	40.06	16.00	16.04	16.05	16.03	27.00	27.04	27.05	27.03	24.00	24.00	24.00	24.00
Mid	5550	40.25	39.98	40.29	40.36	16.05	16.02	16.05	16.06	27.05	27.02	27.05	27.06	24.00	24.00	24.00	24.00
High	5670	40.07	40.01	40.11	40.07	16.03	16.02	16.03	16.03	27.03	27.02	27.03	27.03	24.00	24.00	24.00	24.00

IEEE 802.11ac 80 mode / 5290MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
	5290	80.40	80.43	79.89	80.68	19.05	19.05	19.02	19.07	30.05	30.05	30.02	30.07	24.00	24.00	24.00	24.00

IEEE 802.11ac 80 mode / 5530MHz

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)				10*Log(B) (dB)				11 + 10*Log(B) (dBm)				Maximum Conducted Output Power Limit (dBm)			
		Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3
	5530	80.85	80.67	80.29	80.50	19.08	19.07	19.05	19.06	30.08	30.07	30.05	30.06	24.00	24.00	24.00	24.00

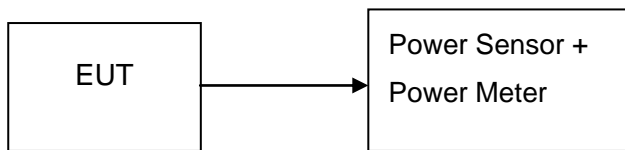


6.4.2 MEASUREMENT EQUIPMENT USED

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



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 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3		
Low	5180	17.56	17.26	17.51	17.71	0.05702	0.05321	0.05636	0.05902	30.00	PASS
Mid	5200	19.27	19.31	19.21	19.42	0.08453	0.08531	0.08337	0.08750		PASS
High	5240	17.24	19.15	19.06	19.28	0.05297	0.08222	0.08054	0.08472		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 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3		
Low	5260	17.33	17.46	17.24	17.41	0.05408	0.05572	0.05297	0.05508	24.00	PASS
Mid	5300	17.30	17.54	17.57	17.15	0.05370	0.05675	0.05715	0.05188		PASS
High	5320	17.52	17.61	17.29	17.25	0.05649	0.05768	0.05358	0.05309		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 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3		
Low	5500	19.50	19.13	19.35	19.71	0.08913	0.08185	0.08610	0.09354	24.00	PASS
Mid	5580	19.54	18.94	19.13	19.52	0.08995	0.07834	0.08185	0.08954		PASS
High	5700	19.49	18.83	19.22	19.38	0.08892	0.07638	0.08356	0.08670		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 3	Antenna 0	Antenna 1	Antenna 2	Antenna 3		
Low	5745	22.46	22.14	22.54	22.11	0.17620	0.16368	0.17947	0.16255	30.00	PASS
Mid	5785	22.57	22.02	22.45	22.07	0.18072	0.15922	0.17579	0.16106		PASS
High	5825	22.26	22.25	22.24	22.02	0.16827	0.16788	0.16749	0.15922		PASS



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	Antenna 3	Total			
Low	5180	11.46	11.28	11.93	12.39	17.81	0.06036	26.48	PASS
Mid	5200	13.54	13.27	13.77	15.31	20.07	0.10161		PASS
High	5240	13.38	13.38	13.35	15.25	19.94	0.09868		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	Antenna 3	Total			
Low	5260	13.76	13.51	13.73	13.72	19.70	0.09336	20.48	PASS
Mid	5300	13.47	13.45	13.67	13.98	19.67	0.09265		PASS
High	5320	13.70	13.32	13.41	13.76	19.57	0.09062		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	Antenna 3	Total			
Low	5500	13.65	13.45	13.46	13.72	19.59	0.09104	20.48	PASS
Mid	5580	13.61	13.43	13.61	13.69	19.61	0.09134		PASS
High	5700	13.81	13.89	13.89	13.72	19.85	0.09658		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	Antenna 3	Total			
Low	5745	17.03	17.33	17.51	17.77	23.44	0.22075	26.48	PASS
Mid	5785	17.19	17.09	17.53	17.76	23.42	0.21986		PASS
High	5825	17.25	17.08	17.45	17.53	23.35	0.21635		PASS

Remark:

Directional Gain= $G_{ant} + 10\log(N_{ant})$ dBi

G_{ant} : Gain of Individual Antennas (Same for Each Antenna)

N_{ant} : Number of Transmit Antennas



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	Antenna 3	Total			
Low	5190	10.58	10.98	11.14	11.77	17.16	0.05199	26.48	PASS
High	5230	11.02	11.31	11.17	11.68	17.32	0.05398		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	Antenna 3	Total			
Low	5270	14.00	14.20	14.05	14.15	20.12	0.10283	20.48	PASS
High	5310	14.17	14.26	14.25	14.11	20.22	0.10516		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	Antenna 3	Total			
Low	5510	14.23	14.14	14.12	14.02	20.15	0.10348	20.48	PASS
Mid	5550	14.87	14.27	14.14	14.11	20.38	0.10913		PASS
High	5670	14.26	14.15	14.18	14.18	20.21	0.10503		PASS

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	Antenna 3	Total			
Low	5755	18.33	18.23	18.43	18.03	24.28	0.26780	26.48	PASS
High	5795	18.28	18.41	18.35	18.27	24.35	0.27217		PASS

Remark:

Directional Gain= $G_{ant} + 10\log(N_{ant})$ dBi

G_{ant} : Gain of Individual Antennas (Same for Each Antenna)

N_{ant} : Number of Transmit Antennas



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	Antenna 3	Total			
	5210	11.58	11.28	11.03	11.41	17.35	0.05433	26.48	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	Antenna 3	Total			
	5290	13.96	13.36	13.78	13.62	19.71	0.09346	20.48	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	Antenna 3	Total			
	5530	13.75	13.87	13.83	13.86	19.85	0.09657	20.48	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	Antenna 3	Total			
	5775	18.03	18.05	18.32	18.39	24.22	0.26430	26.48	PASS

Remark:

Directional Gain= $G_{ant} + 10\log(N_{ant})$ dBi

G_{ant} : Gain of Individual Antennas (Same for Each Antenna)

N_{ant} : Number of Transmit Antennas



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.

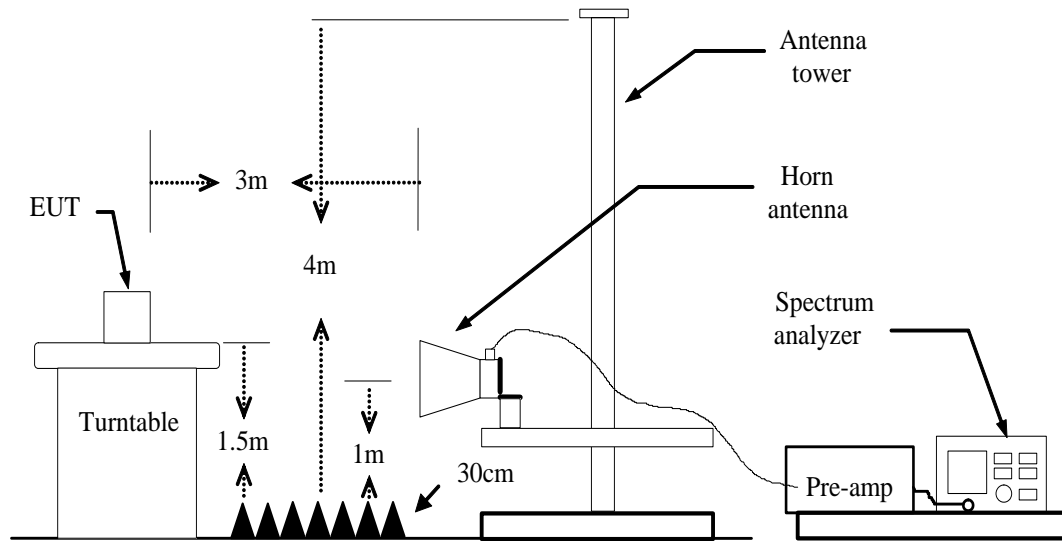
6.5.2 MEASUREMENT EQUIPMENT USED

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	02/28/2017	02/27/2018
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2017	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.



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.



6.5.5 TEST RESULT

IEEE 802.11a mode / 5500 ~ 5700MHz

Antenna 0:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.45MHz, CH High: 21.34MHz
4. Frequency Range: 5489.2750MHz, 5715.6700MHz

Antenna 1:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.55MHz, CH High: 21.44MHz
4. Frequency Range: 5489.2250MHz, 5715.6700MHz

Antenna 2:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.39MHz, CH High: 21.42MHz
4. Frequency Range: 5489.3050MHz, 5710.7100MHz

Antenna 3:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.23MHz, CH High: 21.40MHz
4. Frequency Range: 5489.3850MHz, 5710.7100MHz



IEEE 802.11a mode / 5745 ~ 5825MHz

Antenna 0:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.61MHz, CH High: 21.42MHz
4. Frequency Range: 5734.1850MHz, 5835.7100MHz

Antenna 1:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.55MHz, CH High: 21.52MHz
4. Frequency Range: 5734.2250MHz, 5835.7600MHz

Antenna 2:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.53MHz, CH High: 21.50MHz
4. Frequency Range: 5734.2350MHz, 5835.7500MHz

Antenna 3:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.39MHz, CH High: 21.47MHz
4. Frequency Range: 5734.3050MHz, 5835.7350MHz



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

Antenna 0:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.32MHz, CH High: 21.35MHz
4. Frequency Range: 5489.3400MHz, 5710.6750MHz

Antenna 1:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.41MHz, CH High: 21.39MHz
4. Frequency Range: 5489.2950MHz, 5710.6950MHz

Antenna 2:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.13MHz, CH High: 21.38Hz
4. Frequency Range: 5489.4350MHz, 5710.6900MHz

Antenna 3:

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 21.41MHz, CH High: 21.46MHz
4. Frequency Range: 5489.2950MHz, 5710.7300MHz



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

Antenna 0:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.60MHz, CH High: 21.55MHz
4. Frequency Range: 5734.2000MHz, 5835.7750MHz

Antenna 1:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.40MHz, CH High: 21.28MHz
4. Frequency Range: 5734.3000MHz, 5835.6400MHz

Antenna 2:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.53MHz, CH High: 21.46MHz
4. Frequency Range: 5734.2350MHz, 5835.7300MHz

Antenna 3:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 21.50MHz, CH High: 21.59MHz
4. Frequency Range: 5734.2500MHz, 5835.7950MHz



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

Antenna 0:

1. Operating Frequency: 5510-5670MHz
2. CH Low: 5510MHz, CH High: 5670MHz
3. 26dB bandwidth: CH Low: 40.38MHz, CH High: 40.07MHz
4. Frequency Range: 5489.8100MHz, 5690.0350MHz

Antenna 1:

1. Operating Frequency: 5510-5670MHz
2. CH Low: 5510MHz, CH High: 5670MHz
3. 26dB bandwidth: CH Low: 40.49MHz, CH High: 40.01MHz
4. Frequency Range: 5489.7550MHz, 5690.0050MHz

Antenna 2:

1. Operating Frequency: 5510-5670MHz
2. CH Low: 5510MHz, CH High: 5670MHz
3. 26dB bandwidth: CH Low: 40.08MHz, CH High: 40.11MHz
4. Frequency Range: 5489.9600MHz, 5690.0550MHz

Antenna 3:

1. Operating Frequency: 5510-5670MHz
2. CH Low: 5510MHz, CH High: 5670MHz
3. 26dB bandwidth: CH Low: 40.27MHz, CH High: 40.07MHz
4. Frequency Range: 5489.8650MHz, 5690.0350MHz



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

Antenna 0:

1. Operating Frequency: 5755-5795MHz
2. CH Low: 5755MHz, CH High: 5795MHz
3. 26dB bandwidth: CH Low: 40.04MHz, CH High: 39.86MHz
4. Frequency Range: 5734.9800MHz, 5814.9300MHz

Antenna 1:

1. Operating Frequency: 5755-5795MHz
2. CH Low: 5755MHz, CH High: 5795MHz
3. 26dB bandwidth: CH Low: 39.74MHz, CH High: 39.79MHz
4. Frequency Range: 5735.1300MHz, 5814.8950MHz

Antenna 2:

1. Operating Frequency: 5755-5795MHz
2. CH Low: 5755MHz, CH High: 5795MHz
3. 26dB bandwidth: CH Low: 39.88MHz, CH High: 39.71MHz
4. Frequency Range: 5735.0600MHz, 5814.8950MHz

Antenna3 :

1. Operating Frequency: 5755-5795MHz
2. CH Low: 5755MHz, CH High: 5795MHz
3. 26dB bandwidth: CH Low: 39.83MHz, CH High: 39.95MHz
4. Frequency Range: 5735.0850MHz, 5814.9750MHz



IEEE 802.11ac 80 mode / 5530MHz

Antenna 0:

1. Operating Frequency: 5530MHz
2. CH: 5530MHz
3. 26dB bandwidth: CH: 80.85MHz
4. Frequency Range: 5489.5750MHz, 5570.4250MHz

Antenna 1:

1. Operating Frequency: 5530MHz
2. CH: 5530MHz
3. 26dB bandwidth: CH: 80.67MHz
4. Frequency Range: 5489.5750MHz, 5570.4250MHz

Antenna 2:

1. Operating Frequency: 5530MHz
2. CH: 5530MHz
3. 26dB bandwidth: CH: 80.29MHz
4. Frequency Range: 5489.8550MHz, 5570.1450MHz

Antenna 3:

1. Operating Frequency: 5530MHz
2. CH: 5530MHz
3. 26dB bandwidth: CH: 80.50MHz
4. Frequency Range: 5489.7500MHz, 5570.2500MHz



IEEE 802.11ac 80 mode / 5775MHz

Antenna 0:

1. Operating Frequency: 5775MHz
2. CH: 5775MHz
3. 26dB bandwidth: CH: 82.00MHz
4. Frequency Range: 5734.0000MHz, 5816.0000MHz

Antenna 1:

1. Operating Frequency: 5775MHz
2. CH: 5775MHz
3. 26dB bandwidth: CH: 81.71MHz
4. Frequency Range: 5734.1450MHz, 5815.8550MHz

Antenna 2:

1. Operating Frequency: 5775MHz
2. CH: 5775MHz
3. 26dB bandwidth: CH: 81.84MHz
4. Frequency Range: 5734.0800MHz, 5815.9200MHz

Antenna 3:

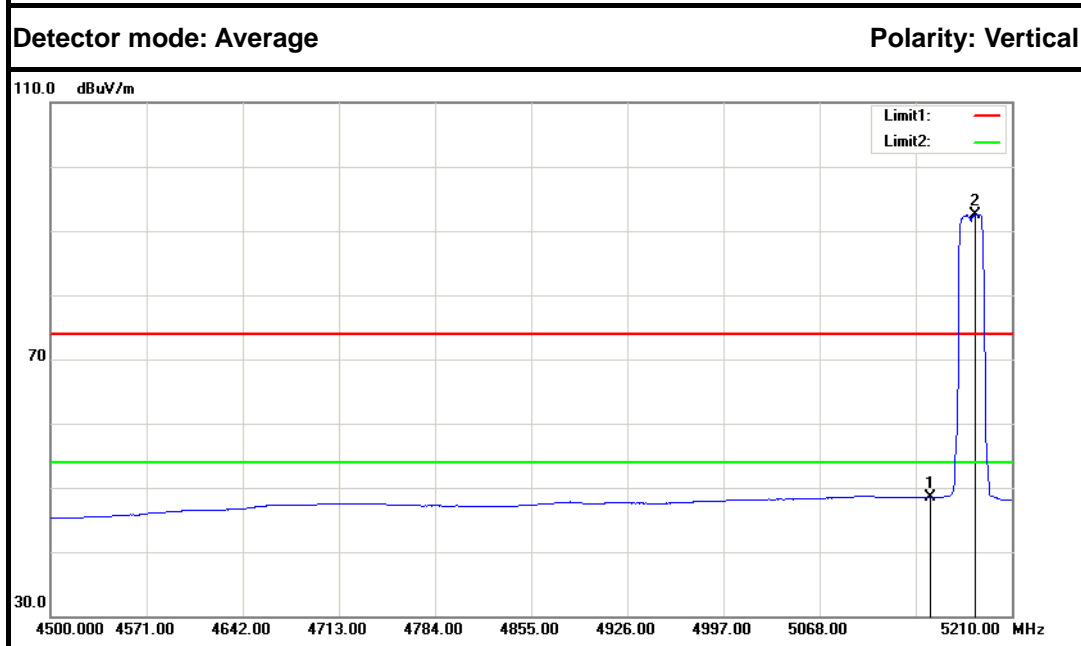
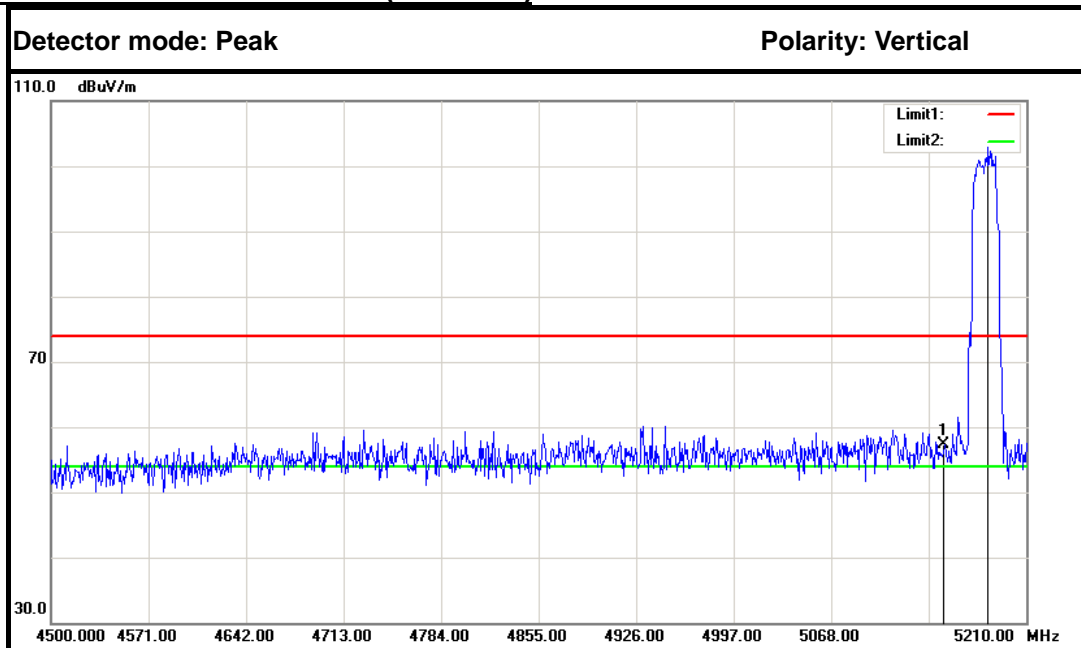
1. Operating Frequency: 5775MHz
2. CH: 5775MHz
3. 26dB bandwidth: CH: 82.40MHz
4. Frequency Range: 5733.8000MHz, 5816.2000MHz

Because the mentioned conditions the Fundamental Frequency Range was far away from the restricted bands in the table published in 15.205, the test is not applicable.

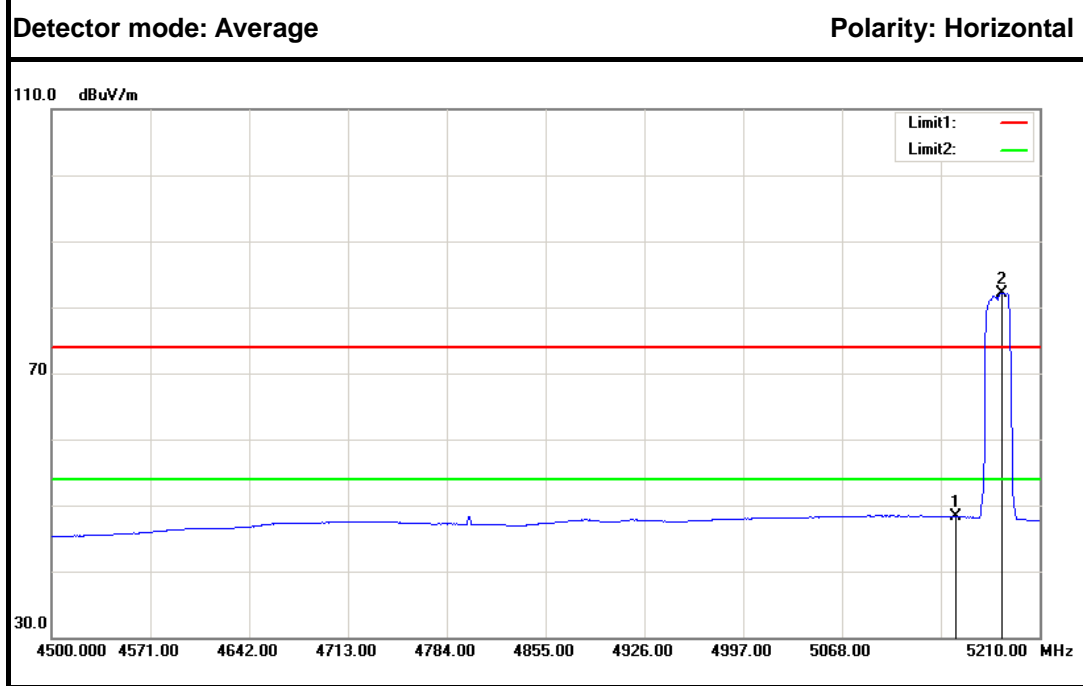
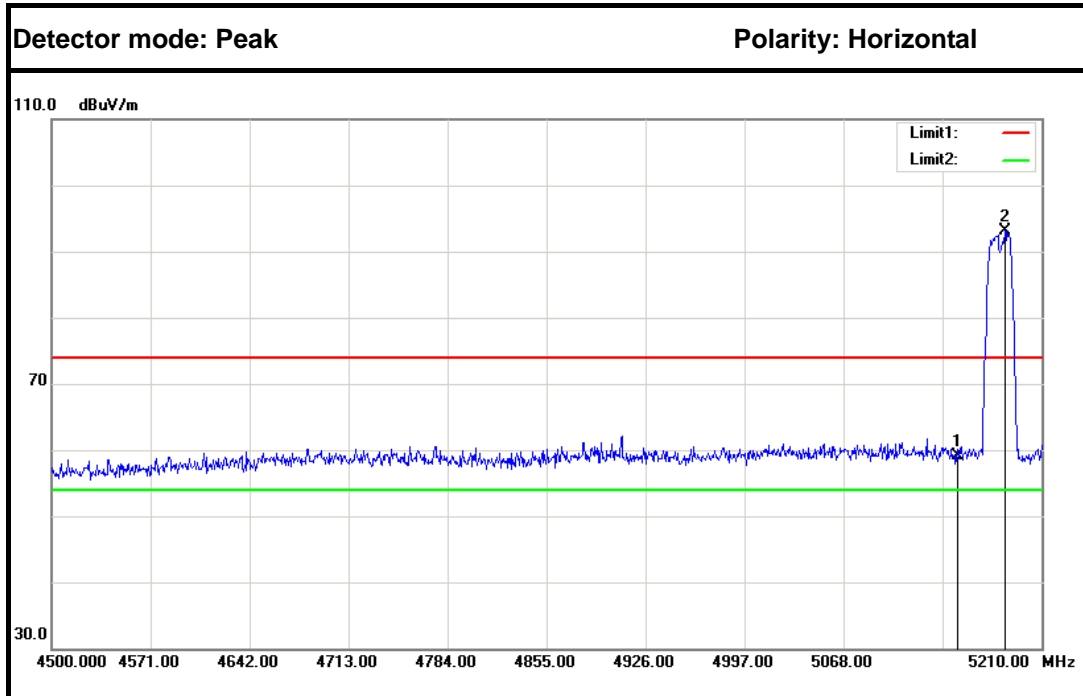


Test Plot

IEEE 802.11a mode / 5180MHz (Antenna 0)



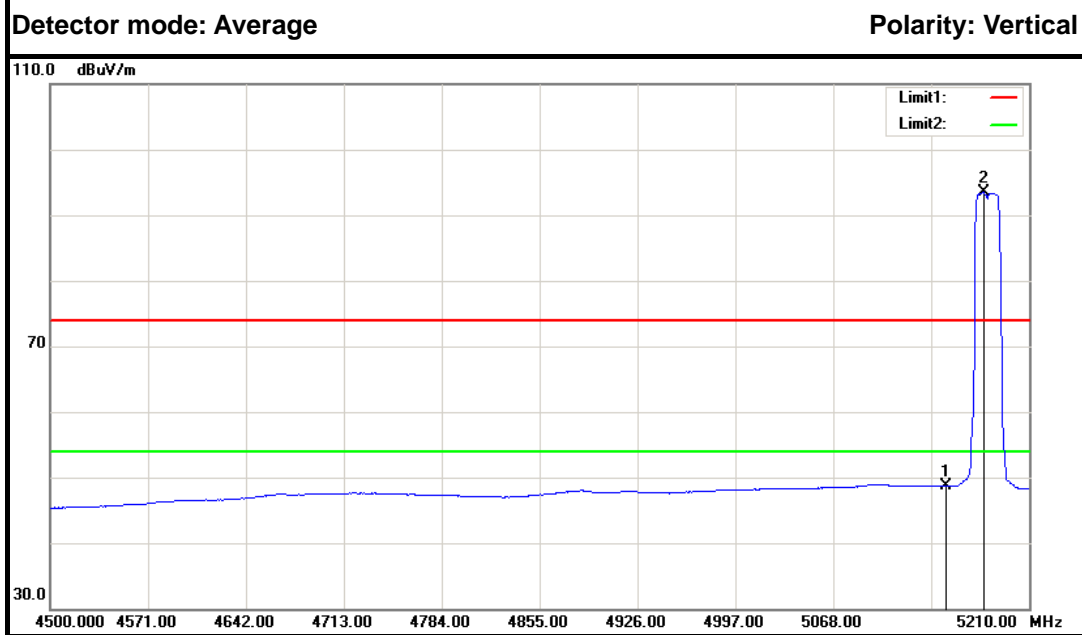
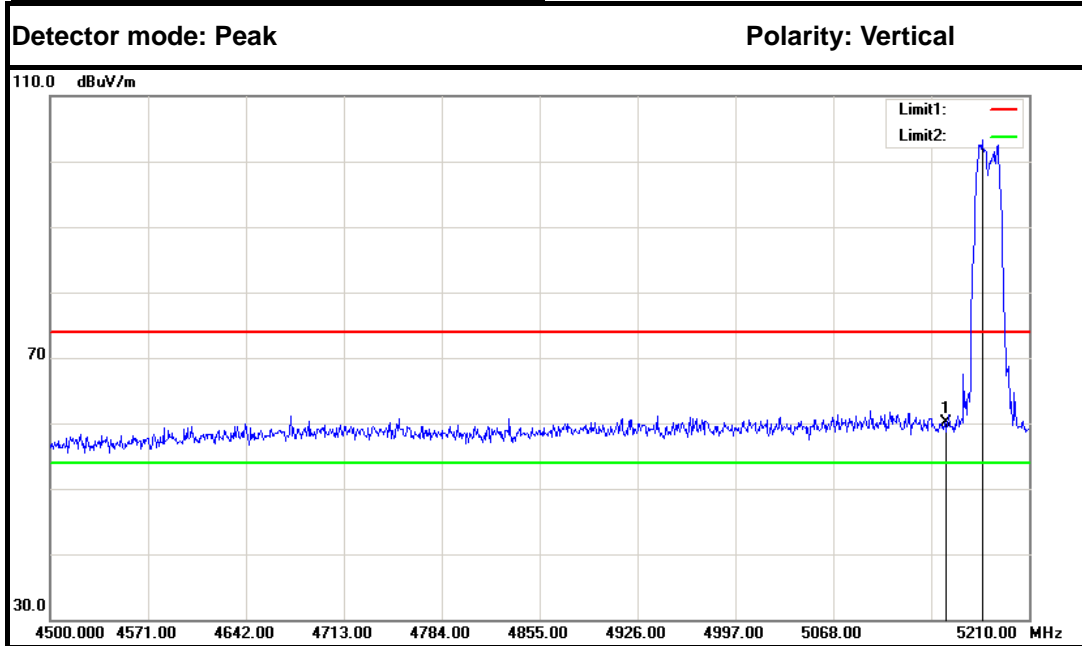
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.04	5.25	57.29	74.00	-16.71	Peak	Vertical
2	5182.310	97.64	5.30	102.94	---	---	Peak	Vertical
1	5150.000	43.28	5.25	48.53	54.00	-5.47	Average	Vertical
2	5183.020	87.18	5.31	92.49	---	---	Average	Vertical



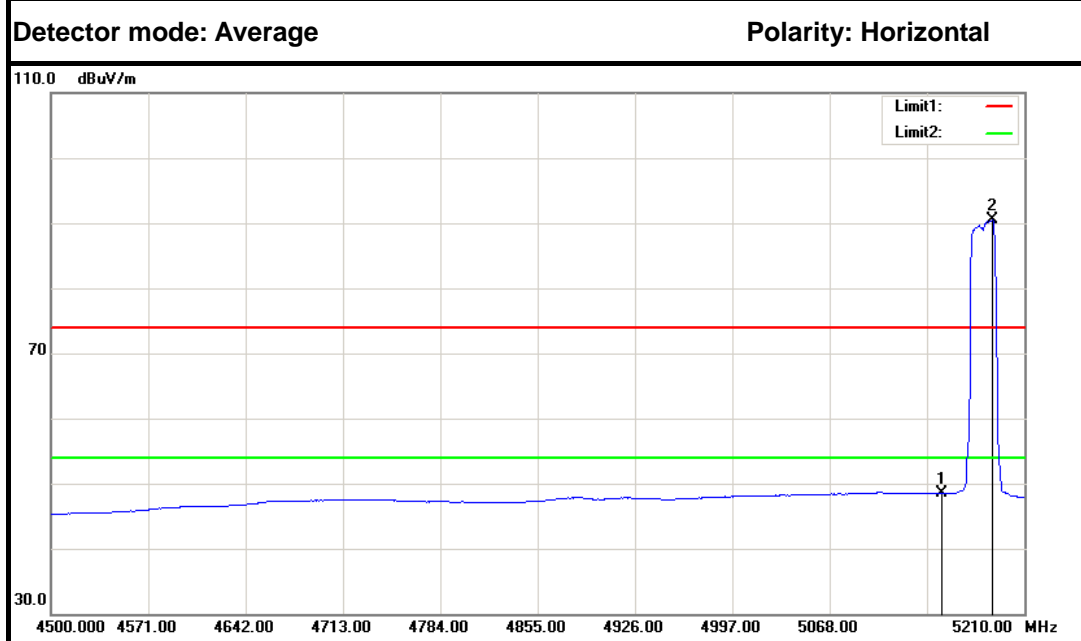
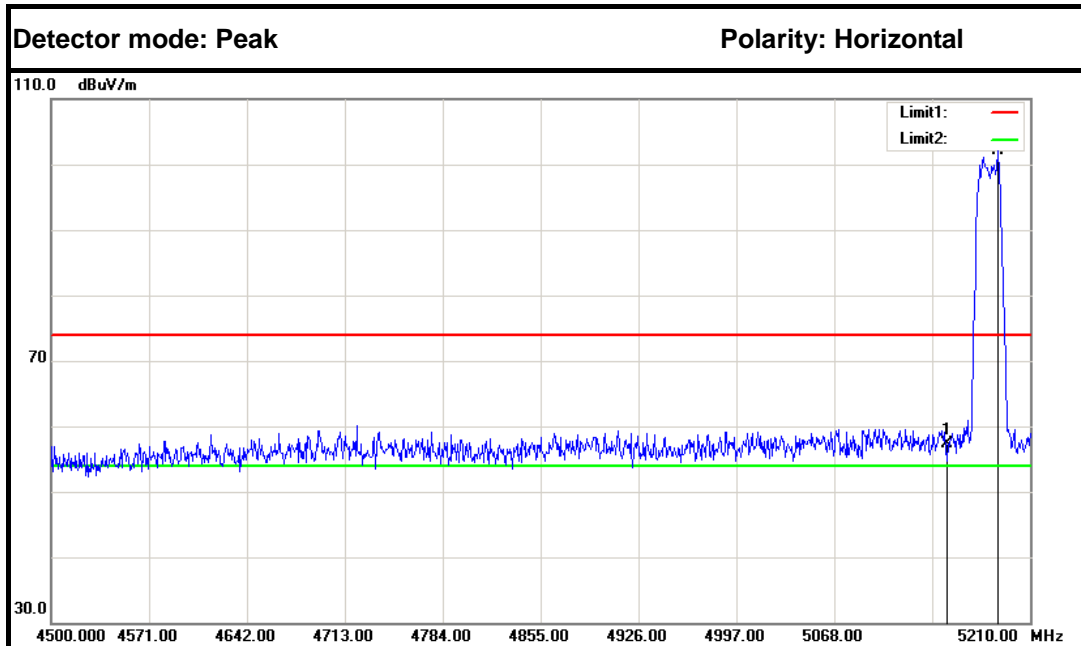
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1.	5150.000	53.77	5.25	59.02	74.00	-14.98	Peak	Horizontal
2.	5183.730	87.80	5.31	93.11	---	---	Peak	Horizontal
1	5150.000	43.03	5.25	48.28	54.00	-5.72	Average	Horizontal
2	5183.020	76.88	5.31	82.19	---	---	Average	Horizontal



IEEE 802.11a mode / 5180MHz (Antenna 1)



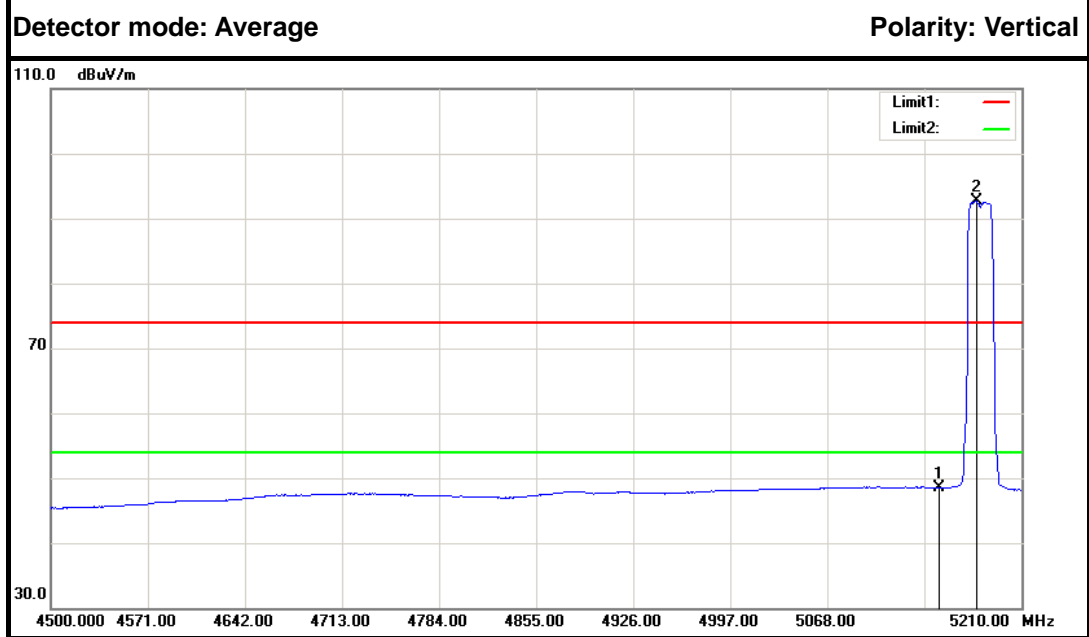
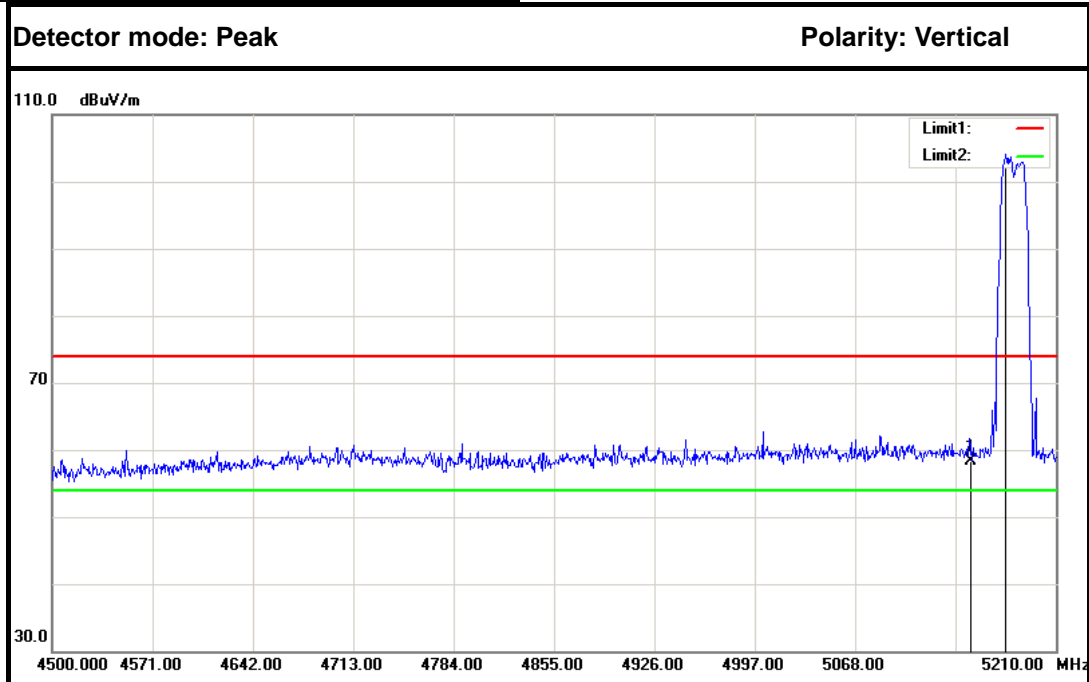
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	54.86	5.25	60.11	74.00	-13.89	Peak	Vertical
2	5175.920	98.03	5.29	103.32	---	---	Peak	Vertical
1	5150.000	43.50	5.25	48.75	54.00	-5.25	Average	Vertical
2	5177.340	88.24	5.30	93.54	---	---	Average	Vertical



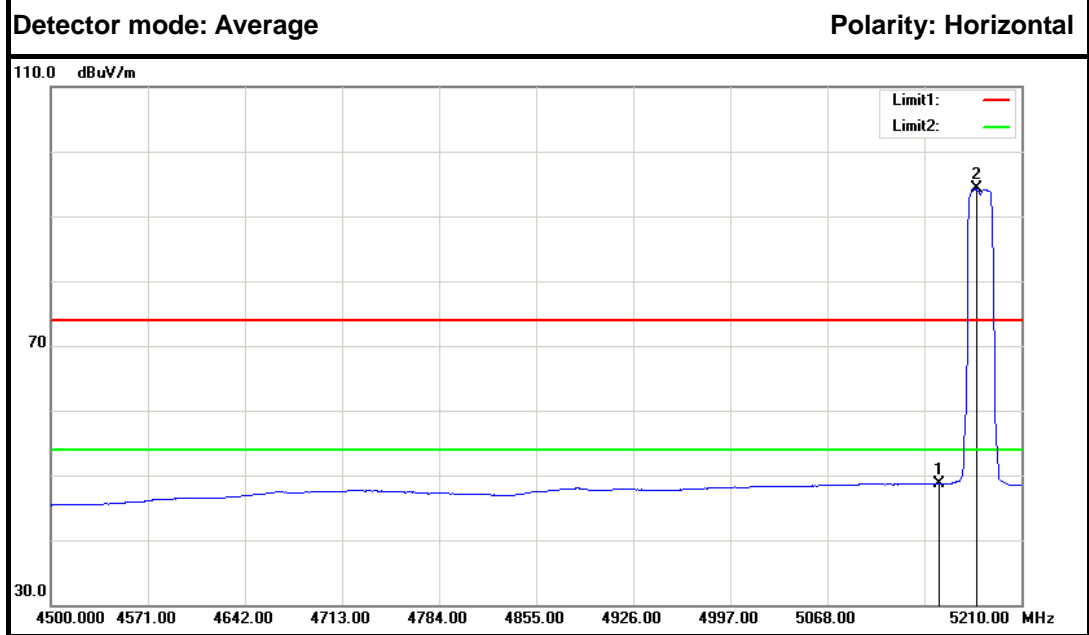
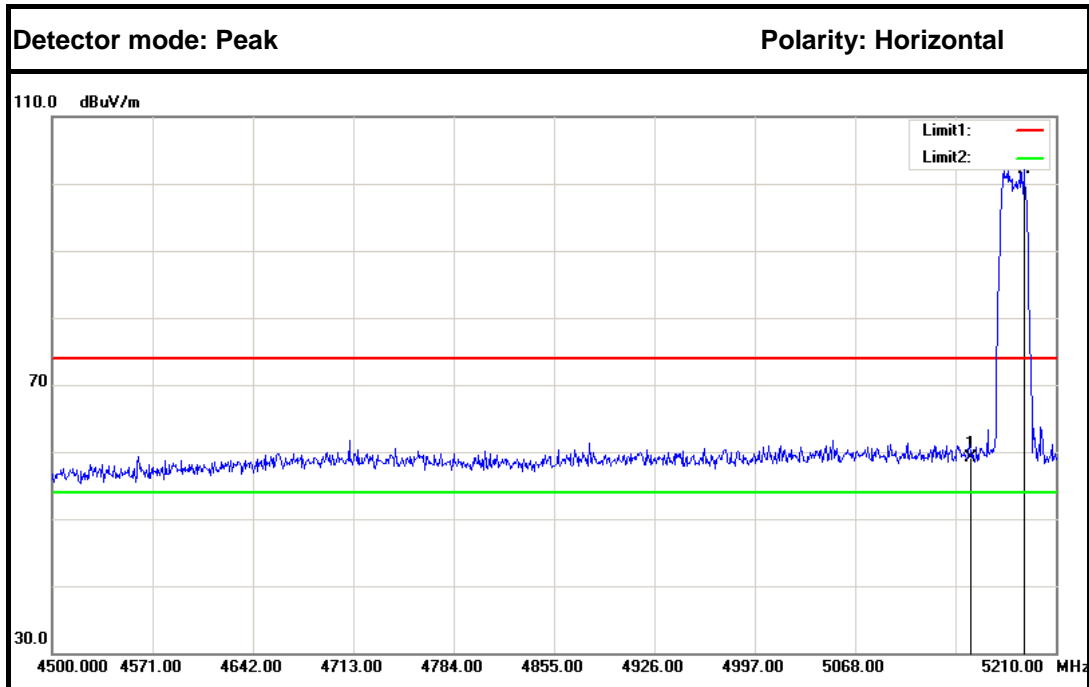
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.03	5.25	57.28	74.00	-16.72	Peak	Horizontal
2	5186.570	96.75	5.31	102.06	---	---	Peak	Horizontal
1	5150.000	43.20	5.25	48.45	54.00	-5.55	Average	Horizontal
2	5186.570	85.10	5.31	90.41	---	---	Average	Horizontal



IEEE 802.11a mode / 5180MHz (Antenna 2)



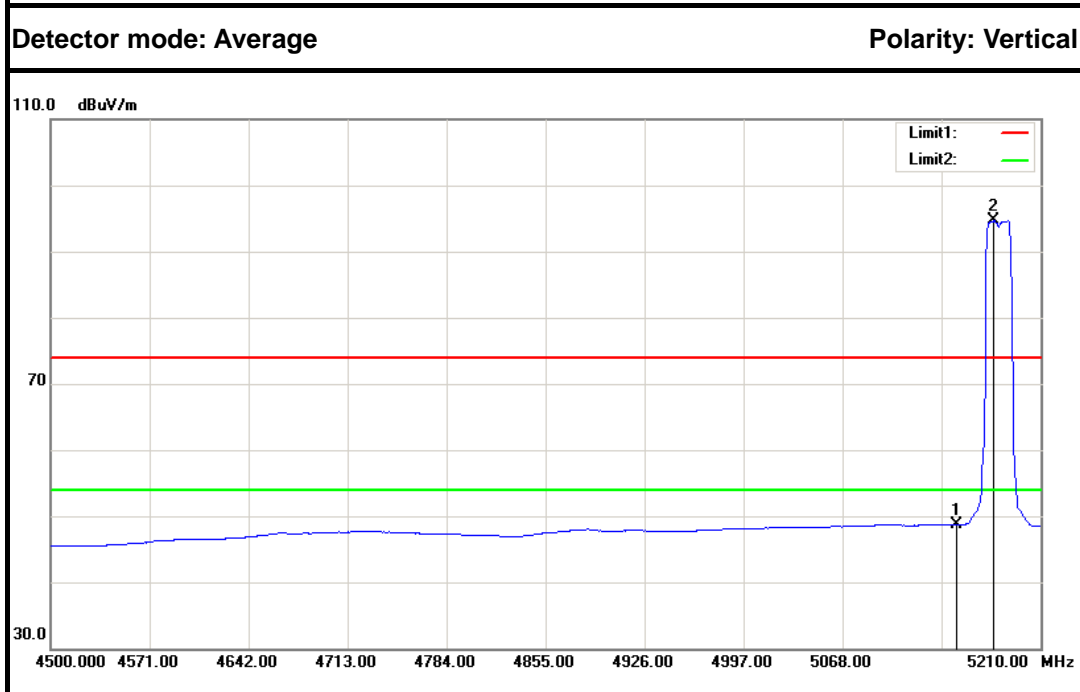
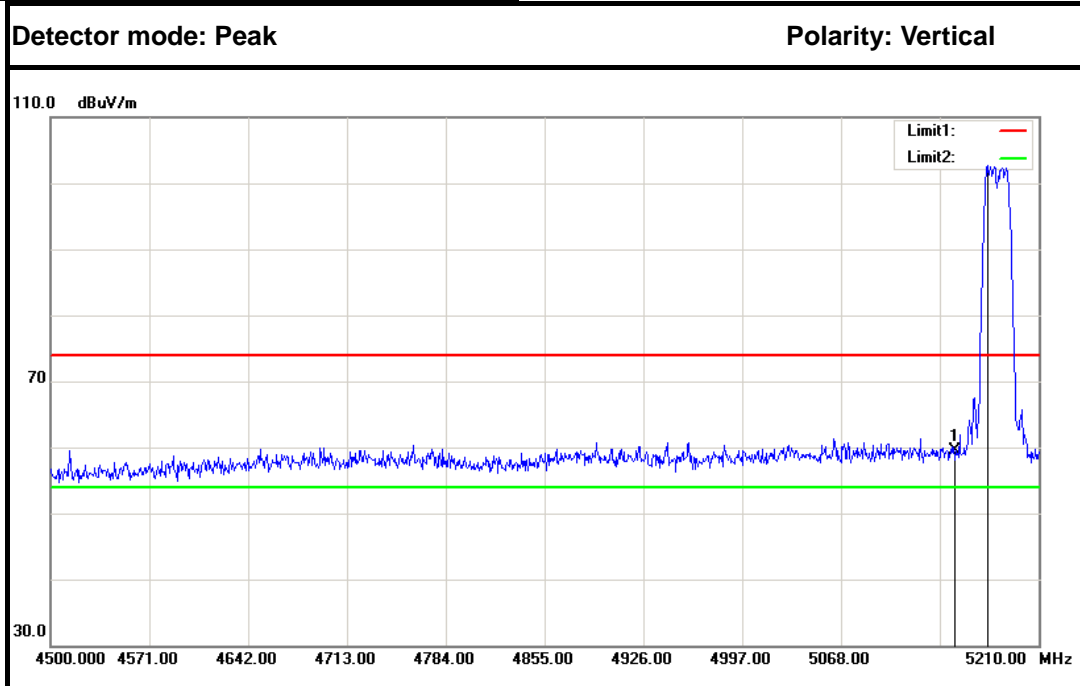
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1.	5150.000	52.98	5.25	58.23	74.00	-15.77	Peak	Vertical
2.	5174.500	98.71	5.29	104.00	---	---	Peak	Vertical
1.	5150.000	43.34	5.25	48.59	54.00	-5.41	Average	Vertical
2.	5177.340	87.41	5.30	92.71	---	---	Average	Vertical



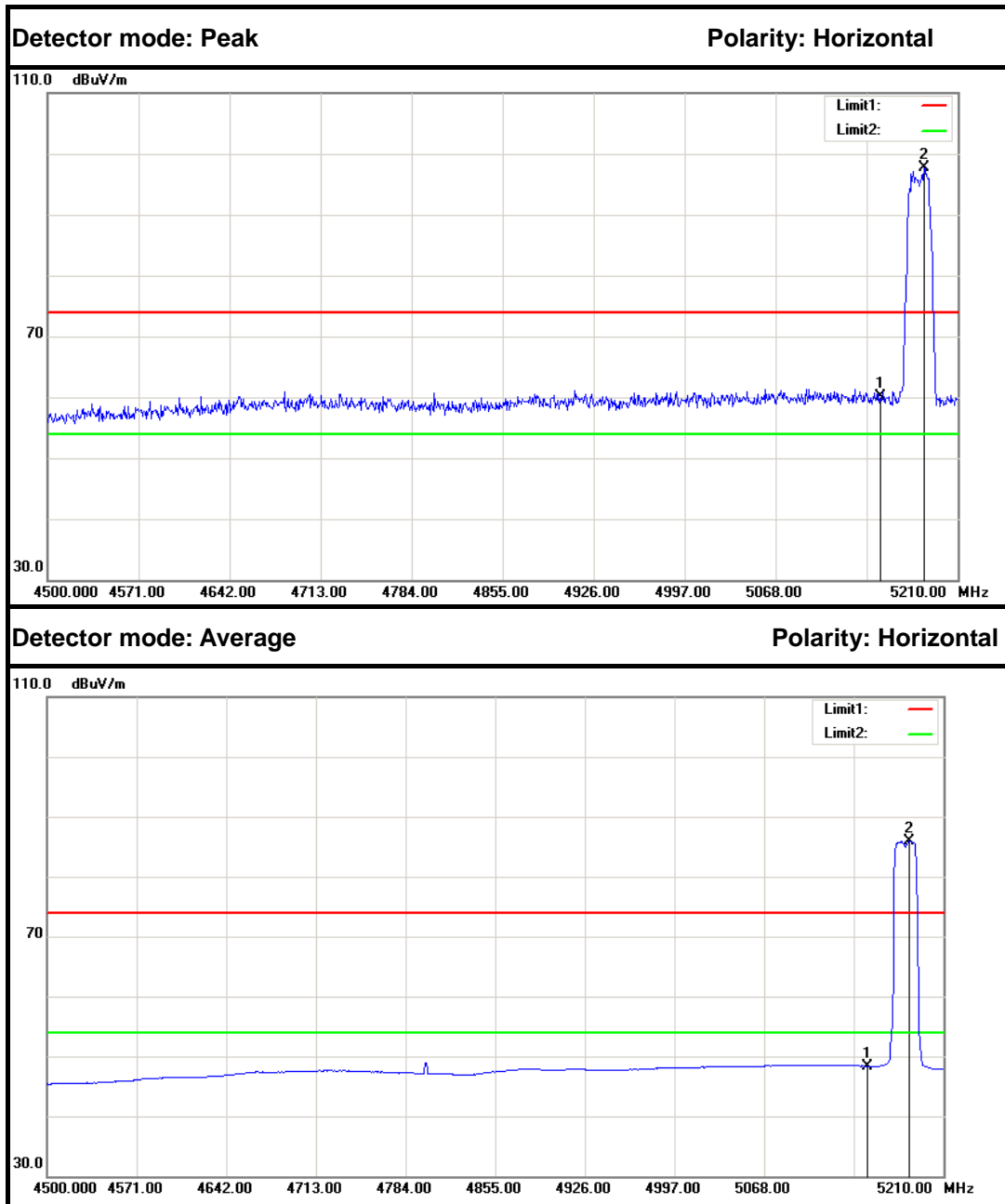
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	53.81	5.25	59.06	74.00	-14.94	Peak	Horizontal
2	5187.280	96.85	5.31	102.16	---	---	Peak	Horizontal
1	5150.000	43.49	5.25	48.74	54.00	-5.26	Average	Horizontal
2	5177.340	88.92	5.30	94.22	---	---	Average	Horizontal



IEEE 802.11a mode / 5180MHz (Antenna 3)



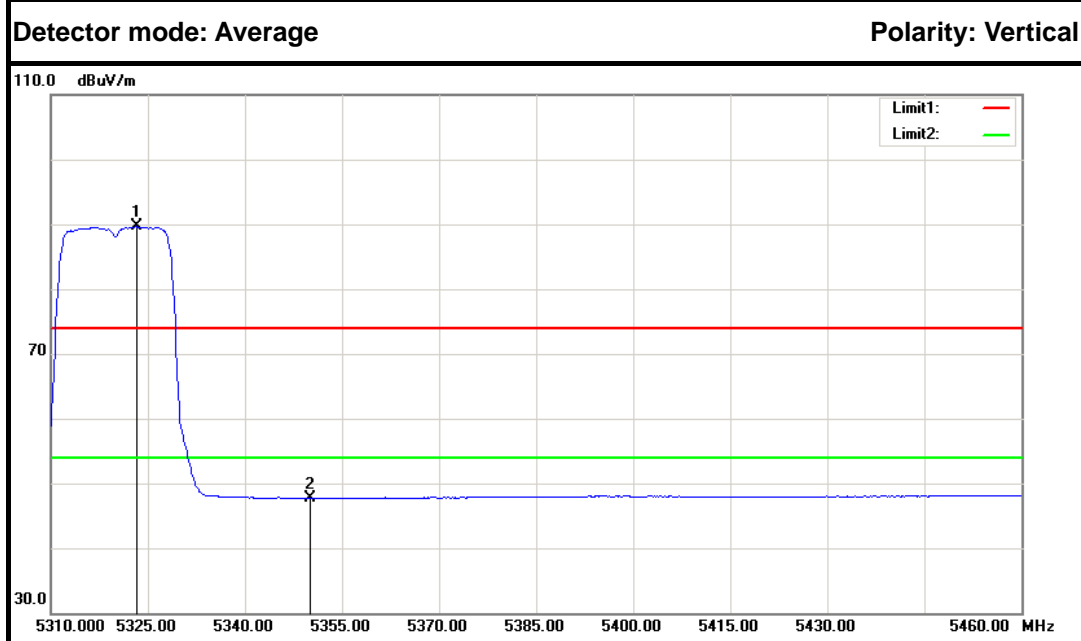
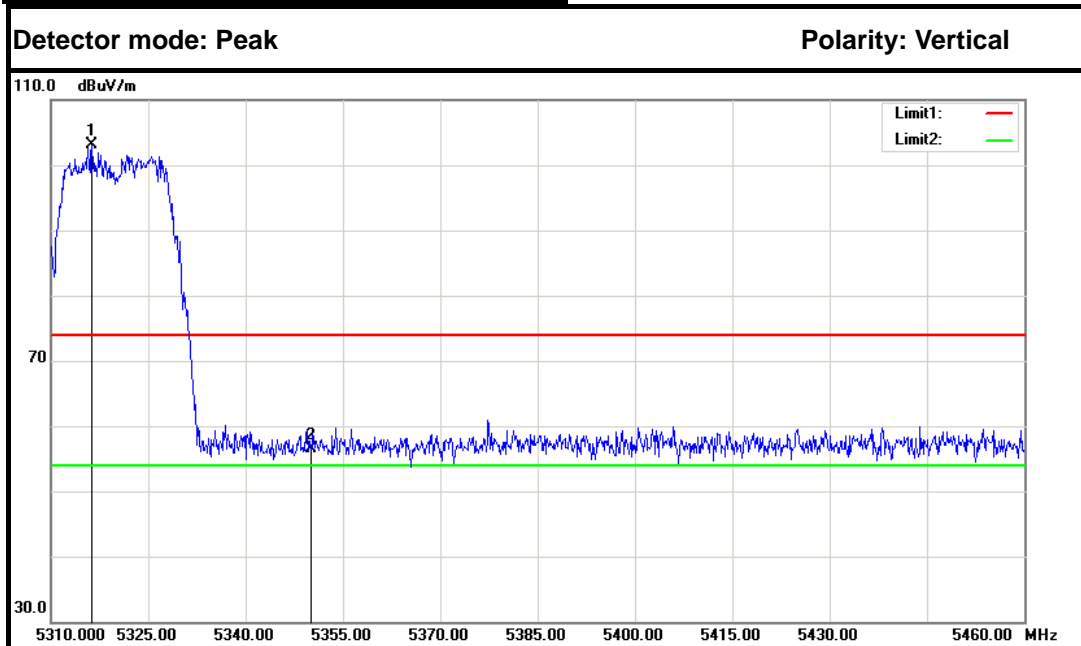
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
3.	5150.000	54.18	5.25	59.43	74.00	-14.57	Peak	Vertical
4.	5173.080	97.34	5.29	102.63	---	---	Peak	Vertical
3.	5150.000	43.45	5.25	48.70	54.00	-5.30	Average	Vertical
4.	5176.630	89.35	5.29	94.64	---	---	Average	Vertical



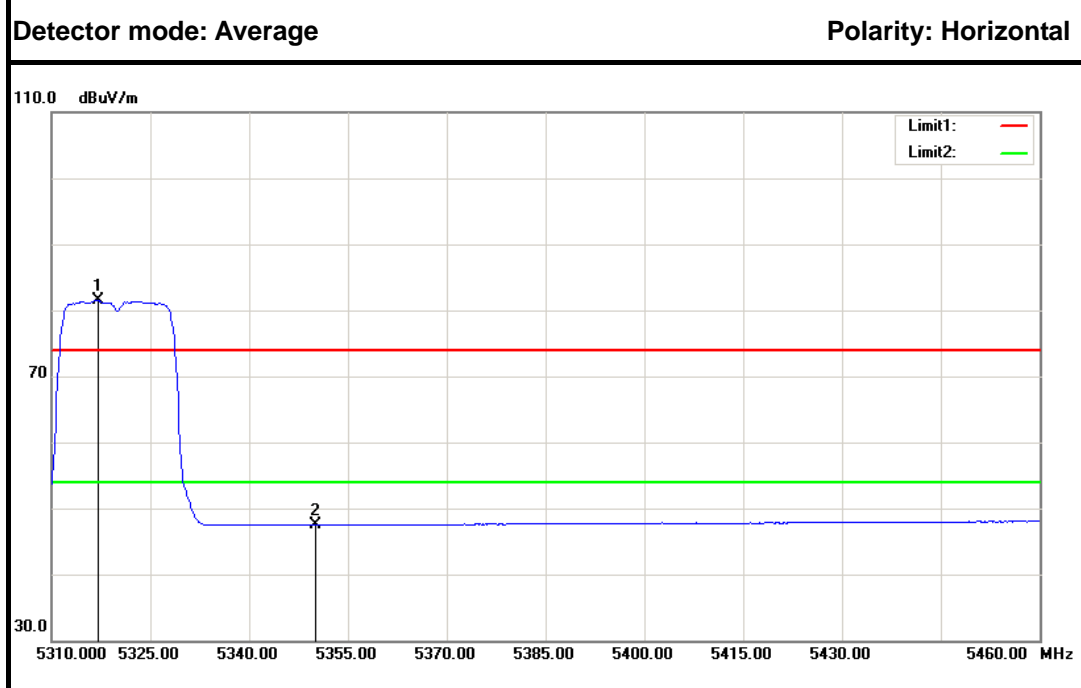
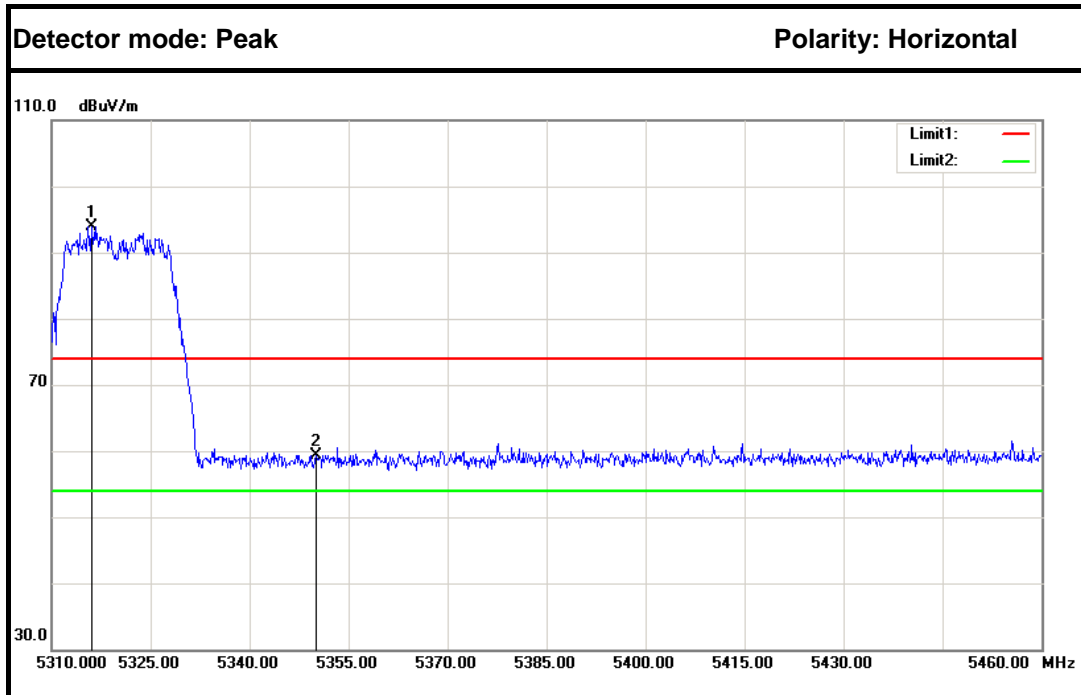
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	54.83	5.25	60.08	74.00	-13.92	Peak	Horizontal
2	5183.730	92.43	5.31	97.74	---	---	Peak	Horizontal
1	5150.000	43.11	5.25	48.36	54.00	-5.64	Average	Horizontal
2	5183.020	80.60	5.31	85.91	---	---	Average	Horizontal



IEEE 802.11a mode / 5320(Antenna 0)



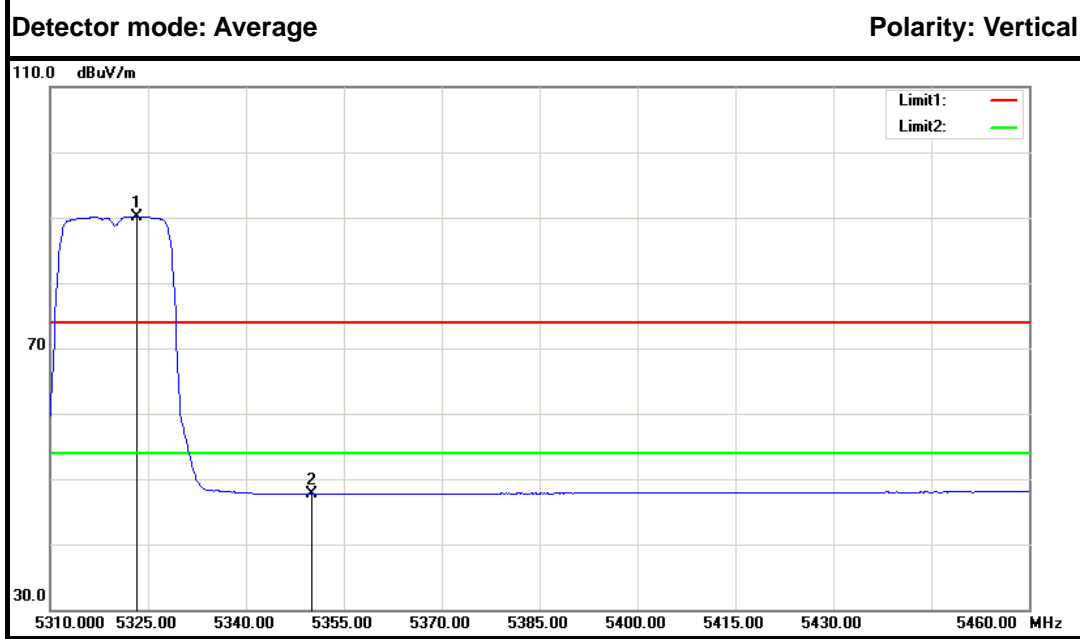
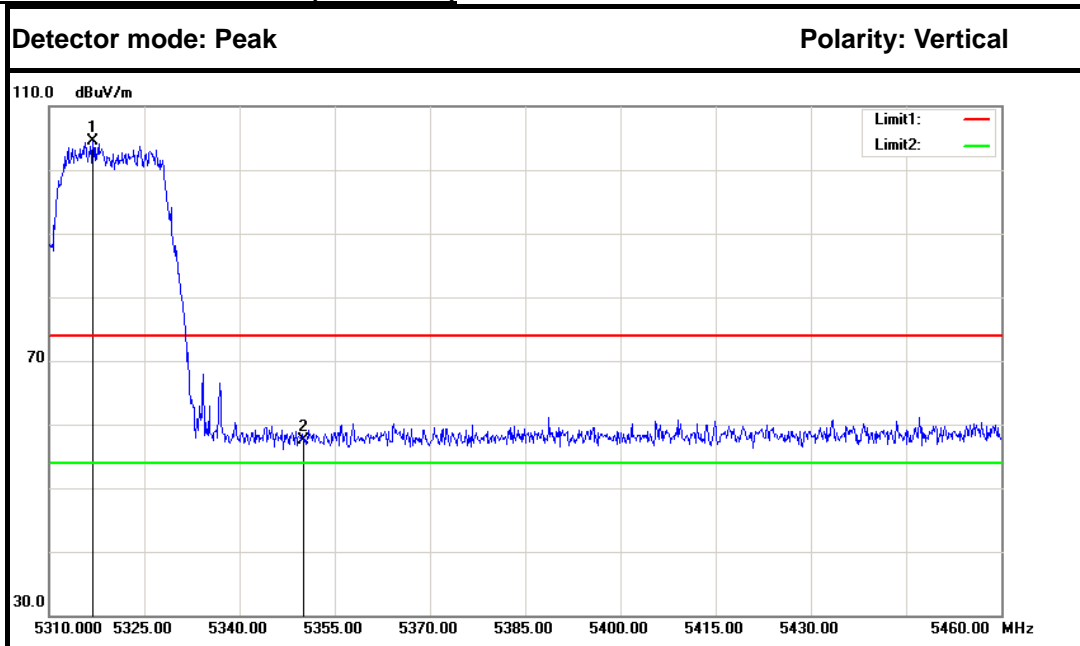
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5316.300	97.54	5.54	103.08	---	---	Peak	Vertical
2	5350.000	50.97	5.60	56.57	74.00	-17.43	Peak	Vertical
1	5323.200	84.05	5.56	89.61	---	---	Average	Vertical
2	5350.000	42.16	5.60	47.76	54.00	-6.24	Average	Vertical



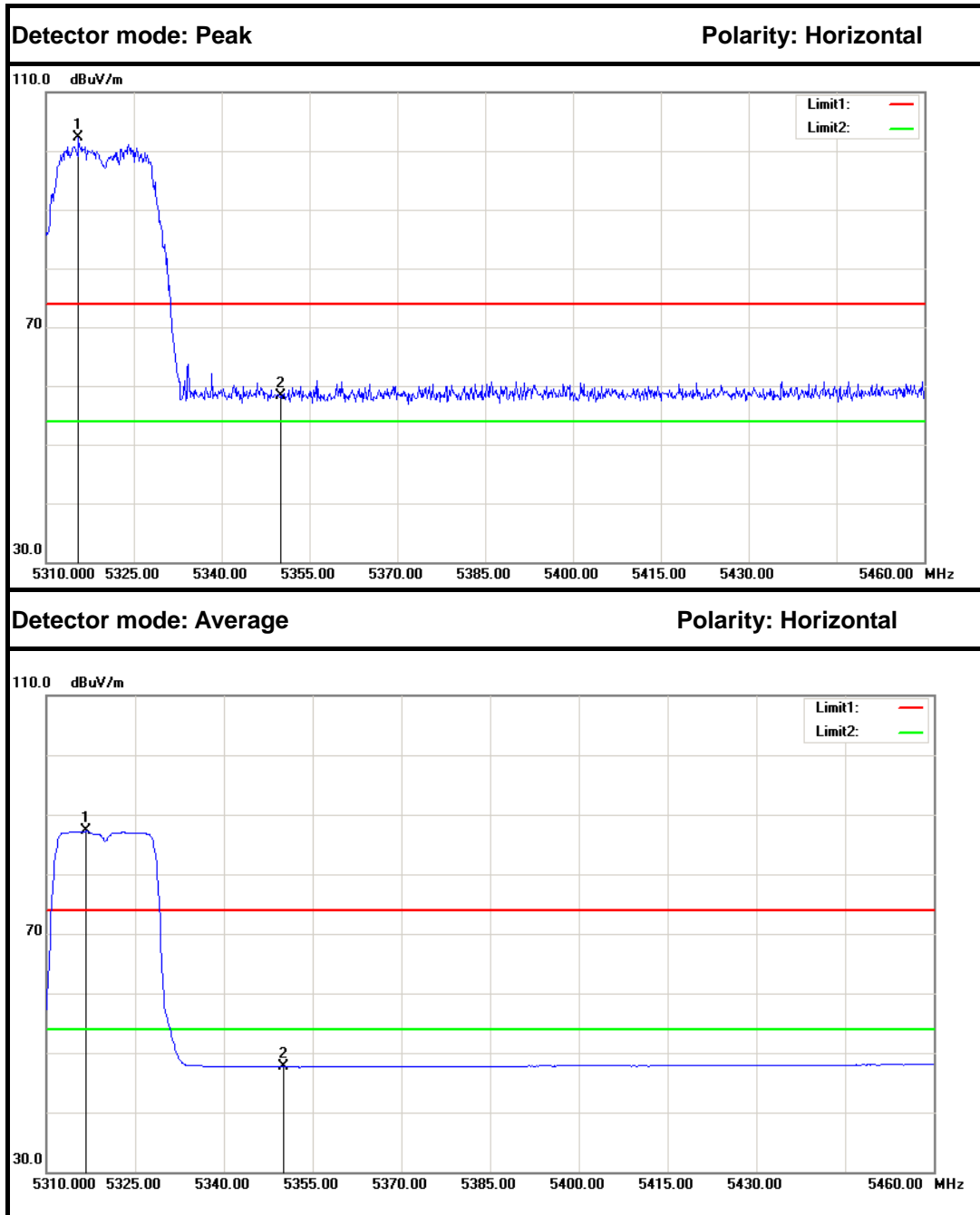
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5316.000	88.34	5.54	93.88	---	---	Peak	Horizontal
2	5350.000	53.71	5.60	59.31	74.00	-14.69	Peak	Horizontal
1	5317.050	75.93	5.54	81.47	---	---	Average	Horizontal
2	5350.000	41.94	5.60	47.54	54.00	-6.46	Average	Horizontal



IEEE 802.11a mode / 5320(Antenna 1)



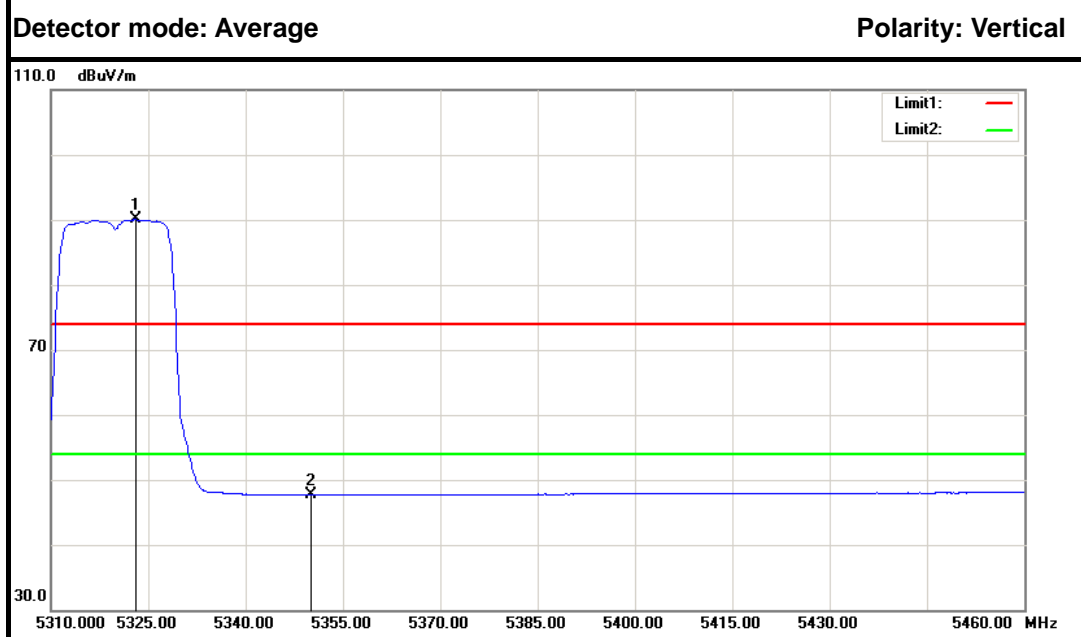
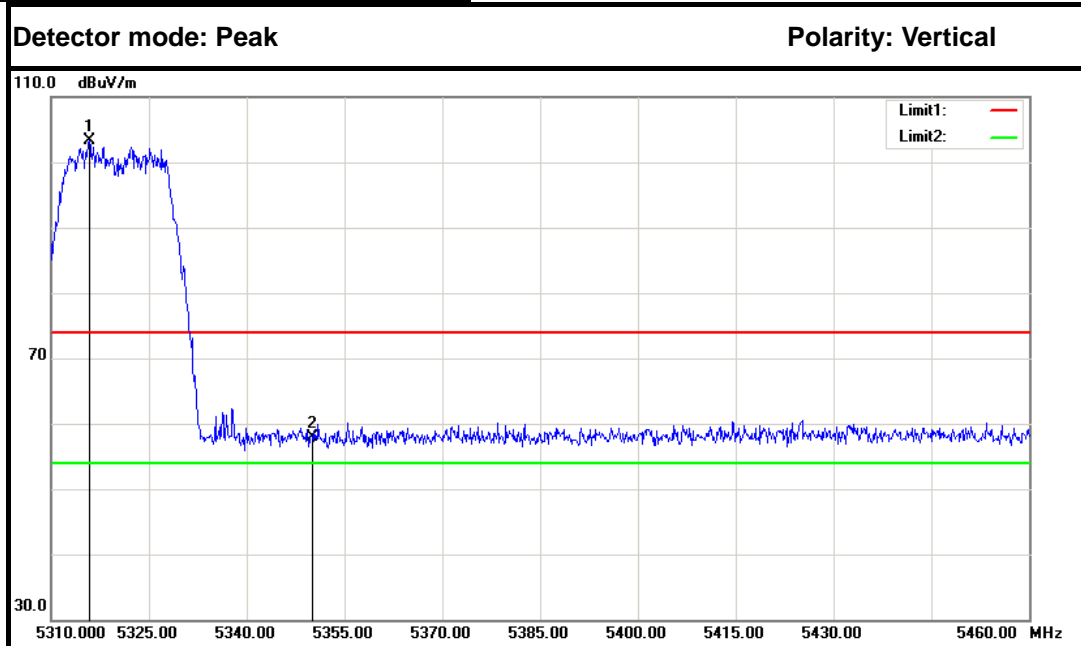
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5316.900	99.00	5.54	104.54	---	---	Peak	Vertical
2	5350.000	52.00	5.60	57.60	74.00	-16.40	Peak	Vertical
1	5323.200	84.62	5.56	90.18	---	---	Average	Vertical
2	5350.000	42.11	5.60	47.71	54.00	-6.29	Average	Vertical



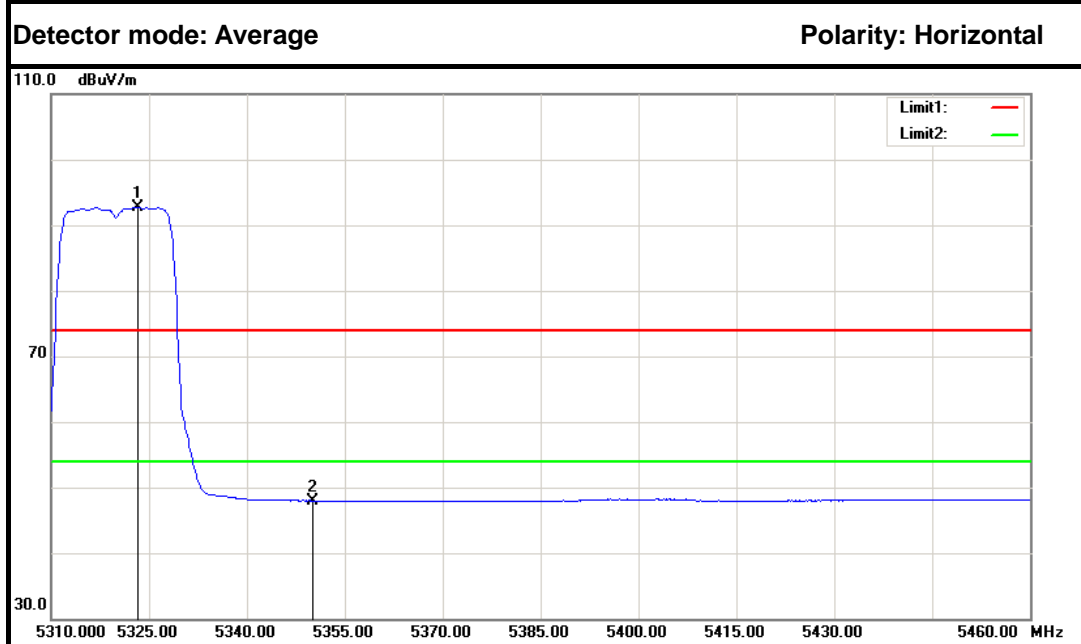
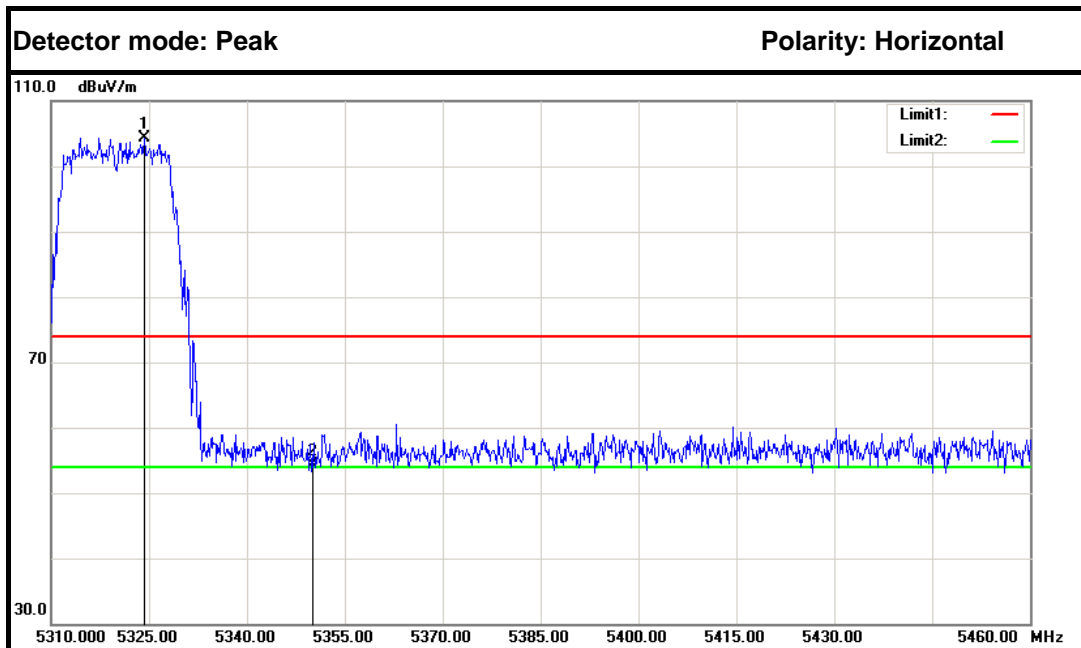
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1.	5315.550	96.75	5.54	102.29	---	---	Peak	Horizontal
2.	5350.000	52.62	5.60	58.22	74.00	-15.78	Peak	Horizontal
1.	5316.750	81.67	5.54	87.21	---	---	Average	Horizontal
2.	5350.000	42.10	5.60	47.70	54.00	-6.30	Average	Horizontal



IEEE 802.11a mode / 5320(Antenna 2)



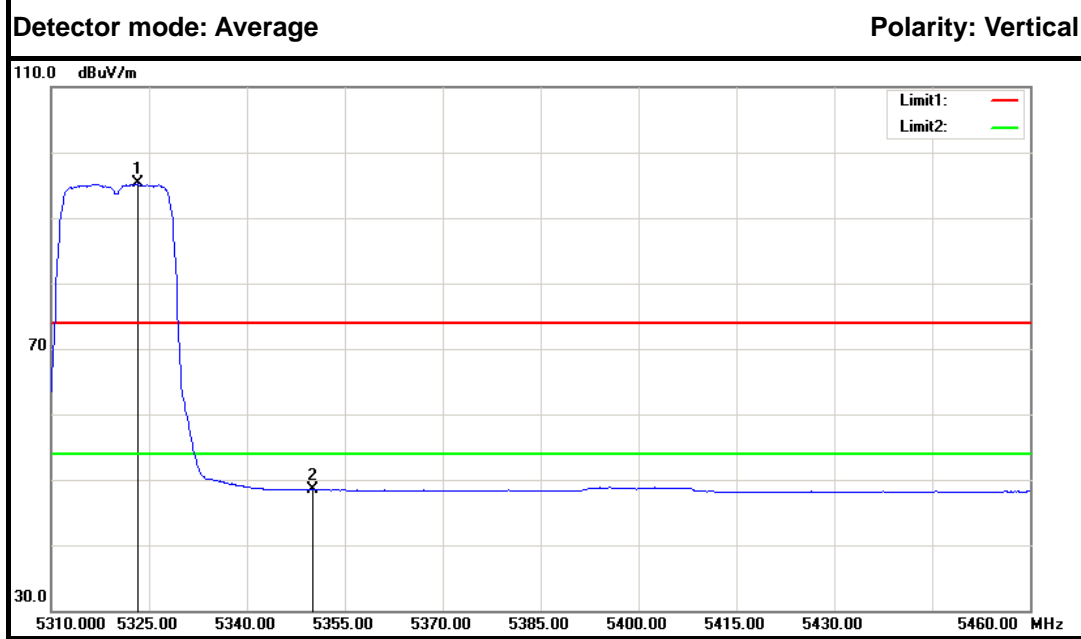
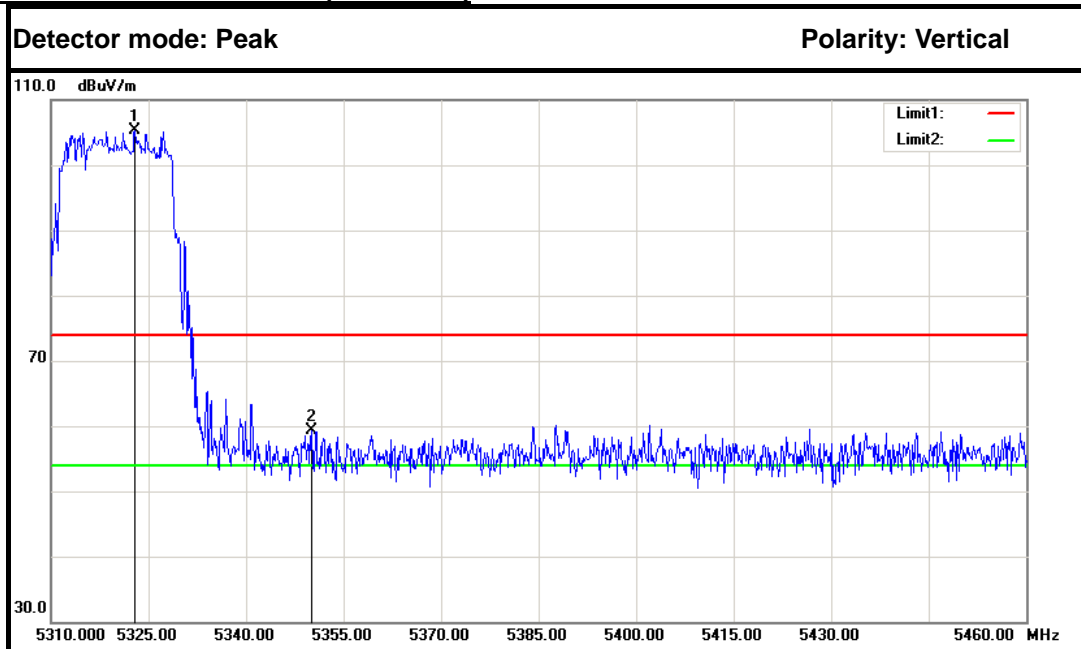
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5315.850	97.85	5.54	103.39	---	---	Peak	Vertical
2	5350.000	52.30	5.60	57.90	74.00	-16.10	Peak	Vertical
1	5323.050	84.45	5.56	90.01	---	---	Average	Vertical
2	5350.000	42.06	5.60	47.66	54.00	-6.34	Average	Vertical



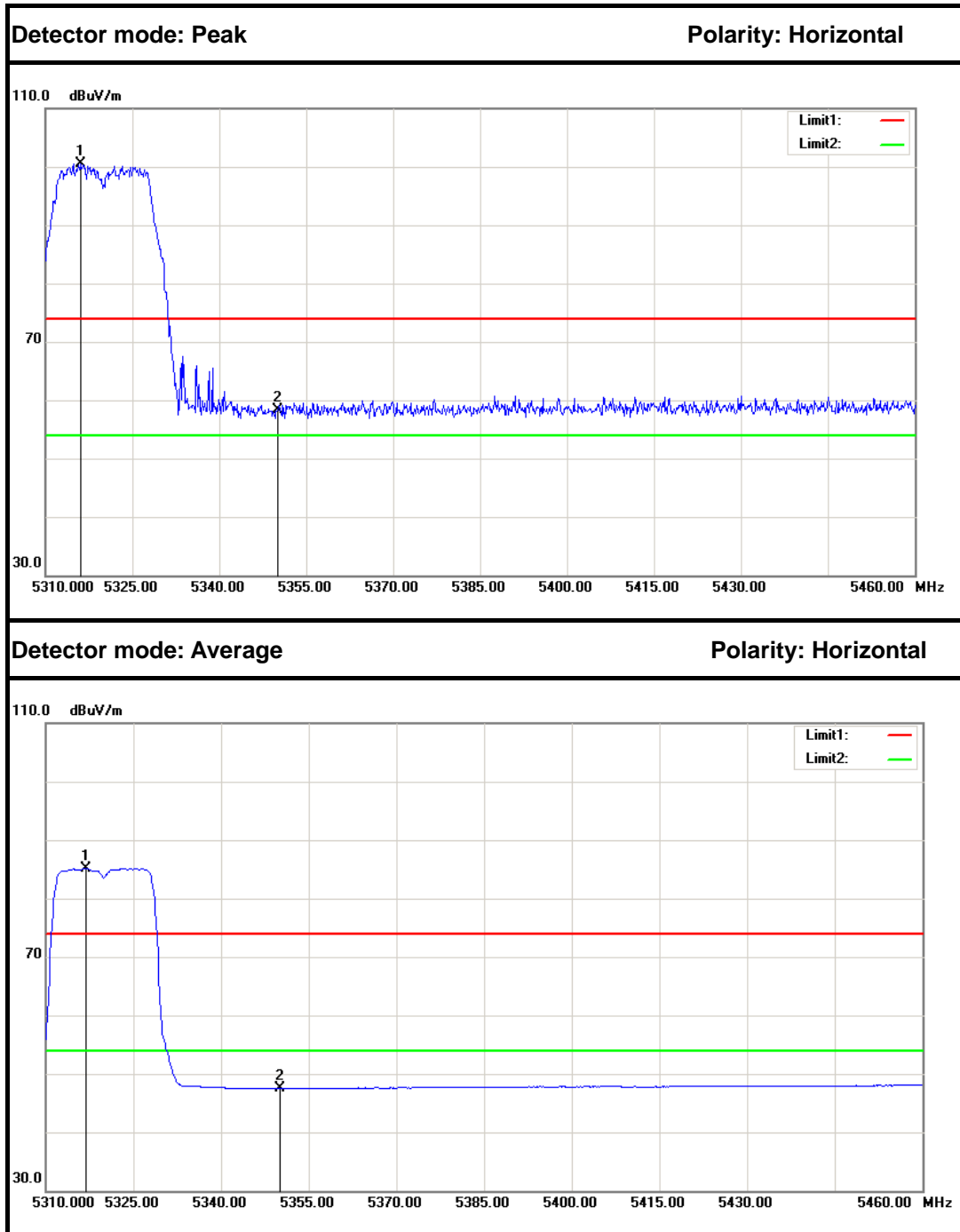
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1.	5324.250	98.75	5.56	104.31	---	---	Peak	Horizontal
2.	5350.000	48.67	5.60	54.27	74.00	-19.73	Peak	Horizontal
1.	5323.200	87.13	5.56	92.69	---	---	Average	Horizontal
2.	5350.000	42.35	5.60	47.95	54.00	-6.05	Average	Horizontal



IEEE 802.11a mode / 5320(Antenna 3)



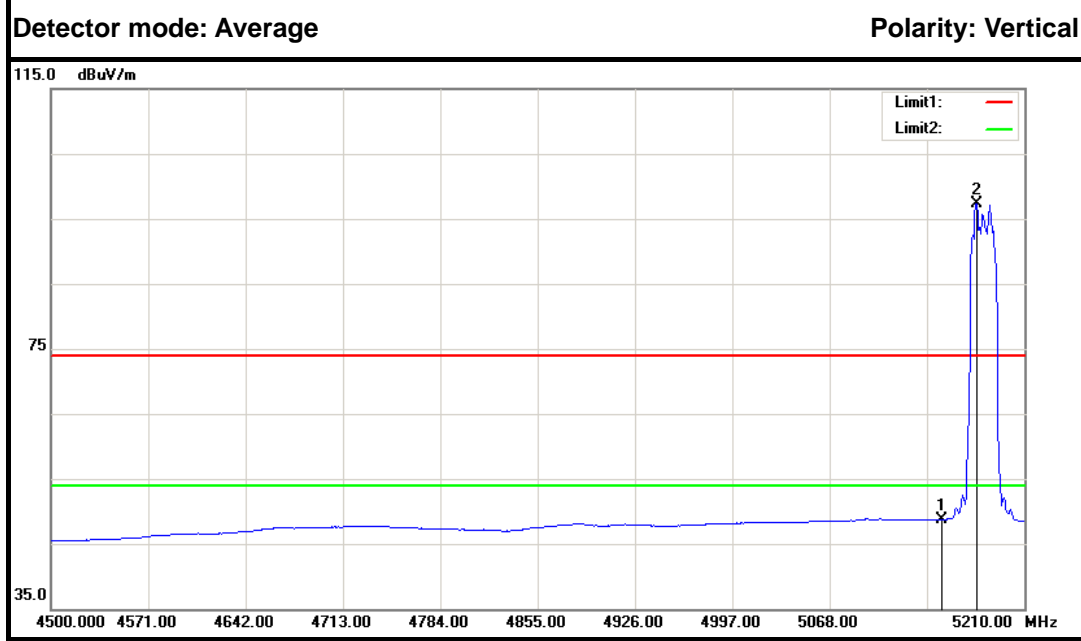
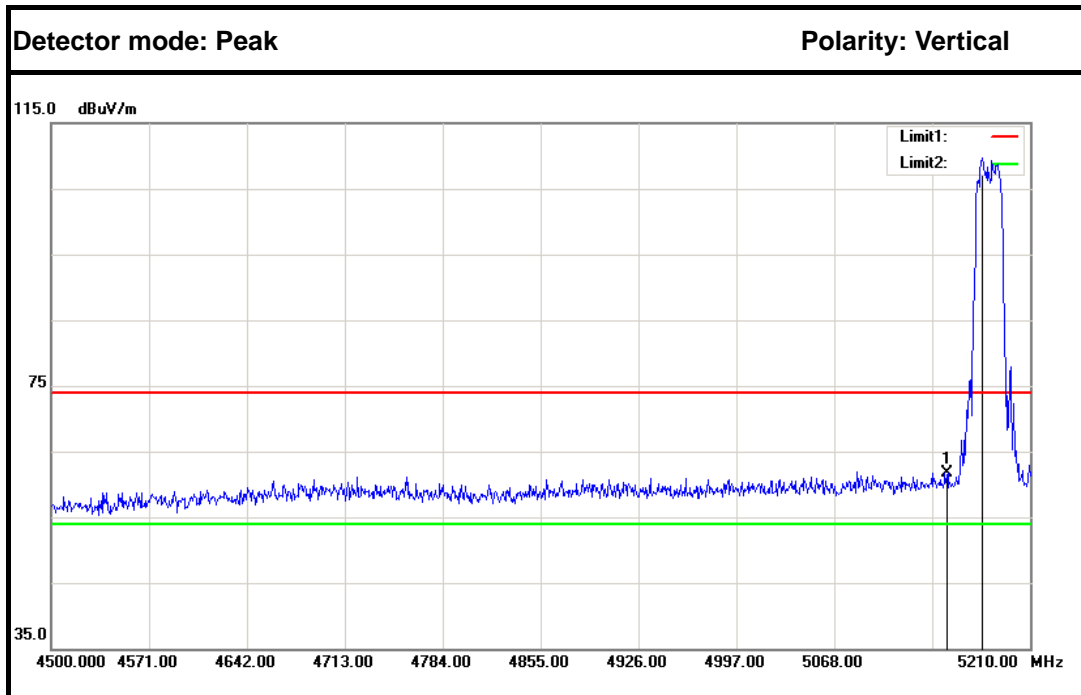
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5322.900	99.76	5.55	105.31	---	---	Peak	Vertical
2	5350.000	53.73	5.60	59.33	74.00	-14.67	Peak	Vertical
1	5323.200	89.67	5.56	95.23	---	---	Average	Vertical
2	5350.000	42.88	5.60	48.48	54.00	-5.52	Average	Vertical



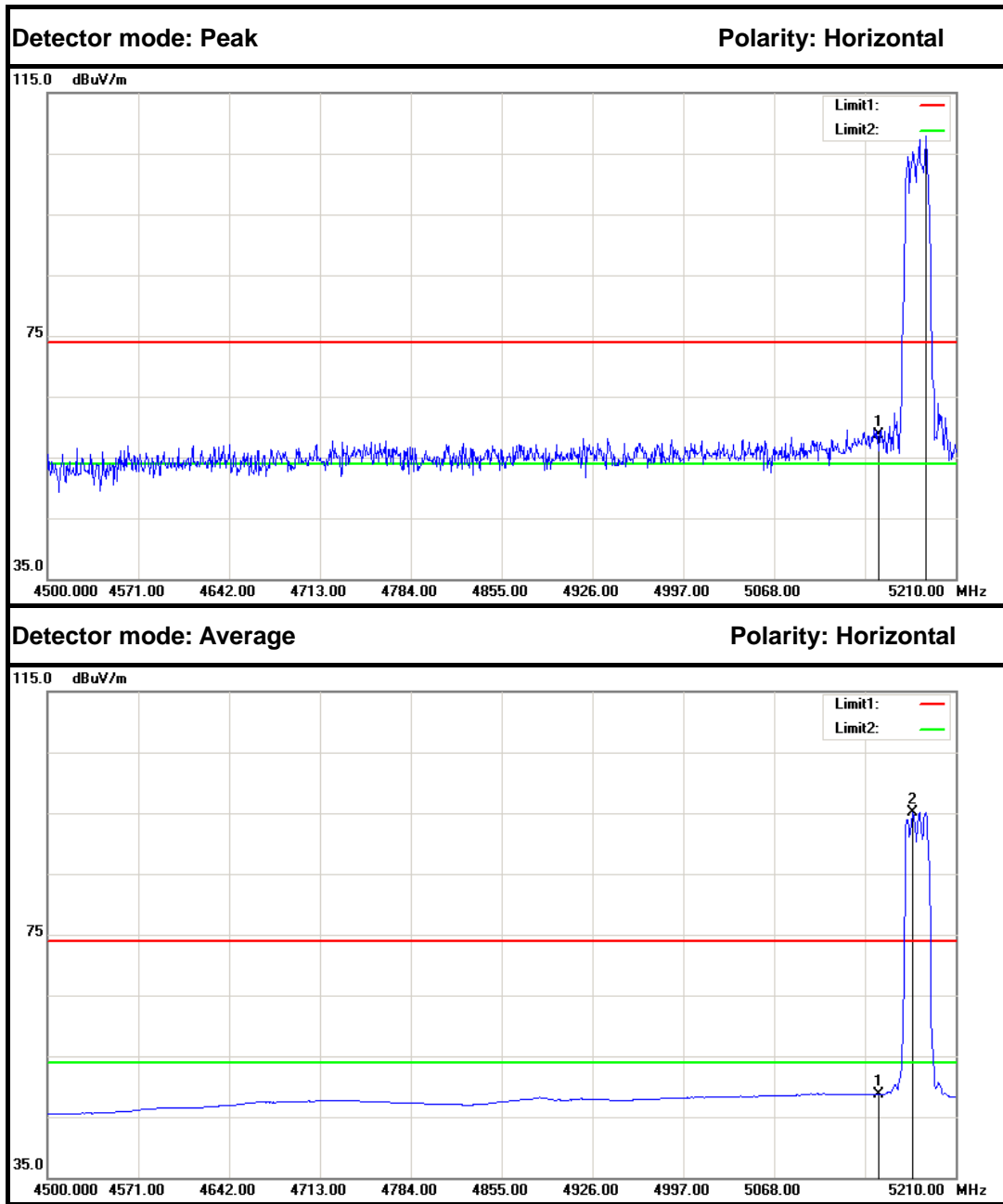
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1.	5316.000	94.90	5.54	100.44	---	---	Peak	Horizontal
2.	5350.000	52.74	5.60	58.34	74.00	-15.66	Peak	Horizontal
1.	5316.900	79.60	5.54	85.14	---	---	Average	Horizontal
2.	5350.000	41.94	5.60	47.54	54.00	-6.46	Average	Horizontal



IEEE 802.11n HT 20 MHz mode / 5180 MHz (Antenna 0+ Antenna 1+ Antenna 2+ Antenna 3)



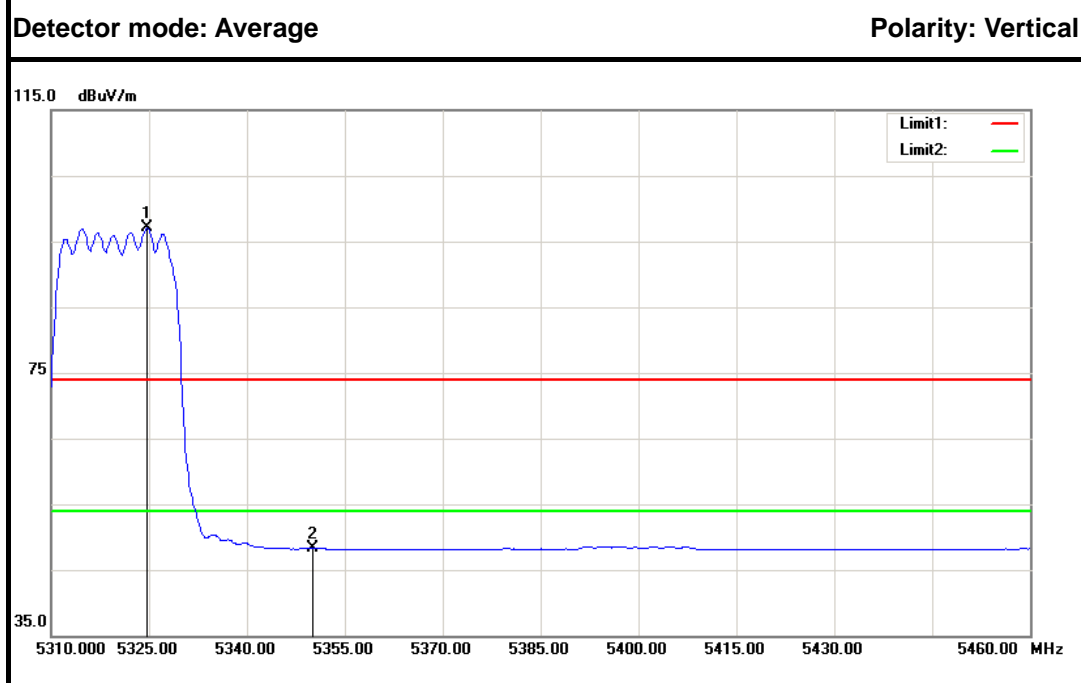
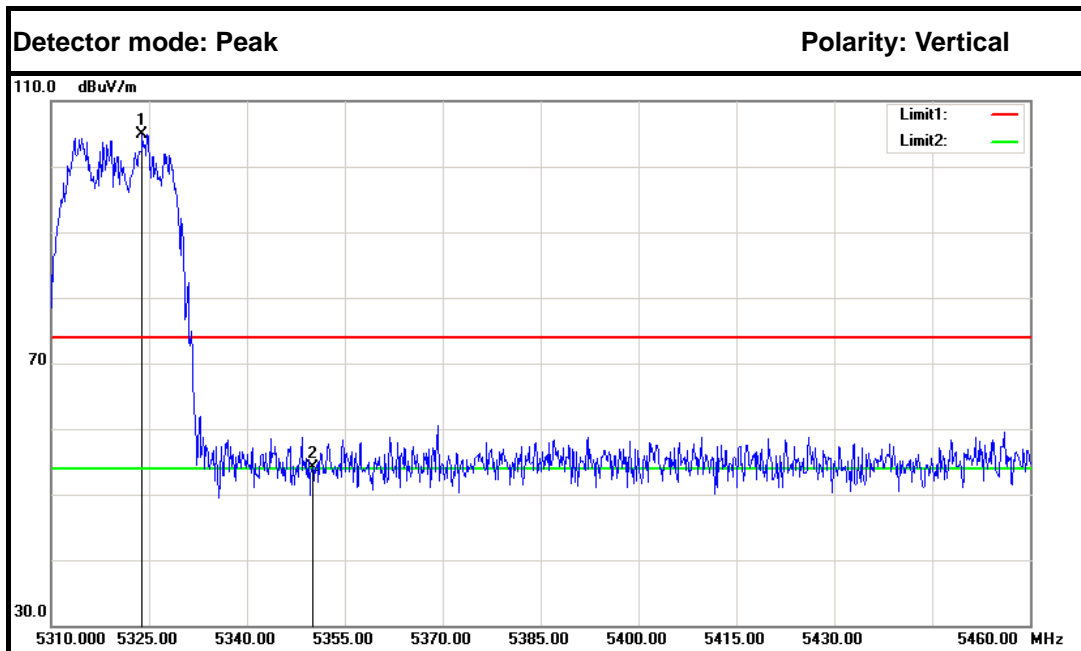
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	56.50	5.25	61.75	74.00	-12.25	Peak	Vertical
2	5175.210	104.44	5.29	109.73	---	---	Peak	Vertical
1	5150.000	43.52	5.25	48.77	54.00	-5.23	Average	Vertical
2	5175.210	92.00	5.29	97.29	---	---	Average	Vertical



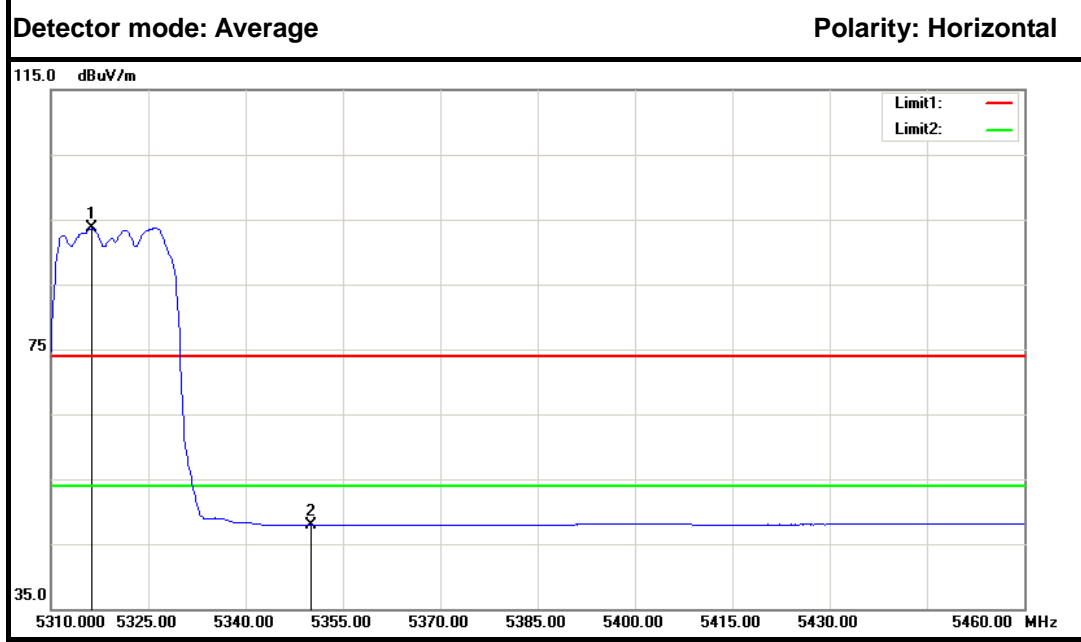
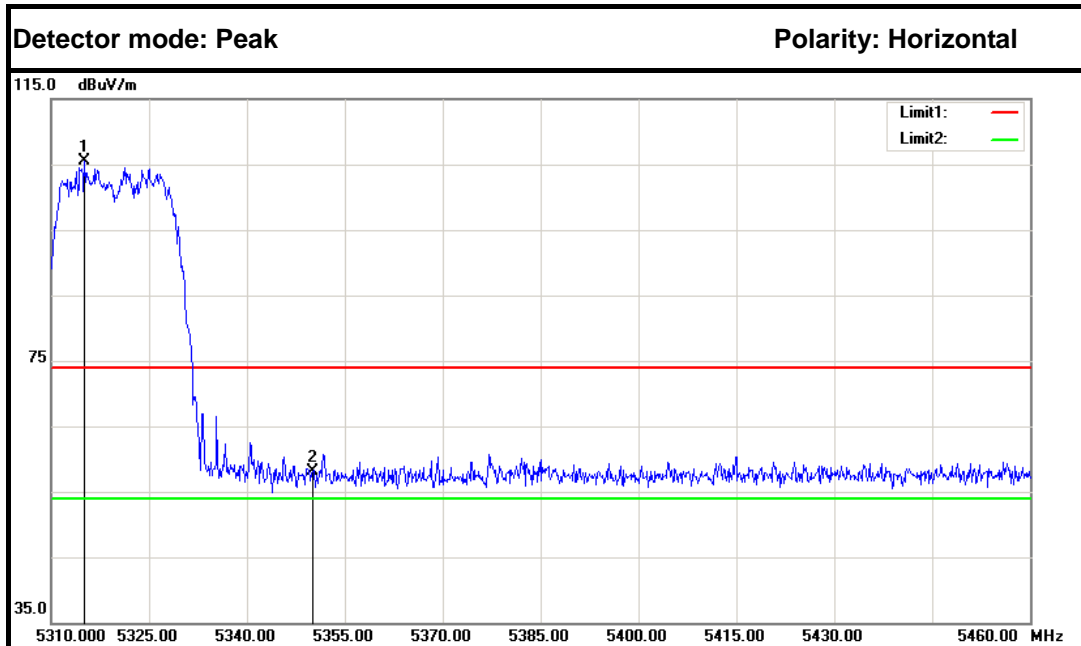
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	53.49	5.25	58.74	74.00	-15.26	Peak	Horizontal
2	5186.570	102.59	5.31	107.90	---	---	Peak	Horizontal
1	5150.000	43.49	5.25	48.74	54.00	-5.26	Average	Horizontal
2	5176.630	89.84	5.29	95.13	---	---	Average	Horizontal



IEEE 802.11n HT 20 MHz mode / 5320 MHz (Antenna 0+ Antenna 1+ Antenna 2+ Antenna 3)



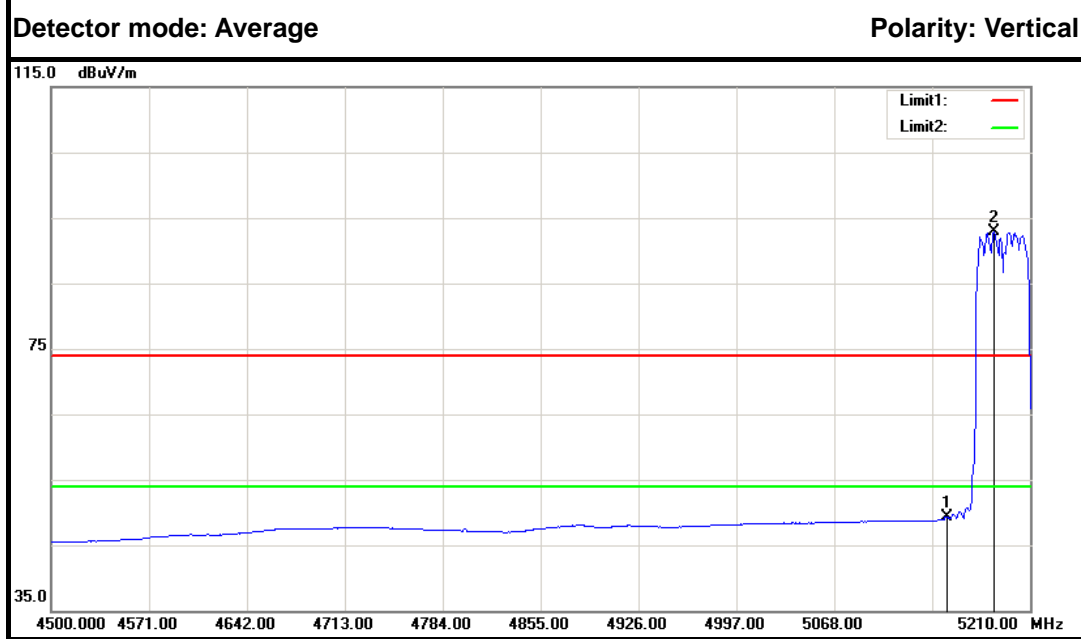
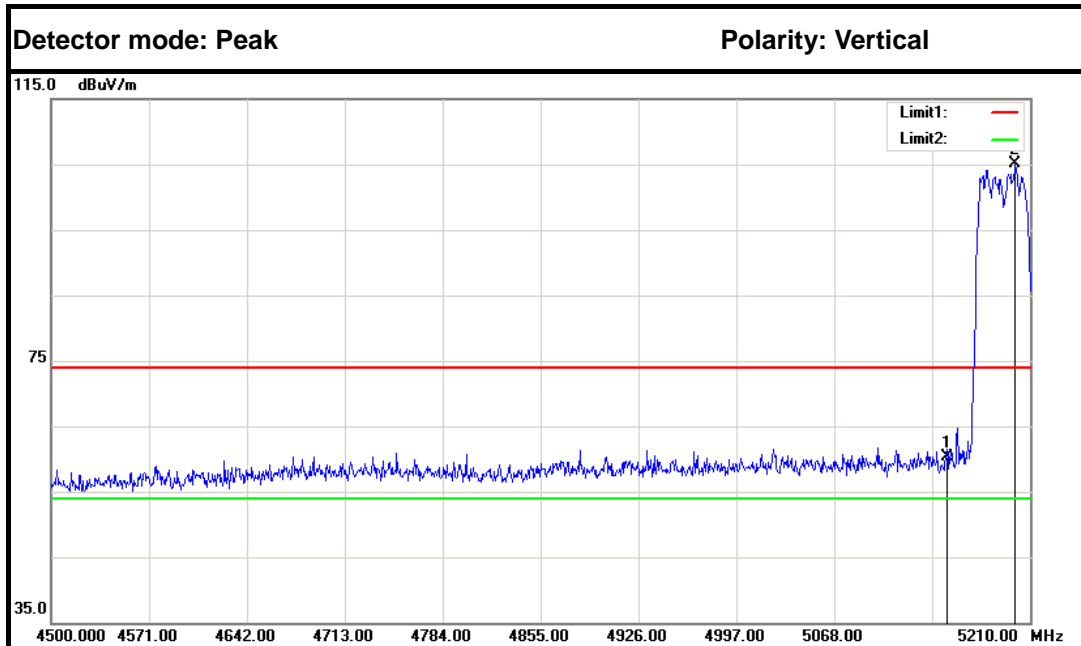
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5323.950	99.39	5.56	104.95	---	---	Peak	Vertical
2	5350.000	48.55	5.60	54.15	74.00	-19.85	Peak	Vertical
1	5324.700	91.46	5.56	97.02	---	---	Average	Vertical
2	5350.000	42.62	5.60	48.22	54.00	-5.78	Average	Vertical



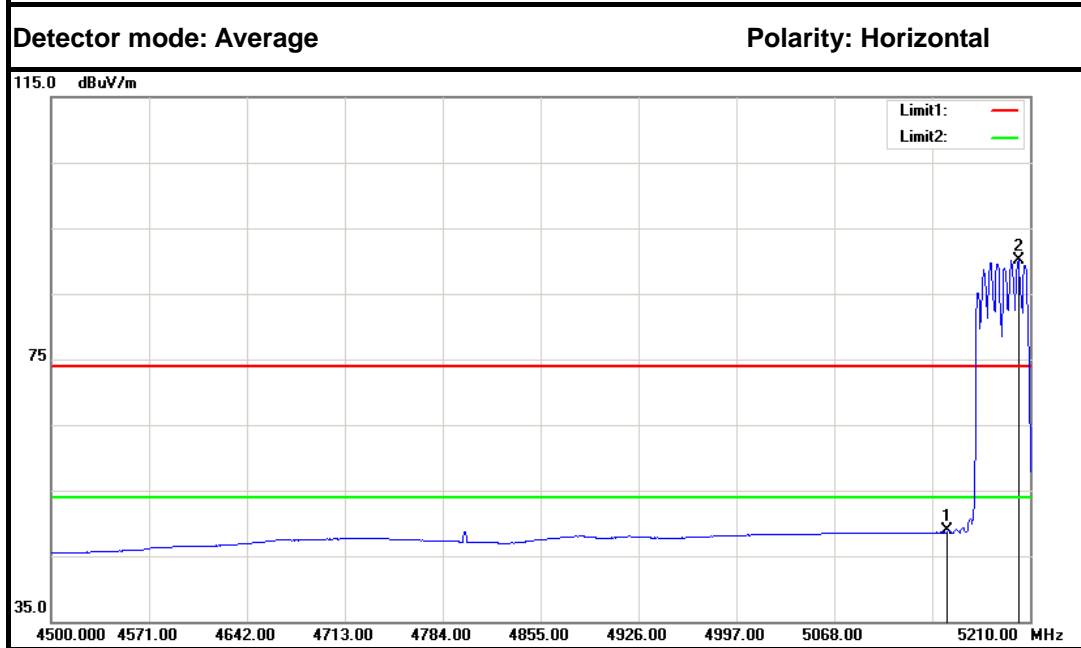
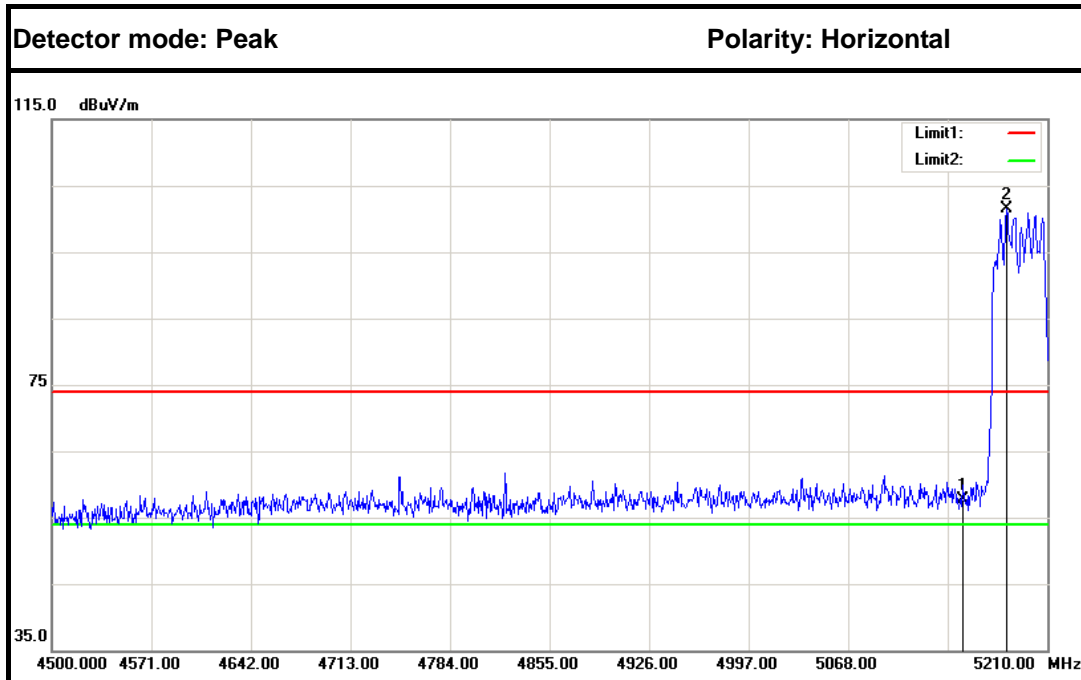
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5315.100	99.89	5.54	105.43	---	---	Peak	Horizontal
2	5350.000	52.47	5.60	58.07	74.00	-15.93	Peak	Horizontal
1	5316.300	88.11	5.54	93.65	---	---	Average	Horizontal
2	5350.000	42.28	5.60	47.88	54.00	-6.12	Average	Horizontal



IEEE 802.11n HT 40 MHz mode / 5190 MHz (Antenna 0+ Antenna 1+ Antenna 2+ Antenna 3)



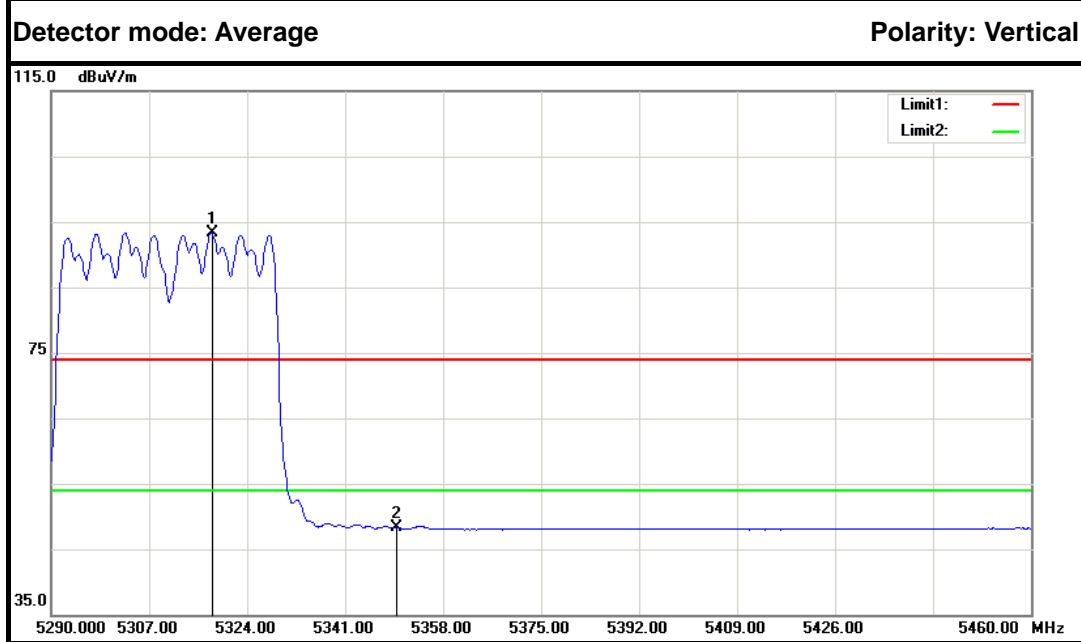
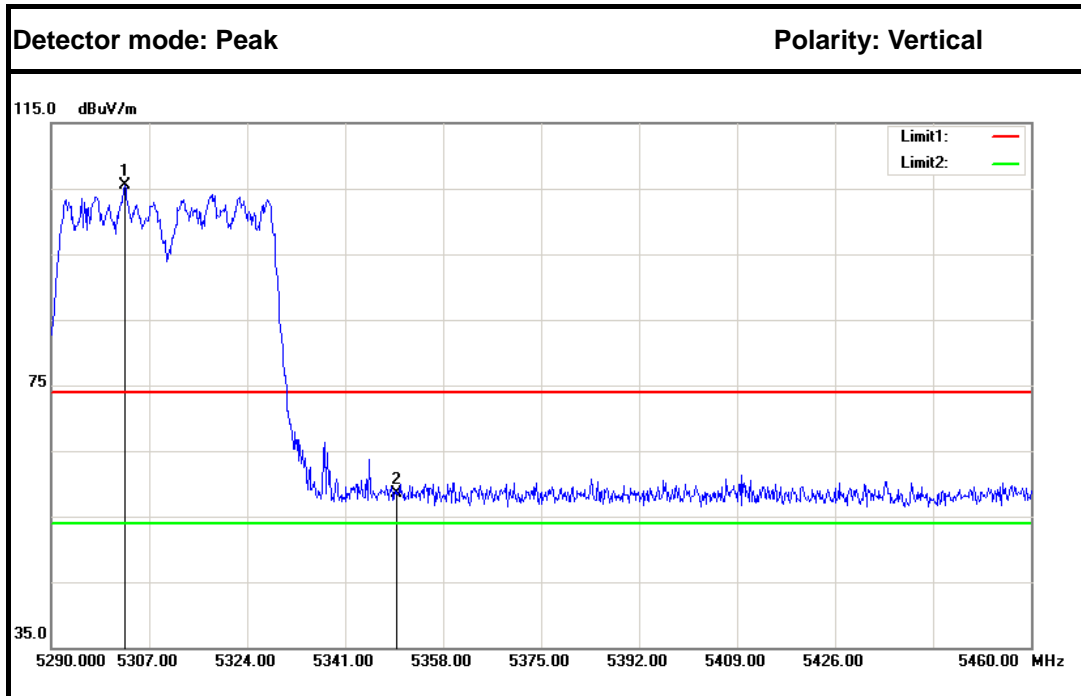
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	55.13	5.25	60.38	74.00	-13.62	Peak	Vertical
2	5199.350	99.73	5.33	105.06	---	---	Peak	Vertical
1	5150.000	43.97	5.25	49.22	54.00	-4.78	Average	Vertical
2	5183.730	87.61	5.31	92.92	---	---	Average	Vertical



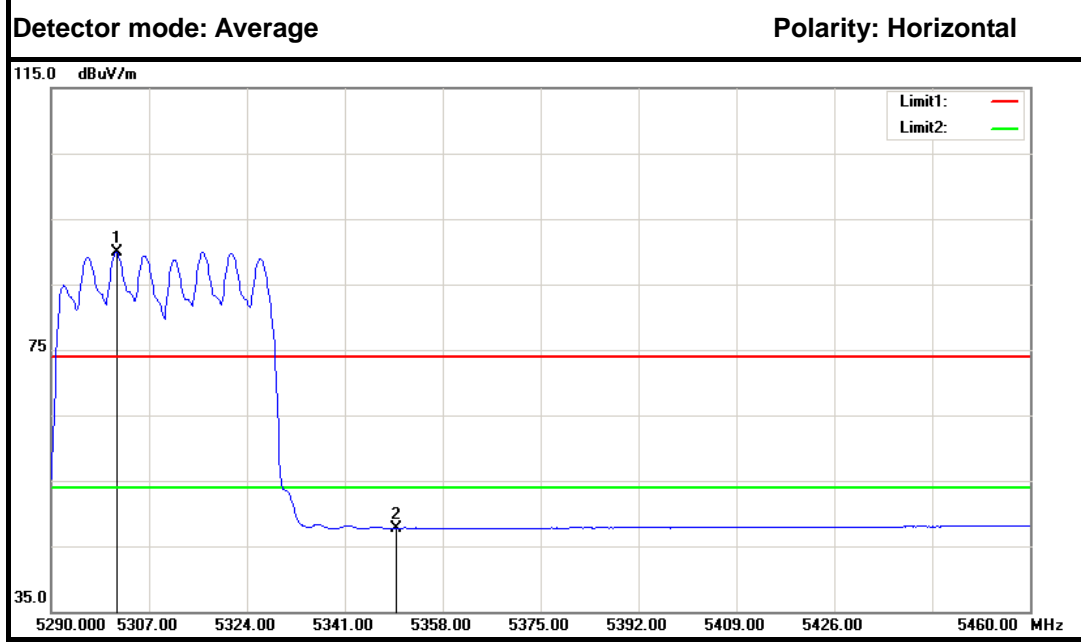
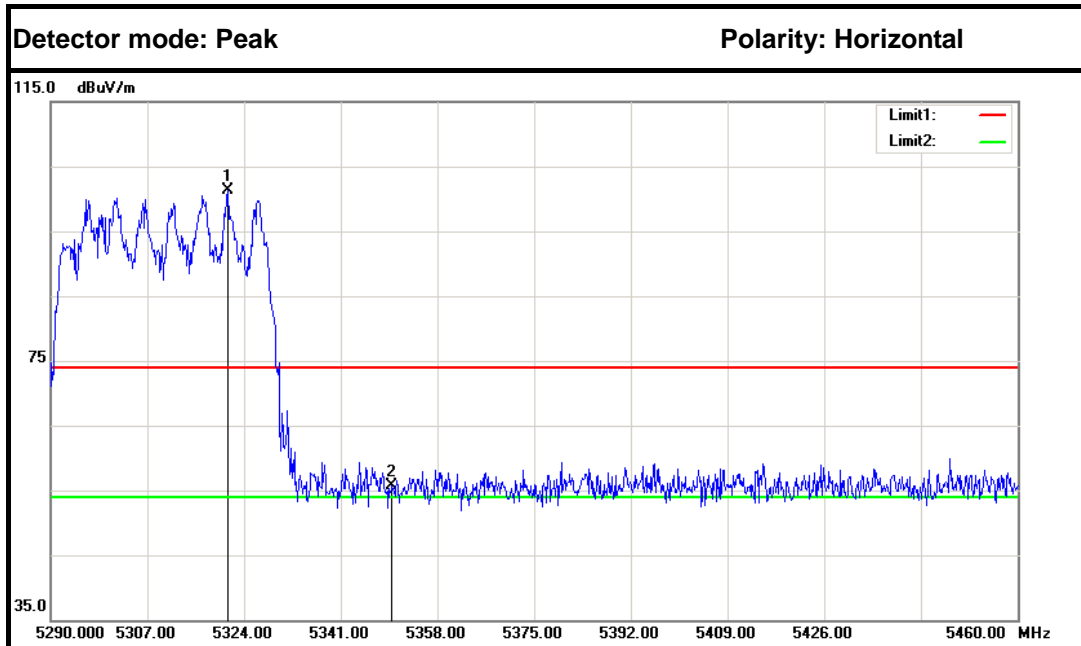
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	52.54	5.25	57.79	74.00	-16.21	Peak	Horizontal
2	5180.890	96.28	5.30	101.58	---	---	Peak	Horizontal
1	5150.000	43.57	5.25	48.82	54.00	-5.18	Average	Horizontal
2	5201.480	84.75	5.34	90.09	---	---	Average	Horizontal



IEEE 802.11n HT 40 MHz mode / 5310MHz (Antenna 0+ Antenna 1 + Antenna 2+ Antenna 3)



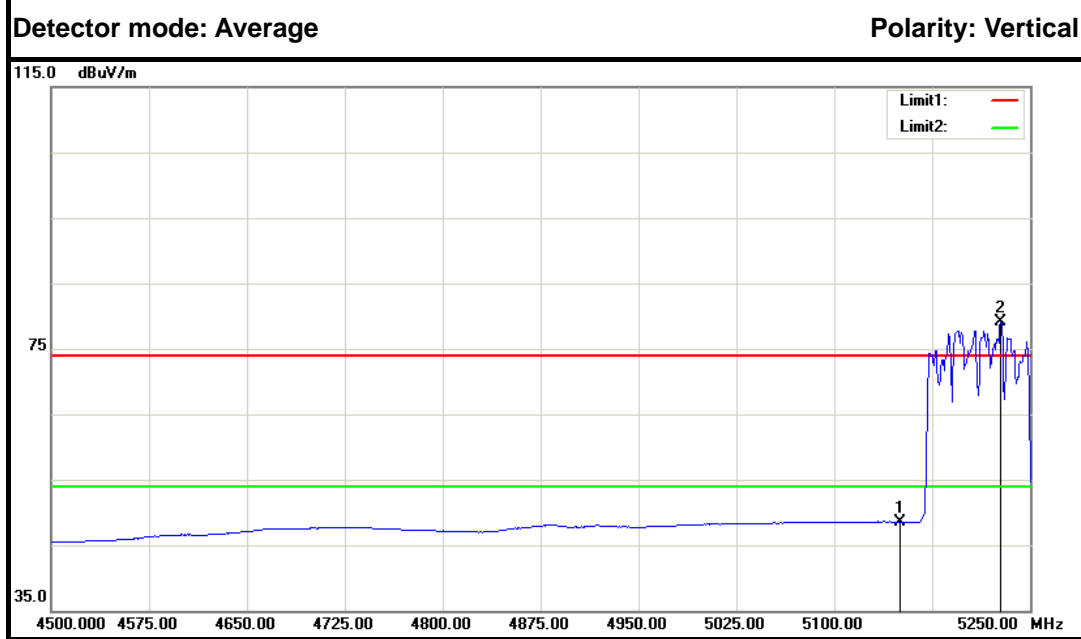
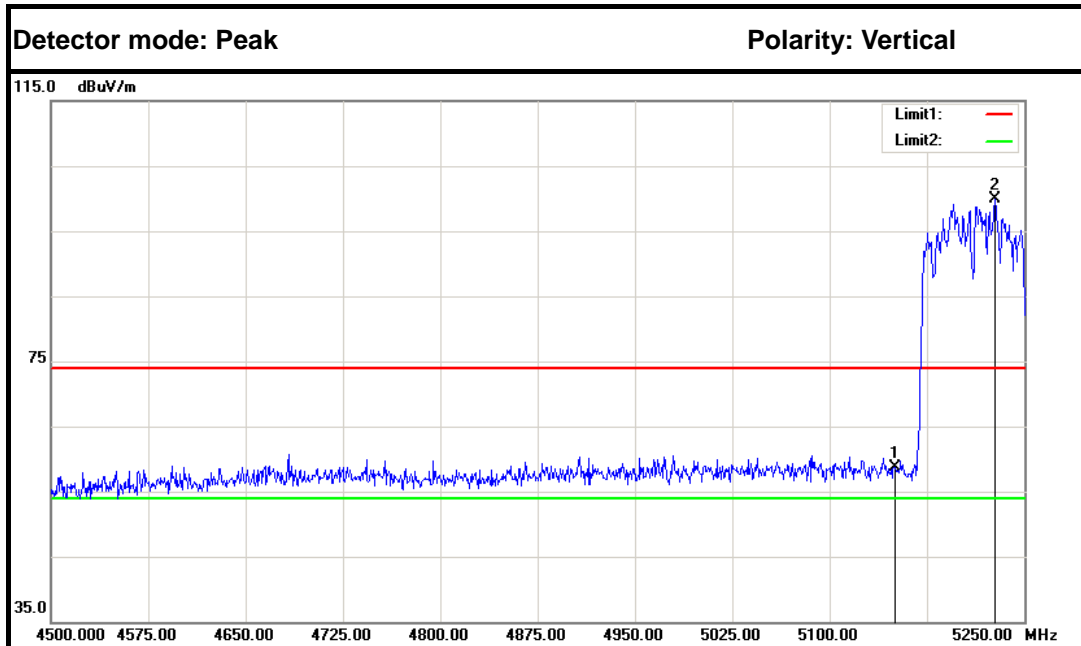
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5302.750	99.93	5.52	105.45	---	---	Peak	Vertical
2	5350.000	52.81	5.60	58.41	74.00	-15.59	Peak	Vertical
1	5317.880	87.73	5.55	93.28	---	---	Average	Vertical
2	5350.000	42.66	5.60	48.26	54.00	-5.74	Average	Vertical



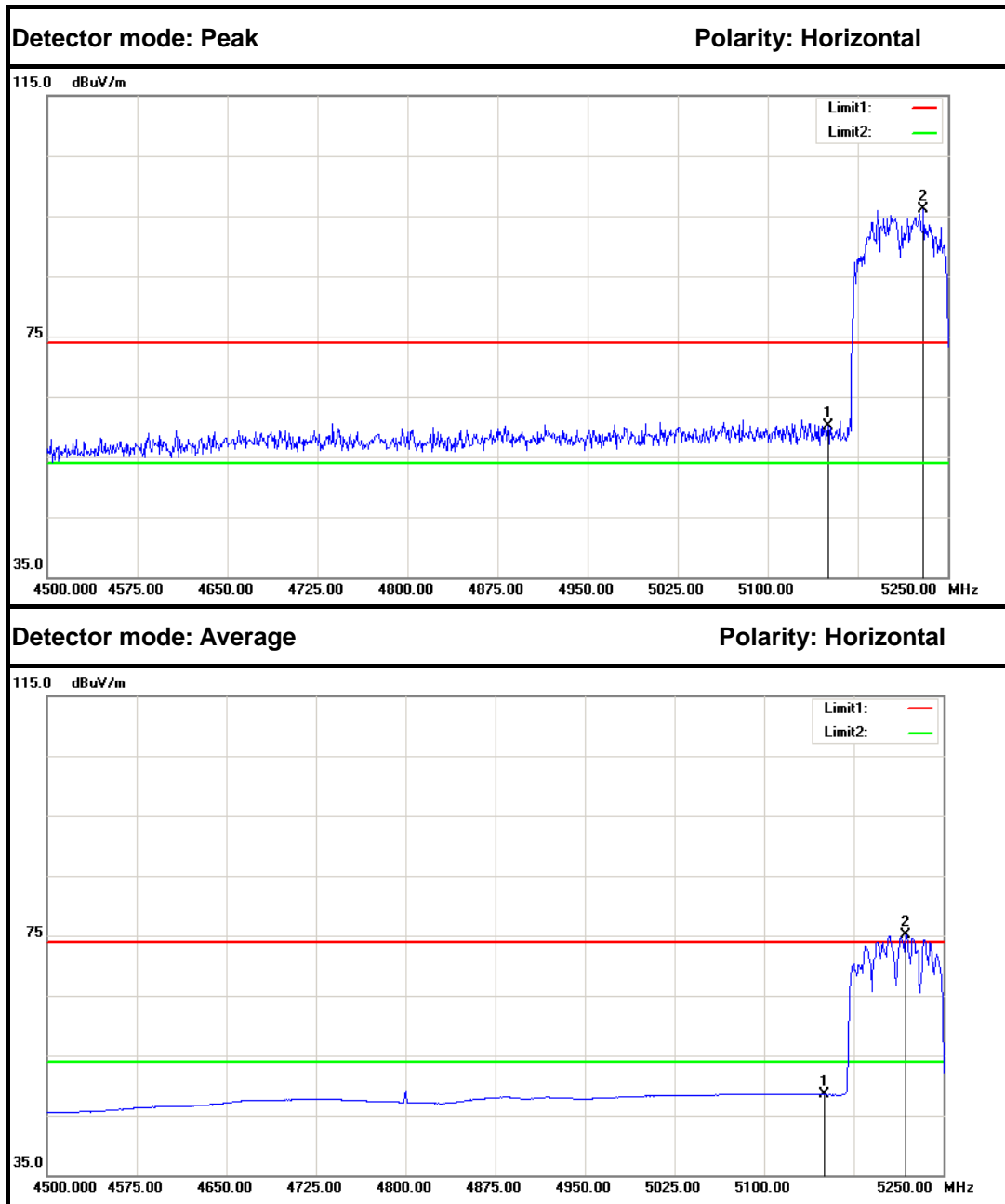
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5321.110	95.71	5.55	101.26	---	---	Peak	Horizontal
2	5350.000	50.16	5.60	55.76	74.00	-18.24	Peak	Horizontal
1	5301.390	84.31	5.52	89.83	---	---	Average	Horizontal
2	5350.000	42.10	5.60	47.70	54.00	-6.30	Average	Horizontal



IEEE 802.11ac 80 mode / 5210 MHz (Antenna 0+ Antenna 1+ Antenna 2+ Antenna 3)



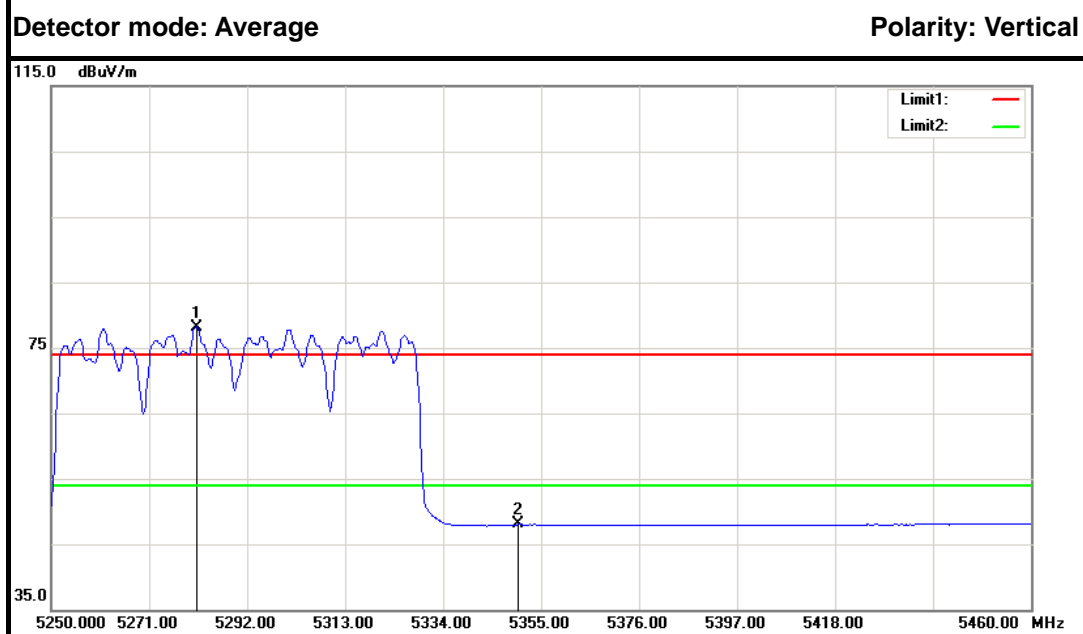
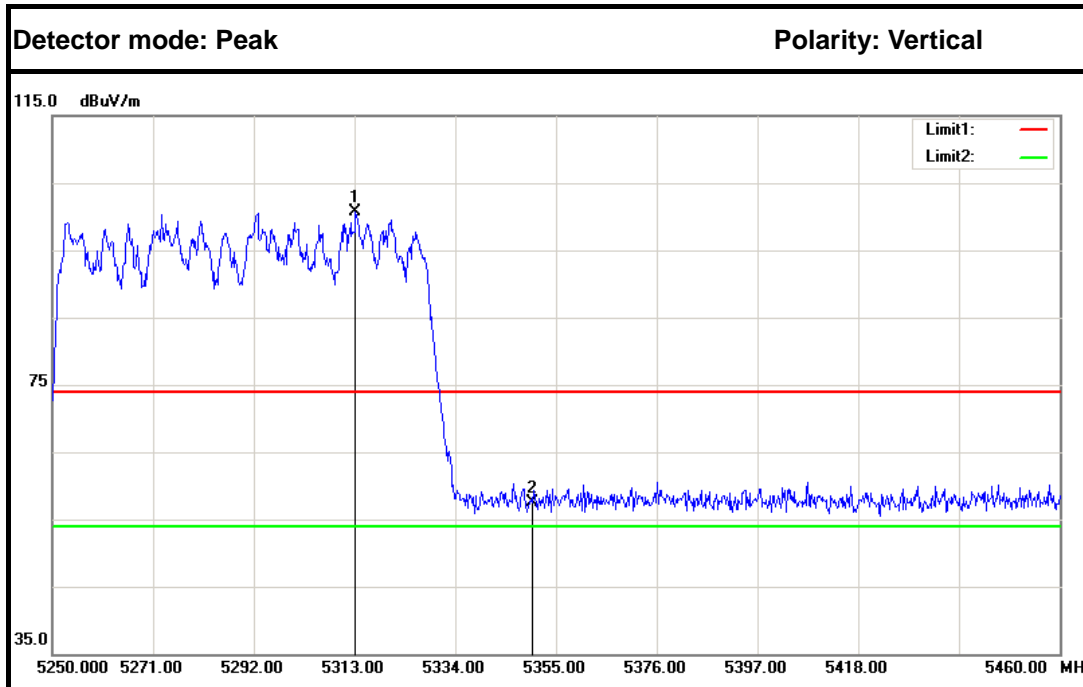
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5150.000	53.54	5.25	58.79	74.00	-15.21	Peak	Vertical
2	5227.500	94.53	5.38	99.91	---	---	Peak	Vertical
1	5150.000	43.26	5.25	48.51	54.00	-5.49	Average	Vertical
2	5227.500	73.68	5.38	79.06	---	---	Average	Vertical



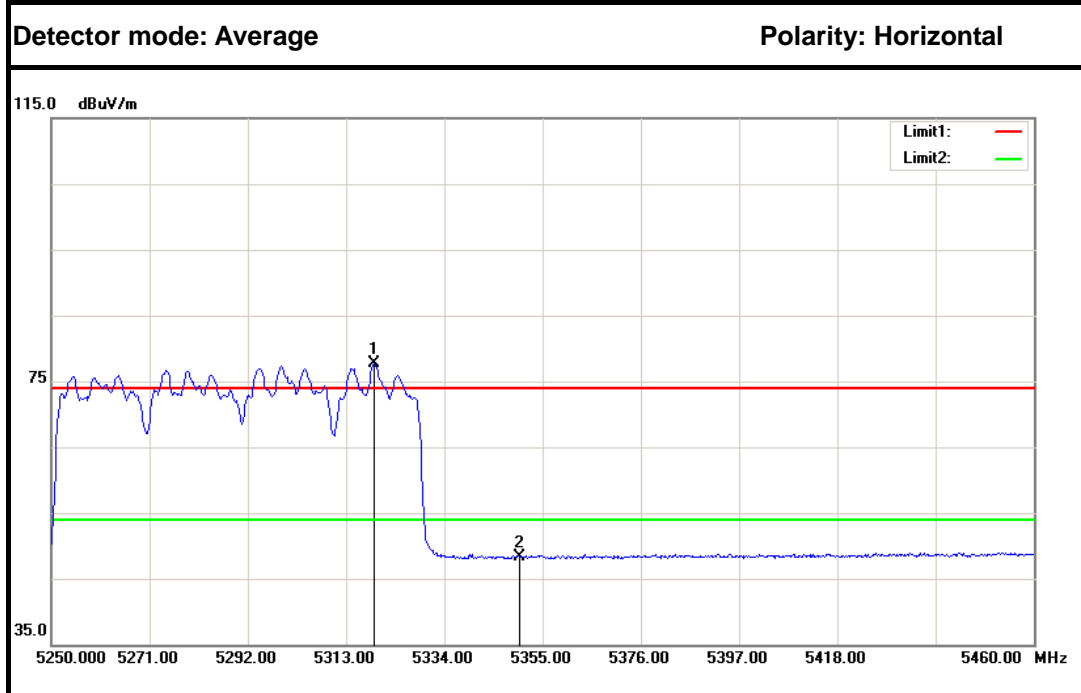
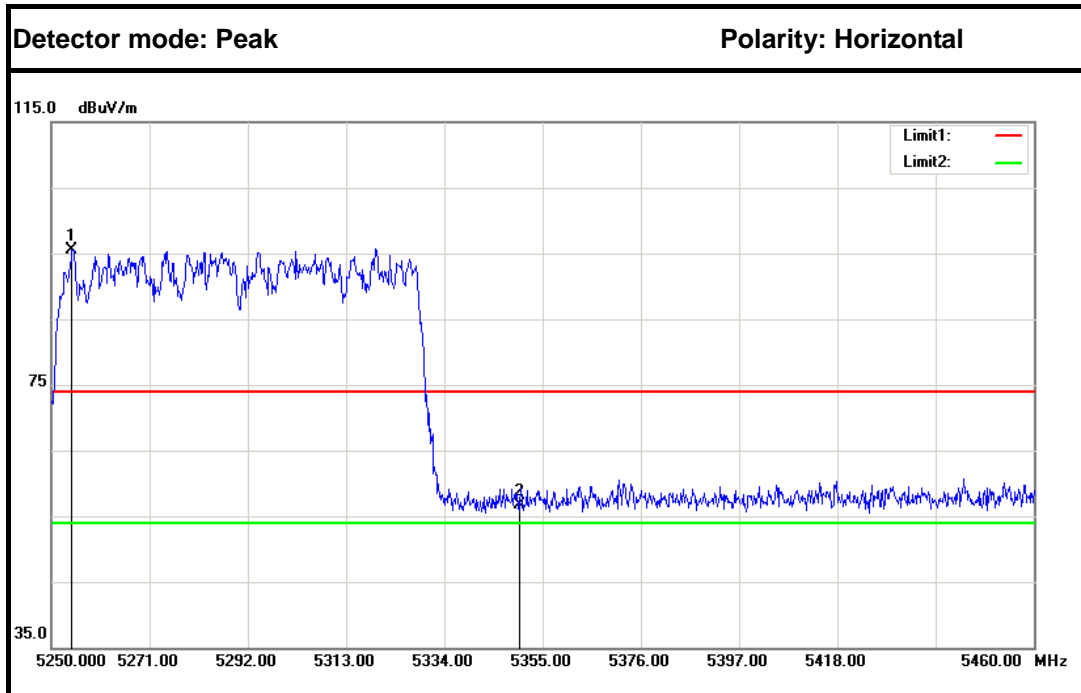
No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1.	5150.000	54.84	5.25	60.09	74.00	-13.91	Peak	Horizontal
2.	5229.750	90.63	5.39	96.02	---	---	Peak	Horizontal
1.	5150.000	43.18	5.25	48.43	54.00	-5.57	Average	Horizontal
2.	5218.500	69.82	5.37	75.19	---	---	Average	Horizontal



IEEE 802.11ac 80 mode / 5290 MHz (Antenna 0+ Antenna 1+Antenna 2+Antenna 3)



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5313.210	95.16	5.54	100.70	---	---	Peak	Vertical
2	5350.000	51.94	5.60	57.54	74.00	-16.46	Peak	Vertical
1	5281.080	72.72	5.48	78.20	---	---	Average	Vertical
2	5350.000	42.43	5.60	48.03	54.00	-5.97	Average	Vertical



No.	Frequency (MHz)	Reading (dB)	Factor (dB/m)	Result (dB/m)	Limit (dB/m)	Margin (dB)	Remark	Antenna Polar
1	5254.410	90.16	5.43	95.59	---	---	Peak	Horizontal
2	5350.000	51.01	5.60	56.61	74.00	-17.39	Peak	Horizontal
1	5319.090	72.14	5.55	77.69	---	---	Average	Horizontal
2	5350.000	42.74	5.60	48.34	54.00	-5.66	Average	Horizontal



6.6 PEAK POWER SPECTRAL DENSITY

6.6.1 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 $11 \text{ dBm} + 10 \log B$, 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.

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.

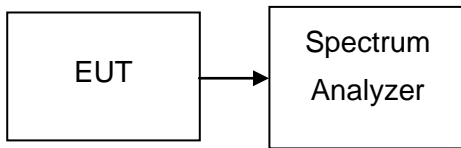
6.6.2 MEASUREMENT EQUIPMENT USED

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

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



6.6.3 TEST CONFIGURATION



6.6.4 TEST PROCEDURE

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



6.6.5 TEST RESULTS

Test Data

Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	PPSD (dBm)				Limit (dBm)	Margain				Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 3		Antenna 0	Antenna 1	Antenna 2	Antenna 3	
Low	5180	5.393	5.650	5.249	6.156	17	-11.607	-11.350	-11.751	-10.844	PASS
Mid	5200	7.126	7.553	7.335	6.501		-9.874	-9.447	-9.665	-10.499	PASS
High	5240	7.411	7.999	7.628	6.302		-9.589	-9.001	-9.372	-10.698	PASS

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

Channel	Frequency (MHz)	PPSD (dBm)				Limit (dBm)	Margain				Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 3		Antenna 0	Antenna 1	Antenna 2	Antenna 3	
Low	5260	5.720	5.552	6.124	6.497	11	-5.280	-5.448	-4.876	-4.503	PASS
Mid	5300	5.736	5.986	6.218	5.906		-5.264	-5.014	-4.782	-5.094	PASS
High	5320	5.565	5.893	6.309	6.016		-5.435	-5.107	-4.691	-4.984	PASS

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

Channel	Frequency (MHz)	PPSD (dBm)				Limit (dBm)	Margain				Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 3		Antenna 0	Antenna 1	Antenna 2	Antenna 3	
Low	5500	9.150	8.721	8.202	8.854	11	-1.850	-2.279	-2.798	-2.146	PASS
Mid	5580	9.024	7.609	8.130	8.119		-1.976	-3.391	-2.870	-2.881	PASS
High	5700	7.835	7.235	7.307	8.112		-3.165	-3.765	-3.693	-2.888	PASS

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

Channel	Frequency (MHz)	PPSD (dBm)				Limit (dBm)	Margain				Result
		Antenna 0	Antenna 1	Antenna 2	Antenna 3		Antenna 0	Antenna 1	Antenna 2	Antenna 3	
Low	5745	10.248	9.249	10.733	10.027	30	-19.752	-20.751	-19.267	-19.973	PASS
Mid	5785	10.218	9.950	10.416	10.211		-19.782	-20.050	-19.584	-19.789	PASS
High	5825	10.434	10.326	10.524	10.190		-19.566	-19.674	-19.476	-19.810	PASS