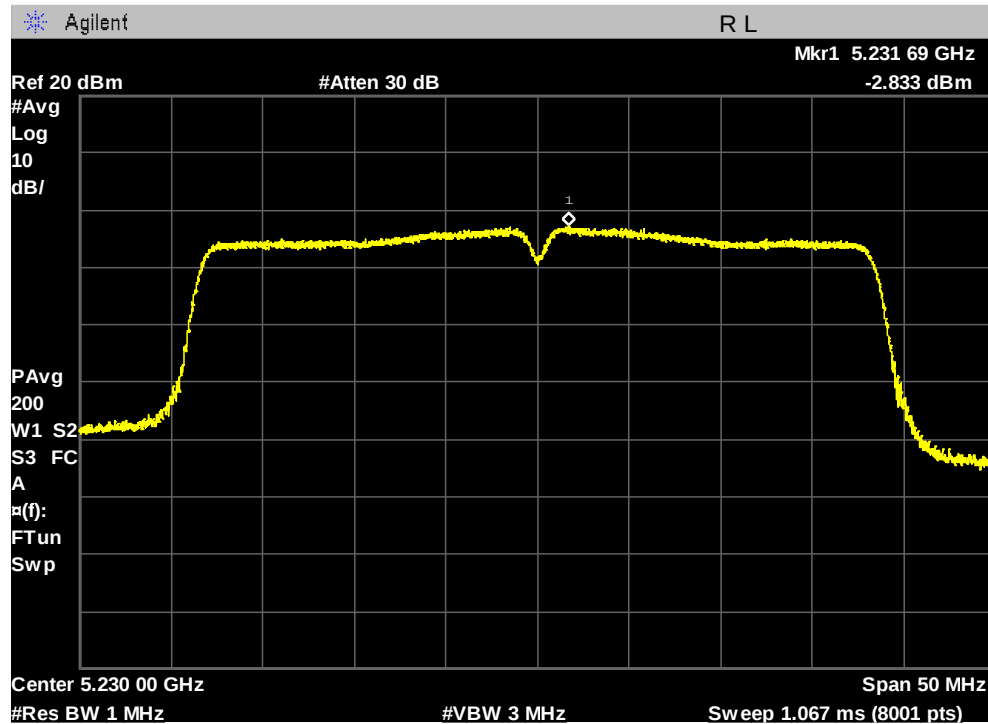


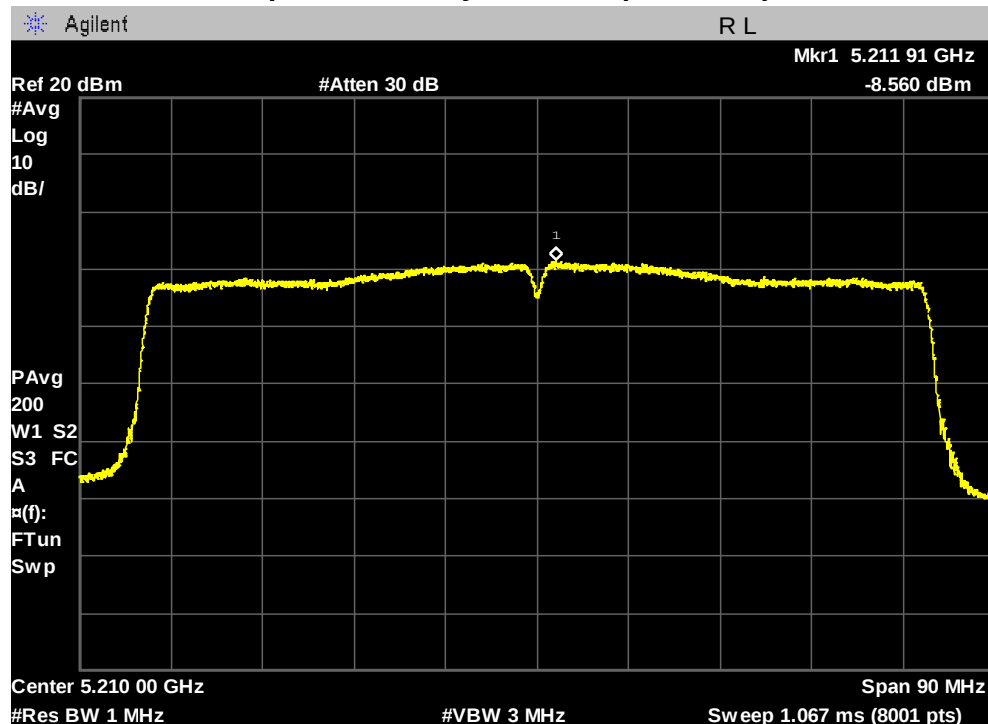
TEST DATA

Maximum Power Spectral Density, Highest Channel (5230 MHz)



802.11ac (80 MHz) mode 1TX

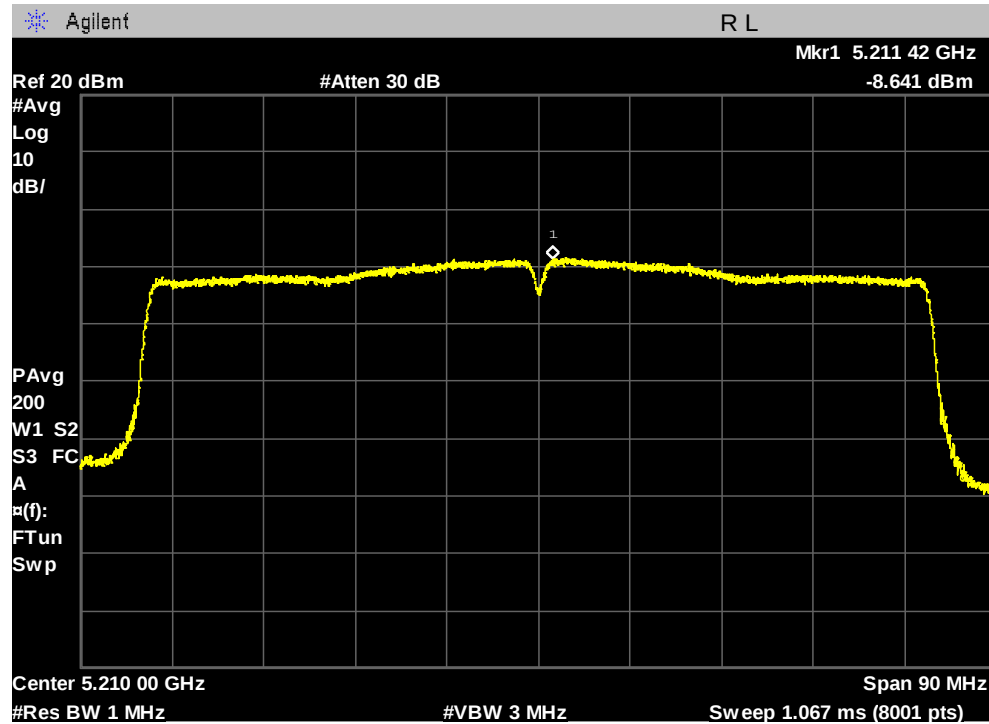
Maximum Power Spectral Density, Channel (5210 MHz)



TEST DATA

802.11ac (80 MHz) mode 2TX

Maximum Power Spectral Density, Channel (5210 MHz)



TEST DATA

8.6.2 Maximum Power Spectral Density – U-NII-2A band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5260	5.09	0.07	5.16	11.00
Middle	5300	4.96	0.07	5.03	11.00
Highest	5320	3.41	0.07	3.48	11.00

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5260	4.93	0.08	5.01	11.00
Middle	5300	4.54	0.08	4.62	11.00
Highest	5320	3.10	0.08	3.18	11.00

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5260	4.85	0.08	7.94	11.00
Middle	5300	4.9	0.08	7.99	11.00
Highest	5320	3.19	0.08	6.28	11.00

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5270	0.9	0.16	1.06	11.00
Highest	5310	-2.99	0.16	-2.83	11.00

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5270	1.05	0.16	4.22	11.00
Highest	5310	-2.67	0.16	0.50	11.00

TEST DATA

802.11ac (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5260	4.87	0.08	4.95	11.00
Middle	5300	4.55	0.08	4.63	11.00
Highest	5320	3.07	0.08	3.15	11.00

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5260	4.97	0.08	8.06	11.00
Middle	5300	5.02	0.08	8.11	11.00
Highest	5320	3.28	0.08	6.37	11.00

802.11ac (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5270	0.9	0.16	1.06	11.00
Highest	5310	-3.07	0.16	-2.91	11.00

TEST DATA

802.11ac (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5270	0.95	0.16	4.12	11.00
Highest	5310	-2.87	0.16	0.30	11.00

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5290	-7.15	0.32	-6.83	11.00

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5290	-7.4	0.32	-4.07	11.00

TEST DATA

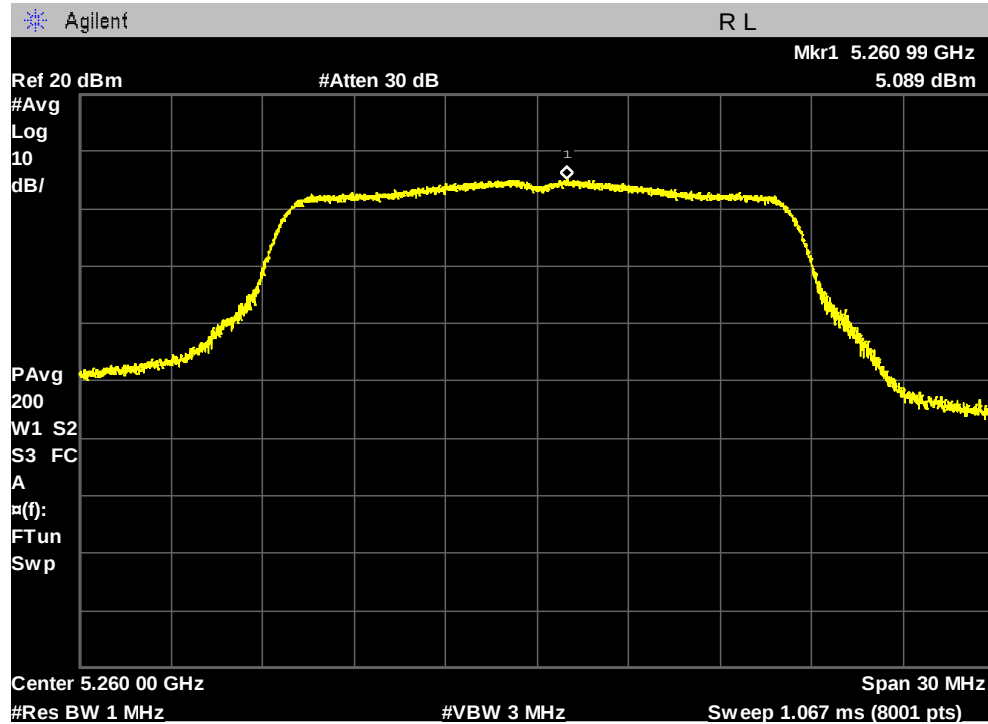
Note:

1. Maximum PSD = Measured PSD + Duty Factor
2. "Measure and add $10 \log(N_{ANT})$ dB, where N_{ANT} is the number of outputs" was used for measuring in-band Total PSD.
Total PSD = Measured PSD + duty factor + $10 \log(N_{ANT})$
3. For CDD transmission, directional gain is. **5.80 dBi**
For MIMO transmission, directional gain is **2.79 dBi**.
Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
For power spectral density (PSD) measurements on all devices employing CDD, directional gain is as follows,
Directional gain = G_{ANT} + Array Gain = 2.79 dBi + 3.01 dB = 5.80 dBi
Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB = $10 \log(2/1)$ = 3.01 dB.
where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi.
For CDD mode of this device, $N_{SS}=1$.
For power spectral density (PSD) measurements on all devices employing MIMO, directional gain is as follows,
Directional gain = G_{ANT} + $10 \log(N_{ANT}/N_{SS})$ dBi = 2.79 dBi + $10 \log(2/2)$ dB = 2.79 dBi.
where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and $N_{SS}=2$.
4. For FCC PSD Limit, If transmitting antennas of directional gain greater than 6 dBi was used, maximum power spectral density was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
5. Power Spectral Density(PSD) was measured by same method with conducted output power according to II.F.1 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
6. The following equation was used for spectrum offset:
Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

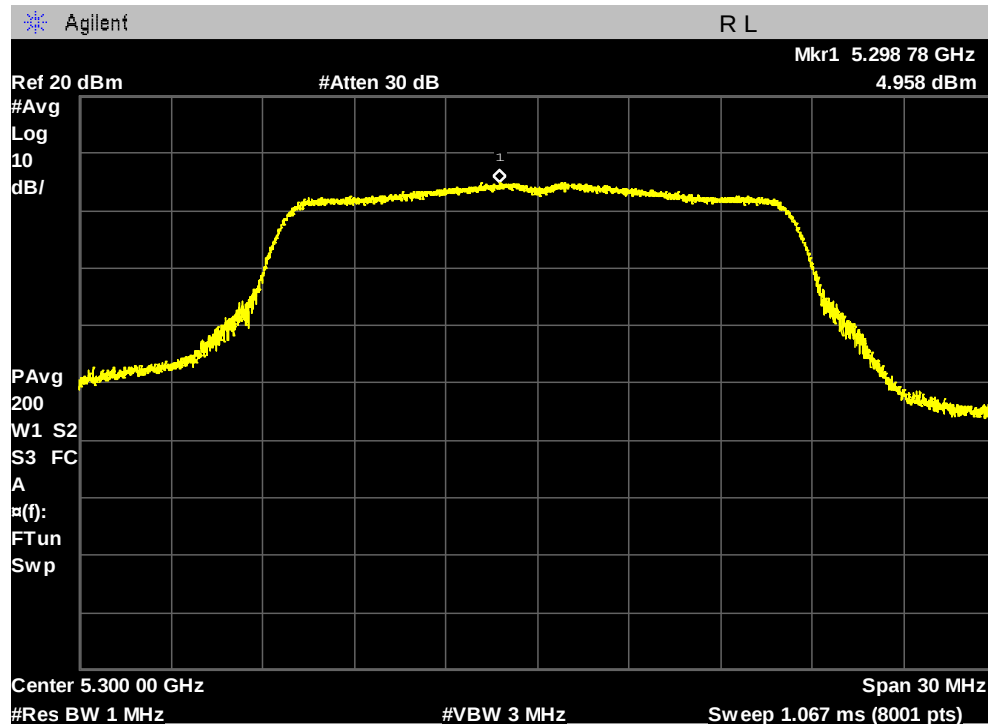
PLOTS OF EMISSIONS

802.11a mode 1TX

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

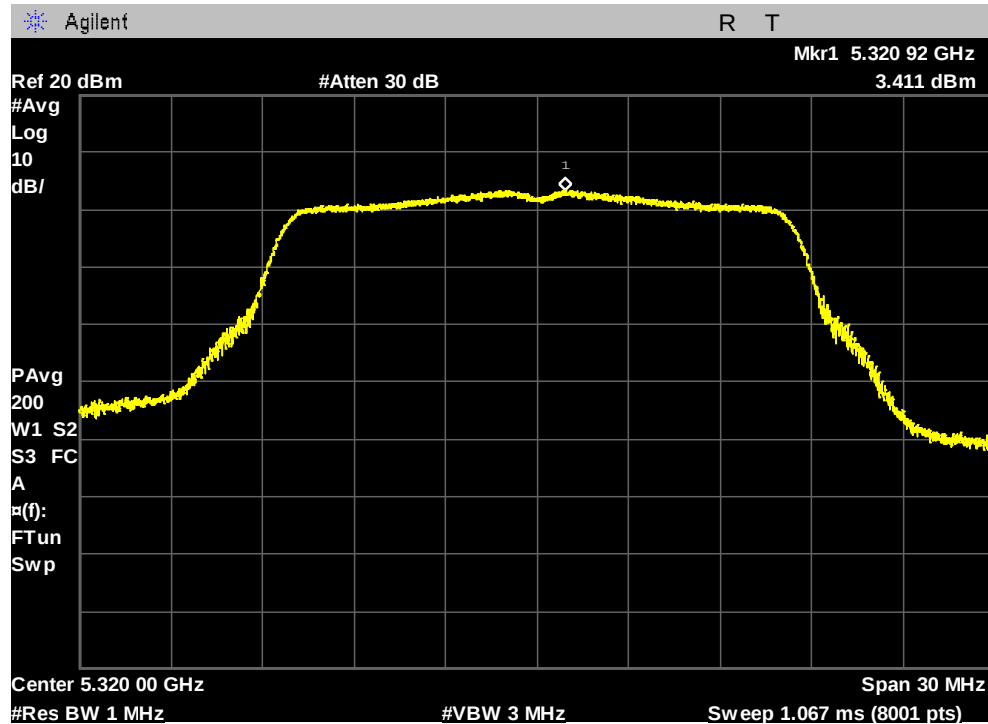


Maximum Power Spectral Density, Middle Channel (5300 MHz)



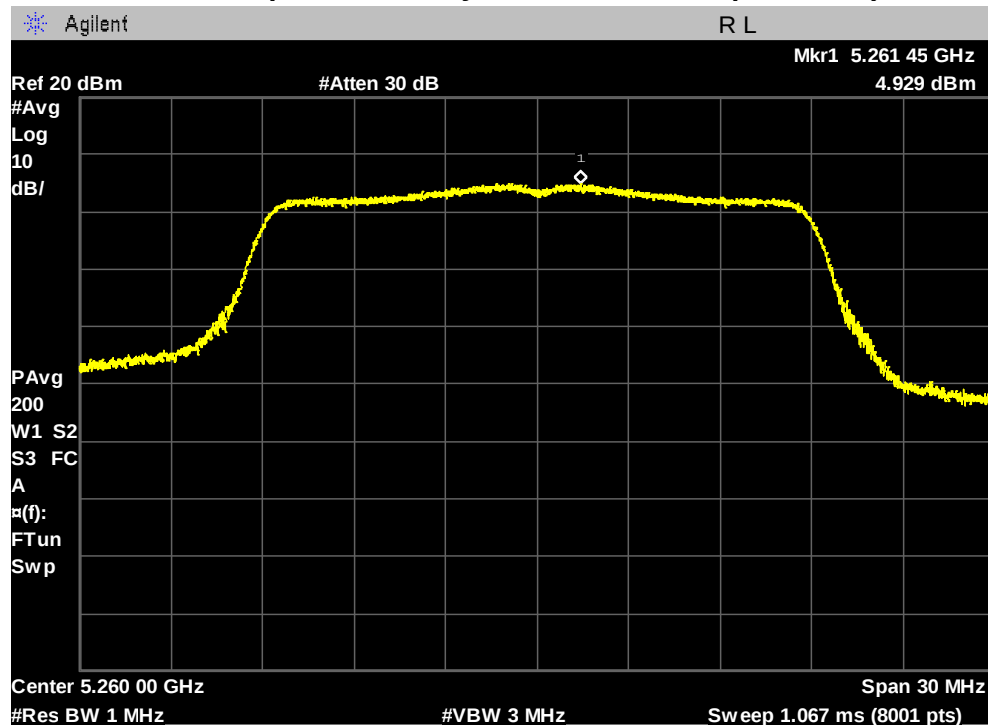
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



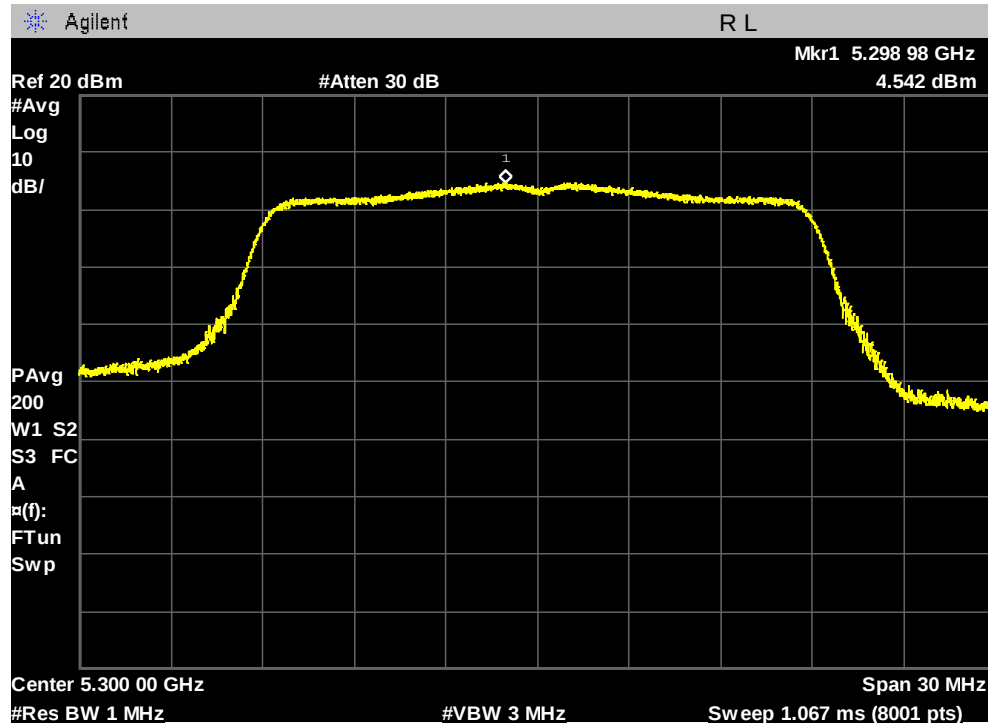
802.11n (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

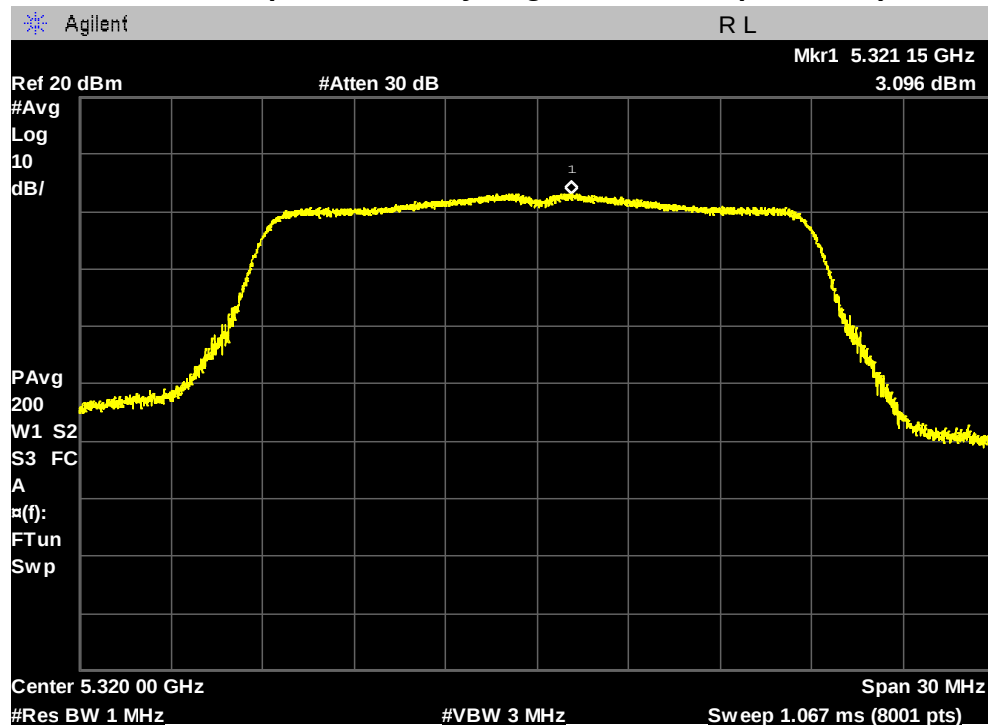


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



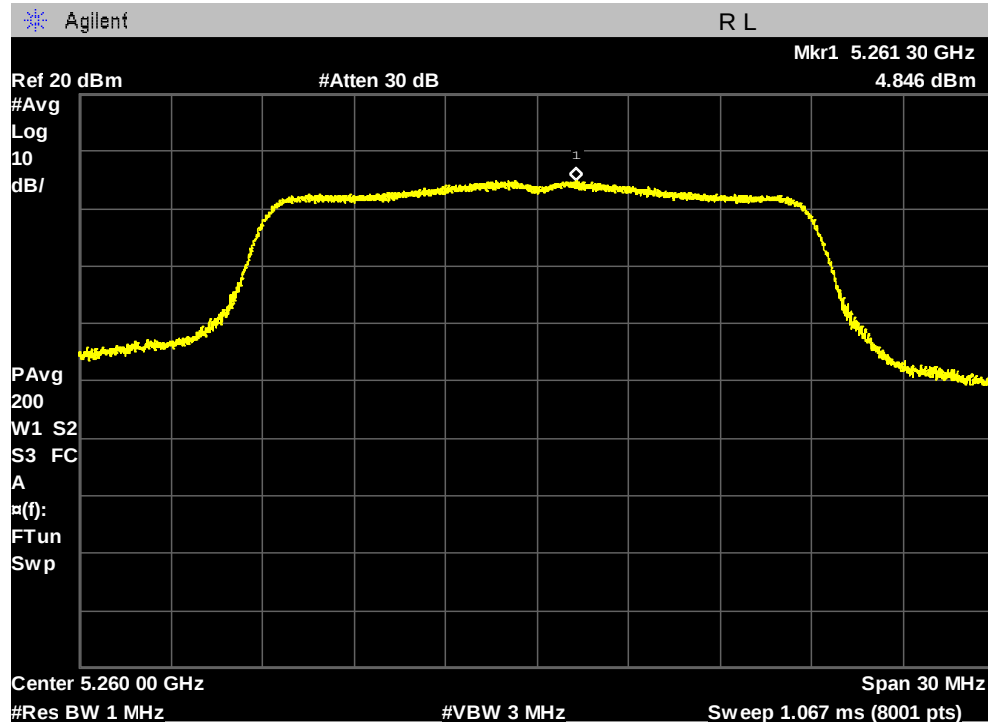
Maximum Power Spectral Density, Highest Channel (5320 MHz)



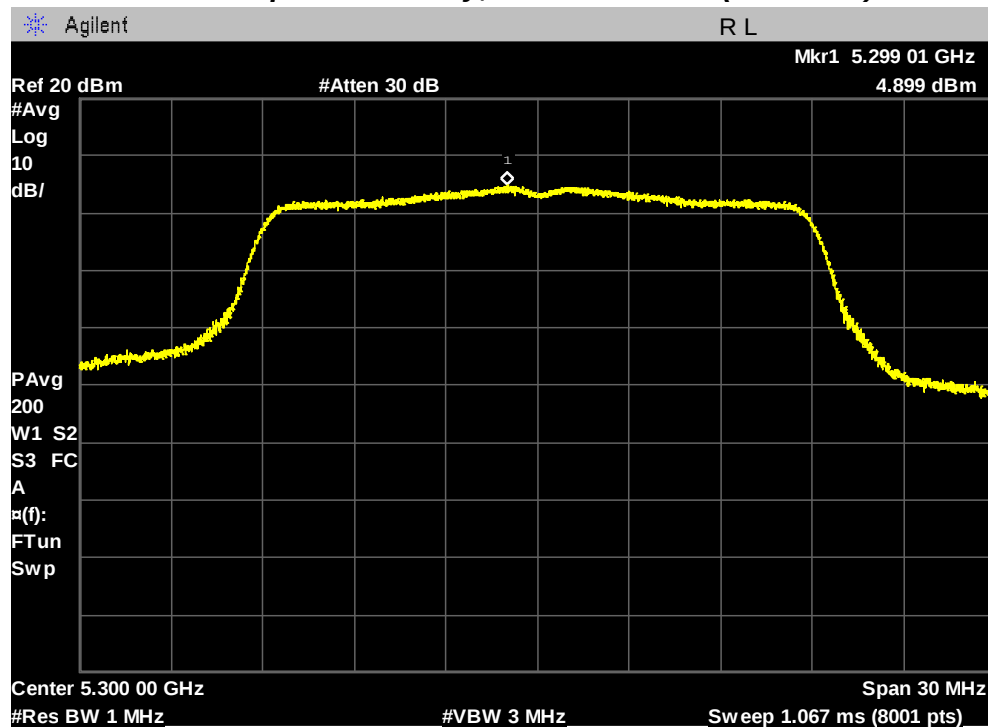
PLOTS OF EMISSIONS

802.11n (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

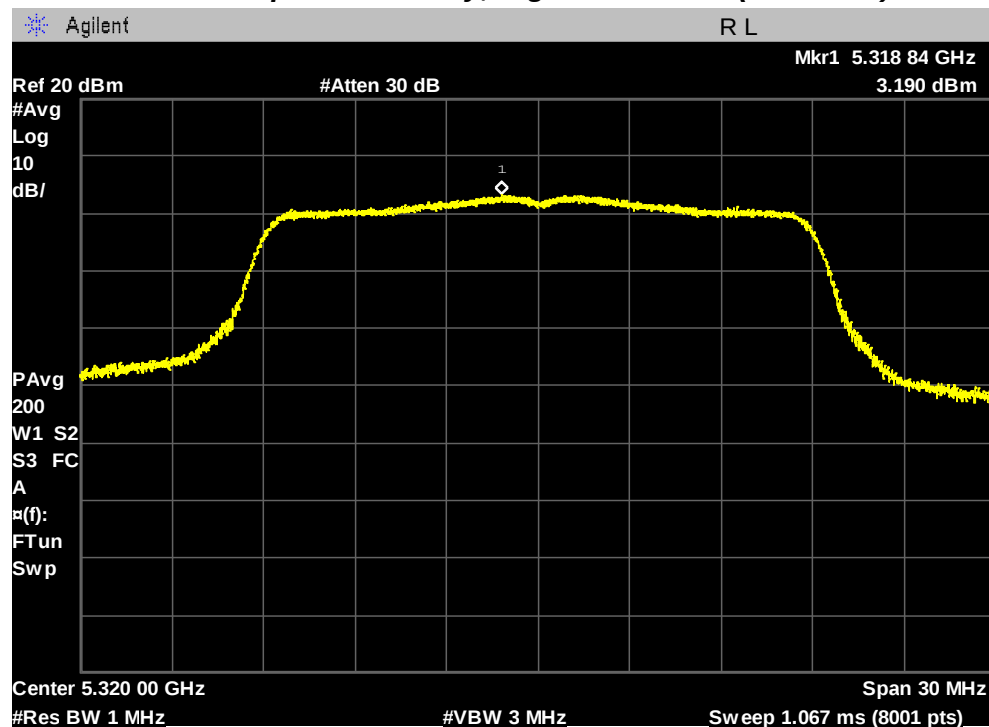


Maximum Power Spectral Density, Middle Channel (5300 MHz)



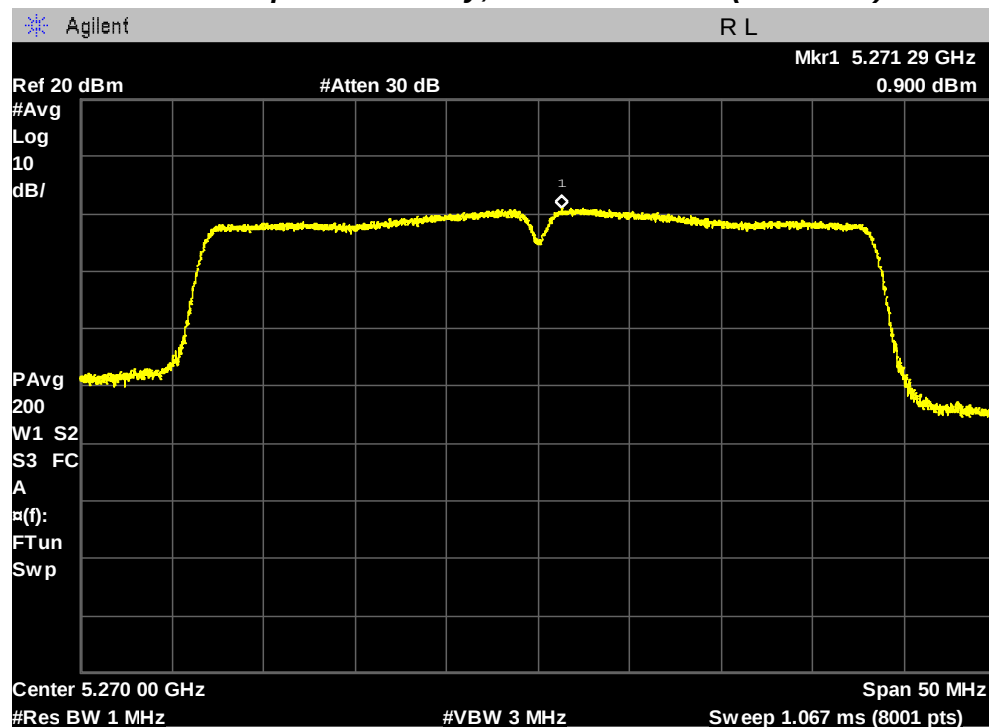
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



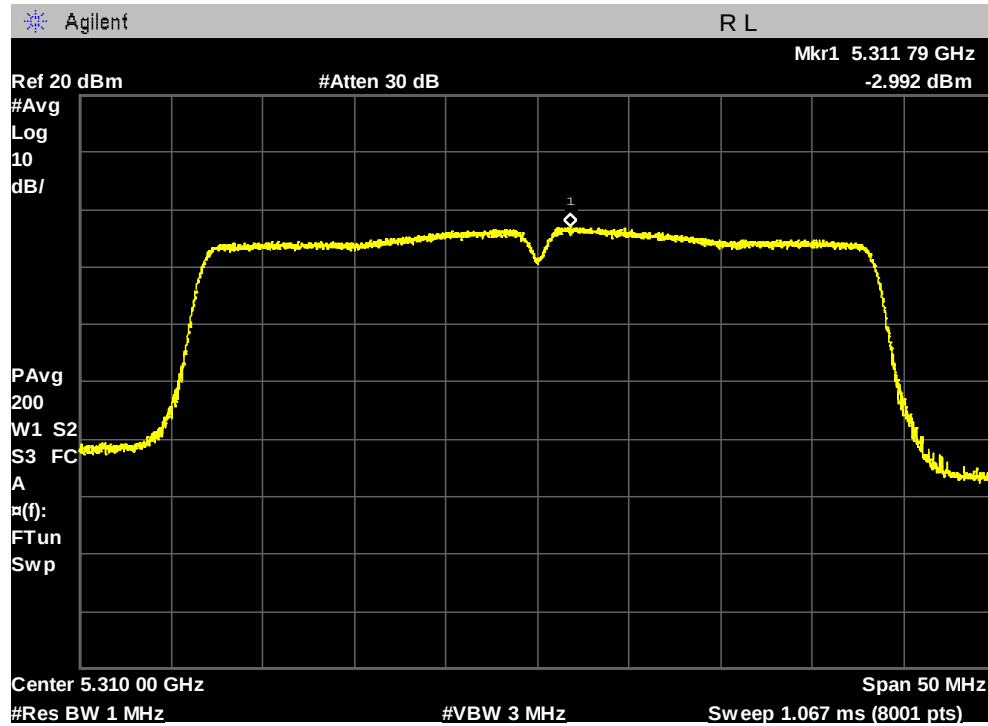
802.11n (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



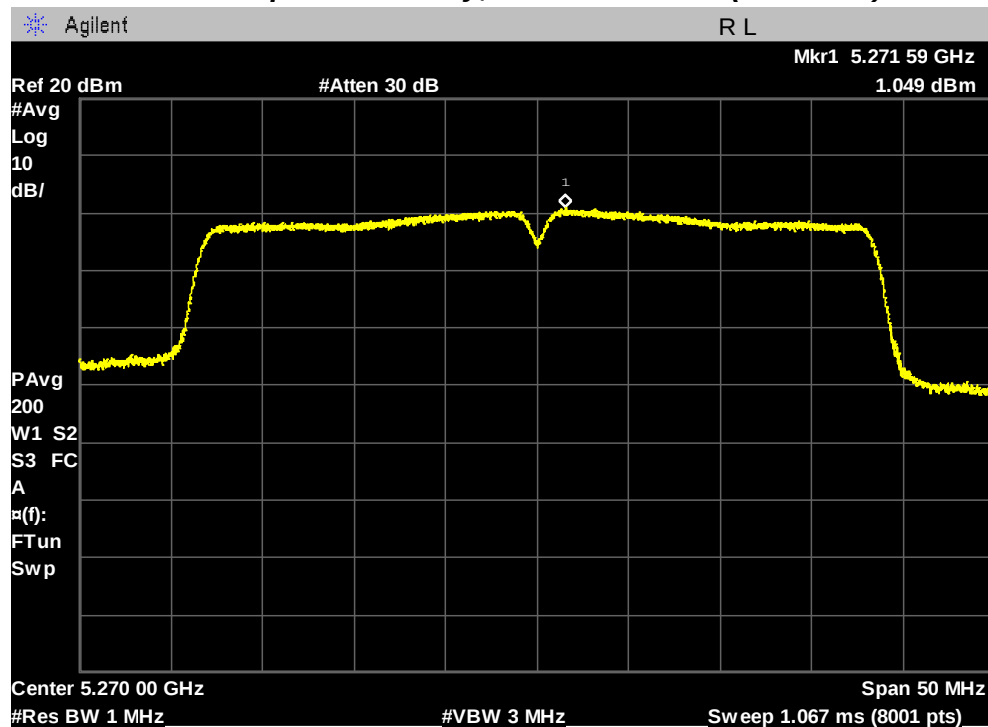
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5310 MHz)



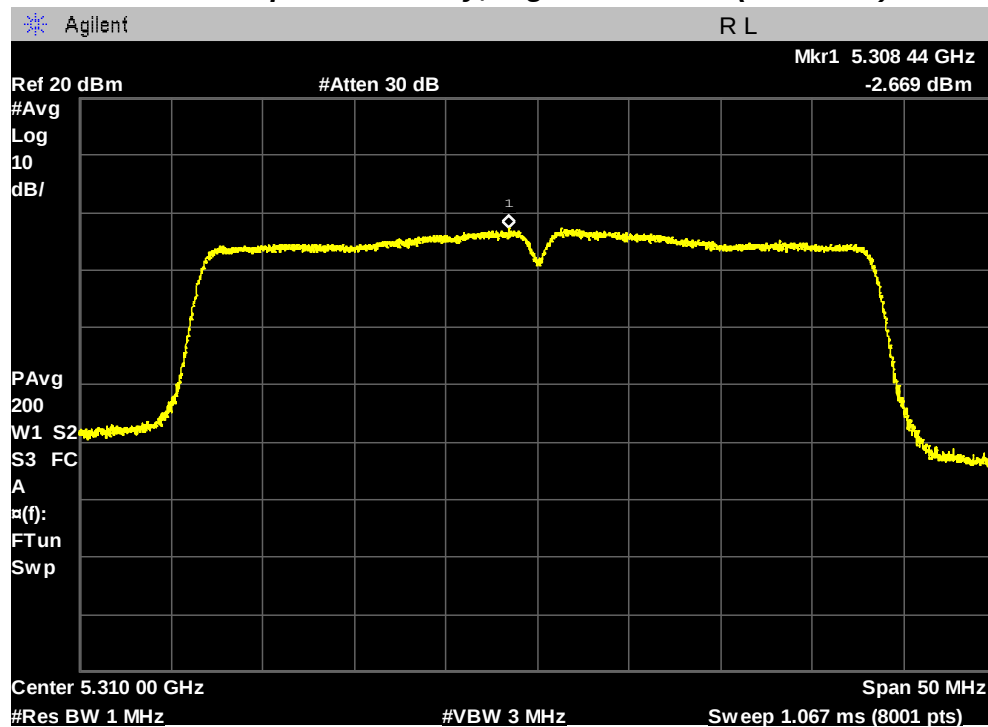
802.11n (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



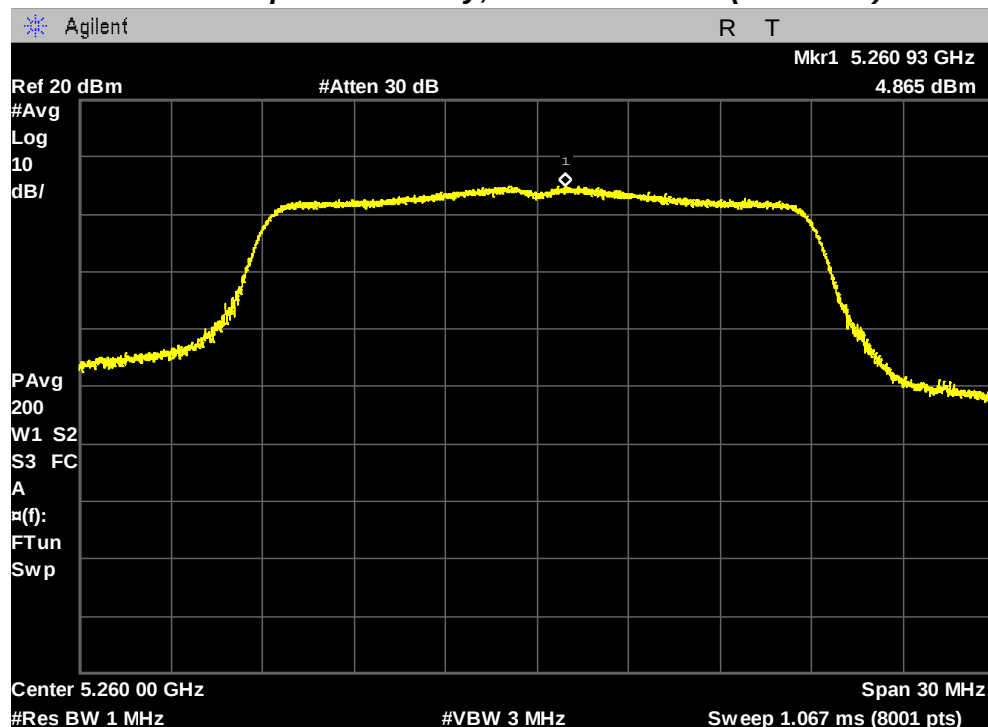
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5310 MHz)



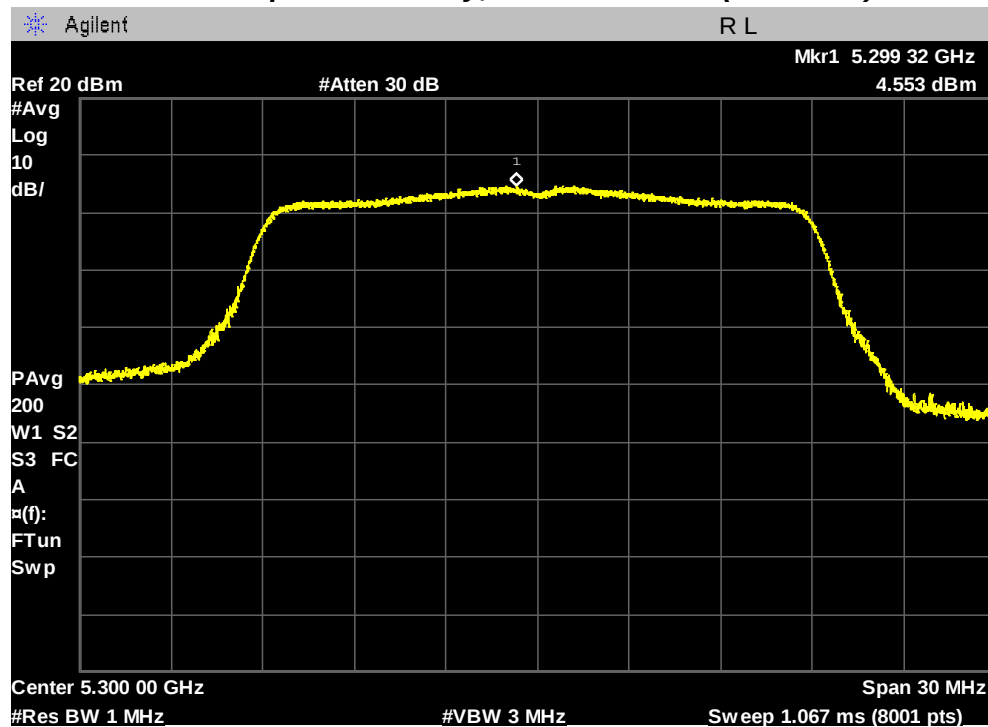
802.11ac (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

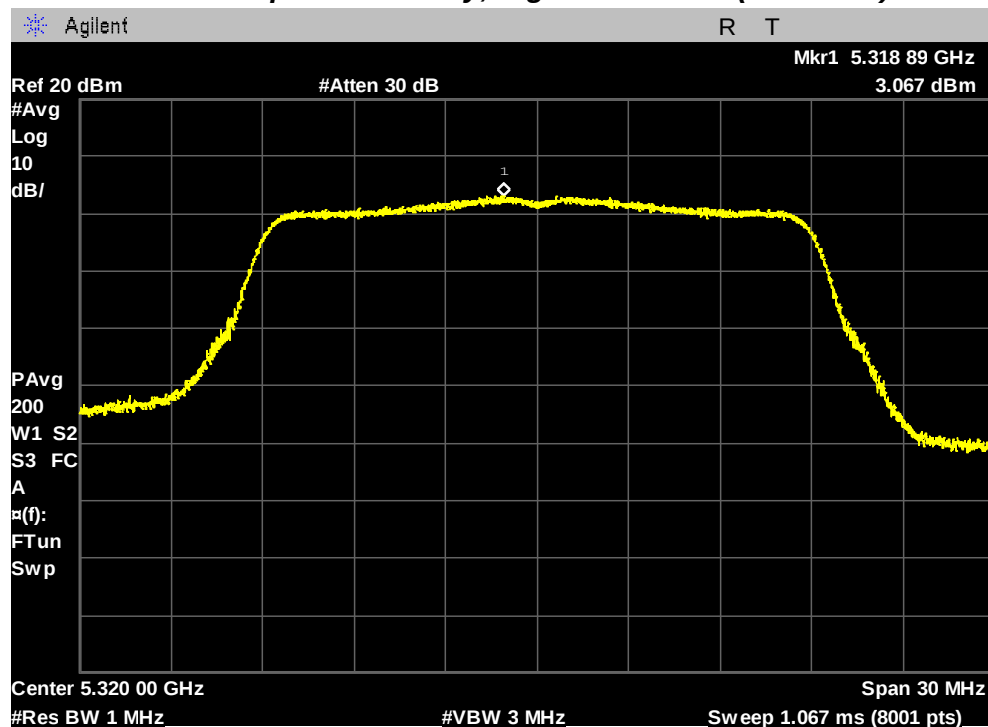


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



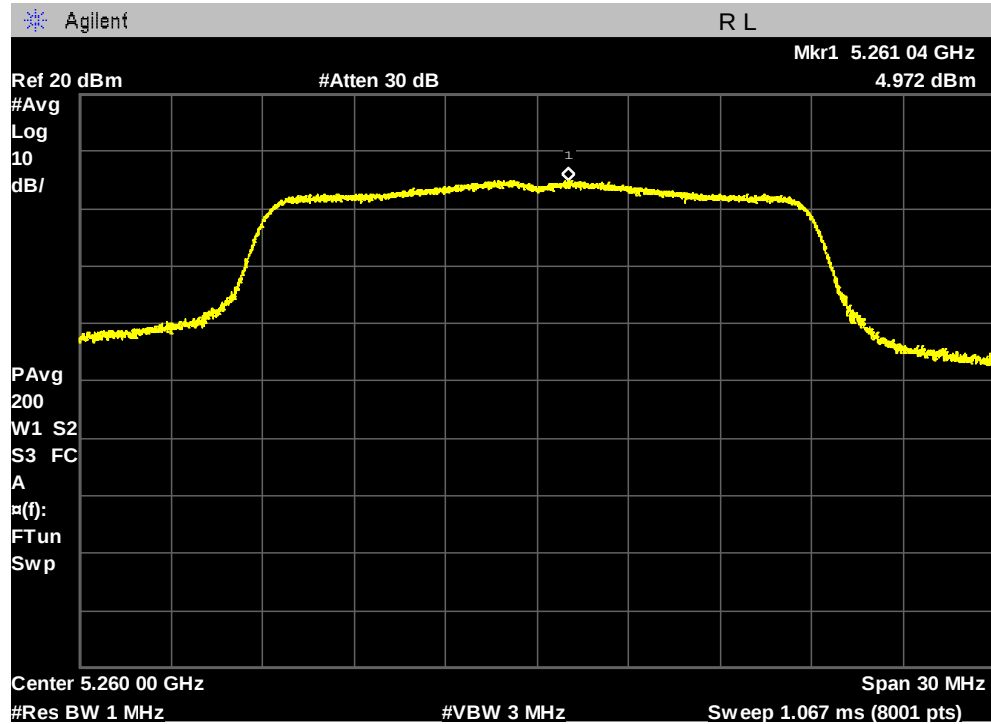
Maximum Power Spectral Density, Highest Channel (5320 MHz)



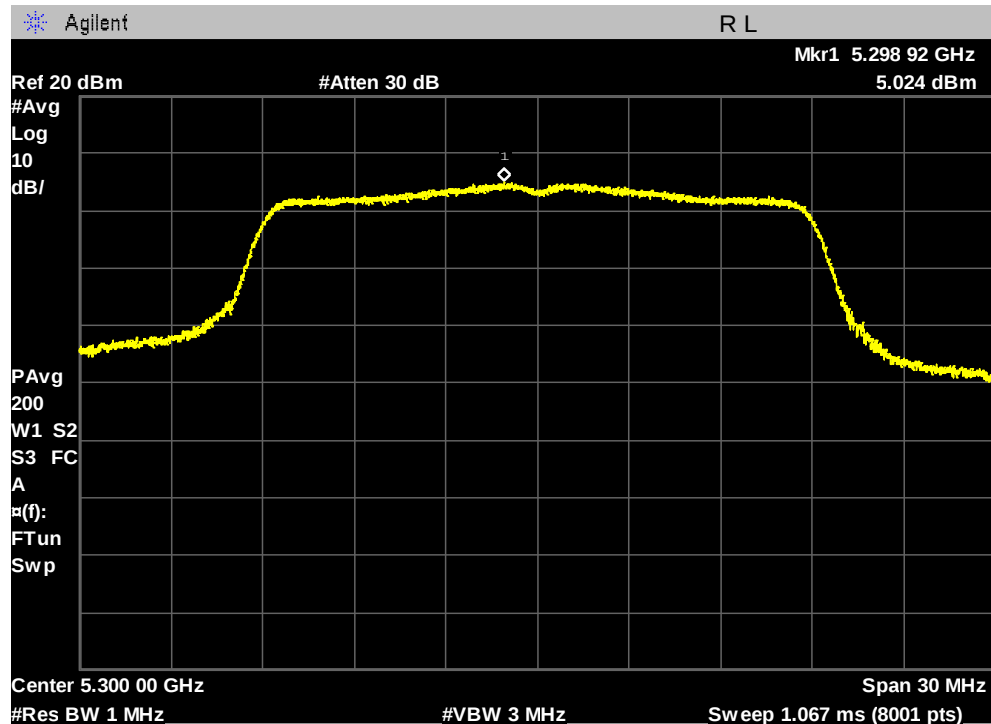
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

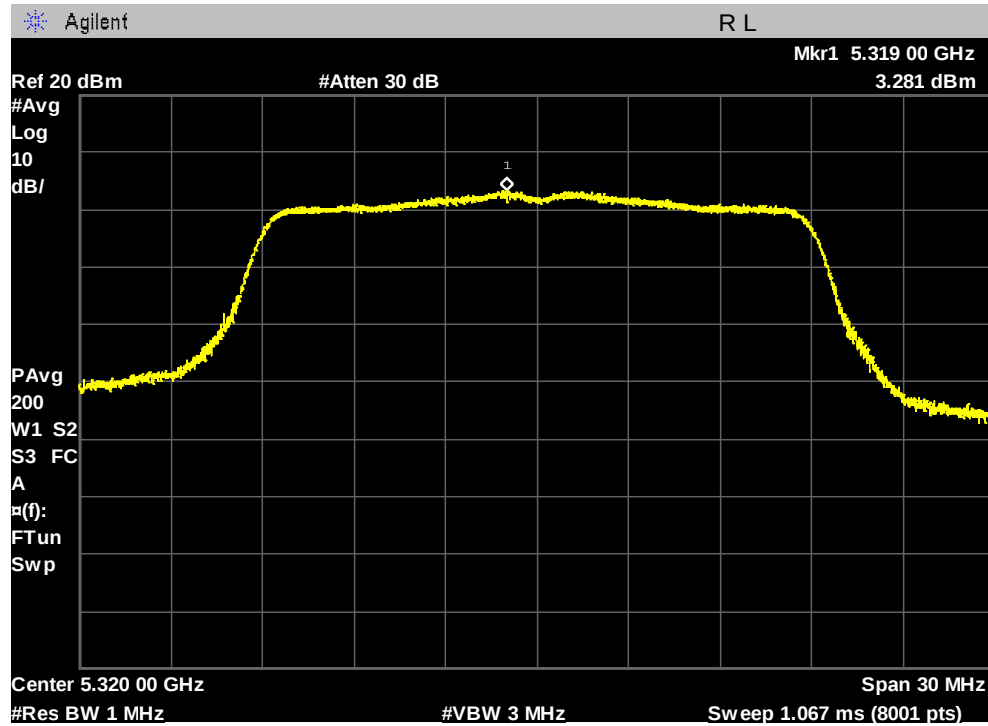


Maximum Power Spectral Density, Middle Channel (5300 MHz)



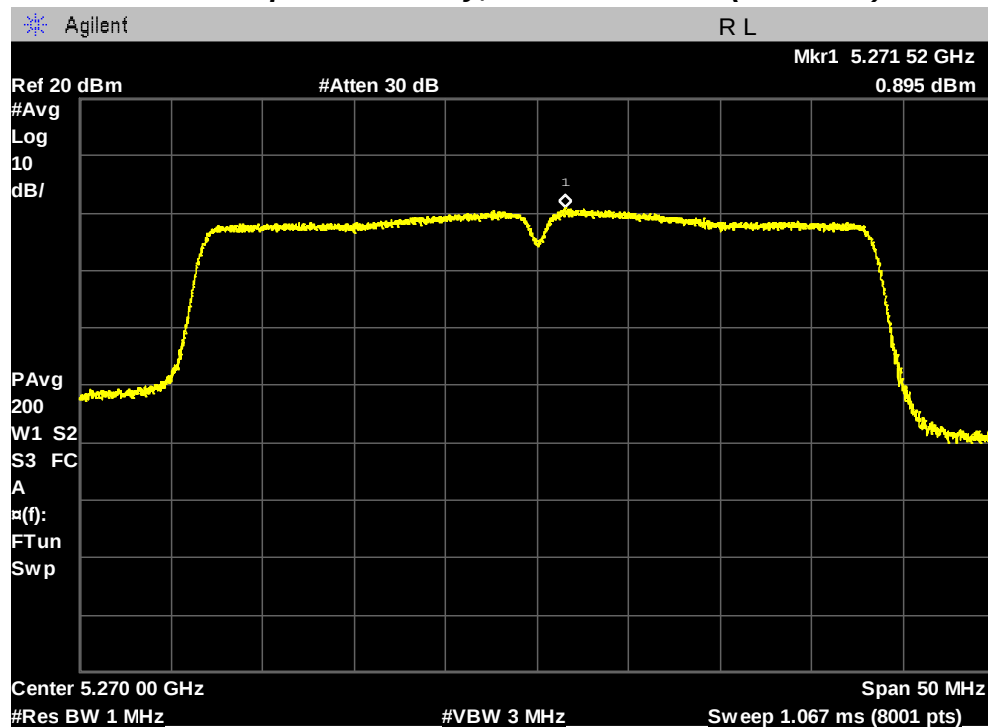
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



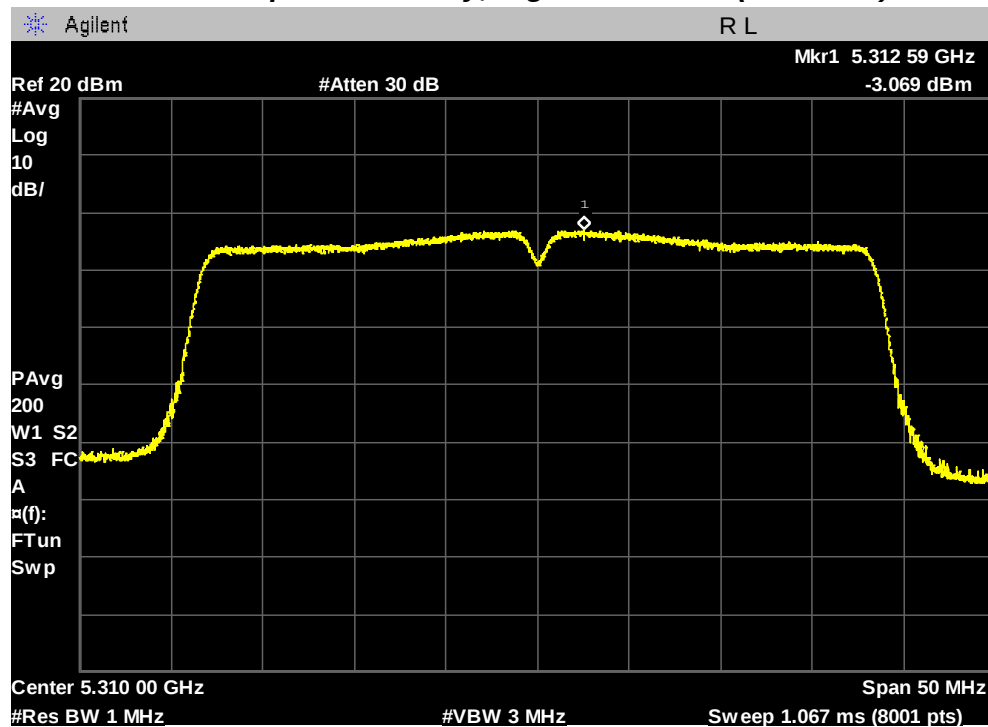
802.11ac (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



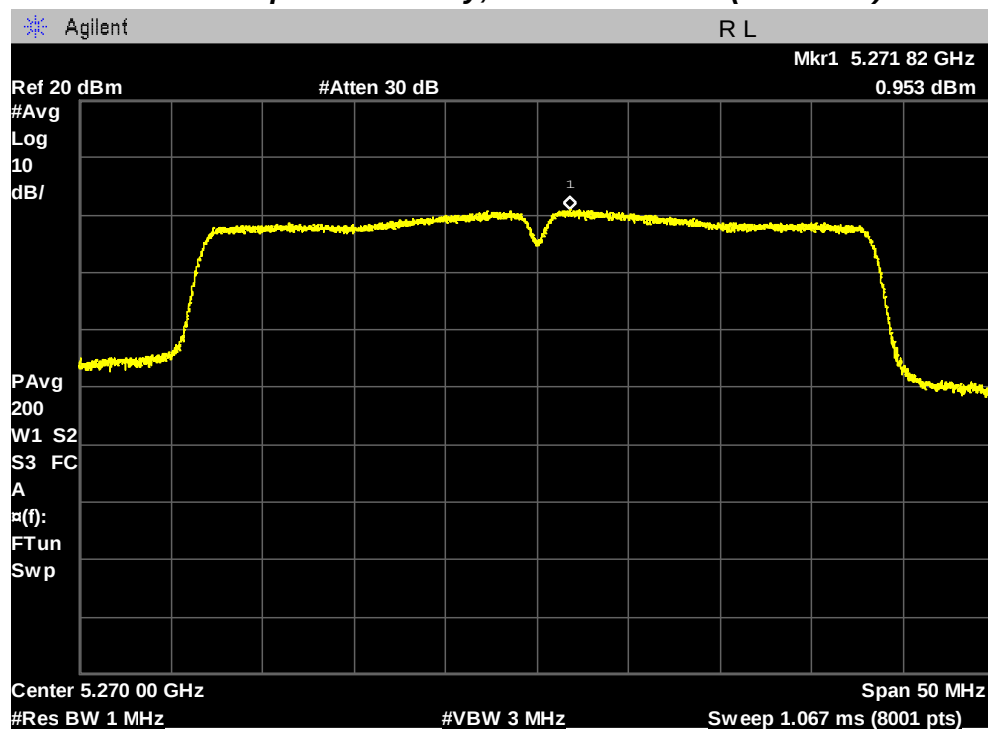
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5310 MHz)



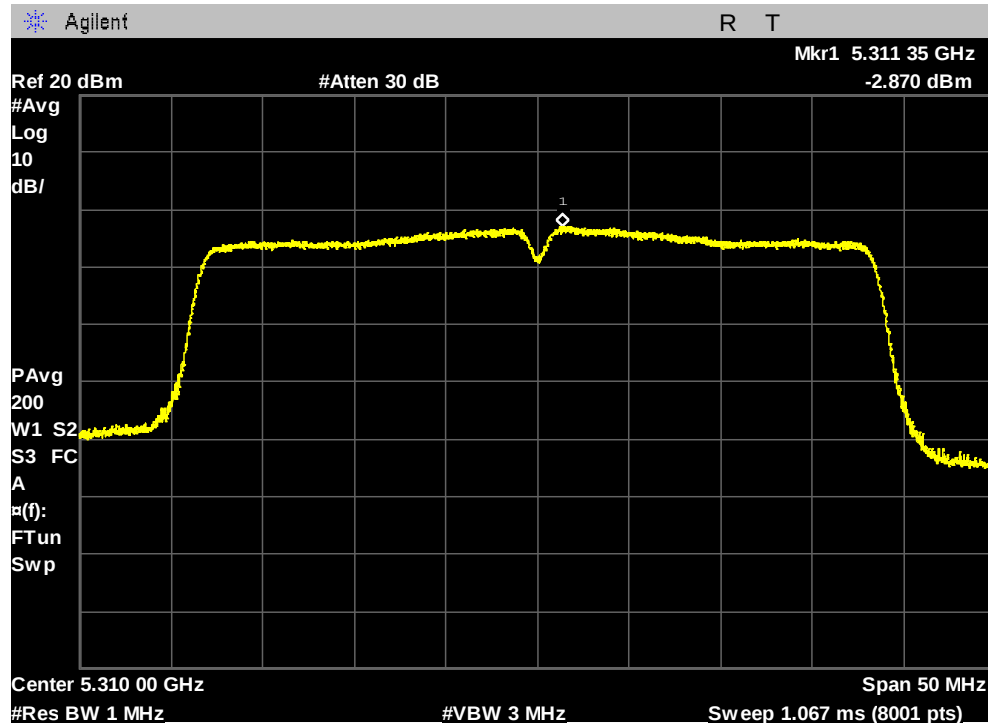
802.11ac (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



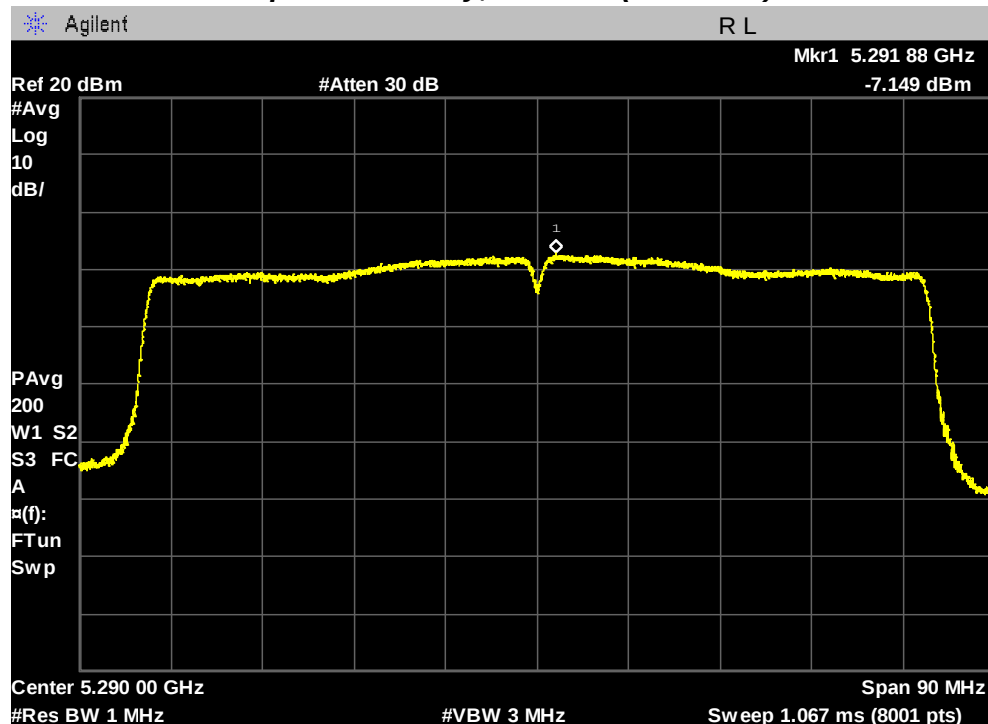
TEST DATA

Maximum Power Spectral Density, Highest Channel (5310 MHz)



802.11ac (80 MHz) mode 1TX

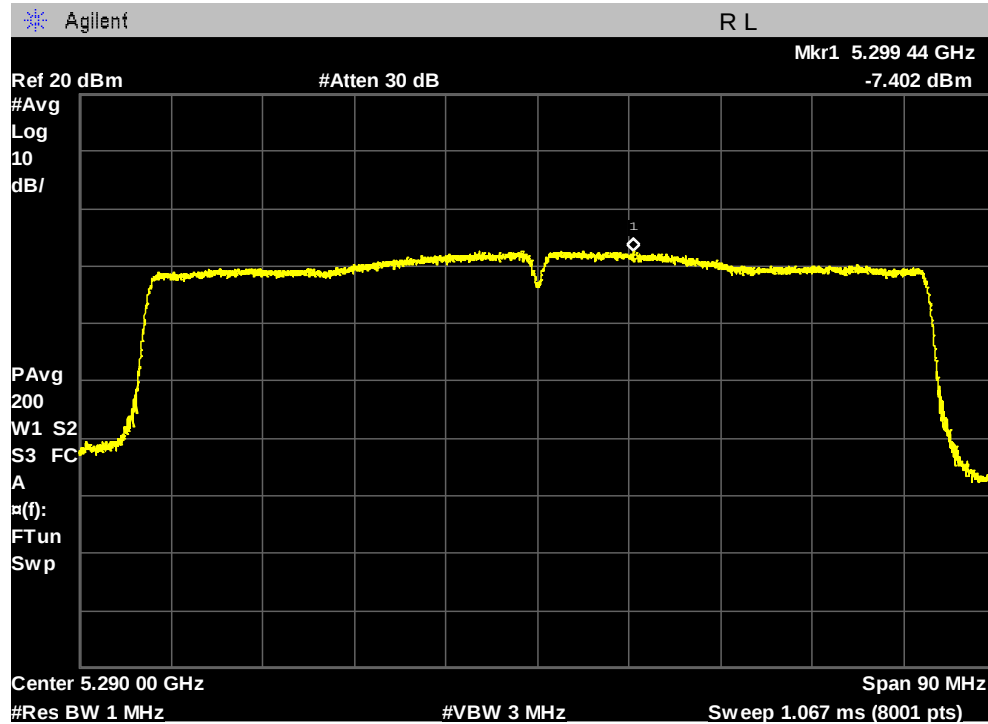
Maximum Power Spectral Density, Channel (5290 MHz)



TEST DATA

802.11ac (80 MHz) mode 2TX

Maximum Power Spectral Density, Channel (5290 MHz)



TEST DATA

8.6.3 Maximum Power Spectral Density – U-NII-2C band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel, Straddle channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5500	1.83	0.08	1.91	11.00
Middle	5600	1.79	0.08	1.87	11.00
Highest	5700	1.97	0.08	2.05	11.00

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5500	1.45	0.07	1.52	11.00
Middle	5600	1.60	0.07	1.67	11.00
Highest	5700	1.63	0.07	1.70	11.00

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5500	1.75	0.07	4.83	11.00
Middle	5600	1.84	0.07	4.92	11.00
Highest	5700	2.05	0.07	5.13	11.00

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5510	-4.07	0.21	-3.86	11.00
Middle	5590	0.63	0.21	0.84	11.00
Highest	5670	0.49	0.21	0.70	11.00

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5510	-3.95	0.21	-0.73	11.00
Middle	5590	0.73	0.21	3.95	11.00
Highest	5670	0.84	0.21	4.06	11.00

TEST DATA

802.11ac (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5500	1.71	0.07	1.78	11.00
Middle	5600	1.76	0.07	1.83	11.00
Highest	5700	1.87	0.07	1.94	11.00

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5500	1.58	0.07	4.66	11.00
Middle	5600	1.65	0.07	4.73	11.00
Highest	5700	1.64	0.07	4.72	11.00

802.11ac (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5510	-3.98	0.16	-3.82	11.00
Middle	5590	0.66	0.16	0.82	11.00
Highest	5670	0.72	0.16	0.88	11.00

TEST DATA

802.11ac (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5510	-3.92	0.16	-0.75	11.00
Middle	5590	0.66	0.16	3.83	11.00
Highest	5670	0.70	0.16	3.87	11.00

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5530	-9.66	0.31	-9.35	11.00
Highest	5610	-4.40	0.31	-4.09	11.00

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5530	-9.32	0.31	-6.00	11.00
Highest	5610	-4.50	0.31	-1.18	11.00

TEST DATA

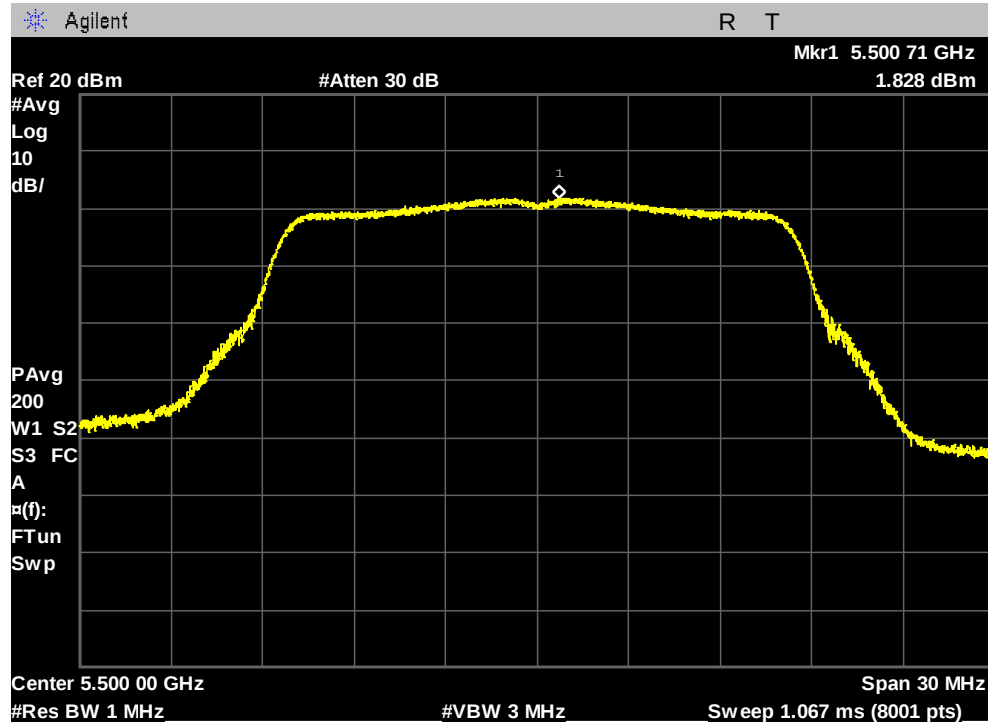
Note:

1. Maximum PSD = Measured PSD + Duty Factor
2. "Measure and add $10 \log(N_{ANT})$ dB, where N_{ANT} is the number of outputs" was used for measuring in-band Total PSD.
 $Total\ PSD = Measured\ PSD + duty\ factor + 10 \log(N_{ANT})$
3. For CDD transmission, directional gain is. **5.80 dBi**
For MIMO transmission, directional gain is **2.79 dBi**.
Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
For power spectral density (PSD) measurements on all devices employing CDD, directional gain is as follows,
Directional gain = $G_{ANT} + Array\ Gain = 2.79\ dBi + 3.01\ dB = 5.80\ dBi$
Array Gain = $10 \log(N_{ANT}/N_{SS})\ dB = 10 \log(2/1) = 3.01\ dB$.
where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi.
For CDD mode of this device, $N_{SS}=1$.
For power spectral density (PSD) measurements on all devices employing MIMO, directional gain is as follows,
Directional gain = $G_{ANT} + 10 \log(N_{ANT}/N_{SS})\ dBi = 2.79\ dBi + 10 \log(2/2)\ dB = 2.79\ dBi$.
where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and $N_{SS}=2$.
4. For FCC PSD Limit, If transmitting antennas of directional gain greater than 6 dBi was used, maximum power spectral density was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
5. Power Spectral Density(PSD) was measured by same method with conducted output power according to II.F.1 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
6. The following equation was used for spectrum offset:
 $Spectrum\ offset\ (dB) = Attenuator\ (dB) + Cable\ Loss\ (dB) + SMA\ Type\ Connector\ Loss\ (dB)$

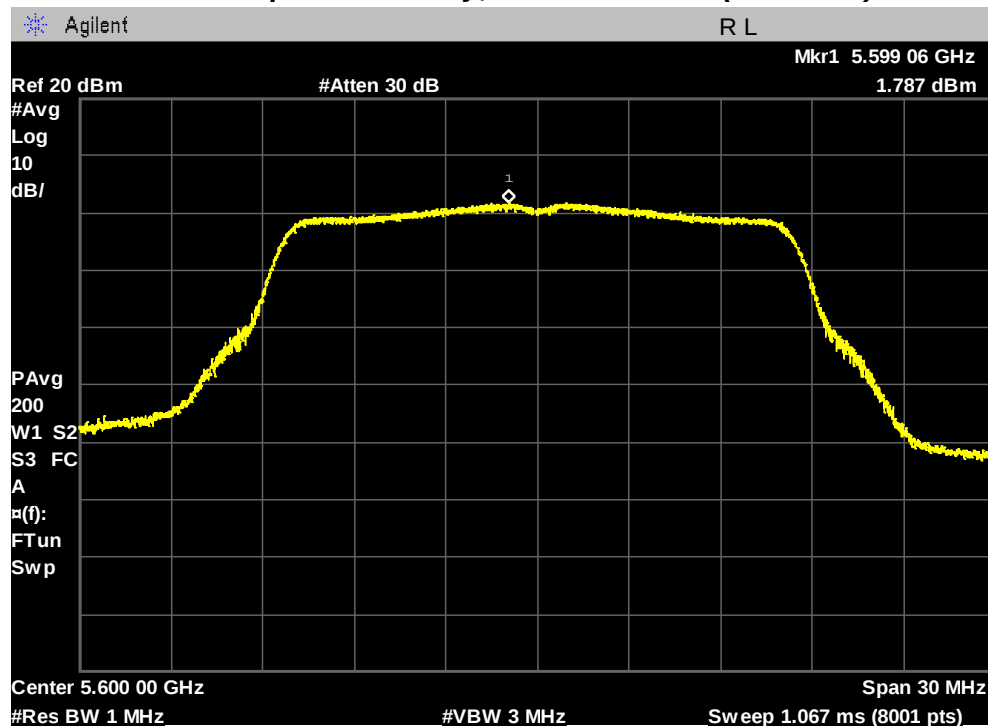
PLOTS OF EMISSIONS

802.11a mode 1TX

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

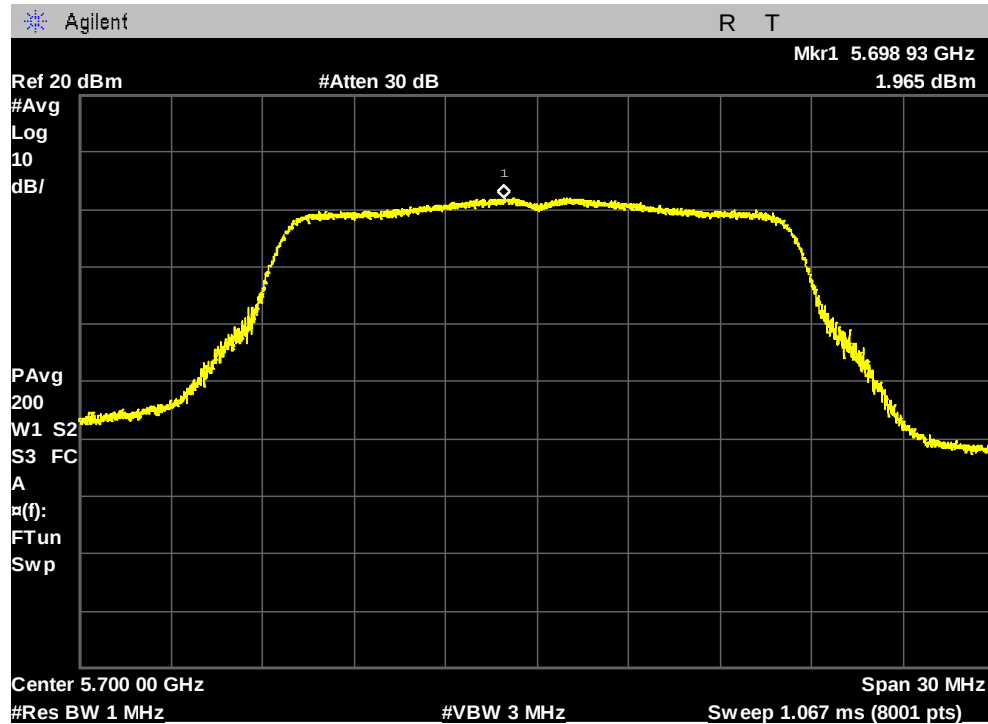


Maximum Power Spectral Density, Middle Channel (5600 MHz)



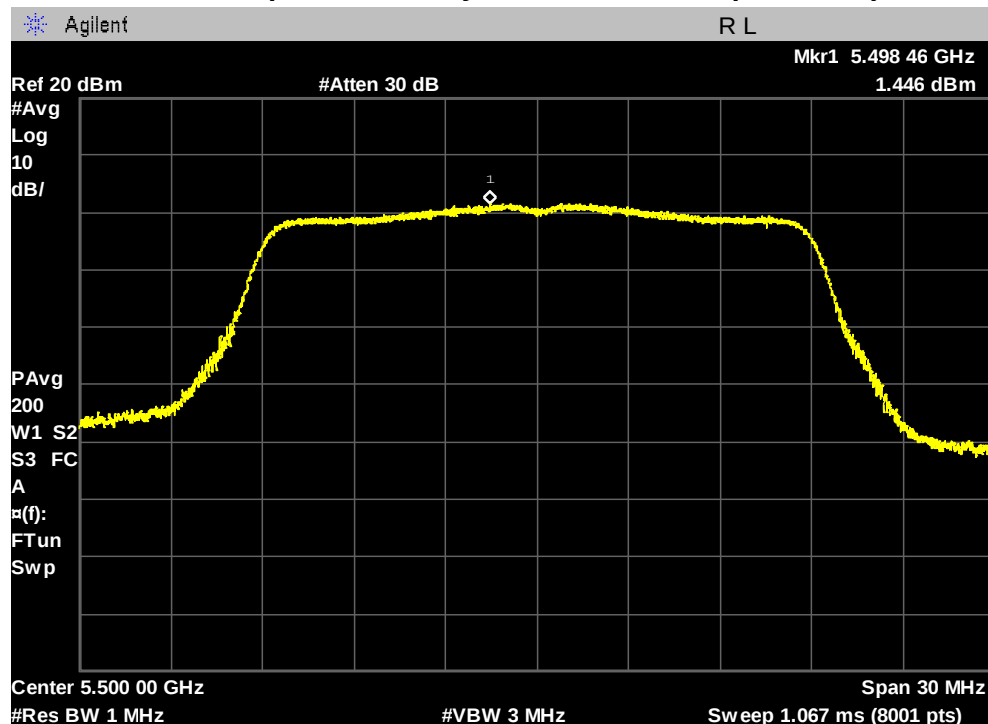
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



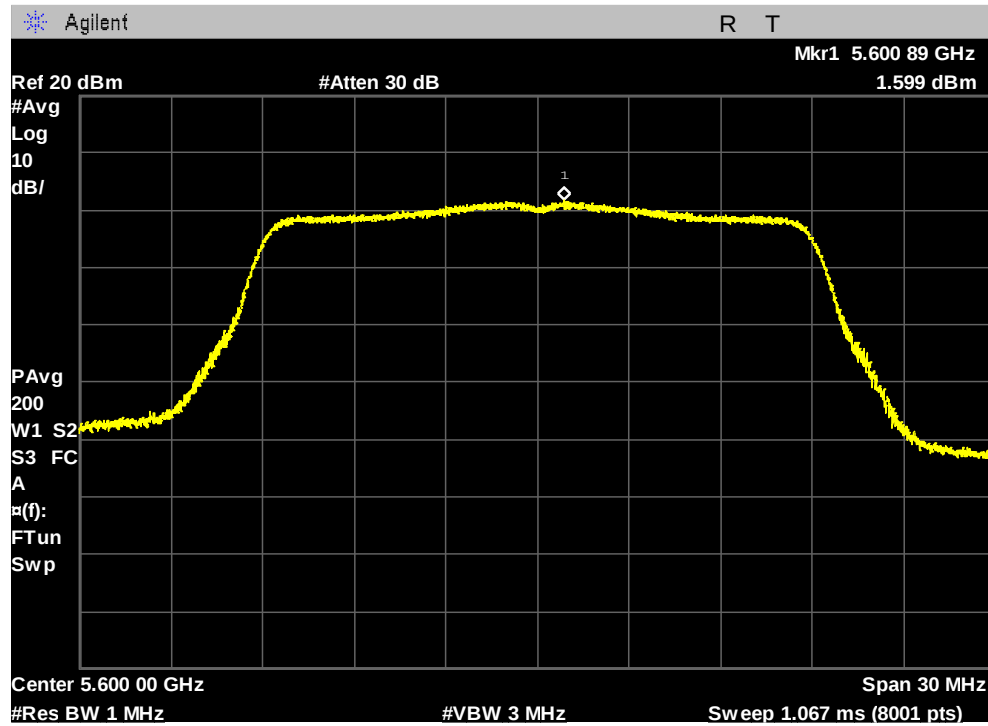
802.11n (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

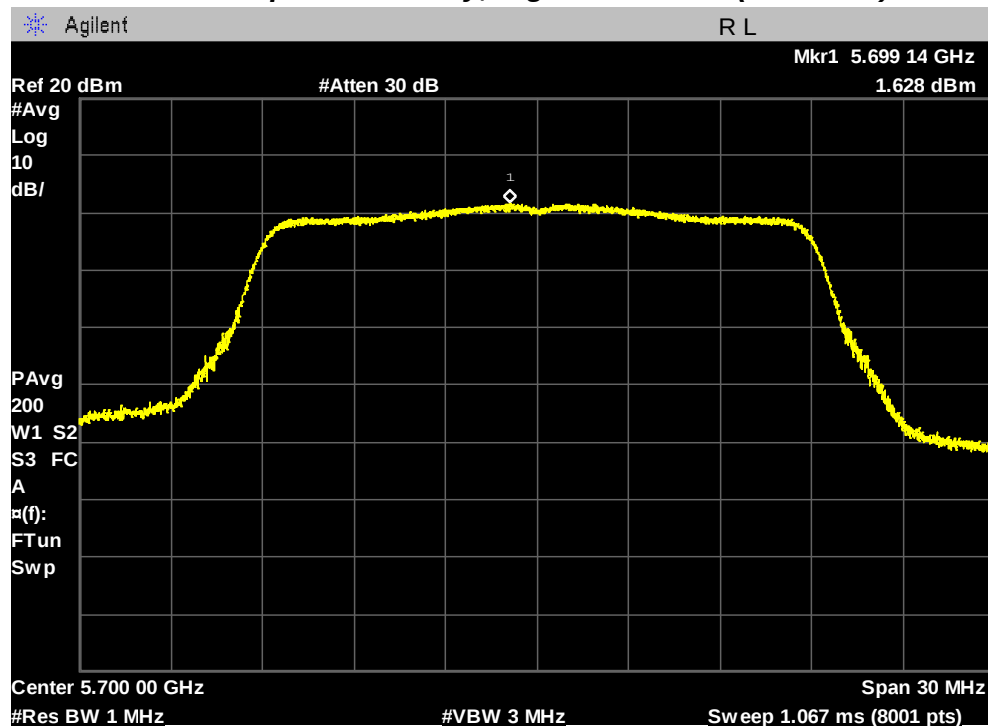


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5600 MHz)



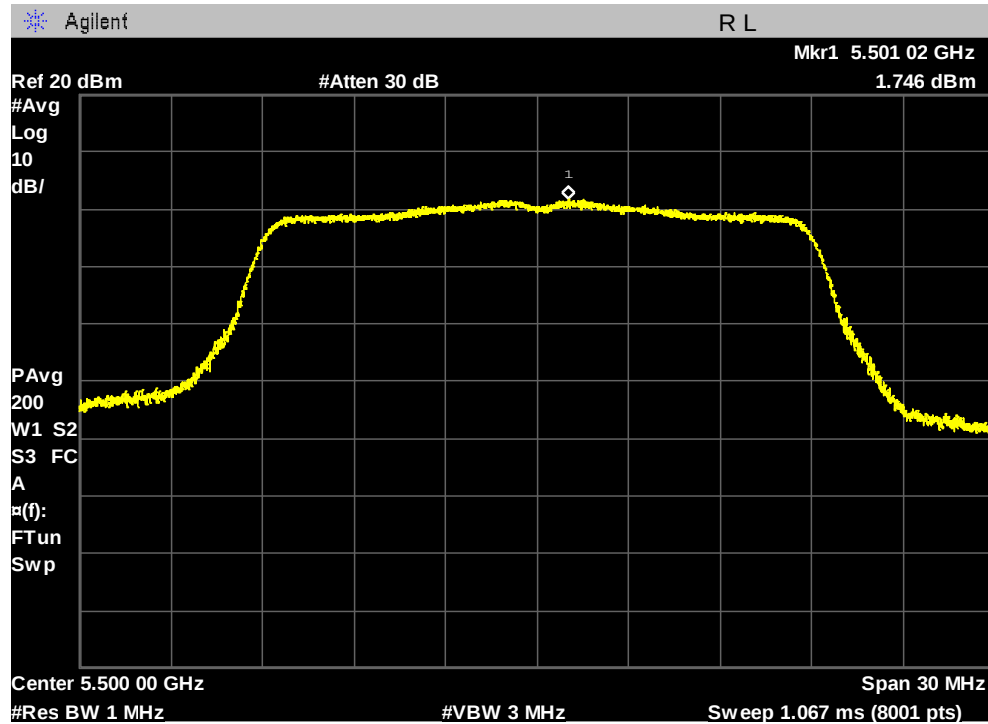
Maximum Power Spectral Density, Highest Channel (5700 MHz)



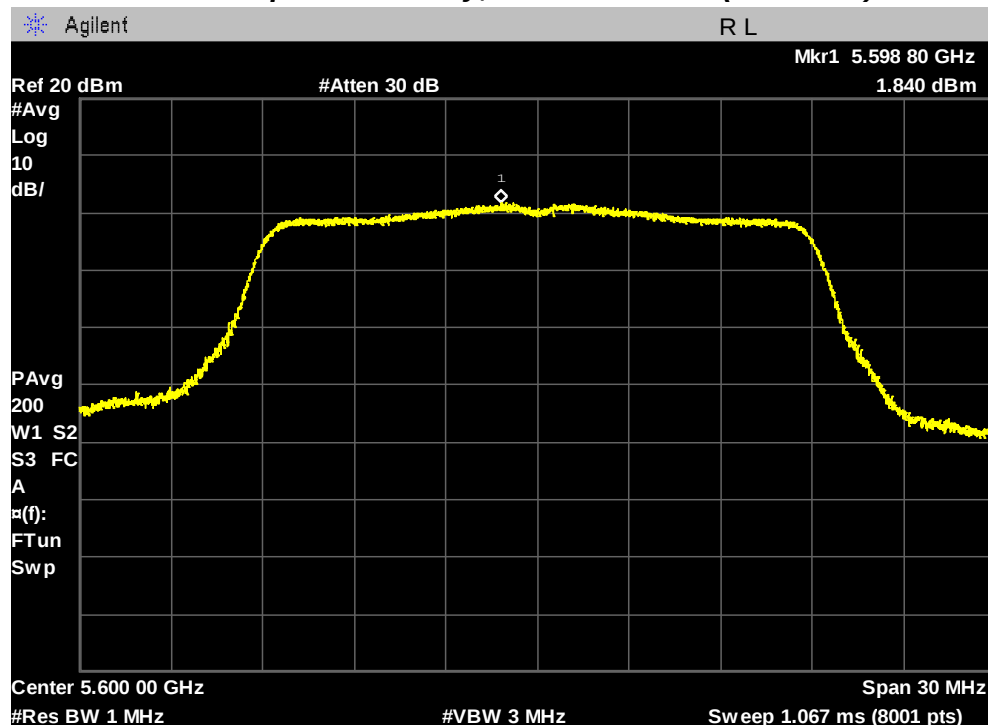
PLOTS OF EMISSIONS

802.11n (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

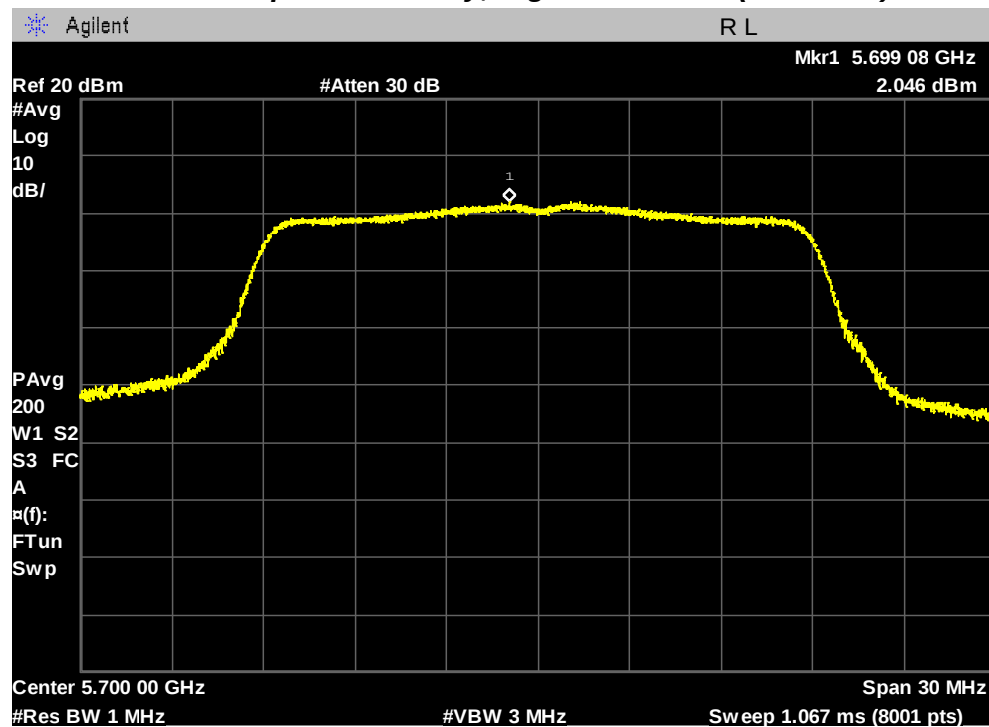


Maximum Power Spectral Density, Middle Channel (5600 MHz)



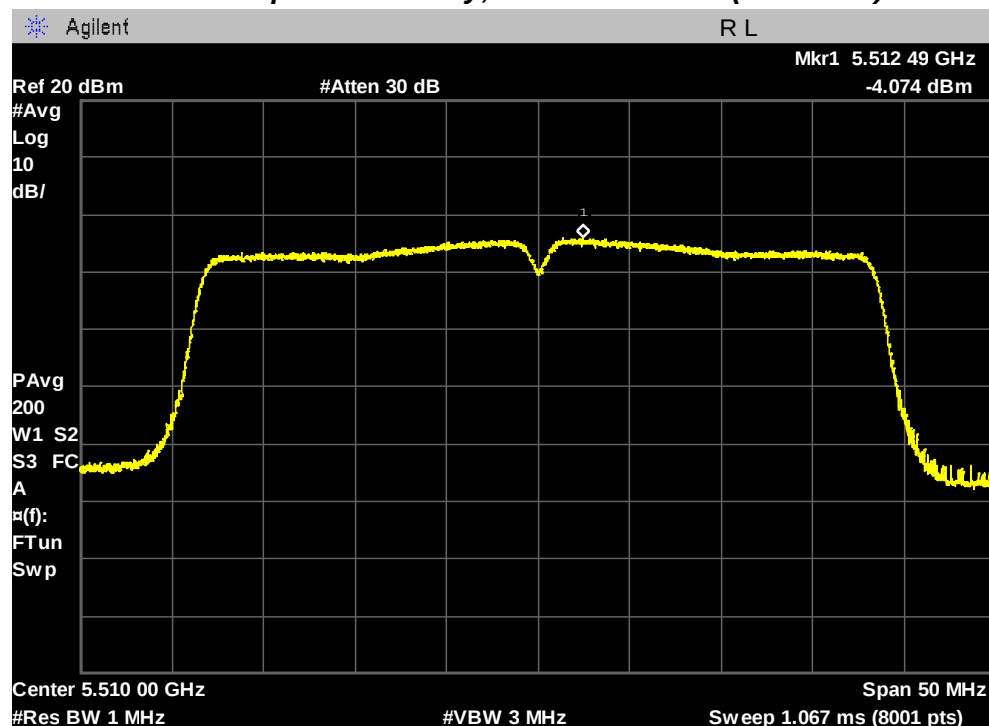
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



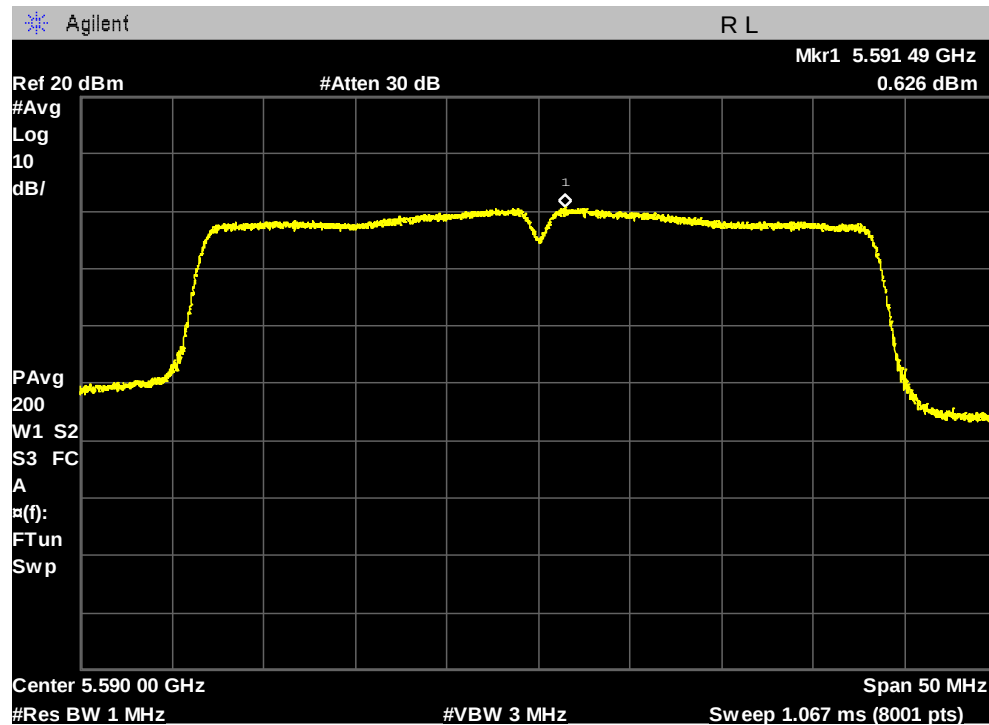
802.11n (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

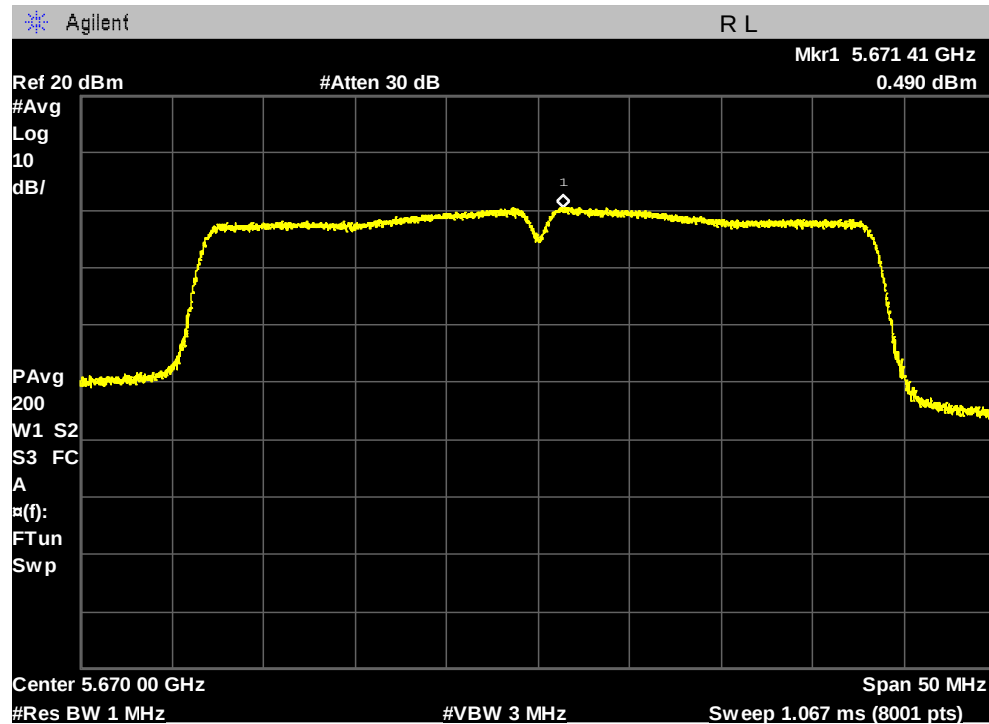


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5590 MHz)



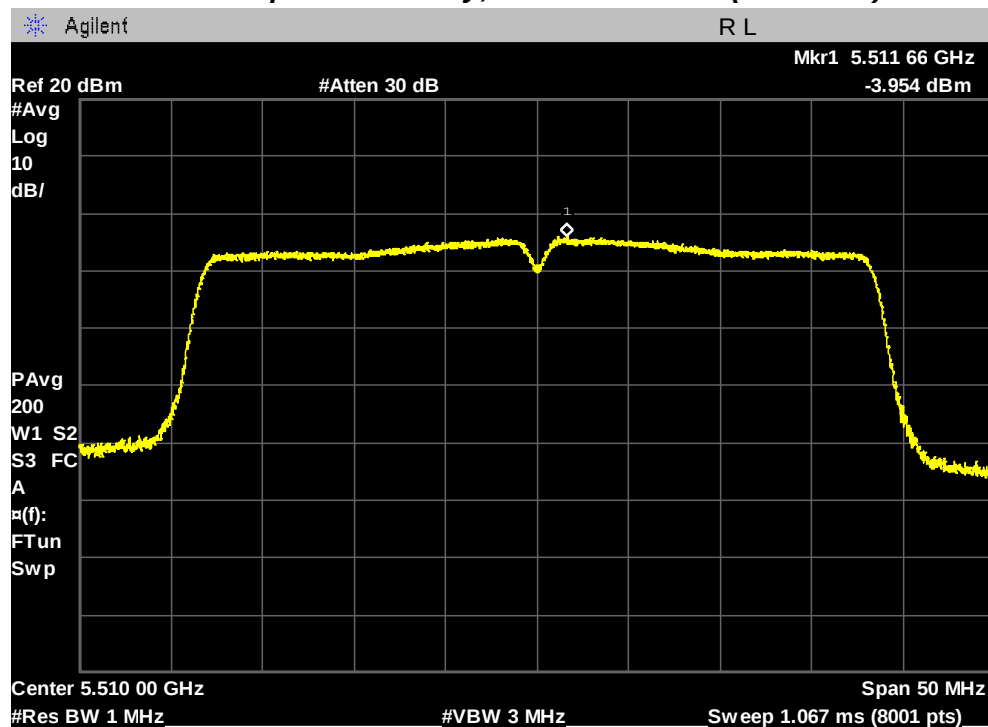
Maximum Power Spectral Density, Highest Channel (5670 MHz)



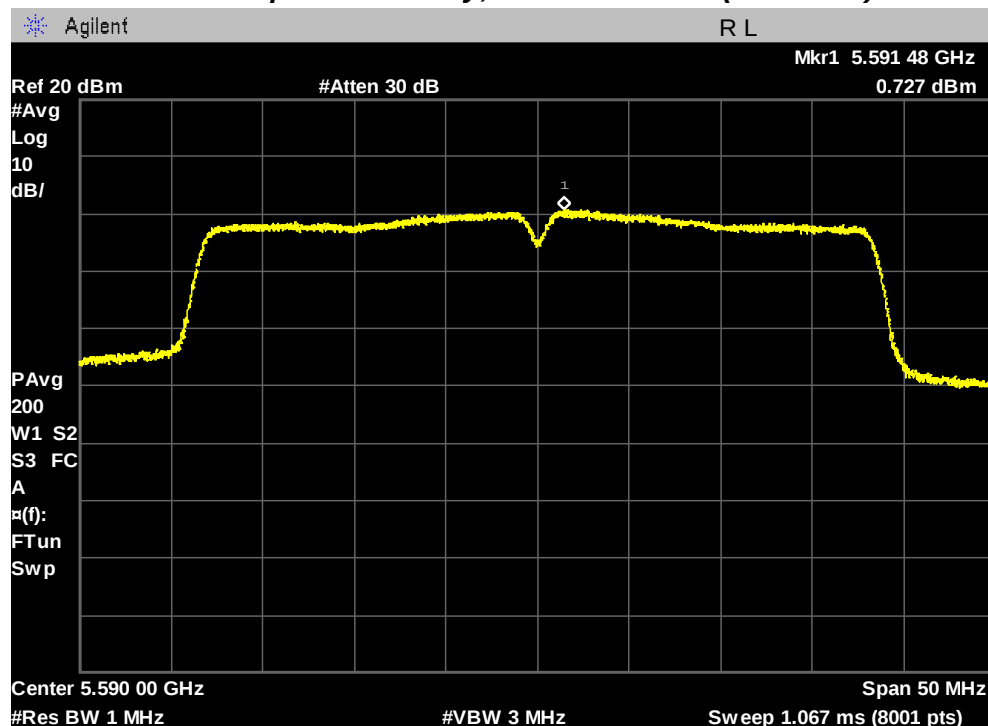
PLOTS OF EMISSIONS

802.11n (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

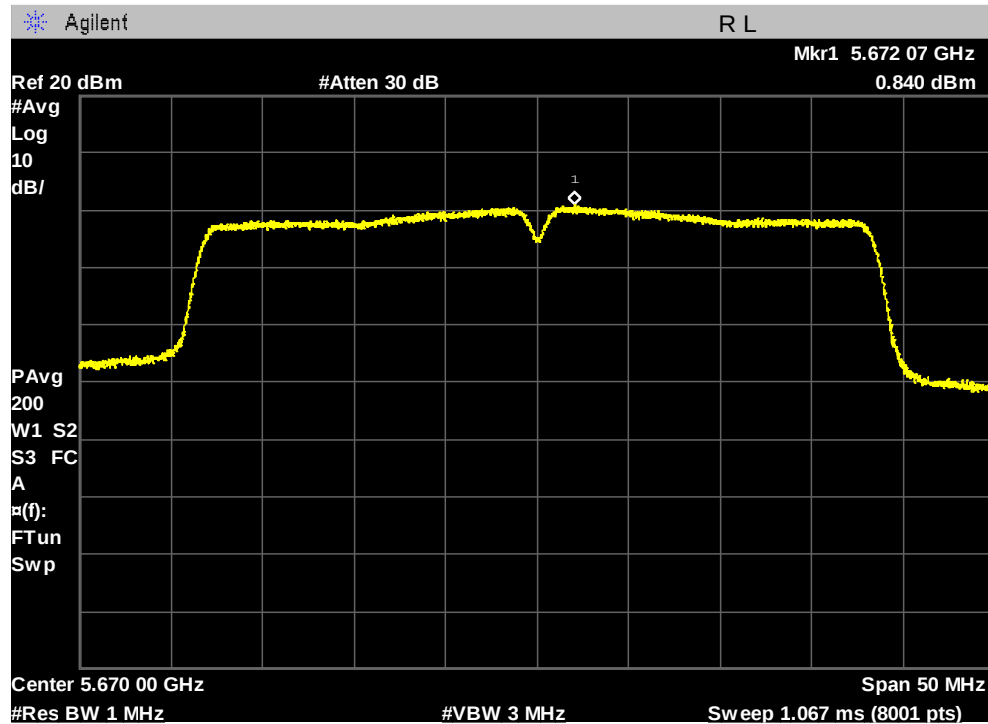


Maximum Power Spectral Density, Middle Channel (5590 MHz)



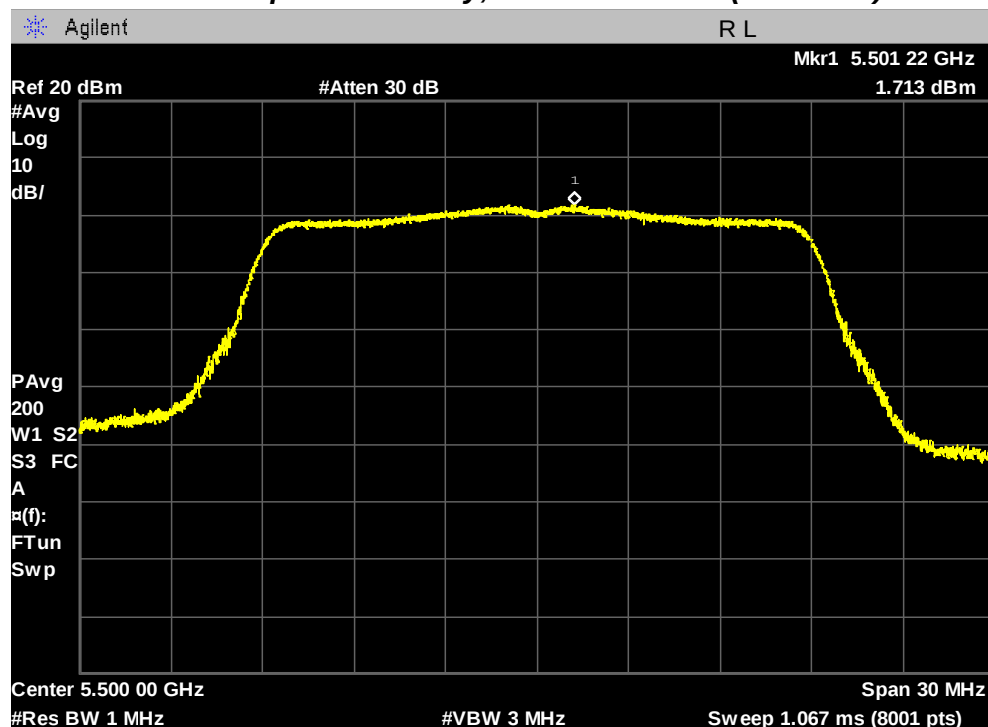
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



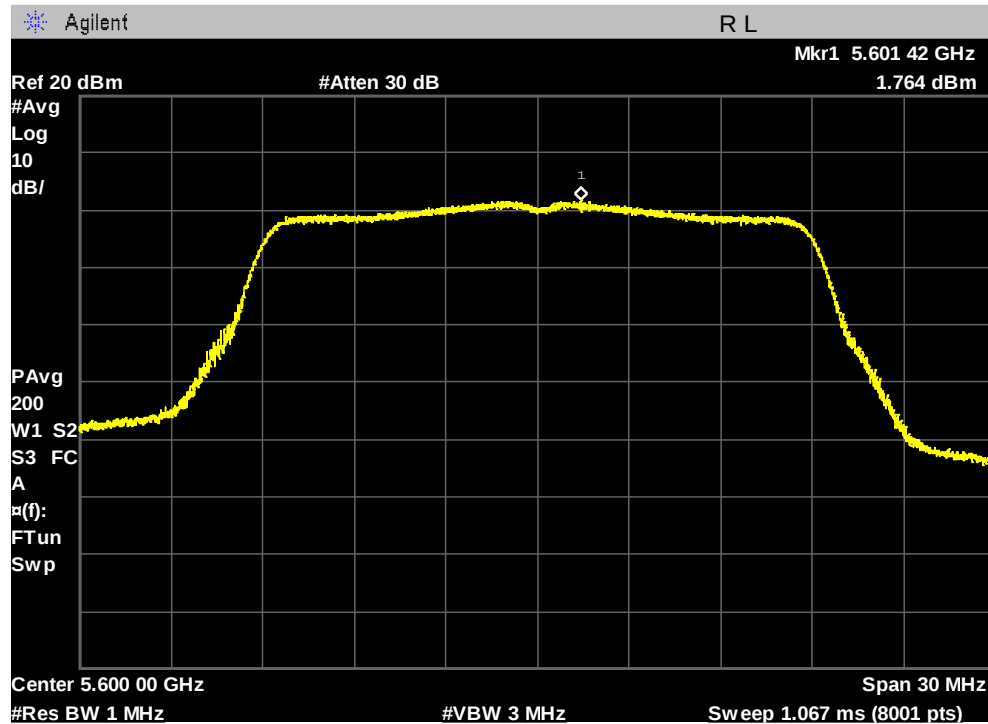
802.11ac (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

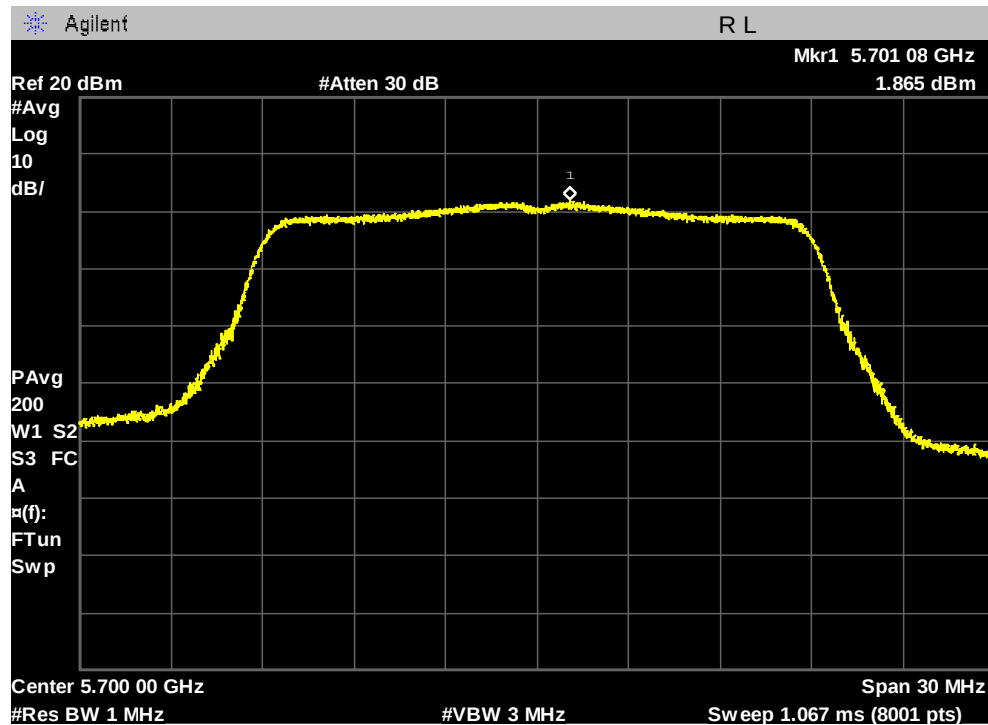


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5600 MHz)



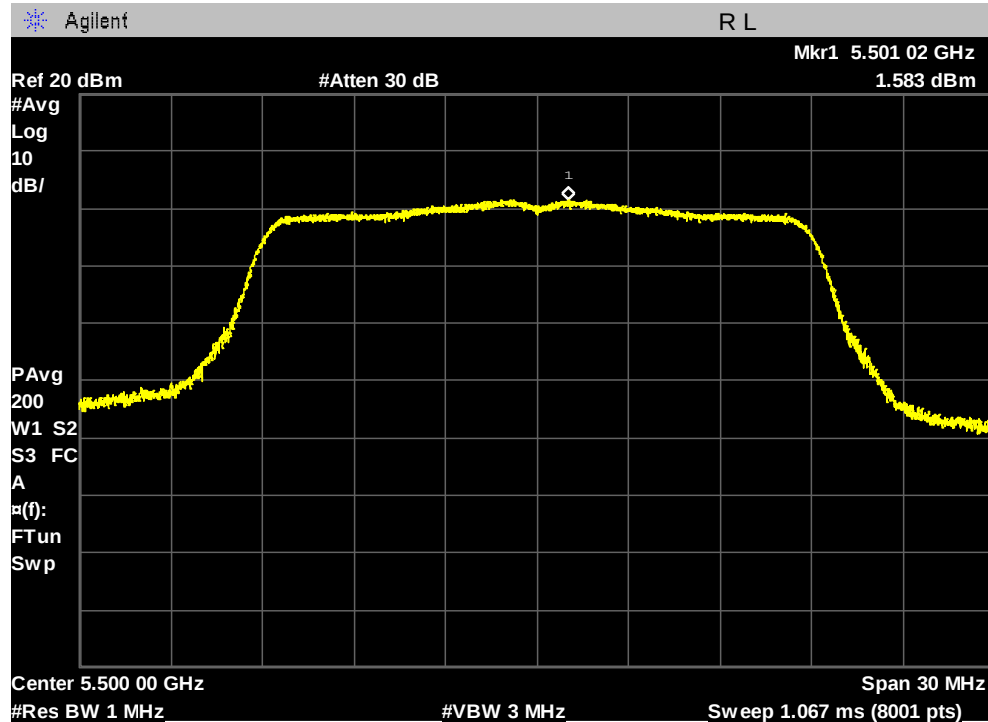
Maximum Power Spectral Density, Highest Channel (5700 MHz)



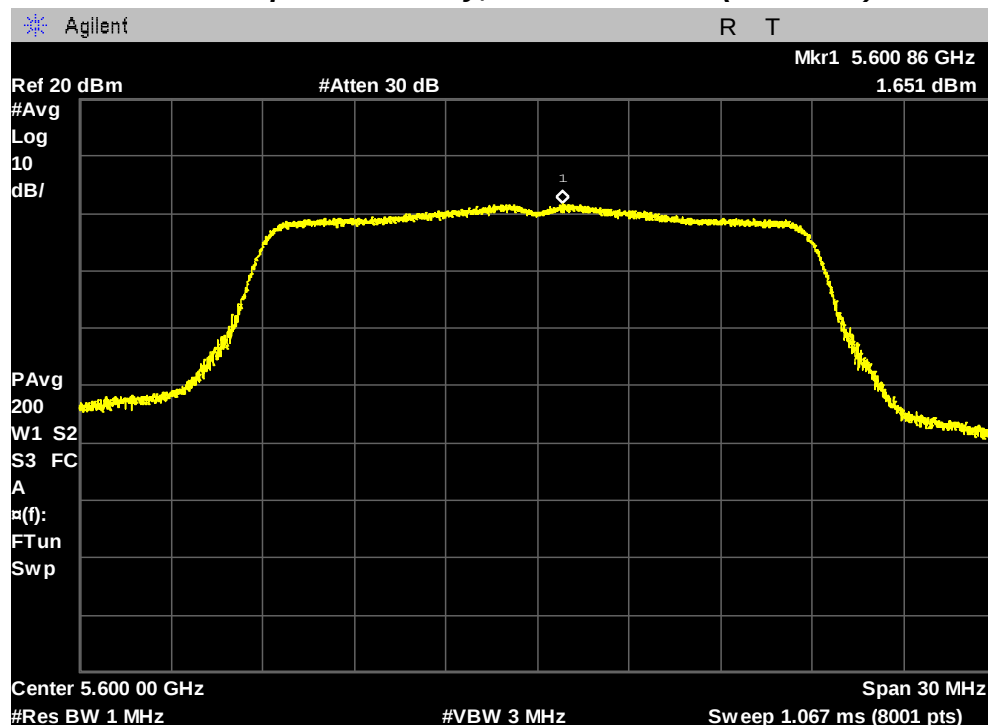
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

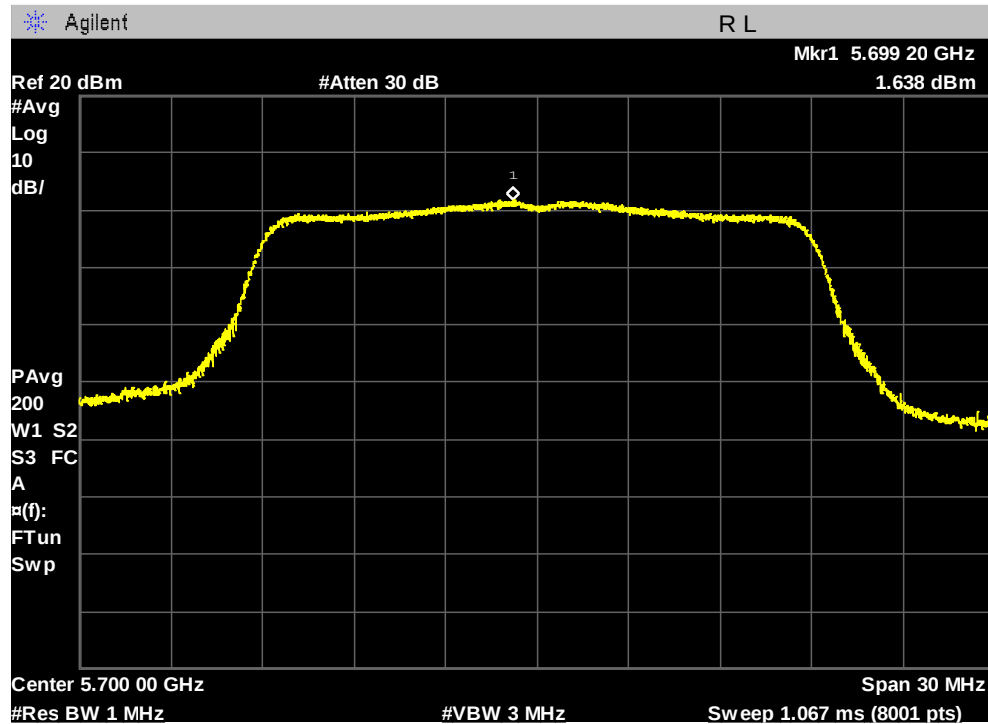


Maximum Power Spectral Density, Middle Channel (5600 MHz)



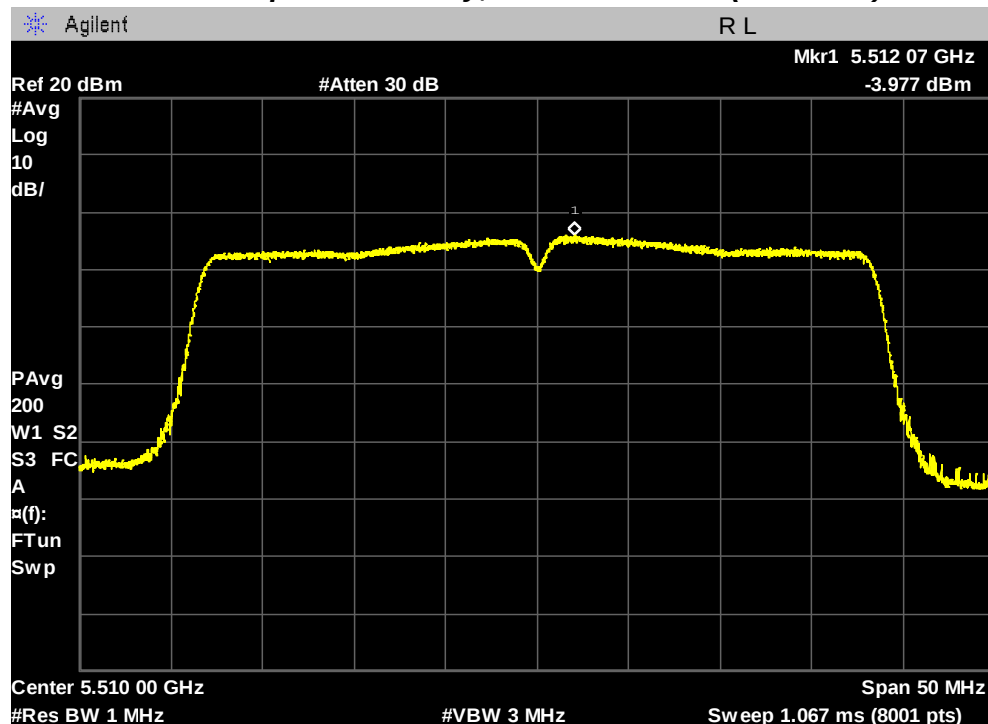
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



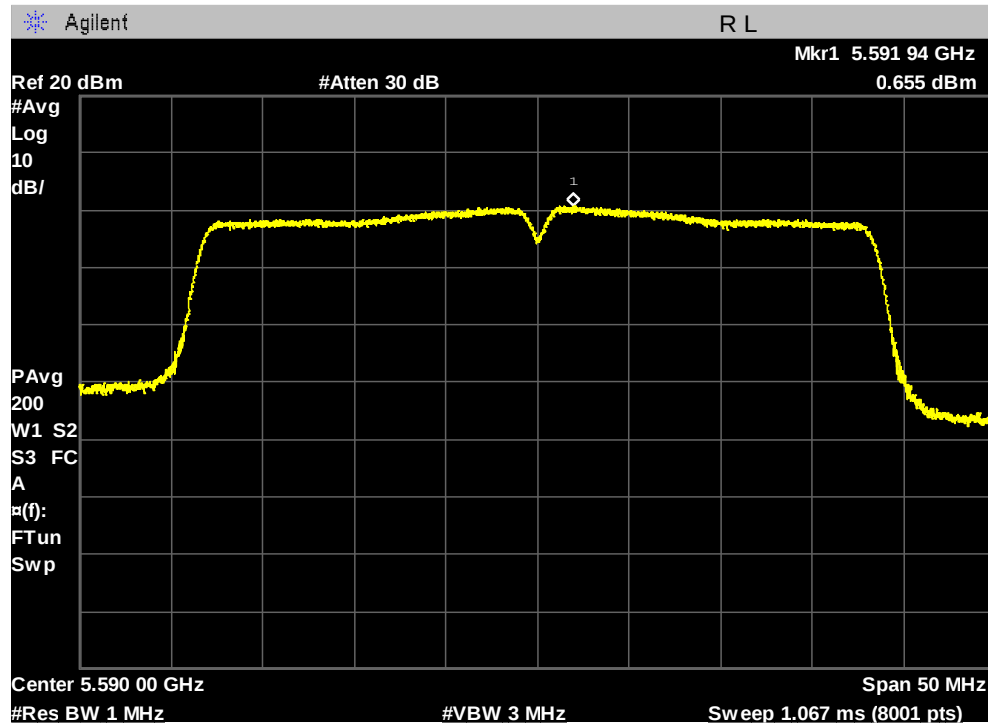
802.11ac (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

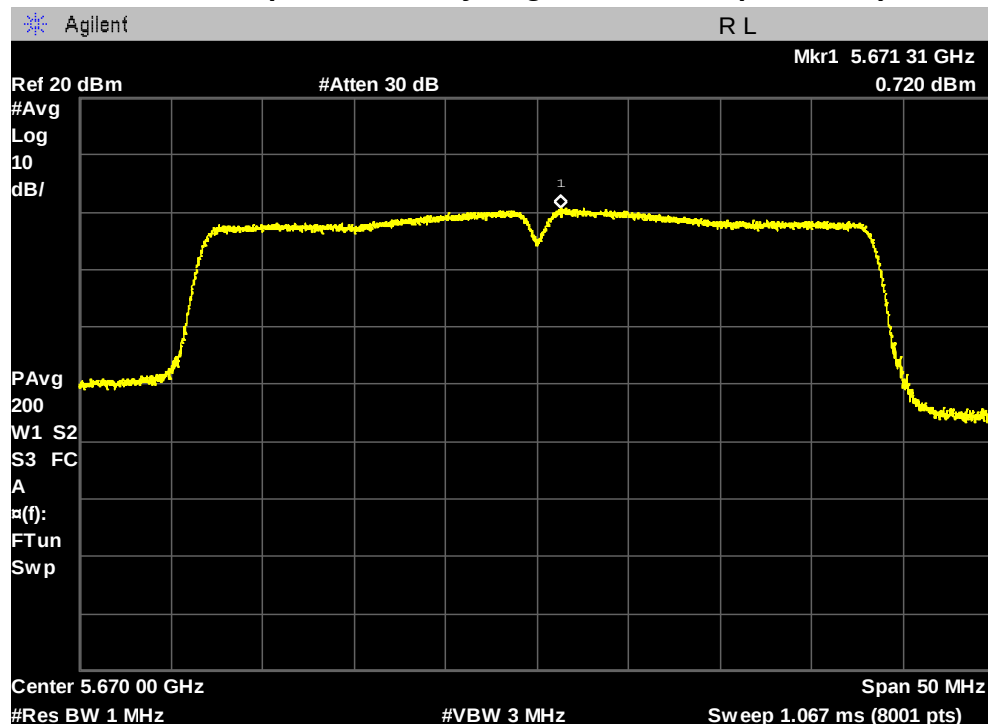


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5590 MHz)



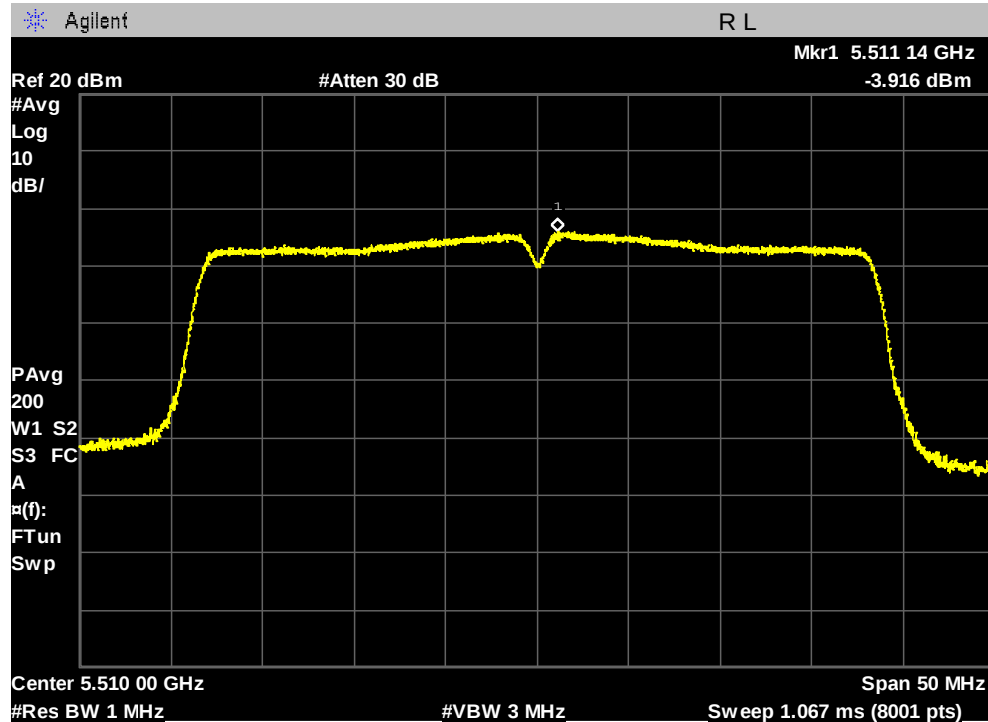
Maximum Power Spectral Density, Highest Channel (5670 MHz)



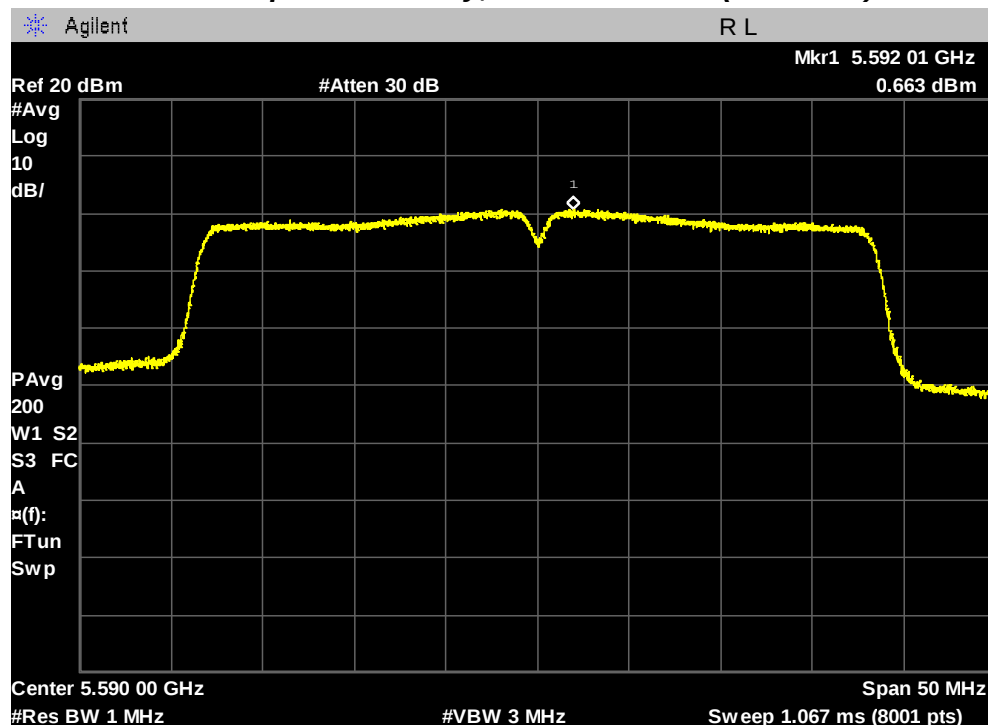
PLOTS OF EMISSIONS

802.11ac (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

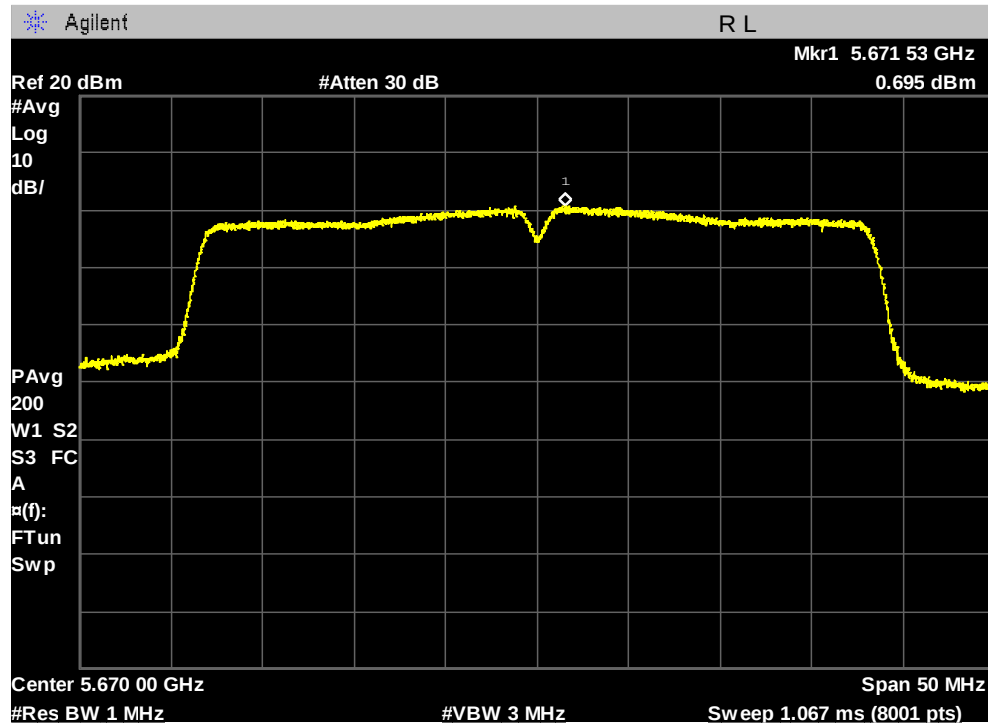


Maximum Power Spectral Density, Middle Channel (5590 MHz)



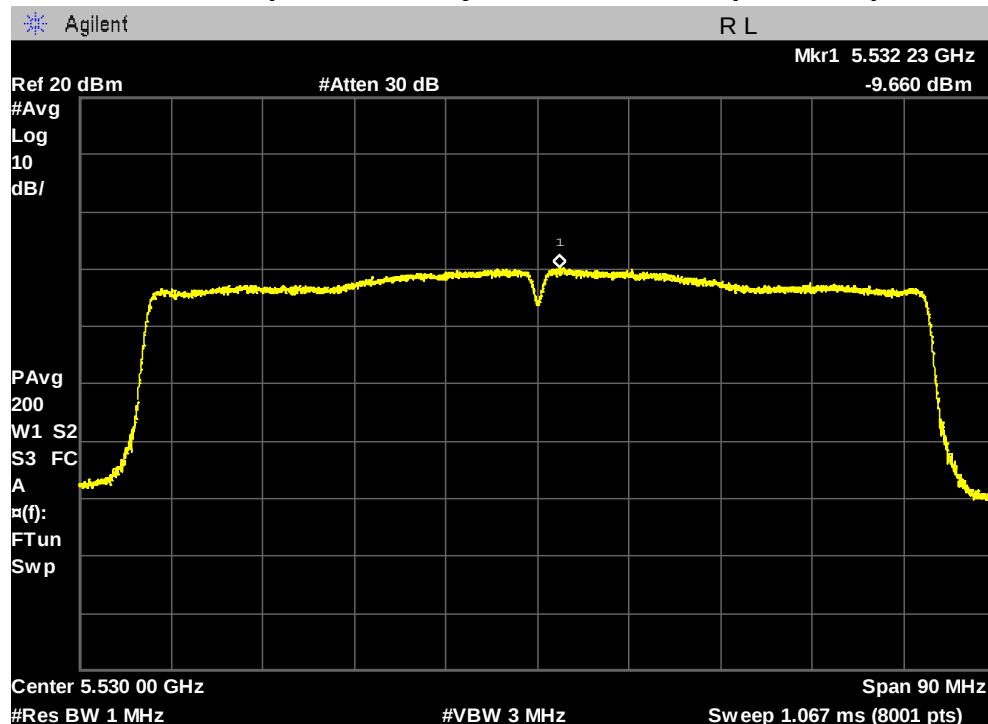
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



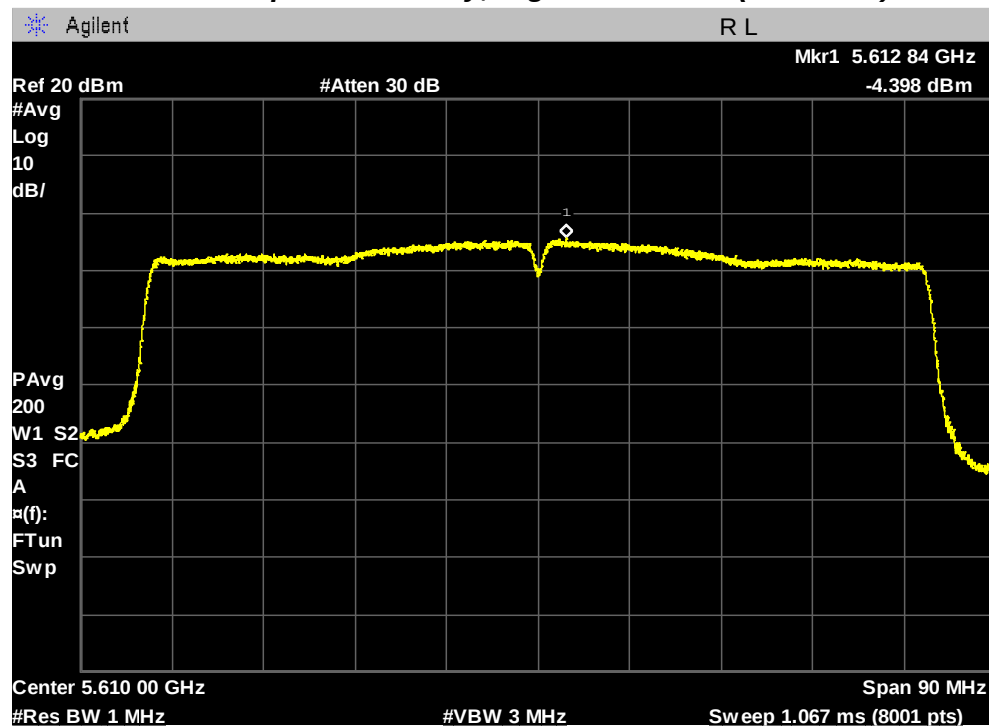
802.11ac (80 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5530 MHz)



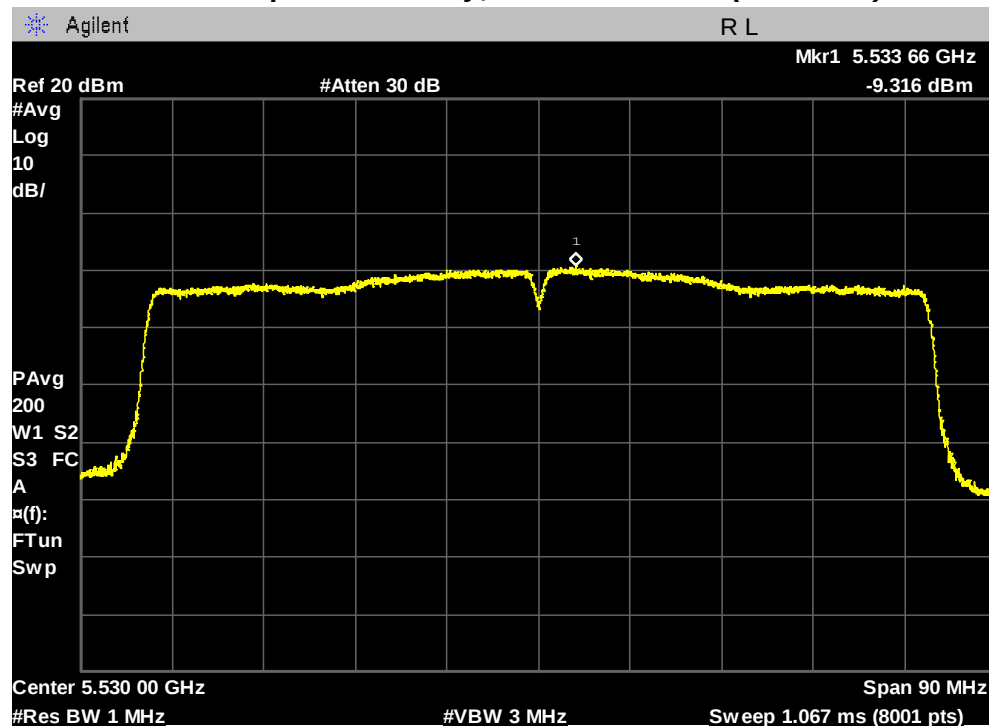
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5610 MHz)



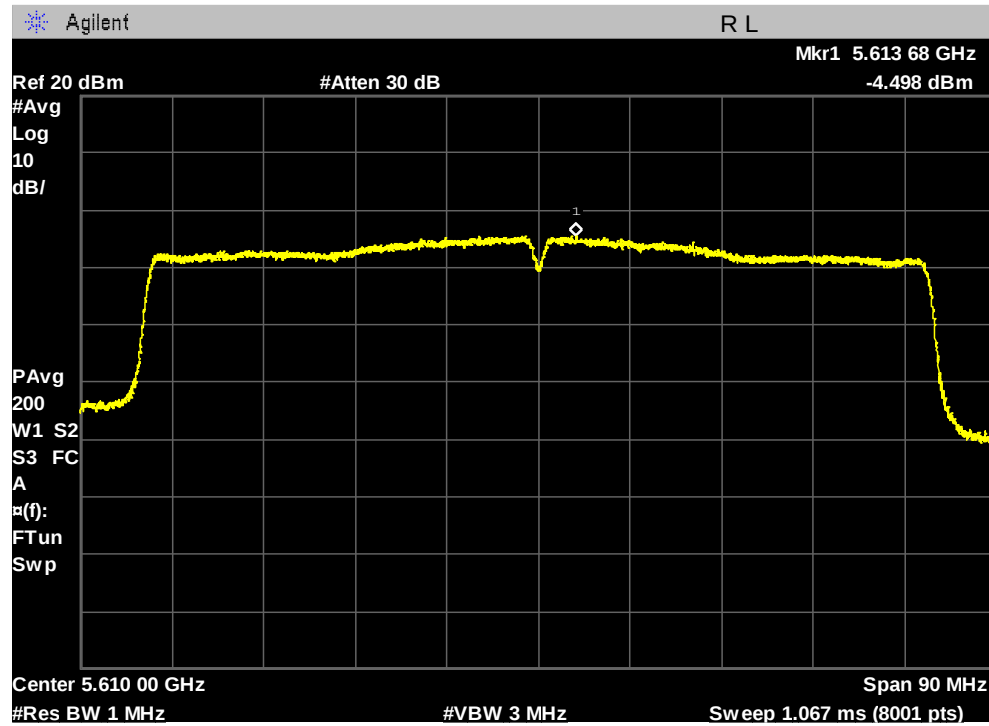
802.11ac (80 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5530 MHz)



PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5610 MHz)



TEST DATA

8.6.4 Maximum Power Spectral Density – U-NII-3 band

FCC §15.407(a)

Test Mode : Set to Straddle channel, Lowest channel, Middle channel and Highest channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
Lowest	5745	-1.89	0.07	-1.82	30.00
Middle	5785	-1.67	0.07	-1.60	30.00
Highest	5825	-2.11	0.07	-2.04	30.00

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
Lowest	5745	-2.19	0.09	-2.10	30.00
Middle	5785	-2.09	0.09	-2.00	30.00
Highest	5825	-2.40	0.09	-2.31	30.00

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
				Total PSD	
Lowest	5745	-2.34	0.09	0.76	30.00
Middle	5785	-1.84	0.09	1.26	30.00
Highest	5825	-2.36	0.09	0.74	30.00

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
Lowest	5755	-2.83	0.21	-2.62	30.00
Highest	5795	-2.53	0.21	-2.32	30.00

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
				Total PSD	
Lowest	5755	-2.49	0.21	0.73	30.00
Highest	5795	-2.44	0.21	0.78	30.00

TEST DATA

802.11ac (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
Lowest	5745	-2.21	0.09	-2.12	30.00
Middle	5785	-1.87	0.09	-1.78	30.00
Highest	5825	-2.53	0.09	-2.44	30.00

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
				Total PSD	
Lowest	5745	-1.91	0.09	1.19	30.00
Middle	5785	-1.86	0.09	1.24	30.00
Highest	5825	-2.16	0.09	0.94	30.00

802.11ac (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
Lowest	5755	-2.52	0.20	-2.32	30.00
Highest	5795	-2.59	0.20	-2.39	30.00

TEST DATA

802.11ac (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
				Total PSD	
Lowest	5755	-2.55	0.20	0.66	30.00
Highest	5795	-2.55	0.20	0.66	30.00

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
Middle	5775	-8.53	0.37	-8.16	30.00

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/500kHz)	Duty Factor (dB)	Maximum PSD (dBm/500kHz)	FCC Limit (dBm/500kHz)
				Total PSD	
Middle	5775	-8.41	0.37	-5.03	30.00

TEST DATA

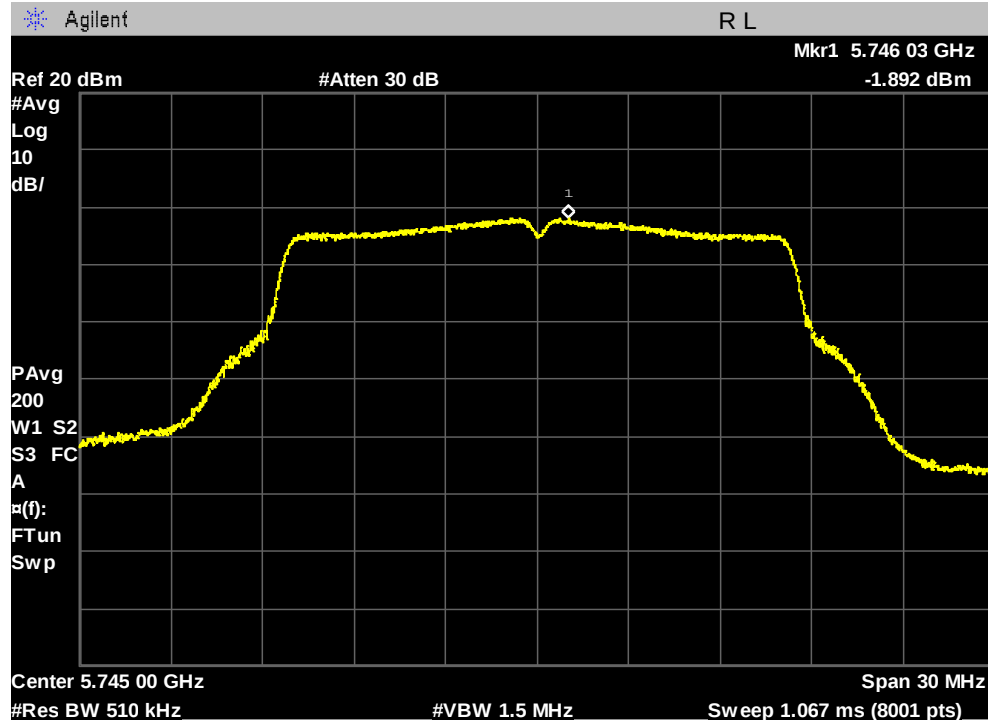
Note:

1. Maximum PSD = Measured PSD + Duty Factor
2. "Measure and add $10 \log(N_{ANT})$ dB, where N_{ANT} is the number of outputs" was used for measuring in-band Total PSD.
Total PSD = Measured PSD + duty factor + $10 \log(N_{ANT})$
3. For CDD transmission, directional gain is. **5.80 dBi**
For MIMO transmission, directional gain is **2.79 dBi**.
Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
For power spectral density (PSD) measurements on all devices employing CDD, directional gain is as follows,
Directional gain = $G_{ANT} + \text{Array Gain} = 2.79 \text{ dBi} + 3.01 \text{ dB} = 5.80 \text{ dBi}$
Array Gain = $10 \log(N_{ANT}/N_{SS}) \text{ dB} = 10 \log(2/1) = 3.01 \text{ dB}$
where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi.
For CDD mode of this device, $N_{SS}=1$.
For power spectral density (PSD) measurements on all devices employing MIMO, directional gain is as follows,
Directional gain = $G_{ANT} + 10 \log(N_{ANT}/N_{SS}) \text{ dBi} = 2.79 \text{ dBi} + 10 \log(2/2) \text{ dB} = 2.79 \text{ dBi}$
where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and $N_{SS}=2$.
4. For FCC PSD Limit, If transmitting antennas of directional gain greater than 6 dBi was used, maximum power spectral density was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
5. Power Spectral Density(PSD) was measured by same method with conducted output power according to II.F.1 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
6. The following equation was used for spectrum offset:
Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

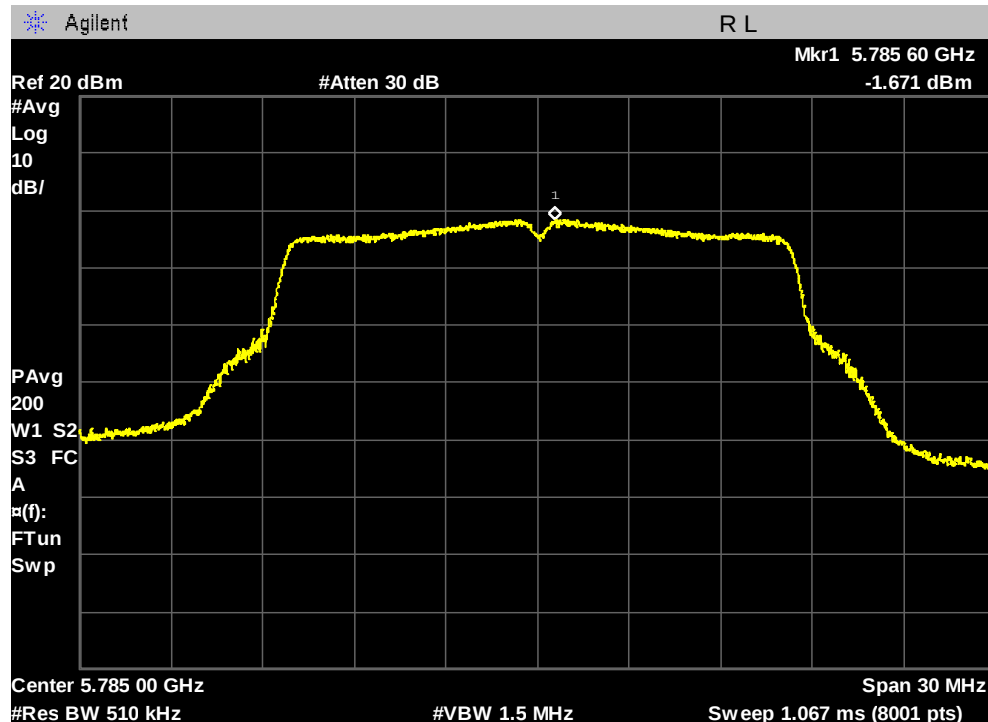
PLOTS OF EMISSIONS

802.11a mode 1TX

Maximum Power Spectral Density, Lowest Channel (5745 MHz)

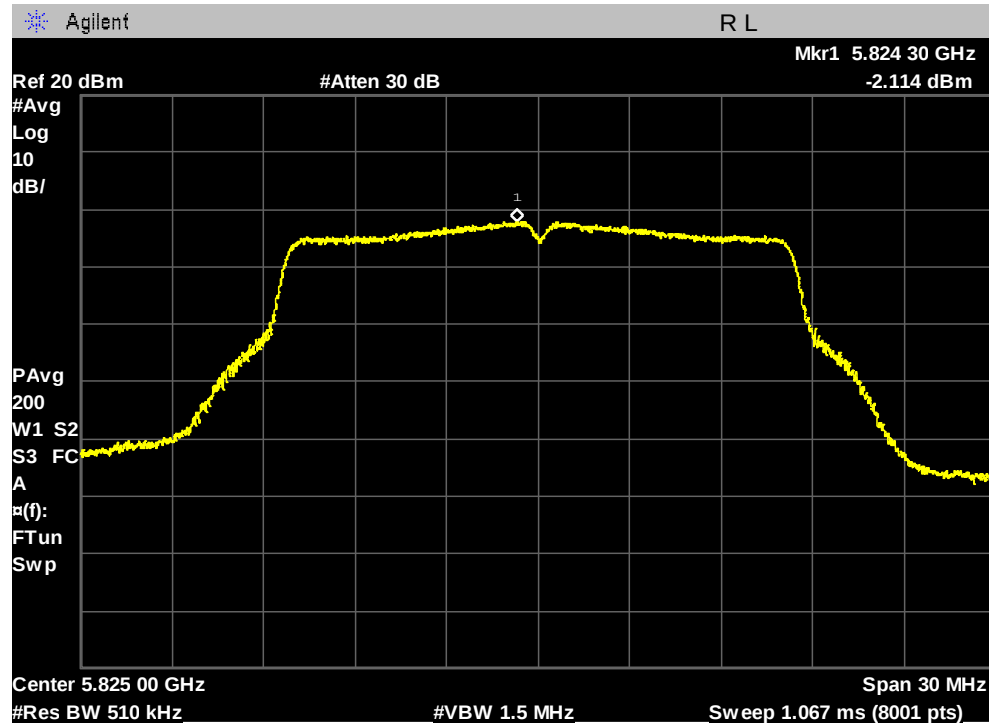


Maximum Power Spectral Density, Middle Channel (5785 MHz)



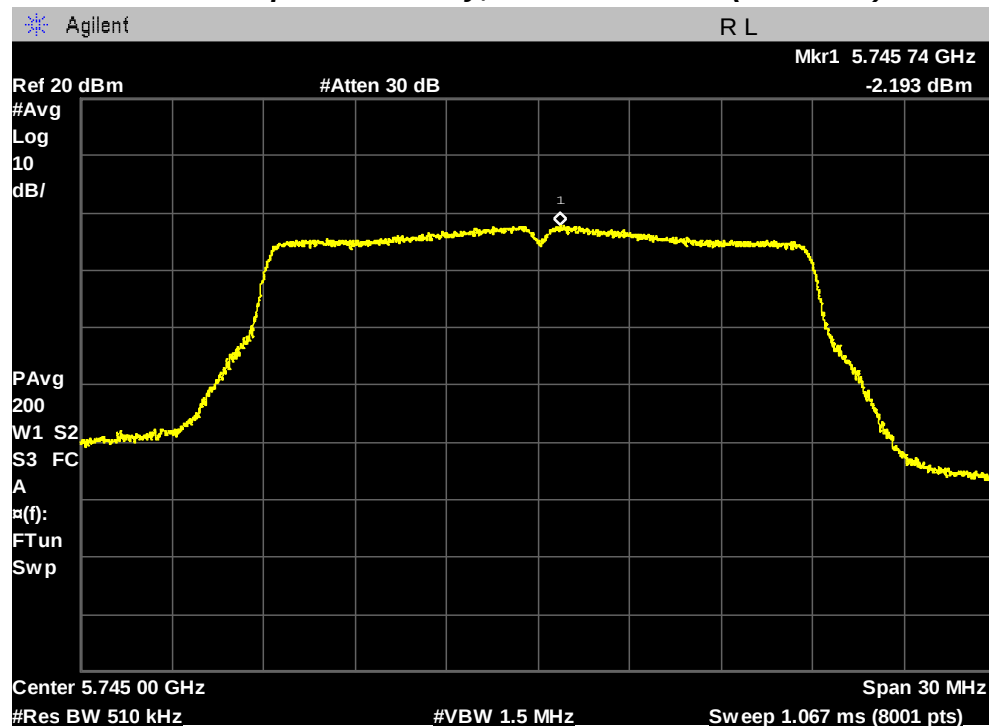
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5825 MHz)



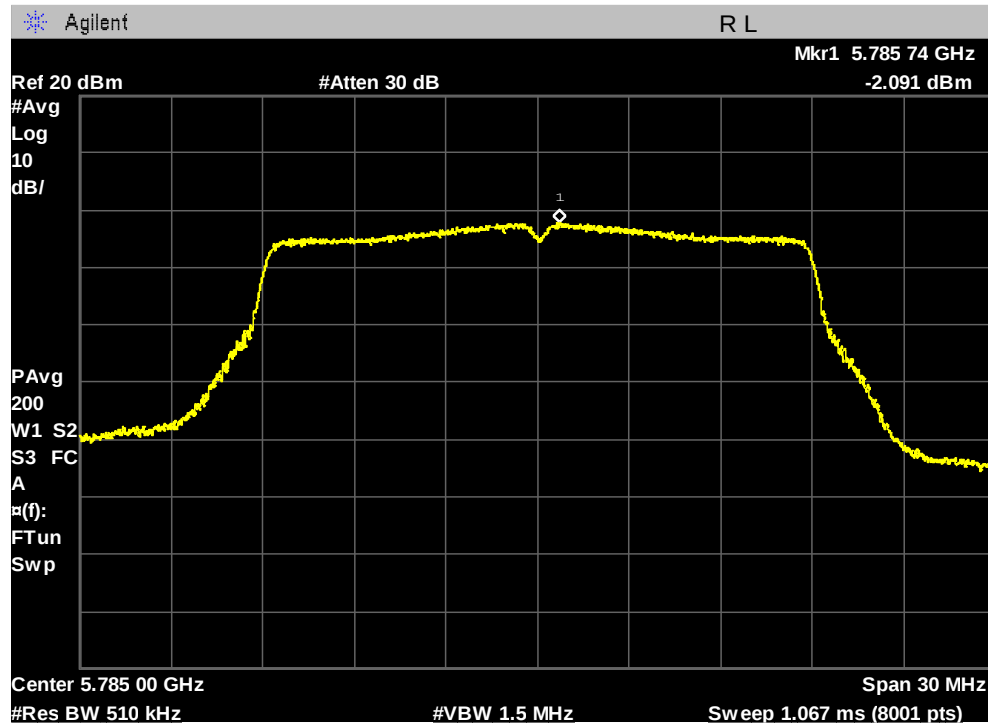
802.11n (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5745 MHz)

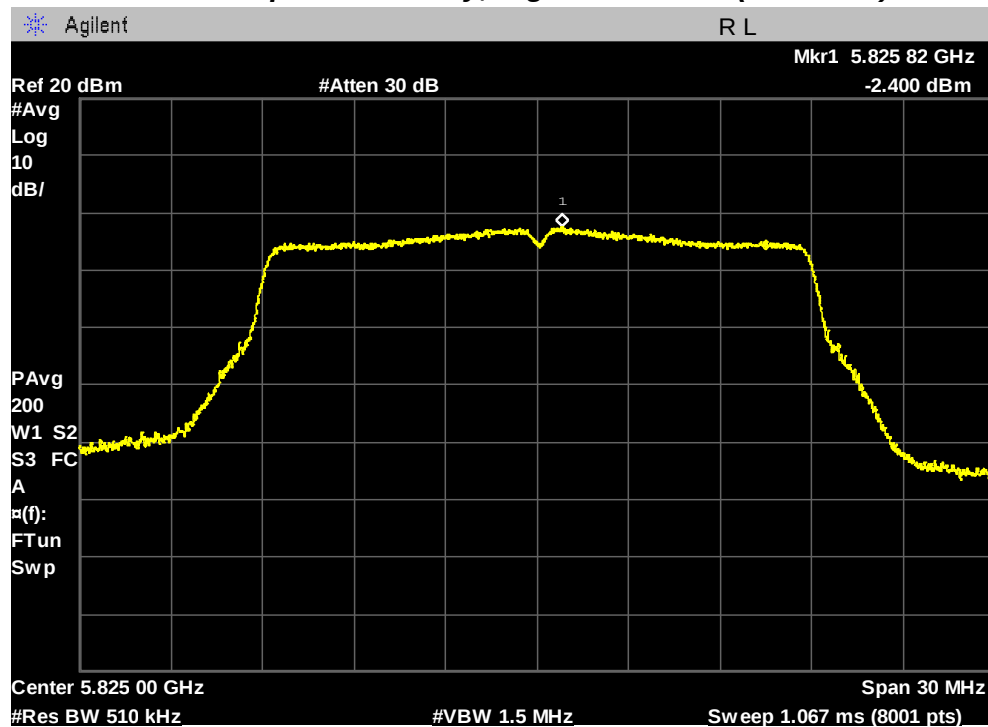


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5785 MHz)



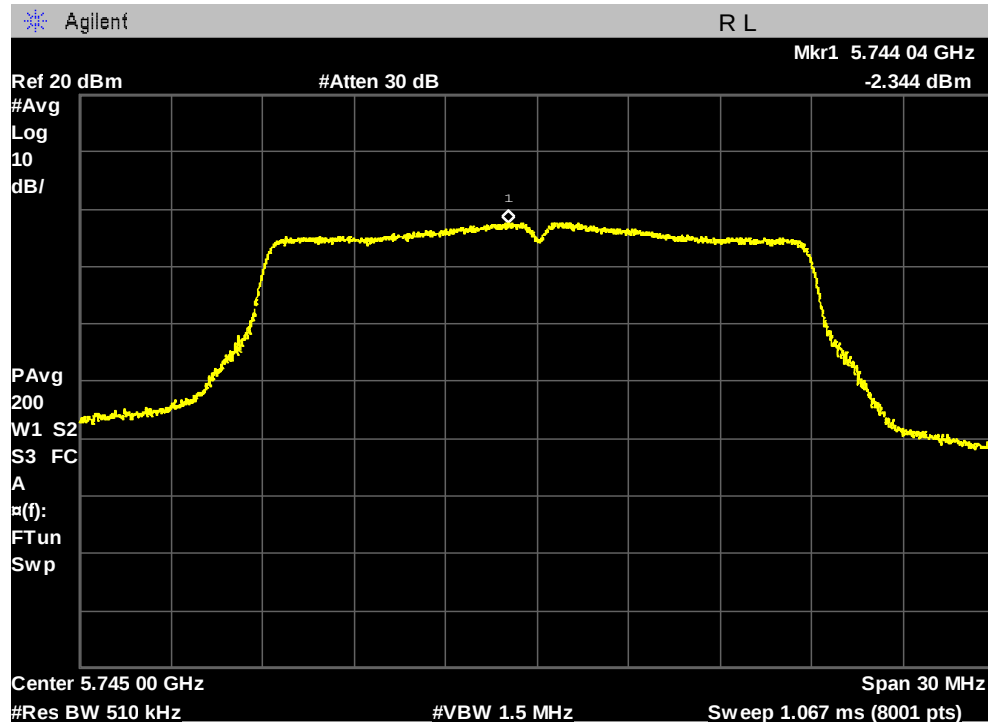
Maximum Power Spectral Density, Highest Channel (5825 MHz)



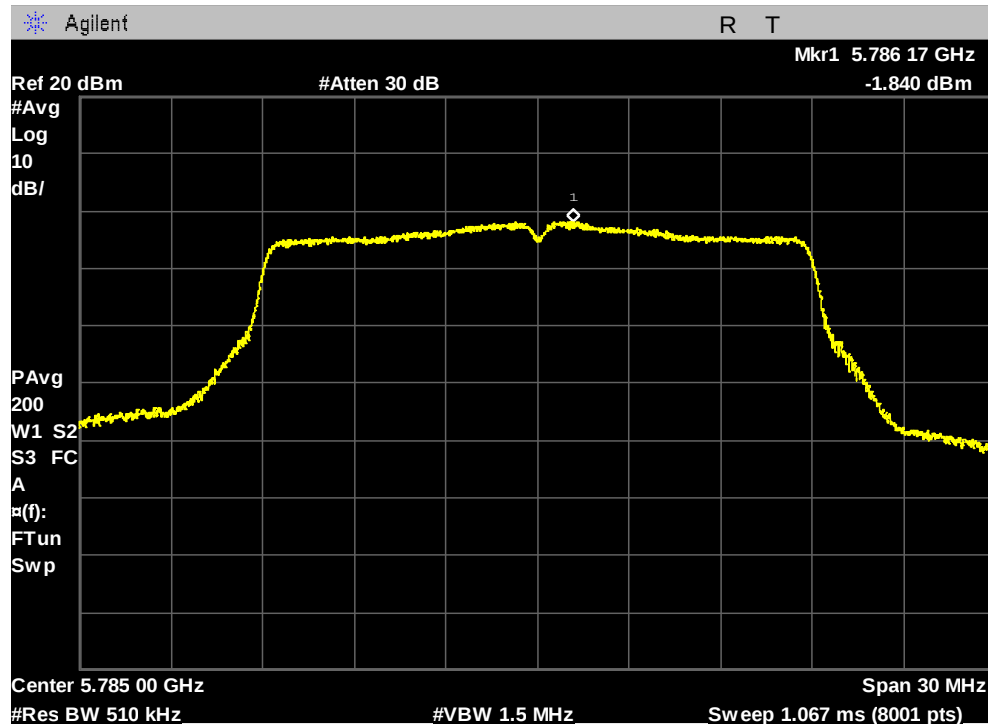
PLOTS OF EMISSIONS

802.11n (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5745 MHz)

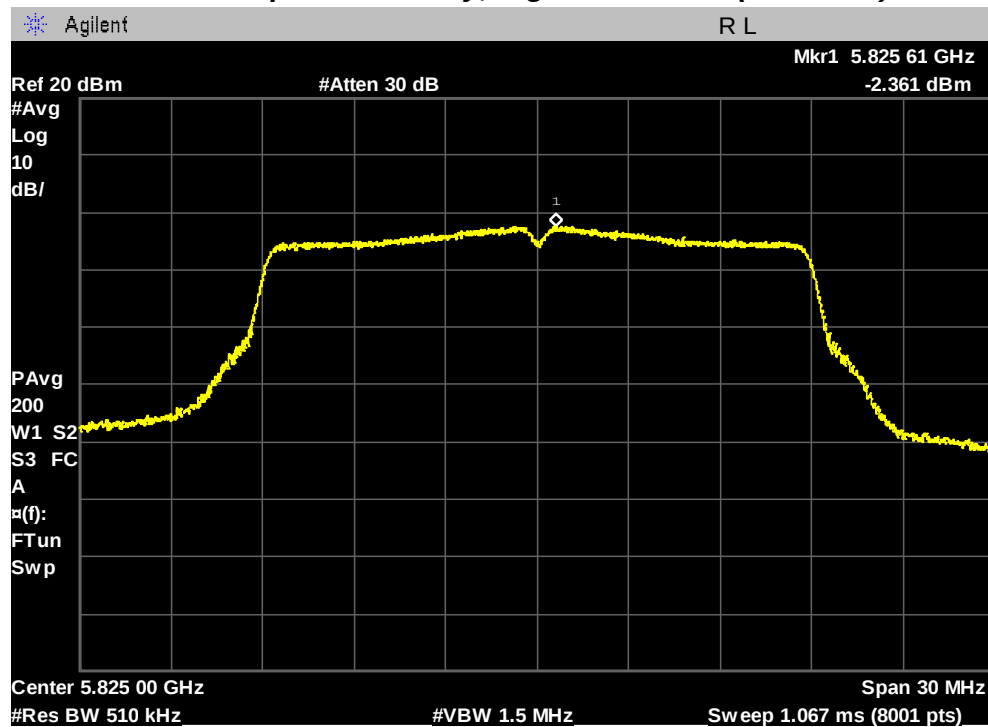


Maximum Power Spectral Density, Middle Channel (5785 MHz)



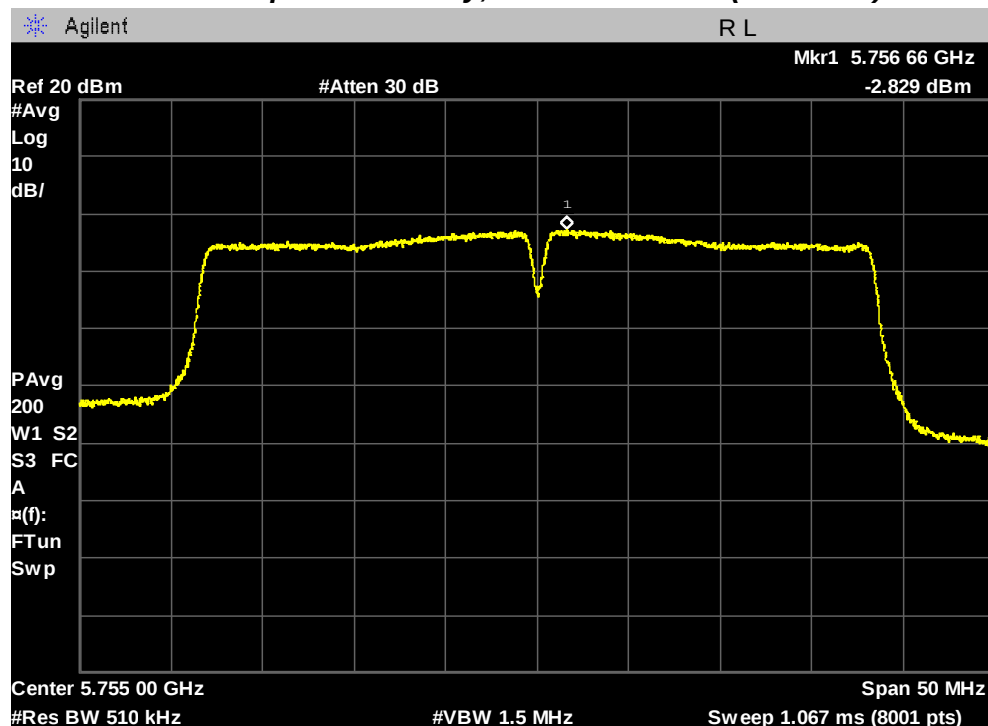
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5825 MHz)



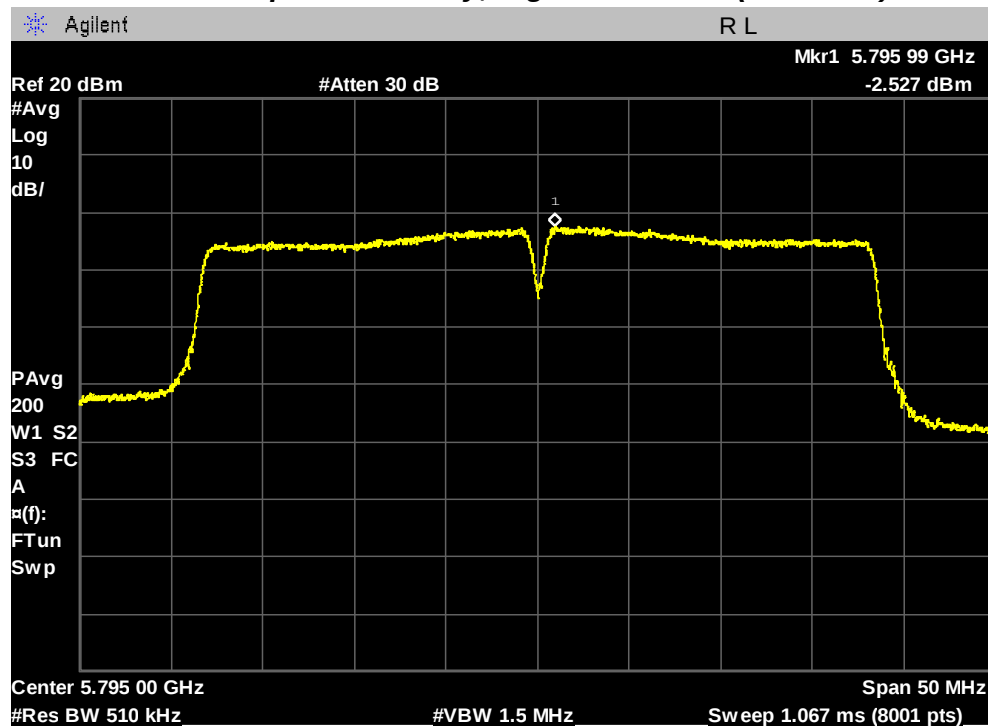
802.11n (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5755 MHz)



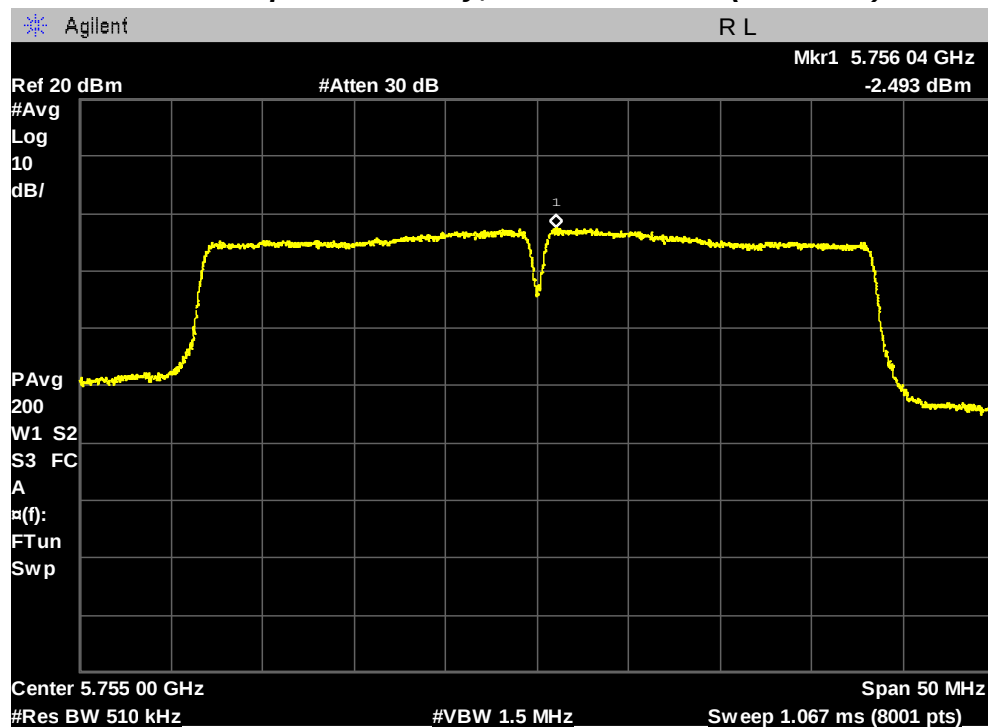
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5795 MHz)



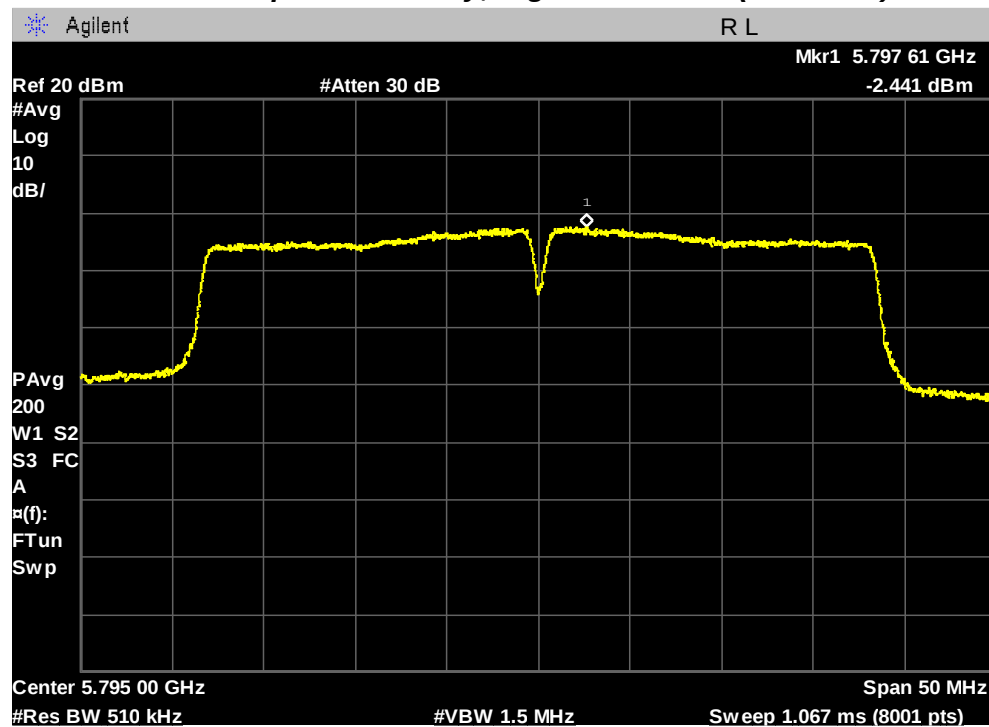
802.11n (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5755 MHz)



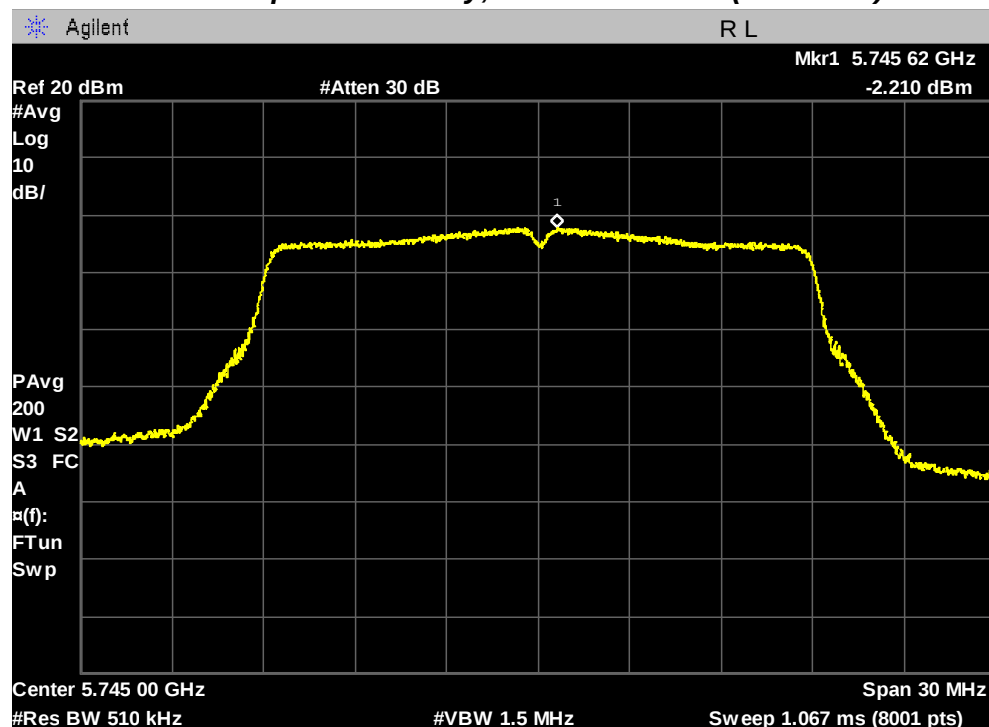
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5795 MHz)



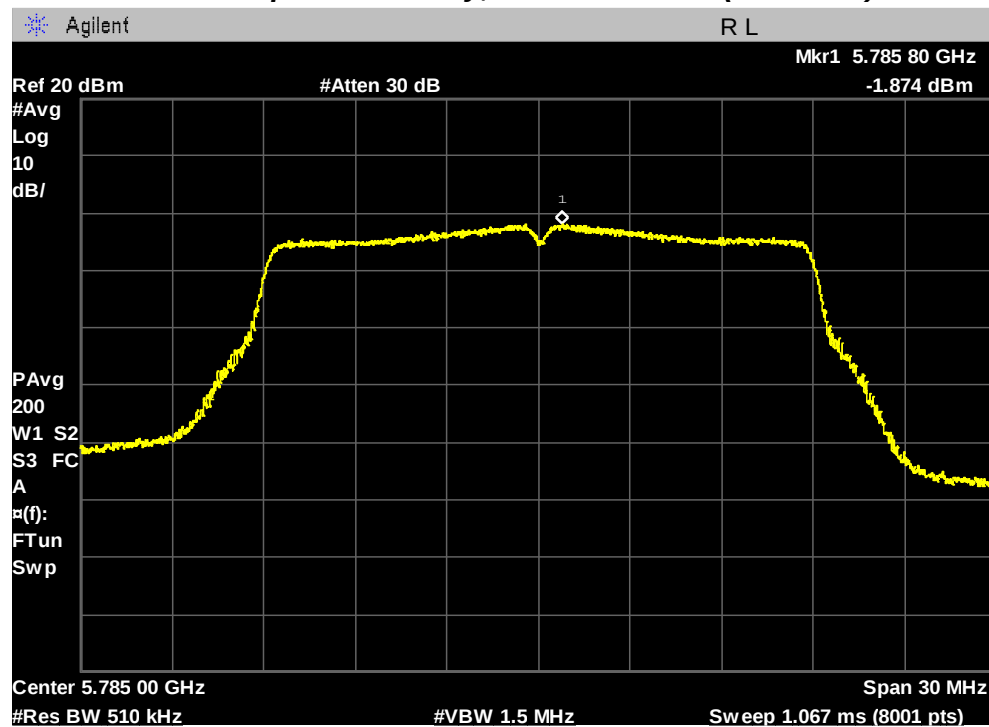
802.11ac (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5745 MHz)

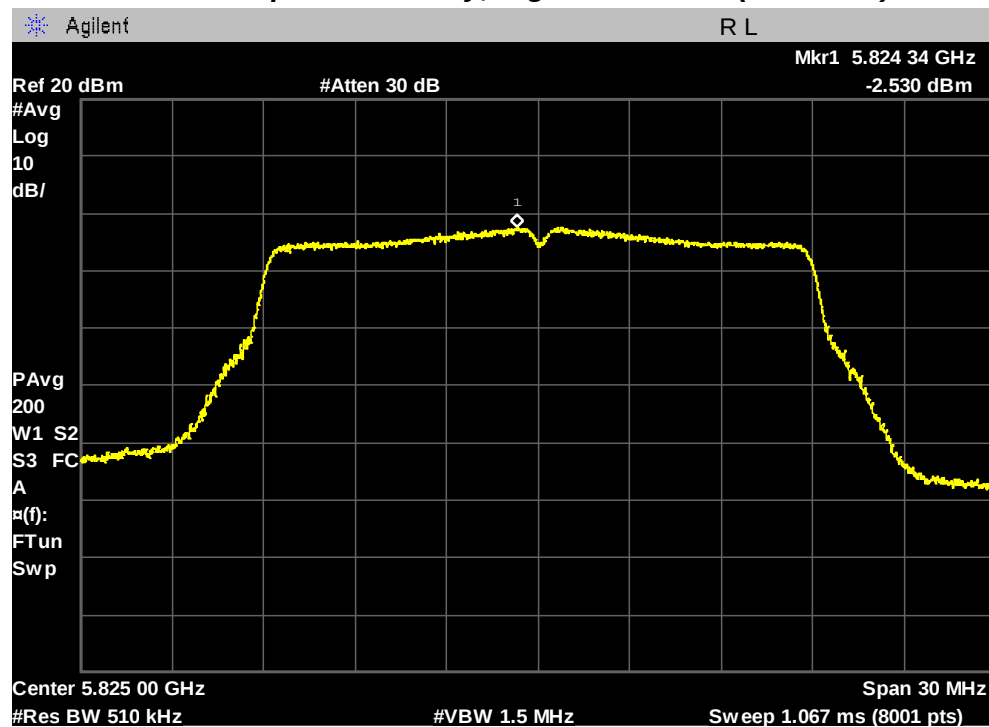


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5785 MHz)



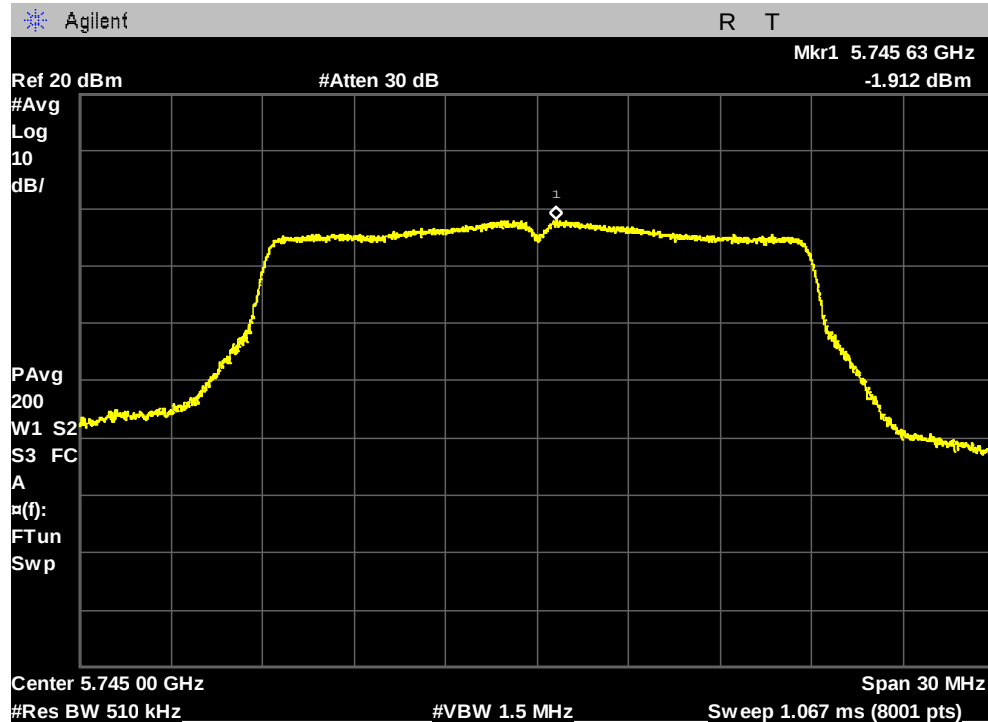
Maximum Power Spectral Density, Highest Channel (5825 MHz)



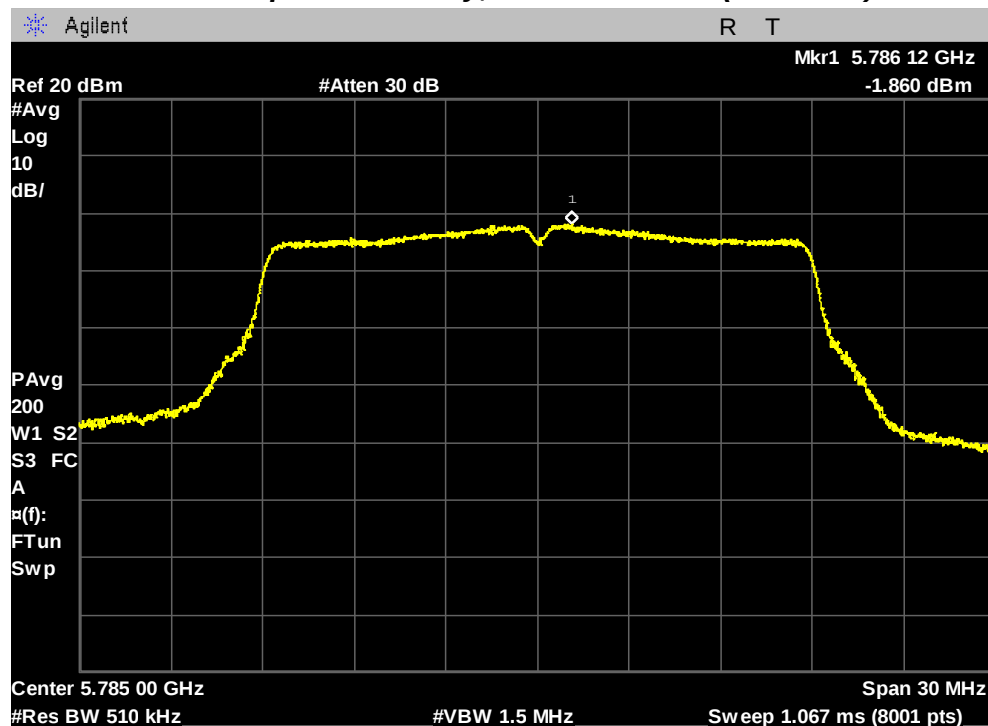
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5745 MHz)

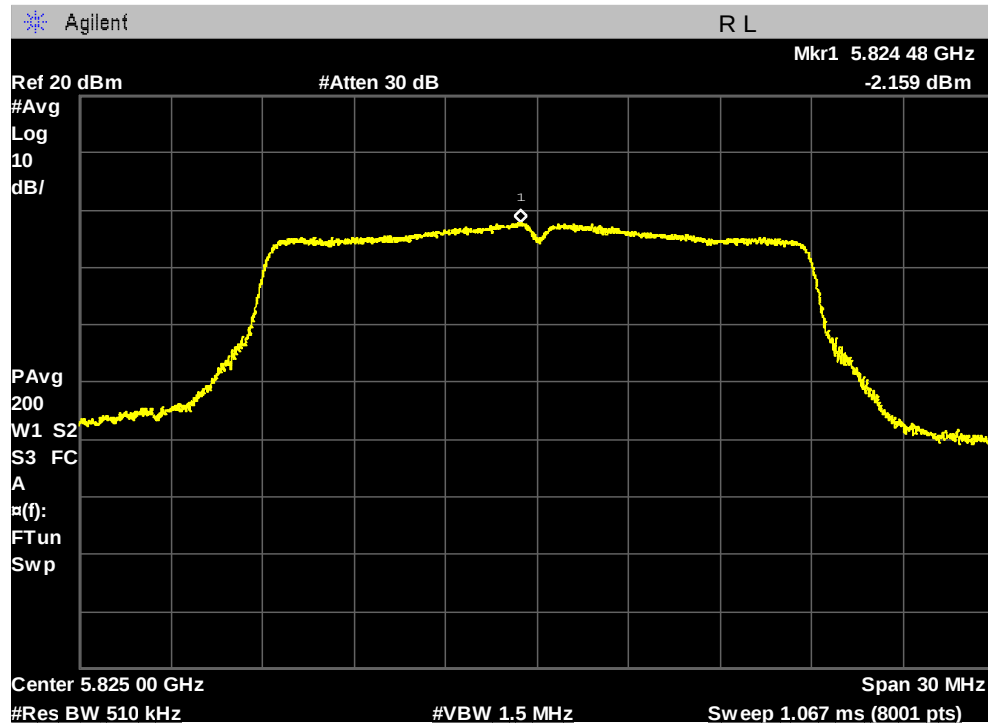


Maximum Power Spectral Density, Middle Channel (5785 MHz)



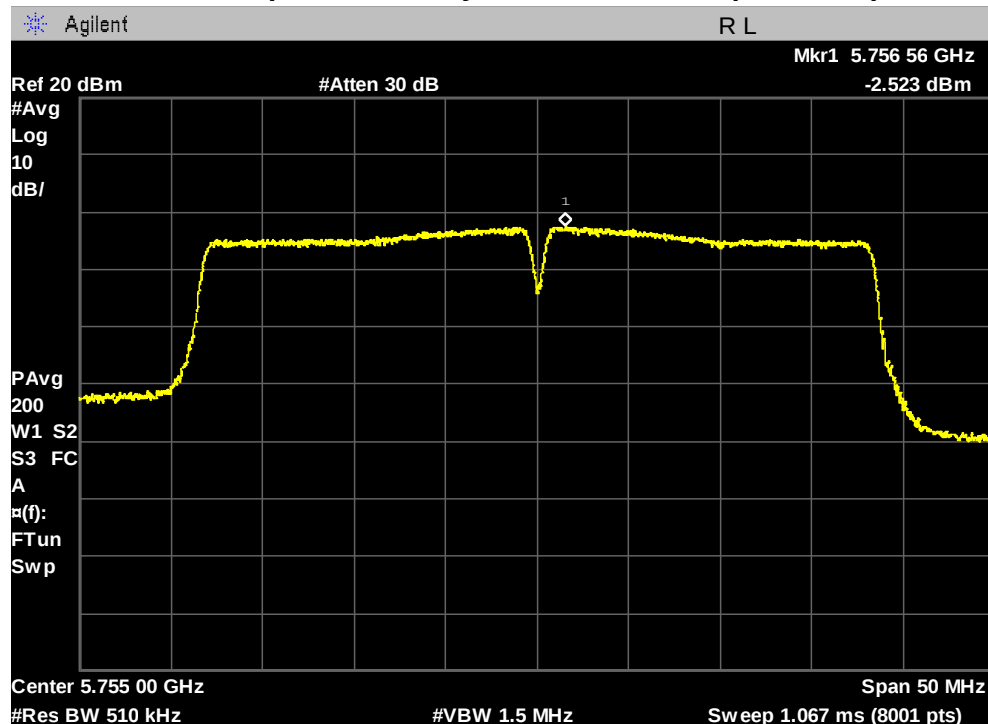
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5825 MHz)



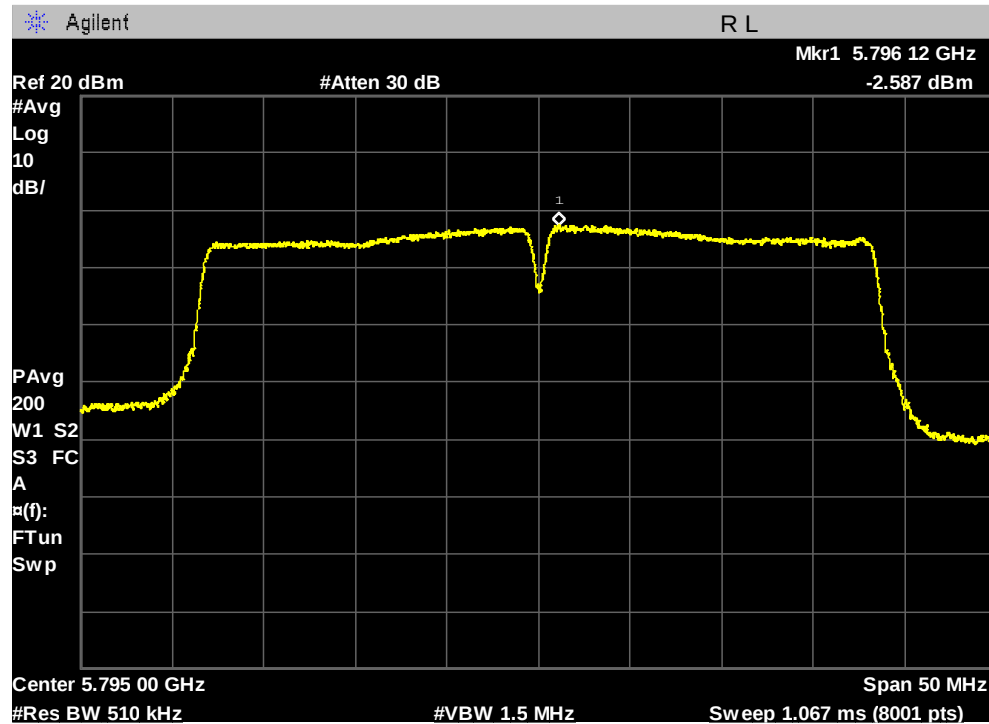
802.11ac (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5755 MHz)



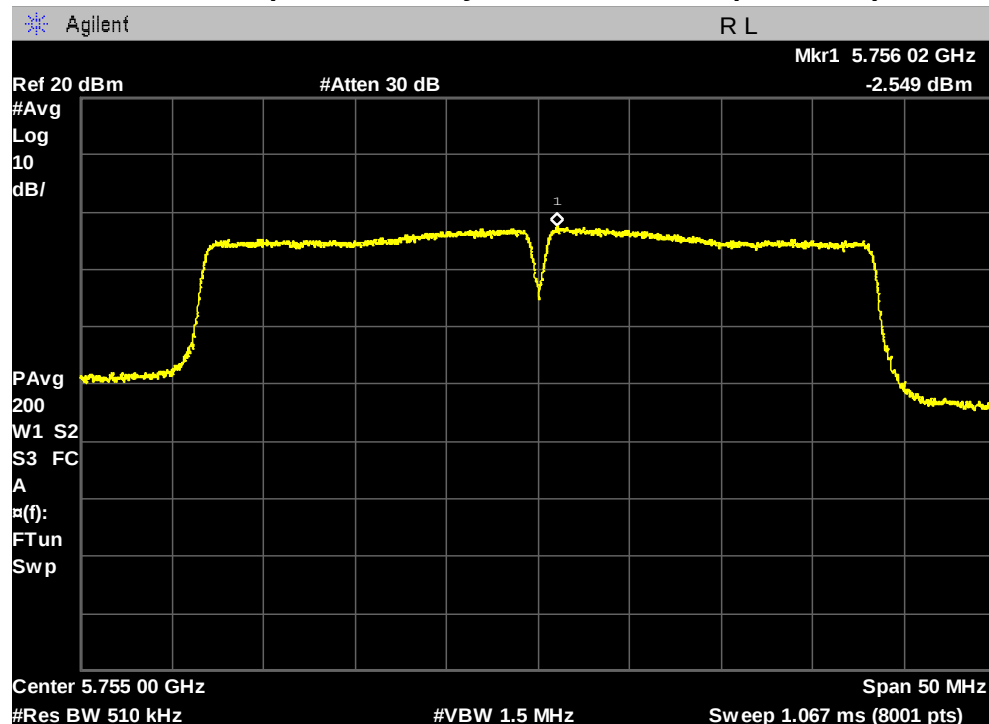
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5795 MHz)



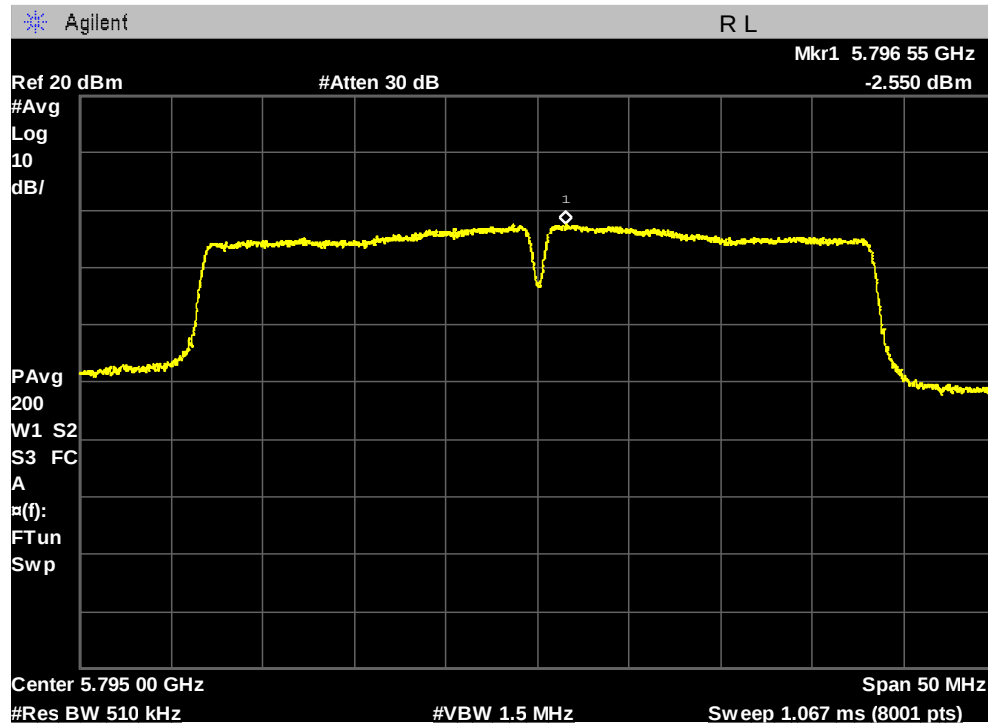
802.11ac (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5755 MHz)



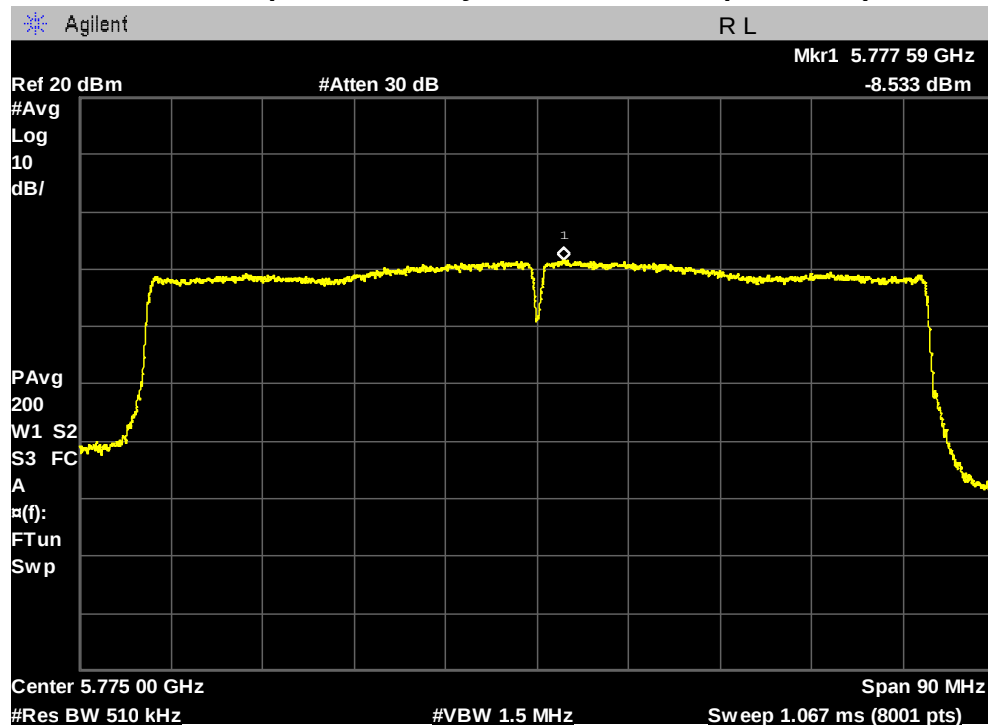
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5795 MHz)



802.11ac (80 MHz) mode 1TX

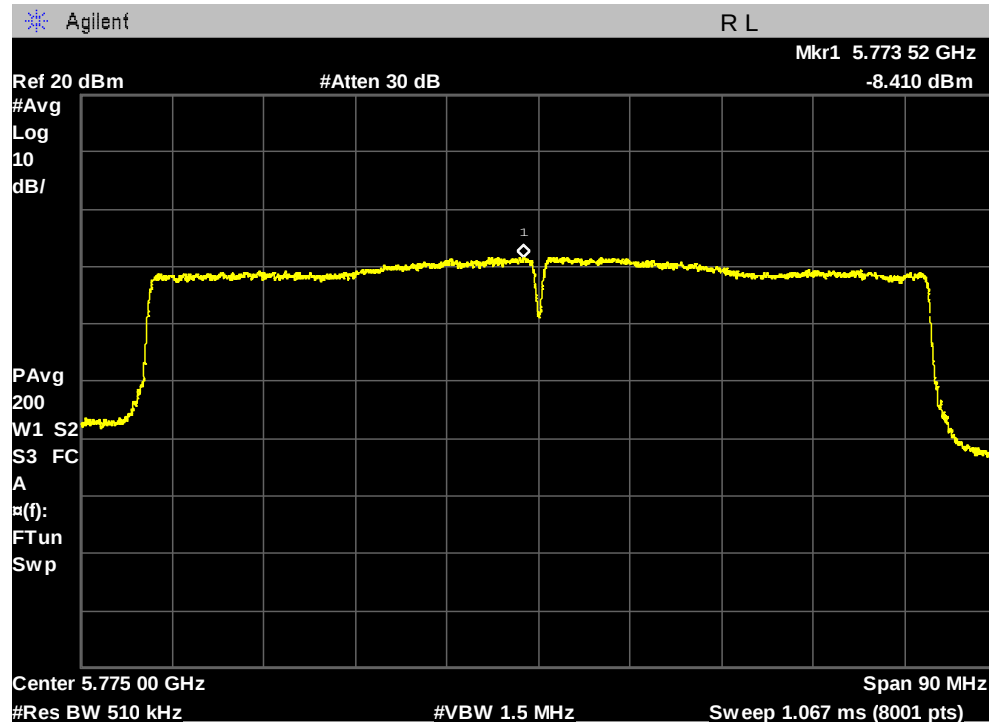
Maximum Power Spectral Density, Middle Channel (5775 MHz)



PLOTS OF EMISSIONS

802.11ac (80 MHz) mode 2TX

Maximum Power Spectral Density, Middle Channel (5775 MHz)



TEST DATA

8.7 Radiated Spurious Emissions

8.7.1 Radiated Spurious Emissions – U-NII-1 band

FCC §15.407(b)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11ac (40MHz) mode

Lowest Channel (5190 MHz)

Frequency (M Hz)	Reading (dBμV)	Polarization (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4848.00	45.1	V	peak	-0.4	44.7	68.2	23.5
10473.00	38.5	H	peak	13.3	51.8	68.2	16.4
17992.00	33.6	V	peak	28.0	61.6	68.2	6.6
17992.00	23.9	H	average	28.0	51.9	54.0	2.1

Highest Channel (5230 MHz)

Frequency (M Hz)	Reading (dBμV)	Polarization (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3729.00	46.4	V	peak	-4.3	42.1	68.2	26.1
11462.50	37.8	V	peak	14.5	52.3	68.2	15.9
11462.50	25.7	V	average	14.5	40.2	54.0	13.8
17980.50	34.6	H	peak	27.8	62.4	68.2	5.8
17980.50	24.2	H	average	27.8	52.0	54.0	2.0

TEST DATA

Note:

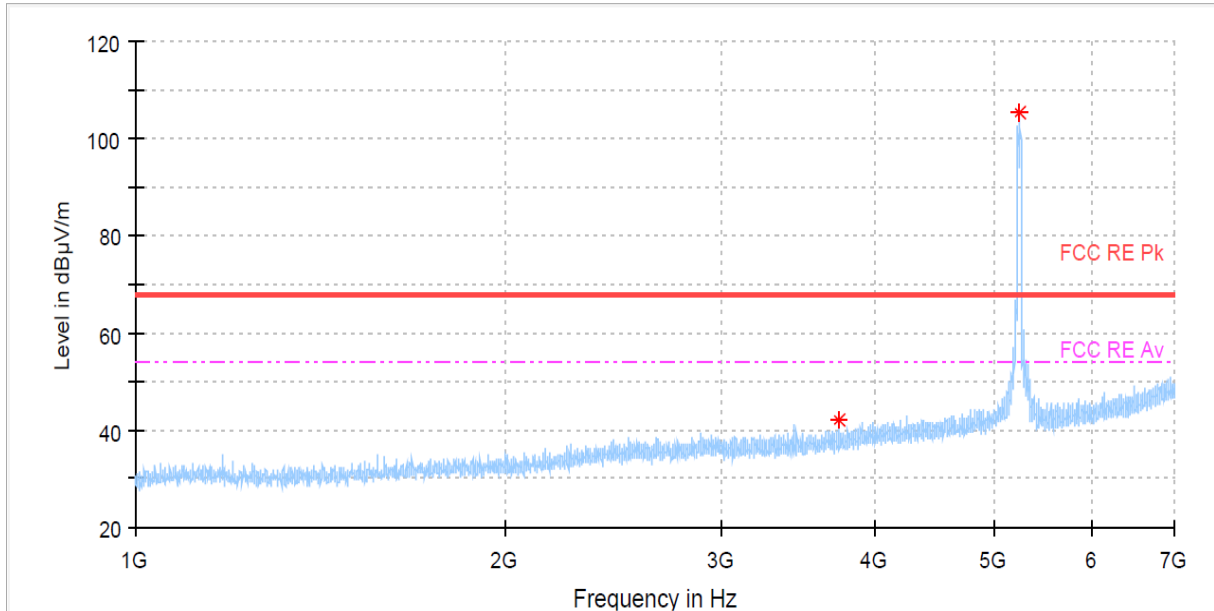
1. *Pol. H = Horizontal V = Vertical
2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
4. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 10 kHz (VBW $\geq 1/T$), Detector = Peak.
5. The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported.
6. ***For outside of the restricted band, the peak limit is applied according to Part 15.407(b).
Peak limit is 68.2 dB μ V/m. ($E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm/MHz}] + 95.2 = 68.2 \text{ dB}\mu\text{V/m}$, for $\text{EIPR}[\text{dBm/MHz}] = -27\text{dBm}$.)
7. For restricted band, the peak limit is 68.2 dB μ V/m, the average limit is 54 dB μ V/m per FCC §15.209.
8. Highest channel(5230MHz) in ac (40MHz) mode was the worst channel with respect to spurious emission.
9. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
10. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

PLOTS OF EMISSIONS

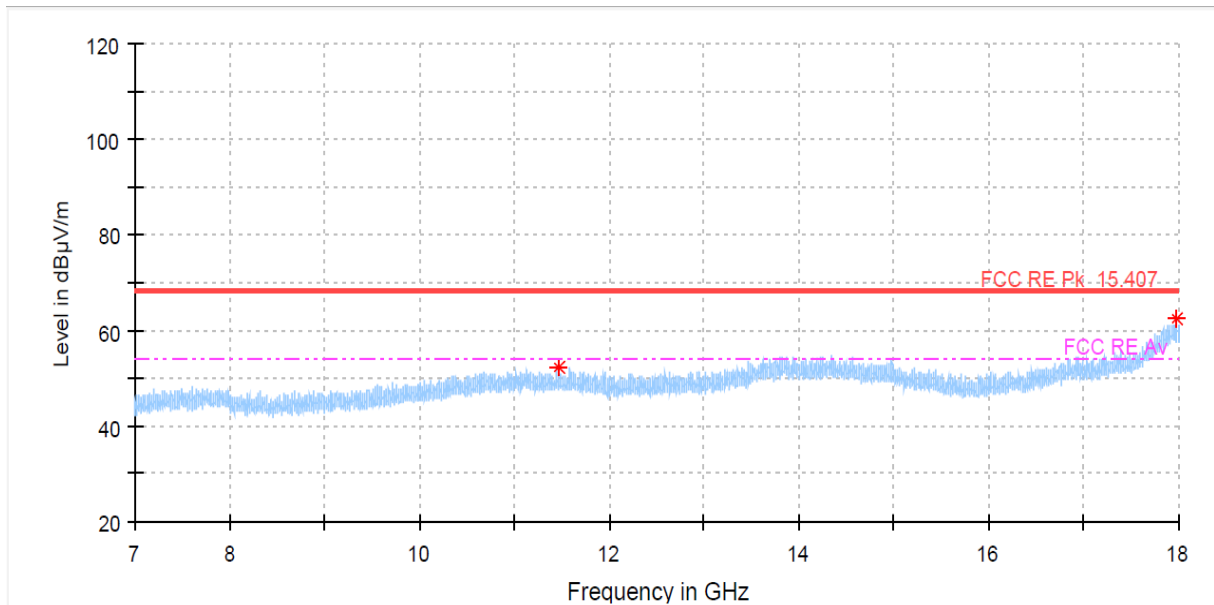
Worst Case

802.11ac (40MHz) mode

Highest channel : 1 GHz to 7 GHz_Peak

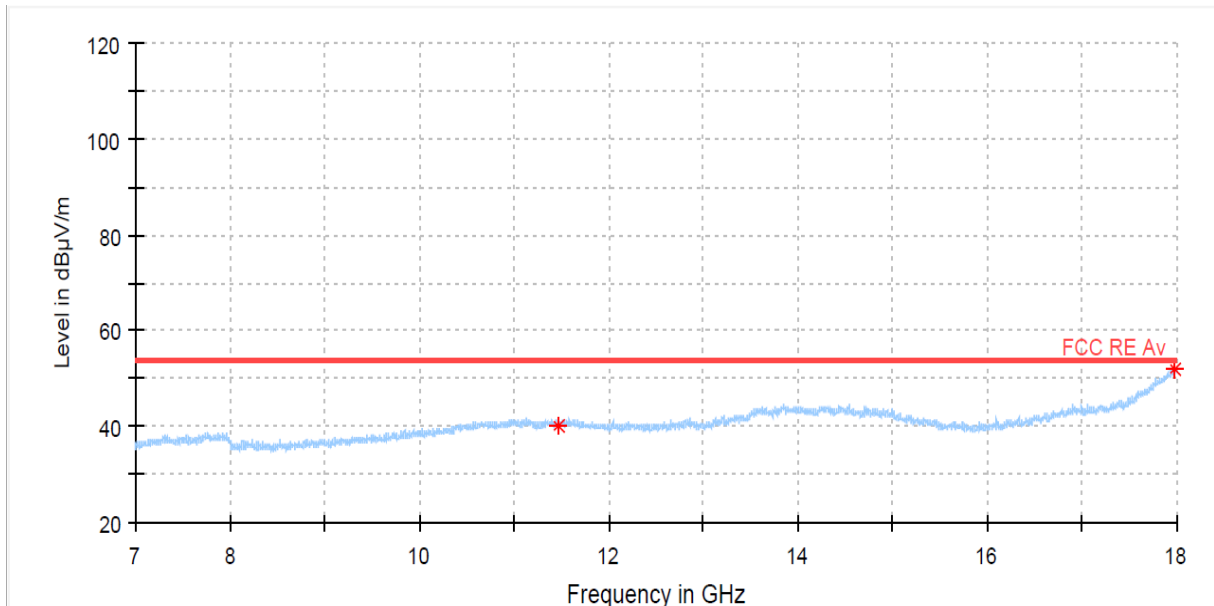


Highest channel : 7 GHz to 18 GHz_Peak

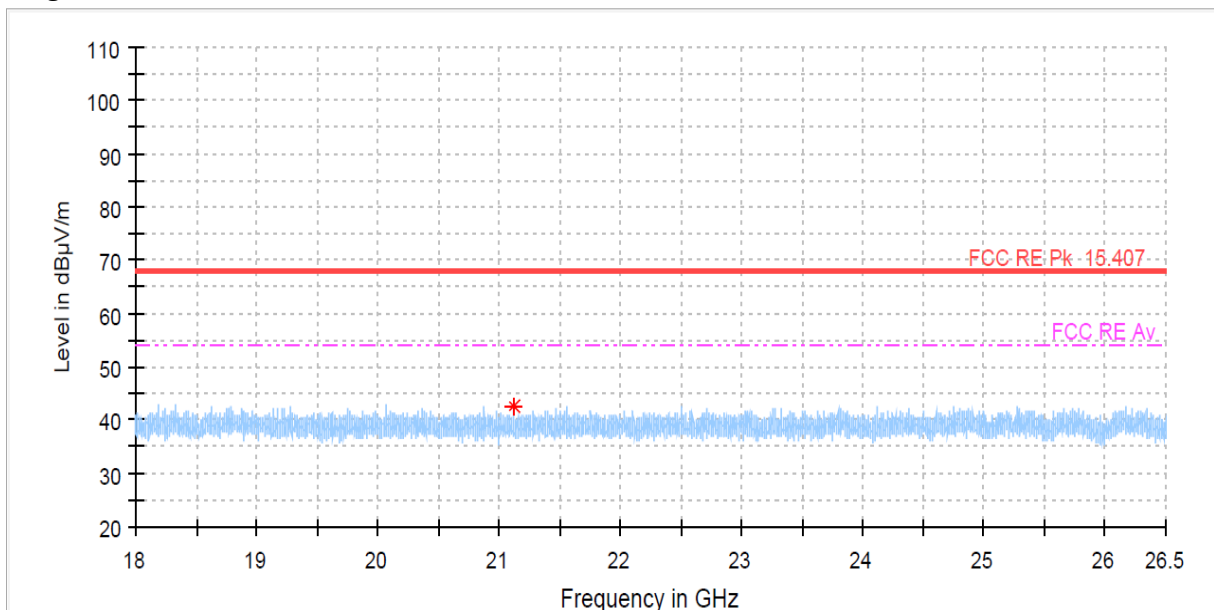


PLOTS OF EMISSIONS

Highest channel : 7 GHz to 18 GHz_Average

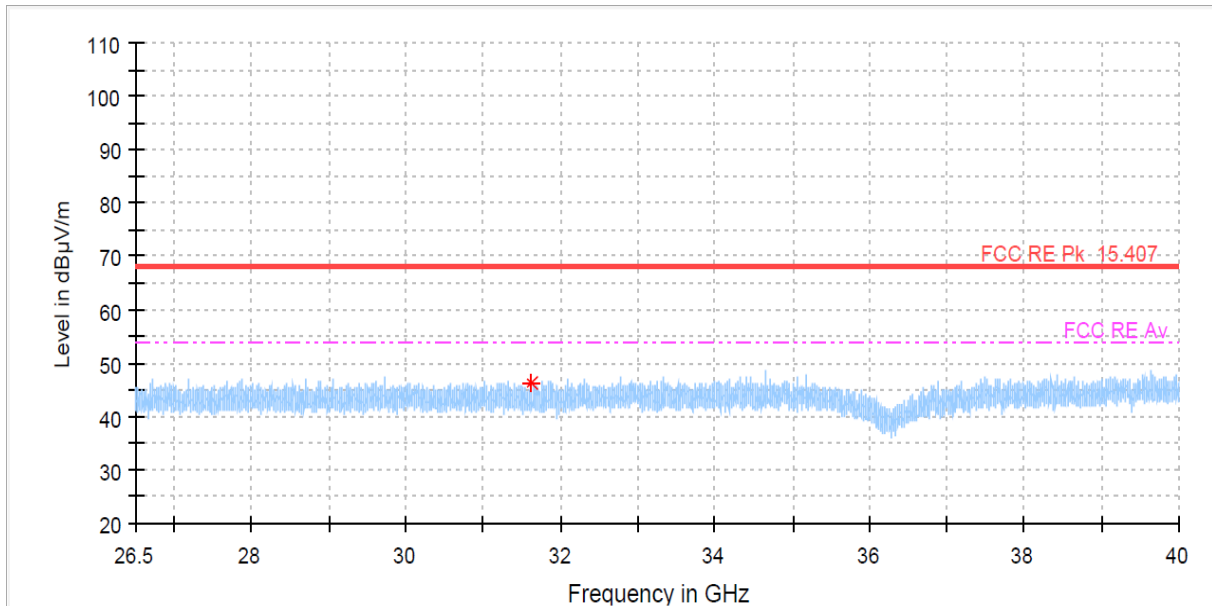


Highest channel : 18 GHz to 26.5 GHz_Peak



PLOTS OF EMISSIONS

Highest channel : 26.5 GHz to 40 GHz_Peak



TEST DATA

8.7.2 Radiated Spurious Emissions – U-NII-2A band

FCC §15.407(b)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11ac (20MHz) mode

Lowest Channel (5260 MHz)

Frequency (M Hz)	Reading (dBμV)	Polarization (H/V)	Mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3233.00	48.2	H	peak	-6.3	41.9	68.2	26.3
5404.00	48.5	V	peak	0.9	49.4	68.2	18.8
11711.50	38.3	H	peak	14.3	52.6	68.2	15.6
11711.50	26.1	H	average	14.3	40.4	54.0	13.6
17976.00	33.5	V	peak	27.7	61.2	68.2	7.0
17976.00	23.9	H	average	27.7	51.6	54.0	2.4

Middle Channel (5300 MHz)

Frequency (M Hz)	Reading (dBμV)	Polarization (H/V)	Mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5413.50	49.0	V	peak	1.0	50.0	68.2	18.2
11096.50	38.4	V	peak	14.6	53.0	68.2	15.2
17995.00	32.9	V	peak	28.0	60.9	68.2	7.3
17995.00	23.8	V	average	28.0	51.8	54.0	2.2

TEST DATA

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBμV)	Pol.* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4652.00	47.1	H	peak	-1.4	45.7	68.2	22.5
5433.50	48.1	V	average	1.1	49.2	68.2	19.0
17998.50	34.3	H	peak	28.1	62.4	68.2	5.8
17998.50	23.8	V	average	28.1	51.9	54.0	2.2

Note:

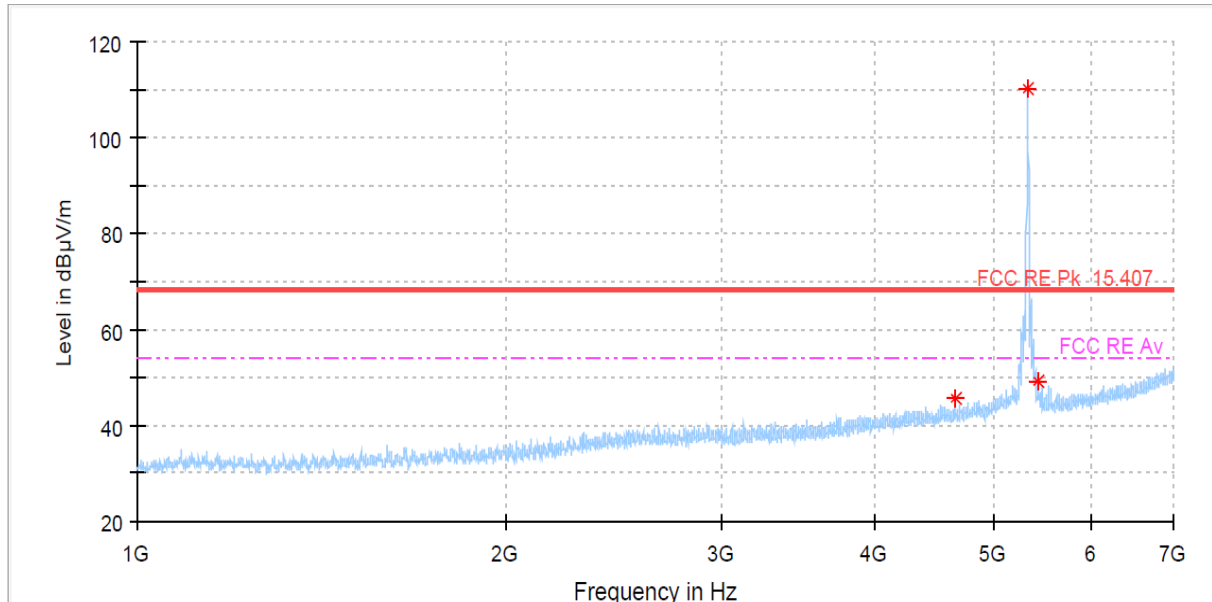
- *Pol. H = Horizontal V = Vertical
- **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
- At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
- As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 10 kHz (VBW ≥ 1/T), Detector = Peak.
- The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported.
- ***For outside of the restricted band, the peak limit is applied according to Part 15.407(b).
Peak limit is 68.2 dBμV/m. ($E[dBμV/m] = EIRP[dBm/MHz] + 95.2 = 68.2 \text{ dBμV/m}$, for $EIRP[dBm/MHz] = -27\text{dBm}$.)
- For restricted band, the peak limit is 68.2 dBμV/m, the average limit is 54 dBμV/m per FCC §15.209.
- Highest channel(5320MHz) in ac (20MHz) mode was the worst channel with respect to spurious emission.
- The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
- At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

PLOTS OF EMISSIONS

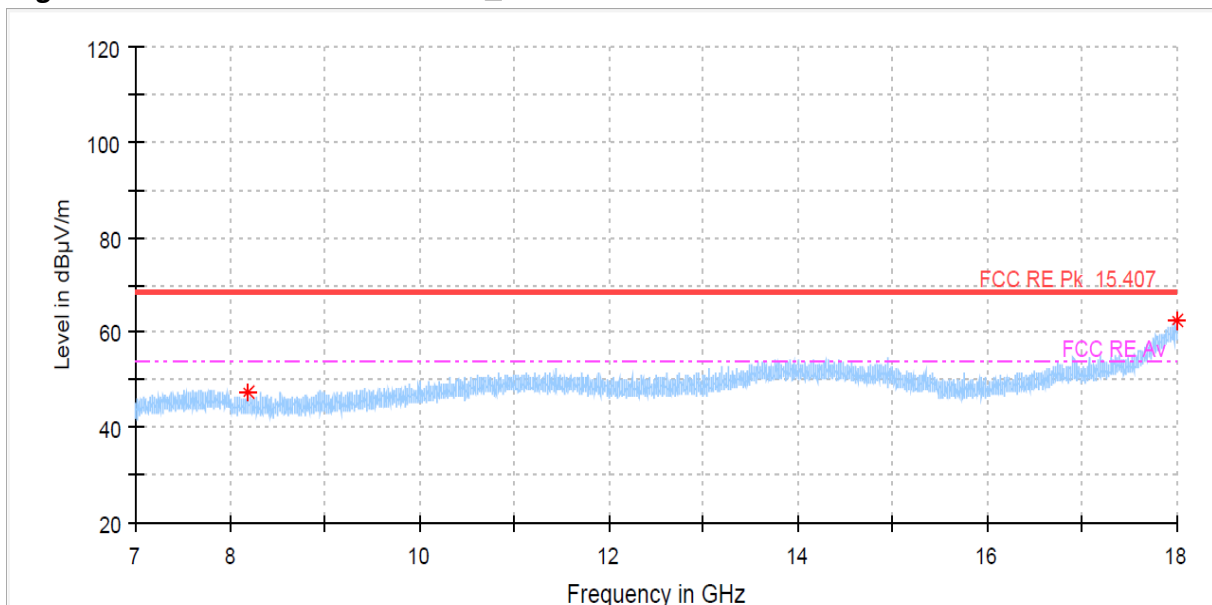
Worst Case

802.11ac (20MHz) mode

Highest channel : 1 GHz to 7 GHz_Peak

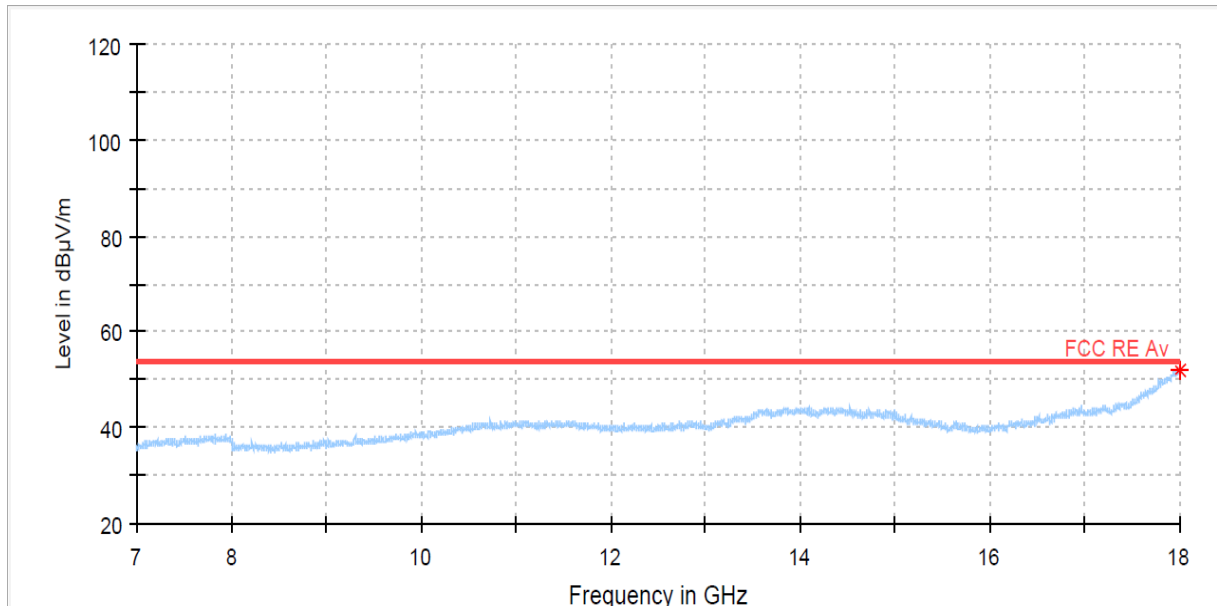


Highest channel : 7 GHz to 18 GHz_Peak

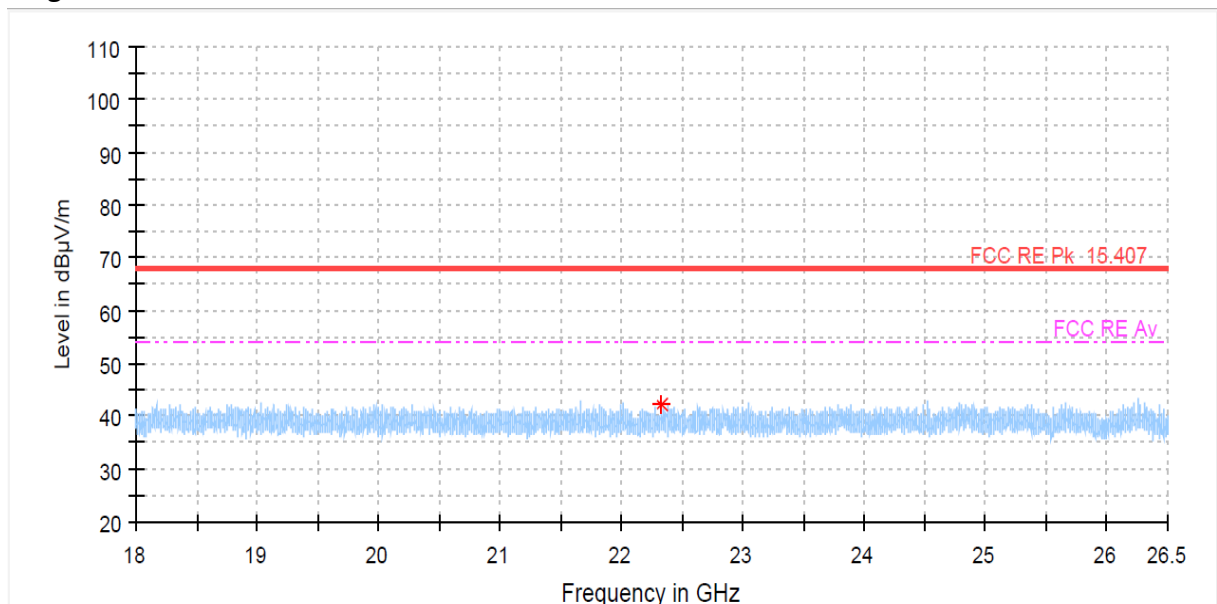


PLOTS OF EMISSIONS

Highest channel : 7 GHz to 18 GHz_Average

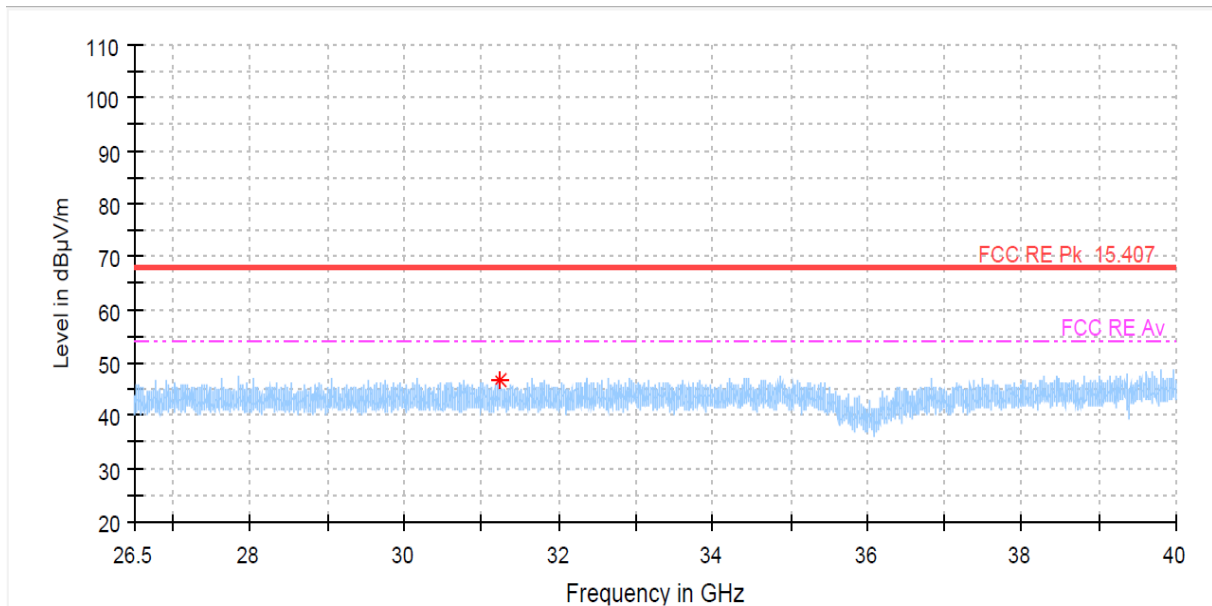


Highest channel : 18 GHz to 26.5 GHz_Peak



PLOTS OF EMISSIONS

Highest channel : 26.5 GHz to 40 GHz_Peak



TEST DATA

8.7.3 Radiated Spurious Emissions – U-NII-2C band

FCC §15.407(b)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11ac (40MHz) mode

Lowest Channel (5510 MHz)

Frequency (M Hz)	Reading (dBμV)	Polarization (H/V)	mode	Att+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4077.50	46.7	V	peak	-3.2	43.5	68.2	24.7
10777.50	38.6	V	peak	14.1	52.7	68.2	15.5
17995.50	33.3	V	peak	28.1	61.4	68.2	6.8
17995.50	23.8	V	average	28.1	51.9	54.0	2.1

Middle Channel (5590 MHz)

Frequency (M Hz)	Reading (dBμV)	Polarization (H/V)	mode	Att+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3167.00	56.6	V	peak	-6.5	50.1	68.2	18.1
11618.00	37.6	V	peak	14.4	52.0	68.2	16.2
17987.00	33.6	V	peak	27.9	61.5	68.2	6.8
17987.00	23.9	H	average	27.9	51.8	54.0	2.2

Highest Channel (5670 MHz)

Frequency (M Hz)	Reading (dBμV)	Polarization (H/V)	mode	Att+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1535.50	49.2	V	peak	-11.9	37.3	68.2	31.0
3991.00	48.8	V	peak	-3.6	45.2	68.2	23.0
14495.00	36.0	H	peak	17.6	53.6	68.2	14.6
14495.00	25.2	H	average	17.6	42.8	54.0	11.2
17971.50	34.6	H	peak	27.6	62.2	68.2	6.0
17971.50	24.2	H	average	27.6	51.8	54.0	2.2

TEST DATA

Note:

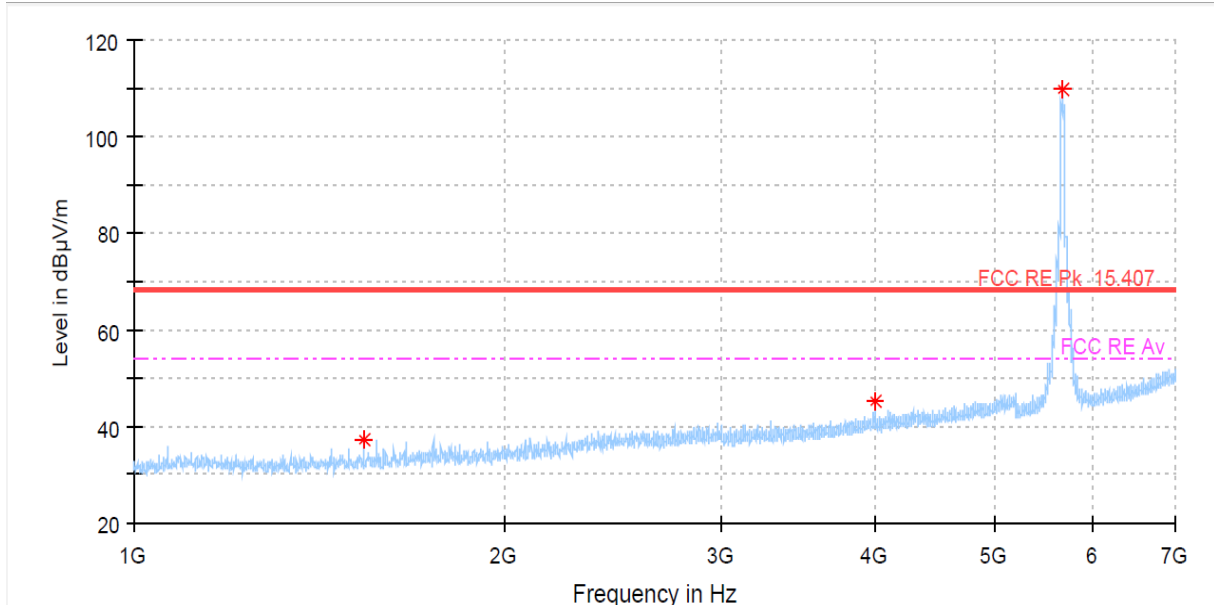
1. *Pol. H = Horizontal V = Vertical
2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
4. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 10 kHz (VBW $\geq 1/T$), Detector = Peak.
5. The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported.
6. ***For outside of the restricted band, the peak limit is applied according to Part 15.407(b).
Peak limit is 68.2 dB μ V/m. ($E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm/MHz}] + 95.2 = 68.2 \text{ dB}\mu\text{V/m}$, for $\text{EIRP}[\text{dBm/MHz}] = -27\text{dBm}$.)
7. For restricted band, the peak limit is 68.2 dB μ V/m, the average limit is 54 dB μ V/m per FCC §15.209.
8. Highest channel(5670MHz) in ac (40MHz) mode was the worst channel with respect to spurious emission.
9. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
10. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

PLOTS OF EMISSIONS

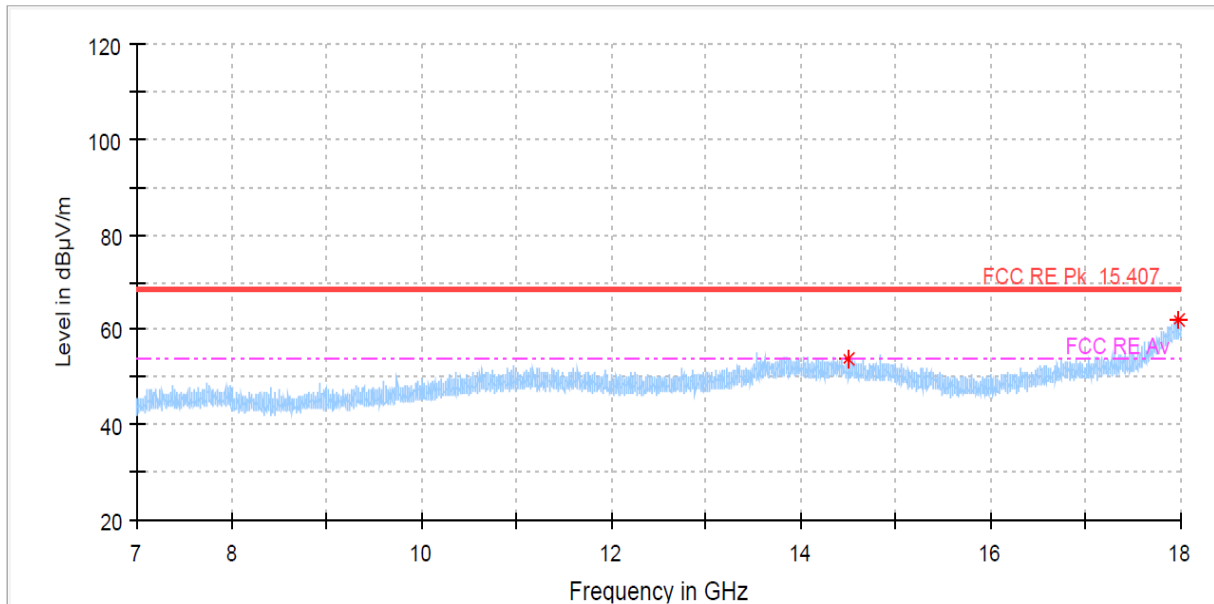
Worst Case

802.11ac (40MHz) mode

Highest channel : 1 GHz to 7 GHz_Peak

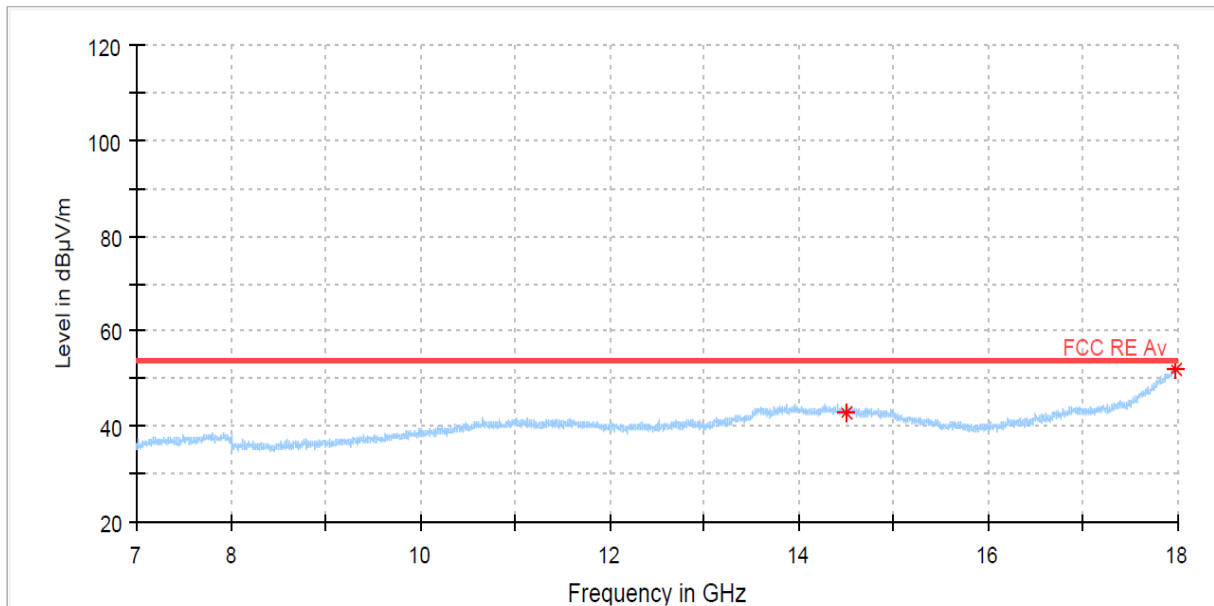


Highest channel : 7 GHz to 18 GHz_Peak

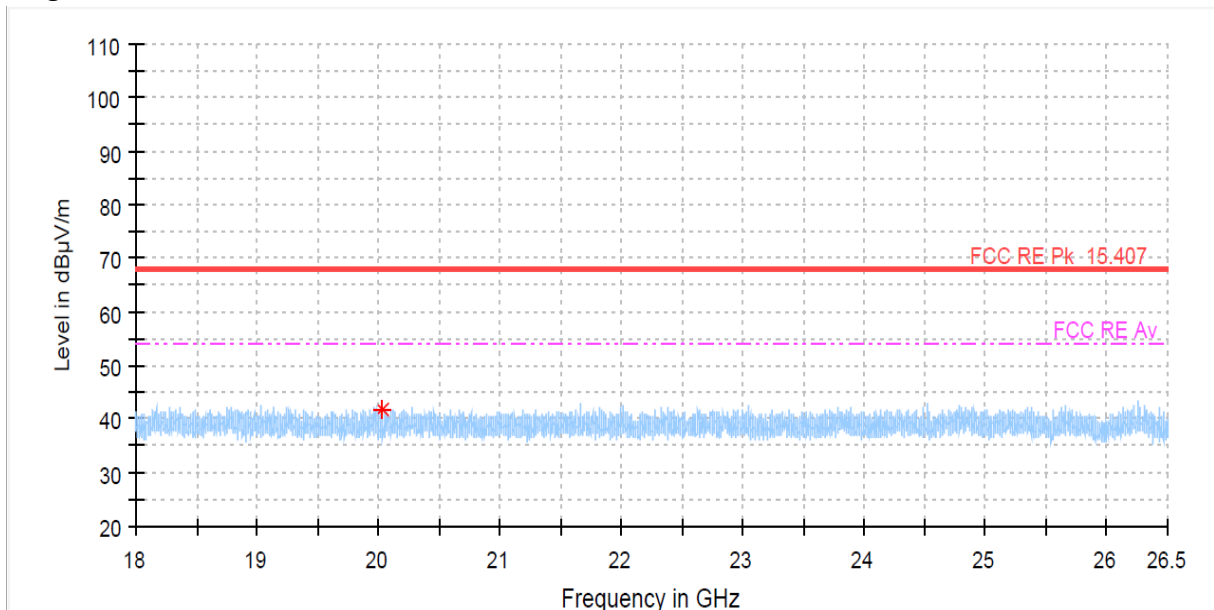


PLOTS OF EMISSIONS

Highest channel : 7 GHz to 18 GHz_Average

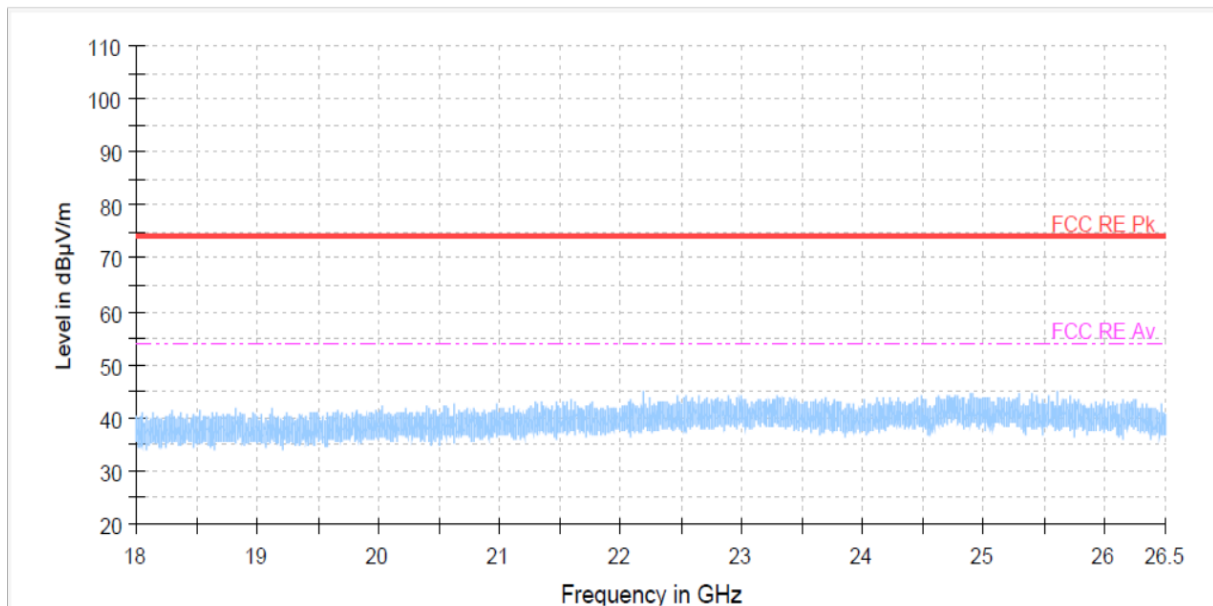


Highest channel : 18 GHz to 26.5 GHz_Peak

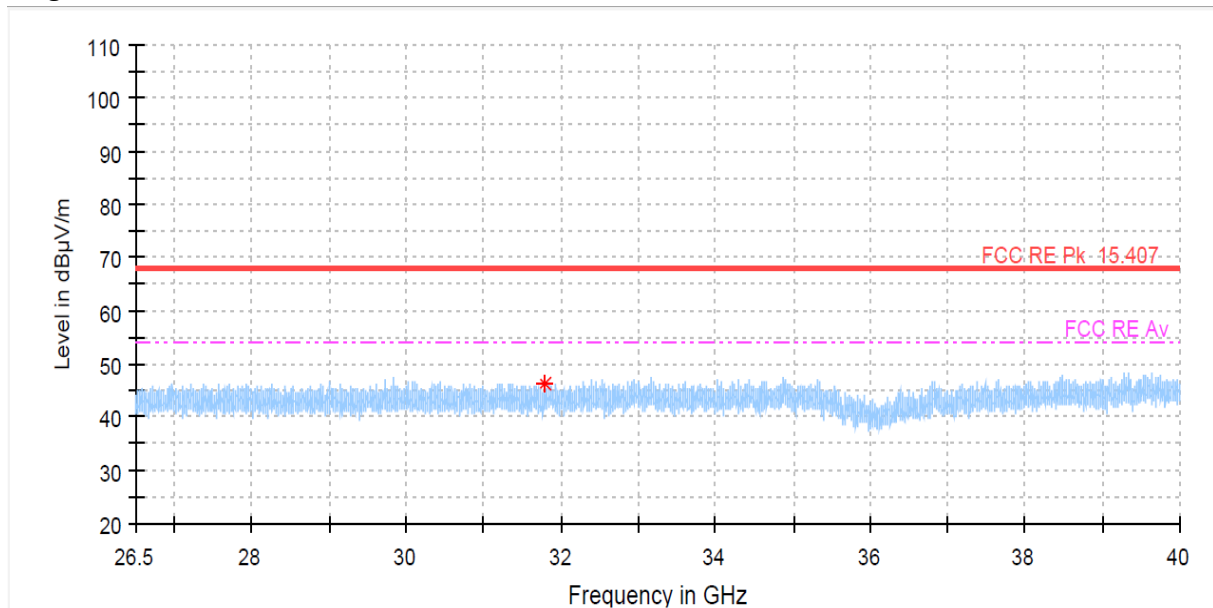


PLOTS OF EMISSIONS

Highest channel : 26.5 GHz to 40 GHz_Peak



Highest channel : 26.5 GHz to 40 GHz_Peak



TEST DATA

8.7.4 Radiated Spurious Emissions – U-NII-3 band

FCC §15.407(b)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11ac (40MHz) mode

Lowest Channel (5755 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1066.00	54.5	V	peak	-11.2	43.3	68.2	24.9
1574.50	53.9	V	peak	-11.8	42.1	68.2	26.1
14491.50	35.9	V	peak	17.6	53.5	68.2	14.7
14491.50	25.5	H	average	17.6	43.1	54.0	10.9
17995.00	34.0	H	peak	28.0	62.0	68.2	6.2
17995.00	23.8	H	average	28.0	51.8	54.0	2.3

Highest Channel (5795 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1065.00	54.3	V	peak	-11.2	43.1	68.2	25.2
2129.00	52.2	V	peak	-9.5	42.7	68.2	25.5
17964.00	34.7	V	peak	27.5	62.2	68.2	6.0
17964.00	23.9	H	average	27.5	51.4	54.0	2.6

TEST DATA

Note:

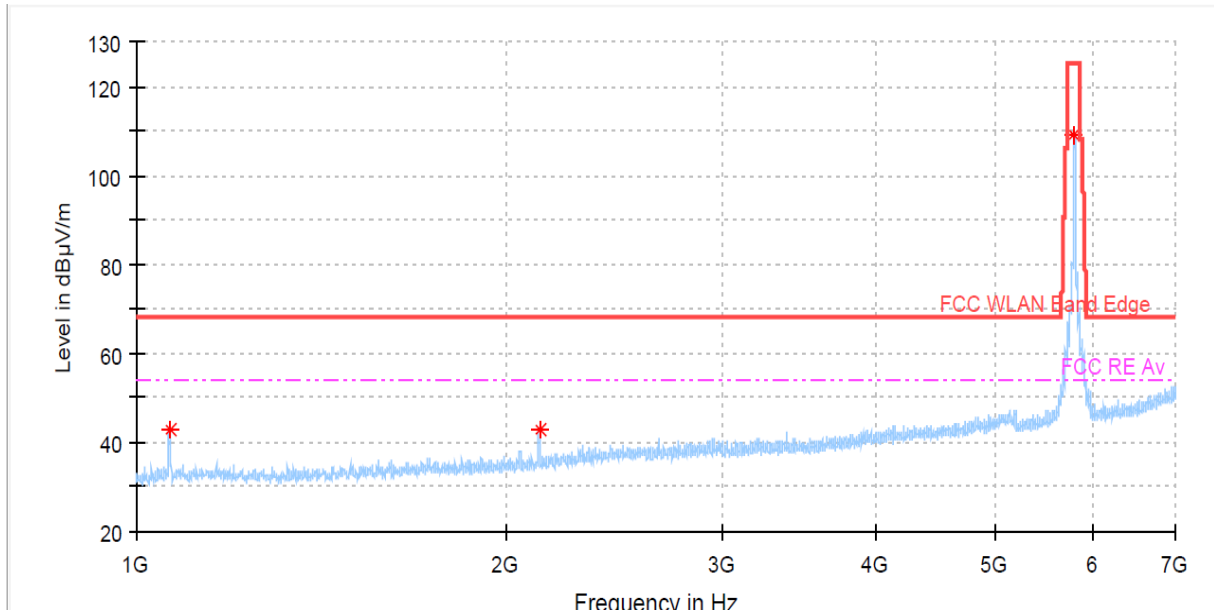
1. *Pol. H = Horizontal V = Vertical
2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
4. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 10 kHz (VBW $\geq 1/T$), Detector = Peak.
5. The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported.
6. ***For outside of the restricted band, the peak limit is applied according to Part 15.407(b).
Peak limit is 68.2 dB μ V/m. ($E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm/MHz}] + 95.2 = 68.2 \text{ dB}\mu\text{V/m}$, for $\text{EIRP}[\text{dBm/MHz}] = -27\text{dBm}$.)
7. For restricted band, the peak limit is 68.2 dB μ V/m, the average limit is 54 dB μ V/m per FCC §15.209.
8. Highest channel(5795MHz) in ac (40MHz) mode was the worst channel with respect to spurious emission.
9. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
10. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

PLOTS OF EMISSIONS

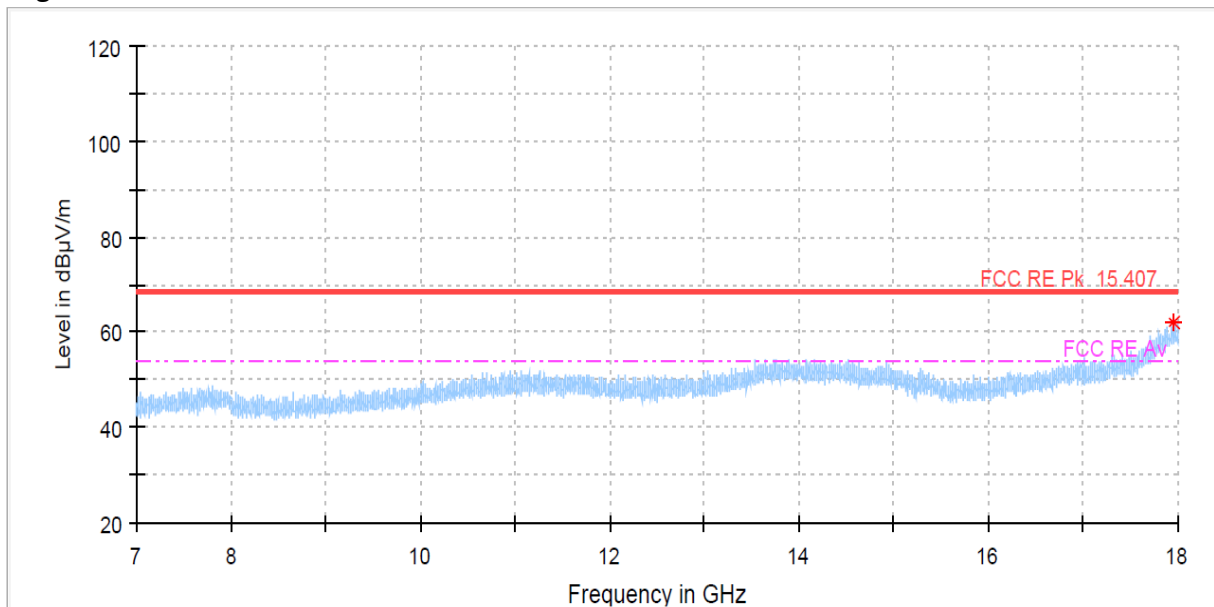
Worst Case

802.11ac (40MHz) mode

Highest channel : 1 GHz to 7 GHz_Peak

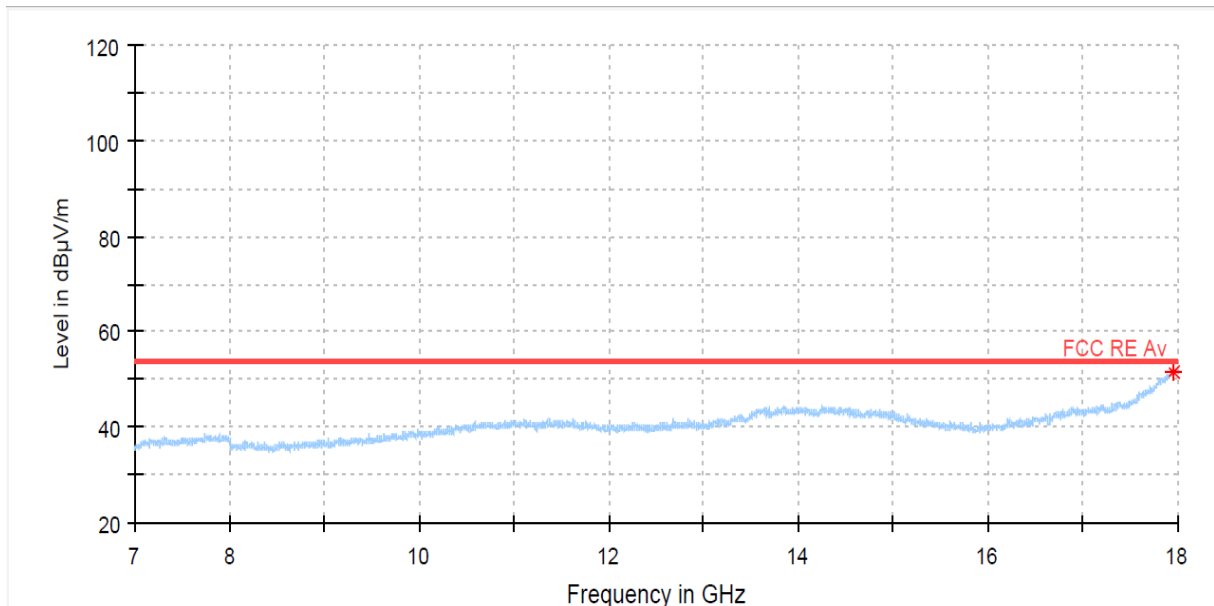


Highest channel : 7 GHz to 18 GHz_Peak

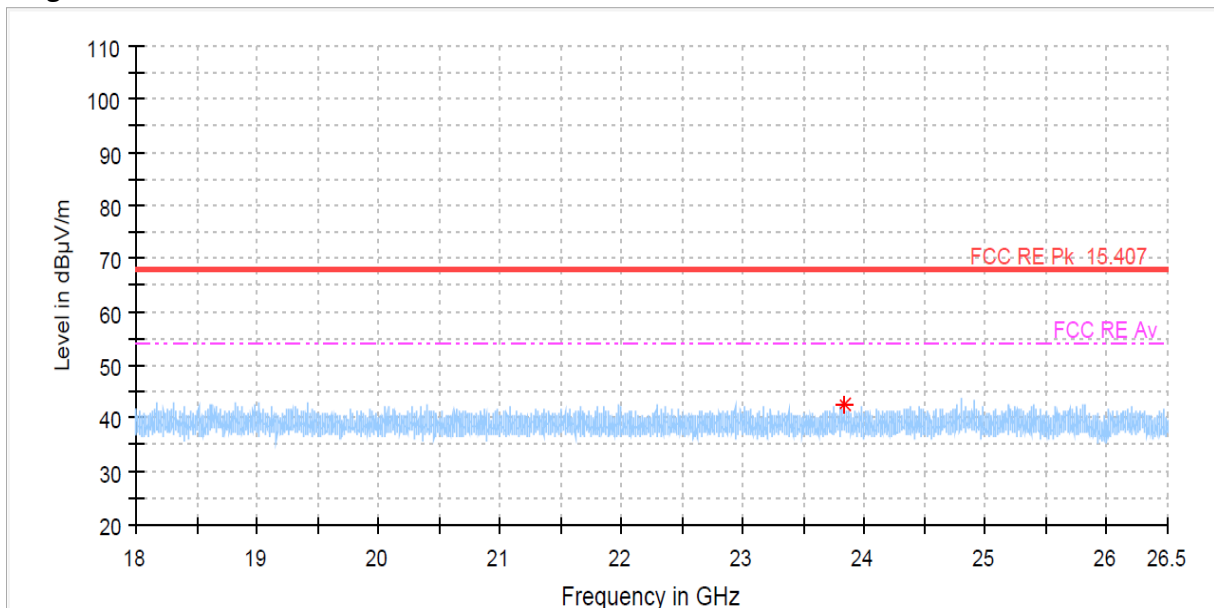


PLOTS OF EMISSIONS

Highest channel : 7 GHz to 18 GHz_Average

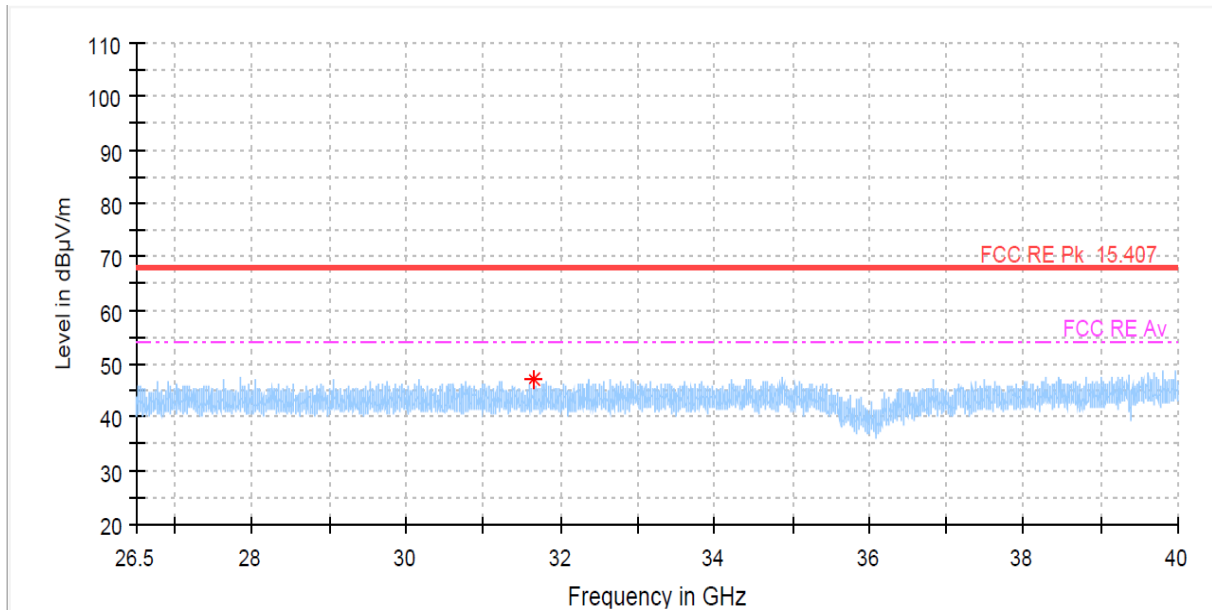


Highest channel : 18 GHz to 26.5 GHz_Peak



PLOTS OF EMISSIONS

Highest channel : 26.5 GHz to 40 GHz_Peak



TEST DATA

8.8 Radiated Band Edge

8.8.1 Radiated Band Edge – U-NII-1 band and UNII-2A band

FCC §15.407(b)

Test Mode : Set to Lowest channel and Highest channel

802.11ac (20MHz) mode

Lowest Channel (5180 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar* (H/V)	mode	Att+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5148.34	52.9	V	peak	0.4	53.3	68.2	3.5
5149.80	53.0	V	peak	0.4	53.4	68.2	14.8
5149.98	48.5	V	peak	0.4	48.9	68.2	3.5

Highest Channel (5320 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar* (H/V)	mode	Att+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5350.00	61.9	V	peak	0.7	62.6	74.0	11.4
5350.00	46.0	V	average	0.7	46.7	54.0	7.3
5350.03	71.5	V	peak	0.7	72.2	74.0	1.8
5350.03	45.6	V	average	0.7	46.3	54.0	3.2
5389.89	60.1	V	peak	0.9	61.0	74.0	13.0
5389.89	41.9	V	average	0.9	42.8	54.0	3.2

TEST DATA

802.11ac (40 MHz) mode

Lowest Channel (5190 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5145.04	54.6	V	peak	0.4	55.0	68.2	13.2
5145.04	40.7	V	average	0.4	41.1	54.0	12.9
5148.12	54.6	V	peak	0.4	55.0	68.2	13.2
5148.12	41.6	V	average	0.4	42.0	54.0	12.0
5149.98	48.7	V	peak	0.4	49.1	68.2	19.1
5149.98	41.7	V	average	0.4	42.1	54.0	11.9

Highest Channel (5310 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5350.00	51.2	V	peak	0.7	51.9	74.0	22.1
5350.00	45.2	V	average	0.7	45.9	54.0	8.1
5350.04	64.2	V	peak	0.7	64.9	74.0	9.1
5350.04	45.2	V	average	0.7	45.9	54.0	8.2

802.11ac (80MHz) mode

Lowest Channel (5210 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5116.50	57.4	V	peak	0.4	57.8	68.2	10.4
5116.50	41.7	V	average	0.4	42.1	54.0	11.9
5147.83	63.4	V	peak	0.4	63.8	68.2	4.4
5147.83	48.4	V	average	0.4	48.8	54.0	5.2
5150.00	58.1	V	peak	0.4	58.5	68.2	9.7
5150.00	48.9	V	average	0.4	49.3	54.0	4.7

TEST DATA

Highest Channel (5290 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	Attenuation (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5350.00	47.3	V	peak	0.7	48.0	74.0	26.0
5350.00	42.8	V	average	0.7	43.5	54.0	10.5
5356.24	47.3	V	peak	0.7	48.0	74.0	26.0
5356.24	42.8	V	average	0.7	43.5	54.0	10.5

TEST DATA

8.8.2 Radiated Band Edge – UNII-2C band

FCC §15.407(b)

Test Mode : Set to Lowest channel and Highest channel

802.11ac (20MHz) mode

Lowest Channel (5500 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5459.95	59.3	V	peak	1.3	60.6	68.2	7.6
5459.95	45.0	V	average	1.3	46.3	54.0	7.7
5470.00	59.3	V	peak	1.3	60.6	68.2	7.6
5470.00	46.8	V	average	1.3	48.1	54.0	5.9

Highest Channel (5700 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5725.00	53.5	V	peak	1.8	55.3	68.2	11.8
5727.74	61.0	V	peak	1.8	62.8	68.2	11.8

802.11ac (40MHz) mode

Lowest Channel (5510 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5452.98	58.9	V	peak	1.2	60.1	68.2	8.1
5452.98	43.3	V	average	1.2	44.5	54.0	12.4
5470.00	59.7	V	peak	1.3	61.0	68.2	7.2
5470.00	49.6	V	average	1.3	50.9	54.0	3.1

TEST DATA

Highest Channel (5670 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5725.00	60.4	V	peak	1.8	62.2	68.2	6.0
5728.38	64.3	V	peak	1.8	66.1	68.2	2.1

802.11ac (80MHz) mode

Lowest Channel (5530 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5454.58	57.6	V	peak	1.3	58.9	68.2	9.3
5454.58	44.5	V	average	1.3	45.8	54.0	8.2
5469.99	52.9	V	peak	1.3	54.2	68.2	14.0
5469.99	47.5	V	average	1.3	48.8	54.0	5.2

Highest Channel (5610 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5454.18	53.4	V	peak	1.3	54.7	68.2	13.5
5454.18	43.5	V	average	1.3	44.8	54.0	16.5
5465.90	55.2	V	peak	1.3	56.5	68.2	11.7
5465.90	44.7	V	average	1.3	46.0	54.0	8.1
5470.00	51.7	V	peak	1.3	53.0	68.2	15.2
5470.00	45.1	V	average	1.3	46.4	54.0	7.6
5725.01	49.9	V	peak	1.3	51.2	68.2	17.0
5730.43	55.1	V	peak	1.3	56.4	68.2	11.8

TEST DATA

8.8.3 Radiated Band Edge – U-NII-3 band

FCC §15.407(b)

Test Mode : Set to Lowest channel and Highest channel

802.11ac (20MHz) mode

Lowest Channel (5745 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5714.92	71.8	V	peak	1.7	73.5	109.4	35.9
5718.13	72.7	V	peak	1.7	74.4	110.3	35.9
5724.99	70.9	V	peak	1.8	72.7	122.2	49.5

Highest Channel (5825 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5850.01	54.8	V	peak	2.1	56.9	122.2	65.3
5850.23	64.7	V	peak	2.1	66.8	121.7	54.9

802.11ac (40 MHz) mode

Lowest Channel (5755 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5700.11	73.3	V	peak	1.6	74.9	105.2	30.3
5724.99	75.0	V	peak	1.8	76.8	122.2	45.4

TEST DATA

Highest Channel (5795 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5850.01	57.6	V	peak	2.1	59.7	122.2	62.5
5852.47	63.8	V	peak	2.1	65.9	116.6	44.0
5879.96	58.8	V	peak	2.3	61.1	101.5	40.5

802.11ac (80 MHz) mode

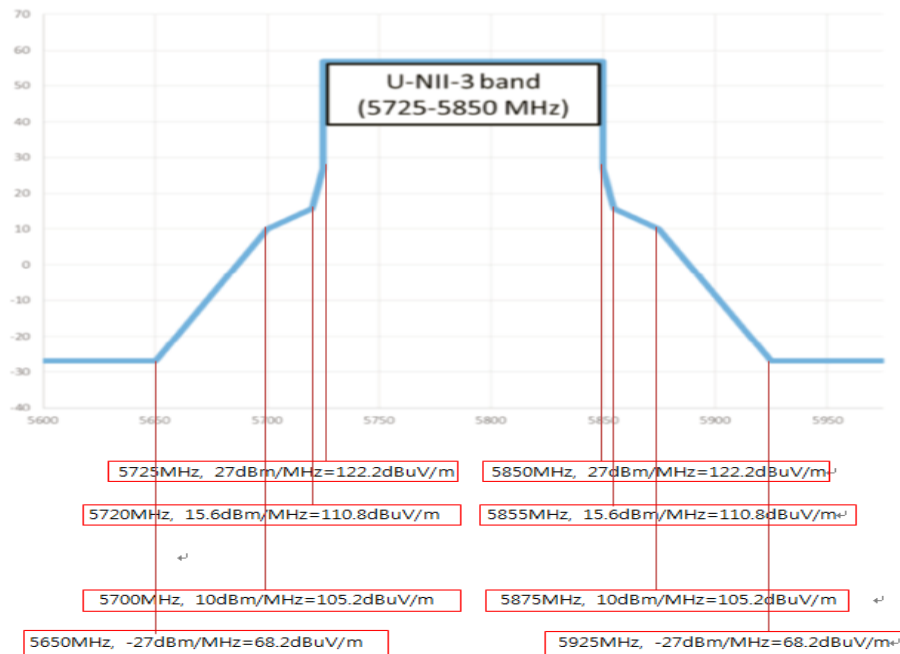
Middle Channel (5775 MHz)

Frequency (M Hz)	Reading (dBμV)	Polar (H/V)	mode	AF+CL+Am p (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5718.18	70.4	V	peak	1.7	72.1	110.3	38.2
5724.99	67.7	V	peak	1.8	69.5	122.2	52.7
5850.00	55.0	V	peak	2.1	57.1	122.2	65.1
5850.75	59.0	V	peak	2.1	61.1	120.5	59.4
5869.84	59.0	V	peak	2.2	61.2	106.6	45.5

TEST DATA

Note:

1. *Pol. H = Horizontal V = Vertical
2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. ***Average measurement was not performed because peak-detected emission complies with the average limit.
4. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
5. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 3 kHz ($VBW \geq 1/T$), Detector = Peak.
6. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
7. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.
8. Middle channel (5210MHz) in ac (80MHz) mode for UNII-1 band, Highest channel (5310MHz) in ac (40MHz) mode for UNII-2A band, Highest channel (5670MHz) in ac (40MHz) mode for UNII-2C band, Lowest channel (5755MHz) in ac (40MHz) mode for UNII-3 band were the worst channels in each band.
9. For restricted band, the peak limit is 68.2 dB μ V/m, the average limit is 54 dB μ V/m per FCC §15.209.
10. For outside of the restricted band, the peak limit is applied according to Part 15.407(b).
For UNII-1, UNII-2A, UNII-2C band, peak limit is 68.2 dB μ V/m. ($E[dB\mu V/m] = EIRP[dBm/MHz] + 95.2 = 68.2$ dB μ V/m, for $EIRP[dBm/MHz] = -27$ dBm.)
For UNII 3 band, the peak limit of bandedge to 75MHz above or below bandedge is specified in 15.407(b)(4)(i) as below.



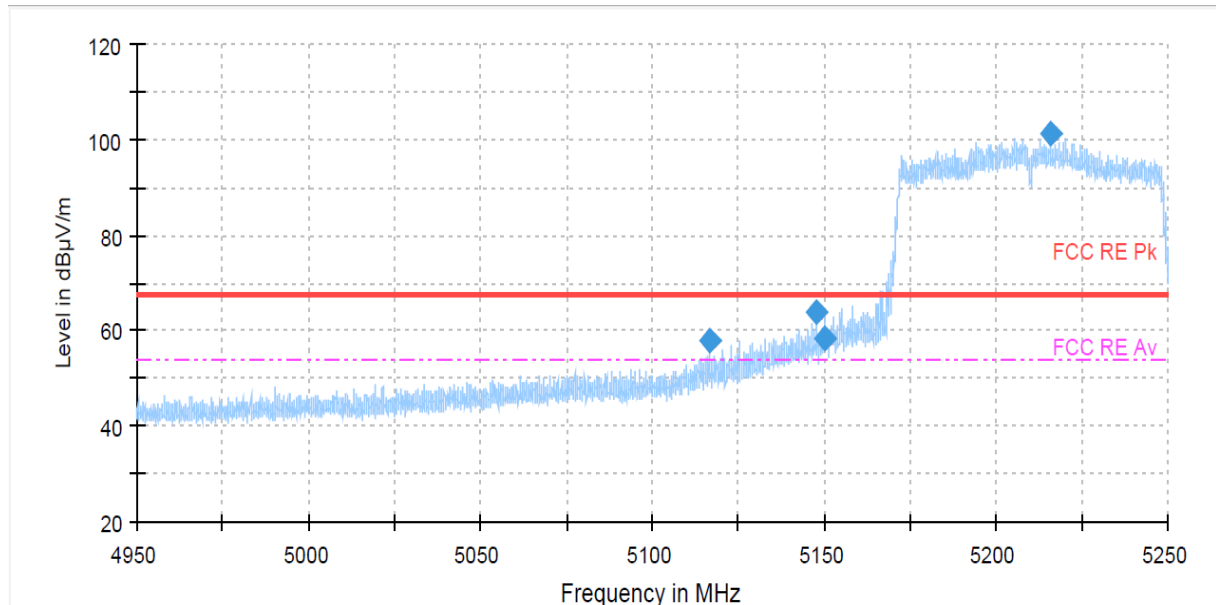
PLOTS OF EMISSIONS

Worst Case

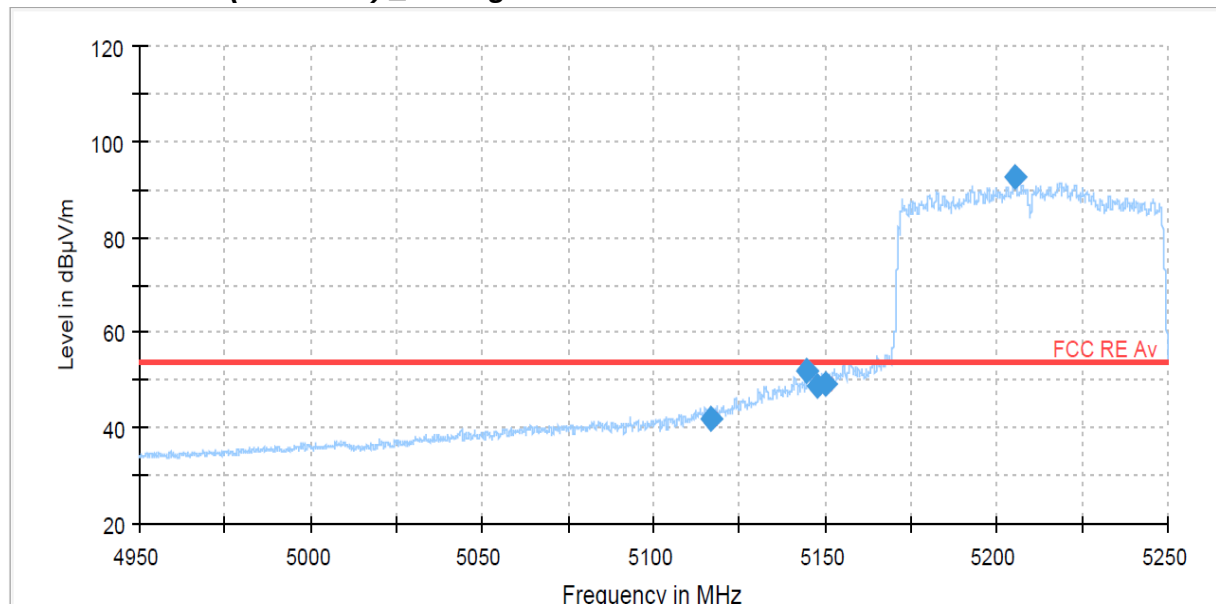
Radiated Band Edge – U-NII-1 band

802.11ac (80MHz) mode

Middle channel (5210 MHz) _Peak



Middle channel (5210 MHz) _Average

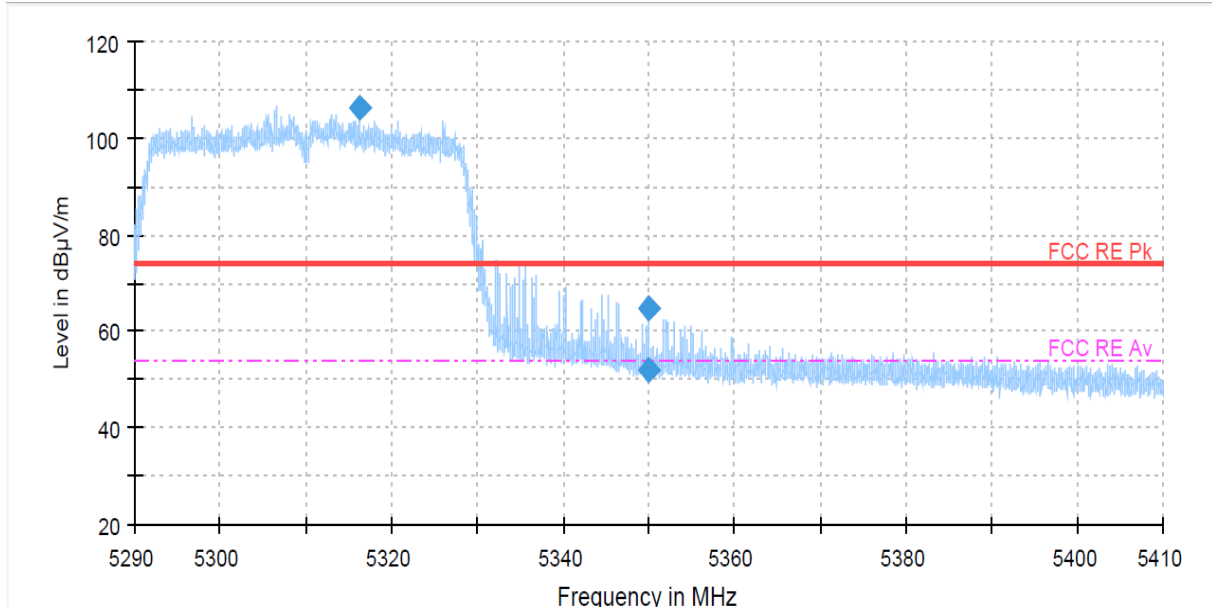


PLOTS OF EMISSIONS

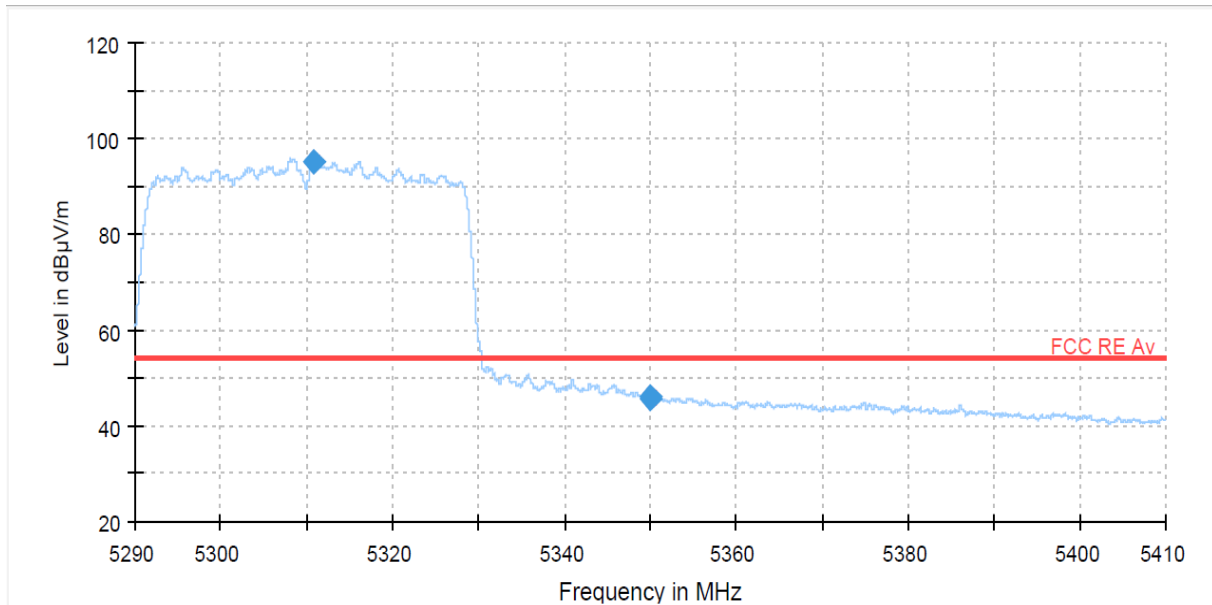
Radiated Band Edge – U-NII-2A band

802.11ac (40MHz) mode

Highest channel (5310 MHz) _Peak



Highest channel (5310 MHz) _Average

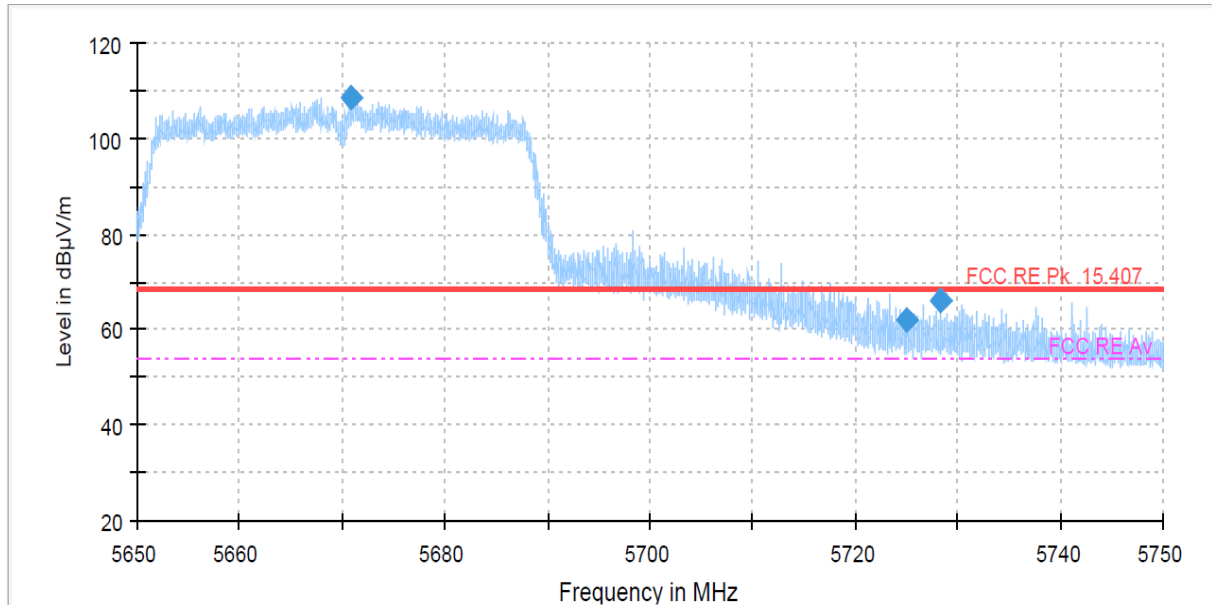


PLOTS OF EMISSIONS

Radiated Band Edge – U-NII-2C band

802.11ac (40MHz) mode

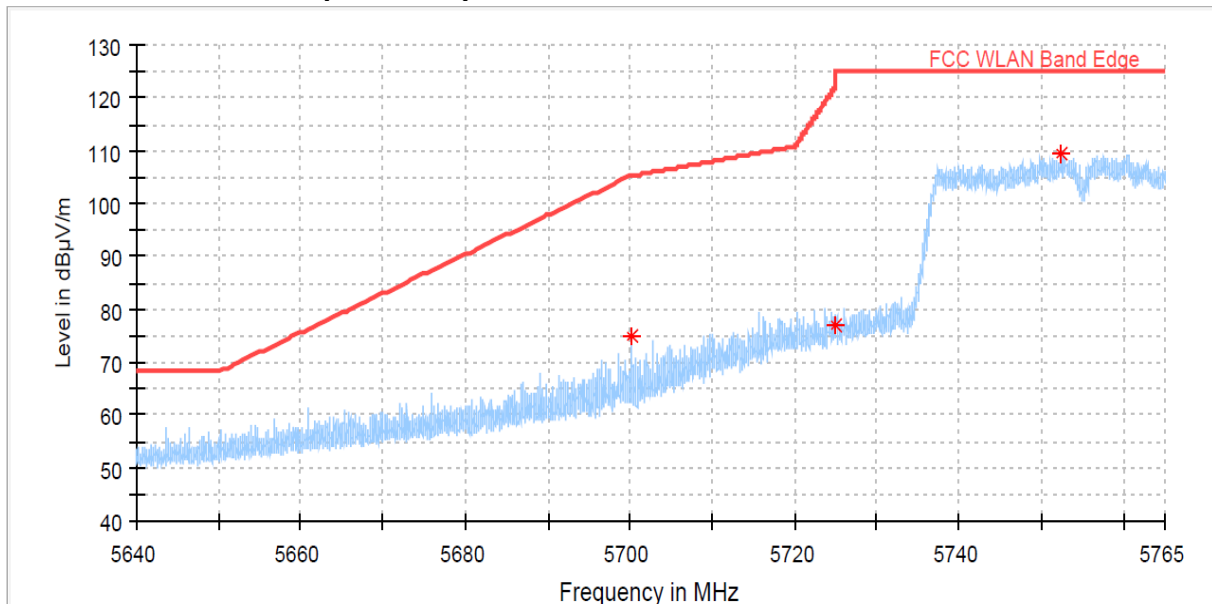
Highest channel (5670 MHz) _Peak



Radiated Band Edge – U-NII-3 band

802.11ac mode(80MHz)

Middle channel Lower (5775 MHz) _Peak



9. TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	*Test Receiver	R & S	ESU 40	100202	Apr. 02 2019	1 year
2	*Test Receiver	R & S	ESCS30	100302	Oct. 11 2018	1 year
3	*Attenuator	PASTERNAK	PE7395-10	1441-1	Jul. 11 2019	1 year
4	*Attenuator	FAIRVIEW	SA3N5W-06	N/A	Apr. 03 2019	1 year
5	*Attenuator	FAIRVIEW	SA3N5W-10	N/A	Apr. 03 2019	1 year
6	Attenuator	WEINSCHEL	56-10	58765	Oct. 12 2018	1 year
7	*Amplifier	R & S	SCU 01	10029	Apr. 02 2019	1 year
8	*Amplifier	R & S	SCU18F	180025	Apr. 02 2019	1 year
9	*Amplifier	R & S	SCU26	10011	Jul. 15 2019	1 year
10	*Amplifier	R & S	SCU40	100380	Jul. 15 2019	1 year
11	Spectrum Analyzer	R & S	FSW43	100732	Apr. 02 2019	1 year
12	*Spectrum Analyzer	Agilent	E4440A	MY44022567	Oct. 11 2018	1 year
13	*Spectrum Analyzer	R & S	FSW43	104084	Apr. 02 2019	1 year
14	*Loop Antenna	R & S	HFH2-Z2	100279	Feb. 13 2019	2 year
15	*Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-508	Jun. 28 2019	2 year
16	*Horn Antenna	Q-par Angus	QSH20S20	8179	Jul. 15 2019	2 year
17	*Horn Antenna	Q-par Angus	QSH22K20	8180	Jul. 15 2019	2 year
18	*Trilog-Broadband Antenna	SCHWARZBECK	VULB 9163	946	May. 18 2019	2 year
19	*LISN	R & S	ESH3-Z5	833874/006	Oct. 12 2018	1 year
20	*Position Controller	INNCO	CO2000	12480406/L	N/A	N/A
21	*Controller	INNCO	CO3000	CO3000/937/38330516/L	N/A	N/A
22	*Turn Table	INNCO	DS1200S	N/A	N/A	N/A
23	*Turn Table	INNCO	DT2000-2t	N/A	N/A	N/A
24	*Antenna Mast	INNCO	MA4000	N/A	N/A	N/A
25	*TILT Antenna Mast	INNCO	MA4640-XP-EP	N/A	N/A	N/A
26	*Open Switch And Control Unit	R & S	OSP-120	100081	N/A	N/A
27	*Open Switch And Control Unit	R & S	OSP-120	101766	N/A	N/A
28	*Shielded Room	Seo-Young EMC	N/A	N/A	N/A	N/A
29	*Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
30	*WiFi Filter Bank	R & S	U083	N/A	N/A	N/A
31	*WiFi Filter Bank	R & S	U082	N/A	N/A	N/A

*) Test equipment used during the test

10. ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of measurement uncertainty contained in CISPR 16-4-2 with the confidence level of 95%

1. Conducted Uncertainty Calculation

Source of Uncertainty	X_i	Uncertainty of X_i		Coverage factor k	$u(X_i)$ (dB)	C_i	$C_i u(X_i)$ (dB)
		Value (dB)	Probability Distribution				
Receiver reading	RI	± 0.1	normal 1	1.000	0.1	1	0.1
Attenuation AMN-Receiver	LC	± 0.08	normal 2	2.000	0.04	1	0.04
AMN Voltage division factor	LAMN	± 0.8	normal 2	2.000	0.4	1	0.4
Sine wave voltage	dVSW	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	dVPA	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	dVPR	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	dVNF	± 0.00	-	-	0.00	1	0.00
AMN Impedance	dZ	± 1.80	triangular	2.449	0.73	1	0.73
Ⓐ Mismatch	M	+ 0.70	U-Shaped	1.414	0.49	1	0.49
Ⓑ Mismatch	M	- 0.80	U-Shaped	1.414	- 0.56	1	- 0.56
Measurement System Repeatability	RS	0.05	normal 1	1.000	0.05	1	0.05
Remark	Ⓐ: AMN-Receiver Mismatch : + Ⓑ: AMN-Receiver Mismatch : -						
Combined Standard Uncertainty	Normal			± 1.88			
Expanded Uncertainty U	Normal ($k = 2$)			± 3.76			

2. Radiation Uncertainty Calculation

Source of Uncertainty	X_i	Uncertainty of X_i		Coverage factor k	$u(X_i)$ (dB)	C_i	$C_i u(X_i)$ (dB)
		Value (dB)	Probability Distribution				
Measurement System Repeatability	RS	0.34	normal 1	1.00	0.34	1	0.34
Receiver reading	Ri	± 0.02	normal 2	2.00	0.01	1	0.01
Sine wave voltage	dVsw	± 0.17	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	dVpa	± 0.92	normal 2	2.00	0.46	1	0.46
Pulse repetition rate response	dVpr	± 0.35	normal 2	2.00	0.18	1	0.18
Noise floor proximity	dVnf	± 0.50	normal 2	2.00	0.25	1	0.25
Antenna Factor Calibration	AF	± 2.00	rectangular	$\sqrt{3}$	1.15	1	1.15
Cable Loss	CL	± 1.00	normal 2	2.00	0.50	1	0.50
Antenna Directivity	AD	± 0.00	rectangular	$\sqrt{3}$	0.00	1	0.00
Antenna Factor Height Dependence	AH	± 2.00	rectangular	$\sqrt{3}$	1.15	1	1.15
Antenna Phase Centre Variation	AP	± 0.20	rectangular	$\sqrt{3}$	0.12	1	0.12
Antenna Factor Frequency Interpolation	Ai	± 0.25	rectangular	$\sqrt{3}$	0.14	1	0.14
Site Imperfections	Si	± 4.00	triangular	$\sqrt{6}$	1.63	1	1.63
Measurement Distance Variation	DV	± 0.60	rectangular	$\sqrt{3}$	0.35	1	0.35
Antenna Balance	Dbal	± 0.90	rectangular	$\sqrt{3}$	0.52	1	0.52
Cross Polarisation	DCross	± 0.00	rectangular	$\sqrt{3}$	0.00	1	0.18
Mismatch	M	+ 0.98 - 1.11	U-Shaped	$\sqrt{2}$	0.74	1	0.74
EUT Volume Diameter	Vd	0.33	normal 1	1.00	0.33	1	0.11
Remark							
Combined Standard Uncertainty	Normal						
Expanded Uncertainty U	Normal ($k = 2$)						