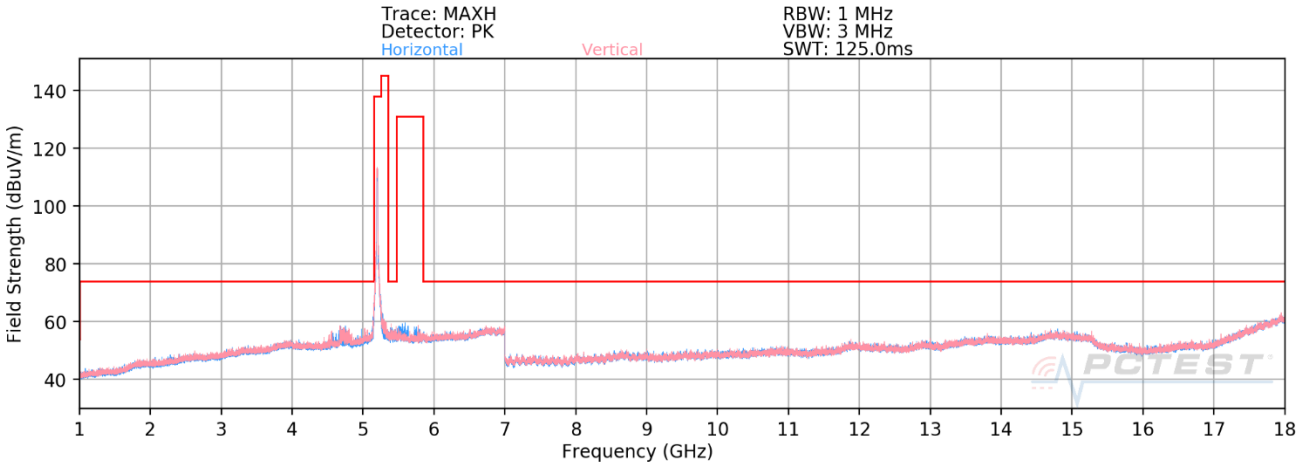
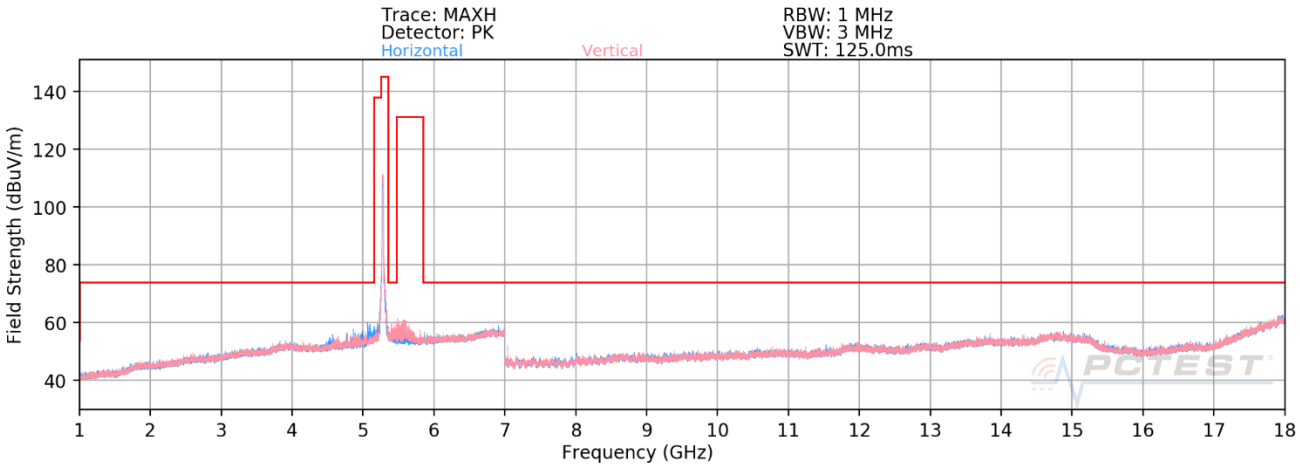
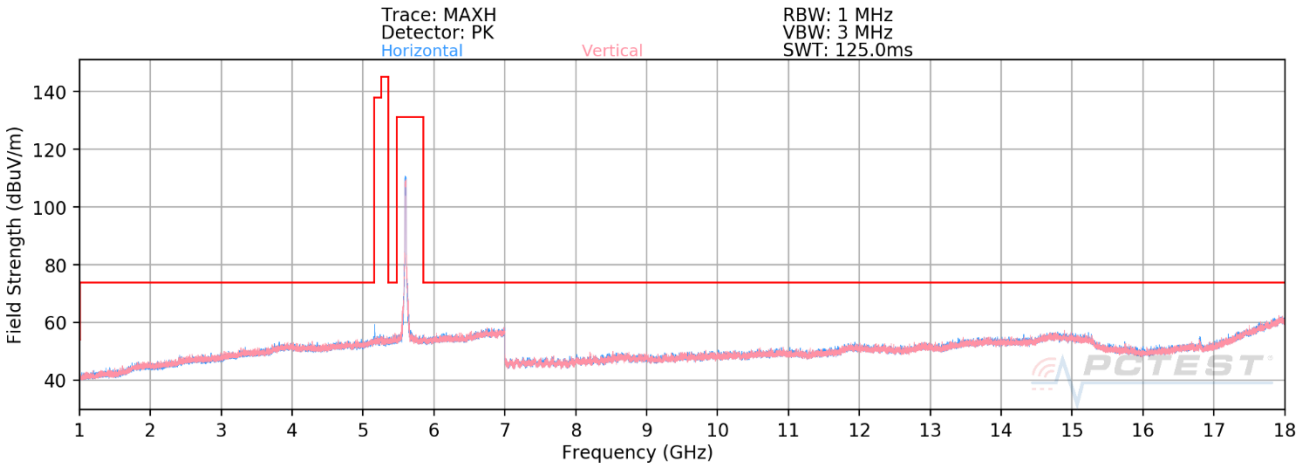
7.6.3 MIMO Radiated Spurious Emission Measurements (Above 1GHz)



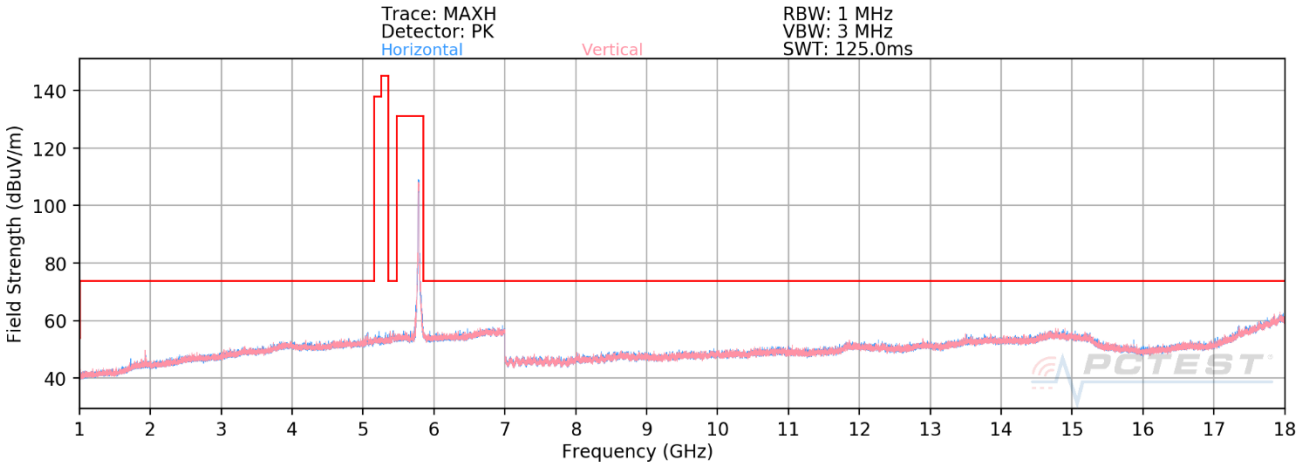
Plot 7-173. Radiated Spurious Plot above 1GHz MIMO (802.11a – U1 Ch. 40)



Plot 7-174. Radiated Spurious Plot above 1GHz MIMO (802.11a – U2A Ch. 56)

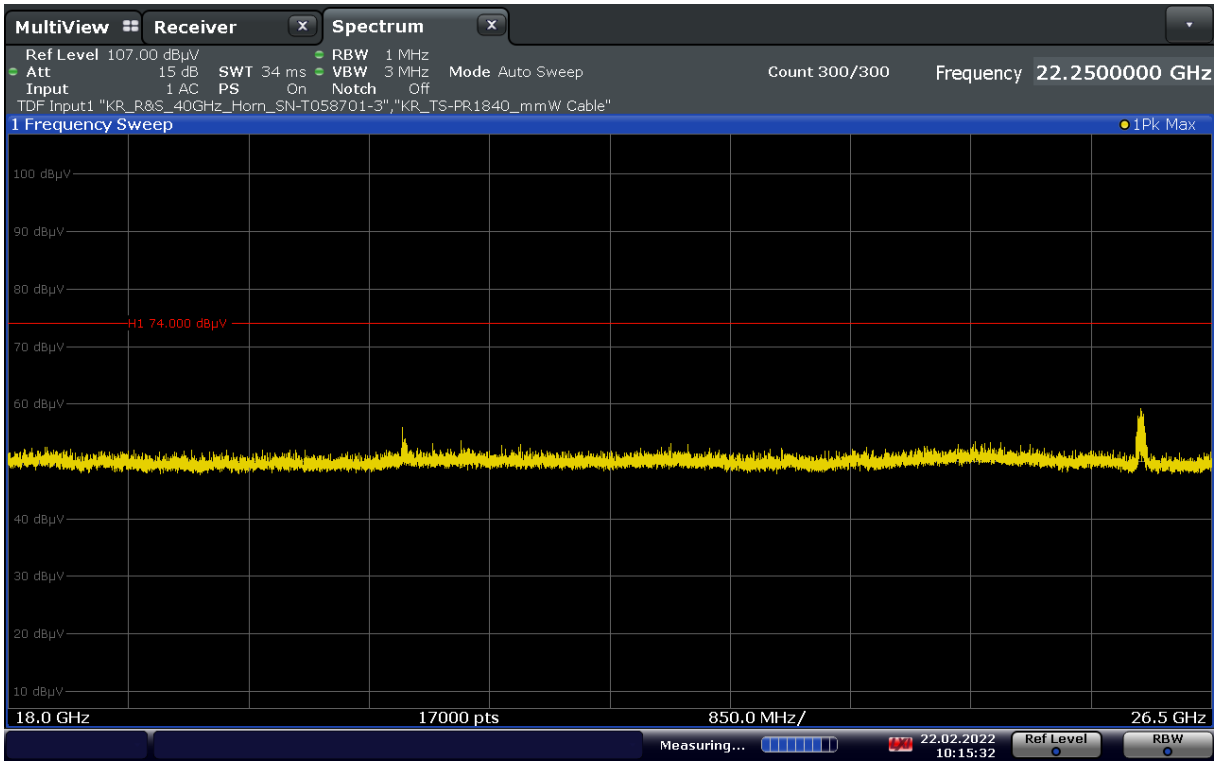


Plot 7-175. Radiated Spurious Plot above 1GHz MIMO (802.11a – U2C Ch. 120)

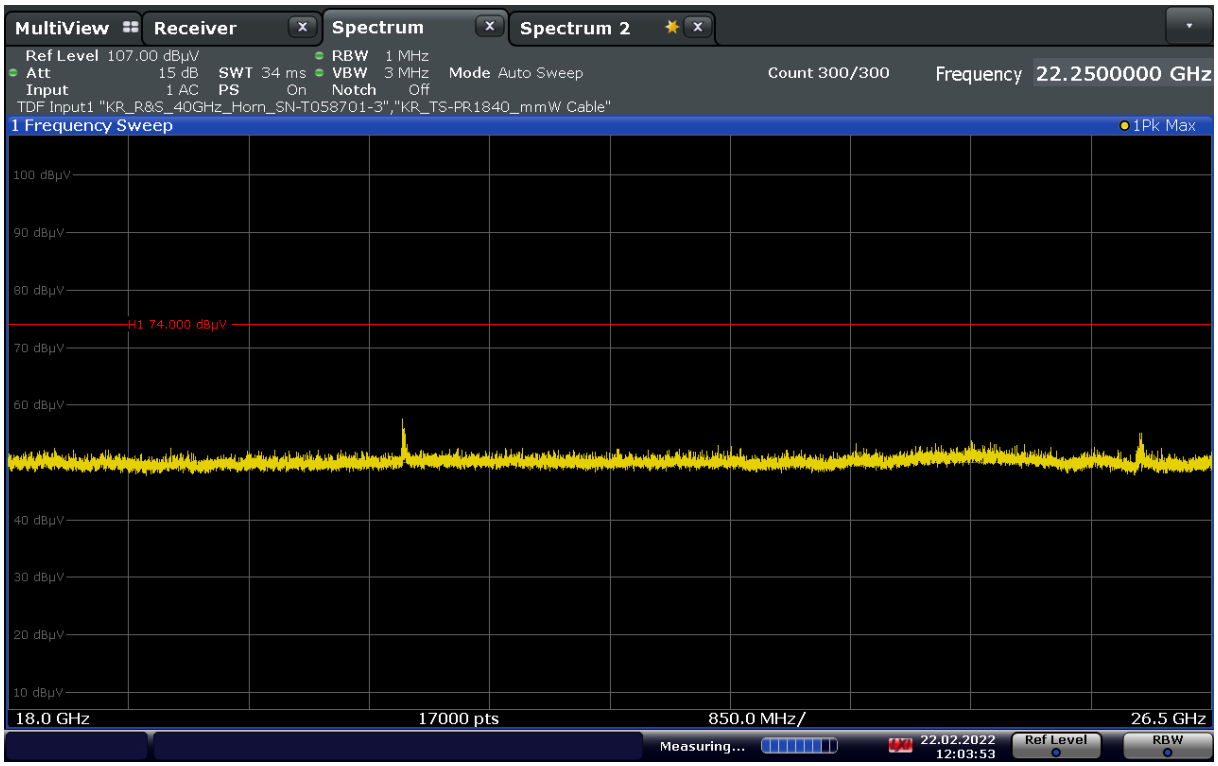


Plot 7-176. Radiated Spurious Plot above 1GHz MIMO (802.11a – U3 Ch. 157)

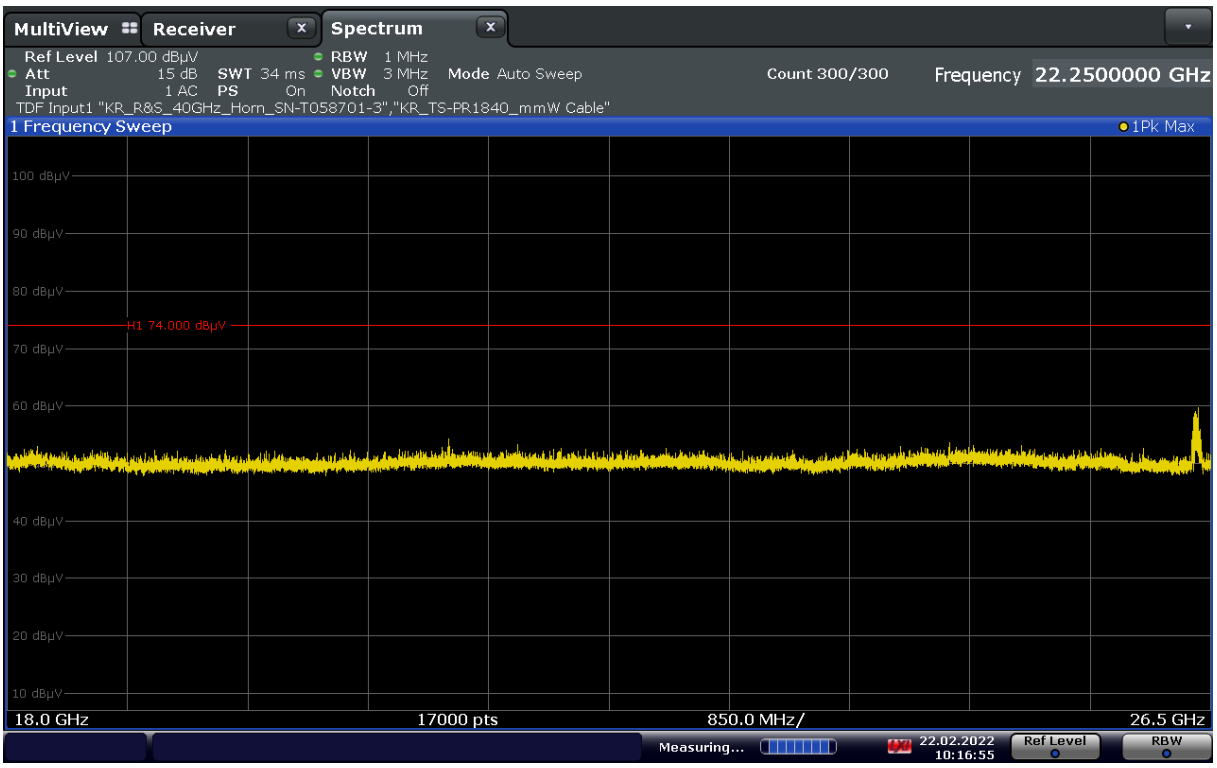
MIMO Radiated Spurious Emissions Measurements (Above 18GHz)



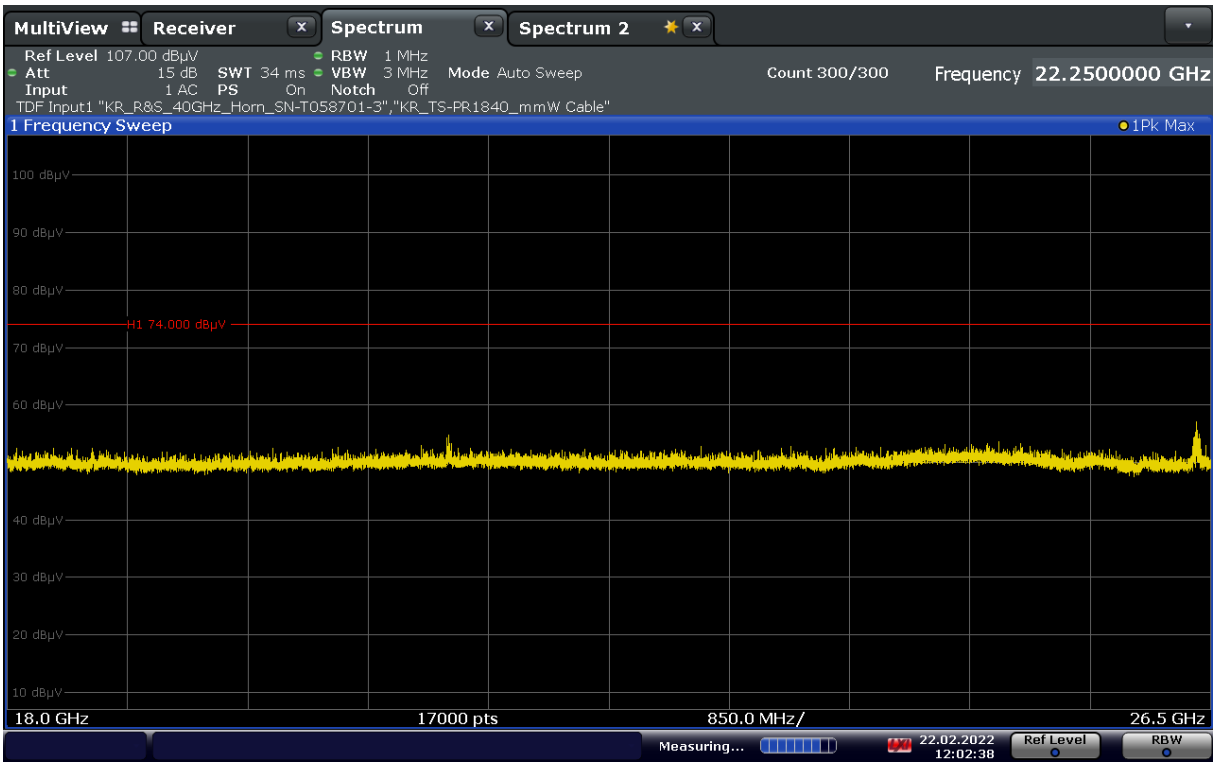
Plot 7-177. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U1 Ch. 40 – Ant. Pol. H)



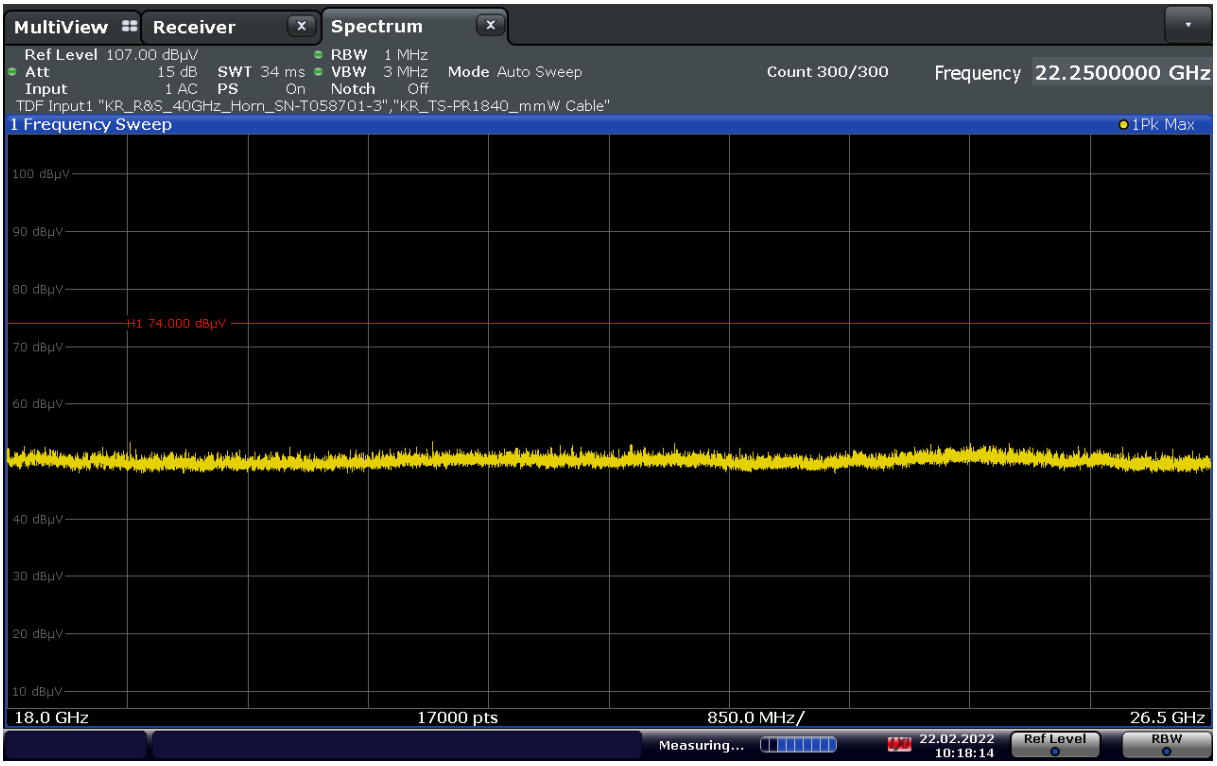
Plot 7-178. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U1 Ch. 40 – Ant. Pol. V)



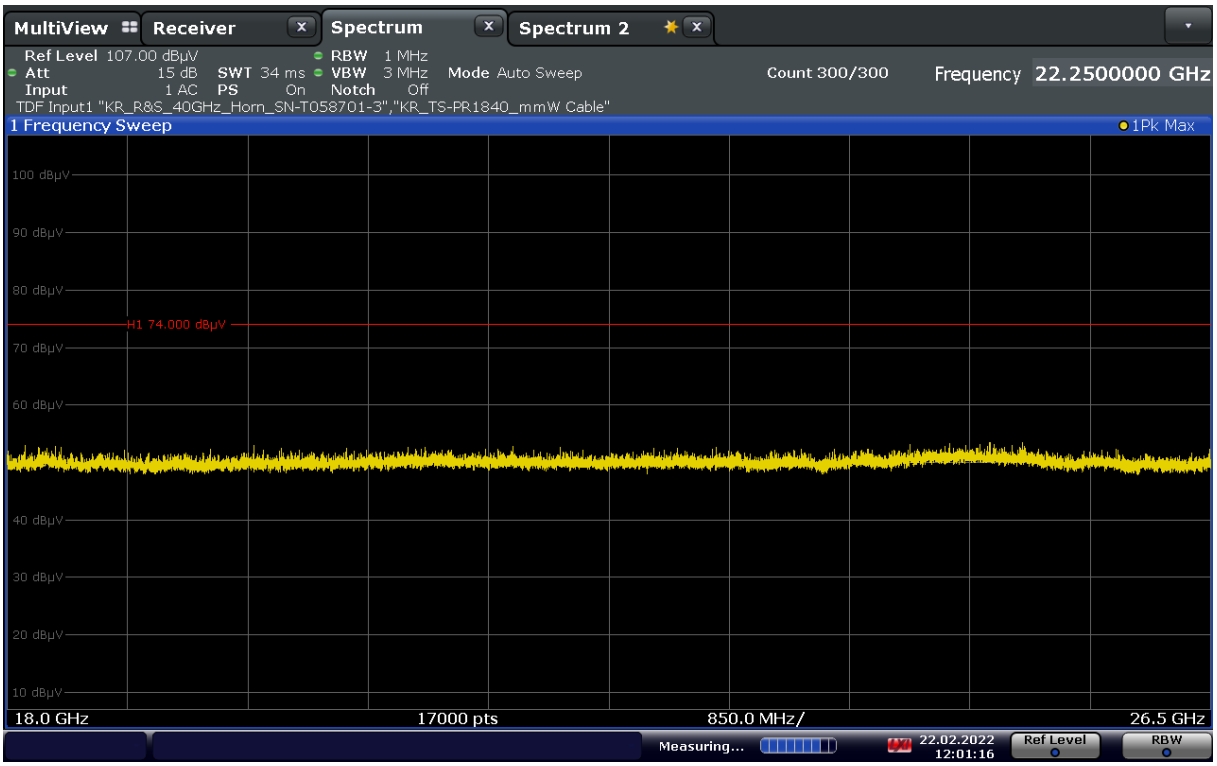
Plot 7-179. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U2A Ch. 56 – Ant. Pol. H)



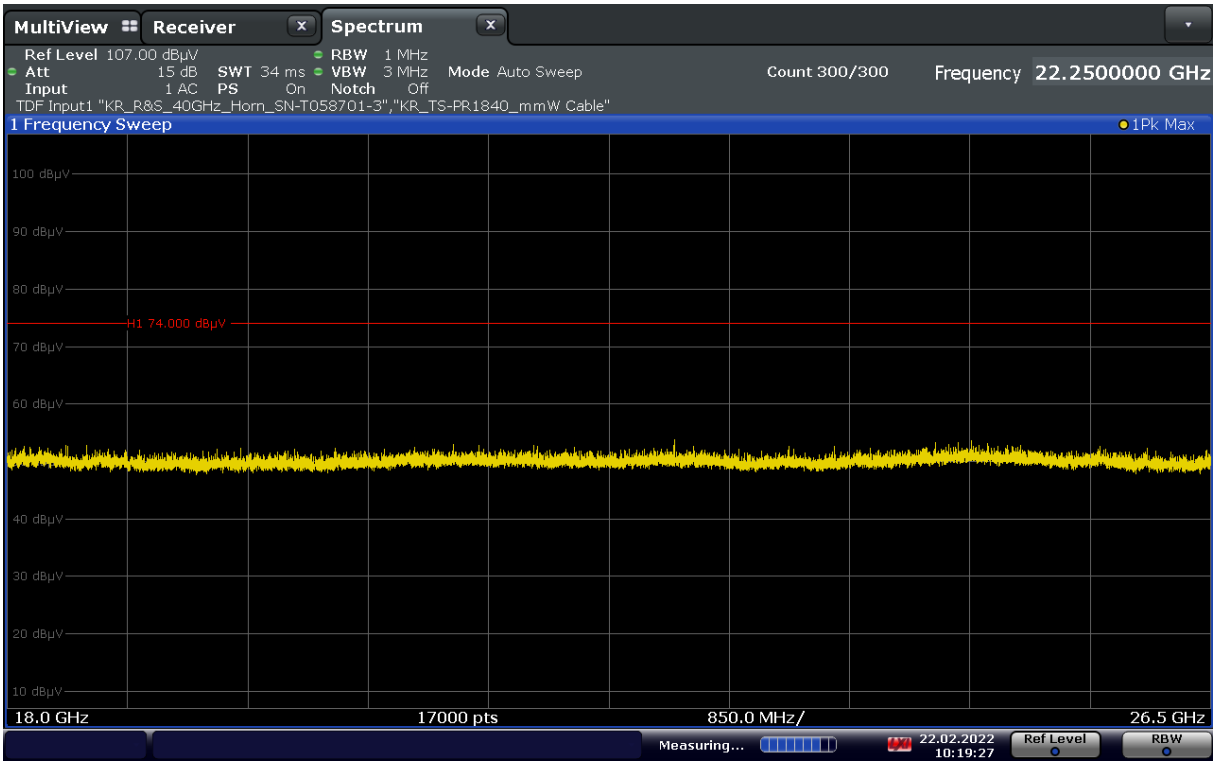
Plot 7-180. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U2A Ch. 56 – Ant. Pol. V)



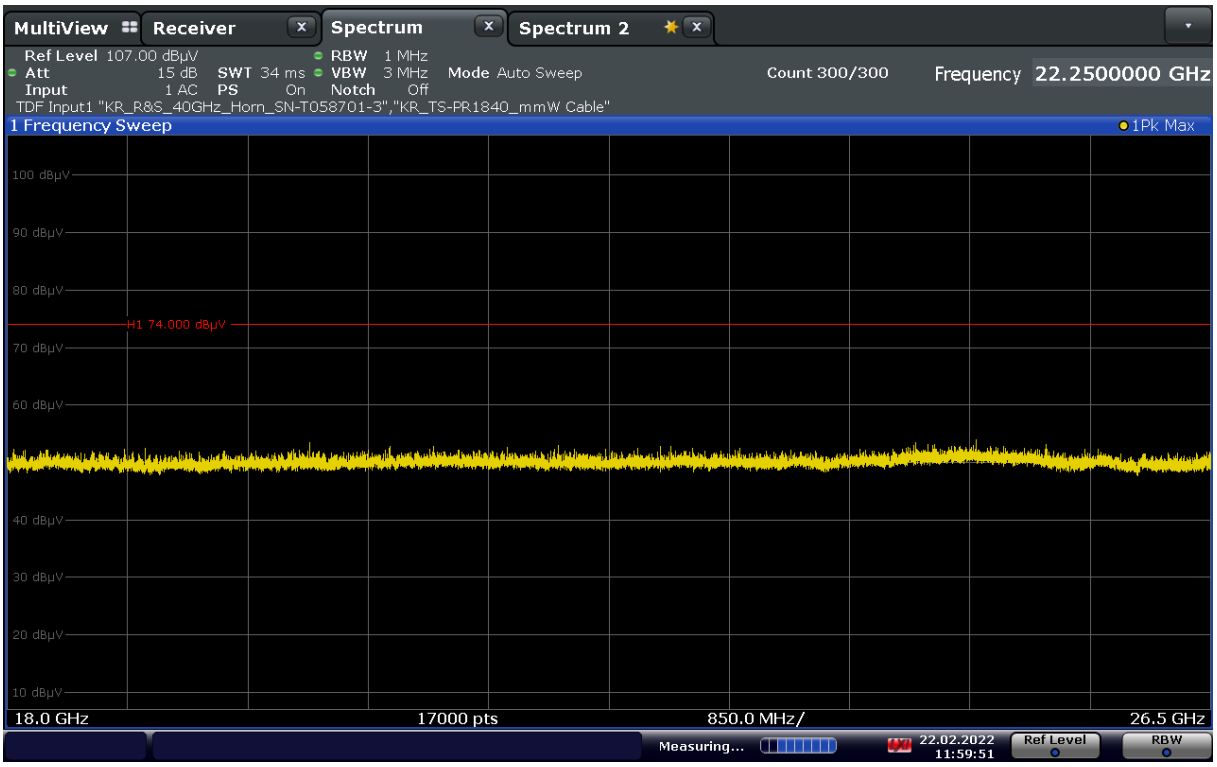
Plot 7-181. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U2C Ch. 120 – Ant. Pol. H)



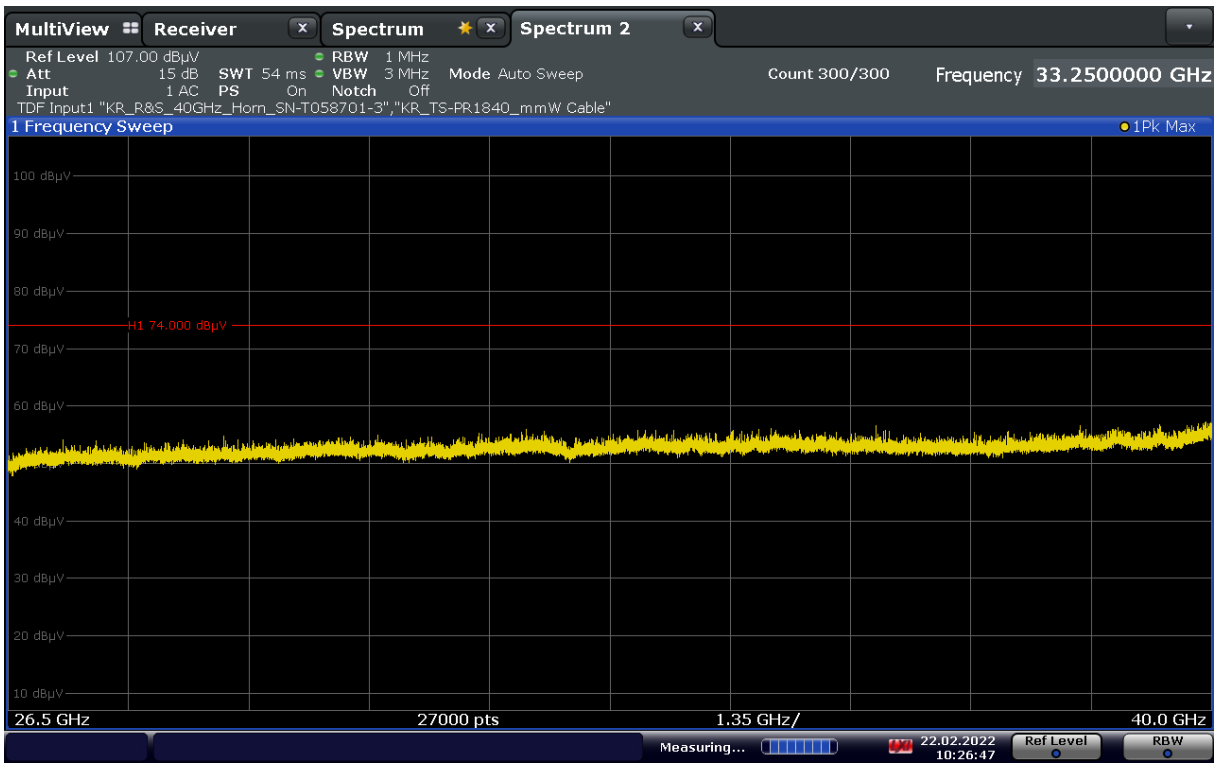
Plot 7-182. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U2C Ch. 120 – Ant. Pol. V)



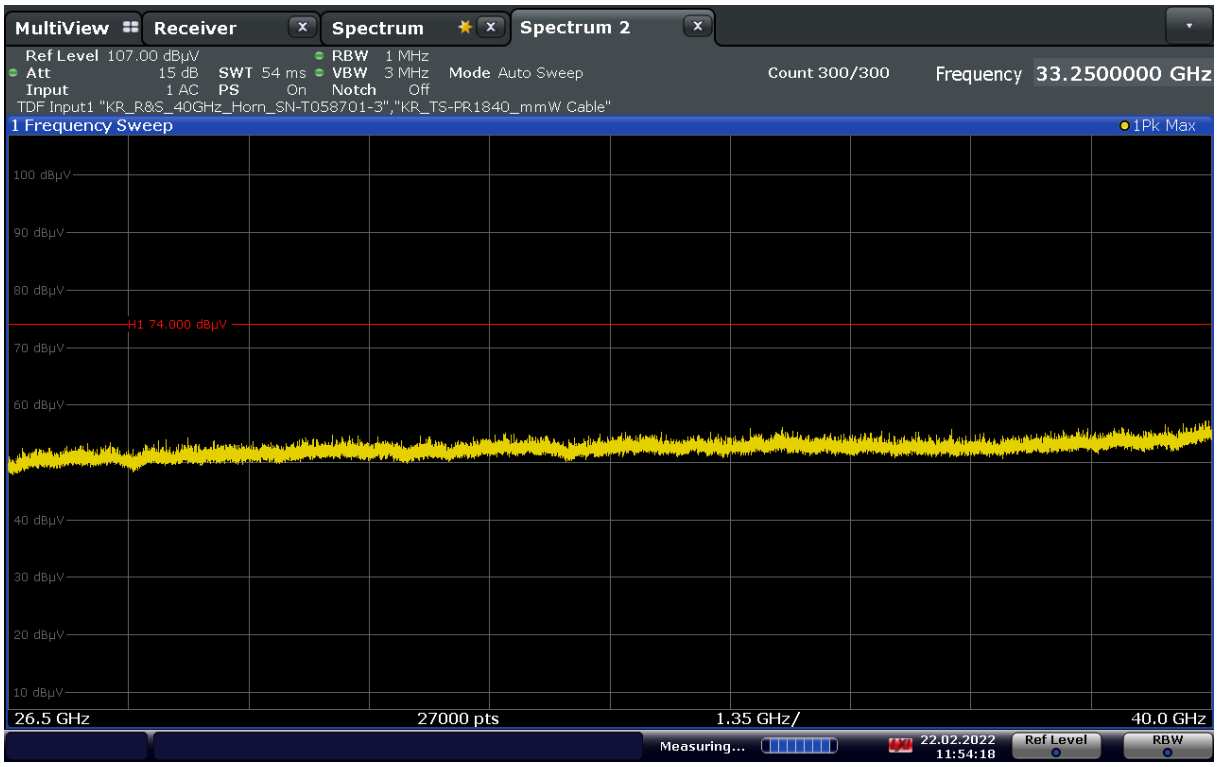
Plot 7-183. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U3 Ch. 157 – Ant. Pol. H)



Plot 7-184. Radiated Spurious Plot above 18GHz - 26.5GHz MIMO (802.11a – U3 Ch. 157 – Ant. Pol. V)



Plot 7-185. Radiated Spurious Plot 26.5GHz - 40GHz MIMO (802.11a – Ant. Pol. H)



Plot 7-186. Radiated Spurious Plot 26.5GHz - 40GHz MIMO (802.11a – Ant. Pol. V)

MIMO Radiated Spurious Emission Measurements

§15.407(b) §15.205 & §15.209; RSS-Gen [8.9]

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5180MHz
Channel:	36

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	H	-	-	-70.76	13.60	0.00	49.84	68.20	-18.36
*	15540.00	Average	H	-	-	-83.34	16.45	0.00	40.11	53.98	-13.87
*	15540.00	Peak	H	-	-	-72.25	16.45	0.00	51.20	73.98	-22.78
*	20720.00	Average	H	150	298	-57.33	-3.62	-9.54	36.51	53.98	-17.47
*	20720.00	Peak	H	150	298	-48.67	-3.62	-9.54	45.17	73.98	-28.81
	25900.00	Peak	H	150	322	-42.65	-3.07	-9.54	51.74	68.20	-16.46

Table 7-42. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5200MHz
Channel:	40

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	H	192	246	-70.33	13.03	0.00	49.70	68.20	-18.50
*	15600.00	Average	H	-	-	-83.24	16.13	0.00	39.89	53.98	-14.09
*	15600.00	Peak	H	-	-	-72.72	16.13	0.00	50.41	73.98	-23.57
*	20800.00	Average	H	150	333	-57.09	-3.63	-9.54	36.74	53.98	-17.24
*	20800.00	Peak	H	150	333	-44.68	-3.63	-9.54	49.15	73.98	-24.83
	26000.00	Peak	H	150	312	-40.90	-3.02	-9.54	53.54	68.20	-14.66

Table 7-43. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5240MHz
Channel:	48

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	H	191	235	-71.25	13.93	0.00	49.68	68.20	-18.52
*	15720.00	Average	H	191	251	-83.06	15.65	0.00	39.59	53.98	-14.39
*	15720.00	Peak	H	191	251	-71.72	15.65	0.00	50.93	73.98	-23.05
*	20960.00	Average	H	150	335	-57.98	-3.65	-9.54	35.83	53.98	-18.15
*	20960.00	Peak	H	150	335	-45.23	-3.65	-9.54	48.58	73.98	-25.40
	26200.00	Peak	H	150	297	-41.13	-2.67	-9.54	53.66	68.20	-14.54

Table 7-44. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5260MHz
Channel:	52

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	H	186	254	-70.03	13.28	0.00	50.25	68.20	-17.95
*	15780.00	Average	H	-	-	-83.45	15.74	0.00	39.29	53.98	-14.69
*	15780.00	Peak	H	-	-	-72.25	15.74	0.00	50.49	73.98	-23.49
*	21040.00	Average	H	150	336	-59.87	-3.67	-9.54	33.92	53.98	-20.06
*	21040.00	Peak	H	150	336	-47.49	-3.67	-9.54	46.30	73.98	-27.68
	26300.00	Peak	H	150	299	-42.44	-2.49	-9.54	52.53	68.20	-15.67

Table 7-45. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5280MHz
Channel:	56

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	Peak	H	181	245	-70.71	13.77	0.00	50.06	68.20	-18.14
*	15840.00	Average	H	151	232	-82.62	15.67	0.00	40.05	53.98	-13.93
*	15840.00	Peak	H	151	232	-71.66	15.67	0.00	51.01	73.98	-22.97
*	21120.00	Average	H	150	328	-58.11	-3.63	-9.54	35.72	53.98	-18.26
*	21120.00	Peak	H	150	328	-47.01	-3.63	-9.54	46.82	73.98	-27.16
	26400.00	Peak	H	150	295	-43.60	-3.02	-9.54	50.84	68.20	-17.36

Table 7-46. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5320MHz
Channel:	64

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	H	159	235	-81.91	13.38	0.00	38.47	53.98	-15.51
*	10640.00	Peak	H	159	235	-71.17	13.38	0.00	49.21	73.98	-24.77
*	15960.00	Average	H	175	209	-82.52	14.75	0.00	39.23	53.98	-14.75
*	15960.00	Peak	H	175	209	-71.48	14.75	0.00	50.27	73.98	-23.71
*	21280.00	Average	H	150	338	-59.62	-3.64	-9.54	34.20	53.98	-19.78
*	21280.00	Peak	H	150	338	-49.46	-3.64	-9.54	44.36	73.98	-29.62
	26600.00	Peak	H	150	288	-46.10	-1.87	-9.54	49.49	68.20	-18.71

Table 7-47. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5500MHz
Channel:	100

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	H	171	234	-82.53	13.69	0.00	38.16	53.98	-15.82
*	11000.00	Peak	H	171	234	-71.73	13.69	0.00	48.96	73.98	-25.02
	16500.00	Peak	H	173	205	-70.45	15.49	0.00	52.04	68.20	-16.16
	22000.00	Peak	H	150	338	-51.03	-3.97	-9.54	42.46	68.20	-25.74
	27500.00	Peak	H	150	291	-48.24	-1.30	-9.54	47.92	68.20	-20.28

Table 7-48. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5500MHz
Channel:	120

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11200.00	Average	H	-	-	-82.84	14.17	0.00	38.33	53.98	-15.65
*	11200.00	Peak	H	-	-	-72.25	14.17	0.00	48.92	73.98	-25.06
	16800.00	Peak	H	169	237	-68.22	17.00	0.00	55.78	68.20	-12.42
*	22400.00	Average	H	150	338	-60.52	-3.79	-9.54	33.15	53.98	-20.83
*	22400.00	Peak	H	150	338	-49.69	-3.79	-9.54	43.98	73.98	-30.00
	28000.00	Peak	H	150	276	-47.85	-1.48	-9.54	48.13	68.20	-20.07

Table 7-49. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5720MHz
Channel:	144

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11440.00	Average	H	-	-	-83.38	14.83	0.00	38.45	53.98	-15.53
*	11440.00	Peak	H	-	-	-72.71	14.83	0.00	49.12	73.98	-24.86
	17160.00	Peak	H	169	258	-66.68	18.59	0.00	58.91	68.20	-9.29
*	22880.00	Average	H	150	332	-60.50	-3.74	-9.54	33.22	53.98	-20.76
*	22880.00	Peak	H	150	332	-49.13	-3.74	-9.54	44.59	73.98	-29.39
	28600.00	Peak	H	150	289	-49.93	-0.98	-9.54	46.55	68.20	-21.65

Table 7-50. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5745MHz
Channel:	149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11490.00	Average	H	-	-	-83.02	14.92	0.00	38.90	53.98	-15.08
*	11490.00	Peak	H	-	-	-72.44	14.92	0.00	49.48	73.98	-24.50
	17235.00	Peak	H	168	264	-65.76	19.05	0.00	60.29	68.20	-7.91
*	22980.00	Average	H	150	307	-61.23	-3.80	-9.54	32.43	53.98	-21.55
*	22980.00	Peak	H	150	307	-50.78	-3.80	-9.54	42.88	73.98	-31.10
	28725.00	Peak	H	150	268	-49.09	-0.80	-9.54	47.57	69.20	-21.63

Table 7-51. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5785MHz
Channel:	157

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11570.00	Average	H	-	-	-82.82	14.62	0.00	38.80	53.98	-15.18
*	11570.00	Peak	H	-	-	-71.45	14.62	0.00	50.17	73.98	-23.81
	17355.00	Peak	H	169	264	-68.20	20.61	0.00	59.41	68.20	-8.79
	23140.00	Peak	H	150	310	-51.00	-3.82	-9.54	42.64	68.20	-25.56
	28925.00	Peak	H	150	276	-48.88	-0.97	-9.54	47.61	68.20	-20.59

Table 7-52. Radiated Measurements MIMO

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	1 & 3 Meters
Operating Frequency:	5825MHz
Channel:	165

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11650.00	Average	H	-	-	-82.68	14.29	0.00	38.61	53.98	-15.37
*	11650.00	Peak	H	-	-	-71.77	14.29	0.00	49.52	73.98	-24.46
	17475.00	Peak	H	167	263	-70.76	21.71	0.00	57.95	68.20	-10.25
	23300.00	Peak	H	150	331	-51.14	-3.83	-9.54	42.49	68.20	-25.71
	29125.00	Peak	H	150	278	-48.99	-0.31	-9.54	48.16	68.20	-20.04

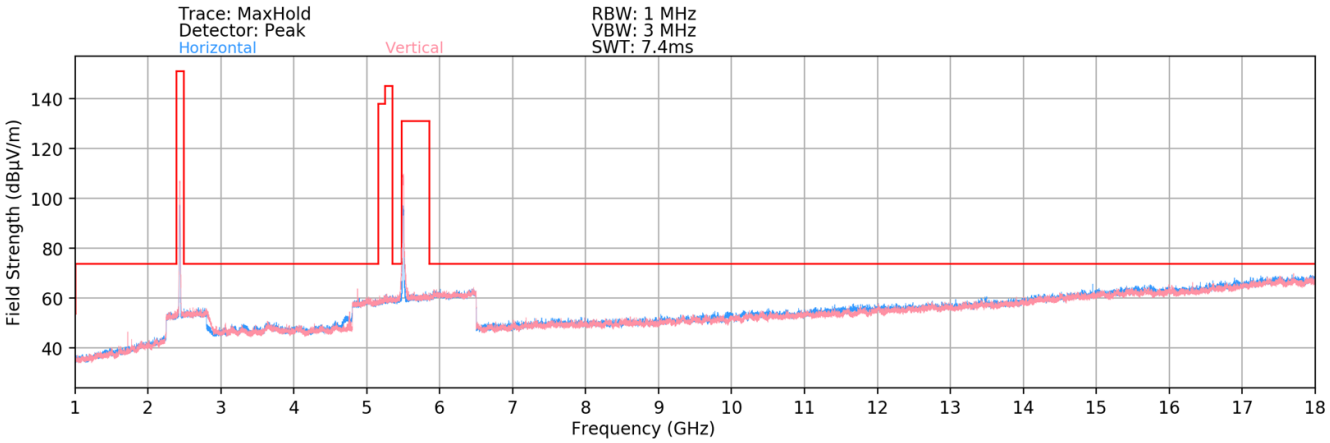
Table 7-53. Radiated Measurements MIMO

7.6.4 Simultaneous Tx Radiated Spurious Emissions Measurements

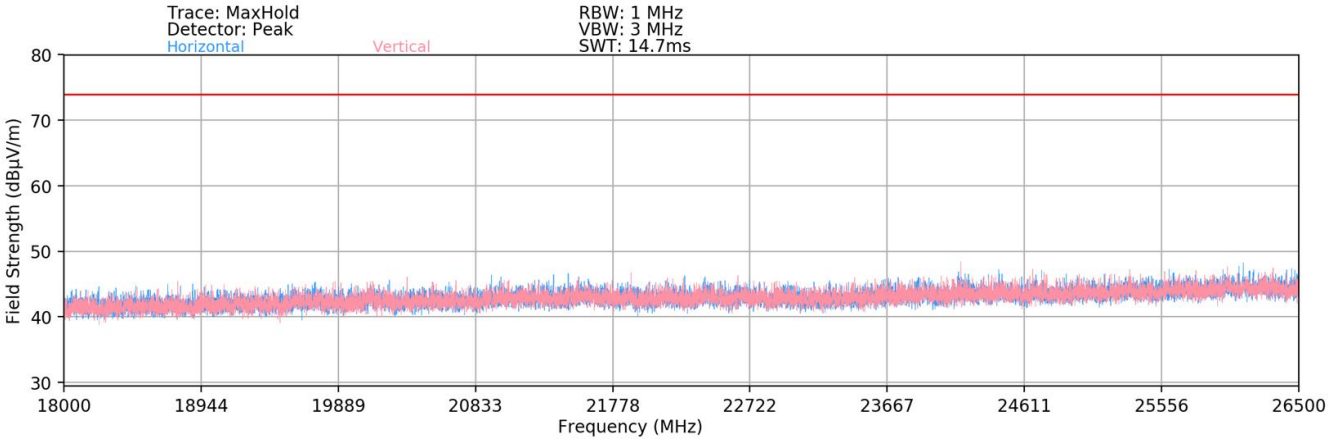
§15.407(b) §15.205 & §15.209; RSS-Gen [8.9]

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	2
Channel	6	100
Operating Frequency (MHz)	2437	5500
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

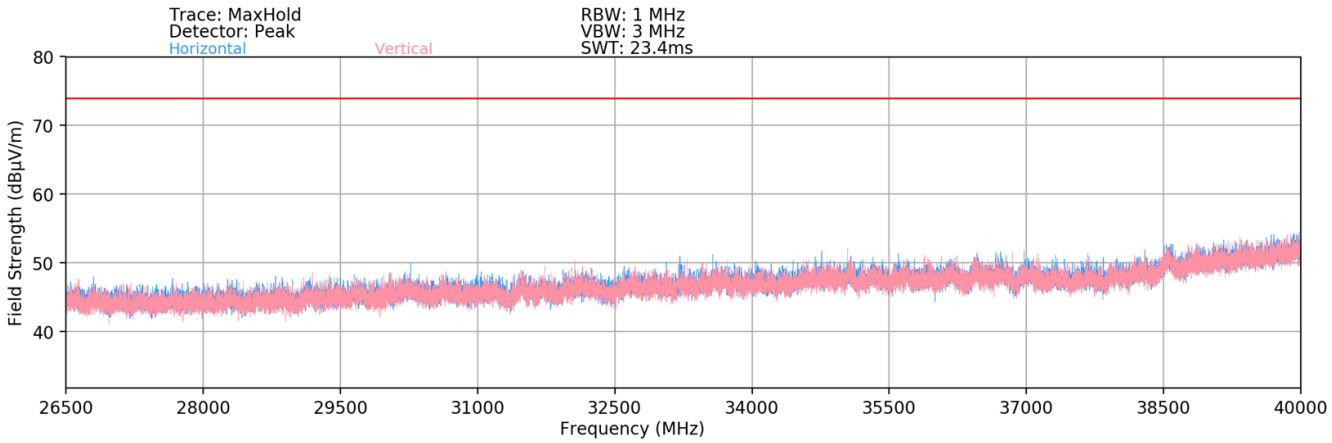
Table 7-54. Simultaneous Transmission Config-1



Plot 7-187. Radiated Spurious Plot above 1GHz (2.4GHz – 5GHz)



Plot 7-188. Radiated Spurious Plot 18GHz – 26.5GHz (2.4GHz – 5GHz)



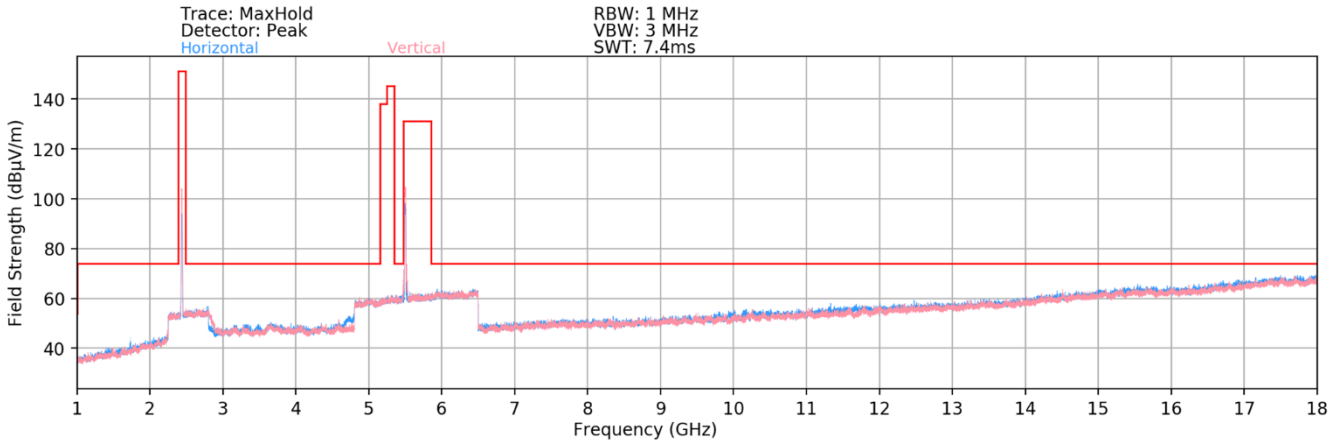
Plot 7-189. Radiated Spurious Plot above 26.5GHz (2.4GHz – 5GHz)

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	3689.00	Average	H	-	-	-82.63	8.30	32.67	53.98	-21.31
*	3689.00	Peak	H	-	-	-72.47	8.30	42.84	73.98	-31.14
	6752.00	Peak	H	-	-	-72.20	15.81	50.61	68.20	-17.59
	8563.00	Peak	H	-	-	-73.18	18.65	52.47	68.20	-15.73
*	11626.00	Average	H	-	-	-84.36	22.50	45.14	53.98	-8.84
*	11626.00	Peak	H	-	-	-73.57	22.50	55.93	73.98	-18.05

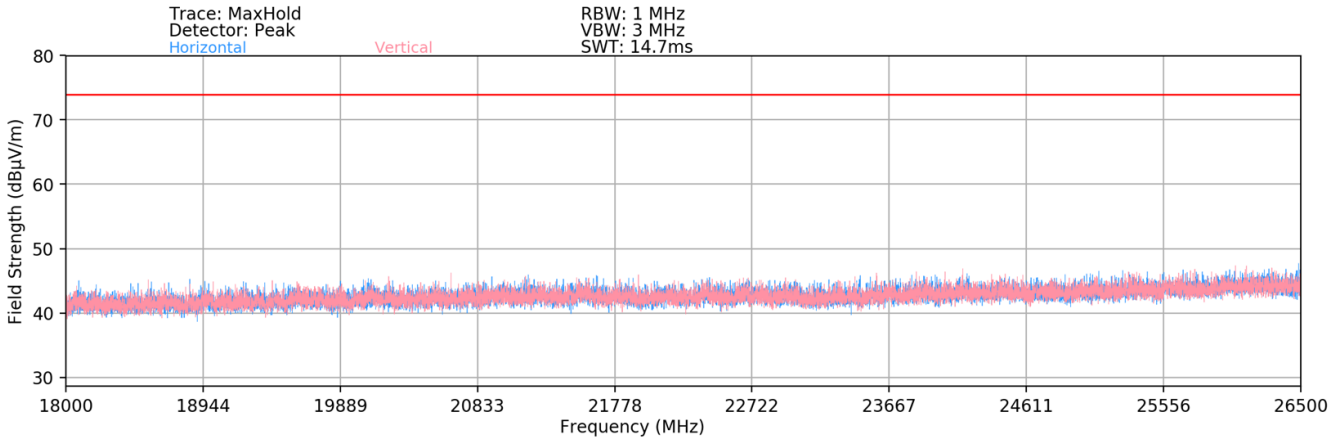
Table 7-55. Radiated Measurements (ANT1 2.4GHz – ANT2 5GHz)

Description	2.4 GHz Emission	5 GHz Emission
Antenna	2	1
Channel	6	100
Operating Frequency (MHz)	2437	5500
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

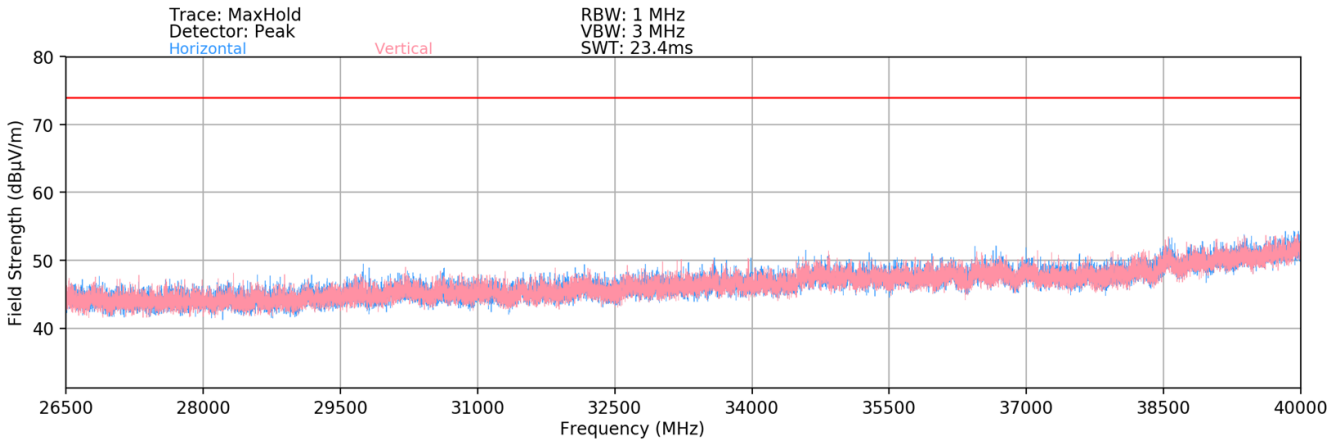
Table 7-56. Simultaneous Transmission Config-2



Plot 7-190. Radiated Spurious Plot above 1GHz (5GHz – 2.4 GHz)



Plot 7-191. Radiated Spurious Plot 18GHz – 26.5GHz (5GHz – 2.4 GHz)



Plot 7-192. Radiated Spurious Plot above 26.5GHz (5GHz – 2.4 GHz)

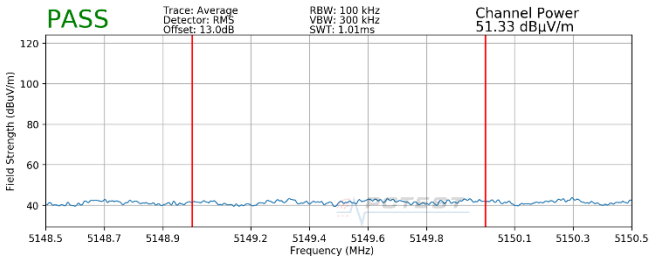
	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	3689.00	Average	V	-	-	-81.34	8.30	33.97	53.98	-20.01
*	3689.00	Peak	V	-	-	-70.60	8.30	44.70	73.98	-29.28
	6752.00	Peak	V	-	-	-72.87	15.81	49.94	68.20	-18.26
	8563.00	Peak	V	-	-	-73.33	18.65	52.32	68.20	-15.88
*	11626.00	Average	V	-	-	-84.92	23.90	45.98	53.98	-8.00
*	11626.00	Peak	V	-	-	-73.96	23.90	56.95	73.98	-17.03

Table 7-57. Radiated Measurements (ANT1 5GHz – ANT2 2.4GHz)

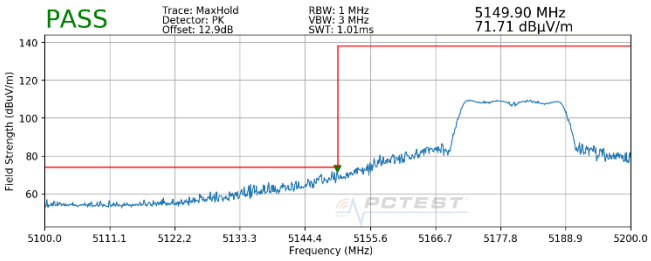
7.6.5 SISO Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]; RSS-Gen [8.9]

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36

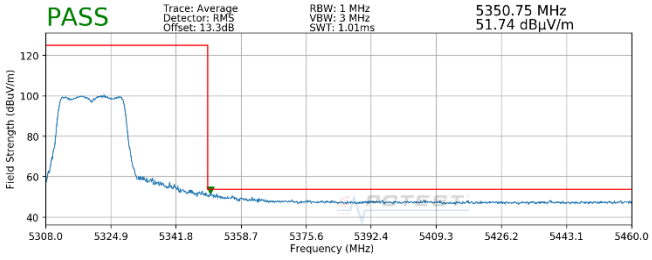


Plot 7-193. Radiated Lower Band Edge Plot SISO ANT1 (Average – UNII Band 1)

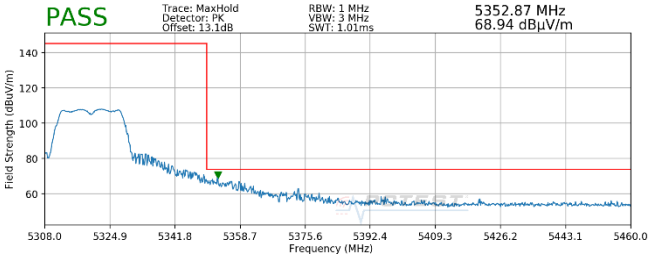


Plot 7-194. Radiated Lower Band Edge Plot SISO ANT1 (Peak – UNII Band 1)

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64

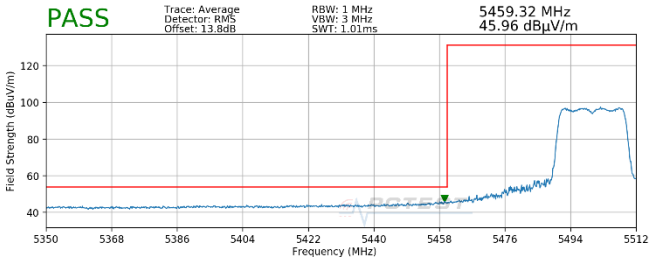


Plot 7-195. Radiated Upper Band Edge Plot SISO ANT1 (Average – UNII Band 2A)

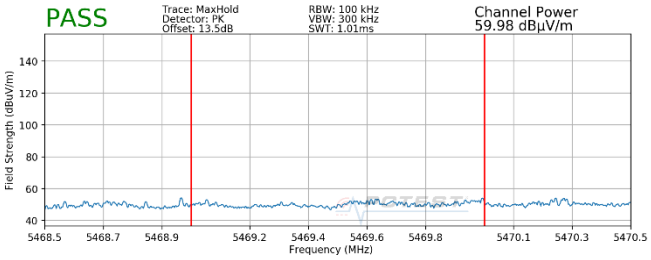


Plot 7-196. Radiated Upper Band Edge Plot SISO ANT1 (Peak – UNII Band 2A)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100

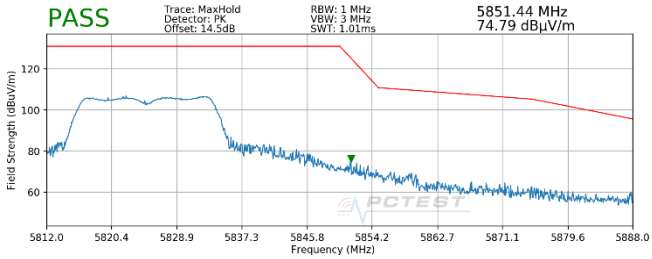


Plot 7-197. Radiated Lower Band Edge Plot SISO ANT1 (Average – UNII Band 2C)



Plot 7-198. Radiated Lower Band Edge Plot SISO ANT1 (Peak – UNII Band 2C)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165

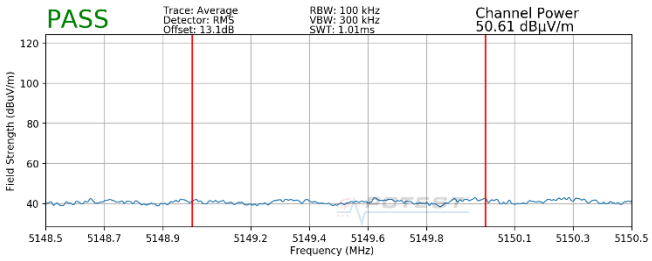


Plot 7-199. Radiated Upper Band Edge Plot SISO ANT1 (Peak – UNII Band 3)

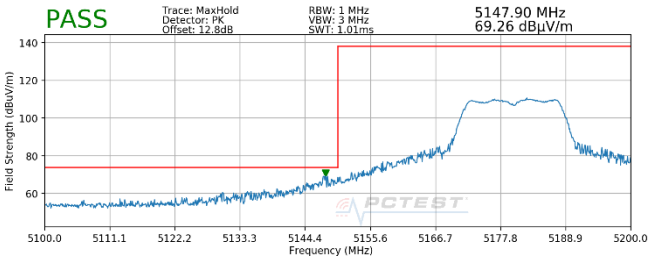
7.6.6 SISO Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36

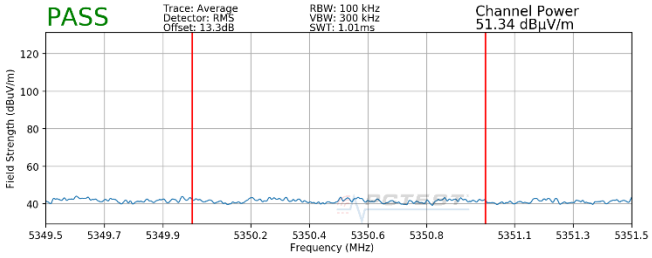


Plot 7-200. Radiated Lower Band Edge Plot SISO ANT2 (Average – UNII Band 1)

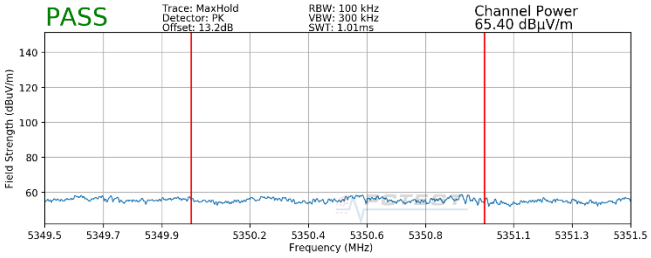


Plot 7-201. Radiated Lower Band Edge Plot SISO ANT2 (Peak – UNII Band 1)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64

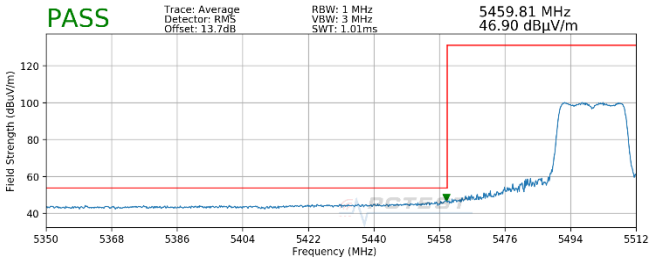


Plot 7-202. Radiated Upper Band Edge Plot SISO ANT2 (Average – UNII Band 2A)

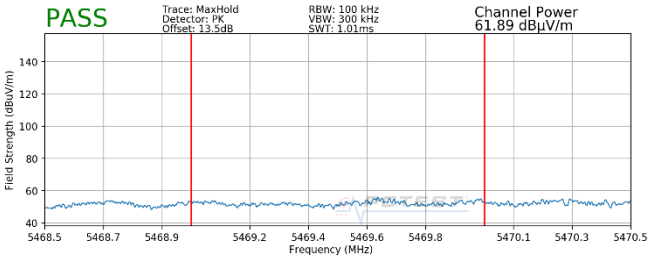


Plot 7-203. Radiated Upper Band Edge Plot SISO ANT2 (Peak – UNII Band 2A)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100

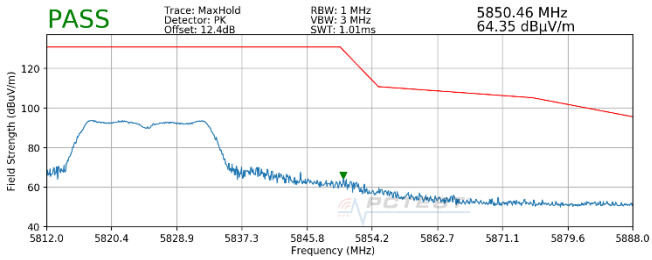


Plot 7-204. Radiated Lower Band Edge Plot SISO ANT2 (Average – UNII Band 2C)



Plot 7-205. Radiated Lower Band Edge Plot SISO ANT2 (Peak – UNII Band 2C)

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165

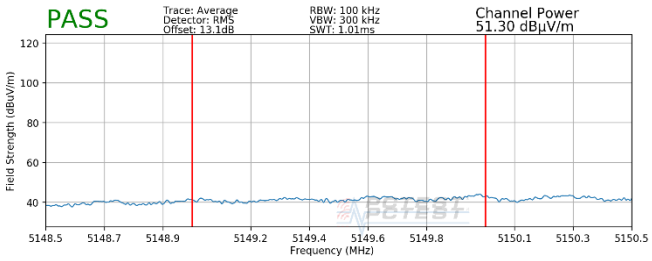


Plot 7-206. Radiated Upper Band Edge Plot SISO ANT2 (Peak – UNII Band 3)

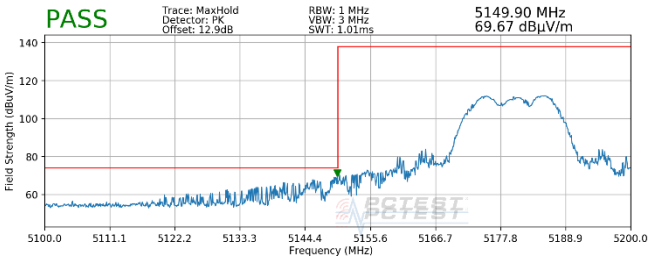
7.6.7 MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	6Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36

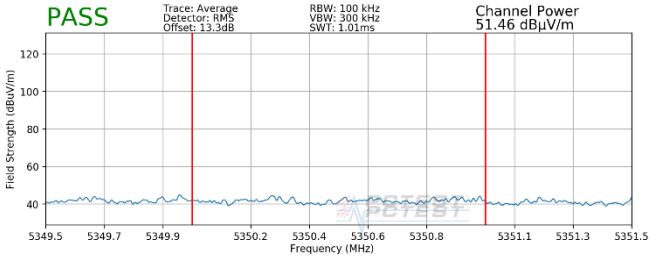


Plot 7-207. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 1)

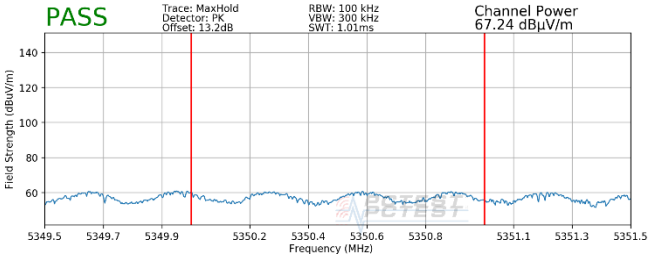


Plot 7-208. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 1)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64

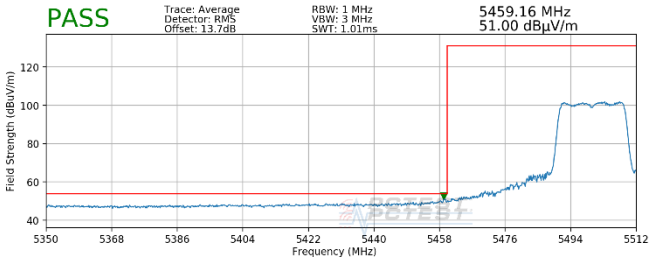


Plot 7-209. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 2A)

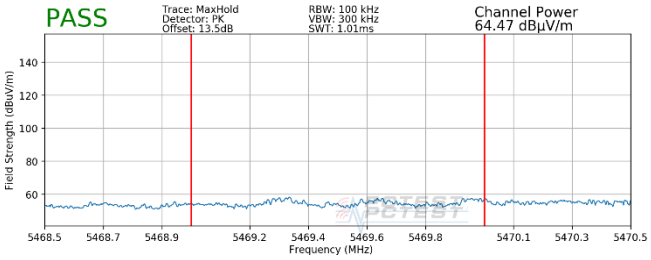


Plot 7-210. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 2A)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100

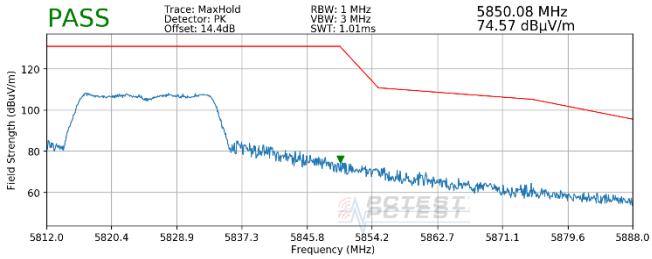


Plot 7-211. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 2C)



Plot 7-212. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 2C)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165



Plot 7-213. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 3)

7.7 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-58 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-58. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

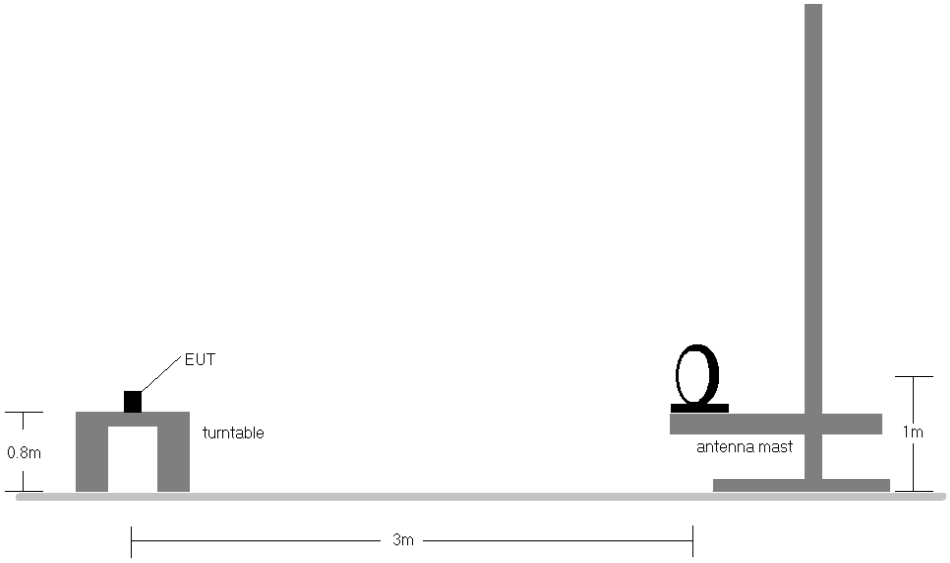


Figure 7-6. Radiated Test Setup < 30MHz

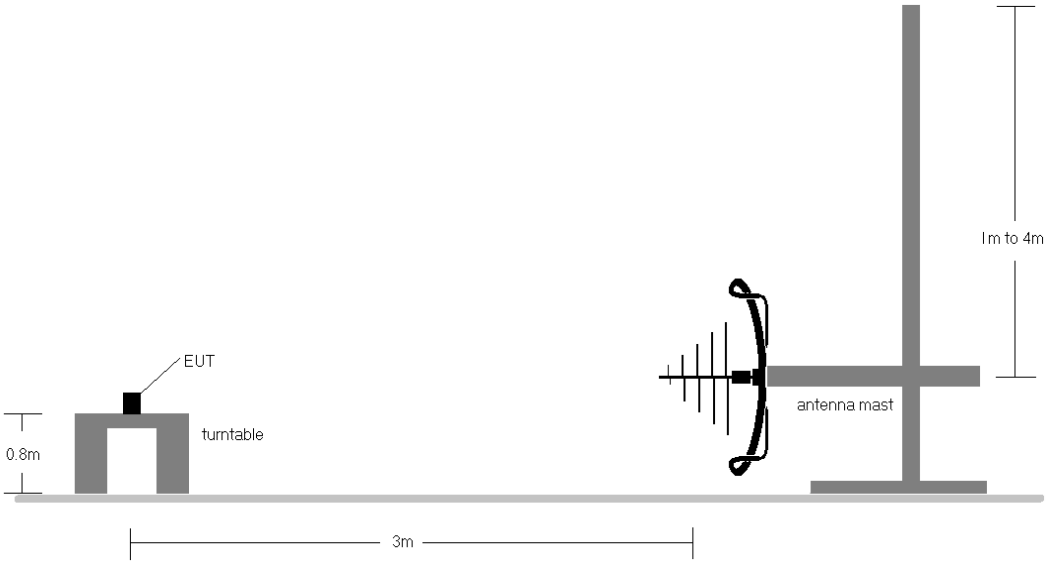


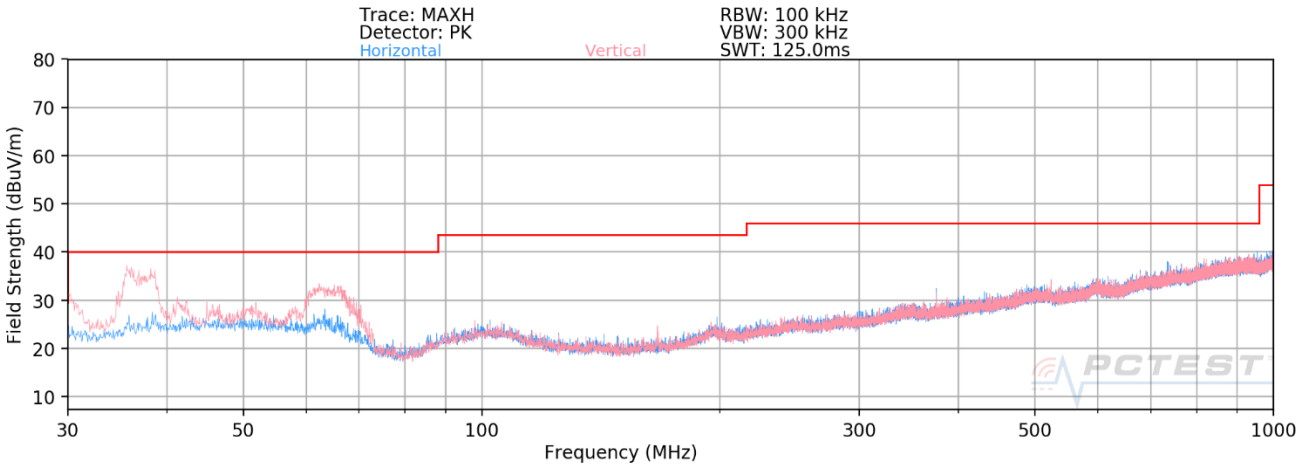
Figure 7-7. Radiated Test Setup < 1GHz

Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-58.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. The unit was tested while powered by a DC power source.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

MIMO Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]



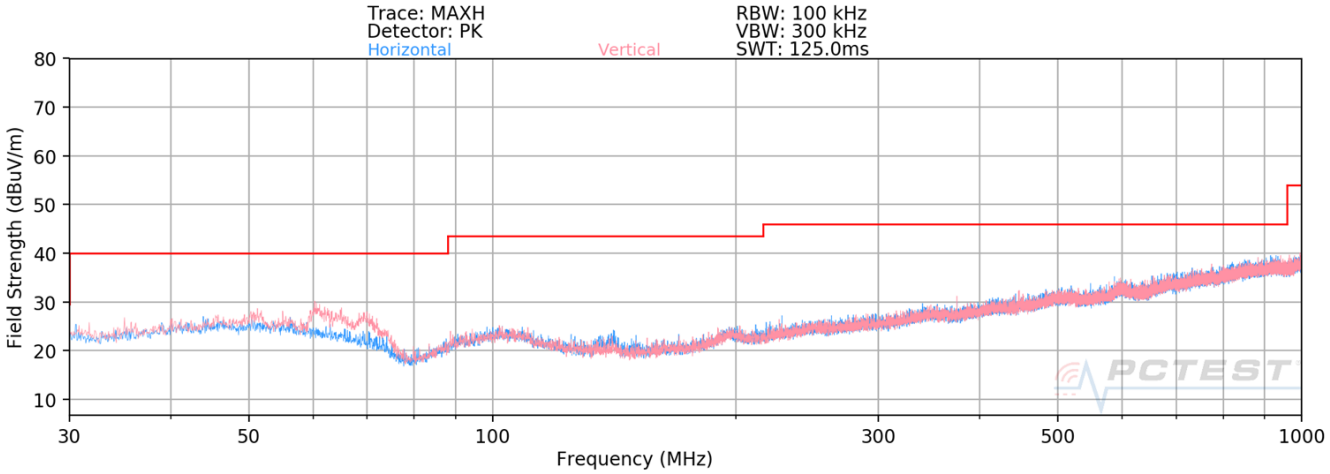
Plot 7-214. Radiated Spurious Plot below 1GHz MIMO

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
36.15	Quasi-Peak	V	112	179	-84.60	12.05	34.45	40.00	-5.55
42.36	Quasi-Peak	V	103	175	-94.40	14.00	26.60	40.00	-13.40
68.11	Quasi-Peak	V	114	204	-92.80	10.86	25.06	40.00	-14.94
166.88	Quasi-Peak	V	112	184	-99.90	9.85	16.95	43.52	-26.58
374.95	Quasi-Peak	V	110	155	-96.90	16.67	26.77	46.02	-19.25
499.93	Quasi-Peak	V	102	149	-102.00	19.12	24.12	46.02	-21.90

Table 7-59. Radiated measurements below 1GHz MIMO

Simultaneous Tx Radiated Spurious Emissions Measurements (Below 1GHz)

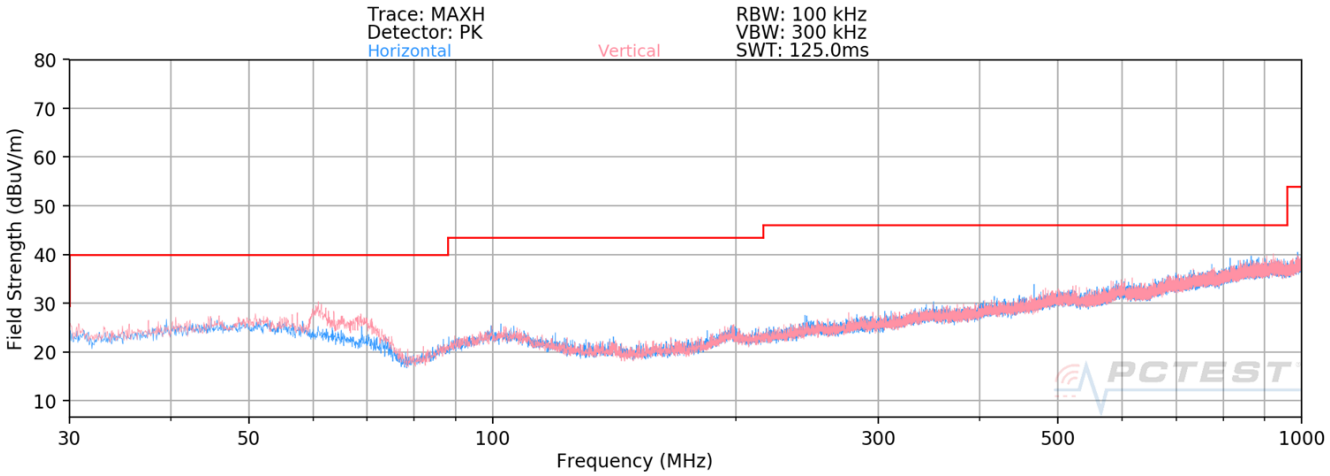
§15.209; RSS-Gen [8.9]



Plot 7-215. Radiated Spurious Plot below 1GHz (2.4GHz – 5GHz)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
49.48	Quasi-Peak	V	102	9	-98.90	14.64	22.74	40.00	-17.26
62.03	Quasi-Peak	V	100	8	-94.20	12.86	25.66	40.00	-14.34
148.50	Quasi-Peak	H	218	308	-97.20	9.09	18.89	43.52	-24.63
374.94	Quasi-Peak	H	247	298	-98.90	16.63	24.73	46.02	-21.29
456.60	Quasi-Peak	V	109	262	-94.00	17.92	30.92	46.02	-15.10
596.30	Quasi-Peak	V	-	-	-100.70	21.07	27.37	46.02	-18.65

Table 7-60. Radiated Spurious Emissions below 1GHz RSDB



Plot 7-216. Radiated Spurious Plot below 1GHz (5GHz – 2.4 GHz)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
61.29	Quasi-Peak	V	101	10	-94.40	13.07	25.67	40.00	-14.33
143.25	Quasi-Peak	H	137	338	-94.50	9.07	21.57	43.52	-21.95
166.26	Quasi-Peak	V	107	15	-98.10	9.79	18.69	43.52	-24.83
285.44	Quasi-Peak	V	120	4	-99.50	14.50	22.00	46.02	-24.02
449.95	Quasi-Peak	H	160	8	-95.40	17.91	29.51	46.02	-16.51
492.74	Quasi-Peak	V	105	338	-99.70	19.10	26.40	46.02	-19.62

Table 7-61. Radiated Spurious Emissions below 1GHz RSDB

7.8 Line-Conducted Test Data

§15.407; RSS-Gen [8.8]

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

Frequency of emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-62. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

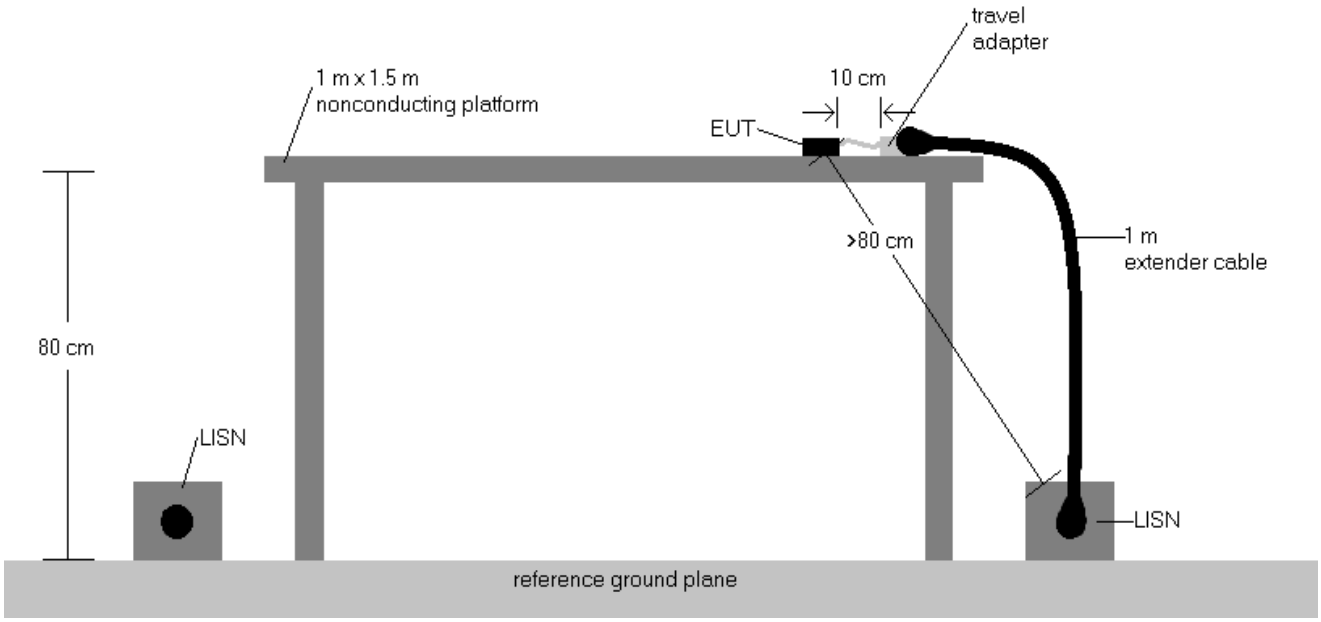
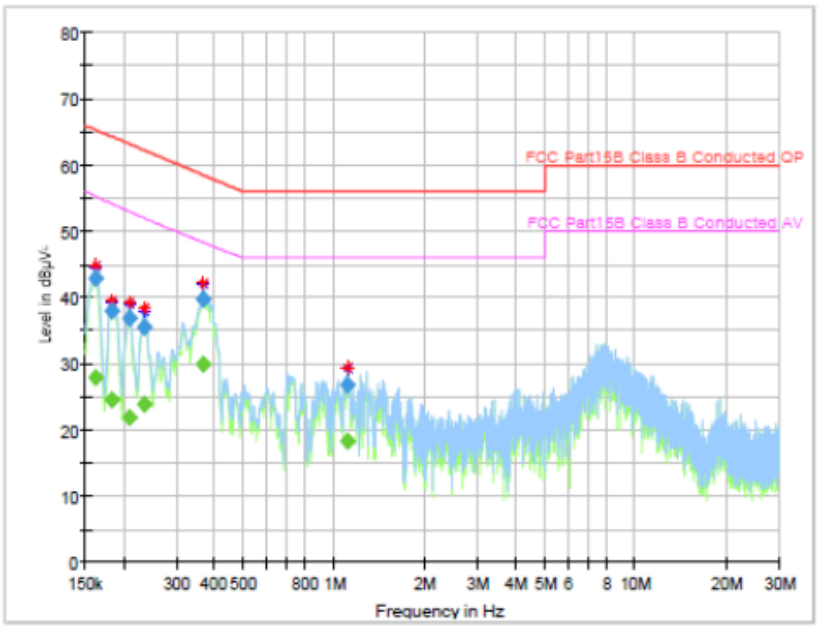


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207 and RSS-Gen (8.8).
3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
5. Margin (dB) = QP/AV Limit (dBμV) - QP/AV Level (dBμV)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

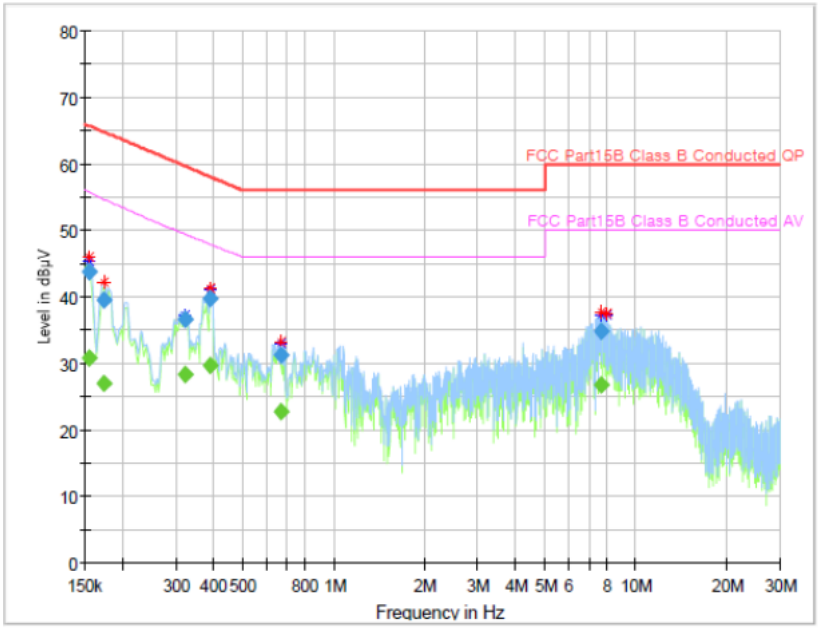


Plot 7-217. Line Conducted Plot with 802.11a UNII Band 1 (L1)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.161940	---	27.86	55.30	27.44	1000.0	9.000	L1	9.9
0.161940	42.91	---	65.36	22.45	1000.0	9.000	L1	9.9
0.182835	---	24.53	54.22	29.68	1000.0	9.000	L1	10.0
0.182835	38.03	---	64.36	26.32	1000.0	9.000	L1	10.0
0.209700	---	21.99	53.02	31.02	1000.0	9.000	L1	9.8
0.209700	36.88	---	63.22	26.33	1000.0	9.000	L1	9.8
0.236565	---	24.01	51.98	27.97	1000.0	9.000	L1	9.7
0.236565	35.57	---	62.22	26.65	1000.0	9.000	L1	9.7
0.370890	---	30.01	48.30	18.29	1000.0	9.000	L1	9.8
0.370890	39.71	---	58.48	18.77	1000.0	9.000	L1	9.8
1.111170	---	18.38	46.00	27.62	1000.0	9.000	L1	9.8
1.111170	26.87	---	56.00	29.13	1000.0	9.000	L1	9.8

Table 7-63. Line Conducted Data with 802.11a UNII Band 1 (L1)

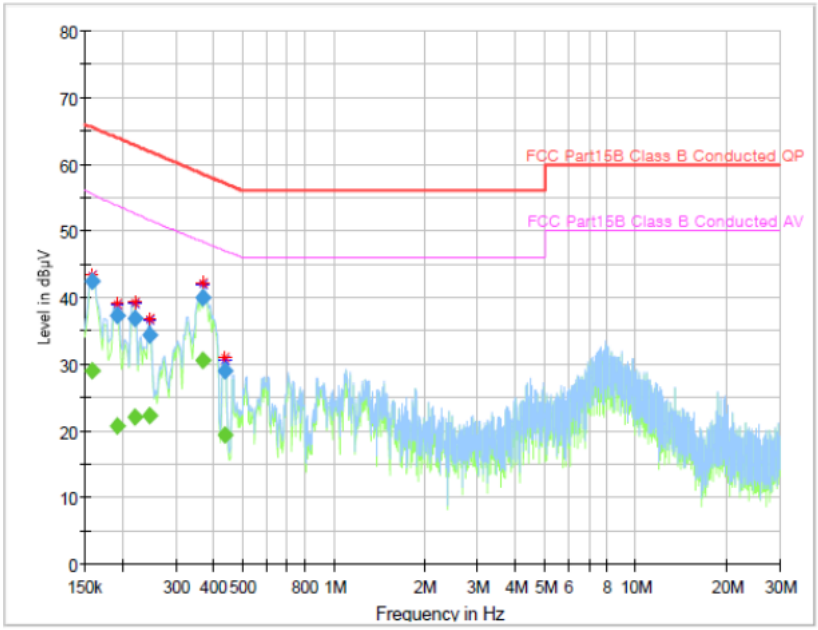


Plot 7-218. Line Conducted Plot with 802.11a UNII Band 1 (N)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155970	---	30.76	55.64	24.89	1000.0	9.000	N	9.8
0.155970	43.85	---	65.68	21.83	1000.0	9.000	N	9.8
0.173880	---	26.94	54.67	27.73	1000.0	9.000	N	10.0
0.173880	39.63	---	64.77	25.14	1000.0	9.000	N	10.0
0.323130	---	28.29	49.40	21.11	1000.0	9.000	N	9.8
0.323130	36.63	---	59.63	22.99	1000.0	9.000	N	9.8
0.391785	---	29.77	47.87	18.10	1000.0	9.000	N	9.9
0.391785	39.86	---	58.03	18.16	1000.0	9.000	N	9.9
0.669390	---	22.79	46.00	23.21	1000.0	9.000	N	9.9
0.669390	31.26	---	56.00	24.74	1000.0	9.000	N	9.9
7.708020	---	26.79	50.00	23.21	1000.0	9.000	N	10.1
7.708020	34.91	---	60.00	25.09	1000.0	9.000	N	10.1

Table 7-64. Line Conducted Data with 802.11a UNII Band 1 (N)

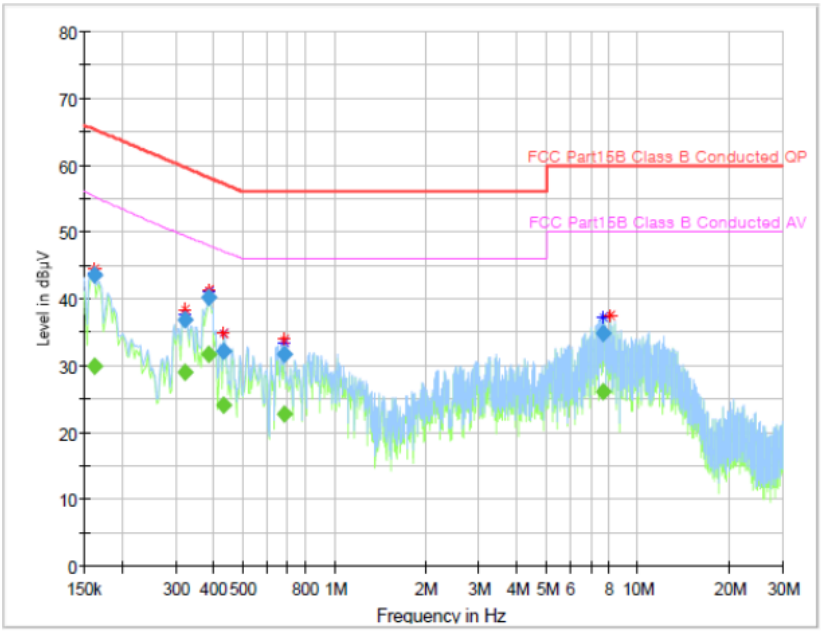


Plot 7-219. Line Conducted Plot with 802.11a UNII Band 2A (L1)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.158955	---	29.13	55.47	26.34	1000.0	9.000	L1	9.9
0.158955	42.38	---	65.52	23.14	1000.0	9.000	L1	9.9
0.191790	---	20.70	53.80	33.10	1000.0	9.000	L1	9.9
0.191790	37.33	---	63.96	26.63	1000.0	9.000	L1	9.9
0.218655	---	22.04	52.66	30.61	1000.0	9.000	L1	9.8
0.218655	36.87	---	62.87	26.00	1000.0	9.000	L1	9.8
0.245520	---	22.45	51.67	29.22	1000.0	9.000	L1	9.7
0.245520	34.48	---	61.91	27.43	1000.0	9.000	L1	9.7
0.370890	---	30.60	48.30	17.70	1000.0	9.000	L1	9.8
0.370890	39.90	---	58.48	18.58	1000.0	9.000	L1	9.8
0.436560	---	19.40	47.03	27.63	1000.0	9.000	L1	9.9
0.436560	29.04	---	57.13	28.09	1000.0	9.000	L1	9.9

Table 7-65. Line Conducted Data with 802.11a UNII Band 2A (L1)

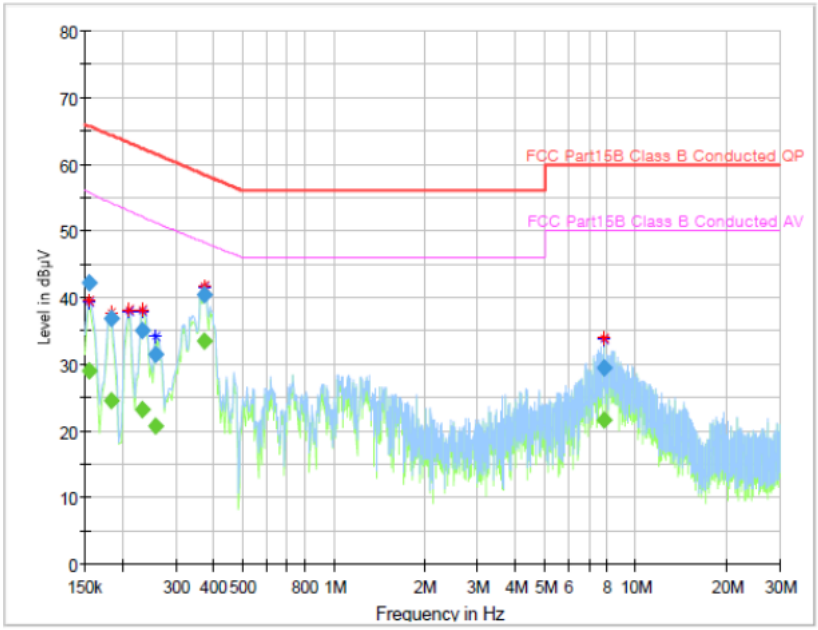


Plot 7-220. Line Conducted Plot with 802.11a UNII Band 2A (N)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.161940	---	29.84	55.30	25.46	1000.0	9.000	N	9.9
0.161940	43.64	---	65.36	21.72	1000.0	9.000	N	9.9
0.323130	---	29.01	49.40	20.39	1000.0	9.000	N	9.8
0.323130	36.91	---	59.63	22.71	1000.0	9.000	N	9.8
0.385815	---	31.82	47.99	16.17	1000.0	9.000	N	9.9
0.385815	40.28	---	58.15	17.87	1000.0	9.000	N	9.9
0.433575	---	24.23	47.08	22.85	1000.0	9.000	N	9.9
0.433575	32.29	---	57.18	24.90	1000.0	9.000	N	9.9
0.681330	---	22.73	46.00	23.27	1000.0	9.000	N	9.9
0.681330	31.70	---	56.00	24.30	1000.0	9.000	N	9.9
7.702050	---	26.10	50.00	23.90	1000.0	9.000	N	10.1
7.702050	34.75	---	60.00	25.25	1000.0	9.000	N	10.1

Table 7-66. Line Conducted Data with 802.11a UNII Band 2A (N)

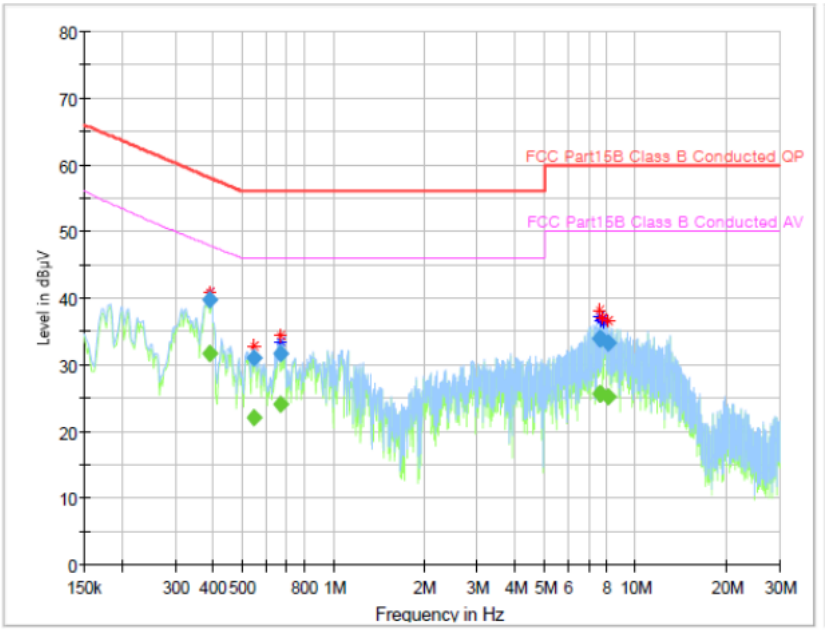


Plot 7-221. Line Conducted Plot with 802.11a UNII Band 2C (L1)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155970	---	28.95	55.64	26.69	1000.0	9.000	L1	9.8
0.155970	42.32	---	65.68	23.36	1000.0	9.000	L1	9.8
0.182835	---	24.57	54.22	29.65	1000.0	9.000	L1	10.0
0.182835	36.88	---	64.36	27.47	1000.0	9.000	L1	10.0
0.233580	---	23.31	52.09	28.78	1000.0	9.000	L1	9.7
0.233580	35.08	---	62.32	27.24	1000.0	9.000	L1	9.7
0.257460	---	20.84	51.27	30.43	1000.0	9.000	L1	9.7
0.257460	31.55	---	61.51	29.97	1000.0	9.000	L1	9.7
0.373875	---	33.49	48.24	14.75	1000.0	9.000	L1	9.8
0.373875	40.54	---	58.41	17.88	1000.0	9.000	L1	9.8
7.833390	---	21.61	50.00	28.39	1000.0	9.000	L1	10.1
7.833390	29.50	---	60.00	30.50	1000.0	9.000	L1	10.1

Table 7-67. Line Conducted Data with 802.11a UNII Band 2C (L1)

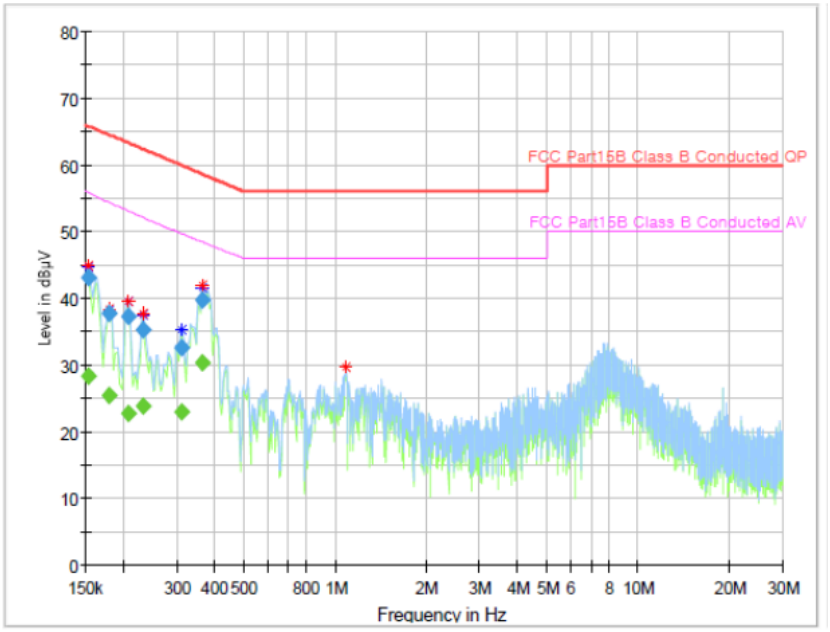


Plot 7-222. Line Conducted Plot with 802.11a UNII Band 2C (N)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.391785	---	31.65	47.87	16.22	1000.0	9.000	N	9.9
0.391785	39.79	---	58.03	18.24	1000.0	9.000	N	9.9
0.549990	---	22.02	46.00	23.98	1000.0	9.000	N	9.9
0.549990	31.06	---	56.00	24.94	1000.0	9.000	N	9.9
0.666405	---	24.05	46.00	21.95	1000.0	9.000	N	9.9
0.666405	31.66	---	56.00	24.34	1000.0	9.000	N	9.9
7.624440	---	25.66	50.00	24.34	1000.0	9.000	N	10.1
7.624440	33.92	---	60.00	26.08	1000.0	9.000	N	10.1
7.657275	---	25.80	50.00	24.20	1000.0	9.000	N	10.1
7.657275	34.04	---	60.00	25.96	1000.0	9.000	N	10.1
8.119950	---	25.36	50.00	24.64	1000.0	9.000	N	10.1
8.119950	33.19	---	60.00	26.81	1000.0	9.000	N	10.1

Table 7-68. Line Conducted Data with 802.11a UNII Band 2C (N)

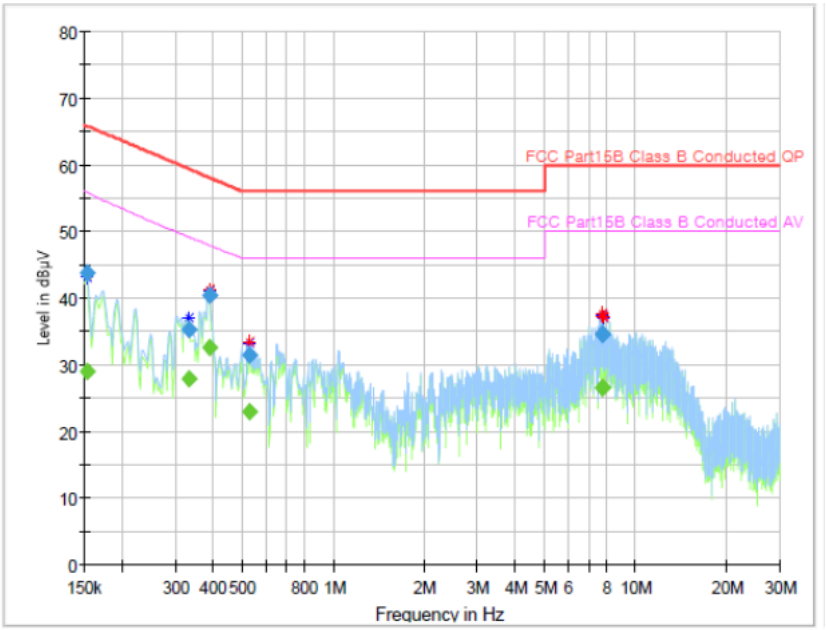


Plot 7-223. Line Conducted Plot with 802.11a UNII Band 3 (L1)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.152985	---	28.35	55.82	27.47	1000.0	9.000	L1	9.8
0.152985	43.24	---	65.84	22.60	1000.0	9.000	L1	9.8
0.179850	---	25.46	54.36	28.90	1000.0	9.000	L1	10.0
0.179850	37.82	---	64.49	26.67	1000.0	9.000	L1	10.0
0.206715	---	22.72	53.14	30.42	1000.0	9.000	L1	9.9
0.206715	37.31	---	63.34	26.03	1000.0	9.000	L1	9.9
0.233580	---	23.98	52.09	28.12	1000.0	9.000	L1	9.7
0.233580	35.32	---	62.32	27.01	1000.0	9.000	L1	9.7
0.311190	---	22.93	49.71	26.77	1000.0	9.000	L1	9.7
0.311190	32.72	---	59.94	27.22	1000.0	9.000	L1	9.7
0.364920	---	30.43	48.43	17.99	1000.0	9.000	L1	9.8
0.364920	39.87	---	58.62	18.75	1000.0	9.000	L1	9.8

Table 7-69. Line Conducted Data with 802.11a UNII Band 3 (L1)



Plot 7-224. Line Conducted Plot with 802.11a UNII Band 3 (N)

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.152985	---	29.15	55.82	26.67	1000.0	9.000	N	9.8
0.152985	43.71	---	65.84	22.13	1000.0	9.000	N	9.8
0.332085	---	27.87	49.18	21.31	1000.0	9.000	N	9.8
0.332085	35.41	---	59.40	23.99	1000.0	9.000	N	9.8
0.388800	---	32.54	47.93	15.39	1000.0	9.000	N	9.9
0.388800	40.35	---	58.09	17.74	1000.0	9.000	N	9.9
0.529095	---	23.08	46.00	22.92	1000.0	9.000	N	9.9
0.529095	31.44	---	56.00	24.56	1000.0	9.000	N	9.9
7.761750	---	26.62	50.00	23.38	1000.0	9.000	N	10.1
7.761750	34.70	---	60.00	25.30	1000.0	9.000	N	10.1
7.809510	---	26.60	50.00	23.40	1000.0	9.000	N	10.1
7.809510	34.58	---	60.00	25.42	1000.0	9.000	N	10.1

Table 7-70. Line Conducted Data with 802.11a UNII Band 3 (N)

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Seowon Intech LTE Indoor CPE FCC ID: V7MESLCTGA** is in compliance with in compliance with Part 15 Subpart E (15.047) of FCC Rules.