



4.4 Power Spectral Density

Test Procedures

Maximum Power Spectral Density (KDB 789033, Method SA-2)
Multiple Transmitter Output (KDB 662911 D01, D02)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Test Settings :

Center frequency = the highest, middle and the lowest channels

- a) RBW = 1 MHz, 500 KHz (UNII 3)
- b) VBW = 3 MHz, 1.5 MHz (UNII 3)
- c) Sweep time = auto
- d) Detector = power averaging (rms)
- e) Trace mode = Average at least 100
- f) Duty cycle factor = $10\log(1/x)$

Test mode	Duty Cycle Factor (dB)
802.11a	0.58
802.11n_HT20	0.62
802.11n_HT40	1.14
802.11ac_VHT20	0.60
802.11ac_VHT40	1.13
802.11ac_VHT80	2.04



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (75) / (166) Pages

Limit

Operating Mode	ANT Configuration	ANT Gain (dBi)	Mode	Band	Limit (dBm)
SISO	ANT0	2.00	802.11a/n/ac	UNII 1	11
				UNII 2A	11
	ANT1	2.00		UNII 2C	11
				UNII 3	30
MIMO (2Tx)	ANT0 + ANT1	5.01	802.11a/n/ac	UNII 1	11
				UNII 2A	11
				UNII 2C	11
				UNII 3	30

Test Data

ANTO

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	-1.98	0.58	-1.40	11.00	12.40
	5 200	-2.10	0.58	-1.52	11.00	12.52
	5 240	-2.21	0.58	-1.63	11.00	12.63
	5 260	-2.50	0.58	-1.92	11.00	12.92
	5 300	-2.34	0.58	-1.76	11.00	12.76
	5 320	-2.09	0.58	-1.51	11.00	12.51
	5 500	-1.68	0.58	-1.10	11.00	12.10
	5 600	-1.81	0.58	-1.23	11.00	12.23
	5 720	-0.99	0.58	-0.41	11.00	11.41
	5 745	-2.57	0.58	-1.99	30.00	31.99
	5 785	-2.37	0.58	-1.79	30.00	31.79
	5 825	-1.28	0.58	-0.70	30.00	30.70
802.11n _HT20	5 180	-3.50	0.62	-2.88	11.00	13.88
	5 200	-2.55	0.62	-1.93	11.00	12.93
	5 240	-4.17	0.62	-3.55	11.00	14.55
	5 260	-2.99	0.62	-2.37	11.00	13.37
	5 300	-3.78	0.62	-3.16	11.00	14.16
	5 320	-3.36	0.62	-2.74	11.00	13.74
	5 500	-2.14	0.62	-1.52	11.00	12.52
	5 600	-2.54	0.62	-1.92	11.00	12.92
	5 720	-1.58	0.62	-0.96	11.00	11.96
	5 745	-2.60	0.62	-1.98	30.00	31.98
	5 785	-1.90	0.62	-1.28	30.00	31.28
	5 825	-1.64	0.62	-1.02	30.00	31.02
802.11ac _VHT20	5 180	-3.65	0.60	-3.05	11.00	14.05
	5 200	-4.49	0.60	-3.89	11.00	14.89
	5 240	-3.83	0.60	-3.23	11.00	14.23
	5 260	-4.79	0.60	-4.19	11.00	15.19
	5 300	-4.91	0.60	-4.31	11.00	15.31
	5 320	-4.68	0.60	-4.08	11.00	15.08
	5 500	-2.62	0.60	-2.02	11.00	13.02
	5 600	-2.70	0.60	-2.10	11.00	13.10
	5 720	-1.88	0.60	-1.28	11.00	12.28
	5 745	-2.14	0.60	-1.54	30.00	31.54



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (77) / (166) Pages

	5 785	-2.87	0.60	-2.27	30.00	32.27
	5 825	-1.48	0.60	-0.88	30.00	30.88
802.11n _HT40	5 190	-8.29	1.14	-7.15	11.00	18.15
	5 230	-8.65	1.14	-7.51	11.00	18.51
	5 270	-6.86	1.14	-5.72	11.00	16.72
	5 310	-7.26	1.14	-6.12	11.00	17.12
	5 510	-4.58	1.14	-3.44	11.00	14.44
	5 590	-5.43	1.14	-4.29	11.00	15.29
	5 710	-4.31	1.14	-3.17	11.00	14.17
	5 755	-5.67	1.14	-4.53	30.00	34.53
	5 795	-4.74	1.14	-3.60	30.00	33.60
802.11ac _VHT40	5 190	-8.11	1.13	-6.98	11.00	17.98
	5 230	-7.69	1.13	-6.56	11.00	17.56
	5 270	-6.50	1.13	-5.37	11.00	16.37
	5 310	-7.01	1.13	-5.88	11.00	16.88
	5 510	-4.28	1.13	-3.15	11.00	14.15
	5 590	-4.94	1.13	-3.81	11.00	14.81
	5 710	-3.85	1.13	-2.72	11.00	13.72
	5 755	-5.62	1.13	-4.49	30.00	34.49
5 795	-5.21	1.13	-4.08	30.00	34.08	
802.11ac _VHT80	5 210	-11.48	2.04	-9.44	11.00	20.44
	5 290	-11.99	2.04	-9.95	11.00	20.95
	5 530	-8.32	2.04	-6.28	11.00	17.28
	5 690	-7.96	2.04	-5.92	11.00	16.92
	5 775	-8.97	2.04	-6.93	30.00	36.93
Measurement uncertainty		± 1.5 dB				

ANT1

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	0.08	0.58	0.66	11.00	10.34
	5 200	0.72	0.58	1.30	11.00	9.70
	5 240	0.27	0.58	0.85	11.00	10.15
	5 260	0.58	0.58	1.16	11.00	9.84
	5 300	0.63	0.58	1.21	11.00	9.79
	5 320	0.80	0.58	1.38	11.00	9.62
	5 500	0.59	0.58	1.17	11.00	9.83
	5 600	-0.92	0.58	-0.34	11.00	11.34
	5 720	-0.86	0.58	-0.28	11.00	11.28
	5 745	-2.64	0.58	-2.06	30.00	32.06
	5 785	-5.63	0.58	-5.05	30.00	35.05
	5 825	-2.13	0.58	-1.55	30.00	31.55
802.11n _HT20	5 180	-1.13	0.62	-0.51	11.00	11.51
	5 200	-0.68	0.62	-0.06	11.00	11.06
	5 240	-0.87	0.62	-0.25	11.00	11.25
	5 260	-1.54	0.62	-0.92	11.00	11.92
	5 300	-1.26	0.62	-0.64	11.00	11.64
	5 320	-1.21	0.62	-0.59	11.00	11.59
	5 500	-2.08	0.62	-1.46	11.00	12.46
	5 600	-2.62	0.62	-2.00	11.00	13.00
	5 720	-2.20	0.62	-1.58	11.00	12.58
	5 745	-3.33	0.62	-2.71	30.00	32.71
	5 785	-3.53	0.62	-2.91	30.00	32.91
	5 825	-2.96	0.62	-2.34	30.00	32.34
802.11ac _VHT20	5 180	-0.18	0.60	0.42	11.00	10.58
	5 200	0.02	0.60	0.62	11.00	10.38
	5 240	-0.46	0.60	0.14	11.00	10.86
	5 260	-1.23	0.60	-0.63	11.00	11.63
	5 300	-1.08	0.60	-0.48	11.00	11.48
	5 320	-0.87	0.60	-0.27	11.00	11.27
	5 500	-2.29	0.60	-1.69	11.00	12.69
	5 600	-3.11	0.60	-2.51	11.00	13.51
	5 720	-3.74	0.60	-3.14	11.00	14.14
	5 745	-4.03	0.60	-3.43	30.00	33.43
	5 785	-3.08	0.60	-2.48	30.00	32.48



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (79) / (166) Pages

	5 825	-3.56	0.60	-2.96	30.00	32.96
802.11n _HT40	5 190	-5.26	1.14	-4.12	11.00	15.12
	5 230	-4.65	1.14	-3.51	11.00	14.51
	5 270	-3.61	1.14	-2.47	11.00	13.47
	5 310	-4.01	1.14	-2.87	11.00	13.87
	5 510	-3.25	1.14	-2.11	11.00	13.11
	5 590	-4.26	1.14	-3.12	11.00	14.12
	5 710	-5.25	1.14	-4.11	11.00	15.11
	5 755	-6.12	1.14	-4.98	30.00	34.98
	5 795	-5.51	1.14	-4.37	30.00	34.37
802.11ac _VHT40	5 190	-3.67	1.13	-2.54	11.00	13.54
	5 230	-4.17	1.13	-3.04	11.00	14.04
	5 270	-4.26	1.13	-3.13	11.00	14.13
	5 310	-3.73	1.13	-2.60	11.00	13.60
	5 510	-3.63	1.13	-2.50	11.00	13.50
	5 590	-4.41	1.13	-3.28	11.00	14.28
	5 710	-4.95	1.13	-3.82	11.00	14.82
	5 755	-6.05	1.13	-4.92	30.00	34.92
	5 795	-5.81	1.13	-4.68	30.00	34.68
802.11ac _VHT80	5 210	-7.50	2.04	-5.46	11.00	16.46
	5 290	-7.95	2.04	-5.91	11.00	16.91
	5 530	-6.99	2.04	-4.95	11.00	15.95
	5 690	-9.37	2.04	-7.33	11.00	18.33
	5 775	-10.58	2.04	-8.54	30.00	38.54
Measurement uncertainty		± 1.5 dB				

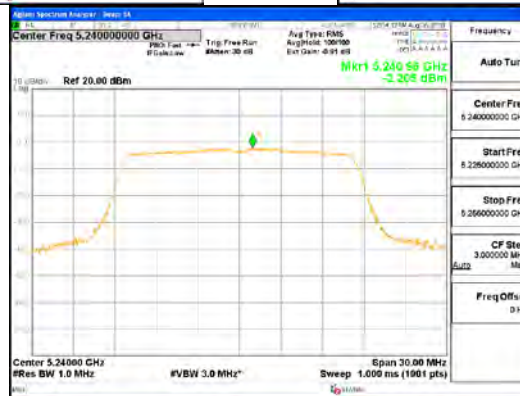
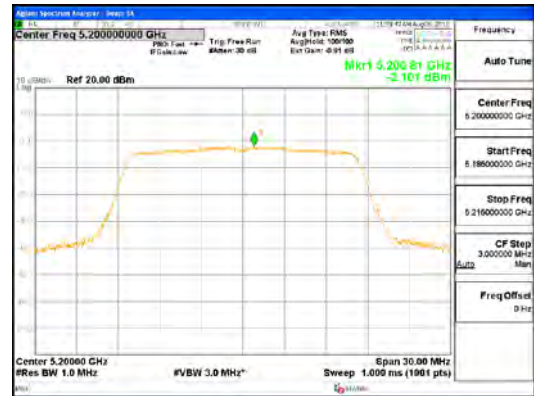
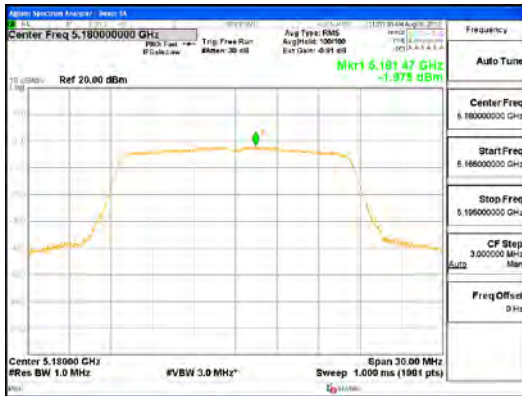
ANTO + ANT1

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	2.18	0.58	2.76	11.00	8.24
	5 200	2.55	0.58	3.13	11.00	7.87
	5 240	2.21	0.58	2.79	11.00	8.21
	5 260	2.32	0.58	2.90	11.00	8.10
	5 300	2.40	0.58	2.98	11.00	8.02
	5 320	2.60	0.58	3.18	11.00	7.82
	5 500	2.61	0.58	3.19	11.00	7.81
	5 600	1.67	0.58	2.25	11.00	8.75
	5 720	2.09	0.58	2.67	11.00	8.33
	5 745	0.41	0.58	0.99	30.00	29.01
	5 785	-0.69	0.58	-0.11	30.00	30.11
	5 825	1.33	0.58	1.91	30.00	28.09
802.11n _HT20	5 180	0.86	0.62	1.48	11.00	9.52
	5 200	1.50	0.62	2.12	11.00	8.88
	5 240	0.80	0.62	1.42	11.00	9.58
	5 260	0.81	0.62	1.43	11.00	9.57
	5 300	0.67	0.62	1.29	11.00	9.71
	5 320	0.86	0.62	1.48	11.00	9.52
	5 500	0.90	0.62	1.52	11.00	9.48
	5 600	0.43	0.62	1.05	11.00	9.95
	5 720	1.13	0.62	1.75	11.00	9.25
	5 745	0.06	0.62	0.68	30.00	29.32
	5 785	0.37	0.62	0.99	30.00	29.01
	5 825	0.76	0.62	1.38	30.00	28.62
802.11ac _VHT20	5 180	1.43	0.60	2.03	11.00	8.97
	5 200	1.34	0.60	1.94	11.00	9.06
	5 240	1.18	0.60	1.78	11.00	9.22
	5 260	0.36	0.60	0.96	11.00	10.04
	5 300	0.42	0.60	1.02	11.00	9.98
	5 320	0.64	0.60	1.24	11.00	9.76
	5 500	0.56	0.60	1.16	11.00	9.84
	5 600	0.11	0.60	0.71	11.00	10.29
	5 720	0.30	0.60	0.90	11.00	10.10
	5 745	0.03	0.60	0.63	30.00	29.37

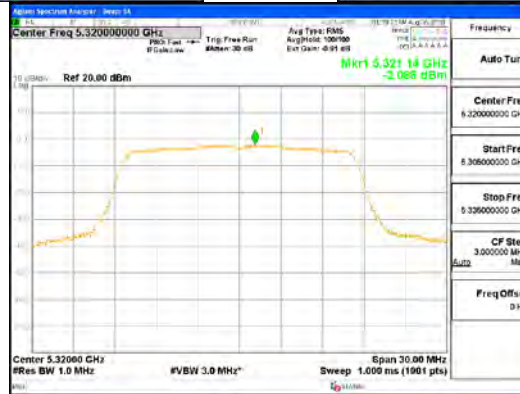
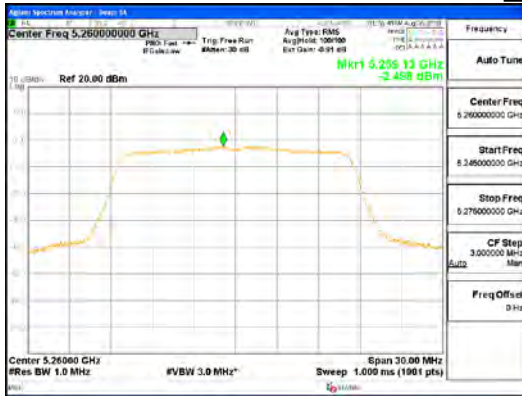


	5 785	0.04	0.60	0.64	30.00	29.36
	5 825	0.61	0.60	1.21	30.00	28.79
802.11n _HT40	5 190	-3.51	1.14	-2.37	11.00	13.37
	5 230	-3.19	1.14	-2.05	11.00	13.05
	5 270	-1.93	1.14	-0.79	11.00	11.79
	5 310	-2.33	1.14	-1.19	11.00	12.19
	5 510	-0.85	1.14	0.29	11.00	10.71
	5 590	-1.80	1.14	-0.66	11.00	11.66
	5 710	-1.74	1.14	-0.60	11.00	11.60
	5 755	-2.88	1.14	-1.74	30.00	31.74
	5 795	-2.10	1.14	-0.96	30.00	30.96
802.11ac _VHT40	5 190	-2.34	1.13	-1.21	11.00	12.21
	5 230	-2.57	1.13	-1.44	11.00	12.44
	5 270	-2.23	1.13	-1.10	11.00	12.10
	5 310	-2.06	1.13	-0.93	11.00	11.93
	5 510	-0.93	1.13	0.20	11.00	10.80
	5 590	-1.66	1.13	-0.53	11.00	11.53
	5 710	-1.35	1.13	-0.22	11.00	11.22
	5 755	-2.82	1.13	-1.69	30.00	31.69
5 795	-2.49	1.13	-1.36	30.00	31.36	
802.11ac _VHT80	5 210	-6.04	2.04	-4.00	11.00	15.00
	5 290	-6.51	2.04	-4.47	11.00	15.47
	5 530	-4.59	2.04	-2.55	11.00	13.55
	5 690	-5.60	2.04	-3.56	11.00	14.56
	5 775	-6.69	2.04	-4.65	30.00	34.65
Measurement uncertainty		± 1.5 dB				

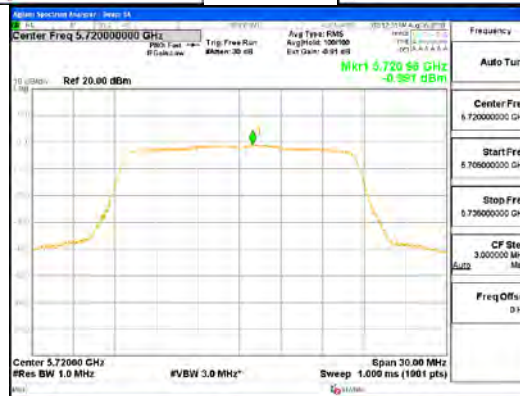
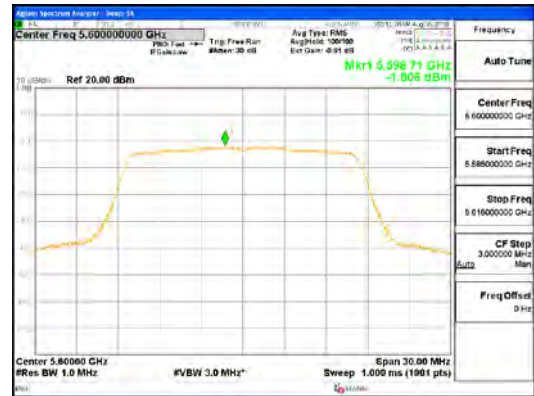
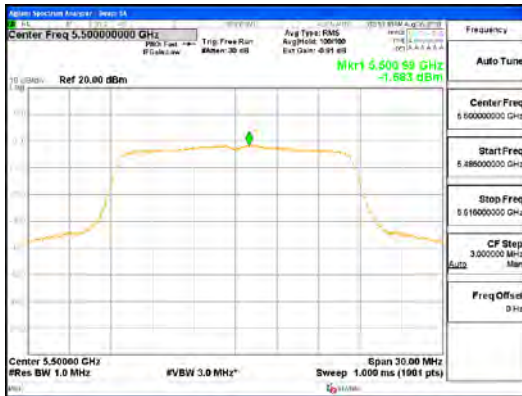
See next pages for actual measured spectrum plots.



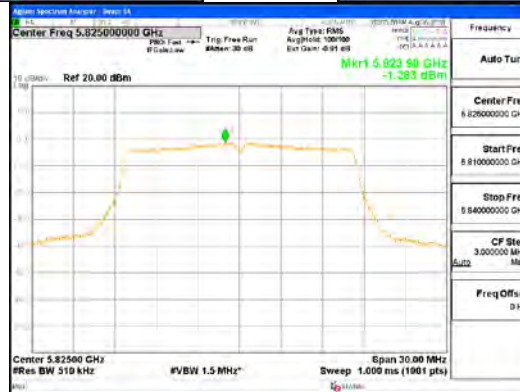
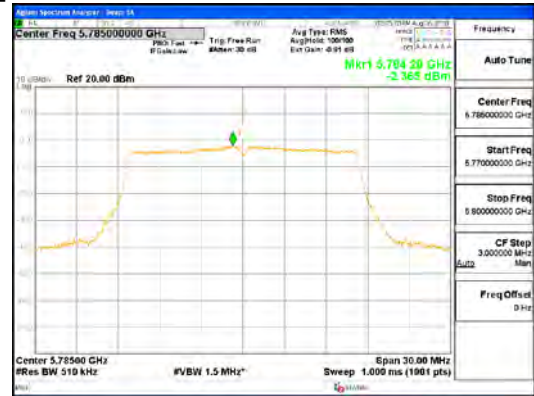
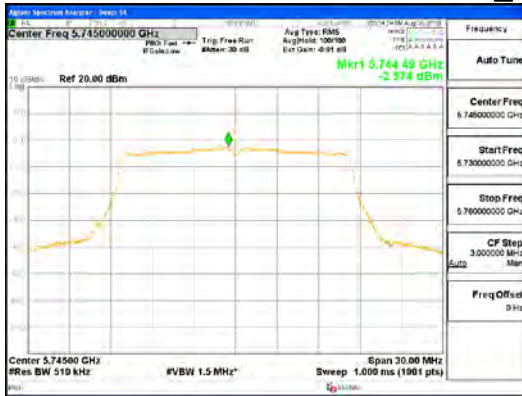
ANTO_802.11a_UNII 1



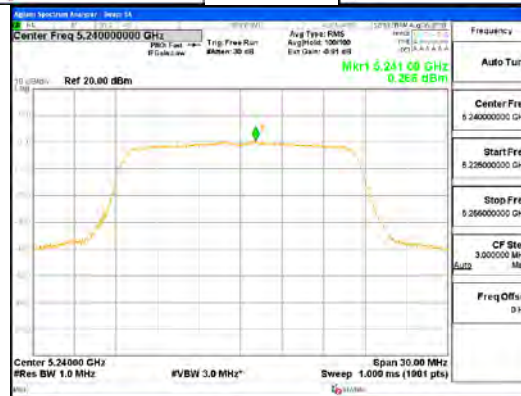
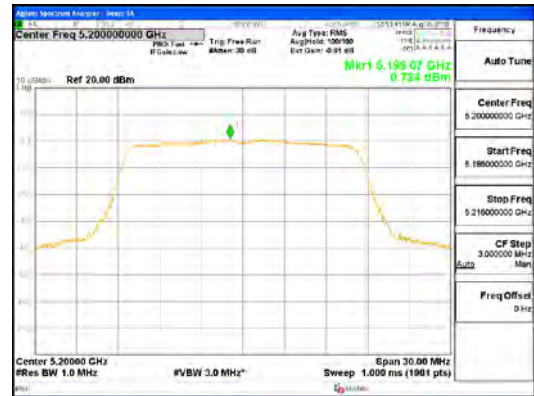
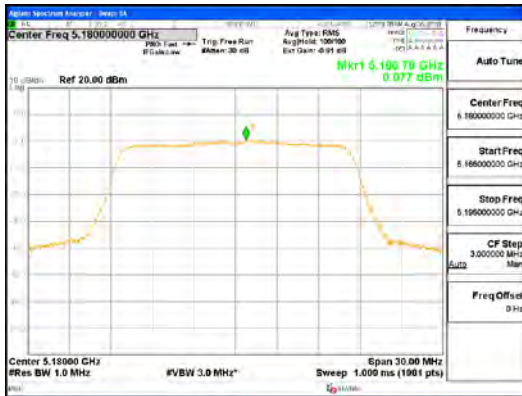
ANTO_802.11a_UNII 2A



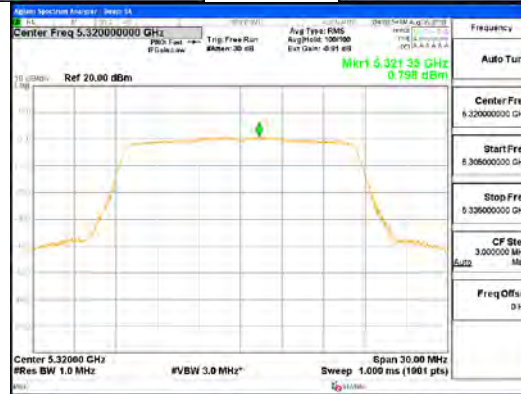
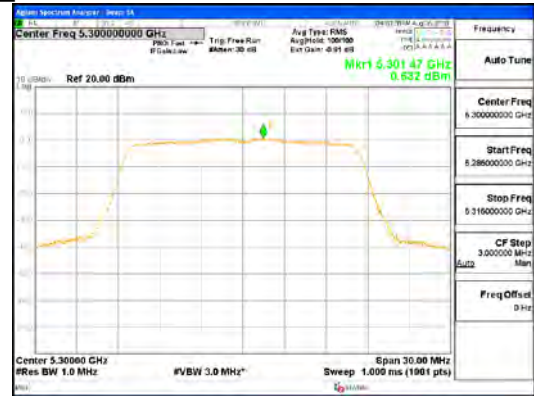
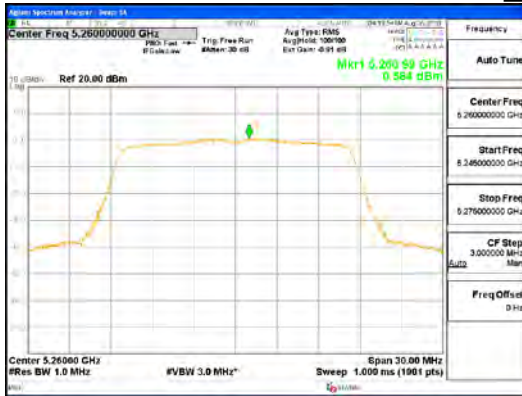
ANTO_802.11a_UNII 2C



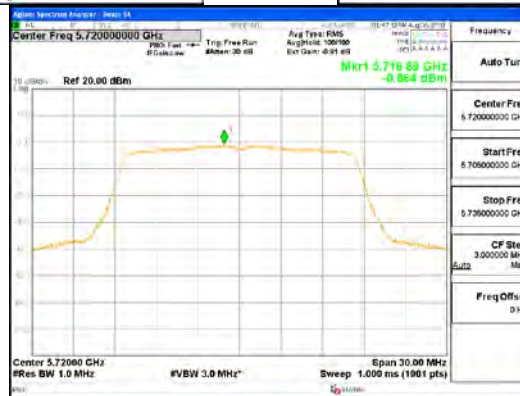
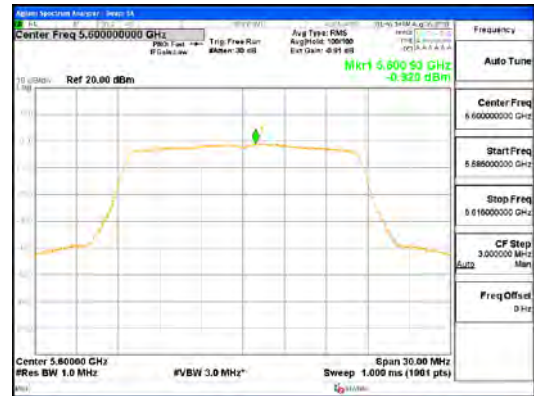
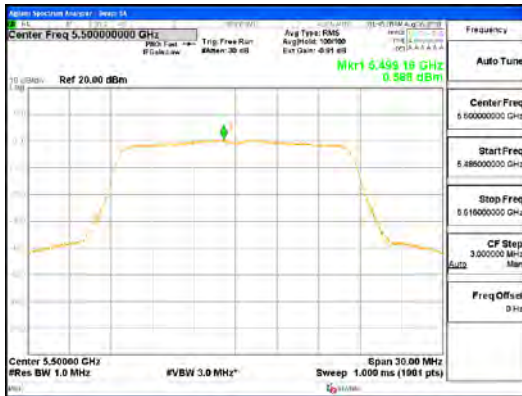
ANTO_802.11a_UNII 3



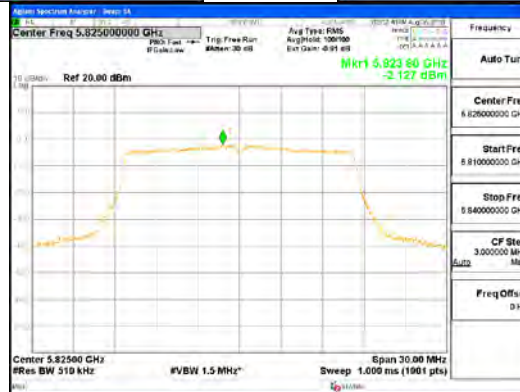
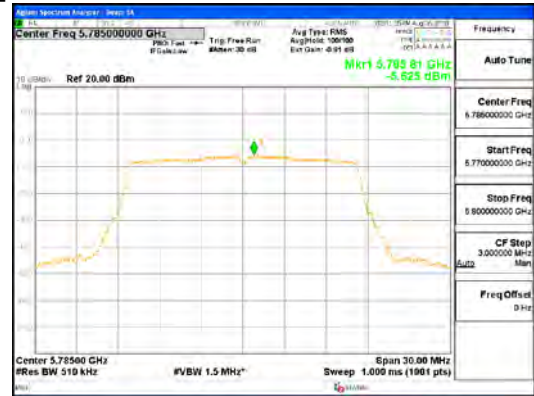
ANT1_802.11a_UNII 1



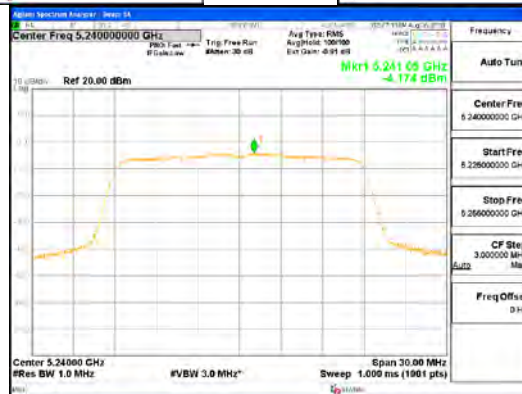
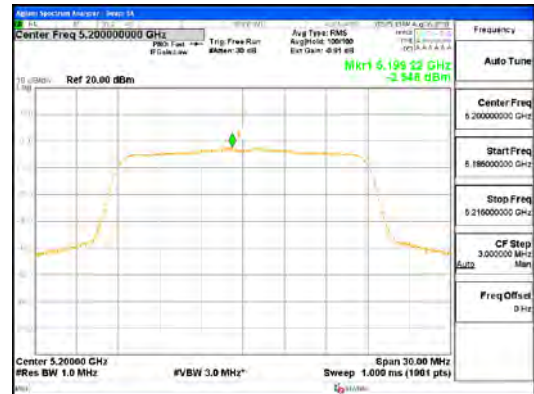
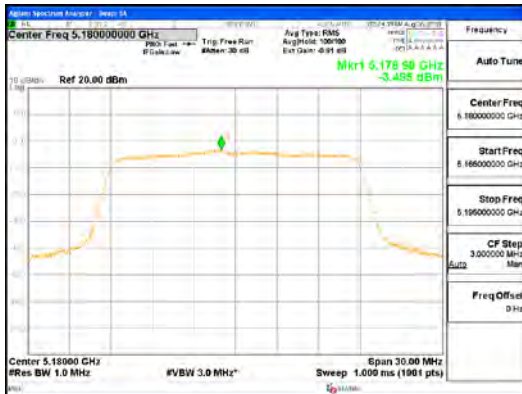
ANT1_802.11a_UNII 2A



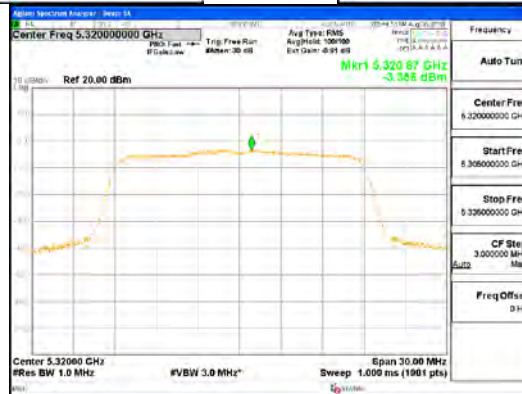
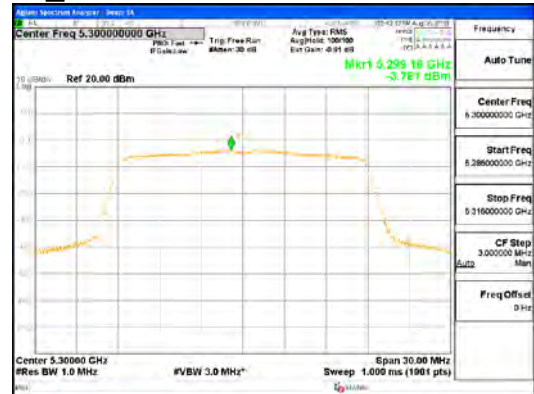
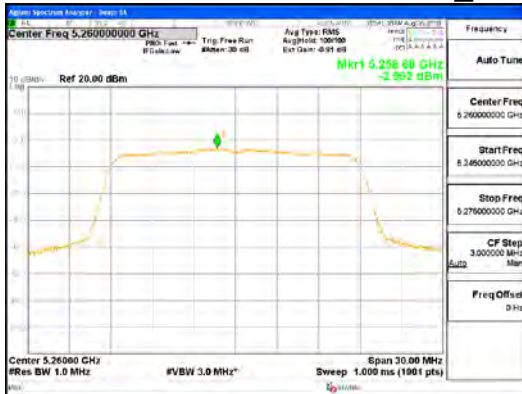
ANT1_802.11a_UNII 2C



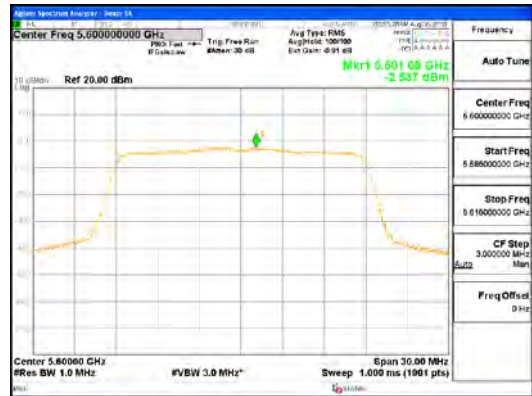
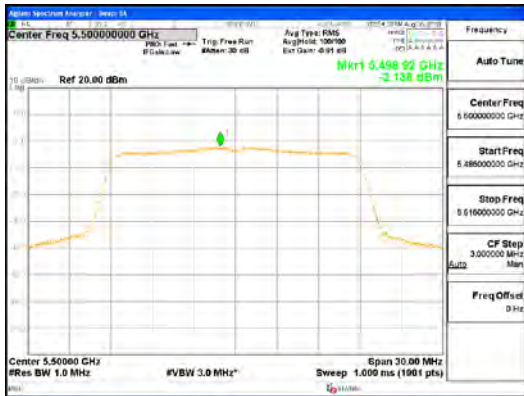
ANT1_802.11a_UNII 3



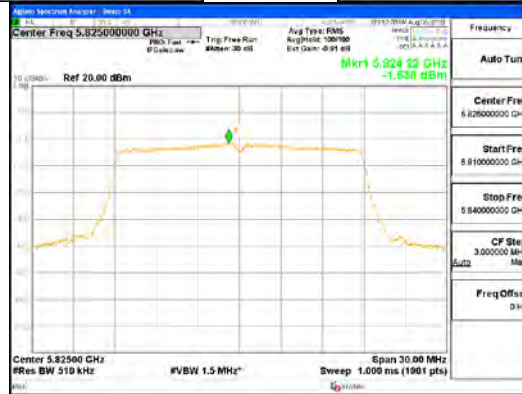
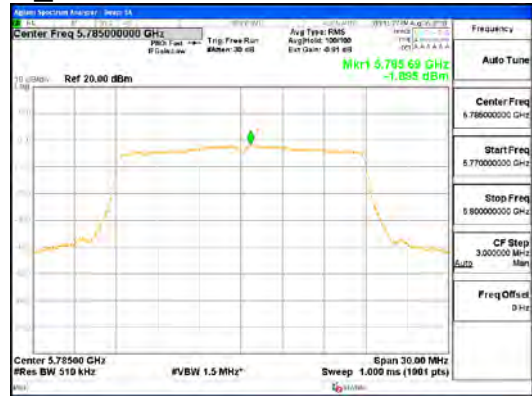
ANTO_802.11n_HT20_UNII 1



ANTO_802.11n_HT20_UNII 2A



ANTO_802.11n_HT20_UNII 2C

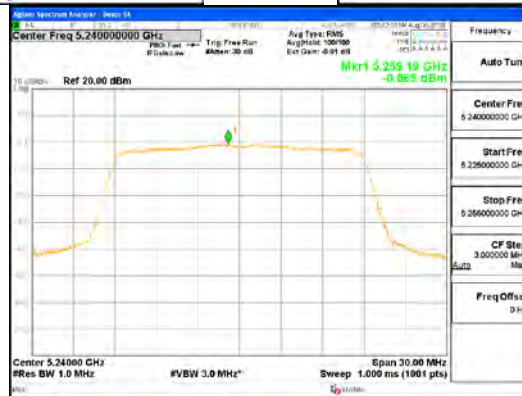
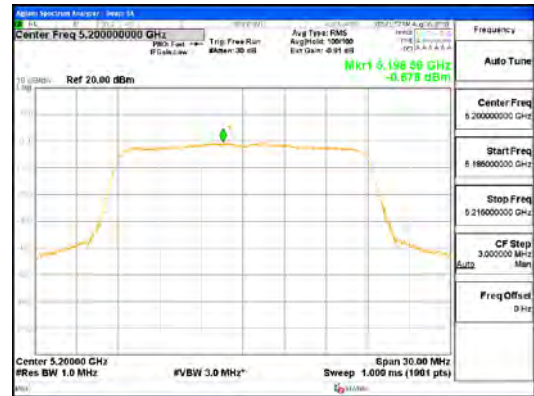
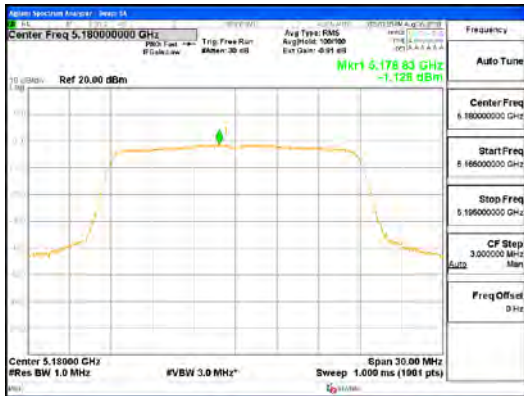


ANTO_802.11n_HT20_UNII 3

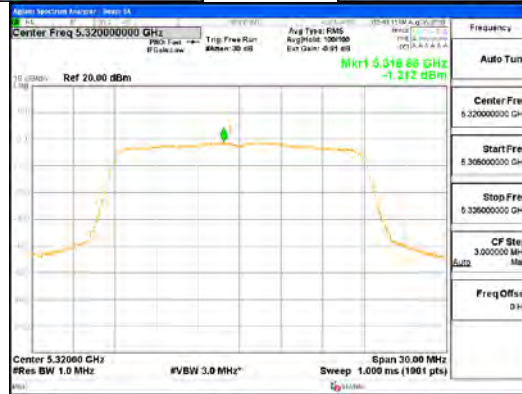
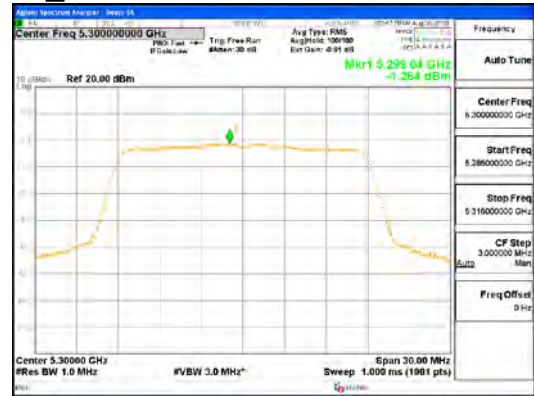
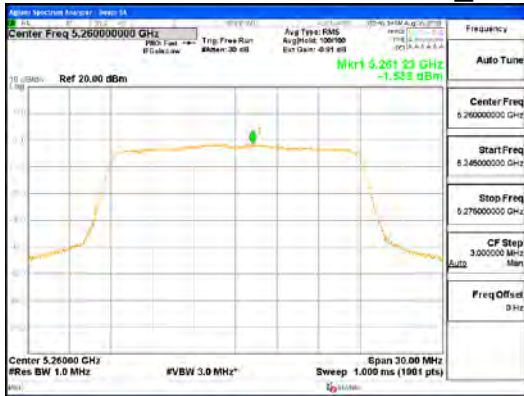


CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

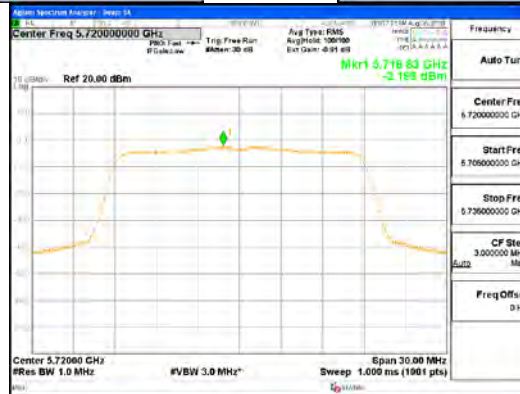
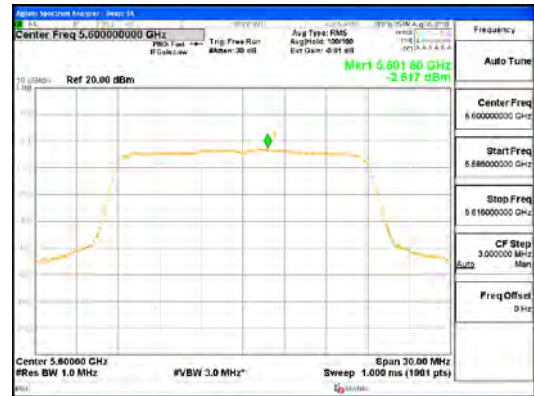
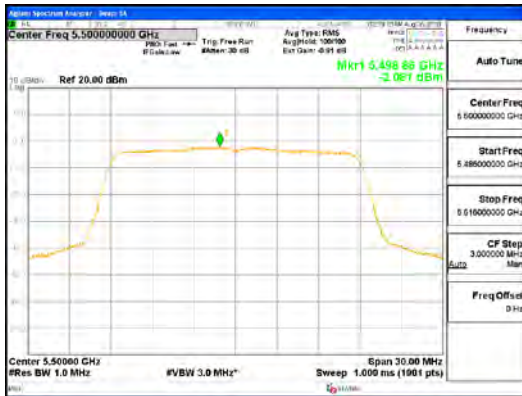
Report No.:
 CTK-2018-02469
 Page (88) / (166) Pages



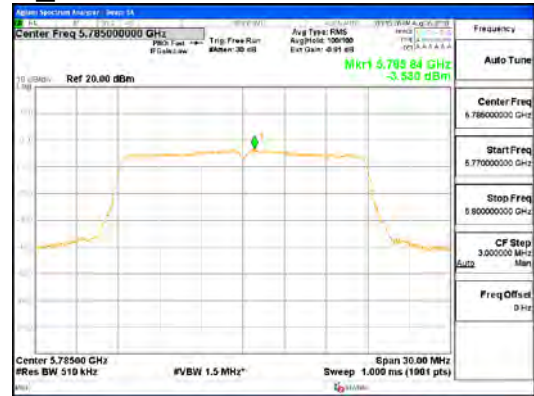
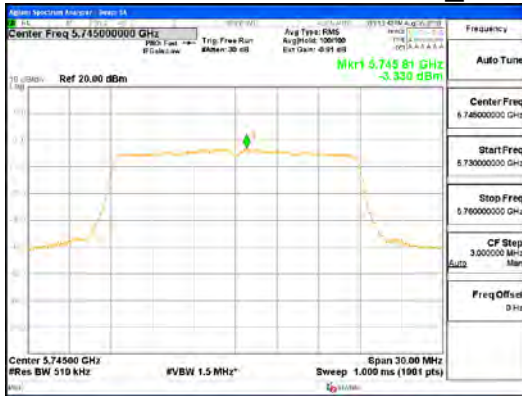
ANT1_802.11n_HT20_UNII 1



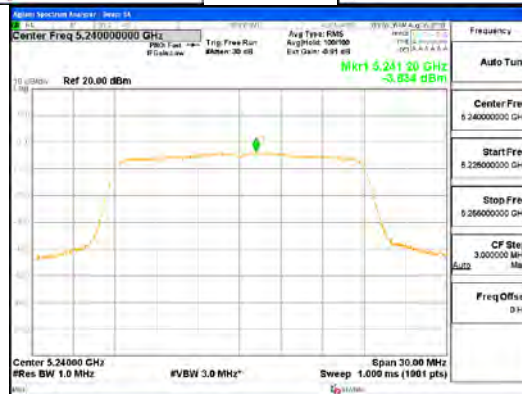
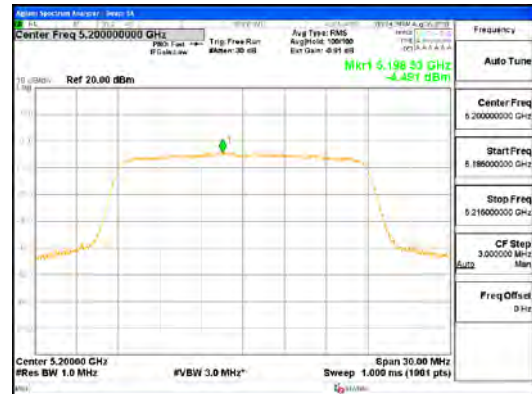
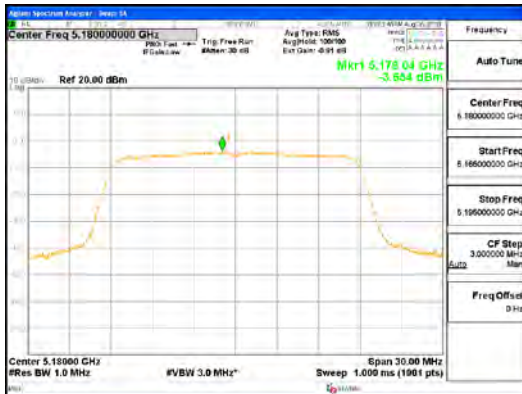
ANT1_802.11n_HT20_UNII 2A



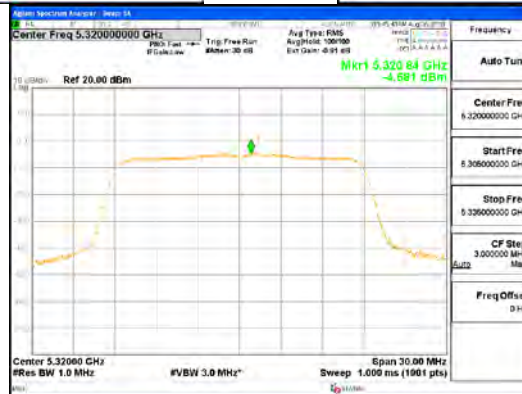
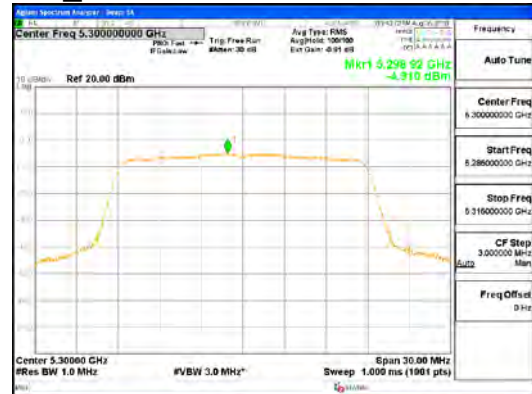
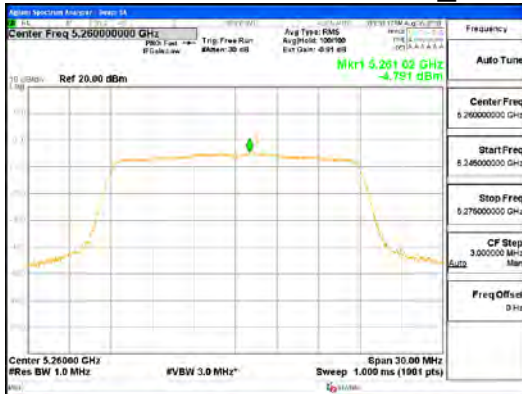
ANT1_802.11n_HT20_UNII 2C



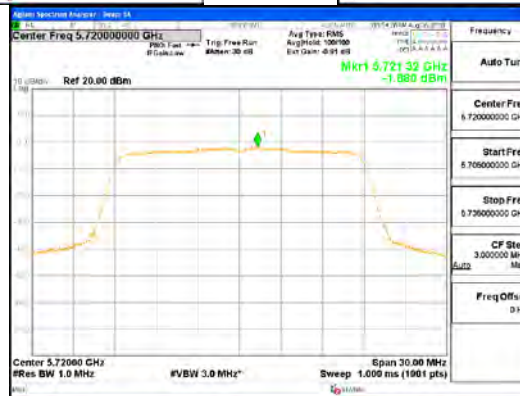
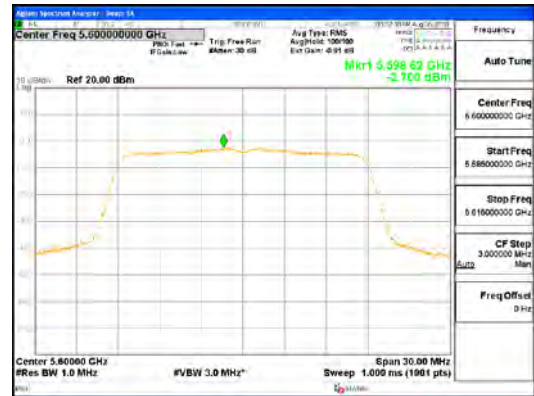
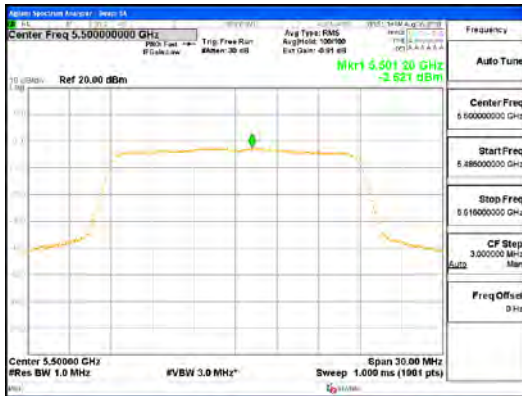
ANT1_802.11n_HT20_UNII 3



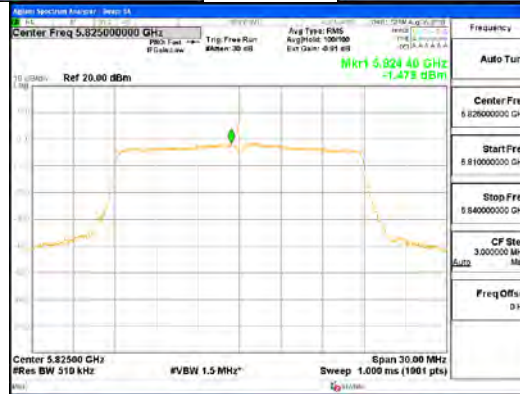
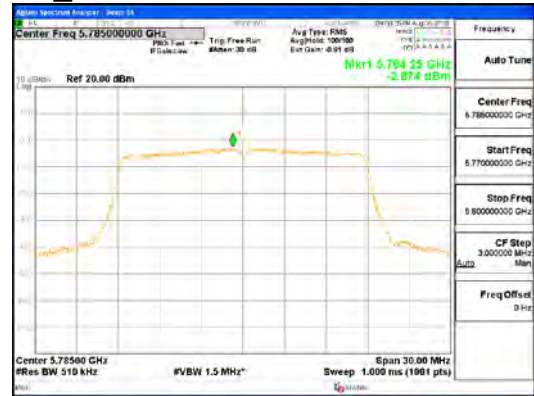
ANTO_802.11ac_VHT20_UNII 1



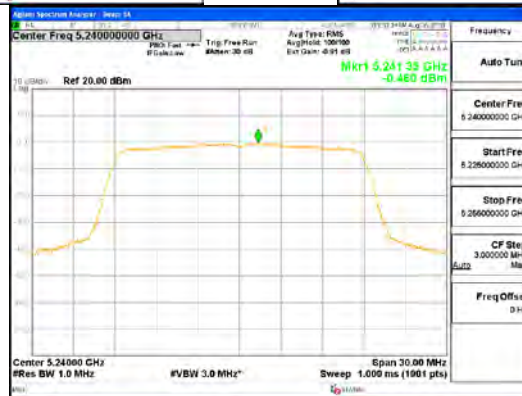
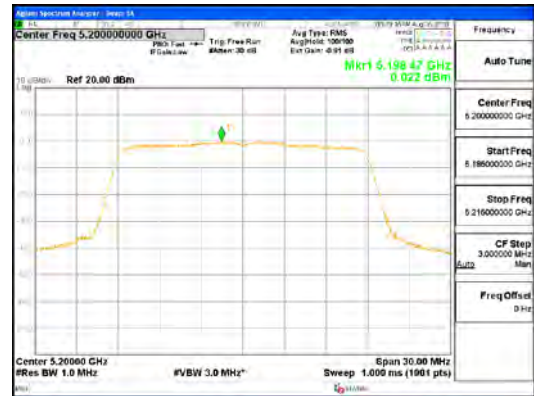
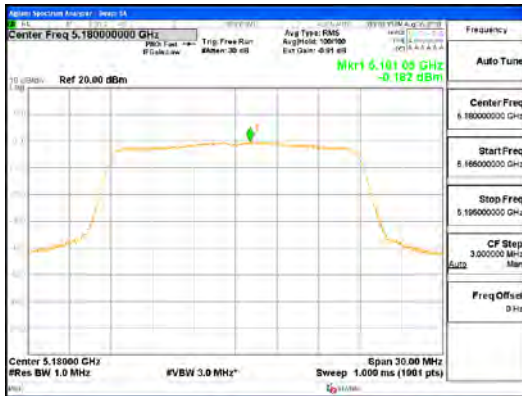
ANTO_802.11ac_VHT20_UNII 2A



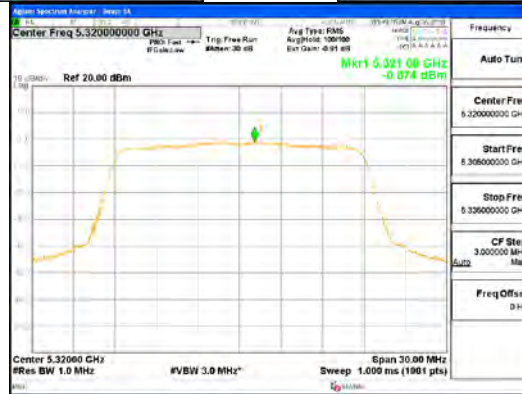
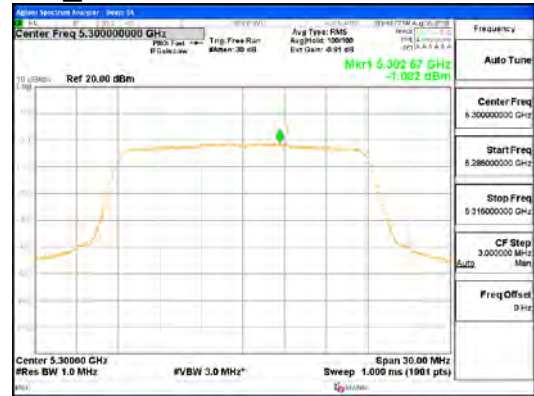
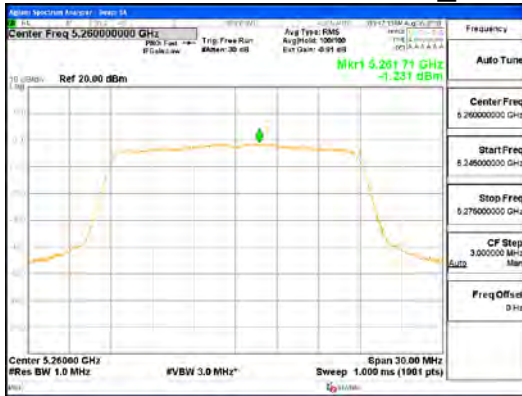
ANTO_802.11ac_VHT20_UNII 2C



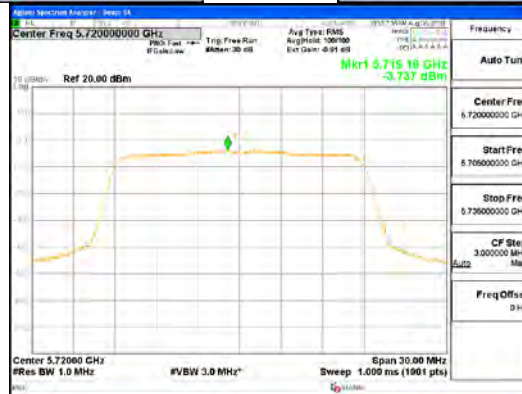
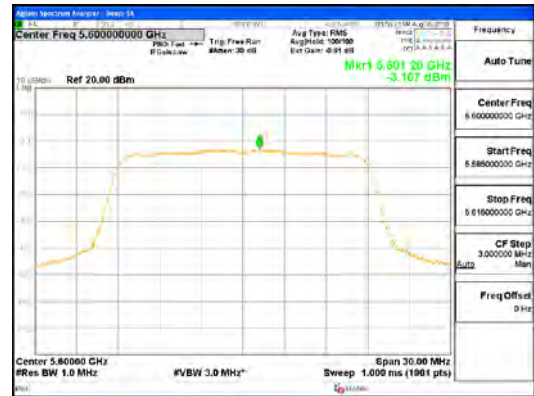
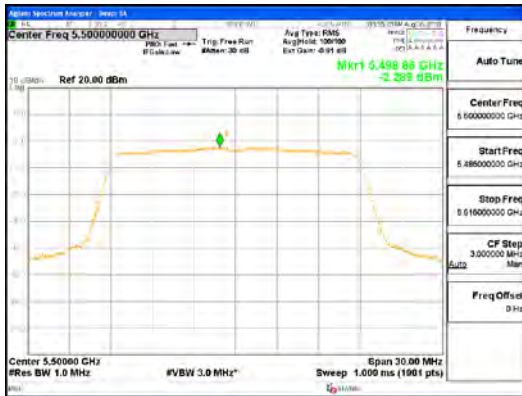
ANTO_802.11ac_VHT20_UNII 3



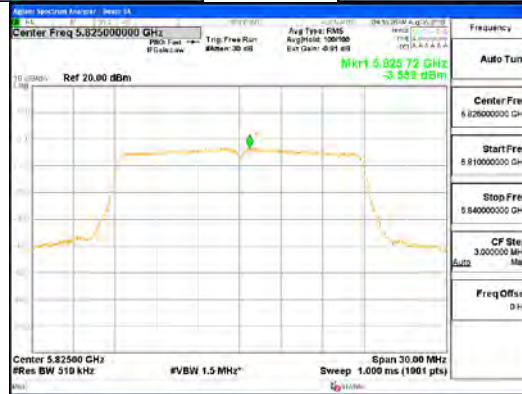
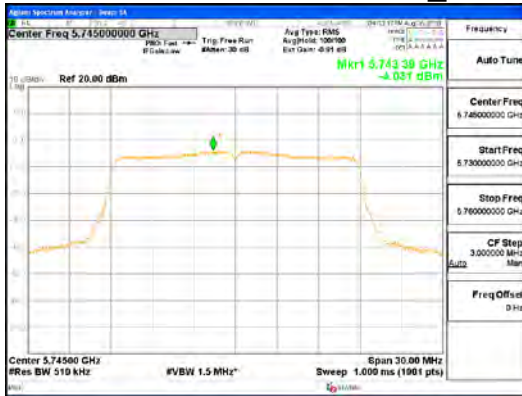
ANT1_802.11ac_VHT20_UNII 1



ANT1_802.11ac_VHT20_UNII 2A



ANT1_802.11ac_VHT20_UNII 2C

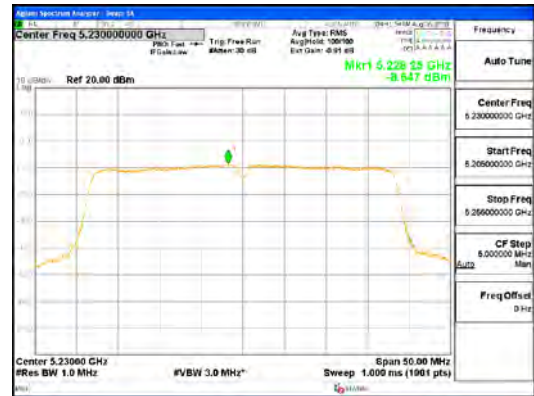
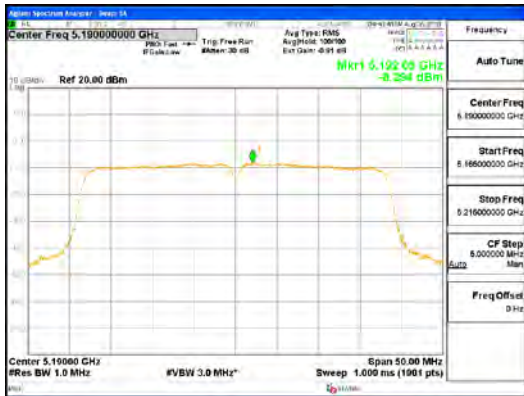


ANT1_802.11ac_VHT20_UNII 3

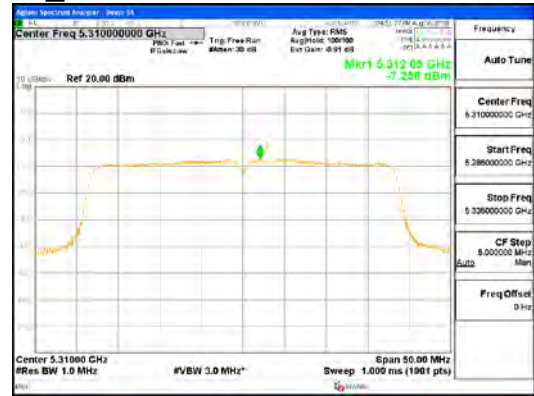
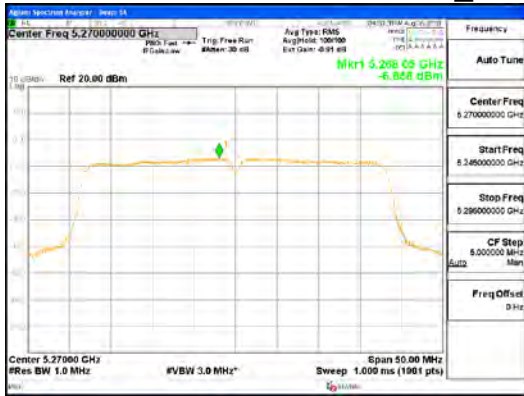


CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

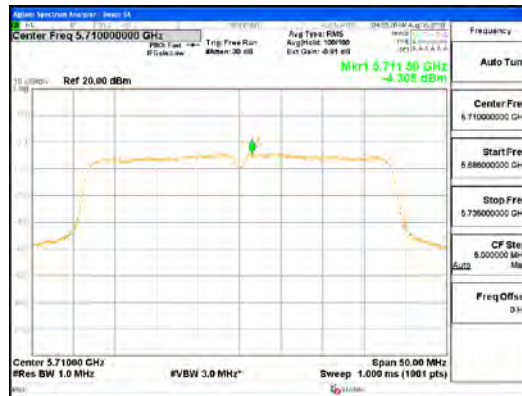
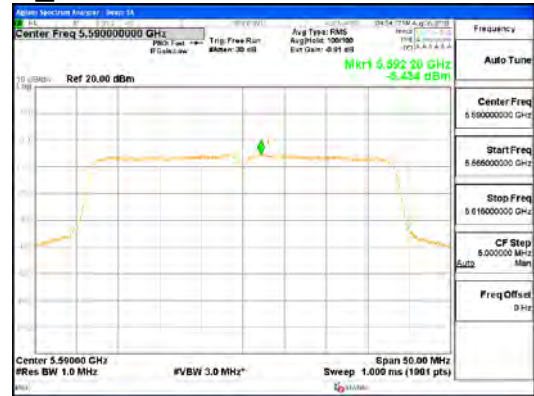
Report No.:
 CTK-2018-02469
 Page (94) / (166) Pages



ANTO_802.11n_HT40_UNII 1



ANTO_802.11n_HT40_UNII 2A

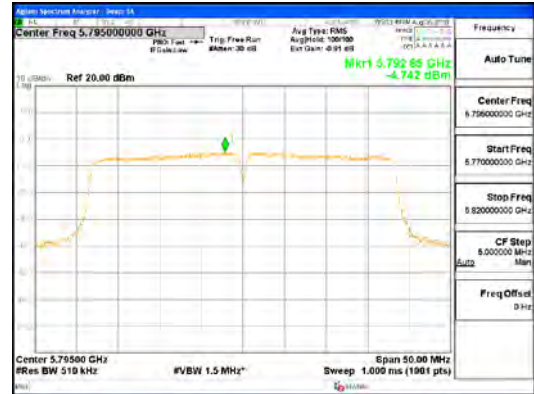


ANTO_802.11n_HT40_UNII 2C

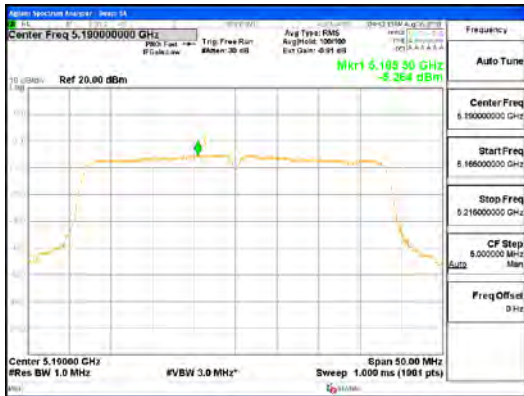


CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

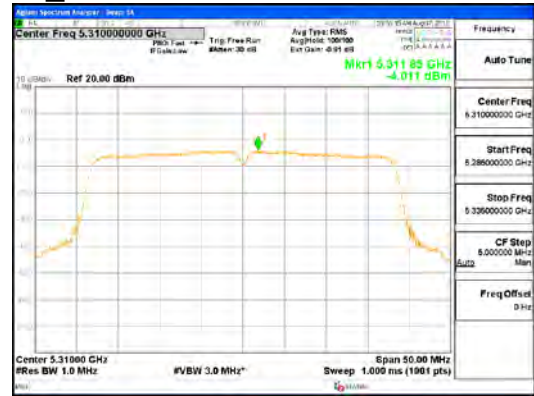
Report No.:
CTK-2018-02469
Page (95) / (166) Pages



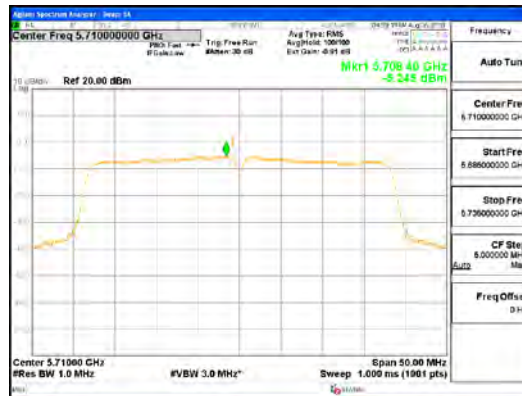
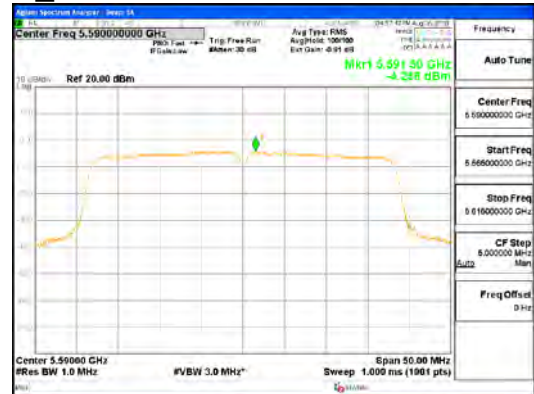
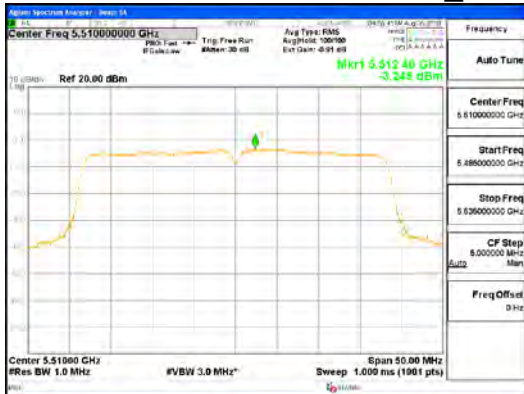
ANTO_802.11n_HT40_UNII 3



ANT1_802.11n_HT40_UNII 1



ANT1_802.11n_HT40_UNII 2A

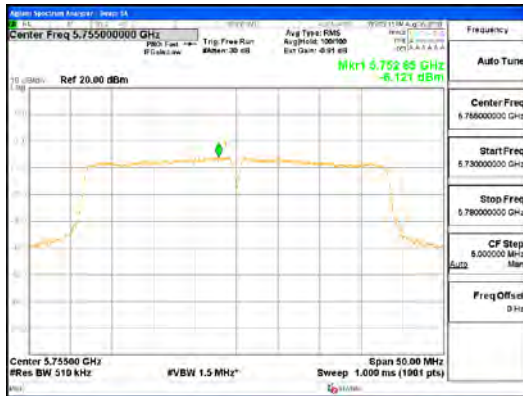


ANT1_802.11n_HT40_UNII 2C



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (97) / (166) Pages

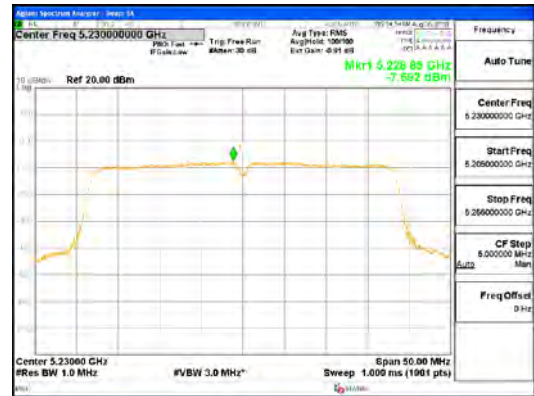
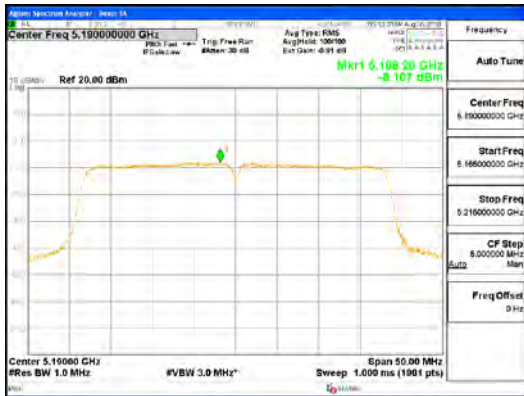


ANT1_802.11n_HT40_UNII 3

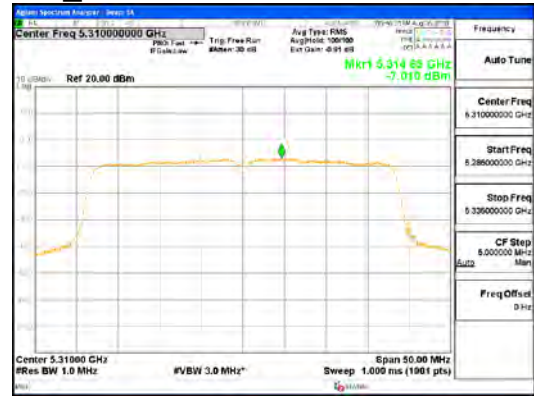
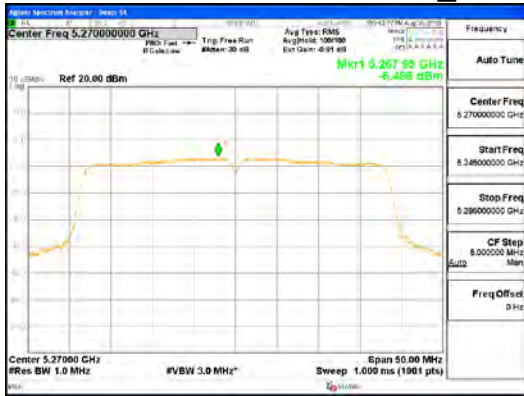


CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

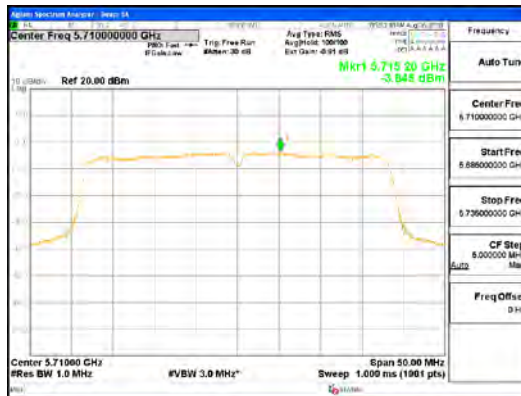
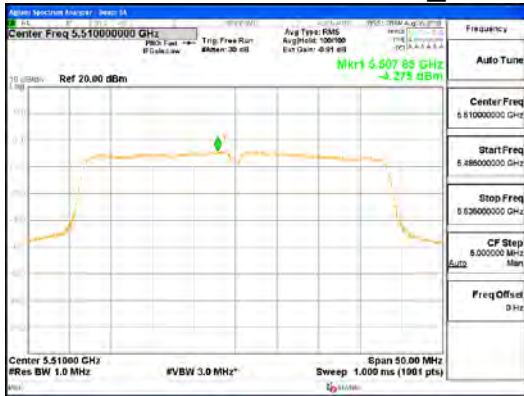
Report No.:
 CTK-2018-02469
 Page (98) / (166) Pages



ANTO_802.11ac_VHT40_UNII 1



ANTO_802.11ac_VHT40_UNII 2A

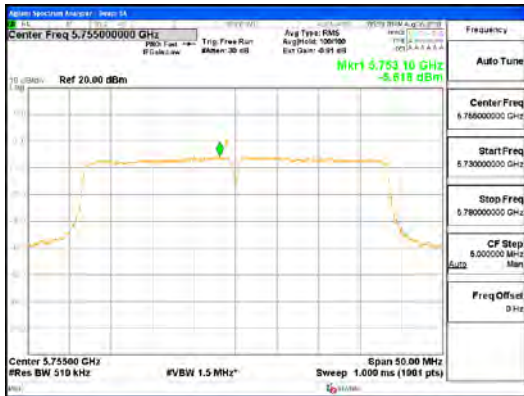


ANTO_802.11ac_VHT40_UNII 2C



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (99) / (166) Pages

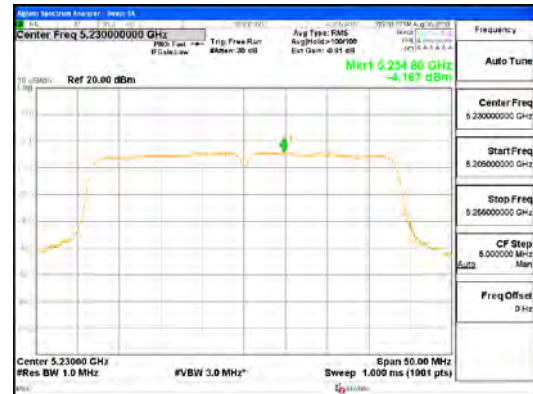
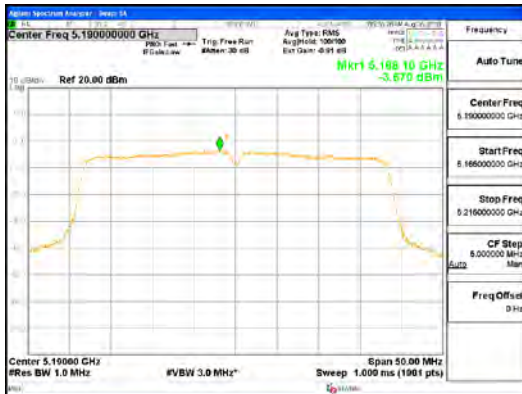


ANTO_802.11ac_VHT40_UNII 3

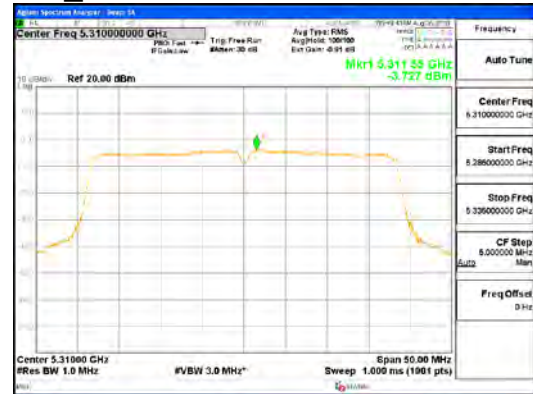


CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

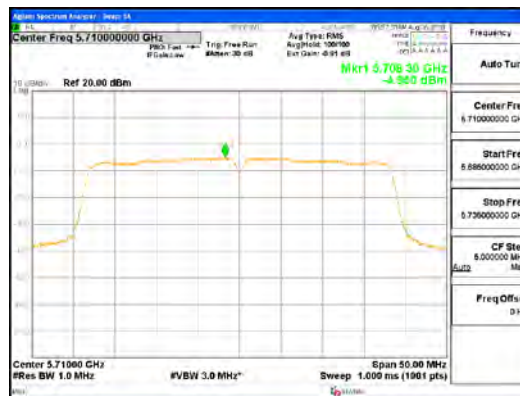
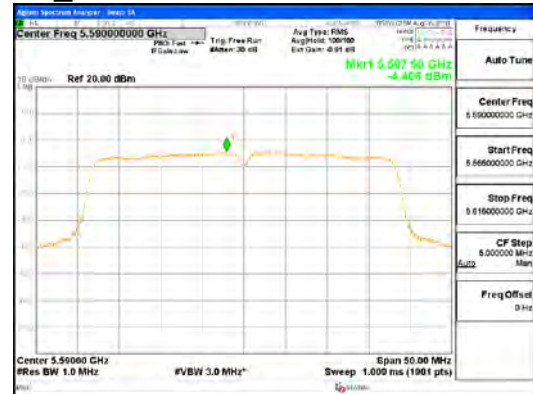
Report No.:
CTK-2018-02469
Page (100) / (166) Pages



ANT1_802.11ac_VHT40_UNII 1



ANT1_802.11ac_VHT40_UNII 2A

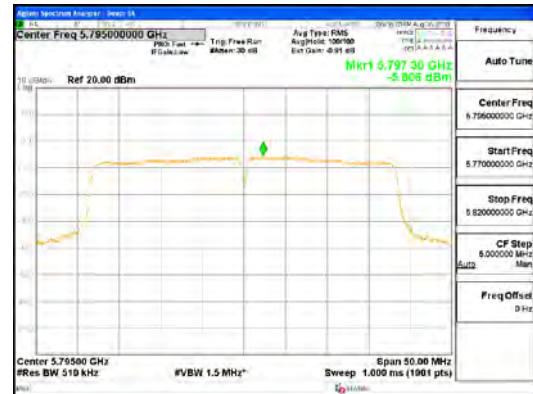
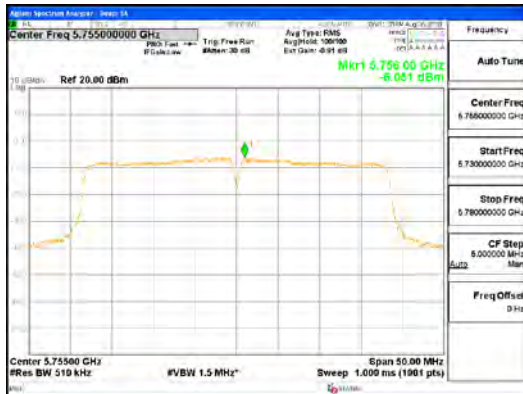


ANT1_802.11ac_VHT40_UNII 2C

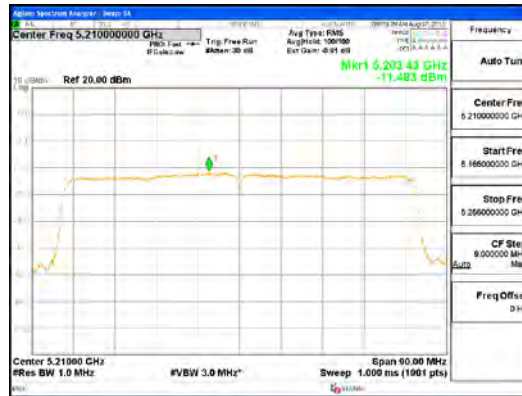


CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (101) / (166) Pages



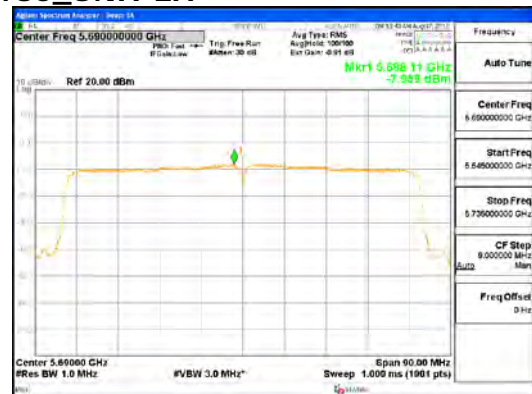
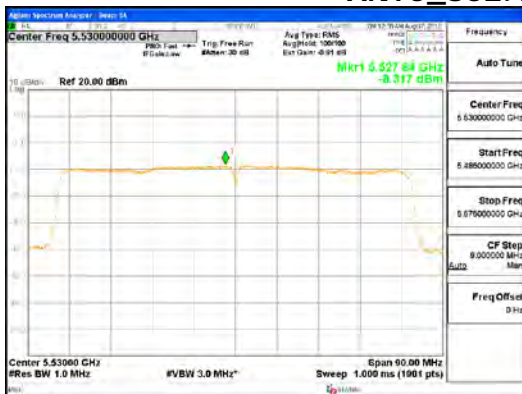
ANT1_802.11ac_VHT40_UNII 3



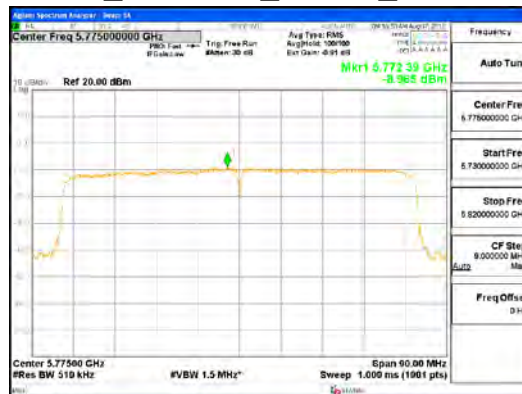
ANTO_802.11ac_VHT80_UNII 1



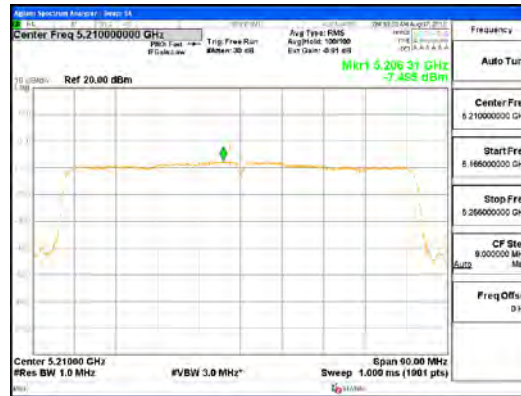
ANTO_802.11ac_VHT80_UNII 2A



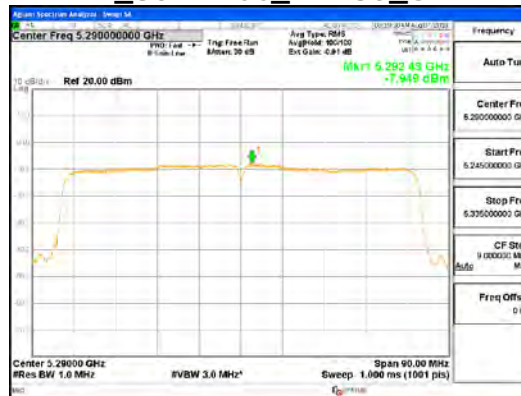
ANTO_802.11ac_VHT80_UNII 2C



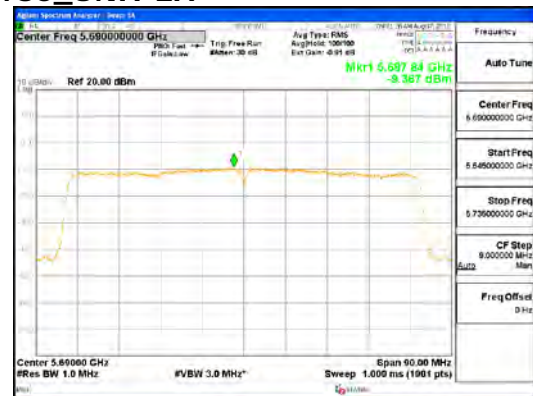
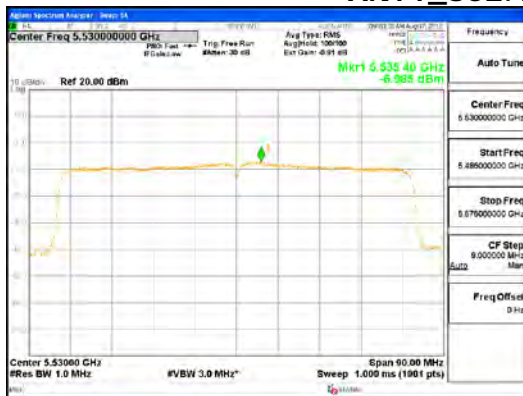
ANTO_802.11ac_VHT80_UNII 3



ANT1_802.11ac_VHT80_UNII 1



ANT1_802.11ac_VHT80_UNII 2A



ANT1_802.11ac_VHT80_UNII 2C



ANT1_802.11ac_VHT80_UNII 3

4.5 Frequency Stability

Test Procedures

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 0 °C and +45 °C (Declaration by the Manufacturer). The temperature was incremented by 10 °C (5 °C) intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

Data for the worst case channel is shown below.

Temperature (°C)	0	10	20	30	40
Frequency	Measured Frequency Error (kHz)				
5 180 MHz	74.059	53.609	54.363	11.520	35.244
5 200 MHz	48.563	47.674	4.972	21.944	24.337
5 240 MHz	46.419	46.664	45.948	17.837	28.522
5 260 MHz	94.213	12.194	56.314	20.081	40.441
5 300 MHz	46.511	30.481	11.760	-22.976	19.783
5 320 MHz	32.362	26.389	13.169	-7.505	14.946
5 500 MHz	-11.185	0.05	-44.461	-41.649	-35.446
5 600 MHz	40.153	29.189	-25.140	-36.660	-19.748
5 720 MHz	67.015	3.704	43.163	53.543	34.012
5 745 MHz	56.102	53.420	44.339	49.592	37.997
5 785 MHz	94.419	95.189	44.338	53.424	15.629
5 825 MHz	73.460	65.248	32.821	60.321	28.081

Note :

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature range as tested.

4.6 Unwanted Emissions

Test Location

- 10 m SAC (test distance : 10 m, 3 m)
 3 m SAC (test distance : 3 m)

Test Procedures

- 1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency range above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

Test Settings:

Frequency Range = 9 kHz ~ 1 GHz

- a) RBW = 100 kHz for $f < 1$ GHz, 9 kHz for $f < 30$ MHz
 b) VBW \geq RBW
 c) Detector = CISPR Quasi-peak
 d) Sweep time = auto couple

- Peak

Frequency Range = 1 GHz ~ 40 GHz

- a) RBW = 1 MHz
 b) VBW $\geq 3 \times$ RBW
 d) Sweep time = auto
 c) Detector = Peak
 e) Trace mode = max hold

- Average (duty cycle $\geq 98\%$)

Frequency Range = 1 GHz ~ 40 GHz

- a) RBW = 1 MHz
 b) VBW $\geq 3 \times$ RBW
 d) Sweep time = auto
 f) Trace mode = average (at least 100 traces)
 c) Detector = RMS
 e) Averaging type = power (i.e., RMS)



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (106) / (166) Pages

- Average (duty cycle < 98%)

Frequency Range = 1 GHz ~ 40 GHz

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Detector = RMS

d) Sweep time = auto

e) Averaging type = power (i.e., RMS)

f) Trace mode = average (at least 100 traces)

If power averaging (RMS) mode, then the applicable correction factor is $10 \log(1/x)$, where x is the duty cycle.

Test mode	Duty Cycle Factor (dB)
802.11a	0.58
802.11n_HT20	0.62
802.11n_HT40	1.14
802.11ac_VHT20	0.60
802.11ac_VHT40	1.13
802.11ac_VHT80	2.04

Limit

- 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m	Deasurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	-	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

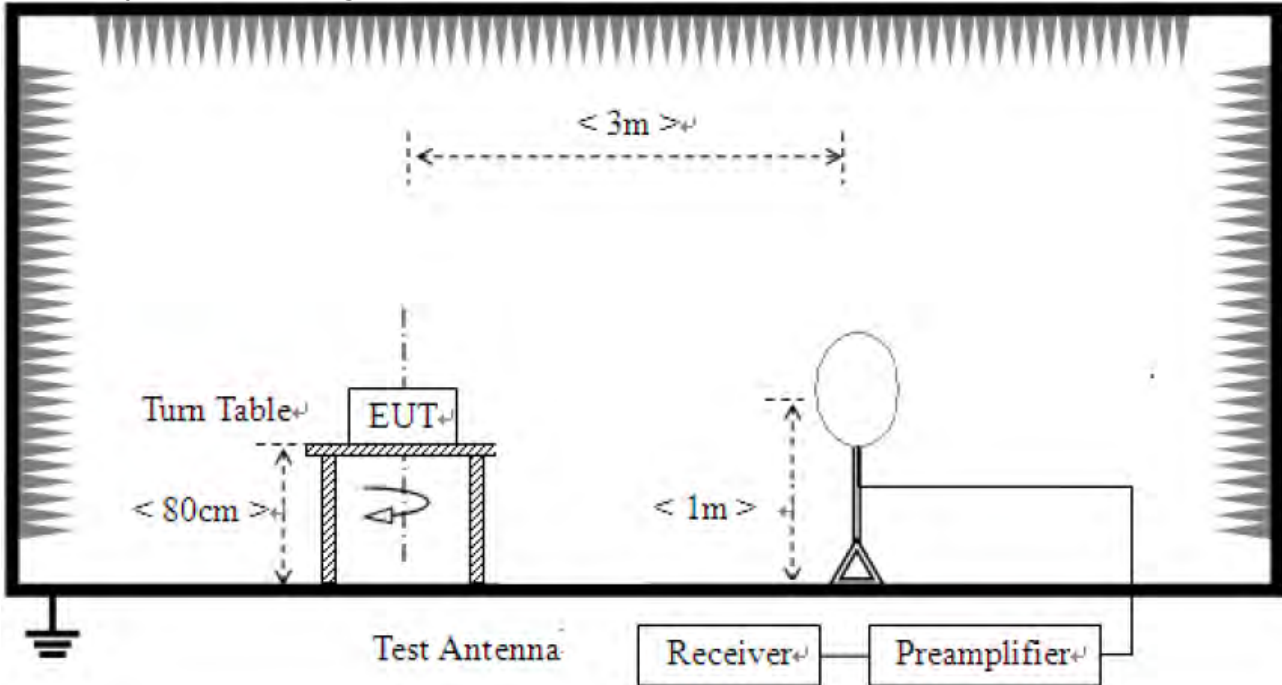
- 15.407, KDB 789033

E.I.R.P -27 dBm/MHz

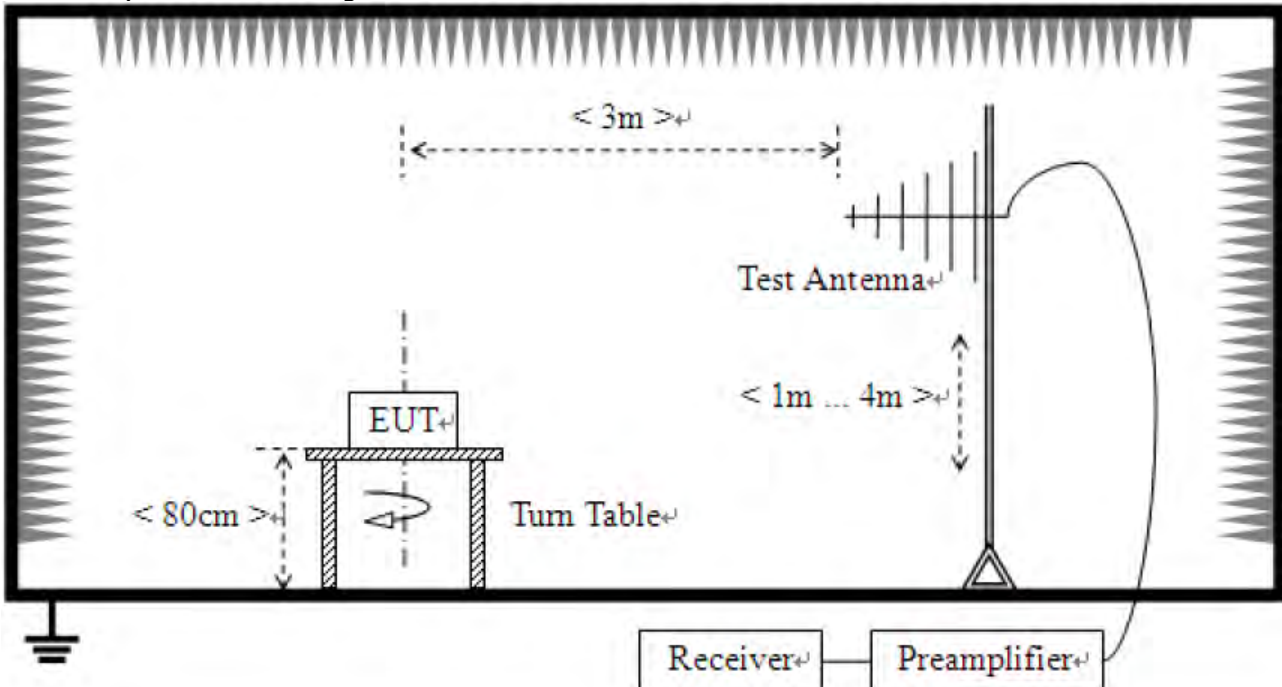
$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2$, for $d = 3\text{m}$

Test Setup:

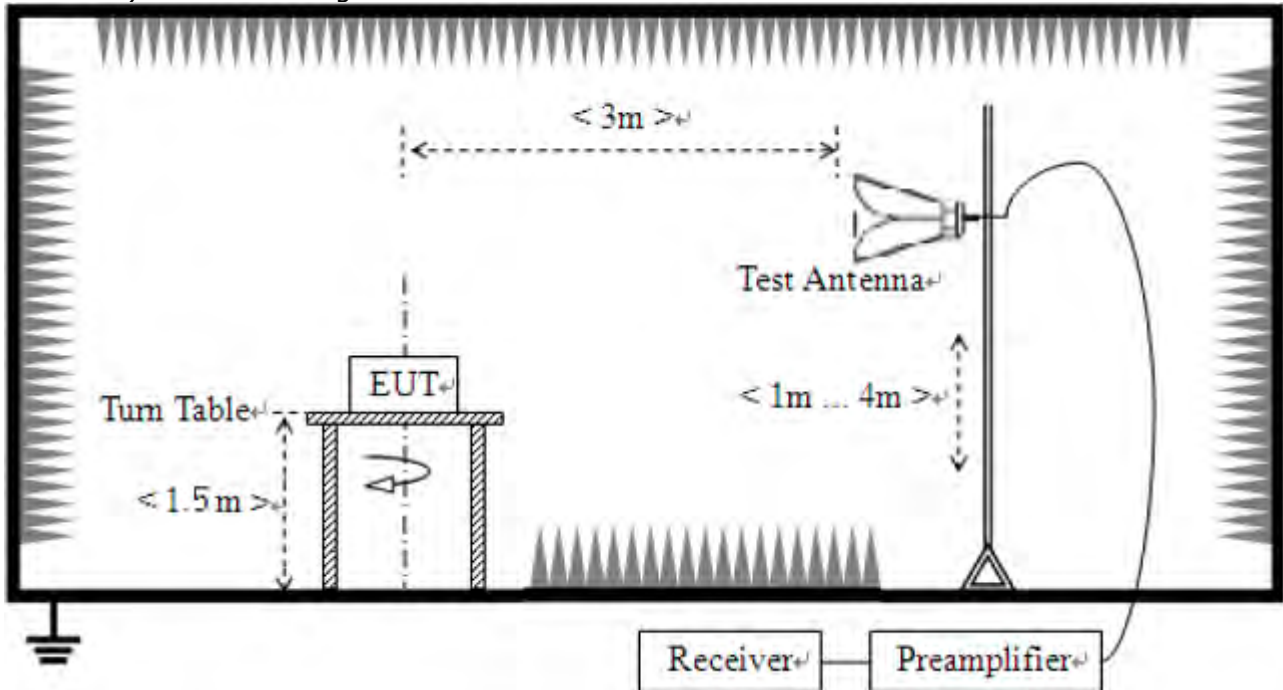
- 1) For field strength of emissions from 9 kHz to 30 MHz



- 2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



Test Mode

We have done all test mode.

The worst case antenna configuration and Test mode are determined to be as follows.

802.11a : ANT0 + ANT1 (MIMO)

802.11n : ANT0 + ANT1 (MIMO)

802.11ac : ANT0 + ANT1 (MIMO)

So the results are only attached worst cases.



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (109) / (166) Pages

Test Results

1) 9 kHz to 30 MHz

Test mode : Transmitter, 802.11a, 802.11n, 802.11ac (Worst case)

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	See note

Note :

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)

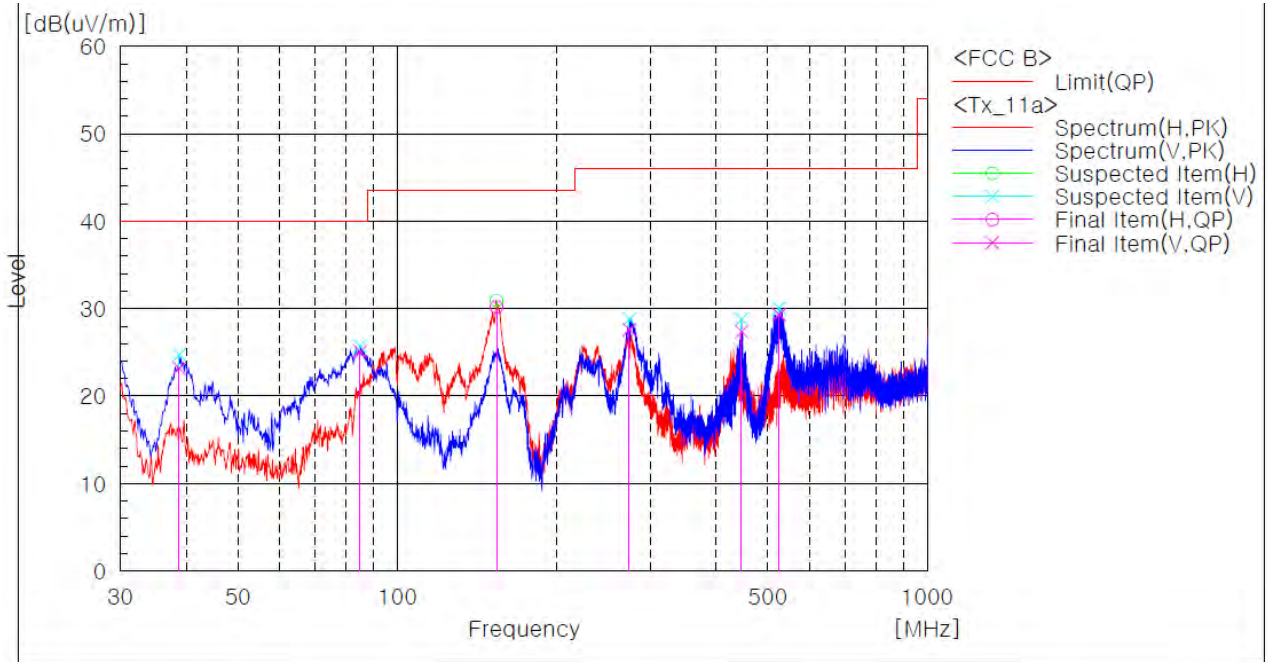
2) 30 MHz to 1 GHz

Test mode : Transmitter, 802.11a(Worst Case)

The requirements are:

Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	38.709	V	37.1	-13.9	23.2	40.0	16.8	99.8	350.9	
2	85.087	V	42.5	-17.4	25.1	40.0	14.9	99.8	111.9	
3	153.783	H	47.5	-17.3	30.2	43.5	13.3	99.8	43.8	
4	273.972	V	40.0	-12.4	27.6	46.0	18.4	99.8	154.6	
5	445.983	V	37.6	-10.2	27.4	46.0	18.6	99.8	133.8	
6	525.348	V	38.4	-9.1	29.3	46.0	16.7	99.8	133.8	

Remark :

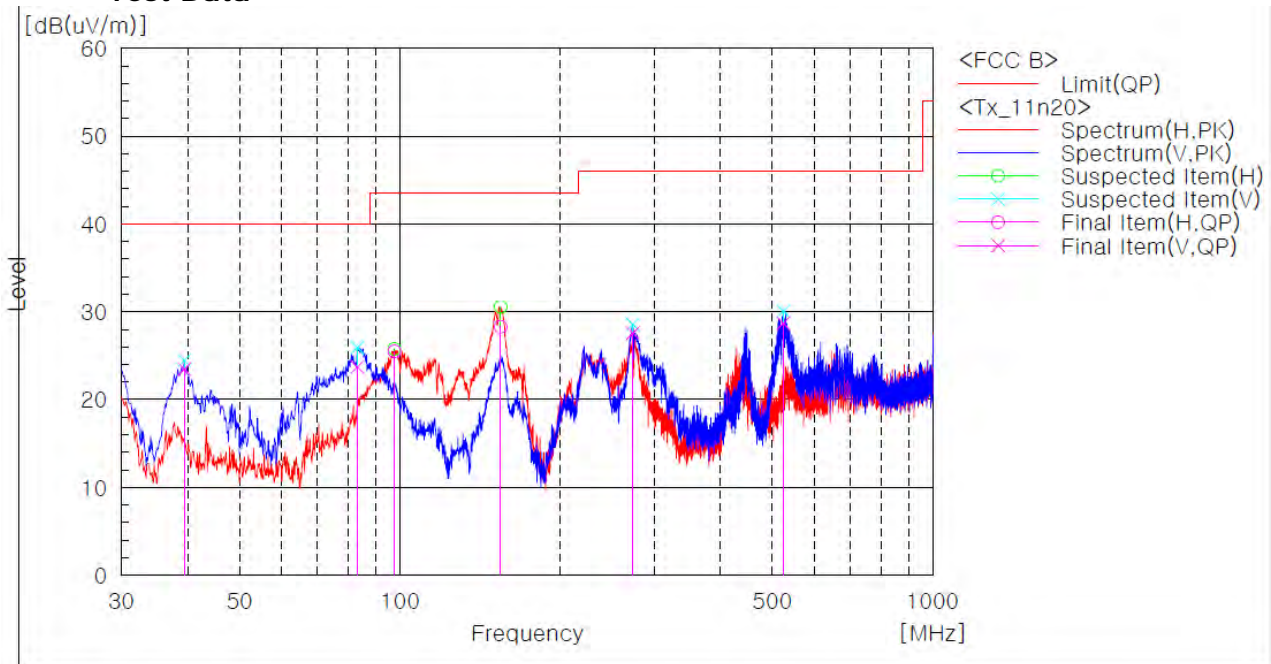
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

Test mode : Transmitter, 802.11n_HT20(Worst Case)

The requirements are:

Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	39.363	V	37.1	-13.6	23.5	40.0	16.5	99.8	350.2	
2	83.127	V	41.6	-17.9	23.7	40.0	16.3	99.8	137.1	
3	97.607	H	39.8	-14.3	25.5	43.5	18.0	99.8	77.1	
4	154.545	H	45.6	-17.3	28.3	43.5	15.2	99.8	46.0	
5	273.537	V	40.0	-12.4	27.6	46.0	18.4	99.8	157.0	
6	523.715	V	37.9	-9.2	28.7	46.0	17.3	99.8	157.0	

Remark :

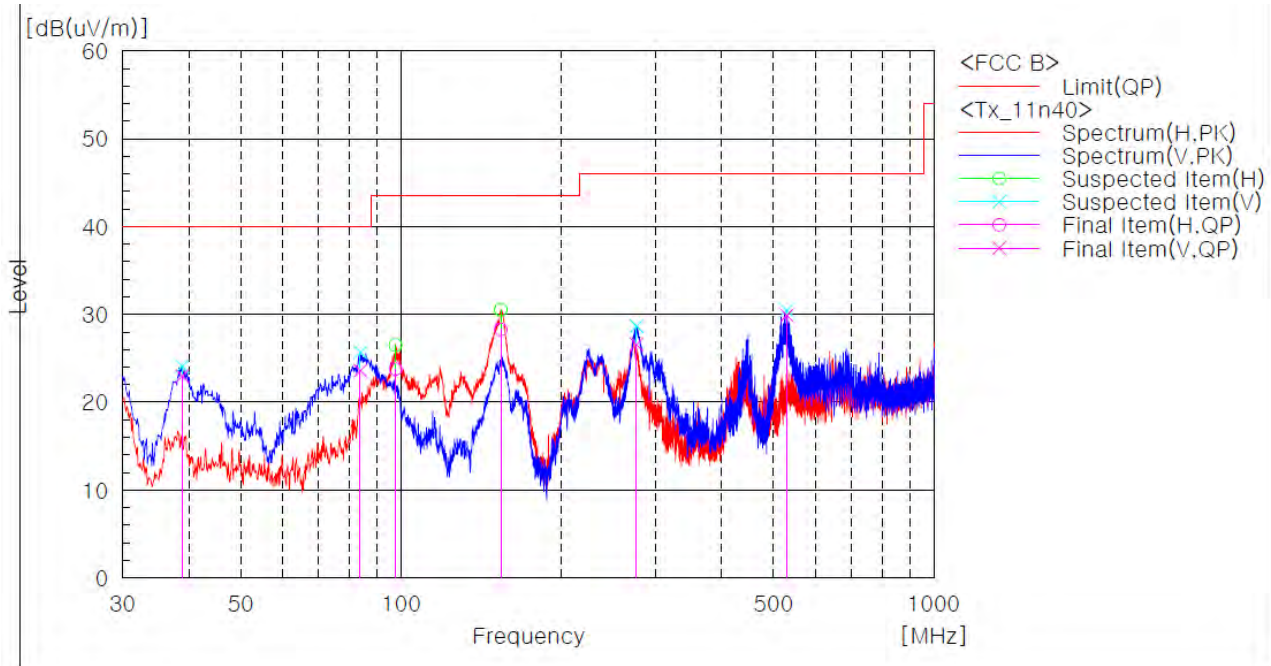
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

Test mode : Transmitter, 802.11n_HT40(Worst Case)

The requirements are:

Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	38.818	V	36.9	-13.9	23.0	40.0	17.0	99.8	313.1	
2	83.781	V	41.3	-17.7	23.6	40.0	16.4	99.8	108.9	
3	97.607	H	38.1	-14.3	23.8	43.5	19.7	99.8	113.9	
4	153.891	H	45.6	-17.3	28.3	43.5	15.2	99.8	78.6	
5	276.476	V	38.9	-12.3	26.6	46.0	19.4	99.8	143.3	
6	529.376	V	39.0	-9.1	29.9	46.0	16.1	99.8	155.4	

Remark :

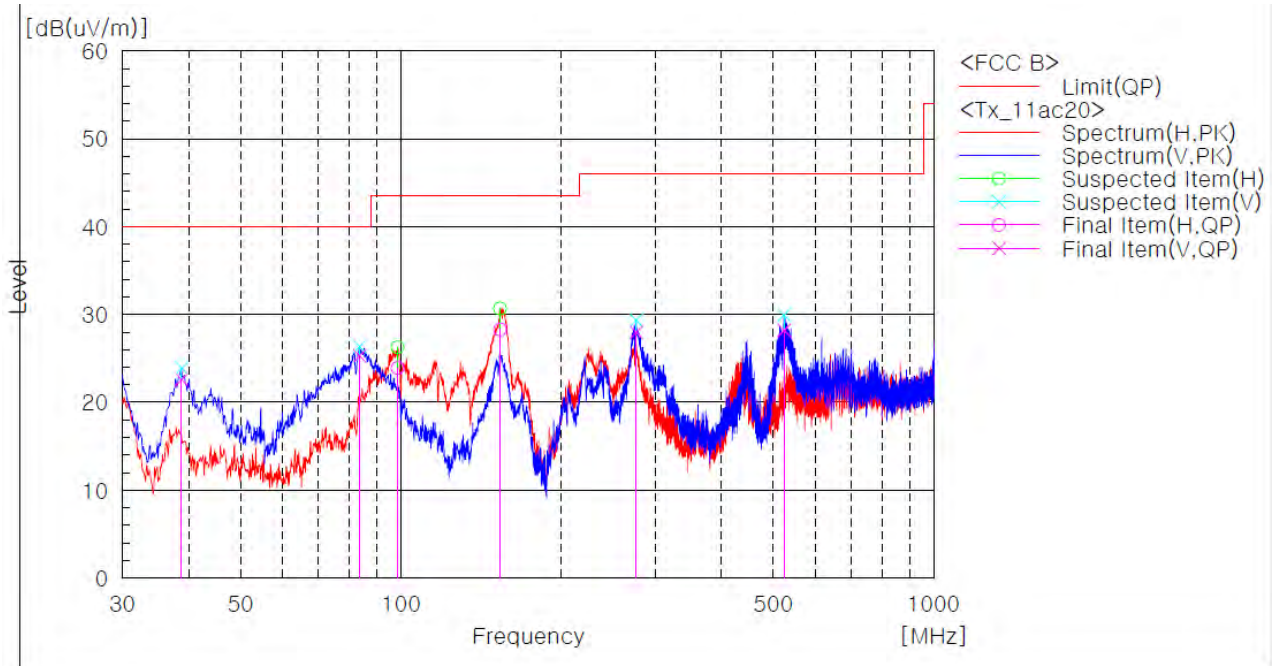
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

Test mode : Transmitter, 802.11ac_VHT20(Worst Case)

The requirements are:

Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	38.709	V	36.5	-13.9	22.6	40.0	17.4	99.8	278.0	
2	83.563	V	43.1	-17.8	25.3	40.0	14.7	99.8	176.5	
3	98.478	H	38.1	-14.2	23.9	43.5	19.6	99.8	98.2	
4	153.565	H	45.6	-17.3	28.3	43.5	15.2	99.8	54.0	
5	276.368	V	40.3	-12.3	28.0	46.0	18.0	99.8	152.1	
6	523.062	V	37.4	-9.2	28.2	46.0	17.8	99.8	105.6	

Remark :

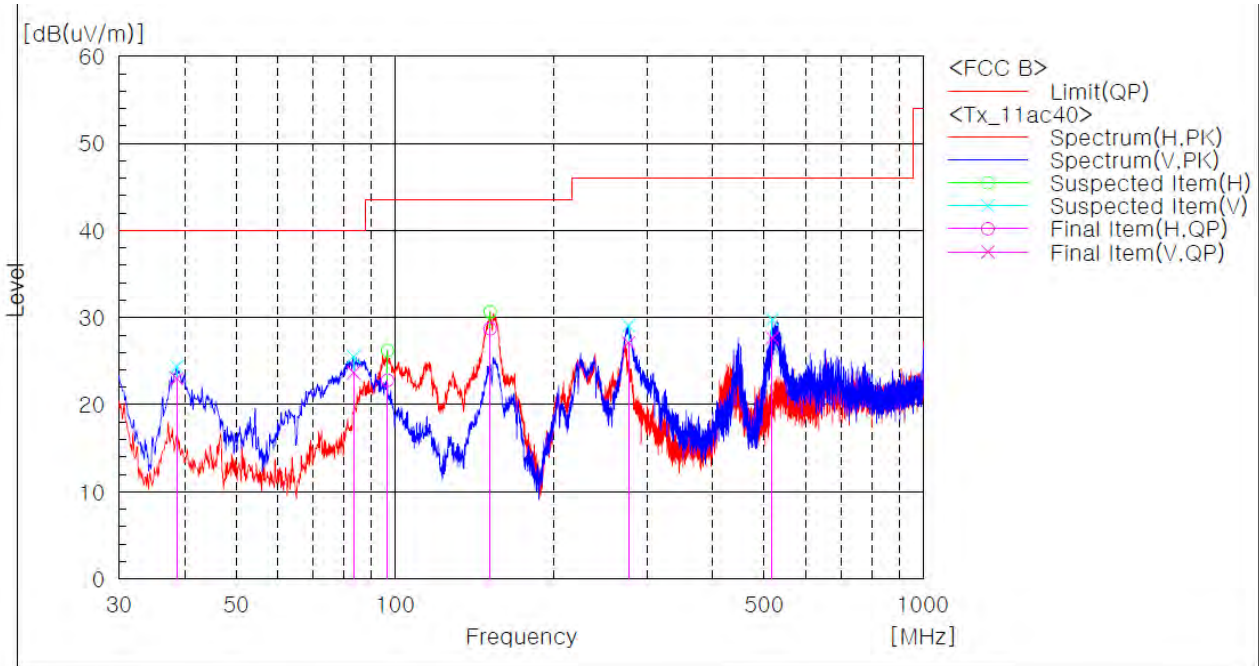
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

Test mode : Transmitter, 802.11ac_VHT40(Worst Case)

The requirements are:

Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	38.601	V	37.0	-14.0	23.0	40.0	17.0	99.8	317.8	
2	83.454	V	41.5	-17.8	23.7	40.0	16.3	99.8	156.0	
3	96.736	H	37.2	-14.4	22.8	43.5	20.7	99.8	80.3	
4	151.387	H	46.1	-17.4	28.7	43.5	14.8	99.8	56.5	
5	276.694	V	39.4	-12.3	27.1	46.0	18.9	99.8	188.8	
6	518.271	V	37.0	-9.3	27.7	46.0	18.3	99.8	156.0	

Remark :

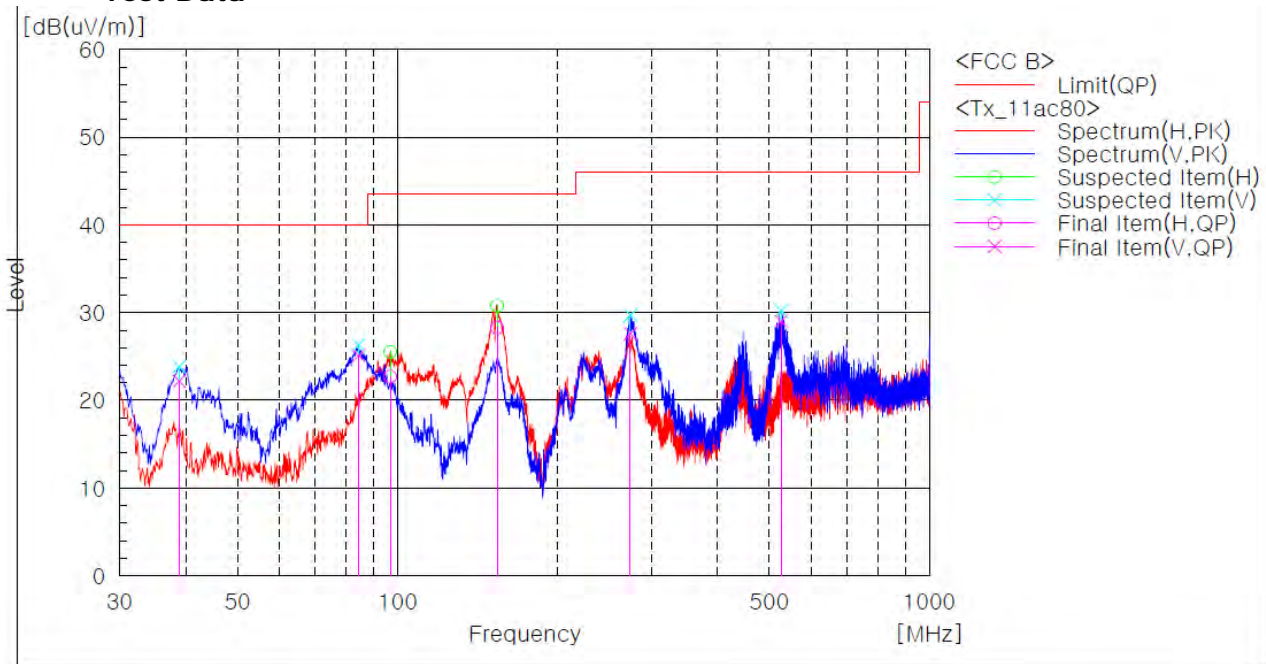
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

Test mode : Transmitter, 802.11ac_VHT80(Worst Case)

The requirements are:

Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	38.818	V	36.1	-13.9	22.2	40.0	17.8	99.8	251.4	
2	84.325	V	42.7	-17.6	25.1	40.0	14.9	99.8	158.7	
3	96.845	H	37.0	-14.3	22.7	43.5	20.8	99.8	79.2	
4	153.783	H	45.6	-17.3	28.3	43.5	15.2	99.8	79.2	
5	273.755	V	40.0	-12.4	27.6	46.0	18.4	99.8	158.7	
6	526.328	V	38.1	-9.1	29.0	46.0	17.0	99.8	147.2	

Remark :

1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain



3) above 1 GHz

Test mode : Transmitter, 802.11a

The requirements are:

Complies

Test Data

Ch.36(5 180 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.21	H	54.00	74.00	39.18	47.90	14.82	26.10
1 920.24	V	54.00	74.00	31.38	39.30	22.62	34.70
15 540.56	H	54.00	74.00	46.18	64.20	7.82	9.80
15 540.39	V	54.00	74.00	46.38	63.10	7.62	10.90
5 121.00	H	54.00	74.00	41.38	52.50	12.62	21.50
5 146.00	V	54.00	74.00	38.98	53.10	15.02	20.90

Ch.40(5 200 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.22	H	54.00	74.00	38.78	47.70	15.22	26.30
1 920.23	V	54.00	74.00	31.38	40.60	22.62	33.40
15 600.51	H	54.00	74.00	43.38	57.00	10.62	17.00
15 600.98	V	54.00	74.00	44.38	56.80	9.62	17.20

Ch.48(5 240 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.28	H	54.00	74.00	38.18	47.60	15.82	26.40
1 920.42	V	54.00	74.00	30.98	40.60	23.02	33.40
15 720.52	H	54.00	74.00	45.18	61.10	8.82	12.90
15 720.55	V	54.00	74.00	44.08	57.40	9.92	16.60



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (117) / (166) Pages

Ch.52(5 260 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.29	H	54.00	74.00	37.68	47.60	16.32	26.40
1 920.34	V	54.00	74.00	30.88	40.40	23.12	33.60
15 780.33	H	54.00	74.00	43.88	59.30	10.12	14.70
15 780.75	V	54.00	74.00	44.18	57.60	9.82	16.40

Ch.60(5 300 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.30	H	54.00	74.00	39.88	47.50	14.12	26.50
1 920.37	V	54.00	74.00	30.18	40.50	23.82	33.50
15 900.58	H	54.00	74.00	44.18	61.60	9.82	12.40
15 900.69	V	54.00	74.00	44.78	58.30	9.22	15.70

Ch.64(5 320 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.30	H	54.00	74.00	37.68	48.70	16.32	25.30
1 920.37	V	54.00	74.00	31.08	40.60	22.92	33.40
15 960.71	H	54.00	74.00	44.18	60.70	9.82	13.30
15 960.98	V	54.00	74.00	42.68	57.50	11.32	16.50
5 385.76	H	54.00	74.00	42.68	53.30	11.32	20.70
5 357.62	V	54.00	74.00	41.38	53.60	12.62	20.40



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (118) / (166) Pages

Ch.100(5 500 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.21	H	54.00	74.00	38.88	48.10	15.12	25.90
1 920.20	V	54.00	74.00	31.88	40.00	22.12	34.00
5 440.06	H	54.00	74.00	42.68	52.70	11.32	21.30
5 455.37	V	54.00	74.00	41.88	52.70	12.12	21.30

Ch.120(5 600 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 440.17	V	54.00	74.00	30.68	44.50	23.32	29.50
1 920.09	H	54.00	74.00	38.98	47.50	15.02	26.50
1 920.27	V	54.00	74.00	31.18	40.50	22.82	33.50

Ch.144(5 720 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 919.65	H	54.00	74.00	30.98	45.70	23.02	28.30
1 920.22	V	54.00	74.00	38.68	47.80	15.32	26.20
1 920.22	V	54.00	74.00	32.08	45.90	21.92	28.10

Ch.149(5 745 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 440.14	H	54.00	74.00	30.68	43.20	23.32	30.80
1 920.21	H	54.00	74.00	38.38	46.70	15.62	27.30
1 920.21	V	54.00	74.00	31.88	42.00	22.12	32.00
5 558.21	H	-	68.20	-	52.80	-	15.40
5 644.72	V	-	68.20	-	52.70	-	15.50



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (119) / (166) Pages

Ch.157(5 785 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.14	H	54.00	74.00	38.88	47.50	15.12	26.50
1 920.01	V	54.00	74.00	30.58	41.20	23.42	32.80

Ch.165(5 825 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 440.25	H	54.00	74.00	31.08	43.10	22.92	30.90
1 920.18	H	54.00	74.00	36.48	47.70	17.52	26.30
1 920.10	V	54.00	74.00	31.38	42.90	22.62	31.10
5 946.97	H	-	68.20	-	55.00	-	13.20
5 948.82	V	-	68.20	-	54.00	-	14.20

Remarks

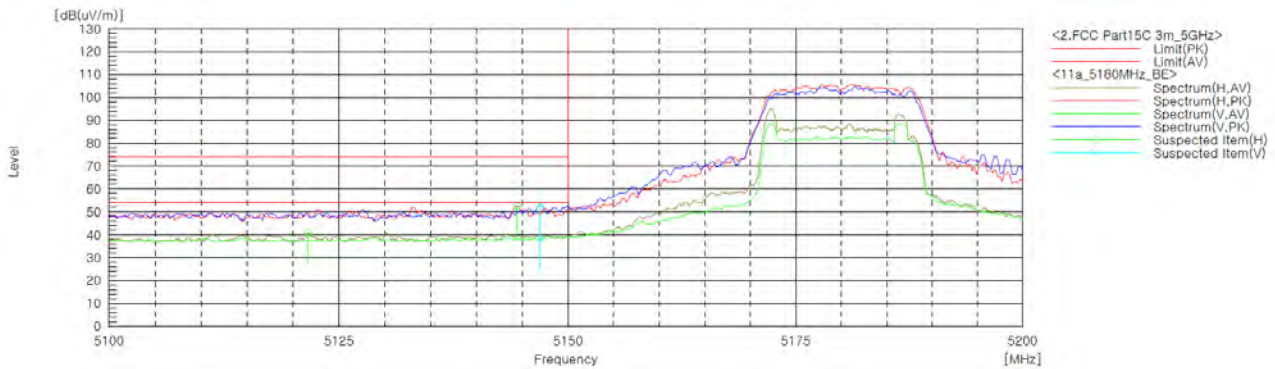
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (120) / (166) Pages

Worst Case Mode :	802.11a
Worst Case Transfer Rate :	6 Mbps
Distance of Measurements :	3 Meters
Operating Frequency :	5 180 MHz
Channel :	36



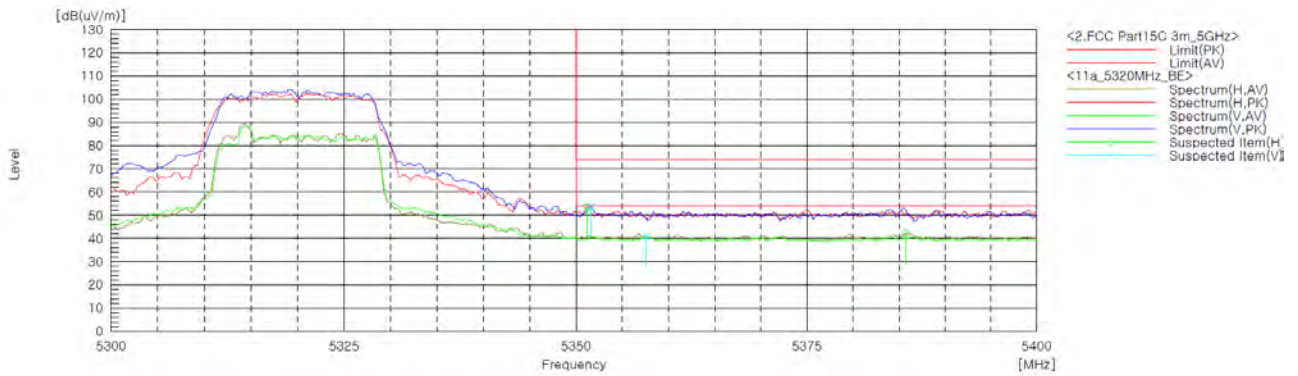
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (121) / (166) Pages

Worst Case Mode :	802.11a
Worst Case Transfer Rate :	6 Mbps
Distance of Measurements :	3 Meters
Operating Frequency :	5 320 MHz
Channel :	64



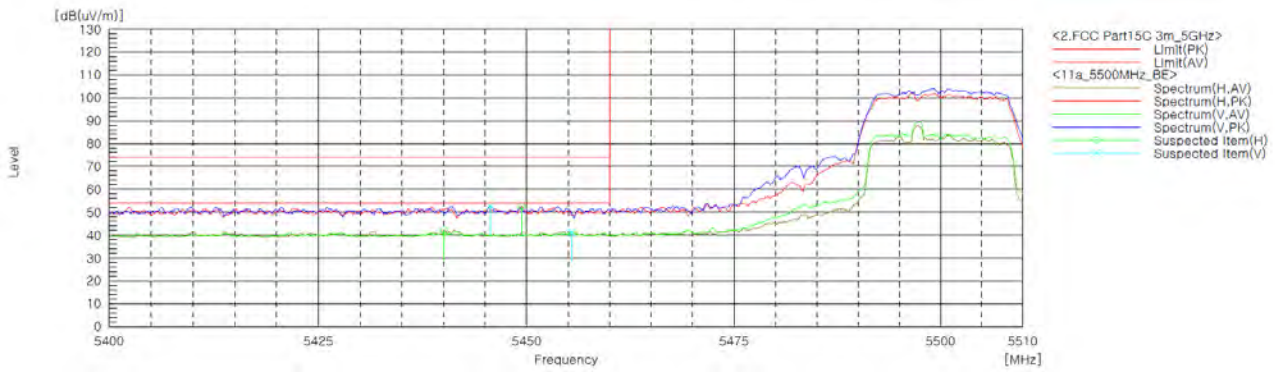
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (122) / (166) Pages

Worst Case Mode :	802.11a
Worst Case Transfer Rate :	6 Mbps
Distance of Measurements :	3 Meters
Operating Frequency :	5 500 MHz
Channel :	100



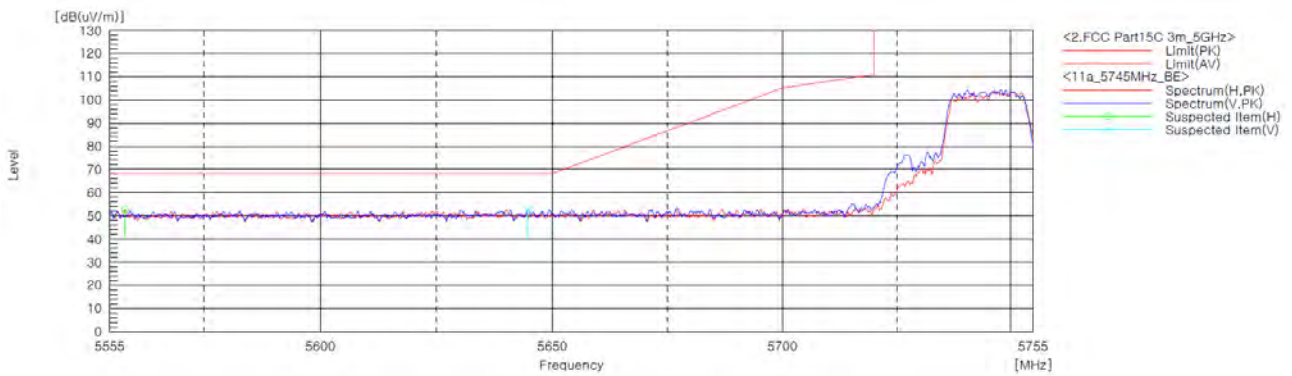
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (123) / (166) Pages

Worst Case Mode :	802.11a
Worst Case Transfer Rate :	6 Mbps
Distance of Measurements :	3 Meters
Operating Frequency :	5 745 MHz
Channel :	149



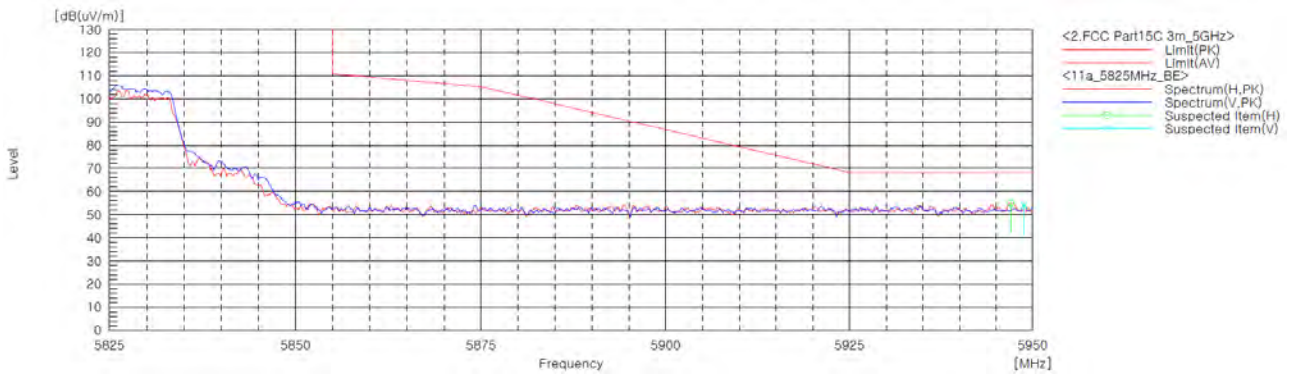
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (124) / (166) Pages

Worst Case Mode :	802.11a
Worst Case Transfer Rate :	6 Mbps
Distance of Measurements :	3 Meters
Operating Frequency :	5 825 MHz
Channel :	165



Radiated Restricted Upper Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (125) / (166) Pages

Test mode : Transmitter, 802.11n_HT20

The requirements are:

Complies

Test Data

Ch.36(5 180 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.22	H	54.00	74.00	39.12	44.50	14.88	29.50
1 920.21	V	54.00	74.00	31.92	42.00	22.08	32.00
15 535.61	H	54.00	74.00	43.72	56.30	10.28	17.70
15 541.33	V	54.00	74.00	43.82	55.20	10.18	18.80
5 148.65	H	54.00	74.00	42.92	53.40	11.08	20.60
5 148.00	V	54.00	74.00	40.52	52.80	13.48	21.20

Ch.40(5 200 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.27	H	54.00	74.00	37.62	47.70	16.38	26.30
1 920.06	V	54.00	74.00	32.42	40.60	21.58	33.40
15 600.10	H	54.00	74.00	42.72	56.20	11.28	17.80
15 600.08	V	54.00	74.00	43.92	55.00	10.08	19.00

Ch.48(5 240 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.26	H	54.00	74.00	38.52	44.90	15.48	29.10
1 920.00	V	54.00	74.00	30.72	42.20	23.28	31.80
15 720.50	H	54.00	74.00	43.32	55.40	10.68	18.60
15 720.71	V	54.00	74.00	43.92	53.20	10.08	20.80

Ch.52(5 260 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.11	H	54.00	74.00	38.62	44.60	15.38	29.40
1 920.30	V	54.00	74.00	31.62	42.50	22.38	31.50
15 780.97	H	54.00	74.00	44.02	55.30	9.98	18.70
15 780.47	V	54.00	74.00	44.22	54.50	9.78	19.50

Ch.60(5 300 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.20	H	54.00	74.00	38.72	46.50	15.28	27.50
1 920.09	V	54.00	74.00	31.72	41.20	22.28	32.80
15 900.22	H	54.00	74.00	43.32	55.80	10.68	18.20
15 900.77	V	54.00	74.00	43.02	51.80	10.98	22.20

Ch.64(5 320 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.22	H	54.00	74.00	38.42	44.80	15.58	29.20
1 920.34	V	54.00	74.00	31.62	42.90	22.38	31.10
15 959.33	H	54.00	74.00	43.12	54.40	10.88	19.60
15 970.26	V	54.00	74.00	42.32	52.20	11.68	21.80
5 382.73	H	54.00	74.00	42.32	52.90	11.68	21.10
5 357.88	V	54.00	74.00	41.62	52.20	12.38	21.80

Ch.100(5 500 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.31	H	54.00	74.00	38.52	44.60	15.48	29.40
1 920.31	V	54.00	74.00	31.52	41.90	22.48	32.10
5 441.42	H	54.00	74.00	42.52	52.10	11.48	21.90
5 455.03	V	54.00	74.00	42.92	52.60	11.08	21.40

Ch.120(5 600 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.29	H	54.00	74.00	38.52	45.30	15.48	28.70
1 920.16	V	54.00	74.00	31.62	41.20	22.38	32.80

Ch.144(5 720 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.32	H	54.00	74.00	38.62	46.80	15.38	27.20
1 920.51	V	54.00	74.00	32.62	43.90	21.38	30.10

Ch.149(5 745 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 440.17	H	54.00	74.00	30.72	46.40	23.28	27.60
1 920.37	H	54.00	74.00	31.52	42.40	22.48	31.60
5 585.89	H	-	68.20	-	52.90	-	15.30
5 608.33	V	-	68.20	-	52.70	-	15.50

Ch.157(5 785 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 440.17	H	54.00	74.00	31.52	44.20	22.48	29.80
1 920.32	H	54.00	74.00	38.42	47.20	15.58	26.80
1 920.08	V	54.00	74.00	29.72	39.90	24.28	34.10

Ch.165(5 825 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.20	H	54.00	74.00	39.52	46.20	14.48	27.80
1 920.19	V	54.00	74.00	33.42	43.50	20.58	30.50
5 945.33	H	-	68.20	-	54.30	-	13.90
5 936.21	V	-	68.20	-	54.20	-	14.00

Remarks

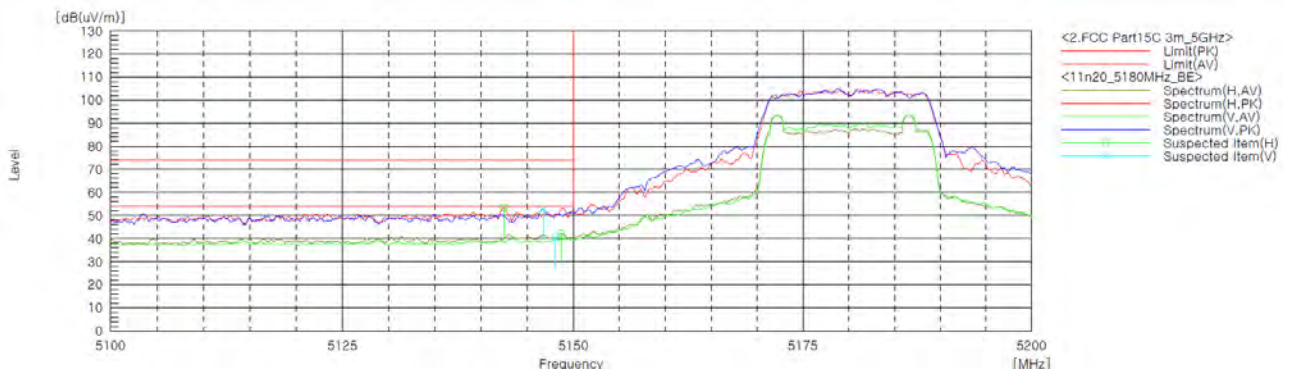
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

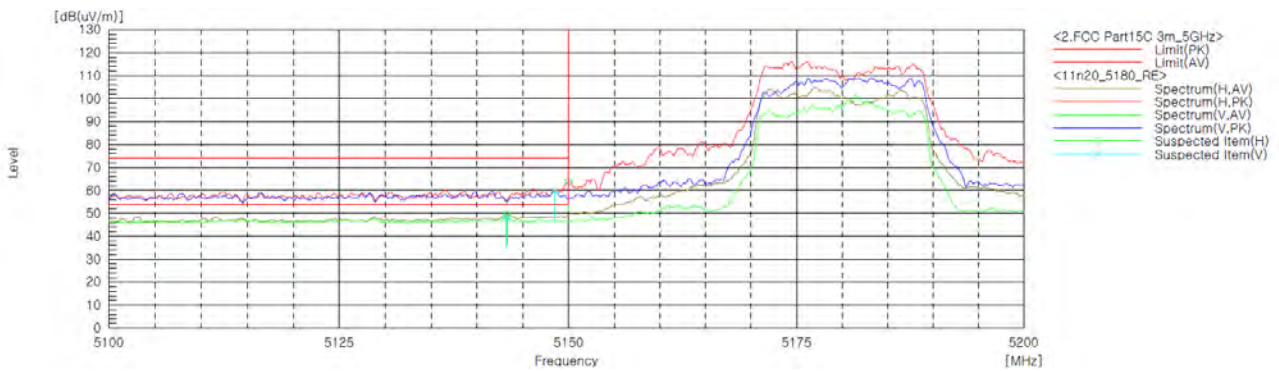
Report No.:
 CTK-2018-02469
 Page (128) / (166) Pages

Worst Case Mode :	802.11n_HT20
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 180 MHz
Channel :	36



Radiated Restricted Lower Band Edge Plot

Worst Case Mode :	802.11n_HT20
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 320 MHz
Channel :	64



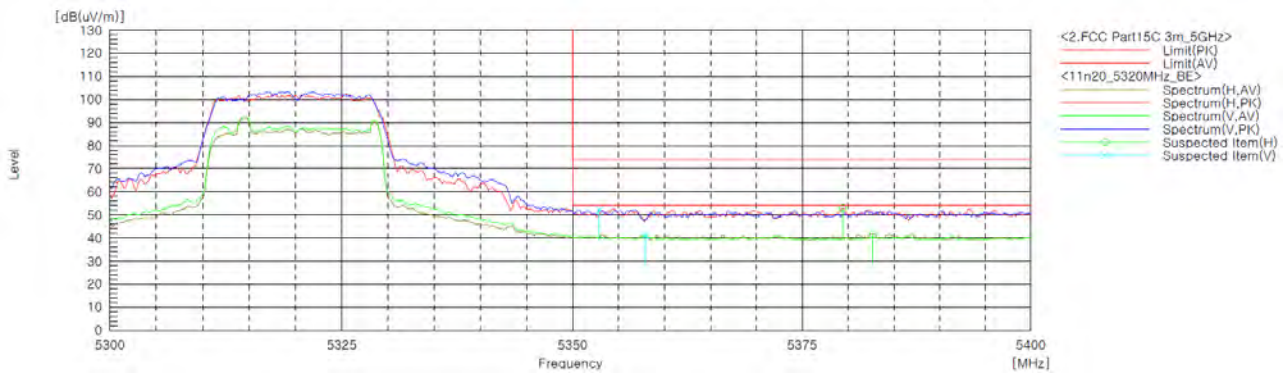
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (130) / (166) Pages

Worst Case Mode :	802.11n_HT20
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 500 MHz
Channel :	100



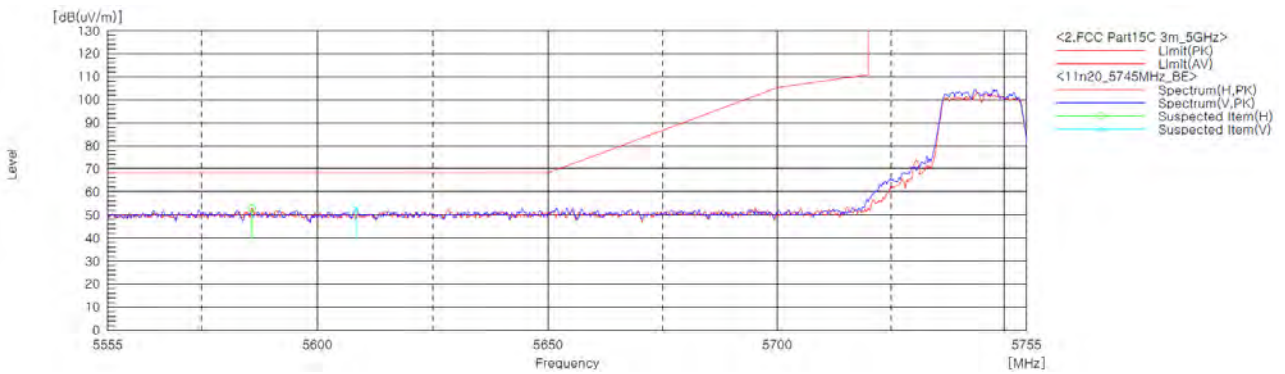
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

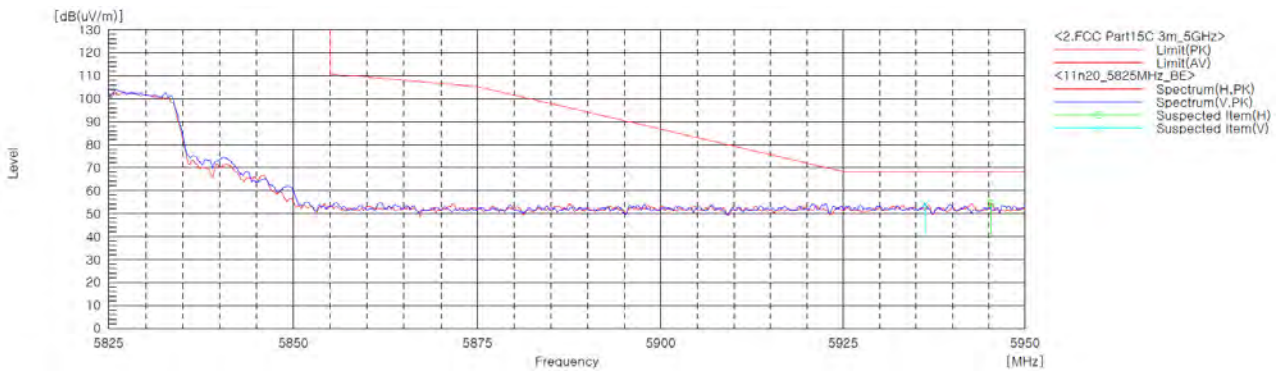
Report No.:
CTK-2018-02469
Page (131) / (166) Pages

Worst Case Mode :	802.11n_HT20
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 745 MHz
Channel :	149



Radiated Restricted Lower Band Edge Plot

Worst Case Mode :	802.11n_HT20
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 825 MHz
Channel :	165



Radiated Restricted Upper Band Edge Plot



Test mode : Transmitter, 802.11ac_VHT20

The requirements are:

Complies

Test Data

Ch.36(5 180 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.24	H	54.00	74.00	39.10	47.40	14.90	26.60
1 920.22	V	54.00	74.00	32.80	41.90	21.20	32.10
5 141.11	H	54.00	74.00	40.40	52.10	13.60	21.90
5 143.41	V	54.00	74.00	39.20	49.80	14.80	24.20

Ch.40(5 200 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.41	H	54.00	74.00	38.30	47.10	15.70	26.90
1 920.40	V	54.00	74.00	32.80	42.00	21.20	32.00

Ch.48(5 240 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.12	H	54.00	74.00	38.10	46.40	15.90	27.60
1 920.31	V	54.00	74.00	32.50	40.90	21.50	33.10

Ch.52(5 260 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.28	H	54.00	74.00	37.20	46.40	16.80	27.60
1 920.01	V	54.00	74.00	30.60	41.10	23.40	32.90

Ch.60(5 300 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.37	H	54.00	74.00	38.70	47.10	15.30	26.90
1 920.09	V	54.00	74.00	31.90	42.90	22.10	31.10

Ch.64(5 320 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.20	H	54.00	74.00	38.40	47.60	15.60	26.40
1 920.29	V	54.00	74.00	31.80	41.10	22.20	32.90
5 372.53	H	54.00	74.00	41.90	52.10	12.10	21.90
5 377.50	V	54.00	74.00	41.10	52.10	12.90	21.90

Ch.100(5 500 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.17	H	54.00	74.00	39.40	47.60	14.60	26.40
1 920.12	V	54.00	74.00	33.50	41.30	20.50	32.70
5 452.99	H	54.00	74.00	41.80	52.40	12.20	21.60
5 425.74	V	54.00	74.00	42.40	52.70	11.60	21.30

Ch.120(5 600 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.08	H	54.00	74.00	38.50	48.50	15.50	25.50
1 920.17	V	54.00	74.00	31.90	41.00	22.10	33.00

Ch.144(5 720 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.34	H	54.00	74.00	39.40	47.30	14.60	26.70
1 920.35	V	54.00	74.00	33.00	41.40	21.00	32.60

Ch.149(5 745 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.35	H	54.00	74.00	38.90	48.30	15.10	25.70
1 920.18	V	54.00	74.00	32.10	41.60	21.90	32.40
5 621.98	H	-	68.20	-	45.70	-	22.50
5 646.31	V	-	68.20	-	47.00	-	21.20



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (135) / (166) Pages

Ch.157(5 785 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.08	H	54.00	74.00	38.70	47.80	15.30	26.20
1 920.19	V	54.00	74.00	32.70	41.60	21.30	32.40

Ch.165(5 825 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.23	H	54.00	74.00	38.60	47.40	15.40	26.60
1 920.35	V	54.00	74.00	31.70	40.60	22.30	33.40
5 936.60	H	-	68.20	-	53.60	-	14.60
5 946.77	V	-	68.20	-	55.40	-	12.80

Remarks

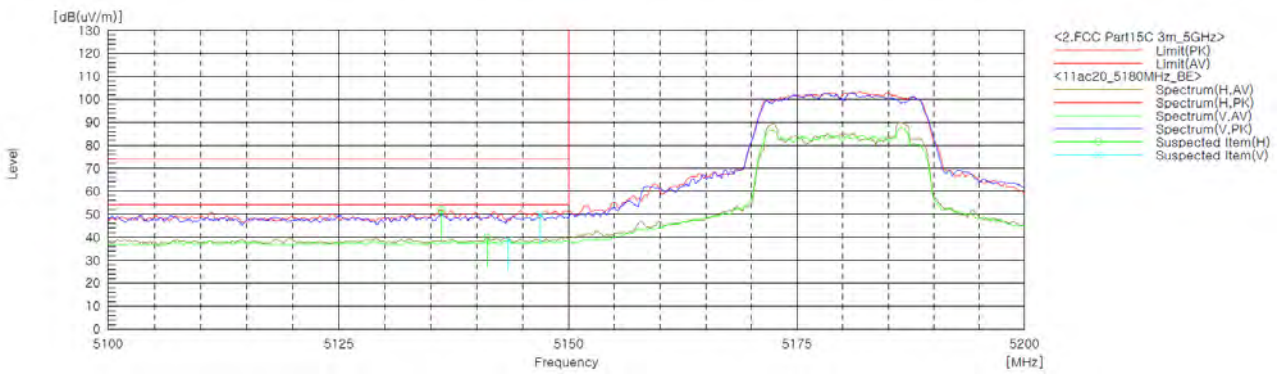
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (136) / (166) Pages

Worst Case Mode :	802.11ac_VHT20
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 180 MHz
Channel :	36



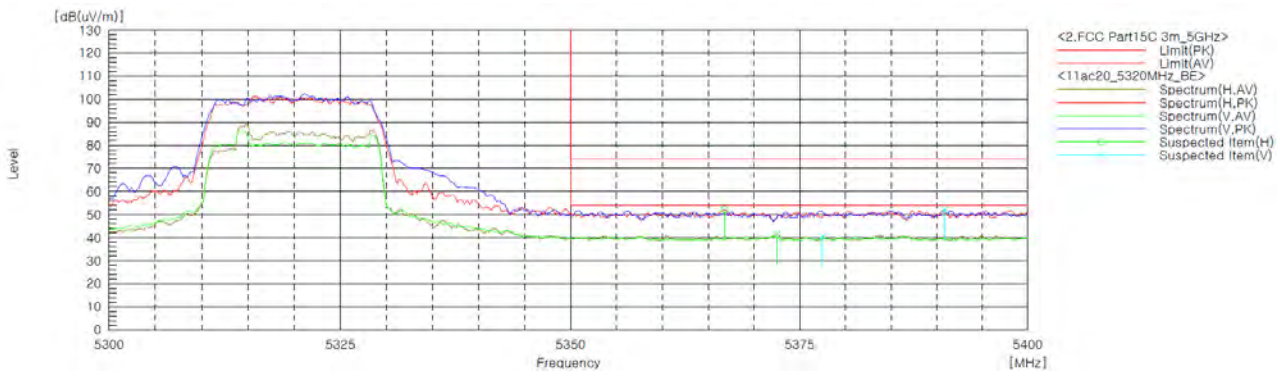
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (137) / (166) Pages

Worst Case Mode :	802.11ac_VHT20
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 320 MHz
Channel :	64



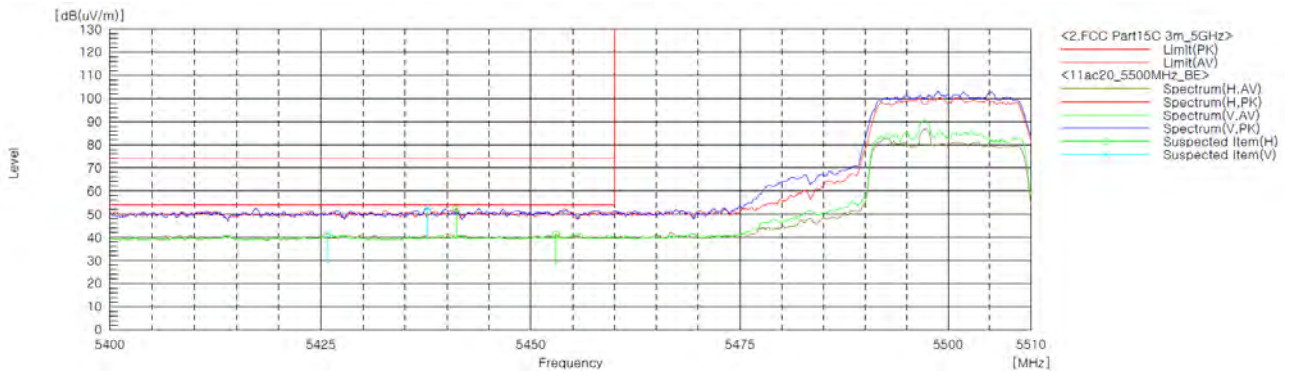
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

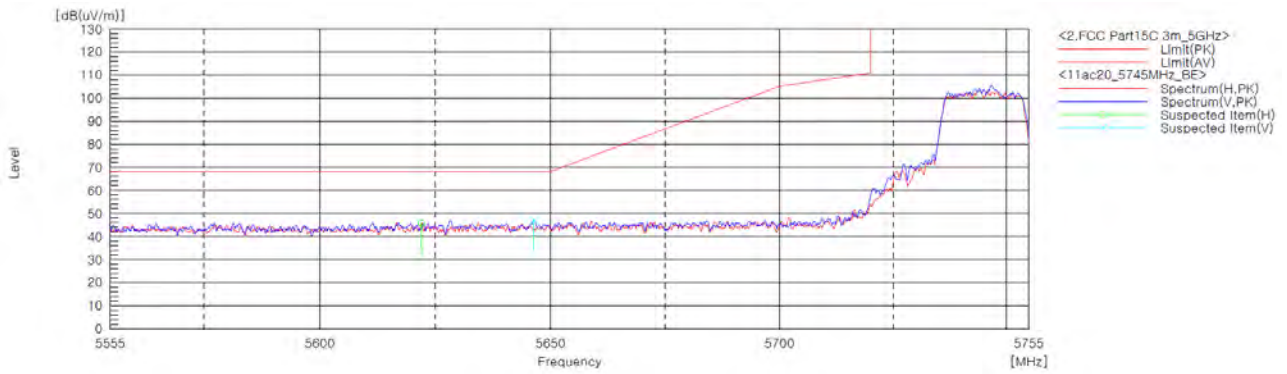
Report No.:
 CTK-2018-02469
 Page (138) / (166) Pages

Worst Case Mode :	802.11ac_VHT20
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 500 MHz
Channel :	100



Radiated Restricted Lower Band Edge Plot

Worst Case Mode :	802.11ac_VHT20
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 745 MHz
Channel :	149



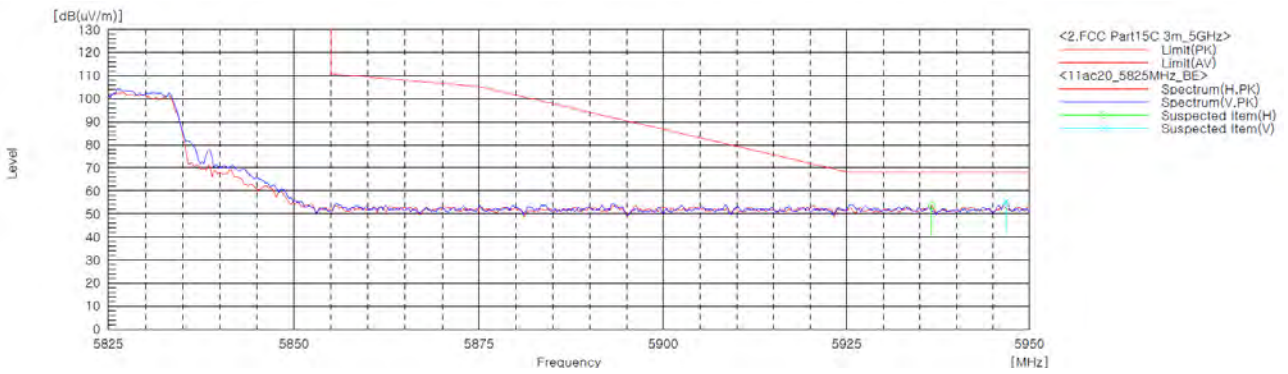
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (140) / (166) Pages

Worst Case Mode :	802.11ac_VHT20
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 825 MHz
Channel :	165



Radiated Restricted Upper Band Edge Plot



Test mode : Transmitter, 802.11n_HT40

The requirements are:

Complies

Test Data

Ch.38(5 190 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.23	H	54.00	74.00	39.24	47.70	14.76	26.30
1 920.20	V	54.00	74.00	32.54	41.00	21.46	33.00
5 146.81	H	54.00	74.00	43.14	57.80	10.86	16.20
5 149.88	V	54.00	74.00	43.24	59.20	10.76	14.80

Ch.46(5 230 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.12	H	54.00	74.00	39.14	47.40	14.86	26.60
1 920.37	V	54.00	74.00	31.44	41.60	22.56	32.40

Ch.54(5 270 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.05	H	54.00	74.00	39.14	46.80	14.86	27.20
1 920.51	V	54.00	74.00	32.24	41.80	21.76	32.20

Ch.62(5 310 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.44	H	54.00	74.00	38.94	47.00	15.06	27.00
1 920.21	V	54.00	74.00	31.44	40.70	22.56	33.30
5 354.86	H	54.00	74.00	43.84	54.70	10.16	19.30
5 353.19	V	54.00	74.00	44.74	63.00	9.26	11.00



Ch.102(5 510 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.05	H	54.00	74.00	39.04	46.10	14.96	27.90
1 920.29	V	54.00	74.00	32.24	41.70	21.76	32.30
5 457.71	H	54.00	74.00	43.54	54.90	10.46	19.10
5 459.99	V	54.00	74.00	43.34	55.30	10.66	18.70

Ch.118(5 590 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.04	H	54.00	74.00	39.14	46.90	14.86	27.10
1 920.29	V	54.00	74.00	31.44	41.10	22.56	32.90

Ch.142(5 710 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.43	H	54.00	74.00	39.04	47.30	14.96	26.70
1 920.17	V	54.00	74.00	31.94	41.70	22.06	32.30

Ch.151(5 755 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.23	H	54.00	74.00	40.14	48.70	13.86	25.30
1 920.20	V	54.00	74.00	33.04	40.10	20.96	33.90
5 580.84	H	-	68.20	-	52.60	-	15.60
5 565.10	V	-	68.20	-	53.30	-	14.90

Ch.159(5 795 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.29	H	54.00	74.00	39.24	47.20	14.76	26.80
1 920.18	V	54.00	74.00	32.44	42.10	21.56	31.90
6 256.33	H	54.00	74.00	37.94	49.10	16.06	24.90
6 256.63	V	54.00	74.00	40.94	51.60	13.06	22.40
5 948.23	H	-	68.20	-	53.70	-	14.50
5 947.65	V	-	68.20	-	53.20	-	15.00

Remarks

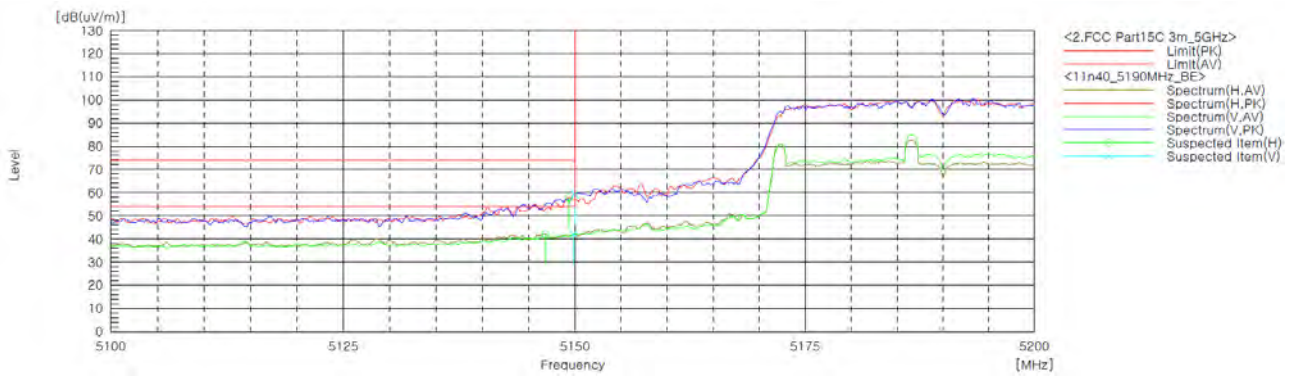
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (143) / (166) Pages

Worst Case Mode :	802.11n_HT40
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 190 MHz
Channel :	38



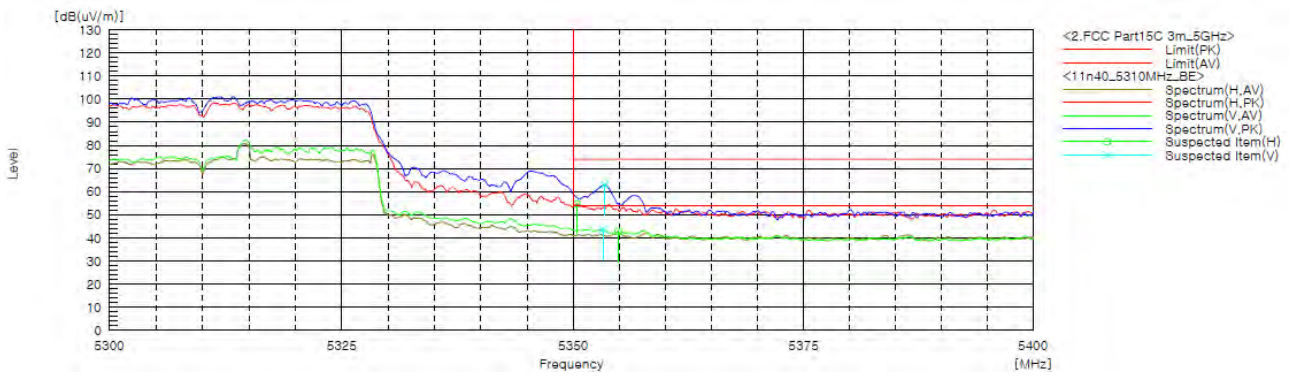
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (144) / (166) Pages

Worst Case Mode :	802.11n_HT40
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 310 MHz
Channel :	62



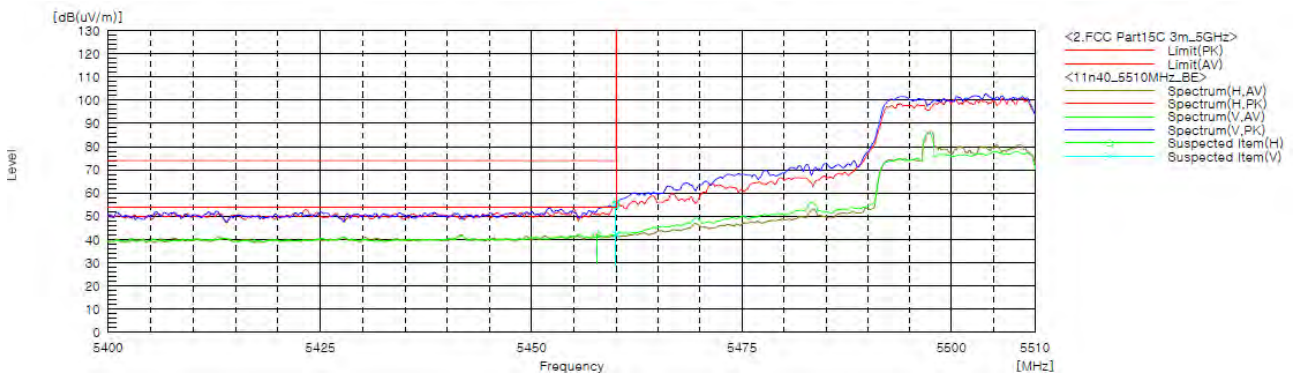
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (145) / (166) Pages

Worst Case Mode :	802.11n_HT40
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 510 MHz
Channel :	102



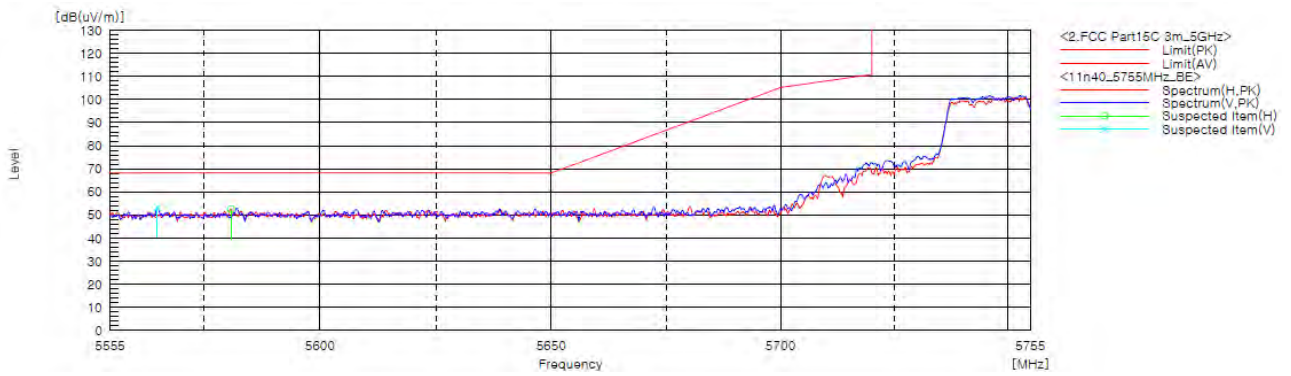
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (146) / (166) Pages

Worst Case Mode :	802.11n_HT40
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 755 MHz
Channel :	151



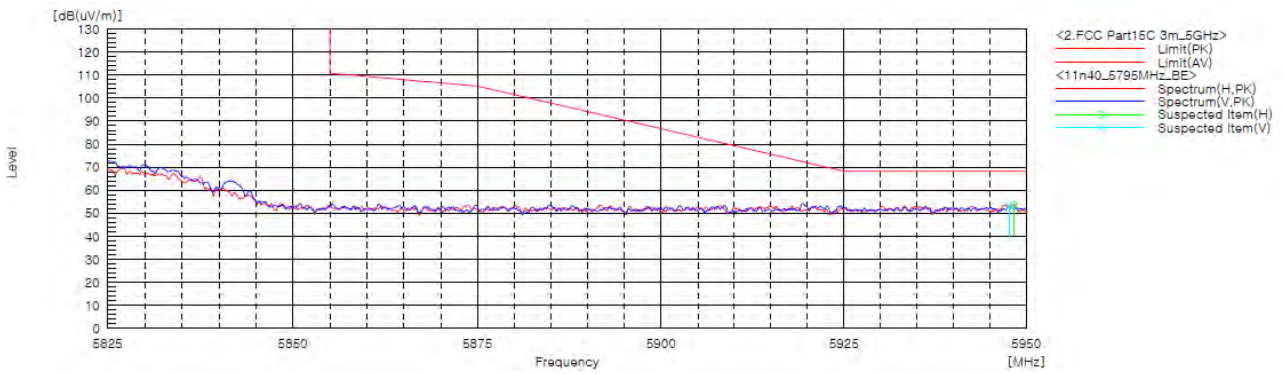
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (147) / (166) Pages

Worst Case Mode :	802.11n_HT40
Worst Case Transfer Rate :	MCS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 795 MHz
Channel :	159



Radiated Restricted Upper Band Edge Plot



Test mode : Transmitter, 802.11ac_VHT40

The requirements are:

Complies

Test Data

Ch.38(5 190 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.20	H	54.00	74.00	39.73	48.10	14.27	25.90
1 920.22	V	54.00	74.00	32.63	42.20	21.37	31.80
5 149.35	H	54.00	74.00	46.43	58.70	7.57	15.30
5 146.61	V	54.00	74.00	43.23	58.30	10.77	15.70

Ch.46(5 230 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.28	H	54.00	74.00	39.13	47.30	14.87	26.70
1 920.18	V	54.00	74.00	29.33	31.20	24.67	42.80

Ch.54(5 270 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.27	H	54.00	74.00	39.53	47.50	14.47	26.50
1 920.16	V	54.00	74.00	32.33	40.90	21.67	33.10

Ch.62(5 310 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.17	H	54.00	74.00	39.13	47.40	14.87	26.60
1 920.34	V	54.00	74.00	32.33	41.60	21.67	32.40
5 350.92	H	54.00	74.00	43.93	55.70	10.07	18.30
5 351.15	V	54.00	74.00	45.03	62.80	8.97	11.20



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (149) / (166) Pages

Ch.102(5 510 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.31	H	54.00	74.00	47.60	14.77	26.40	47.60
1 920.44	V	54.00	74.00	42.30	22.37	31.70	42.30
5 459.67	H	54.00	74.00	53.00	11.07	21.00	53.00
5 459.99	V	54.00	74.00	55.30	10.87	18.70	55.30

Ch.118(5 590 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.20	H	54.00	74.00	39.03	47.90	14.97	26.10
1 920.21	V	54.00	74.00	32.33	42.10	21.67	31.90

Ch.142(5 710 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.19	H	54.00	74.00	38.93	48.90	15.07	25.10
1 920.32	V	54.00	74.00	32.43	42.40	21.57	31.60

Ch.151(5 755 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.16	H	54.00	74.00	39.03	47.90	14.97	26.10
1 920.28	V	54.00	74.00	32.33	42.30	21.67	31.70
6 250.85	H	54.00	74.00	38.13	49.50	15.87	24.50
6 250.99	V	54.00	74.00	40.83	51.10	13.17	22.90
5 570.22	H	-	68.20	-	52.40	-	15.80
5 631.27	V	-	68.20	-	52.90	-	15.30



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (150) / (166) Pages

Ch.159(5 795 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.24	H	54.00	74.00	39.13	48.80	14.87	25.20
1 920.29	V	54.00	74.00	32.43	42.00	21.57	32.00
6 258.51	H	54.00	74.00	37.93	48.00	16.07	26.00
6 257.73	V	54.00	74.00	41.33	52.10	12.67	21.90
5 936.10	H	-	68.20	-	53.90	-	14.30
5 943.35	V	-	68.20	-	53.50	-	14.70

Remarks

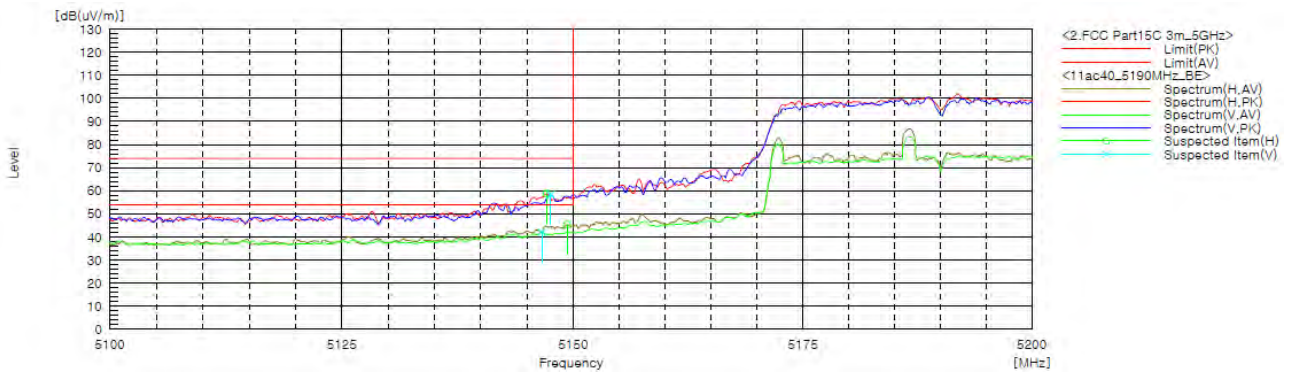
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (151) / (166) Pages

Worst Case Mode :	802.11ac_VHT40
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 190 MHz
Channel :	38



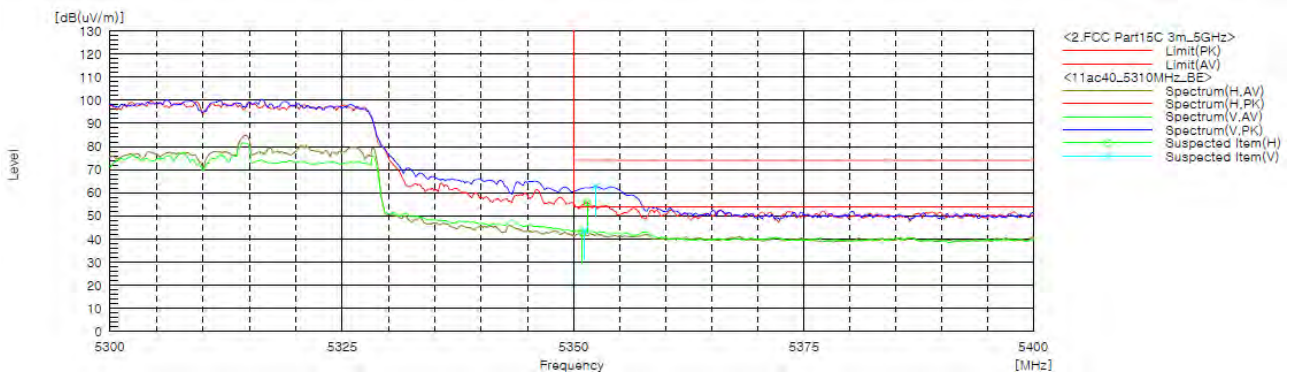
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (152) / (166) Pages

Worst Case Mode :	802.11ac_VHT40
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 310 MHz
Channel :	62



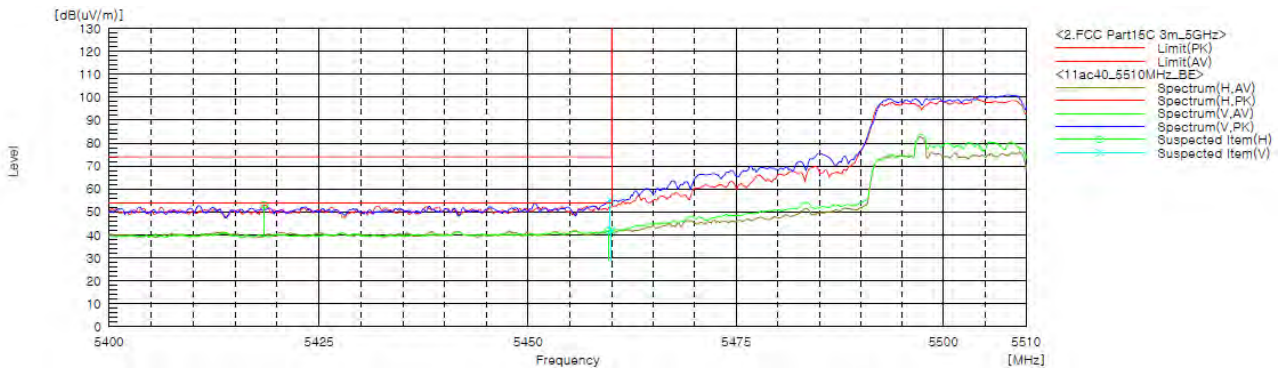
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

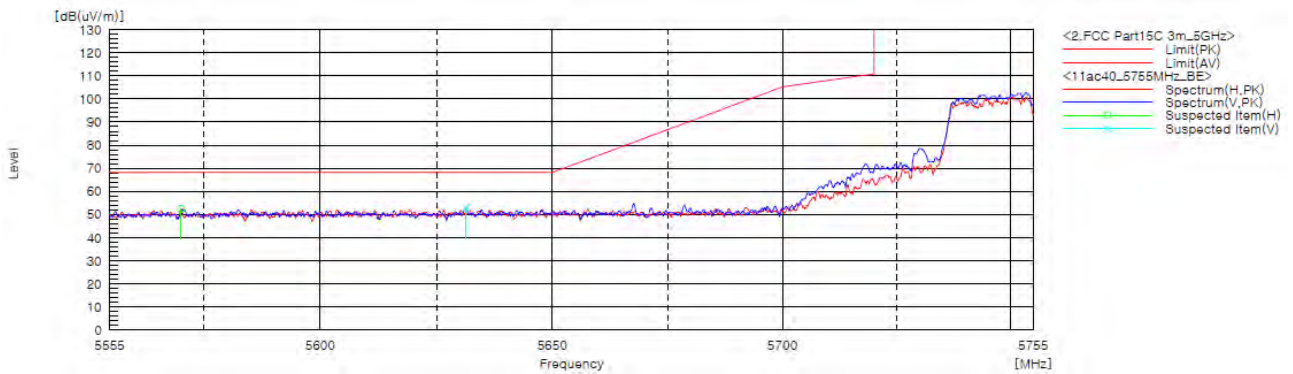
Report No.:
CTK-2018-02469
Page (153) / (166) Pages

Worst Case Mode :	802.11ac_VHT40
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 510 MHz
Channel :	102



Radiated Restricted Lower Band Edge Plot

Worst Case Mode :	802.11ac_VHT40
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 755 MHz
Channel :	151



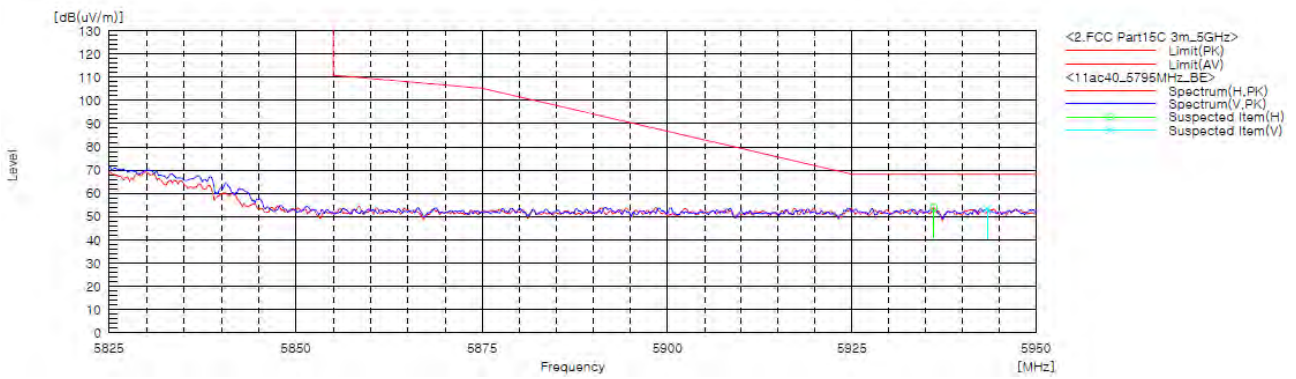
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (155) / (166) Pages

Worst Case Mode :	802.11ac_VHT40
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 795 MHz
Channel :	159



Radiated Restricted Upper Band Edge Plot



Test mode : Transmitter, 802.11ac_VHT80

The requirements are:

Complies

Test Data

Ch.42(5 210 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.22	H	54.00	74.00	40.04	47.00	13.96	27.00
1 920.02	V	54.00	74.00	33.24	42.10	20.76	31.90
4 763.72	H	54.00	74.00	36.04	47.10	17.96	26.90
4 763.88	V	54.00	74.00	34.54	44.30	19.46	29.70
5 142.99	H	54.00	74.00	47.64	62.00	6.36	12.00
5 143.33	V	54.00	74.00	45.34	60.60	8.66	13.40

Ch.58(5 290 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.36	H	54.00	74.00	40.24	48.20	13.76	25.80
1 920.34	V	54.00	74.00	33.44	42.90	20.56	31.10
5 357.90	H	54.00	74.00	46.74	57.90	7.26	16.10
5 357.68	V	54.00	74.00	48.24	62.90	5.76	11.10

Ch.106(5 530 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.17	H	54.00	74.00	39.64	48.40	14.36	25.60
1 920.32	V	54.00	74.00	33.24	42.50	20.76	31.50
5 455.54	H	54.00	74.00	47.54	60.70	6.46	13.30
5 455.33	V	54.00	74.00	50.14	67.50	3.86	6.50

Ch.138(5 690 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.32	H	54.00	74.00	40.84	48.30	13.16	25.70
1 920.26	V	54.00	74.00	34.14	42.50	19.86	31.50
6 135.62	H	54.00	74.00	40.74	49.20	13.26	24.80
6 135.97	V	54.00	74.00	44.24	52.30	9.76	21.70



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (157) / (166) Pages

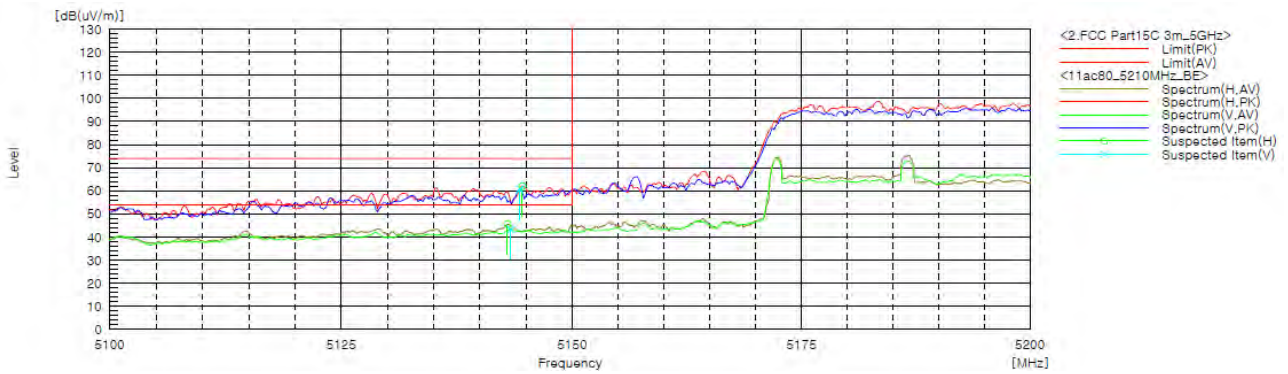
Ch.155(5 775 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
1 920.21	H	54.00	74.00	40.34	48.50	13.66	25.50
1 920.14	V	54.00	74.00	33.54	43.10	20.46	30.90
6 209.74	H	54.00	74.00	40.64	49.70	13.36	24.30
6 209.11	V	54.00	74.00	42.44	52.40	11.56	21.60
5 648.00	H	-	68.20	-	52.70	-	15.50
5 643.89	V	-	68.20	-	53.60	-	14.60
5 945.74	H	-	68.20	-	54.00	-	14.20
5 944.74	V	-	68.20	-	53.70	-	14.50

Remarks

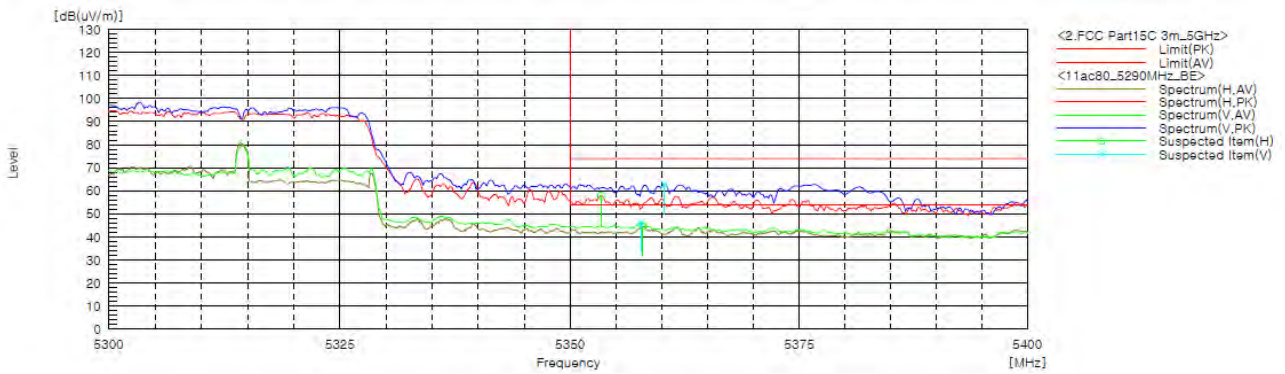
1. The EUT was tested in three orientations in order to determine that "X axis" was the worst case.

Worst Case Mode :	802.11ac_VHT80
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 210 MHz
Channel :	42



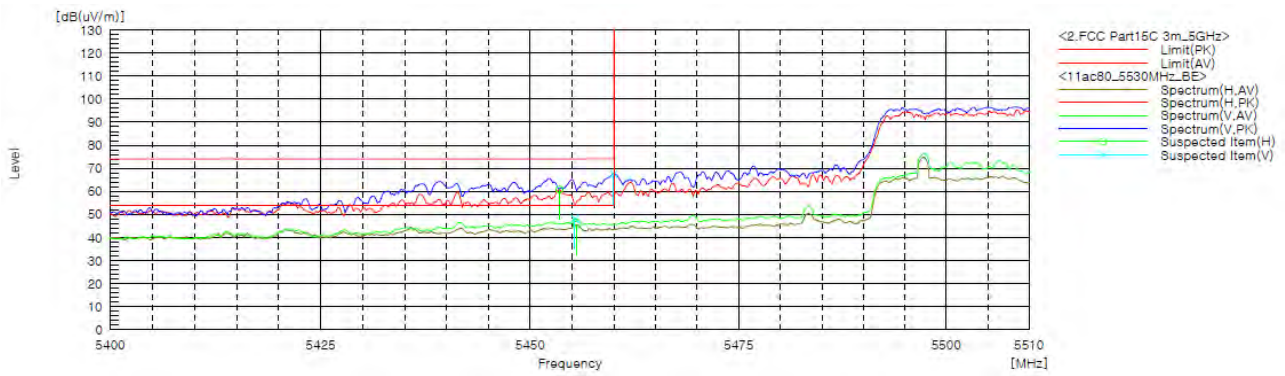
Radiated Restricted Lower Band Edge Plot

Worst Case Mode :	802.11ac_VHT80
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 290 MHz
Channel :	58



Radiated Restricted Lower Band Edge Plot

Worst Case Mode :	802.11ac_VHT80
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 530 MHz
Channel :	106



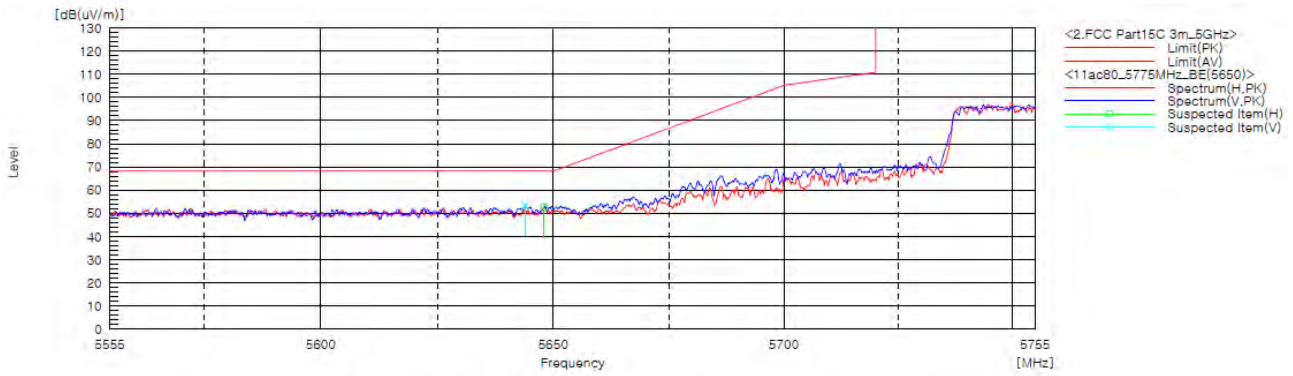
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (161) / (166) Pages

Worst Case Mode :	802.11ac_VHT80
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 775 MHz
Channel :	155



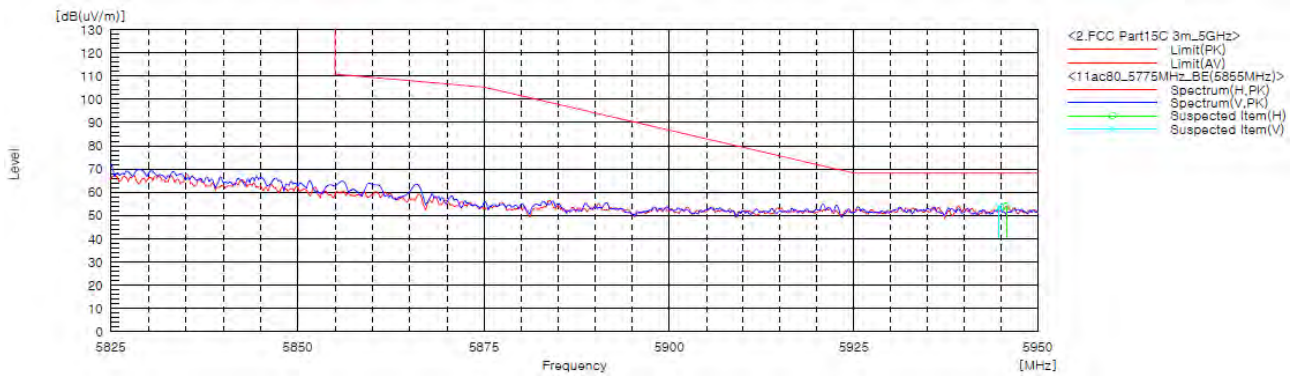
Radiated Restricted Lower Band Edge Plot



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (162) / (166) Pages

Worst Case Mode :	802.11ac_VHT80
Worst Case Transfer Rate :	MNSS 0
Distance of Measurements :	3 Meters
Operating Frequency :	5 775 MHz
Channel :	155



Radiated Restricted Upper Band Edge Plot



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-02469
Page (163) / (166) Pages

4.7 AC Conducted Emissions

Test Location

Shielded Room

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency.

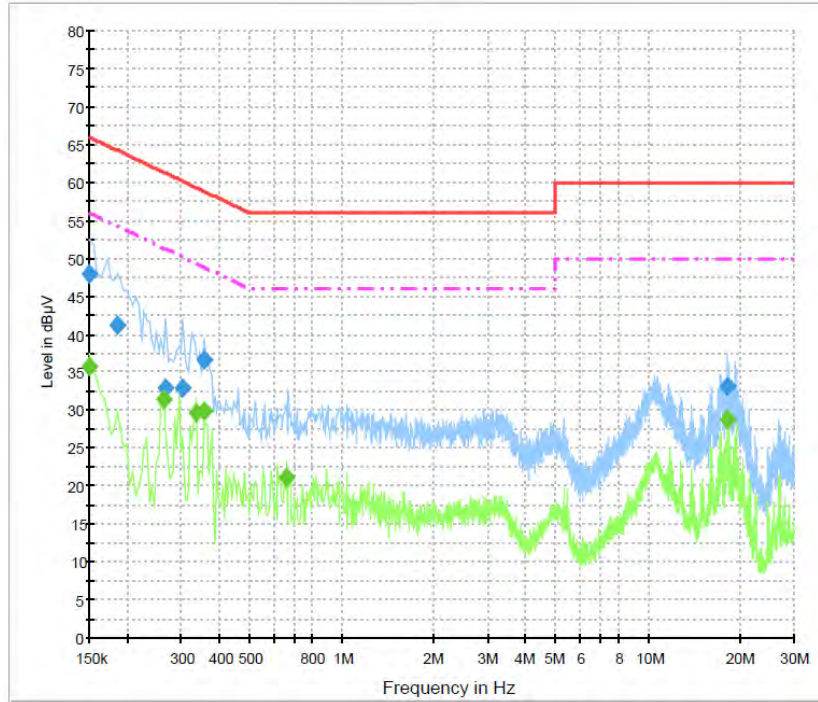
Test Results

The requirements are:

Complies

Test Data

[LINE]
Class B_L1



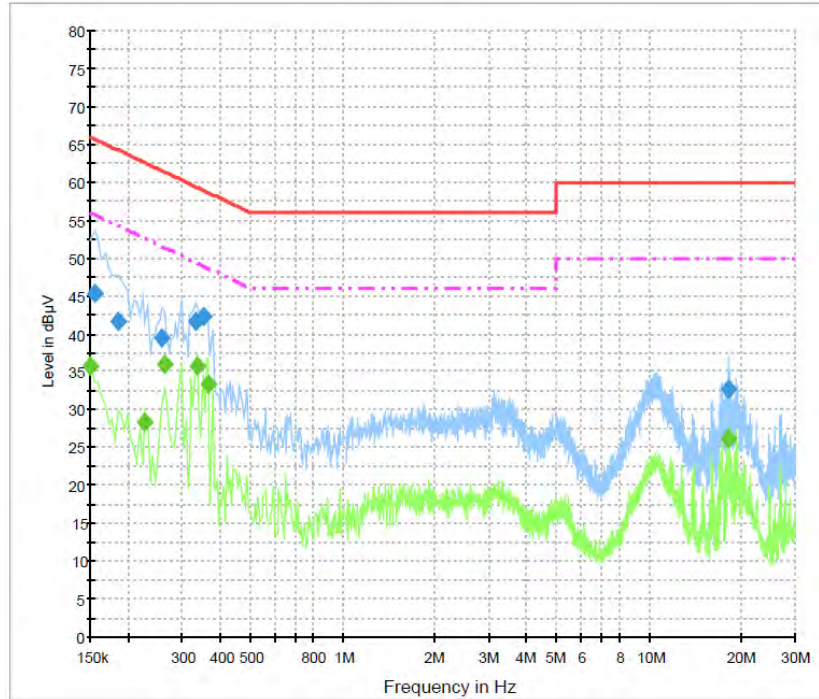
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	48.1	1000.0	9.000	On	L1	9.8	17.9	66.0
0.186000	41.2	1000.0	9.000	On	L1	9.9	23.0	64.2
0.267000	32.8	1000.0	9.000	On	L1	9.8	28.4	61.2
0.303000	32.9	1000.0	9.000	On	L1	9.8	27.3	60.2
0.357000	36.7	1000.0	9.000	On	L1	9.9	22.1	58.8
18.217500	33.2	1000.0	9.000	On	L1	10.0	26.8	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	35.6	1000.0	9.000	On	L1	9.8	20.4	56.0
0.262500	31.5	1000.0	9.000	On	L1	9.7	19.9	51.4
0.334500	29.5	1000.0	9.000	On	L1	9.9	19.8	49.3
0.357000	29.8	1000.0	9.000	On	L1	9.9	19.0	48.8
0.663000	21.1	1000.0	9.000	On	L1	9.9	24.9	46.0
18.177000	28.8	1000.0	9.000	On	L1	10.0	21.2	50.0

[NEUTRAL]
Class B_N



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	45.2	1000.0	9.000	On	N	9.8	20.5	65.8
0.186000	41.7	1000.0	9.000	On	N	9.9	22.5	64.2
0.258000	39.5	1000.0	9.000	On	N	9.6	22.0	61.5
0.330000	41.6	1000.0	9.000	On	N	9.8	17.8	59.5
0.352500	42.2	1000.0	9.000	On	N	9.9	16.7	58.9
18.217500	32.6	1000.0	9.000	On	N	10.0	27.4	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	35.7	1000.0	9.000	On	N	9.8	20.3	56.0
0.226500	28.3	1000.0	9.000	On	N	9.8	24.3	52.6
0.262500	36.0	1000.0	9.000	On	N	9.6	15.3	51.4
0.334500	35.7	1000.0	9.000	On	N	9.9	13.6	49.3
0.366000	33.4	1000.0	9.000	On	N	9.9	15.2	48.6
18.258000	26.1	1000.0	9.000	On	N	10.0	23.9	50.0



CTK Co., Ltd.
 (Ho-dong), 113, Yejik-ro, Cheoin-gu,
 Yongin-si, Gyeonggi-do, Korea
 Tel: +82-31-339-9970
 Fax: +82-31-624-9501

Report No.:
 CTK-2018-02469
 Page (166) / (166) Pages

APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2017-11-01	2018-11-01
2	Signal Generator	Rohde & Schwarz	SMB100A	175528	2017-11-01	2018-11-01
3	EMI Test Receiver	Rohde & Schwarz	ESCI7	100814	2017-10-25	2018-10-25
4	Bilog Antenna	Schaffner	CBL6111C	2551	2018-05-10	2020-05-10
5	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2018-05-02	2020-05-02
6	6dB Attenuator	R&S	DNF	272.4110.50-2	2017-10-25	2018-10-25
7	AMPLIFIER	SONOMA	310	291721	2018-02-02	2019-02-02
8	EMI Test Receiver	Rohde & Schwarz	ESU40	100336	2018-02-01	2019-02-01
9	LISN	Rohde & Schwarz	ENV216	101760	2018-01-31	2019-01-31
10	Preamplifier	Agilent	8449B	3008A02011	2017-11-30	2018-11-30
11	Horn Antenna	ETS-Lindgren	3116	00062504	2017-12-04	2019-12-04
12	Horn Antenna	ETS-Lindgren	3117	00154525	2017-02-17	2019-02-17
13	Singnal Canditioning Unit	R&S	SCU-40	10023	2017-11-01	2018-11-01
14	Band Reject Filter	Micro Tronics	BRM50716	G184	2018-01-26	2019-01-26
15	Temp&Humi Chamber	ESPEC CORP.	SH-242	93008423	2017-09-18	2018-09-18