

# KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

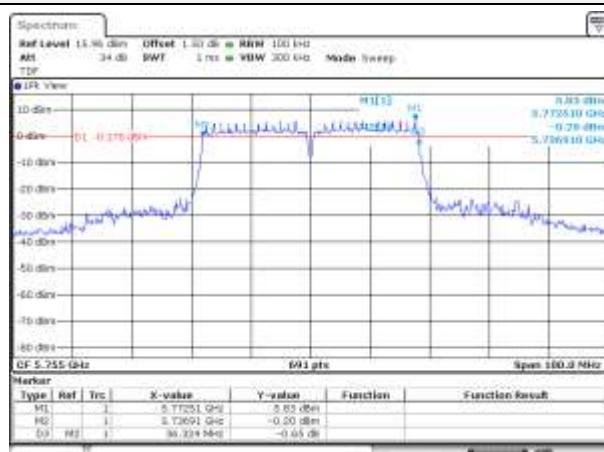
Report No.:

KR20-SRF0030-D

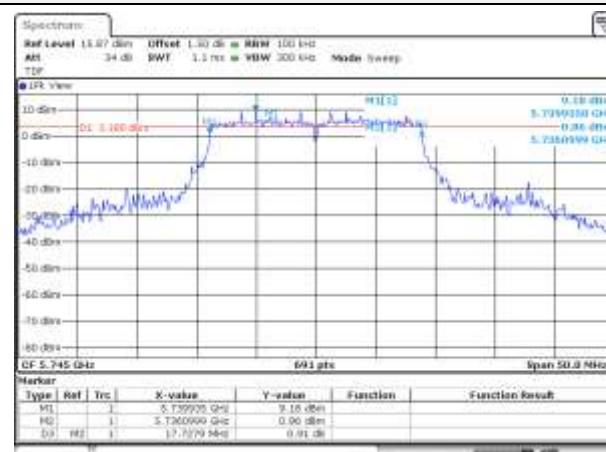
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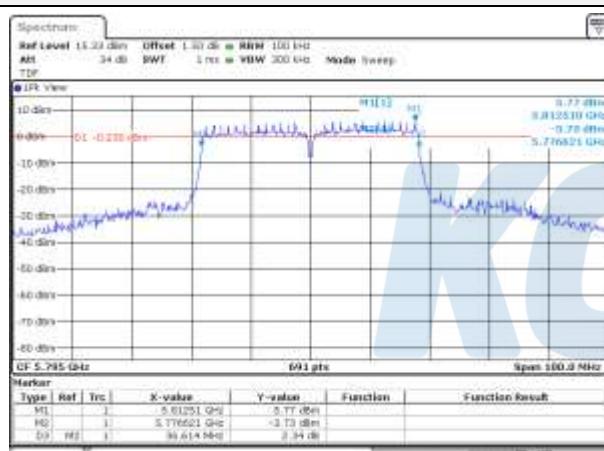
## UNII-3 / 802.11n HT40 / 5 755 MHz



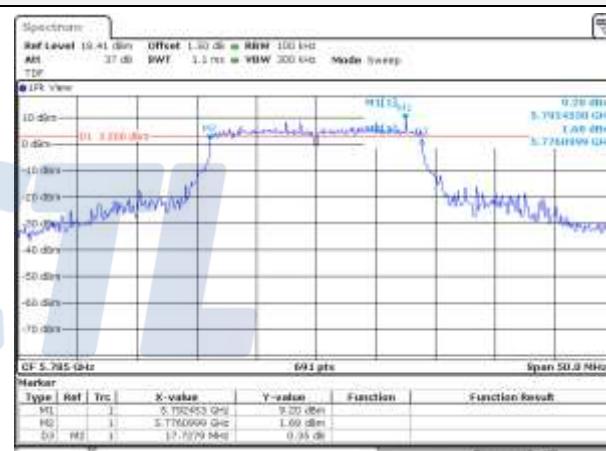
## UNII-3 / 802.11ac VHT20 / 5 745 MHz



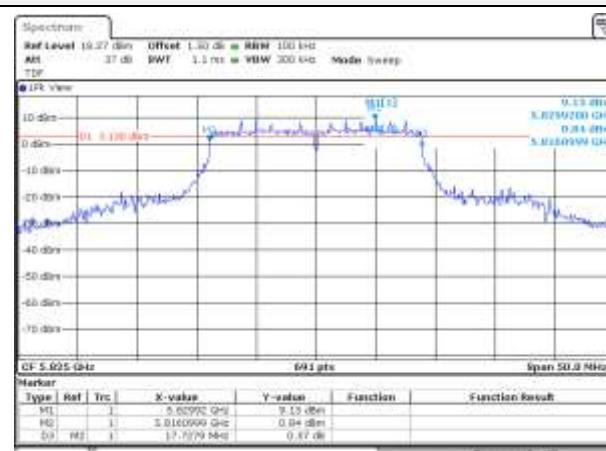
## UNII-3 / 802.11n HT40 / 5 795 MHz



## UNII-3 / 802.11ac VHT20 / 5 785 MHz



## UNII-3 / 802.11ac VHT20 / 5 825 MHz



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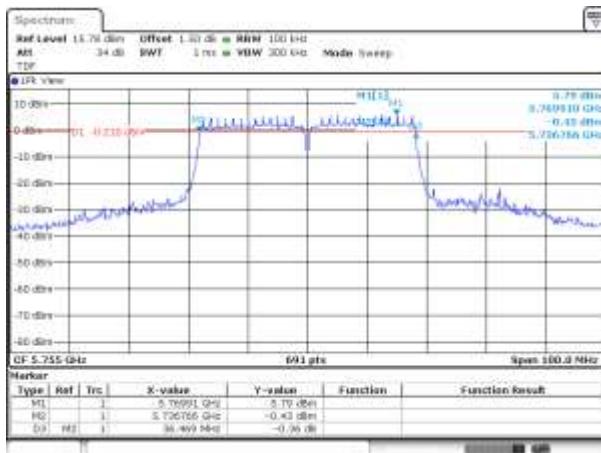
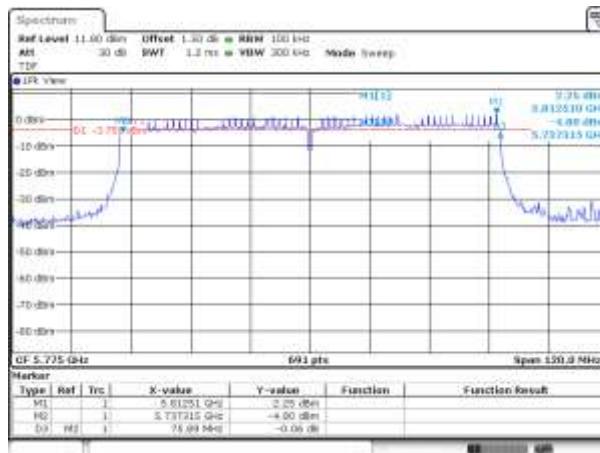
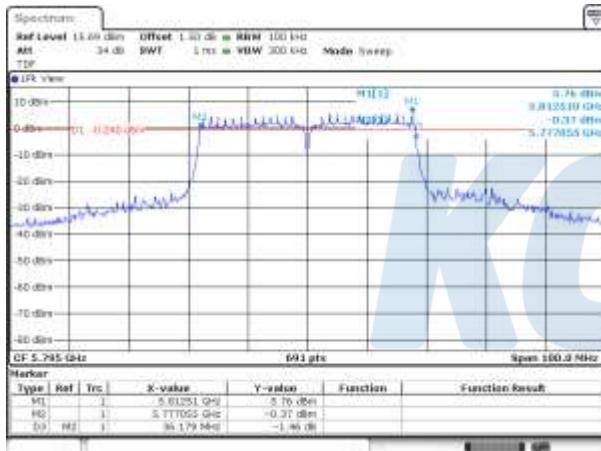
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**UNII-3 / 802.11ac VHT40 / 5 755 MHz****UNII-3 / 802.11ac VHT80 / 5 775 MHz****UNII-3 / 802.11ac VHT40 / 5 795 MHz**

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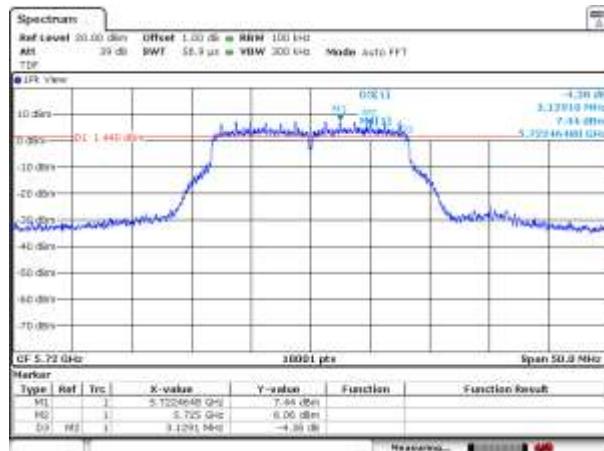
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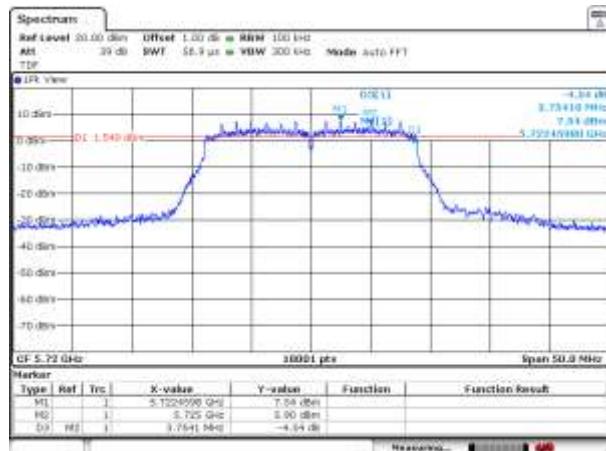
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## ANT 3

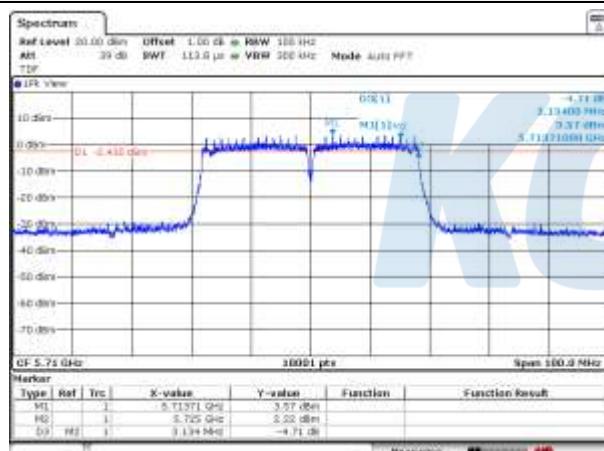
### UNII-2C / 802.11a / 5 720 MHz



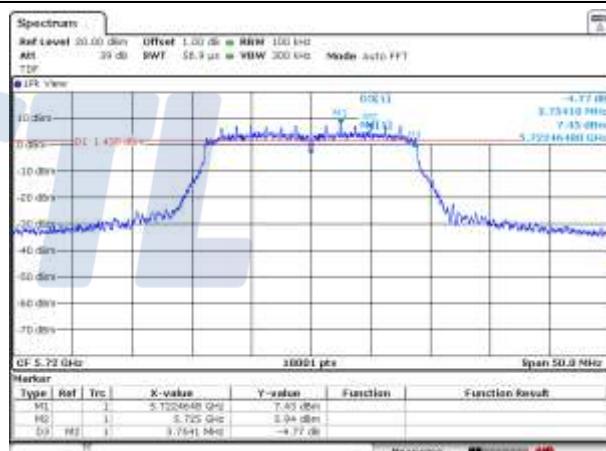
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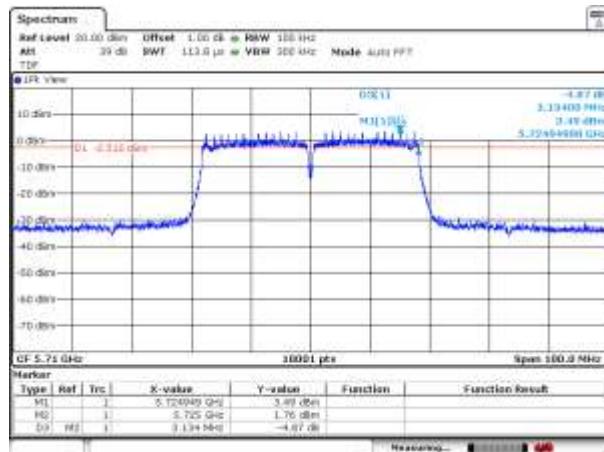
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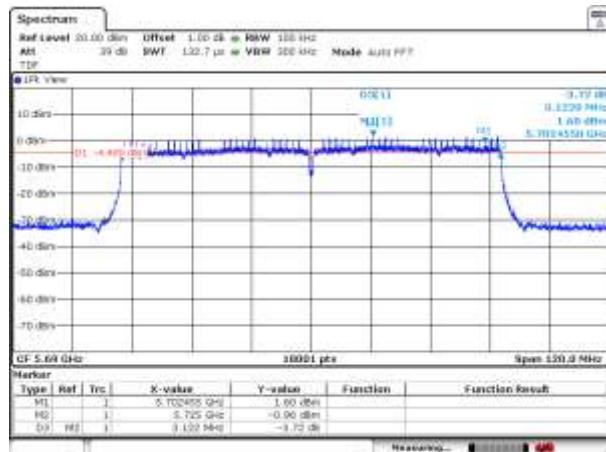
### UNII-2C / 802.11ac VHT20 / 5 720 MHz



### UNII-2C / 802.11ac VHT40 / 5 710 MHz



### UNII-2C / 802.11ac VHT80 / 5 690 MHz



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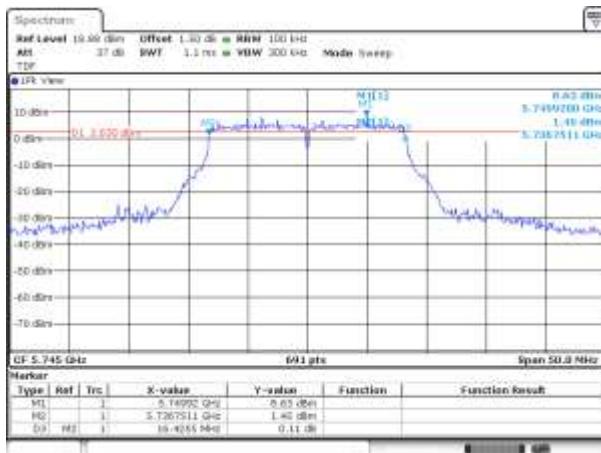
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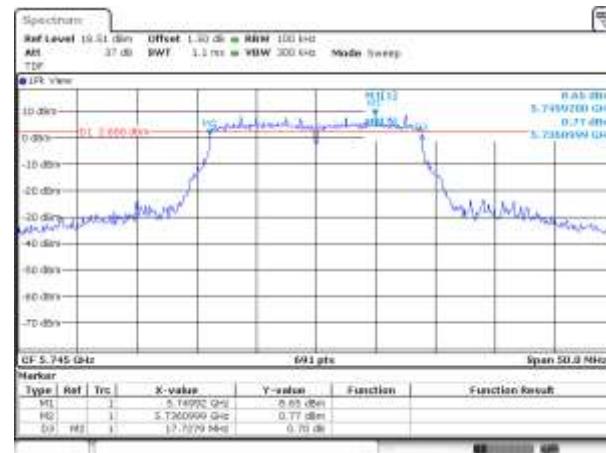
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## UNII-3 / 802.11a / 5 745 MHz



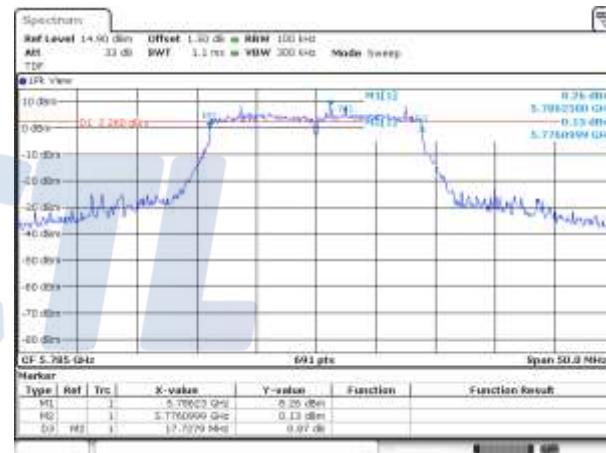
## UNII-3 / 802.11n HT20 / 5 745 MHz



## UNII-3 / 802.11a / 5 785 MHz



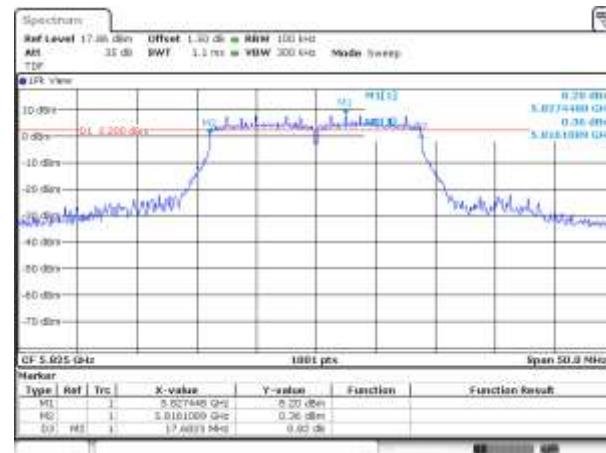
## UNII-3 / 802.11n HT20 / 5 785 MHz



## UNII-3 / 802.11a / 5 825 MHz



## UNII-3 / 802.11n HT20 / 5 825 MHz



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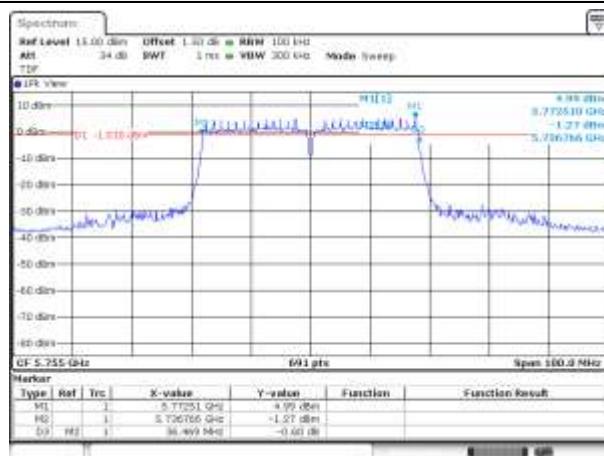
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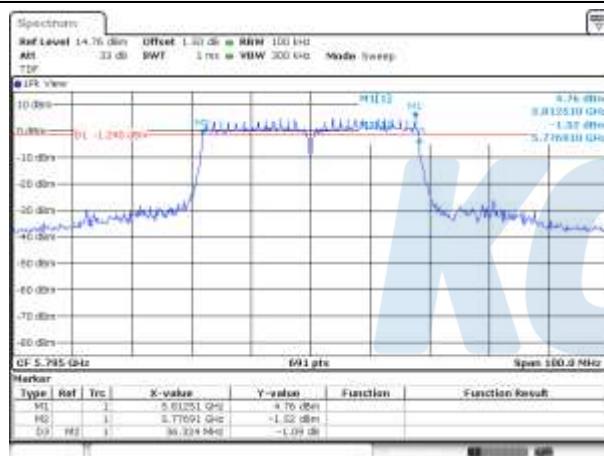
## UNII-3 / 802.11n HT40 / 5 755 MHz



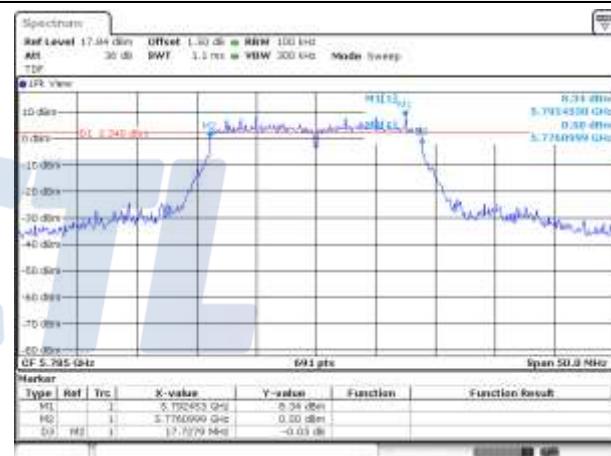
## UNII-3 / 802.11ac VHT20 / 5 745 MHz



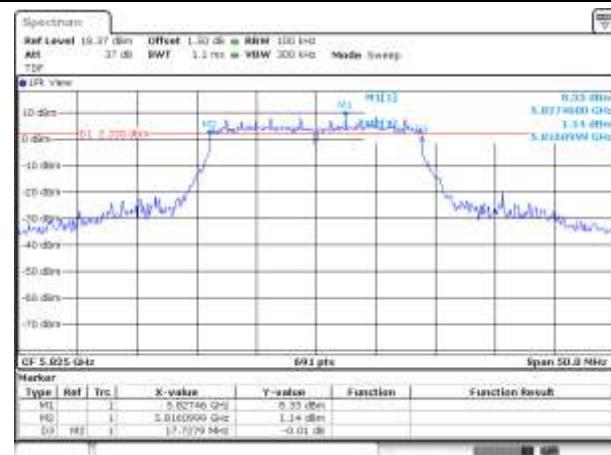
## UNII-3 / 802.11n HT40 / 5 795 MHz



## UNII-3 / 802.11ac VHT20 / 5 785 MHz



## UNII-3 / 802.11ac VHT20 / 5 825 MHz



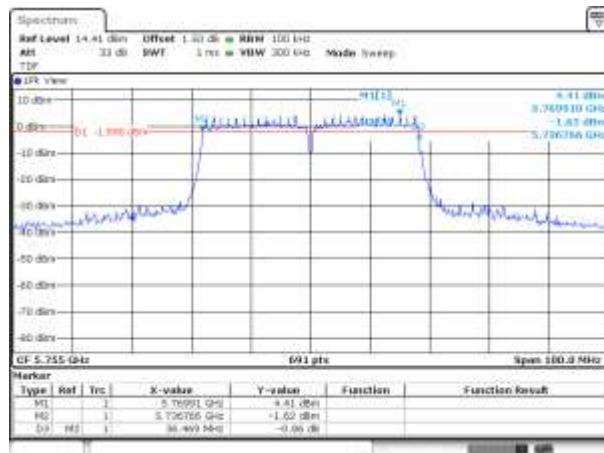
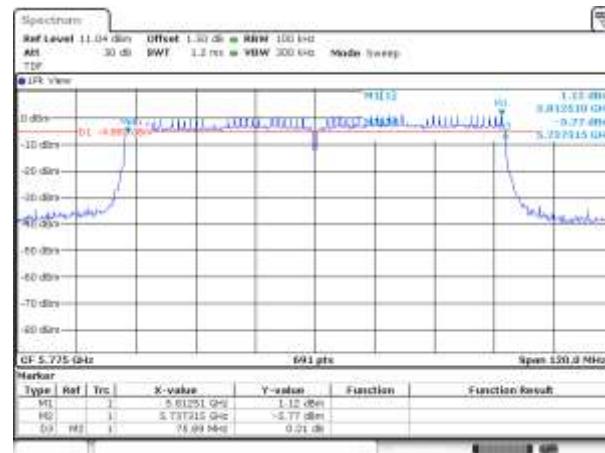
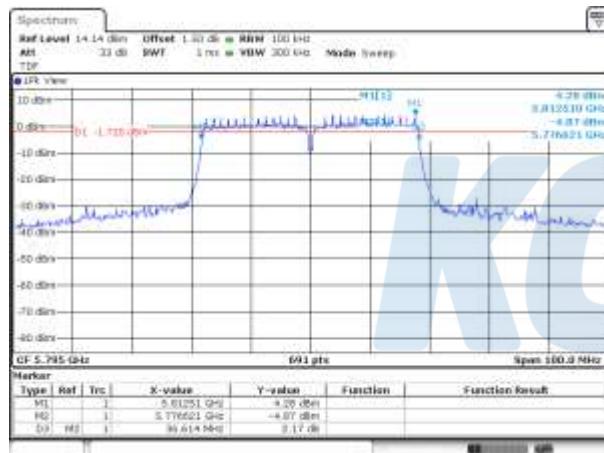
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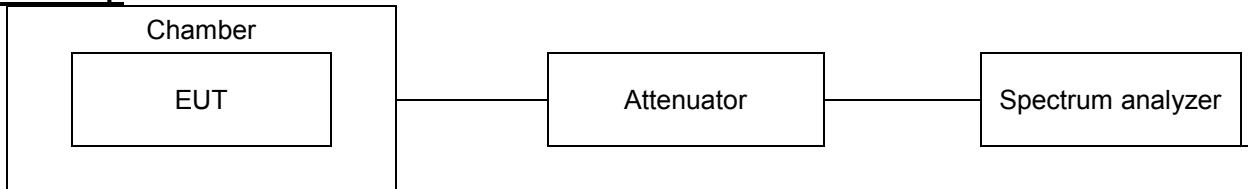
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**KCTL****UNII-3 / 802.11ac VHT40 / 5 755 MHz****UNII-3 / 802.11ac VHT80 / 5 775 MHz****UNII-3 / 802.11ac VHT40 / 5 795 MHz**

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## 7.5. Frequency Stability

### Test setup



### Limit

N/A

### Test procedure

ANSI C63.10-2013, clause 6.8.1

### Test settings

The frequency stability of the carrier frequency of the intentional radiator shall be maintained all conditions of normal operation as specified in the user manual. The frequency stability shall be maintained over a temperature variation of specified in the user manual at normal supply voltage, and over a variation in the primary supply voltage of specified in the user manual of the rated supply voltage at a temperature of 20 °C. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage.

1. The EUT was placed inside the environmental test chamber.
2. The temperature was incremented by 10 °C intervals from lowest temperature.
3. Each increase step of temperature measured the frequency.
4. The test temperature was set 20 °C and the supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
5. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

**Test results****Test mode : 802.11a UNII-1 5 180 MHz**

Voltage	Voltage	TEMP	Maintaining time	Measure frequency	Frequency deviation	Deviation
				[Hz]	[ppm]	
100	12	+22(Ref)	Startup	5 179 917 036	-16.02	-0.001 60
			2 minutes	5 179 917 642	-15.90	-0.001 59
			5 minutes	5 179 918 313	-15.77	-0.001 58
			10 minutes	5 179 919 019	-15.63	-0.001 56
		-30	Startup	5 180 008 955	1.73	0.000 17
			2 minutes	5 180 009 141	1.76	0.000 18
			5 minutes	5 180 009 175	1.77	0.000 18
			10 minutes	5 180 009 160	1.77	0.000 18
		-20	Startup	5 180 010 492	2.03	0.000 20
			2 minutes	5 180 010 312	1.99	0.000 20
			5 minutes	5 180 010 246	1.98	0.000 20
			10 minutes	5 180 010 215	1.97	0.000 20
		-10	Startup	5 179 967 941	-6.19	-0.000 62
			2 minutes	5 179 967 857	-6.21	-0.000 62
			5 minutes	5 179 967 852	-6.21	-0.000 62
			10 minutes	5 179 967 834	-6.21	-0.000 62
		0	Startup	5 179 966 560	-6.46	-0.000 65
			2 minutes	5 179 966 435	-6.48	-0.000 65
			5 minutes	5 179 966 412	-6.48	-0.000 65
			10 minutes	5 179 966 408	-6.48	-0.000 65
		10	Startup	5 179 943 311	-10.94	-0.001 09
			2 minutes	5 179 943 202	-10.96	-0.001 10
			5 minutes	5 179 943 195	-10.97	-0.001 10
			10 minutes	5 179 943 185	-10.97	-0.001 10
		20	Startup	5 179 925 892	-14.31	-0.001 43
			2 minutes	5 179 925 783	-14.33	-0.001 43
			5 minutes	5 179 925 775	-14.33	-0.001 43
			10 minutes	5 179 925 763	-14.33	-0.001 43
		30	Startup	5 179 919 766	-15.49	-0.001 55
			2 minutes	5 179 919 735	-15.50	-0.001 55
			5 minutes	5 179 919 712	-15.50	-0.001 55
			10 minutes	5 179 919 700	-15.50	-0.001 55
		40	Startup	5 179 922 098	-15.04	-0.001 50
			2 minutes	5 179 922 157	-15.03	-0.001 50
			5 minutes	5 179 922 179	-15.02	-0.001 50
			10 minutes	5 179 922 183	-15.02	-0.001 50
		50	Startup	5 179 931 972	-13.13	-0.001 31
			2 minutes	5 179 932 005	-13.13	-0.001 31
			5 minutes	5 179 932 017	-13.12	-0.001 31
			10 minutes	5 179 932 288	-13.07	-0.001 31
85	10.2	22	Startup	5 179 916 936	-16.04	-0.001 60
			2 minutes	5 179 916 931	-16.04	-0.001 60
			5 minutes	5 179 917 002	-16.02	-0.001 60
			10 minutes	5 179 917 015	-16.02	-0.001 60
115	13.8	22	Startup	5 179 917 523	-15.92	-0.001 59
			2 minutes	5 179 917 786	-15.87	-0.001 59
			5 minutes	5 179 917 812	-15.87	-0.001 59
			10 minutes	5 179 917 803	-15.87	-0.001 59

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**Test mode : 802.11a UNII-2A 5 260 MHz**

Voltage	Voltage	TEMP	Maintaining time	Measure frequency	Frequency deviation	Deviation
				[Hz]	[ppm]	[%]
100	12	+22(Ref)	Startup	5 259 917 026	-15.77	-0.001 58
			2 minutes	5 259 917 254	-15.73	-0.001 57
			5 minutes	5 259 917 367	-15.71	-0.001 57
			10 minutes	5 259 917 650	-15.66	-0.001 57
		-30	Startup	5 260 008 823	1.68	0.000 17
			2 minutes	5 260 008 867	1.69	0.000 17
			5 minutes	5 260 008 886	1.69	0.000 17
			10 minutes	5 260 008 893	1.69	0.000 17
		-20	Startup	5 260 010 586	2.01	0.000 20
			2 minutes	5 260 010 320	1.96	0.000 20
			5 minutes	5 260 010 311	1.96	0.000 20
			10 minutes	5 260 010 254	1.95	0.000 19
		-10	Startup	5 259 967 902	-6.10	-0.000 61
			2 minutes	5 259 967 803	-6.12	-0.000 61
			5 minutes	5 259 967 752	-6.13	-0.000 61
			10 minutes	5 259 967 744	-6.13	-0.000 61
		0	Startup	5 259 966 420	-6.38	-0.000 64
			2 minutes	5 259 966 325	-6.40	-0.000 64
			5 minutes	5 259 966 222	-6.42	-0.000 64
			10 minutes	5 259 966 201	-6.43	-0.000 64
		10	Startup	5 259 943 105	-10.82	-0.001 08
			2 minutes	5 259 943 003	-10.84	-0.001 08
			5 minutes	5 259 942 853	-10.86	-0.001 09
			10 minutes	5 259 942 842	-10.87	-0.001 09
		20	Startup	5 259 925 536	-14.16	-0.001 42
			2 minutes	5 259 925 423	-14.18	-0.001 42
			5 minutes	5 259 925 410	-14.18	-0.001 42
			10 minutes	5 259 925 398	-14.18	-0.001 42
		30	Startup	5 259 919 657	-15.27	-0.001 53
			2 minutes	5 259 919 655	-15.27	-0.001 53
			5 minutes	5 259 919 512	-15.30	-0.001 53
			10 minutes	5 259 919 510	-15.30	-0.001 53
		40	Startup	5 259 922 010	-14.83	-0.001 48
			2 minutes	5 259 922 265	-14.78	-0.001 48
			5 minutes	5 259 922 302	-14.77	-0.001 48
			10 minutes	5 259 922 315	-14.77	-0.001 48
		50	Startup	5 259 932 103	-12.91	-0.001 29
			2 minutes	5 259 932 157	-12.90	-0.001 29
			5 minutes	5 259 932 263	-12.88	-0.001 29
			10 minutes	5 259 932 284	-12.87	-0.001 29
85	10.2	22	Startup	5 259 916 835	-15.81	-0.001 58
			2 minutes	5 259 916 889	-15.80	-0.001 58
			5 minutes	5 259 917 005	-15.78	-0.001 58
			10 minutes	5 259 917 023	-15.78	-0.001 58
115	13.8	22	Startup	5 259 917 702	-15.65	-0.001 56
			2 minutes	5 259 917 864	-15.62	-0.001 56
			5 minutes	5 259 917 889	-15.61	-0.001 56
			10 minutes	5 259 917 921	-15.60	-0.001 56

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KCTL-TIR001-003/2

**Test mode : 802.11a UNII-2C 5 500 MHz**

Voltage	Voltage	TEMP	Maintaining time	Measure frequency	Frequency deviation	Deviation
				[Hz]	[ppm]	[%]
100	12	+22(Ref)	Startup	5 499 918 120	-14.89	-0.001 49
			2 minutes	5 499 918 235	-14.87	-0.001 49
			5 minutes	5 499 918 478	-14.82	-0.001 48
			10 minutes	5 499 918 663	-14.79	-0.001 48
		-30	Startup	5 500 009 006	1.64	0.000 16
			2 minutes	5 500 009 237	1.68	0.000 17
			5 minutes	5 500 009 354	1.70	0.000 17
			10 minutes	5 500 009 497	1.73	0.000 17
		-20	Startup	5 500 010 623	1.93	0.000 19
			2 minutes	5 500 010 477	1.90	0.000 19
			5 minutes	5 500 010 432	1.90	0.000 19
			10 minutes	5 500 010 387	1.89	0.000 19
		-10	Startup	5 499 967 726	-5.87	-0.000 59
			2 minutes	5 499 967 632	-5.89	-0.000 59
			5 minutes	5 499 967 573	-5.90	-0.000 59
			10 minutes	5 499 967 571	-5.90	-0.000 59
		0	Startup	5 499 966 604	-6.07	-0.000 61
			2 minutes	5 499 966 535	-6.08	-0.000 61
			5 minutes	5 499 966 403	-6.11	-0.000 61
			10 minutes	5 499 966 364	-6.12	-0.000 61
		10	Startup	5 499 943 303	-10.31	-0.001 03
			2 minutes	5 499 943 257	-10.32	-0.001 03
			5 minutes	5 499 943 133	-10.34	-0.001 03
			10 minutes	5 499 943 087	-10.35	-0.001 03
		20	Startup	5 499 925 733	-13.50	-0.001 35
			2 minutes	5 499 925 656	-13.52	-0.001 35
			5 minutes	5 499 925 602	-13.53	-0.001 35
			10 minutes	5 499 925 584	-13.53	-0.001 35
		30	Startup	5 499 919 896	-14.56	-0.001 46
			2 minutes	5 499 919 803	-14.58	-0.001 46
			5 minutes	5 499 919 753	-14.59	-0.001 46
			10 minutes	5 499 919 752	-14.59	-0.001 46
		40	Startup	5 499 922 117	-14.16	-0.001 42
			2 minutes	5 499 922 267	-14.13	-0.001 41
			5 minutes	5 499 922 356	-14.12	-0.001 41
			10 minutes	5 499 922 347	-14.12	-0.001 41
		50	Startup	5 499 932 167	-12.33	-0.001 23
			2 minutes	5 499 932 188	-12.33	-0.001 23
			5 minutes	5 499 932 302	-12.31	-0.001 23
			10 minutes	5 499 932 333	-12.30	-0.001 23
85	10.2	22	Startup	5 499 916 863	-15.12	-0.001 51
			2 minutes	5 499 916 896	-15.11	-0.001 51
			5 minutes	5 499 916 958	-15.10	-0.001 51
			10 minutes	5 499 916 970	-15.10	-0.001 51
115	13.8	22	Startup	5 499 917 428	-15.01	-0.001 50
			2 minutes	5 499 917 634	-14.98	-0.001 50
			5 minutes	5 499 917 688	-14.97	-0.001 50
			10 minutes	5 499 917 702	-14.96	-0.001 50

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**KCTL**

**Test mode : 802.11a UNII-3 5 745 MHz**

Voltage	Voltage	TEMP	Maintaining time	Measure frequency	Frequency deviation	Deviation
				[Hz]	[ppm]	[%]
100	12	+22(Ref)	Startup	5 744 917 547	-14.35	-0.001 44
			2 minutes	5 744 917 785	-14.31	-0.001 43
			5 minutes	5 744 918 237	-14.23	-0.001 42
			10 minutes	5 744 918 577	-14.17	-0.001 42
		-30	Startup	5 745 009 223	1.61	0.000 16
			2 minutes	5 745 009 350	1.63	0.000 16
			5 minutes	5 745 009 467	1.65	0.000 16
			10 minutes	5 745 009 551	1.66	0.000 17
		-20	Startup	5 745 010 647	1.85	0.000 19
			2 minutes	5 745 010 520	1.83	0.000 18
			5 minutes	5 745 010 421	1.81	0.000 18
			10 minutes	5 745 010 384	1.81	0.000 18
		-10	Startup	5 744 967 903	-5.59	-0.000 56
			2 minutes	5 744 967 827	-5.60	-0.000 56
			5 minutes	5 744 967 766	-5.61	-0.000 56
			10 minutes	5 744 967 745	-5.61	-0.000 56
		0	Startup	5 744 966 852	-5.77	-0.000 58
			2 minutes	5 744 966 677	-5.80	-0.000 58
			5 minutes	5 744 966 603	-5.81	-0.000 58
			10 minutes	5 744 966 599	-5.81	-0.000 58
		10	Startup	5 744 943 438	-9.85	-0.000 98
			2 minutes	5 744 943 355	-9.86	-0.000 99
			5 minutes	5 744 943 105	-9.90	-0.000 99
			10 minutes	5 744 943 057	-9.91	-0.000 99
		20	Startup	5 744 925 725	-12.93	-0.001 29
			2 minutes	5 744 925 634	-12.94	-0.001 29
			5 minutes	5 744 925 604	-12.95	-0.001 29
			10 minutes	5 744 925 578	-12.95	-0.001 30
		30	Startup	5 744 919 866	-13.95	-0.001 39
			2 minutes	5 744 919 804	-13.96	-0.001 40
			5 minutes	5 744 919 753	-13.97	-0.001 40
			10 minutes	5 744 919 702	-13.98	-0.001 40
		40	Startup	5 744 922 254	-13.53	-0.001 35
			2 minutes	5 744 922 369	-13.51	-0.001 35
			5 minutes	5 744 922 396	-13.51	-0.001 35
			10 minutes	5 744 922 407	-13.51	-0.001 35
		50	Startup	5 744 932 024	-11.83	-0.001 18
			2 minutes	5 744 932 165	-11.81	-0.001 18
			5 minutes	5 744 932 289	-11.79	-0.001 18
			10 minutes	5 744 932 333	-11.78	-0.001 18
85	10.2	22	Startup	5 744 916 904	-14.46	-0.001 45
			2 minutes	5 744 916 986	-14.45	-0.001 44
			5 minutes	5 744 917 122	-14.43	-0.001 44
			10 minutes	5 744 917 138	-14.42	-0.001 44
115	13.8	22	Startup	5 744 917 564	-14.35	-0.001 43
			2 minutes	5 744 917 688	-14.33	-0.001 43
			5 minutes	5 744 917 863	-14.30	-0.001 43
			10 minutes	5 744 917 902	-14.29	-0.001 43

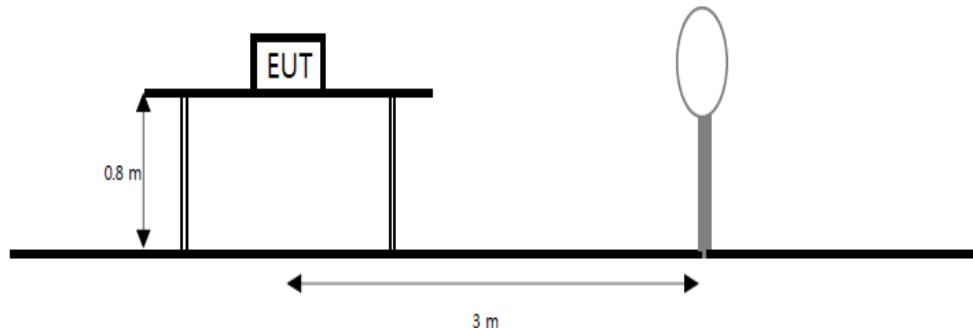
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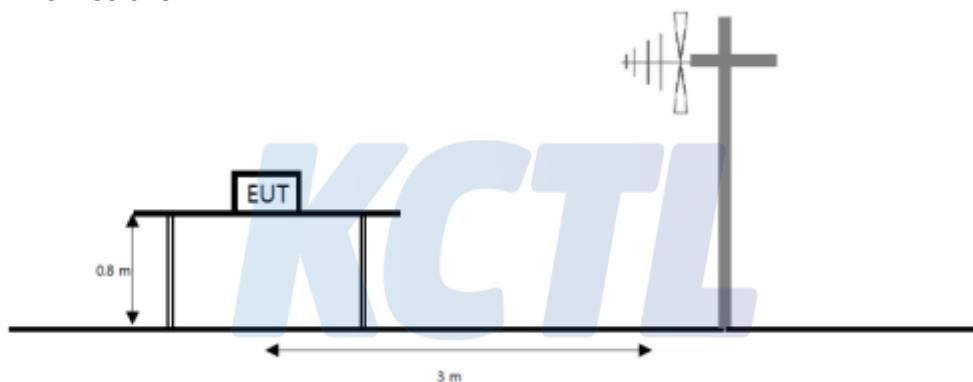
## 7.6. Spurious Emission, Band Edge and Restricted bands

### Test setup

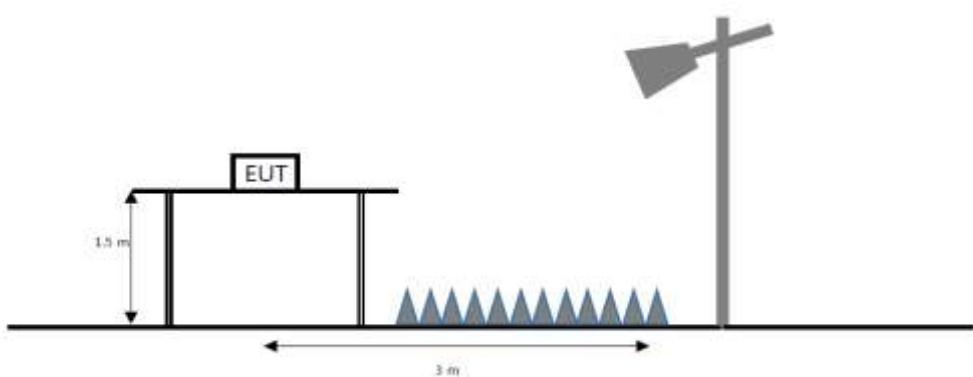
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz emissions, whichever is lower.



**Limit**

According to section 15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength ( $\mu$ V/m)	Measurement distance (m)
0.009 - 0.490	2 400/F(kHz)	300
0.490 - 1.705	24 000/F(kHz)	30
1.705 - 30	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

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

According to section 15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.009 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.694 75 - 16.695 25	608 - 614	5.35 - 5.46
2.173 5 - 2.190 5	16.804 25 - 16.804 75	960 - 1 240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1 300 - 1 427	8.025 - 8.5
4.177 25 - 4.177 75	37.5 - 38.25	1 435 - 1 626.5	9.0 - 9.2
4.207 25 - 4.207 75	73 - 74.6	1 645.5 - 1 646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1 660 - 1 710	10.6 - 12.7
6.267 75 - 6.268 25	108 - 121.94	1 718.8 - 1 722.2	13.25 - 13.4
6.311 75 - 6.312 25	123 - 138	2 200 - 2 300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2 310 - 2 390	15.35 - 16.2
8.362 - 8.366	156.524 75 - 156.525	2 483.5 - 2 500	17.7 - 21.4
8.376 25 - 8.386 75	25	2 690 - 2 900	22.01 - 23.12
8.414 25 - 8.414 75	156.7 - 156.9	3 260 - 3 267	23.6 - 24.0
12.29 - 12.293	162.012 5 - 167.17	3 332 - 3 339	31.2 - 31.8
12.519 75 - 12.520 25	167.72 - 173.2	3 345.8 - 3 358	36.43 - 36.5
12.576 75 - 12.577 25	240 - 285	3 600 - 4 400	Above 38.6
13.36 - 13.41	322 - 335.4		

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in section 15.209. At frequencies equal to or less than 1 000 MHz, compliance with the limits in section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 MHz, compliance with the emission limits in section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in section 15.35 apply to these measurements.

According to section 15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz

**KCTL Inc.**

65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
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For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.



### **Test procedure**

ANSI C63.10-2013 Section 6.4.6

KDB 558074 D01 V05r02

### **Test settings**

#### **Peak field strength measurements**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in table
3. VBW  $\geq$  (3×RBW)
4. Detector = peak
5. Sweep time = auto
6. Trace mode = max hold
7. Allow sweeps to continue until the trace stabilizes

**Table. RBW as a function of frequency**

Frequency	RBW
9 kHz to 150 kHz	200 Hz to 300 Hz
0.15 MHz to 30 MHz	9 kHz to 10 kHz
30 MHz to 1 000 MHz	100 kHz to 120 kHz
> 1 000 MHz	1 MHz

#### **Average field strength measurements**

##### **Trace averaging with continuous EUT transmission at full power**

If the EUT can be configured or modified to transmit continuously ( $D \geq 98\%$ ), then the average emission levels shall be measured using the following method (with EUT transmitting continuously):

1. RBW = 1 MHz (unless otherwise specified).
2. VBW  $\geq$  (3×RBW).
3. Detector = RMS (power averaging), if  $[\text{span} / (\# \text{ of points in sweep})] \leq (\text{RBW} / 2)$ . Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
4. Averaging type = power (i.e., rms):
  - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
  - 2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.
5. Sweep time = auto.
6. Perform a trace average of at least 100 traces.

##### **Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction**

If continuous transmission of the EUT ( $D \geq 98\%$ ) cannot be achieved and the duty cycle is constant (duty cycle variations are less than  $\pm 2\%$ ), then the following procedure shall be used:

1. The EUT shall be configured to operate at the maximum achievable duty cycle.
2. Measure the duty cycle D of the transmitter output signal as described in 11.6.
3. RBW = 1 MHz (unless otherwise specified).
4. VBW  $\geq$  [3 × RBW].
5. Detector = RMS (power averaging), if  $[\text{span} / (\# \text{ of points in sweep})] \leq (\text{RBW} / 2)$ . Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this

condition cannot be satisfied, then the detector mode shall be set to peak.

6. Averaging type = power (i.e., rms):
  - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
  - 2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.
7. Sweep time = auto.
8. Perform a trace average of at least 100 traces.
9. A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
  - 1) If power averaging (rms) mode was used in step f), then the applicable correction factor is  $[10 \log (1 / D)]$ , where D is the duty cycle.
  - 2) If linear voltage averaging mode was used in step f), then the applicable correction factor is  $[20 \log (1 / D)]$ , where D is the duty cycle.
  - 3) If a specific emission is demonstrated to be continuous ( $D \geq 98\%$ ) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

**Notes:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz( $\geq 1/T$ ) for Average detection (AV) at frequency above 1 GHz. (where T = pulse width)
2.  $f < 30$  MHz, extrapolation factor of 40 dB/decade of distance.  $F_d = 40 \log(D_m/D_s)$   
 $f \geq 30$  MHz, extrapolation factor of 20 dB/decade of distance.  $F_d = 20 \log(D_m/D_s)$   
Where:
  - $F_d$ = Distance factor in dB
  - $D_m$ = Measurement distance in meters
  - $D_s$ = Specification distance in meters
3. Factors(dB) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or  $F_d$ (dB)
4. The worst-case emissions are reported however emissions whose levels were not within 20 dB of respective limits were not reported.
5. Average test would be performed if the peak result were greater than the average limit.
6. <sup>1)</sup> means restricted band.
7. According to part 15.31(f)(2), an extrapolation factor of 40 dB/decade is applied because measured distance of radiated emission is 3 m.

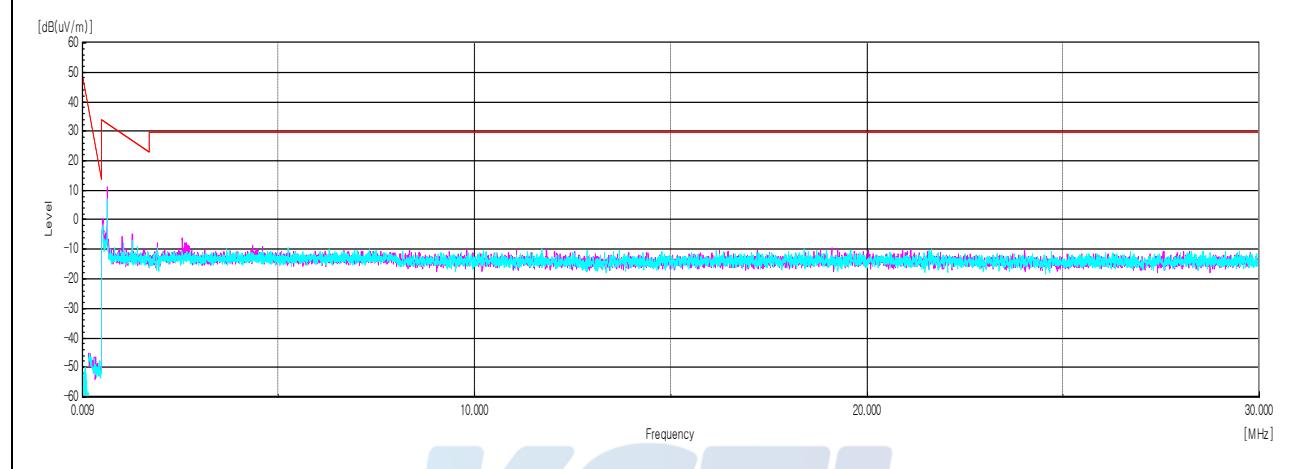
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**Test results (Below 30 MHz) – Worst case: 802.11a\_UNII 3\_MIMO Highest frequency**

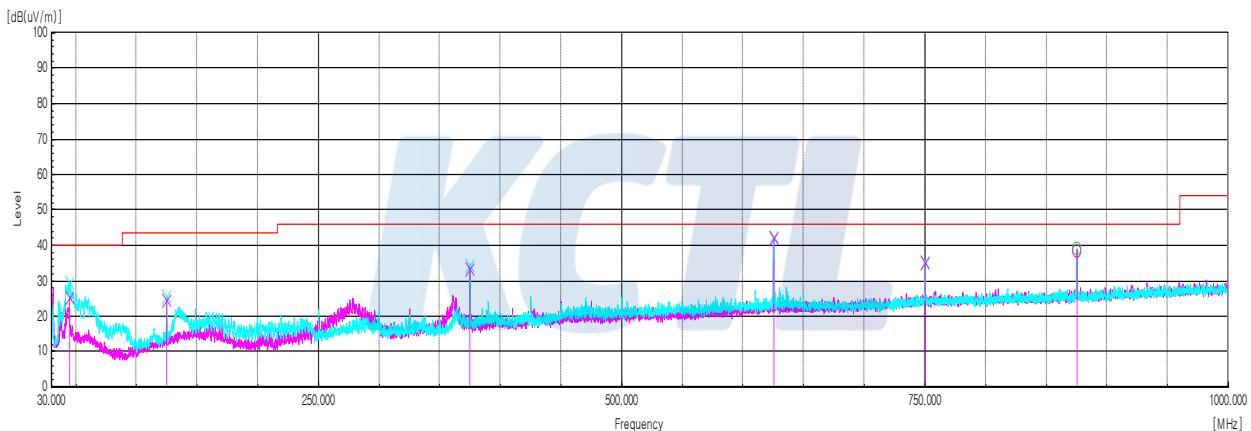
Frequency	Pol.	Reading	Cable Loss	Amp Gain	Antenna Factor	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
No spurious emissions were detected within 20 dB of the limit.									

**Horizontal/Vertical**

**Test results (Below 1 000 MHz) – Worst case: Worst case: 802.11a\_UNII 3\_MIMO Highest frequency**

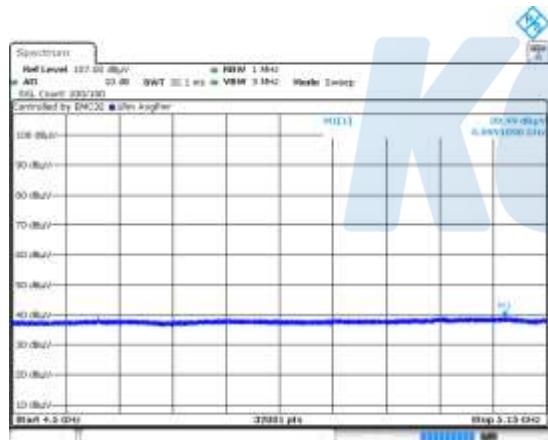
Frequency (MHz)	Pol. (V/H)	Reading (dB( $\mu$ V))	Amp. + Cable (dB)	Antenna Factor (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Quasi peak data</b>								
41.76	V	36.40	18.40	-30.41	-	24.39	40.00	15.61
124.94	V	35.30	17.50	-29.02	-	23.78	43.50	19.72
374.96	V	39.70	21.10	-27.26	-	33.54	46.00	12.46
625.10	V	42.00	26.20	-25.83	-	42.37	46.00	3.63
750.10	V	32.70	28.00	-25.13	-	35.57	46.00	10.43
875.11	H	33.40	29.00	-24.52	-	37.88	46.00	8.12

**Horizontal/Vertical**

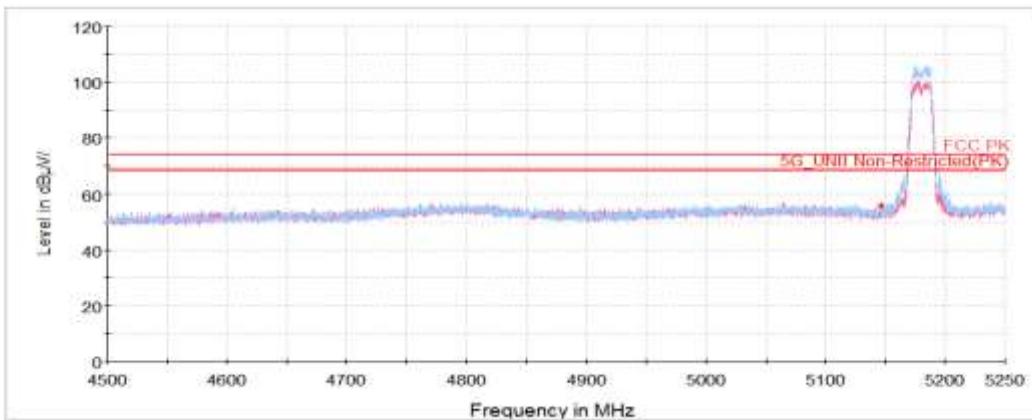


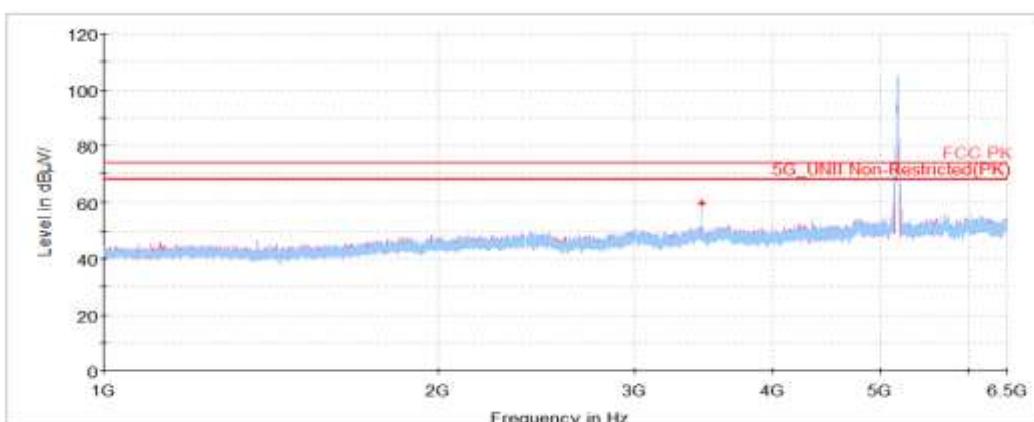
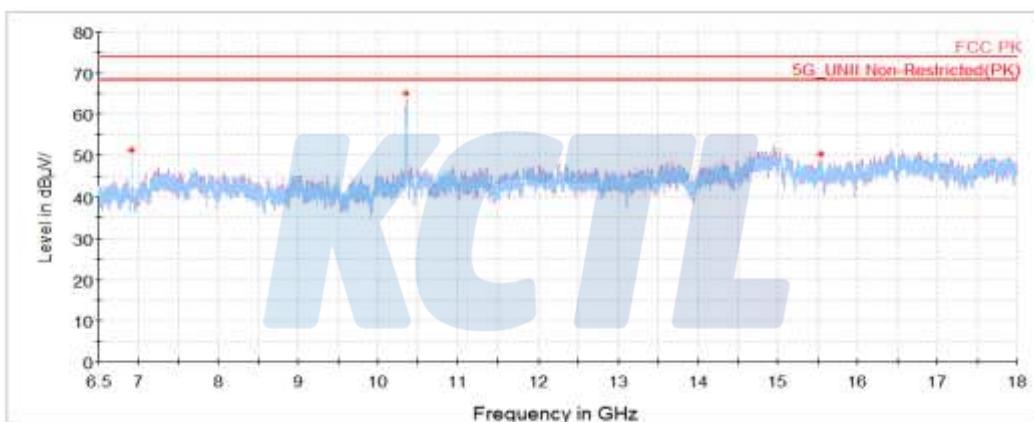
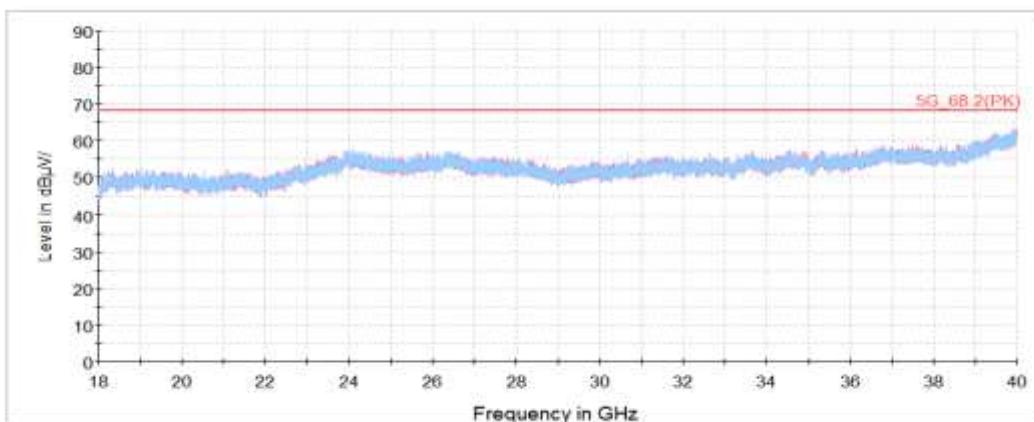
**Test results (Above 1 000 MHz)****802.11a UNII 1 ANT 0****Lowest Channel (5 180 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
3 453.34	H	73.23	32.59	-46.40	-	59.42	68.20	8.78
5 099.11 <sup>1)</sup>	H	48.32	34.16	-26.79	-	55.69	74.00	18.31
6 906.09	H	68.81	35.40	-52.89	-	51.32	68.20	16.88
10 358.61	V	78.17	37.26	-50.29	-	65.14	68.20	3.06
15 541.88 <sup>1)</sup>	V	58.76	40.01	-48.57	-	50.20	74.00	23.80
<b>Average Data</b>								
5 099.11 <sup>1)</sup>	H	39.49	34.16	-26.79	0.22	47.08	54.00	6.92

**Average data (5 099.11 MHz)**

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**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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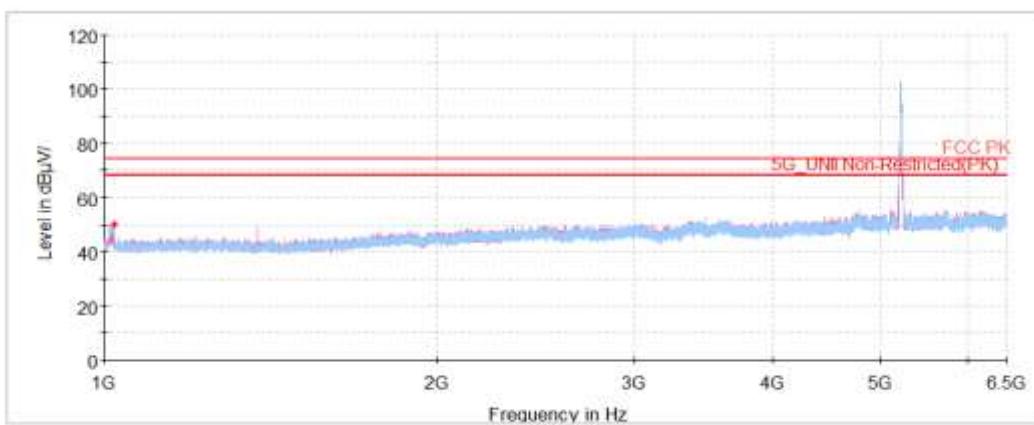
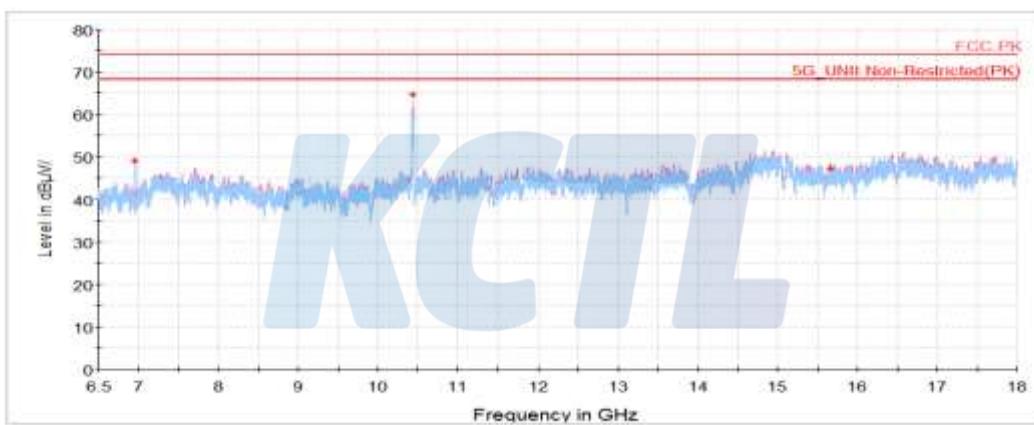
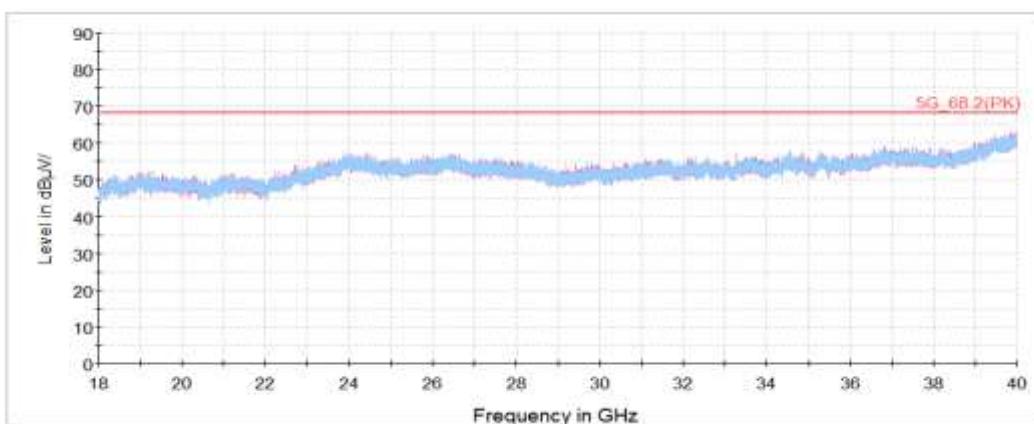
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**Middle Channel (5 220 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
6 959.64	H	66.37	35.40	-52.77	-	49.00	68.20	19.20
10 438.75	V	77.19	37.34	-49.93	-	64.60	68.20	3.60
15 662.63 <sup>1)</sup>	V	55.89	40.03	-48.63	-	47.29	74.00	26.71
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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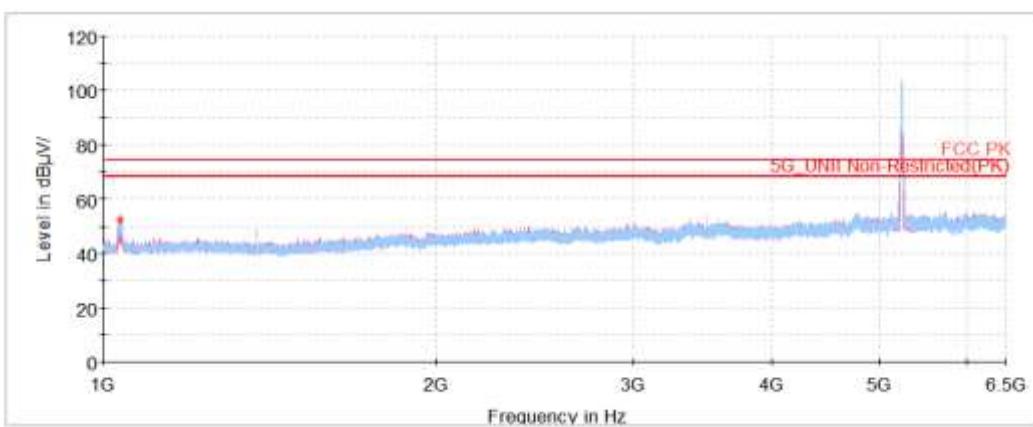
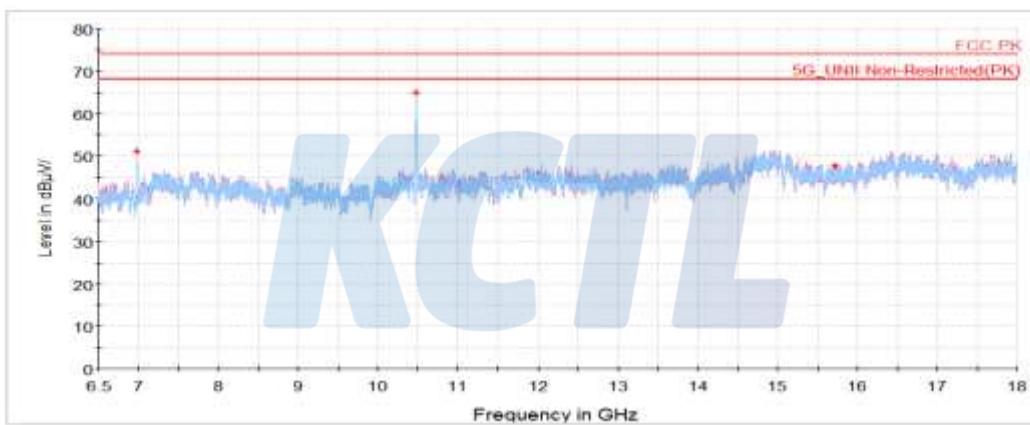
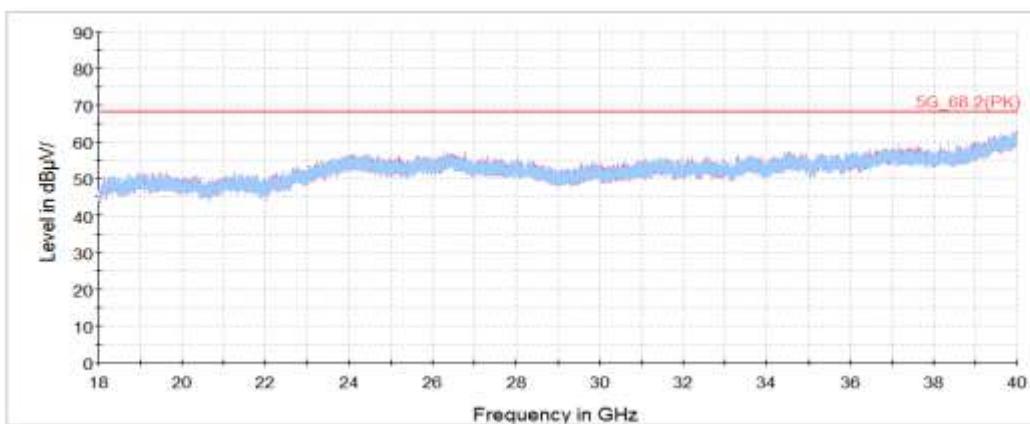
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**Highest Channel (5 240 MHz)**

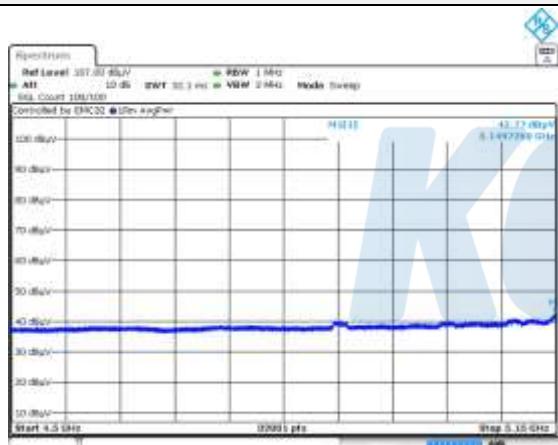
Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor	Amp. + Cable	DCCF	Result (dB(µV/m))	Limit (dB(µV/m))	Margin
<b>Peak data</b>								
6 986.59	H	68.44	35.40	-52.71	-	51.13	68.20	17.07
10 483.31	H	77.21	37.38	-49.73	-	64.86	68.20	3.34
15 720.13 <sup>1)</sup>	V	56.30	40.04	-48.66	-	47.68	74.00	26.32
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



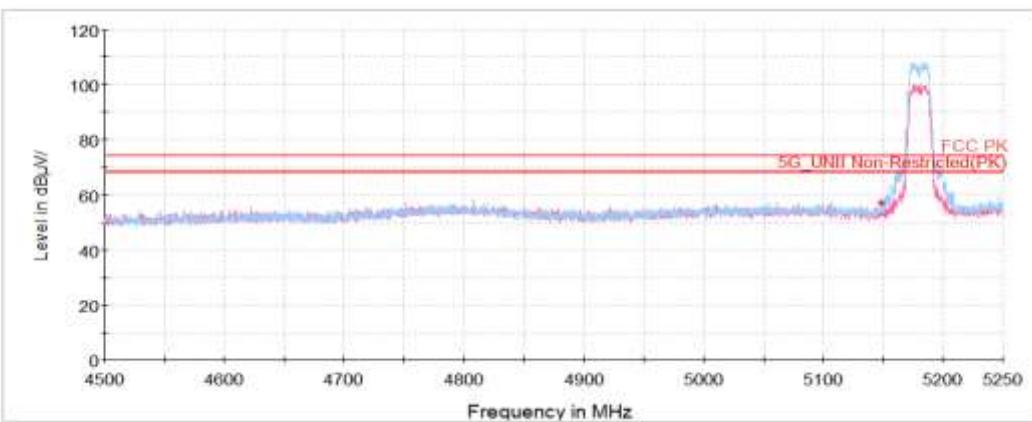
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

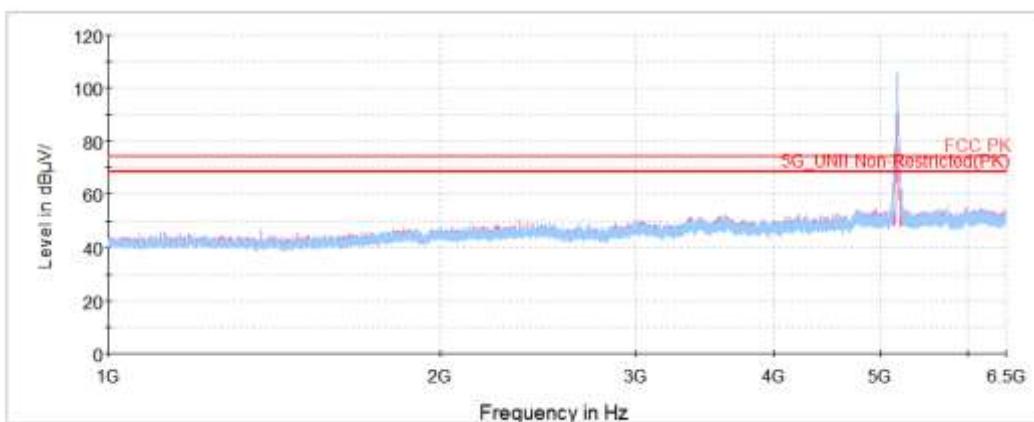
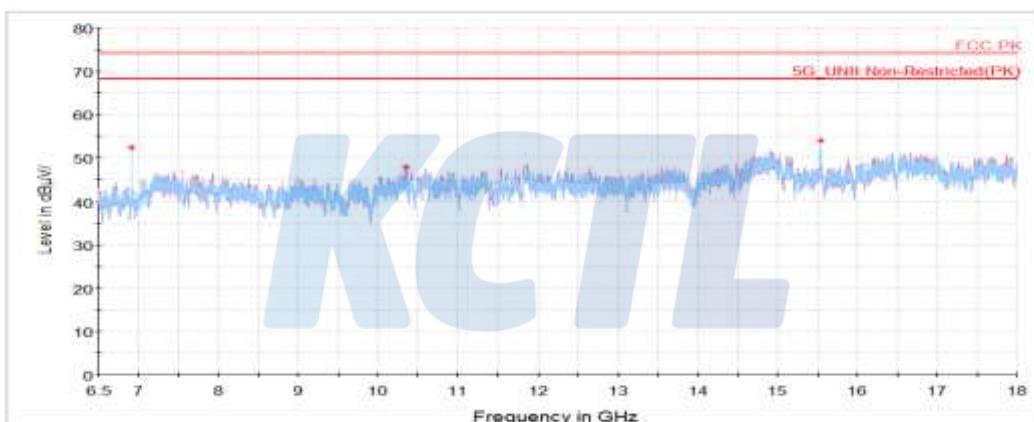
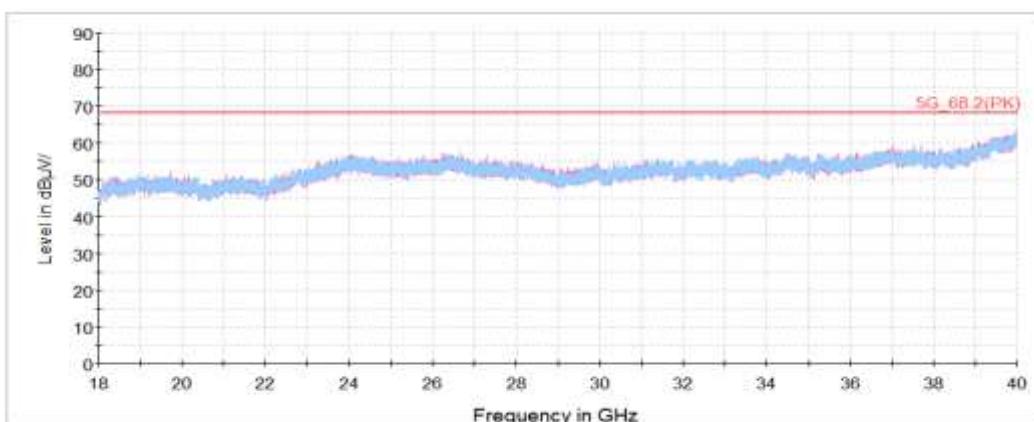
**802.11a UNII 1 ANT 1****Lowest Channel (5 180 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(µV))	(dB)	(dB)	(dB)	(dB(µV/m))	(dB(µV/m))	(dB)
<b>Peak data</b>								
5 149.73 <sup>1)</sup>	H	49.59	34.24	-27.12	-	56.71	74.00	17.29
6 906.45	H	69.88	35.40	-52.89	-	52.39	68.20	15.81
10 358.61	V	60.81	37.26	-50.29	-	47.78	68.20	20.42
15 537.25 <sup>1)</sup>	H	62.51	40.01	-48.57	-	53.95	74.00	20.05
<b>Average Data</b>								
5 149.73 <sup>1)</sup>	H	42.77	34.24	-27.12	0.22	50.11	54.00	3.89

**Average data (5 149.73 MHz)**

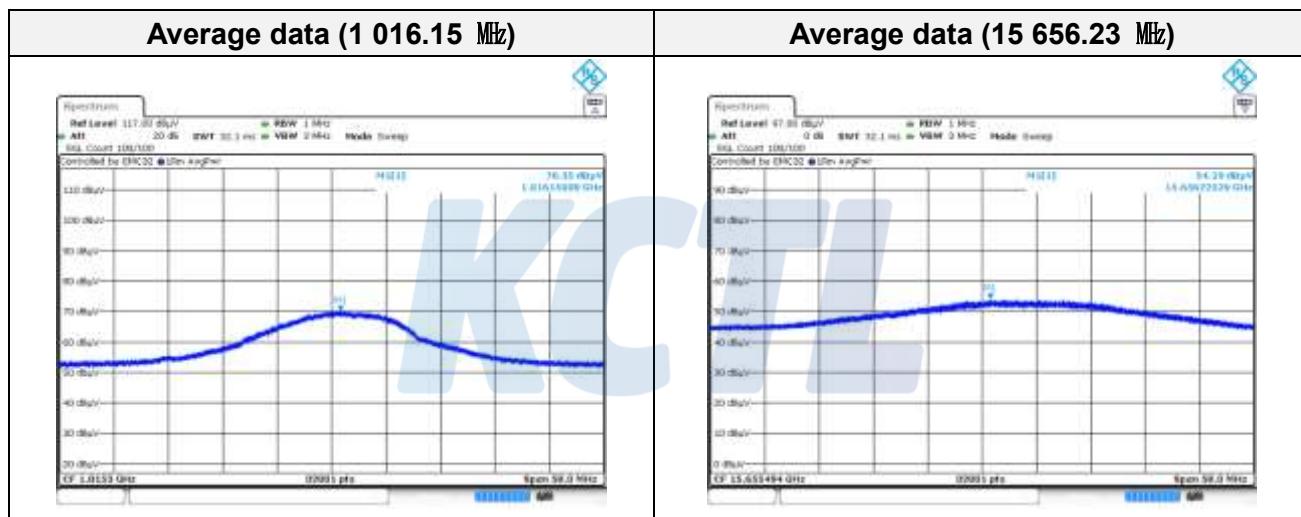
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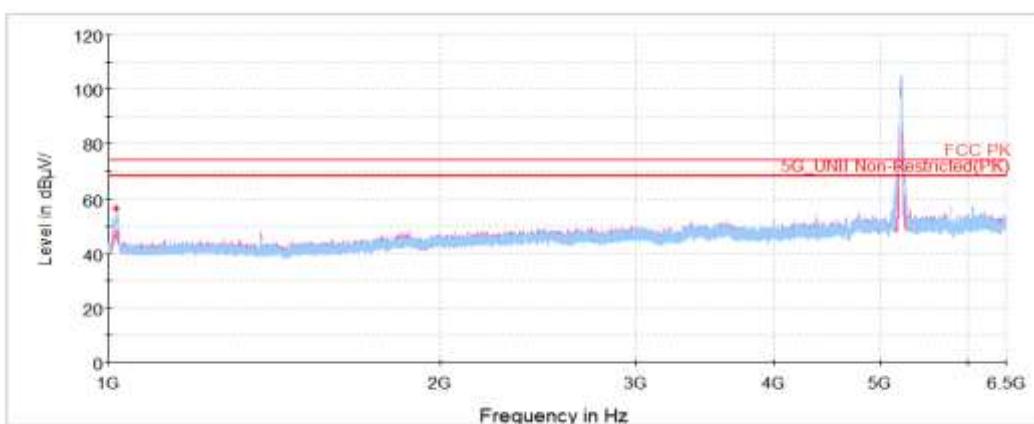
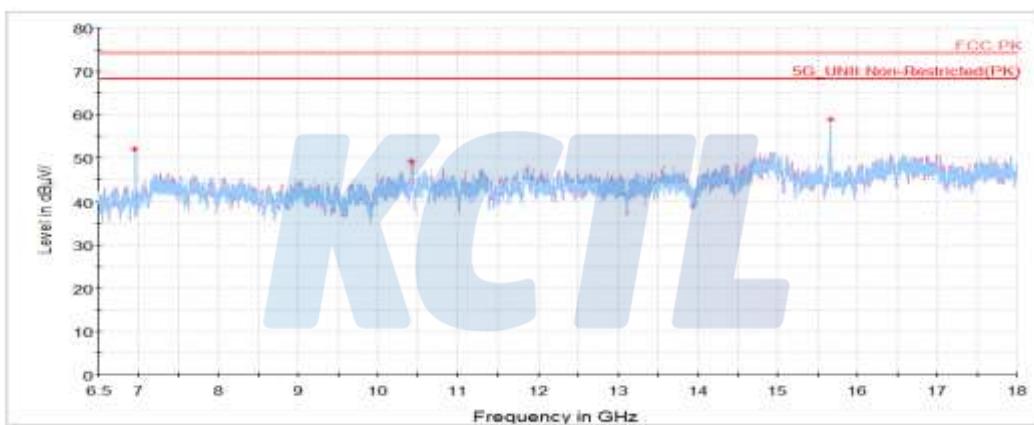
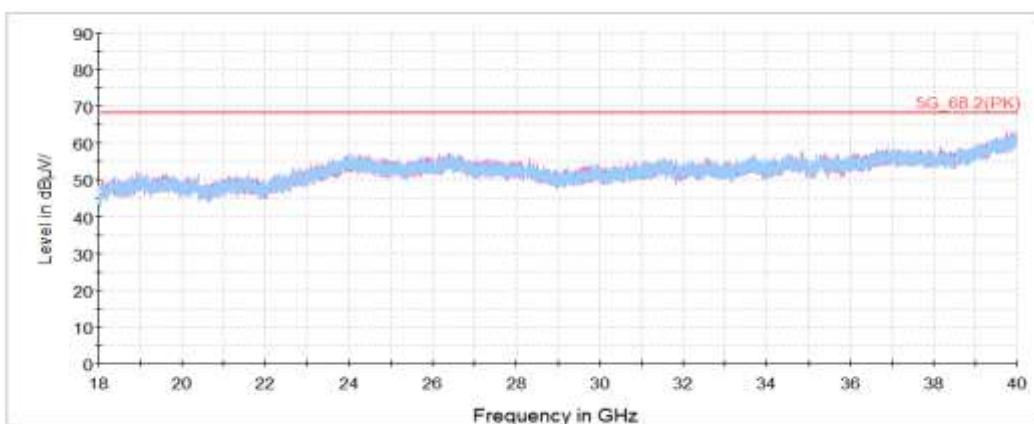
**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Middle Channel (5 220 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 016.15 <sup>1)</sup>	V	78.85	27.81	-50.59	-	56.07	74.00	17.93
6 959.64	H	69.28	35.40	-52.77	-	51.91	68.20	16.29
10 430.13	V	61.74	37.33	-49.97	-	49.10	68.20	19.10
15 656.23 <sup>1)</sup>	H	67.43	40.03	-48.63	-	58.83	74.00	15.17
<b>Average Data</b>								
1 016.15 <sup>1)</sup>	V	70.35	27.81	-50.59	0.22	47.79	54.00	6.21
15 656.23 <sup>1)</sup>	H	54.29	40.03	-48.63	0.22	45.91	54.00	8.09



**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

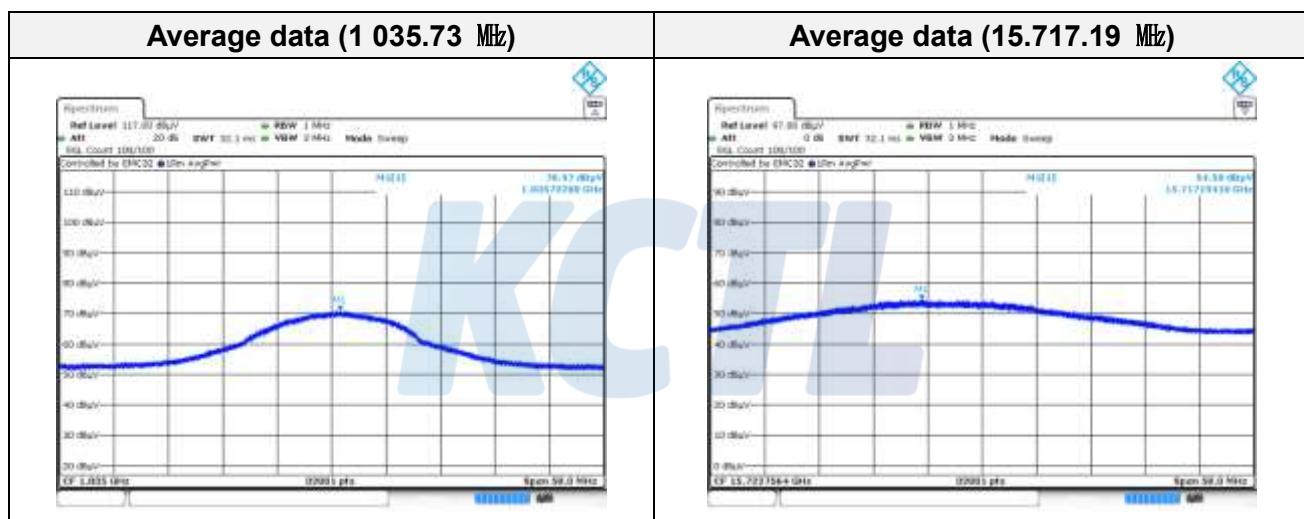
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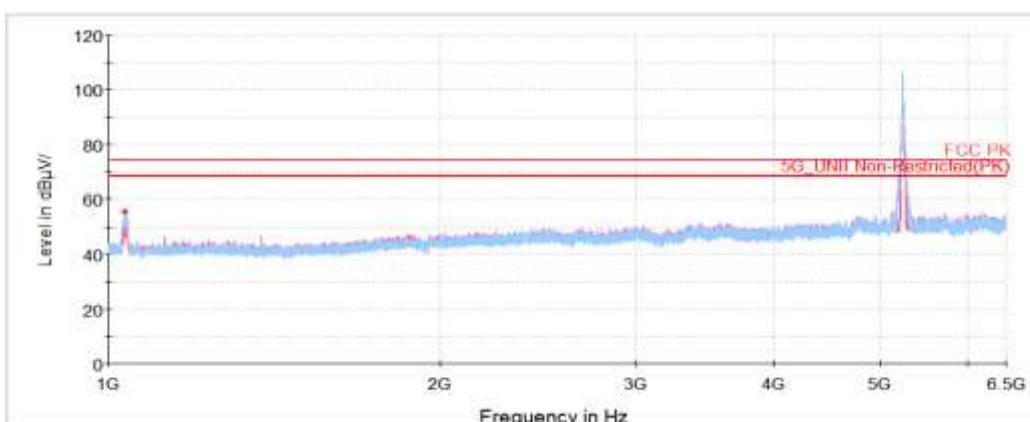
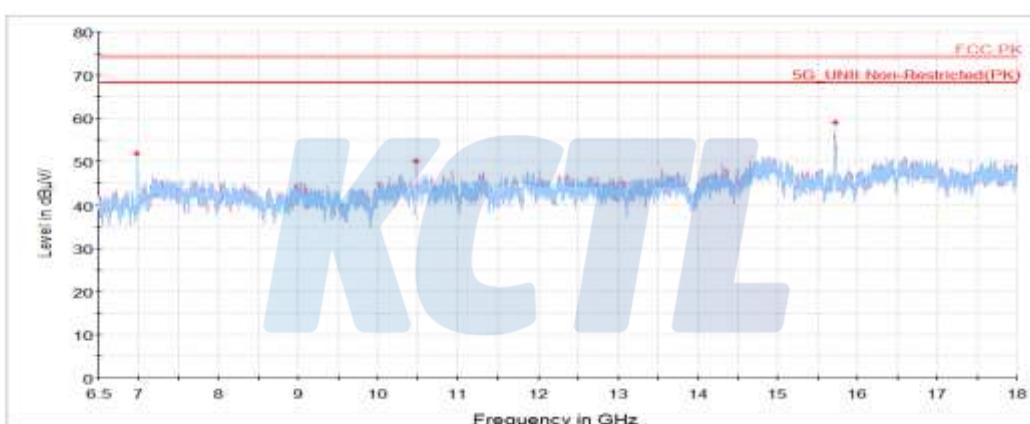
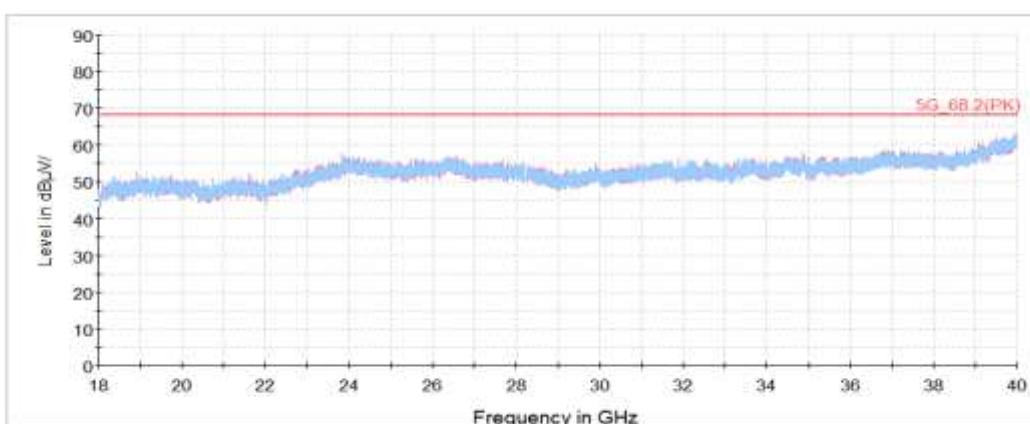
KR20-SRF0030-D

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**KCTL****Highest Channel (5 240 MHz)**

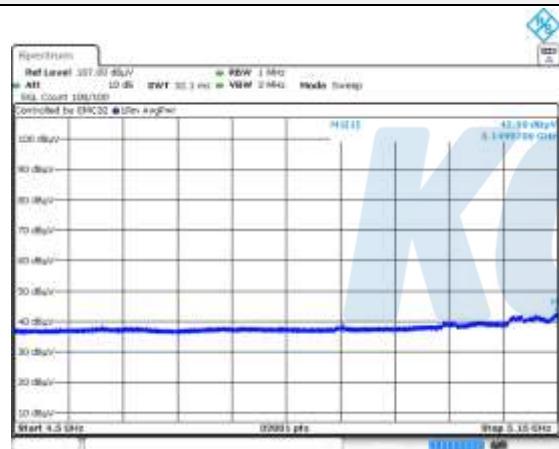
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 035.73 <sup>1)</sup>	H	78.06	27.81	-50.60	-	55.27	74.00	18.73
6 986.23	H	69.10	35.40	-52.71	-	51.79	68.20	16.41
10 482.95	V	62.26	37.38	-49.73	-	49.91	68.20	18.29
15 717.19 <sup>1)</sup>	V	67.59	40.04	-48.66	-	58.97	74.00	15.03
<b>Average Data</b>								
1 035.73 <sup>1)</sup>	H	70.97	27.81	-50.60	0.22	48.40	54.00	5.60
15 717.19 <sup>1)</sup>	H	54.58	40.04	-48.66	0.22	46.18	54.00	7.82



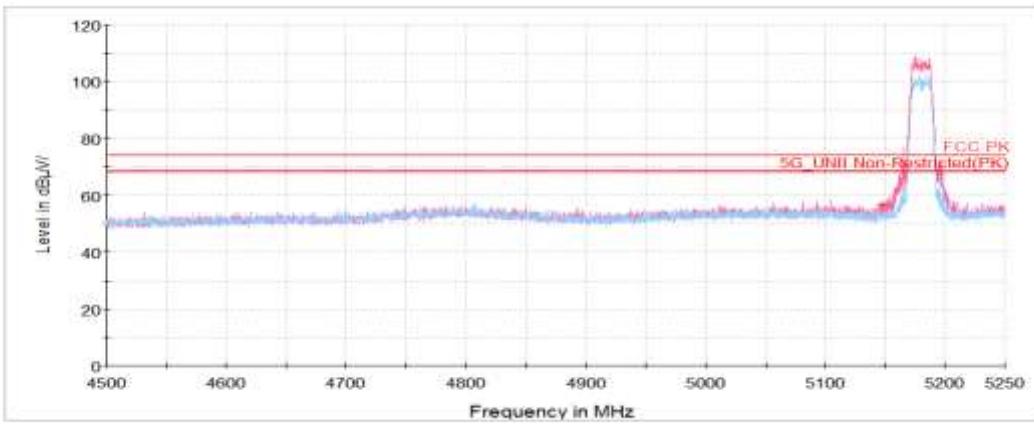
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

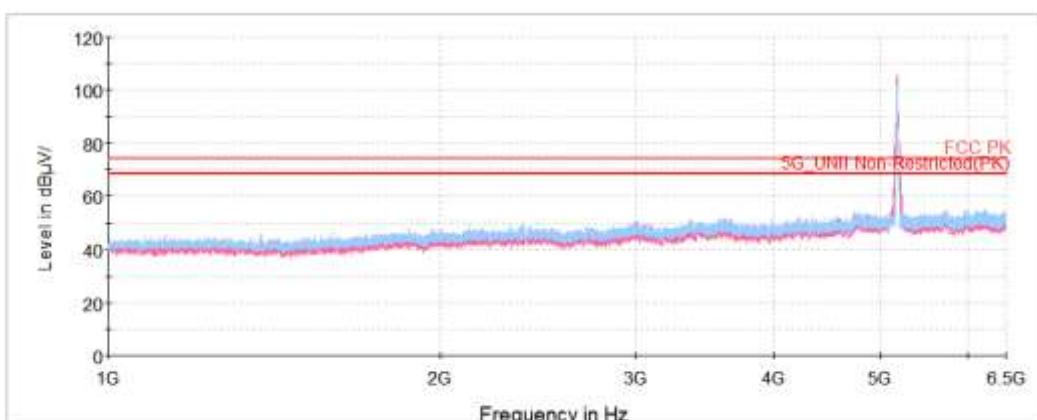
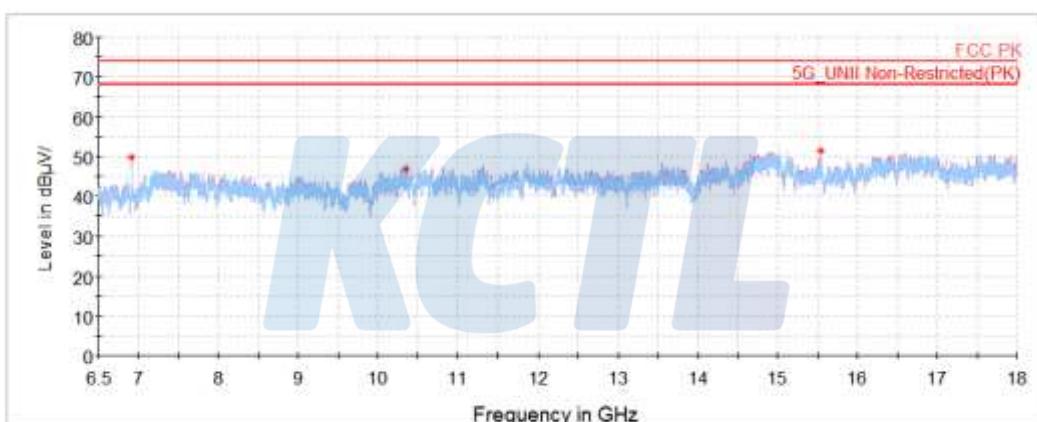
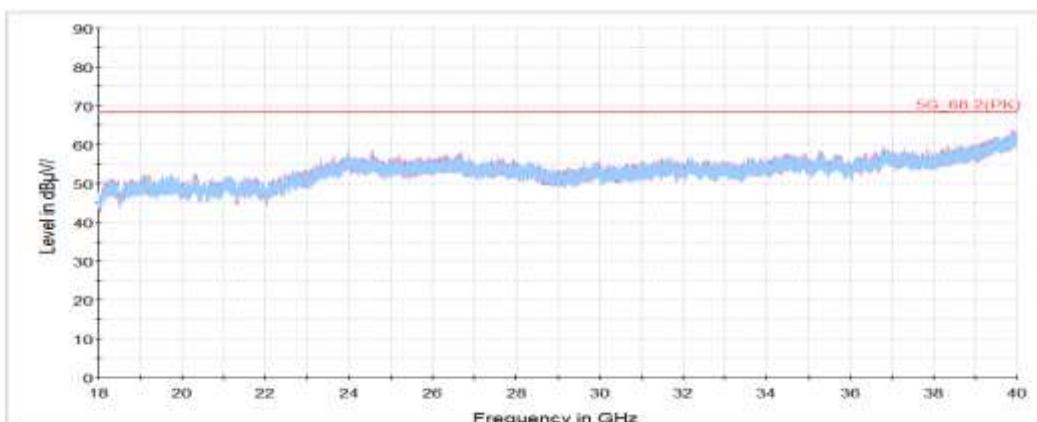
**802.11a UNII 1 ANT 2****Lowest Channel (5 180 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(µV))	(dB)	(dB)	(dB)	(dB(µV/m))	(dB(µV/m))	(dB)
<b>Peak data</b>								
5 149.97 <sup>1)</sup>	V	49.25	34.24	-27.12	-	56.37	74.00	17.63
6 906.45	V	67.24	35.40	-52.89	-	49.75	68.20	18.45
10 358.61	V	60.05	37.26	-50.29	-	47.02	68.20	21.18
15 537.40 <sup>1)</sup>	V	59.84	40.01	-48.57	-	51.28	74.00	22.72
<b>Average Data</b>								
5 149.97 <sup>1)</sup>	V	43.00	34.24	-27.12	0.22	50.34	54.00	3.66

**Average data (5 149.97 MHz)**

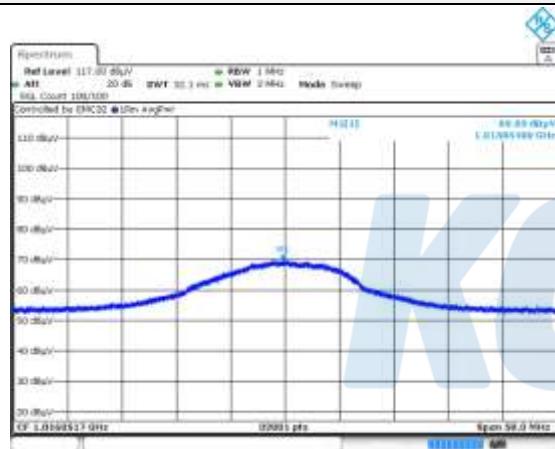
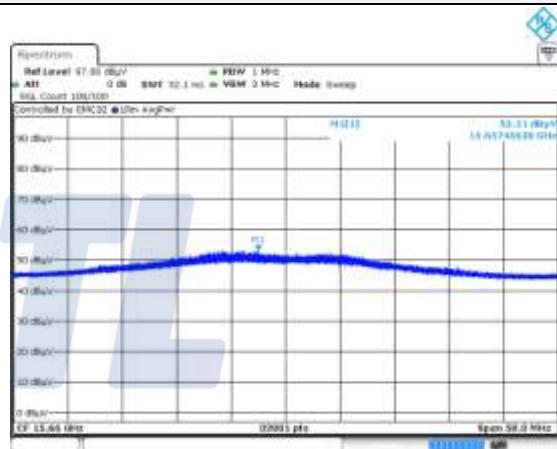
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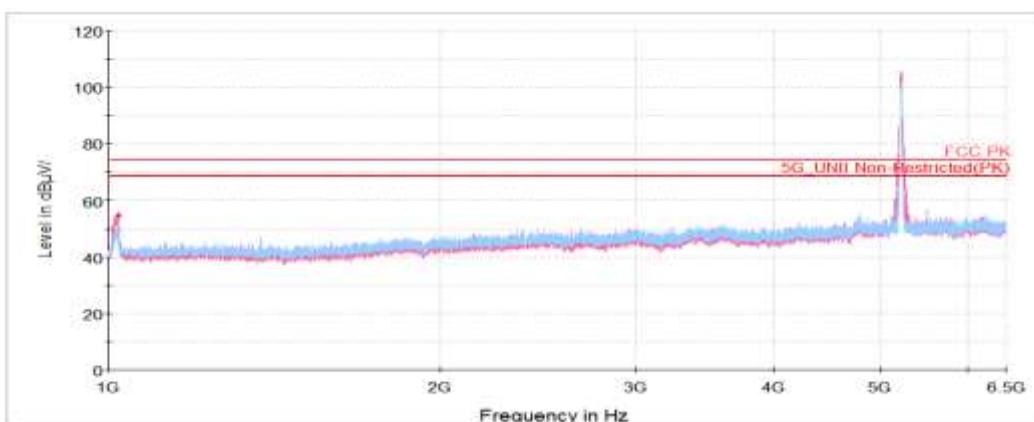
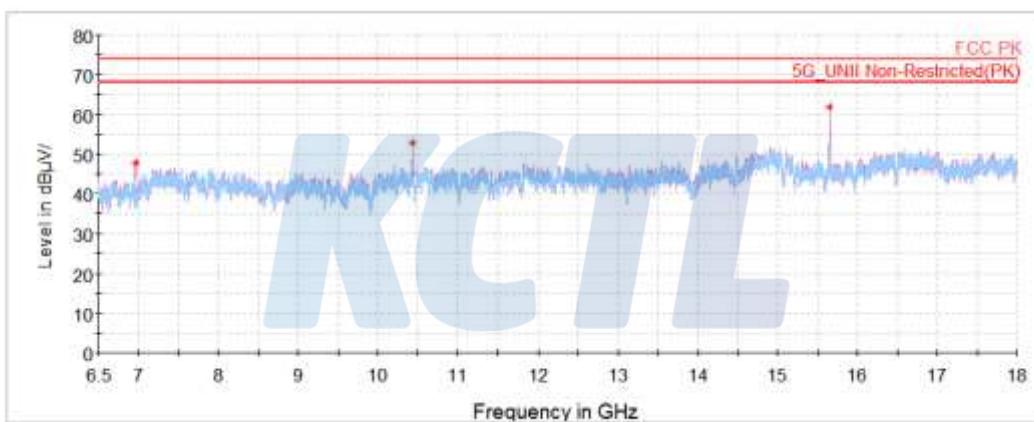
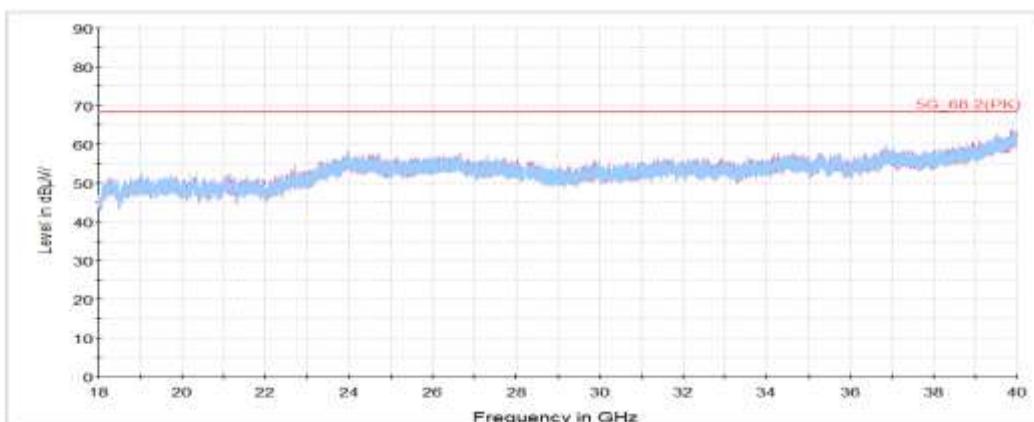
**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Middle Channel (5 220 MHz)**

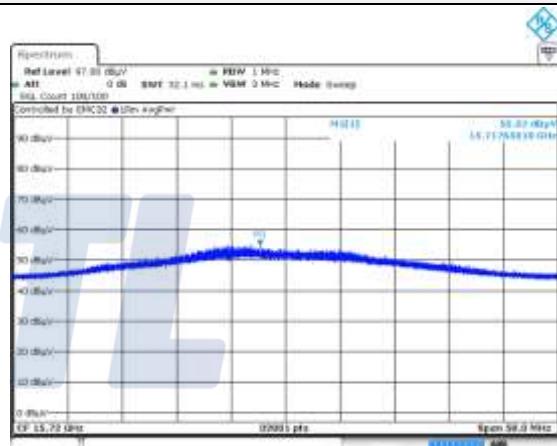
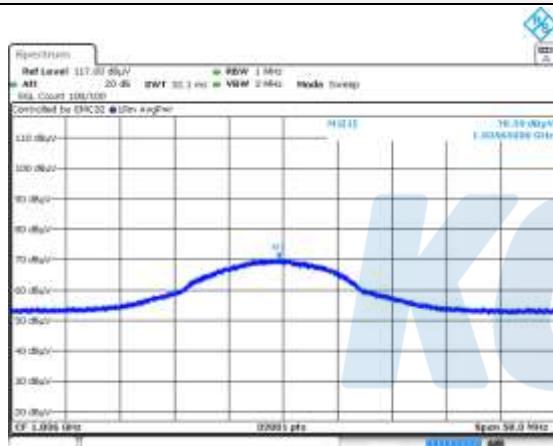
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 015.85 <sup>1)</sup>	V	77.20	27.81	-50.59	-	54.42	74.00	19.58
10 438.39	V	65.22	37.34	-49.93	-	52.63	68.20	15.57
15 657.46 <sup>1)</sup>	V	70.40	40.03	-48.63	-	61.80	74.00	12.20
<b>Average Data</b>								
1 015.85 <sup>1)</sup>	V	69.89	27.81	-50.59	0.22	47.33	54.00	6.67
15 657.46 <sup>1)</sup>	V	53.21	40.03	-48.63	0.22	44.83	54.00	9.17

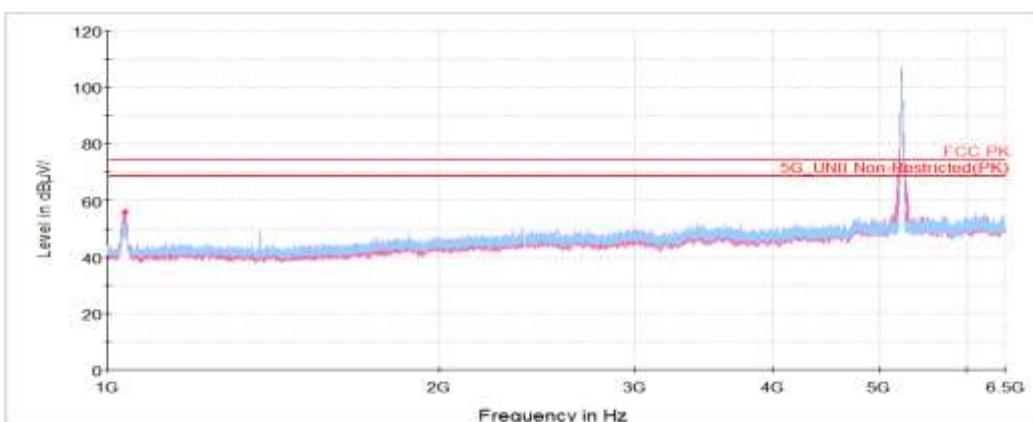
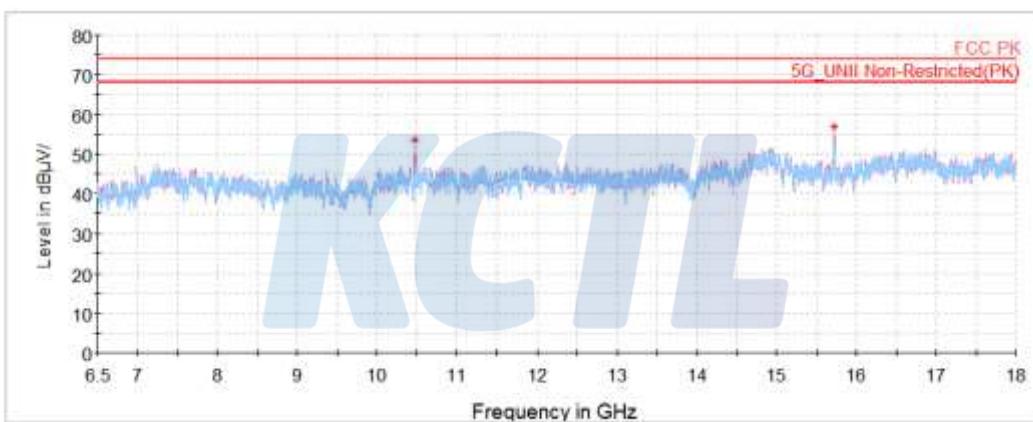
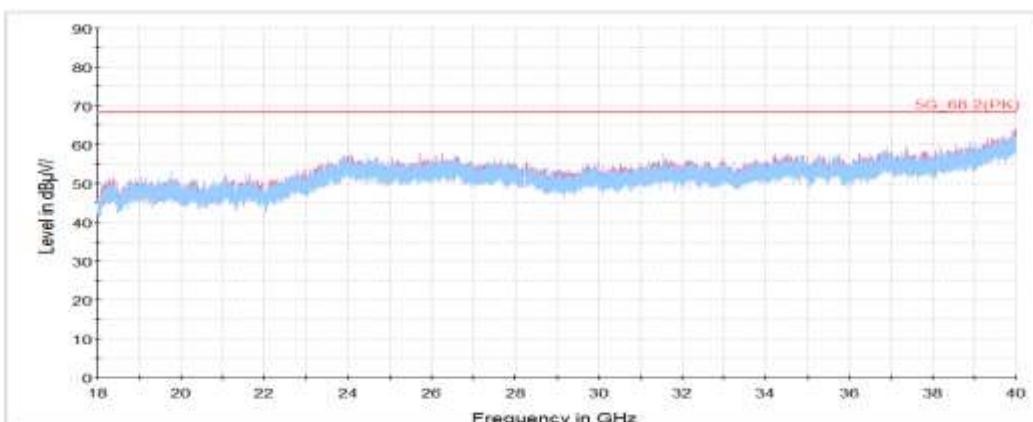
**Average data (1 015.85 MHz)****Average data (15 657.46 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Highest Channel (5 240 MHz)**

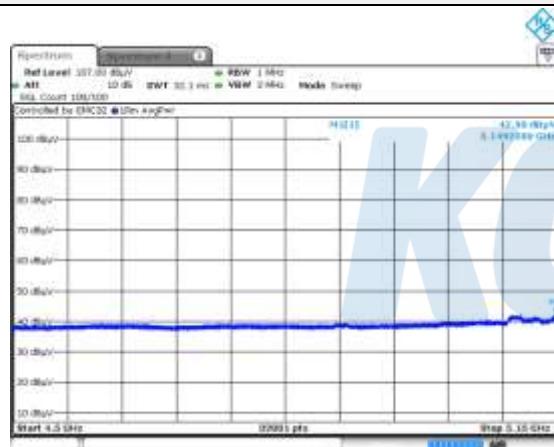
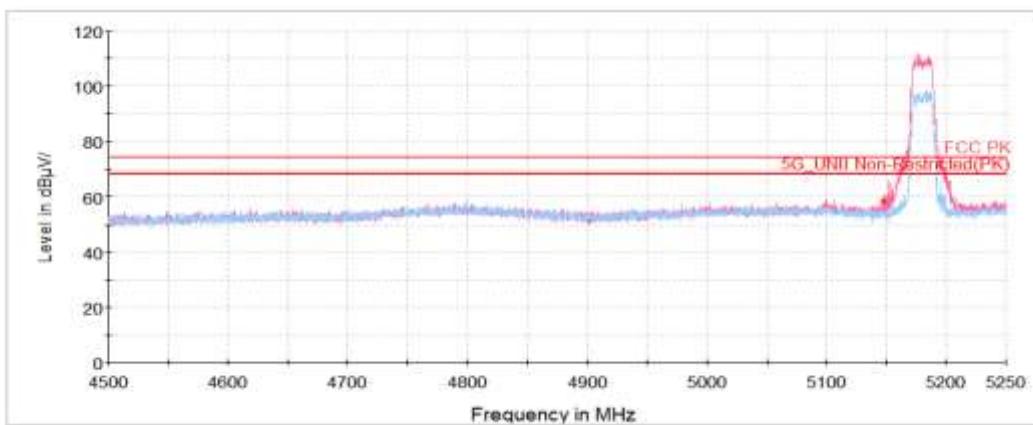
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 035.65 <sup>1)</sup>	V	78.40	27.81	-50.60	-	55.61	74.00	18.39
10 480.08	V	65.99	37.38	-49.74	-	53.63	68.20	14.57
15 717.65 <sup>1)</sup>	V	65.46	40.04	-48.66	-	56.84	74.00	17.16
<b>Average Data</b>								
1 035.65 <sup>1)</sup>	V	70.39	27.81	-50.60	0.22	47.82	54.00	6.18
15 717.65 <sup>1)</sup>	V	55.02	40.04	-48.66	0.22	46.62	54.00	7.38

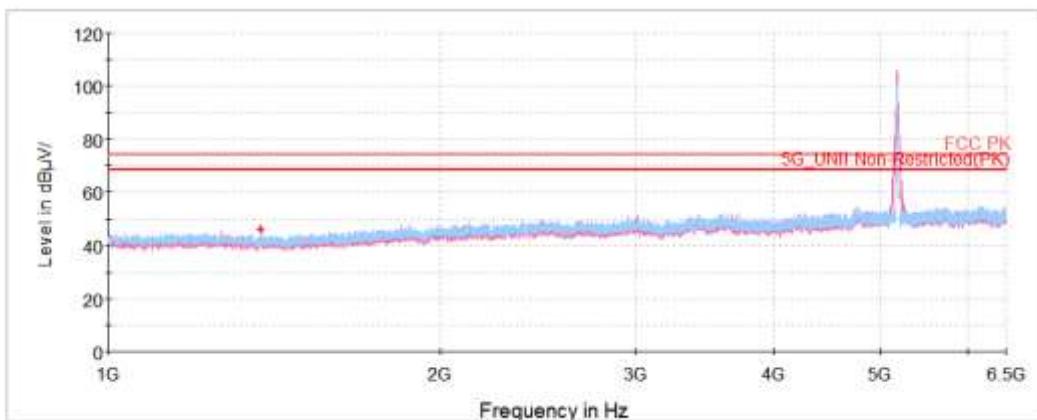
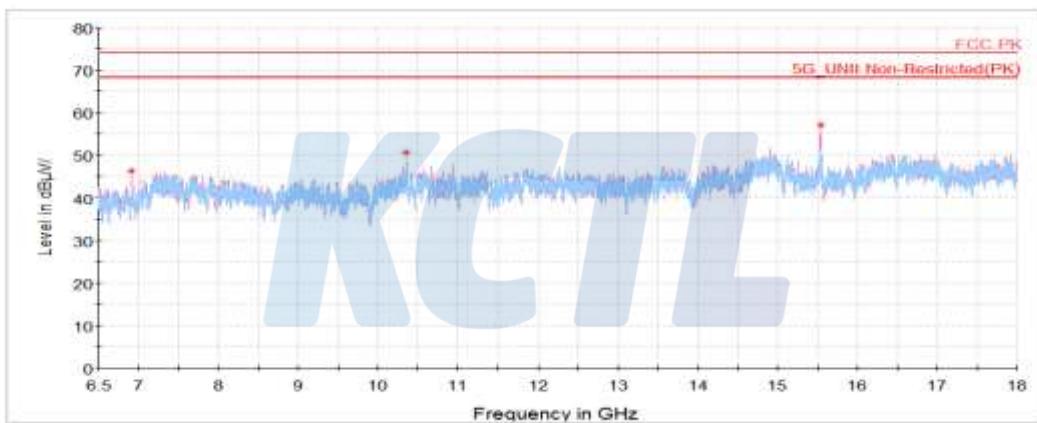
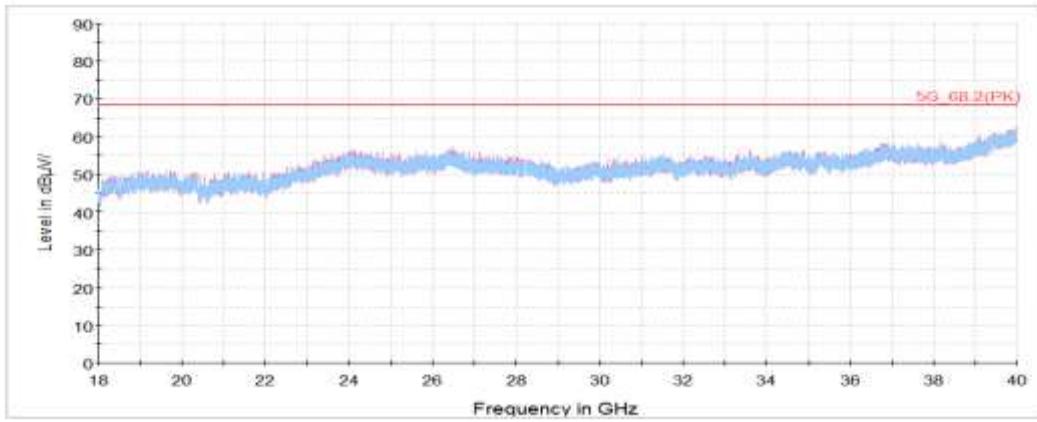
**Average data (1 035.65 MHz)****Average data (15 717.65 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**802.11a UNII 1 ANT 3****Lowest Channel (5 180 MHz)**

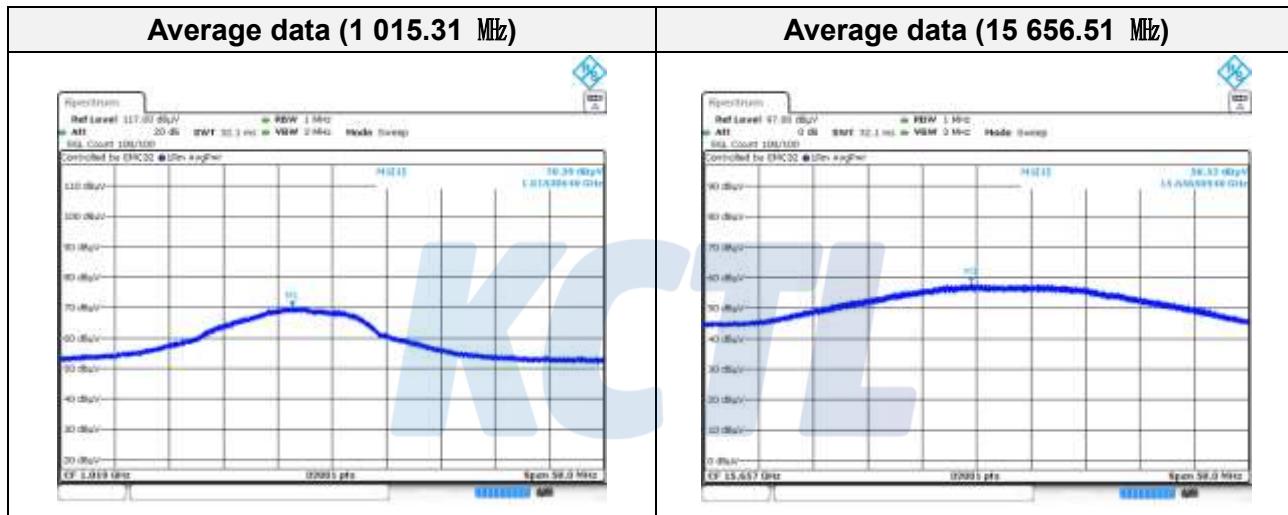
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
5 149.24 <sup>1)</sup>	V	51.07	34.24	-27.11	-	58.20	74.00	15.80
10 360.41	V	63.63	37.26	-50.28	-	50.61	68.20	17.59
15 536.94 <sup>1)</sup>	V	65.60	40.01	-48.57	-	57.04	74.00	16.96
<b>Average Data</b>								
5 149.24 <sup>1)</sup>	V	42.90	34.24	-27.11	0.22	50.25	54.00	3.75
15 536.94 <sup>1)</sup>	V	52.58	40.01	-48.57	0.22	44.24	54.00	9.76

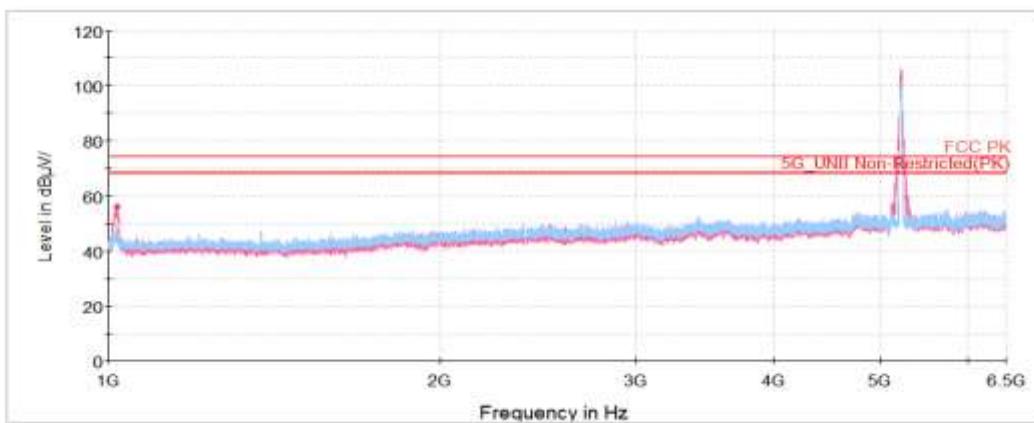
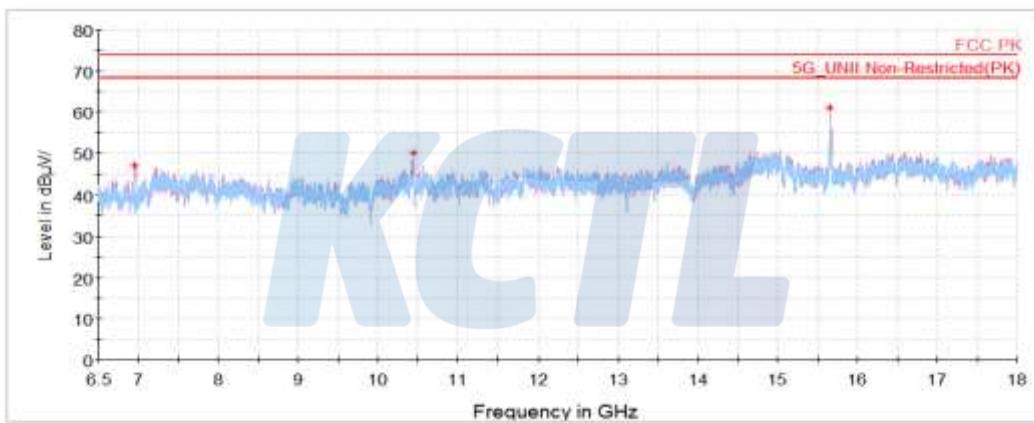
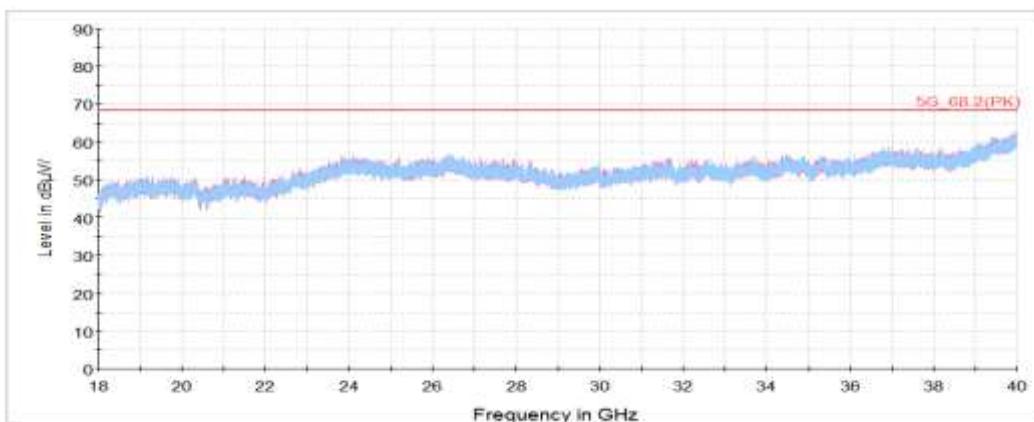
**Average data (5 149.24 MHz)****Average data (15 536.94 MHz)****Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Middle Channel (5 220 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 015.31 <sup>1)</sup>	V	78.43	27.81	-50.59	-	55.65	74.00	18.35
10 445.94	V	62.60	37.35	-49.90	-	50.05	68.20	18.15
15 656.51 <sup>1)</sup>	H	69.66	40.03	-48.63	-	61.06	74.00	12.94
<b>Average Data</b>								
1 015.31 <sup>1)</sup>	V	70.39	27.81	-50.59	0.22	47.83	54.00	6.17
15 656.51 <sup>1)</sup>	H	58.52	40.03	-48.63	0.22	50.14	54.00	3.86



**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

65, Sinwon-ro, Yeongtong-gu,  
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[www.kctl.co.kr](http://www.kctl.co.kr)

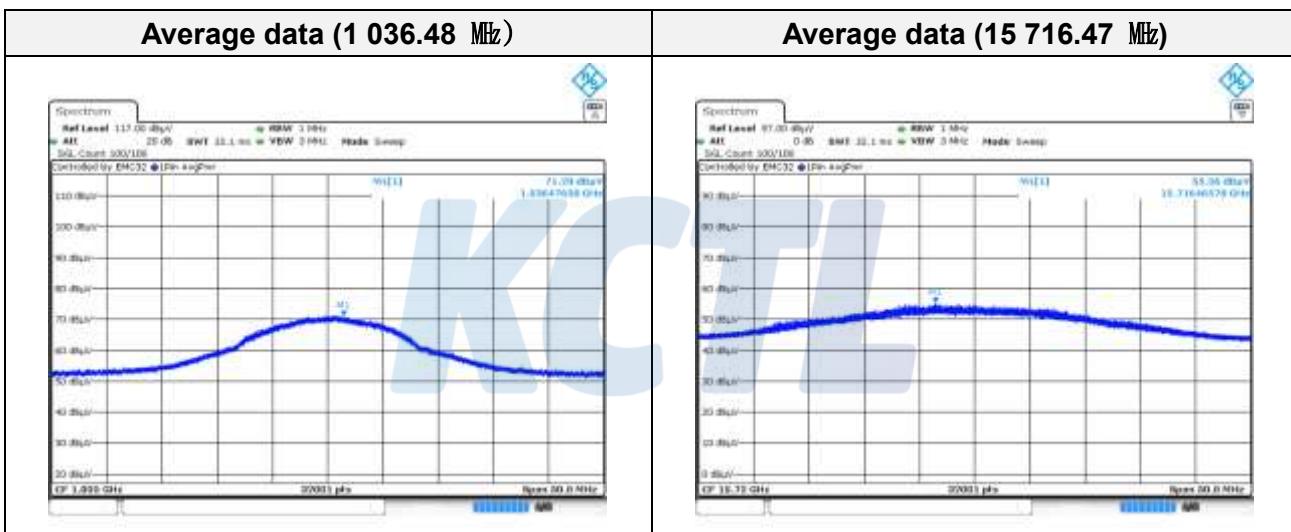
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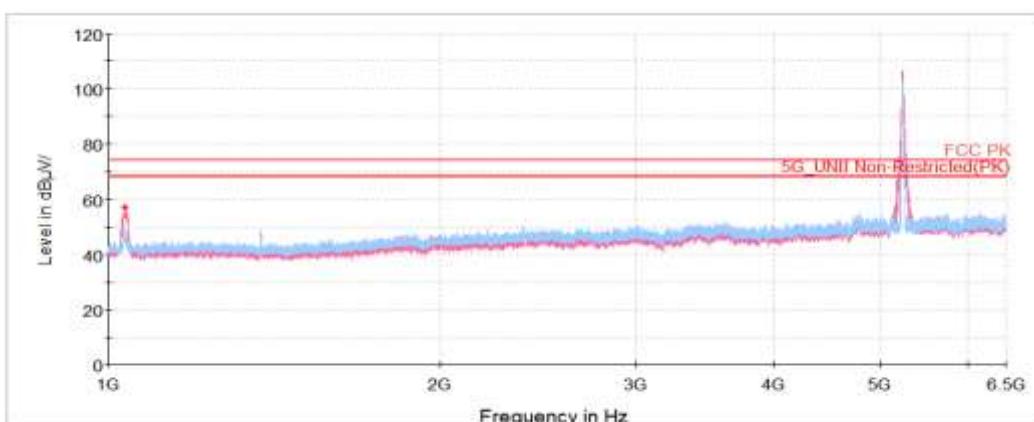
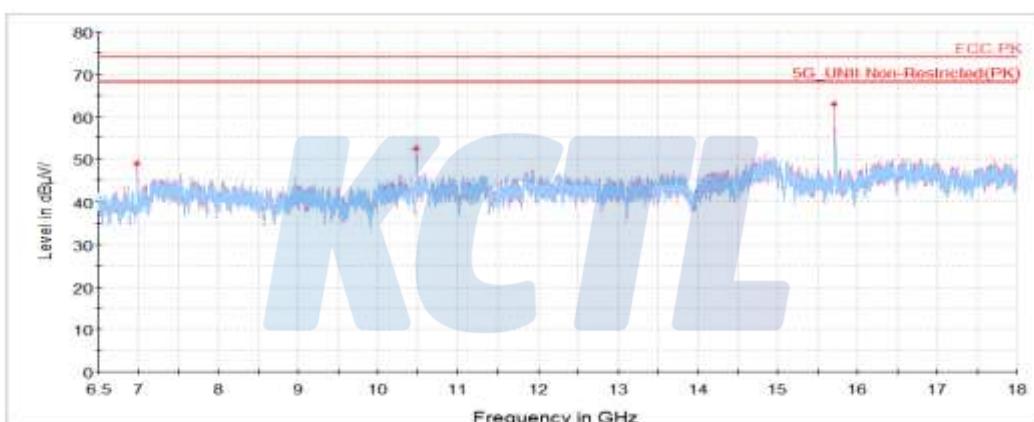
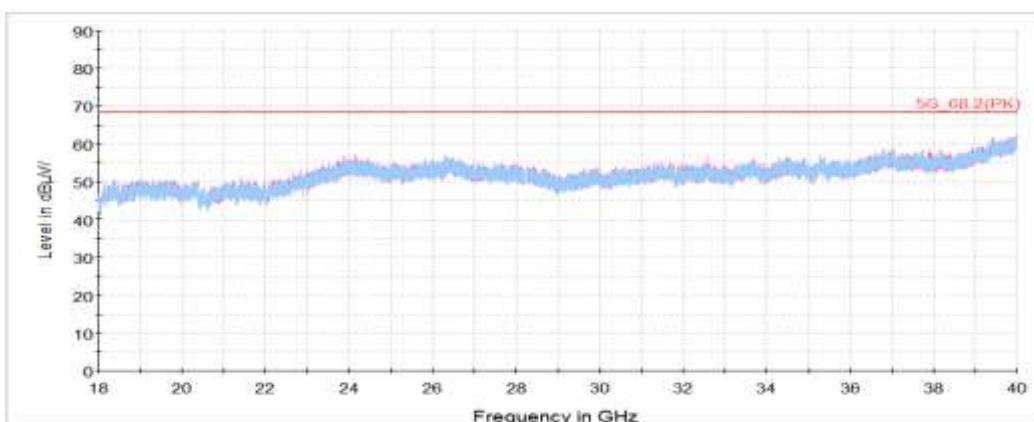
KR20-SRF0030-D

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**KCTL****Highest Channel (5 240 MHz)**

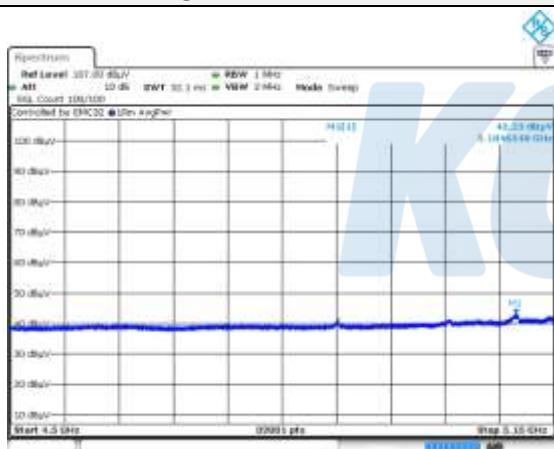
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 036.48 <sup>1)</sup>	V	79.57	27.81	-50.60	-	56.78	74.00	17.22
6 986.23	V	66.15	35.40	-52.71	-	48.84	68.20	19.36
10 485.83	V	64.81	37.39	-49.72	-	52.48	68.20	15.72
15 716.47 <sup>1)</sup>	V	71.62	40.04	-48.66	-	63.00	74.00	11.00
<b>Average Data</b>								
1 036.48 <sup>1)</sup>	V	71.28	27.81	-50.60	0.22	48.71	54.00	5.29
15 716.47 <sup>1)</sup>	V	55.36	40.04	-48.66	0.22	46.96	54.00	7.04



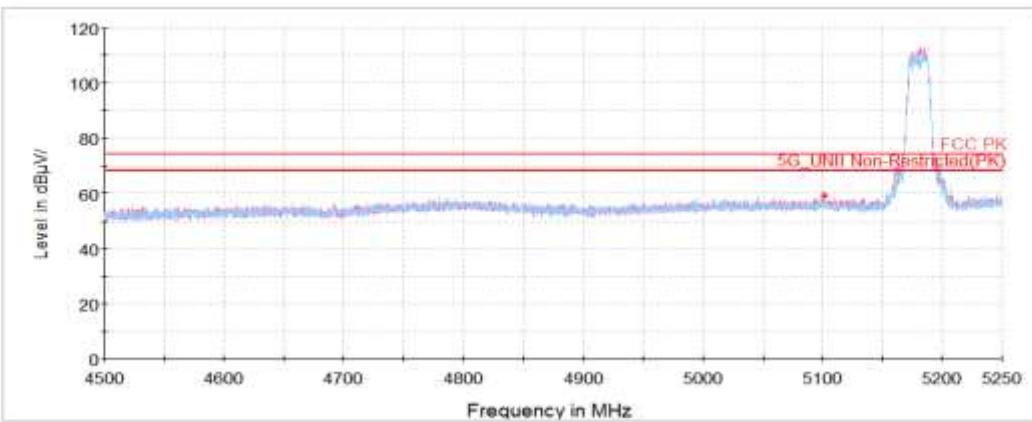
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

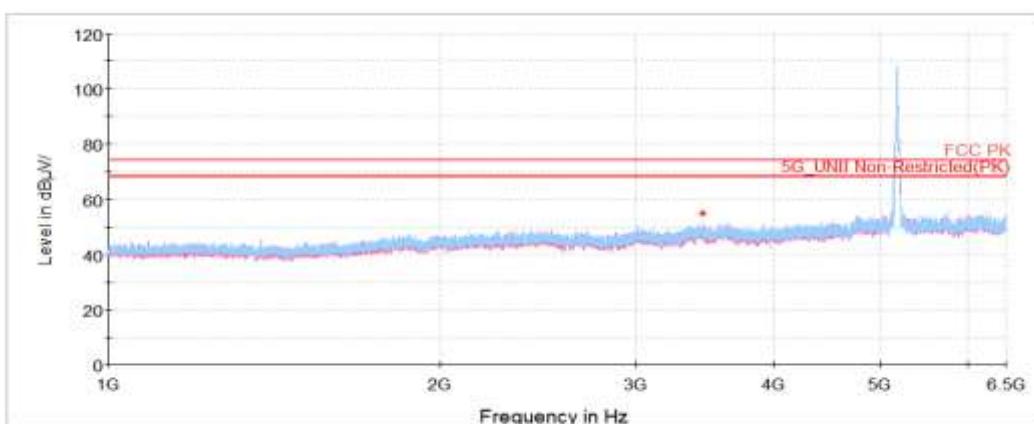
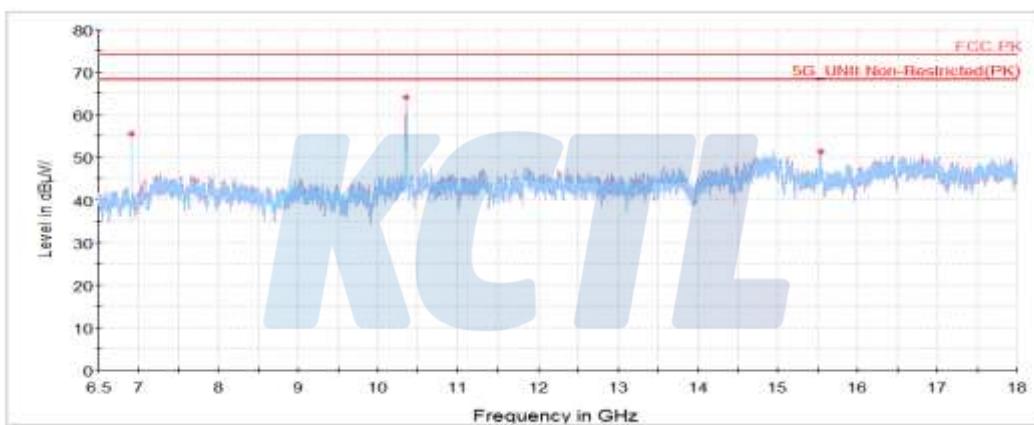
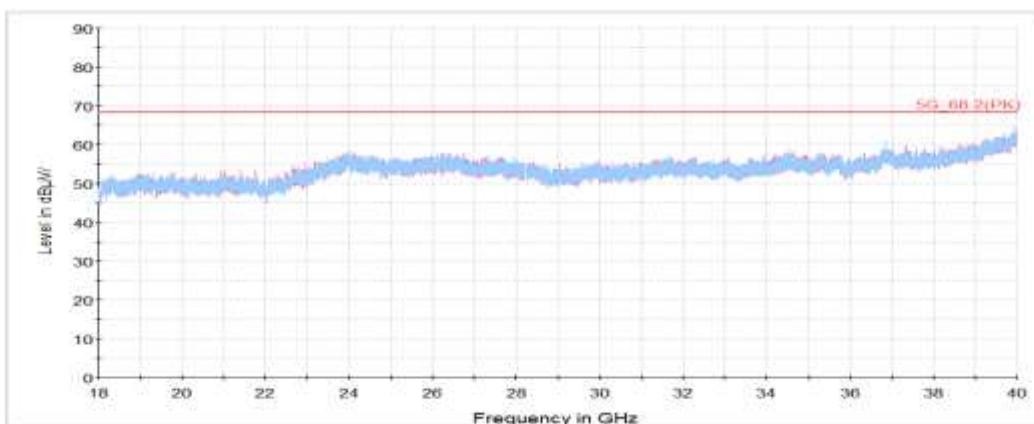
**802.11a UNII 1 4TX MIMO****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
3 453.34	H	68.47	32.59	-46.40	-	54.66	68.20	13.54
5 104.65 <sup>1)</sup>	V	51.44	34.17	-26.82	-	58.79	74.00	15.21
6 906.81	H	72.83	35.40	-52.89	-	55.34	68.20	12.86
10 361.13	V	76.99	37.26	-50.28	-	63.97	68.20	4.23
15 536.33 <sup>1)</sup>	V	59.83	40.01	-48.57	-	51.27	74.00	22.73
<b>Average Data</b>								
5 104.65 <sup>1)</sup>	V	43.23	34.17	-26.82	0.22	50.80	54.00	3.20

**Average data (5 104.65 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

65, Sinwon-ro, Yeongtong-gu,  
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[www.kctl.co.kr](http://www.kctl.co.kr)

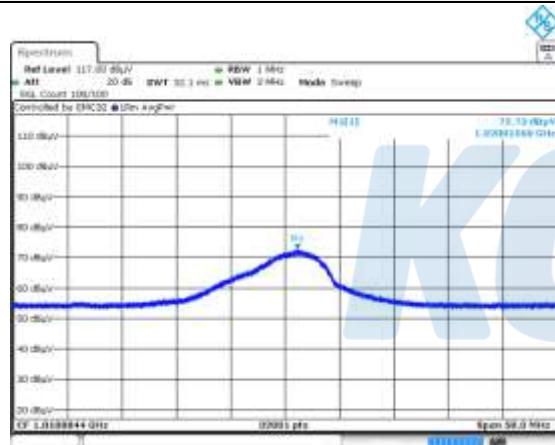
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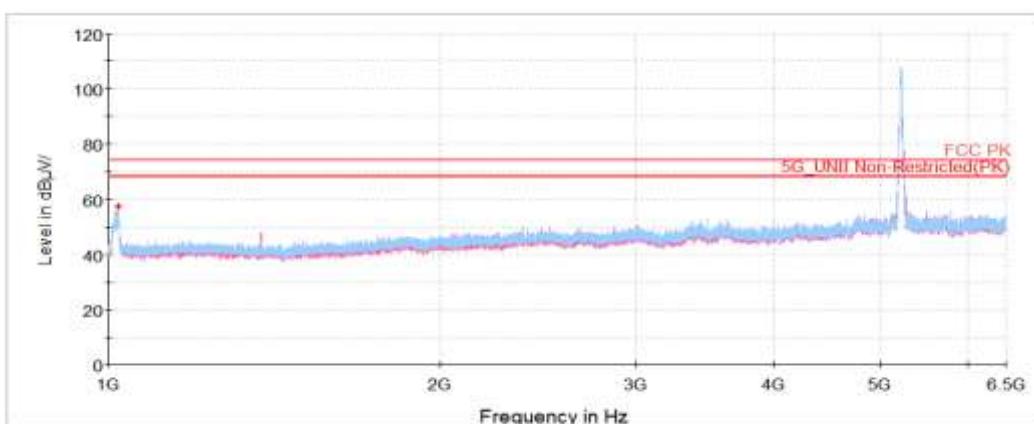
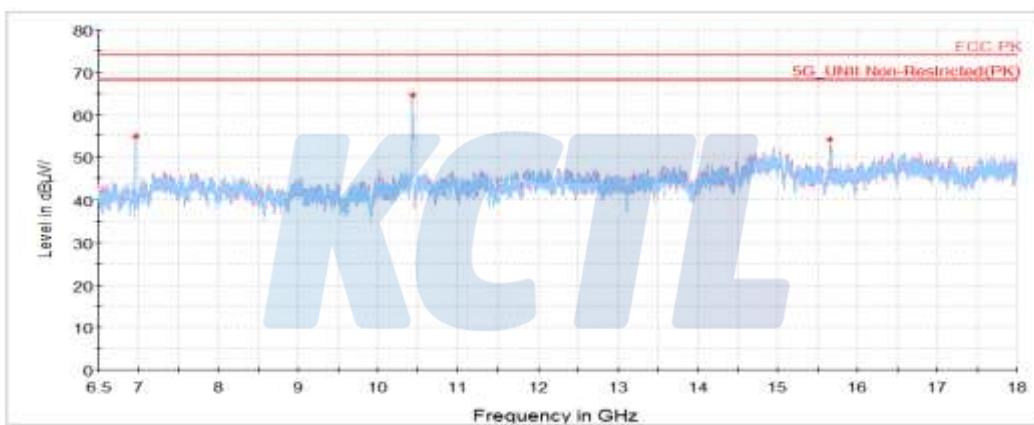
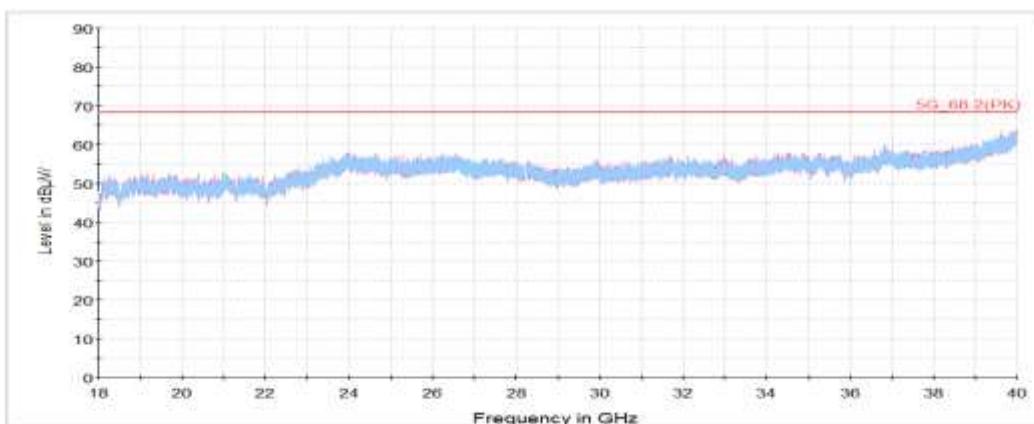
KR20-SRF0030-D

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**KCTL****Middle Channel (5 220 MHz)**

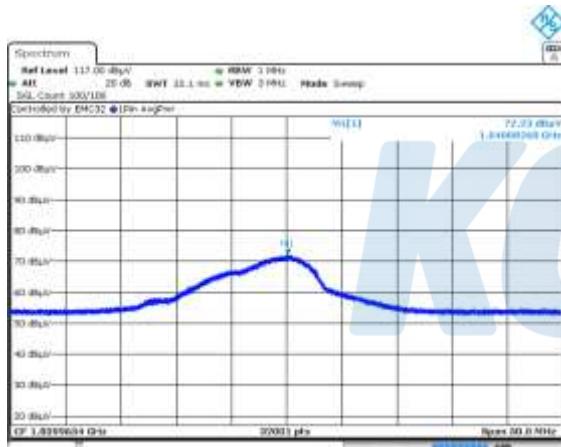
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 020.02 <sup>1)</sup>	V	79.84	27.81	-50.60	-	57.05	74.00	16.95
6 960.00	H	72.27	35.40	-52.77	-	54.90	68.20	13.30
10 437.67	H	77.11	37.34	-49.93	-	64.52	68.20	3.68
15 664.87 <sup>1)</sup>	V	62.68	40.03	-48.63	-	54.08	74.00	19.92
<b>Average Data</b>								
1 020.02 <sup>1)</sup>	V	72.73	27.81	-50.60	0.22	50.16	54.00	3.84
15 664.87 <sup>1)</sup>	V	54.84	40.03	-48.63	0.22	46.46	54.00	7.54

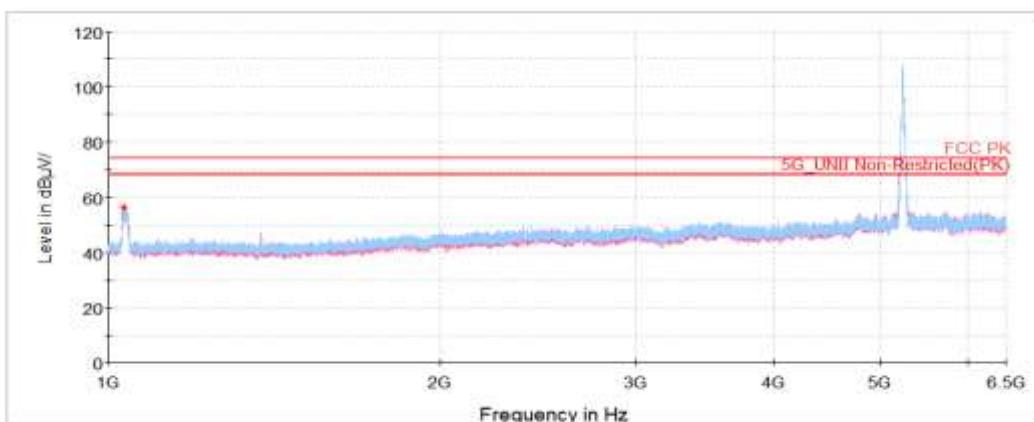
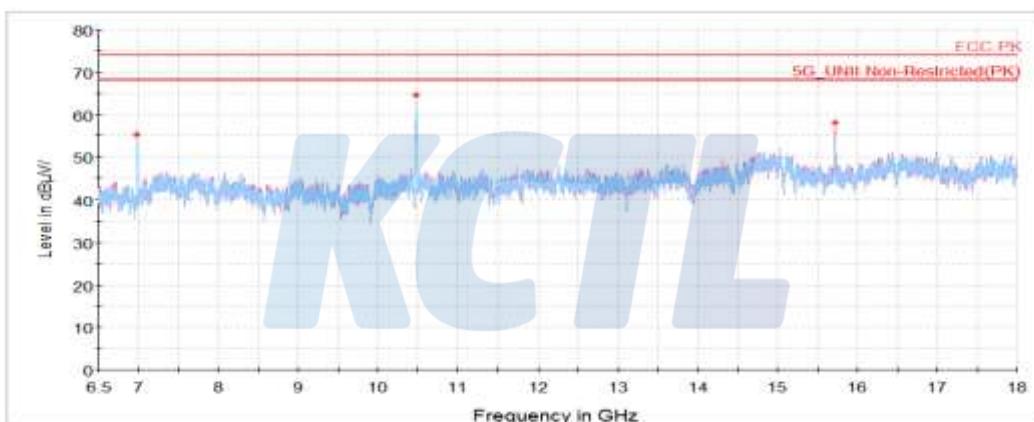
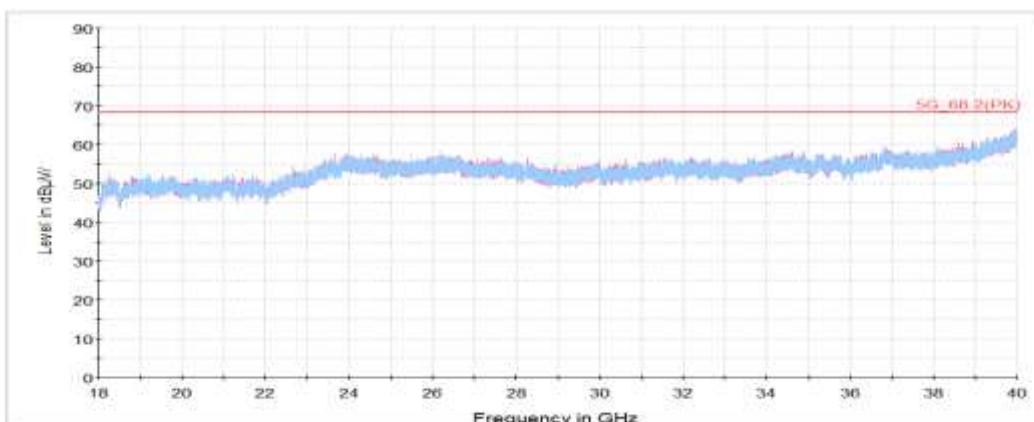
**Average data (1 020.02 MHz)****Average data (15 664.87 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Highest Channel (5 240 MHz)**

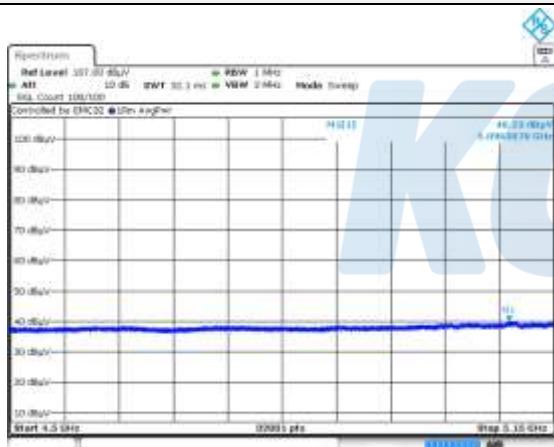
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 040.08 <sup>1)</sup>	H	78.79	27.82	-50.60	-	56.01	74.00	17.99
6 986.59	H	72.68	35.40	-52.71	-	55.37	68.20	12.83
10 476.48	V	76.94	37.38	-49.76	-	64.56	68.20	3.64
15 714.00 <sup>1)</sup>	V	66.66	40.04	-48.66	-	58.04	74.00	15.96
<b>Average Data</b>								
1 040.08 <sup>1)</sup>	V	72.23	27.82	-50.60	0.22	49.67	54.00	4.33
15 714.00 <sup>1)</sup>	V	54.20	40.04	-48.66	0.22	45.80	54.00	8.20

**Average data (1 040.08 MHz)****Average data (15 714.00 MHz)**

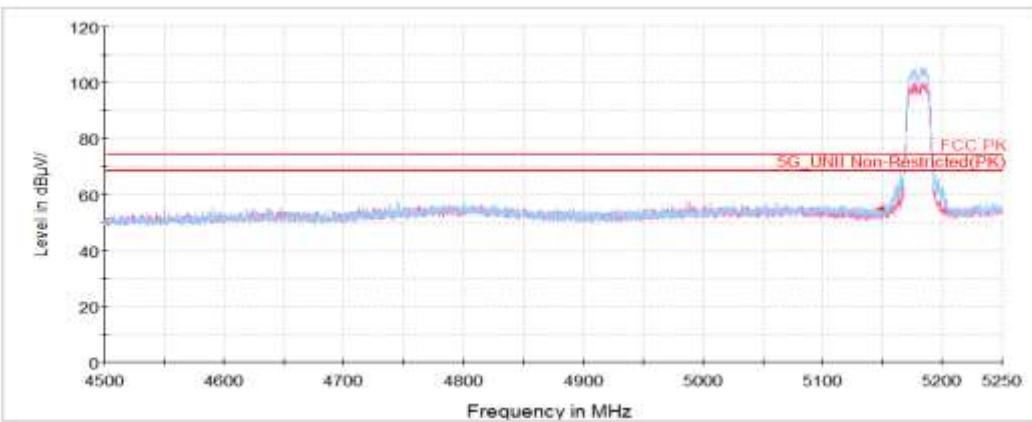
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

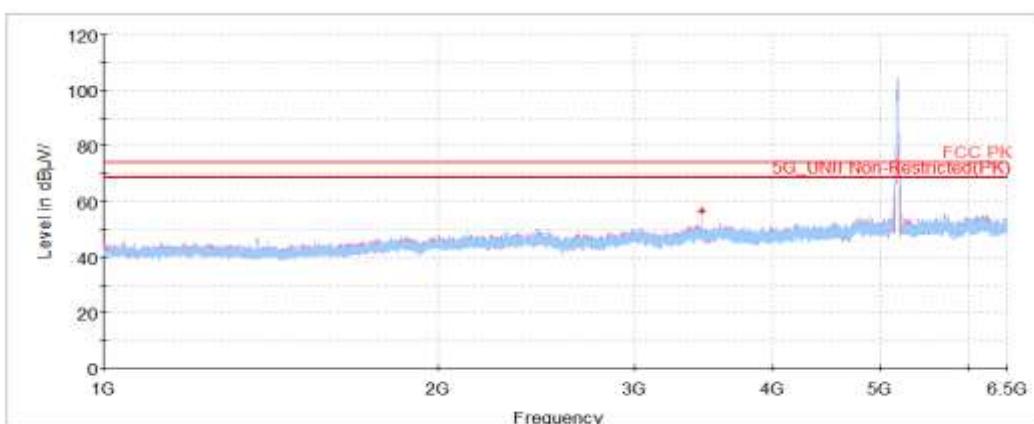
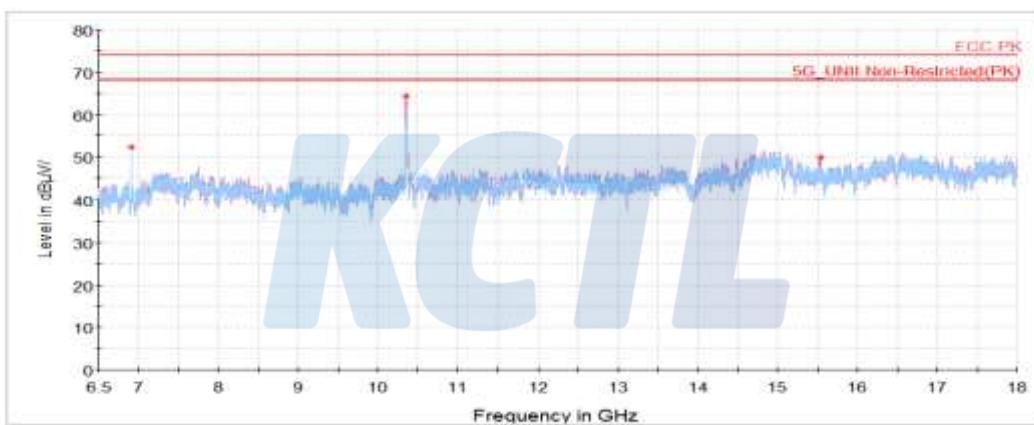
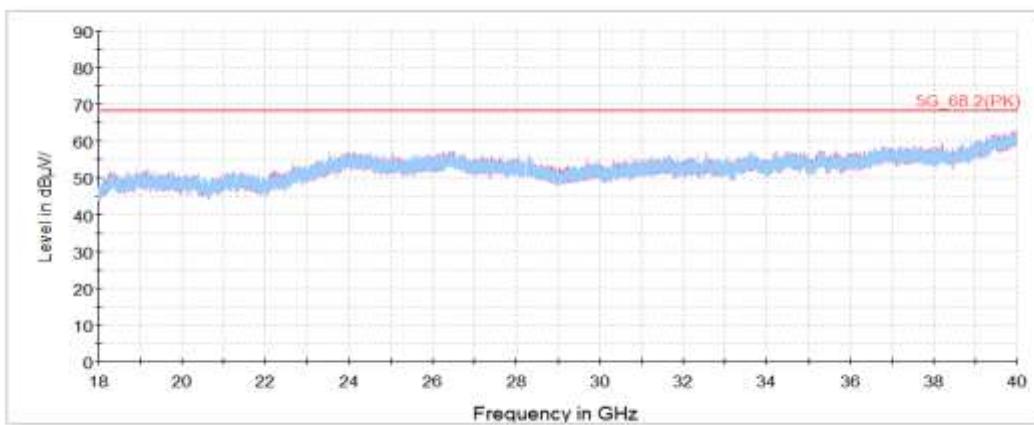
**802.11n HT20 UNII 1 ANT 0****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
3 453.34	H	70.30	32.59	-46.40	-	56.49	68.20	11.71
5 096.39 <sup>1)</sup>	H	47.41	34.15	-26.78	-	54.78	74.00	19.22
6 906.45	H	69.79	35.40	-52.89	-	52.30	68.20	15.90
10 362.56	V	77.26	37.26	-50.27	-	64.25	68.20	3.95
15 542.95 <sup>1)</sup>	V	58.45	40.01	-48.57	-	49.89	74.00	24.11
<b>Average Data</b>								
5 096.39 <sup>1)</sup>	H	40.23	34.15	-26.78	0.22	47.82	54.00	6.18

**Average data (5 096.39 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

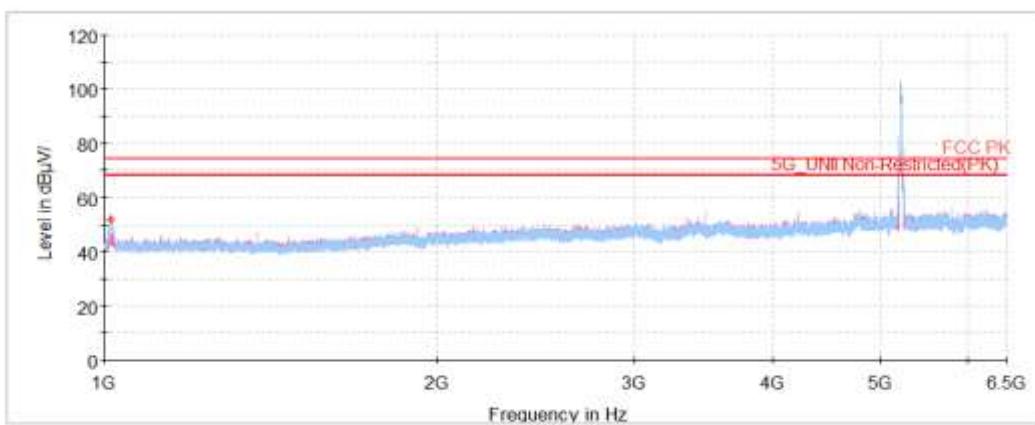
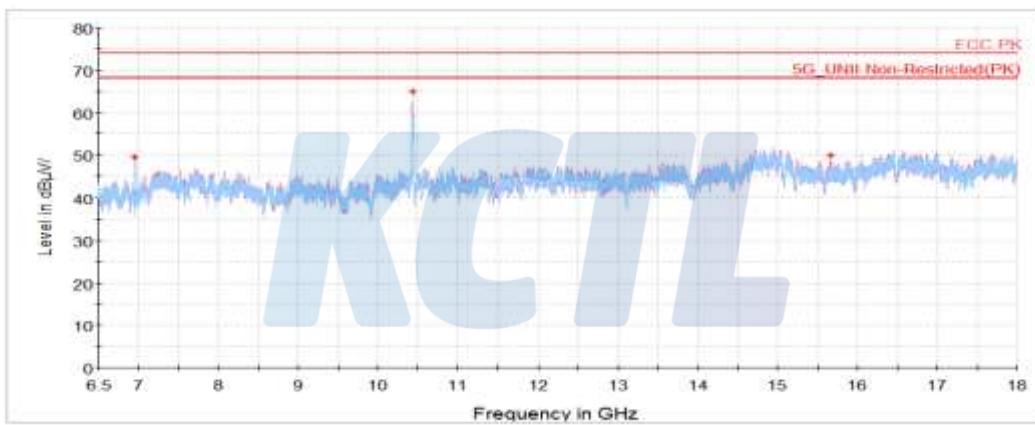
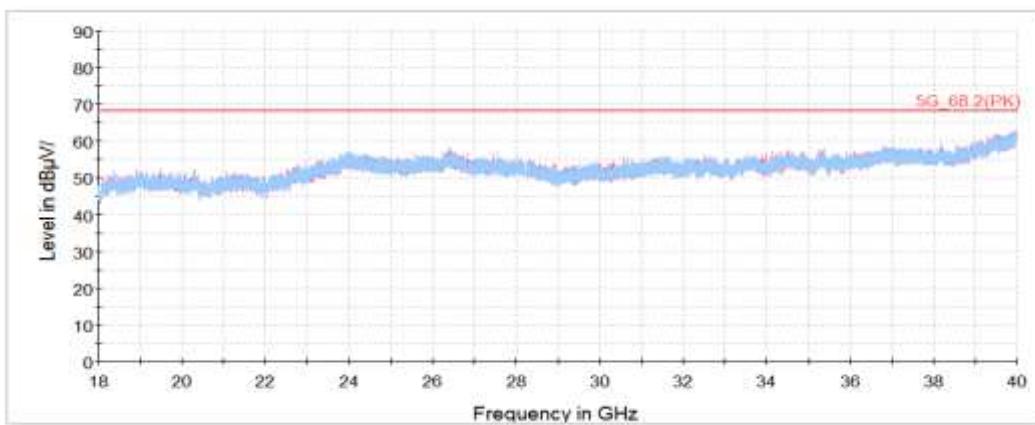
65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

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**Middle Channel (5 220 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
6 959.64	H	66.76	35.40	-52.77	-	49.39	68.20	18.81
10 439.47	H	77.51	37.34	-49.93	-	64.92	68.20	3.28
15 661.19 <sup>1)</sup>	V	58.48	40.03	-48.63	-	49.88	74.00	24.12
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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Report No.:

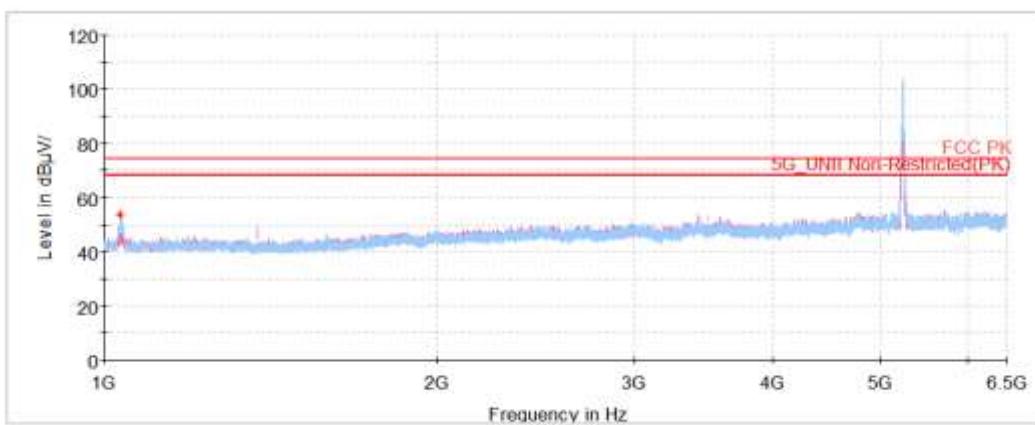
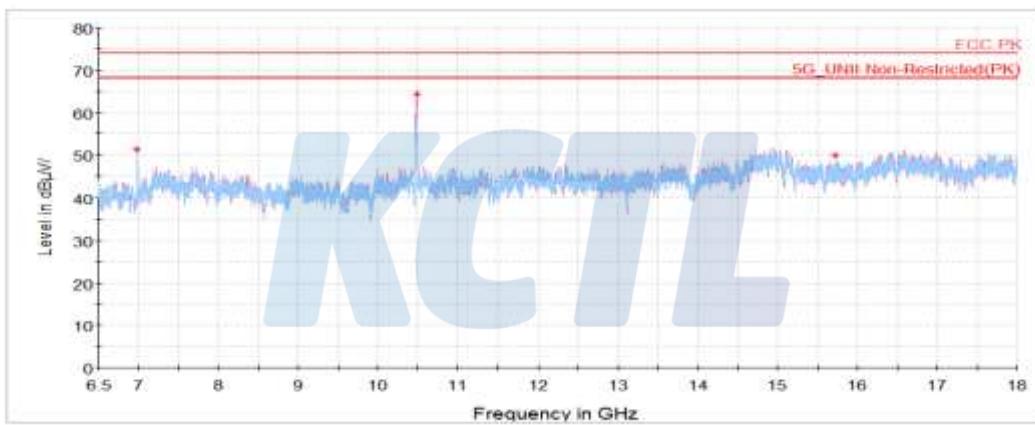
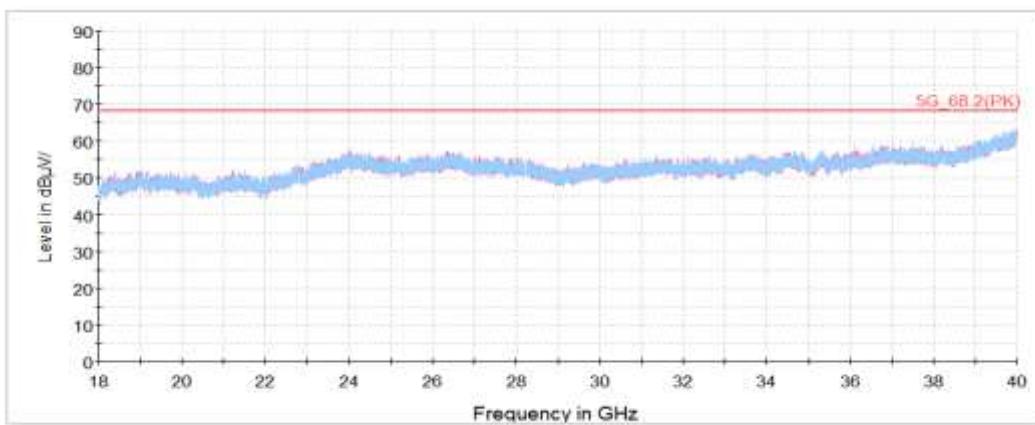
KR20-SRF0030-D

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**Highest Channel (5 240 MHz)**

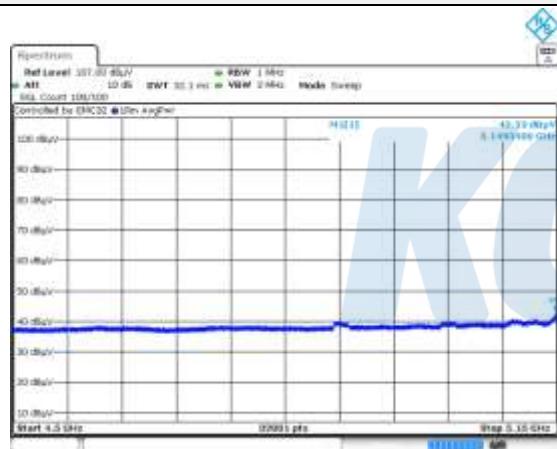
Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor	Amp. + Cable	DCCF	Result (dB(µV/m))	Limit (dB(µV/m))	Margin
<b>Peak data</b>								
6 986.59	H	68.65	35.40	-52.71	-	51.34	68.20	16.86
10 487.27	V	76.59	37.39	-49.71	-	64.27	68.20	3.93
15 716.17 <sup>1)</sup>	V	58.53	40.04	-48.66	-	49.91	74.00	24.09
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



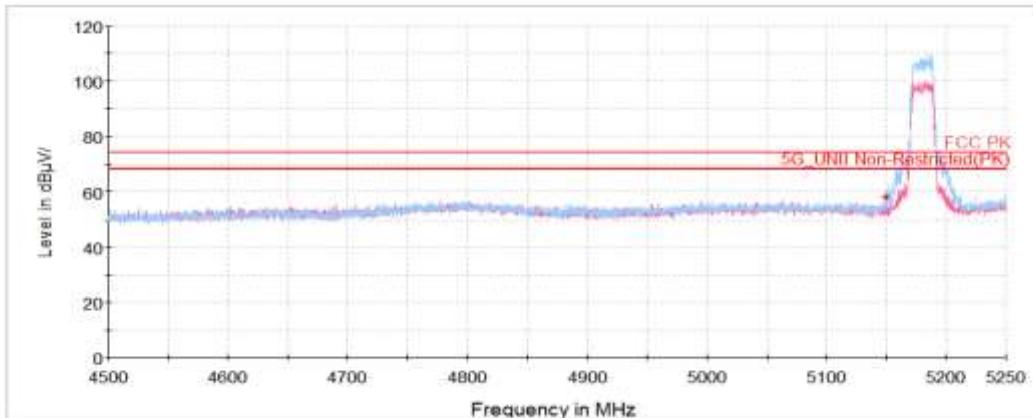
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

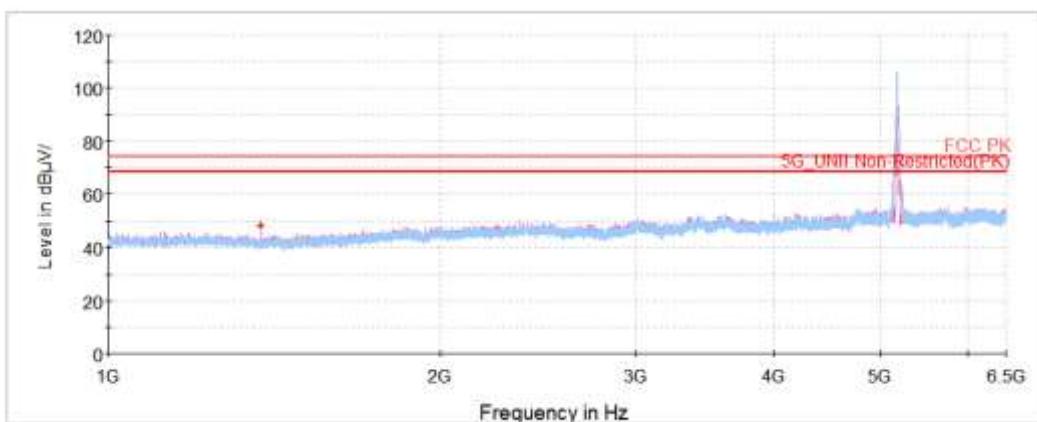
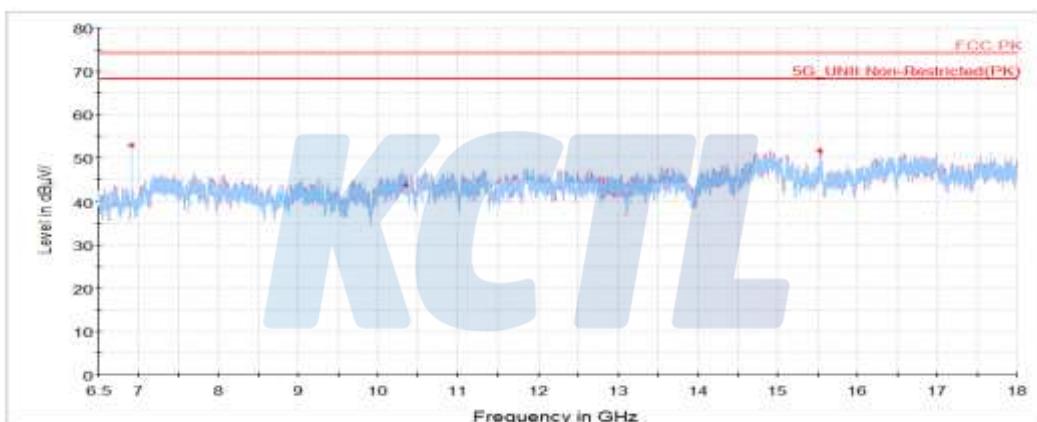
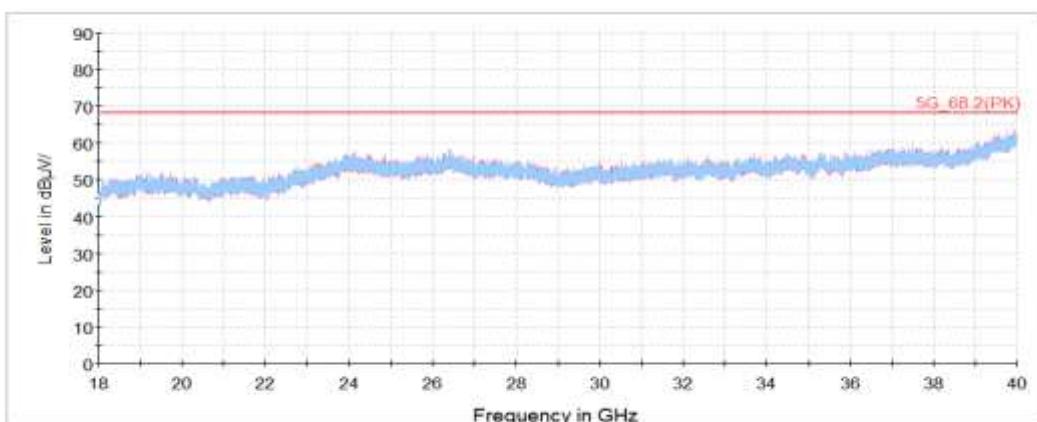
**802.11n HT20 UNII 1 ANT 1****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 149.34 <sup>1)</sup>	H	50.84	34.24	-27.11	-	57.97	74.00	16.03
6 906.45	H	70.41	35.40	-52.89	-	52.92	68.20	15.28
10 360.77	V	56.74	37.26	-50.28	-	43.72	68.20	24.48
15 542.06 <sup>1)</sup>	H	60.18	40.01	-48.57	-	51.62	74.00	22.38
<b>Average Data</b>								
5 149.34 <sup>1)</sup>	H	43.33	34.24	-27.11	0.22	50.68	54.00	3.32

**Average data (5 149.34 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

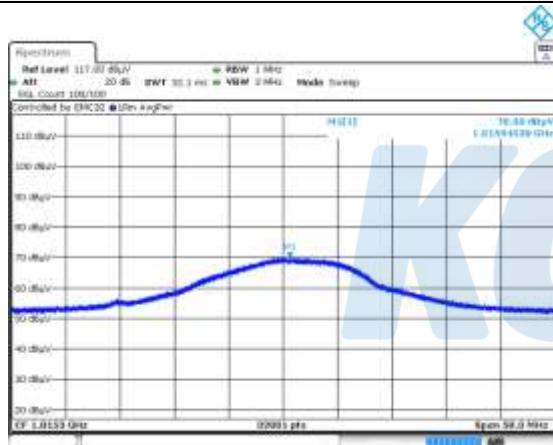
**KCTL Inc.**

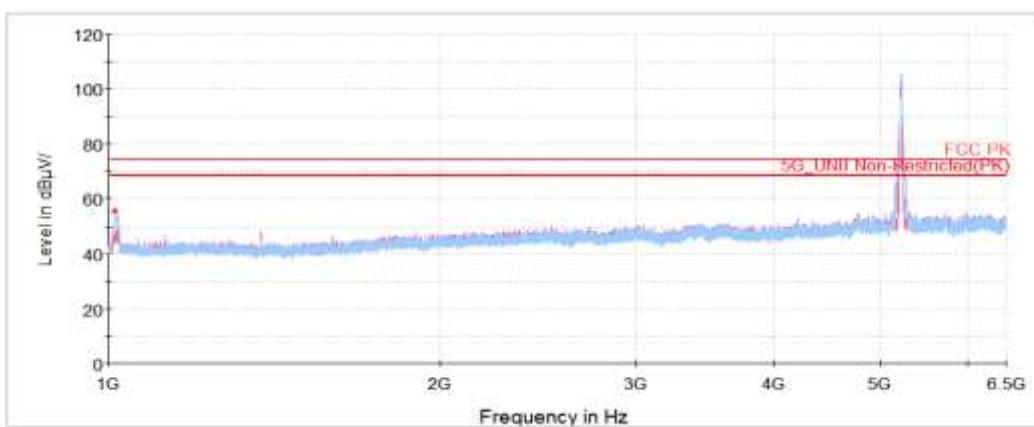
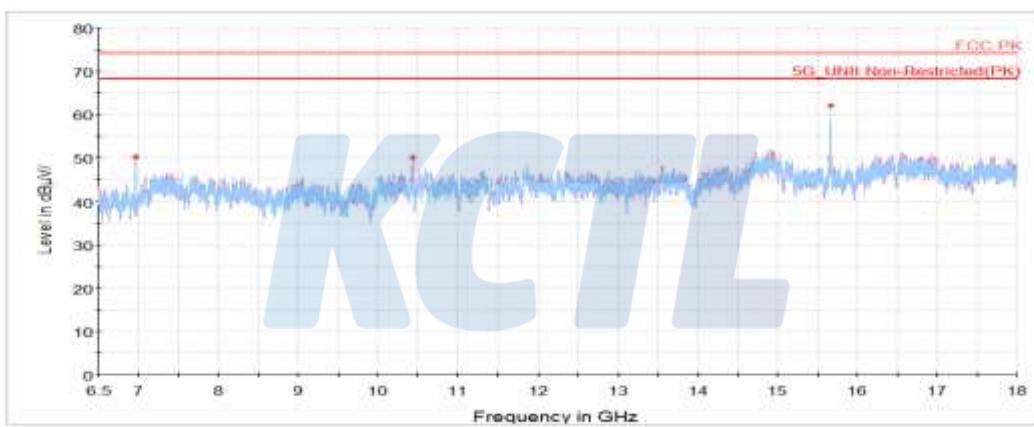
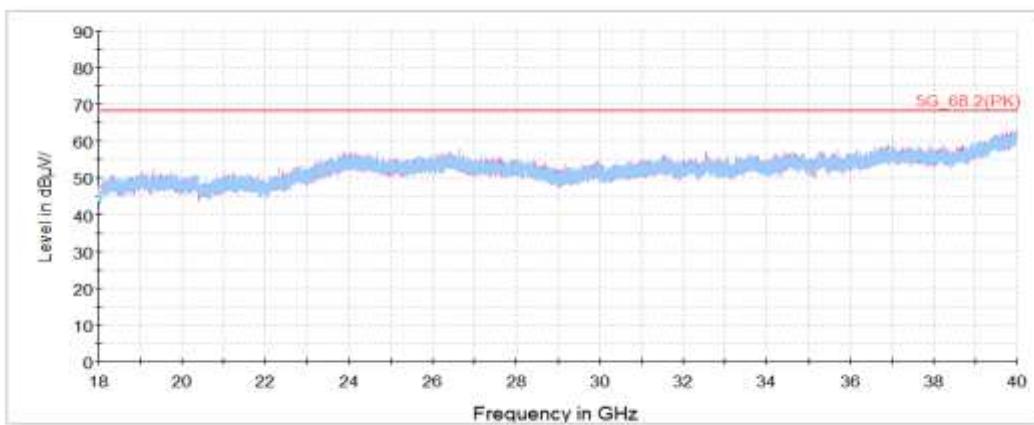
65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

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**KCTL****Middle Channel (5 220 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 015.95 <sup>1)</sup>	H	78.25	27.81	-50.59	-	55.47	74.00	18.53
6 960.00	H	67.58	35.40	-52.77	-	50.21	68.20	17.99
10 436.95	V	62.58	37.34	-49.94	-	49.98	68.20	18.22
15 661.24 <sup>1)</sup>	H	70.55	40.03	-48.63	-	61.95	74.00	12.05
<b>Average Data</b>								
1 015.95 <sup>1)</sup>	H	70.00	27.81	-50.59	0.22	47.44	54.00	6.56
15 661.24 <sup>1)</sup>	H	54.40	40.03	-48.63	0.22	46.02	54.00	7.98

**Average data (1 015.95 MHz)****Average data (15 661.24 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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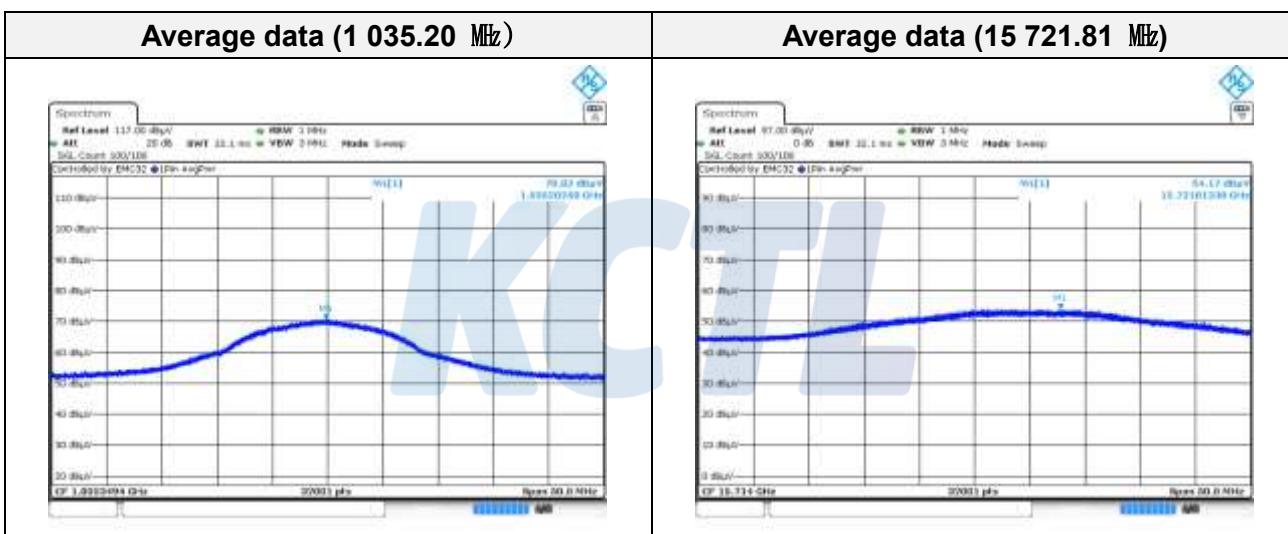
Report No.:

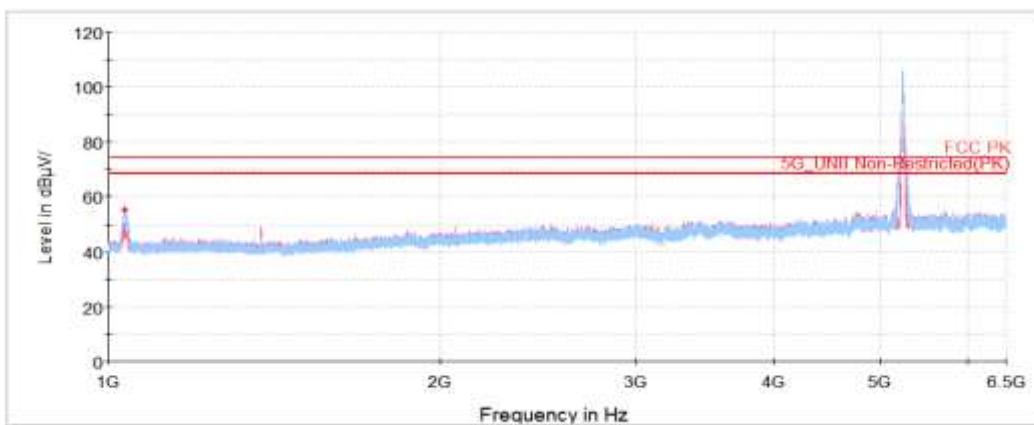
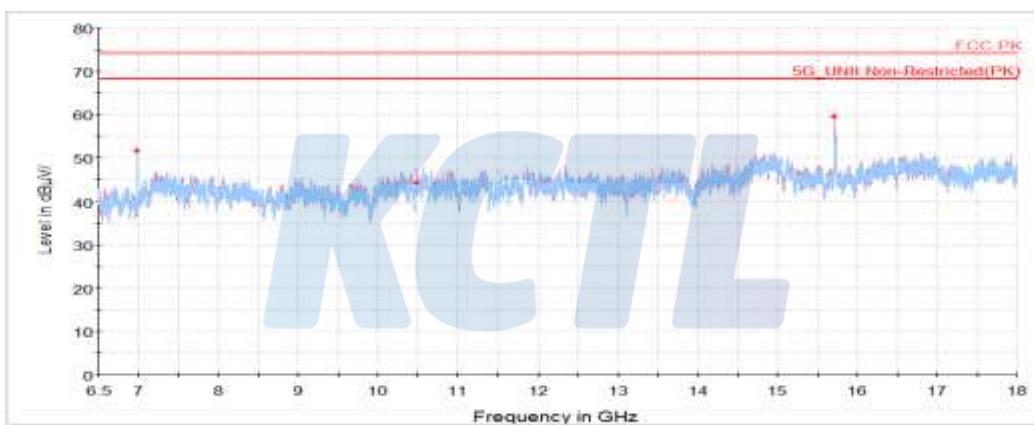
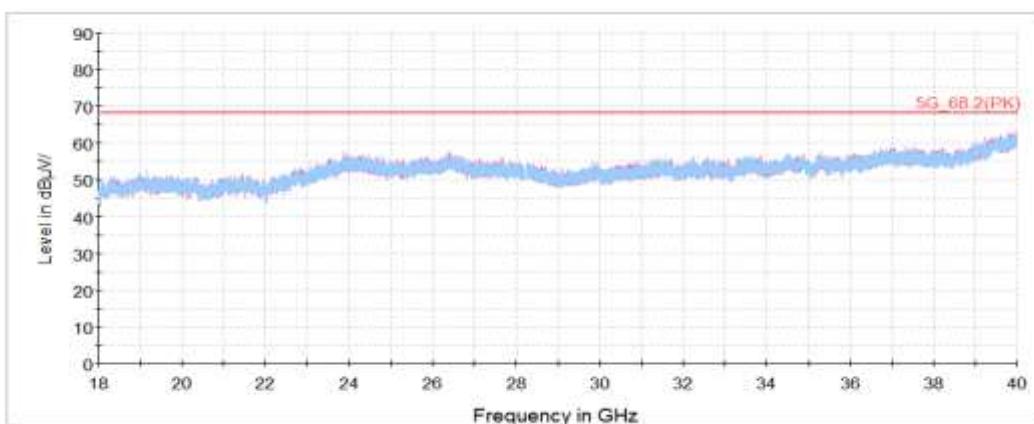
KR20-SRF0030-D

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**KCTL****Highest Channel (5 240 MHz)**

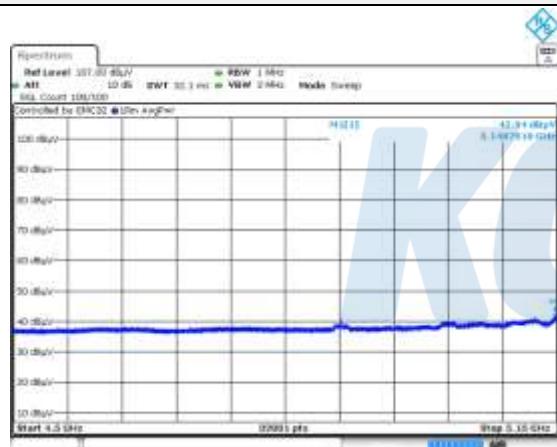
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 035.20 <sup>1)</sup>	H	77.81	27.81	-50.60	-	55.02	74.00	18.98
6 986.23	H	68.89	35.40	-52.71	-	51.58	68.20	16.62
10 481.88	H	56.66	37.38	-49.73	-	44.31	68.20	23.89
15 721.81 <sup>1)</sup>	V	68.21	40.04	-48.67	-	59.58	74.00	14.42
<b>Average Data</b>								
1 035.20 <sup>1)</sup>	H	70.82	27.81	-50.60	0.22	48.25	54.00	5.75
15 721.81 <sup>1)</sup>	H	54.17	40.04	-48.67	0.22	45.76	54.00	8.24



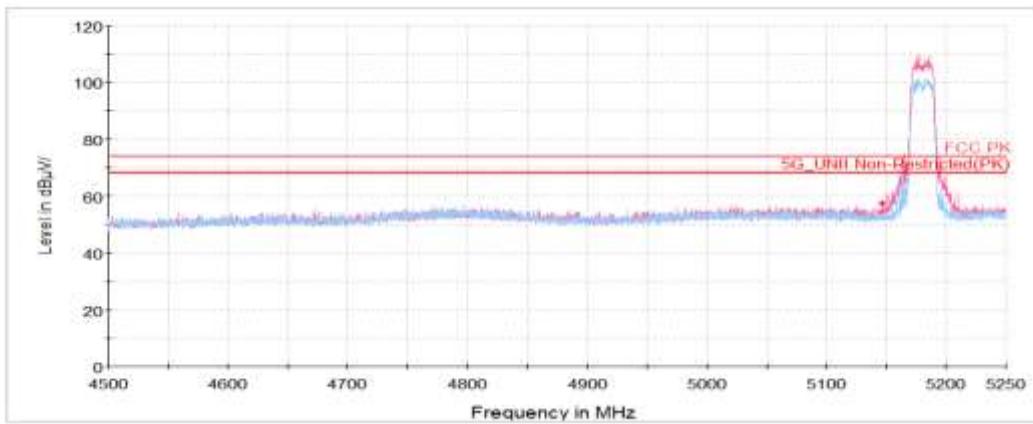
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

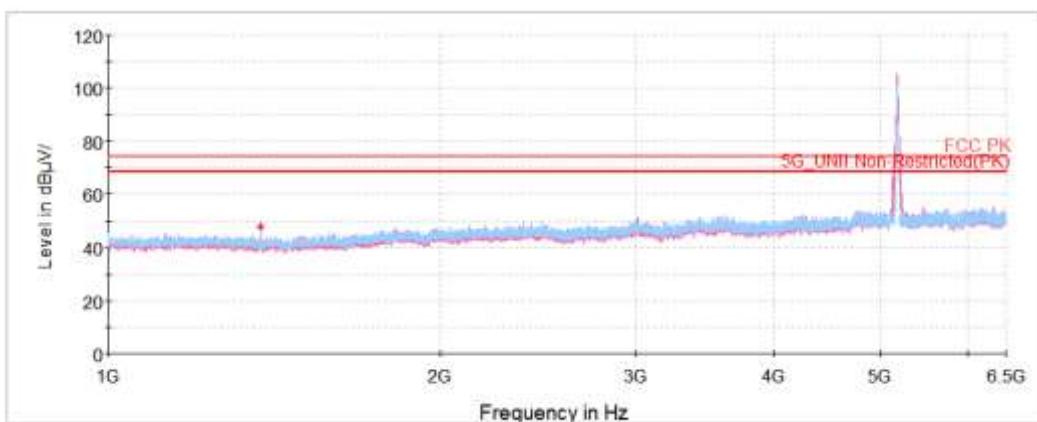
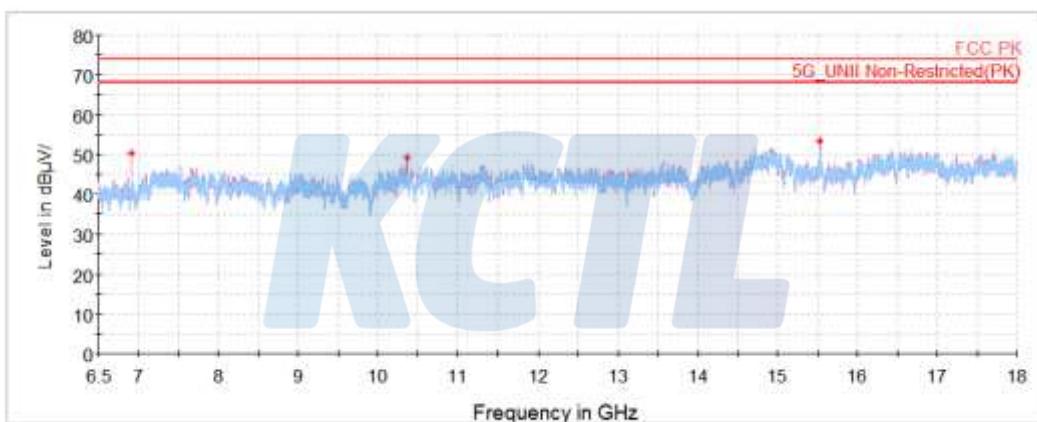
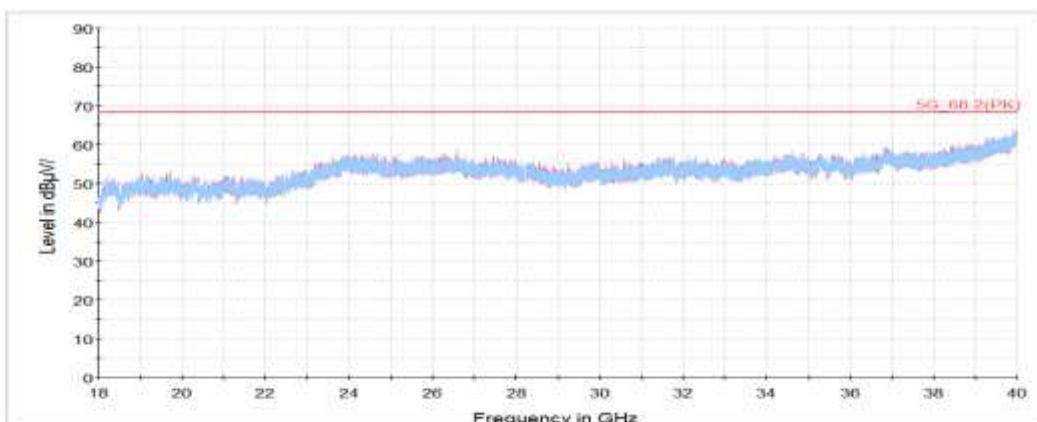
**802.11n HT20 UNII 1 ANT 2****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 148.79 <sup>1)</sup>	V	50.12	34.24	-27.11	-	57.25	74.00	16.75
6 906.45	V	67.83	35.40	-52.89	-	50.34	68.20	17.86
10 370.83	V	62.05	37.27	-50.24	-	49.08	68.20	19.12
15 544.85 <sup>1)</sup>	V	61.75	40.01	-48.57	-	53.19	74.00	20.81
<b>Average Data</b>								
5 148.79 <sup>1)</sup>	V	42.84	34.24	-27.11	0.22	50.19	54.00	3.81

**Average data (5 148.79 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

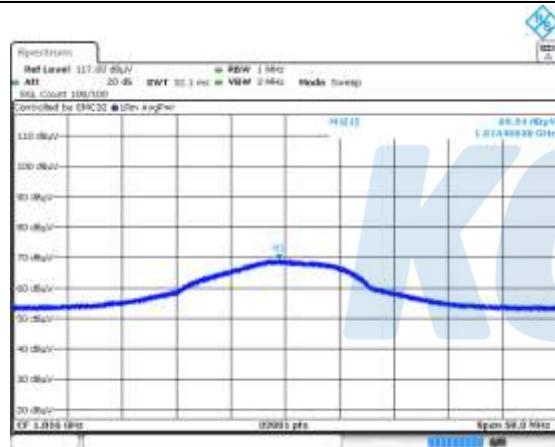
**KCTL Inc.**

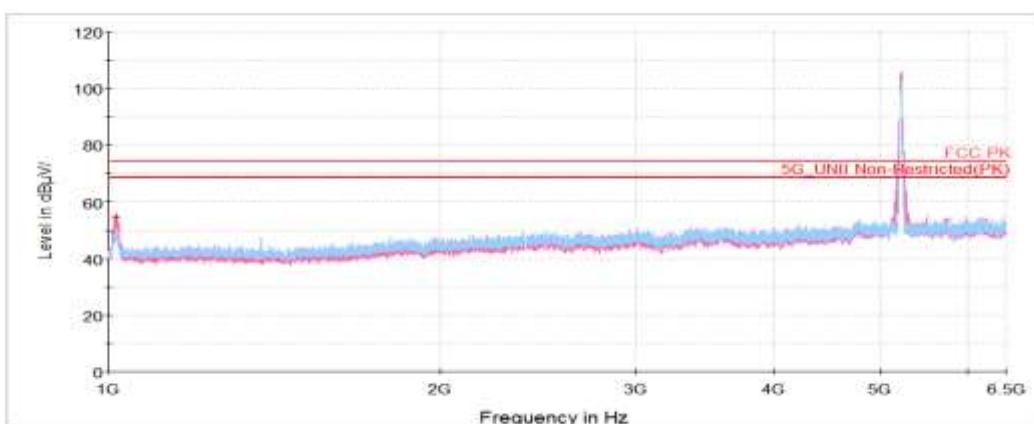
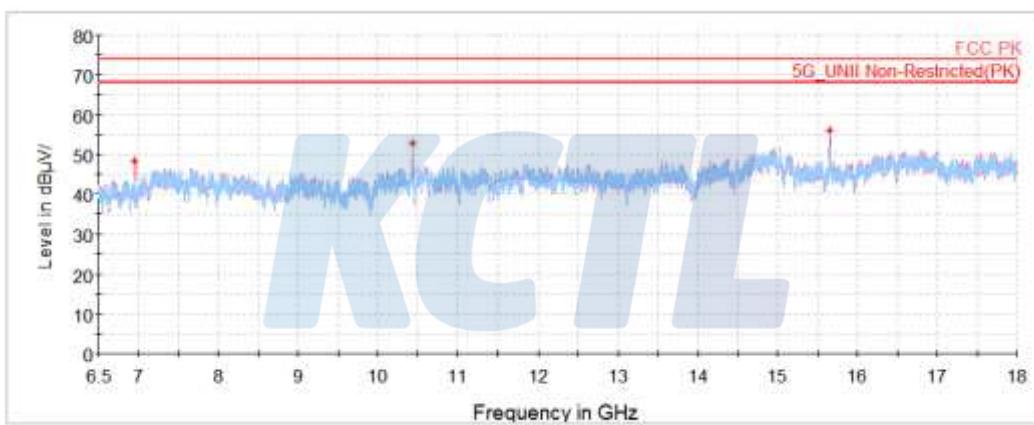
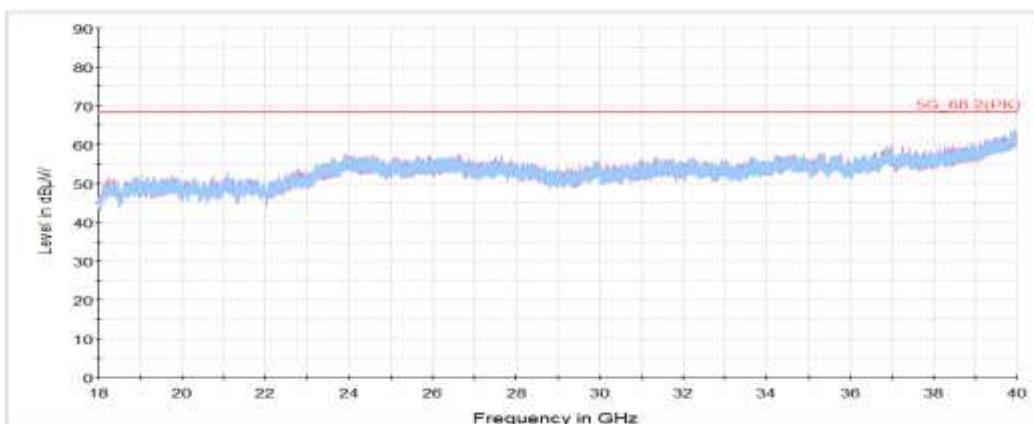
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TEL: 82-31-285-0894 FAX: 82-505-299-8311  
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**KCTL****Middle Channel (5 220 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 015.41 <sup>1)</sup>	V	77.05	27.81	-50.59	-	54.27	74.00	19.73
6 959.64	V	65.72	35.40	-52.77	-	48.35	68.20	19.85
10 434.08	V	65.29	37.33	-49.95	-	52.67	68.20	15.53
15 654.88 <sup>1)</sup>	V	64.49	40.03	-48.63	-	55.89	74.00	18.11
<b>Average Data</b>								
1 015.41 <sup>1)</sup>	V	69.54	27.81	-50.59	0.22	46.98	54.00	7.02
15 654.88 <sup>1)</sup>	V	52.64	40.03	-48.63	0.22	44.26	54.00	9.74

**Average data (1 015.41 MHz)****Average data (15 654.88 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

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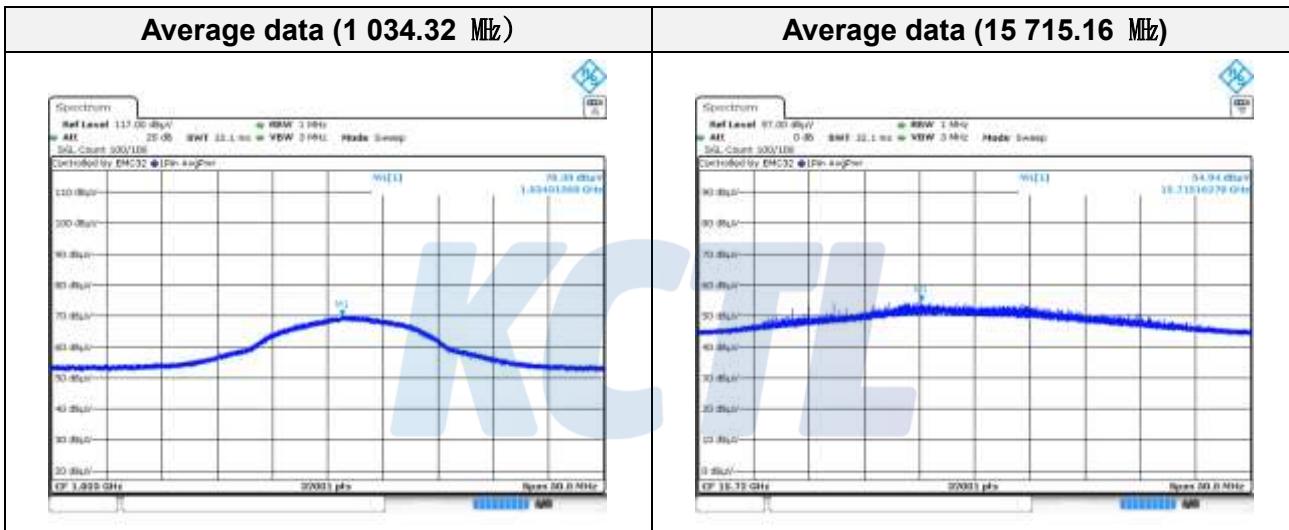
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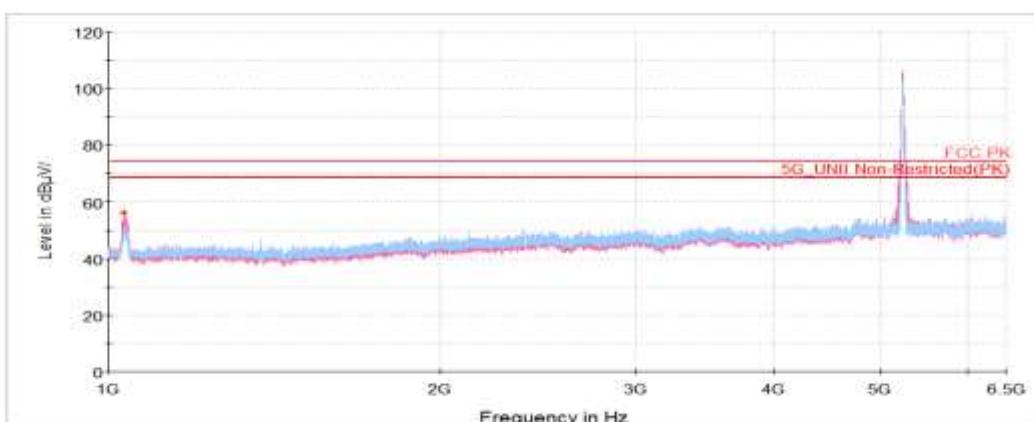
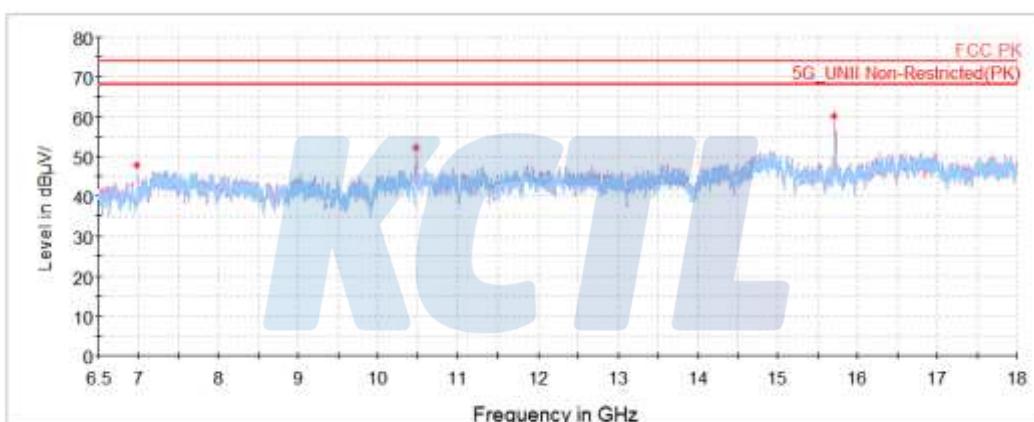
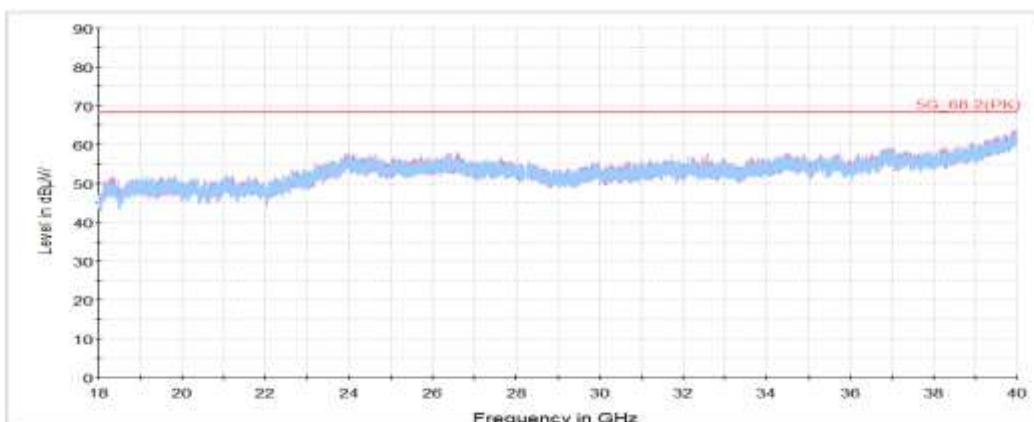
KR20-SRF0030-D

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**KCTL****Highest Channel (5 240 MHz)**

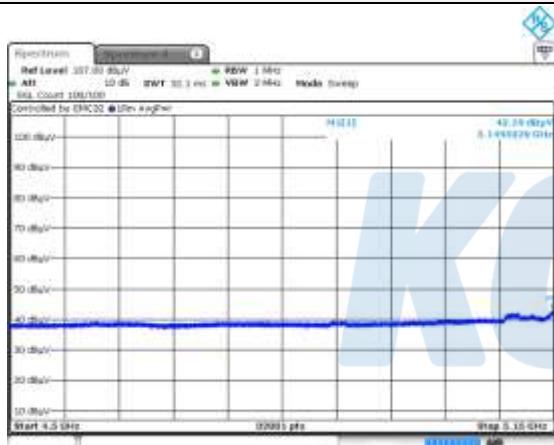
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 034.32 <sup>1)</sup>	V	78.74	27.81	-50.60	-	55.95	74.00	18.05
10 485.47	V	64.50	37.39	-49.72	-	52.17	68.20	16.03
15 715.16 <sup>1)</sup>	V	68.63	40.04	-48.66	-	60.01	74.00	13.99
<b>Average Data</b>								
1 034.32 <sup>1)</sup>	V	70.30	27.81	-50.60	0.22	47.73	54.00	6.27
15 715.16 <sup>1)</sup>	V	54.94	40.04	-48.66	0.22	46.54	54.00	7.46



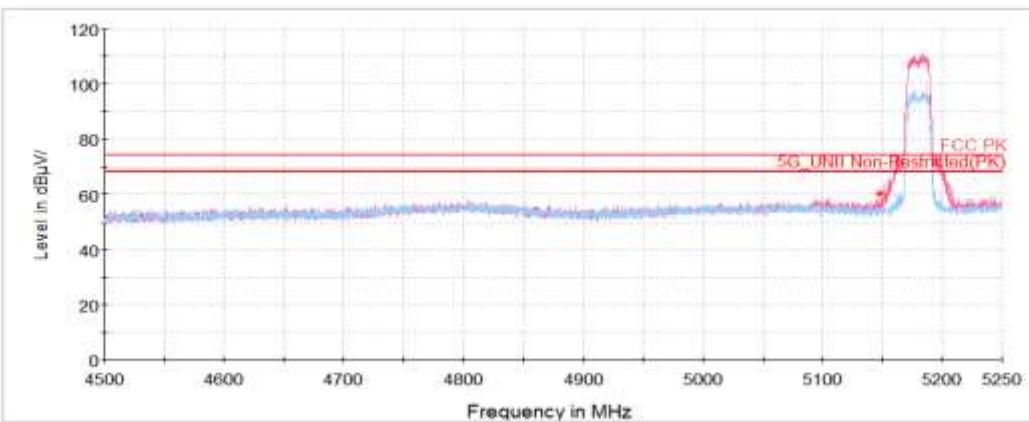
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

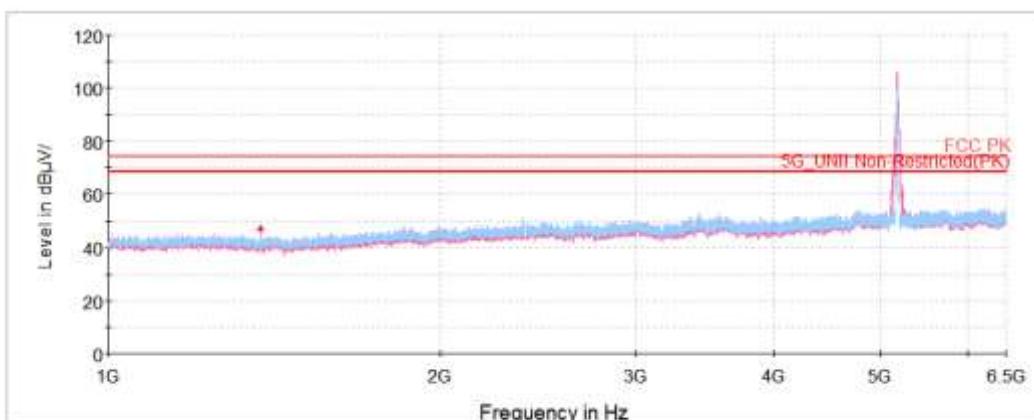
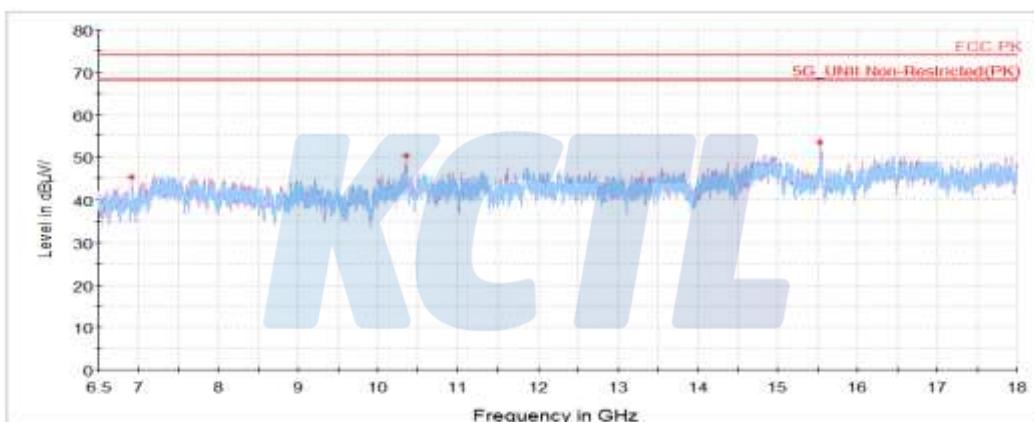
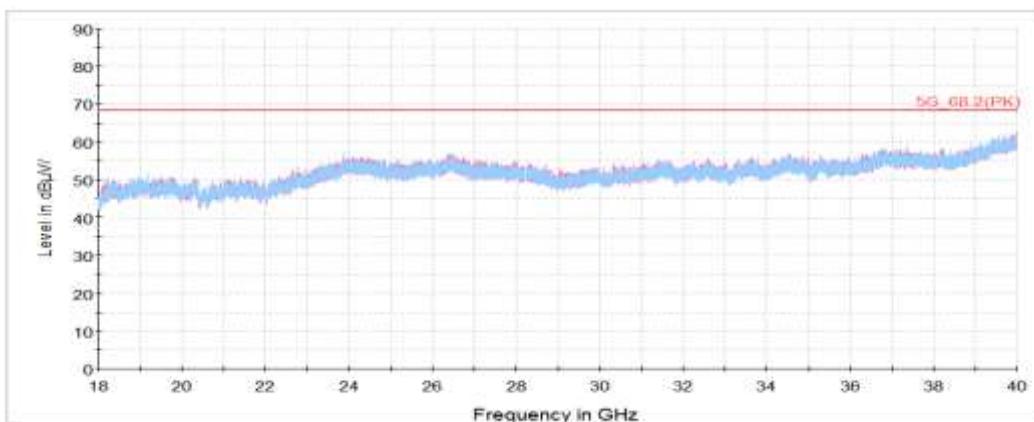
**802.11n HT20 UNII 1 ANT 3****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 149.50 <sup>1)</sup>	V	52.74	34.24	-27.12	-	59.86	74.00	14.14
10 357.89	V	63.33	37.26	-50.29	-	50.30	68.20	17.90
15 542.28 <sup>1)</sup>	V	61.97	40.01	-48.57	-	53.41	74.00	20.59
<b>Average Data</b>								
5 149.50 <sup>1)</sup>	V	43.29	34.24	-27.12	0.22	50.63	54.00	3.37

**Average data (5 149.50 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

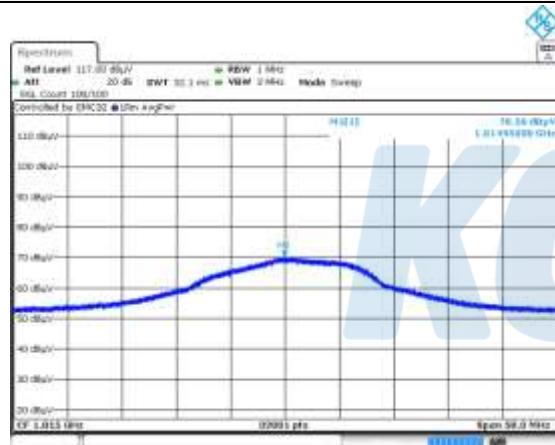
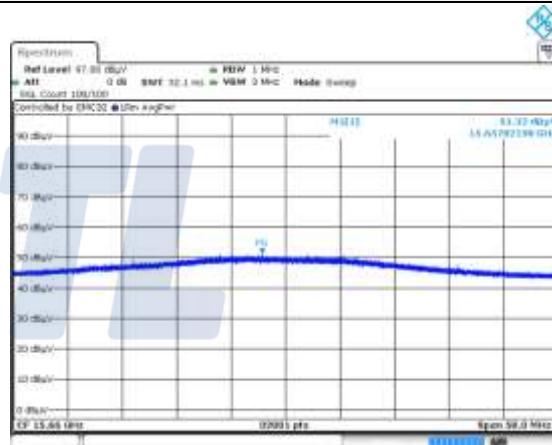
**KCTL Inc.**

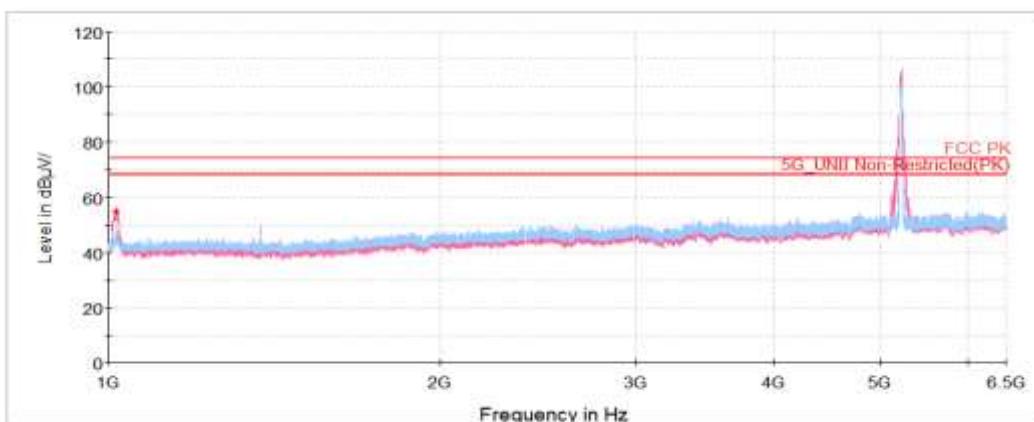
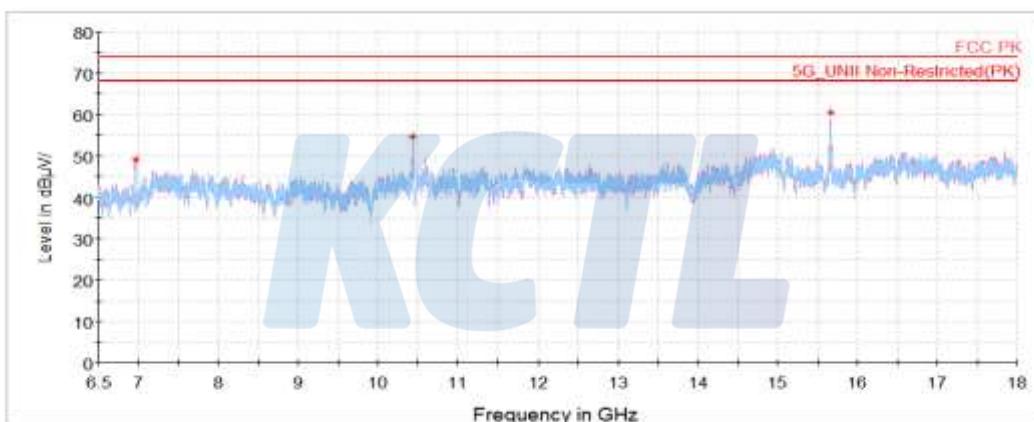
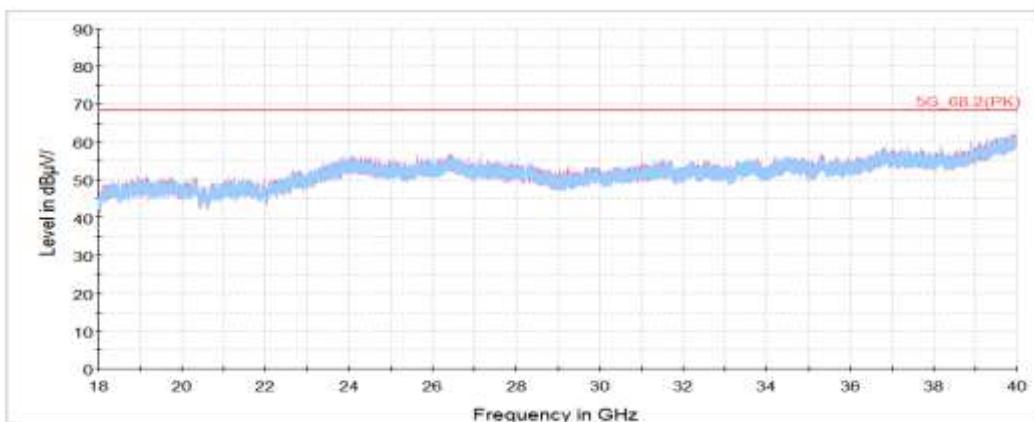
65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
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**KCTL****Middle Channel (5 220 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 014.95 <sup>1)</sup>	V	77.54	27.81	-50.59	-	54.76	74.00	19.24
6 960.00	V	66.28	35.40	-52.77	-	48.91	68.20	19.29
10 438.75	V	67.27	37.34	-49.93	-	54.68	68.20	13.52
15 657.82 <sup>1)</sup>	H	69.05	40.03	-48.63	-	60.45	74.00	13.55
<b>Average Data</b>								
1 014.95 <sup>1)</sup>	V	70.56	27.81	-50.59	0.22	48.00	54.00	6.00
15 657.82 <sup>1)</sup>	V	51.32	40.03	-48.63	0.22	42.94	54.00	11.06

**Average data (1 014.95 MHz)****Average data (15 662.48 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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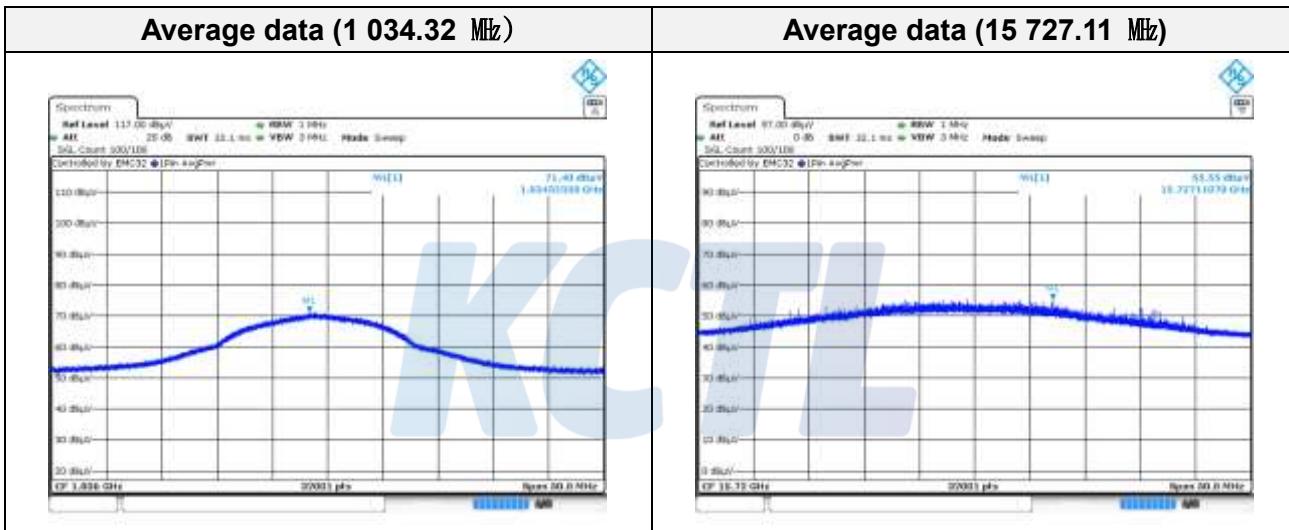
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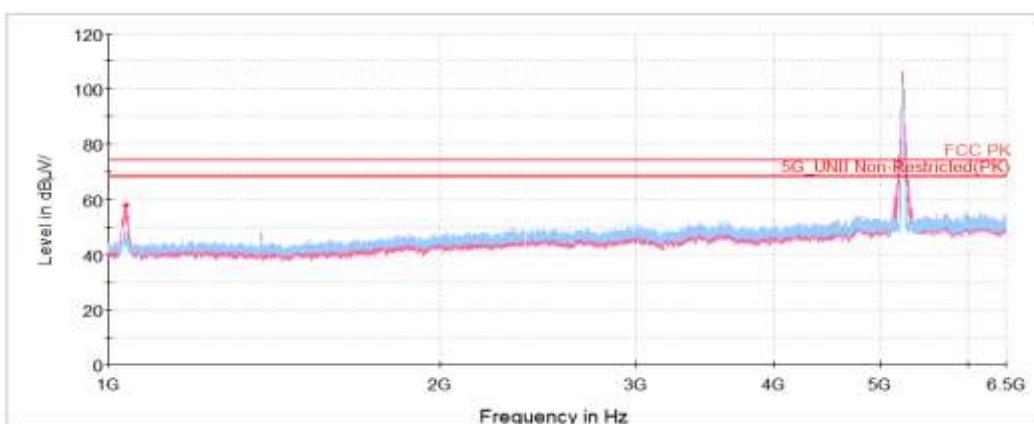
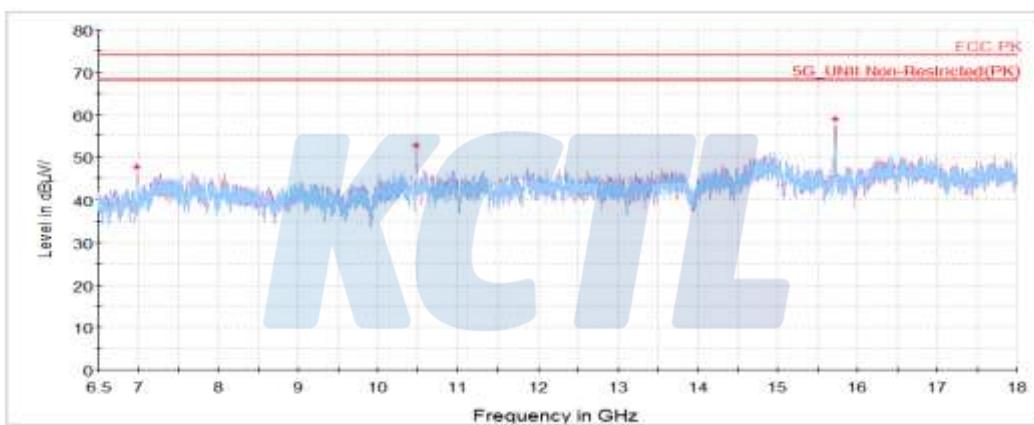
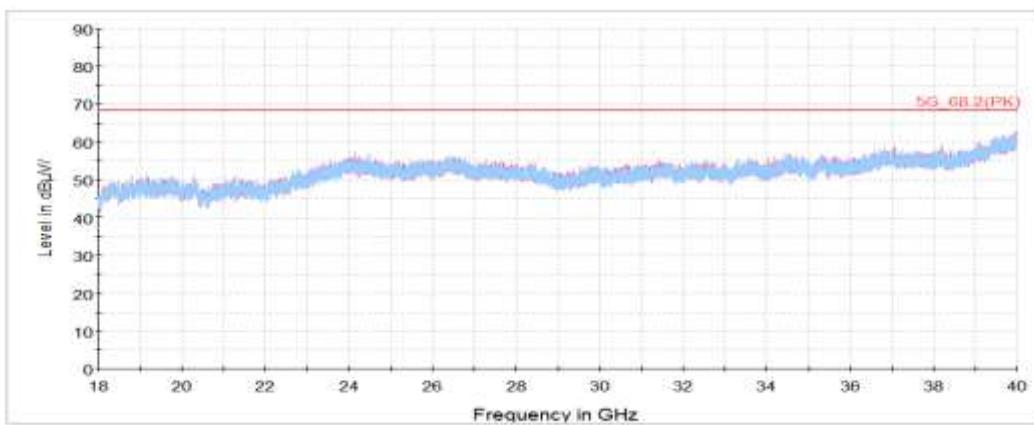
KR20-SRF0030-D

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**KCTL****Highest Channel (5 240 MHz)**

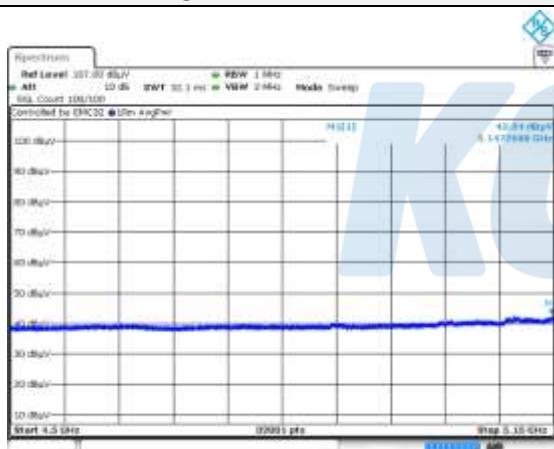
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 034.32 <sup>1)</sup>	V	80.24	27.81	-50.60	-	57.45	74.00	16.55
10 485.11	V	64.90	37.39	-49.72	-	52.57	68.20	15.63
15 727.11 <sup>1)</sup>	H	67.56	40.05	-48.67	-	58.94	74.00	15.06
<b>Average Data</b>								
1 034.32 <sup>1)</sup>	V	71.40	27.81	-50.60	0.22	48.83	54.00	5.17
15 727.11 <sup>1)</sup>	V	55.55	40.05	-48.67	0.22	47.15	54.00	6.85



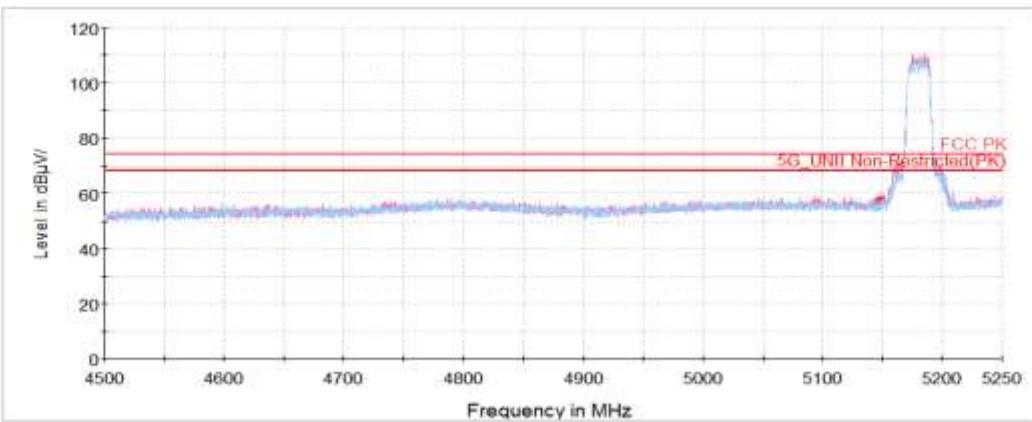
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

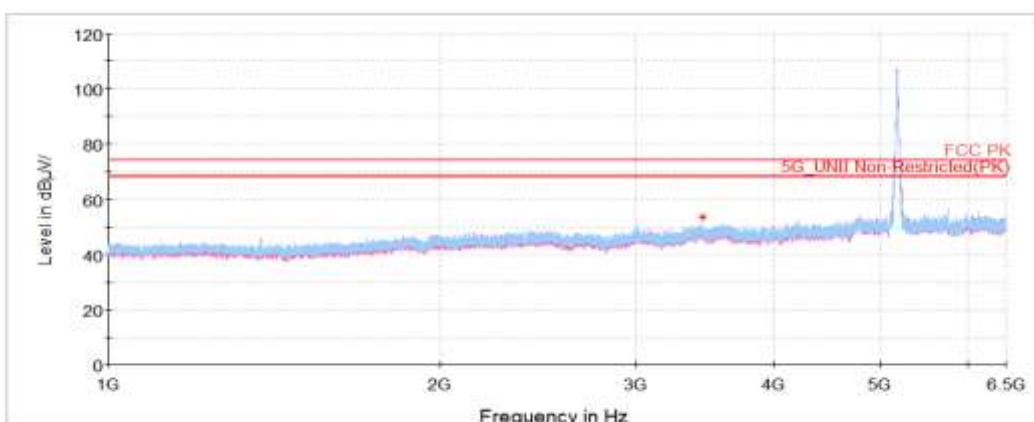
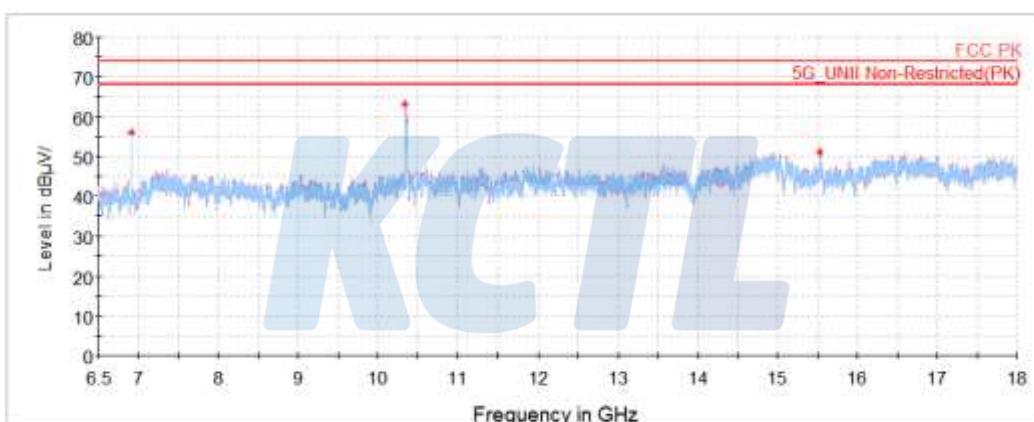
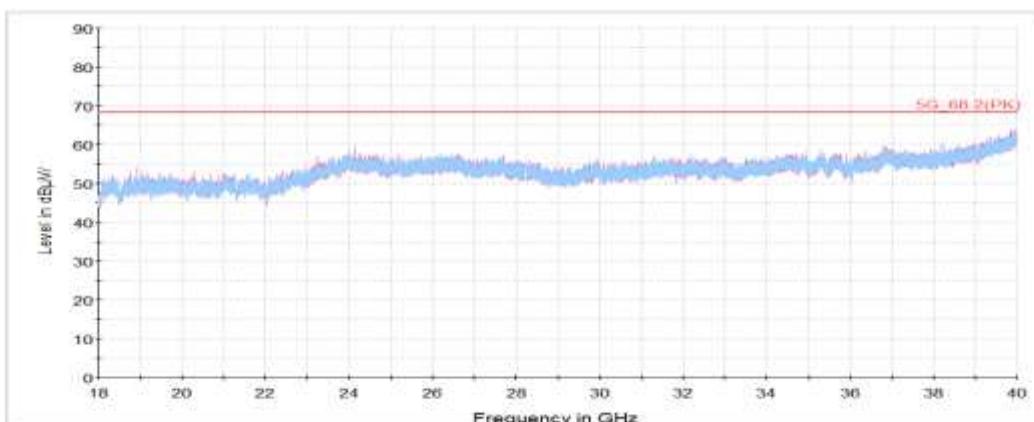
**802.11n HT20 UNII 1 4TX MIMO****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 453.00	H	67.20	32.59	-46.39	-	53.40	68.20	14.80
5 147.27 <sup>1)</sup>	V	50.86	34.24	-27.1	-	58.00	74.00	16.00
6 906.45	H	73.40	35.40	-52.89	-	55.91	68.20	12.29
10 348.55	H	76.13	37.25	-50.34	-	63.04	68.20	5.16
15 523.55 <sup>1)</sup>	V	59.50	40.00	-48.56	-	50.94	74.00	23.06
<b>Average Data</b>								
5 147.27 <sup>1)</sup>	V	43.04	34.24	-27.1	0.22	50.40	54.00	3.60

**Average data (5 147.27 MHz)**

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**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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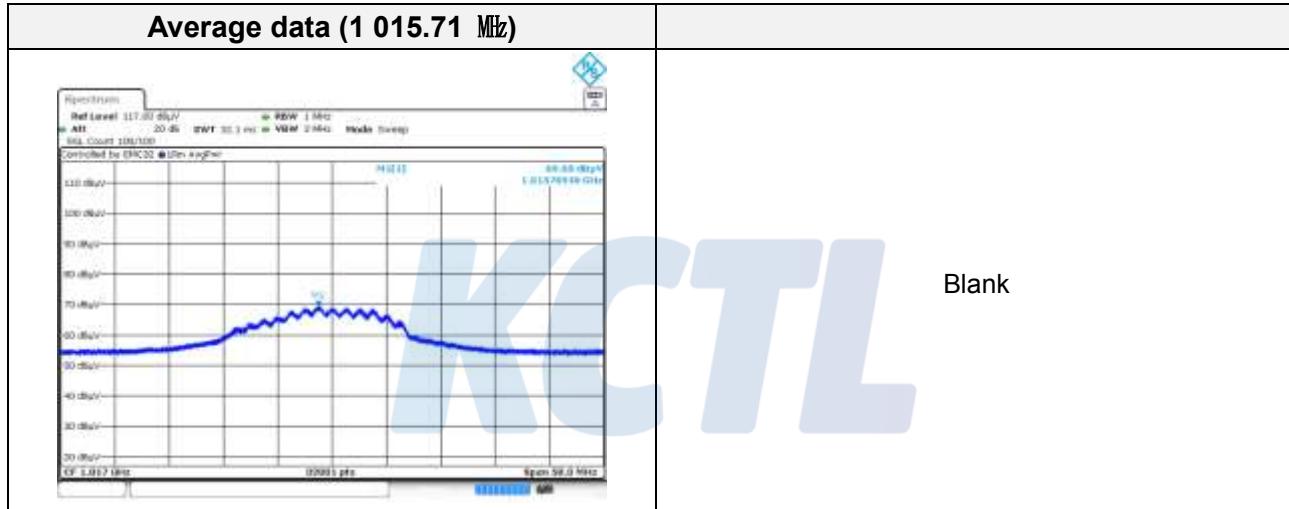
Report No.:

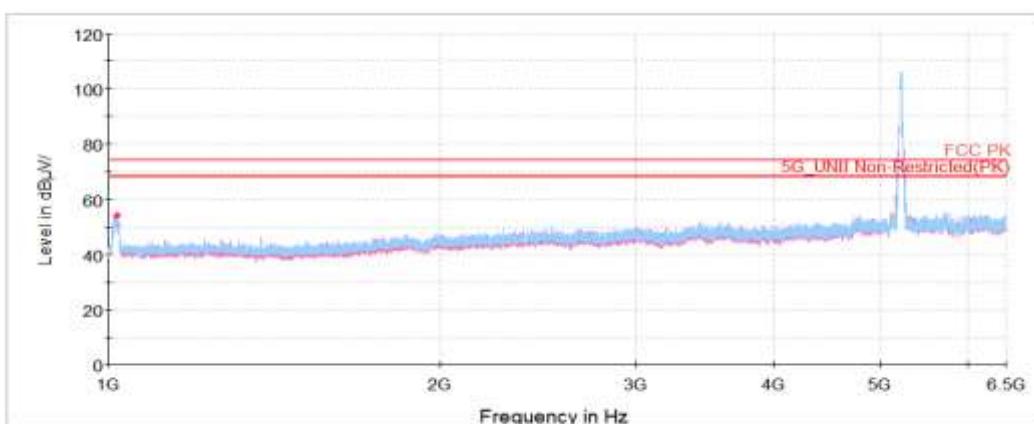
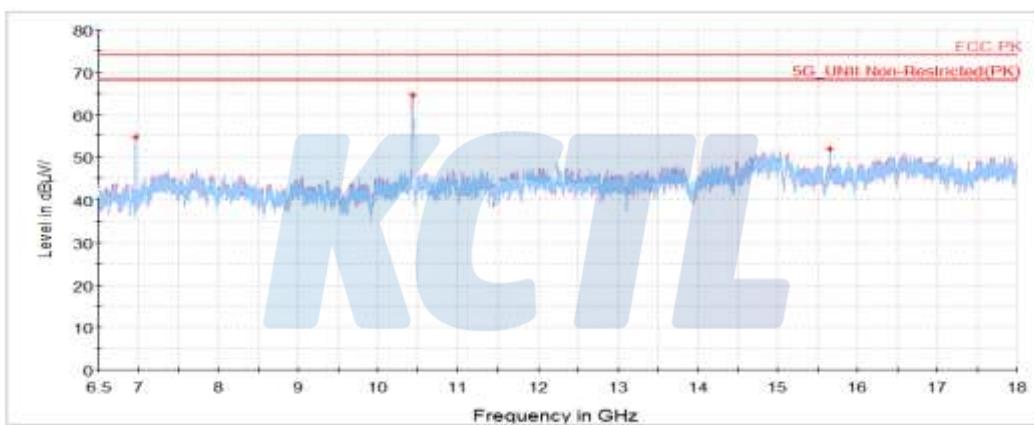
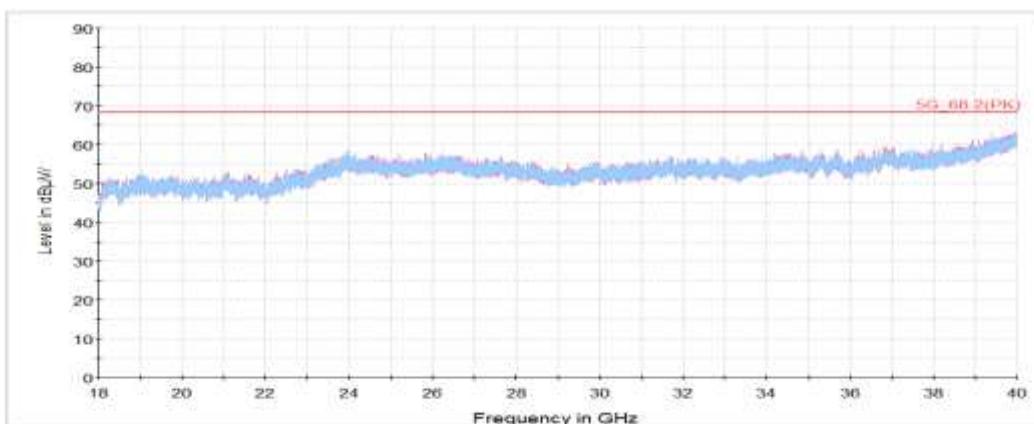
KR20-SRF0030-D

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**KCTL****Middle Channel (5 220 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 015.71 <sup>1)</sup>	V	76.82	27.81	-50.59	-	54.04	74.00	19.96
6 960.00	H	72.14	35.40	-52.77	-	54.77	68.20	13.43
10 442.34	V	77.18	37.34	-49.91	-	64.61	68.20	3.59
15 662.19 <sup>1)</sup>	H	60.44	40.03	-48.63	-	51.84	74.00	22.16
<b>Average Data</b>								
1 015.71 <sup>1)</sup>	V	69.60	27.81	-50.59	0.22	47.04	54.00	6.96

**Average data (1 015.71 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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**Highest Channel (5 240 MHz)**

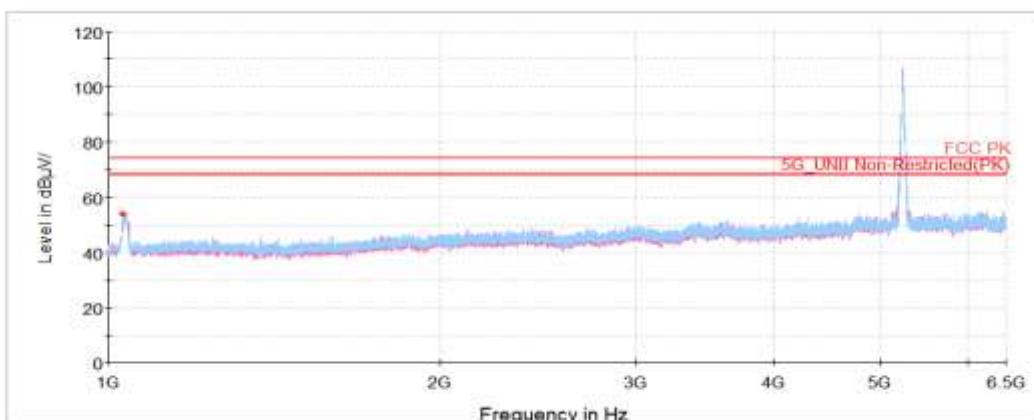
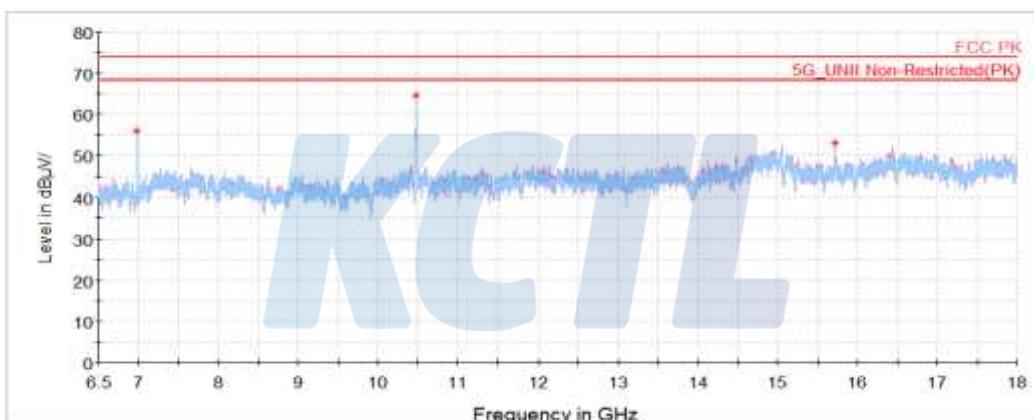
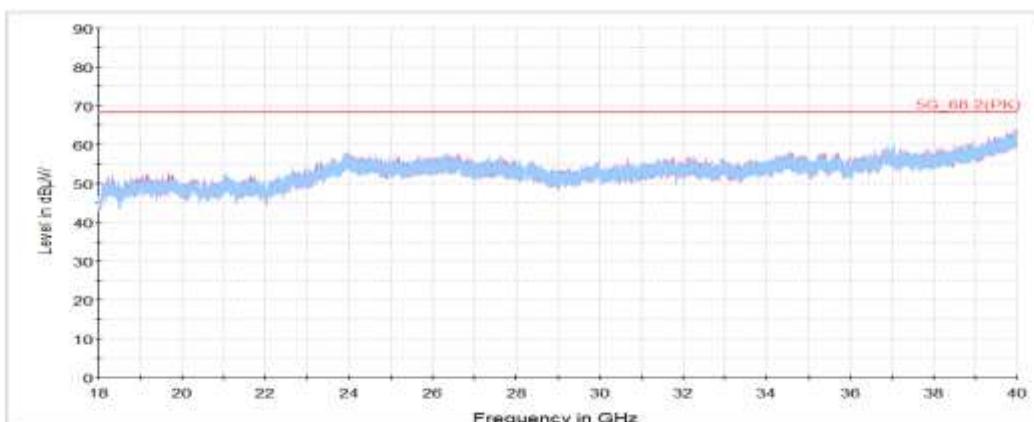
Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor	Amp. + Cable	DCCF	Result (dB(µV/m))	Limit (dB(µV/m))	Margin
<b>Peak data</b>								
6 986.59	H	73.31	35.40	-52.71	-	56.00	68.20	12.20
10 480.80	V	76.84	37.38	-49.74	-	64.48	68.20	3.72
15 723.37 <sup>1)</sup>	V	61.74	40.04	-48.67	-	53.11	74.00	20.89
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



**KCTL Inc.**

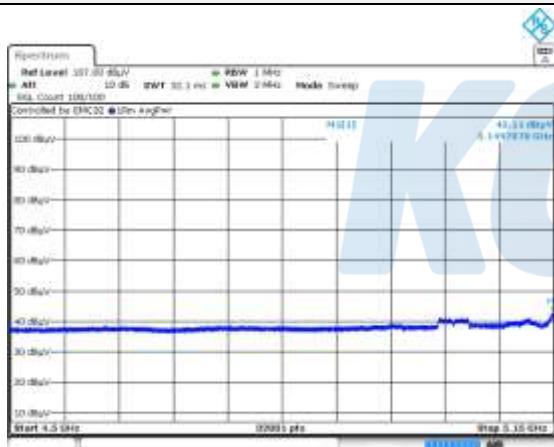
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Suwon-si, Gyeonggi-do, 16677, Korea  
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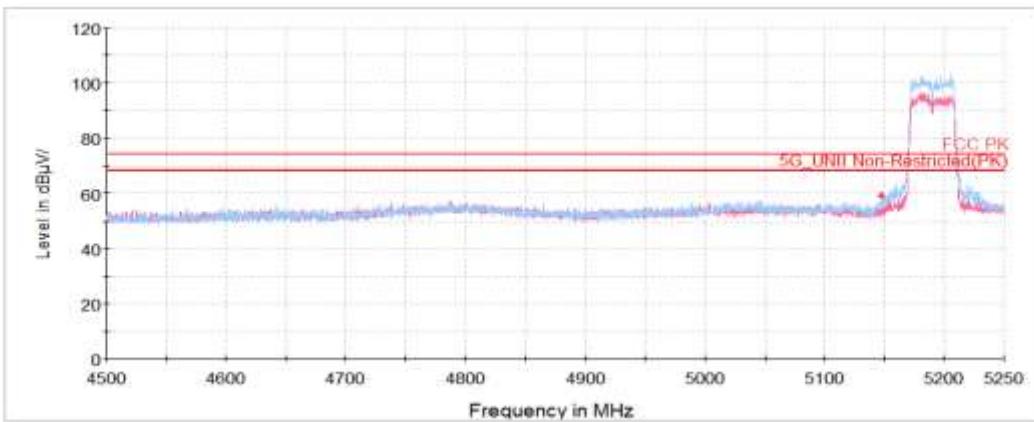
**KCTL****Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

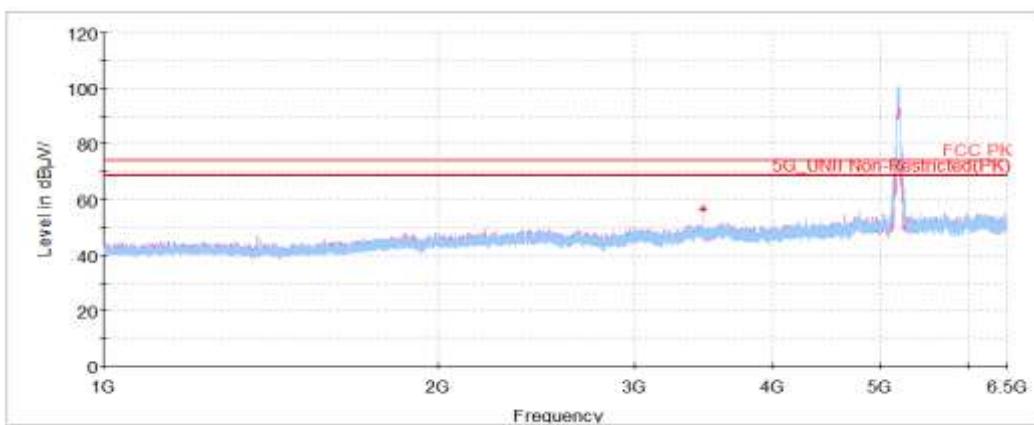
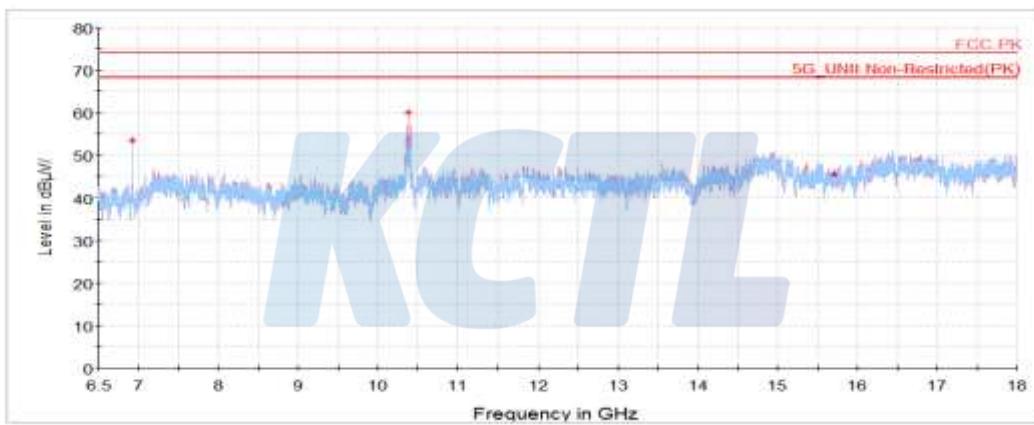
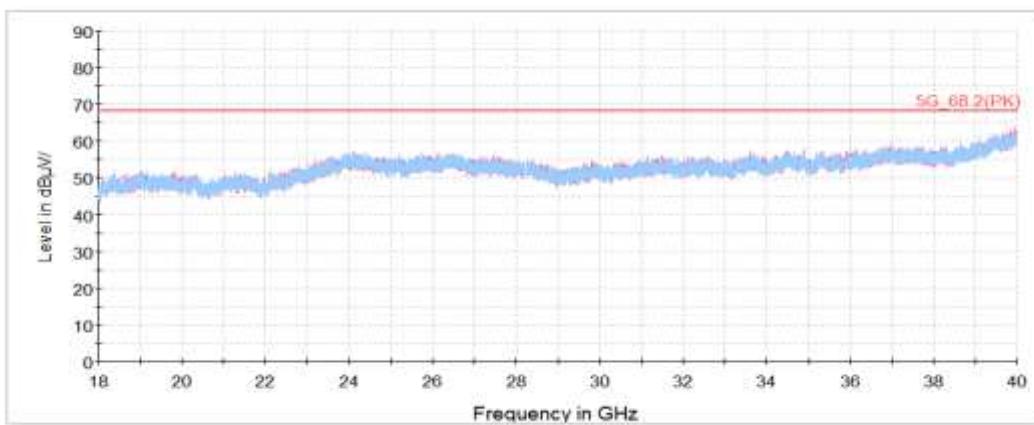
**802.11n HT40 UNII 1 ANT 0****Lowest Channel (5 190 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 460.05	H	70.36	32.59	-46.53	-	56.42	68.20	11.78
5 149.79 <sup>1)</sup>	H	51.73	34.24	-27.12	-	58.85	74.00	15.15
6 919.75	H	70.79	35.40	-52.86	-	53.33	68.20	14.87
10 378.02	H	72.97	37.28	-50.20	-	60.05	68.20	8.15
15 703.95 <sup>1)</sup>	V	53.98	40.04	-48.66	-	45.36	74.00	28.64
<b>Average Data</b>								
5 149.79 <sup>1)</sup>	H	43.11	34.24	-27.12	0.44	50.67	54.00	3.33

**Average data (5 149.79 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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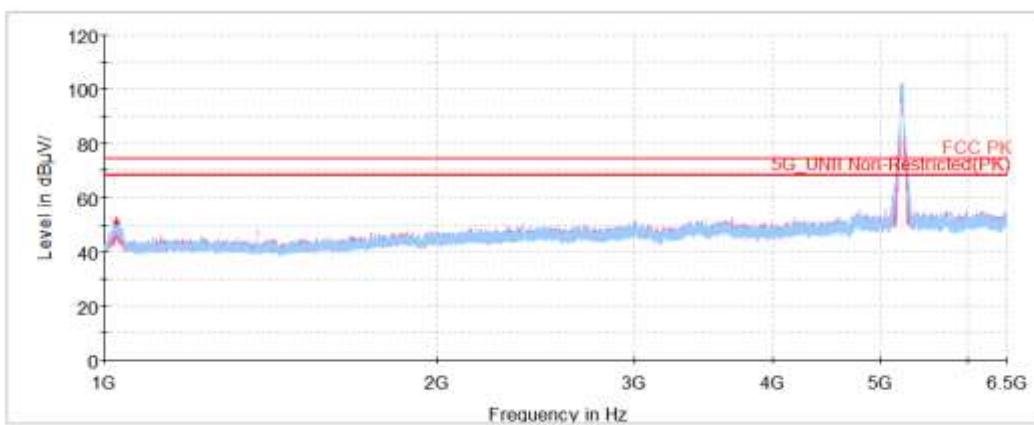
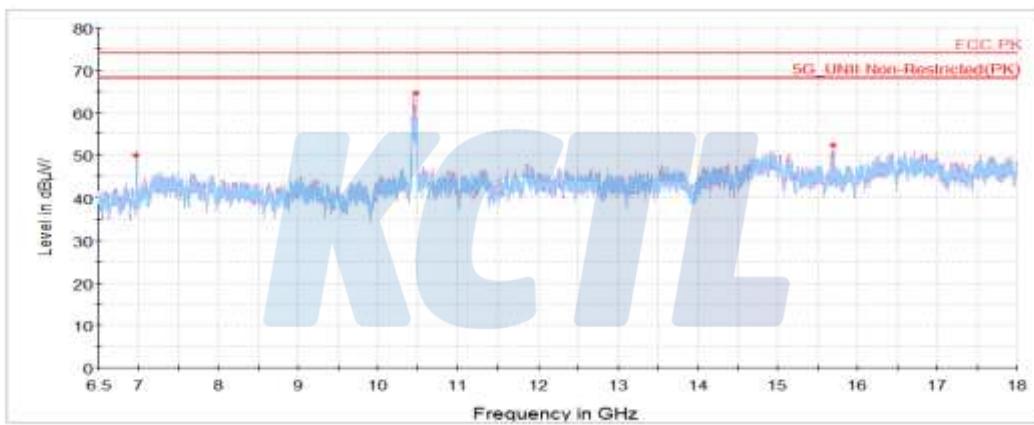
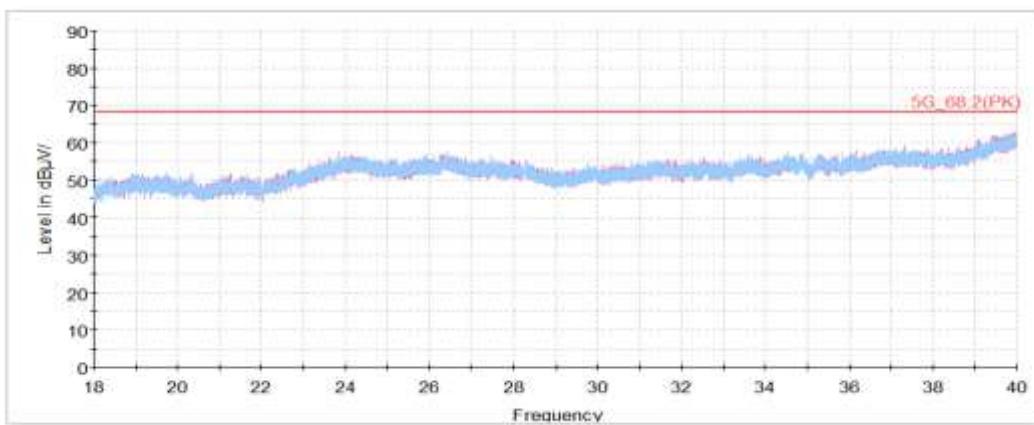
KR20-SRF0030-D

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**Highest Channel (5 230 MHz)**

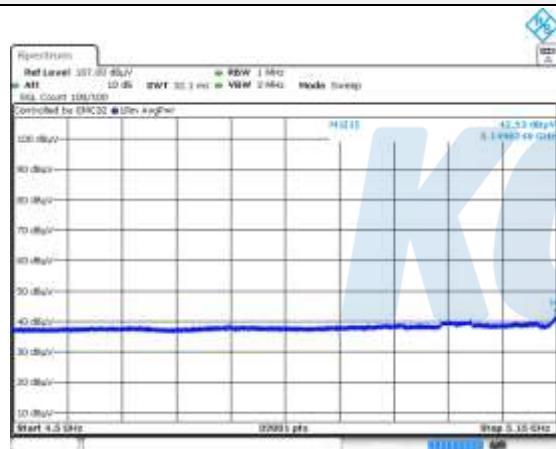
Frequency (MHz)	Pol. (V/H)	Reading (dB(µV))	Antenna Factor	Amp. + Cable	DCCF	Result (dB(µV/m))	Limit (dB(µV/m))	Margin
<b>Peak data</b>								
6 973.30	V	67.28	35.40	-52.74	-	49.94	68.20	18.26
1 0475.41	V	76.92	37.38	-49.76	-	64.54	68.20	3.66
15 692.55 <sup>1)</sup>	H	60.93	40.04	-48.65	-	52.32	74.00	21.68
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



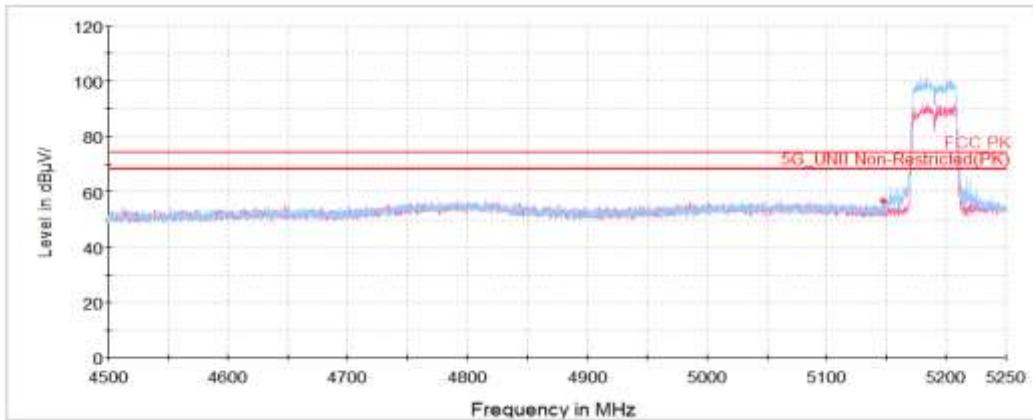
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

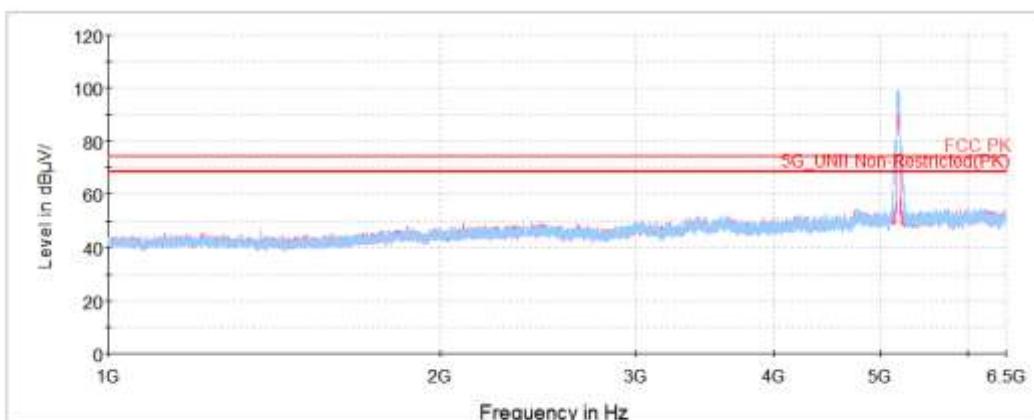
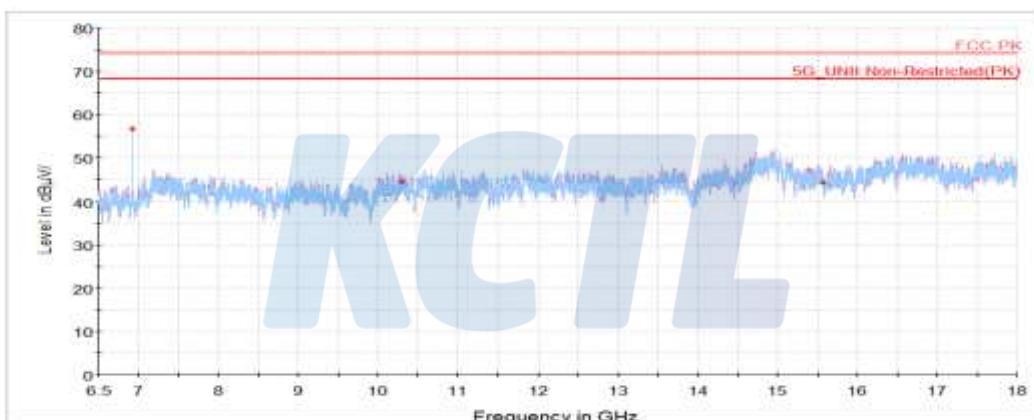
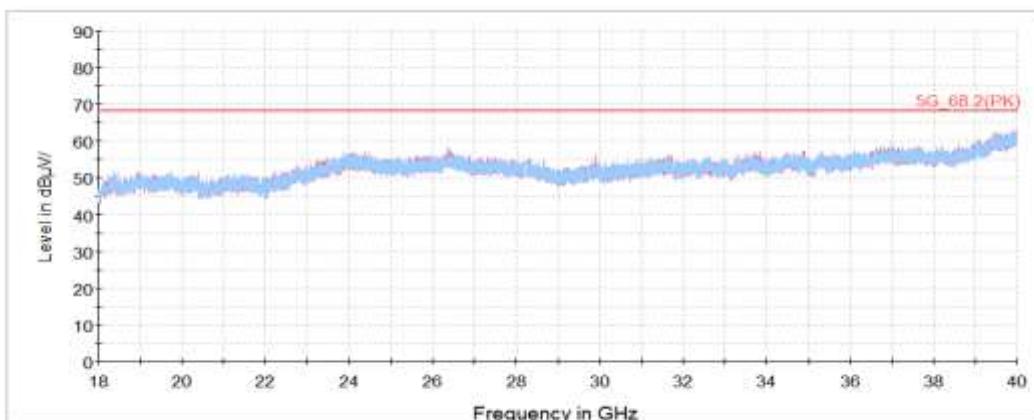
**802.11n HT40 UNII 1 ANT 1****Lowest Channel (5 190 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 149.62 <sup>1)</sup>	H	49.26	34.24	-27.12	-	56.38	74.00	17.62
6 919.75	H	74.01	35.40	-52.86	-	56.55	68.20	11.65
10 299.67	H	57.80	37.20	-50.56	-	44.44	68.20	23.76
15 569.91 <sup>1)</sup>	H	52.85	40.01	-48.58	-	44.28	74.00	29.72
<b>Average Data</b>								
5 149.62 <sup>1)</sup>	H	42.53	34.24	-27.12	0.44	50.09	54.00	3.91

**Average data (5 149.62 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

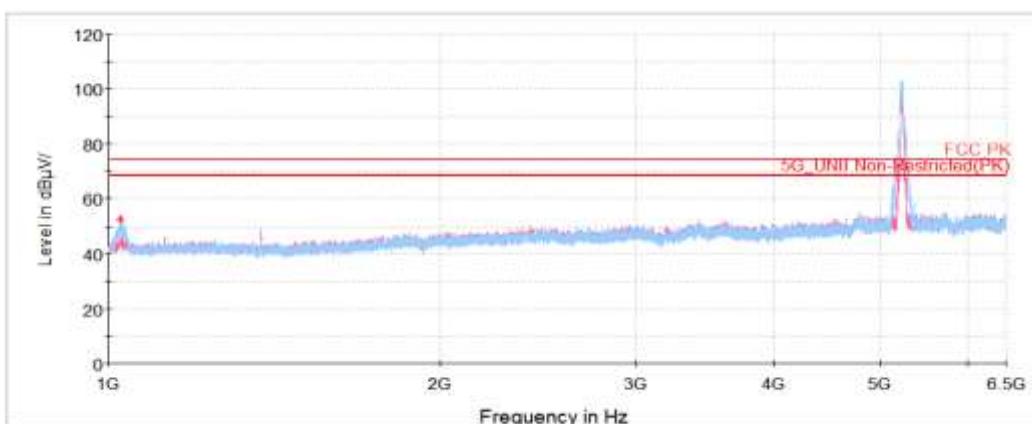
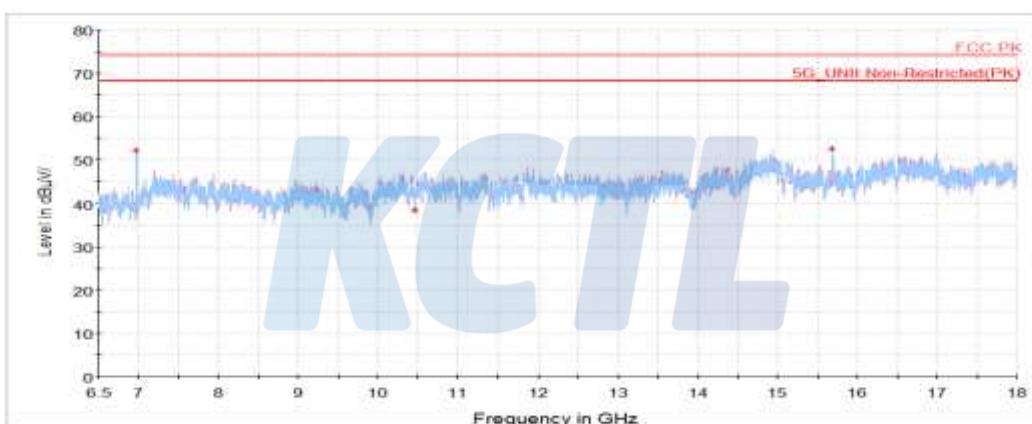
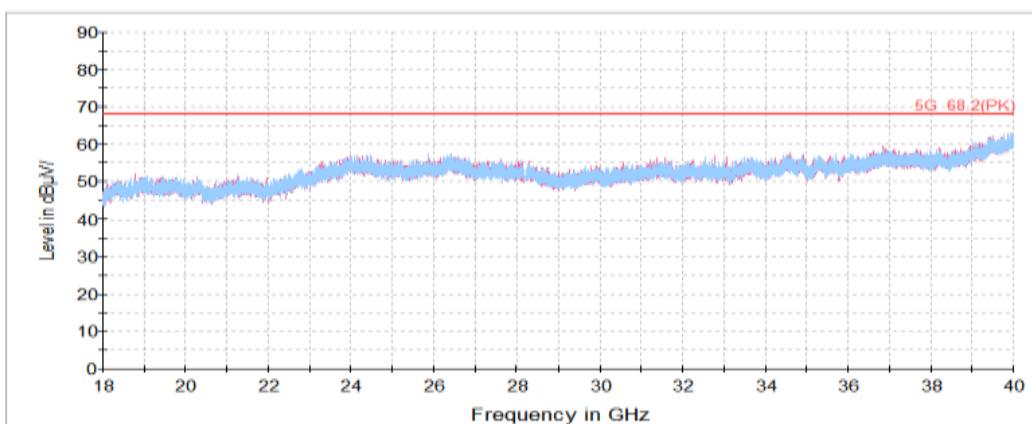
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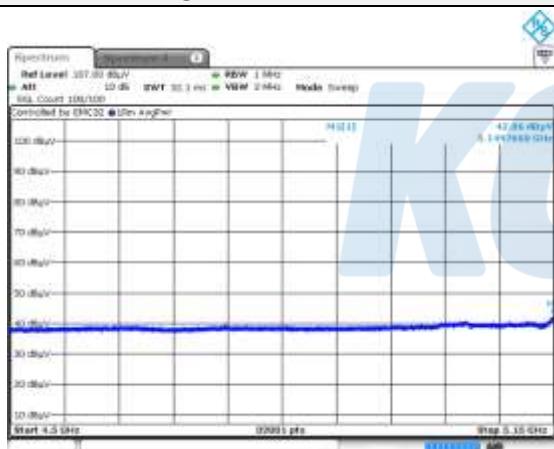
**Highest Channel (5 230 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
10 460.67	H	50.81	37.36	-49.83	-	38.34	74.00	35.66
15 703.39 <sup>1)</sup>	H	61.16	40.04	-48.66	-	52.54	74.00	21.46
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								

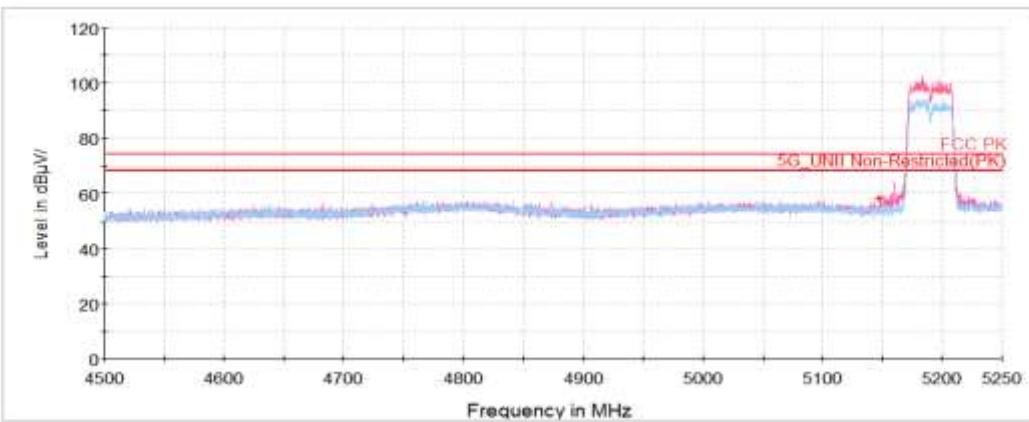
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

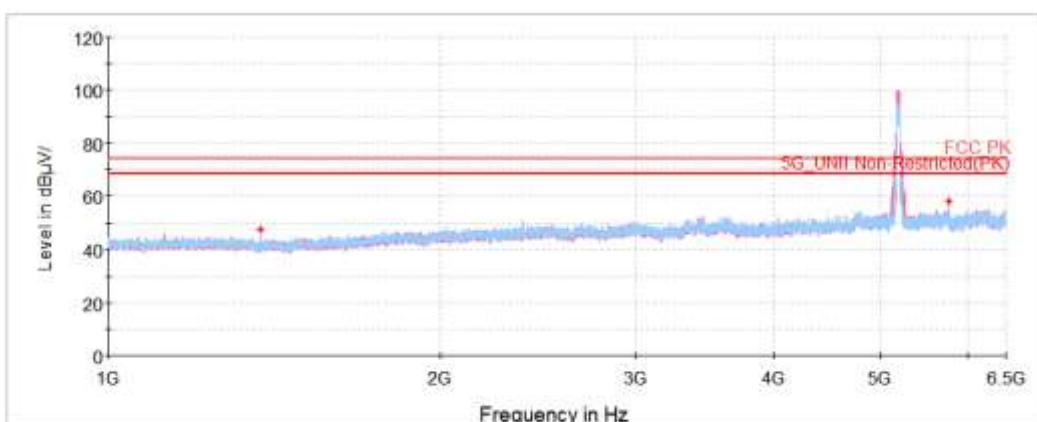
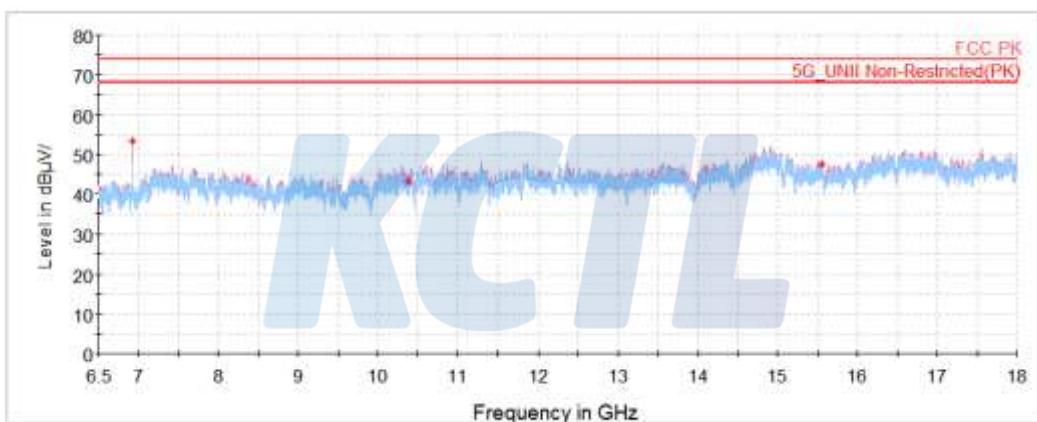
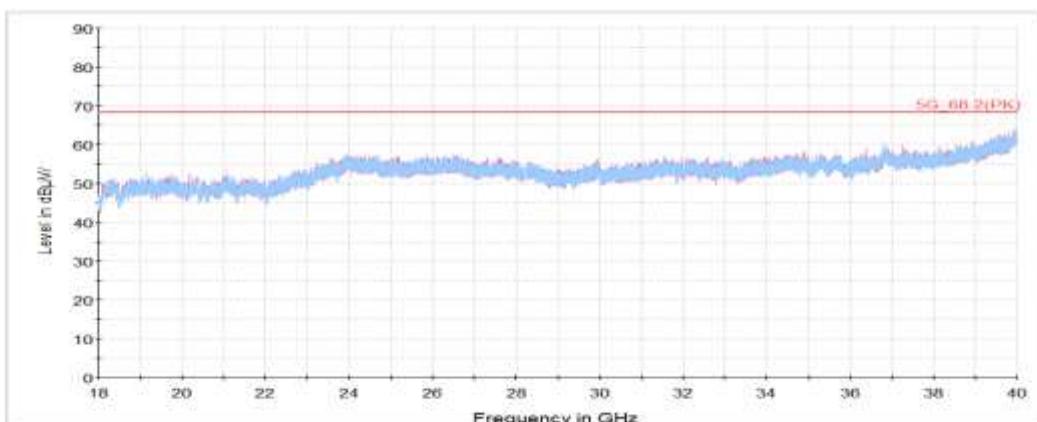
**802.11n HT40 UNII 1 ANT 2****Lowest Channel (5 190 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 149.77 <sup>1)</sup>	V	50.63	34.24	-27.12	-	57.75	74.00	16.25
5 766.61	V	67.65	35.12	-44.95	-	57.82	68.20	10.38
6 920.11	V	70.72	35.40	-52.86	-	53.26	68.20	14.94
10 378.38	V	55.95	37.28	-50.20	-	43.03	68.20	25.17
15 562.72 <sup>1)</sup>	V	55.95	40.01	-48.58	-	47.38	74.00	26.62
<b>Average Data</b>								
5 149.77 <sup>1)</sup>	V	42.86	34.24	-27.12	0.44	50.42	54.00	3.58

**Average data (5 149.77 MHz)**

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**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

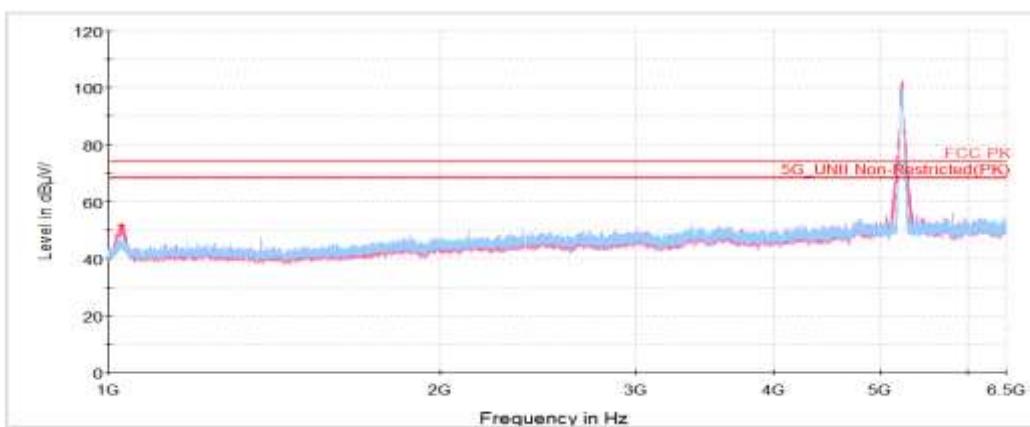
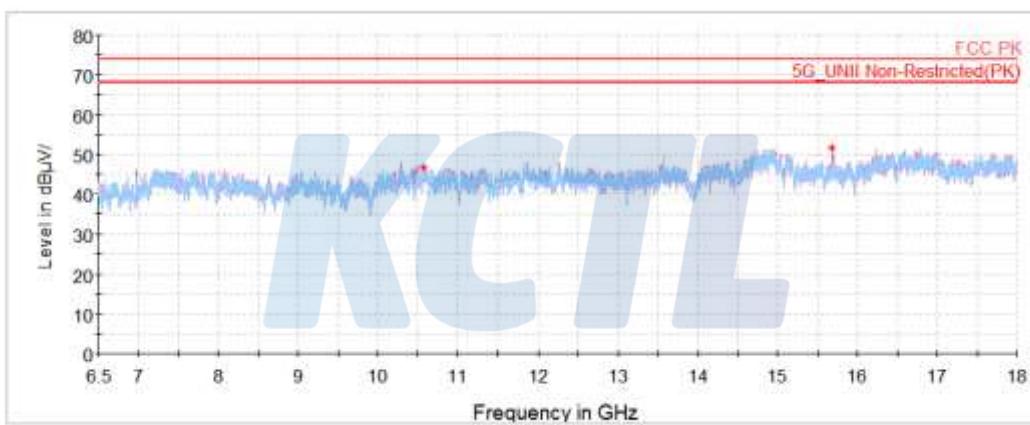
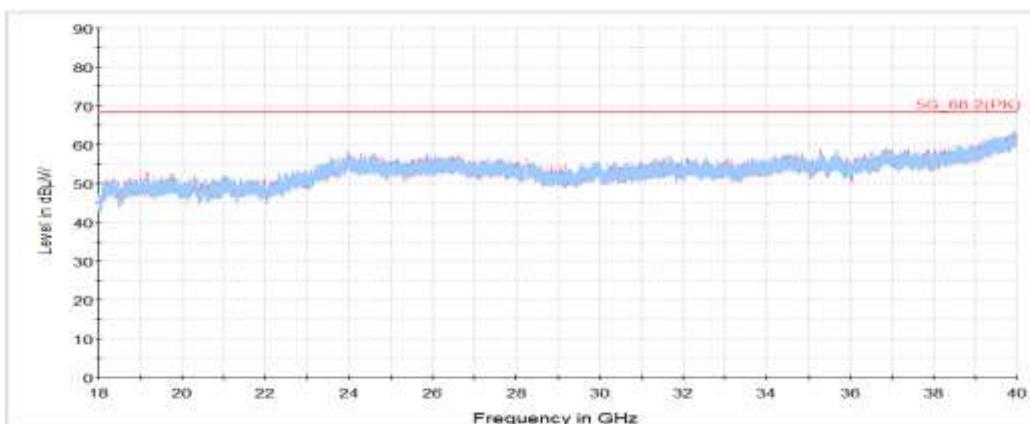
**KCTL Inc.**

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Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
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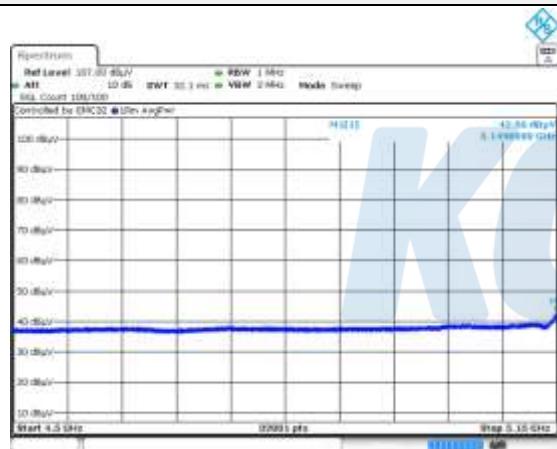
**Highest Channel (5 230 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
10 579.63	V	58.95	37.45	-49.83	-	46.57	68.20	21.63
15 696.77 <sup>1)</sup>	V	60.14	40.04	-48.65	-	51.53	74.00	22.47
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								

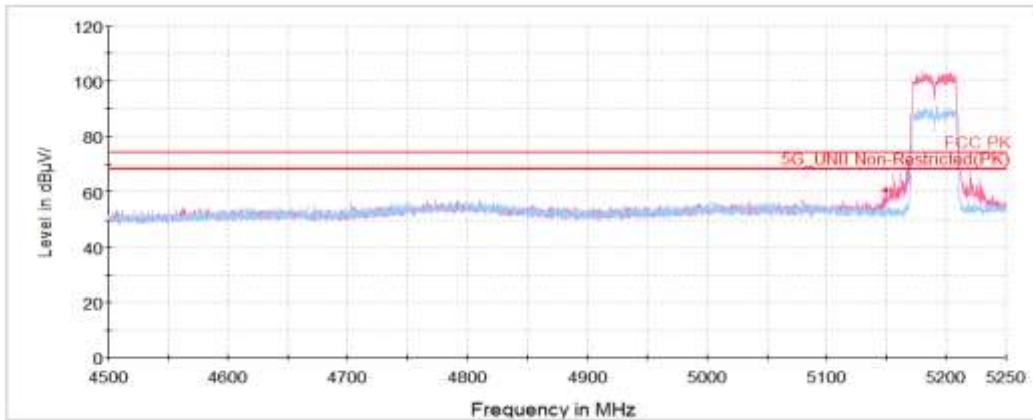
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

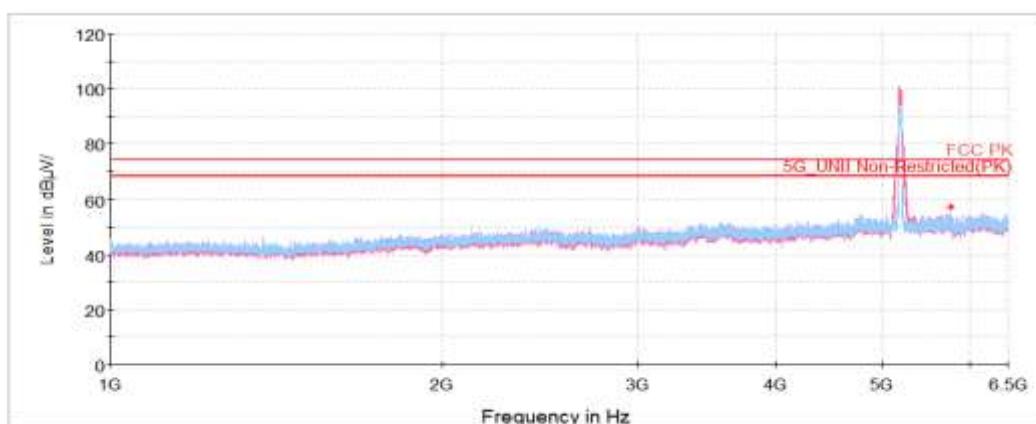
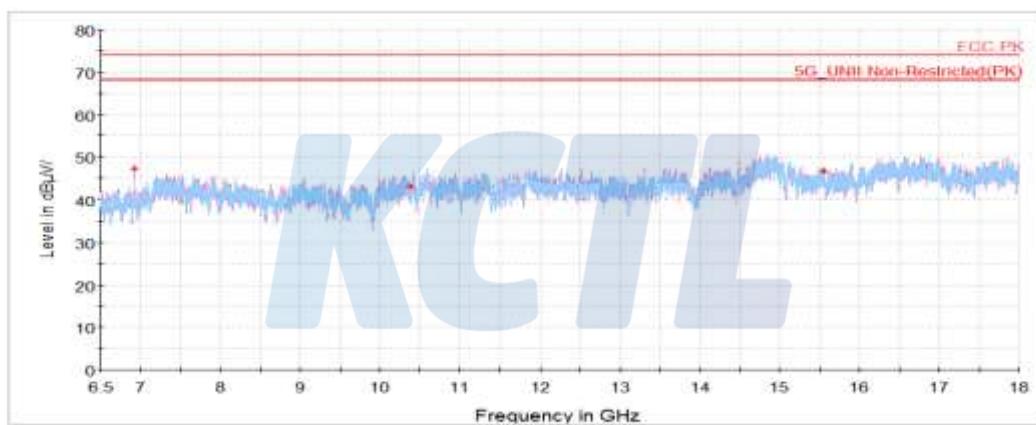
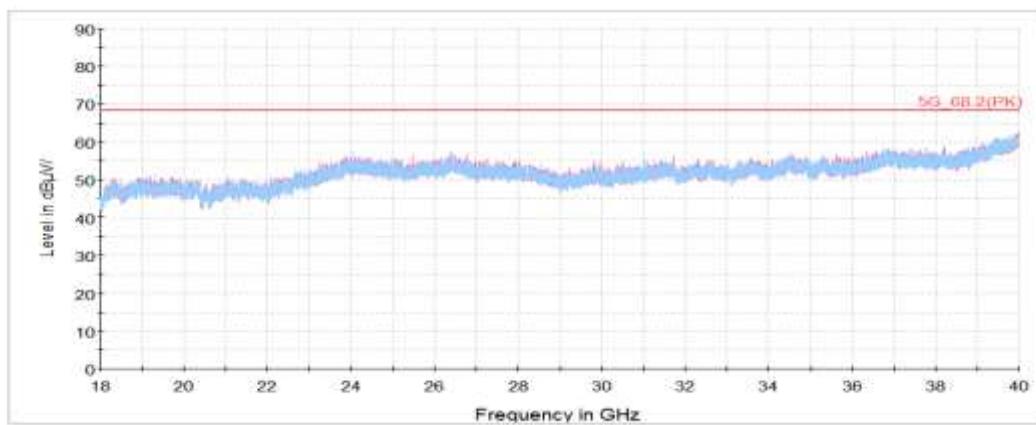
**802.11n HT40 UNII 1 ANT 3****Lowest Channel (5 190 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 149.89 <sup>1)</sup>	V	53.29	34.24	-27.12	-	60.41	74.00	13.59
5 766.61	V	66.89	35.12	-44.95	-	57.06	68.20	11.14
10 380.53	V	55.96	37.28	-50.19	-	43.05	68.20	25.15
15 560.92 <sup>1)</sup>	V	55.14	40.01	-48.58	-	46.57	74.00	27.43
<b>Average Data</b>								
5 149.89 <sup>1)</sup>	V	43.06	34.24	-27.12	0.44	50.62	54.00	3.38

**Average data (5 149.89 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

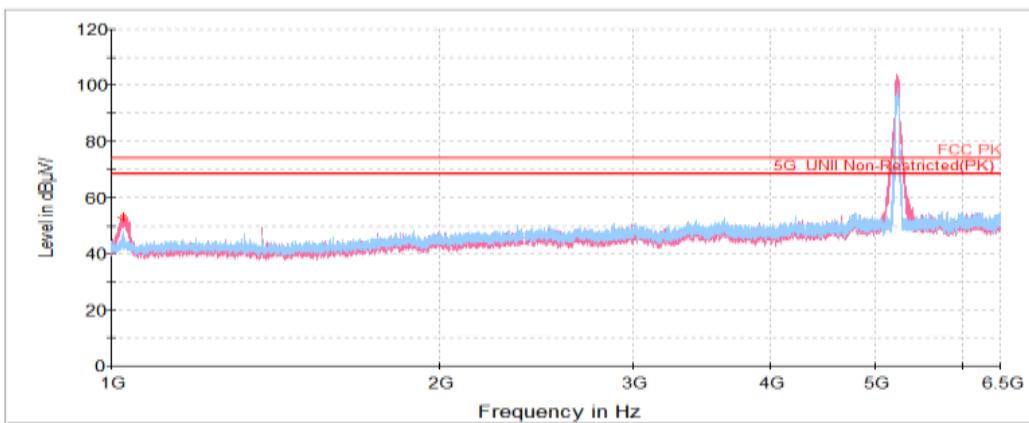
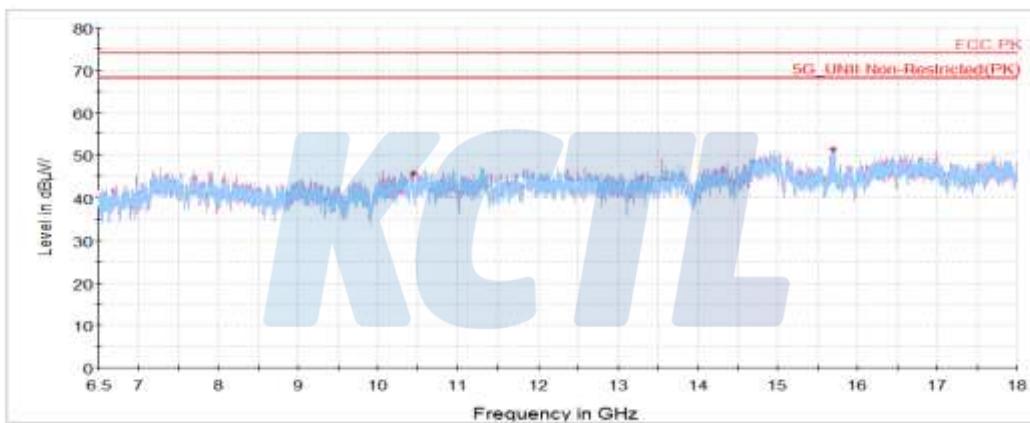
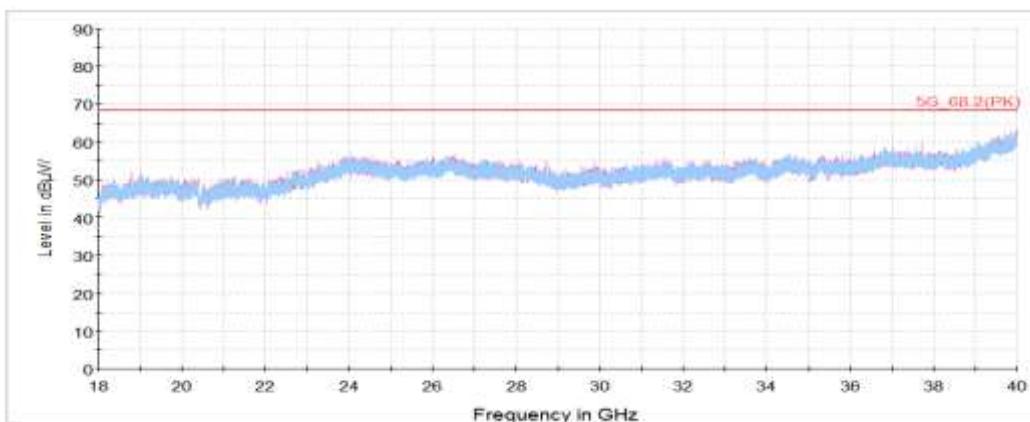
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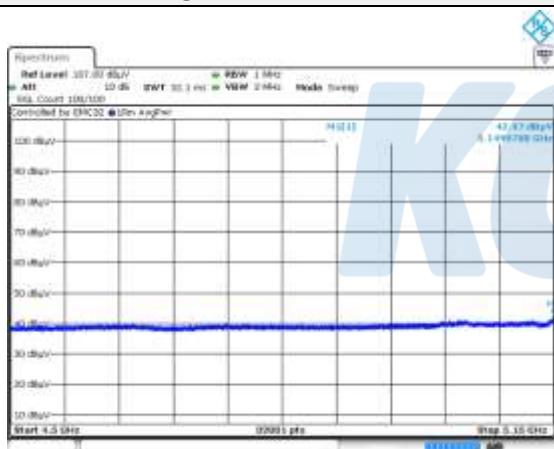
**Highest Channel (5 230 MHz)**

Frequency (MHz)	Pol. (V/H)	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
10 457.44	V	75.83	37.36	-49.84	-	45.64	68.20	22.56
15 693.85 <sup>1)</sup>	V	67.69	40.04	-48.65	-	51.20	74.00	22.80
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								

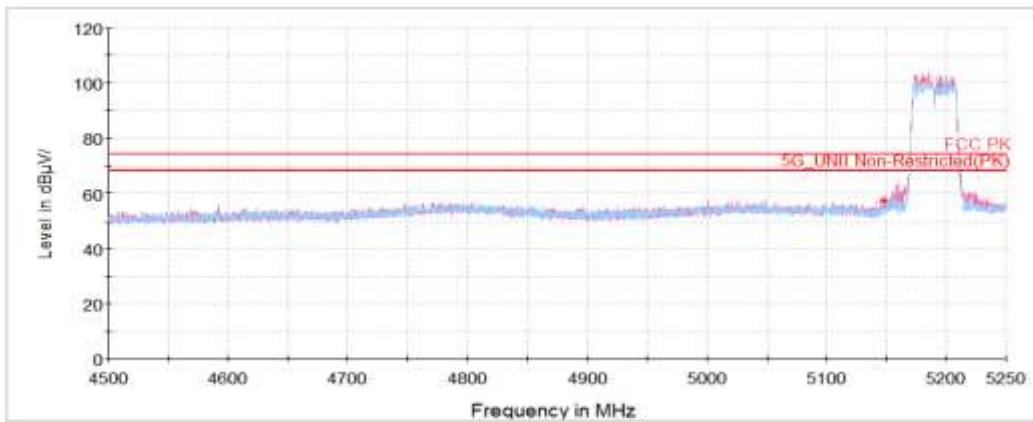
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

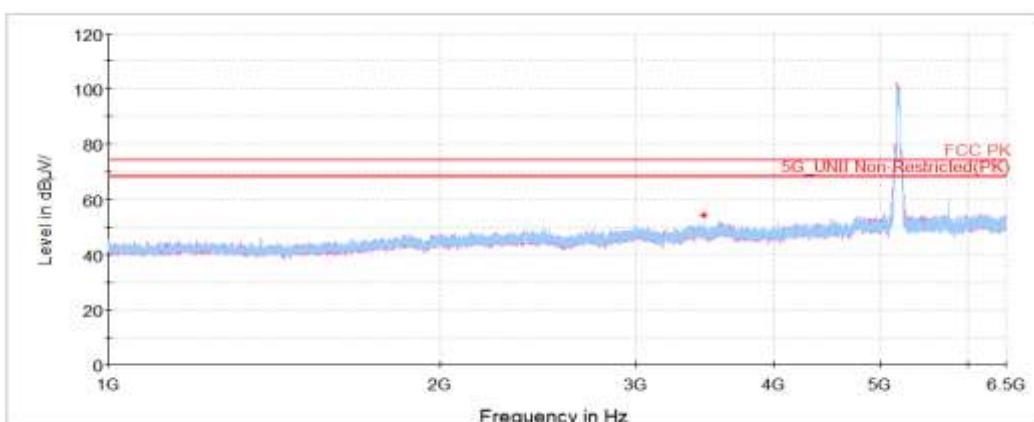
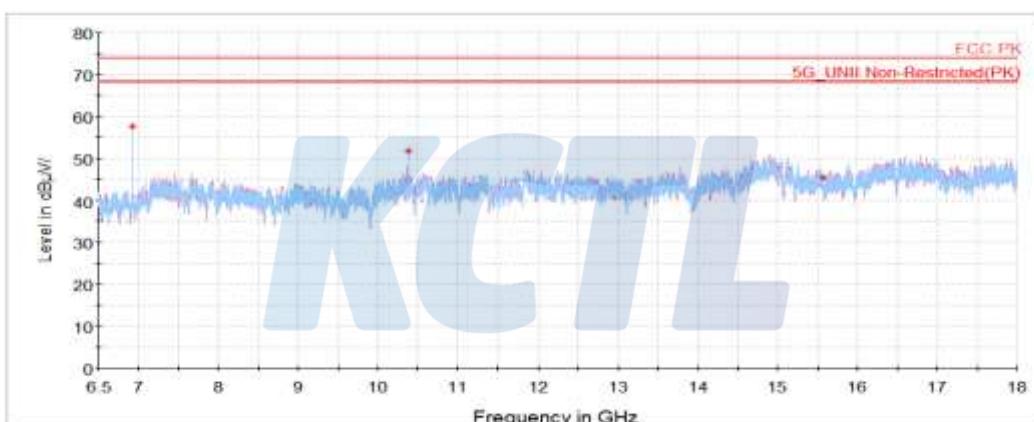
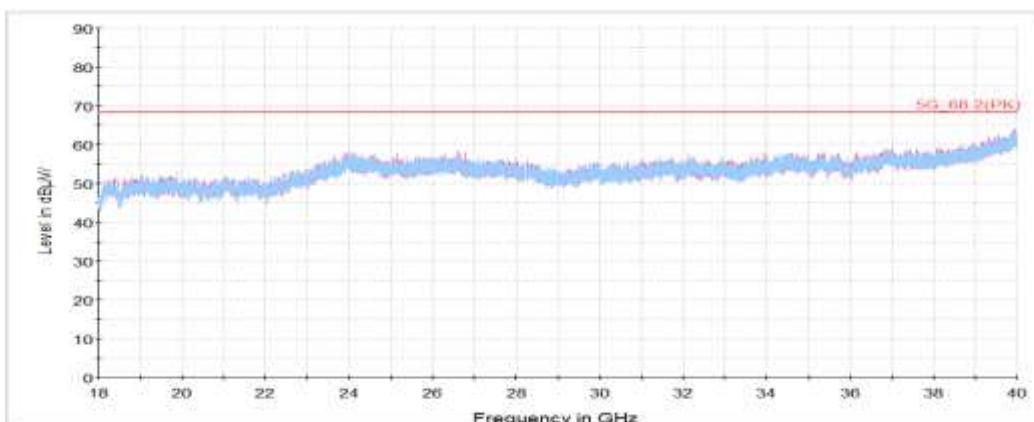
**802.11n HT40 UNII 1 4TX MIMO****Lowest Channel (5 190 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 459.53	H	68.12	32.59	-46.52	-	54.19	68.20	14.01
5 149.97 <sup>1)</sup>	V	50.13	34.24	-27.12	-	57.25	74.00	16.75
6 920.11	V	75.03	35.40	-52.86	-	57.57	68.20	10.63
10 380.17	V	64.58	37.28	-50.19	-	51.67	68.20	16.53
15 566.67 <sup>1)</sup>	H	53.89	40.01	-48.58	-	45.32	74.00	28.68
<b>Average Data</b>								
5 149.97 <sup>1)</sup>	V	42.97	34.24	-27.12	0.44	50.53	54.00	3.47

**Average data (5 149.97 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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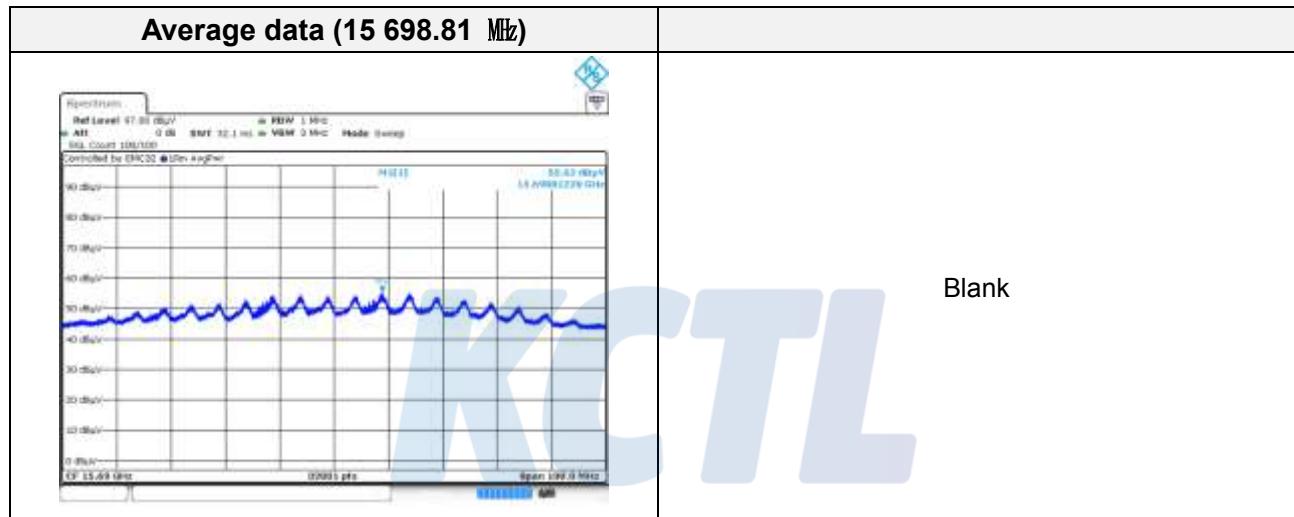
Report No.:

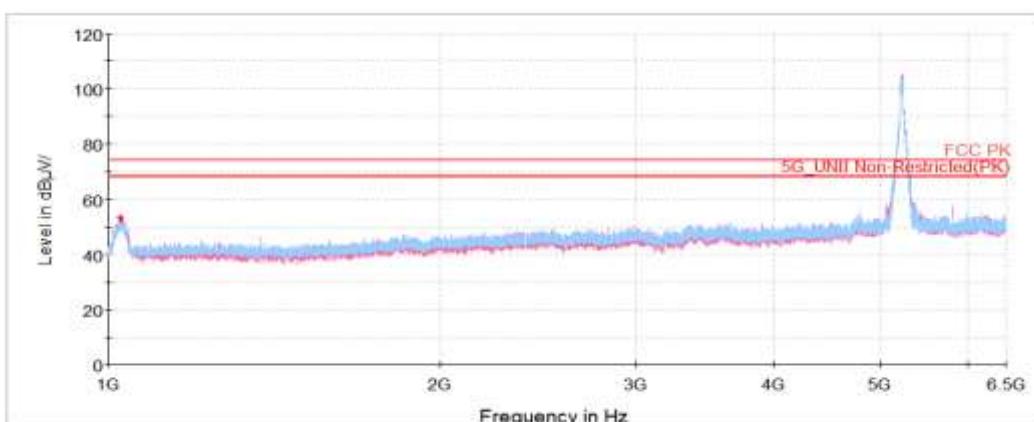
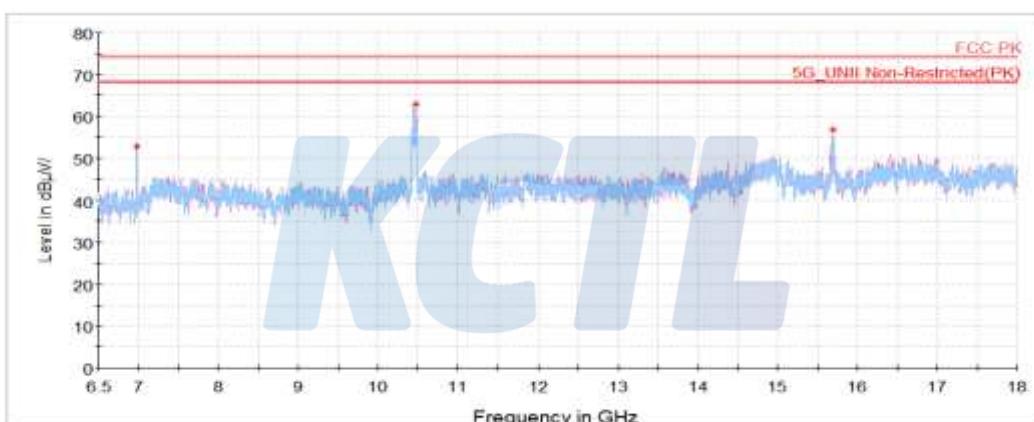
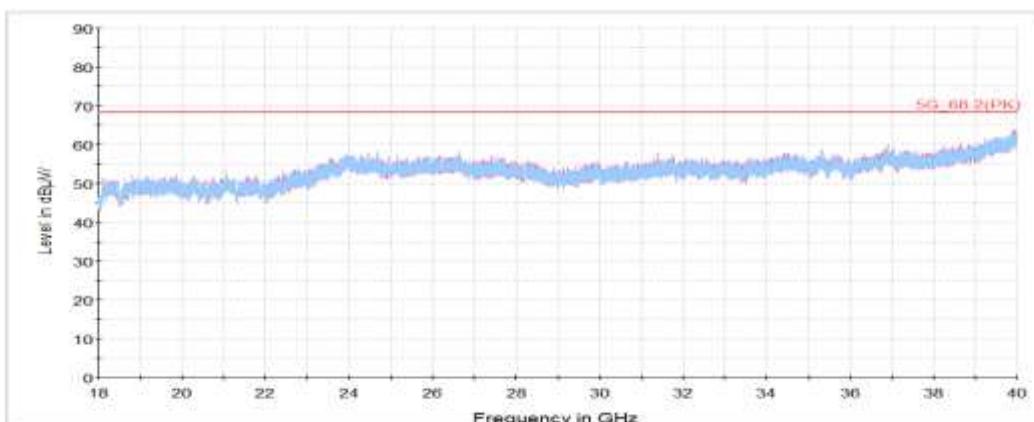
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**Highest Channel (5 230 MHz)**

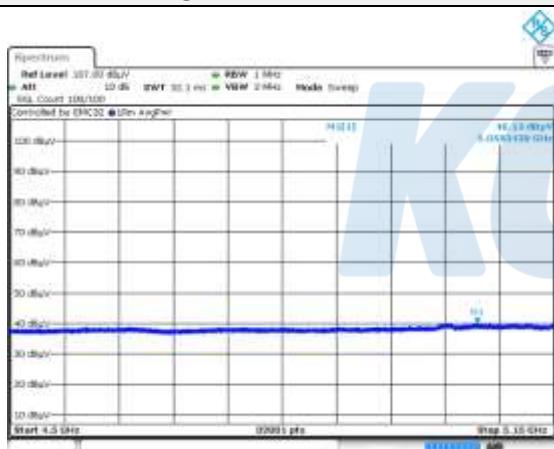
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
6 973.66	H	70.11	35.40	-52.74	-	52.77	68.20	15.43
10 480.08	V	75.19	37.38	-49.74	-	62.83	68.20	5.37
15 698.81 <sup>1)</sup>	V	65.47	40.04	-48.65	-	56.86	74.00	17.14
<b>Average Data</b>								
15 698.81 <sup>1)</sup>	V	55.62	40.04	-48.65	0.44	47.45	54.00	6.55

**Average data (15 698.81 MHz)**

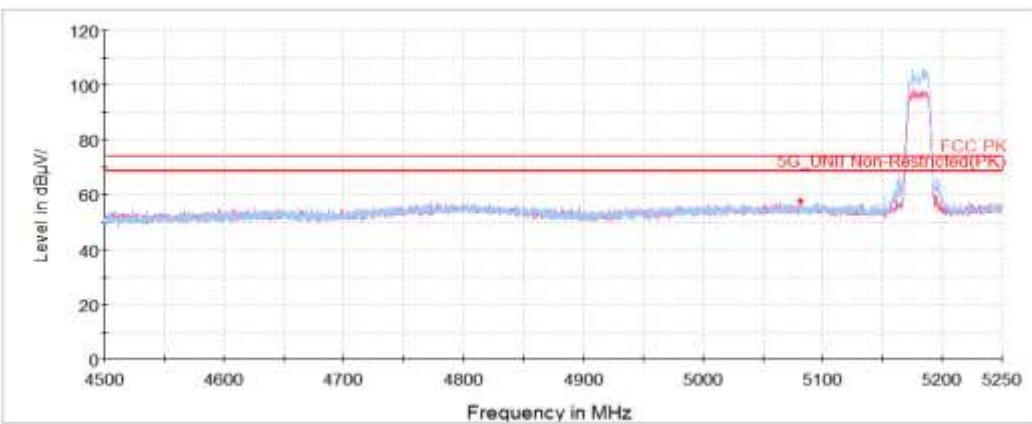
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

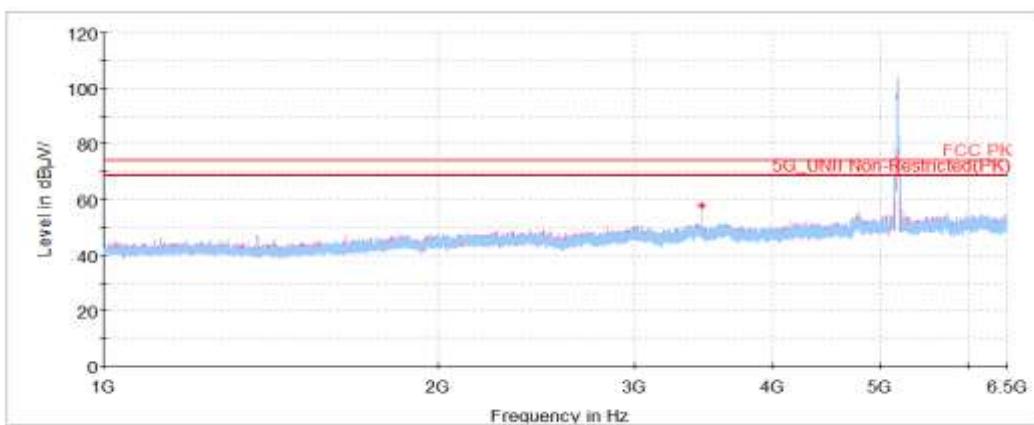
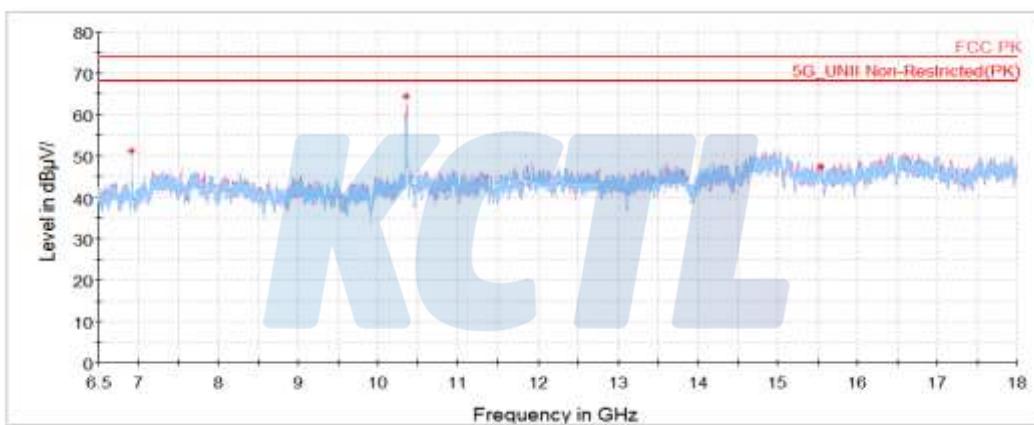
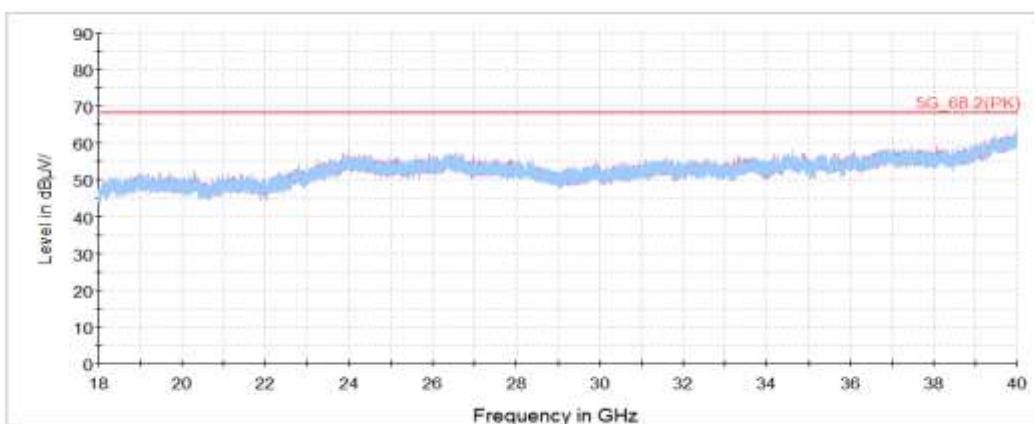
**802.11ac VHT20 UNII 1 ANT 0****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 453.34	H	71.29	32.59	-46.40	-	57.48	68.20	10.72
5 058.34 <sup>1)</sup>	H	50.06	34.09	-26.69	-	57.46	74.00	16.54
6 906.81	H	68.50	35.40	-52.89	-	51.01	68.20	17.19
10 357.89	V	77.43	37.26	-50.29	-	64.40	68.20	3.80
15 538.28 <sup>1)</sup>	H	55.97	40.01	-48.57	-	47.41	74.00	26.59
<b>Average Data</b>								
5 058.34 <sup>1)</sup>	H	40.13	34.09	-26.69	-	47.53	54.00	6.47

**Average data (5 058.34 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

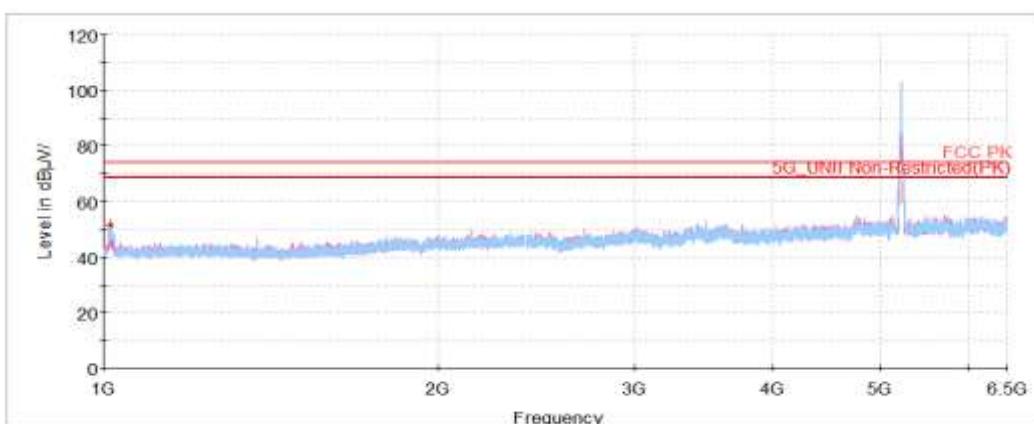
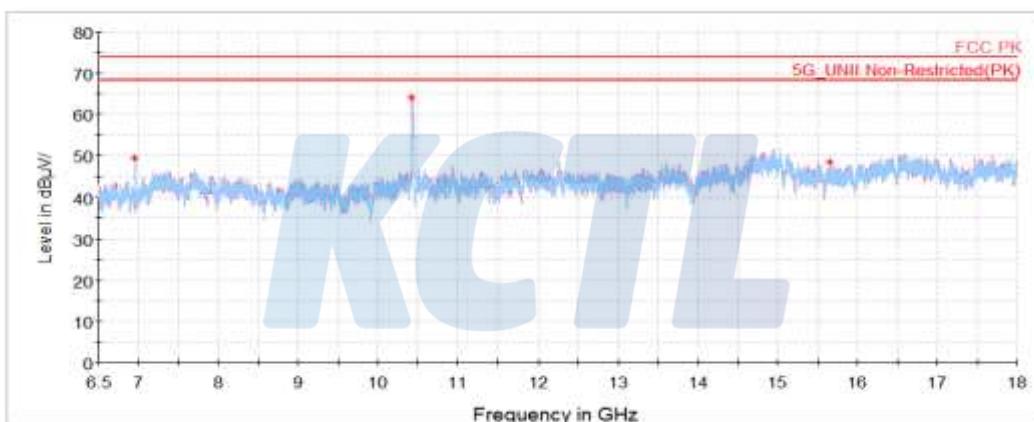
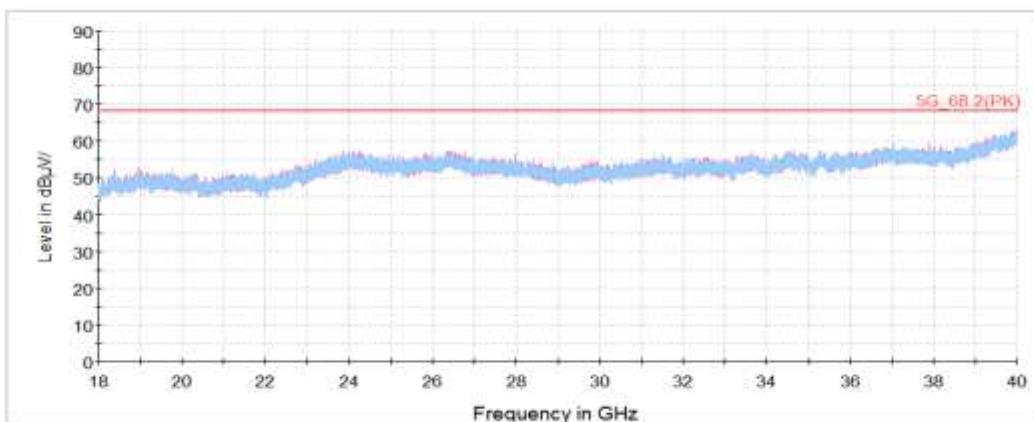
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**Middle Channel (5 220 MHz)**

Frequency (MHz)	Pol. (V/H)	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
6 959.64	H	66.65	35.40	-52.77	-	49.28	68.20	18.92
10 431.56	V	76.84	37.33	-49.96	-	64.21	68.20	3.99
15 658.67 <sup>1)</sup>	H	56.97	40.03	-48.63	-	48.37	74.00	25.63
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

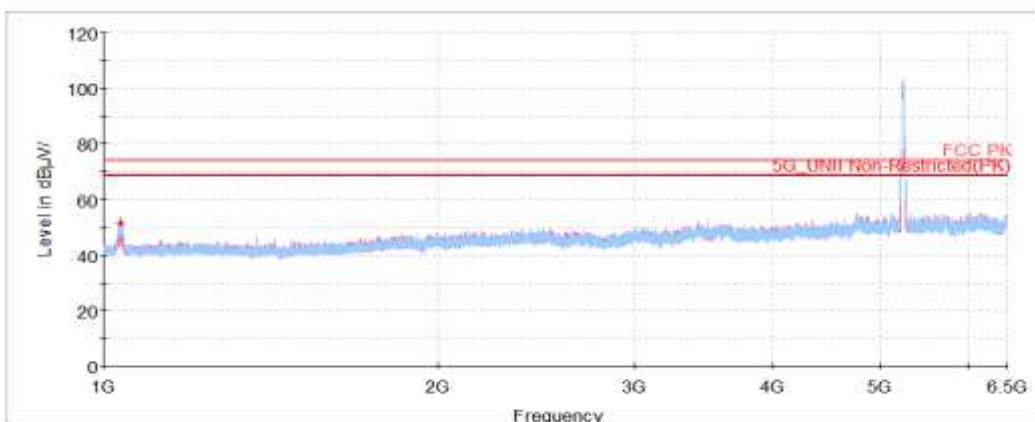
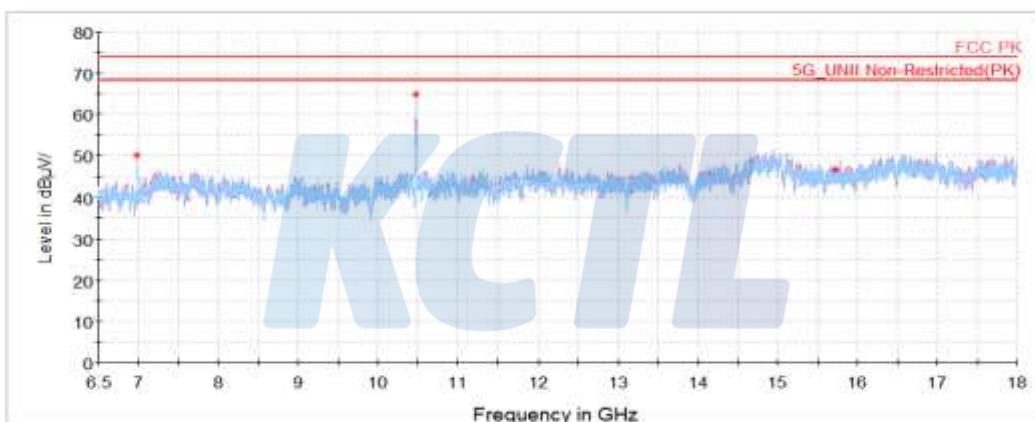
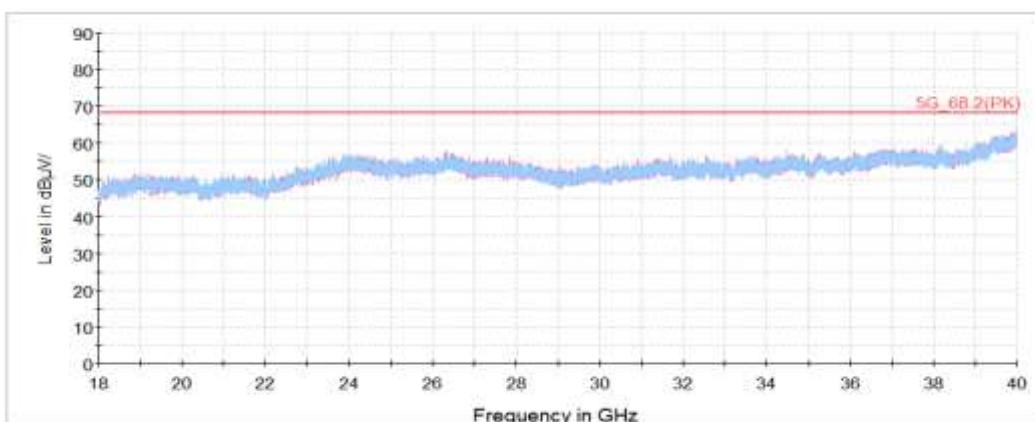
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TEL: 82-31-285-0894 FAX: 82-505-299-8311  
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**Highest Channel (5 240 MHz)**

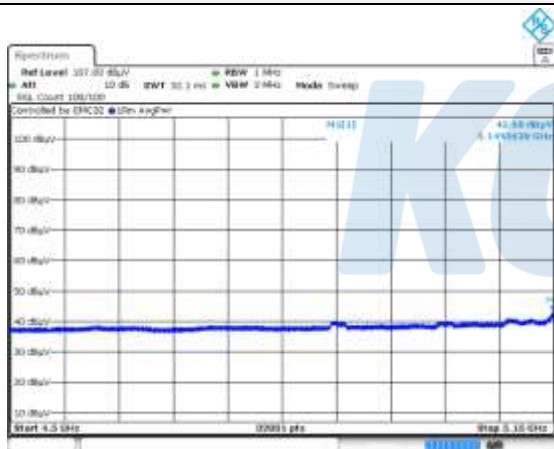
Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor	Amp. + Cable	DCCF	Result (dB(µV/m))	Limit (dB(µV/m))	Margin
<b>Peak data</b>								
6 986.59	H	67.33	35.40	-52.71	-	50.02	68.20	18.18
10 477.56	H	77.21	37.38	-49.75	-	64.84	68.20	3.36
15 722.28 <sup>1)</sup>	H	55.25	40.04	-48.67	-	46.62	74.00	27.38
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



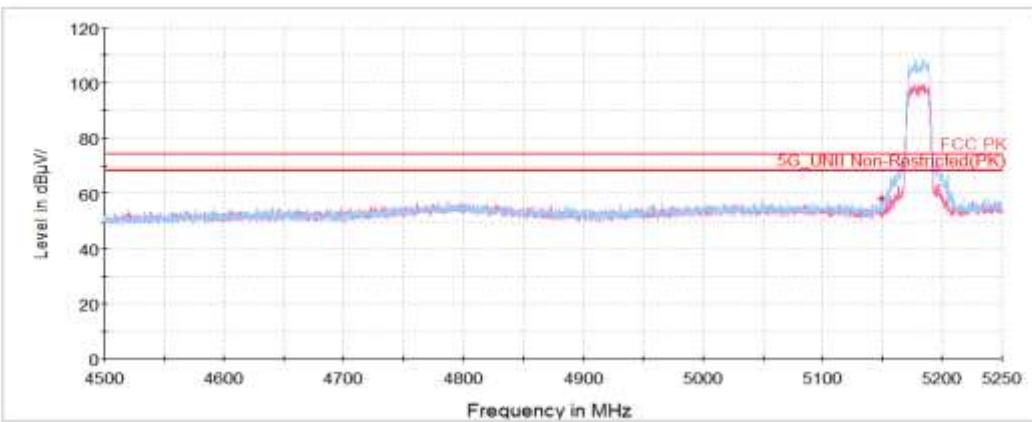
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

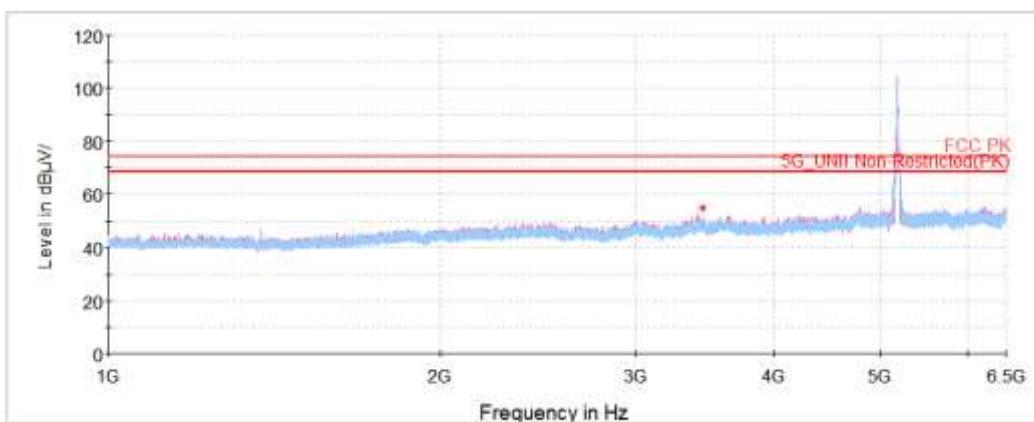
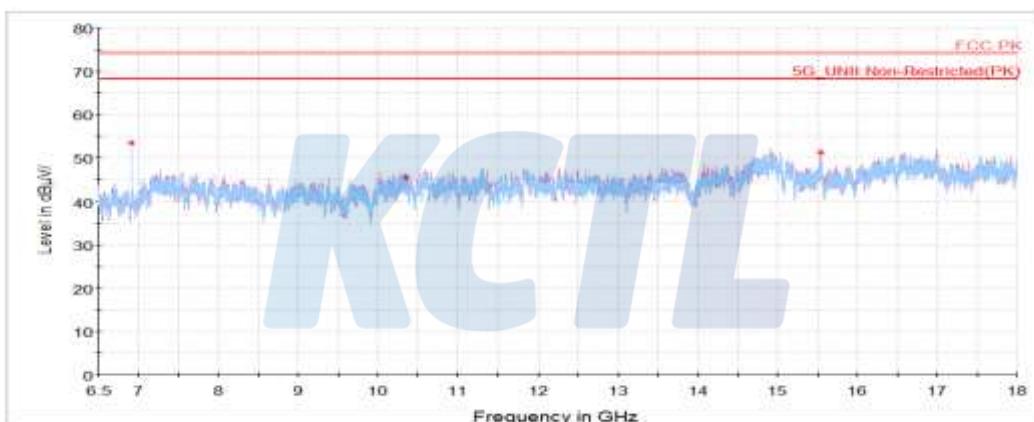
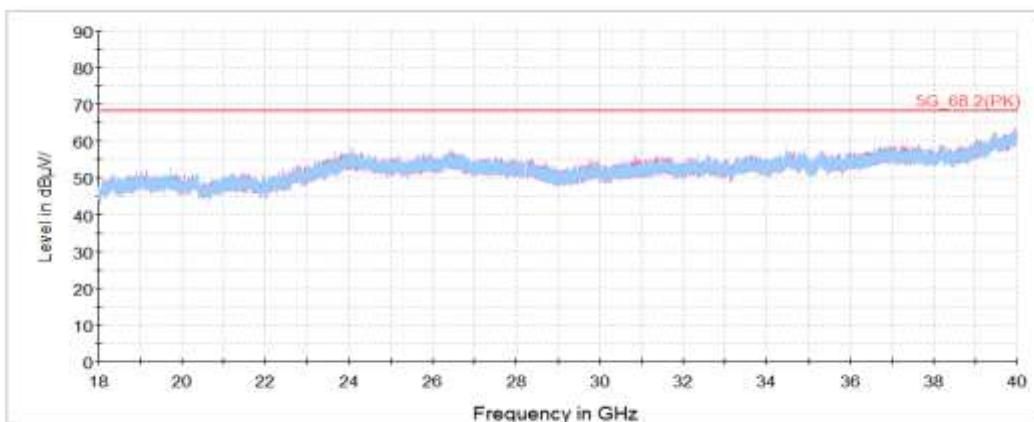
**802.11ac VHT20 UNII 1 ANT 1****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 453.52	H	68.54	32.59	-46.40	-	54.73	68.20	13.47
5 149.56 <sup>1)</sup>	H	50.89	34.24	-27.12	-	58.01	74.00	15.99
6 906.45	H	70.80	35.40	-52.89	-	53.31	68.20	14.89
10 361.13	V	58.51	37.26	-50.28	-	45.49	68.20	22.71
15 542.14 <sup>1)</sup>	V	59.85	40.01	-48.57	-	51.29	74.00	22.71
<b>Average Data</b>								
5 149.56 <sup>1)</sup>	H	43.68	34.24	-27.12	-	50.80	54.00	3.20

**Average data (5 149.56 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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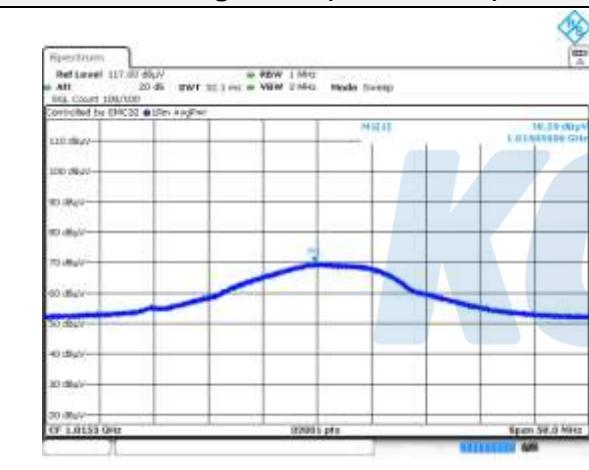
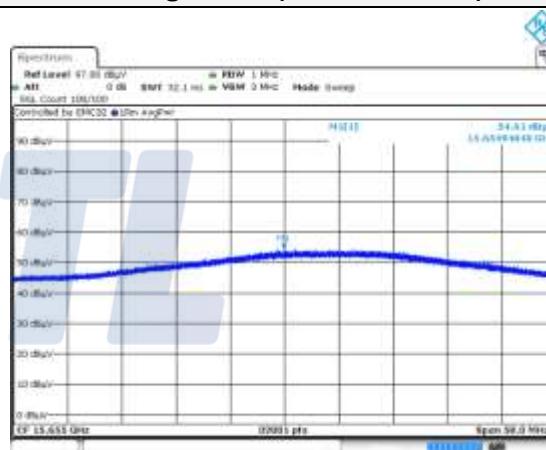
Report No.:

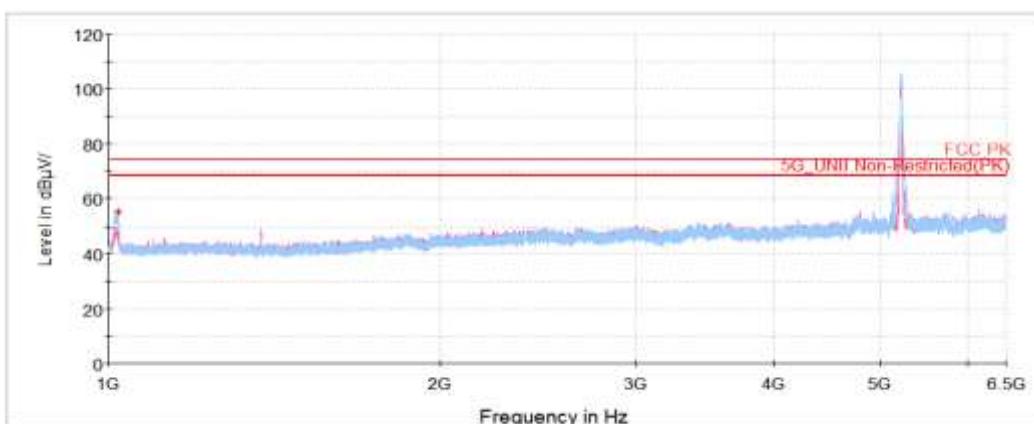
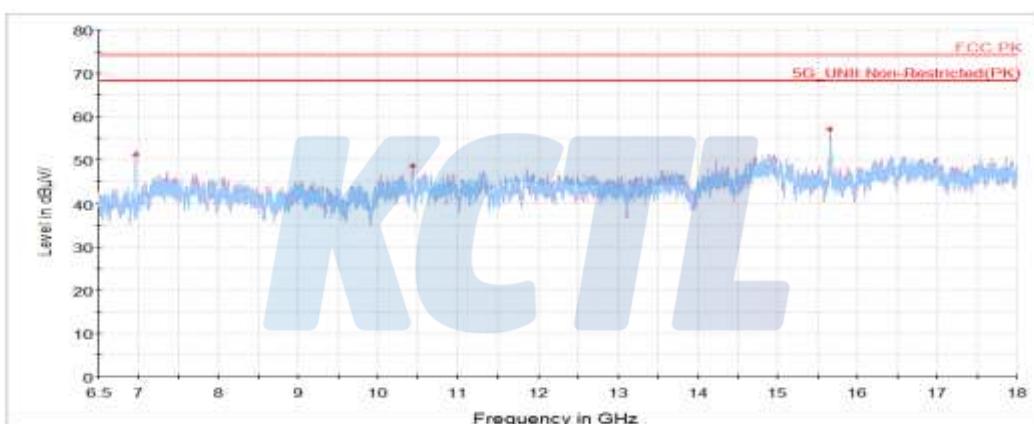
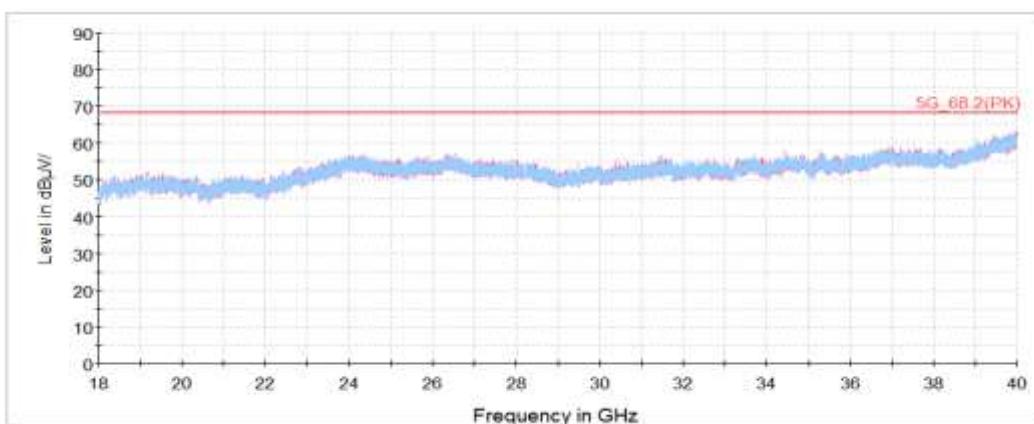
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**KCTL****Middle Channel (5 220 MHz)**

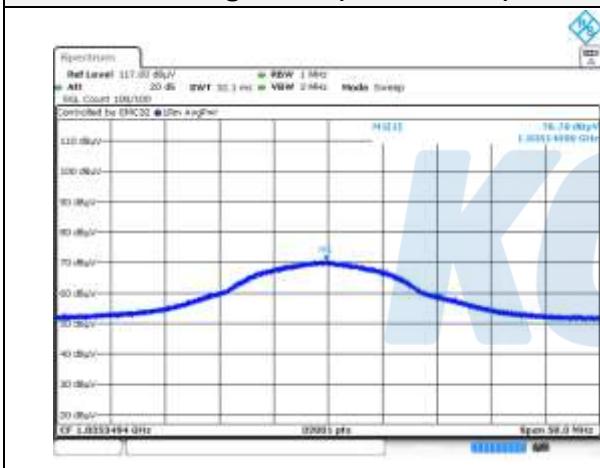
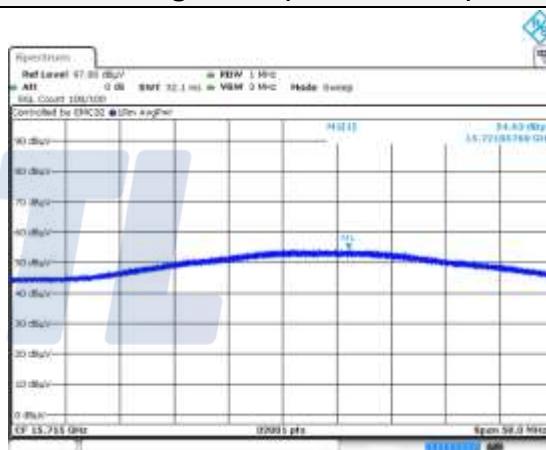
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 015.05 <sup>1)</sup>	H	77.77	27.81	-50.59	-	54.99	74.00	19.01
6 960.00	H	68.58	35.40	-52.77	-	51.21	68.20	16.99
10 434.44	V	61.09	37.33	-49.95	-	48.47	68.20	19.73
15 654.95 <sup>1)</sup>	V	65.63	40.03	-48.63	-	57.03	74.00	16.97
<b>Average Data</b>								
1 015.05 <sup>1)</sup>	H	70.29	27.81	-50.59	-	47.51	54.00	6.49
15 654.95 <sup>1)</sup>	H	54.61	40.03	-48.63	-	46.01	54.00	7.99

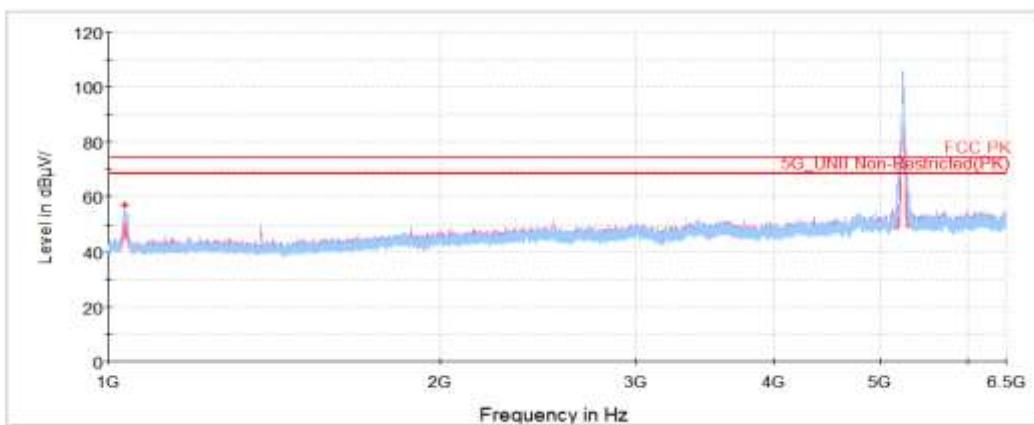
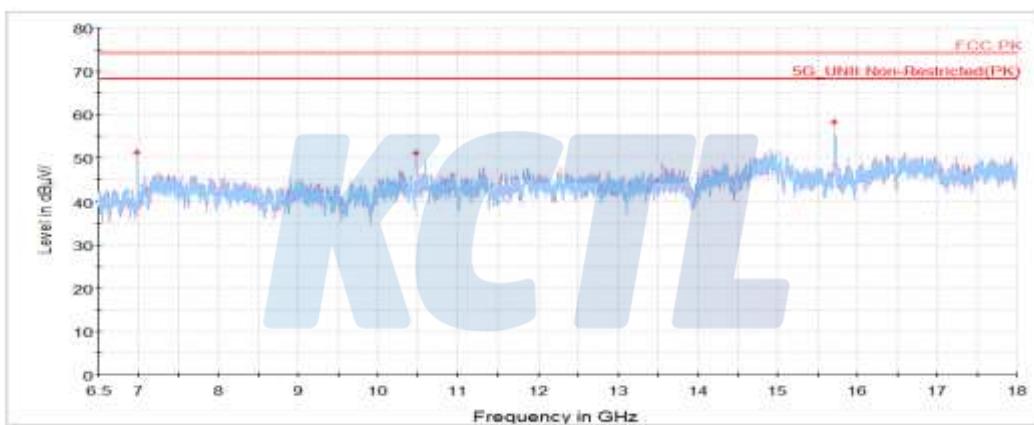
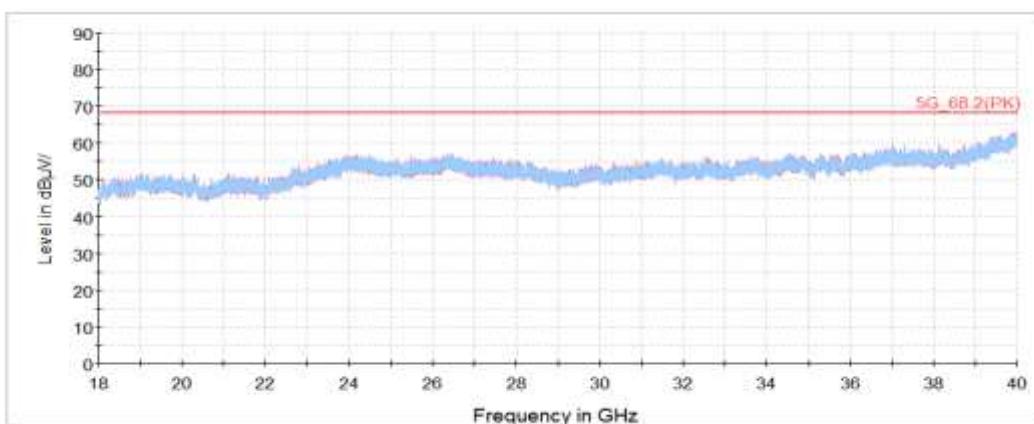
**Average data (1 015.05 MHz)****Average data (15 654.951 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Highest Channel (5 240 MHz)**

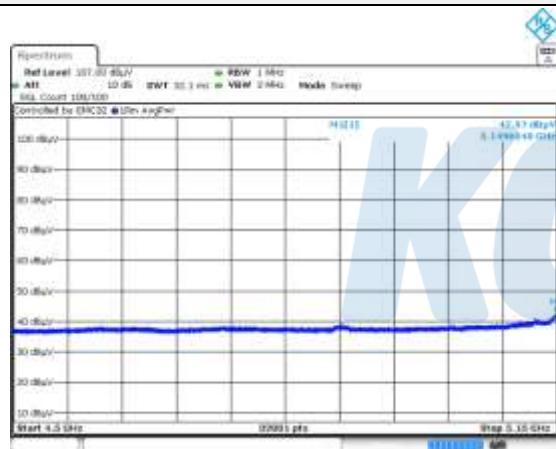
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 035.14 <sup>1)</sup>	H	79.58	27.81	-50.60	-	56.79	74.00	17.21
6 986.59	H	68.55	35.40	-52.71	-	51.24	68.20	16.96
10 485.47	V	63.46	37.39	-49.72	-	51.13	68.20	17.07
15 721.06 <sup>1)</sup>	H	66.79	40.04	-48.67	-	58.16	74.00	15.84
<b>Average Data</b>								
1 035.14 <sup>1)</sup>	H	70.78	27.81	-50.60	-	47.99	54.00	6.01
15 721.06 <sup>1)</sup>	H	54.63	40.04	-48.67	-	46.00	54.00	8.00

**Average data (1 035.14 MHz)****Average data (15 721.06 MHz)**

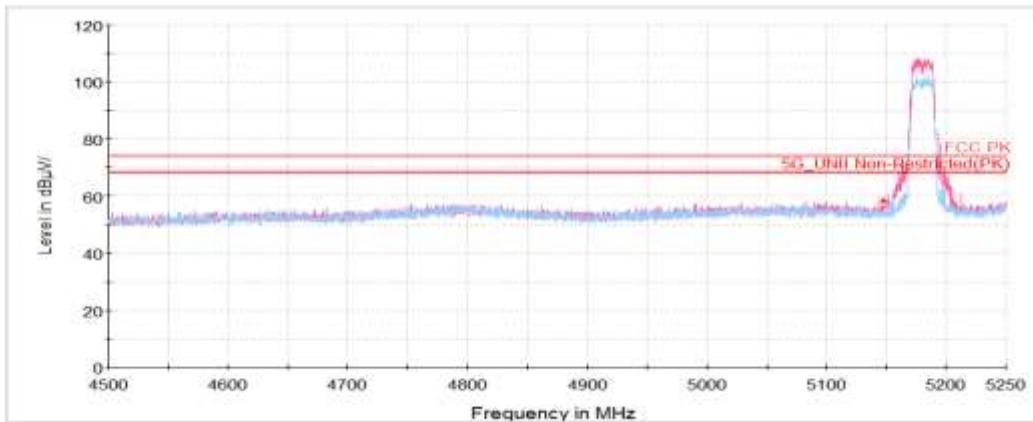
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

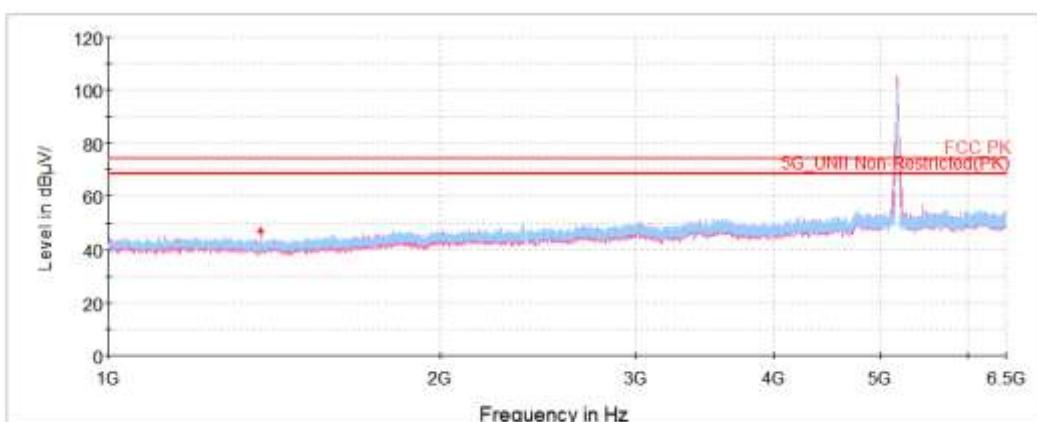
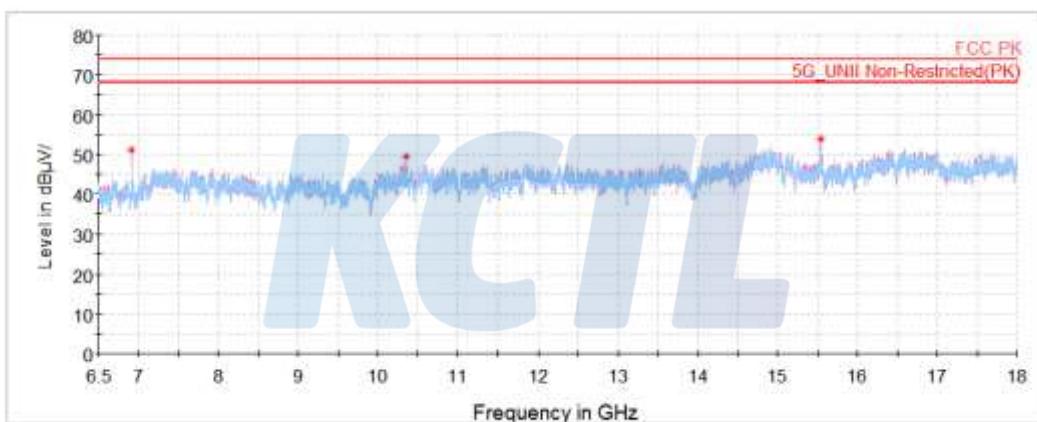
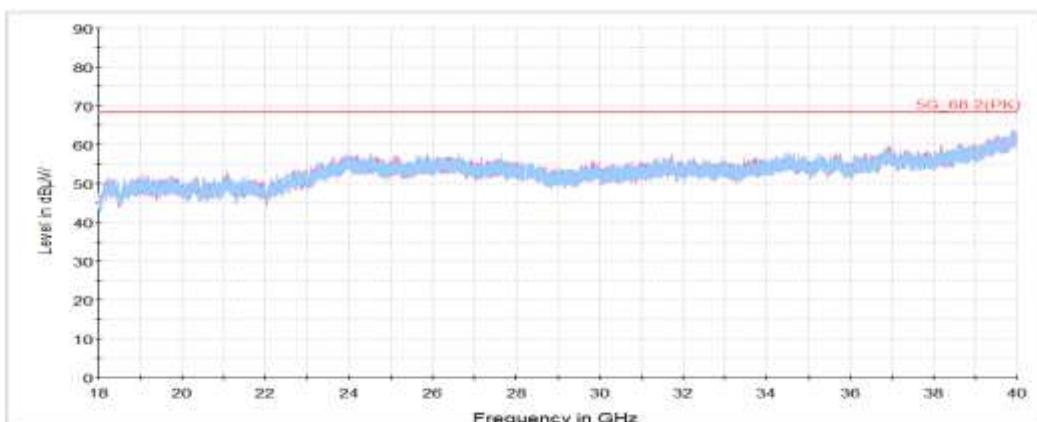
**802.11ac VHT20 UNII 1 ANT 2****Lowest Channel (5 180 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(µV))	(dB)	(dB)	(dB)	(dB(µV/m))	(dB(µV/m))	(dB)
<b>Peak data</b>								
5 149.60 <sup>1)</sup>	V	50.96	34.24	-27.12	-	58.08	74.00	15.92
6 906.09	V	68.44	35.40	-52.89	-	50.95	68.20	17.25
10 359.69	V	62.54	37.26	-50.29	-	49.51	68.20	18.69
15 543.82 <sup>1)</sup>	V	62.27	40.01	-48.57	-	53.71	74.00	20.29
<b>Average Data</b>								
5 149.60 <sup>1)</sup>	V	42.97	34.24	-27.12	-	50.09	54.00	3.91

**Average data (5 149.60 MHz)**

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**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

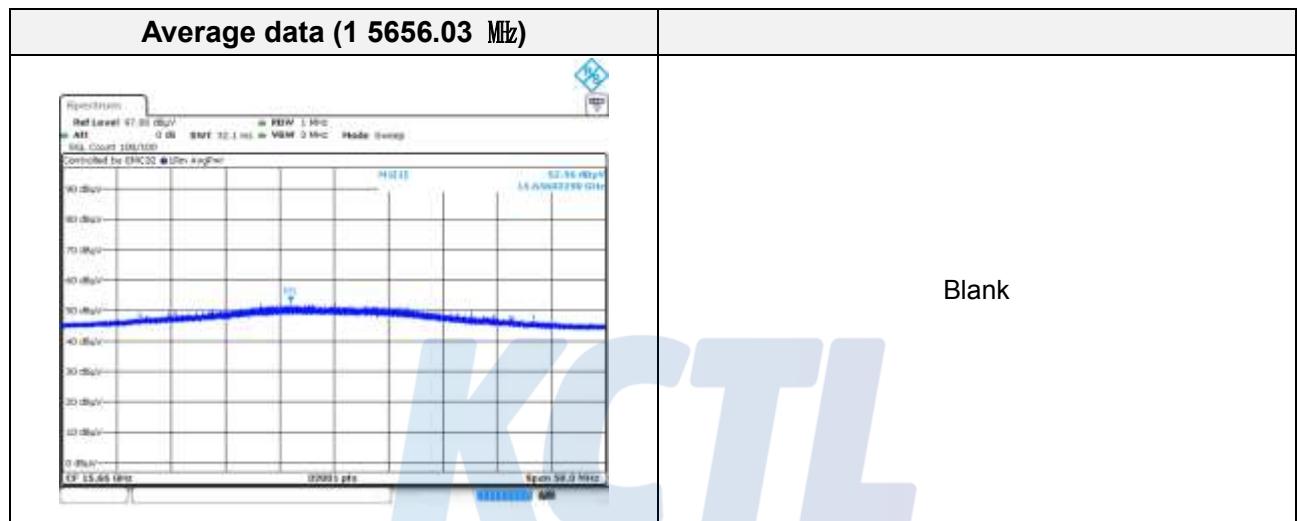
**KCTL Inc.**

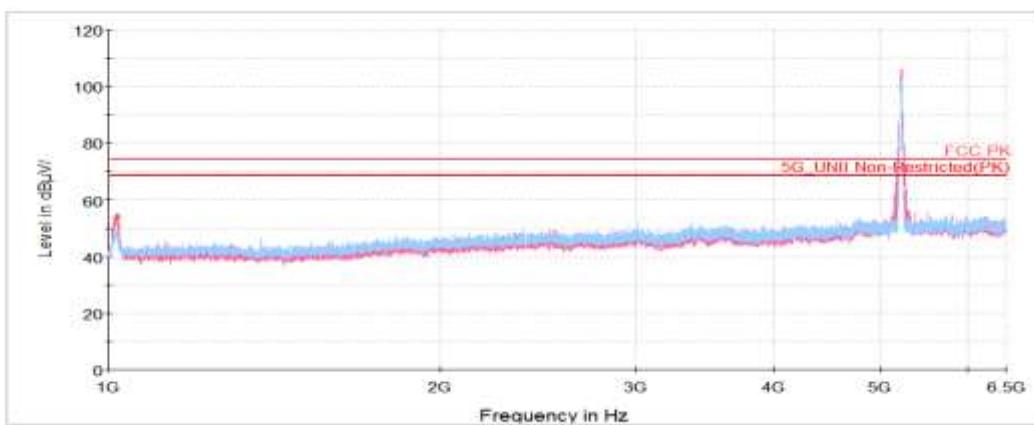
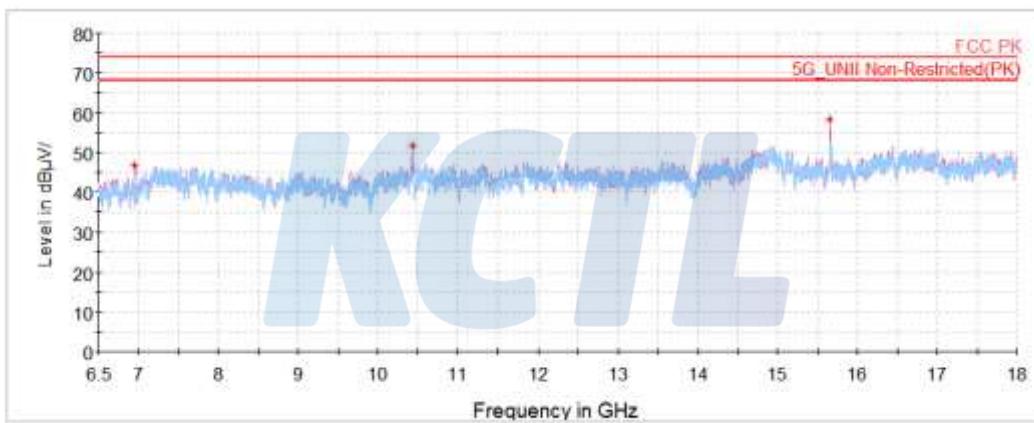
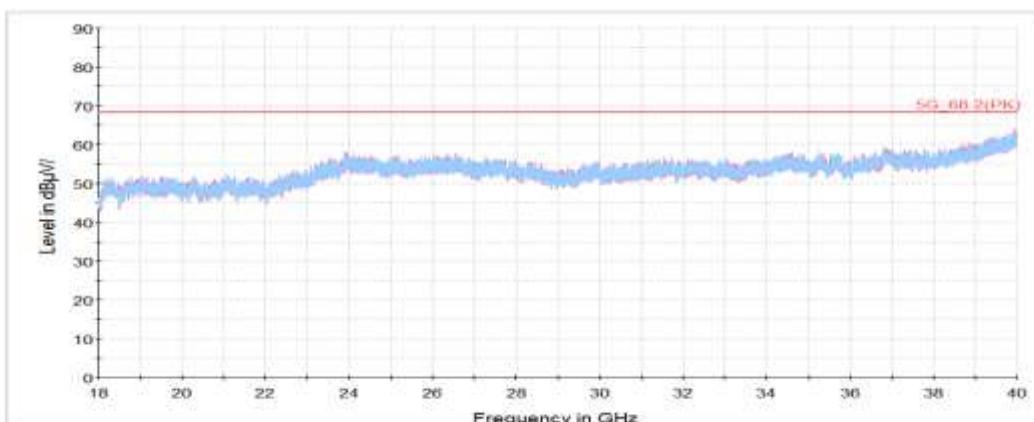
65, Sinwon-ro, Yeongtong-gu,  
 Suwon-si, Gyeonggi-do, 16677, Korea  
 TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

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**Middle Channel (5 220 MHz)**

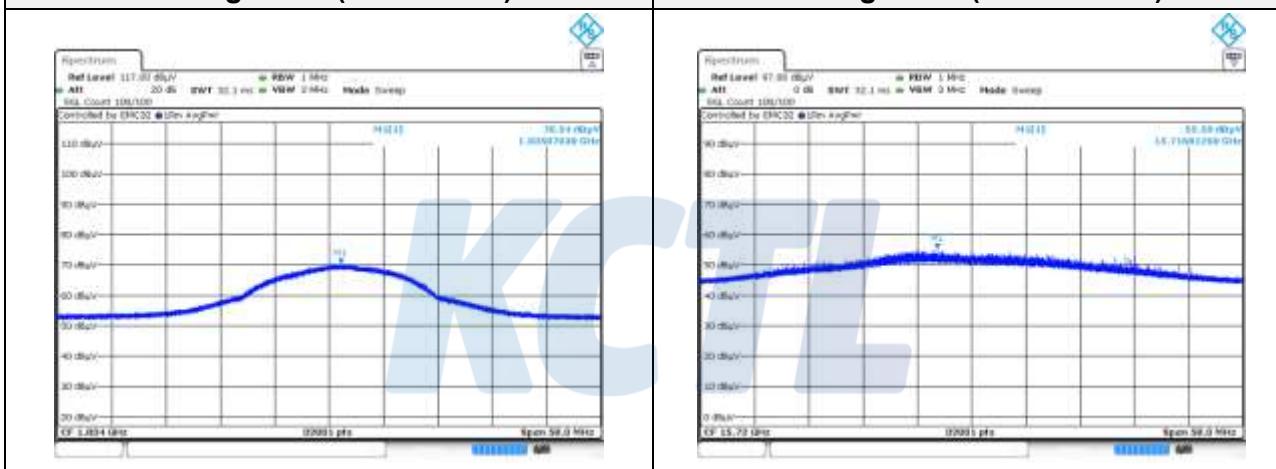
Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
1 0436.59	V	64.23	37.34	-49.94	-	51.63	68.20	16.57
15 656.03 <sup>1)</sup>	V	66.80	40.03	-48.63	-	58.20	74.00	15.80
<b>Average Data</b>								
15 656.03 <sup>1)</sup>	V	52.96	40.03	-48.63	-	44.36	54.00	9.64

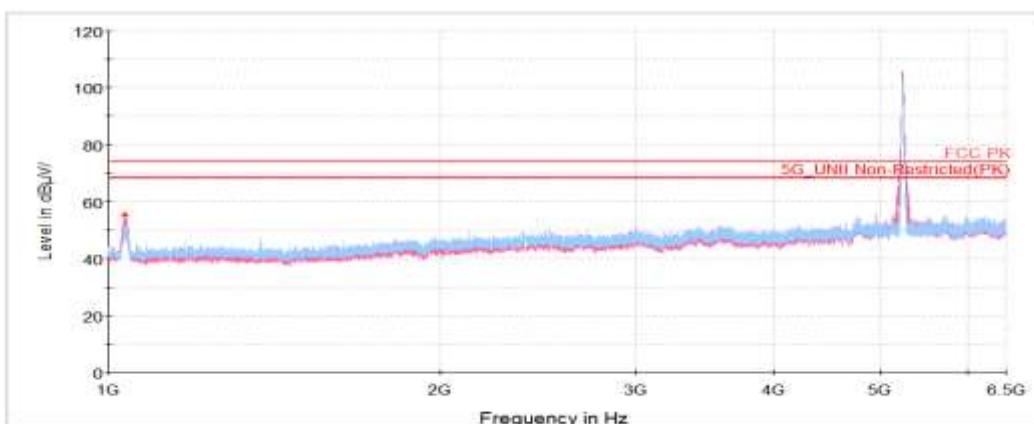
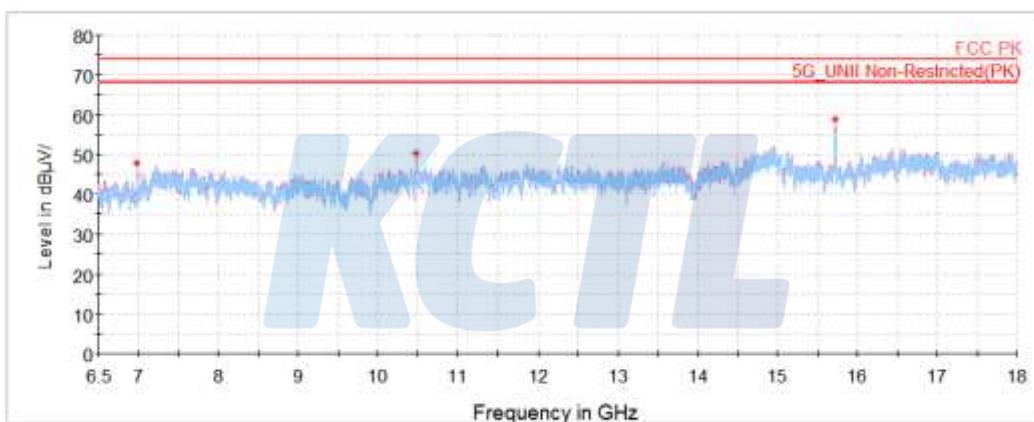
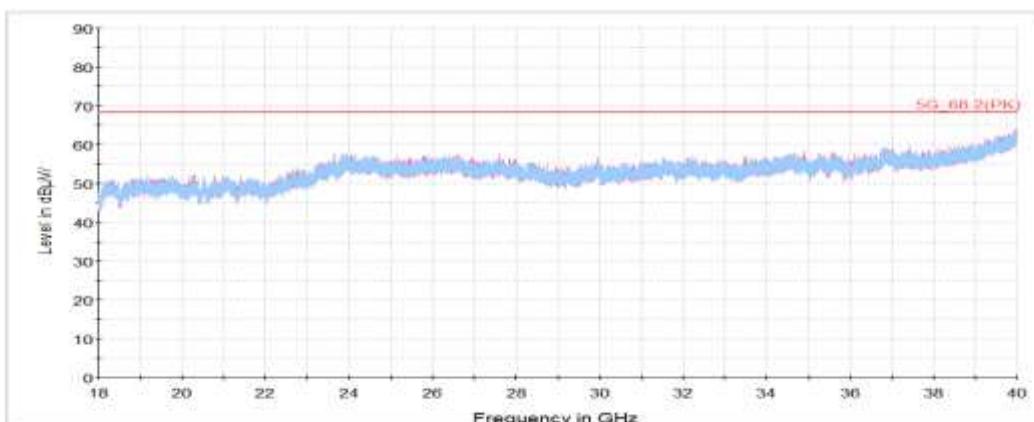
**Average data (1 5656.03 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Highest Channel (5 240 MHz)**

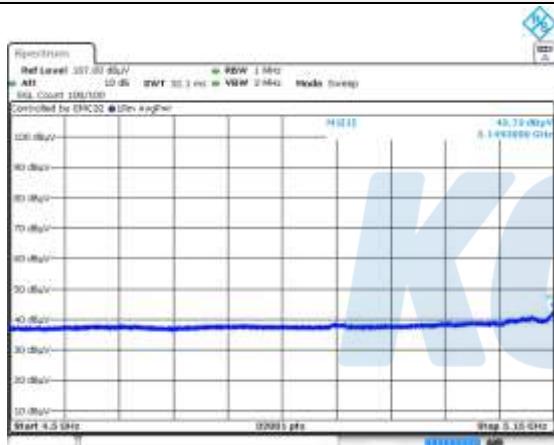
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 035.07 <sup>1)</sup>	V	78.06	27.81	-50.60	-	55.27	74.00	18.73
10 480.80	V	62.60	37.38	-49.74	-	50.24	68.20	17.96
15 716.81 <sup>1)</sup>	V	67.42	40.04	-48.66	-	58.80	74.00	15.20
<b>Average Data</b>								
1 035.07 <sup>1)</sup>	V	70.54	27.81	-50.60	-	47.75	54.00	6.25
15 716.81 <sup>1)</sup>	V	55.50	40.04	-48.66	-	46.88	54.00	7.12

**Average data (1 035.07 MHz)****Average data (15 716.81 MHz)**

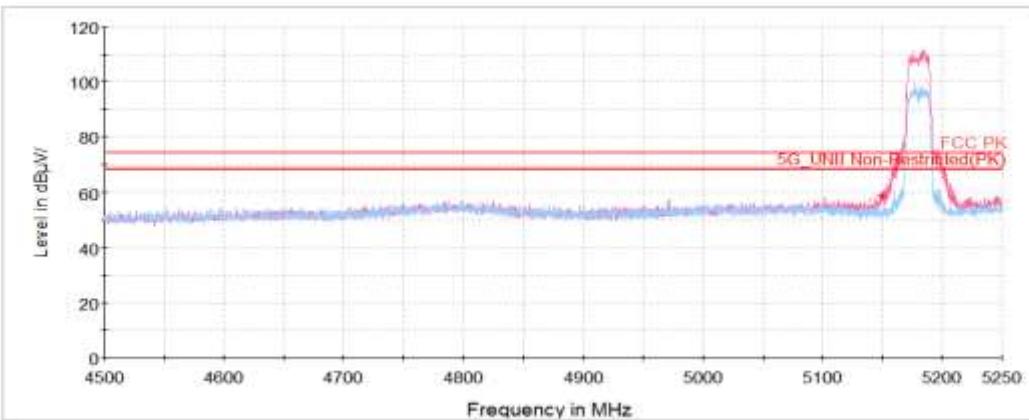
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

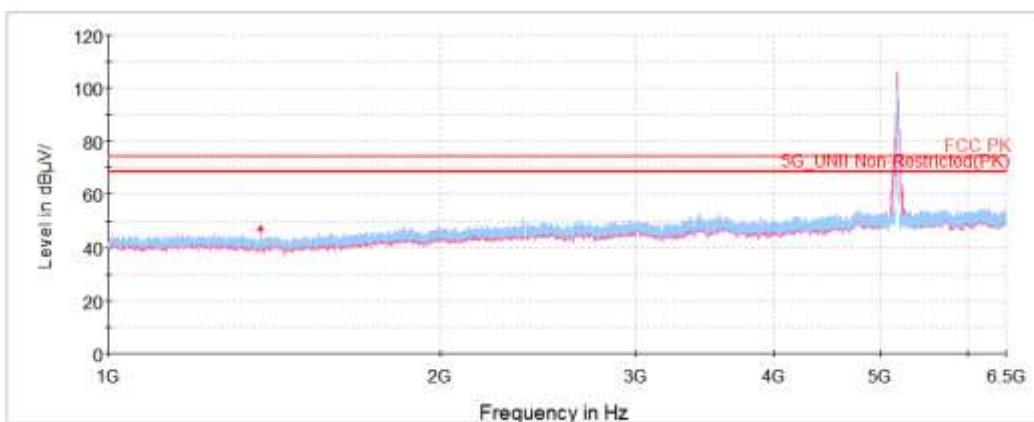
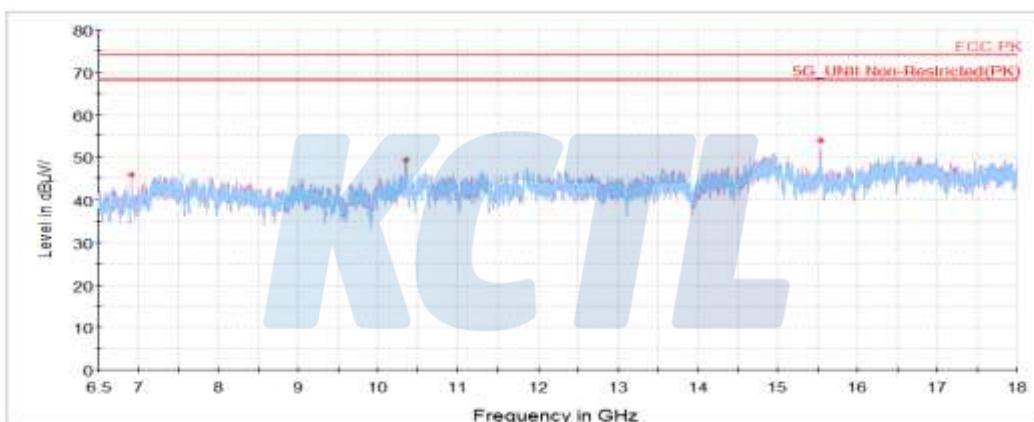
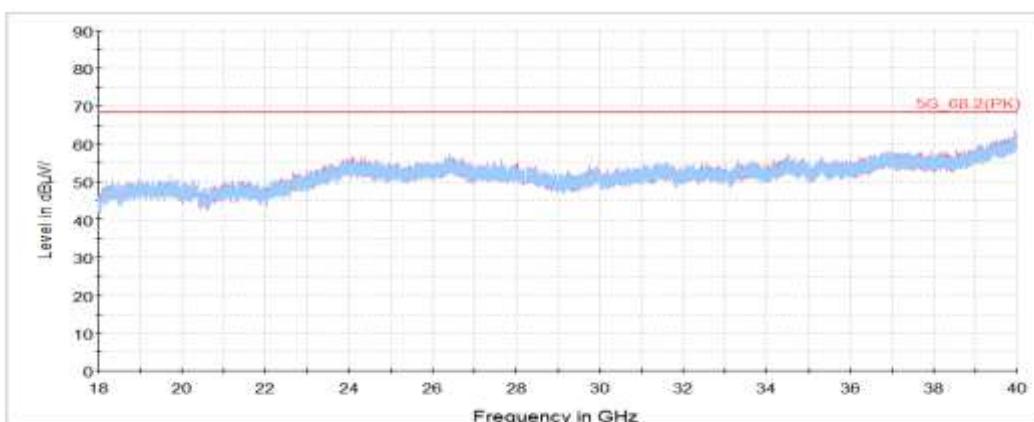
**802.11ac VHT20 UNII 1 ANT 3****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 149.38 <sup>1)</sup>	V	51.32	34.24	-27.11	-	58.45	74.00	15.55
10 360.05	V	62.30	37.26	-50.28	-	49.28	68.20	18.92
15 542.29 <sup>1)</sup>	H	62.40	40.01	-48.57	-	53.84	74.00	20.16
<b>Average Data</b>								
5 149.38 <sup>1)</sup>	V	43.73	34.24	-27.11	-	50.86	54.00	3.14

**Average data (5 149.38 MHz)**

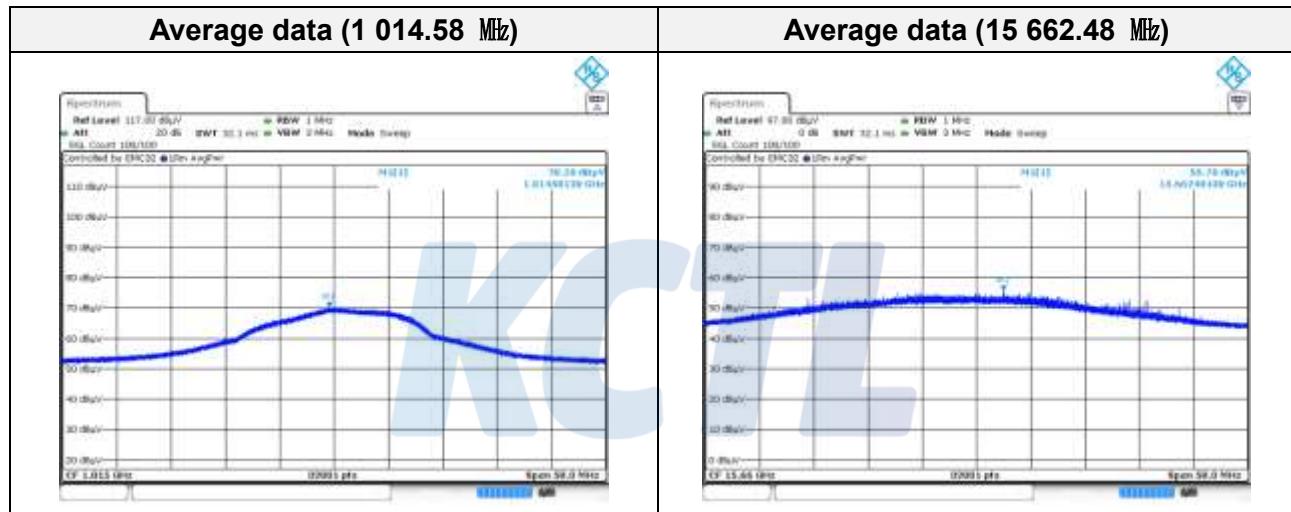
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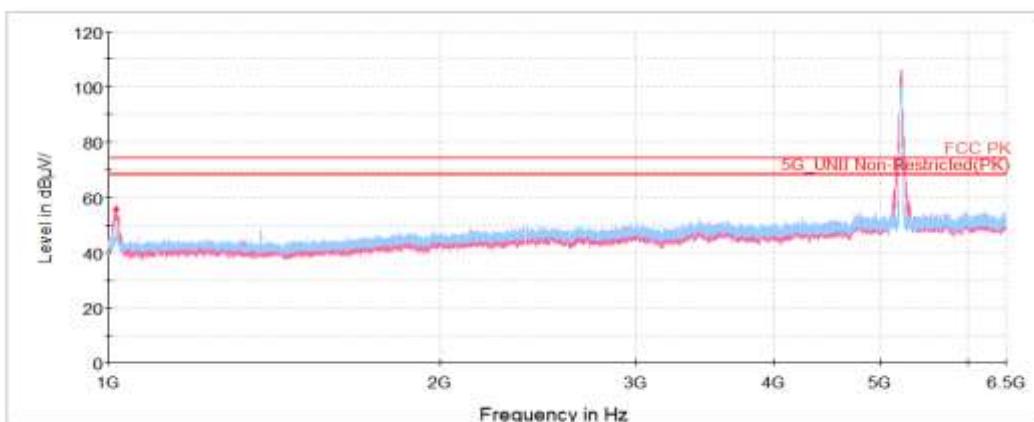
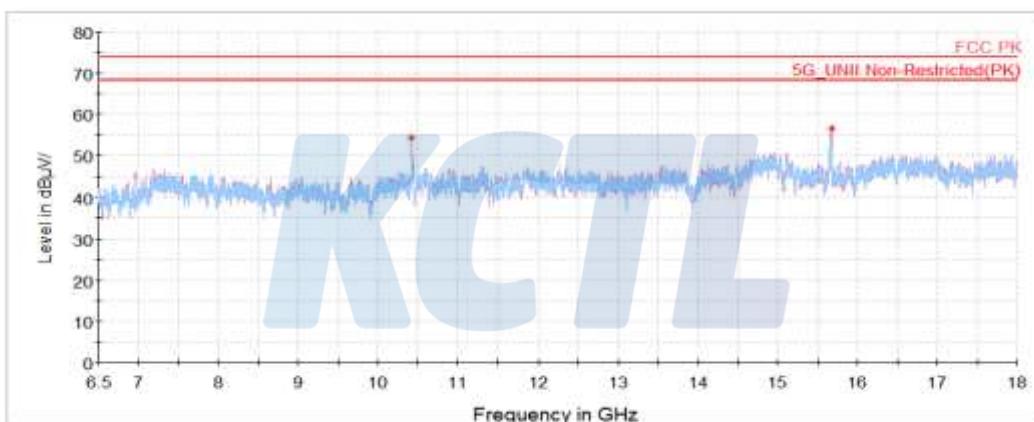
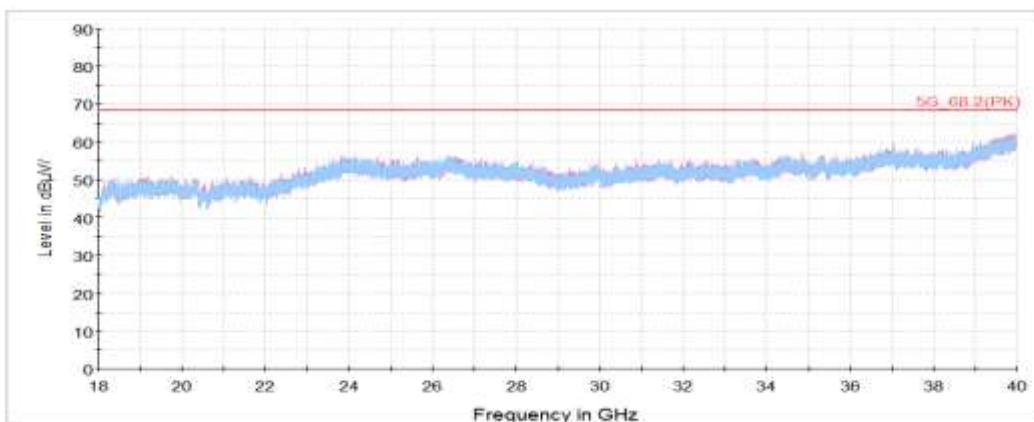
**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Middle Channel (5 220 MHz)**

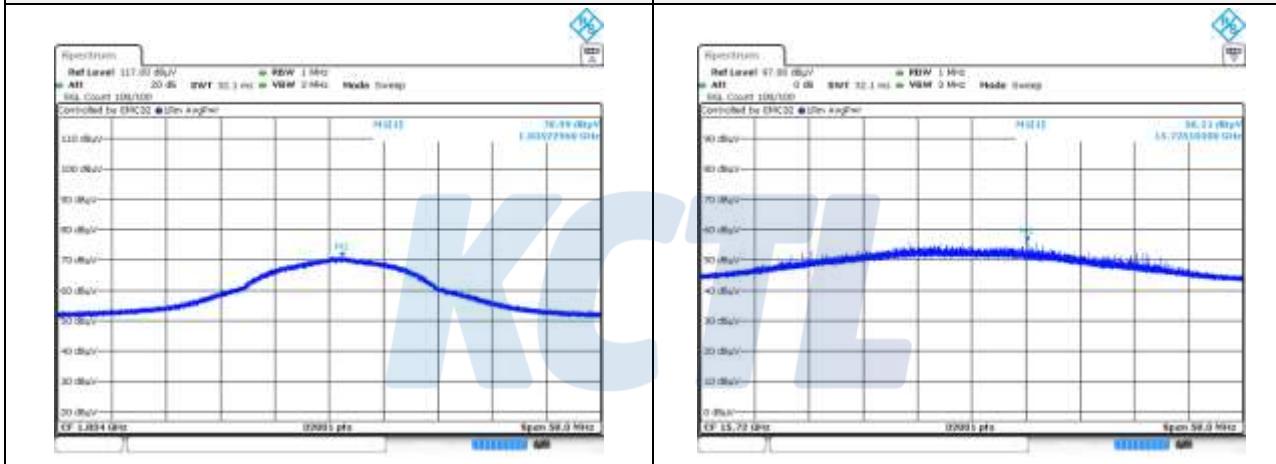
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 014.58 <sup>1)</sup>	V	78.20	27.81	-50.59	-	55.42	74.00	18.58
10 427.97	V	66.86	37.33	-49.98	-	54.21	68.20	13.99
15 662.48 <sup>1)</sup>	V	65.14	40.03	-48.63	-	56.54	74.00	17.46
<b>Average Data</b>								
1 014.58 <sup>1)</sup>	V	70.28	27.81	-50.59	-	47.50	54.00	6.50
15 662.48 <sup>1)</sup>	V	55.70	40.03	-48.63	-	47.10	54.00	6.90



**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Highest Channel (5 240 MHz)**

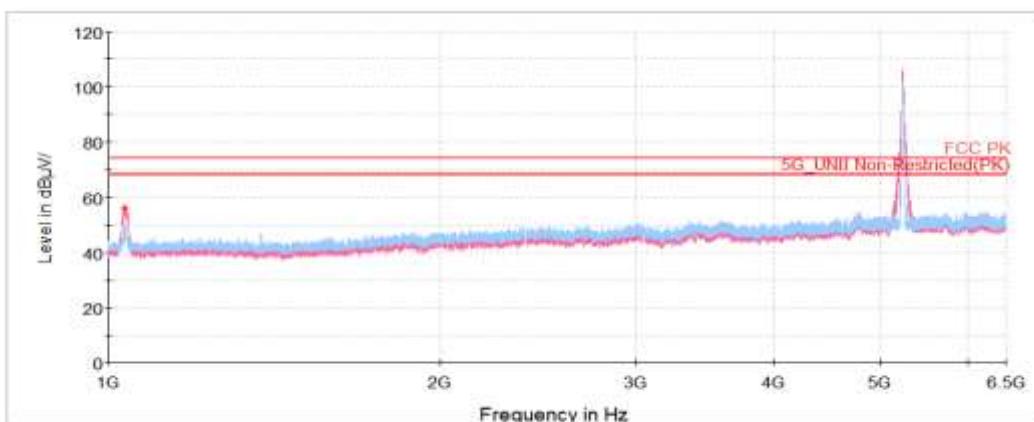
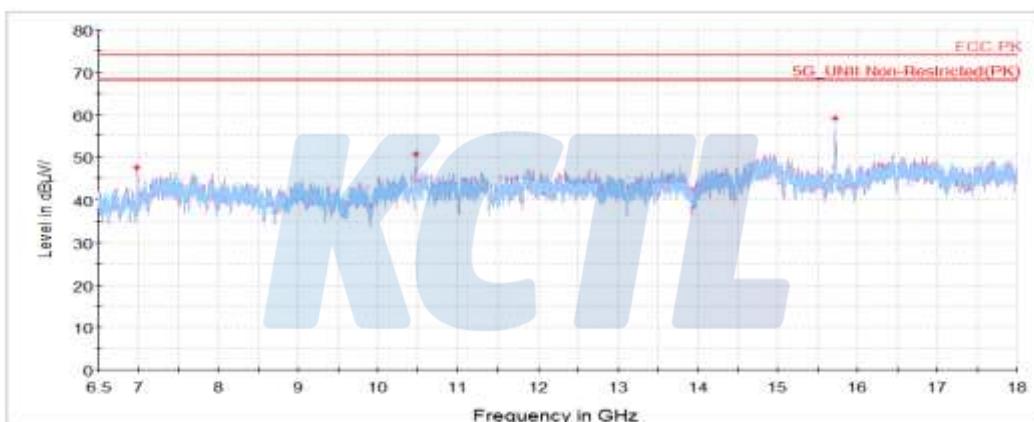
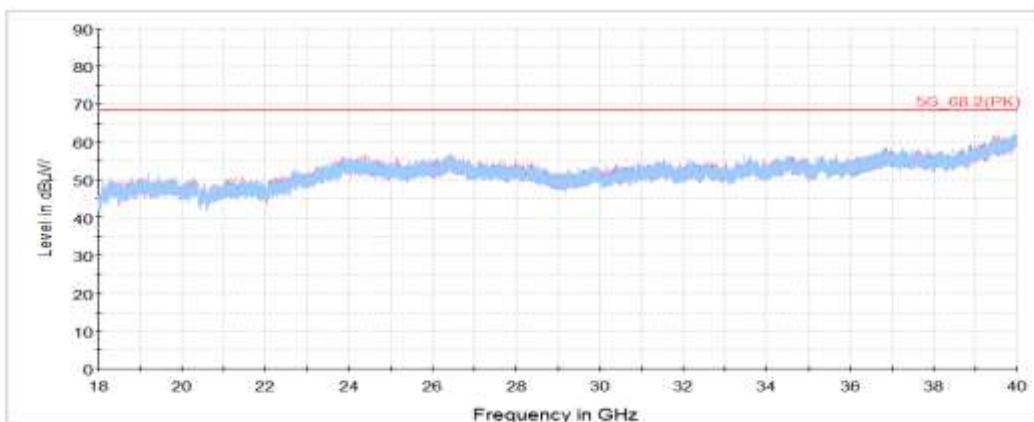
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 035.23 <sup>1)</sup>	V	78.53	27.81	-50.60	-	55.74	74.00	18.26
10 477.92	V	62.94	37.38	-49.75	-	50.57	68.20	17.63
15 725.10 <sup>1)</sup>	V	67.79	40.05	-48.67	-	59.17	74.00	14.83
<b>Average Data</b>								
1 035.23 <sup>1)</sup>	V	70.99	27.81	-50.60	-	48.20	54.00	5.80
15 725.10 <sup>1)</sup>	V	56.21	40.05	-48.67	-	47.59	54.00	6.41

**Average data (1 035.23 MHz)****Average data (15 725.10 MHz)**

**KCTL Inc.**

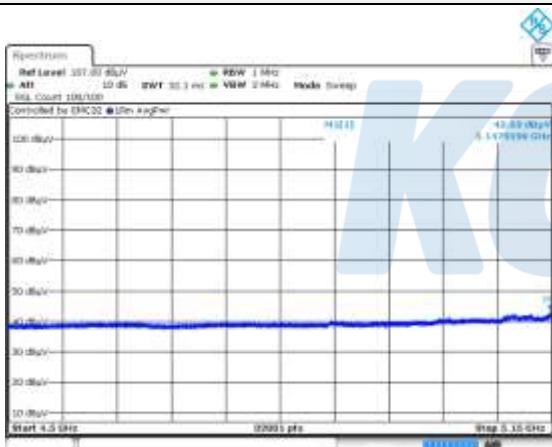
65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

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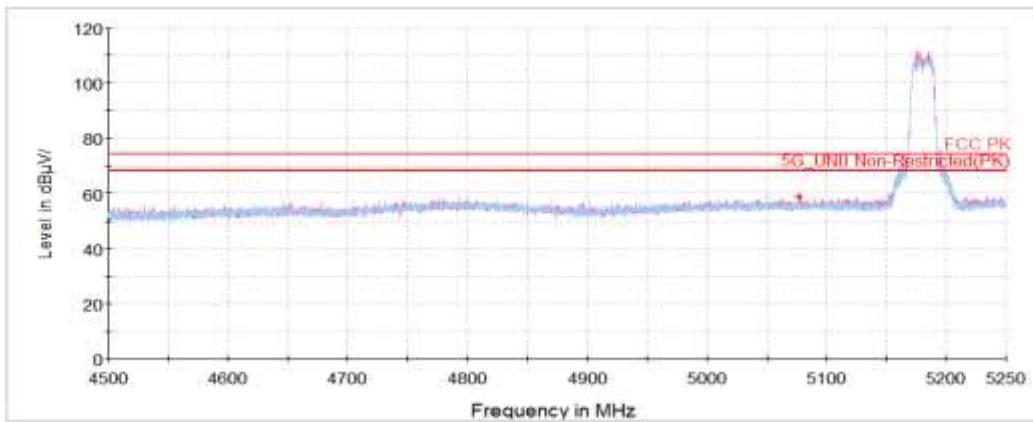
**KCTL****Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

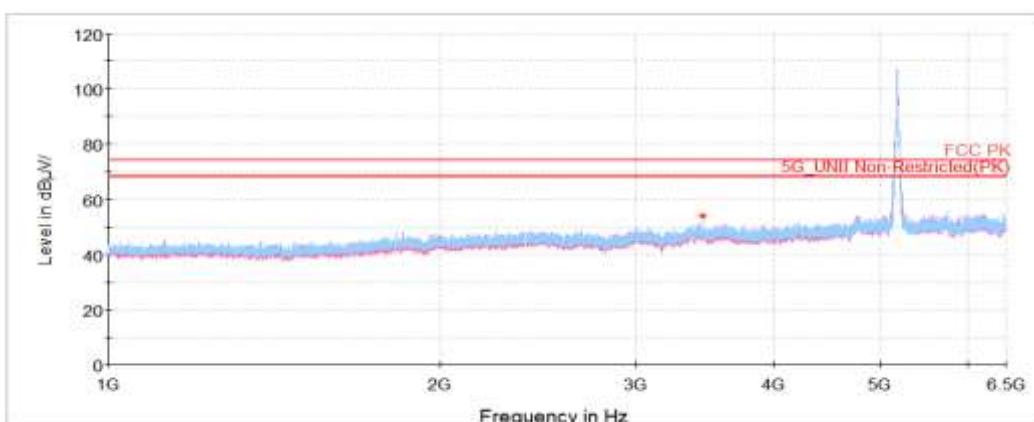
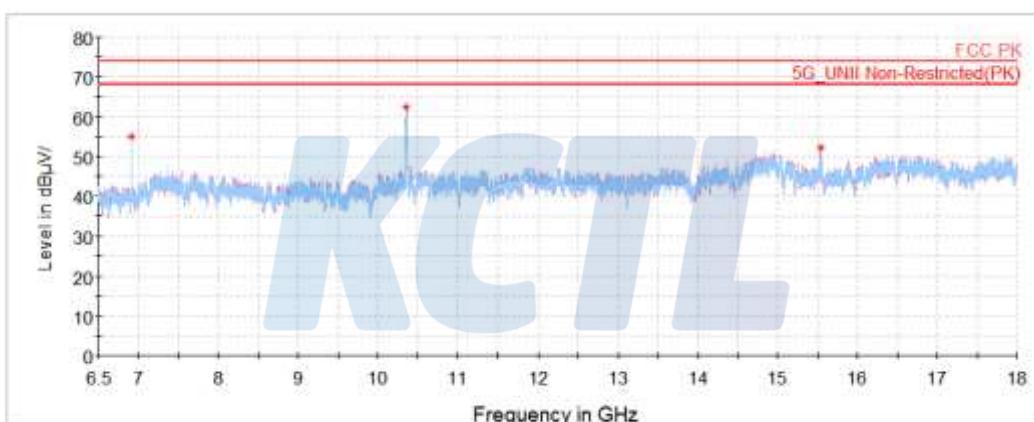
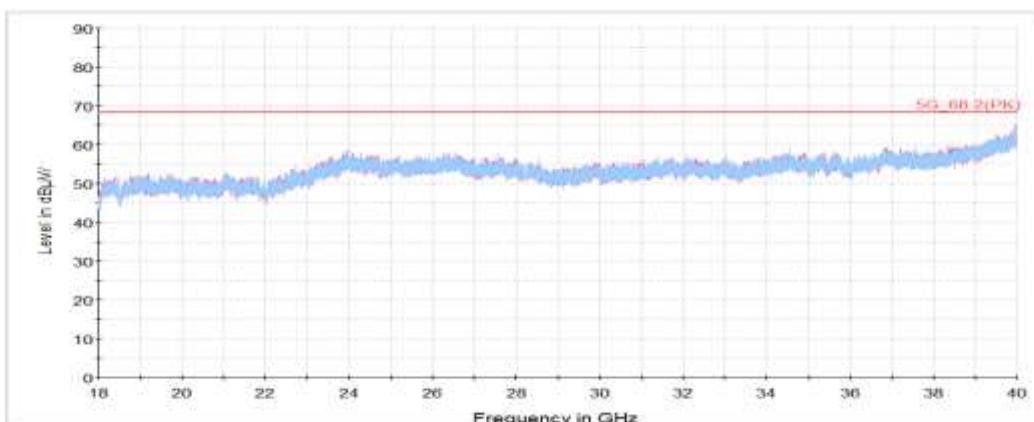
**802.11ac VHT20 UNII 1 4TX MIMO****Lowest Channel (5 180 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
3 453.34	H	67.37	32.59	-46.40	-	53.56	68.20	14.64
5 147.96 <sup>1)</sup>	V	51.50	34.24	-27.11	-	58.63	74.00	15.37
6 906.81	H	72.32	35.40	-52.89	-	54.83	68.20	13.37
10 360.05	V	75.46	37.26	-50.28	-	62.44	68.20	5.76
15 537.72 <sup>1)</sup>	H	60.56	40.01	-48.57	-	52.00	74.00	22.00
<b>Average Data</b>								
5 147.96 <sup>1)</sup>	V	43.69	34.24	-27.11	-	50.82	54.00	3.18

**Average data (5 147.96 MHz)**

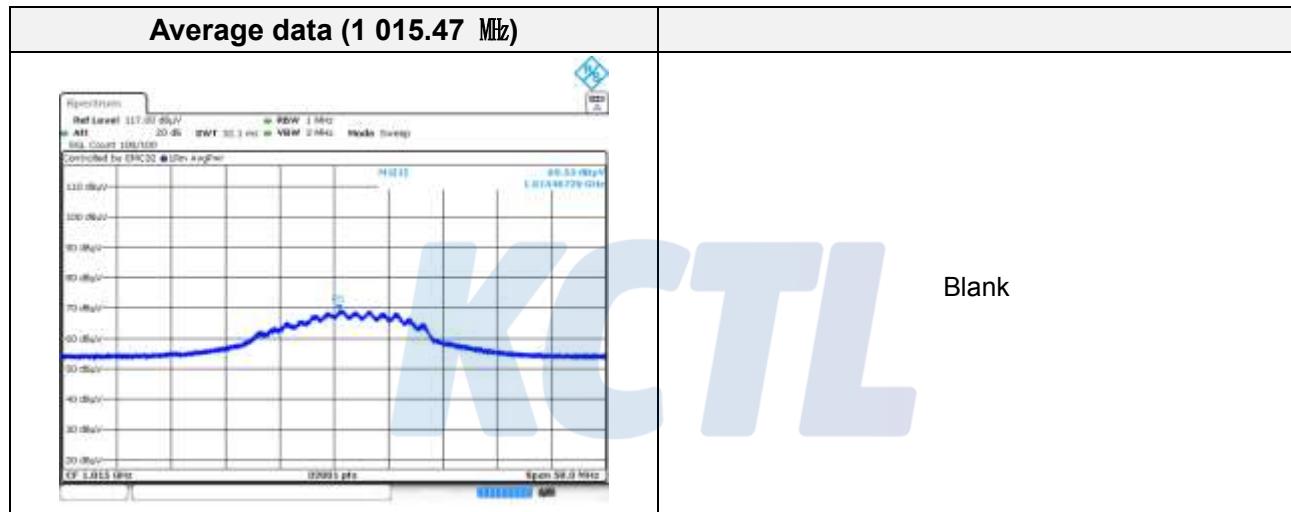
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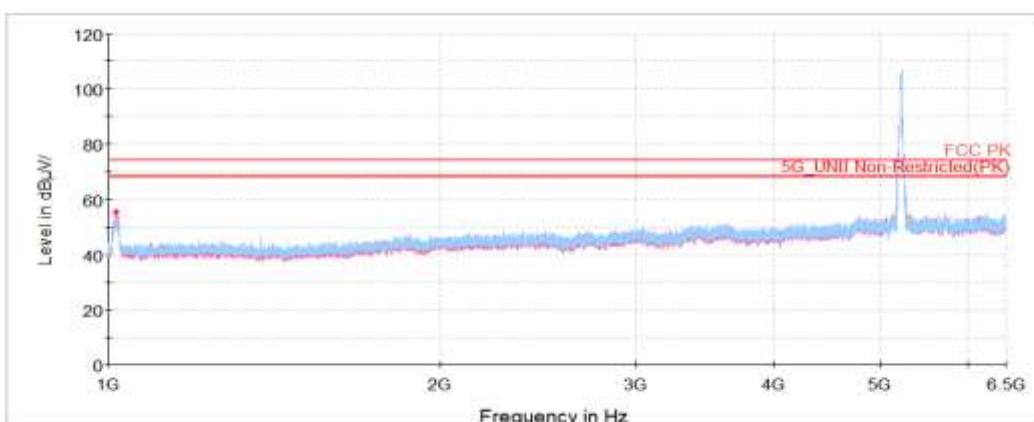
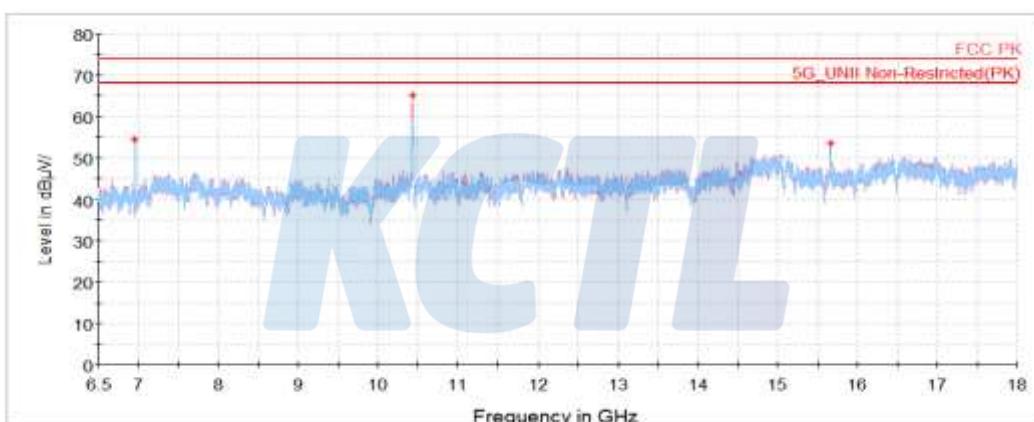
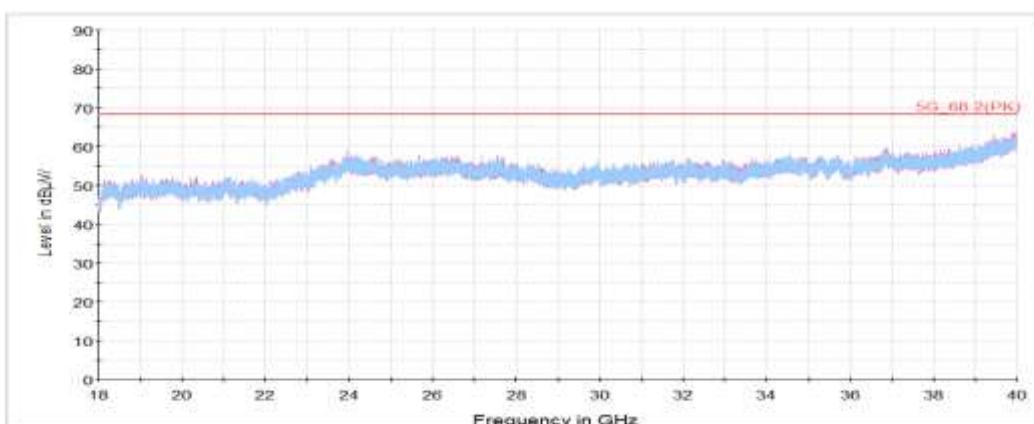
**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Middle Channel (5 220 MHz)**

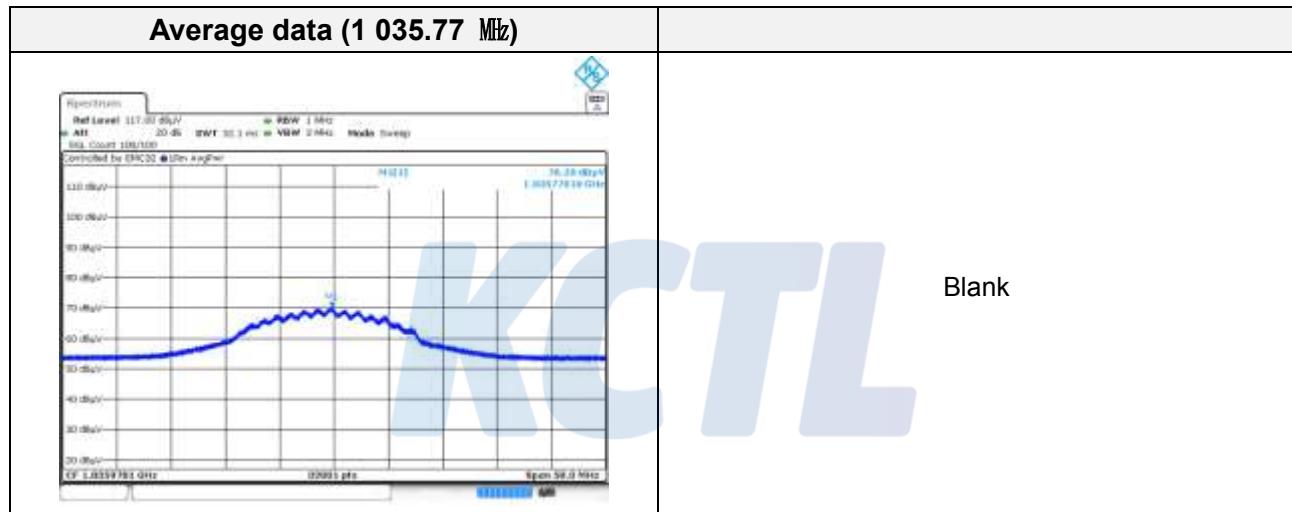
Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
1 015.47 <sup>1)</sup>	V	78.01	27.81	-50.59	-	55.23	74.00	18.77
6 959.64	H	71.65	35.40	-52.77	-	54.28	68.20	13.92
10 441.27	V	77.60	37.34	-49.92	-	65.02	68.20	3.18
15 661.91 <sup>1)</sup>	V	62.12	40.03	-48.63	-	53.52	74.00	20.48
<b>Average Data</b>								
1 015.47 <sup>1)</sup>	V	69.53	27.81	-50.59	-	46.75	54.00	7.25

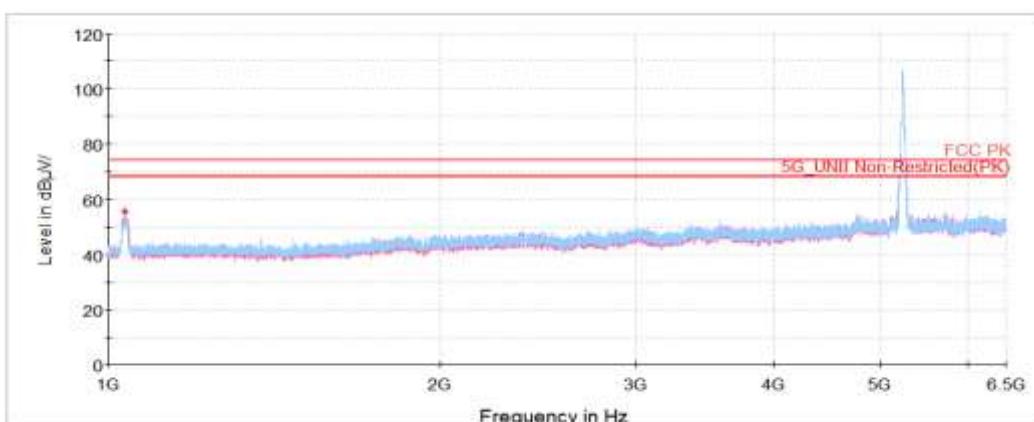
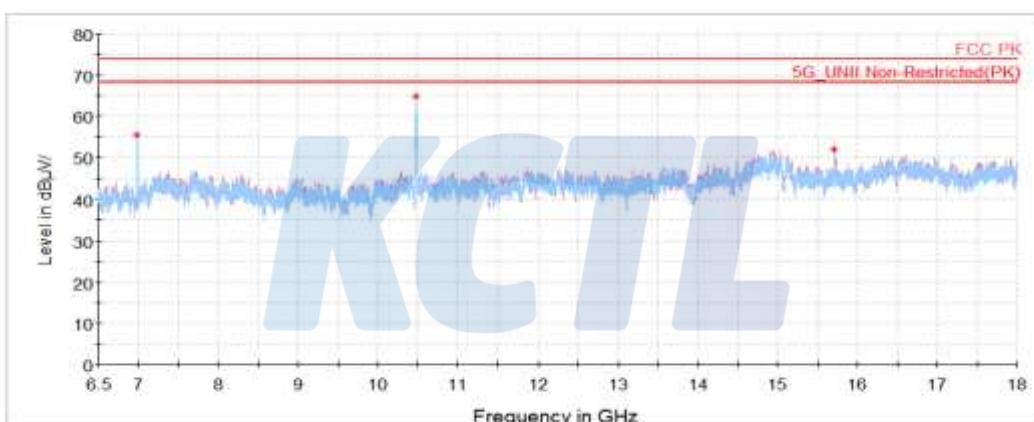
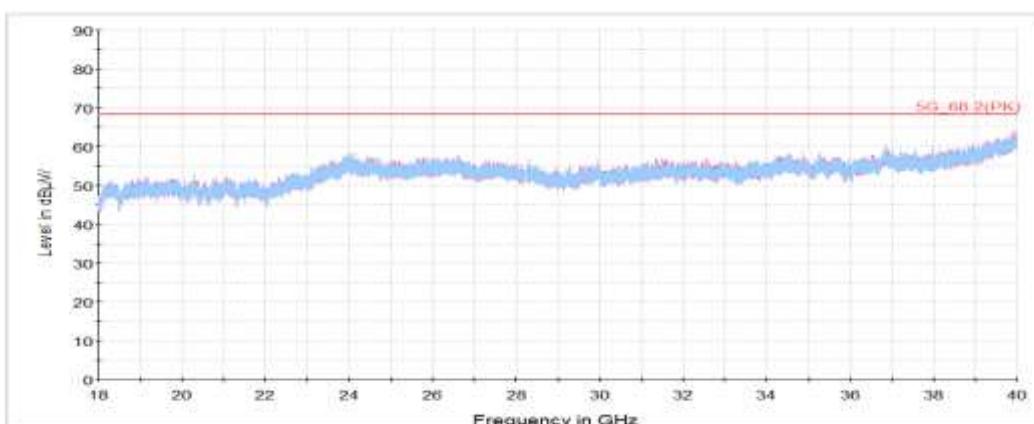
**Average data (1 015.47 MHz)**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**Highest Channel (5 240 MHz)**

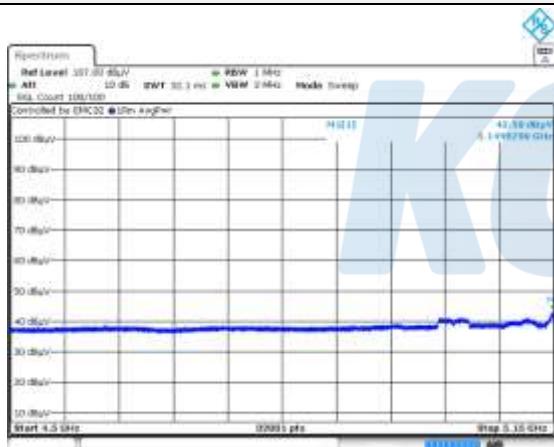
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
1 035.77 <sup>1)</sup>	H	78.13	27.81	-50.60	-	55.34	74.00	18.66
6 986.59	H	72.71	35.40	-52.71	-	55.40	68.20	12.80
10 477.92	H	77.23	37.38	-49.75	-	64.86	68.20	3.34
15 716.78 <sup>1)</sup>	H	60.56	40.04	-48.66	-	51.94	74.00	22.06
<b>Average Data</b>								
1 035.77 <sup>1)</sup>	V	70.20	27.81	-50.60	-	47.41	54.00	6.59

**Average data (1 035.77 MHz)**

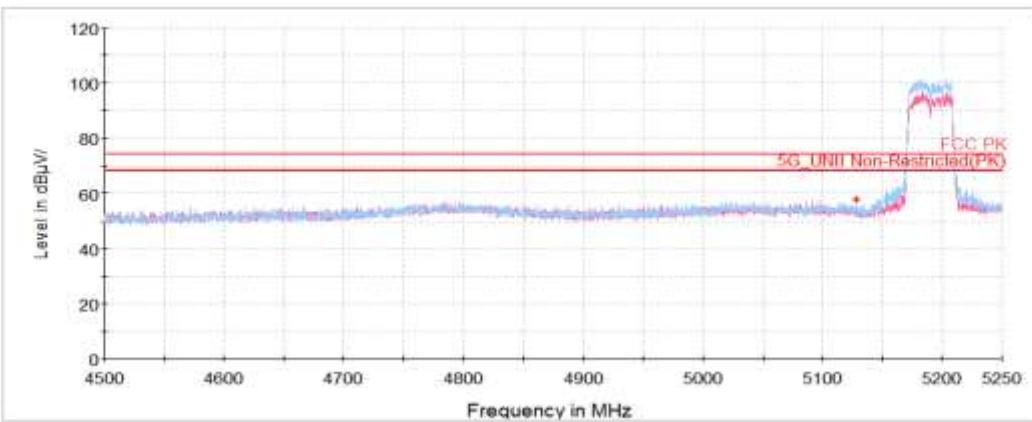
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

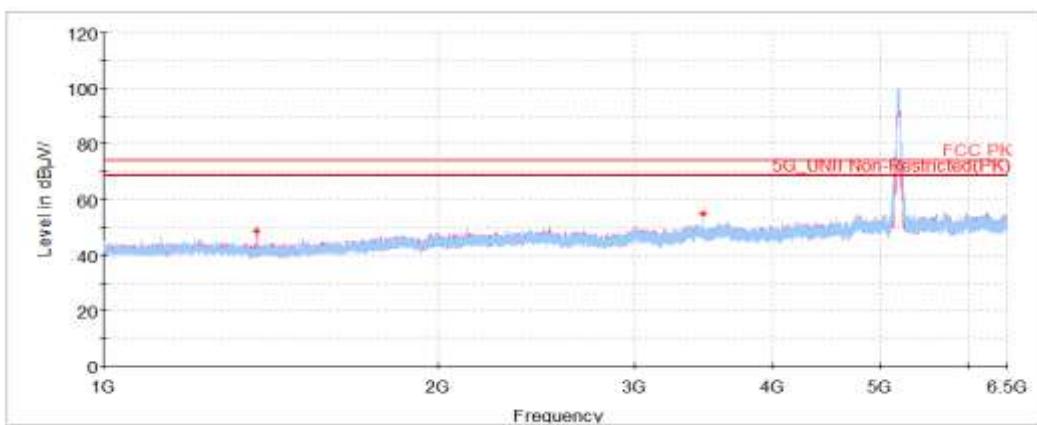
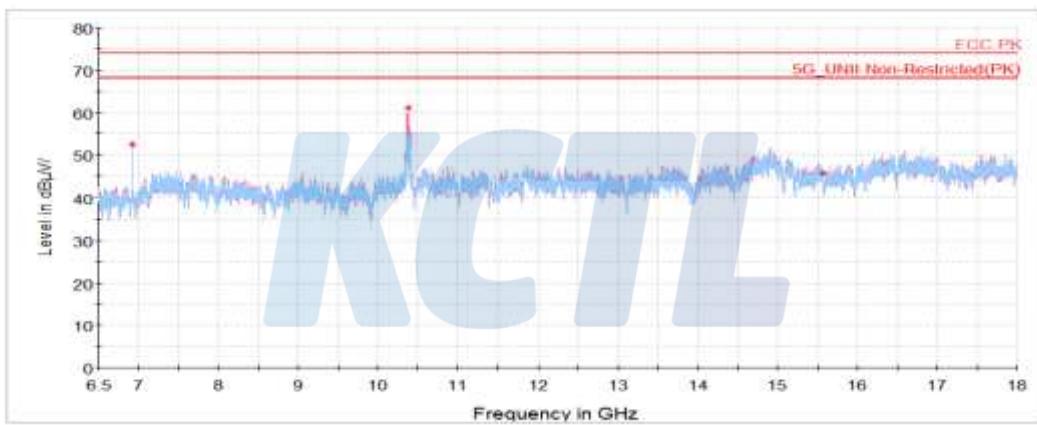
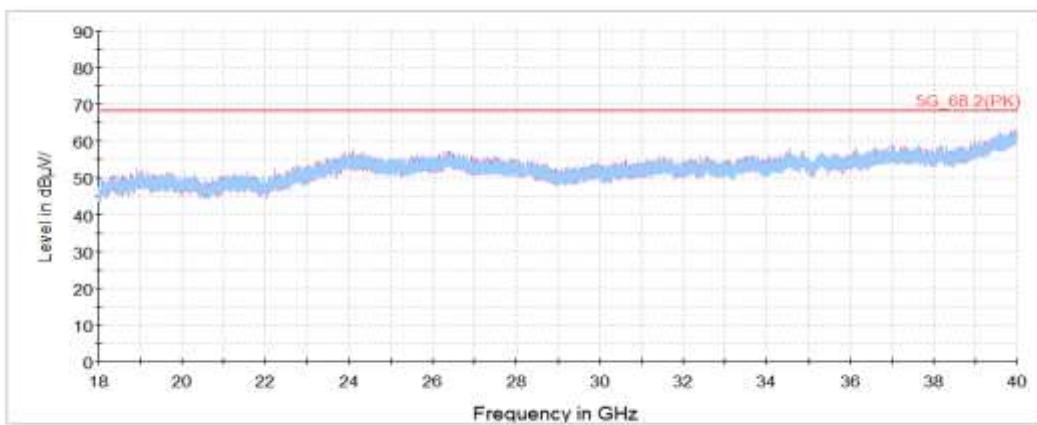
**802.11ac VHT40 UNII 1 ANT 0****Lowest Channel (5 190 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 458.67	H	68.55	32.59	-46.51	-	54.63	68.20	13.57
5 149.93 <sup>1)</sup>	H	50.54	34.24	-27.12	-	57.66	74.00	16.34
6 919.75	H	69.90	35.40	-52.86	-	52.44	68.20	15.76
10 380.17	H	73.99	37.28	-50.19	-	61.08	68.20	7.12
15 566.67 <sup>1)</sup>	V	54.15	40.01	-48.58	-	45.58	74.00	28.42
<b>Average Data</b>								
5 149.93 <sup>1)</sup>	H	43.58	34.24	-27.12	0.13	50.83	54.00	3.17

**Average data (5 149.93 MHz)**

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**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

65, Sinwon-ro, Yeongtong-gu,  
 Suwon-si, Gyeonggi-do, 16677, Korea  
 TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

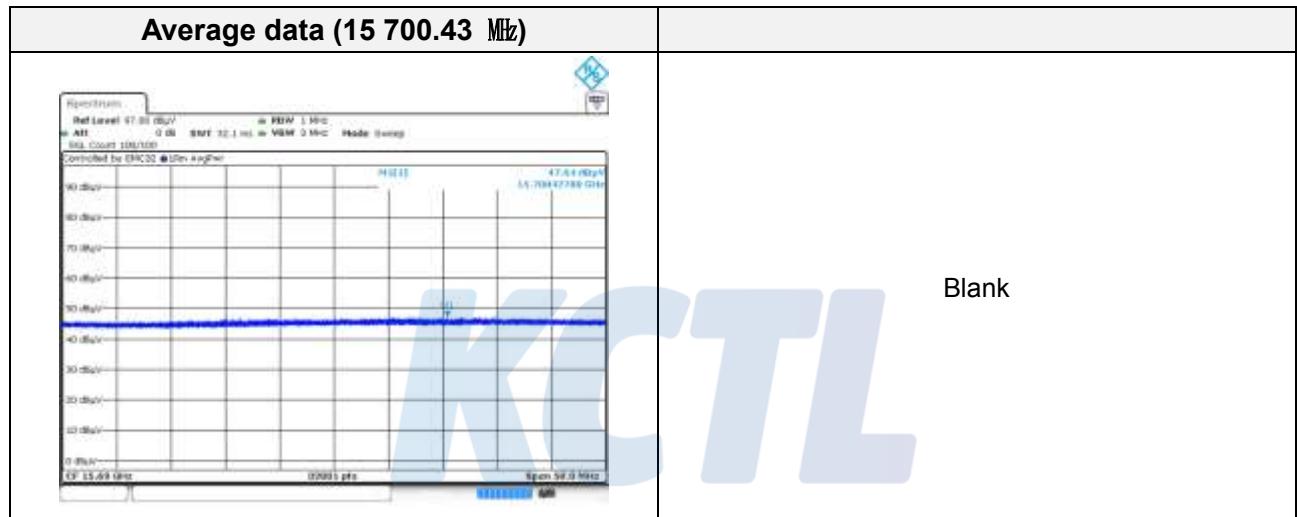
Report No.:

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**Highest Channel (5 230 MHz)**

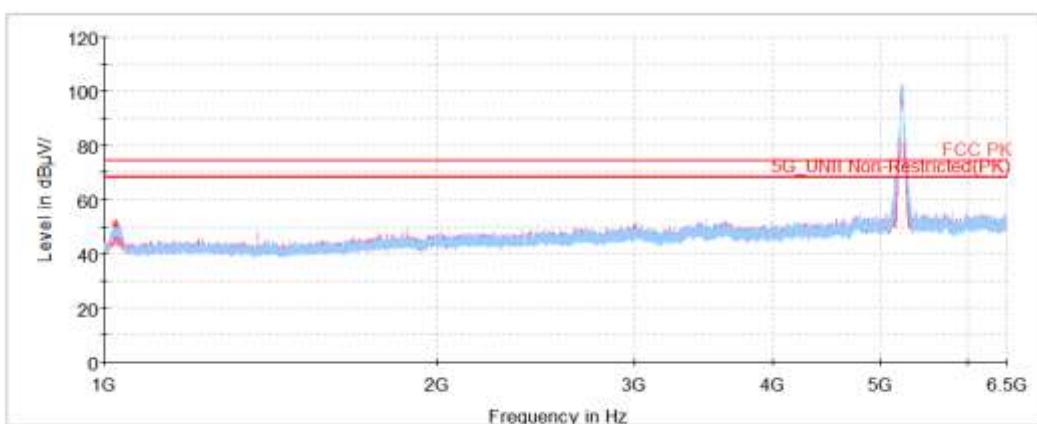
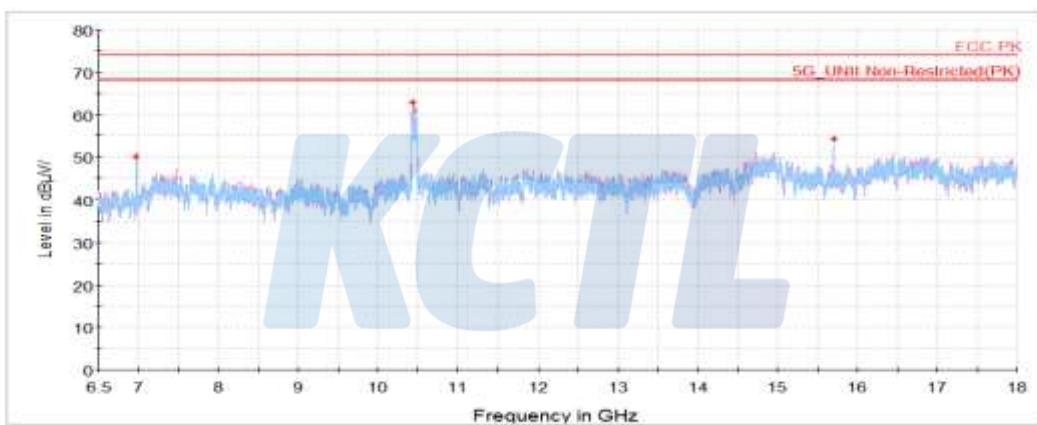
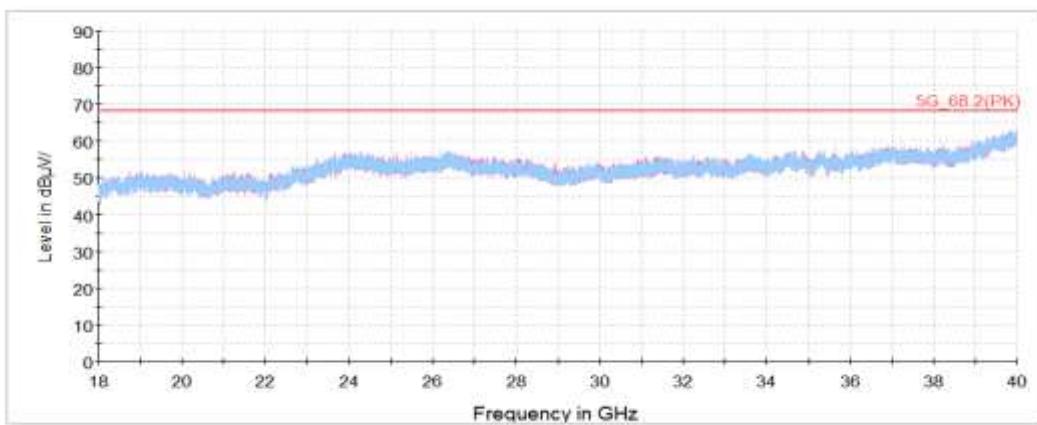
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(µV))	(dB)	(dB)	(dB)	(dB(µV/m))	(dB(µV/m))	(dB)
<b>Peak data</b>								
6 973.30	H	67.42	35.40	-52.74	-	50.08	68.20	18.12
10 440.19	V	75.45	37.34	-49.92	-	62.87	68.20	5.33
15 700.43 <sup>1)</sup>	H	62.88	40.04	-48.65	-	54.27	74.00	19.73
<b>Average Data</b>								
15 700.43 <sup>1)</sup>	V	47.64	40.04	-48.65	0.13	39.16	54.00	14.84

**Average data (15 700.43 MHz)**

**KCTL Inc.**

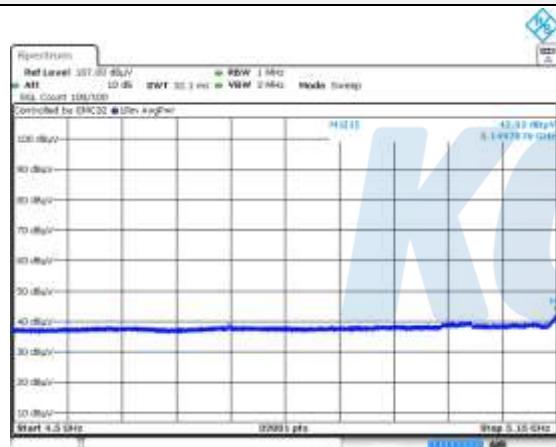
65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

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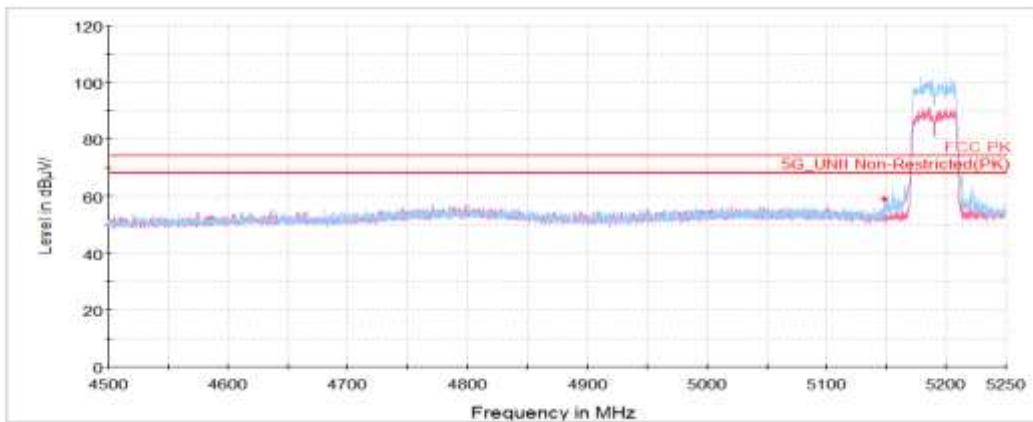
**KCTL****Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

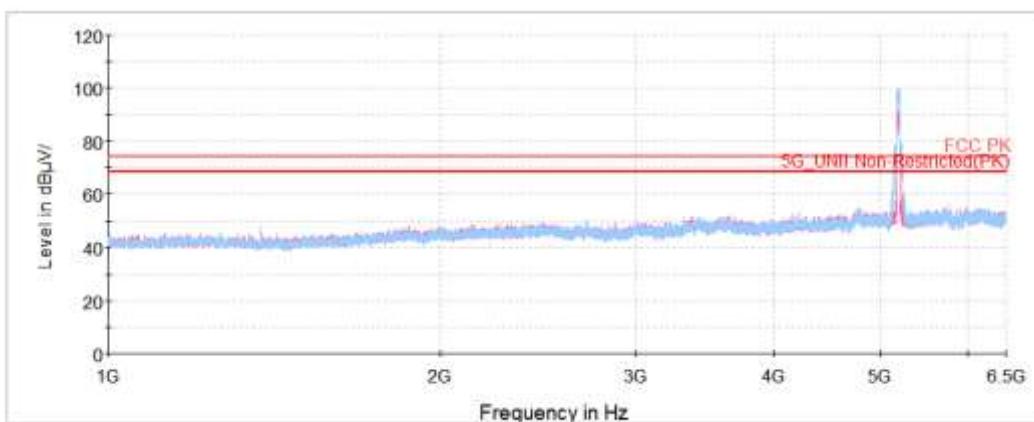
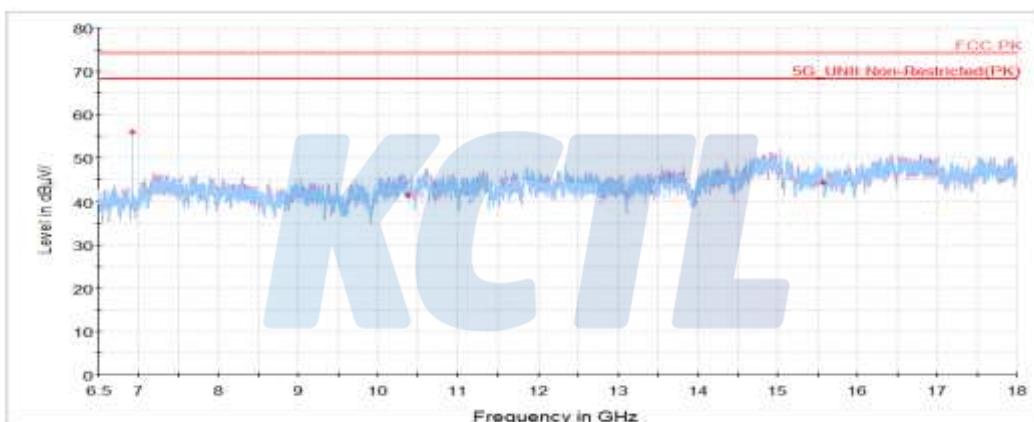
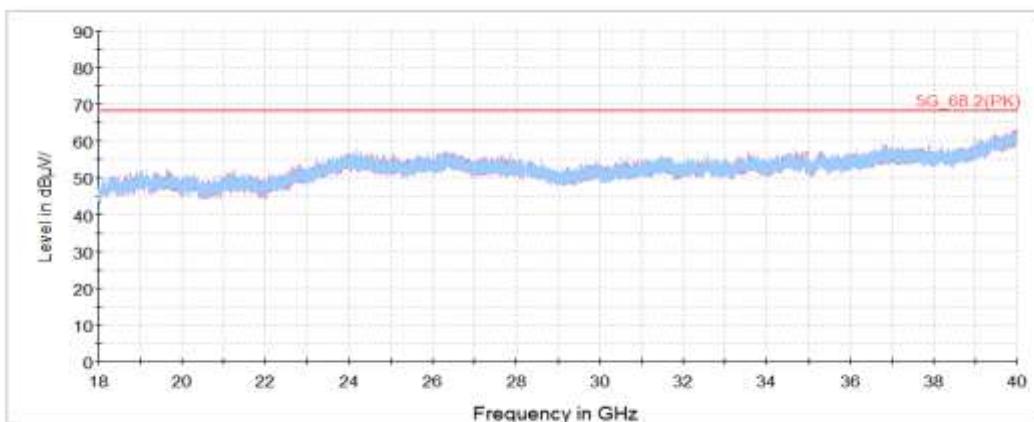
**802.11ac VHT40 UNII 1 ANT 1****Lowest Channel (5 190 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB( $\mu$ V))	(dB)	(dB)	(dB)	(dB( $\mu$ V/m))	(dB( $\mu$ V/m))	(dB)
<b>Peak data</b>								
5 148.57 <sup>1)</sup>	H	51.71	34.24	-27.11	-	58.84	74.00	15.16
6 920.11	H	73.44	35.40	-52.86	-	55.98	68.20	12.22
10 380.53	H	54.34	37.28	-50.19	-	41.43	68.20	26.77
15 570.98 <sup>1)</sup>	V	52.78	40.01	-48.58	-	44.21	74.00	29.79
<b>Average Data</b>								
5 148.57 <sup>1)</sup>	H	43.02	34.24	-27.11	0.13	50.28	54.00	3.72

**Average data (5 148.57 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**KCTL Inc.**

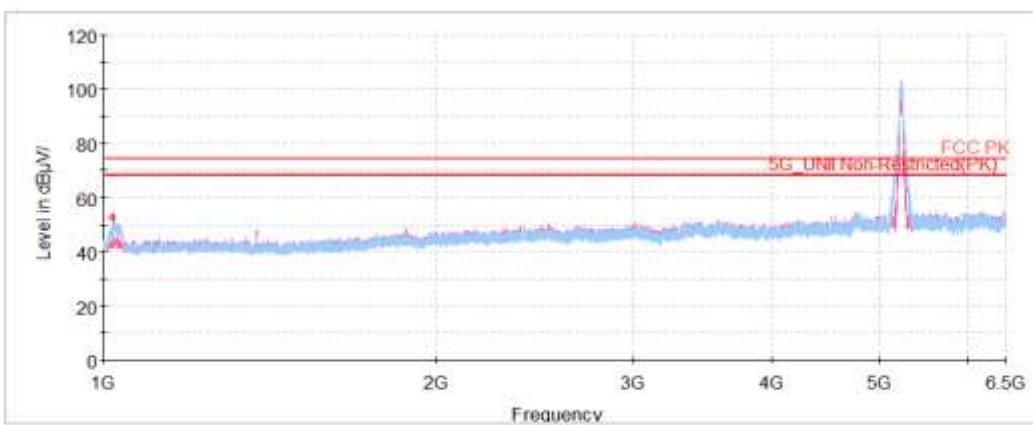
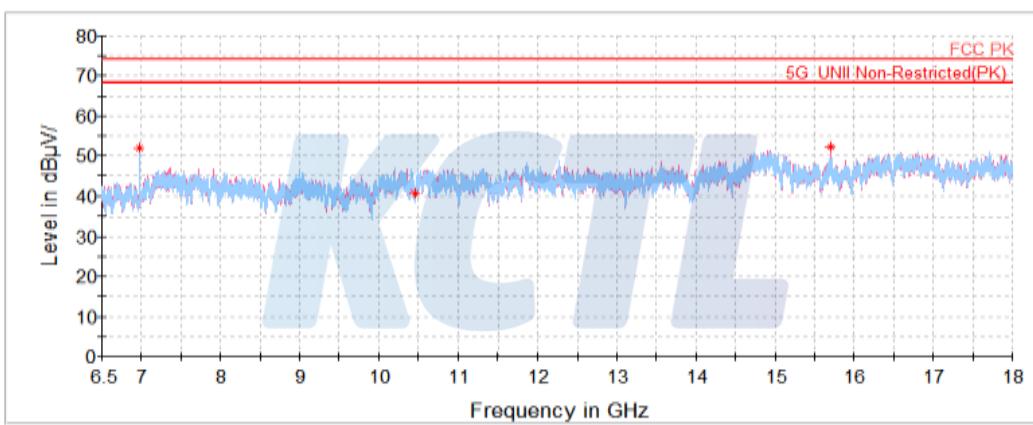
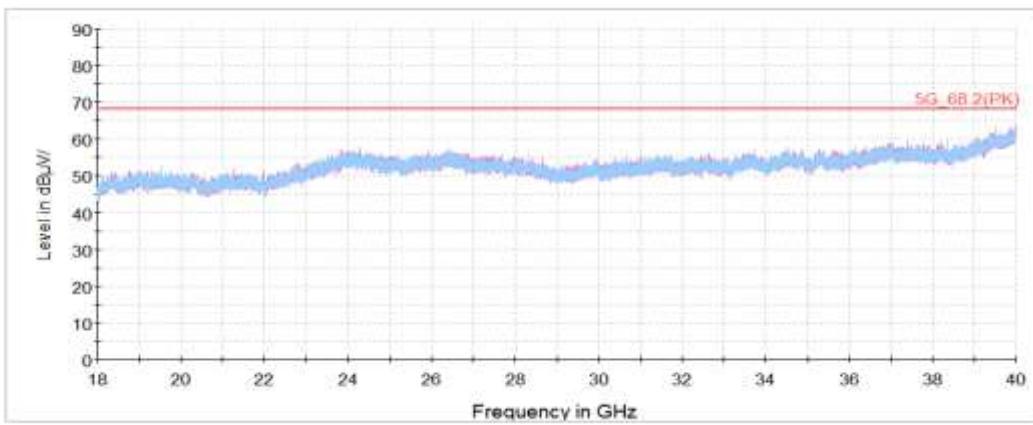
65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
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**Highest Channel (5 230 MHz)**

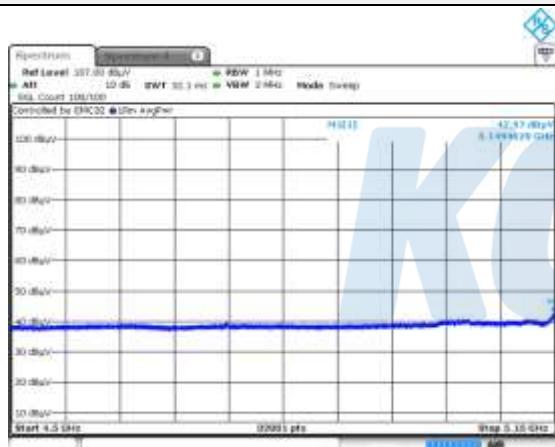
Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
6 973.30	H	69.14	35.40	-52.74	-	51.80	68.20	16.40
10 461.39	H	53.04	37.36	-49.83	-	40.57	68.20	27.63
15 703.48 <sup>1)</sup>	V	60.86	40.04	-48.66	-	52.24	74.00	21.76
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								



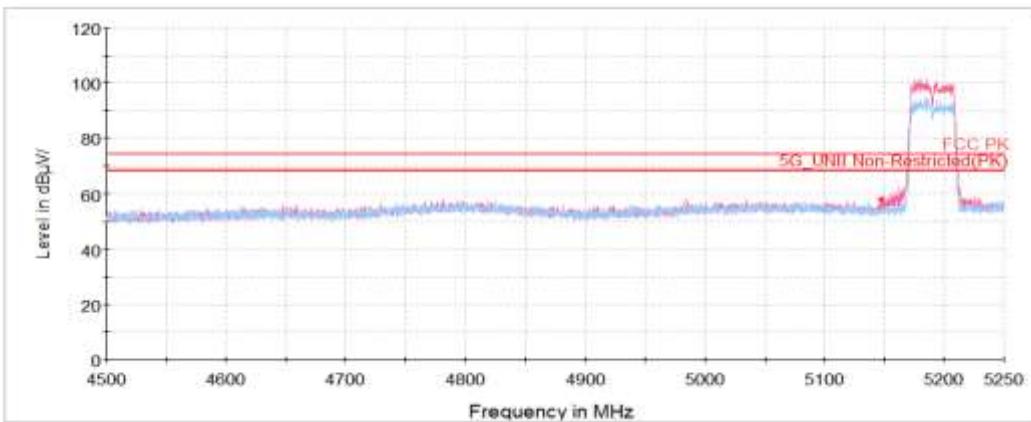
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

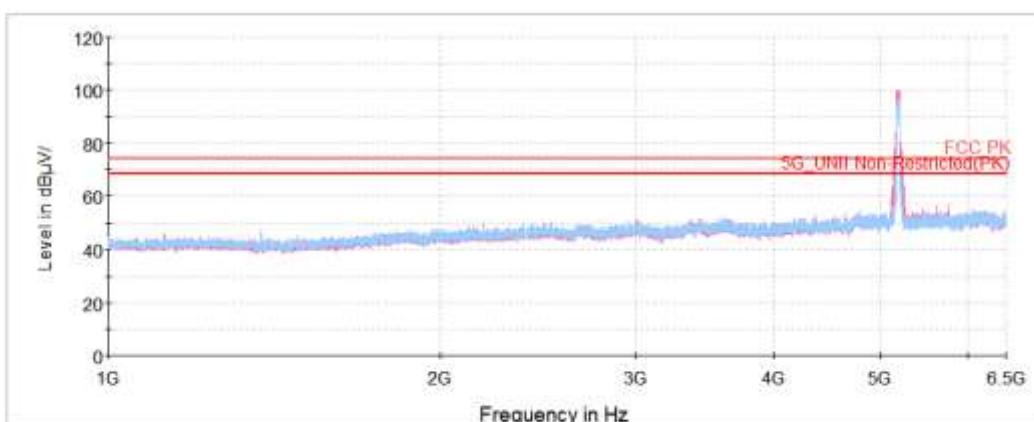
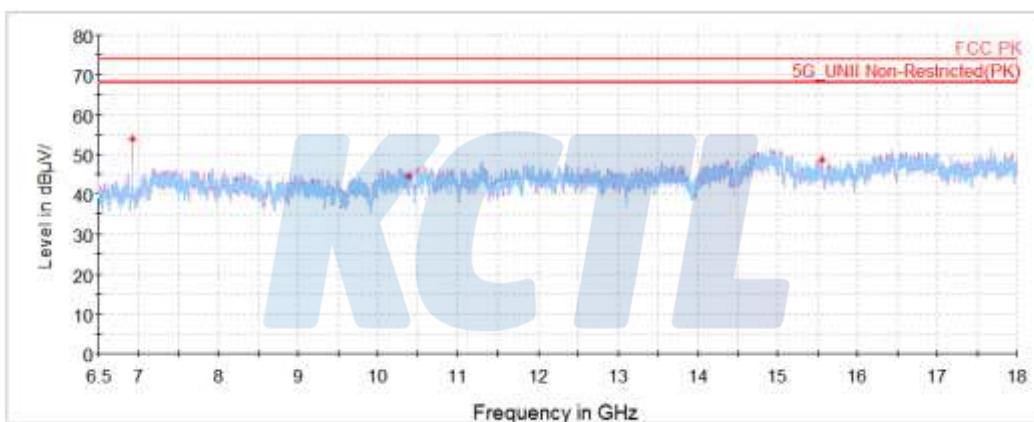
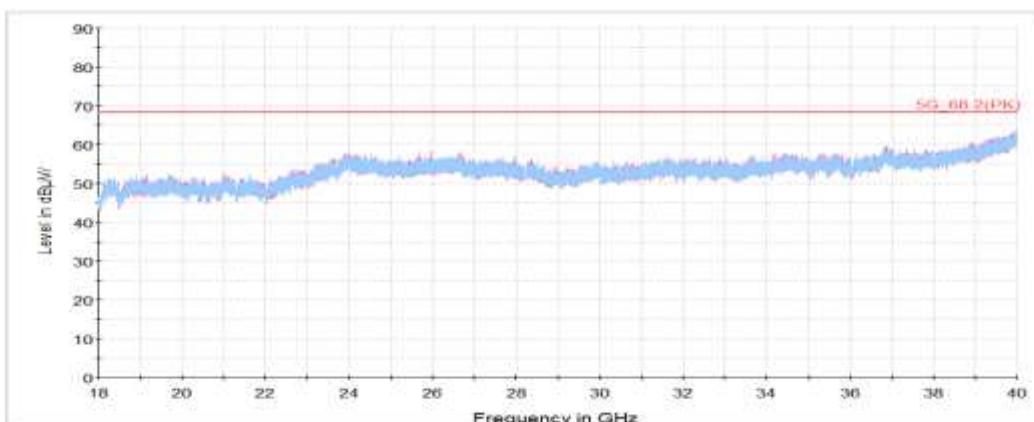
**802.11ac VHT40 UNII 1 ANT 2****Lowest Channel (5 190 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(µV))	(dB)	(dB)	(dB)	(dB(µV/m))	(dB(µV/m))	(dB)
<b>Peak data</b>								
5 149.46 <sup>1)</sup>	V	50.65	34.24	-27.12	-	57.77	74.00	16.23
6 919.75	V	71.25	35.40	-52.86	-	53.79	68.20	14.41
10 381.25	V	57.38	37.28	-50.19	-	44.47	68.20	23.73
15 558.77 <sup>1)</sup>	V	57.09	40.01	-48.58	-	48.52	74.00	25.48
<b>Average Data</b>								
5 149.46 <sup>1)</sup>	V	42.97	34.24	-27.12	0.13	50.22	54.00	3.78

**Average data (5 149.46 MHz)**

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**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

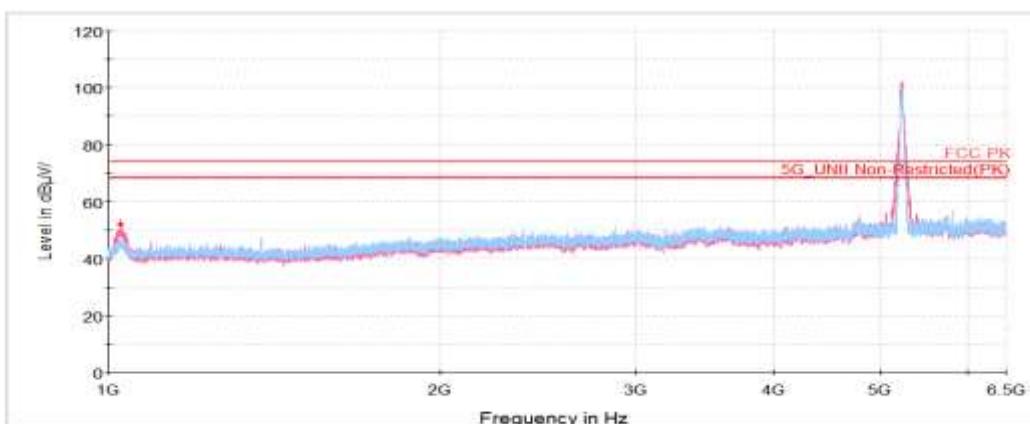
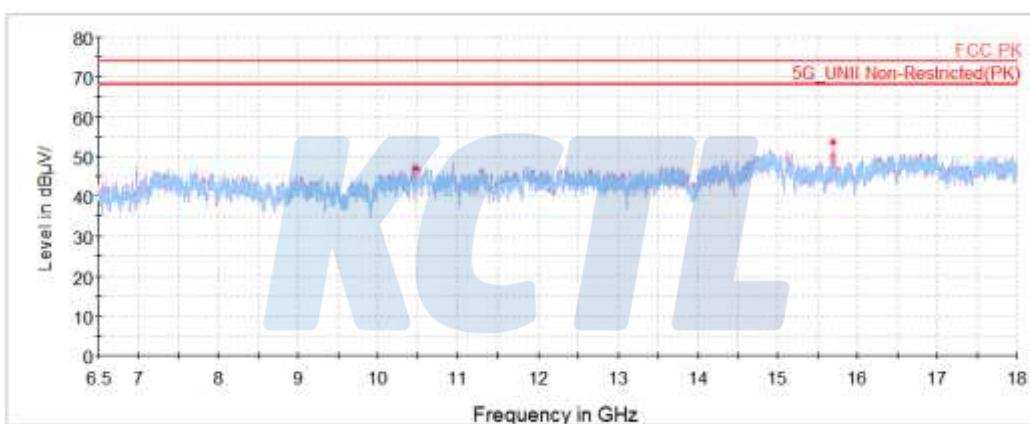
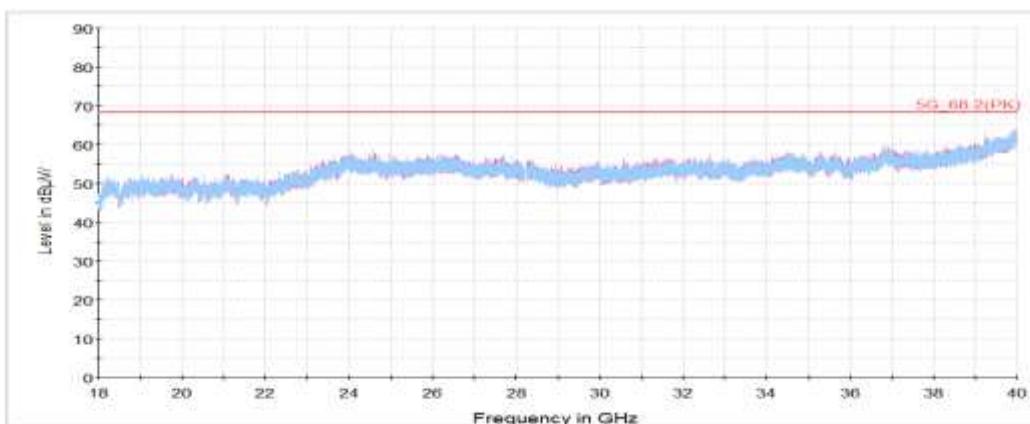
**KCTL Inc.**

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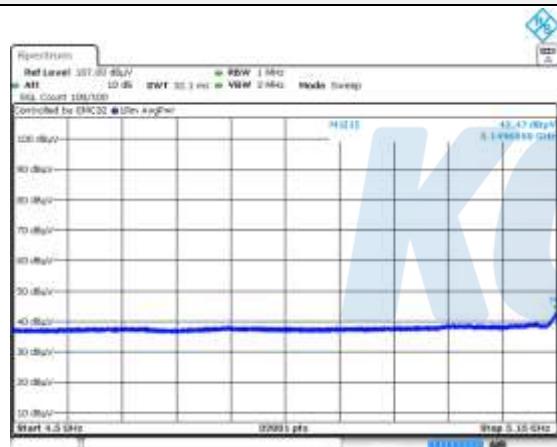
**Highest Channel (5 230 MHz)**

Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
10 483.67	V	59.15	37.38	-49.73	-	46.80	68.20	21.40
15 698.60 <sup>1)</sup>	V	62.06	40.04	-48.65	-	53.45	74.00	20.55
<b>Average Data</b>								
No spurious emissions were detected within 20 dB of the limit.								

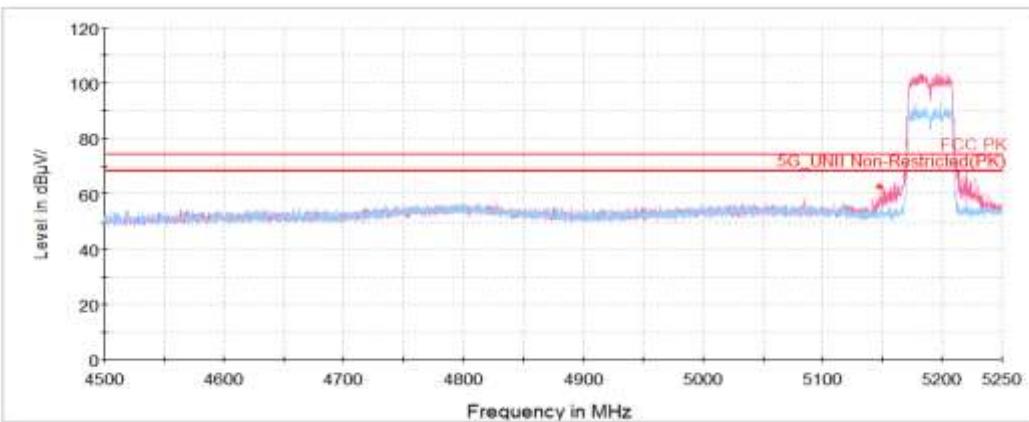
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

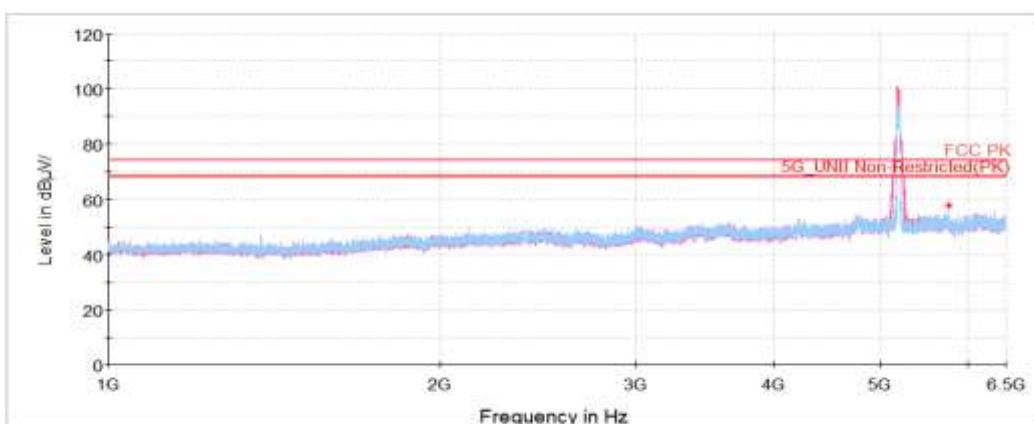
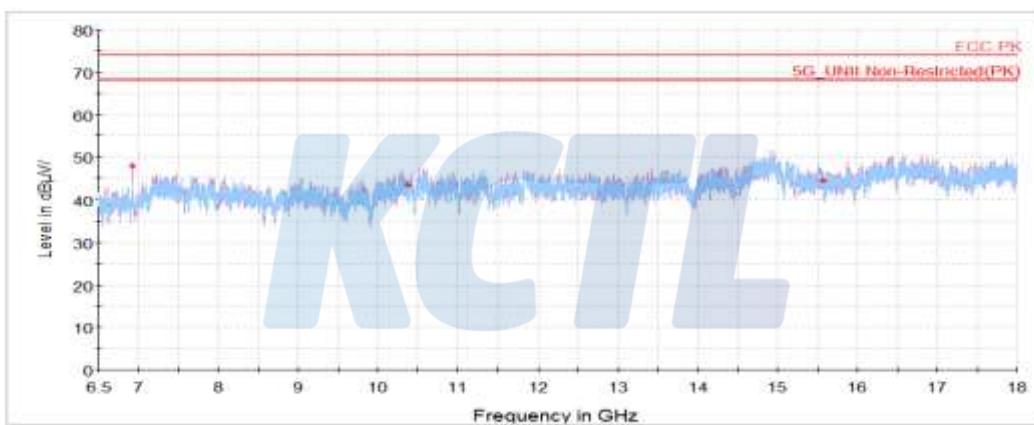
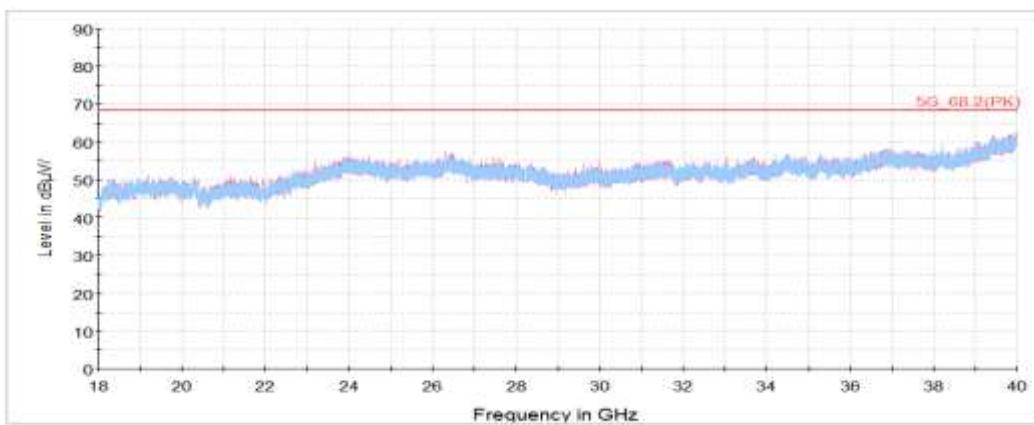
**802.11ac VHT40 UNII 1 ANT 3****Lowest Channel (5 190 MHz)**

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(µV))	(dB)	(dB)	(dB)	(dB(µV/m))	(dB(µV/m))	(dB)
<b>Peak data</b>								
5 149.69 <sup>1)</sup>	V	55.46	34.24	-27.12	-	62.58	74.00	11.42
5 766.61	V	67.42	35.12	-44.95	-	57.59	68.20	10.61
10 376.94	H	56.28	37.28	-50.21	-	43.35	68.20	24.85
15 568.83 <sup>1)</sup>	H	53.04	40.01	-48.58	-	44.47	74.00	29.53
<b>Average Data</b>								
5 149.69 <sup>1)</sup>	V	43.47	34.24	-27.12	0.13	50.72	54.00	3.28

**Average data (5 149.69 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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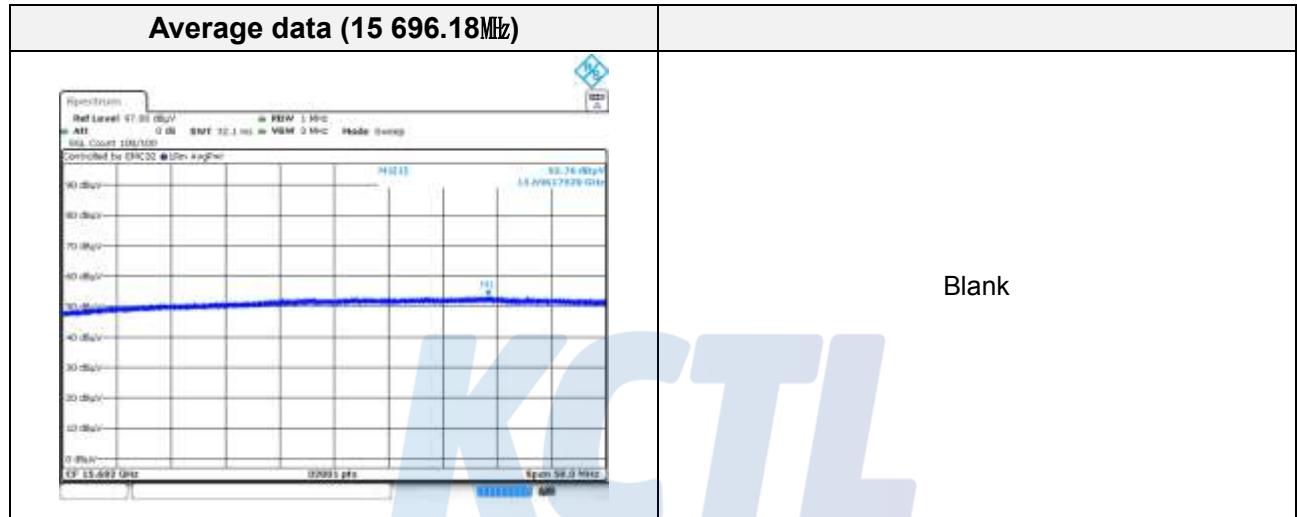
Report No.:

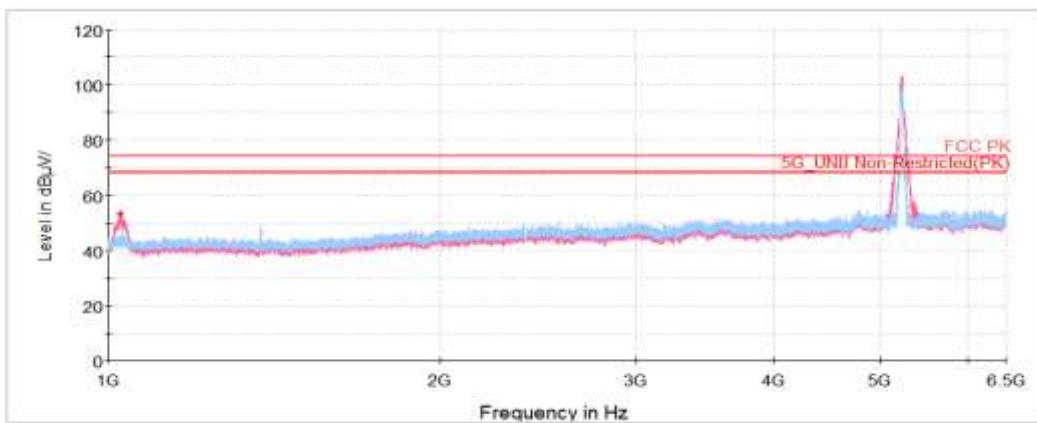
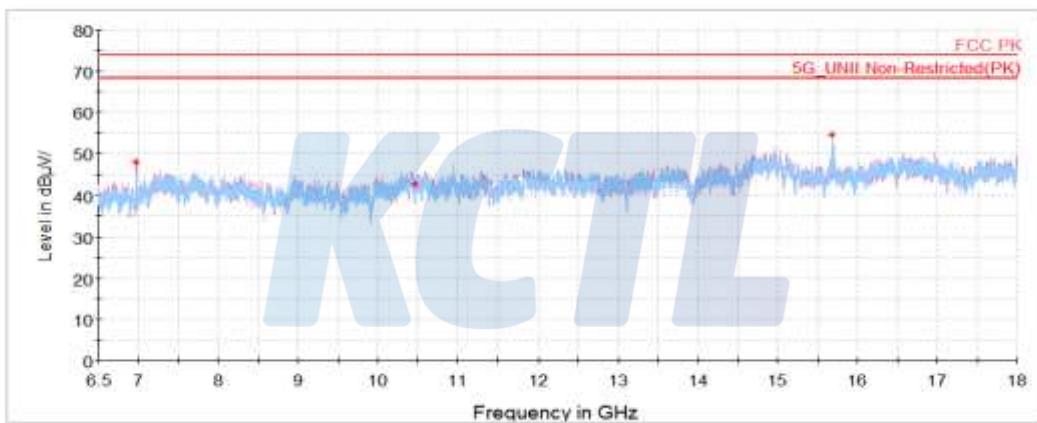
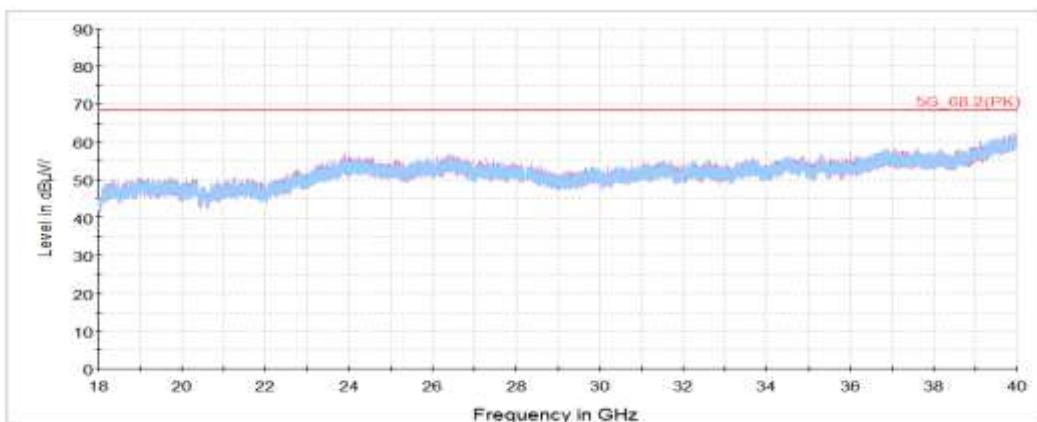
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**Highest Channel (5 230 MHz)**

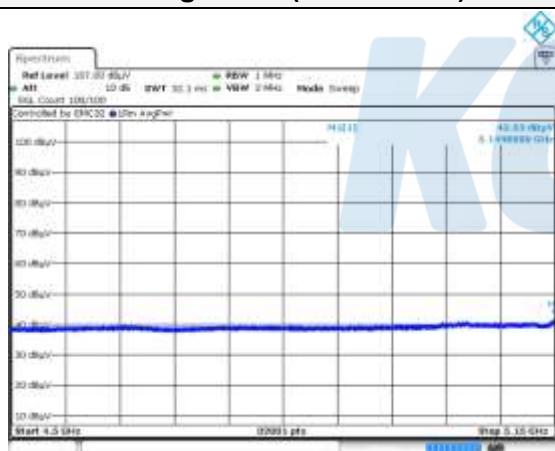
Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
10 460.67	H	55.04	37.36	-49.83	-	42.57	68.20	25.63
15 696.18 <sup>1)</sup>	H	63.04	40.04	-48.65	-	54.43	74.00	19.57
<b>Average Data</b>								
15 696.18 <sup>1)</sup>	H	53.76	40.04	-48.65	0.13	45.28	54.00	8.72

**Average data (15 696.18MHz)**

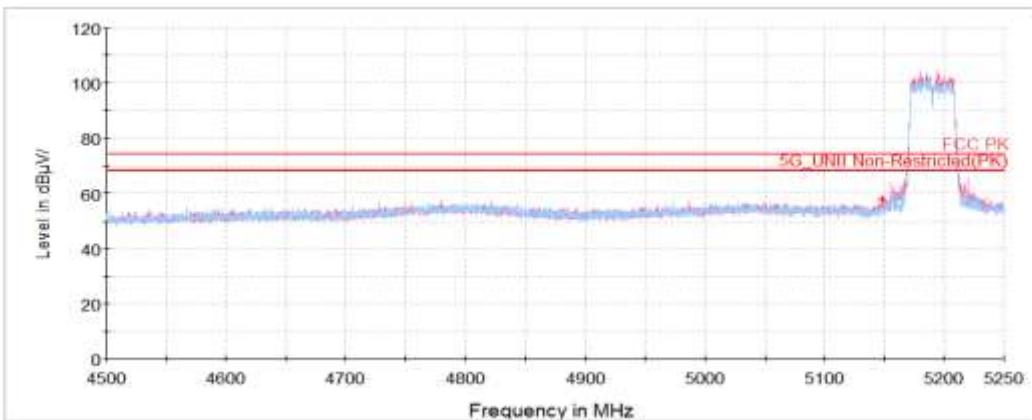
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

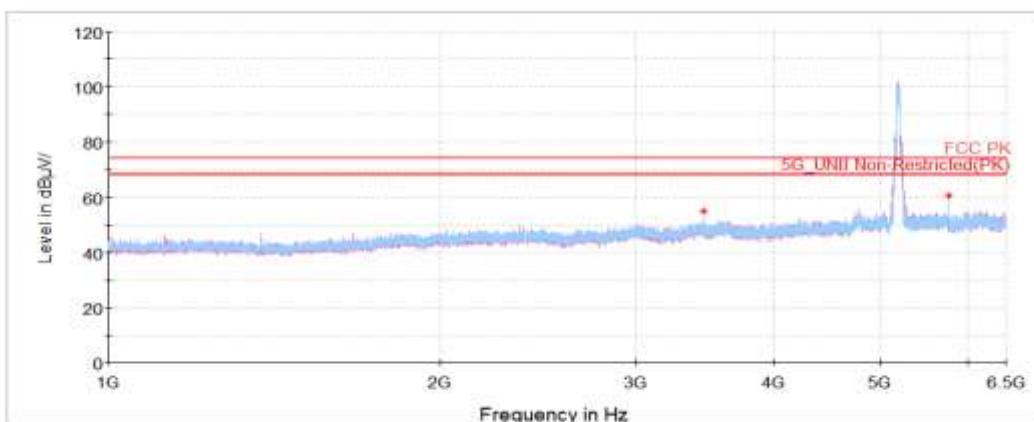
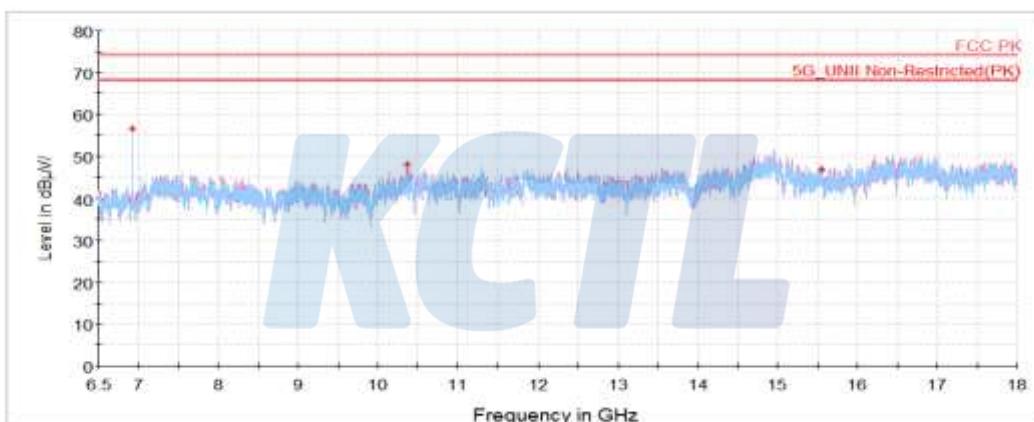
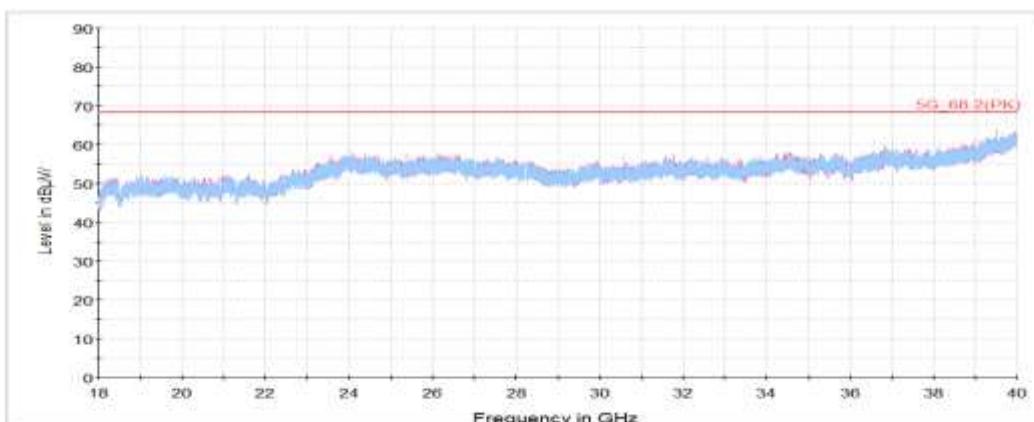
**802.11ac VHT40 UNII 1 4TX MIMO****Lowest Channel (5 190 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 460.39	H	68.66	32.59	-46.54	-	54.71	68.20	13.49
5 149.89 <sup>1)</sup>	V	50.55	34.24	-27.12	-	57.67	74.00	16.33
5 766.95	H	70.35	35.12	-44.96	-	60.51	68.20	7.69
6 919.75	V	74.09	35.40	-52.86	-	56.63	68.20	11.57
10 371.55	V	60.93	37.27	-50.23	-	47.97	68.20	20.23
15 557.33 <sup>1)</sup>	V	55.28	40.01	-48.58	-	46.71	74.00	27.29
<b>Average Data</b>								
5 149.89 <sup>1)</sup>	V	43.03	34.24	-27.12	0.13	50.28	54.00	3.72

**Average data (5 149.89 MHz)**

Blank

**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

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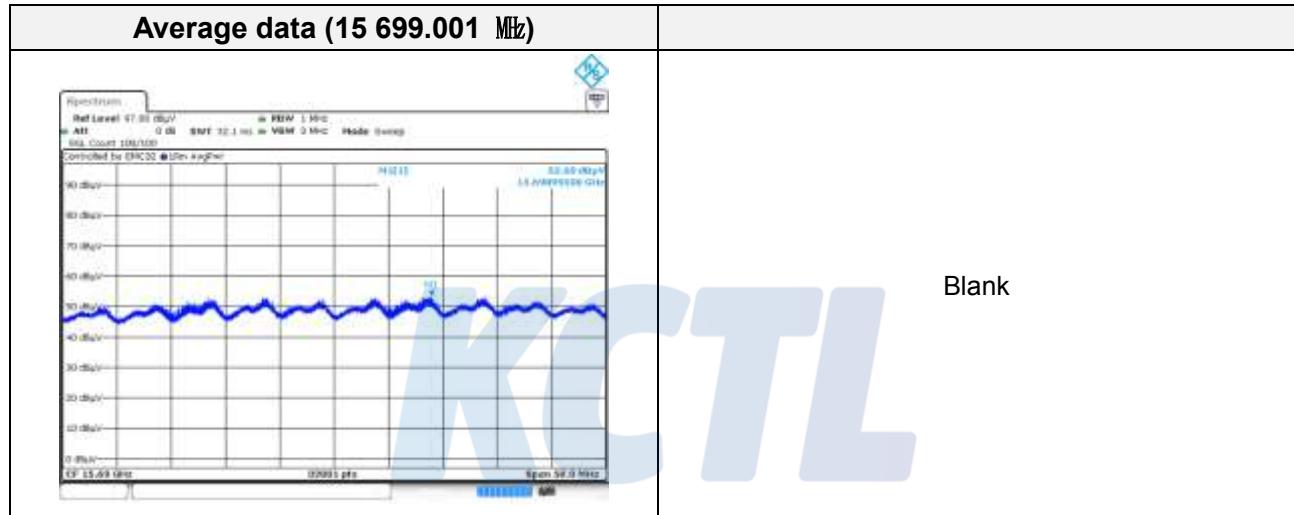
Report No.:

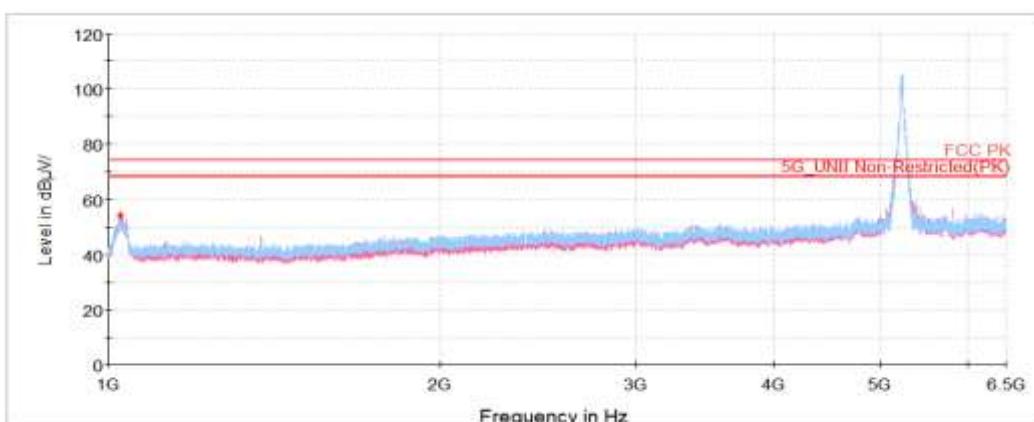
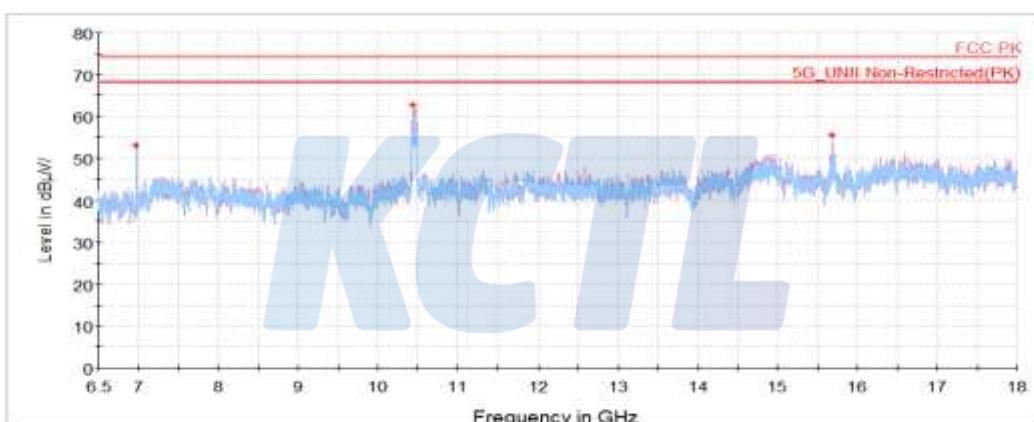
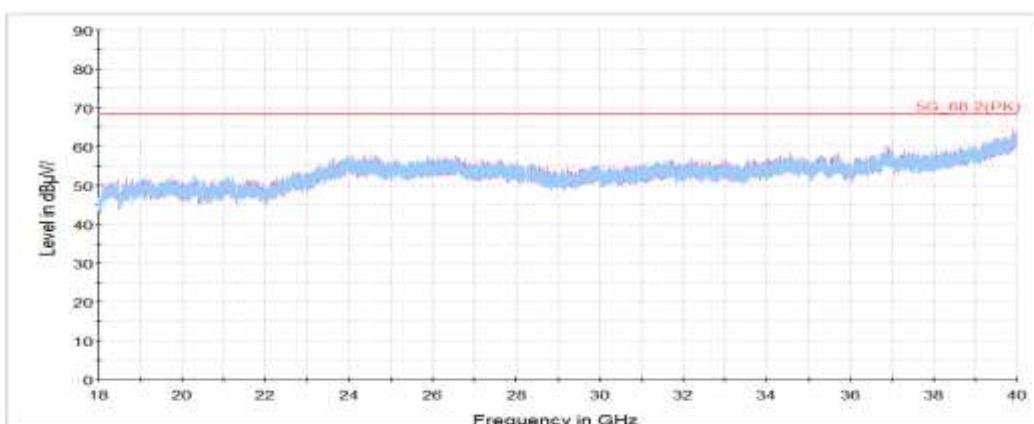
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**Highest Channel (5 230 MHz)**

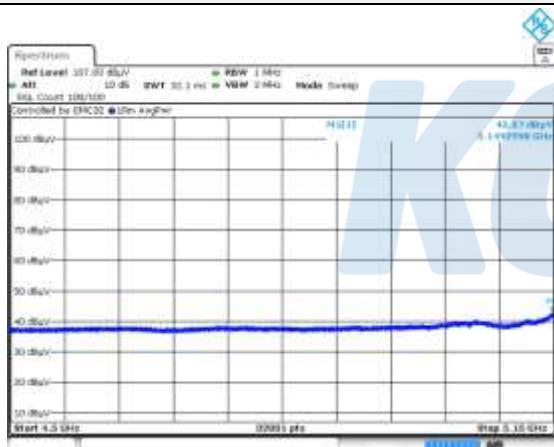
Frequency (MHz)	Pol.	Reading (dB(µV))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB(µV/m))	Limit (dB(µV/m))	Margin (dB)
<b>Peak data</b>								
6 973.30	V	70.30	35.40	-52.74	-	52.96	68.20	15.24
10 444.50	V	75.23	37.34	-49.90	-	62.67	68.20	5.53
15 699.00 <sup>1)</sup>	V	64.11	40.04	-48.65	-	55.50	74.00	18.50
<b>Average Data</b>								
15 699.00 <sup>1)</sup>	V	53.60	40.04	-48.65	0.13	45.12	54.00	8.88

**Average data (15 699.001 MHz)**

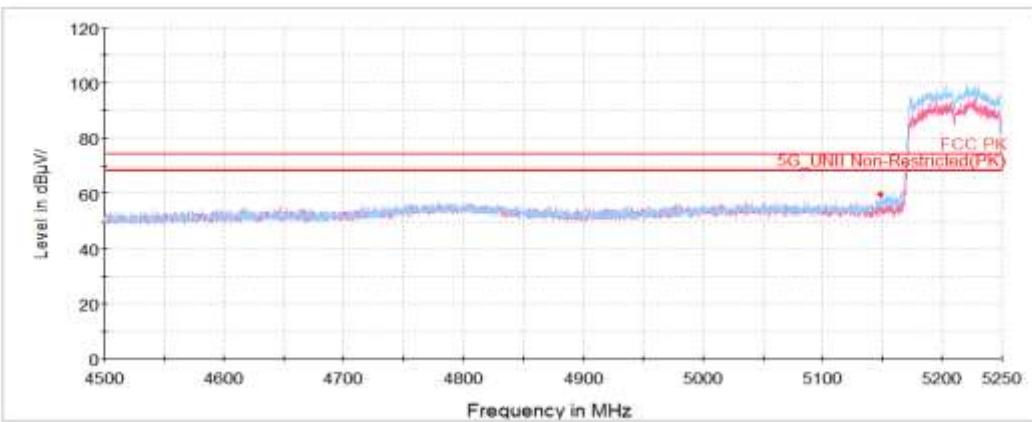
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

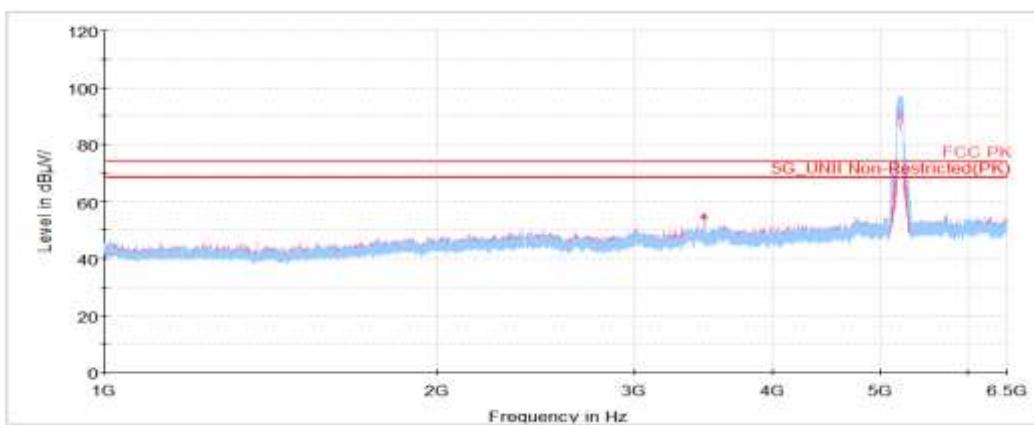
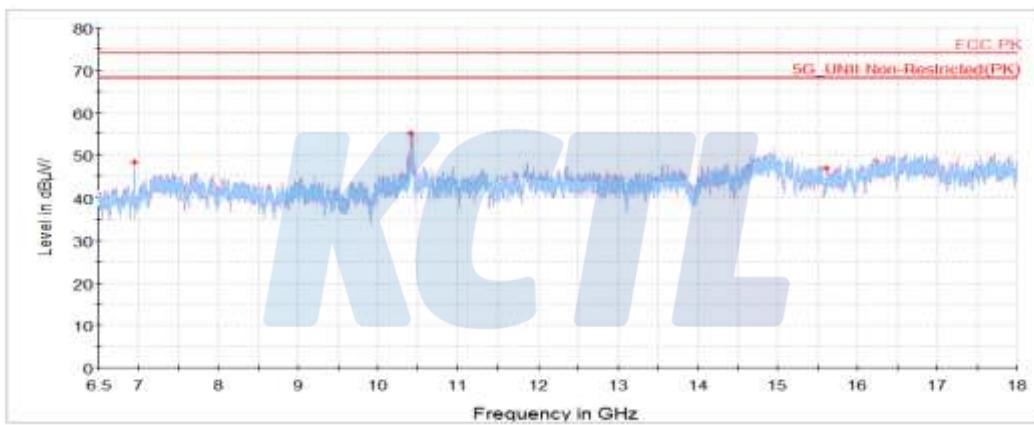
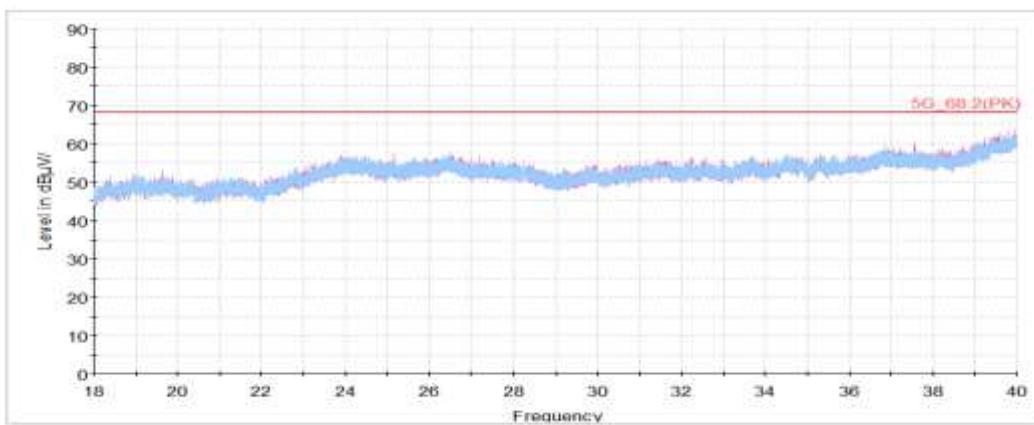
**802.11ac VHT80 UNII 1 ANT 0****Middle Channel (5 210 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
3 472.77	H	68.69	32.59	-46.79	-	54.49	68.20	13.71
5 149.30 <sup>1)</sup>	H	52.06	34.24	-27.11	-	59.19	74.00	14.81
6 946.70	H	65.65	35.40	-52.80	-	48.25	68.20	19.95
10 415.03	V	67.78	37.32	-50.04	-	55.06	68.20	13.14
15 607.28 <sup>1)</sup>	V	55.39	40.02	-48.60	-	46.81	74.00	27.19
<b>Average Data</b>								
5 149.30 <sup>1)</sup>	H	43.07	34.24	-27.11	0.27	50.47	54.00	3.53

**Average data (5 149.30 MHz)**

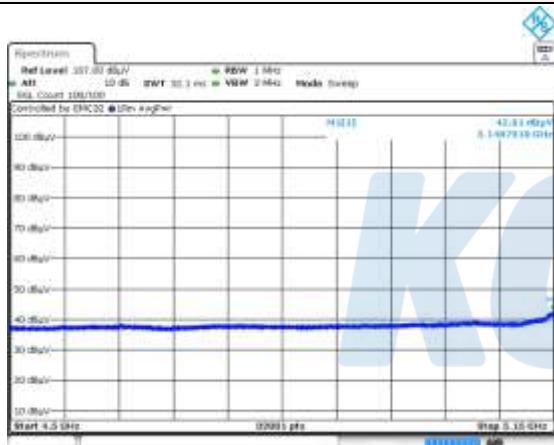
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**Horizontal/Vertical for Band-edge**

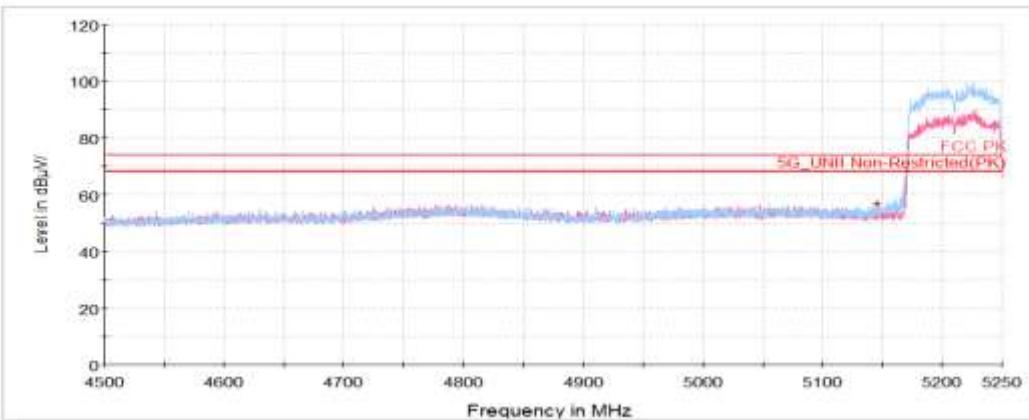
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

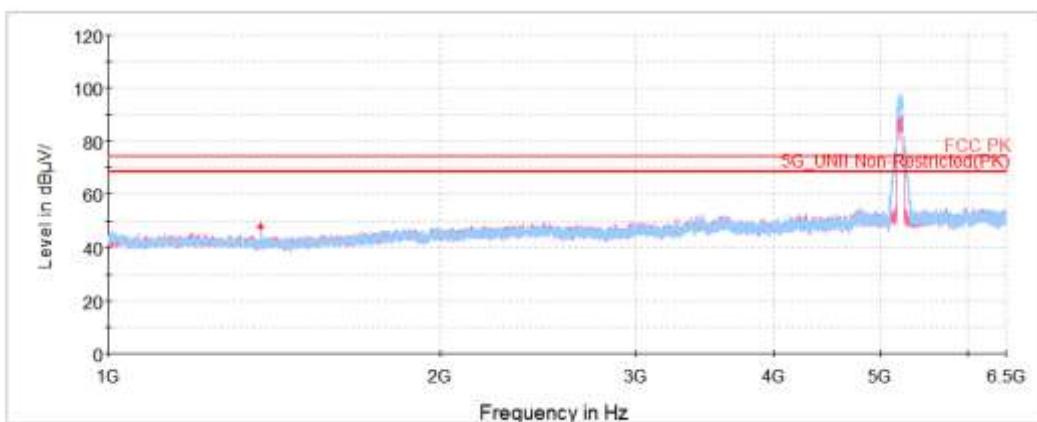
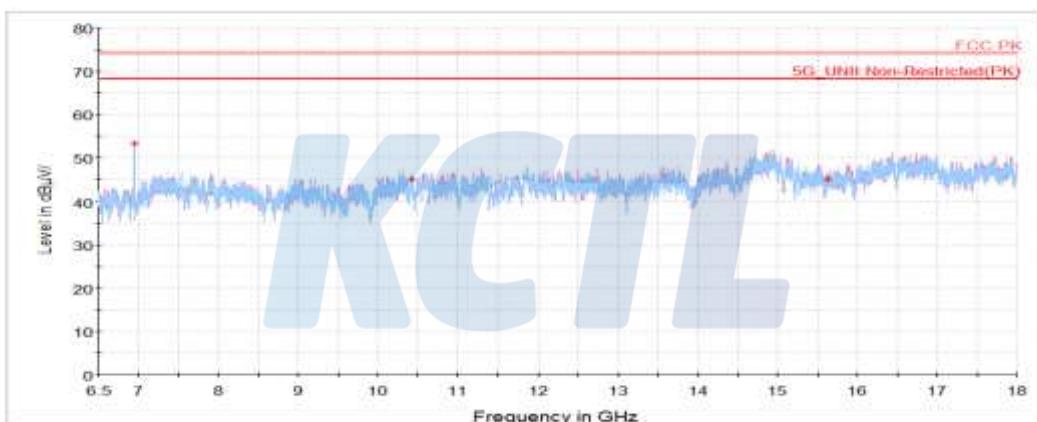
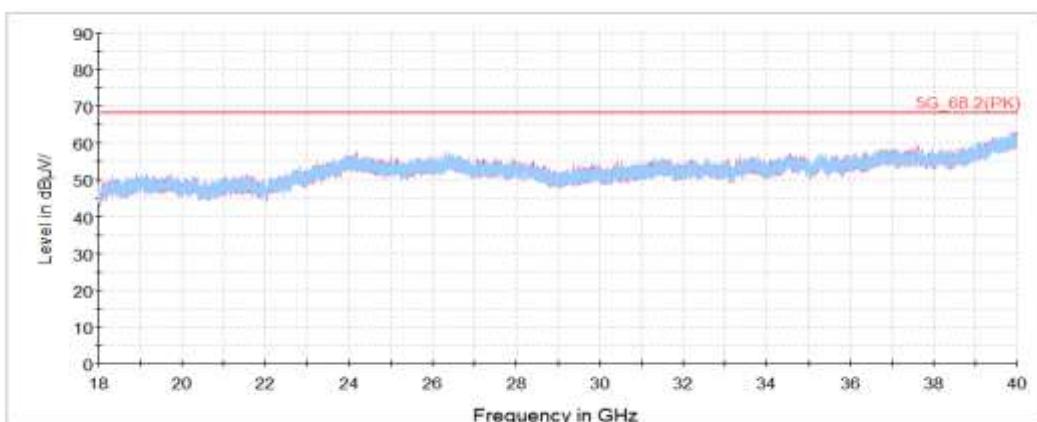
**802.11ac VHT80 UNII 1 ANT 1****Middle Channel (5 210 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 148.79 <sup>1)</sup>	H	49.62	34.24	-27.11	-	56.75	74.00	17.25
10 420.42	V	57.70	37.32	-50.01	-	45.01	74.00	28.99
15 630.28 <sup>1)</sup>	V	53.50	40.03	-48.62	-	44.91	74.00	29.09
<b>Average Data</b>								
5 148.79 <sup>1)</sup>	H	42.81	34.24	-27.11	0.27	50.21	54.00	3.79

**Average data (5 148.79 MHz)**

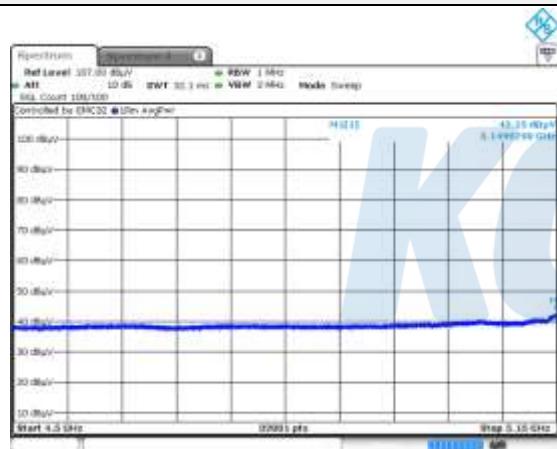
Blank

**Horizontal/Vertical for Band-edge**

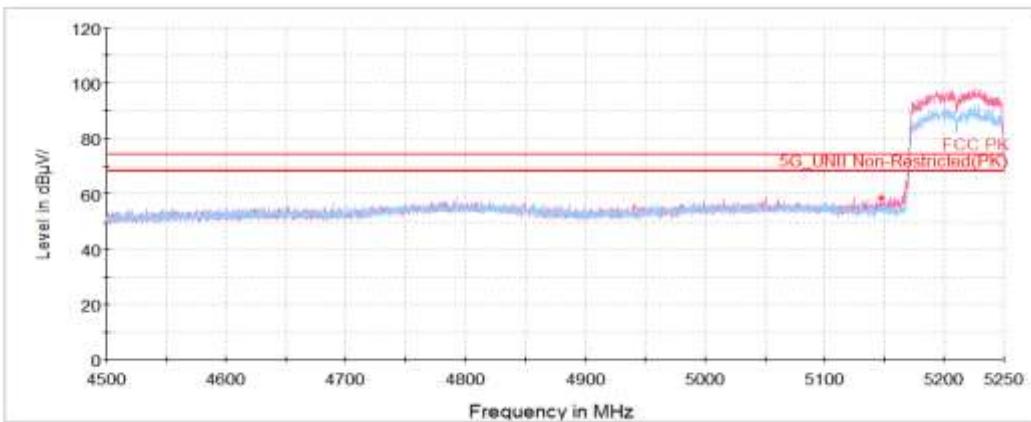
**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

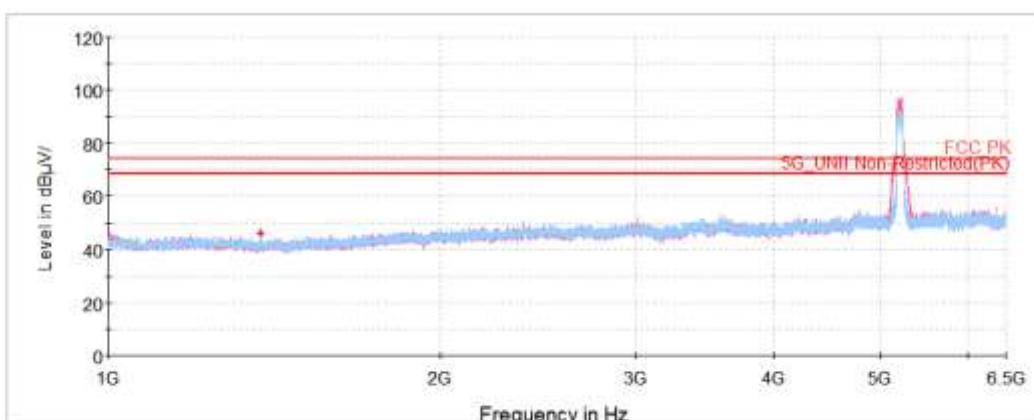
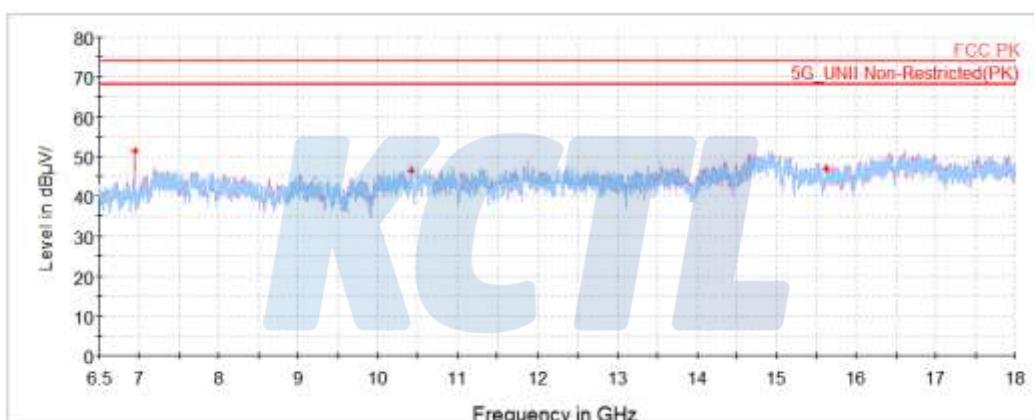
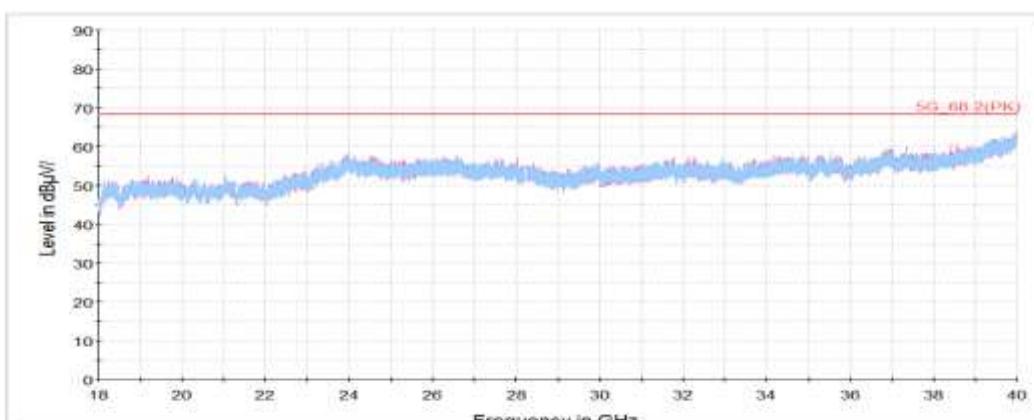
**802.11ac VHT80 UNII 1 ANT 2****Middle Channel (5 210 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 149.93 <sup>1)</sup>	V	51.04	34.24	-27.12	-	58.16	74.00	15.84
6 946.34	V	68.70	35.40	-52.80	-	51.30	68.20	16.90
10 426.17	H	59.11	37.33	-49.99	-	46.45	68.20	21.75
15 632.08 <sup>1)</sup>	V	55.47	40.03	-48.62	-	46.88	74.00	27.12
<b>Average Data</b>								
5 149.93 <sup>1)</sup>	V	43.25	34.24	-27.12	0.27	50.64	54.00	3.36

**Average data (5 149.93 MHz)**

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**Horizontal/Vertical for Band-edge**

**Horizontal/Vertical for 1 GHz ~ 6.5 GHz****Horizontal/Vertical for 6.5 GHz ~ 18 GHz****Horizontal/Vertical for 18 GHz ~ 40 GHz**

**802.11ac VHT80 UNII 1 ANT 3****Middle Channel (5 210 MHz)**

Frequency (MHz)	Pol.	Reading (dB( $\mu$ V))	Antenna Factor (dB)	Amp. + Cable (dB)	DCCF (dB)	Result (dB( $\mu$ V/m))	Limit (dB( $\mu$ V/m))	Margin (dB)
<b>Peak data</b>								
5 148.47 <sup>1)</sup>	V	51.15	34.24	-27.11	-	58.28	74.00	15.72
10 418.63	V	55.99	37.32	-50.02	-	43.29	68.20	24.91
15 626.33 <sup>1)</sup>	H	54.49	40.03	-48.61	-	45.91	74.00	28.09
<b>Average Data</b>								
5 148.47 <sup>1)</sup>	V	43.48	34.24	-27.11	0.27	50.88	54.00	3.12

**Average data (5 148.47 MHz)**

Blank

**Horizontal/Vertical for Band-edge**