

802.11ax_RU mode (HE 80 / 484T / RU offset 65)_MIMO Middle Channel (5 775 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 724.50	H	52.43	35.07	-25.91	-	61.59	121.06	59.47

802.11ax_RU mode (HE 40 / 242T / RU offset 61)_MIMO Lowest Channel (5 755 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 723.98	H	52.58	35.07	-25.90	-	61.75	119.88	58.13

802.11ax_RU mode (HE 40 / 106T / RU offset 53)_MIMO Lowest Channel (5 755 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 719.00	H	52.82	35.06	-25.83	-	62.05	110.52	48.47

802.11ax_RU mode (HE 40 / 52T / RU offset 37)_MIMO Lowest Channel (5 755 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 724.16	H	52.12	35.07	-25.91	-	61.28	120.28	59.00

802.11ax_RU mode (HE 80 / 26T / RU offset 0)_MIMO Middle Channel (5 775 MHz)

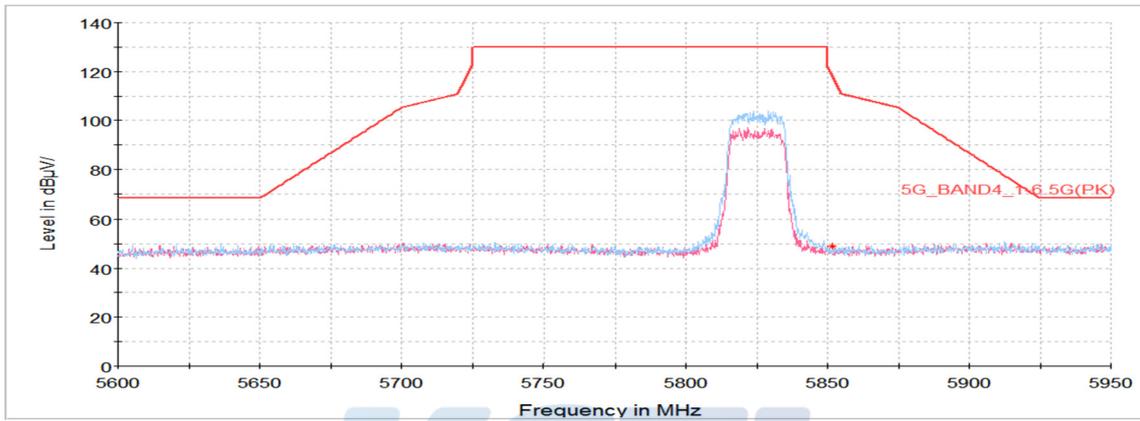
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 724.16	H	55.21	35.07	-25.91	-	64.37	120.28	55.91

UNII-3 1Tx (SISO) Bandedge (Highest Channel)

802.11ax_HE20 SU mode_MIMO Highest Channel (5 825 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 851.69	H	40.19	35.22	-26.67	-	48.74	118.35	69.61

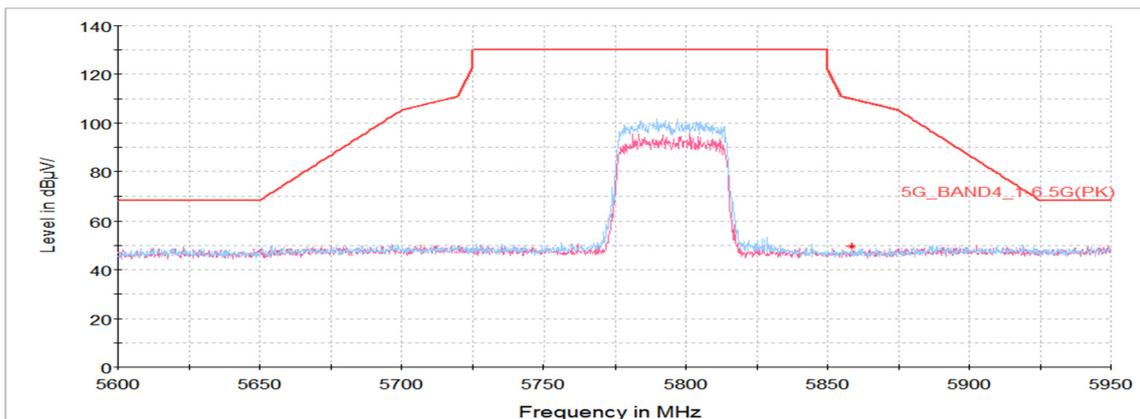
Horizontal/Vertical for Band-edge



802.11ax_HE40 SU mode_MIMO Highest Channel (5 795 MHz)

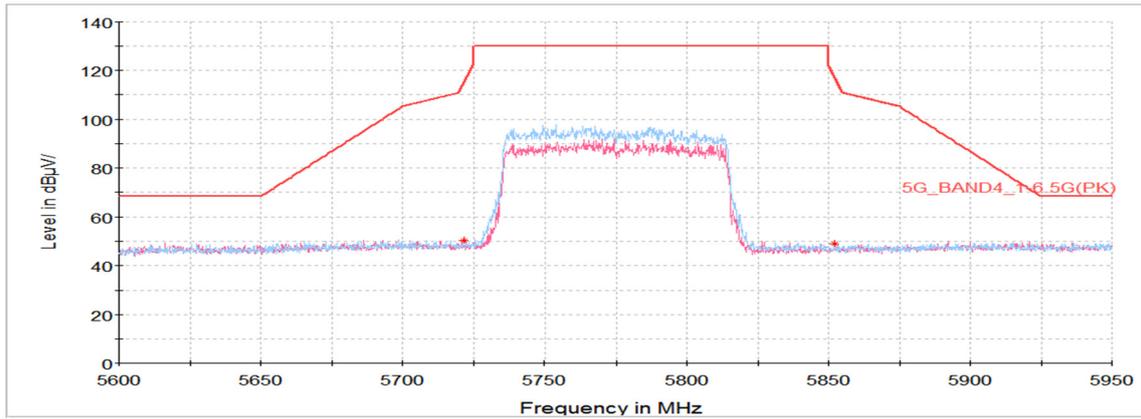
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 858.73	H	40.94	35.23	-26.63	-	49.54	109.75	60.21

Horizontal/Vertical for Band-edge



802.11ax_HE80 SU mode_MIMO Middle Channel (5 775 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 852.03	H	40.42	35.22	-26.67	-	48.97	117.57	68.60

Horizontal/Vertical for Band-edge**KCTL**

802.11ax_RU mode (HE 80 / 484T / RU offset 66)_MIMO Middle Channel (5 775 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 868.88	V	52.06	35.24	-26.57	-	60.73	106.92	46.19

802.11ax_RU mode (HE 40 / 242T / RU offset 62)_MIMO Highest Channel (5 795 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 854.27	H	50.07	35.23	-26.65	-	58.65	112.47	53.82

802.11ax_RU mode (HE 40 / 106T / RU offset 56)_MIMO Highest Channel (5 795 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 860.97	H	49.83	35.23	-26.61	-	58.45	109.13	50.68

802.11ax_RU mode (HE 40 / 52T / RU offset 44)_MIMO Highest Channel (5 795 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 853.41	H	51.32	35.22	-26.66	-	59.88	114.43	54.55

802.11ax_RU mode (HE 20 / 26T / RU offset 8)_MIMO Highest Channel (5 825 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
5 859.42	H	50.25	35.23	-26.62	-	58.86	109.56	50.70

UNII-2C 1Tx (SISO) Harmonics and Spurious Emissions**802.11ax_HE20 SU mode_MIMO Lowest Channel (5 745 MHz)**

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 487.41	H	57.17	37.99	-49.72	-	45.44	74.00	28.56
16 557.83	V	56.70	41.56	-45.35	-	52.91	68.20	15.29
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_MIMO Middle Channel (5 785 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 575.81	H	56.02	38.09	-49.79	-	44.32	74.00	29.68
16 570.41	V	56.43	41.57	-45.40	-	52.60	68.20	15.60
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_MIMO Highest Channel (5 825 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 649.84	V	58.22	38.18	-49.92	-	46.48	74.00	27.52
16 562.86	H	56.48	41.56	-45.37	-	52.67	68.20	15.53
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE40 SU mode_MIMO Lowest Channel (5 755 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 504.30	V	58.73	38.01	-49.67	-	47.07	74.00	26.93
16 546.69	H	56.35	41.55	-45.31	-	52.59	68.20	15.61
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE40 SU mode_MIMO Highest Channel (5 795 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 601.33	H	58.13	38.12	-49.84	-	46.41	74.00	27.59
16 898.52	V	56.90	41.90	-46.60	-	52.20	68.20	16.00
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE80 SU mode_MIMO Middle Channel (5 775 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 584.80	H	58.62	38.10	-49.81	-	46.91	74.00	27.09
16 557.47	V	57.01	41.56	-45.35	-	53.22	68.20	14.98
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_RU mode (HE 20 / 26T / RU offset 8)_MIMO Lowest Channel (5 745 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 496.39	H	56.55	38.00	-49.68	-	44.87	74.00	29.13
16 563.94	H	56.90	41.56	-45.37	-	53.09	68.20	15.11
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_RU mode (HE 20 / 26T / RU offset 0)_MIMO Middle Channel (5 785 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
10 573.52	V	59.31	37.44	-51.70	-	45.05	74.00	28.95
16 540.22	V	57.28	41.54	-45.28	-	53.54	74.00	20.46
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_RU mode (HE 20 / 26T / RU offset 0)_MIMO Highest Channel (5 825 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 661.70	V	58.50	38.19	-49.94	-	46.75	74.00	27.25
16 563.58	V	57.31	41.56	-45.37	-	53.50	68.20	14.70
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_RU mode (HE 40 / 26T / RU offset 9)_MIMO Lowest Channel (5 755 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 524.42	H	56.91	38.03	-49.70	-	45.24	74.00	28.76
16 544.89	H	57.12	41.54	-45.30	-	53.36	68.20	14.84
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_RU mode (HE 40 / 26T / RU offset 9)_MIMO Highest Channel (5 795 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 587.31	H	58.01	38.10	-49.81	-	46.30	74.00	27.70
16 770.22	V	57.39	41.77	-46.13	-	53.03	68.20	15.17
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_RU mode (HE 80 / 26T / RU offset 36)_MIMO Middle Channel (5 775 MHz)

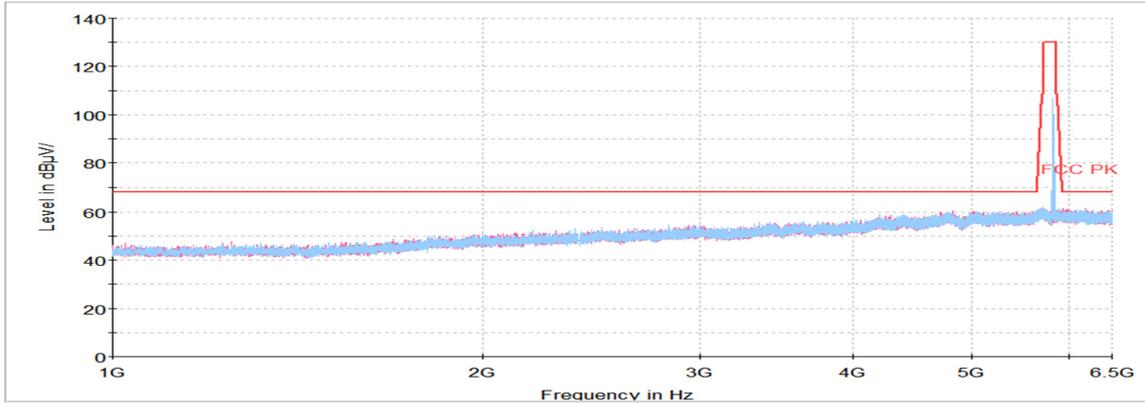
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
11 551.38	H	57.52	38.06	-49.75	-	45.83	74.00	28.17
16 560.70	V	56.69	41.56	-45.36	-	52.89	68.20	15.31
Average Data								
No spurious emissions were detected within 20 dB of the limit								

Plot of Harmonics and Spurious Emissions

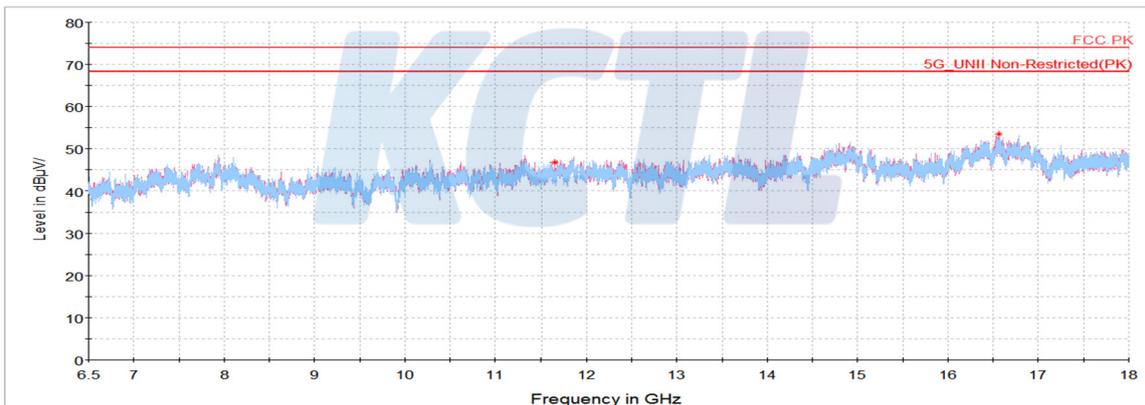
In order to simplify the report, attached plots were only the lowest margin condition

UNII-3_802.11ax_RU mode (HE 20 / 26T / RU offset 0)_MIMO Highest Channel (5 825 MHz)

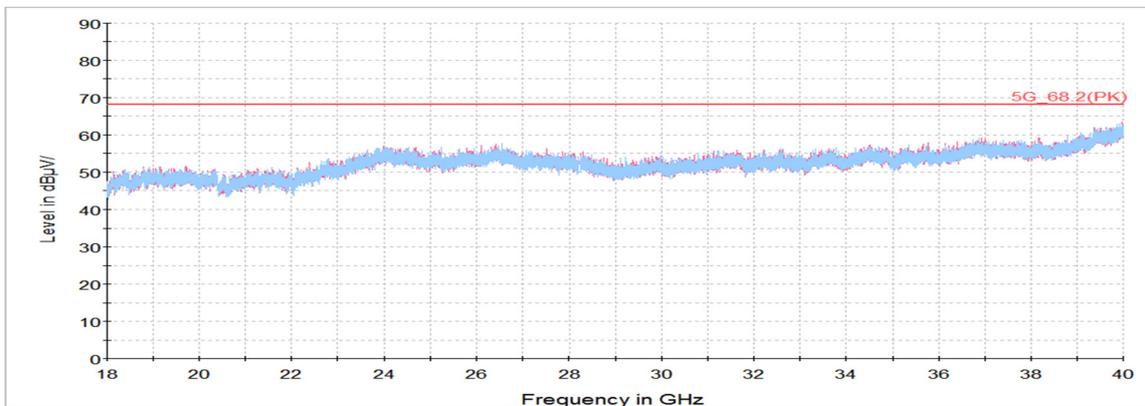
Horizontal/Vertical for 1 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



Spurious Emission for Simultaneous Tx Condition

Case 1	Antenna ALL 2.4 GHz WLAN	Antenna ALL 5 GHz WLAN
Mode	n20	ac20
Channel	6	165
Frequency	2 437	5 825
Data Rate	MCS0	MCS0 VHT20

Case 2	Antenna 0 Bluetooth	Antenna 1 2.4 GHz WLAN
Mode	BDR	ac20
Channel	78	6
Frequency	2 480	2 437
Data Rate	DH5	MCS0 VHT20

Case 3	Antenna 0 Bluetooth	Antenna ALL 5 GHz WLAN
Mode	BDR	ac20
Channel	78	165
Frequency	2 480	5 825
Data Rate	DH5	MCS0 VHT20

Case 4	Antenna 1 Bluetooth	Antenna ALL 5 GHz WLAN
Mode	BDR	ac20
Channel	39	165
Frequency	2 441	5 825
Data Rate	DH5	MCS0 VHT20

Case 5	Antenna 0 Bluetooth	Antenna 1 2.4 GHz WLAN	Antenna ALL 5 GHz WLAN
Mode	BDR	ac20	ac20
Channel	78	6	165
Frequency	2 480	2437	5 825
Data Rate	DH5	MCS0 VHT20	MCS0 VHT20

Case 6	Antenna ALL 2.4 GHz WLAN	Antenna ALL 5 GHz WLAN
Mode	ax20	ax20
Channel	1	40
Frequency	2 412	5 200
Data Rate	MCS0	MCS0
T.O	26T offset4	0

Case 7	Antenna 0 Bluetooth	Antenna 1 2.4 GHz WLAN
Mode	BDR	ax20
Channel	78	1
Frequency	2 480	2 412
Data Rate	DH5	MCS0
T.O	-	SU

Case 8	Antenna 0 Bluetooth	Antenna ALL 5 GHz WLAN
Mode	BDR	ax20
Channel	78	40
Frequency	2 480	5 200
Data Rate	DH5	MCS0
T.O	-	26T offset8

Case 9	Antenna 1 Bluetooth	Antenna ALL 5 GHz WLAN
Mode	BDR	ax20
Channel	39	40
Frequency	2 441	5 200
Data Rate	DH5	MCS0
T.O	-	26T offset8

Case 10	Antenna 0 Bluetooth	Antenna 1 2.4 GHz WLAN	Antenna ALL 5 GHz WLAN
Mode	BDR	ax20	ax20
Channel	78	1	40
Frequency	2 480	2 412	5 200
Data Rate	DH5	MCS0	MCS0
T.O	-	SU	26T offset8

Notes.

The lowest margin condition among the channels and modes were selected for test.

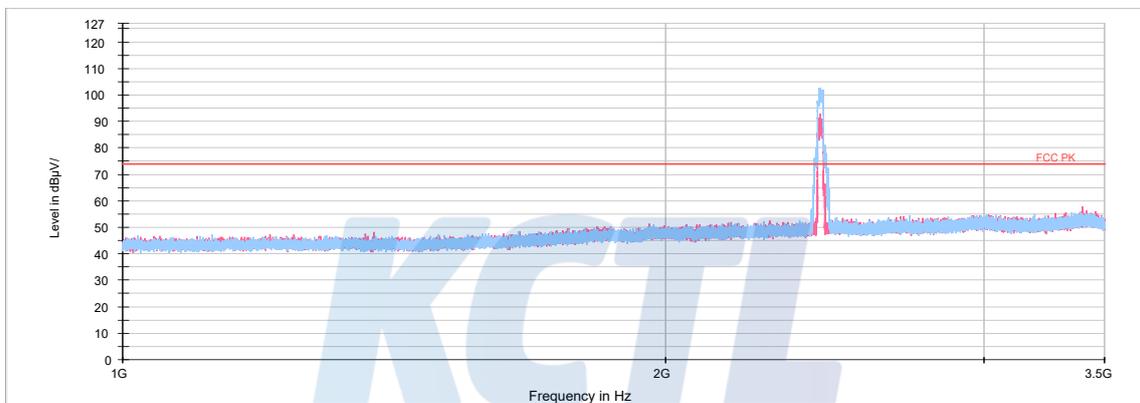
Case 1

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 877.95	H	64.93	33.95	-55.11	-	43.77	74.00	30.23
7 325.48	V	61.41	35.40	-52.42	-	44.39	74.00	29.61
11 645.53	V	57.91	38.17	-49.92	-	46.16	74.00	27.84
17 482.14	V	57.36	41.11	-48.78	-	49.69	68.20	18.51

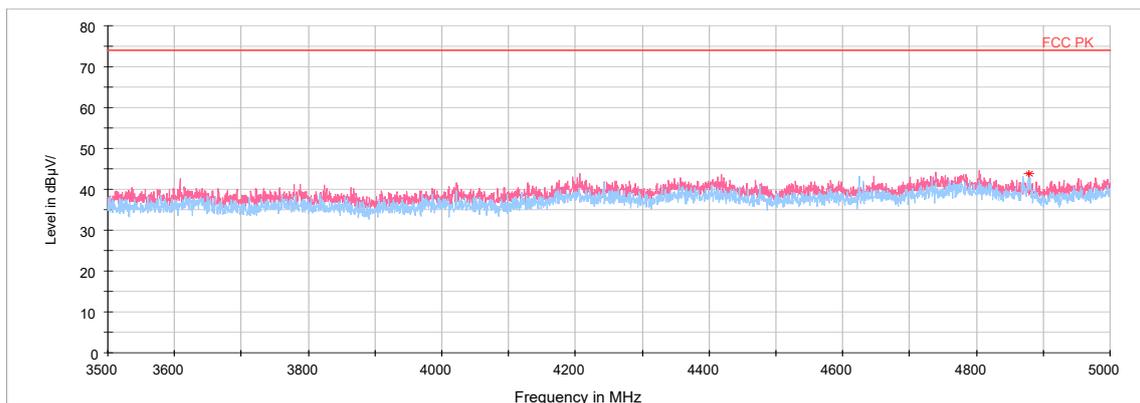
Average Data

No spurious emissions were detected within 20 dB of the limit.

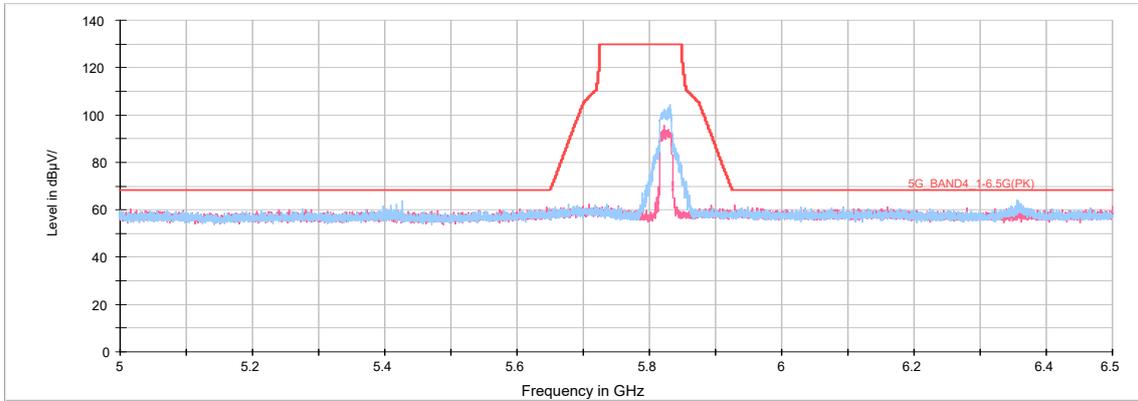
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



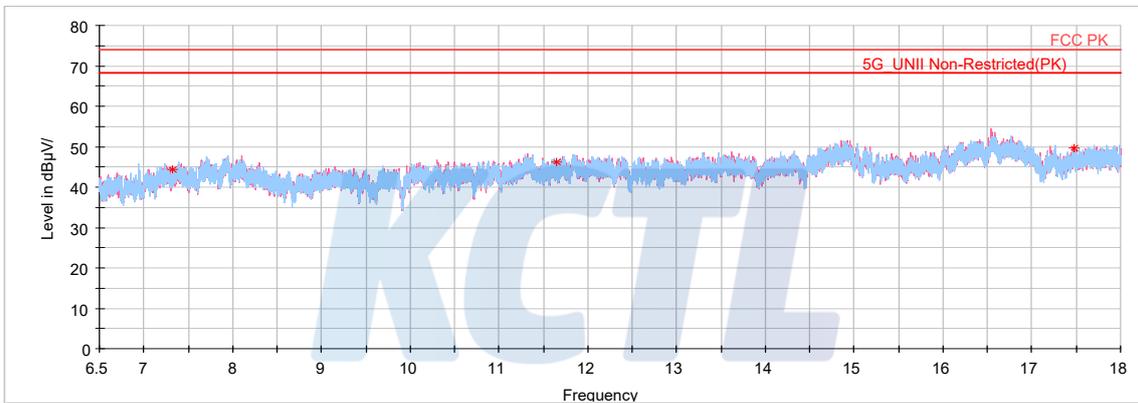
Horizontal/Vertical for 3.5 GHz ~ 5 GHz



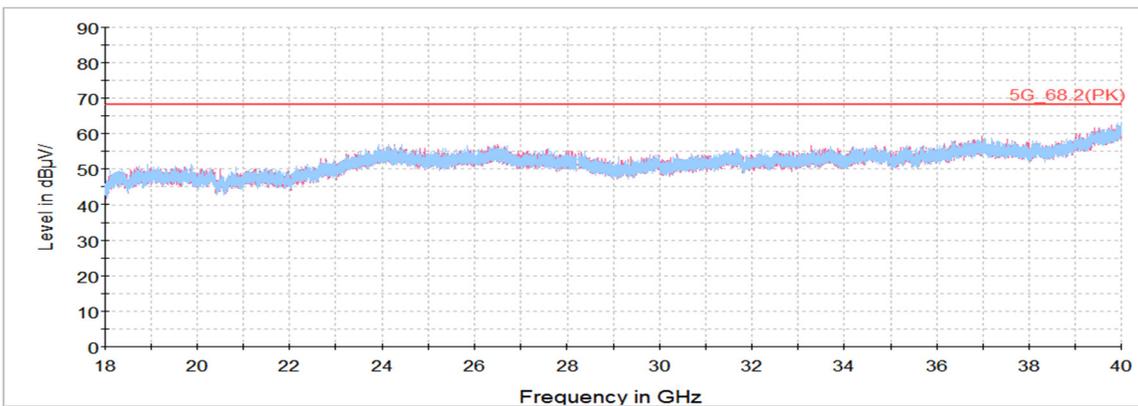
Horizontal/Vertical for 5 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



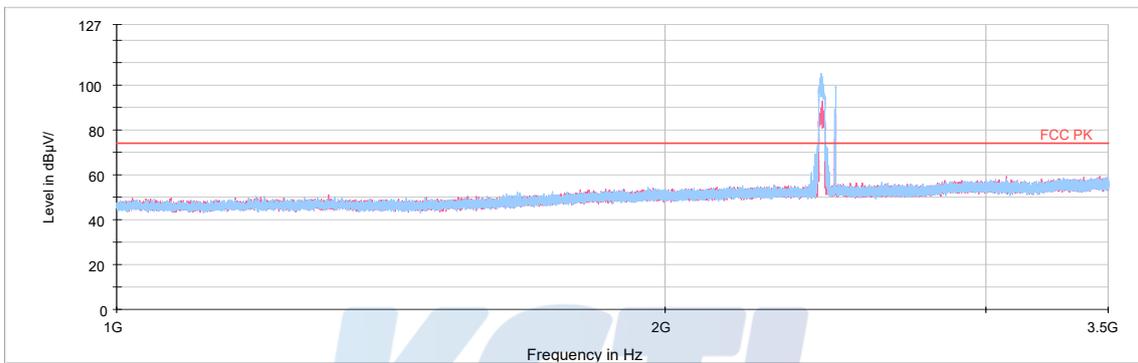
Case 2

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 960.88	V	61.74	33.98	-54.65	-	41.07	74.00	32.93
7 393.70	V	62.49	35.40	-52.38	-	45.51	74.00	28.49

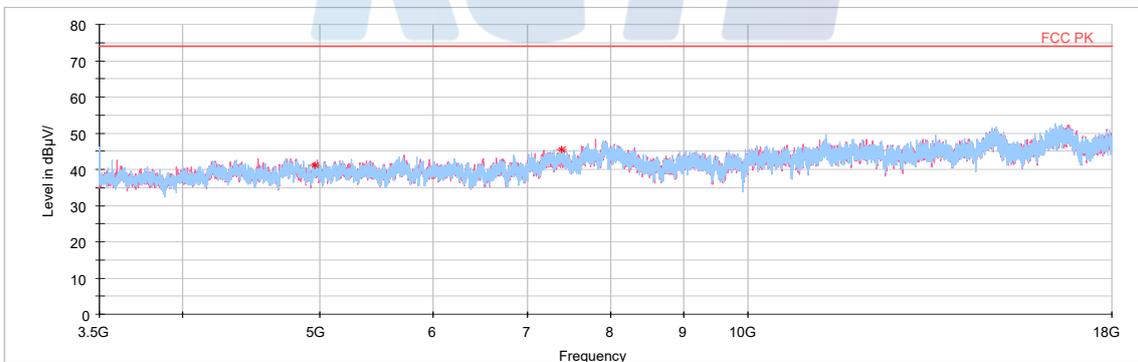
Average Data

No spurious emissions were detected within 20 dB of the limit.

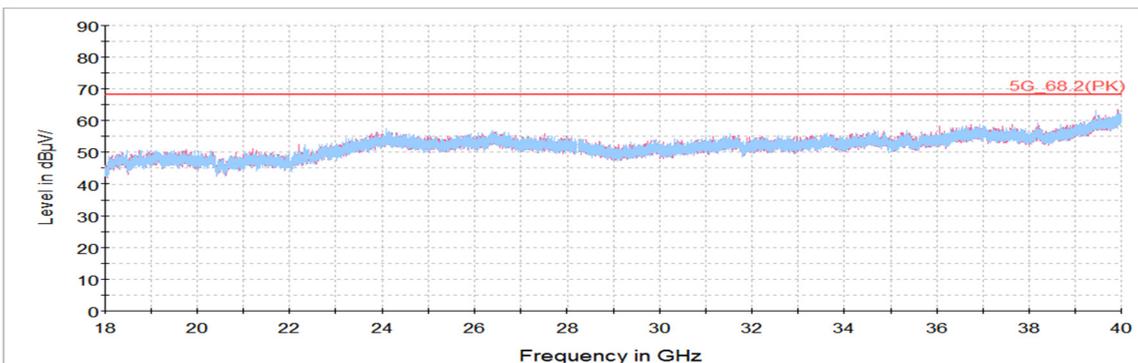
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



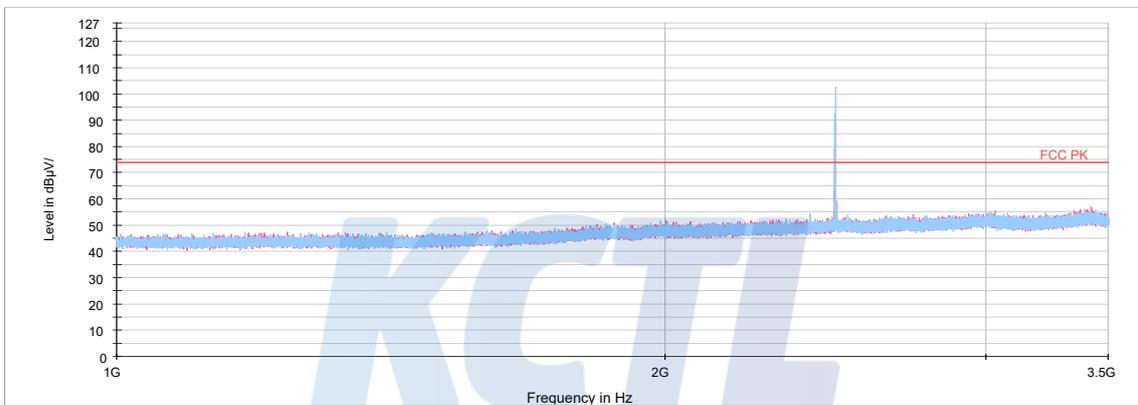
Case 3

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 959.97	H	62.25	33.98	-54.66	-	41.57	74.00	32.43
7 465.64	H	62.43	35.40	-51.89	-	45.94	74.00	28.06
11 652.72	V	58.49	38.18	-49.93	-	46.74	74.00	27.26
17 444.05	V	56.65	41.12	-48.64	-	49.13	68.20	19.07

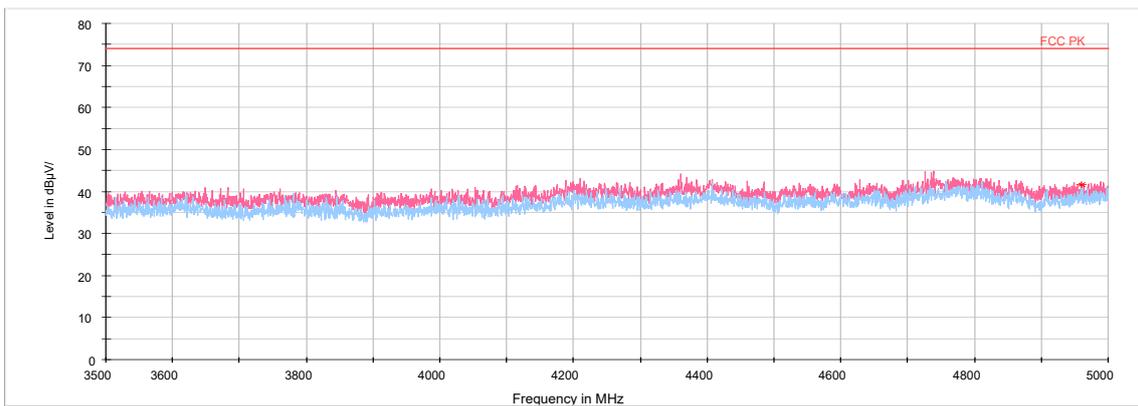
Average Data

No spurious emissions were detected within 20 dB of the limit.

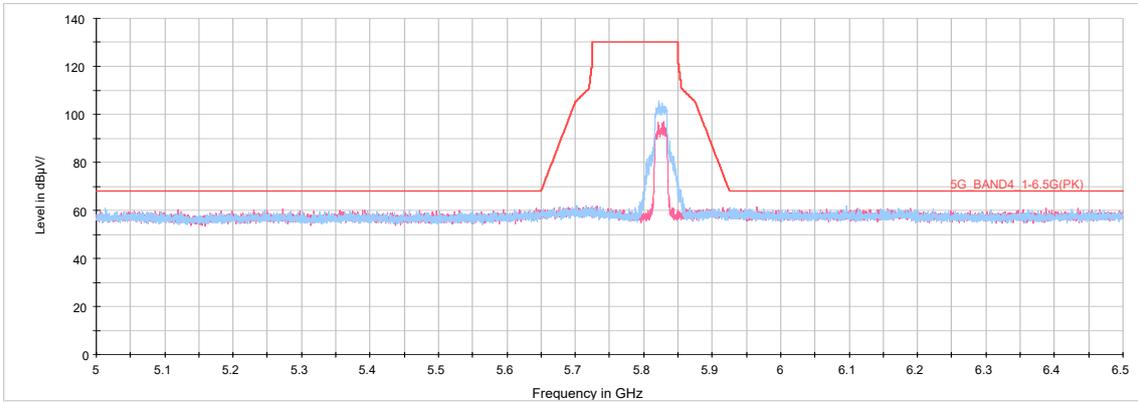
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



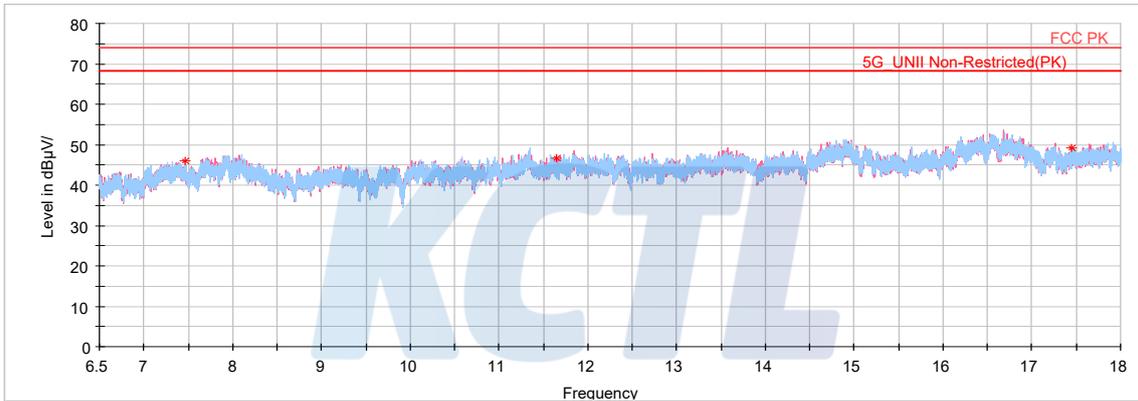
Horizontal/Vertical for 3.5 GHz ~ 5 GHz



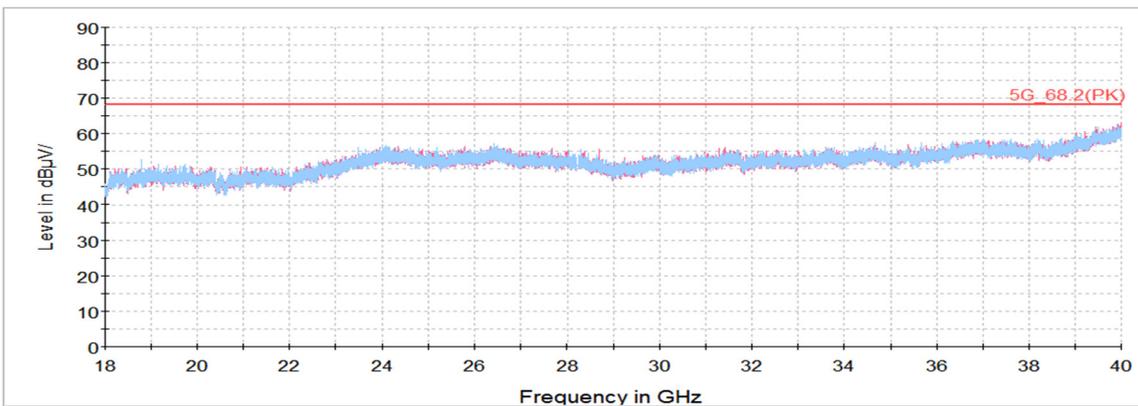
Horizontal/Vertical for 5 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



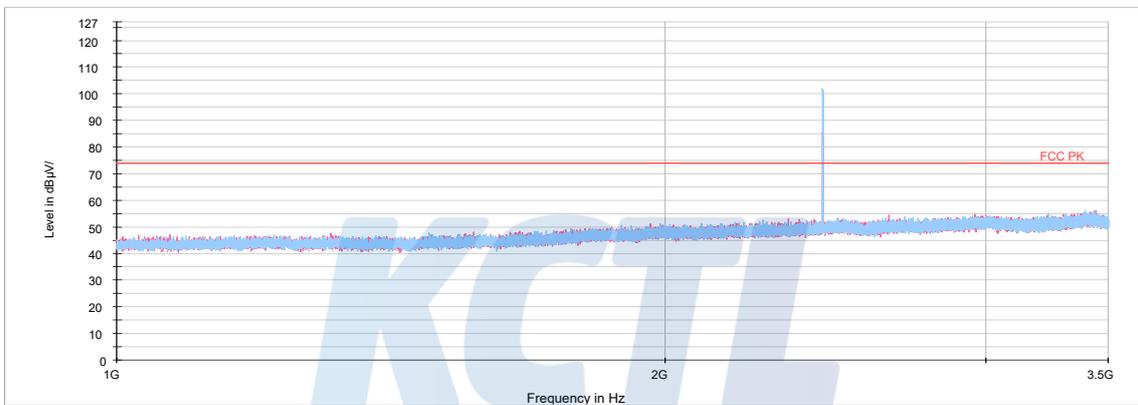
Case 4

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 882.03	H	64.66	33.95	-55.23	-	43.38	74.00	30.62
7 472.11	H	62.09	35.40	-51.87	-	45.62	74.00	28.38
11 651.28	H	58.60	38.18	-49.93	-	46.85	74.00	27.15
17 481.06	V	57.56	41.11	-48.78	-	49.89	68.20	18.31

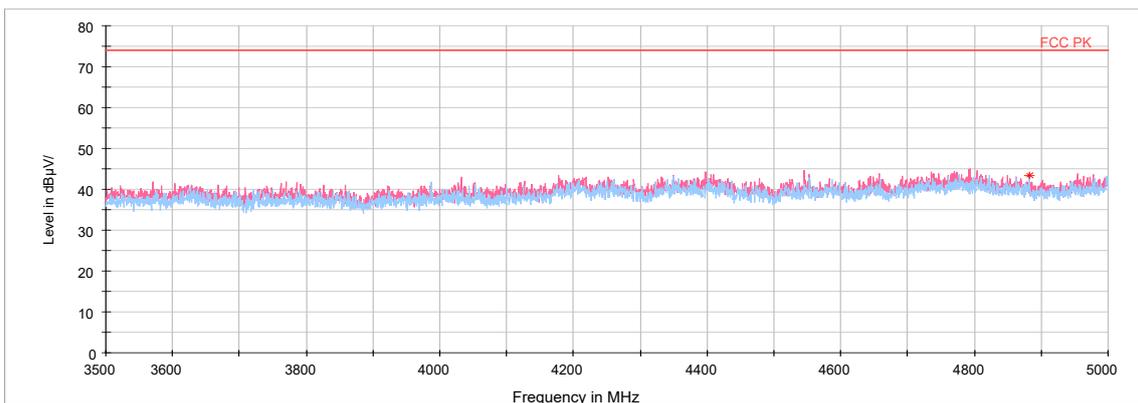
Average Data

No spurious emissions were detected within 20 dB of the limit.

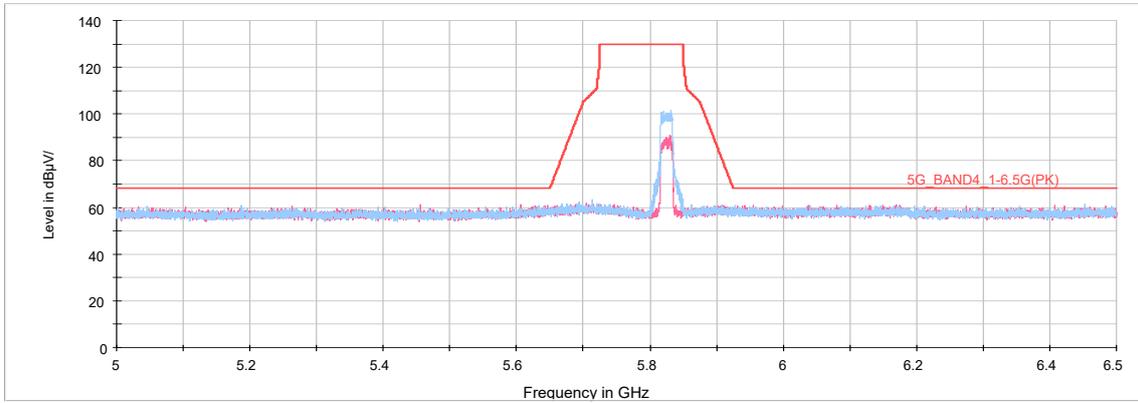
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



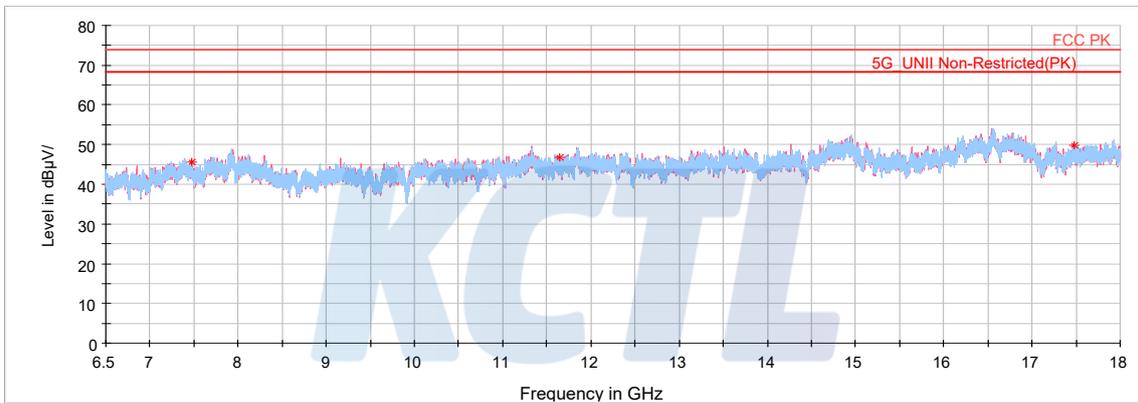
Horizontal/Vertical for 3.5 GHz ~ 5 GHz



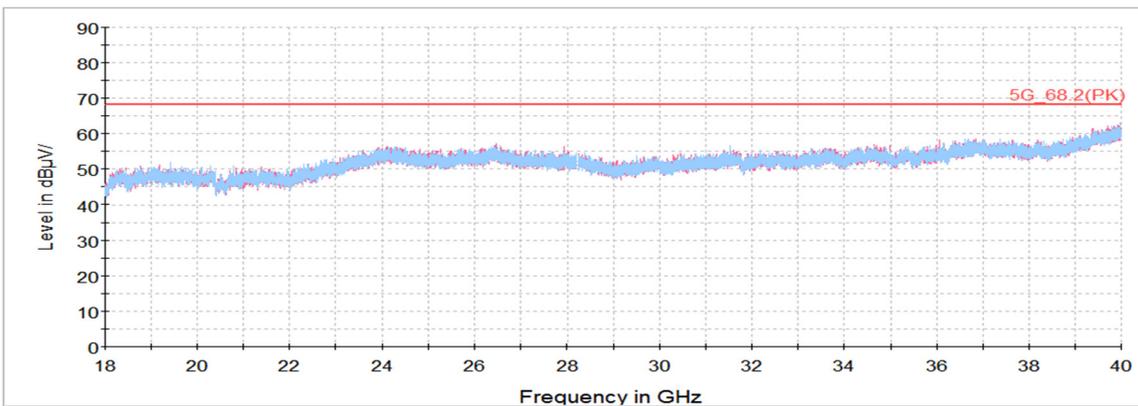
Horizontal/Vertical for 5 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



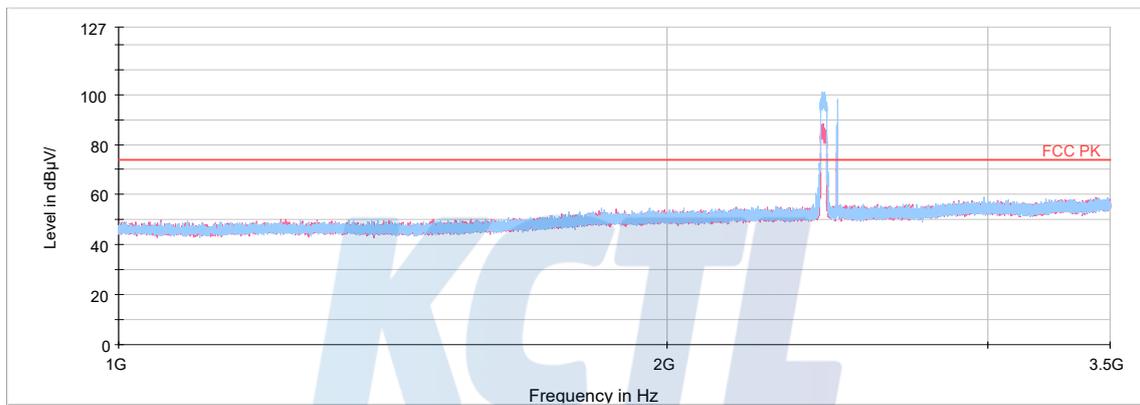
Case 5

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 876.59	V	66.07	33.95	-55.07	-	44.95	74.00	29.05
7 373.64	H	62.78	35.40	-52.24	-	45.94	74.00	28.06
11 635.83	H	59.68	38.16	-49.90	-	47.94	74.00	26.06
17 477.47	V	58.44	41.11	-48.76	-	50.79	68.20	17.41

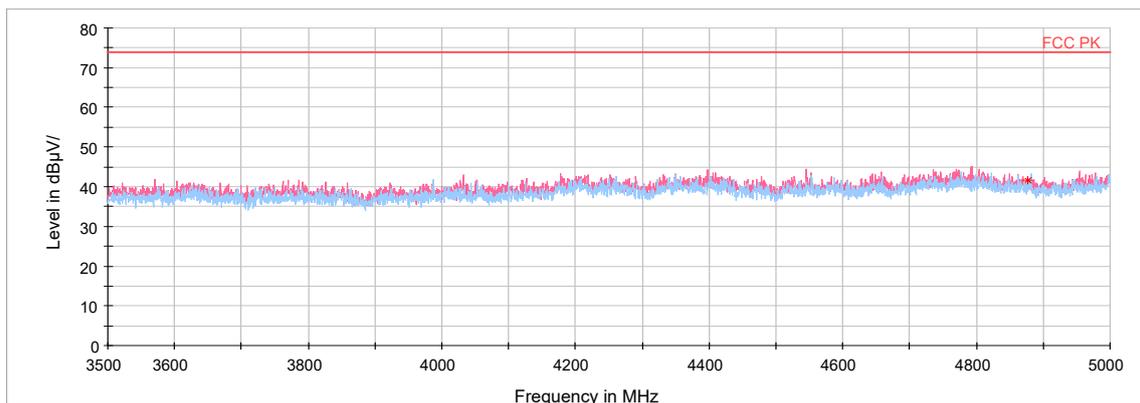
Average Data

No spurious emissions were detected within 20 dB of the limit.

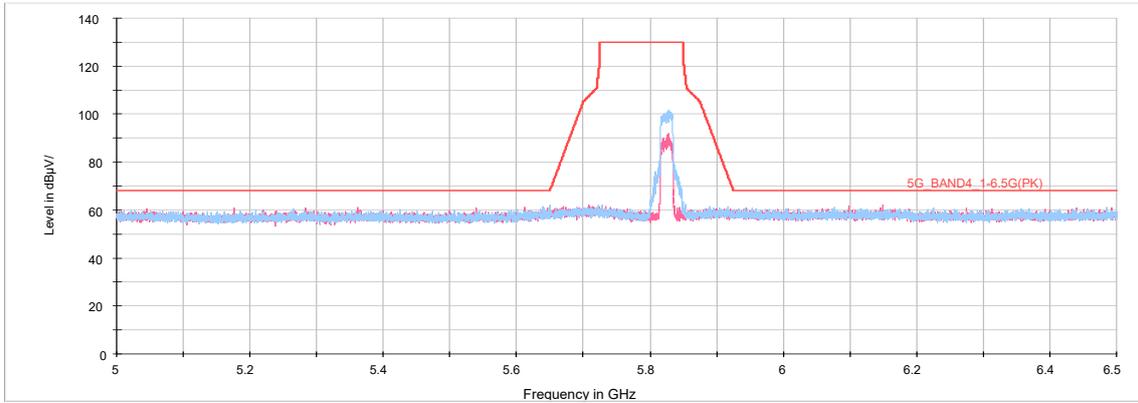
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



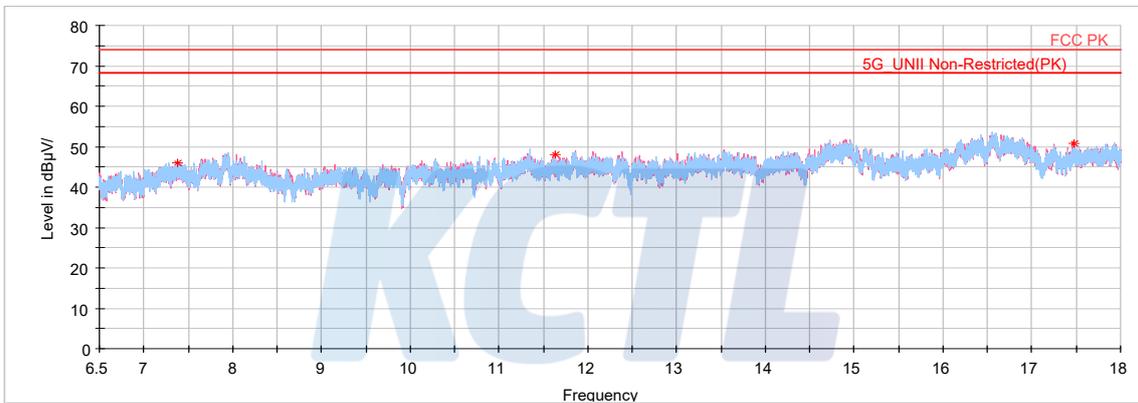
Horizontal/Vertical for 3.5 GHz ~ 5 GHz



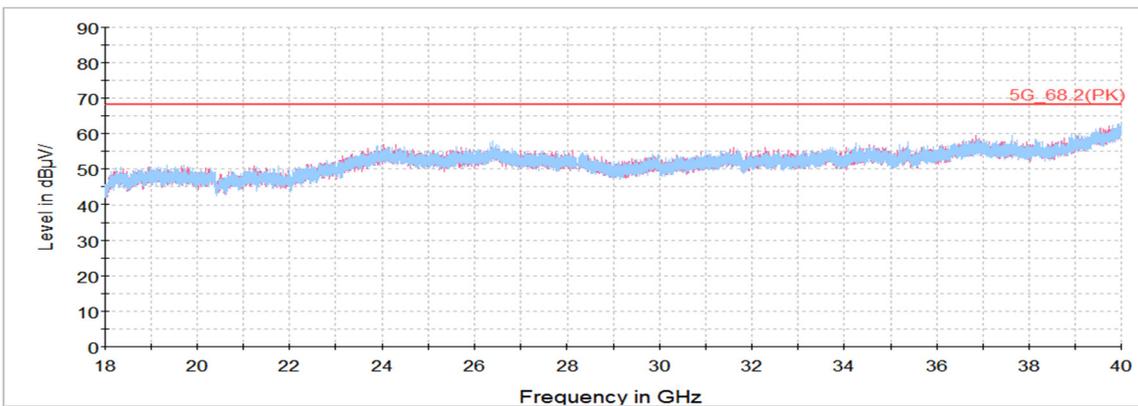
Horizontal/Vertical for 5 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



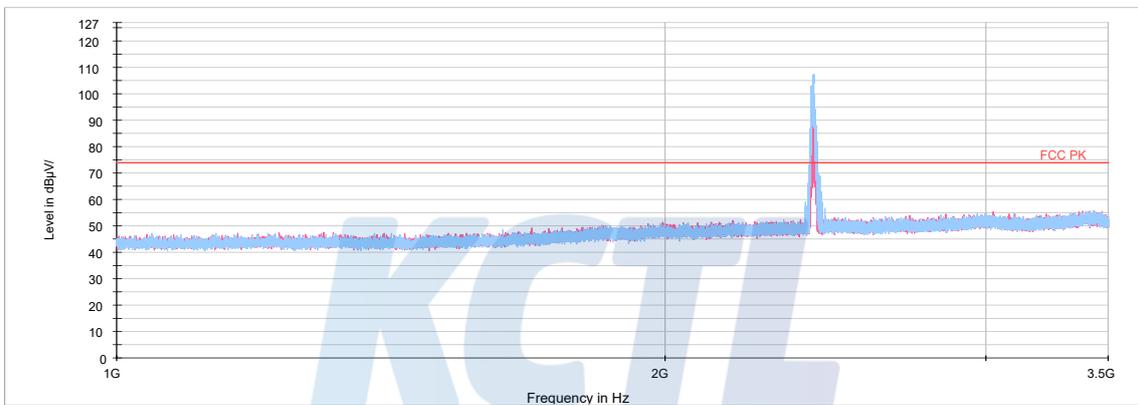
Case 6

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 824.03	H	70.44	33.93	-53.58	-	50.79	74.00	23.21
7 272.66	H	62.47	35.40	-52.62	-	45.25	74.00	28.75
10 407.48	H	59.66	37.31	-51.87	-	45.10	68.20	23.10
15 638.91	H	57.39	40.03	-49.19	-	48.23	74.00	25.77

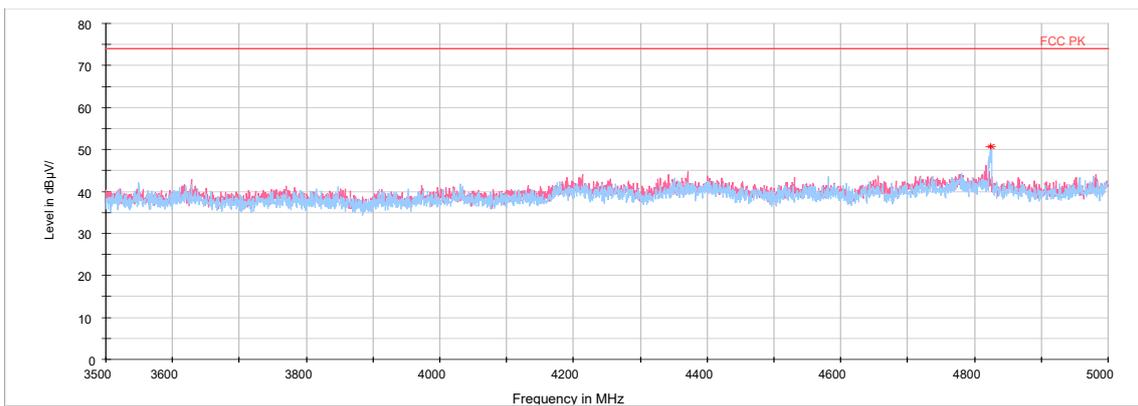
Average Data

No spurious emissions were detected within 20 dB of the limit.

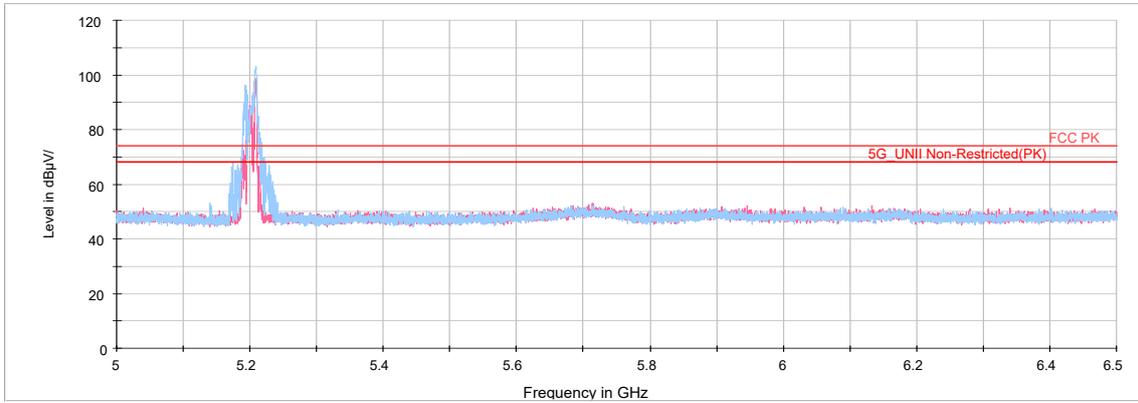
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



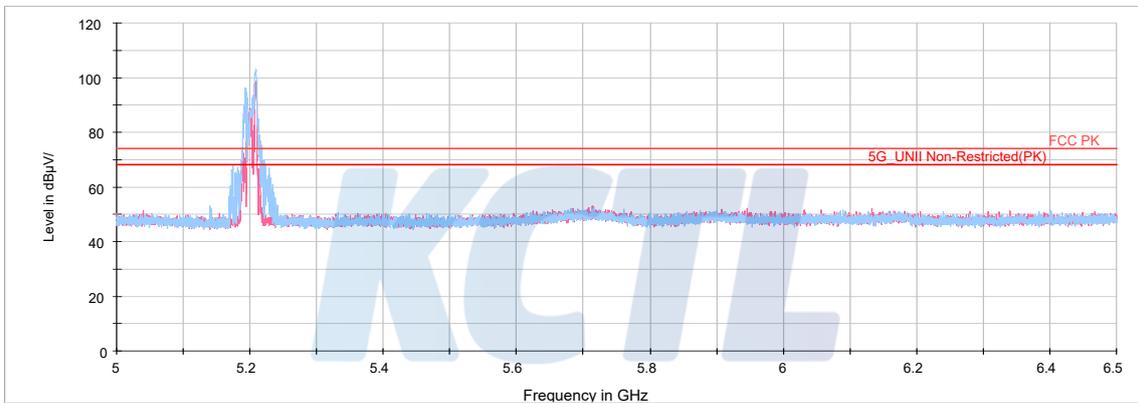
Horizontal/Vertical for 3.5 GHz ~ 5 GHz



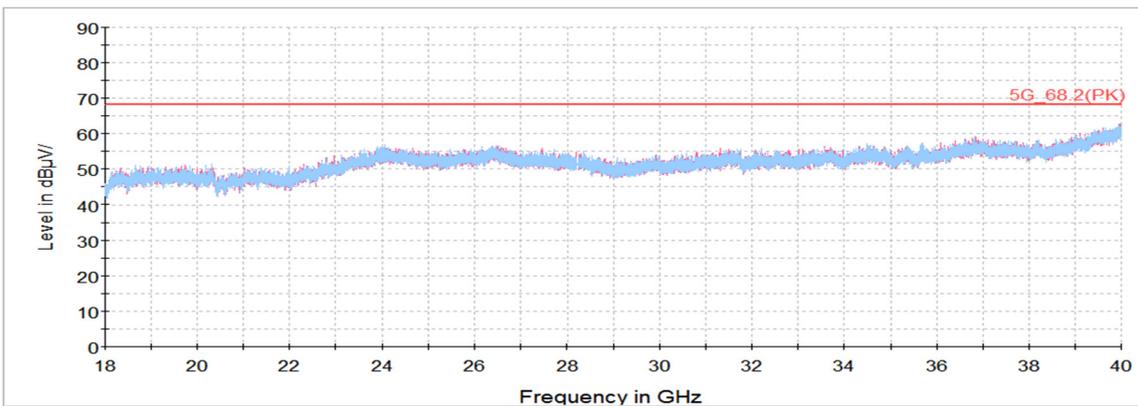
Horizontal/Vertical for 5 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



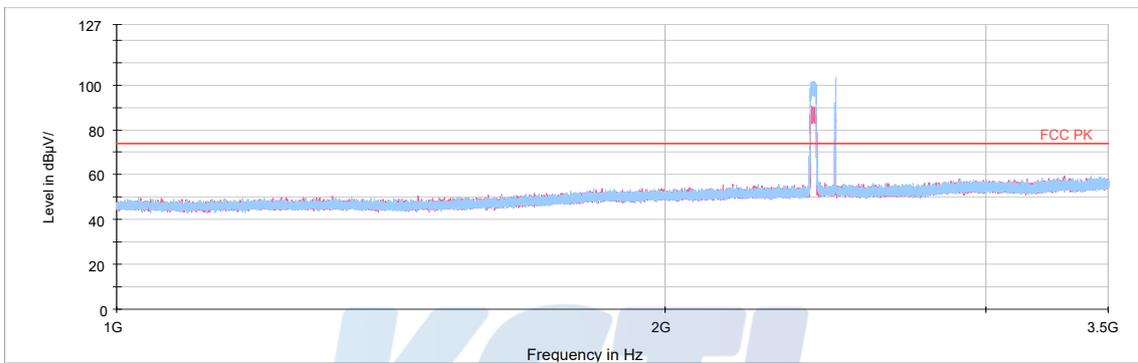
Case 7

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 829.47	H	61.23	33.93	-53.74	-	41.42	74.00	32.58
7 254.59	V	63.82	35.40	-52.90	-	46.32	74.00	27.68

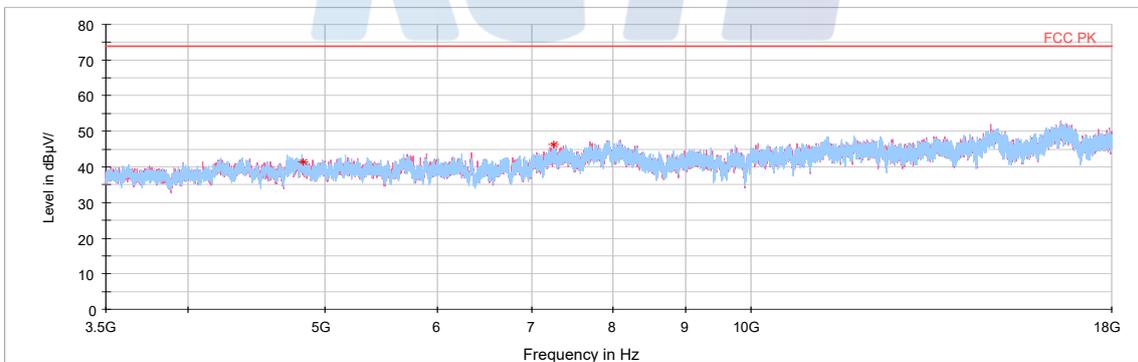
Average Data

No spurious emissions were detected within 20 dB of the limit.

Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz

