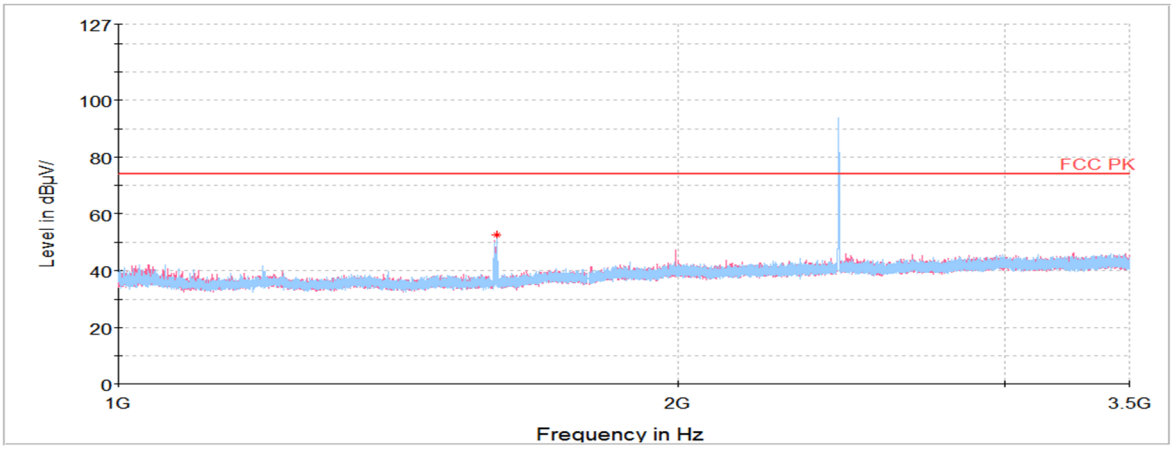
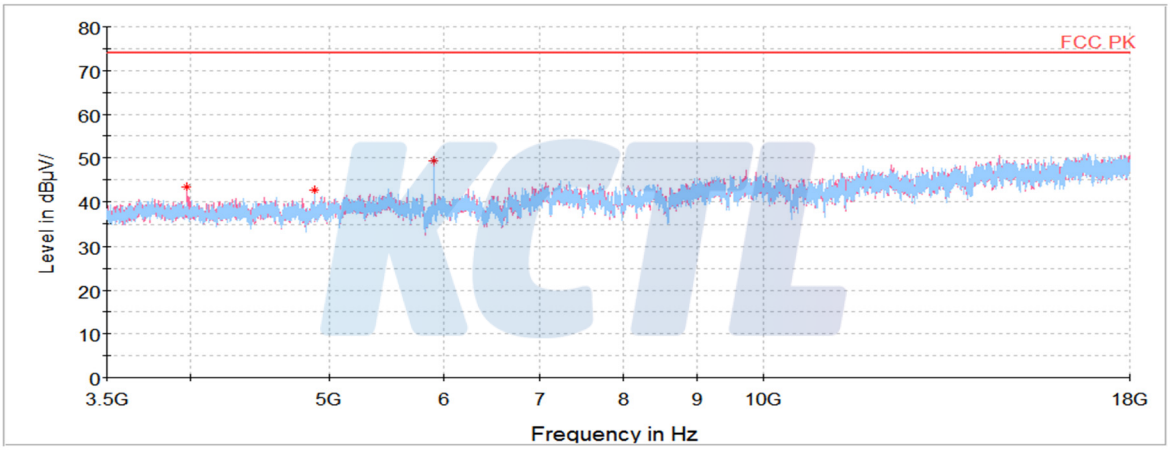
Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓

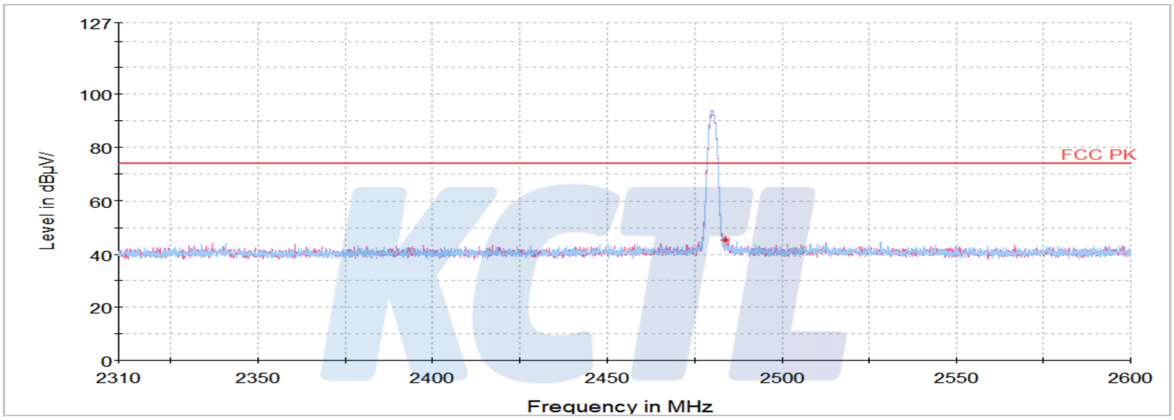


Horizontal/Vertical for 18 ㎓ ~ 26.5 ㎓

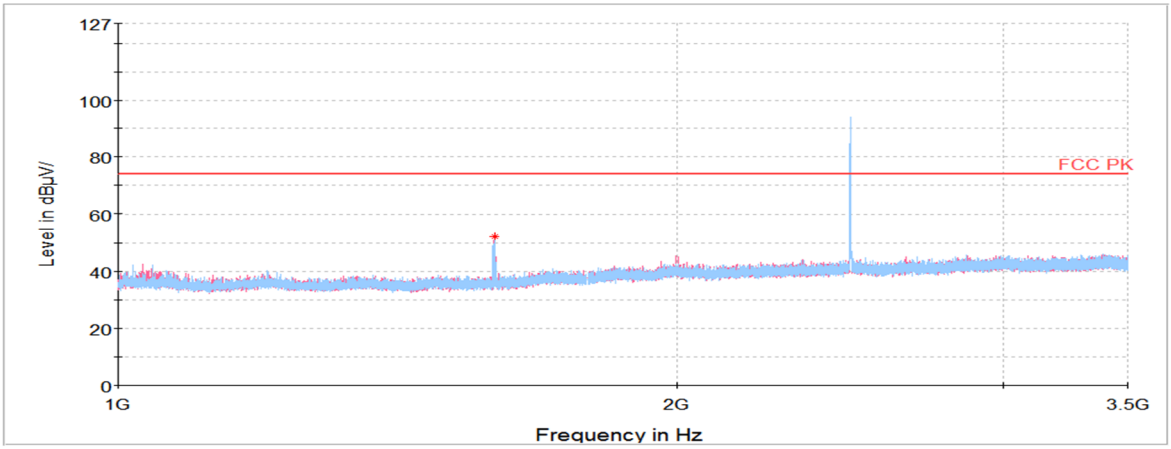
High Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 596.71[1)]	H	60.41	28.72	-36.91	-	52.22	74.00	21.78
2 483.75[1)]	H	48.72	32.09	-35.52	-	45.29	74.00	28.71
4 959.52[1,2)]	H	67.88	33.88	-56.27	-	45.49	74.00	28.51
5 907.91	V	70.82	34.99	-56.14	-	49.67	74.00	24.33
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

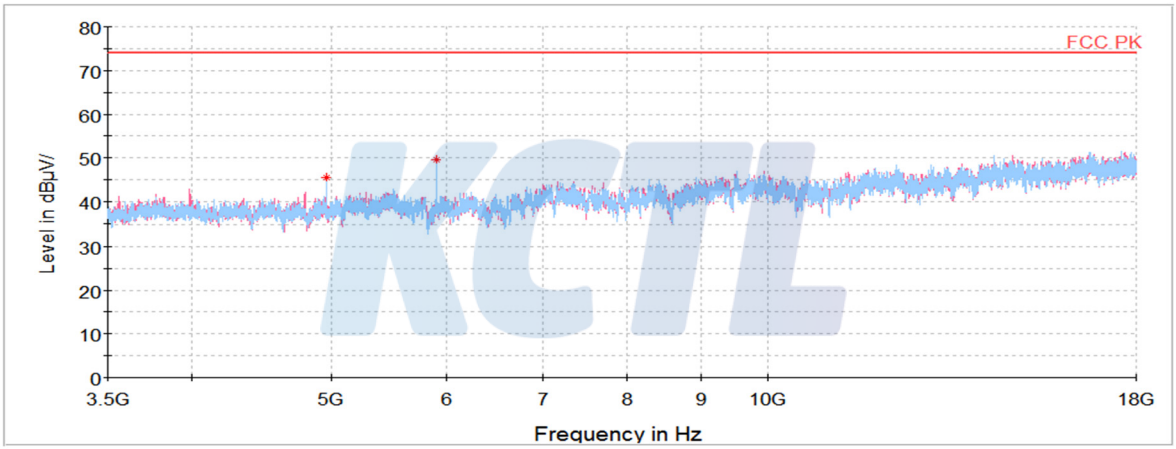
Horizontal/Vertical for Band-edge



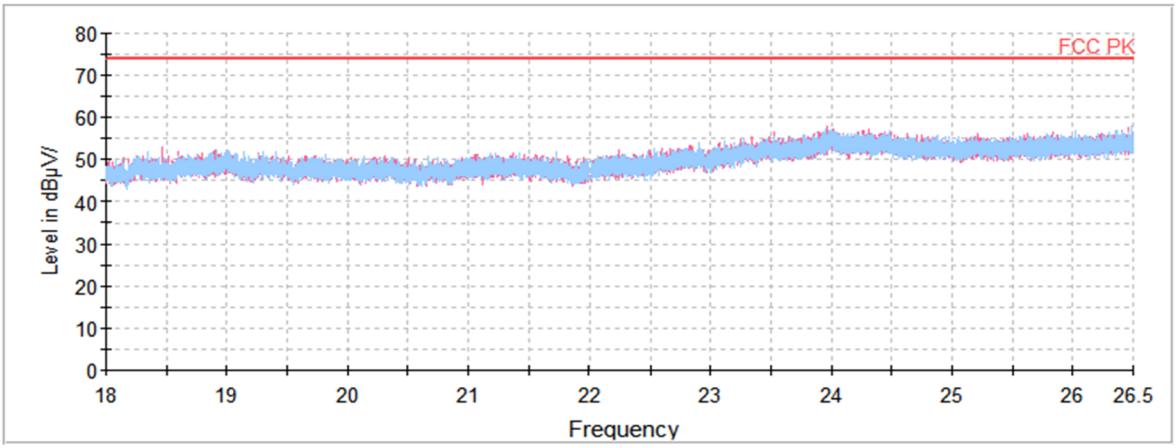
Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



Horizontal/Vertical for 18 ㎓ ~ 26.5 ㎓

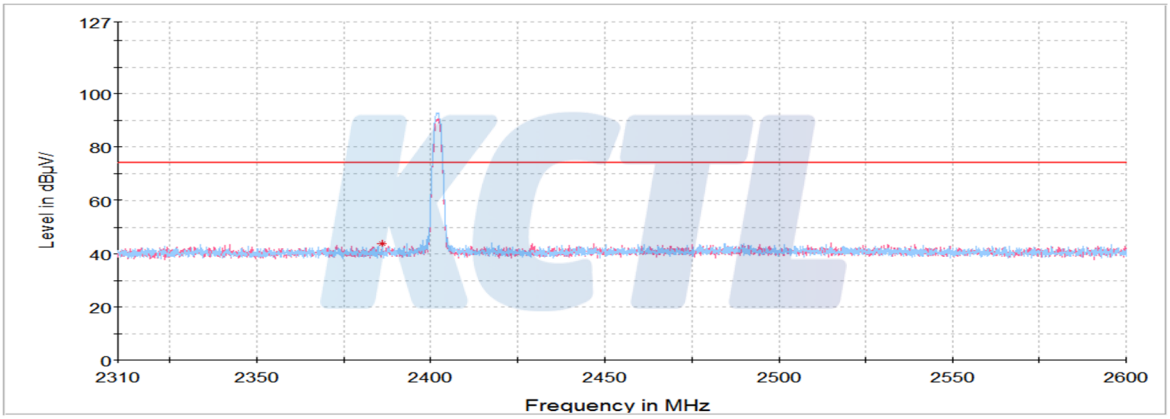


DC 12 V

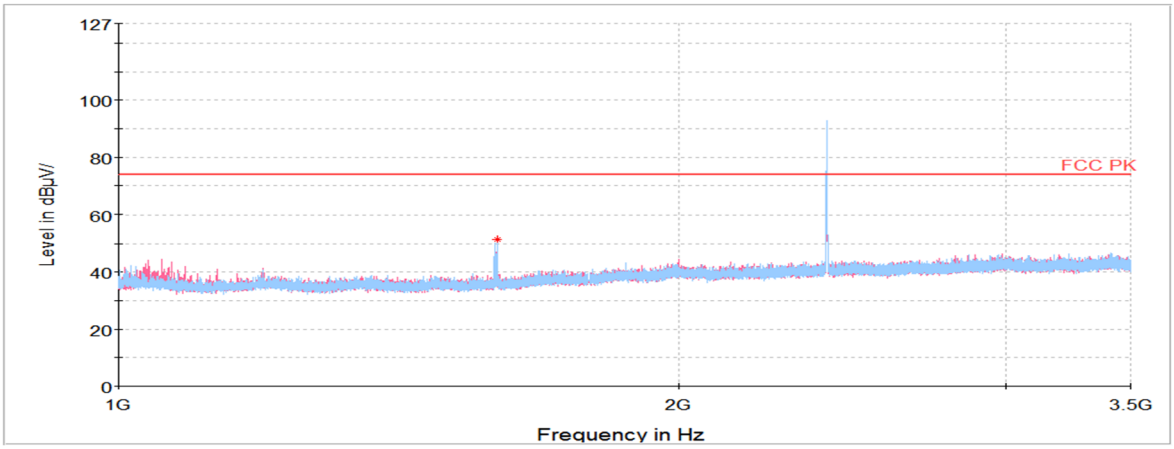
Low Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 598.06[1)]	V	59.77	28.73	-36.91	-	51.59	74.00	22.41
2 386.09[1)]	H	47.84	32.01	-36.01	-	43.84	74.00	30.16
4 804.55[1,2)]	V	62.16	33.78	-56.47	-	39.47	74.00	34.53
5 907.45[1)]	H	69.77	34.99	-56.13	-	48.63	74.00	25.37
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

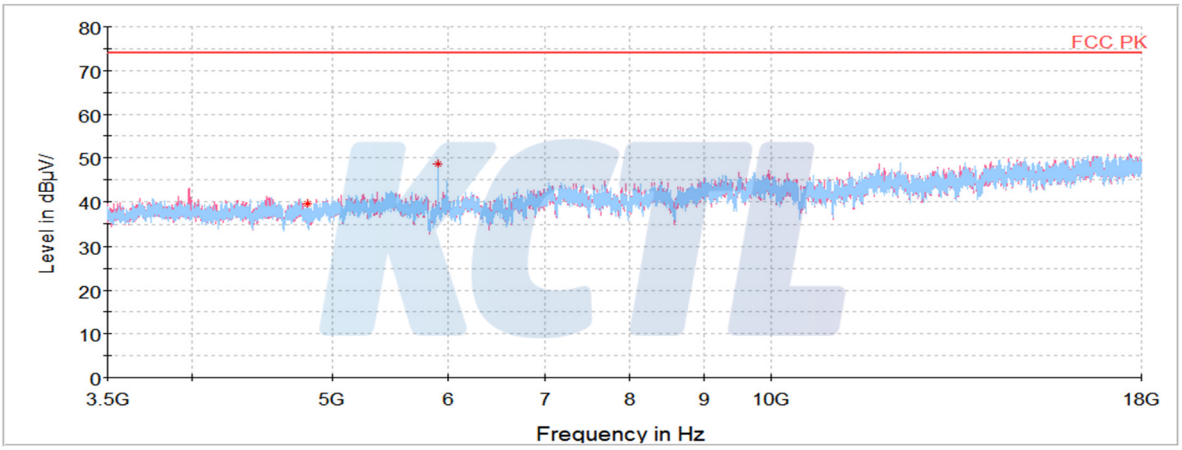
Horizontal/Vertical for Band-edge



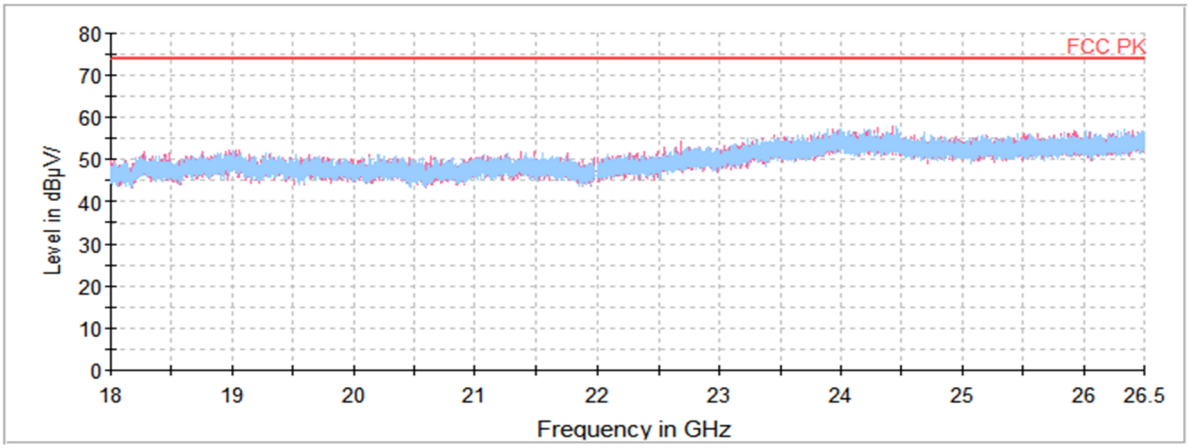
Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



Horizontal/Vertical for 18 ㎓ ~ 26.5 ㎓

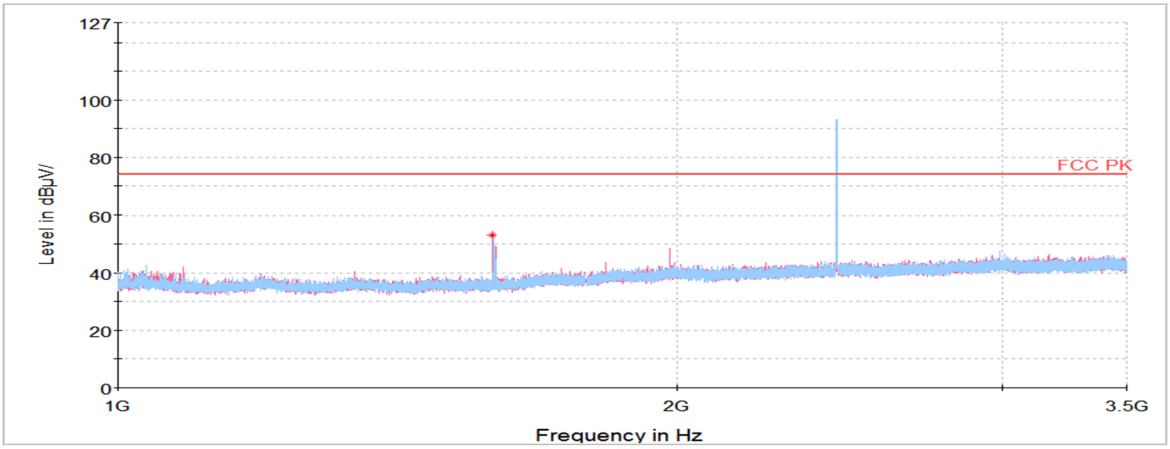


Middle Channel

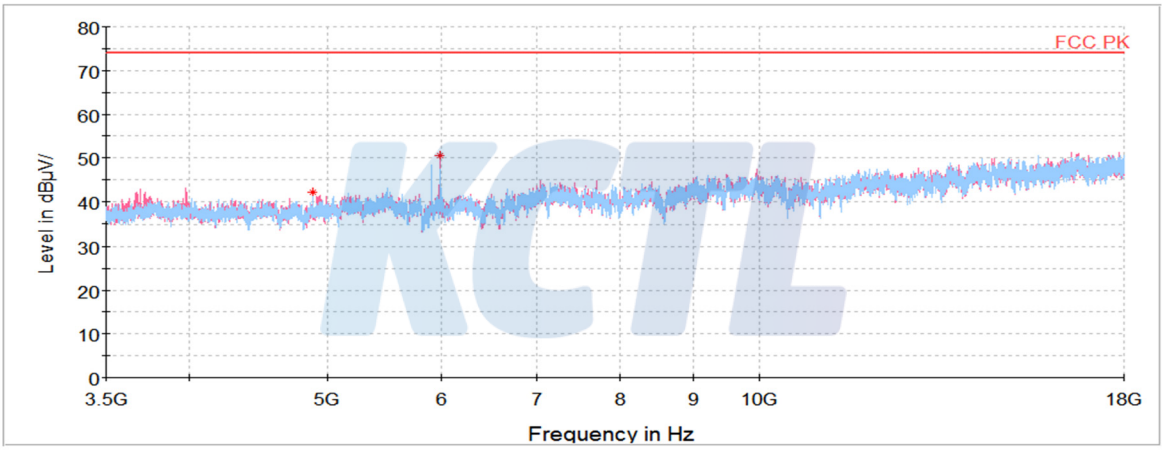
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 595.85[1)]	V	61.34	28.71	-36.90	-	53.15	74.00	20.85
4 879.77[1,2)]	H	65.01	33.83	-56.66	-	42.18	74.00	31.82
5 997.17	V	71.63	35.10	-56.31	-	50.42	74.00	23.58
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

KCTL

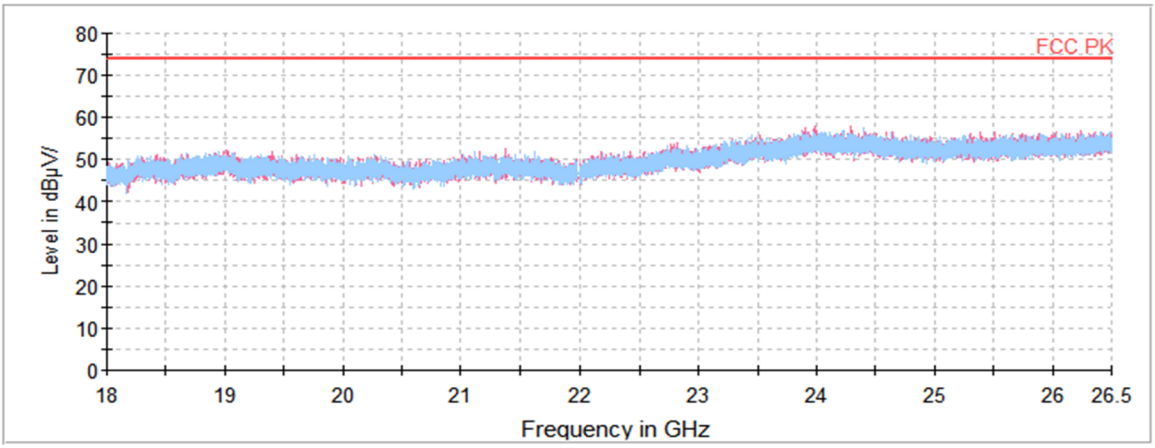
Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



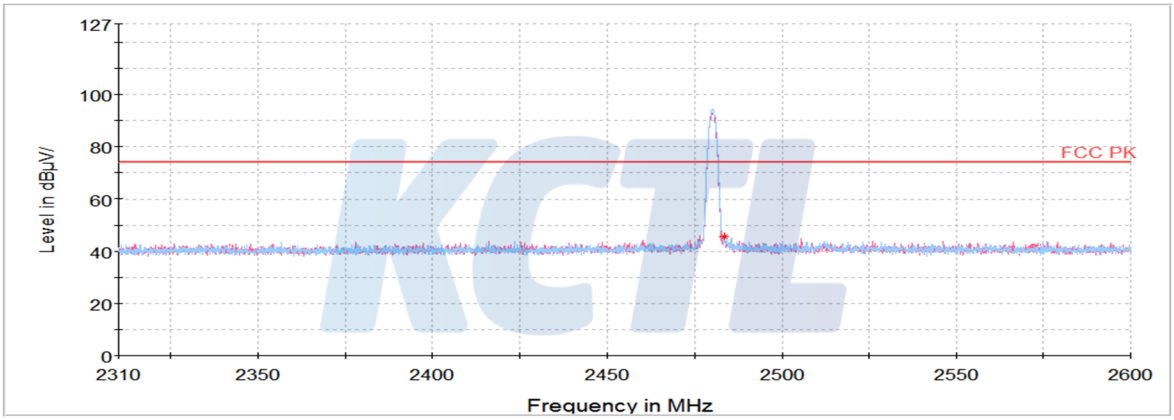
Horizontal/Vertical for 18 ㎓ ~ 26.5 ㎓



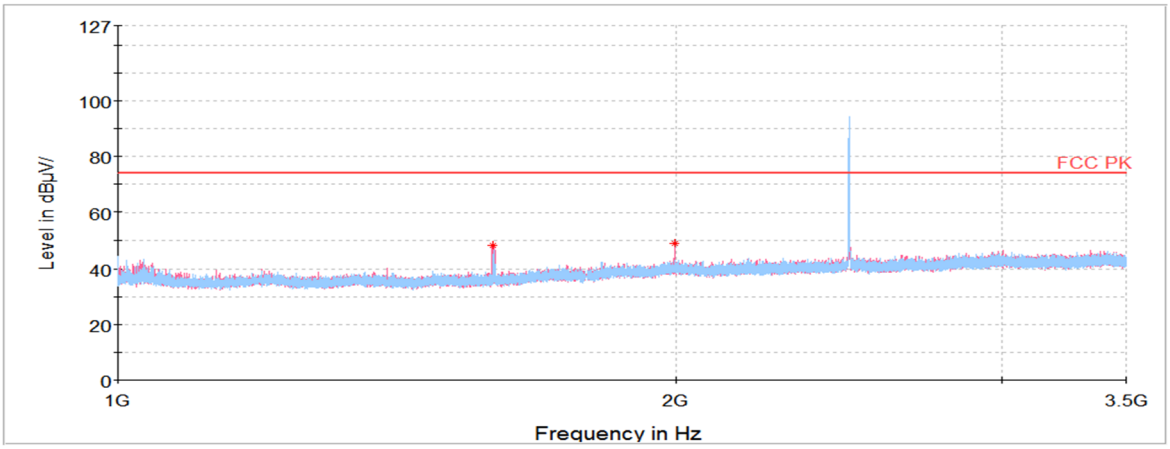
High Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 594.84[1)]	V	56.54	28.70	-36.90	-	48.34	74.00	25.66
1 995.70	V	54.07	31.67	-36.65	-	49.09	74.00	24.91
2 483.67[1)]	V	48.97	32.09	-35.52	-	45.54	74.00	28.46
4 959.52[1,2)]	H	67.34	33.88	-56.27	-	44.95	74.00	29.05
5 907.45	H	70.63	34.99	-56.13	-	49.49	74.00	24.51
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

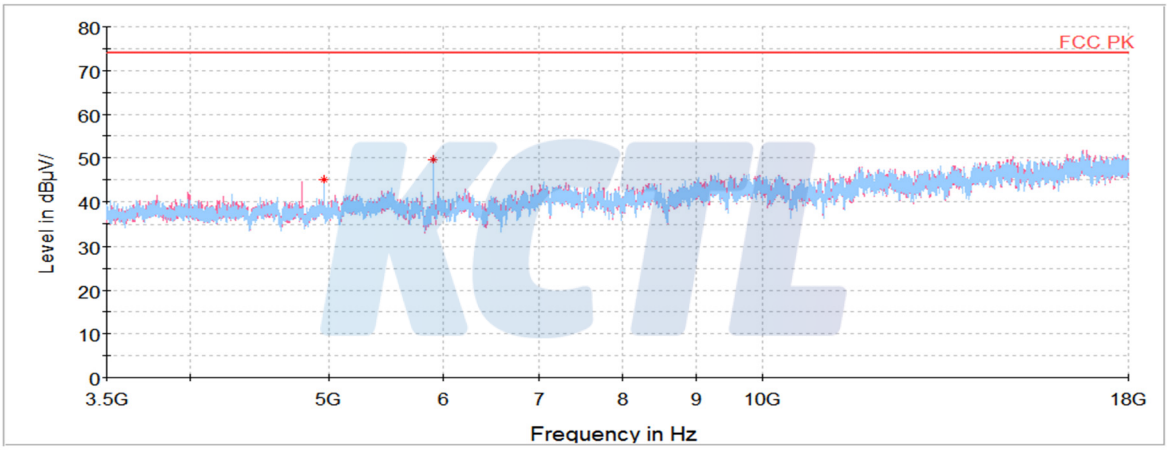
Horizontal/Vertical for Band-edge



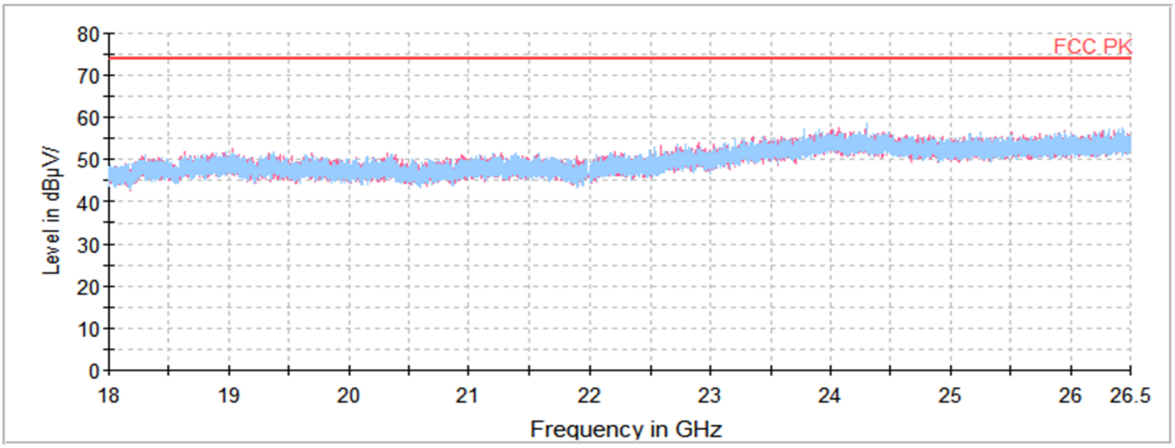
Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓

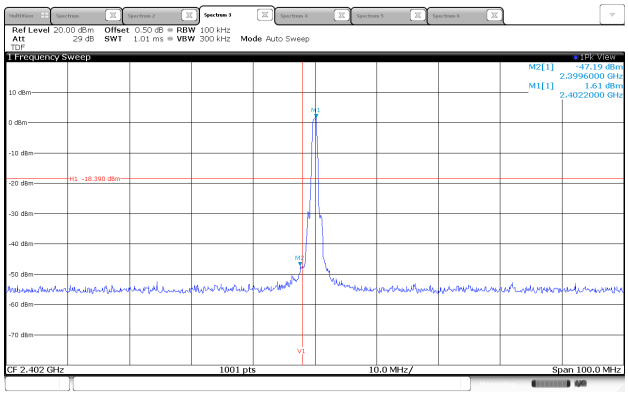
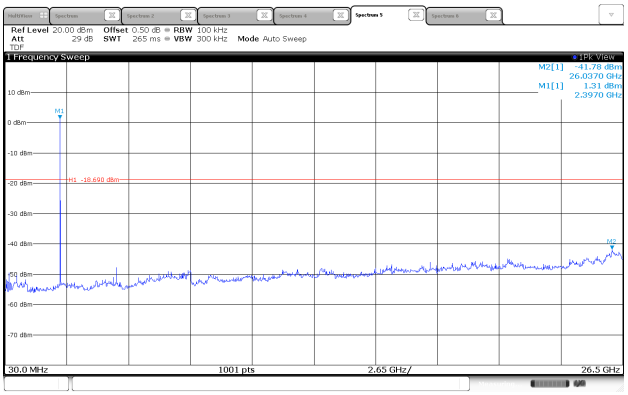
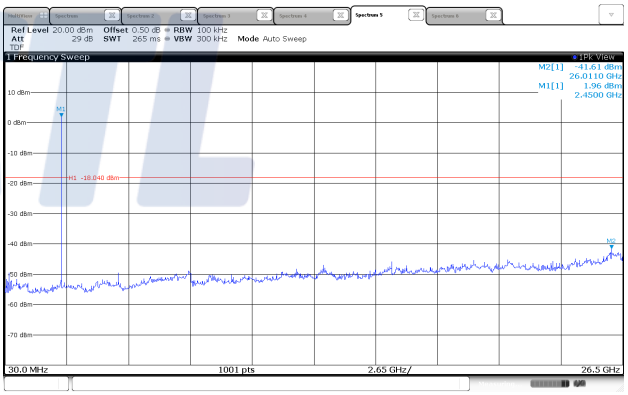
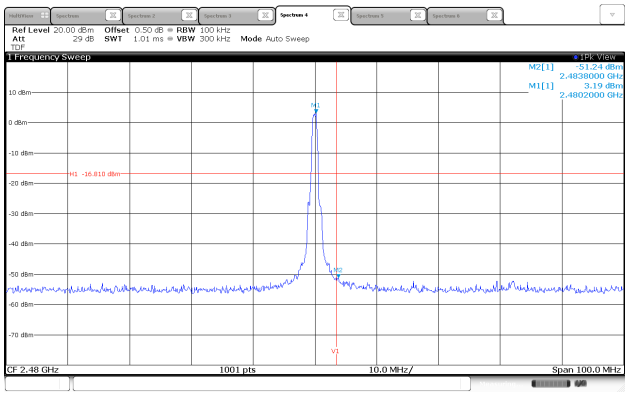
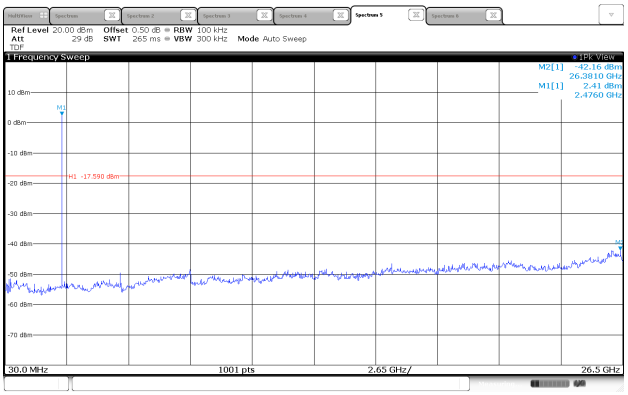


Horizontal/Vertical for 18 ㎓ ~ 26.5 ㎓



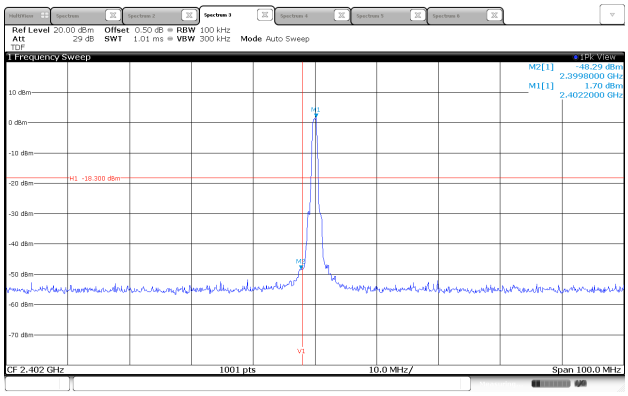
Test results

DC 5 V

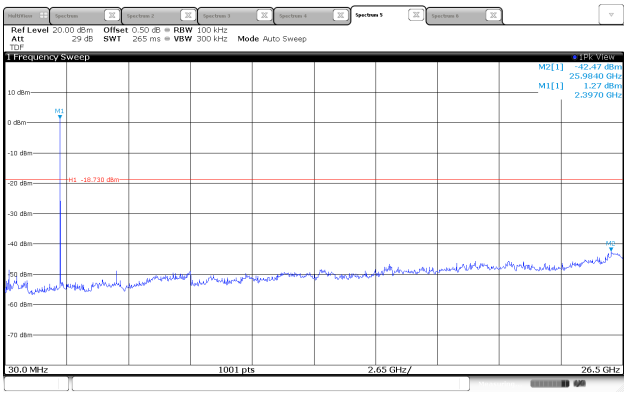
Conducted band-edge / Low ch.	Conducted spurious / Low ch.
	
	Conducted spurious / Mid ch.
Blank	
Conducted band-edge / High ch.	**Conducted spurious / High ch.**
	

DC 12 V

Conducted band-edge / Low ch.

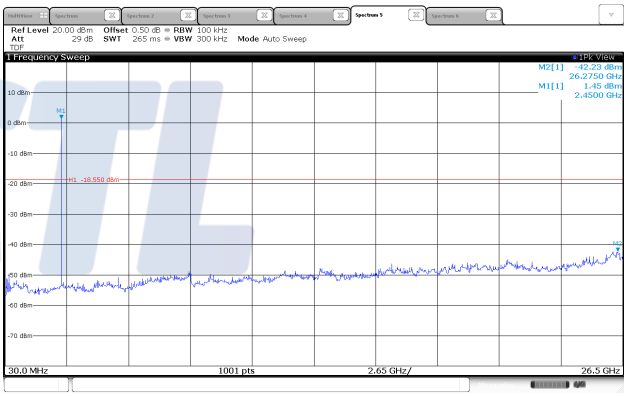


Conducted spurious / Low ch.

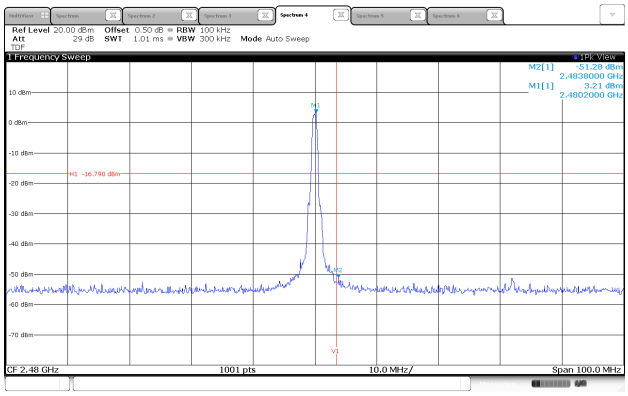


Conducted spurious / Mid ch.

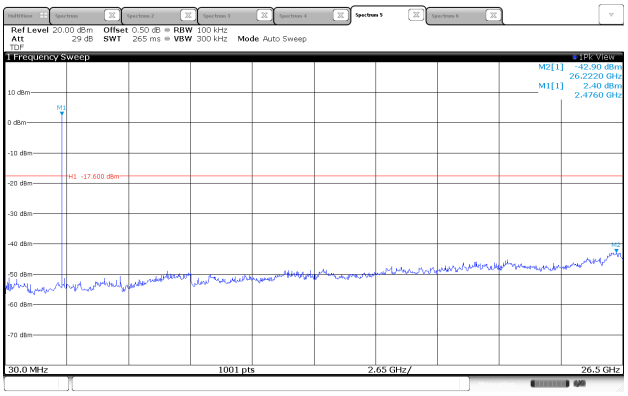
Blank



Conducted band-edge / High ch.

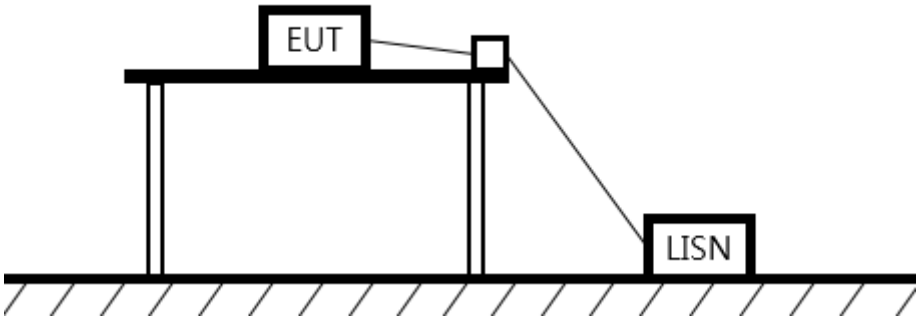


Conducted spurious / High ch.



7.5. AC Conducted emission

Test setup



Limit

According to 15.207(a), RSS-Gen(8.8) For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

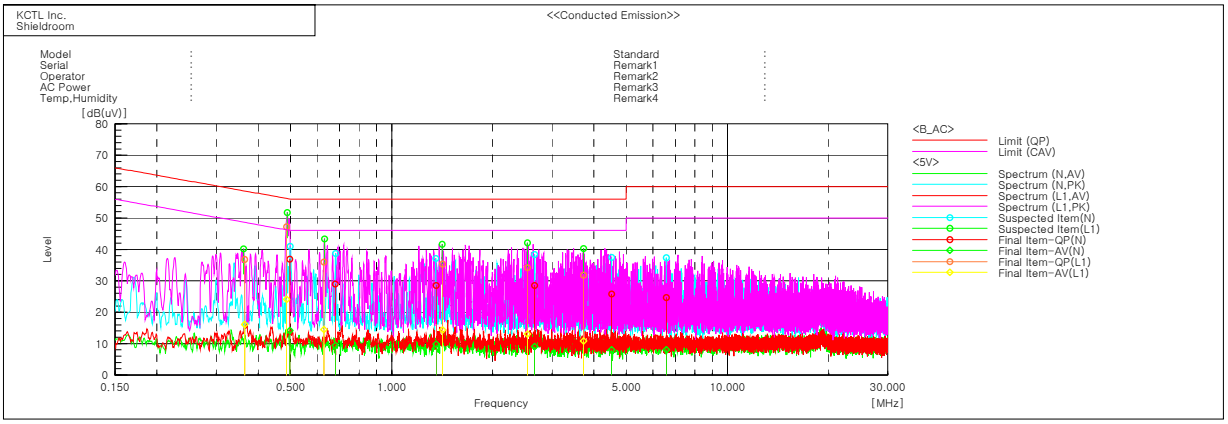
Frequency of Emission (㎒)	Conducted limit (dBμV/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

Measurement procedure

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 ㎝ in which is located 40 ㎝ away from the vertical wall and 1.5m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a spectrum analyzer or an EMI/Field Intensity ㅡ Meter, to the input power source.
3. Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 ㎒ to 30 ㎒.
5. The measurements were made with the detector set to peak amplitude within a bandwidth of 10 ㎑ or to quasi-peak and average within a bandwidth of 9 ㎑. The EUT was in transmitting mode during the measurements.

Test results

Worst case: BLE_1 MBit/s(37 Bytes) Highest frequency_DC 5 V



Final Result

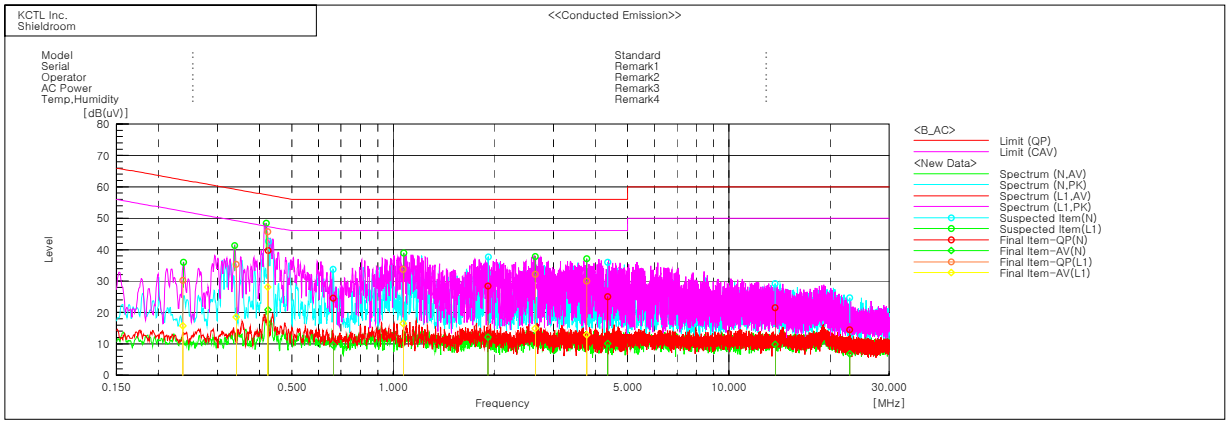
--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.49726	27.1	4.4	9.8	36.9	14.2	56.0	46.0	19.1	31.8
2	0.680	19.2	-0.4	9.8	29.0	9.4	56.0	46.0	27.0	36.6
3	1.35644	18.8	0.1	9.7	28.5	9.8	56.0	46.0	27.5	36.2
4	2.66708	18.9	-0.6	9.7	28.6	9.1	56.0	46.0	27.4	36.9
5	4.51609	16.1	-1.7	9.7	25.8	8.0	56.0	46.0	30.2	38.0
6	6.581	14.8	-1.8	9.8	24.6	8.0	60.0	50.0	35.4	42.0

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.36521	26.8	6.2	9.9	36.7	16.1	58.6	48.6	21.9	32.5
2	0.48691	37.2	14.2	9.9	47.1	24.1	56.2	46.2	9.1	22.1
3	0.62891	26.1	4.6	9.9	36.0	14.5	56.0	46.0	20.0	31.5
4	1.41819	25.5	4.6	9.8	35.3	14.4	56.0	46.0	20.7	31.6
5	2.53884	24.4	3.2	9.8	34.2	13.0	56.0	46.0	21.8	33.0
6	3.73008	21.9	1.1	9.8	31.7	10.9	56.0	46.0	24.3	35.1

Worst case: BLE_1 MBit/s(37 Bytes) Highest frequency_DC 12 V



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.42415	29.9	11.0	9.8	39.7	20.8	57.4	47.4	17.7	26.6
2	0.66319	14.7	-0.2	9.8	24.5	9.6	56.0	46.0	31.5	36.4
3	1.91631	18.7	2.4	9.7	28.4	12.1	56.0	46.0	27.6	33.9
4	4.35542	15.3	0.4	9.7	25.0	10.1	56.0	46.0	31.0	35.9
5	13.71096	11.5	-0.1	10.0	21.5	9.9	60.0	50.0	38.5	40.1
6	22.90215	4.5	-3.2	10.0	14.5	6.8	60.0	50.0	45.5	43.2

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.23671	20.5	6.1	9.7	30.2	15.8	62.2	52.2	32.0	36.4
2	0.3413	25.5	8.8	9.8	35.3	18.6	59.2	49.2	23.9	30.6
3	0.42297	35.8	18.1	9.9	45.7	28.0	57.4	47.4	11.7	19.4
4	1.07224	23.9	6.7	9.8	33.7	16.5	56.0	46.0	22.3	29.5
5	2.65031	22.3	5.1	9.8	32.1	14.9	56.0	46.0	23.9	31.1
6	3.77021	20.2	3.1	9.8	30.0	12.9	56.0	46.0	26.0	33.1

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSW50	101013	20.05.13
Spectrum Analyzer	R&S	FSV30	101013	20.05.13
Wideband Power Sensor	R&S	NRP-Z81	102398	20.01.25
ATTENUATOR	R&S	DNF Dämpfungsglied 10 dB in N-50 Ohm	31212	20.05.13
EMI TEST RECEIVER	R&S	ESCI7	100732	19.08.23
Bi-Log Antenna	SCHWARZBECK	VULB 9168	583	20.05.04
Amplifier	SONOMA INSTRUMENT	310N	284608	19.08.23
COAXIAL FIXED ATTENUATOR	Agilent	8491B-003	2708A18758	20.05.04
Horn antenna	ETS.lindgren	3116	00086632	20.02.15
Horn antenna	ETS.lindgren	3117	155787	19.10.23
AMPLIFIER	L-3 Narda-MITEQ	AMF-7D-01001800 -22-10P	2031196	20.02.21
AMPLIFIER	L-3 Narda-MITEQ	JS44-18004000-33 -8P	2000997	20.07.30
LOOP Antenna	R&S	HFH2-Z2	100355	20.08.24
Antenna Mast	Innco Systems	MA4640-XP-ET	-	-
Turn Table	Innco Systems	DT2000	79	-
Antenna Mast	Innco Systems	MA4000-EP	303	-
Turn Table	Innco Systems	DT2000	79	-
Highpass Filter	WT	WT-A1698-HS	WT160411001	20.05.14
TWO-LINE V - NETWORK	R&S	ENV216	101358	20.04.05
EMI TEST RECEIVER	R&S	ESCI	100001	19.08.23
Vector Signal Generator	R&S	SMBV100A	257566	20.01.04
Signal Generator	R&S	SMR40	100007	20.05.13
Cable Assembly	RadiAll	2301761768000PJ	1724.659	-
Cable Assembly	gigalane	RG-400	-	-
Cable Assembly	HUER+SUHNER	SUCOFLEX 104	MY4342/4	-

End of test report

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