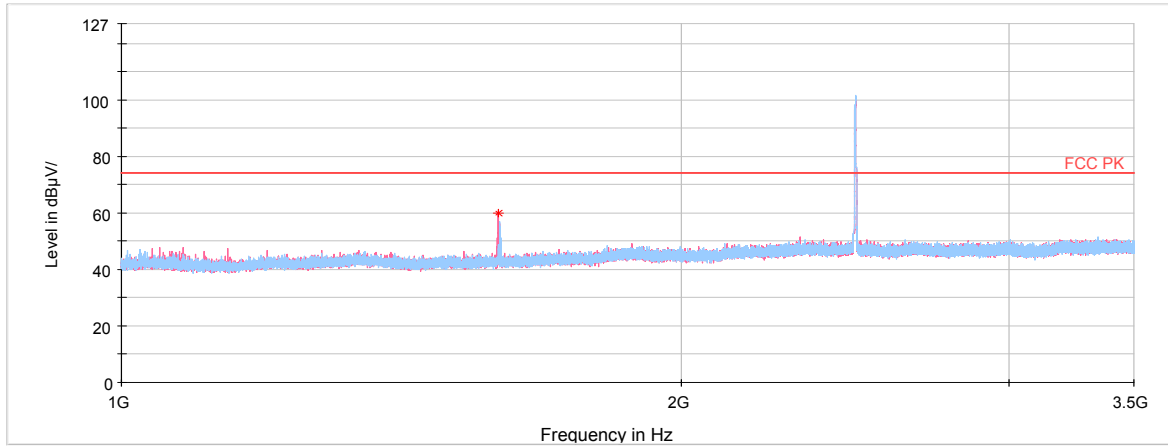
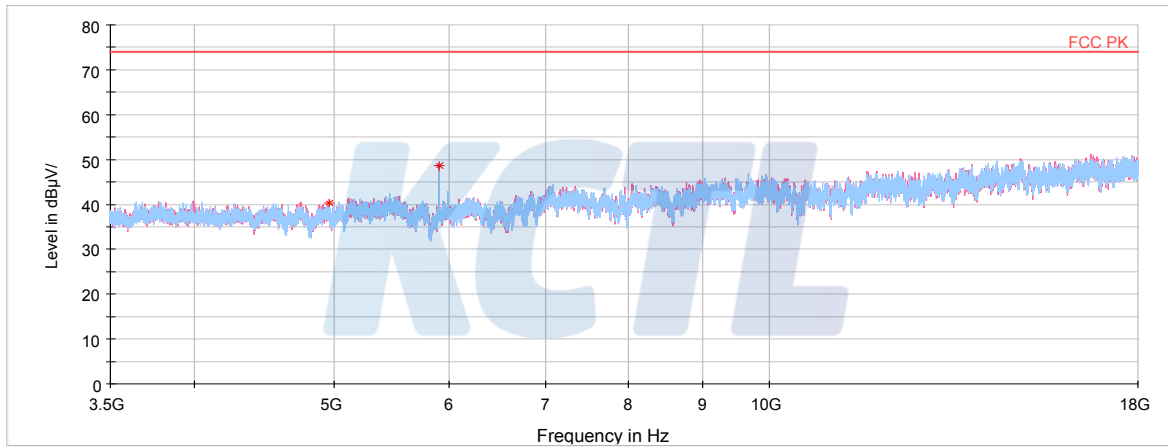


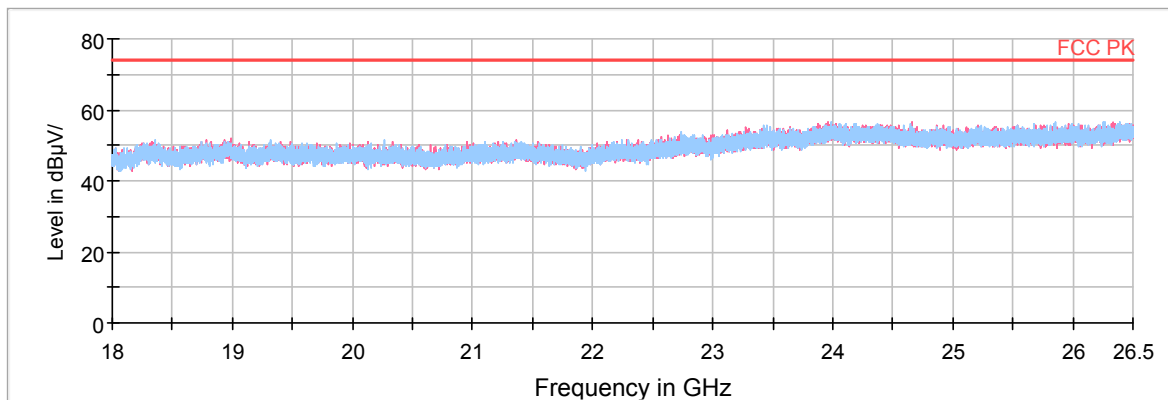
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 26.5 GHz



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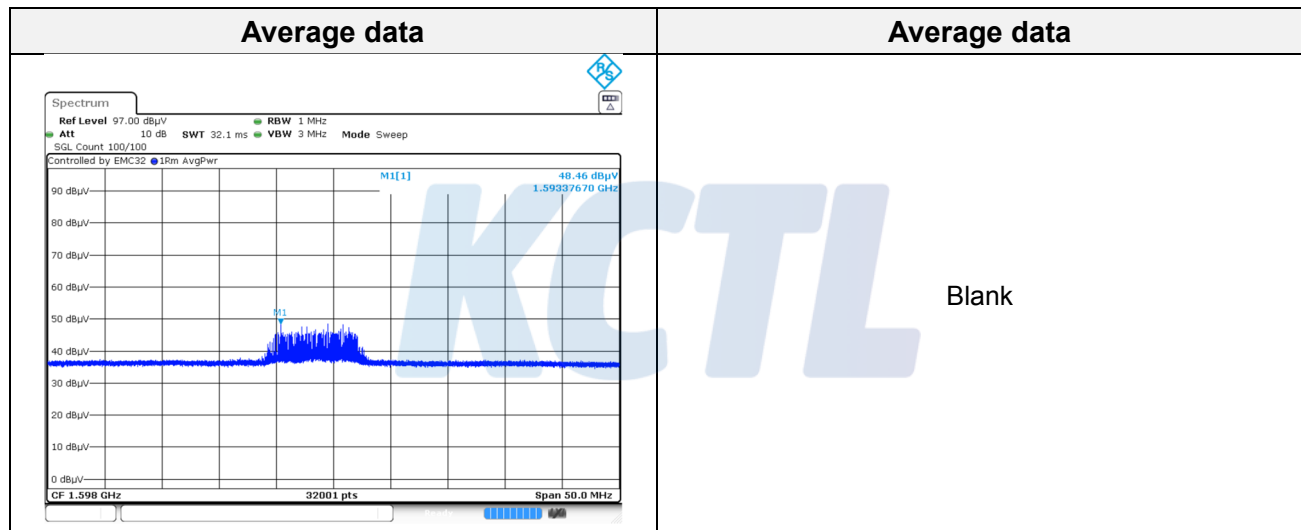
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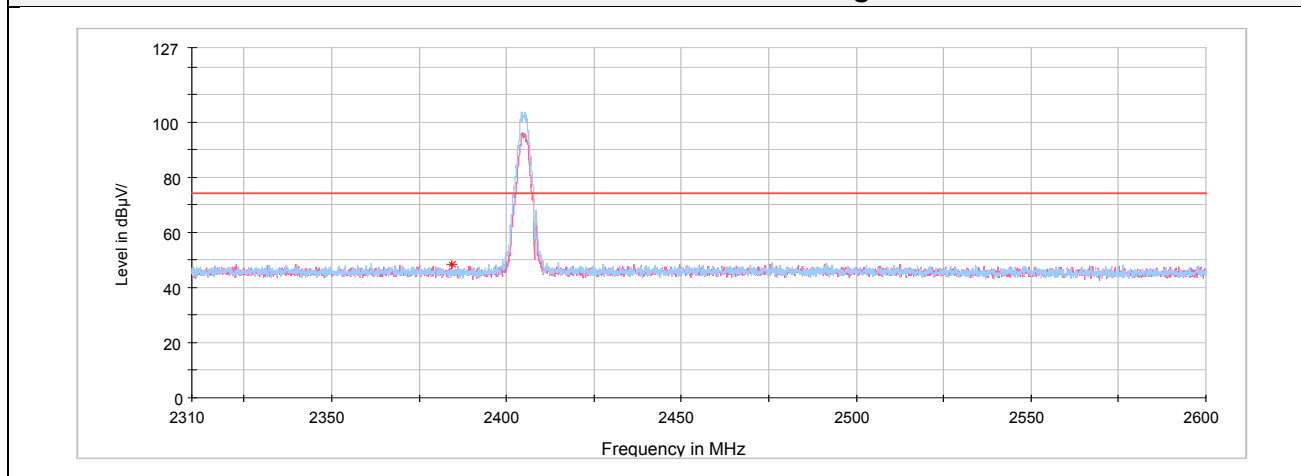
Test results (Above 1 000 MHz)_Simultaneous Transmission

Low Channel

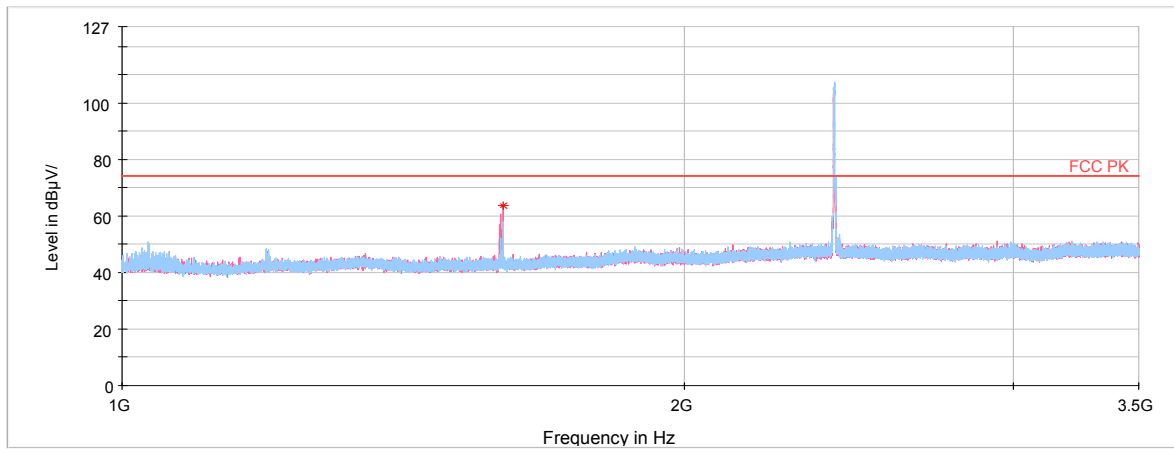
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 593.38 ¹⁾	V	71.81	28.69	-36.90	-	63.60	74.00	10.40
2 384.45 ¹⁾	V	46.28	32.01	-29.80	-	48.49	74.00	25.51
4 809.98 ¹⁾	V	61.30	33.79	-56.49	-	38.60	74.00	35.40
5 907.91	V	69.61	34.99	-56.14	-	48.46	74.00	25.54
Average Data								
1 593.38 ¹⁾	V	48.46	28.69	-36.90	-	40.25	54.00	13.75



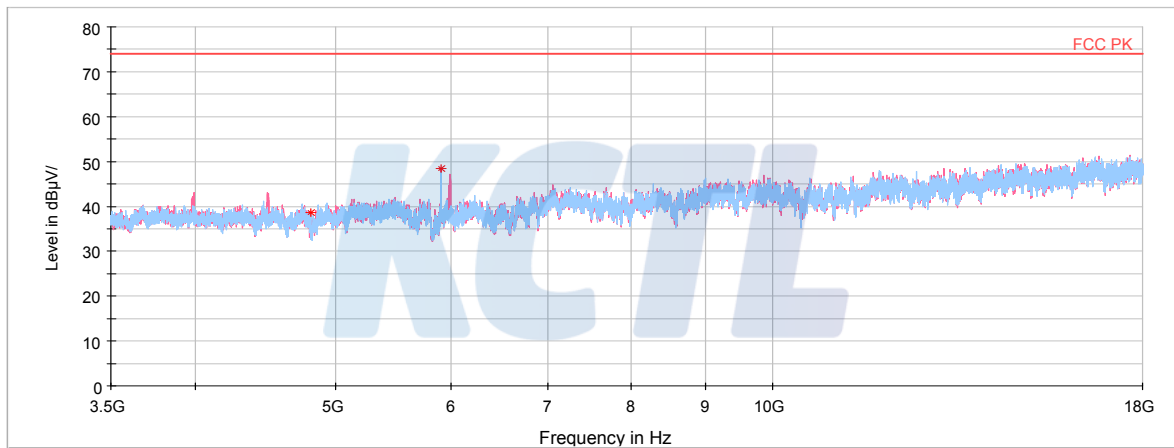
Horizontal/Vertical for Band-edge



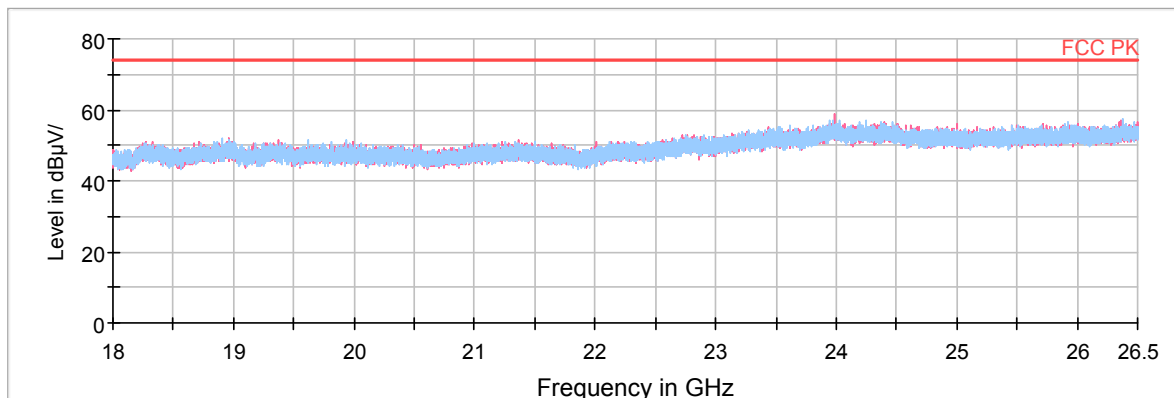
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 26.5 GHz



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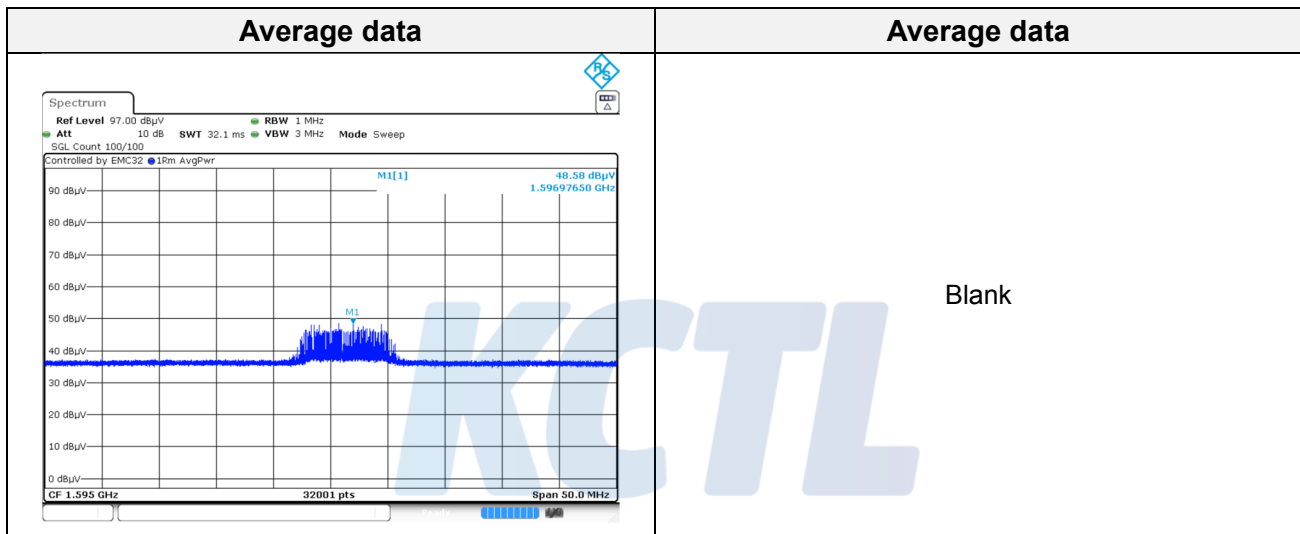
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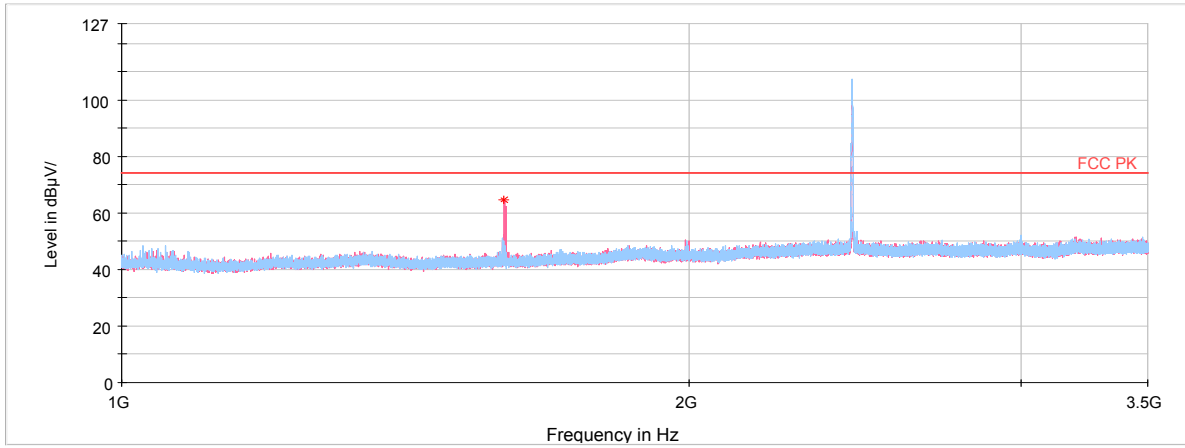


Middle Channel

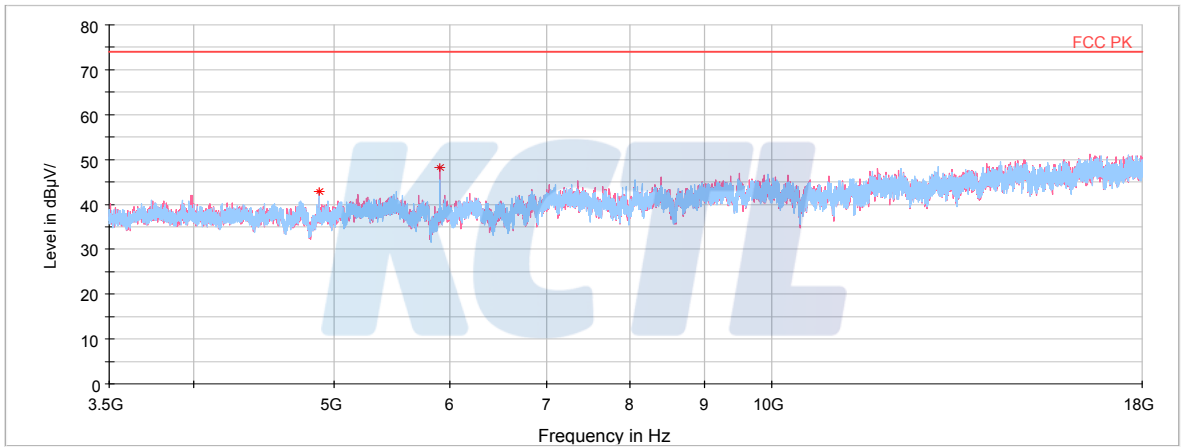
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
1 596.98 ¹⁾	V	72.81	28.72	-36.91	-	64.62	74.00	9.38
4 879.77 ¹⁾	H	65.78	33.83	-56.66	-	42.95	74.00	31.05
5 907.45	V	69.39	34.99	-56.13	-	48.25	74.00	25.75
Average Data								
1 596.98 ¹⁾	V	48.58	28.72	-36.91	-	40.39	54.00	13.61



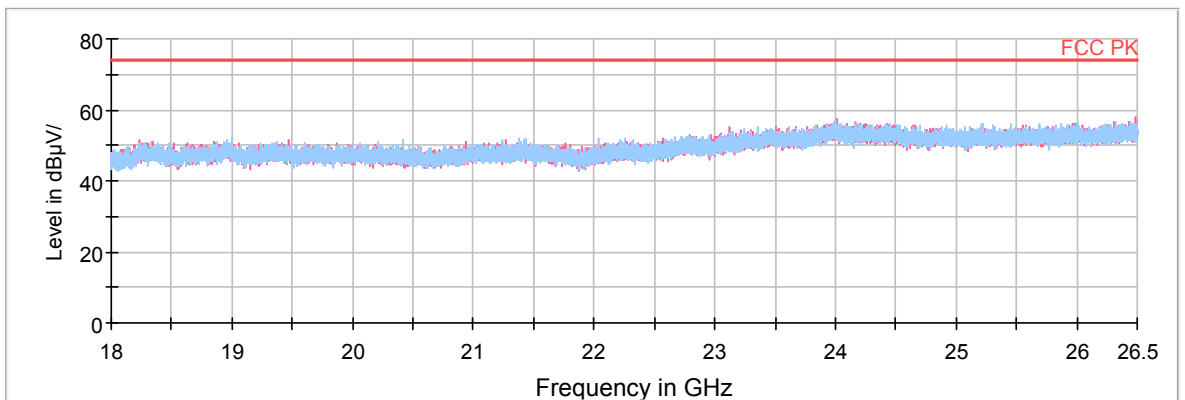
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 26.5 GHz



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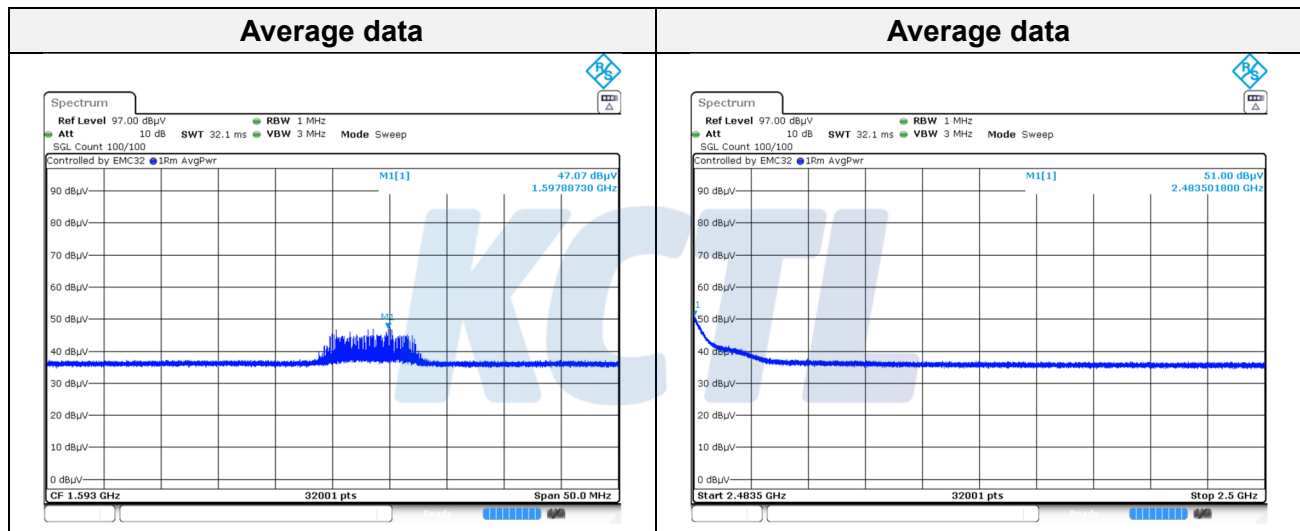
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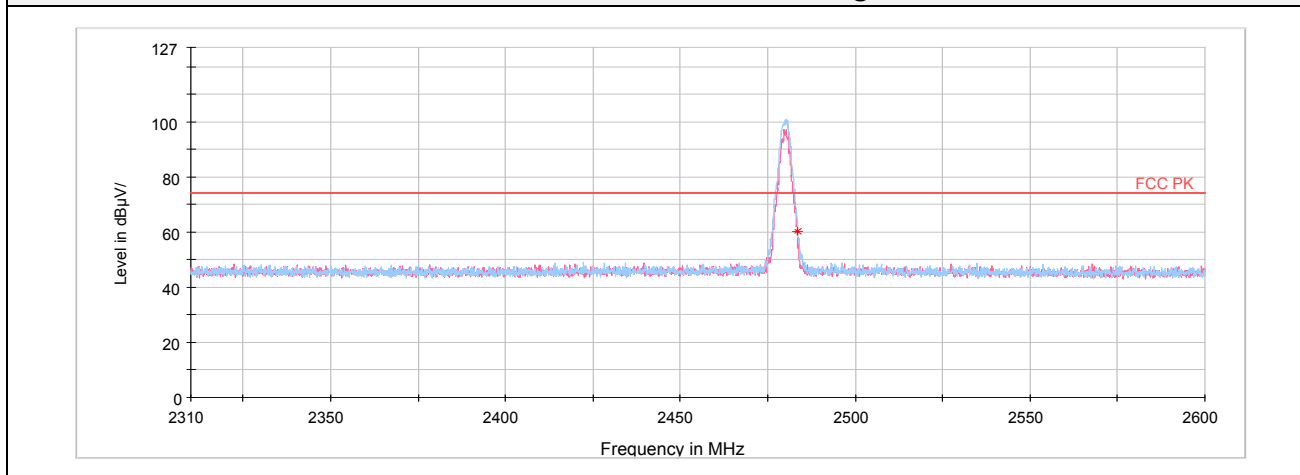


High Channel

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								
1 597.89 ¹⁾	V	67.11	28.72	-36.91	-	58.92	74.00	15.08
2 483.50 ¹⁾	H	58.06	32.09	-29.88	-	60.27	74.00	13.73
4 960.42 ¹⁾	H	64.12	33.88	-56.27	-	41.73	74.00	32.27
5 907.00	V	69.75	34.99	-56.13	-	48.61	74.00	25.39
Average Data								
1 597.89 ¹⁾	V	47.07	28.72	-36.91	-	38.88	54.00	15.12
2 483.50 ¹⁾	H	51.00	32.09	-29.88	-	53.21	54.00	0.79



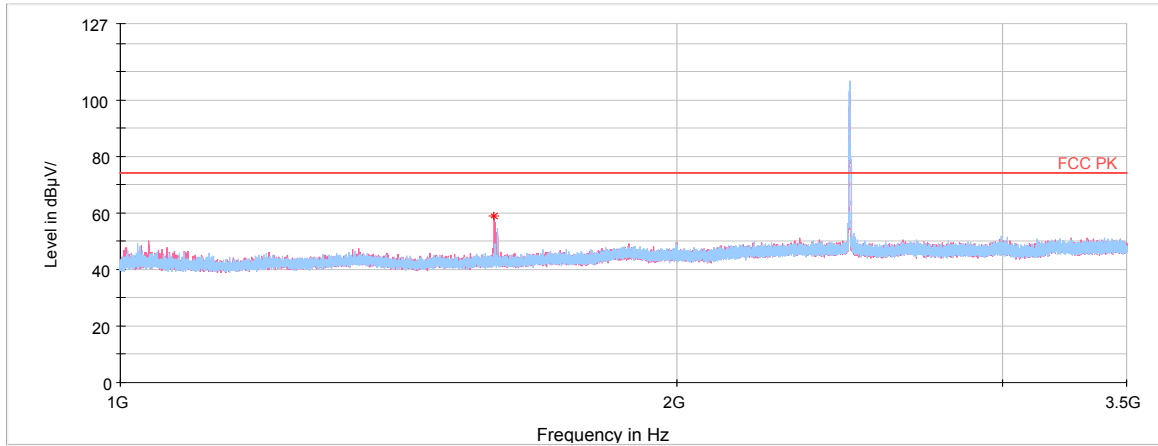
Horizontal/Vertical for Band-edge



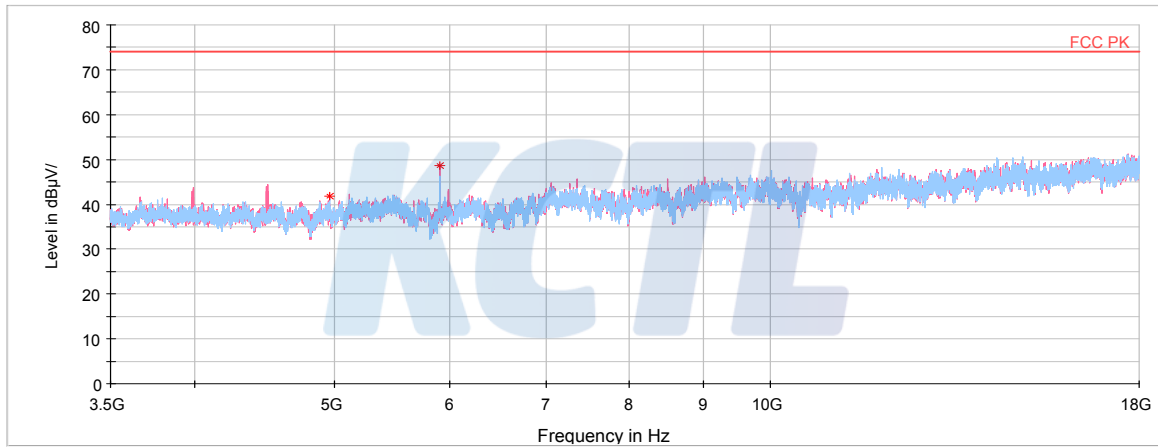
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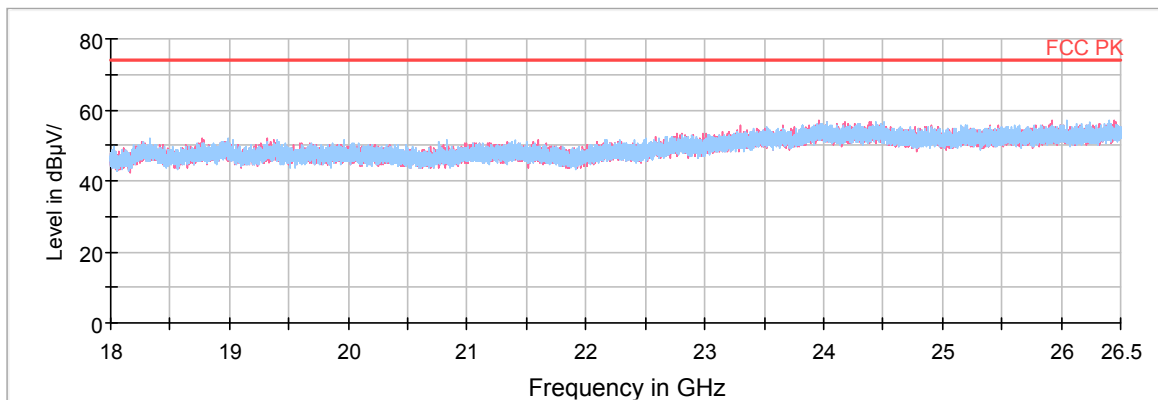
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz

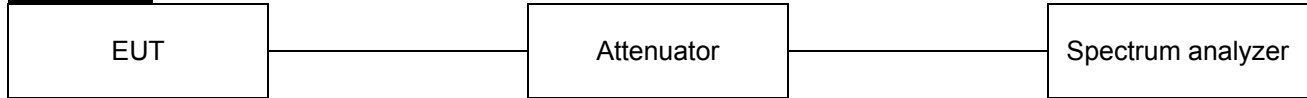


Horizontal/Vertical for 18 GHz ~ 26.5 GHz



7.5. Conducted Spurious Emission

Test setup



Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operation, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation specified in §15.209(a) is not required. In addition, radiated emission limits specified in §15.209(a) (see §15.205(c)).

Limit : 20 dBc

Test procedure

ANSI C63.10 - Section 11.11.3

558074 D01 v04 – Section 11.3

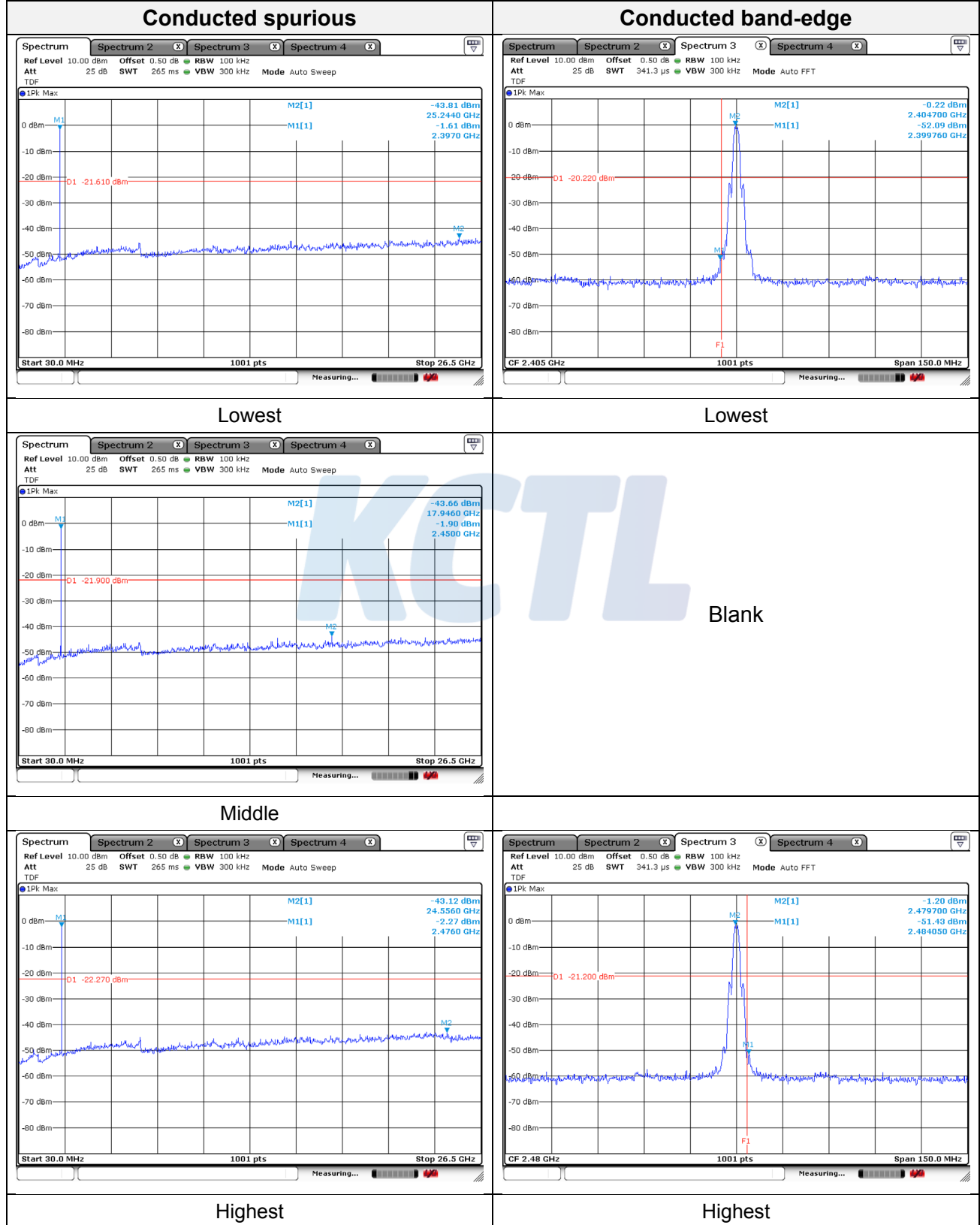
Test settings

Set the spectrum analyzer as follows:

- 1) Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.
Typically, several plots are required to cover this entire span.
- 2) RBW = 100 kHz
- 3) VBW ≥ RBW
- 4) Sweep = auto
- 5) Detector function = peak
- 6) Trace = max hold
- 7) Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
- 8) Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.

Test results

ANT1



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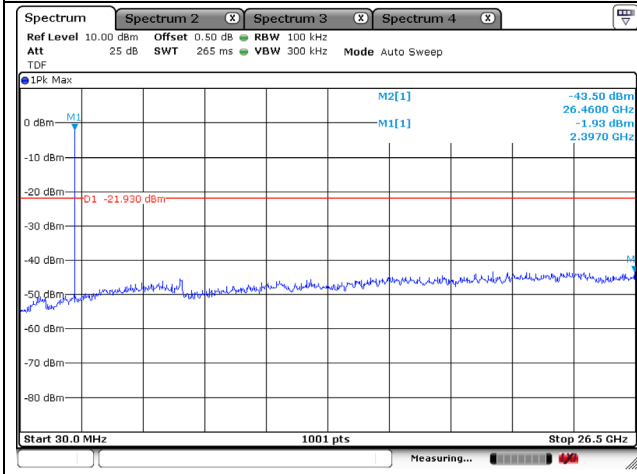
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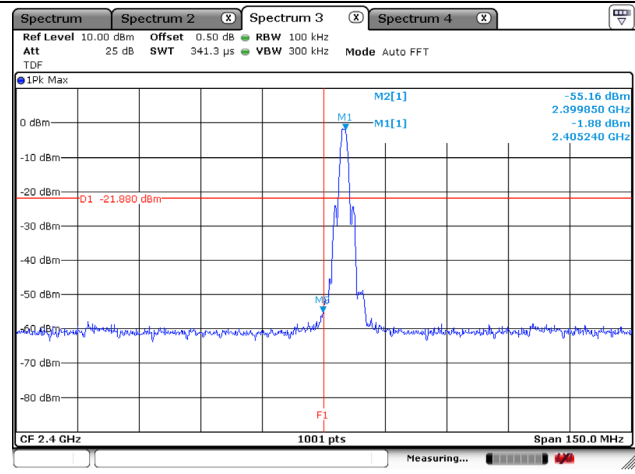


ANT2

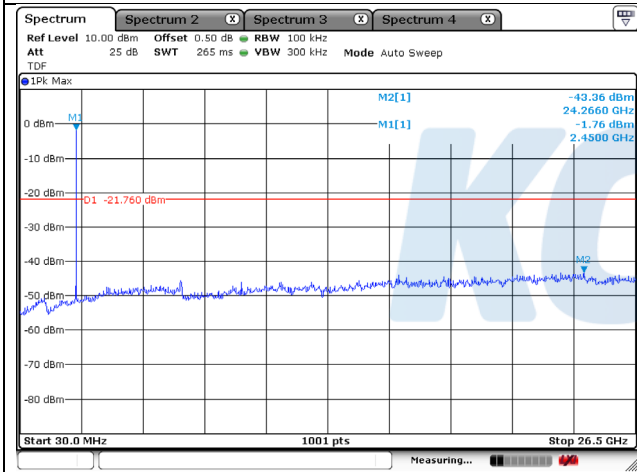
Conducted spurious



Conducted band-edge



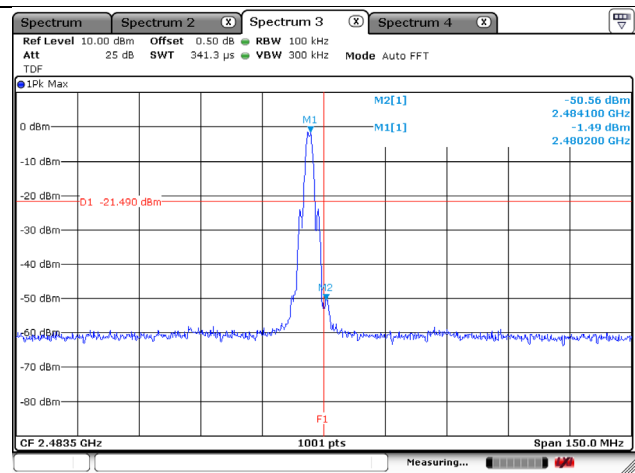
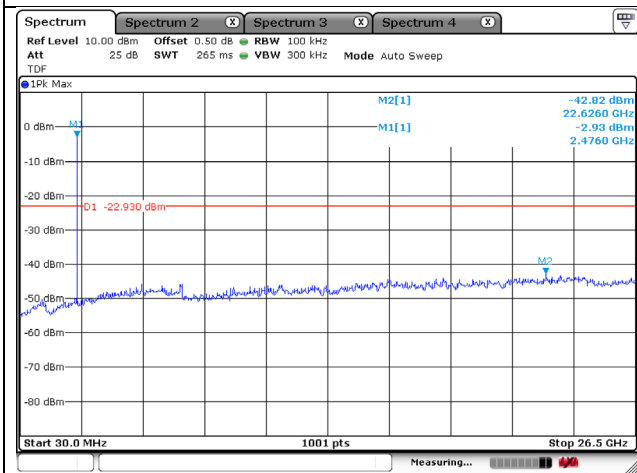
Lowest



Lowest



Middle

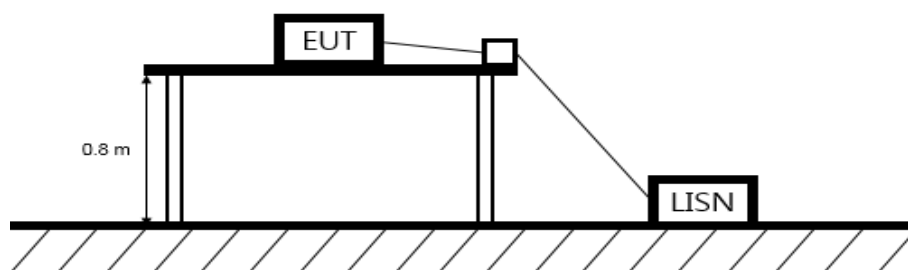


Highest

Highest

7.6. 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 kHz to 30 MHz, 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 (MHz)	Conducted limit (dB μ V/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

Test procedure

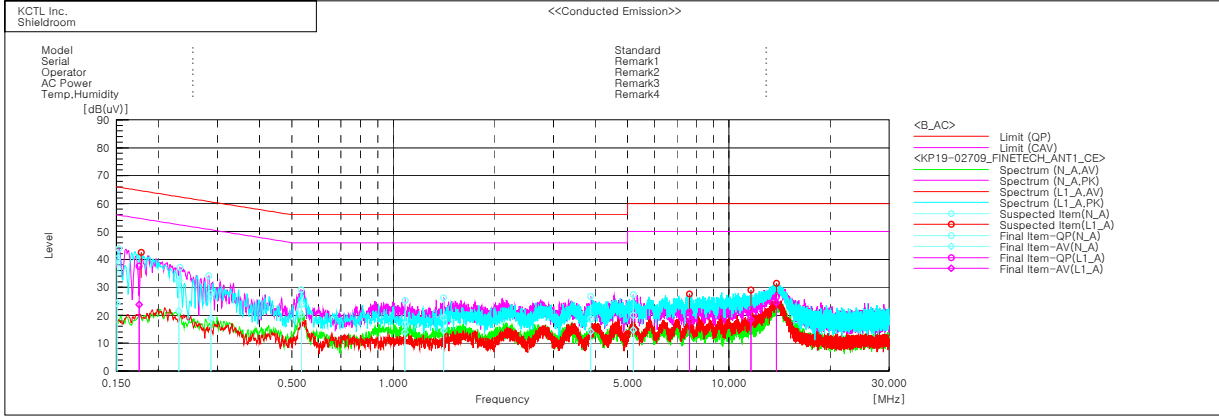
ANSI C63.10-2013 - Section 6.2

Test settings

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm 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 50 Ω /50 μ H LISN, which is an input transducer to a spectrum analyzer or an EMI/Field Intensity 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 MHz to 30 MHz.
5. The measurements were made with the detector set to peak amplitude within a bandwidth of 10 kHz or to quasi-peak and average within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

Test results

Worst case: Zigbee / Low Frequency



Final Result

--- N_A 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	0.15065	30.3	14.4	9.9	40.2	24.3	66.0	56.0	25.8	31.7
2	0.23011	22.4	11.7	9.9	32.3	21.6	62.4	52.4	30.1	30.8
3	0.28702	17.9	9.1	9.8	27.7	18.9	60.6	50.6	32.9	31.7
4	0.53348	13.9	10.1	10.0	23.9	20.1	56.0	46.0	32.1	25.9
5	1.08401	6.8	4.2	9.9	16.7	14.1	56.0	46.0	39.3	31.9
6	1.41415	9.3	4.6	9.9	19.2	14.5	56.0	46.0	36.8	31.5
7	3.87745	8.7	4.3	9.9	18.6	14.2	56.0	46.0	37.4	31.8
8	5.19052	10.1	4.9	9.9	20.0	14.8	60.0	50.0	40.0	35.2

--- L1_A 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	0.17524	27.4	13.6	10.2	37.6	23.8	64.7	54.7	27.1	30.9
2	7.62685	11.0	7.8	10.0	21.0	17.8	60.0	50.0	39.0	32.2
3	11.62305	11.8	8.2	10.3	22.1	18.5	60.0	50.0	37.9	31.5
4	13.84882	16.1	14.0	10.5	26.6	24.5	60.0	50.0	33.4	25.5

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal..Date
Spectrum Analyzer	R&S	FSV40	100989	20.01.04
Spectrum Analyzer	R&S	FSV40	100988	20.01.25
ATTENUATOR	R&S	21-10	0005	20.01.25
ATTENUATOR	Weinschel ENGINEERING	52-10	51395	20.01.28
ATTENUATOR	R&S	DNF Dämpfungsglied 10 dB in N-50 Ohm	31212	20.05.13
Signal Generator	R&S	SMR40	100007	20.05.13
Vector Signal Generator	R&S	SMBV100A	257566	20.01.04
Wideband Power Sensor	R&S	NRP-Z81	102398	20.01.25
DC Power Supply	AGILENT	E3632A	KR94907664	20.05.13
EMI TEST RECEIVER	R&S	ESCI	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	00086635	20.05.09
Horn antenna	ETS.lindgren	3117	161225	20.05.22
AMPLIFIER	L-3 Narda-MITEQ	AMF-7D-01001800 -22-10P	2031196	20.02.21
AMPLIFIER	L-3 Narda-MITEQ	JS44-18004000-33 -8P	2000997	20.08.01
AMPLIFIER	L-3 Narda-MITEQ	AFS5-00101800-25- S-5	2054571	20.02.21
LOOP Antenna	R&S	HFH2-Z2	100355	20.08.24
Antenna Mast	Innco Systems	MA4640-XP-ET	-	-
Antenna Mast	Innco Systems	MA4000-EP	303	-
Turn Table	Innco Systems	DT2000	79	-
EMI TEST RECEIVER	R&S	ESCI	101408	19.08.23
Highpass Filter	WT	WT-A1698-HS	WT160411001	20.05.14
Cable Assembly	RadiAll	2301761768000PJ	1724.659	-
Cable Assembly	gigalane	RG-400	-	-
Cable Assembly	HUER+SUHNER	SUCOFLEX 104	MY4342/4	-

End of test report