

ANNEX A: Test Result

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the loop antenna is vertical, the others are vertical and horizontal. and the worst case was recorded.

1. Unwanted Emission

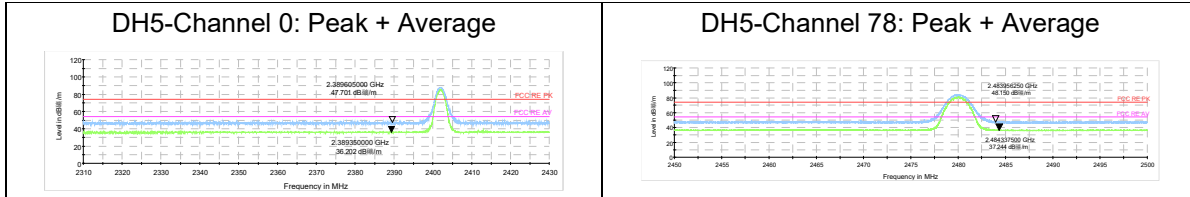
1.1. Bluetooth

The following graphs display the maximum values of horizontal and vertical by software. Blue trace uses the peak detection, Green trace uses the average detection.

A symbol ($\text{dB}_{\text{dBm}}/\text{m}$) in the test plot below means ($\text{dB}\mu\text{V}/\text{m}$)

After the pretest, Bluetooth BR was selected as the worst Mode for Bluetooth.

The signal beyond the limit is carrier.



Result of RE

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier.
The Radiates Emission from 18GHz to 26.5GHz are more than 20dB below the limit are not reported.

Remark:

1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)
2. Margin = Limit – Quasi-Peak/ MAX Peak/ Average
3. A symbol (dB μ V/m) in the test plot below means (dB μ V/m)
4. The following graphs display the maximum values of horizontal and vertical by software.
5. For below 1GHz

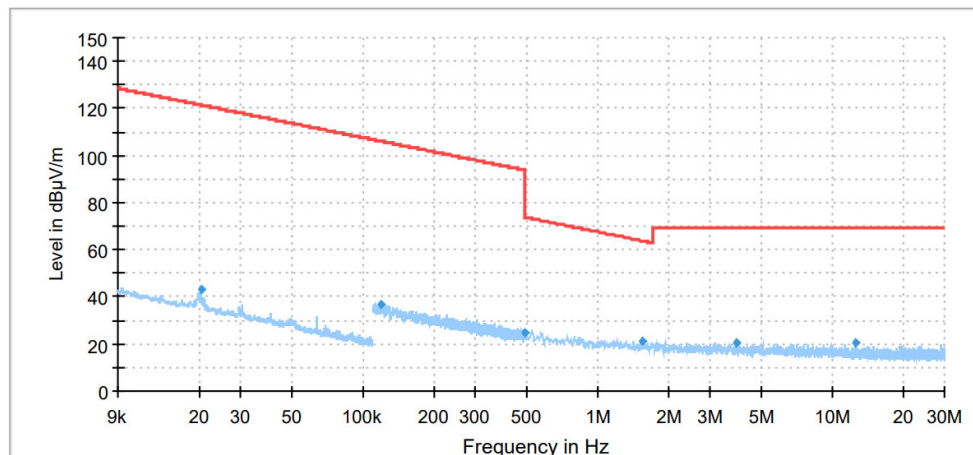
 QP Level @Spectrum Overview H
  QP Level @Spectrum Overview V
  QP Level @Final Results
  QP Limit

For above 1GHz

 PK Level @Spectrum Overview H
  PK Level @Spectrum Overview V
  PK Level @Final Results
  PK Limit
 AVG Level @Spectrum Overview H
  AVG Level @Spectrum Overview V
  AVG Level @Final Results
  AVG Limit

Continuous TX mode:

During the test, the Radiates Emission from 9kHz to 30MHz was performed in all modes with all channels. The test data of the worst-case condition was recorded in this report.

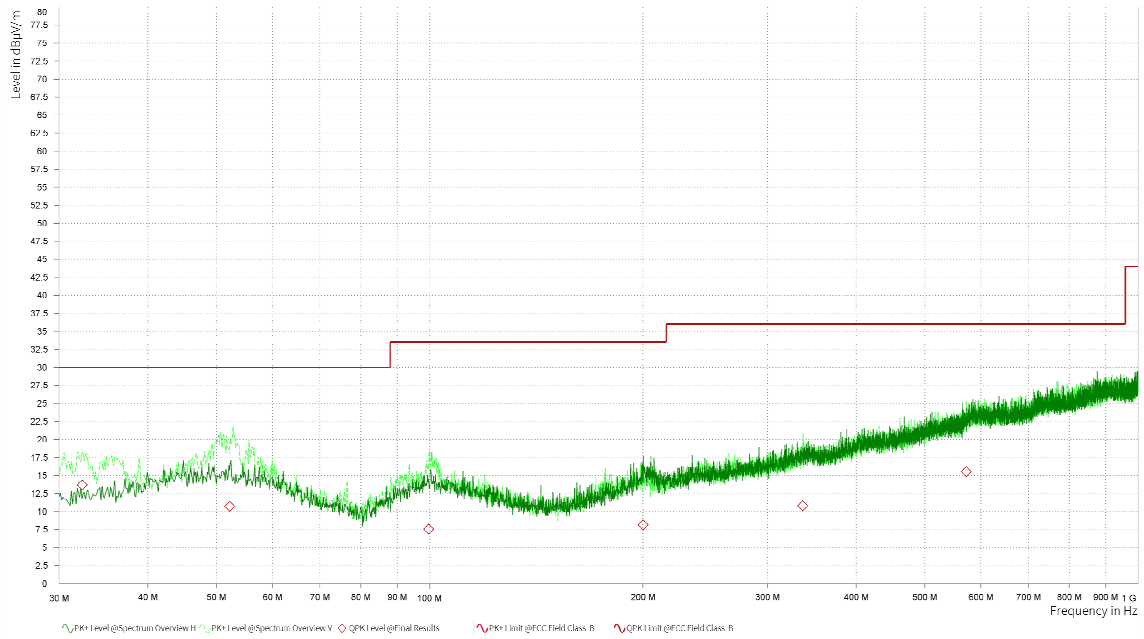


Radiates Emission from 9kHz to 30MHz

Final Result

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Azimuth (deg)	Corr. (dB/m)
0.02	43.05	121.45	78.40	500.00	194.00	17
0.12	36.80	106.02	69.22	150.00	359.00	17
0.49	24.75	73.80	49.05	150.00	249.00	17
1.56	21.37	63.76	42.38	150.00	12.00	17
3.92	20.43	69.50	49.07	150.00	129.00	17
12.61	20.43	69.50	49.07	150.00	218.00	17

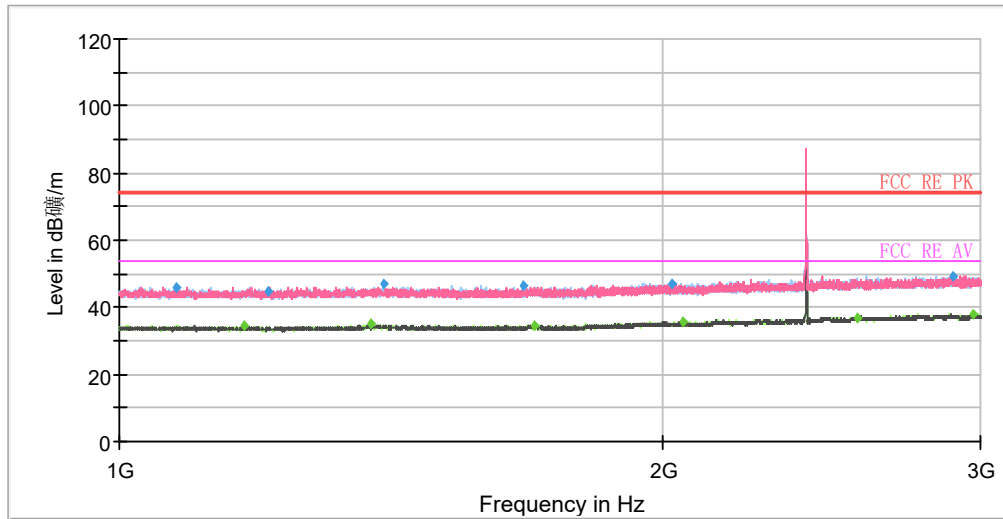
Spectrum Overview H/V



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (m)	Polarization	Azimuth (deg)	Correct Factor (dB)
32.347	13.67	30.00	16.33	1.14	V	66.9	-11.57
52.231	10.70	30.00	19.30	1.79	V	228.9	-8.27
99.660	7.54	33.50	25.96	1.25	V	349.6	-9.70
200.104	8.12	33.50	25.38	1.79	H	284.2	-9.72
336.281	10.77	36.00	25.23	1.25	V	26.8	-6.07
571.993	15.51	36.00	20.49	1.17	V	275.5	-1.87

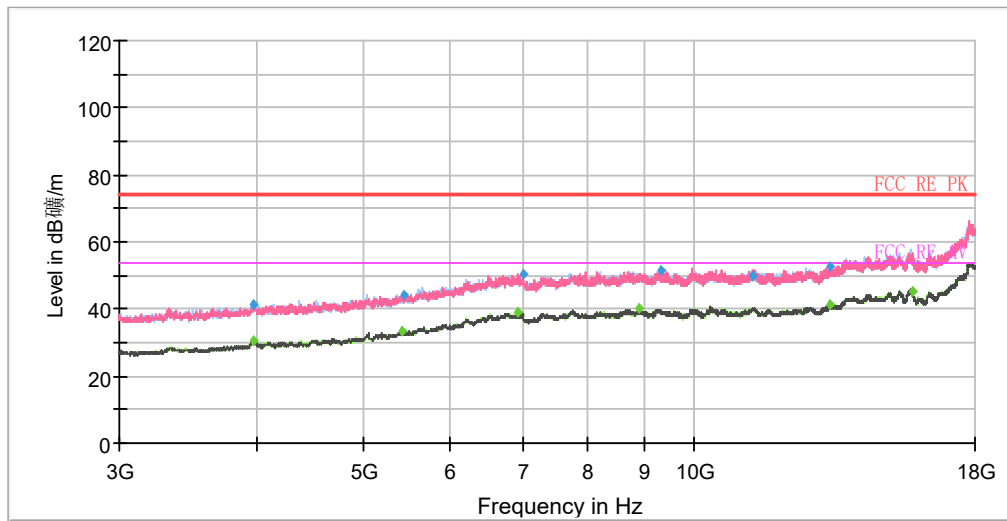
DH5-Channel 0



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

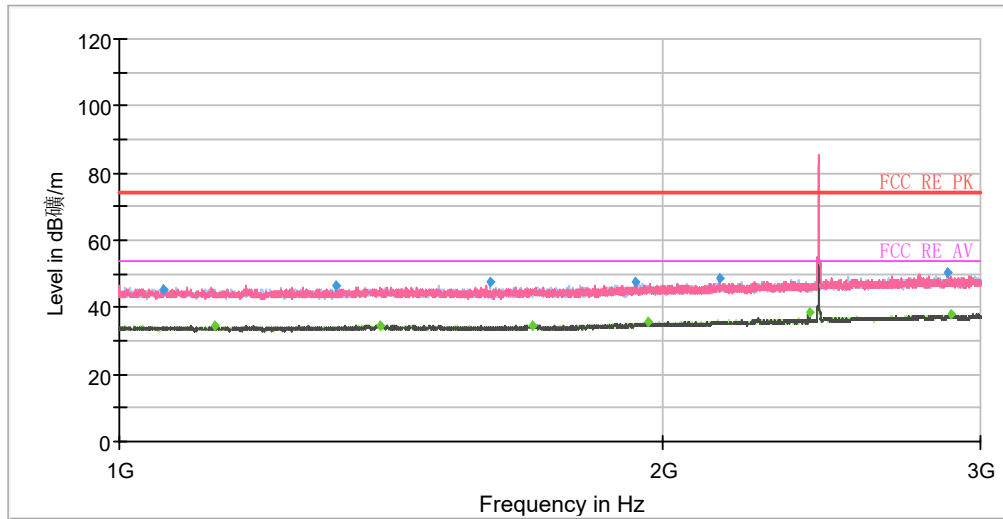
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1076.00	46.05	---	74.00	27.95	500.00	100.0	H	0.00	3
1174.00	---	34.39	54.00	19.61	500.00	100.0	V	2.00	4
1210.00	44.62	---	74.00	29.38	500.00	200.0	V	358.00	3
1377.25	---	34.81	54.00	19.19	500.00	200.0	V	252.00	4
1399.75	46.74	---	74.00	27.26	500.00	100.0	H	359.00	5
1674.00	46.63	---	74.00	27.37	500.00	200.0	H	64.00	5
1697.75	---	34.59	54.00	19.41	500.00	200.0	H	90.00	5
2022.25	47.20	---	74.00	26.80	500.00	200.0	V	168.00	6
2050.50	---	35.68	54.00	18.32	500.00	100.0	V	150.00	6
2566.25	---	36.85	54.00	17.15	500.00	200.0	H	0.00	8
2894.25	49.40	---	74.00	24.60	500.00	100.0	H	0.00	8
2972.00	---	37.85	54.00	16.15	500.00	200.0	V	279.00	8



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3967.50	---	30.42	54.00	23.58	500.00	100.0	H	249.00	1
3978.75	41.08	---	74.00	32.92	500.00	200.0	H	140.00	1
5416.88	---	33.14	54.00	20.86	500.00	100.0	V	110.00	4
5437.50	44.17	---	74.00	29.83	500.00	100.0	H	334.00	4
6916.88	---	39.11	54.00	14.89	500.00	200.0	H	5.00	9
6980.63	50.35	---	74.00	23.65	500.00	100.0	V	0.00	9
8902.50	---	40.08	54.00	13.92	500.00	100.0	H	234.00	12
9313.13	51.46	---	74.00	22.54	500.00	100.0	H	334.00	13
11285.63	50.06	---	74.00	23.94	500.00	100.0	H	359.00	16
13278.75	---	41.07	54.00	12.93	500.00	100.0	V	94.00	17
13308.75	52.56	---	74.00	21.44	500.00	200.0	V	190.00	17
15783.75	---	45.41	54.00	8.59	500.00	100.0	H	110.00	16

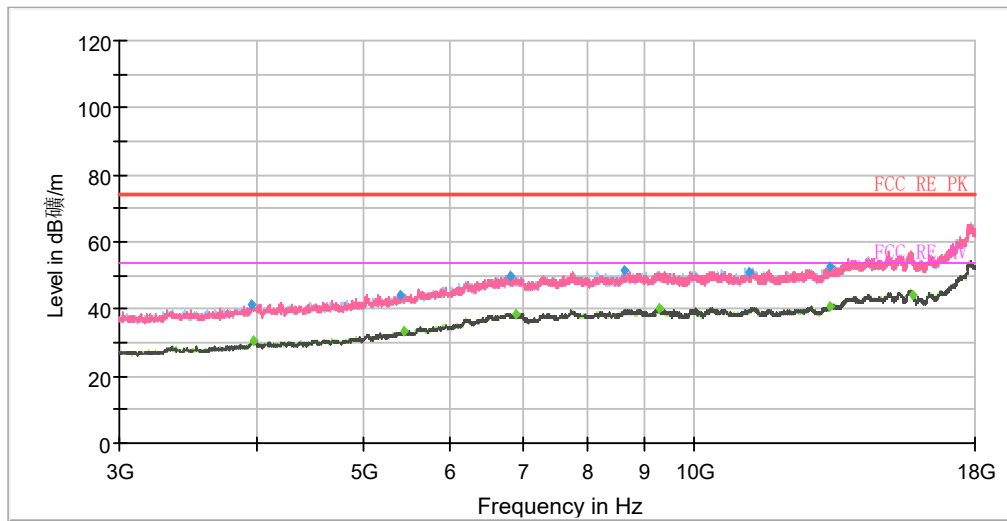
DH5-Channel 39



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

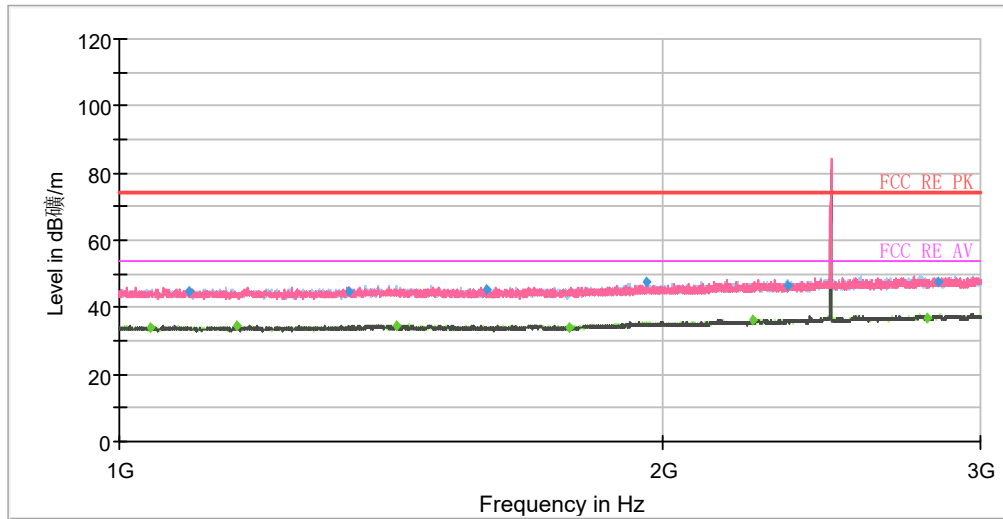
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1058.00	45.23	---	74.00	28.77	500.00	100.0	V	0.00	3
1129.75	---	34.37	54.00	19.63	500.00	100.0	V	30.00	3
1317.50	46.64	---	74.00	27.36	500.00	100.0	V	17.00	4
1393.00	---	34.67	54.00	19.33	500.00	100.0	V	0.00	5
1603.75	47.42	---	74.00	26.58	500.00	100.0	H	45.00	4
1695.50	---	34.80	54.00	19.20	500.00	100.0	V	23.00	5
1931.50	47.32	---	74.00	26.68	500.00	100.0	V	0.00	6
1965.50	---	35.62	54.00	18.38	500.00	100.0	V	38.00	6
2150.25	48.47	---	74.00	25.53	500.00	200.0	V	302.00	7
2411.00	---	38.33	54.00	15.67	500.00	100.0	V	9.00	7
2875.75	50.41	---	74.00	23.59	500.00	100.0	H	200.00	8
2891.75	---	37.94	54.00	16.06	500.00	100.0	V	1.00	8



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3952.50	41.60	---	74.00	32.40	500.00	100.0	V	187.00	0
3973.13	---	30.37	54.00	23.63	500.00	200.0	V	247.00	1
5405.63	44.06	---	74.00	29.94	500.00	100.0	V	67.00	4
5439.38	---	33.19	54.00	20.81	500.00	100.0	H	317.00	4
6804.38	49.85	---	74.00	24.15	500.00	200.0	H	6.00	9
6885.00	---	38.67	54.00	15.33	500.00	100.0	H	156.00	9
8636.25	51.32	---	74.00	22.68	500.00	100.0	V	172.00	12
9303.75	---	39.99	54.00	14.01	500.00	100.0	H	334.00	13
11233.13	50.74	---	74.00	23.26	500.00	200.0	V	348.00	16
13276.88	---	41.03	54.00	12.97	500.00	200.0	V	358.00	17
13288.13	52.73	---	74.00	21.27	500.00	200.0	V	247.00	17
15811.88	---	43.98	54.00	10.02	500.00	100.0	H	6.00	16

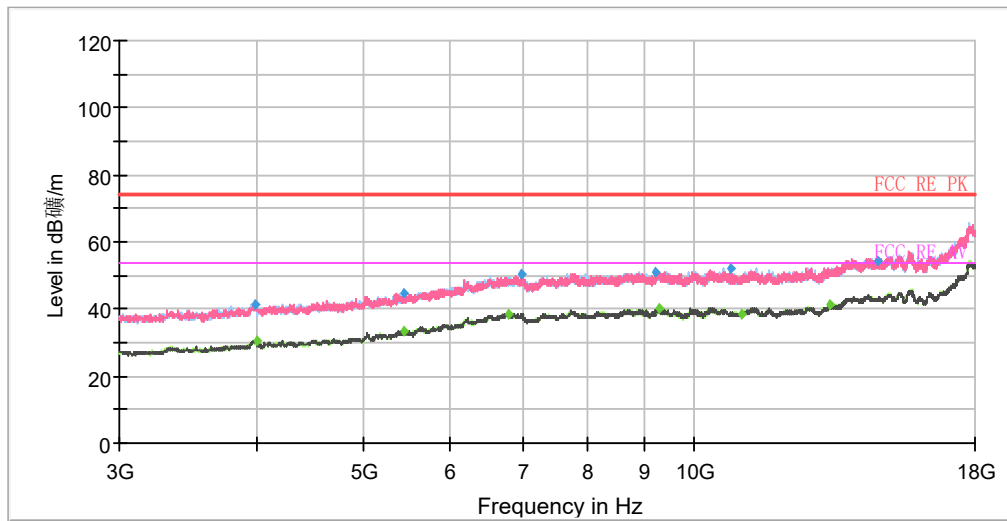
DH5-Channel 78



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1041.25	---	33.69	54.00	20.31	500.00	200.0	H	5.00	3
1093.75	44.84	---	74.00	29.16	500.00	200.0	H	2.00	3
1161.50	---	34.58	54.00	19.42	500.00	100.0	H	343.00	3
1340.00	44.83	---	74.00	29.17	500.00	100.0	H	347.00	4
1423.25	---	34.64	54.00	19.36	500.00	100.0	H	347.00	4
1598.50	45.41	---	74.00	28.59	500.00	200.0	V	358.00	4
1775.75	---	34.13	54.00	19.87	500.00	200.0	H	83.00	5
1959.25	47.36	---	74.00	26.64	500.00	100.0	H	322.00	6
2246.25	---	36.33	54.00	17.67	500.00	200.0	H	3.00	7
2345.25	46.49	---	74.00	27.51	500.00	200.0	H	7.00	7
2801.50	---	37.02	54.00	16.98	500.00	100.0	H	0.00	8
2841.00	47.57	---	74.00	26.43	500.00	100.0	H	292.00	8



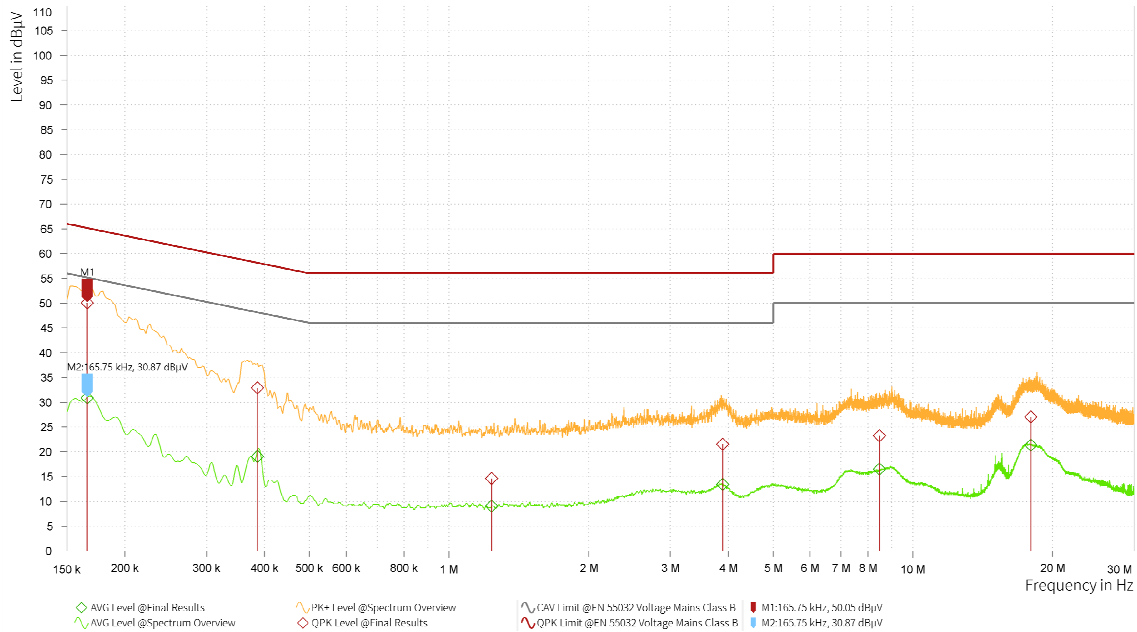
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3980.63	41.31	---	74.00	32.69	500.00	100.0	H	123.00	1
3995.63	---	30.57	54.00	23.43	500.00	200.0	V	358.00	1
5441.25	---	33.45	54.00	20.55	500.00	100.0	H	332.00	4
5443.13	44.86	---	74.00	29.14	500.00	200.0	V	324.00	4
6778.13	---	38.66	54.00	15.34	500.00	100.0	V	107.00	9
6965.63	50.47	---	74.00	23.53	500.00	100.0	V	0.00	9
9225.00	50.91	---	74.00	23.09	500.00	100.0	V	2.00	13
9288.75	---	40.01	54.00	13.99	500.00	100.0	V	18.00	13
10796.25	52.03	---	74.00	21.97	500.00	200.0	V	201.00	15
11062.50	---	38.55	54.00	15.45	500.00	100.0	H	357.00	16
13293.75	---	41.27	54.00	12.73	500.00	200.0	H	11.00	17
14705.63	54.06	---	74.00	19.94	500.00	200.0	V	352.00	18

2. Conducted Emission

2.1. Bluetooth

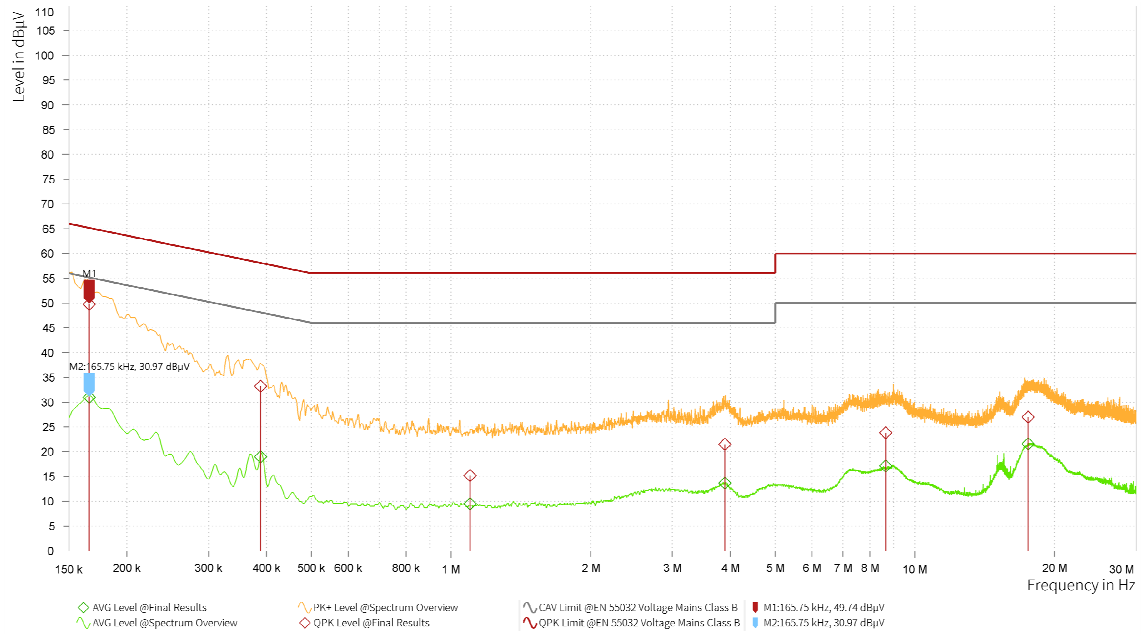
During the test, the Conducted Emission was performed in all modes with all channels. The test data of the worst-case condition was recorded in this report.



Frequency [MHz]	QPK Level [dBμV]	QPK Limit [dBμV]	QPK Margin [dB]	AVG Level [dBμV]	AVG: CAV Limit [dBμV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
0.166	50.05	65.17	15.12	30.87	55.17	24.30	20.89	L1	9.000	1.000
0.386	32.90	58.14	25.24	19.08	48.14	29.06	20.89	L1	9.000	1.000
1.235	14.59	56.00	41.41	9.06	46.00	36.94	19.99	L1	9.000	1.000
3.890	21.56	56.00	34.44	13.44	46.00	32.56	19.43	L1	9.000	1.000
8.473	23.22	60.00	36.78	16.51	50.00	33.49	19.41	L1	9.000	1.000
17.977	27.03	60.00	32.97	21.33	50.00	28.67	19.60	L1	9.000	1.000

Remark: Correct factor=cable loss + LISN factor

L line Conducted Emission from 150 kHz to 30 MHz



Frequency [MHz]	QPK Level [dBµV]	QPK Limit [dBµV]	QPK Margin [dB]	AVG Level [dBµV]	AVG: CAV Limit [dBµV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
0.166	49.74	65.17	15.43	30.97	55.17	24.20	20.90	N	9.000	1.000
0.389	33.19	58.10	24.91	18.98	48.10	29.12	20.90	N	9.000	1.000
1.100	15.18	56.00	40.82	9.49	46.00	36.51	20.10	N	9.000	1.000
3.894	21.50	56.00	34.50	13.65	46.00	32.35	19.44	N	9.000	1.000
8.651	23.83	60.00	36.17	17.11	50.00	32.89	19.42	N	9.000	1.000
17.556	26.97	60.00	33.03	21.56	50.00	28.44	19.62	N	9.000	1.000

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 kHz to 30 MHz