

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 coplanar, the others are vertical and horizontal. and the worst case was recorded.

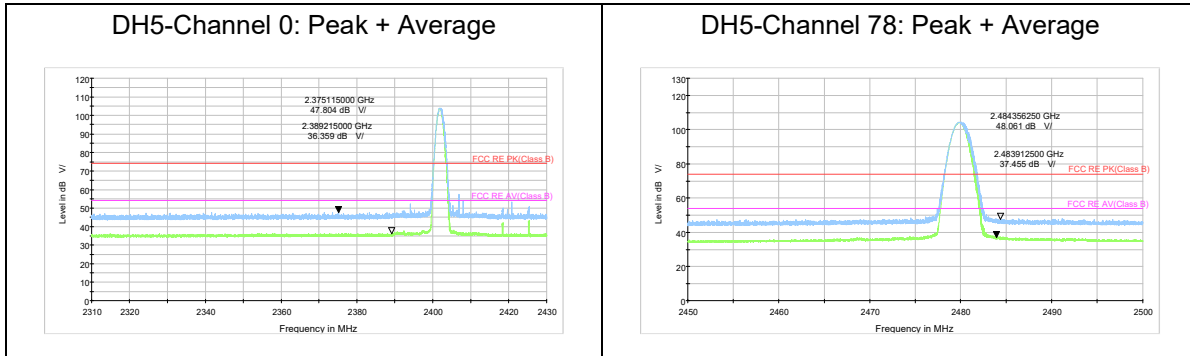
1. Unwanted Emission

1.1. Bluetooth

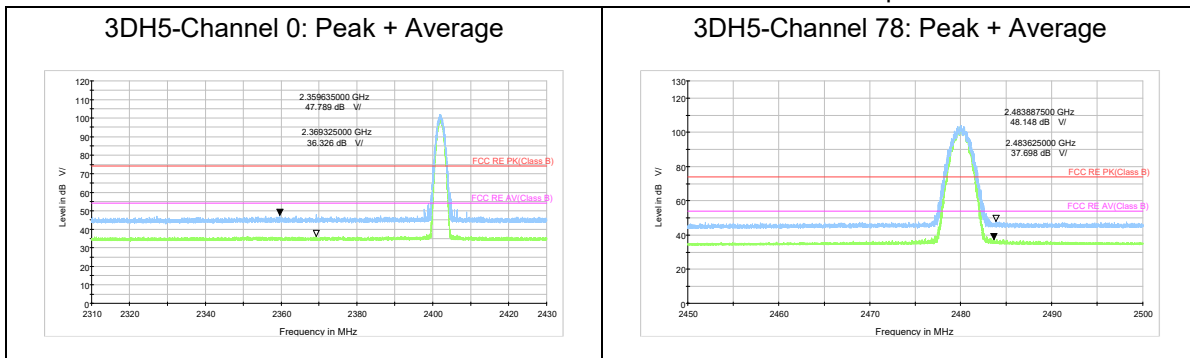
The following graphs display the maximum values of horizontal and vertical by software. Blue trace uses the peak detection, Green trace uses the average detection.

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

The signal beyond the limit is carrier.



The bandage was performed in all EDR mode (2DH5 and 3DH5), 3DH5 was selected as the worse condition. The test data of the worst-case condition was recorded in this report.



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 coaxial and coplanar for 9k-30MHz; horizontal and vertical for above 30MHz by software.
5. For below 1GHz

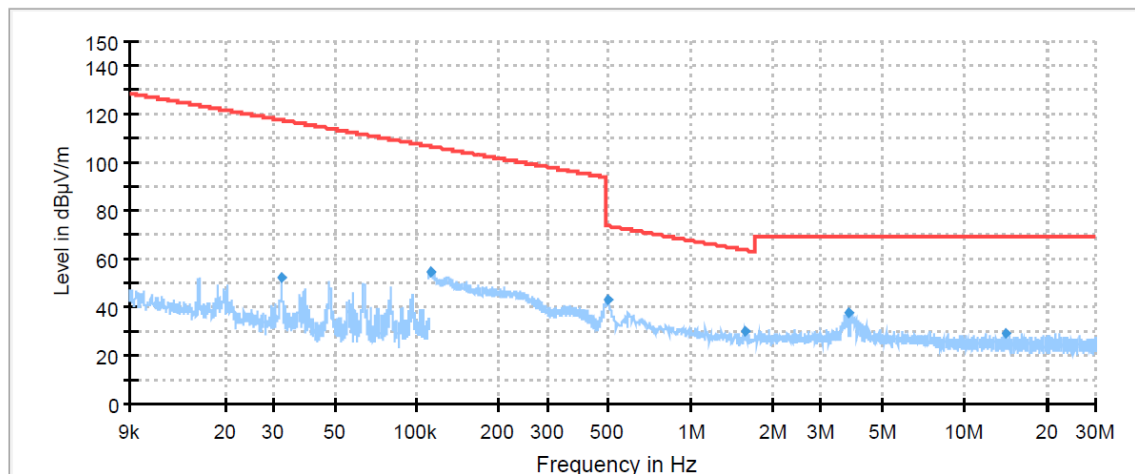
 QP Level @Spectrum Overview H
  QP Level @Spectrum Overview V
  QP Level @Final Results
  QP Limit

For above 1GHz

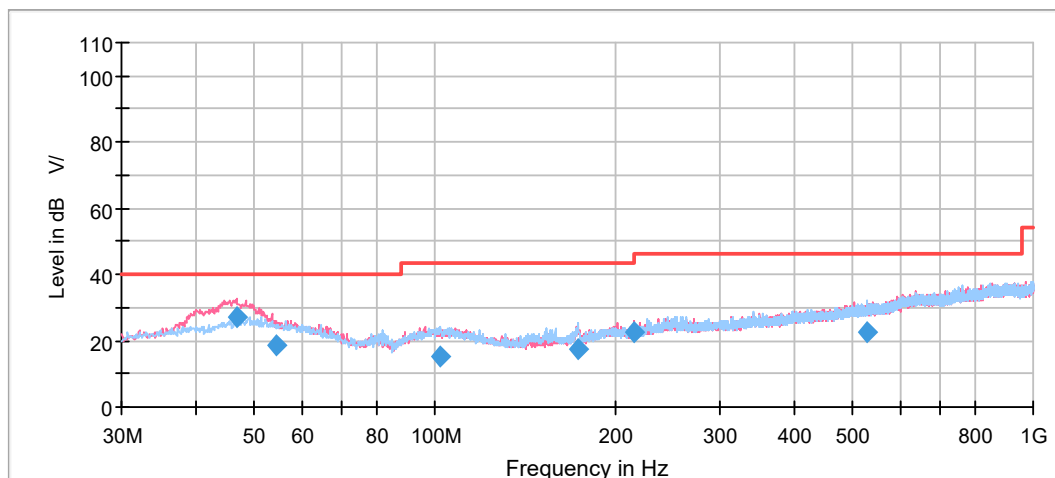
 PK Level @Spectrum Overview H
  PK Level @Spectrum Overview V
  PK Level @Final Results
  PK Limit
 AVG Level @Spectrum Overview H
  AVG Level @Spectrum Overview V
  AVG Level @Final Results
  AVG Limit

Continuous TX mode:

During the test, the Radiates Emission from 9kHz to 1GHz was performed in all modes with all channels. The test data of the worst-case condition (**DH5-Channel 0**) was recorded in this report.



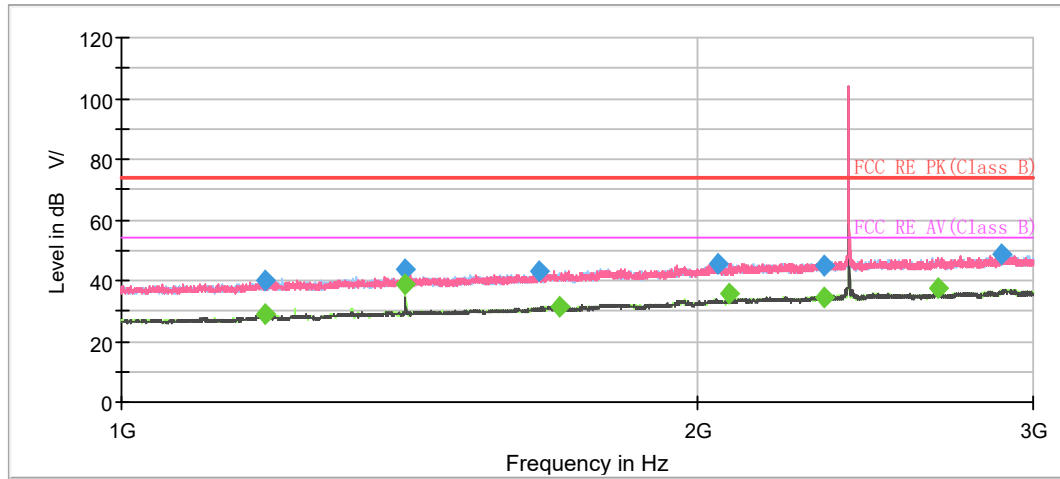
Radiates Emission from 9kHz to 30MHz



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
46.732500	26.92	40.00	13.08	112.0	V	345.0	21.2
54.250000	18.33	40.00	21.67	105.0	V	0.0	20.9
102.143750	15.14	43.50	28.36	121.0	H	33.0	19.2
173.802500	17.29	43.50	26.21	188.0	H	292.0	20.0
215.997500	22.75	43.50	20.75	192.0	V	243.0	18.6
529.792500	22.42	46.00	23.58	103.0	H	304.0	26.0

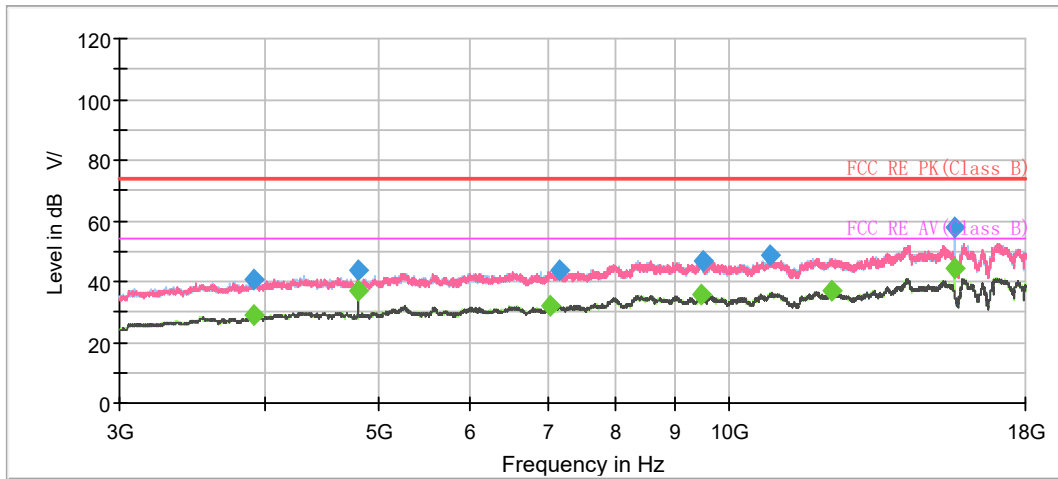
DH5-Channel 0



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

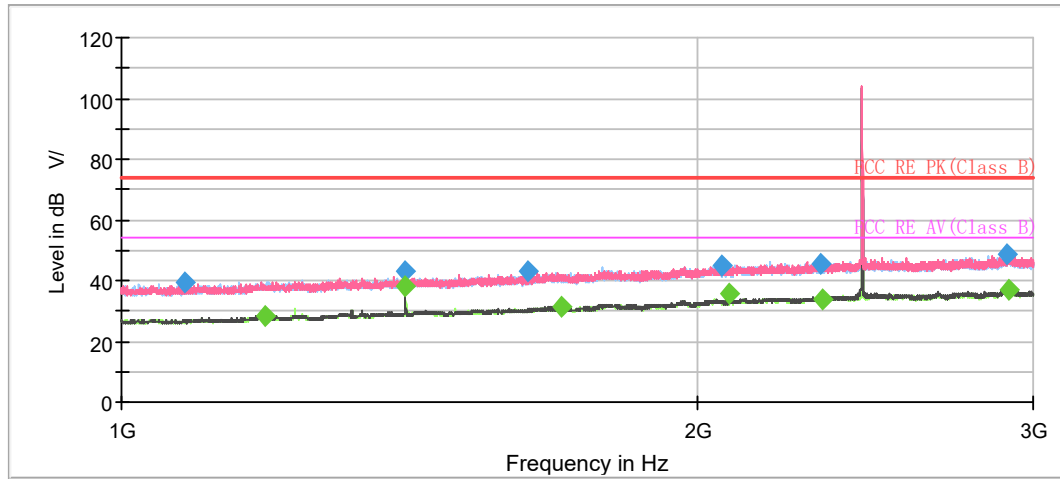
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1188.000000	---	29.03	54.00	24.97	500.0	200.0	V	232.0	-14.4
1188.500000	39.75	---	74.00	34.25	500.0	200.0	H	82.0	-14.4
1407.750000	43.62	---	74.00	30.38	500.0	200.0	H	153.0	-13.1
1408.000000	---	38.48	54.00	15.52	500.0	200.0	H	153.0	-13.1
1653.500000	42.94	---	74.00	31.06	500.0	100.0	H	122.0	-11.0
1694.250000	---	31.46	54.00	22.54	500.0	200.0	V	158.0	-10.7
2051.750000	45.33	---	74.00	28.67	500.0	200.0	H	70.0	-7.9
2079.000000	---	35.63	54.00	18.37	500.0	100.0	V	0.0	-8.0
2330.500000	45.17	---	74.00	28.83	500.0	200.0	H	260.0	-6.5
2334.000000	---	34.42	54.00	19.58	500.0	200.0	H	9.0	-6.5
2673.000000	---	37.32	54.00	16.68	500.0	200.0	V	195.0	-4.7
2888.000000	48.43	---	74.00	25.57	500.0	100.0	V	36.0	-3.6



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3907.500000	---	29.17	54.00	24.83	500.0	100.0	H	123.0	-9.2
3918.750000	40.32	---	74.00	33.68	500.0	100.0	H	251.0	-9.5
4803.750000	43.99	---	74.00	30.01	500.0	100.0	V	251.0	-9.1
4803.750000	---	37.08	54.00	16.92	500.0	100.0	V	251.0	-9.1
7023.750000	---	32.17	54.00	21.83	500.0	200.0	H	232.0	-2.4
7151.250000	43.61	---	74.00	30.39	500.0	200.0	H	232.0	-1.6
9480.000000	---	35.54	54.00	18.46	500.0	100.0	H	68.0	1.2
9504.375000	46.96	---	74.00	27.04	500.0	200.0	V	0.0	0.8
10873.125000	48.87	---	74.00	25.13	500.0	200.0	V	268.0	1.5
12256.875000	---	36.93	54.00	17.07	500.0	200.0	V	27.0	3.2
15667.500000	57.67	---	74.00	16.33	500.0	100.0	H	68.0	2.9
15667.500000	---	44.53	54.00	9.47	500.0	100.0	H	68.0	2.9

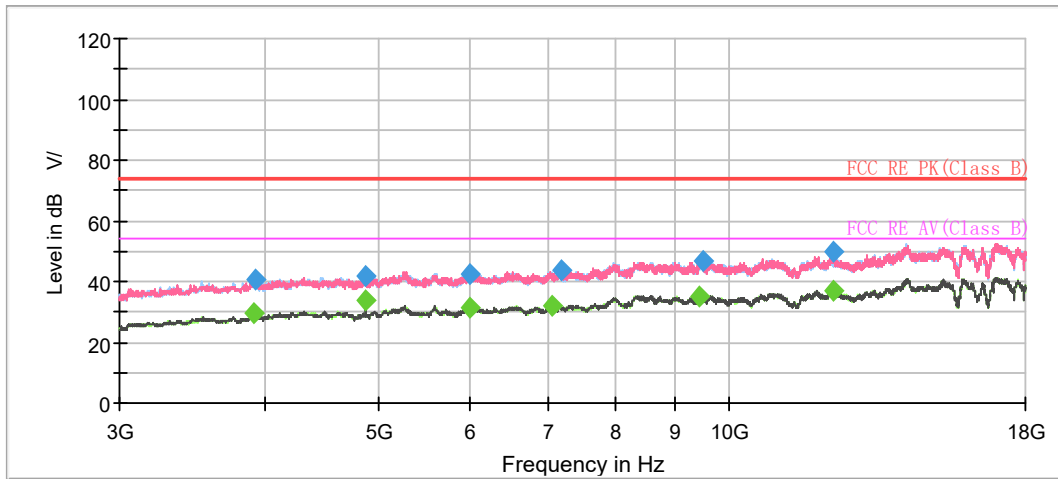
DH5-Channel 39



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

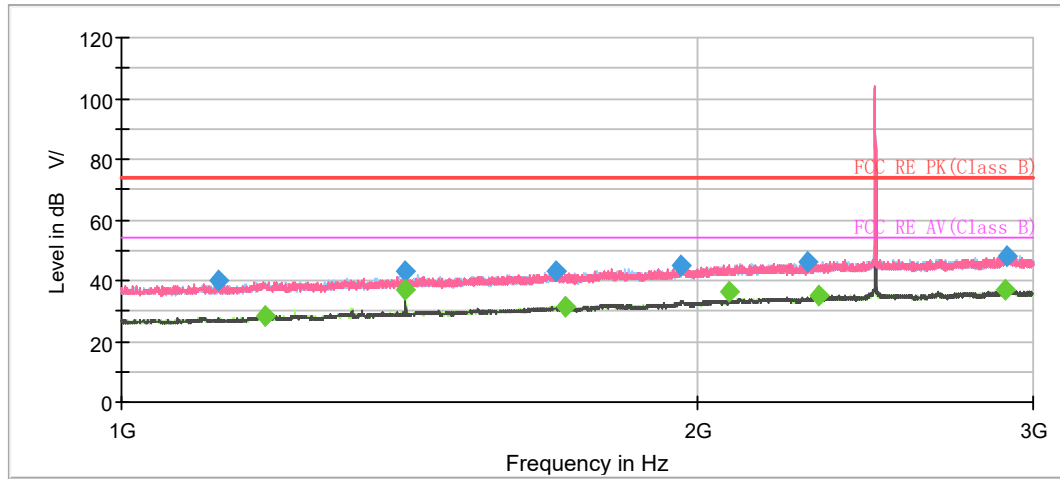
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1080.500000	39.31	---	74.00	34.69	500.0	100.0	V	143.0	-15.8
1188.000000	---	28.59	54.00	25.41	500.0	200.0	V	300.0	-14.4
1407.750000	---	38.05	54.00	15.95	500.0	100.0	H	131.0	-13.1
1408.000000	43.35	---	74.00	30.65	500.0	200.0	H	131.0	-13.1
1632.500000	42.81	---	74.00	31.19	500.0	100.0	V	48.0	-11.6
1700.000000	---	31.33	54.00	22.67	500.0	200.0	V	36.0	-10.7
2061.750000	44.90	---	74.00	29.10	500.0	100.0	H	277.0	-8.1
2079.000000	---	35.75	54.00	18.25	500.0	100.0	V	179.0	-8.0
2323.500000	45.39	---	74.00	28.61	500.0	100.0	H	204.0	-6.5
2329.750000	---	33.78	54.00	20.22	500.0	100.0	H	311.0	-6.5
2904.750000	48.44	---	74.00	25.56	500.0	100.0	V	1.0	-3.2
2916.250000	---	36.77	54.00	17.23	500.0	100.0	V	59.0	-3.3



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)
3907.500000	---	29.27	54.00	24.73	500.0	100.0	V	116.0	-9.2
3926.250000	40.53	---	74.00	33.47	500.0	100.0	V	239.0	-9.7
4880.625000	---	34.10	54.00	19.90	500.0	100.0	V	23.0	-8.4
4880.625000	41.92	---	74.00	32.08	500.0	200.0	H	0.0	-8.4
5992.500000	42.72	---	74.00	31.28	500.0	200.0	H	0.0	-4.9
5996.250000	---	31.22	54.00	22.78	500.0	200.0	H	0.0	-4.9
7050.000000	---	32.24	54.00	21.76	500.0	200.0	H	355.0	-2.3
7181.250000	43.89	---	74.00	30.11	500.0	200.0	H	326.0	-1.6
9453.750000	---	35.35	54.00	18.65	500.0	200.0	V	76.0	0.7
9498.750000	46.55	---	74.00	27.45	500.0	200.0	V	34.0	0.9
12294.375000	---	37.06	54.00	16.94	500.0	100.0	V	142.0	3.0
12294.375000	49.71	---	74.00	24.29	500.0	200.0	V	105.0	3.0

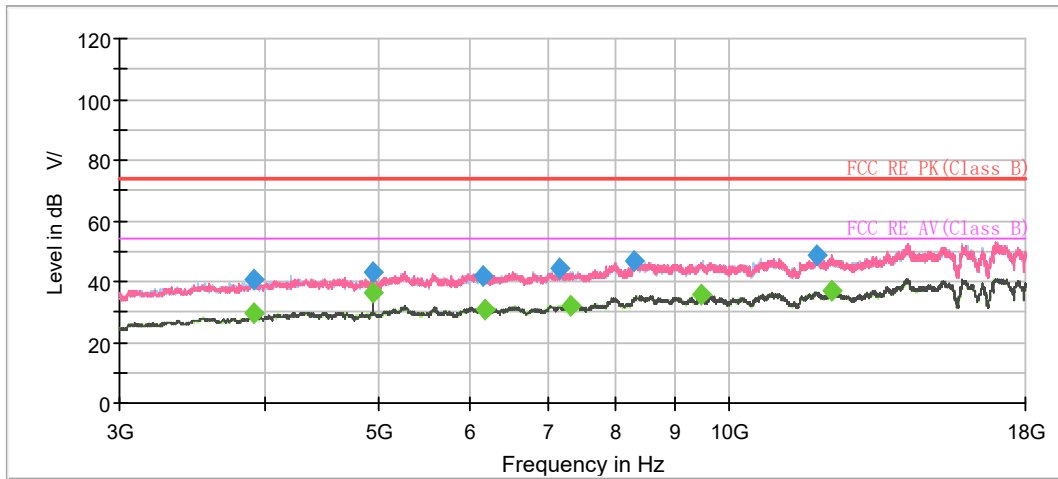
DH5-Channel 78



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)
1123.500000	39.72	---	74.00	34.28	500.0	100.0	H	304.0	-15.6
1188.000000	---	28.55	54.00	25.45	500.0	100.0	V	4.0	-14.4
1407.750000	---	36.75	54.00	17.25	500.0	100.0	H	294.0	-13.1
1408.000000	42.83	---	74.00	31.17	500.0	100.0	H	233.0	-13.1
1686.500000	42.89	---	74.00	31.11	500.0	100.0	H	328.0	-10.7
1706.500000	---	31.49	54.00	22.51	500.0	100.0	V	102.0	-10.7
1963.500000	45.23	---	74.00	28.77	500.0	100.0	H	316.0	-8.4
2079.000000	---	36.05	54.00	17.95	500.0	100.0	V	4.0	-8.0
2283.500000	45.85	---	74.00	28.15	500.0	100.0	H	86.0	-6.7
2319.500000	---	34.94	54.00	19.06	500.0	100.0	V	51.0	-6.5
2900.000000	---	37.06	54.00	16.94	500.0	100.0	V	198.0	-3.2
2908.250000	48.19	---	74.00	25.81	500.0	100.0	V	102.0	-3.2

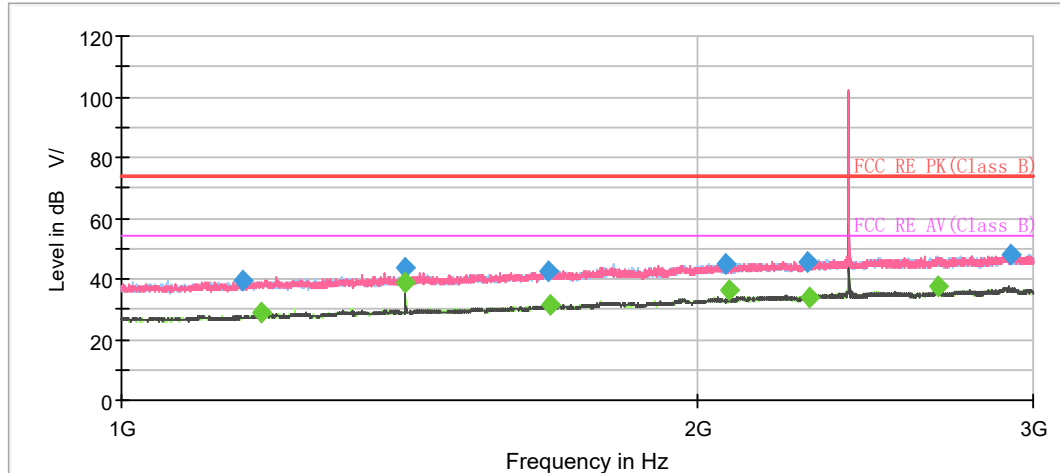


Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3911.250000	40.54	---	74.00	33.46	500.0	100.0	V	101.0	-9.2
3913.125000	---	29.43	54.00	24.57	500.0	100.0	V	150.0	-9.3
4959.375000	---	36.32	54.00	17.68	500.0	100.0	V	115.0	-7.3
4959.375000	43.14	---	74.00	30.86	500.0	200.0	H	60.0	-7.3
6150.000000	42.03	---	74.00	31.97	500.0	100.0	V	304.0	-4.9
6172.500000	---	30.58	54.00	23.42	500.0	100.0	H	40.0	-5.0
7171.875000	44.08	---	74.00	29.92	500.0	200.0	V	237.0	-1.5
7318.125000	---	32.24	54.00	21.76	500.0	100.0	V	136.0	-1.4
8302.500000	46.69	---	74.00	27.31	500.0	100.0	H	61.0	1.2
9480.000000	---	35.45	54.00	18.55	500.0	200.0	V	329.0	1.2
11908.125000	48.68	---	74.00	25.32	500.0	100.0	V	304.0	3.1
12277.500000	---	36.84	54.00	17.16	500.0	200.0	H	330.0	3.2

The Radiates Emission was performed in all EDR mode (2DH5 and 3DH5), 3DH5 was selected as the worse condition. The test data of the worst-case condition was recorded in this report.

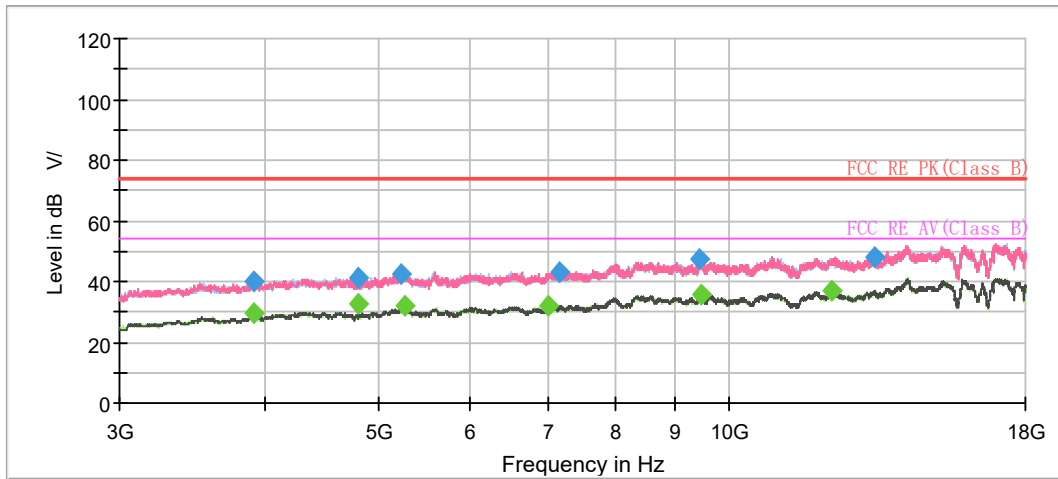
3DH5-Channel 0



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

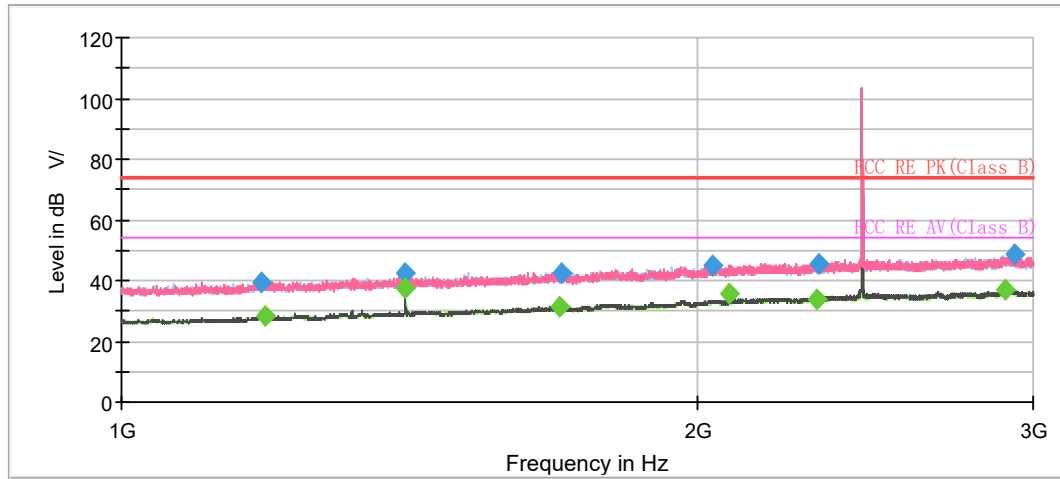
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1157.750000	39.34	---	74.00	34.66	500.0	200.0	V	254.0	-15.3
1184.500000	---	28.96	54.00	25.04	500.0	200.0	V	219.0	-14.3
1408.000000	---	38.50	54.00	15.50	500.0	200.0	H	144.0	-13.1
1408.250000	43.46	---	74.00	30.54	500.0	200.0	H	144.0	-13.1
1674.250000	42.70	---	74.00	31.30	500.0	100.0	V	359.0	-10.7
1677.500000	---	31.46	54.00	22.54	500.0	200.0	H	269.0	-10.7
2071.000000	45.18	---	74.00	28.82	500.0	200.0	H	85.0	-8.1
2079.000000	---	36.14	54.00	17.86	500.0	100.0	V	37.0	-8.0
2286.000000	45.47	---	74.00	28.53	500.0	200.0	V	0.0	-6.7
2291.500000	---	33.83	54.00	20.17	500.0	200.0	H	120.0	-6.6
2673.250000	---	37.45	54.00	16.55	500.0	200.0	V	315.0	-4.7
2920.000000	48.20	---	74.00	25.80	500.0	200.0	H	120.0	-3.3



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3909.375000	---	29.84	54.00	24.16	500.0	100.0	V	264.0	-9.2
3913.125000	40.30	---	74.00	33.70	500.0	200.0	V	36.0	-9.3
4803.750000	---	32.39	54.00	21.61	500.0	100.0	V	244.0	-9.1
4803.750000	41.00	---	74.00	33.00	500.0	100.0	H	55.0	-9.1
5242.500000	42.71	---	74.00	31.29	500.0	100.0	V	0.0	-6.0
5270.625000	---	31.98	54.00	22.02	500.0	100.0	V	145.0	-5.3
7010.625000	---	32.10	54.00	21.90	500.0	200.0	V	0.0	-2.4
7168.125000	43.13	---	74.00	30.87	500.0	200.0	V	208.0	-1.5
9457.500000	47.13	---	74.00	26.87	500.0	200.0	V	44.0	0.8
9466.875000	---	35.41	54.00	18.59	500.0	100.0	H	223.0	1.0
12281.250000	---	36.76	54.00	17.24	500.0	100.0	V	348.0	3.2
13350.000000	48.16	---	74.00	25.84	500.0	200.0	V	0.0	2.1

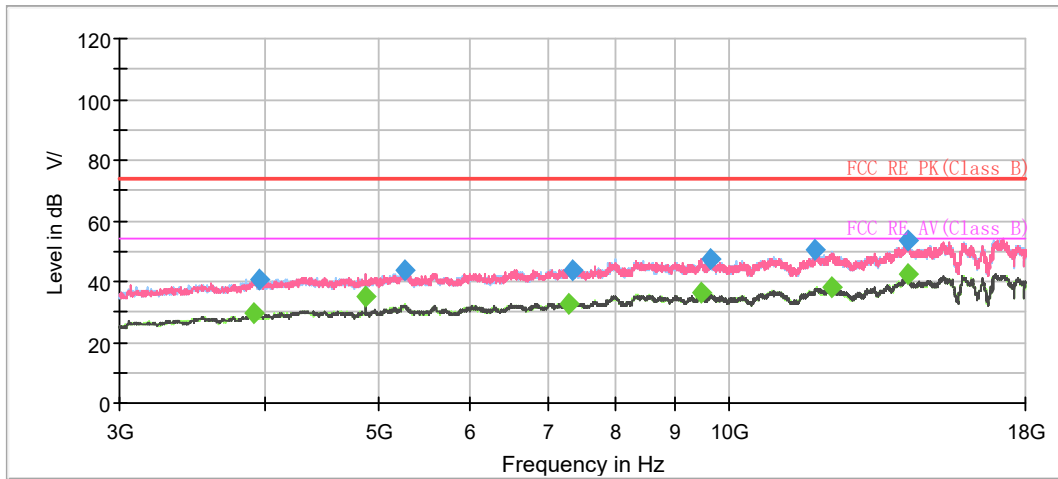
3DH5-Channel 39



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

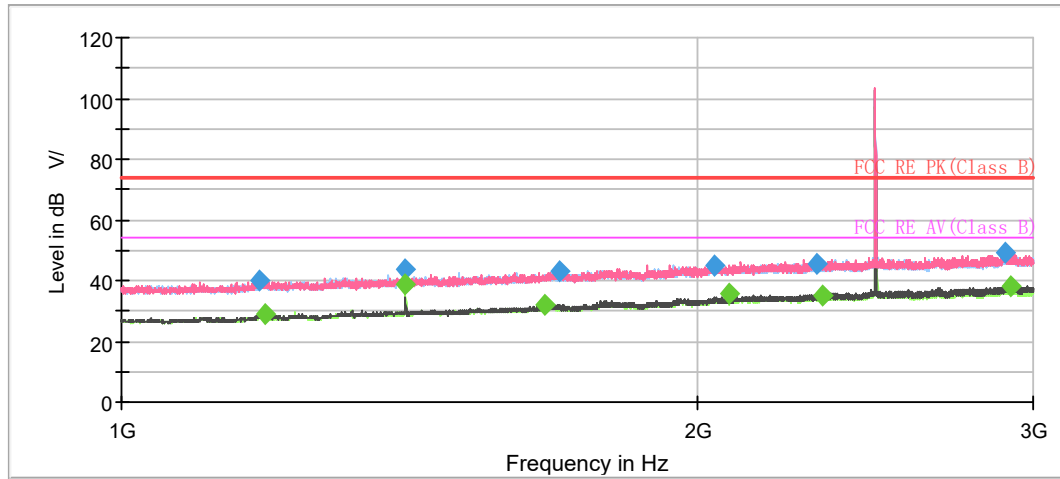
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1184.500000	39.20	---	74.00	34.80	500.0	100.0	H	97.0	-14.3
1188.250000	---	28.57	54.00	25.43	500.0	200.0	V	16.0	-14.4
1407.750000	---	37.53	54.00	16.47	500.0	200.0	H	303.0	-13.1
1408.250000	42.70	---	74.00	31.30	500.0	100.0	H	134.0	-13.1
1696.250000	---	31.43	54.00	22.57	500.0	200.0	H	157.0	-10.7
1697.750000	42.76	---	74.00	31.24	500.0	200.0	V	52.0	-10.7
2038.000000	44.90	---	74.00	29.10	500.0	100.0	V	87.0	-8.0
2079.000000	---	35.78	54.00	18.22	500.0	200.0	V	179.0	-8.0
2313.750000	---	34.01	54.00	19.99	500.0	100.0	H	242.0	-6.5
2315.000000	45.63	---	74.00	28.37	500.0	100.0	V	74.0	-6.5
2901.500000	---	37.12	54.00	16.88	500.0	100.0	V	155.0	-3.2
2933.500000	48.55	---	74.00	25.45	500.0	100.0	V	29.0	-3.4



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)
3909.375000	---	29.75	54.00	24.25	500.0	200.0	V	335.0	-9.2
3960.000000	40.41	---	74.00	33.59	500.0	100.0	V	5.0	-10.3
4880.625000	---	35.35	54.00	18.65	500.0	100.0	H	94.0	-8.4
5265.000000	43.96	---	74.00	30.04	500.0	100.0	H	149.0	-5.3
7303.125000	---	32.84	54.00	21.16	500.0	100.0	V	97.0	-1.5
7346.250000	43.85	---	74.00	30.15	500.0	100.0	V	125.0	-1.5
9465.000000	---	36.05	54.00	17.95	500.0	100.0	V	43.0	1.0
9665.625000	47.27	---	74.00	26.73	500.0	200.0	V	195.0	0.7
11870.625000	50.47	---	74.00	23.53	500.0	200.0	V	321.0	2.5
12279.375000	---	38.45	54.00	15.55	500.0	100.0	V	5.0	3.2
14248.125000	53.39	---	74.00	20.61	500.0	200.0	V	266.0	7.3
14251.875000	---	42.37	54.00	11.63	500.0	100.0	H	94.0	7.2

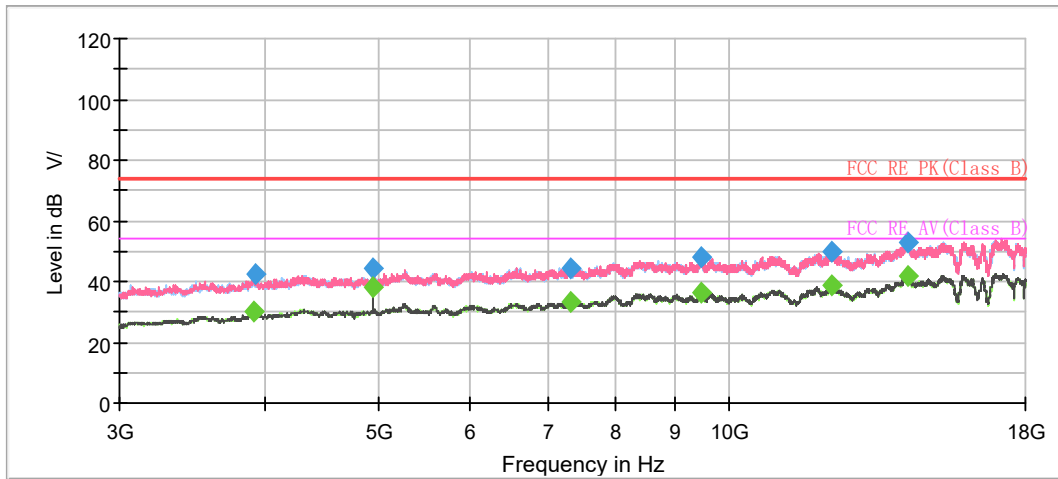
3DH5-Channel 78



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)
1181.250000	39.85	---	74.00	34.15	500.0	200.0	H	181.0	-14.5
1188.000000	---	28.80	54.00	25.20	500.0	200.0	V	277.0	-14.4
1408.000000	---	38.89	54.00	15.11	500.0	200.0	H	156.0	-13.1
1408.250000	43.60	---	74.00	30.40	500.0	200.0	H	145.0	-13.1
1666.250000	---	32.18	54.00	21.82	500.0	100.0	V	0.0	-10.9
1696.500000	42.96	---	74.00	31.04	500.0	200.0	H	99.0	-10.7
2044.250000	44.93	---	74.00	29.07	500.0	100.0	H	327.0	-7.9
2079.000000	---	35.86	54.00	18.14	500.0	100.0	V	48.0	-8.0
2309.500000	45.42	---	74.00	28.58	500.0	100.0	V	0.0	-6.5
2329.500000	---	34.90	54.00	19.10	500.0	100.0	V	0.0	-6.5
2903.250000	49.24	---	74.00	24.76	500.0	100.0	V	0.0	-3.2
2922.500000	---	38.37	54.00	15.63	500.0	100.0	V	0.0	-3.3



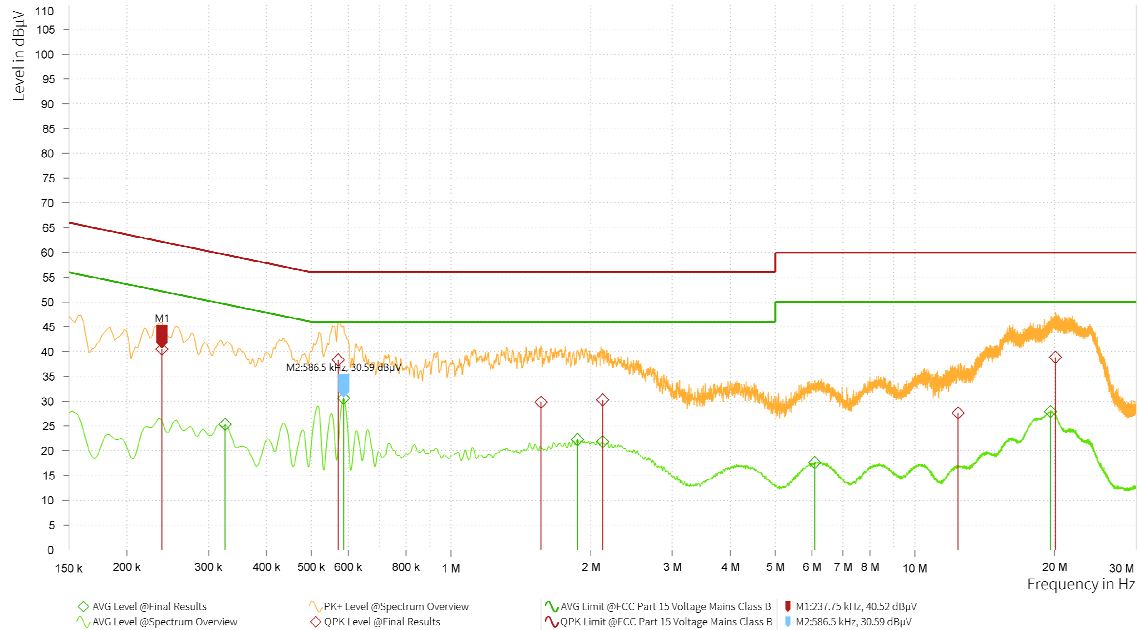
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3909.375000	---	30.20	54.00	23.80	500.0	200.0	H	12.0	-9.2
3930.000000	42.22	---	74.00	31.78	500.0	200.0	H	41.0	-9.8
4959.375000	---	38.15	54.00	15.85	500.0	100.0	V	126.0	-7.3
4959.375000	44.30	---	74.00	29.70	500.0	100.0	V	126.0	-7.3
7310.625000	---	33.03	54.00	20.97	500.0	100.0	V	154.0	-1.4
7325.625000	44.36	---	74.00	29.64	500.0	200.0	V	326.0	-1.4
9468.750000	47.96	---	74.00	26.04	500.0	200.0	V	274.0	1.1
9480.000000	---	36.14	54.00	17.86	500.0	100.0	H	324.0	1.2
12266.250000	---	38.76	54.00	15.24	500.0	200.0	V	274.0	3.2
12270.000000	49.97	---	74.00	24.03	500.0	200.0	H	333.0	3.3
14244.375000	---	41.88	54.00	12.12	500.0	200.0	H	109.0	7.2
14255.625000	52.91	---	74.00	21.09	500.0	100.0	H	241.0	7.2

2. Conducted Emission

2.1. Bluetooth

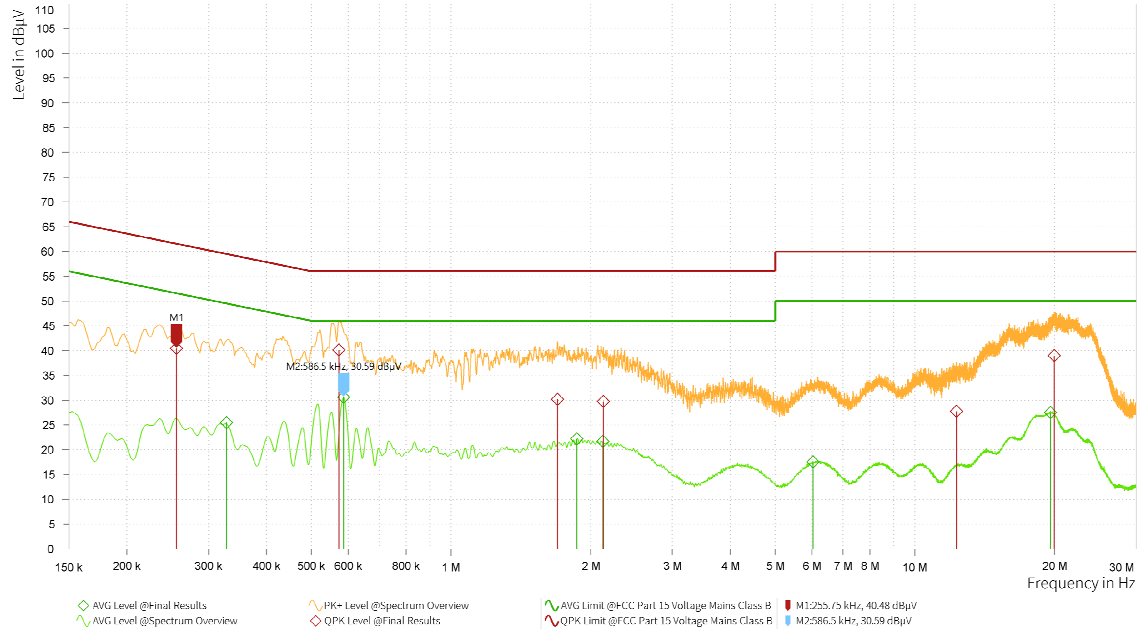
During the test, the Conducted Emission was performed in all modes with all channels. The test data of the worst-case condition (**DH5-Channel 0**) was recorded in this report.



Frequency [MHz]	QPK Level [dBμV]	QPK Limit [dBμV]	QPK Margin [dB]	AVG Level [dBμV]	AVG Limit [dBμV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
0.238	40.52	62.17	21.66	--	--	--	21.31	L1	9.000	1.000
0.326	--	--	--	25.32	49.57	24.24	21.27	L1	9.000	1.000
0.571	38.32	56.00	17.68	--	--	--	21.06	L1	9.000	1.000
0.587	--	--	--	30.59	46.00	15.41	21.04	L1	9.000	1.000
1.563	29.78	56.00	26.22	--	--	--	20.15	L1	9.000	1.000
1.874	--	--	--	22.22	46.00	23.78	20.04	L1	9.000	1.000
2.123	30.28	56.00	25.72	21.82	46.00	24.18	19.98	L1	9.000	1.000
6.081	--	--	--	17.58	50.00	32.42	19.72	L1	9.000	1.000
12.399	27.62	60.00	32.38	--	--	--	19.75	L1	9.000	1.000
19.624	--	--	--	27.90	50.00	22.10	19.93	L1	9.000	1.000
20.103	38.83	60.00	21.17	--	--	--	19.95	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 Limit [dBµV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
0.256	40.48	61.57	21.09	--	--	--	21.26	N	9.000	1.000
0.328	--	--	--	25.45	49.51	24.06	21.23	N	9.000	1.000
0.573	40.15	56.00	15.85	--	--	--	21.00	N	9.000	1.000
0.587	--	--	--	30.59	46.00	15.41	20.99	N	9.000	1.000
1.696	30.16	56.00	25.84	--	--	--	20.06	N	9.000	1.000
1.867	--	--	--	22.18	46.00	23.82	19.99	N	9.000	1.000
2.126	--	--	--	21.68	46.00	24.32	19.92	N	9.000	1.000
2.130	29.73	56.00	26.27	--	--	--	19.92	N	9.000	1.000
6.032	--	--	--	17.54	50.00	32.46	19.75	N	9.000	1.000
12.300	27.74	60.00	32.26	--	--	--	19.73	N	9.000	1.000
19.615	--	--	--	27.51	50.00	22.49	20.06	N	9.000	1.000
19.975	38.98	60.00	21.02	--	--	--	20.08	N	9.000	1.000

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 kHz to 30 MHz