

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 lie-down position (Y axis) and the worst case was recorded.

1. Unwanted Emission

1.1. Bluetooth

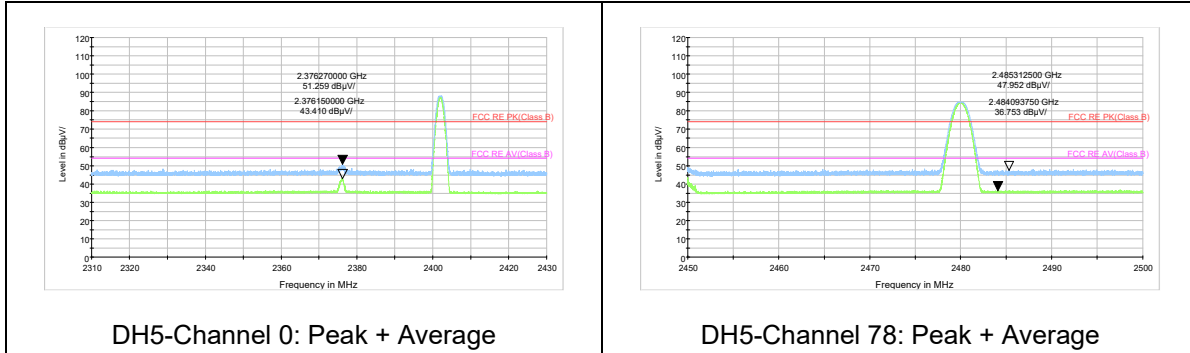
The following graphs display the maximum values of horizontal and vertical by software.

Blue trace uses the peak detection, Green trace uses the average detection.

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

The signal beyond the limit is carrier.

Variant



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

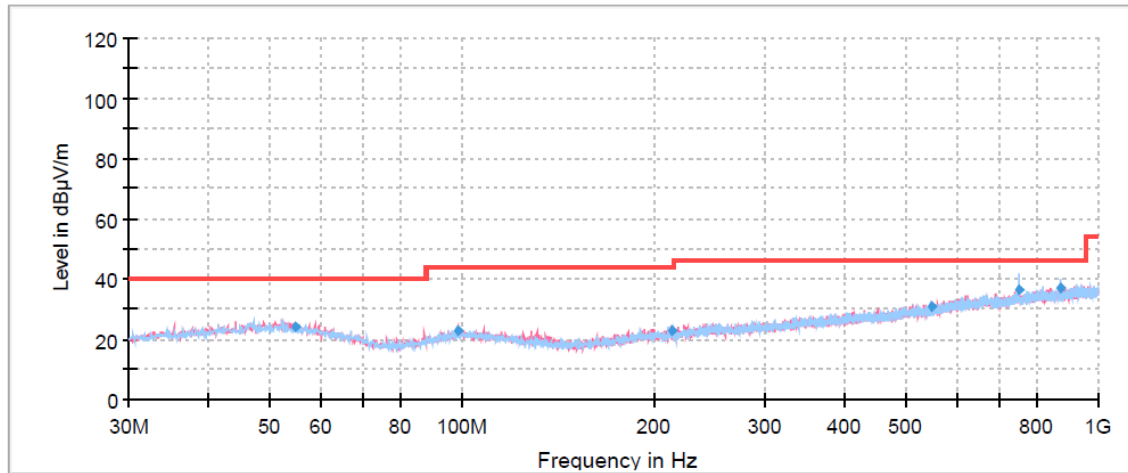
For above 1GHz

 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 30MHz to 1GHz was performed in all modes with all channels. The test data of the worst-case condition (**DH5-Channel 78**) was recorded in this report.

Variant

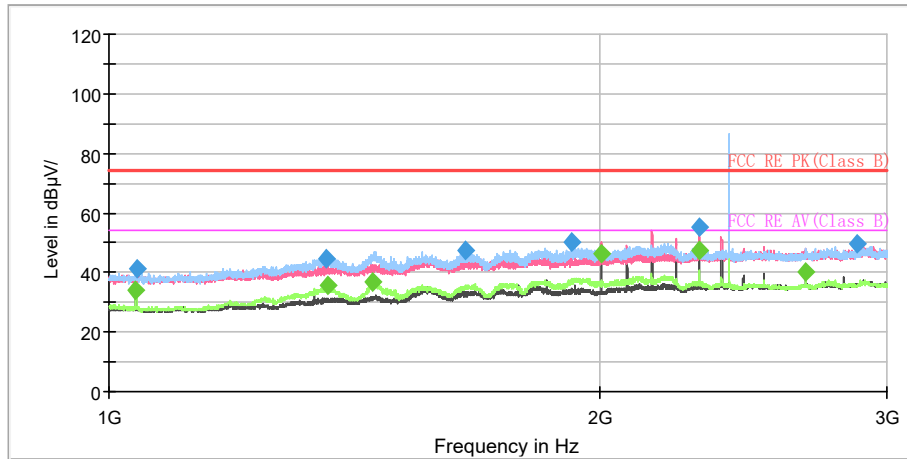


Radiates Emission from 30MHz to 1GHz

Final Result

Frequency (MHz)	QuasiPea k (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
54.86	24.19	40.00	15.82	1000.00	200.0	V	199.00	20
98.39	22.63	43.50	20.87	1000.00	200.0	V	288.00	19
214.54	22.80	43.50	20.70	1000.00	200.0	H	359.00	18
546.65	30.59	46.00	15.41	1000.00	100.0	H	170.00	26
750.10	36.59	46.00	9.41	1000.00	100.0	H	38.00	29
875.11	36.81	46.00	9.19	1000.00	100.0	H	83.00	30

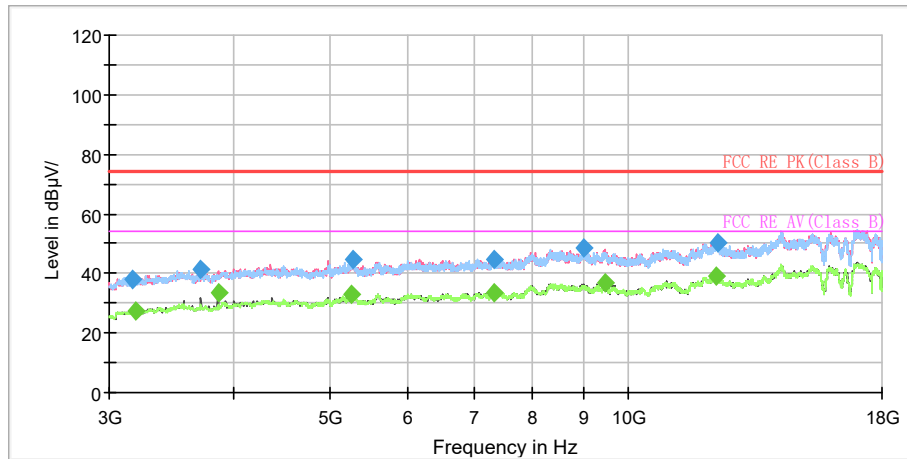
DH5-Channel 0



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

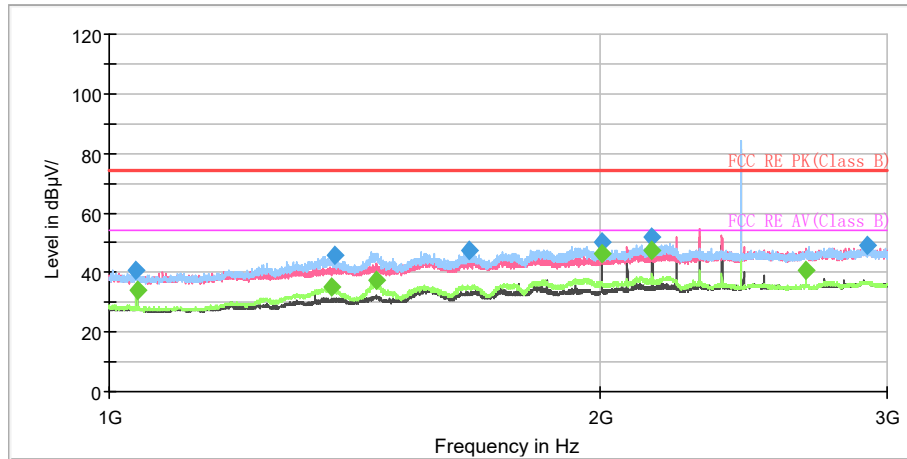
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1039.250000	---	34.24	54.00	19.76	500.0	200.0	V	47.0	-15.8
1039.750000	41.42	---	74.00	32.58	500.0	200.0	V	0.0	-15.8
1359.750000	44.88	---	74.00	29.12	500.0	200.0	H	215.0	-13.4
1363.250000	---	35.48	54.00	18.52	500.0	200.0	H	215.0	-13.4
1452.250000	---	37.10	54.00	16.90	500.0	100.0	H	339.0	-12.6
1656.500000	47.19	---	74.00	26.81	500.0	100.0	H	224.0	-11.0
1921.250000	50.30	---	74.00	23.70	500.0	100.0	H	224.0	-9.6
2004.750000	---	46.15	54.00	7.85	500.0	200.0	V	4.0	-8.7
2301.500000	55.11	---	74.00	18.89	500.0	200.0	V	14.0	-6.5
2301.750000	---	47.58	54.00	6.42	500.0	200.0	V	14.0	-6.5
2673.000000	---	40.06	54.00	13.94	500.0	100.0	V	35.0	-4.7
2879.250000	49.50	---	74.00	24.50	500.0	200.0	H	248.0	-3.9



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)
3170.625000	37.99	---	74.00	36.01	500.0	100.0	V	183.0	-12.6
3191.250000	---	27.19	54.00	26.81	500.0	100.0	V	310.0	-12.7
3712.500000	41.20	---	74.00	32.80	500.0	200.0	V	36.0	-11.0
3860.625000	---	33.44	54.00	20.56	500.0	200.0	V	36.0	-10.9
5268.750000	---	32.76	54.00	21.24	500.0	200.0	H	352.0	-5.2
5276.250000	44.38	---	74.00	29.62	500.0	100.0	V	359.0	-5.4
7318.125000	---	33.66	54.00	20.34	500.0	100.0	V	196.0	-1.4
7320.000000	44.74	---	74.00	29.26	500.0	100.0	V	0.0	-1.4
9018.750000	48.76	---	74.00	25.24	500.0	200.0	H	0.0	0.8
9465.000000	---	36.62	54.00	17.38	500.0	100.0	V	325.0	1.0
12266.250000	---	39.24	54.00	14.76	500.0	100.0	V	196.0	3.2
12307.500000	50.50	---	74.00	23.50	500.0	100.0	H	0.0	2.8

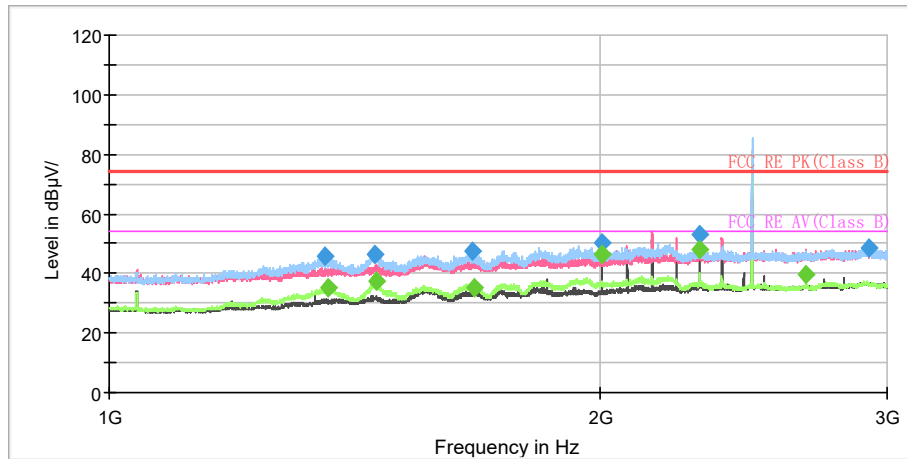
DH5-Channel 39



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

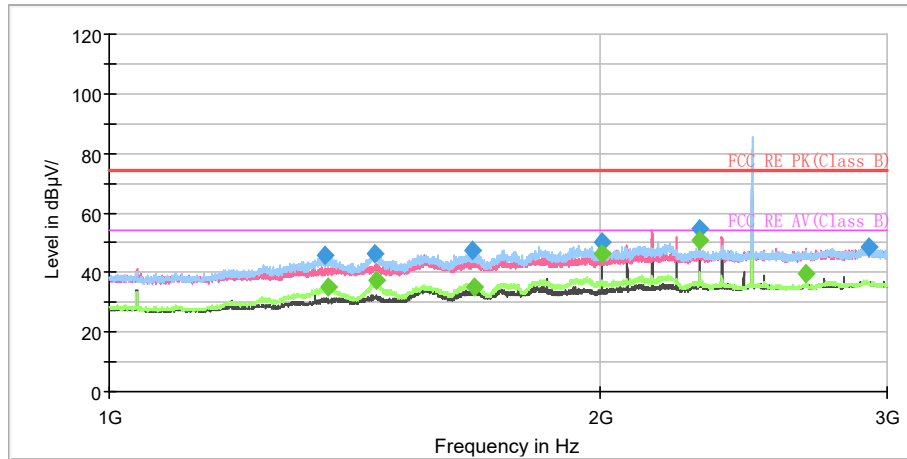
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1039.250000	40.77	---	74.00	33.23	500.0	100.0	V	359.0	-15.8
1039.500000	---	34.30	54.00	19.70	500.0	200.0	H	45.0	-15.8
1370.000000	---	35.05	54.00	18.95	500.0	200.0	H	215.0	-13.2
1375.750000	45.75	---	74.00	28.25	500.0	200.0	H	215.0	-13.1
1457.250000	---	37.14	54.00	16.86	500.0	100.0	H	334.0	-12.6
1662.000000	47.32	---	74.00	26.68	500.0	100.0	H	347.0	-10.9
2004.750000	---	46.22	54.00	7.78	500.0	200.0	V	5.0	-8.7
2004.750000	50.27	---	74.00	23.73	500.0	200.0	V	5.0	-8.7
2153.000000	52.16	---	74.00	21.84	500.0	200.0	V	5.0	-7.3
2153.250000	---	47.62	54.00	6.38	500.0	200.0	V	25.0	-7.3
2673.000000	---	40.62	54.00	13.38	500.0	100.0	V	34.0	-4.7
2917.250000	49.08	---	74.00	24.92	500.0	200.0	V	136.0	-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)
1357.000000	45.56	---	74.00	28.44	500.0	100.0	H	220.0	-13.5
1362.250000	---	35.09	54.00	18.91	500.0	200.0	H	213.0	-13.4
1453.500000	46.39	---	74.00	27.61	500.0	100.0	H	336.0	-12.6
1457.750000	---	37.16	54.00	16.84	500.0	100.0	H	336.0	-12.6
1671.250000	47.34	---	74.00	26.66	500.0	200.0	H	337.0	-10.8
1672.750000	---	35.33	54.00	18.67	500.0	200.0	H	325.0	-10.7
2004.500000	50.10	---	74.00	23.90	500.0	200.0	V	359.0	-8.7
2004.750000	---	46.45	54.00	7.55	500.0	200.0	V	359.0	-8.7
2301.750000	---	47.99	54.00	6.01	500.0	200.0	V	0.0	-6.5
2302.000000	52.81	---	74.00	21.19	500.0	200.0	V	0.0	-6.5
2673.000000	---	39.74	54.00	14.26	500.0	100.0	V	348.0	-4.7
2923.750000	48.81	---	74.00	25.19	500.0	200.0	V	49.0	-3.3

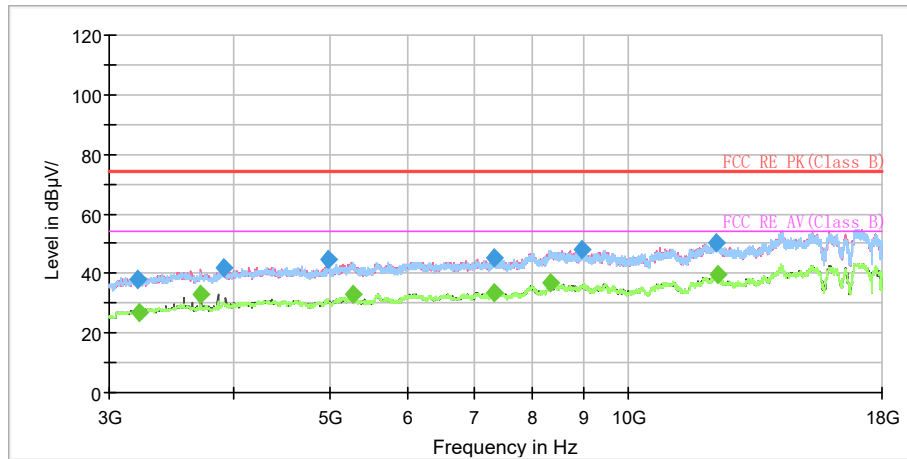
DH5-Channel 78



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)
1357.000000	45.56	---	74.00	28.44	500.0	100.0	H	220.0	-13.5
1362.250000	---	35.09	54.00	18.91	500.0	200.0	H	213.0	-13.4
1453.500000	46.39	---	74.00	27.61	500.0	100.0	H	336.0	-12.6
1457.750000	---	37.16	54.00	16.84	500.0	100.0	H	336.0	-12.6
1671.250000	47.34	---	74.00	26.66	500.0	200.0	H	337.0	-10.8
1672.750000	---	35.33	54.00	18.67	500.0	200.0	H	325.0	-10.7
2004.500000	50.10	---	74.00	23.90	500.0	200.0	V	359.0	-8.7
2004.750000	---	46.45	54.00	7.55	500.0	200.0	V	359.0	-8.7
2301.750000	---	50.99	54.00	3.01	500.0	200.0	V	0.0	-6.5
2302.000000	54.81	---	74.00	19.19	500.0	200.0	V	0.0	-6.5
2673.000000	---	39.74	54.00	14.26	500.0	100.0	V	348.0	-4.7
2923.750000	48.81	---	74.00	25.19	500.0	200.0	V	49.0	-3.3



Radiates Emission from 3GHz to 18GHz

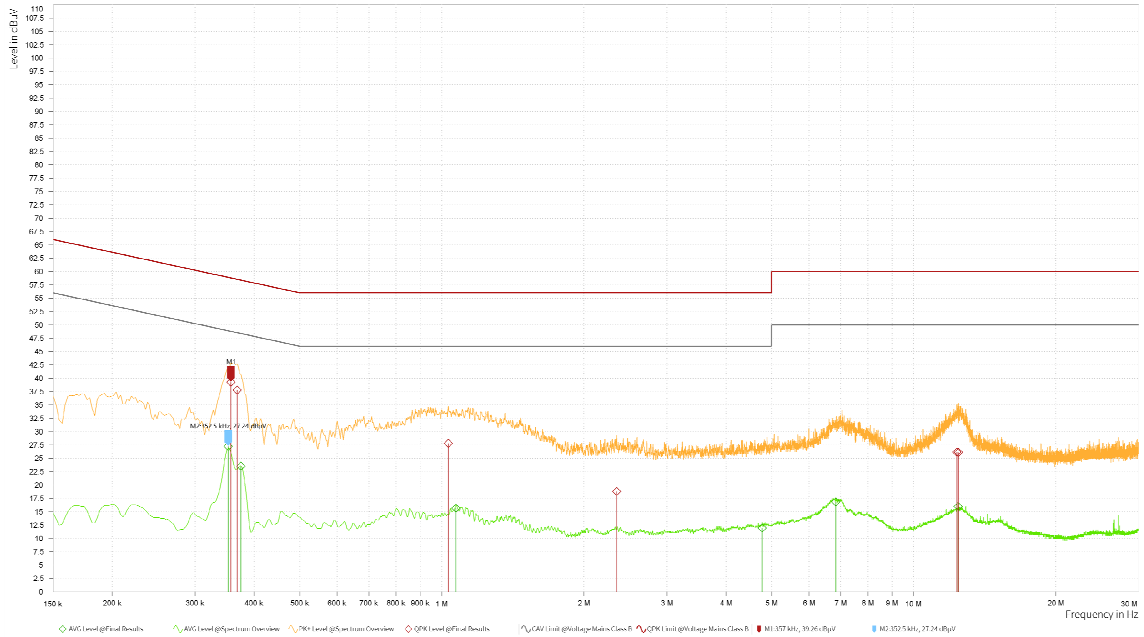
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3206.250000	37.80	---	74.00	36.20	500.0	100.0	H	42.0	-12.8
3217.500000	---	26.80	54.00	27.20	500.0	200.0	V	94.0	-12.9
3712.500000	---	33.04	54.00	20.96	500.0	200.0	V	30.0	-11.0
3907.500000	41.96	---	74.00	32.04	500.0	200.0	V	16.0	-9.2
4989.375000	44.56	---	74.00	29.44	500.0	200.0	V	132.0	-7.9
5270.625000	---	32.82	54.00	21.18	500.0	200.0	V	3.0	-5.3
7316.250000	---	33.59	54.00	20.41	500.0	200.0	V	107.0	-1.3
7331.250000	45.21	---	74.00	28.79	500.0	100.0	V	358.0	-1.4
8351.250000	---	36.80	54.00	17.20	500.0	200.0	H	216.0	1.6
8973.750000	47.73	---	74.00	26.27	500.0	100.0	V	272.0	0.2
12264.375000	50.23	---	74.00	23.77	500.0	200.0	V	81.0	3.2
12303.750000	---	39.36	54.00	14.64	500.0	200.0	V	68.0	2.9

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.

Variant



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]
0.353	--	--	--	27.24	48.90	21.66	21.26	L1	9.000	1.000
0.357	39.26	58.80	19.54	--	--	--	21.25	L1	9.000	1.000
0.368	37.78	58.54	20.77	--	--	--	21.24	L1	9.000	1.000
0.375	--	--	--	23.55	48.39	24.84	21.24	L1	9.000	1.000
1.032	27.79	56.00	28.21	--	--	--	20.43	L1	9.000	1.000
1.070	--	--	--	15.66	46.00	30.34	20.40	L1	9.000	1.000
2.346	18.78	56.00	37.22	--	--	--	19.93	L1	9.000	1.000
4.776	--	--	--	11.93	46.00	34.07	19.75	L1	9.000	1.000
6.837	--	--	--	16.83	50.00	33.17	19.71	L1	9.000	1.000
12.341	26.15	60.00	33.85	--	--	--	19.75	L1	9.000	1.000
12.417	--	--	--	15.95	50.00	34.05	19.75	L1	9.000	1.000
12.442	26.10	60.00	33.90	--	--	--	19.75	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]
0.353	--	--	--	27.15	48.90	21.75	21.20	N	9.000	1.000
0.357	39.14	58.80	19.66	--	--	--	21.20	N	9.000	1.000
0.364	38.53	58.64	20.11	--	--	--	21.19	N	9.000	1.000
0.375	--	--	--	23.59	48.39	24.80	21.18	N	9.000	1.000
1.005	27.24	56.00	28.76	--	--	--	20.50	N	9.000	1.000
1.070	--	--	--	15.67	46.00	30.33	20.44	N	9.000	1.000
4.515	--	--	--	11.89	46.00	34.11	19.80	N	9.000	1.000
4.801	17.46	56.00	38.54	--	--	--	19.80	N	9.000	1.000
6.808	--	--	--	16.91	50.00	33.09	19.72	N	9.000	1.000
12.388	26.15	60.00	33.85	--	--	--	19.73	N	9.000	1.000
12.419	--	--	--	16.06	50.00	33.94	19.73	N	9.000	1.000
12.514	26.20	60.00	33.80	--	--	--	19.74	N	9.000	1.000

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 kHz to 30 MHz