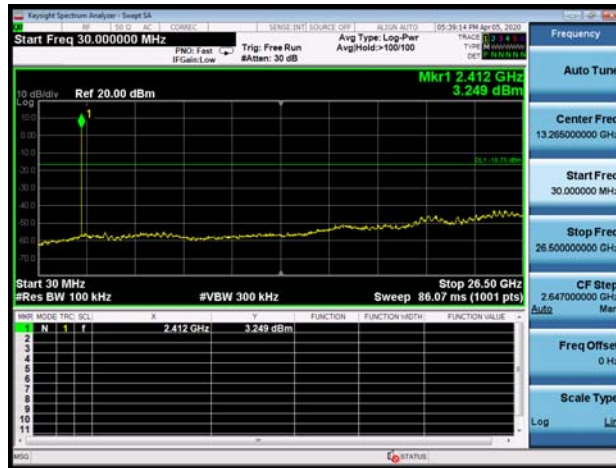
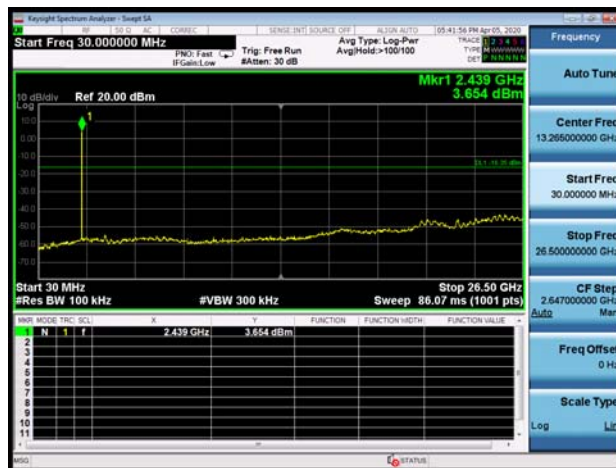


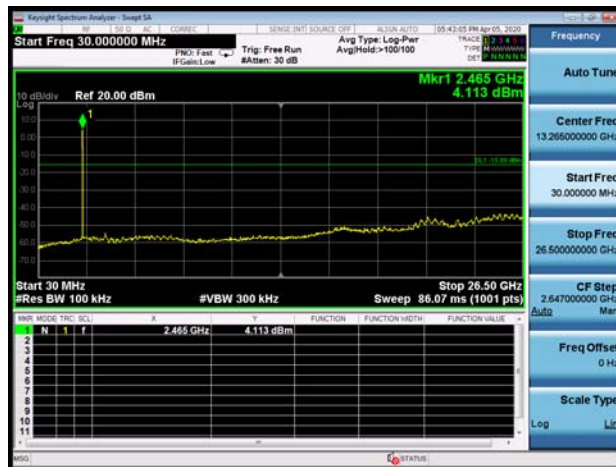
BLE 2M GFSK 2404MHz 30MHz to 26.5GHz



BLE 2M GFSK 2440MHz 30MHz to 26.5GHz

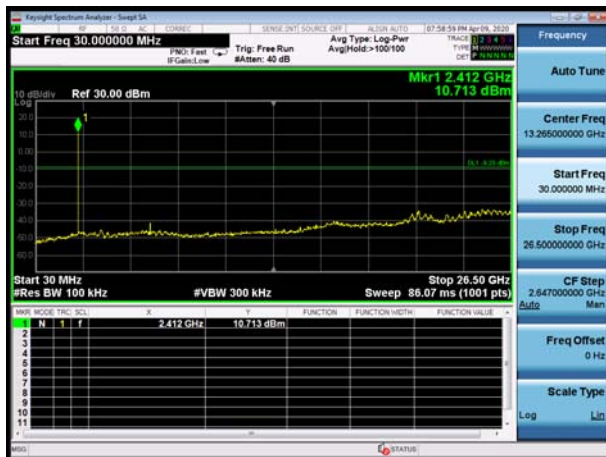


BLE 2M GFSK 2478MHz 30MHz to 26.5GHz

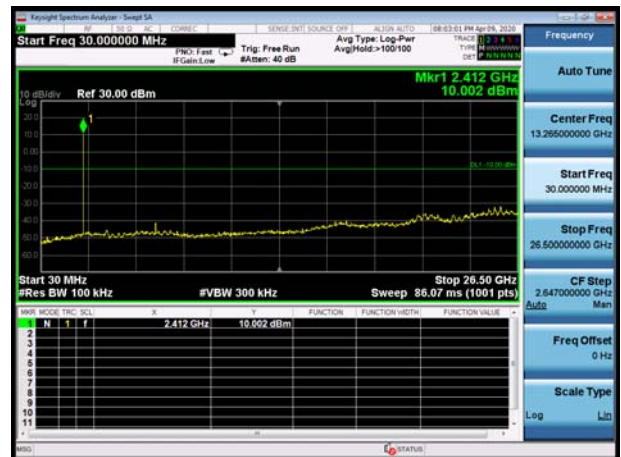


BT UHD High Power Mode

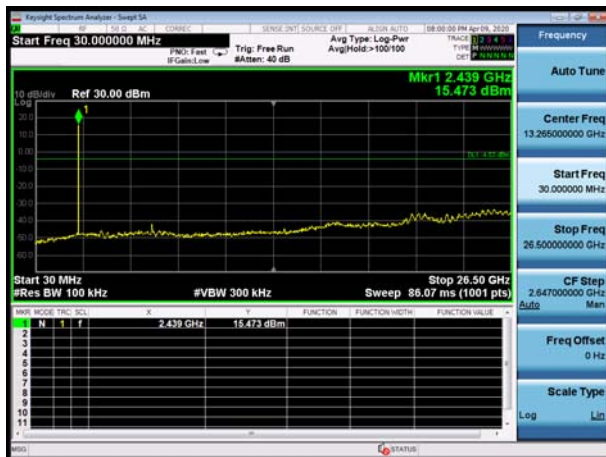
BT UHD 2M $\pi/4$ -DQPSK 2404MHz 30MHz to 26.5GHz



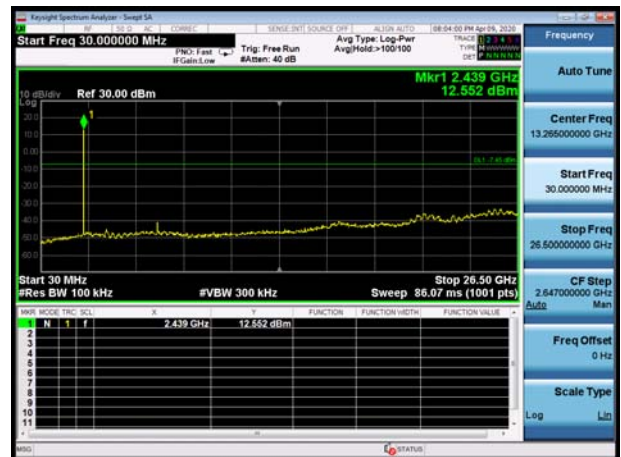
BT UHD 2M 8DPSK 2404MHz 30MHz to 26.5GHz



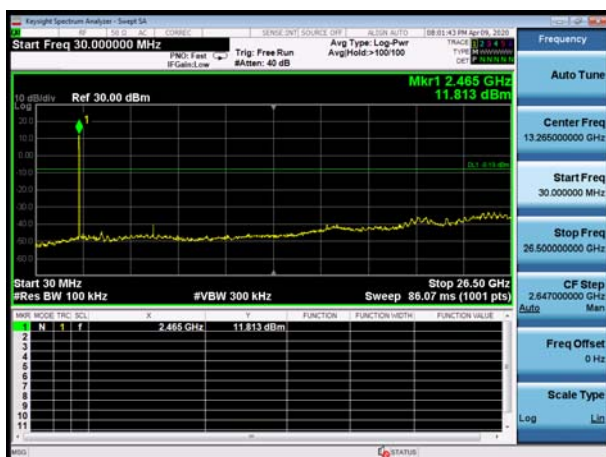
BT UHD 2M $\pi/4$ -DQPSK 2440MHz 30MHz to 26.5GHz



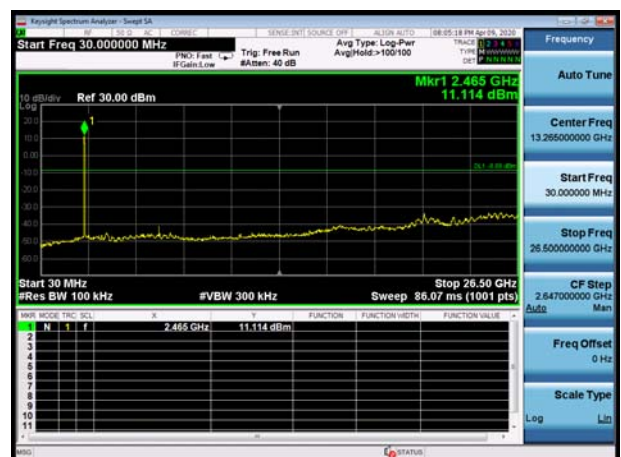
BT UHD 2M 8DPSK 2440MHz 30MHz to 26.5GHz



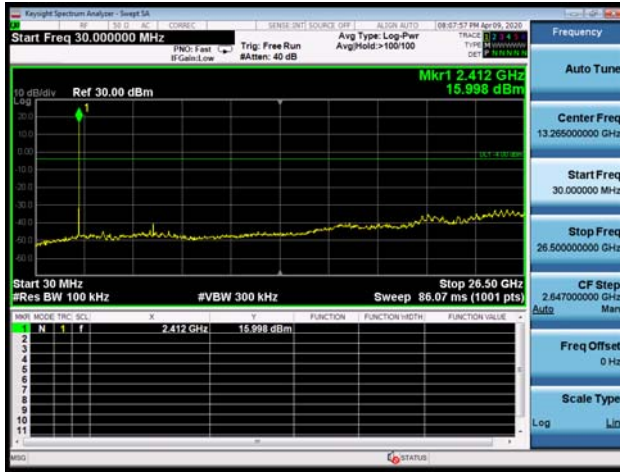
BT UHD 2M $\pi/4$ -DQPSK 2478MHz 30MHz to 26.5GHz



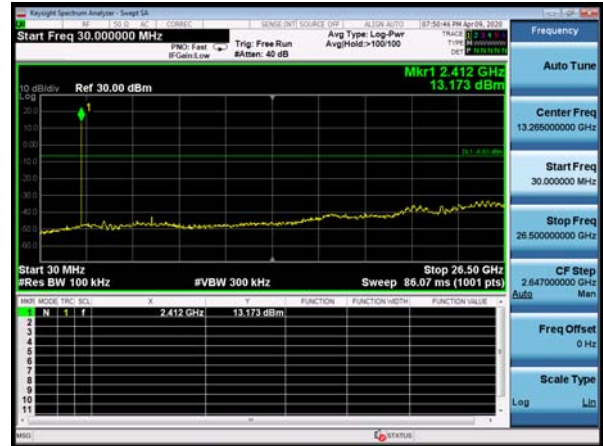
BT UHD 2M 8DPSK 2478MHz 30MHz to 26.5GHz



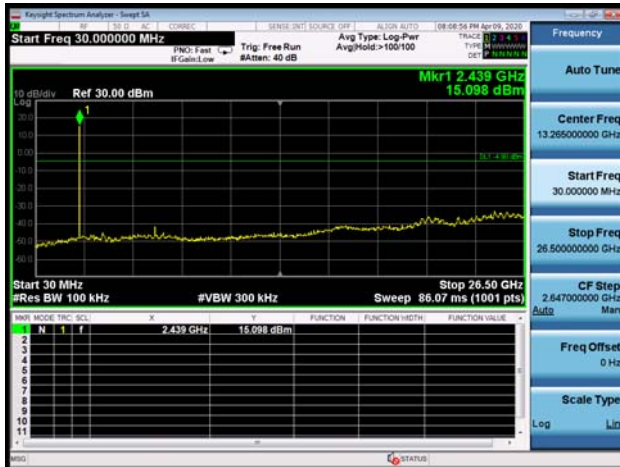
BT UHD 4M $\pi/4$ -DQPSK 2404MHz 30MHz to 26.5GHz



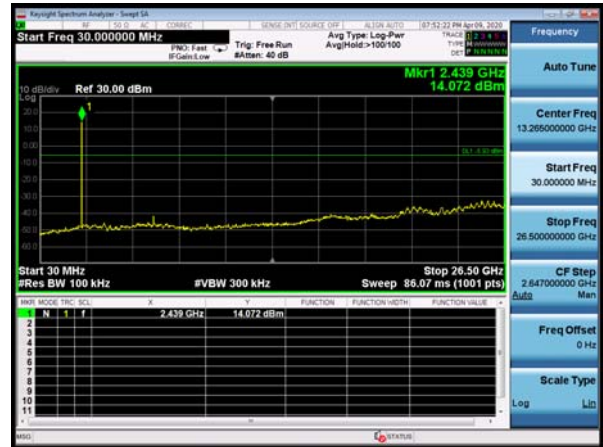
BLE 1M GFSK 2404MHz 30MHz to 26.5GHz



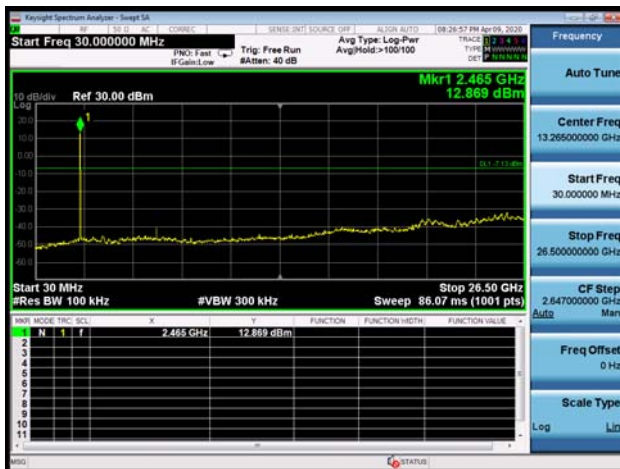
BT UHD 4M $\pi/4$ -DQPSK 2440MHz 30MHz to 26.5GHz



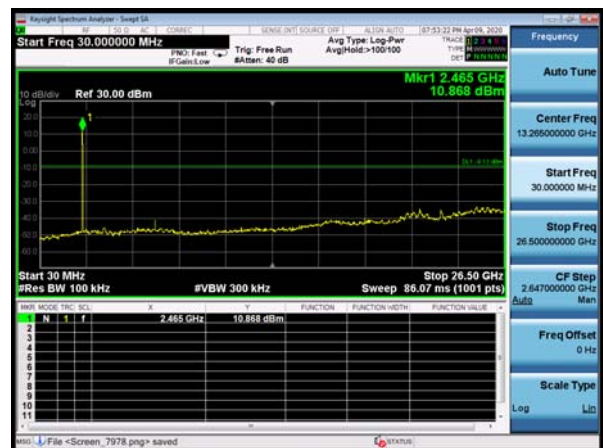
BLE 1M GFSK 2440MHz 30MHz to 26.5GHz



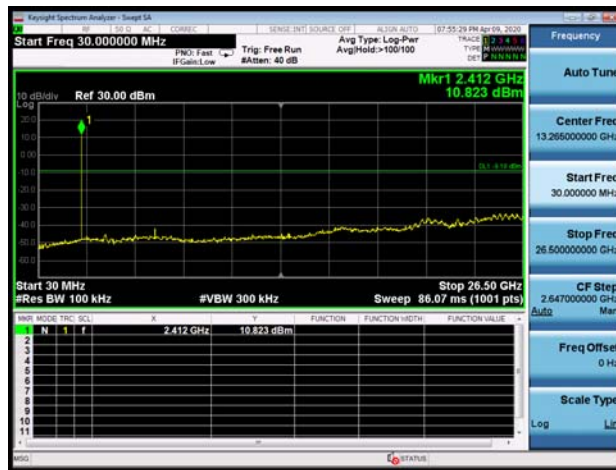
BT UHD 4M $\pi/4$ -DQPSK 2476MHz 30MHz to 26.5GHz



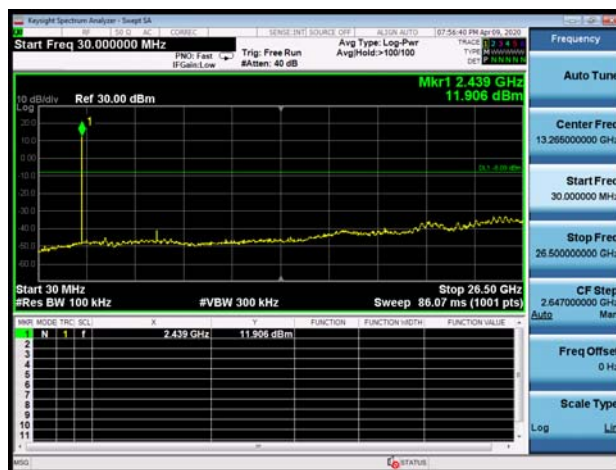
BLE 1M GFSK 2478MHz 30MHz to 26.5GHz



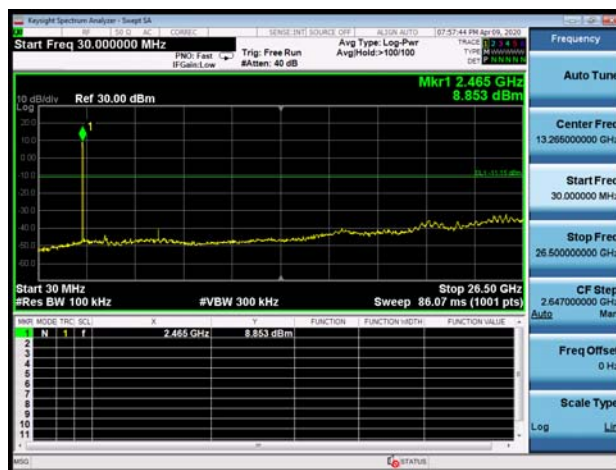
BLE 2M GFSK 2404MHz 30MHz to 26.5GHz



BLE 2M GFSK 2440MHz 30MHz to 26.5GHz



BLE 2M GFSK 2478MHz 30MHz to 26.5GHz



5.8 Unwanted Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

Below 1GHz (detector: Peak and Quasi-Peak)

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz(detector: Peak):

(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit.

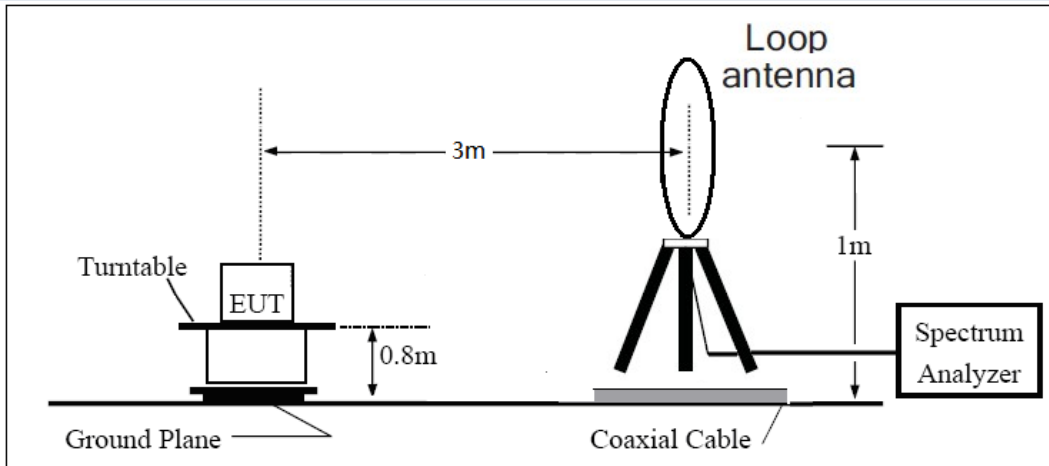
If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak- average correction factor, derived form the appropriate duty cycle calculation.

This setting method can refer to **KDB 558074 D01**.

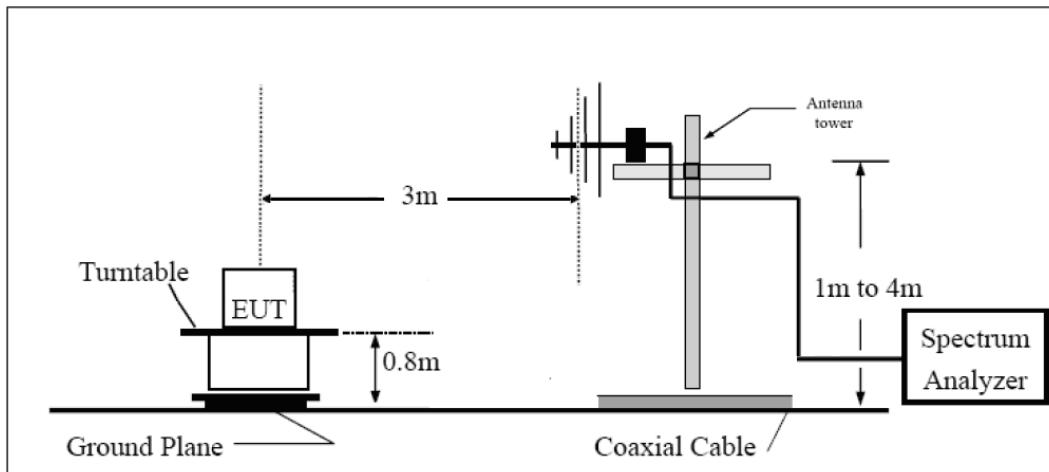
This mode was measured in the following mode: EUT with cradle and EUT without cradle. The worst emission was found in EUT with cradle mode and the worst case was recorded.

The test is in transmitting mode.

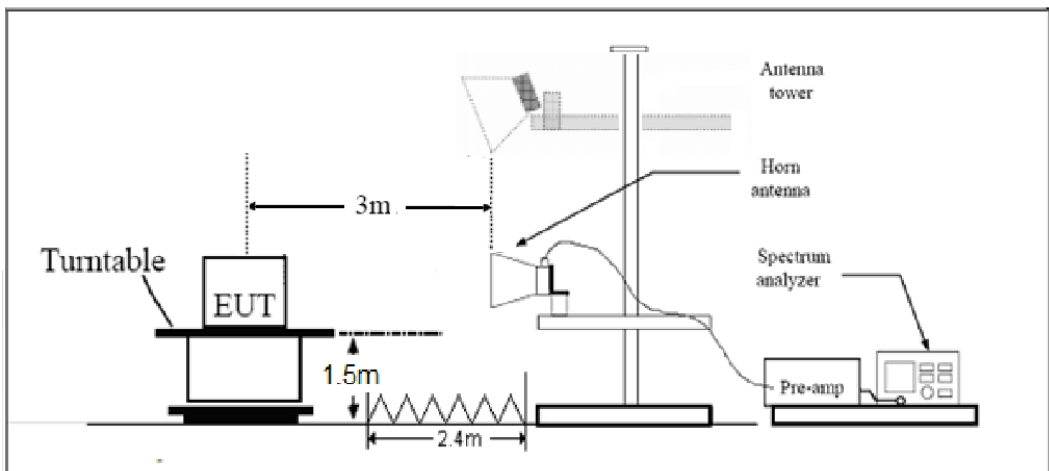
Test setup
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Limits

Rule Part 15.247(d) specifies that “In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74dBuV/m

Average Limit=54dBuV/m

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

**Measurement Uncertainty**

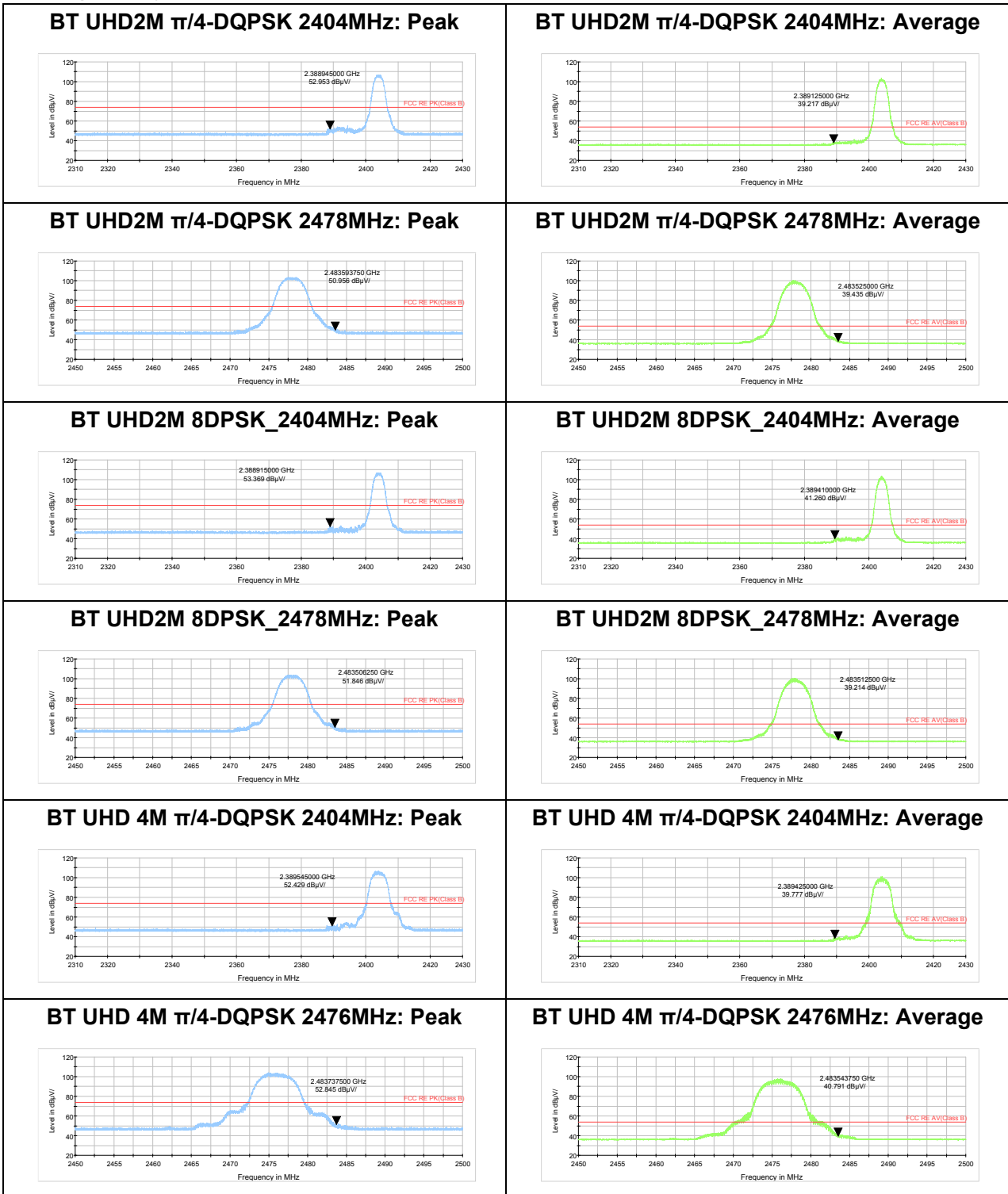
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

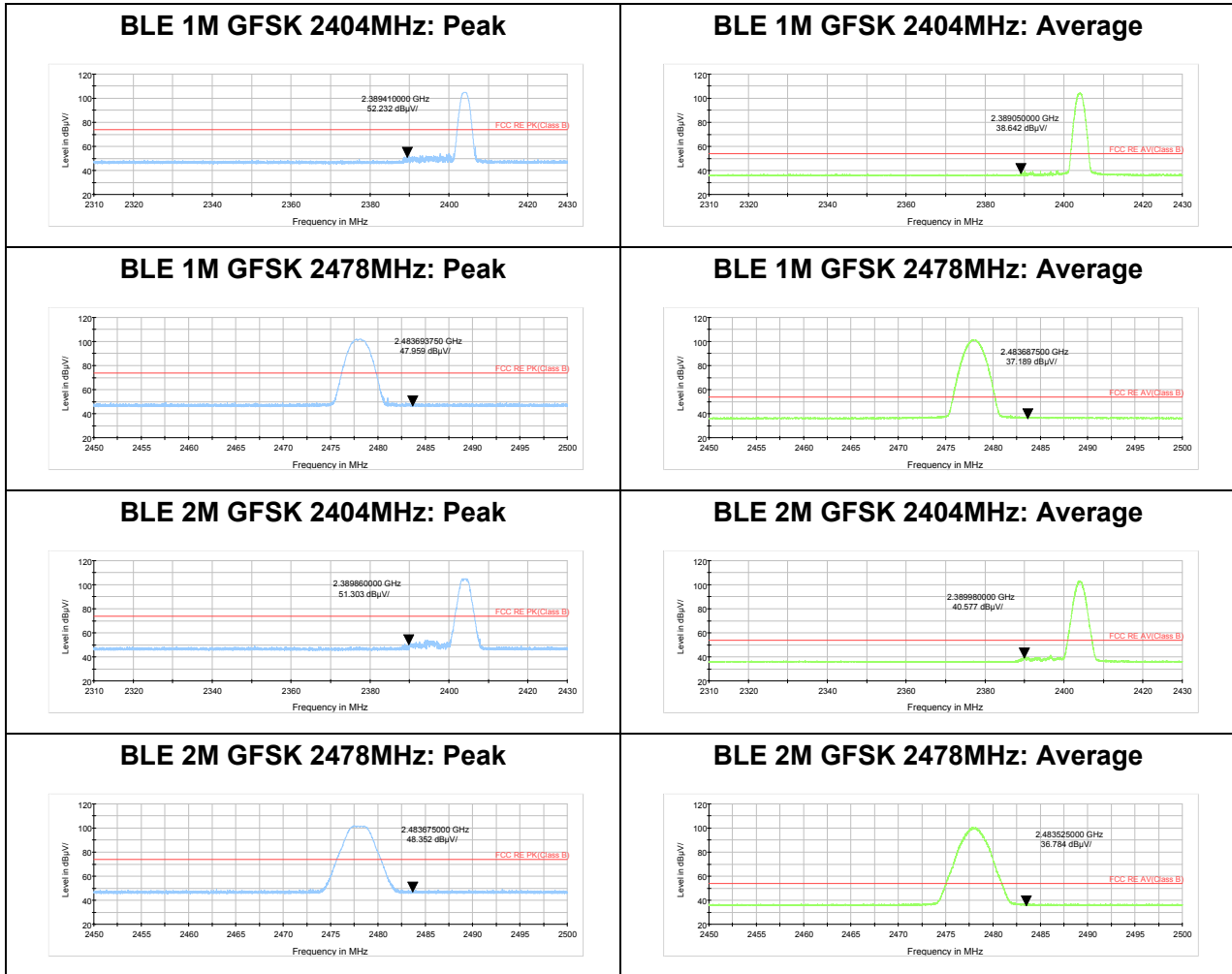
Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.02 dB
200MHz-1GHz	3.28 dB
1-18GHz	3.70 dB
18-26.5GHz	5.78 dB



Test Results:

The signal beyond the limit is carrier.





Result of RE

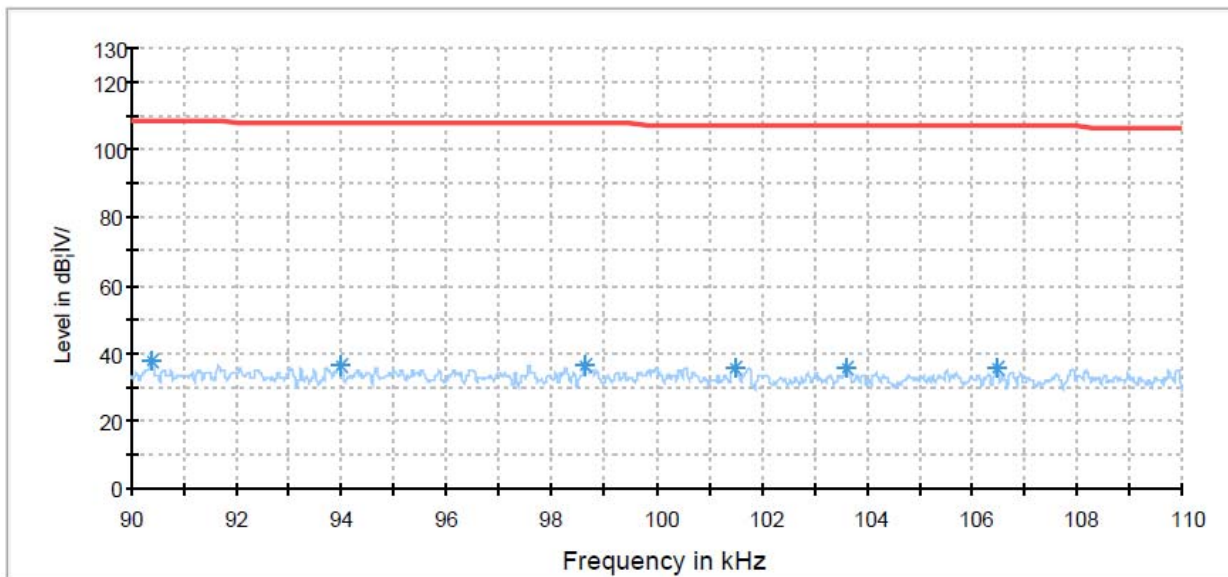
Test result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the Emissions in the frequency band 9kHz-30MHz and 18GHz -26.5GHz are more than 20dB below the limit are not reported.

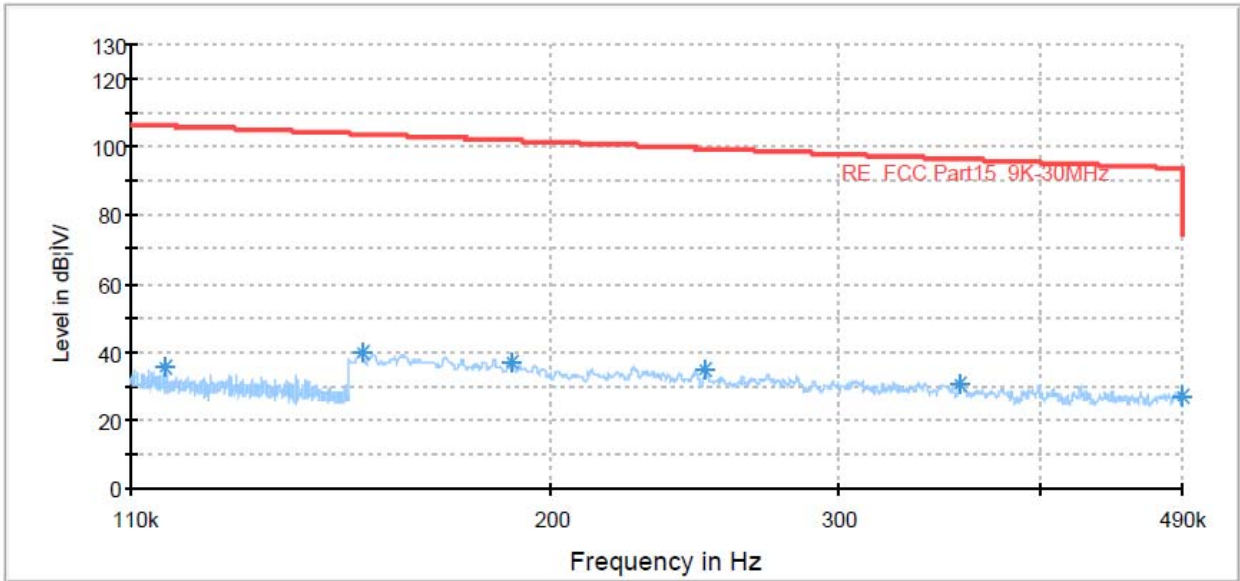
The following graphs display the maximum values of horizontal and vertical by software. For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, **BT UHD High Power Mode 2M 8DPSK 2404MHz** are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

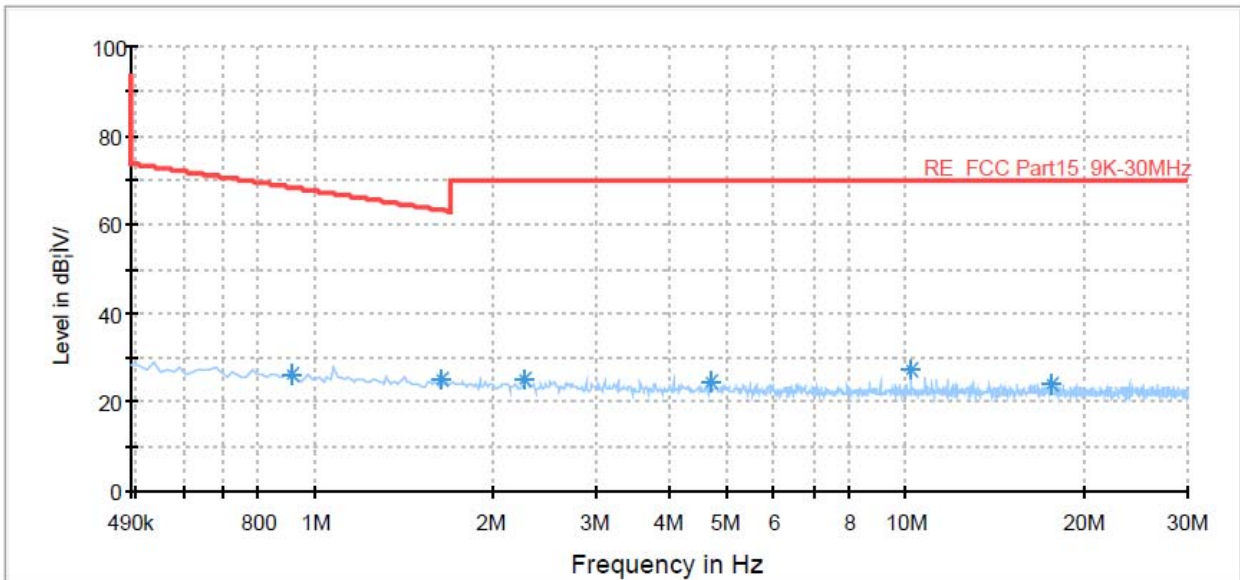
**Continuous TX mode:
BT UHD2M 8DPSK**



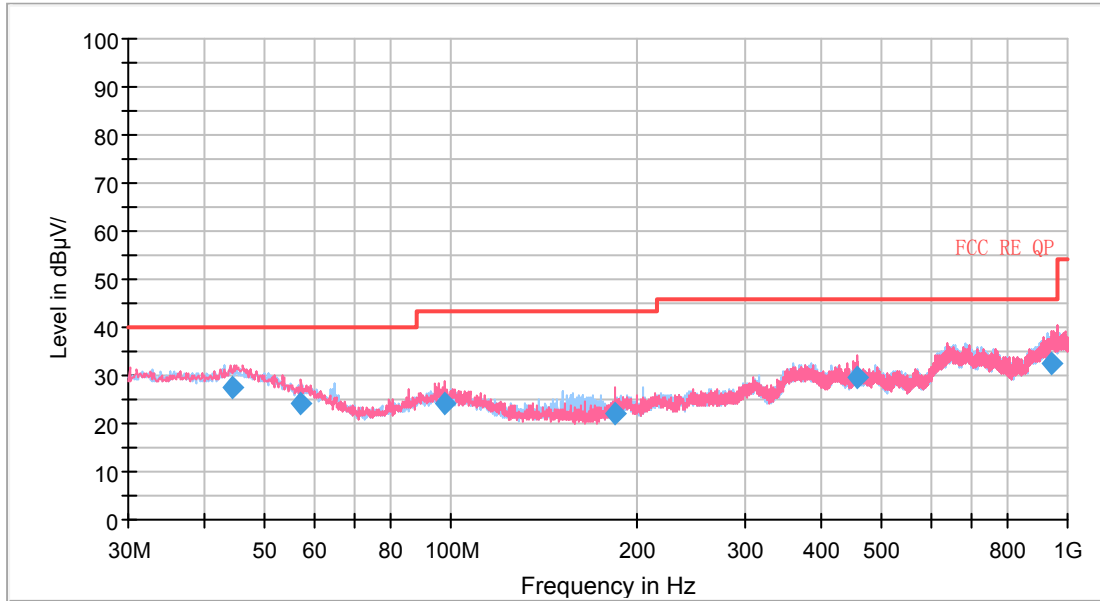
90K-110KHz



110K-490KH



490K-30MHz



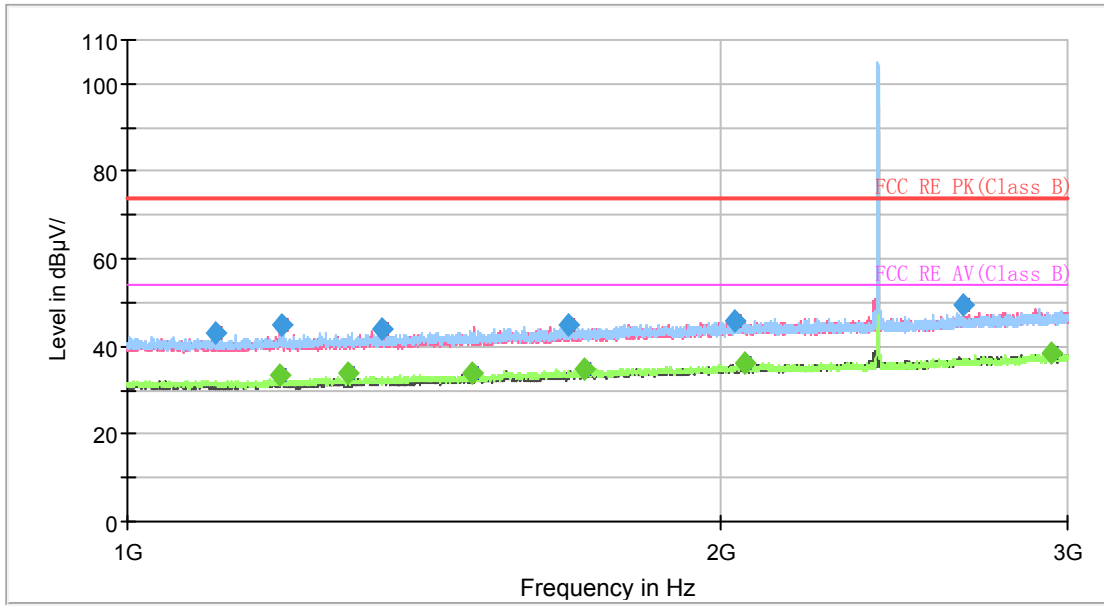
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
44.357678	27.62	123.0	H	85.0	3.4	12.38	40.00
57.257100	24.01	100.0	V	106.0	-0.9	15.99	40.00
97.693356	23.99	109.0	V	292.0	-3.2	19.51	43.50
184.935106	22.03	100.0	V	335.0	-5.8	21.47	43.50
455.281000	29.53	109.0	V	2.0	0.0	16.47	46.00
943.271250	32.68	125.0	V	58.0	9.0	13.32	46.00

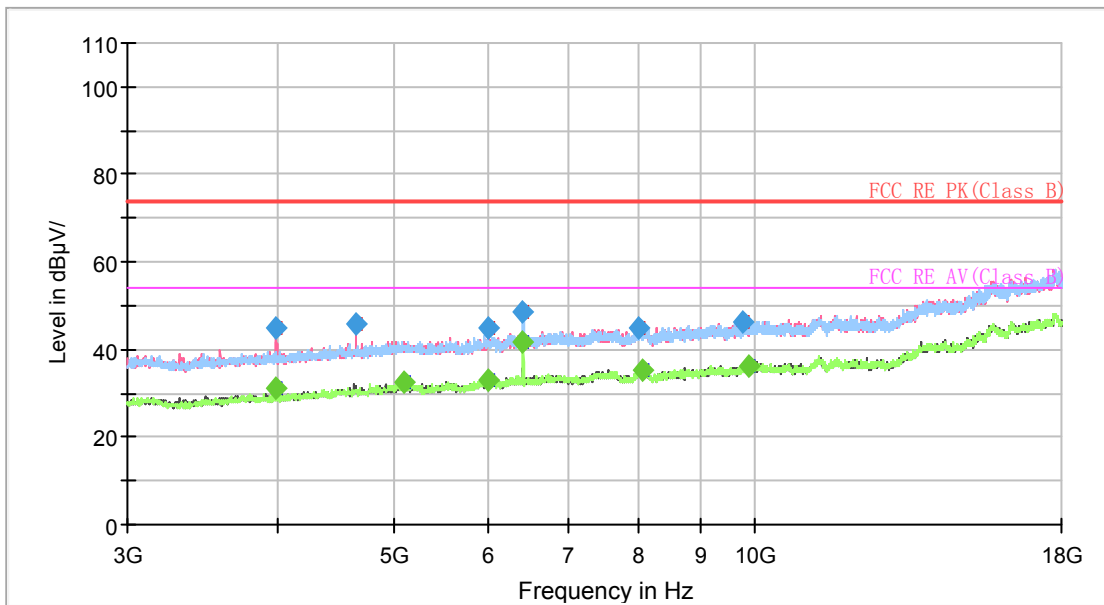
Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)
 2. Margin = Limit – Quasi-Peak



BT UHD2M $\pi/4$ -DQPSK -2404MHz



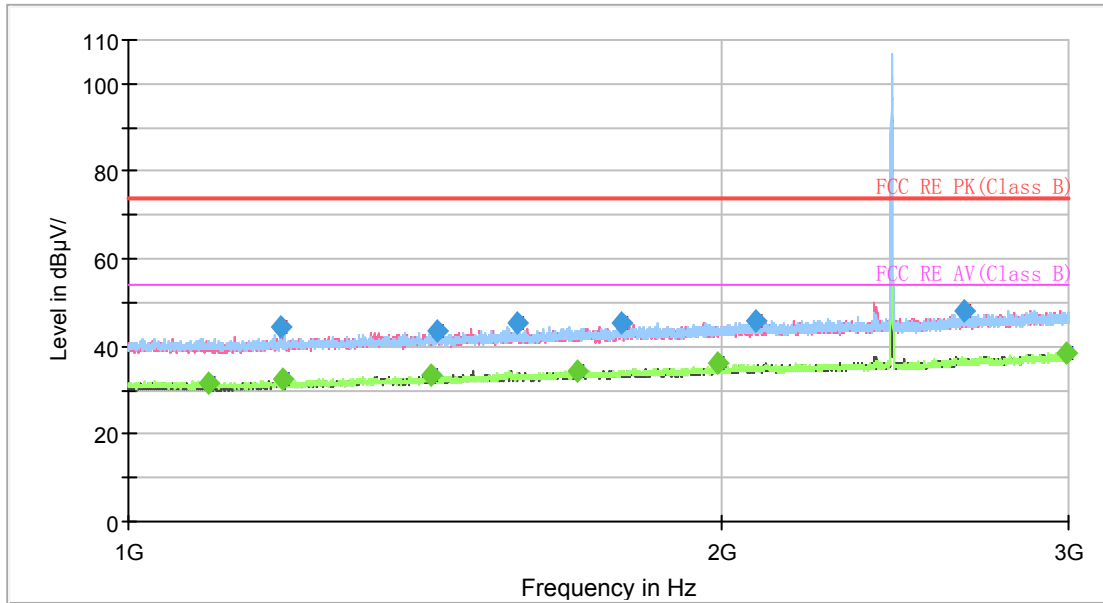
Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



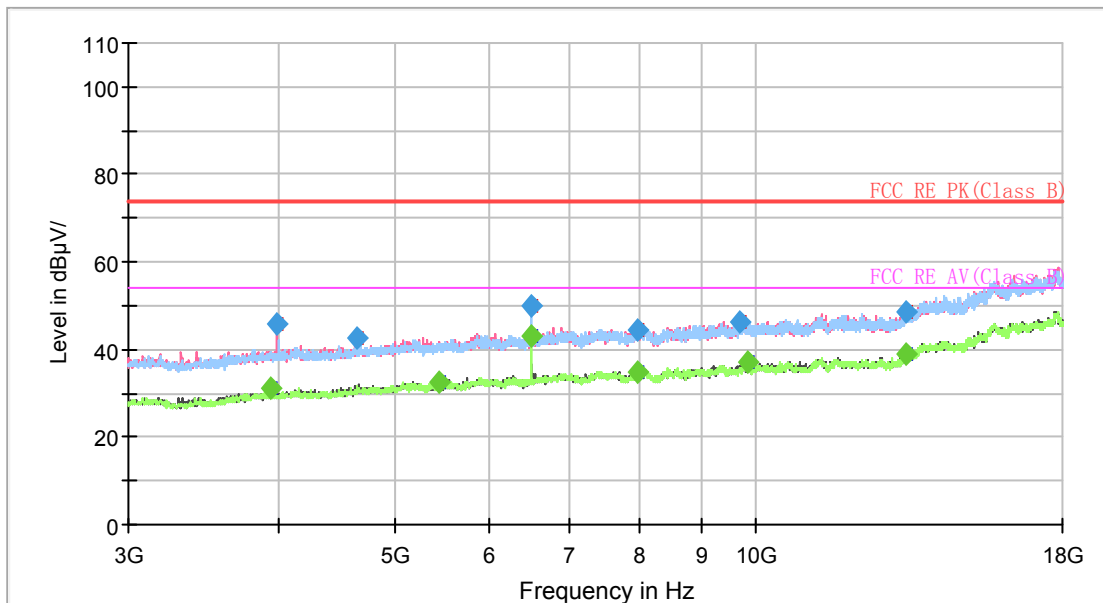
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1108.000000	42.94	---	74.00	31.06	200.0	H	256.0	-0.8
1195.500000	---	33.56	54.00	20.44	200.0	V	333.0	0.1
1199.000000	44.90	---	74.00	29.10	100.0	V	10.0	0.1
1293.000000	---	33.87	54.00	20.13	200.0	H	281.0	0.4
1347.250000	43.79	---	74.00	30.21	200.0	H	351.0	0.7
1494.500000	---	33.76	54.00	20.24	200.0	V	214.0	1.3
1674.250000	45.00	---	74.00	29.00	100.0	V	117.0	2.3
1704.250000	---	34.96	54.00	19.04	200.0	H	266.0	2.6
2031.500000	45.73	---	74.00	28.27	200.0	V	314.0	4.0
2058.750000	---	36.43	54.00	17.57	200.0	H	340.0	4.0
2656.750000	49.34	---	74.00	24.66	100.0	V	348.0	6.3
2947.750000	---	38.29	54.00	15.71	100.0	V	0.0	7.8

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BT UHD2M $\pi/4$ -DQPSK -2440MHz

Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

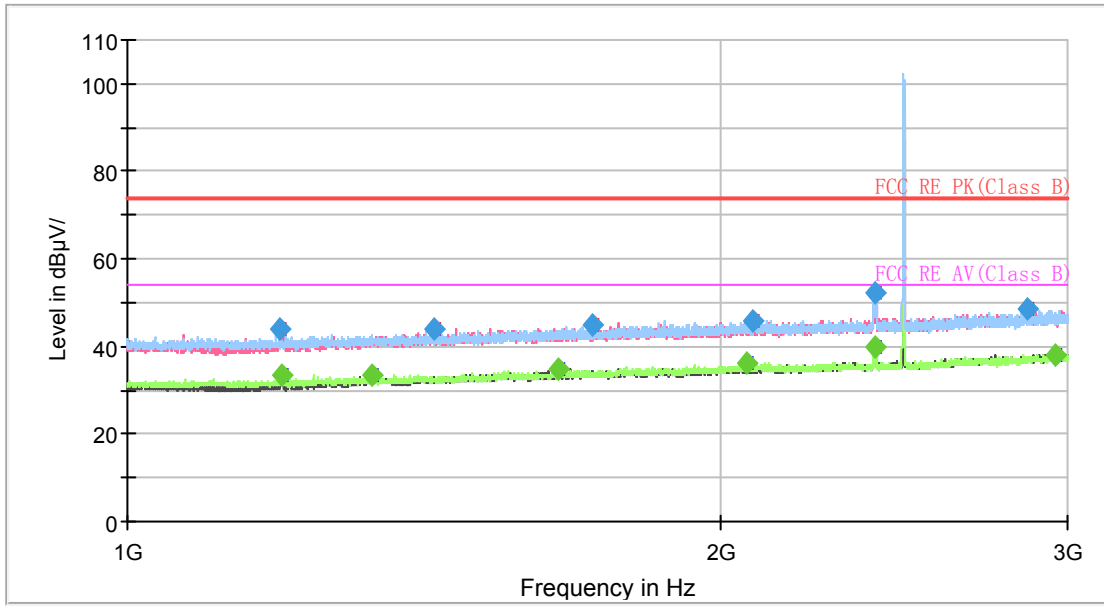


Radiates Emission from 3GHz to 18GHz

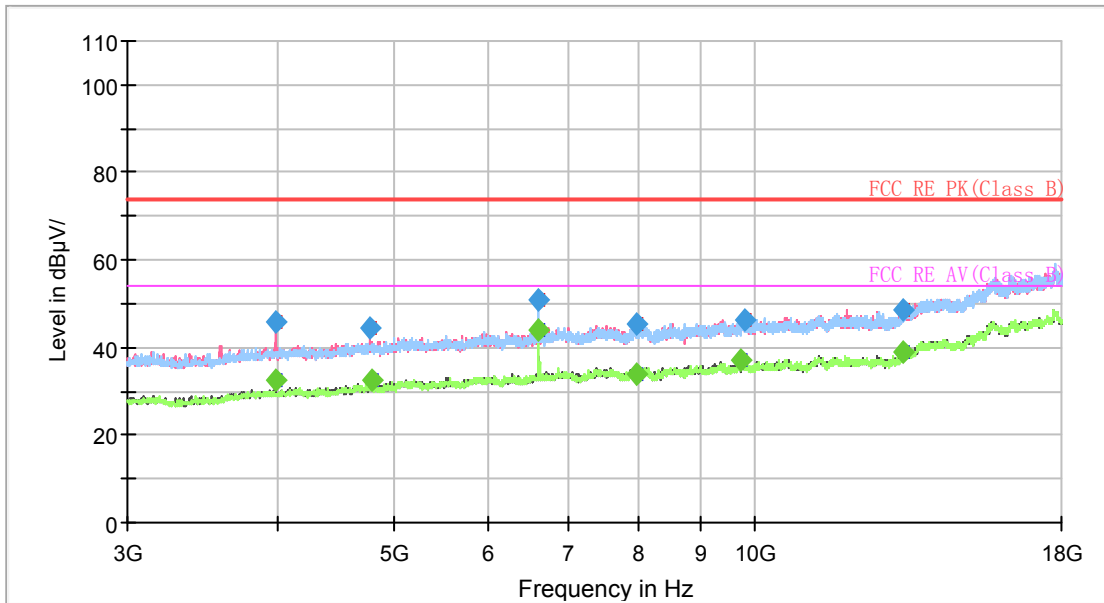
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1099.500000	---	31.78	54.00	22.22	200.0	H	235.0	-0.7
1194.750000	44.43	---	74.00	29.57	200.0	V	337.0	0.1
1199.000000	---	32.75	54.00	21.25	100.0	V	323.0	0.1
1425.750000	---	33.32	54.00	20.68	100.0	H	149.0	1.0
1435.250000	43.52	---	74.00	30.48	200.0	H	350.0	1.1
1574.000000	45.21	---	74.00	28.79	200.0	V	26.0	1.8
1690.500000	---	34.53	54.00	19.47	100.0	H	5.0	2.3
1779.750000	45.34	---	74.00	28.66	100.0	H	257.0	2.9
1990.000000	---	36.00	54.00	18.00	200.0	H	346.0	3.8
2079.500000	45.88	---	74.00	28.12	100.0	H	0.0	4.0
2656.000000	48.23	---	74.00	25.77	100.0	V	213.0	6.3
2993.750000	---	38.73	54.00	15.27	100.0	H	100.0	8.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BT UHD2M $\pi/4$ -DQPSK -2478MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

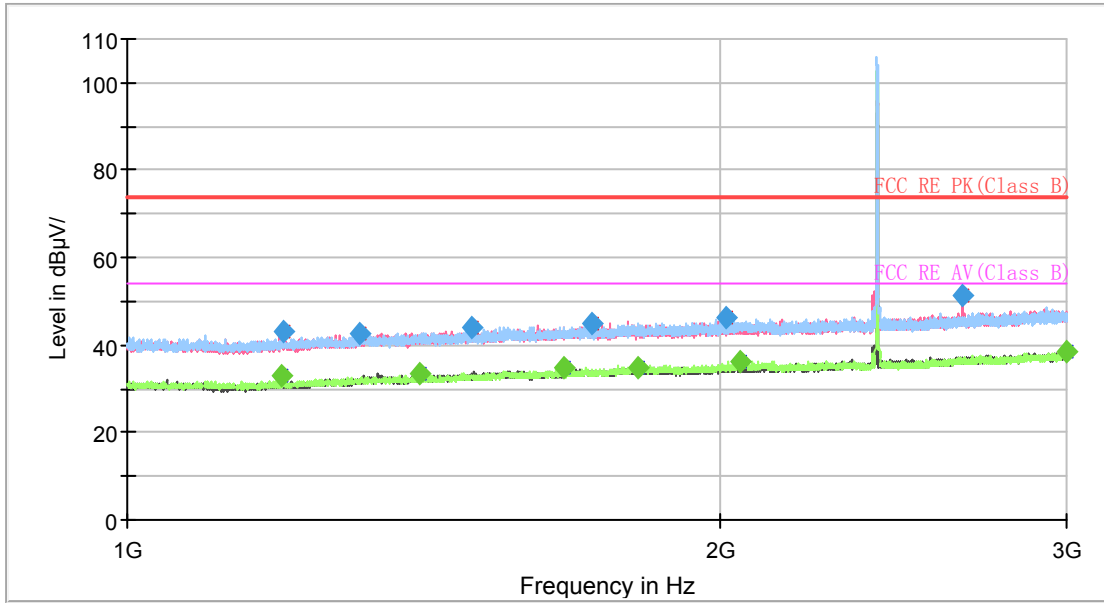


Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1195.250000	43.97	---	74.00	30.03	100.0	V	5.0	0.1
1197.750000	---	33.62	54.00	20.38	200.0	V	334.0	0.1
1330.750000	---	33.42	54.00	20.58	100.0	H	262.0	0.7
1432.250000	44.11	---	74.00	29.89	100.0	V	243.0	1.1
1653.500000	---	34.89	54.00	19.11	100.0	H	215.0	2.1
1722.500000	45.02	---	74.00	28.98	200.0	H	344.0	2.4
2060.000000	---	36.14	54.00	17.86	200.0	H	316.0	4.0
2078.000000	45.70	---	74.00	28.30	200.0	H	175.0	4.0
2395.500000	52.33	---	74.00	21.67	200.0	V	272.0	5.2
2396.000000	---	39.79	54.00	14.21	200.0	V	272.0	5.2
2866.000000	48.48	---	74.00	25.52	100.0	H	70.0	7.5
2959.250000	---	38.17	54.00	15.83	200.0	V	173.0	7.9

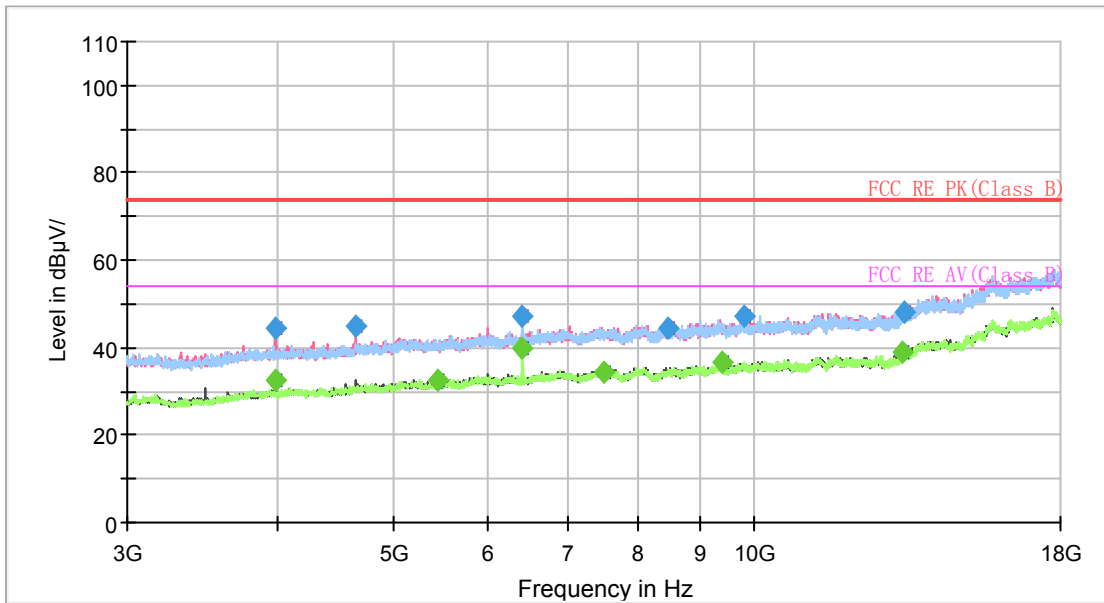
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



BT UHD2M 8DPSK -2404MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

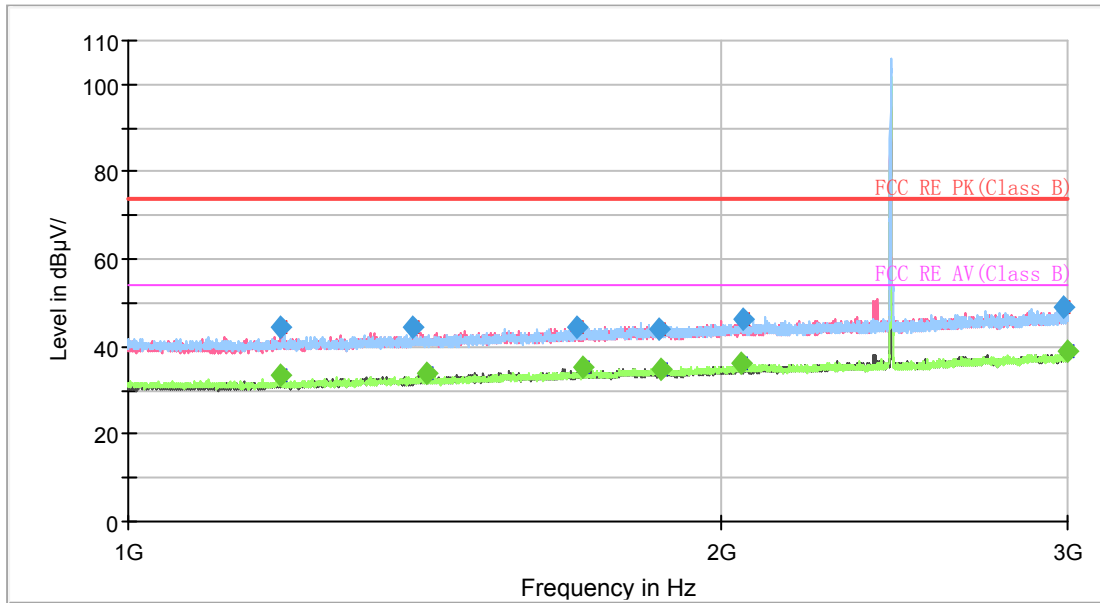


Radiates Emission from 3GHz to 18GHz

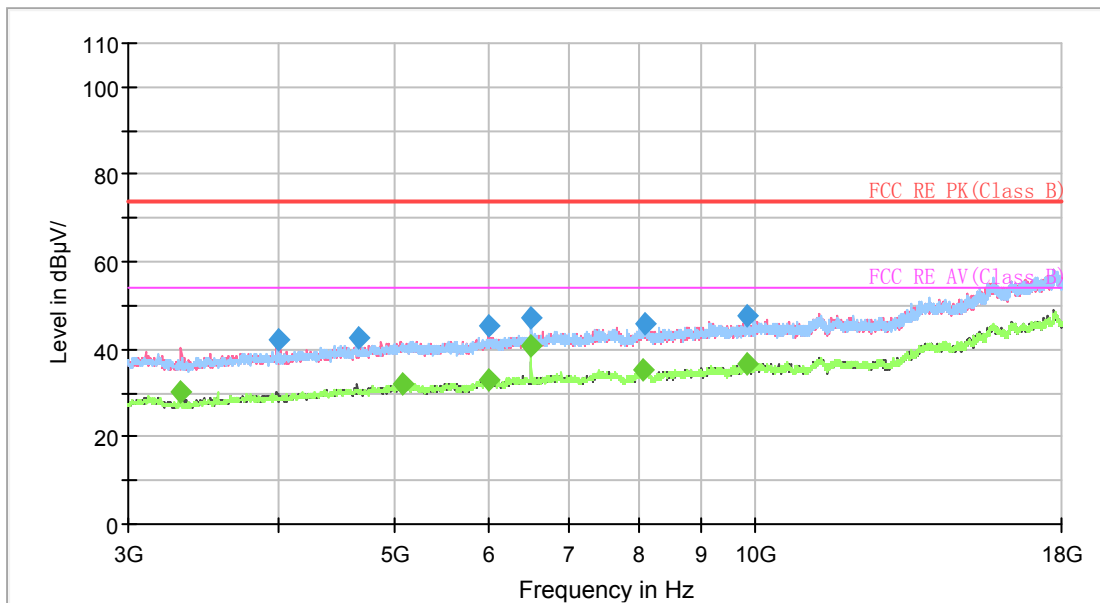
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1196.500000	---	33.04	54.00	20.96	100.0	V	12.0	0.1
1200.250000	43.19	---	74.00	30.81	100.0	V	12.0	0.1
1312.750000	42.77	---	74.00	31.23	100.0	H	0.0	0.7
1408.250000	---	33.38	54.00	20.62	200.0	V	72.0	1.1
1494.750000	43.90	---	74.00	30.10	200.0	V	206.0	1.3
1667.250000	---	34.85	54.00	19.15	100.0	H	82.0	2.2
1721.000000	44.95	---	74.00	29.05	100.0	H	185.0	2.4
1818.750000	---	34.89	54.00	19.11	100.0	V	232.0	2.9
2015.250000	46.17	---	74.00	27.84	100.0	H	227.0	4.0
2046.000000	---	36.36	54.00	17.64	200.0	H	315.0	4.0
2656.750000	51.25	---	74.00	22.75	100.0	V	214.0	6.3
2997.250000	---	38.53	54.00	15.47	100.0	V	80.0	8.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BT UHD2M 8DPSK -2440MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

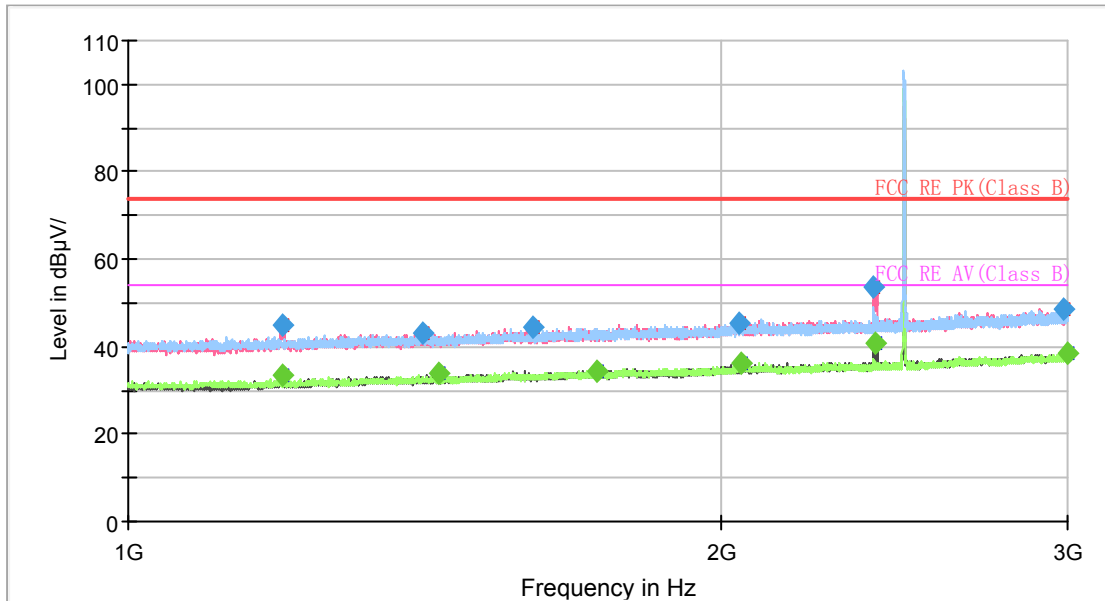


Radiates Emission from 3GHz to 18GHz

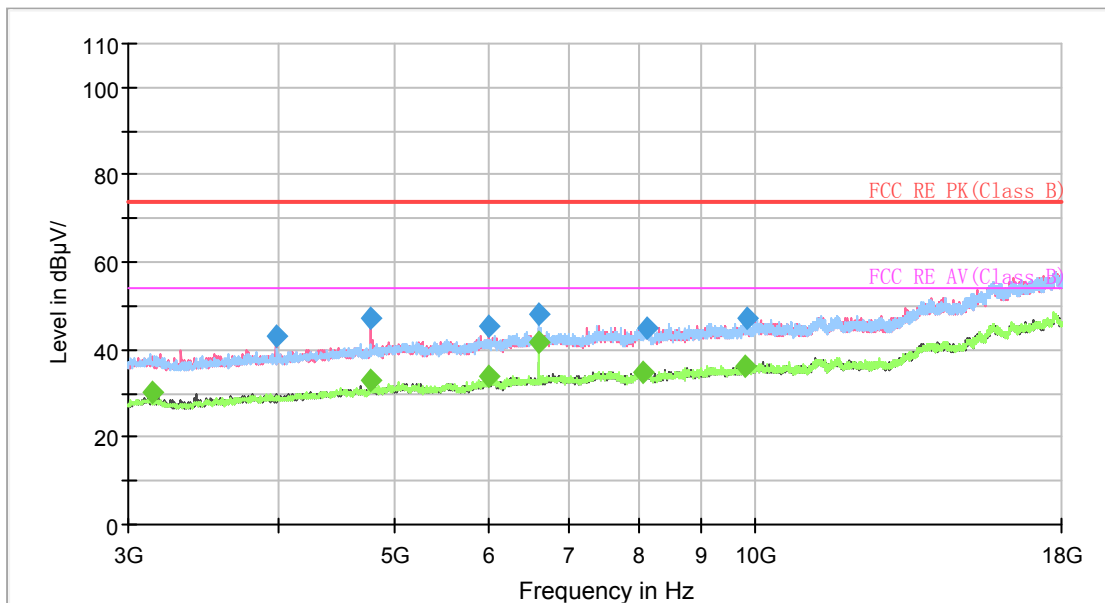
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1194.750000	44.36	---	74.00	29.64	200.0	V	152.0	0.1
1196.000000	---	33.34	54.00	20.66	200.0	V	152.0	0.1
1395.750000	44.33	---	74.00	29.67	200.0	V	1.0	1.0
1418.250000	---	33.76	54.00	20.24	100.0	H	9.0	1.1
1688.000000	44.48	---	74.00	29.52	100.0	H	32.0	2.3
1703.750000	---	35.07	54.00	18.93	200.0	V	47.0	2.6
1859.500000	43.93	---	74.00	30.07	200.0	V	131.0	3.2
1866.000000	---	34.94	54.00	19.06	100.0	H	9.0	3.2
2047.750000	---	36.06	54.00	17.94	200.0	H	335.0	4.0
2050.750000	46.27	---	74.00	27.73	100.0	V	190.0	4.0
2986.500000	48.87	---	74.00	25.13	100.0	H	240.0	8.0
2998.750000	---	38.83	54.00	15.17	100.0	V	352.0	8.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BT UHD2M 8DPSK -2478MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

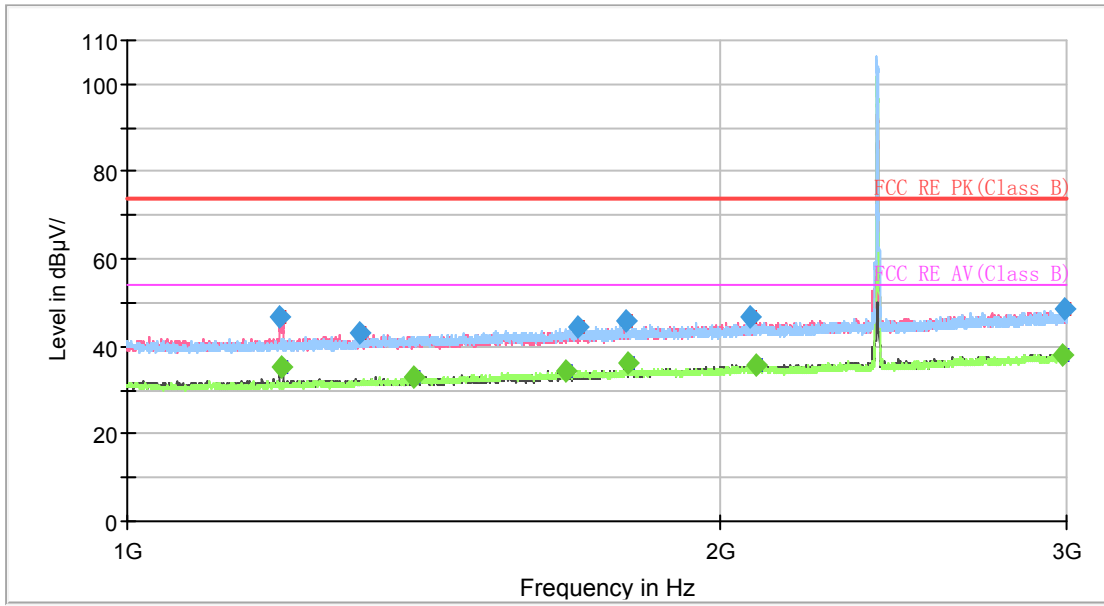


Radiates Emission from 3GHz to 18GHz

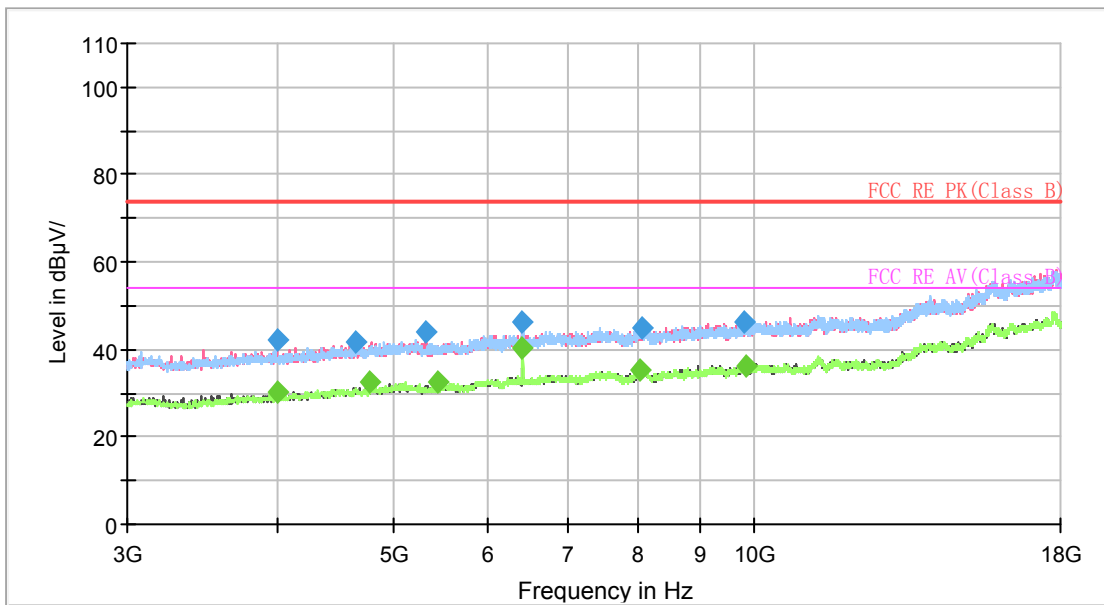
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1197.000000	---	33.68	54.00	20.32	100.0	V	350.0	0.1
1197.000000	45.00	---	74.00	29.00	100.0	V	350.0	0.1
1409.500000	42.89	---	74.00	31.11	200.0	V	31.0	1.1
1437.250000	---	33.78	54.00	20.22	200.0	V	169.0	1.1
1606.000000	44.54	---	74.00	29.46	200.0	H	100.0	1.8
1730.500000	---	34.34	54.00	19.66	200.0	V	200.0	2.5
2042.000000	45.47	---	74.00	28.53	100.0	H	181.0	4.0
2047.500000	---	35.99	54.00	18.01	100.0	H	4.0	4.0
2393.000000	53.82	---	74.00	20.18	200.0	V	267.0	5.2
2394.250000	---	40.94	54.00	13.06	200.0	V	267.0	5.2
2984.000000	48.52	---	74.00	25.48	100.0	H	90.0	8.0
2999.250000	---	38.35	54.00	15.66	200.0	V	218.0	8.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BT UHD 4M $\pi/4$ -DQPSK -2404MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

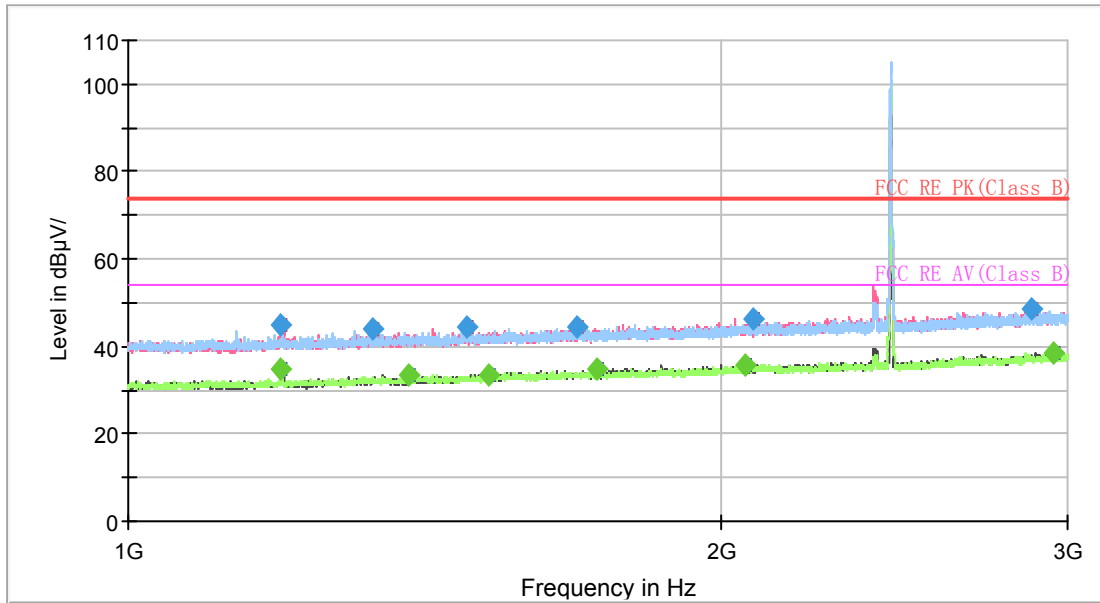


Radiates Emission from 3GHz to 18GHz

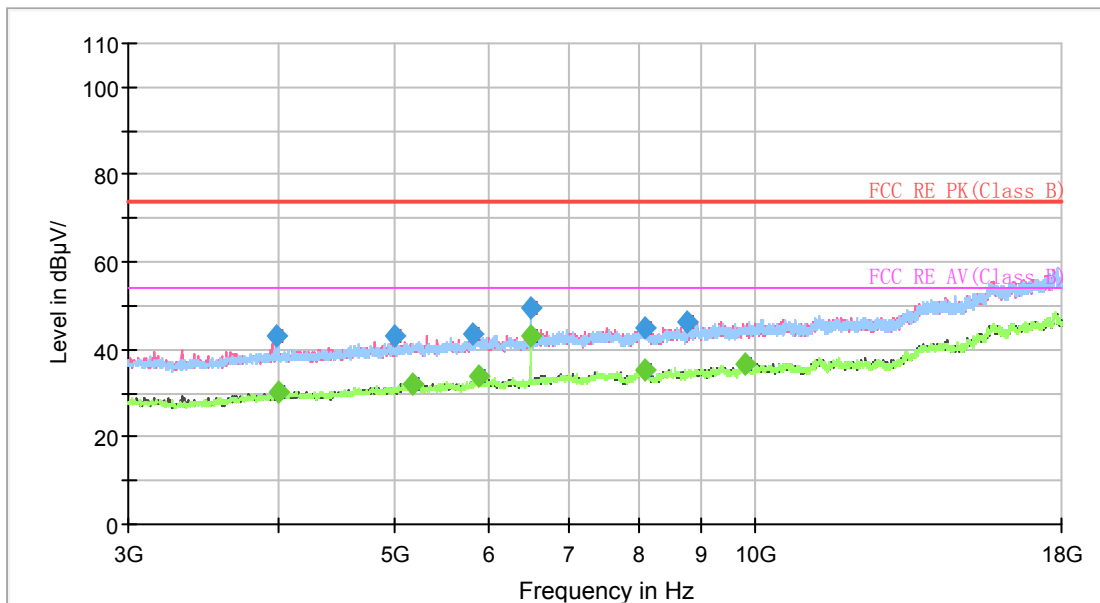
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1195.750000	46.78	---	74.00	27.22	100.0	V	1.0	0.1
1198.750000	---	35.09	54.00	18.91	100.0	V	1.0	0.1
1312.000000	43.25	---	74.00	30.75	200.0	V	122.0	0.6
1399.500000	---	33.11	54.00	20.89	100.0	H	0.0	1.0
1669.250000	---	34.53	54.00	19.47	100.0	H	256.0	2.2
1693.250000	44.53	---	74.00	29.47	200.0	H	198.0	2.4
1792.750000	45.77	---	74.00	28.23	200.0	V	232.0	2.9
1795.500000	---	36.38	54.00	17.62	200.0	V	104.0	2.9
2071.750000	46.56	---	74.00	27.44	100.0	V	102.0	4.0
2085.000000	---	35.78	54.00	18.22	100.0	V	221.0	4.1
2988.500000	---	38.24	54.00	15.76	200.0	V	260.0	8.0
2992.750000	48.49	---	74.00	25.51	200.0	V	154.0	8.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BT UHD 4M $\pi/4$ -DQPSK -2440MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



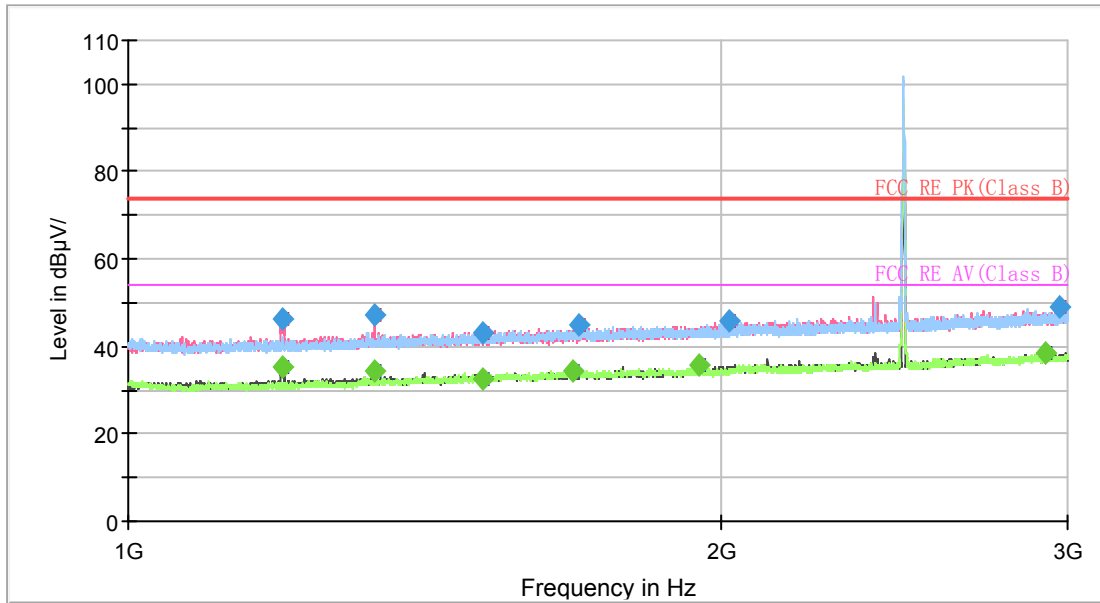
Radiates Emission from 3GHz to 18GHz



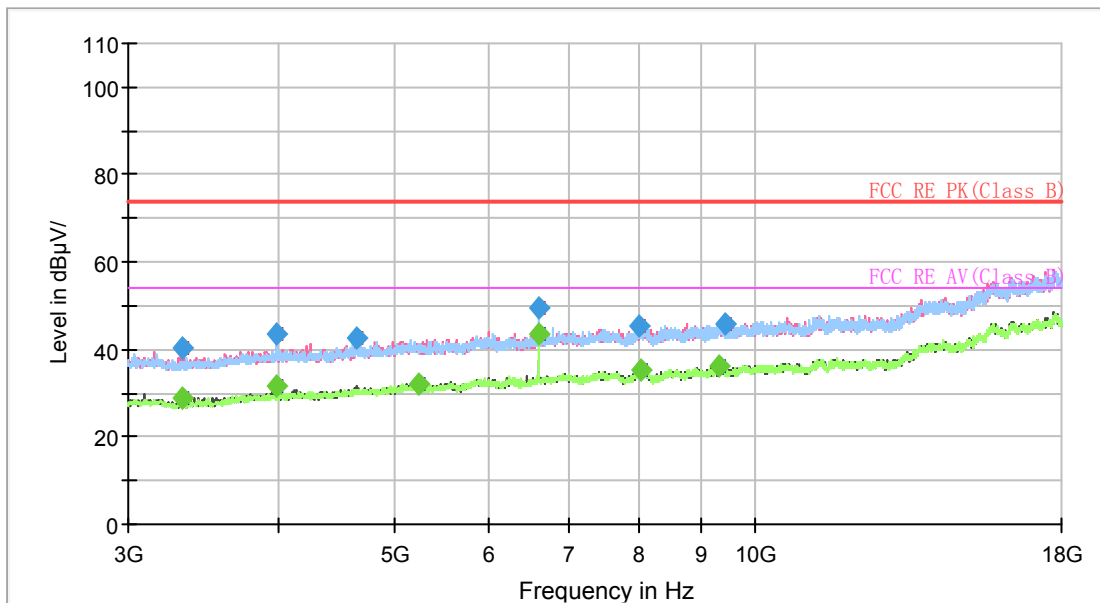
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1195.250000	---	34.63	54.00	19.37	200.0	V	240.0	0.1
1196.000000	44.86	---	74.00	29.14	200.0	V	240.0	0.1
1331.250000	43.86	---	74.00	30.14	200.0	V	112.0	0.7
1389.000000	---	33.57	54.00	20.43	200.0	H	86.0	0.9
1484.250000	44.37	---	74.00	29.63	200.0	H	222.0	1.4
1523.750000	---	33.66	54.00	20.34	200.0	V	156.0	1.4
1691.000000	44.64	---	74.00	29.36	200.0	V	257.0	2.3
1730.750000	---	34.63	54.00	19.37	200.0	V	74.0	2.5
2058.500000	---	35.73	54.00	18.27	100.0	H	286.0	4.0
2076.000000	46.38	---	74.00	27.62	100.0	H	228.0	4.0
2875.750000	48.44	---	74.00	25.56	200.0	H	359.0	7.5
2954.500000	---	38.61	54.00	15.39	200.0	V	36.0	7.8

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BT UHD 4M $\pi/4$ -DQPSK -2476MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

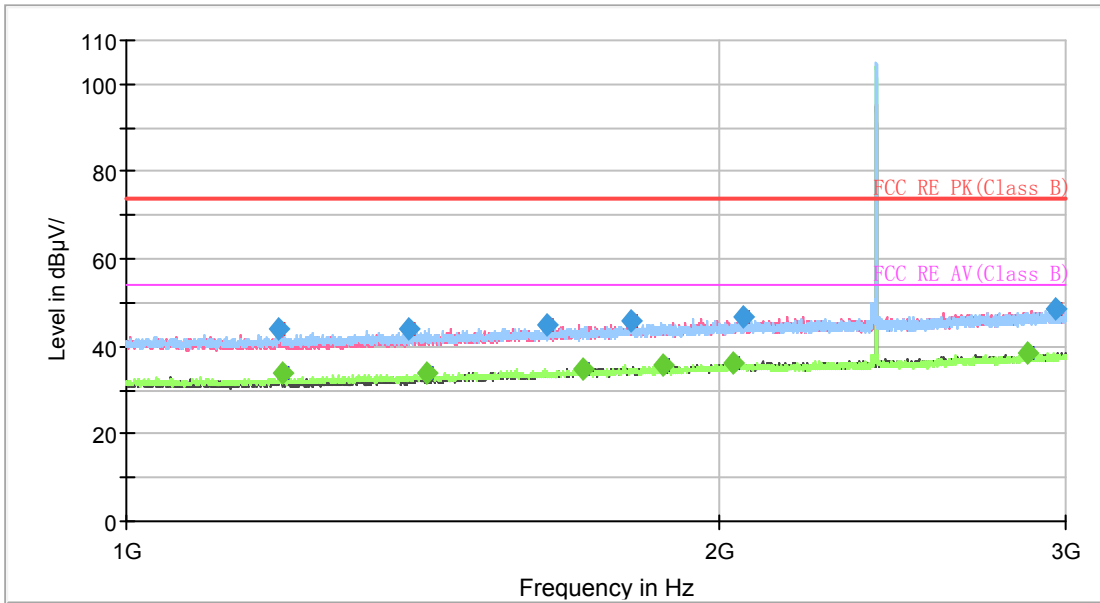


Radiates Emission from 3GHz to 18GHz

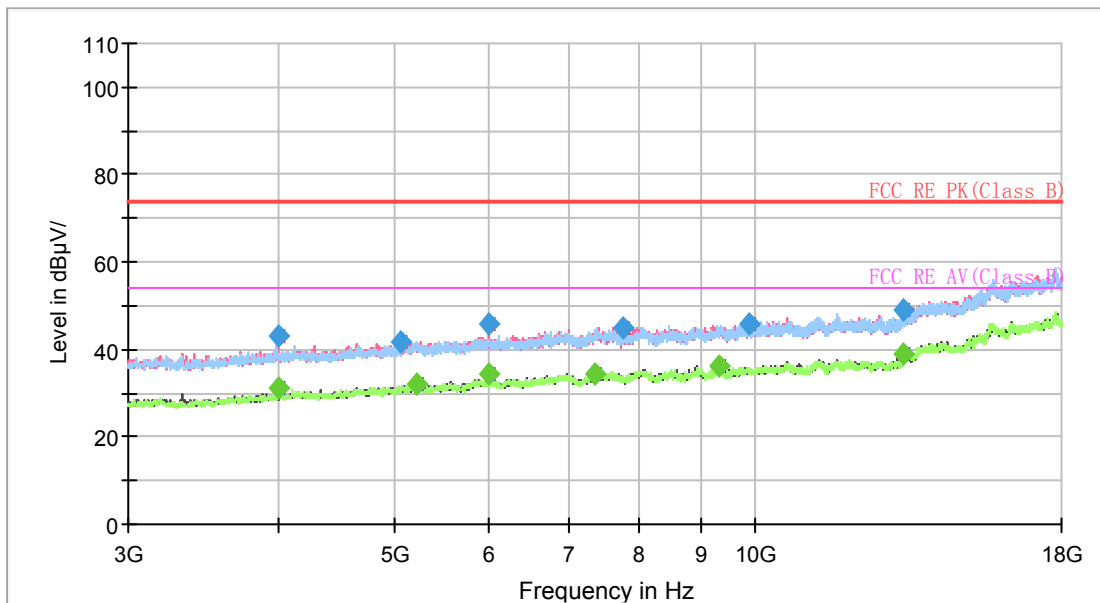
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1196.500000	---	35.34	54.00	18.66	200.0	V	233.0	0.1
1196.500000	46.10	---	74.00	27.90	200.0	V	233.0	0.1
1333.000000	---	34.48	54.00	19.52	200.0	V	121.0	0.7
1333.000000	47.24	---	74.00	26.76	200.0	V	121.0	0.7
1512.250000	43.25	---	74.00	30.75	200.0	V	142.0	1.4
1515.250000	---	32.76	54.00	21.24	200.0	V	0.0	1.4
1681.500000	---	34.29	54.00	19.71	200.0	H	0.0	2.2
1694.250000	44.71	---	74.00	29.29	200.0	H	266.0	2.4
1949.000000	---	35.82	54.00	18.18	200.0	V	12.0	3.7
2017.000000	45.61	---	74.00	28.39	100.0	H	251.0	4.0
2924.000000	---	38.47	54.00	15.53	100.0	V	0.0	7.5
2971.500000	48.84	---	74.00	25.16	100.0	V	139.0	7.9

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BLE 1M GFSK -2404MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



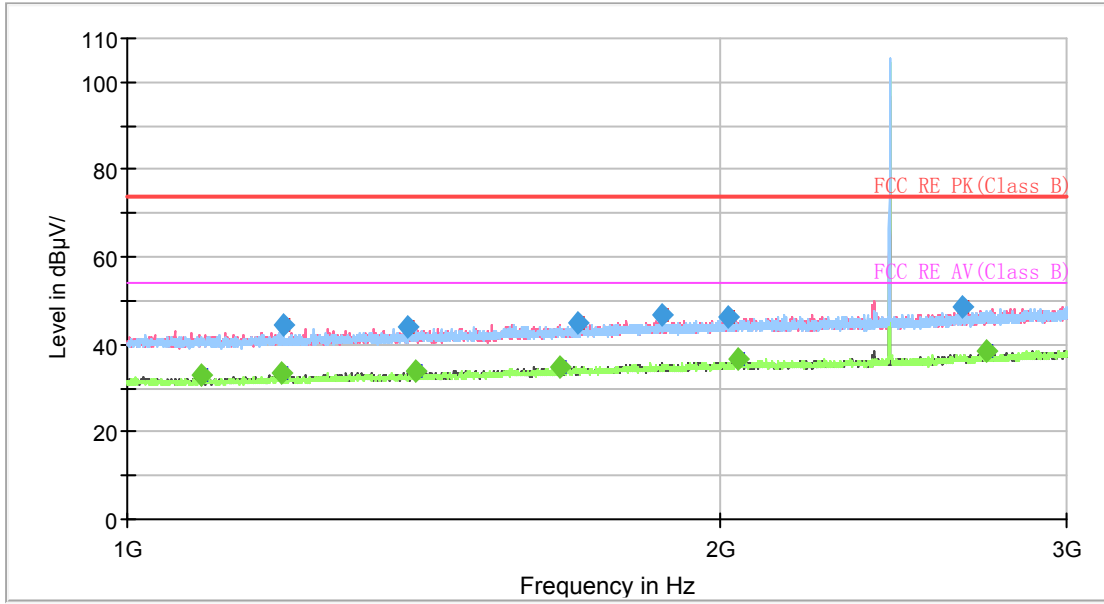
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1195.500000	44.12	---	74.00	29.88	200.0	V	0.0	0.1
1199.250000	---	33.85	54.00	20.15	200.0	V	0.0	0.1
1392.750000	43.94	---	74.00	30.06	200.0	H	354.0	0.9
1419.500000	---	33.87	54.00	20.13	200.0	V	17.0	1.0
1636.250000	44.93	---	74.00	29.07	100.0	V	51.0	2.1
1706.000000	---	34.71	54.00	19.29	100.0	V	327.0	2.6
1804.750000	45.77	---	74.00	28.23	100.0	V	268.0	3.0
1873.250000	---	35.91	54.00	18.09	100.0	V	299.0	3.3
2031.500000	---	36.16	54.00	17.84	100.0	V	359.0	4.0
2055.750000	46.92	---	74.00	27.08	200.0	H	83.0	4.0
2868.500000	---	38.53	54.00	15.47	100.0	V	65.0	7.5
2965.750000	48.46	---	74.00	25.54	100.0	H	64.0	7.9

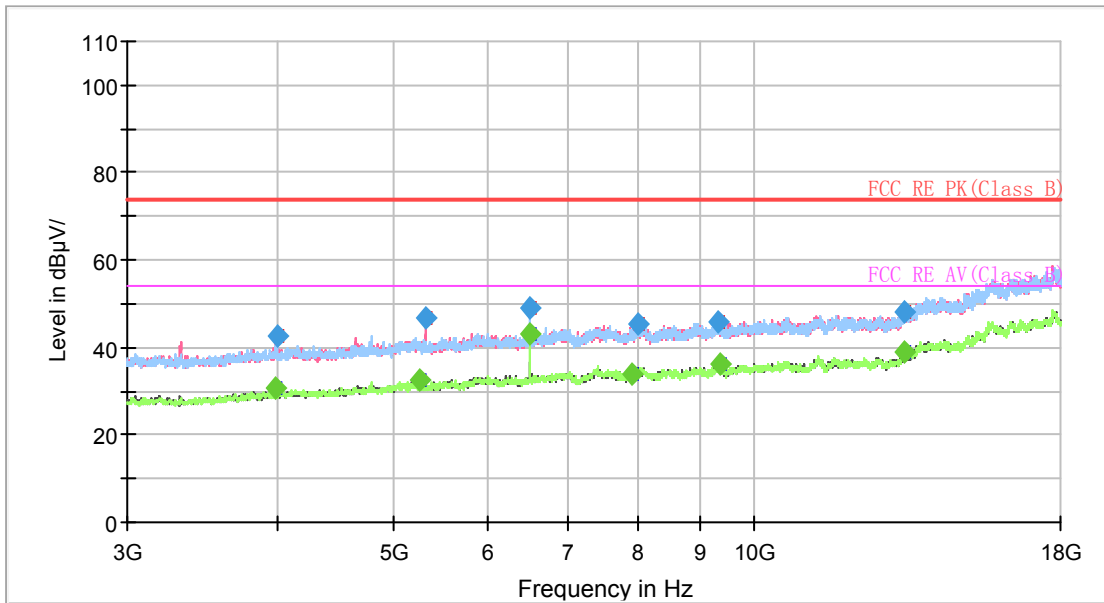
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



BLE 1M GFSK -2440MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



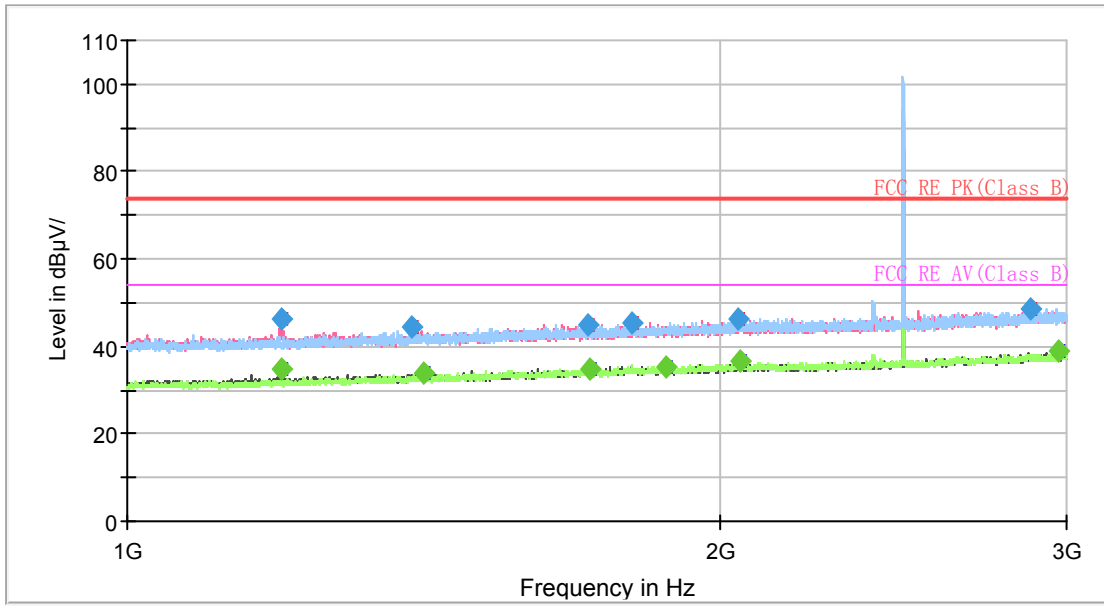
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1090.000000	---	32.77	54.00	21.23	200.0	V	61.0	-0.7
1196.750000	---	33.38	54.00	20.62	200.0	V	36.0	0.1
1200.000000	44.26	---	74.00	29.74	100.0	H	326.0	0.1
1389.500000	43.93	---	74.00	30.07	200.0	V	0.0	0.9
1402.500000	---	34.05	54.00	19.95	100.0	H	74.0	1.0
1657.250000	---	35.00	54.00	19.00	200.0	V	0.0	2.2
1693.500000	44.76	---	74.00	29.24	200.0	V	256.0	2.4
1867.750000	46.58	---	74.00	27.42	200.0	V	101.0	3.2
2019.250000	46.35	---	74.00	27.65	200.0	H	200.0	4.0
2042.750000	---	36.46	54.00	17.54	100.0	H	85.0	4.0
2654.500000	48.59	---	74.00	25.41	100.0	V	359.0	6.3
2734.000000	---	38.48	54.00	15.52	200.0	H	20.0	6.8

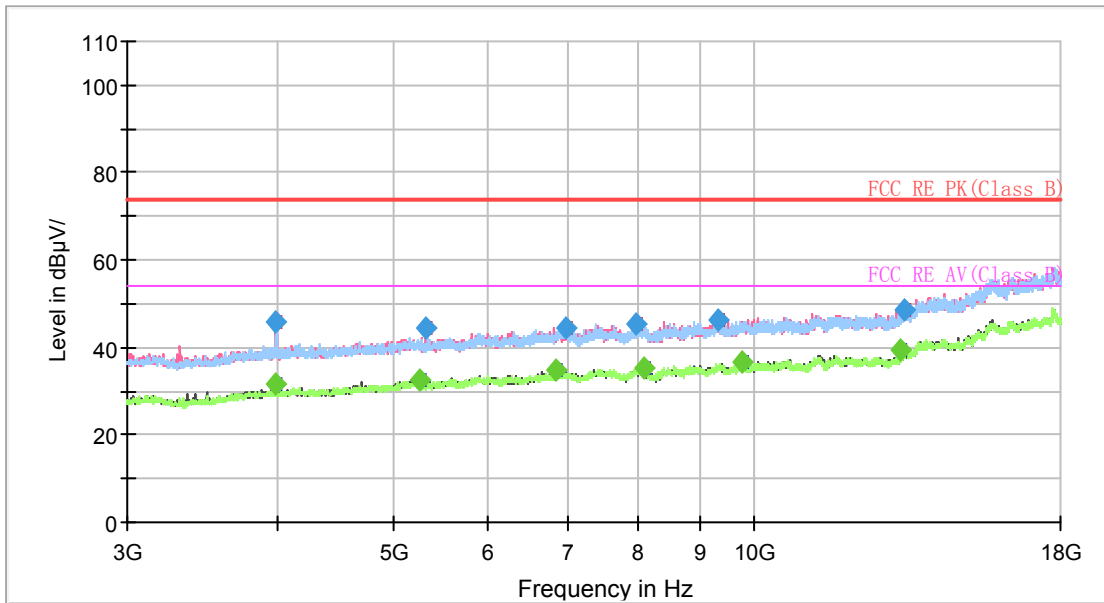
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



BLE 1M GFSK -2478MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



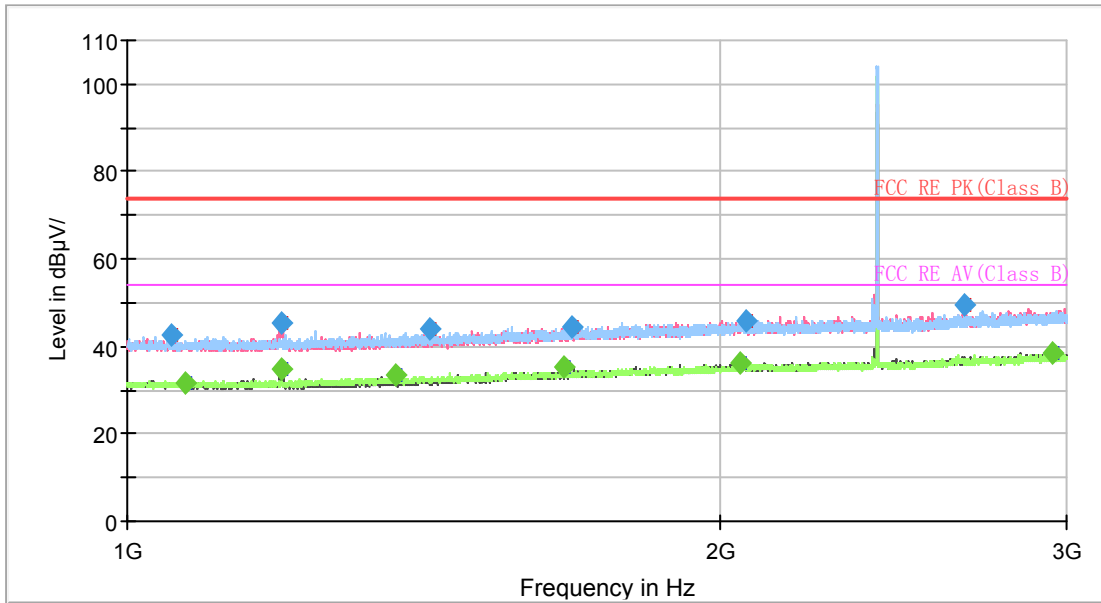
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1196.750000	---	34.70	54.00	19.30	200.0	V	10.0	0.1
1196.750000	46.34	---	74.00	27.66	200.0	V	10.0	0.1
1396.000000	44.43	---	74.00	29.57	200.0	H	169.0	1.0
1415.250000	---	33.82	54.00	20.18	100.0	H	312.0	1.1
1712.250000	45.05	---	74.00	28.95	200.0	V	138.0	2.5
1718.500000	---	34.93	54.00	19.07	200.0	H	335.0	2.5
1806.500000	45.29	---	74.00	28.71	200.0	H	123.0	3.0
1878.000000	---	35.30	54.00	18.70	200.0	V	134.0	3.4
2040.750000	46.45	---	74.00	27.55	100.0	H	93.0	4.0
2045.750000	---	36.47	54.00	17.53	200.0	H	314.0	4.0
2876.500000	48.58	---	74.00	25.42	100.0	V	296.0	7.5
2970.250000	---	38.82	54.00	15.18	200.0	H	274.0	7.9

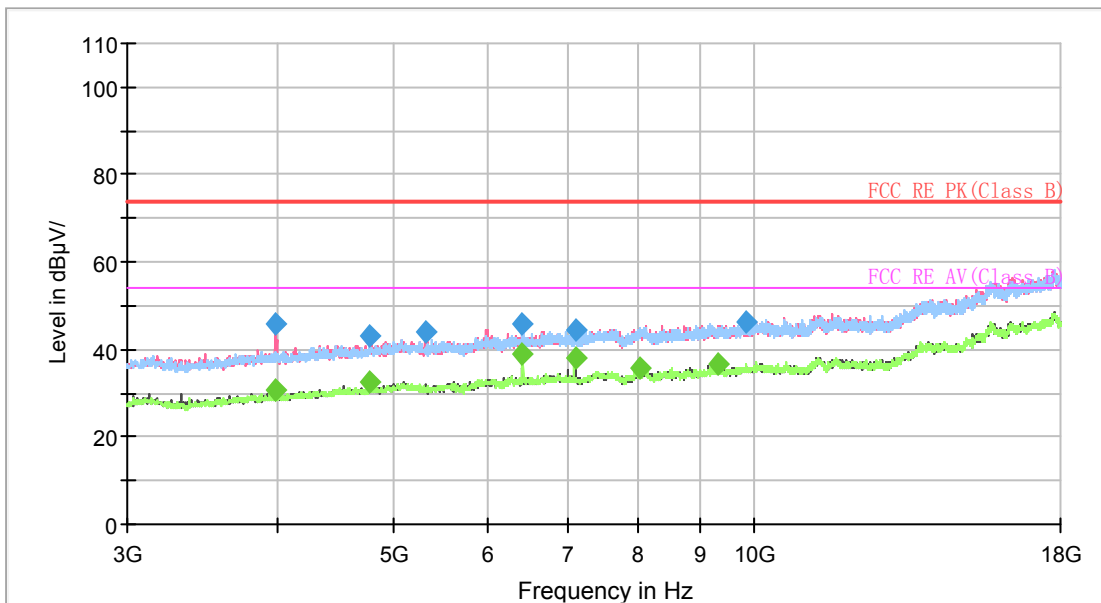
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



BLE 2M GFSK -2404MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

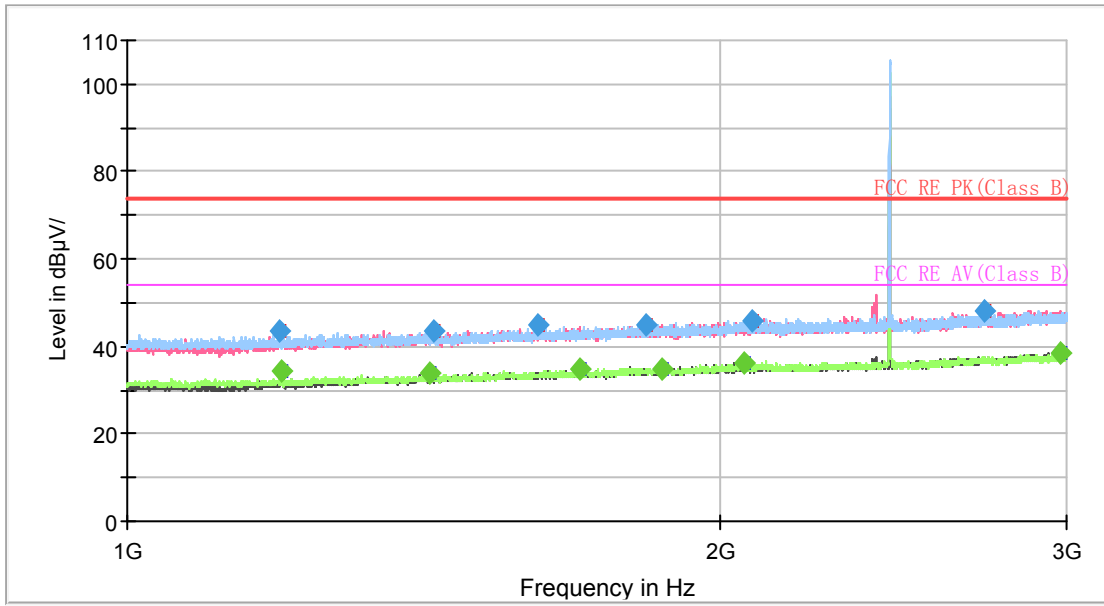


Radiates Emission from 3GHz to 18GHz

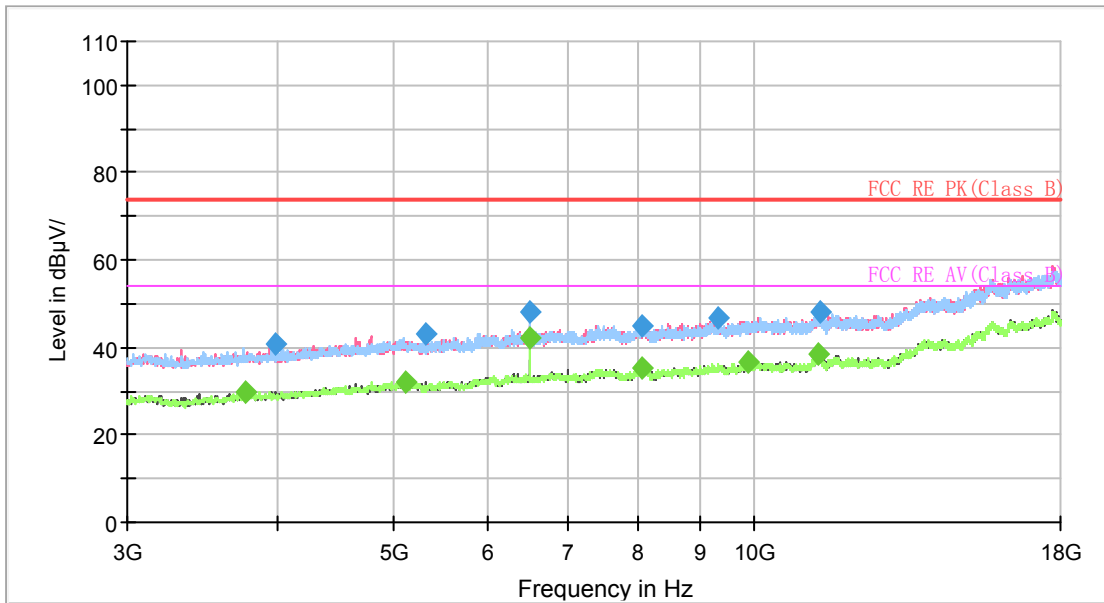
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1054.000000	42.79	---	74.00	31.21	200.0	H	244.0	-0.9
1070.250000	---	31.81	54.00	22.19	100.0	V	167.0	-1.0
1197.500000	---	34.70	54.00	19.30	100.0	V	8.0	0.1
1197.500000	45.41	---	74.00	28.59	100.0	V	8.0	0.1
1368.500000	---	33.34	54.00	20.66	100.0	H	143.0	0.8
1422.750000	43.95	---	74.00	30.05	100.0	H	0.0	1.0
1665.500000	---	35.34	54.00	18.66	200.0	V	156.0	2.2
1680.500000	44.56	---	74.00	29.44	200.0	H	70.0	2.2
2047.250000	---	36.14	54.00	17.86	100.0	H	0.0	4.0
2064.000000	45.91	---	74.00	28.09	200.0	V	26.0	4.0
2661.750000	49.34	---	74.00	24.66	100.0	V	301.0	6.2
2948.000000	---	38.41	54.00	15.59	100.0	H	304.0	7.8

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

BLE 2M GFSK -2440MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



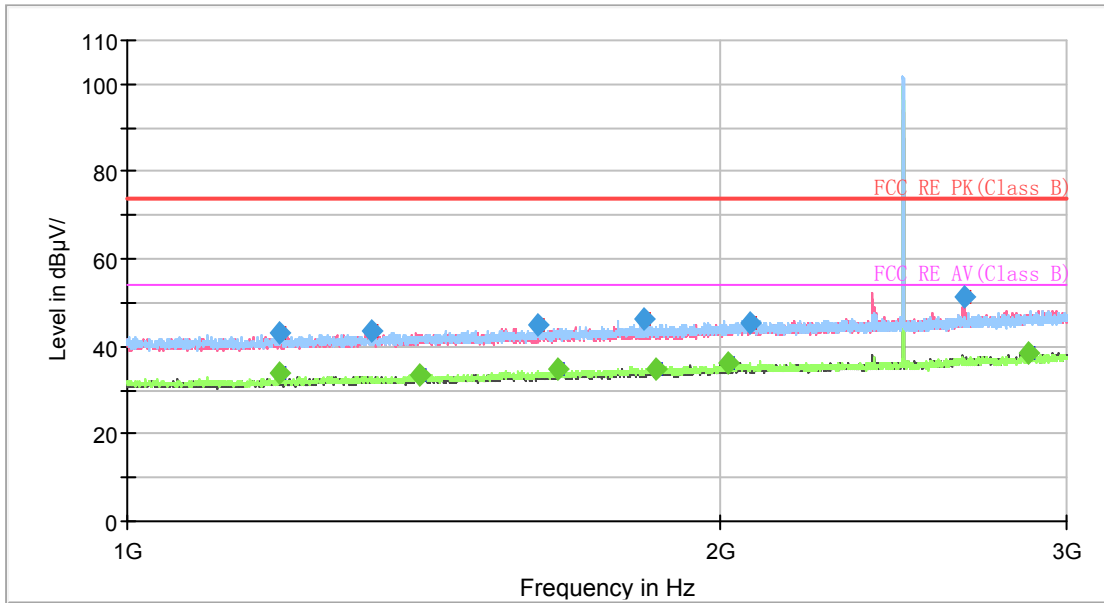
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1196.250000	43.74	---	74.00	30.26	200.0	V	191.0	0.1
1198.000000	---	34.16	54.00	19.84	200.0	V	191.0	0.1
1423.500000	---	33.76	54.00	20.24	100.0	H	5.0	1.0
1431.000000	43.77	---	74.00	30.23	200.0	V	107.0	1.0
1615.750000	45.00	---	74.00	29.00	100.0	V	207.0	1.9
1698.500000	---	34.85	54.00	19.15	200.0	V	262.0	2.5
1833.750000	44.81	---	74.00	29.19	100.0	V	270.0	2.9
1869.000000	---	35.02	54.00	18.98	100.0	H	82.0	3.2
2058.000000	---	36.19	54.00	17.81	100.0	H	233.0	4.0
2077.500000	45.90	---	74.00	28.10	100.0	V	253.0	4.0
2726.250000	48.31	---	74.00	25.69	100.0	H	202.0	6.8
2978.000000	---	38.64	54.00	15.36	200.0	H	69.0	7.9

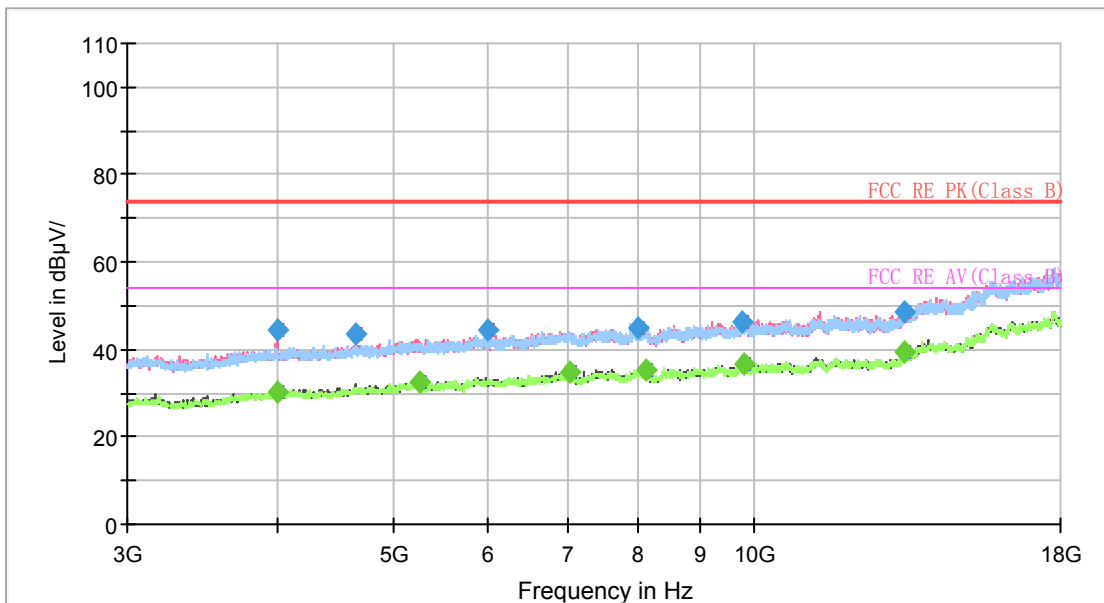
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



BLE 2M GFSK -2478MHz



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

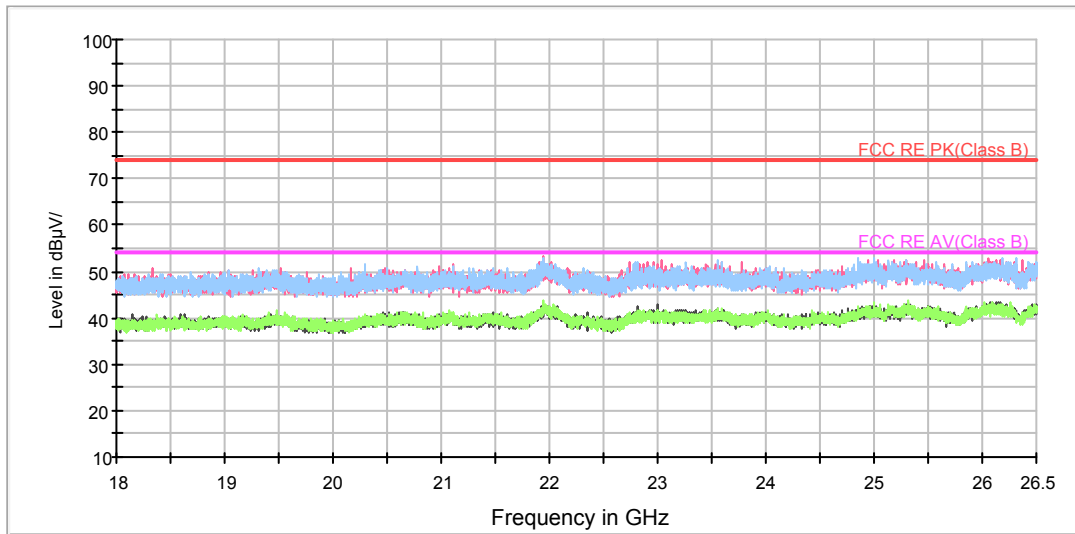
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Correct Factor (dB)
1195.500000	43.16	---	74.00	30.84	200.0	H	308.0	0.1
1196.000000	---	33.73	54.00	20.27	100.0	V	26.0	0.1
1331.750000	43.63	---	74.00	30.37	200.0	V	249.0	0.7
1406.250000	---	33.51	54.00	20.49	200.0	H	172.0	1.0
1616.250000	44.72	---	74.00	29.28	200.0	H	193.0	1.9
1654.750000	---	34.79	54.00	19.21	100.0	H	308.0	2.1
1828.000000	46.15	---	74.00	27.85	200.0	V	235.0	2.8
1854.000000	---	34.87	54.00	19.13	200.0	V	15.0	3.1
2021.250000	---	36.30	54.00	17.70	100.0	H	269.0	4.0
2071.250000	45.53	---	74.00	28.47	100.0	H	45.0	4.0
2664.750000	51.51	---	74.00	22.49	100.0	V	216.0	6.2
2872.500000	---	38.59	54.00	15.41	100.0	V	16.0	7.5

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



During the test, the Radiates Emission from 18GHz to 26.5GHz was performed in all modes with all channels, BT UHD 2M 8DPSK-Channel 0 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

RE 18-26.5GHz PK+AV



Radiates Emission from 18GHz to 26.5GHz

5.9 Conducted Emission

Ambient condition

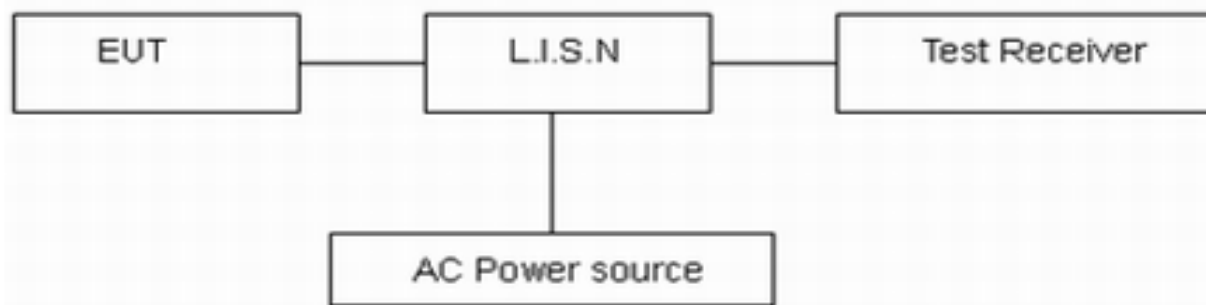
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10-2013. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

The test is in transmitting mode.

Test Setup



Note: AC Power source is used to 120V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

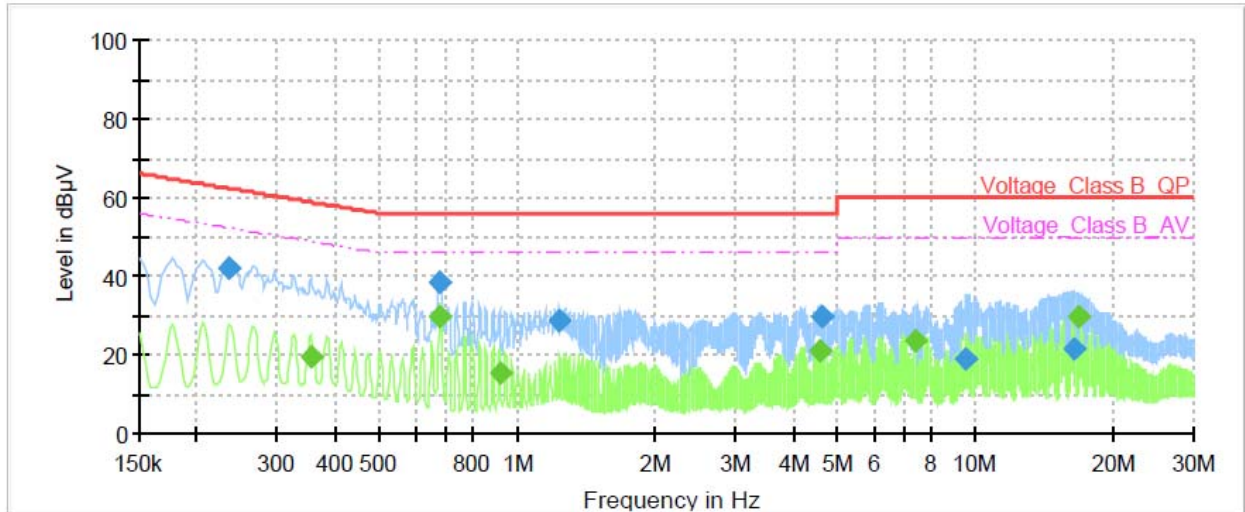
*: Decreases with the logarithm of the frequency.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=2.69$ dB.

Test Results:

Following plots, Blue trace uses the peak detection, Green trace uses the average detection. During the test, the Conducted Emission was performed in all modes with all channels, **BT UHD High Power Mode 2M 8DPSK-2404MHz**, are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

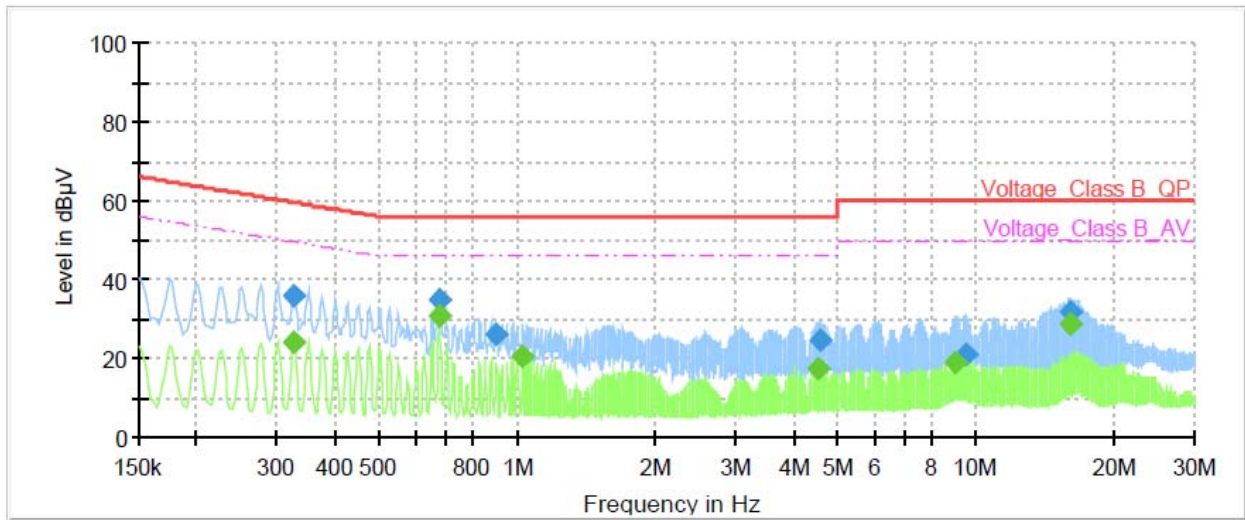


Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.24	41.84	---	62.25	20.42	1000.0	9.000	L1	ON	19
0.35	---	19.23	48.85	29.62	1000.0	9.000	L1	ON	19
0.68	---	29.54	46.00	16.46	1000.0	9.000	L1	ON	19
0.68	38.37	---	56.00	17.63	1000.0	9.000	L1	ON	19
0.92	---	15.34	46.00	30.66	1000.0	9.000	L1	ON	19
1.24	28.73	---	56.00	27.27	1000.0	9.000	L1	ON	19
4.61	---	21.28	46.00	24.72	1000.0	9.000	L1	ON	19
4.64	29.81	---	56.00	26.19	1000.0	9.000	L1	ON	19
7.44	---	23.41	50.00	26.59	1000.0	9.000	L1	ON	19
9.57	19.17	---	60.00	40.83	1000.0	9.000	L1	ON	19
16.45	21.73	---	60.00	38.27	1000.0	9.000	L1	ON	20
16.83	---	29.98	50.00	20.02	1000.0	9.000	L1	ON	20

Remark: Correct factor=cable loss + LISN factor

L line

Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.33	---	24.35	49.57	25.22	1000.0	9.000	N	ON	19
0.33	35.98	---	59.57	23.59	1000.0	9.000	N	ON	19
0.68	---	30.88	46.00	15.12	1000.0	9.000	N	ON	19
0.68	34.94	---	56.00	21.06	1000.0	9.000	N	ON	19
0.90	26.21	---	56.00	29.79	1000.0	9.000	N	ON	19
1.03	---	20.51	46.00	25.49	1000.0	9.000	N	ON	19
4.54	---	17.42	46.00	28.58	1000.0	9.000	N	ON	19
4.56	24.76	---	56.00	31.24	1000.0	9.000	N	ON	19
9.05	---	19.11	50.00	30.89	1000.0	9.000	N	ON	19
9.53	20.85	---	60.00	39.15	1000.0	9.000	N	ON	19
16.04	31.89	---	60.00	28.11	1000.0	9.000	N	ON	19
16.17	---	28.94	50.00	21.06	1000.0	9.000	N	ON	19

Remark: Correct factor=cable loss + LISN factor

N line

Conducted Emission from 150 KHz to 30 MHz

6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Signal Analyzer	R&S	FSV30	100815	2019-12-16	2020-12-15
EMI Test Receiver	R&S	ESCI	100948	2019-05-19	2020-05-18
Loop Antenna	Schwarzbeck	FMZB1519	1519-047	2019-09-26	2021-09-25
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-201	2019-11-18	2021-11-17
Double Ridged Waveguide Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Standard Gain Horn	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
EMI Test Receiver	R&S	ESR	101667	2019-05-19	2020-05-18
LISN	R&S	ENV216	101171	2019-12-16	2022-12-15
Spectrum Analyzer	Agilent	N9010A	MY47191109	2019-05-19	2020-05-18
RF Cable	Agilent	SMA 15cm	0001	2019-06-14	2020-06-13
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Software	R&S	EMC32	9.26.0	/	/

*****END OF REPORT *****