

--- Horizontal Polarization (PK)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2480.000	104.3	-10.0	94.3	74.0	-20.3
2	2532.012	47.1	-10.6	36.5	74.0	37.5
3	2483.500	44.5	-10.1	34.4	74.0	39.6

--- Horizontal Polarization (AV)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2480.000	86.4	-10.0	76.4	54.0	-22.4
2	2532.012	29.7	-10.6	19.1	54.0	34.9
3	2483.500	28.4	-10.1	18.3	54.0	35.7

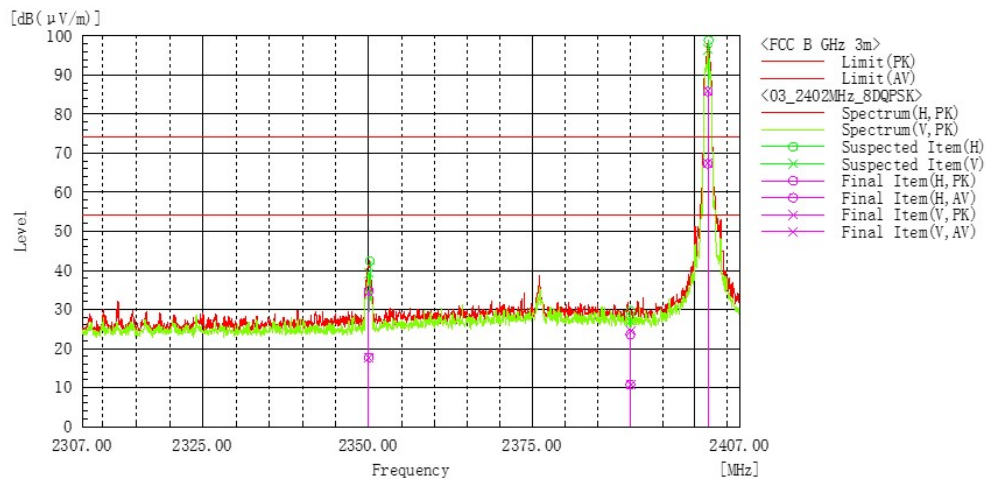
--- Vertical Polarization (PK)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2480.000	99.2	-10.0	89.2	74.0	-15.2
2	2483.500	41.3	-10.1	31.2	74.0	42.8
3	2532.172	43.0	-10.6	32.4	74.0	41.6

--- Vertical Polarization (AV)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2480.000	81.3	-10.0	71.3	54.0	-17.3
2	2483.500	25.9	-10.1	15.8	54.0	38.2
3	2532.172	26.0	-10.6	15.4	54.0	38.6

Carrier Frequency (MHz): 2402

CH Lowest (No.0)

Modulation Type: 8DQPSK



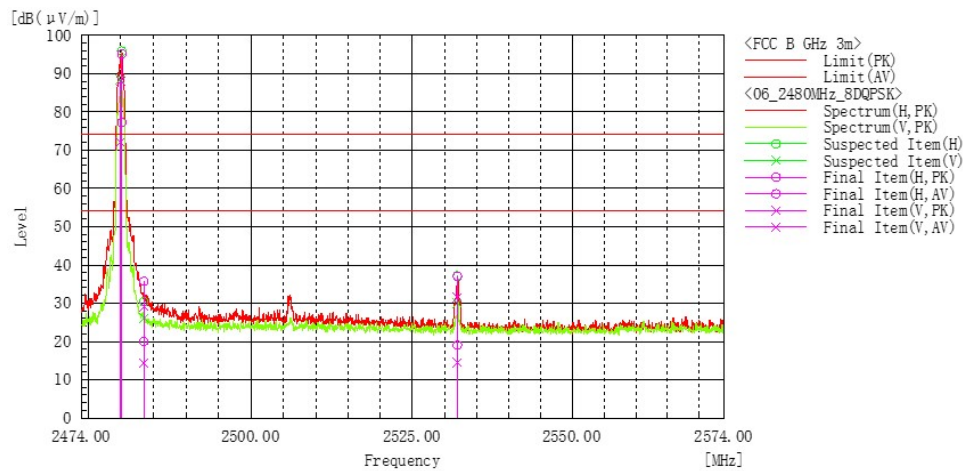
--- Horizontal Polarization (PK)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2350.000	45.2	-10.4	34.8	74.0	39.2
2	2390.000	34.6	-11.0	23.6	74.0	50.4
3	2402.000	96.8	-11.0	85.8	74.0	-11.8

--- Horizontal Polarization (AV)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2350.000	28.1	-10.4	17.7	54.0	36.3
2	2390.000	21.8	-11.0	10.8	54.0	43.2
3	2402.000	78.3	-11.0	67.3	54.0	-13.3

--- Vertical Polarization (PK)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2350.000	44.7	-10.4	34.3	74.0	39.7
2	2390.000	35.5	-11.0	24.5	74.0	49.5
3	2402.000	96.9	-11.0	85.9	74.0	-11.9

--- Vertical Polarization (AV)---						
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2350.000	28.1	-10.4	17.7	54.0	36.3
2	2390.000	21.8	-11.0	10.8	54.0	43.2
3	2402.000	78.4	-11.0	67.4	54.0	-13.4

Carrier Frequency (MHz): 2480
CH Highest (No.78)
Modulation Type: 8DQPSK



Final Result

--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2480.141	105.2	-10.0	95.2	74.0	-21.2
2	2483.500	45.8	-10.1	35.7	74.0	38.3
3	2531.992	47.6	-10.6	37.0	74.0	37.0

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2480.141	87.2	-10.0	77.2	54.0	-23.2
2	2483.500	30.1	-10.1	20.0	54.0	34.0
3	2531.992	29.6	-10.6	19.0	54.0	35.0

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2479.941	98.0	-10.0	88.0	74.0	-14.0
2	2483.500	39.2	-10.1	29.1	74.0	44.9
3	2531.992	42.2	-10.6	31.6	74.0	42.4

--- Vertical Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
1	2479.941	82.1	-10.0	72.1	54.0	-18.1
2	2483.500	24.5	-10.1	14.4	54.0	39.6
3	2531.992	25.0	-10.6	14.4	54.0	39.6

Spurious Radiated Emissions:

Test Engineer	Lu Huansen	Test Date	2019.10.18
Temperature	20.4°C	Relative Humidity	45.2%
Pressure	100.1kPa	Test Sample Selected	No.2

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

Sample calculation: $(20.96\text{dB}\mu\text{V/m}) = (38.46\text{dB}\mu\text{V}) + (-17.5\text{dB/m})$, the corresponding frequency is 30.64MHz.

Spurious Radiated Emissions below 30MHz:

There were no emissions from 9kHz to 30MHz found within 20dB of the limit. Thus, the test result was not reported according to §15.31 (o)

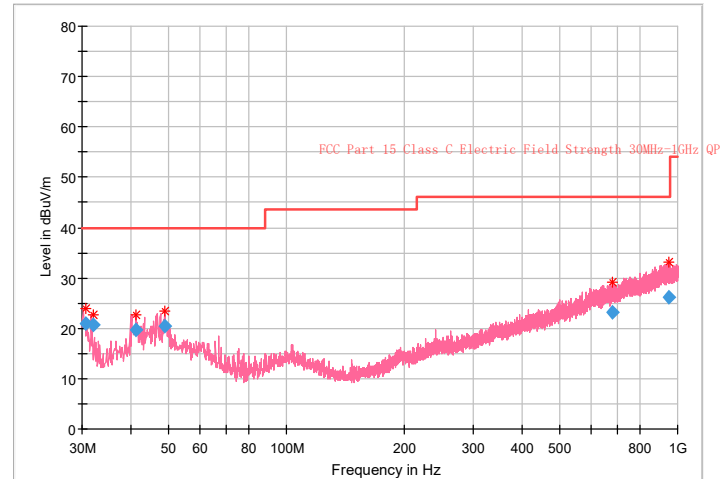
Spurious Radiated Emissions from 30MHz to 1GHz:

Carrier Frequency (MHz): 2402

CH Lowest (No.0)

Modulation Type: GFSK

Full Spectrum



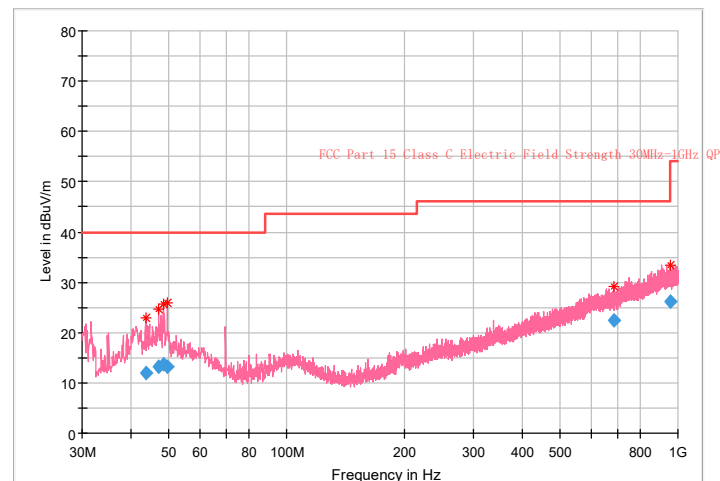
Frequency (MHz)	Reading (dBuV/m)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.640	38.46	20.96	40.00	19.04	120.000	125.0	V	109.0	-17.5
31.969	38.64	20.74	40.00	19.26	120.000	125.0	V	70.0	-17.9
41.195	33.50	19.70	40.00	20.30	120.000	102.0	V	332.0	-13.8
48.721	33.32	20.42	40.00	19.58	120.000	100.0	V	322.0	-12.9
681.771	24.42	23.12	46.00	22.88	120.000	100.0	V	208.0	-1.3
949.776	23.07	26.17	46.00	19.83	120.000	116.0	V	231.0	3.1

Carrier Frequency (MHz): 2402

CH Lowest (No.0)

Modulation Type: 8DPSK

Full Spectrum



Frequency (MHz)	Reading (dBuV/m)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
43.580	25.51	12.01	40.00	27.99	120.000	181.0	V	-21.0	-13.5
47.072	26.22	13.32	40.00	26.68	120.000	125.0	V	-16.0	-12.9
48.333	26.70	13.70	40.00	26.30	120.000	125.0	V	168.0	-13.0
49.497	25.96	13.16	40.00	26.84	120.000	125.0	V	-22.0	-12.8
688.630	23.52	22.32	46.00	23.68	120.000	178.0	V	174.0	-1.2
957.805	23.07	26.27	46.00	19.73	120.000	207.0	V	132.0	3.2

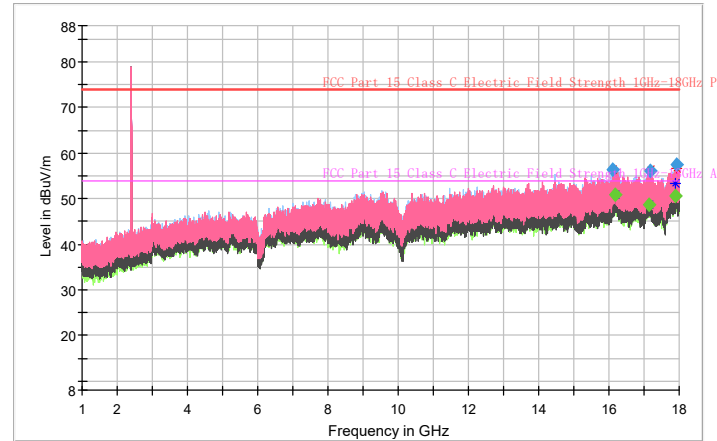
Spurious Radiated Emissions from 1GHz to 18GHz:

Carrier Frequency (MHz): 2402

CH Lowest (No.0)

Modulation Type: GFSK

Full Spectrum



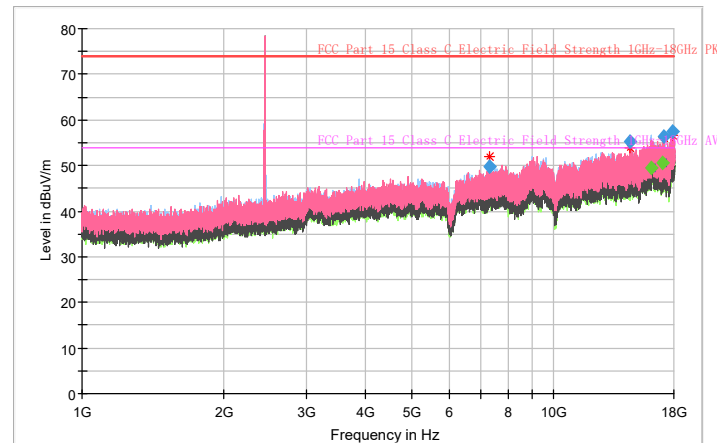
Frequency (MHz)	Average Reading (dBuV/m)	MaxPeak Reading (dBuV/m)	Average (dBuV/m)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
16118.434375	---	45.26	---	56.36	74.00	17.64	1000.000	175.1	V	14.0	11.1
16178.359375	39.11	---	50.91	---	54.00	3.09	1000.000	200.0	H	281.0	11.8
17154.968750	37.46	---	48.66	---	54.00	5.34	1000.000	100.0	H	101.0	11.2
17164.075000	---	45.11	---	56.21	74.00	17.79	1000.000	101.1	H	178.0	11.1
17884.718750	38.58	---	50.48	---	54.00	3.52	1000.000	100.0	H	1.0	11.9
17935.418750	---	45.25	---	57.55	74.00	16.45	1000.000	206.7	V	14.0	12.3

Carrier Frequency (MHz): 2441

CH Middle (No.39)

Modulation Type: GFSK

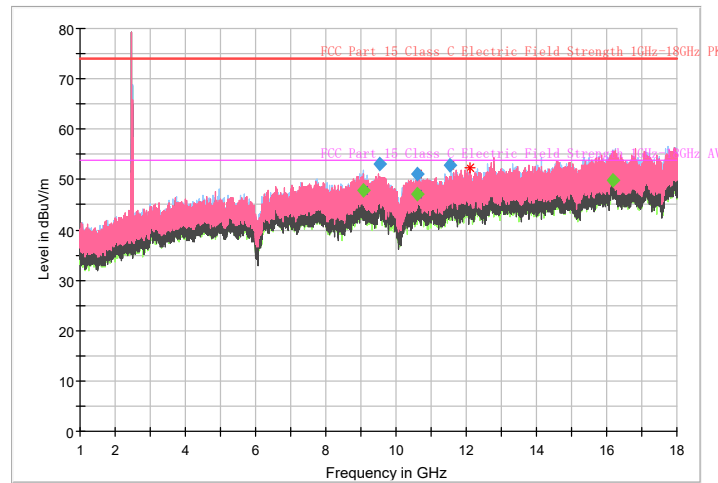
Full Spectrum



Frequency (MHz)	Average Reading (dBuV/m)	MaxPeak Reading (dBuV/m)	Average (dBuV/m)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
7318.200000	---	45.40	---	49.70	74.00	24.30	1000.000	180.5	V	-21.0	4.3
14559.156250	---	47.57	---	55.27	74.00	18.73	1000.000	124.9	V	20.0	7.7
16158.118750	37.72	---	49.62	---	54.00	4.38	1000.000	107.7	H	244.0	11.9
17073.921875	39.37	---	50.67	---	54.00	3.33	1000.000	100.0	H	1.0	11.3
17176.415625	---	45.31	---	56.41	74.00	17.59	1000.000	105.5	H	276.0	11.1
17892.587500	---	45.51	---	57.51	74.00	16.49	1000.000	120.5	V	13.0	12.0

Carrier Frequency (MHz): 2480
CH Highest (No.78)
Modulation Type: GFSK

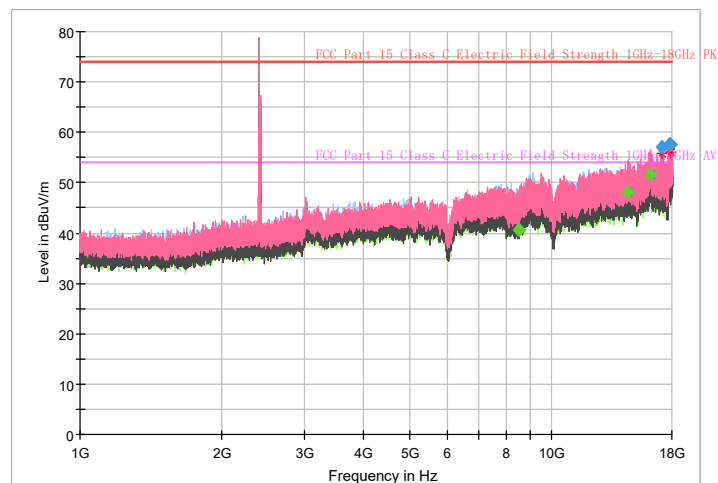
Full Spectrum



Frequency (MHz)	Average Reading (dBuV/m)	MaxPeak Reading (dBuV/m)	Average (dBuV/m)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
9073.759375	40.51	---	47.81	---	54.00	6.19	1000.000	187.9	H	204.0	7.3
9532.803125	---	44.40	---	53.10	74.00	20.90	1000.000	125.0	V	172.0	8.7
10605.281250	39.49	---	46.99	---	54.00	7.01	1000.000	100.0	H	354.0	7.5
10618.937500	---	43.61	---	51.11	74.00	22.89	1000.000	106.0	H	351.0	7.5
11551.096875	---	45.37	---	52.87	74.00	21.13	1000.000	125.0	H	72.0	7.5
16161.843750	37.77	---	49.77	---	54.00	4.23	1000.000	100.0	V	167.0	12

Carrier Frequency (MHz): 2402
CH Lowest (No.0)
Modulation Type: 8DPSK

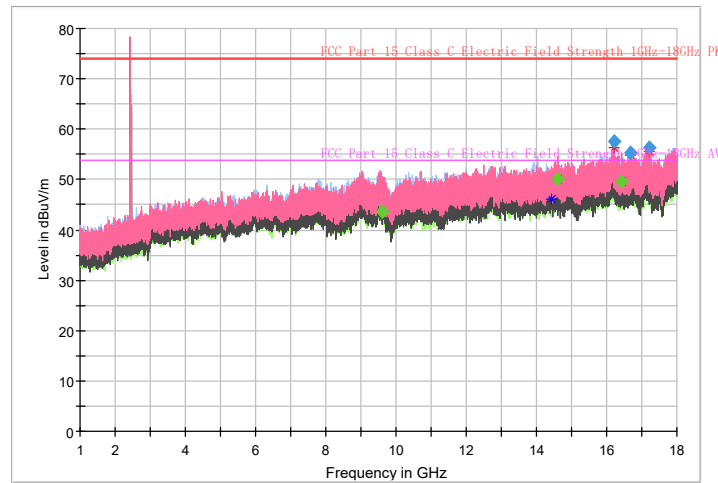
Full Spectrum



Frequency (MHz)	Average Reading (dBuV/m)	MaxPeak Reading (dBuV/m)	Average (dBuV/m)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
8552.5	35.91	---	40.71	---	54.00	13.29	1000	100	H	0	4.8
14548.60938	40.46	---	48.16	---	54.00	5.84	1000	125	V	4	7.7
16219.14375	40.26	---	51.56	---	54.00	2.44	1000	223	V	16	11.3
17099.2	---	45.55	---	56.95	74.00	17.05	1000	195	V	204	11.4
17728.3375	---	45.68	---	57.48	74.00	16.52	1000	184	V	-9	11.8
17924.14688	---	45.49	---	57.69	74.00	16.31	1000	225	H	354	12.2

Carrier Frequency (MHz): 2441
CH Middle (No.39)
Modulation Type: 8DPSK

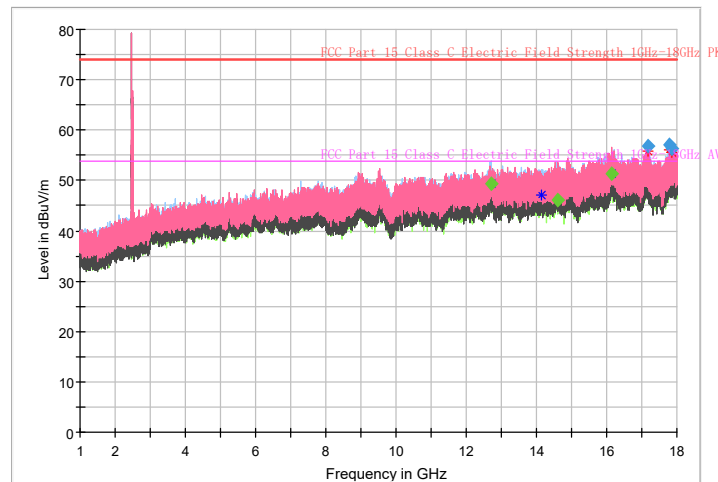
Full Spectrum



Frequency (MHz)	Average Reading (dBuV/m)	MaxPeak Reading (dBuV/m)	Average (dBuV/m)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
9591.6875	35.62	---	43.62	---	54.00	10.38	1000	100	H	127	8
14611.40938	42.36	---	50.06	---	54.00	3.94	1000	222	V	218	7.7
16211.525	---	46.23	---	57.63	74.00	16.37	1000	125	H	-22	11.4
16438.39688	39.66	---	49.56	---	54.00	4.44	1000	185	V	160	9.9
16684.13125	---	44.67	---	55.37	74.00	18.63	1000	125	V	332	10.7
17198.7375	---	45.44	---	56.34	74.00	17.66	1000	189	V	11	10.9

Carrier Frequency (MHz): 2480
CH Highest (No.78)
Modulation Type: 8DPSK

Full Spectrum



Frequency (MHz)	Average Reading (dBuV/m)	MaxPeak Reading (dBuV/m)	Average (dBuV/m)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
12714.08438	41.61	---	49.41	---	54.00	4.59	1000	186	H	54	7.8
14597.23438	38.47	---	46.17	---	54.00	7.83	1000	100	H	356	7.7
16150.36563	39.80	---	51.40	---	54.00	2.60	1000	125	V	196	11.6
17164.475	---	45.66	---	56.76	74.00	17.24	1000	198	V	3	11.1
17771.27188	---	45.91	---	57.11	74.00	16.89	1000	207	H	2	11.2
17866.5375	---	44.63	---	56.33	74.00	17.67	1000	106	H	56	11.7

Spurious Radiated Emissions above 18GHz:

There were no emissions above 18GHz found within 20dB of the limit. Thus, the test result was not reported according to §15.31 (o)

3.8.5. Uncertainty

Frequency	Antenna Polarization	Distance	U_{lab}	k
30MHz-200MHz	Horizontal	3m	4.58	2
	Vertical	3m	4.73	2
200MHz-1GHz	Horizontal	3m	4.90	2
	Vertical	3m	4.93	2
1GHz-6GHz	--	3m	4.89	2
6GHz-18GHz	--	3m	5.23	2
18GHz-26GHz	--	3m	5.32	2

3.9 AC Power Line Conducted Emission

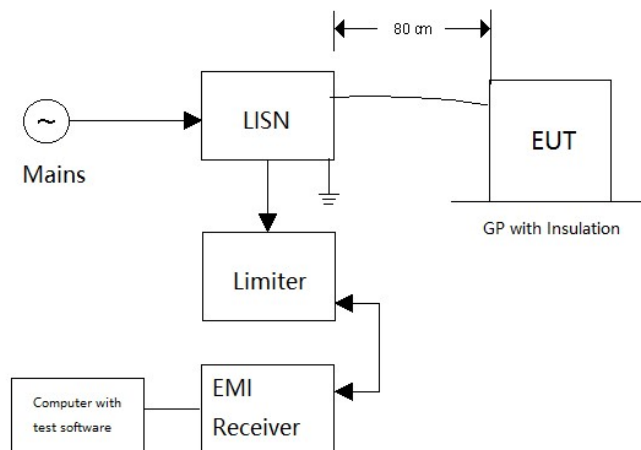
3.9.1. Limit

FCC 47 CFR Part 15 Subpart C - §15.207

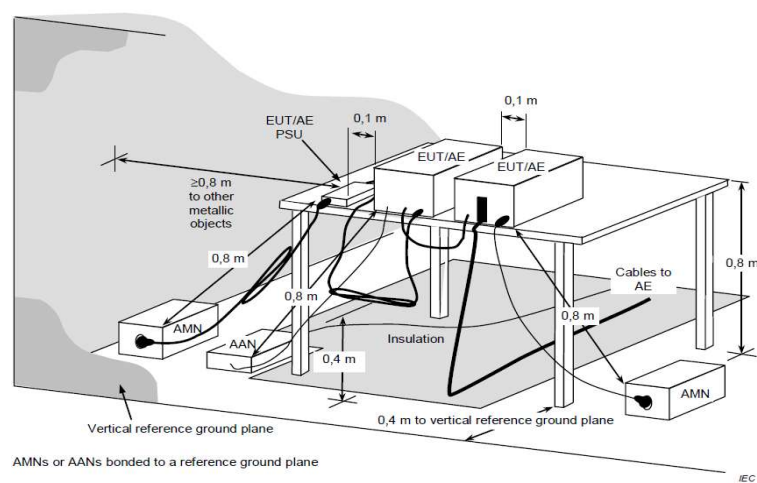
Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5	56	46
5 - 30	60	50

Note: The limits decrease linearly with the logarithm of the frequency in the range of 0.15MHz to 0.5MHz

3.9.2. Test Setup



Test Connection Diagram



Typical Test Layout

3.9.3. Test Procedures

- 1) The measurement procedure follows ANSI C63.10-2013, clause 6.2;
- 2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50ohm/50uH of coupling impedance for the measuring instrument;
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference;
- 4) The frequency range from 150kHz to 30MHz was searched. Emission levels under limit -20dB were not recorded;
- 5) The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz;
- 6) The EUT shall test under the power AC120V/60Hz.

3.9.4. Test Result

N/A

Note:

This test was not performed since the EUT is power off automatically when they are put into the earphone charging case (where the AC power port could only be obtained) as declared by manufacturer.

3.9.5. Uncertainty

$U_{lab}=3.0\text{dB}$, $k=2$ ($U_{Cispr}=3.4\text{dB}$)

Determining compliance with the limits shall be based on the results of the compliance measurements, taking into account the considerations on measurement instrumentation uncertainty.

Because U_{lab} is equal to U_{CISPR} (as specified in CISPR16-4-2), then:

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

4 Test Instruments

Description	Model Name	S/N	Manufacturer	Next Cal Date
Spectrum Analyzer	FSV40	101403	R&S	2020/1/1
Three-way Output Power	E3646A	MY43007301	Agilent	2020/1/1
USB Wideband Power Sensor	U2021XA	MY56120024	Keysight	2019/12/27
Hybrid Antenna	VULB9163	01266	SCHWARZBECK	2020/7/18
Double Ridged Broadband Horn Antenna	BBHA 9120D	1276	SCHWARZBECK	2020/3/26
Pre-Amplifier	SCU40	2046336	R&S	2020/3/26
Pre-Amplifier	SCU18	2046333	R&S	2020/3/26
Pre-Amplifier	PE15A1009	V00140120181115E822	Pasternack Enterprises	2020/3/26
Spectrum Analyzer	FSU26	200449	R&S	2020/1/1
EMI Test Receiver	ESR26	101320	R&S	2019/12/28
Hybrid Antenna	CBL6112B	2873	SCHAFFNER	2020/8/13
Active Loop Antenna	HFH2-Z2	100533	R&S	2020/1/8
Double-Ridged Waveguide Horn Antenna	HF907	100096	R&S	2020/3/26
Broad-Band Horn Antenna	BBHA9170	797	R&S	2020/3/26
16A 2-Line V-Network	ENV216	102328	R&S	2019/12/26
Pulse Limiter	ESH3-Z2	102457	R&S	2019/12/26
10m Semi Anechoic Chamber	SAC10	--	TDK	2022/12/24
Shielding Room for EMS test	SR#1	--	TDK	2024/9/17
Digital Display Temperature and Humidity Recorder	TM320	15082	DICKSON	2020/4/23
Aneroid Barometer	DYM3	868	Shanghai Boji	2020/3/20

--- End of Test Report ---