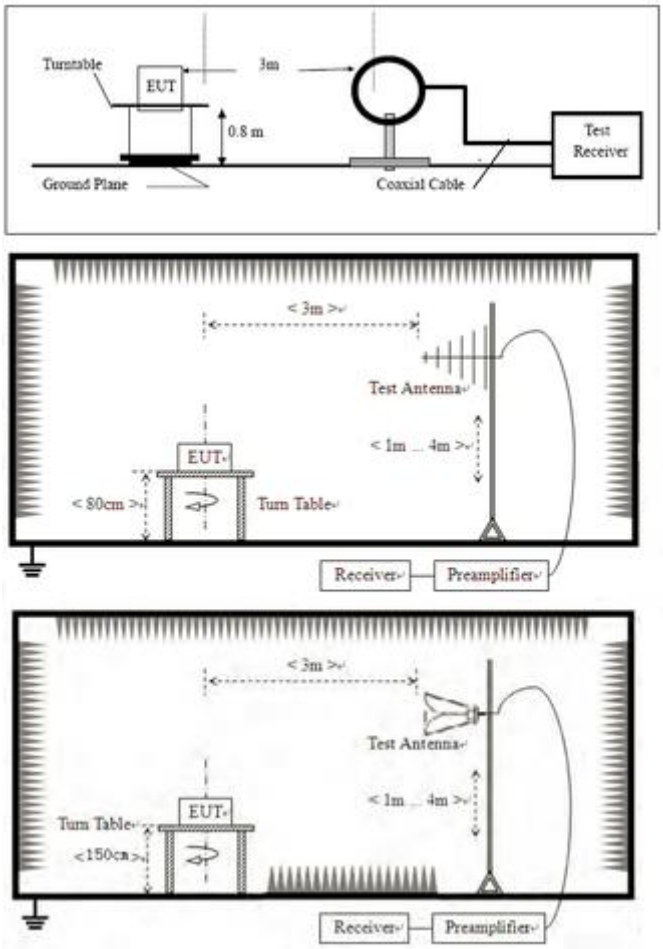
14.2 Block diagram of test setup



14.3 Procedure

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

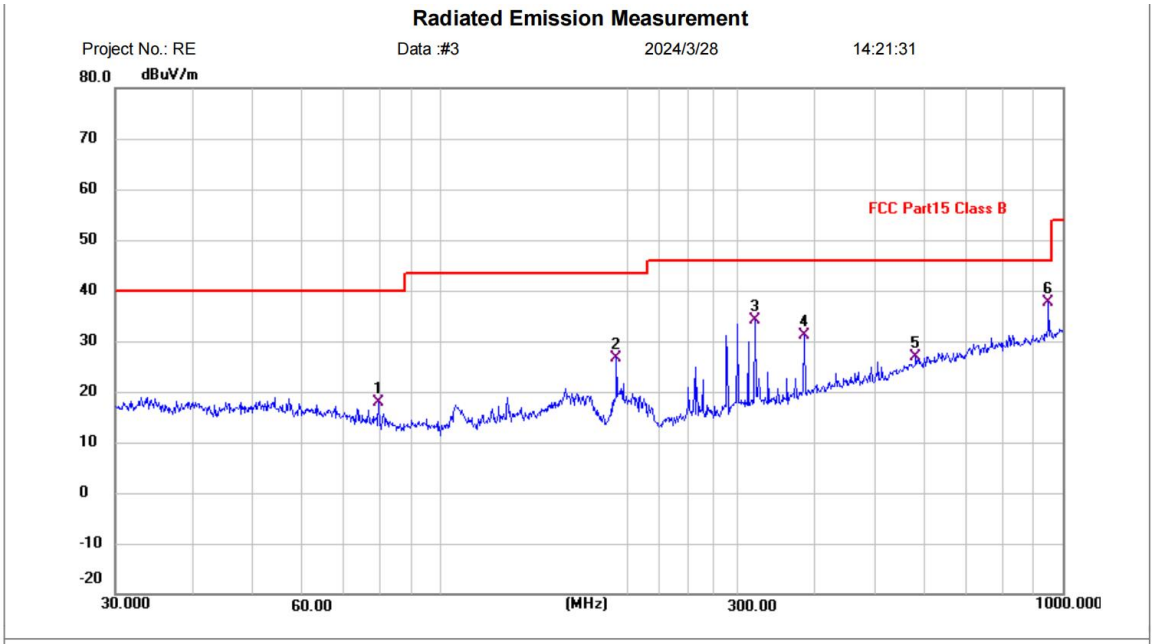
h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.

Remark:
1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.fundamental frequency is blocked by filter, and only spurious emission is shown.
4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

14.4 Test data

Below 1GHz

[Test mode: TX]; [Polarity: Horizontal]



Site
Limit: FCC Part15 Class B
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX Mode
Note:

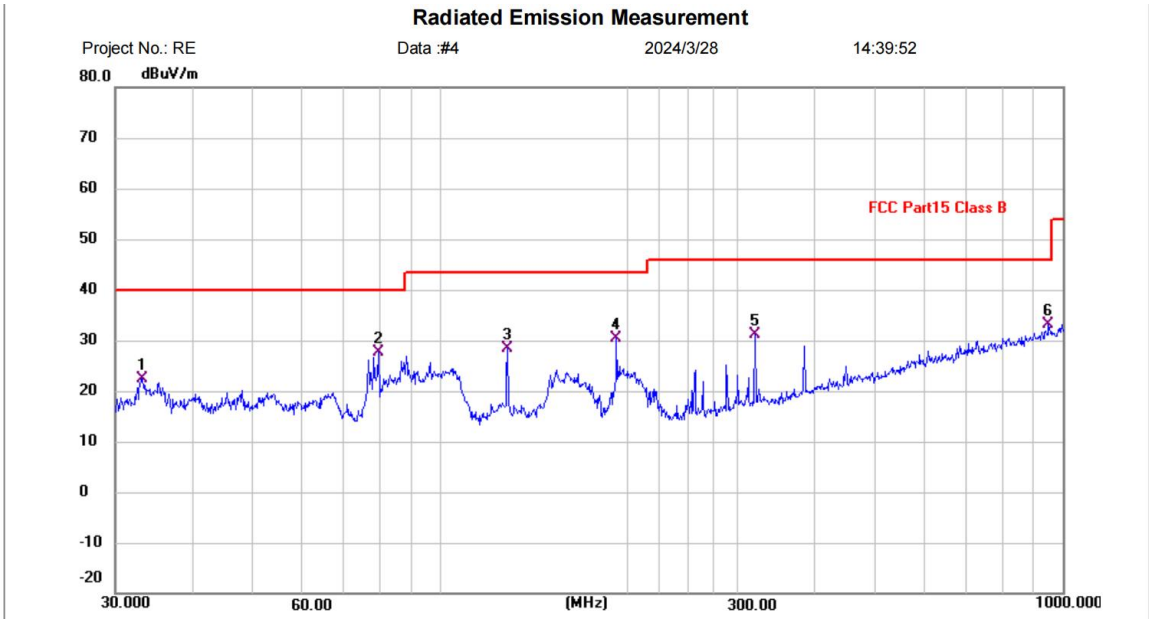
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	79.5209	3.14	14.76	17.90	40.00	-22.10	QP	P	
2	191.7450	10.67	16.08	26.75	43.50	-16.75	QP	P	
3	319.9370	14.24	19.93	34.17	46.00	-11.83	QP	P	
4	383.9318	9.52	21.63	31.15	46.00	-14.85	QP	P	
5	580.7026	0.57	26.40	26.97	46.00	-19.03	QP	P	
6 *	948.7610	5.82	31.84	37.66	46.00	-8.34	QP	P	

Test Result: Pass

[Test mode: TX]; [Polarity: Vertical]



Site
Limit: FCC Part15 Class B
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX Mode
Note:

Polarization: *Vertical*
Power:

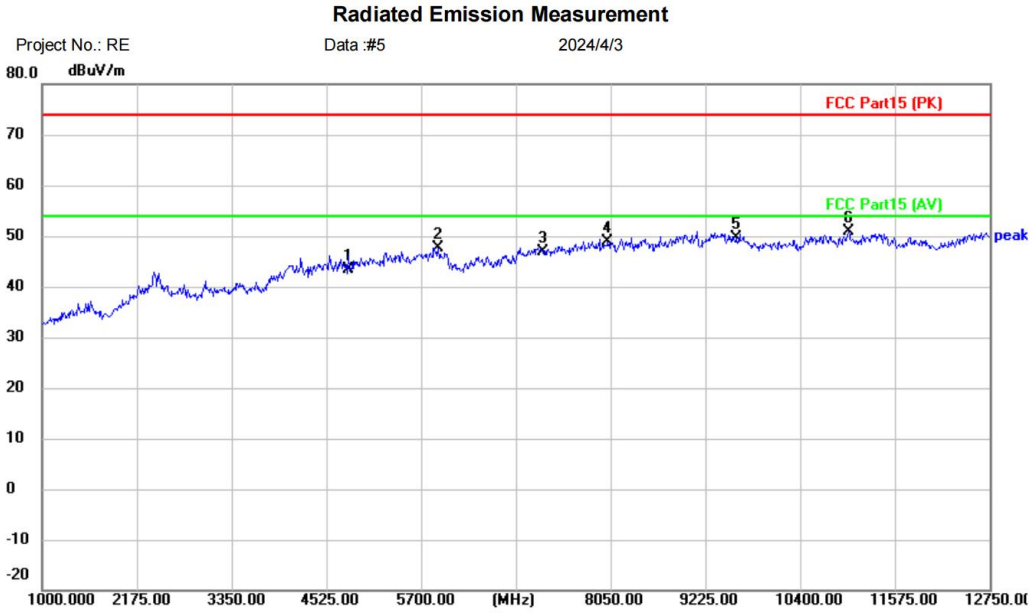
Temperature: (C)
Humidity: %RH

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	33.2112	3.62	18.78	22.40	40.00	-17.60	QP	P	
2 *	79.5209	12.83	14.76	27.59	40.00	-12.41	QP	P	
3	128.1130	10.13	18.33	28.46	43.50	-15.04	QP	P	
4	191.7450	14.20	16.08	30.28	43.50	-13.22	QP	P	
5	319.9370	11.26	19.93	31.19	46.00	-14.81	QP	P	
6	948.7610	1.18	31.84	33.02	46.00	-12.98	QP	P	

Test Result: Pass

Above 1GHz

[Test mode: TX lowest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2402
Note:

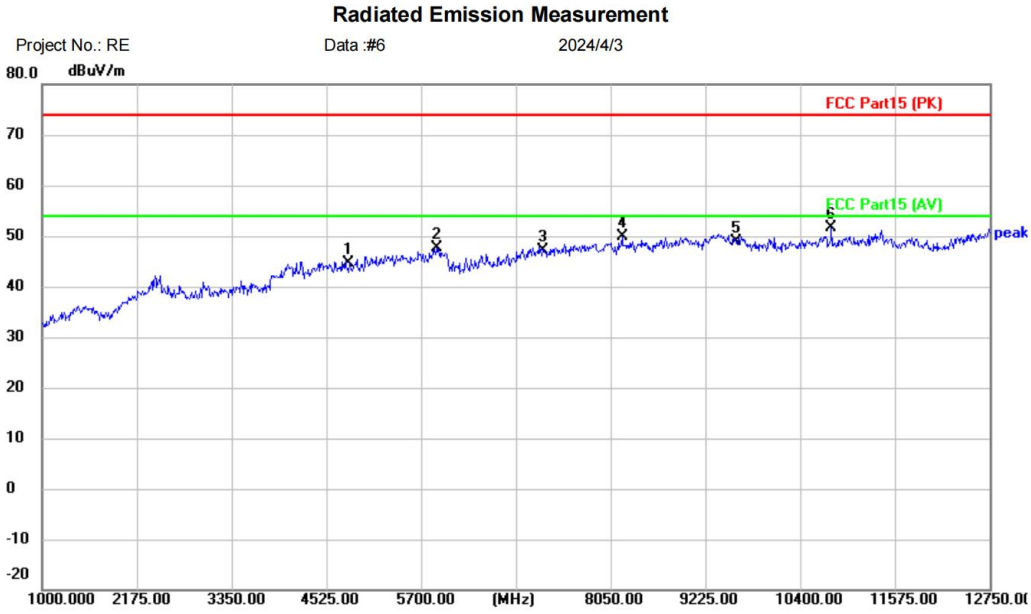
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	37.85	5.64	43.49	74.00	-30.51	peak	
2		5911.500	39.01	8.68	47.69	74.00	-26.31	peak	
3		7206.000	37.62	9.24	46.86	74.00	-27.14	peak	
4		8014.750	39.02	9.87	48.89	74.00	-25.11	peak	
5		9608.000	37.21	12.31	49.52	74.00	-24.48	peak	
6	*	10999.25	37.28	13.48	50.76	74.00	-23.24	peak	

Test Result: Pass

[Test mode:TX lowest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2402
Note:

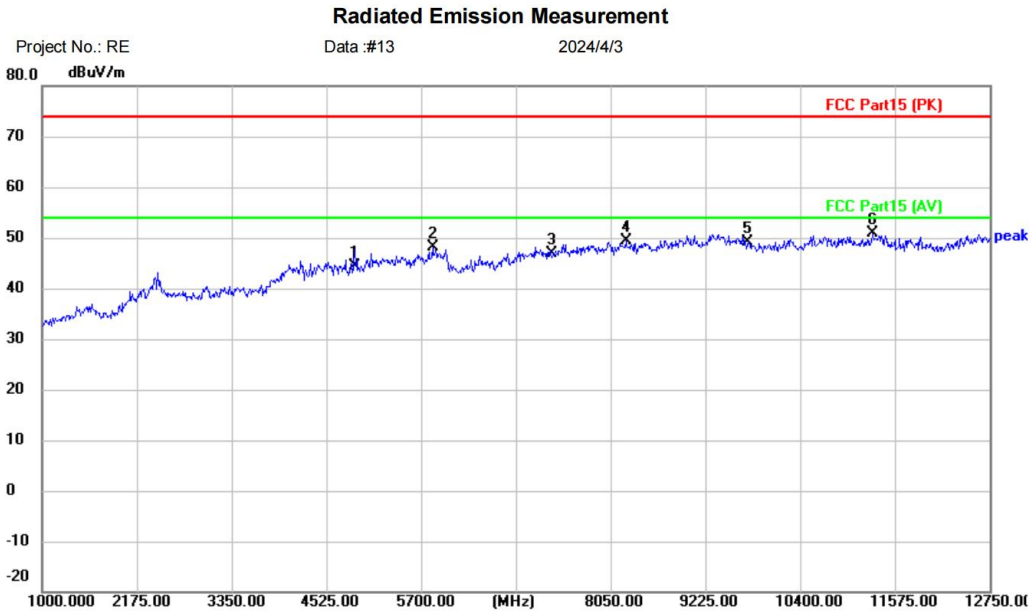
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	38.93	5.64	44.57	74.00	-29.43	peak	
2		5888.000	39.13	8.60	47.73	74.00	-26.27	peak	
3		7206.000	37.89	9.24	47.13	74.00	-26.87	peak	
4		8191.000	40.11	9.88	49.99	74.00	-24.01	peak	
5		9608.000	36.60	12.31	48.91	74.00	-25.09	peak	
6	*	10787.75	38.88	12.86	51.74	74.00	-22.26	peak	

Test Result: Pass

[Test mode: TX middle channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2441
Note:

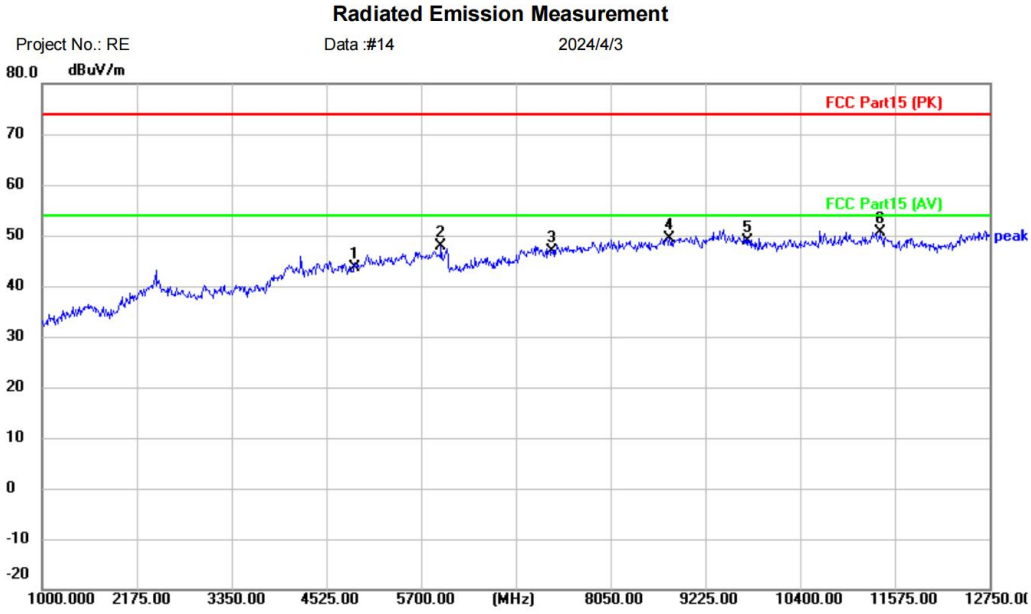
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.000	38.73	5.73	44.46	74.00	-29.54	peak	
2		5841.000	39.80	8.31	48.11	74.00	-25.89	peak	
3		7323.000	37.52	9.43	46.95	74.00	-27.05	peak	
4		8238.000	39.63	9.86	49.49	74.00	-24.51	peak	
5		9764.000	36.83	12.21	49.04	74.00	-24.96	peak	
6	*	11293.00	38.18	12.70	50.88	74.00	-23.12	peak	

Test Result: Pass

[Test mode: TX middle channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2441
Note:

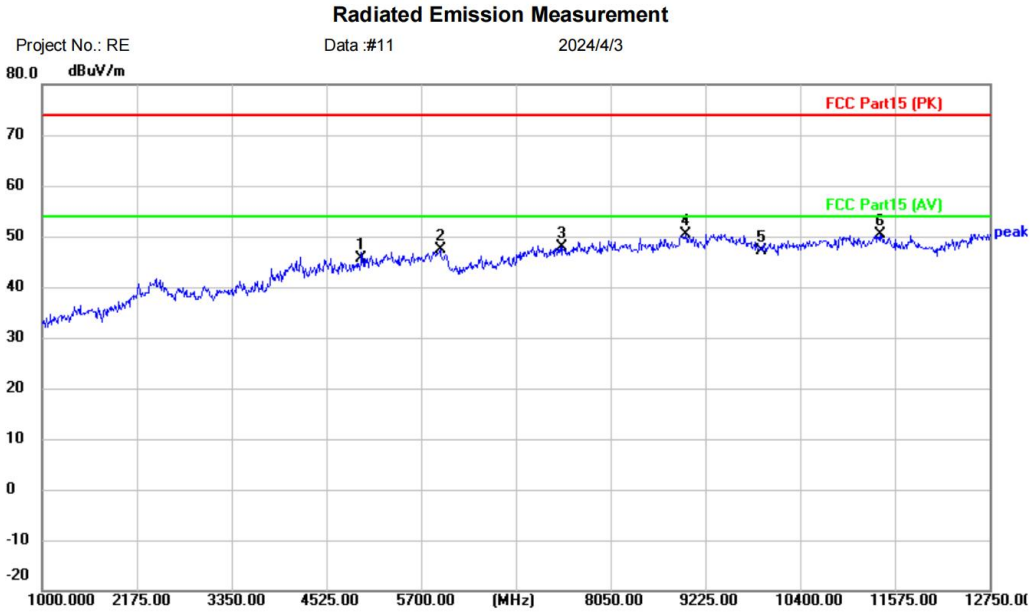
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.000	37.83	5.73	43.56	74.00	-30.44	peak	
2		5946.750	39.05	8.71	47.76	74.00	-26.24	peak	
3		7323.000	37.35	9.43	46.78	74.00	-27.22	peak	
4		8778.500	37.79	11.64	49.43	74.00	-24.57	peak	
5		9764.000	36.56	12.21	48.77	74.00	-25.23	peak	
6	*	11387.00	38.07	12.63	50.70	74.00	-23.30	peak	

Test Result: Pass

[Test mode: TX highest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2480
Note:

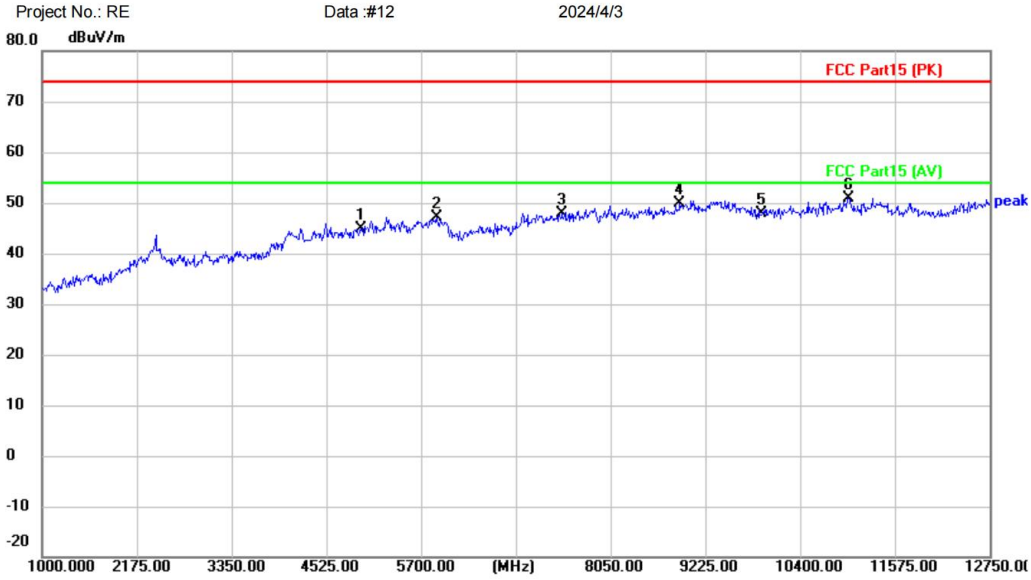
Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.000	38.97	6.60	45.57	74.00	-28.43	peak	
2		5935.000	38.62	8.70	47.32	74.00	-26.68	peak	
3		7440.000	38.23	9.64	47.87	74.00	-26.13	peak	
4		8978.250	37.92	12.37	50.29	74.00	-23.71	peak	
5		9920.000	35.02	12.14	47.16	74.00	-26.84	peak	
6	*	11387.00	37.68	12.63	50.31	74.00	-23.69	peak	

Test Result: Pass

[Test mode: TX highest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2480
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.000	38.29	6.60	44.89	74.00	-29.11	peak	
2		5888.000	38.53	8.60	47.13	74.00	-26.87	peak	
3		7440.000	38.27	9.64	47.91	74.00	-26.09	peak	
4		8907.750	37.76	12.10	49.86	74.00	-24.14	peak	
5		9920.000	35.73	12.14	47.87	74.00	-26.13	peak	
6	*	10999.25	37.40	13.48	50.88	74.00	-23.12	peak	

Test Result: Pass

DH1,DH3, DH5 all have been tested, during the test, GFSK, pi/4DQPSK, 8DPSK,modulation were all pre-scanned Only the GFSK of the worst mode would be recorded in this report.

15 Radiated emissions which fall in the restricted bands

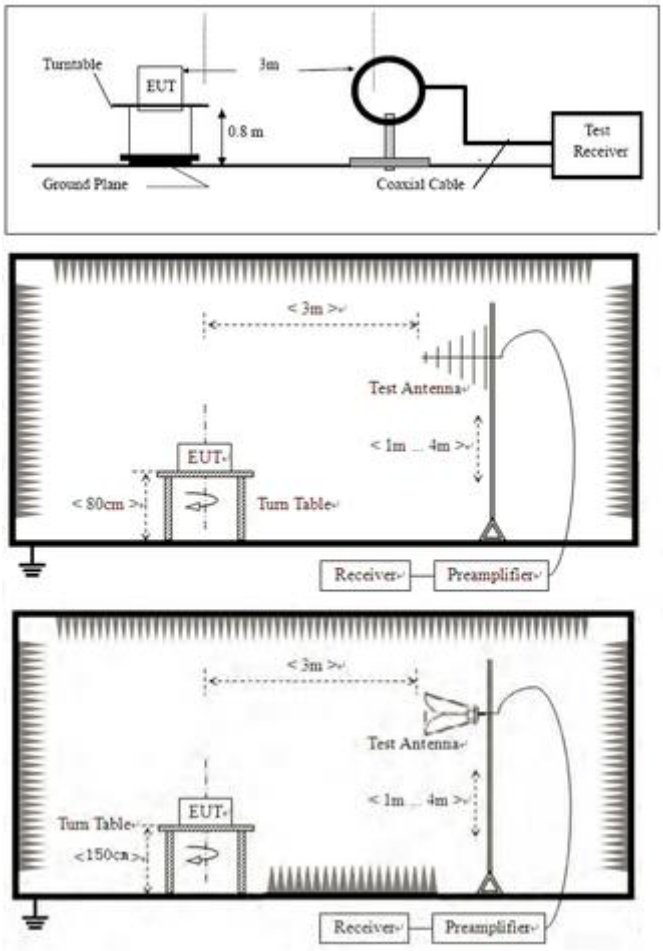
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Miata
Temperature	25℃
Humidity	53%

15.1 Limits

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

15.2 Block diagram of test setup



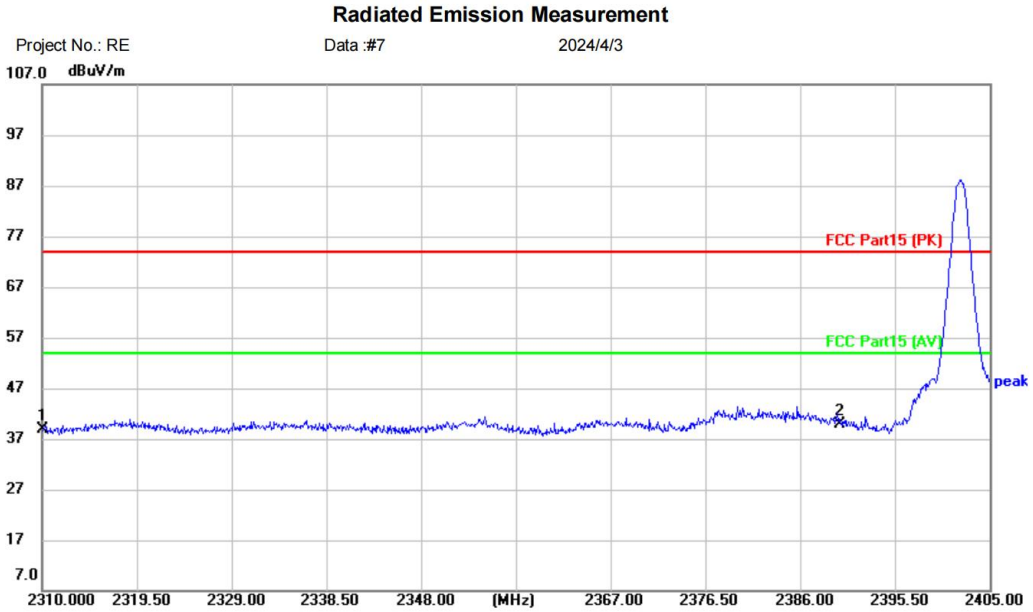
15.3 Procedure

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.
Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

15.4 Test data

[Test mode: TX lowest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2402
Note:

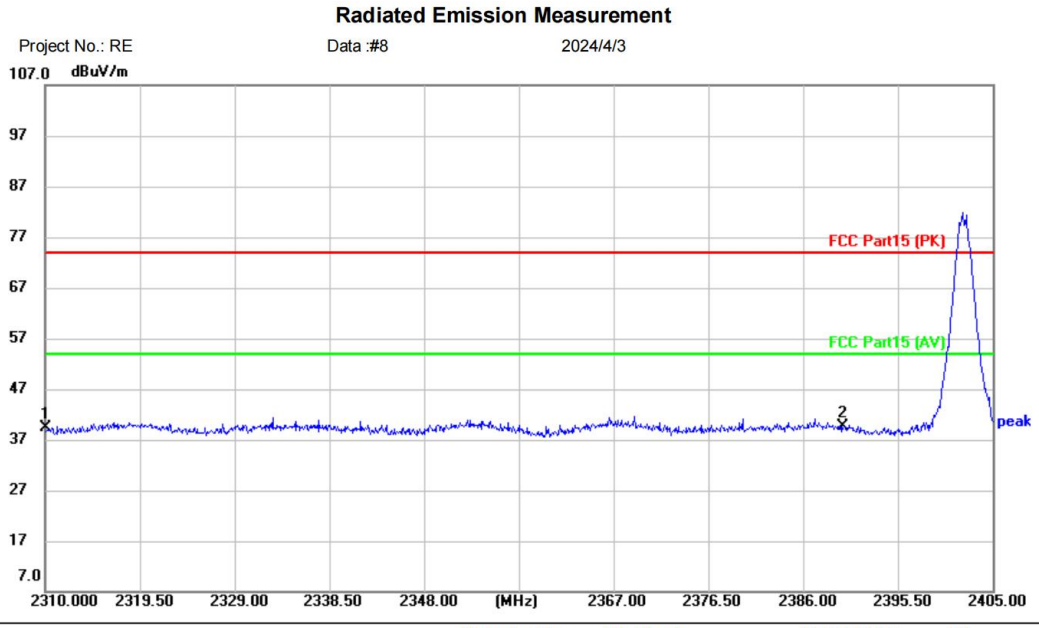
Polarization: *Horizontal*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	41.84	-2.89	38.95	74.00	-35.05	peak	
2	*	2390.000	42.60	-2.70	39.90	74.00	-34.10	peak	

Test Result: Pass

[Test mode: TX lowest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2402
Note:

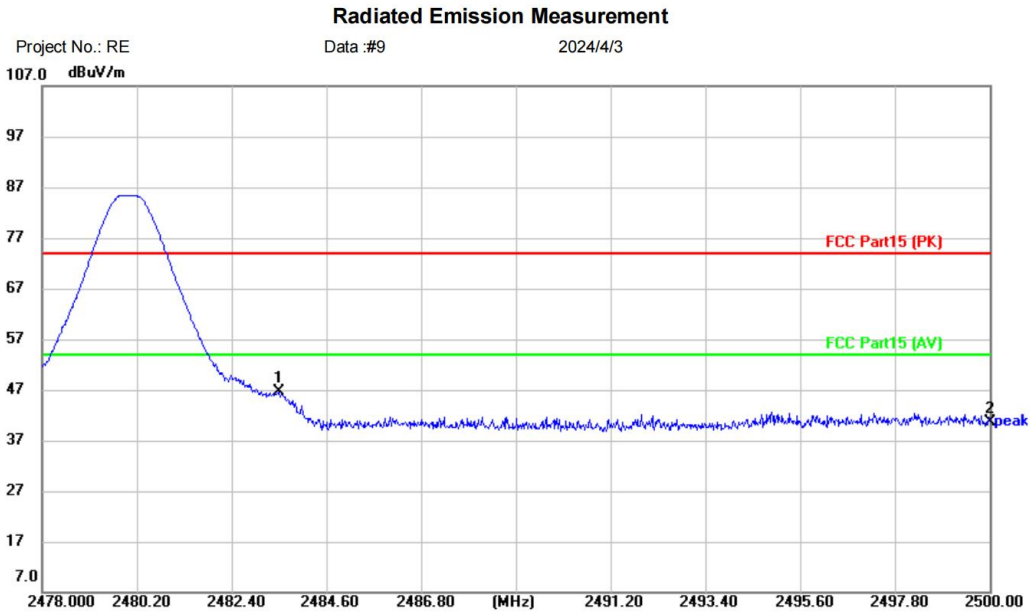
Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2310.000	42.24	-2.89	39.35	74.00	-34.65	peak	
2	*	2390.000	42.25	-2.70	39.55	74.00	-34.45	peak	

Test Result: Pass

[Test mode: TX highest channel]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2480
Note:

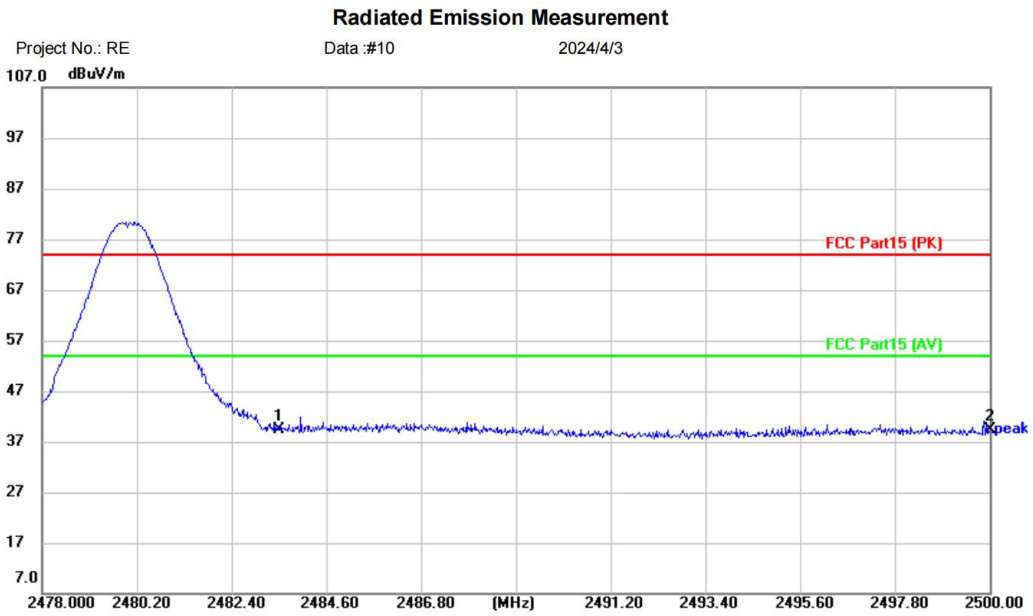
Polarization: ***Horizontal***
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	49.46	-2.91	46.55	74.00	-27.45	peak	
2		2500.000	43.68	-3.00	40.68	74.00	-33.32	peak	

Test Result: Pass

[Test mode: TX highest channel]; [Polarity: Vertical]



Site
Limit: FCC Part15 (PK)
EUT: Karaoke Microphone
M/N: KRMC101
Mode: TX 2480
Note:

Polarization: *Vertical*
Power:

Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	42.18	-2.91	39.27	74.00	-34.73	peak	
2	*	2500.000	42.37	-3.00	39.37	74.00	-34.63	peak	

Test Result: Pass

DH1,DH3, DH5 all have been tested, during the test, GFSK, pi/4DQPSK, 8DPSK,modulation were all pre-scanned Only the GFSK of the worst mode would be recorded in this report.

16 Antenna requirement

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

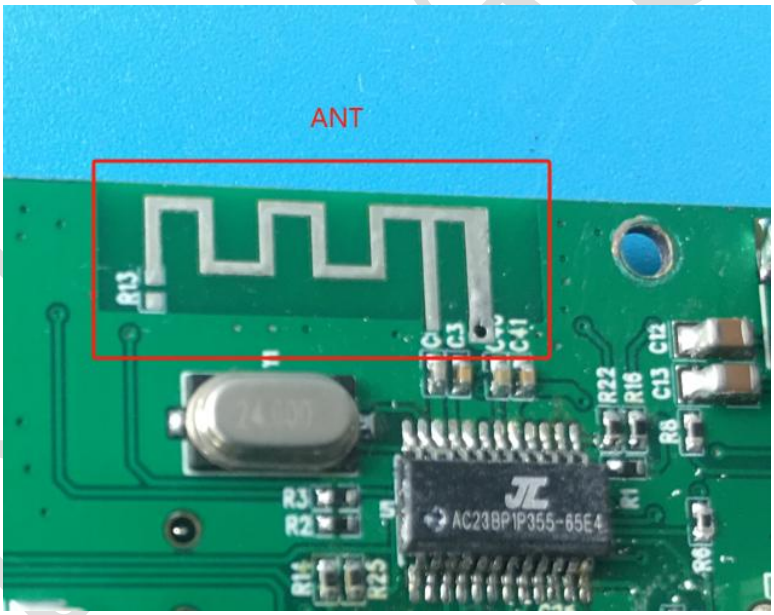
16.1 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -0.58dBi.



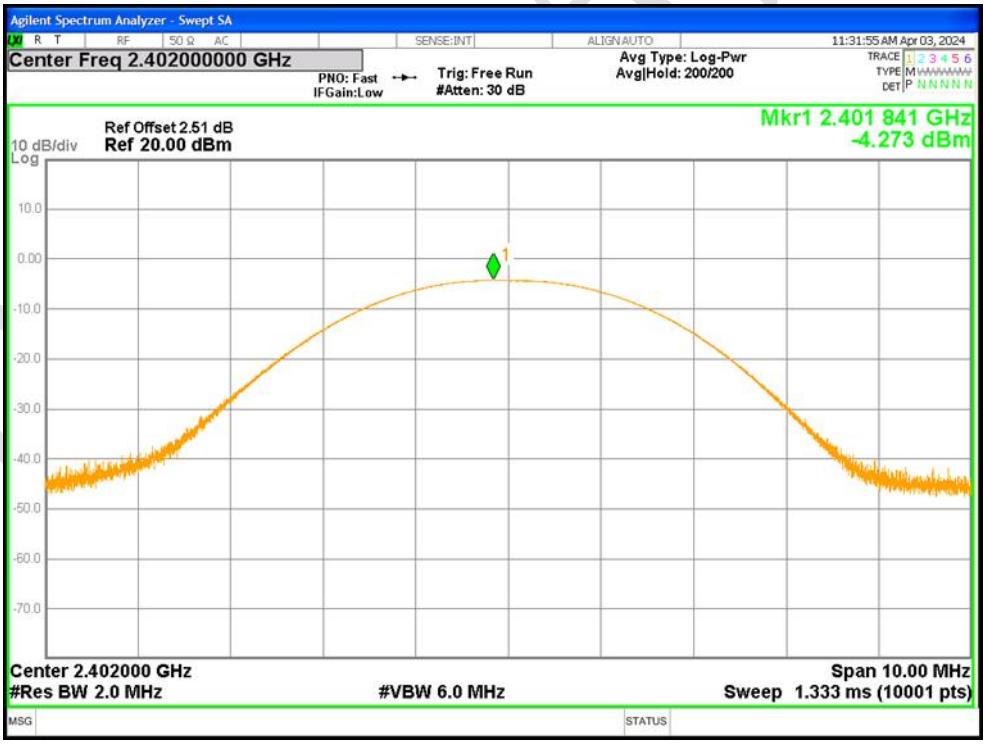
17 Appendix

Appendix1

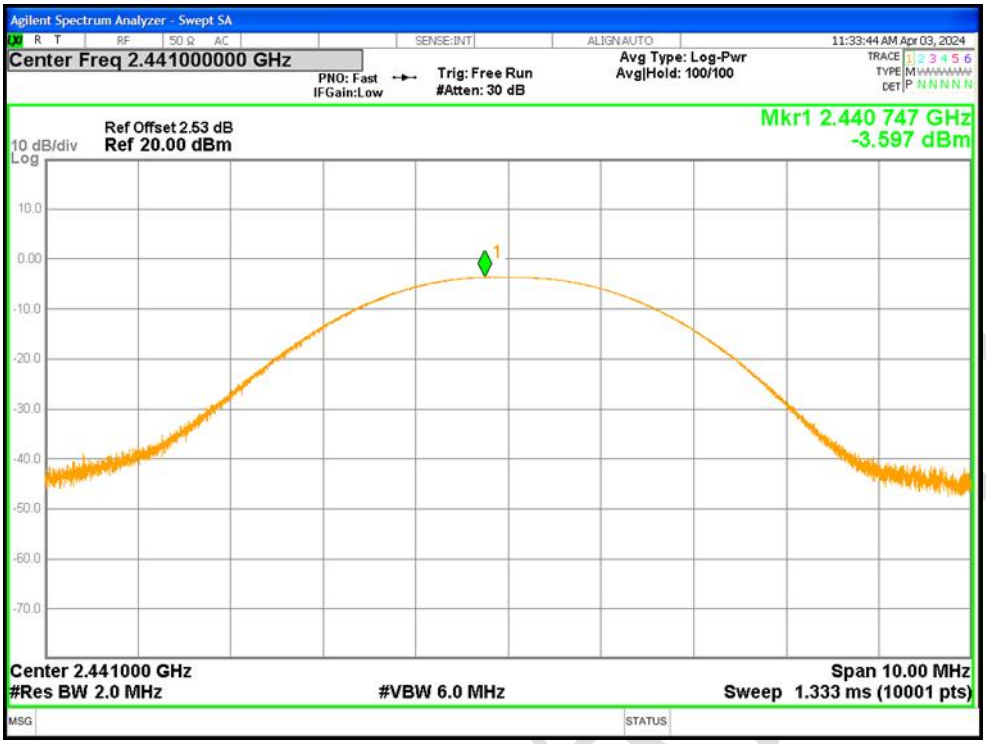
17.1 Maximum conducted output power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	Ant1	-4.273	21	Pass
NVNT	1-DH1	2441	Ant1	-3.597	21	Pass
NVNT	1-DH1	2480	Ant1	-3.867	21	Pass
NVNT	2-DH1	2402	Ant1	-3.409	21	Pass
NVNT	2-DH1	2441	Ant1	-2.74	21	Pass
NVNT	2-DH1	2480	Ant1	-3.057	21	Pass
NVNT	3-DH1	2402	Ant1	-2.751	21	Pass
NVNT	3-DH1	2441	Ant1	-2.093	21	Pass
NVNT	3-DH1	2480	Ant1	-2.341	21	Pass

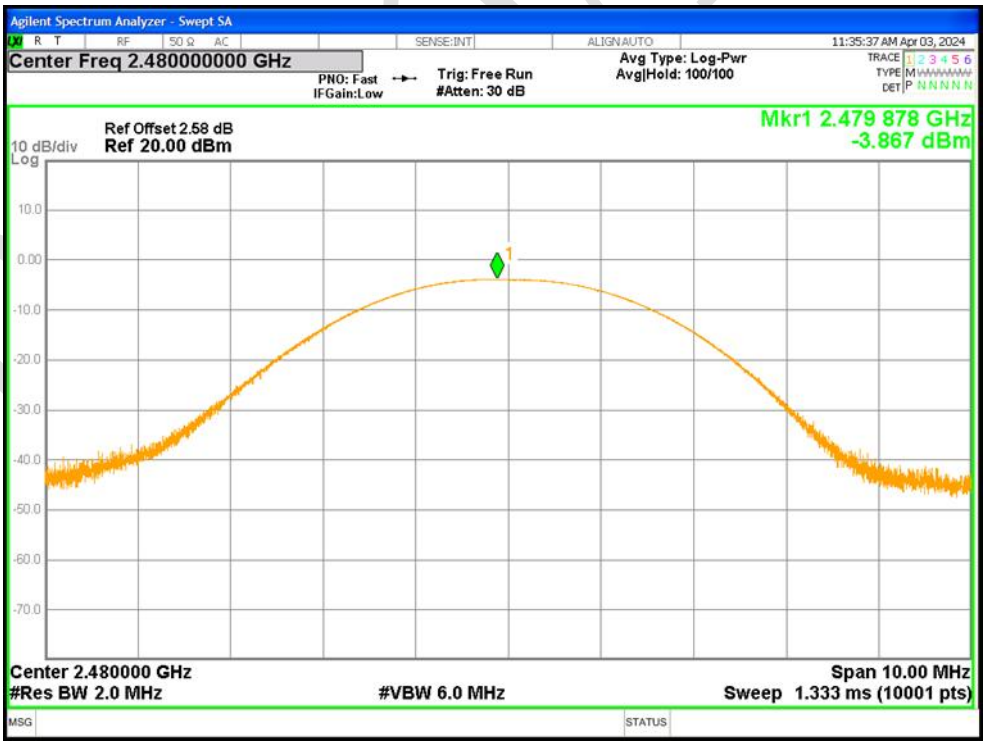
Power NVNT 1-DH1 2402MHz Ant1



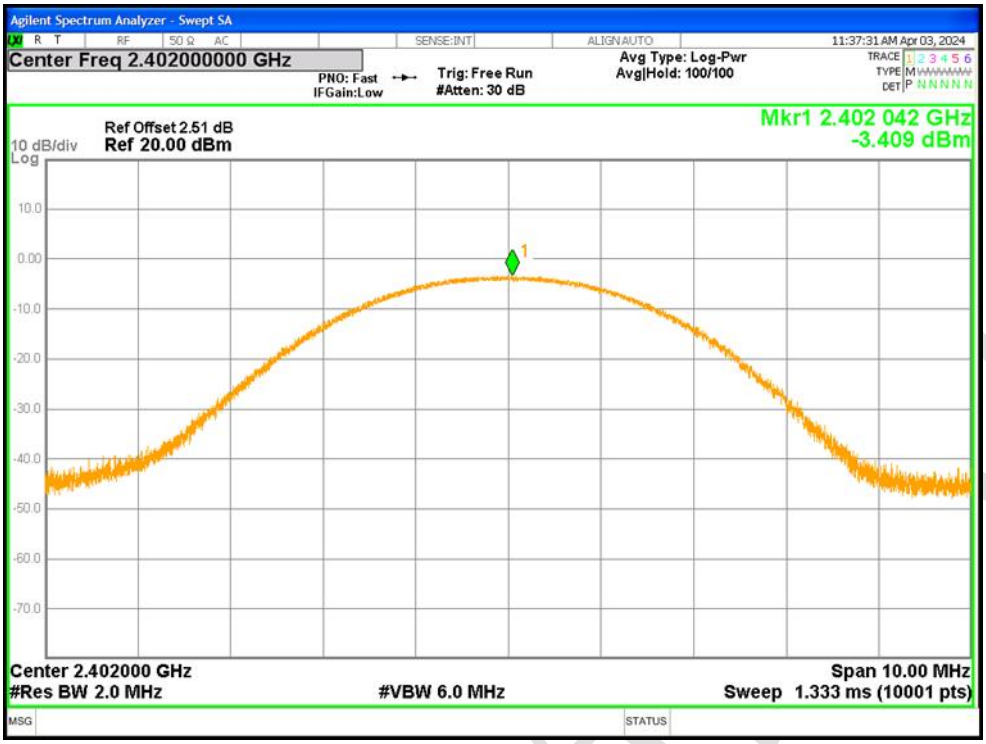
Power NVNT 1-DH1 2441MHz Ant1



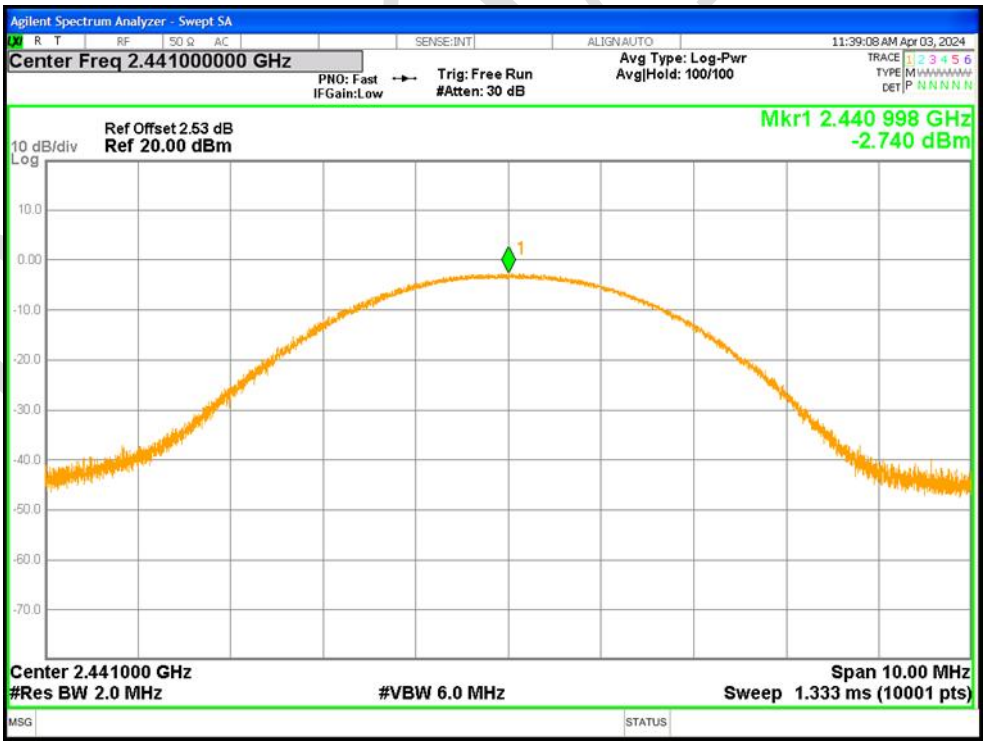
Power NVNT 1-DH1 2480MHz Ant1



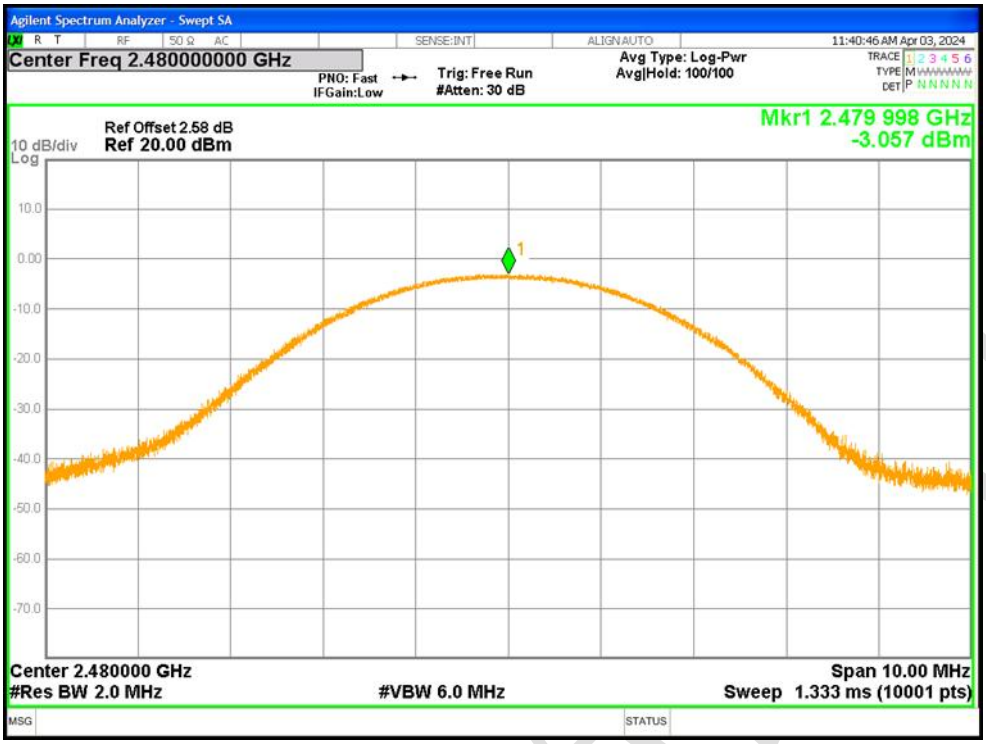
Power NVNT 2-DH1 2402MHz Ant1



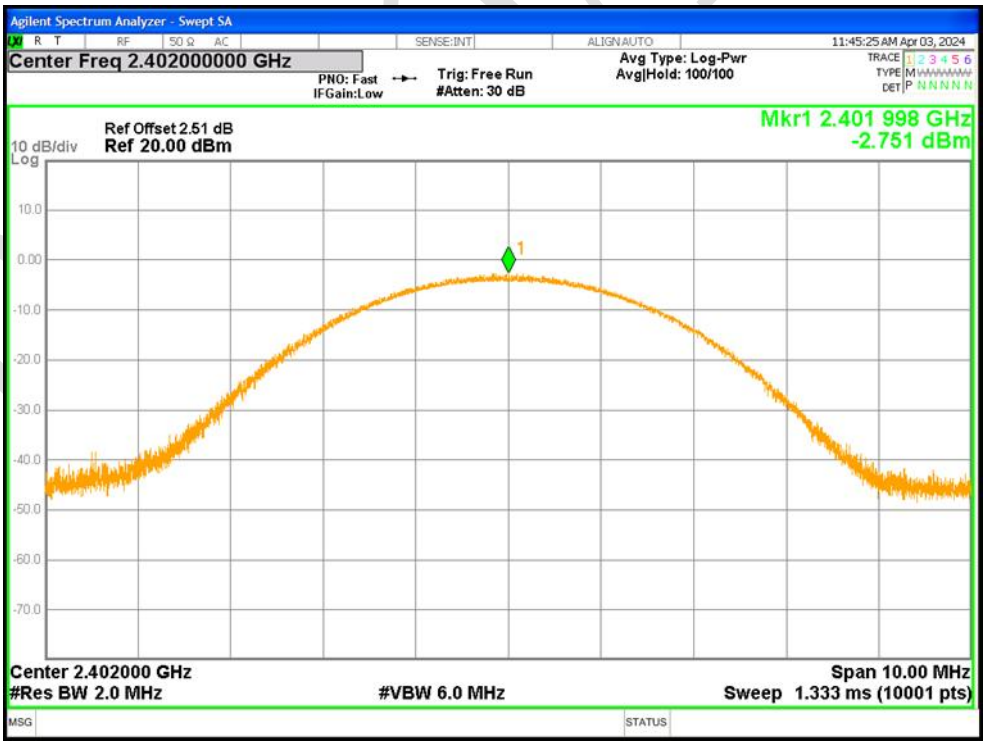
Power NVNT 2-DH1 2441MHz Ant1



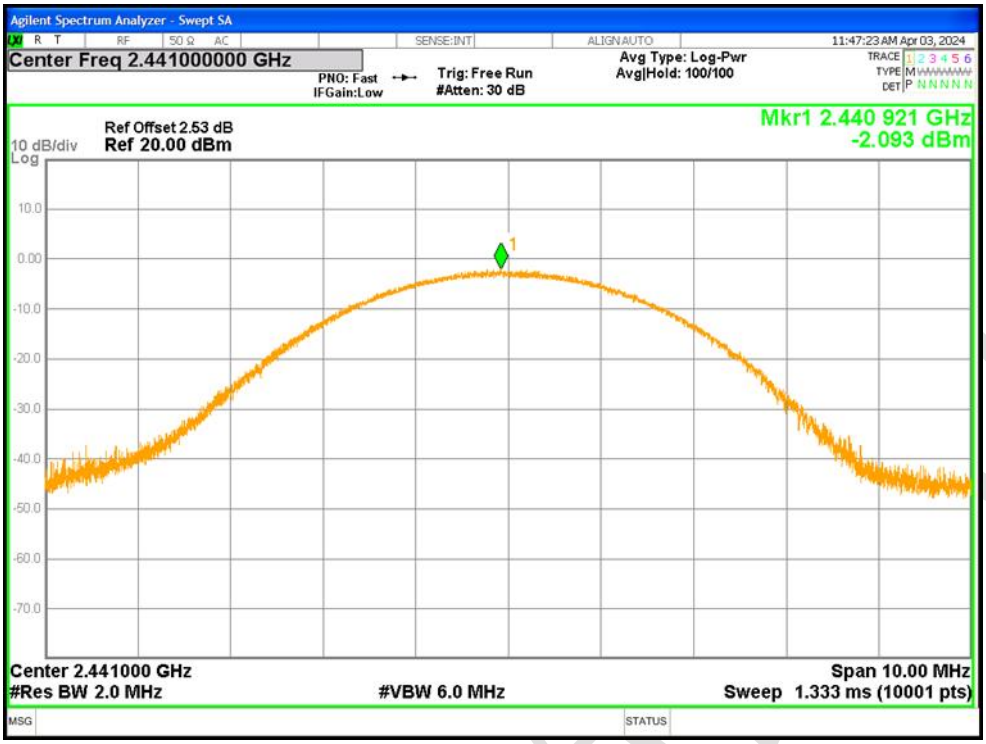
Power NVNT 2-DH1 2480MHz Ant1



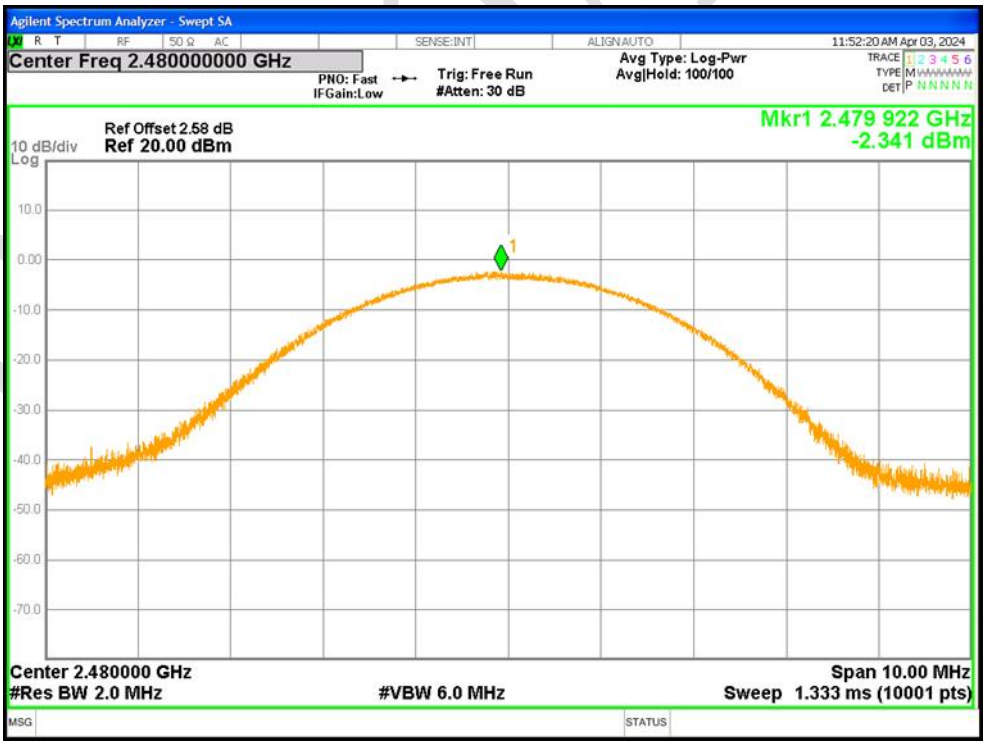
Power NVNT 3-DH1 2402MHz Ant1



Power NVNT 3-DH1 2441MHz Ant1

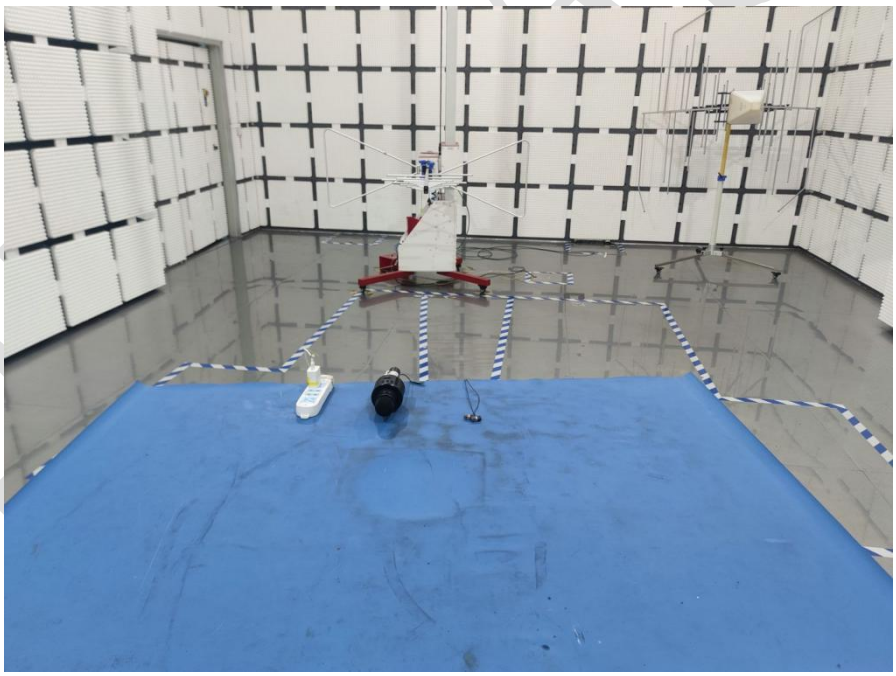


Power NVNT 3-DH1 2480MHz Ant1



APPENDIX A: Photographs of test setup

Radiated spurious emissions



Conducted emissions at AC power line (150kHz-30MHz)

APPENDIX B: Photographs of EUT

Reference to the test report No. BLA-EMC-202403-A9601

----END OF REPORT----