



FCC CERTIFICATION TEST REPORT

Applicant	:	KREAFUNK APS
Address of Applicant	:	Klamsagervej 35 A, st.8230 Abyhoj, Denmark
Manufacturer	:	Shenzhen Runxingfeng Technology co.,Ltd
Address of Manufacturer	:	5/F, No. 210 Lingxia Road, Fenghuang Community, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
Equipment under Test	:	Bluetooth speaker
Model No.	:	Karl
FCC ID	:	2ACVC-KARL
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, ANSI C63.10:2013
Report No.	:	DDT-RE24071735-4E07
Issue Date	:	2024/10/18
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd.
Address of Laboratory	:	Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

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Equipment under Test	:	Bluetooth speaker
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Address of Manufacturer	:	5/F, No. 210 Lingxia Road, Fenghuang Community, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C

Test procedure used:

ANSI C63.10:2013

We Declare:

The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above standards.

Report No.:	DDT-RE24071735-4E07		
Date of Receipt:	2024/08/27	Date of Test:	2024/08/27 - 2024/10/18

Prepared By:**Ziqin Chen/Engineer****Approved By:****Damon Hu/EMC Manager**

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2024/10/18	

1. Summary of Test Results

Description of Test Item	Standard	Results
20 dB Bandwidth & 99% Bandwidth	FCC Part 15: 15.215 ANSI C63.10:2013	Pass
Frequency Tolerance	FCC Part 15:15.225 ANSI C63.10:2013	Pass
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.225 ANSI C63.10:2013	Pass
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.10:2013	Pass
Antenna Requirement	FCC Part 15: 15.203 ANSI C63.10:2013	Pass

2. General Test Information

2.1. Description of EUT

EUT Name	: Bluetooth speaker
Model Number	: Karl
Difference of model number	: /
EUT Function Description	: Please reference user manual of this device
Power Supply	: DC 5V by an external adapter or DC 3.7V built-in lithium battery
Hardware Version	: 1.0
Software Version	: 5.1
Operation frequency	: 13.56MHz
Antenna Type	: Inductive loop coil antenna

Note: This EUT support Bluetooth BR/EDR/LE, NFC, this report only for NFC

Note: EUT is the abbreviation of equipment under test.

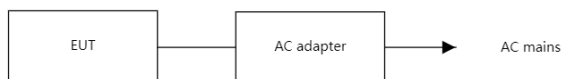
2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Serial No.	Other
N/A	N/A	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	Other
N/A	N/A	N/A	N/A	N/A

2.4. Block diagram of EUT configuration for test



2.5. Deviations of test Stand

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

/	Normal Conditions	Extreme Conditions
Temperature range:	21-25 °C	0 °C and +40 °C
Humidity range:	40-75%	10-90%
Pressure range:	86-106 kPa	86-106 kPa
Power supply	NV: DC 3.7V	DC 3.145V or DC 4.255V (from 85% to 115% of the rated supply voltage)
Note: The Extreme temperature range and extreme voltages are declared by the manufacturer.		

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No.17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China 523808

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

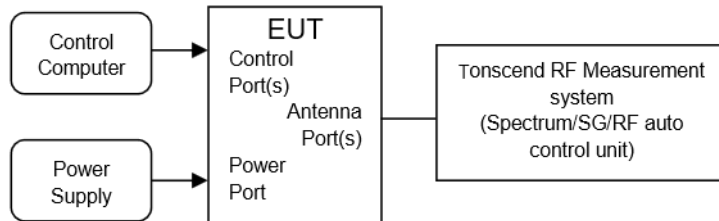
Test Item	Uncertainty
Uncertainty for Radiation Emission test (9 kHz - 30 MHz)	3.78 dB (150 kHz - 30 MHz)
	3.37 dB (9 kHz - 150 kHz)
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz to 18 GHz)	4.10 dB (1-6 GHz)
	4.40 dB (6 GHz - 18 GHz)
Bandwidth	1.1%
Uncertainty for radio frequency (RBW < 20 kHz)	3×10^{-8}
Conducted disturbance at mains terminals	3.34 dB (150 kHz-30 MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
☑RF Connected Test (RF Measurement System 3#)				
SIGNAL ANALYZER	R&S	FSV40	101407	2025/07/08
Wideband Radio Communication Tester	R&S	CMW500	117491	2025/03/31
EXG Analog Signal Generator	KEYSIGHT	N5173B	MY62153058	2025/07/08
MXG Vector Signal Generator	Agilent	N5182A	MY48180912	2025/03/31
RF Control Unit	Tonscend	JS0806-2	20C8060230	2025/03/31
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2025/04/22
Test Software	Tonscend	JS1120-3	Ver.3.2.22	N/A

4. 20 dB Bandwidth & 99% Bandwidth

4.1. Block diagram of test setup



4.2. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

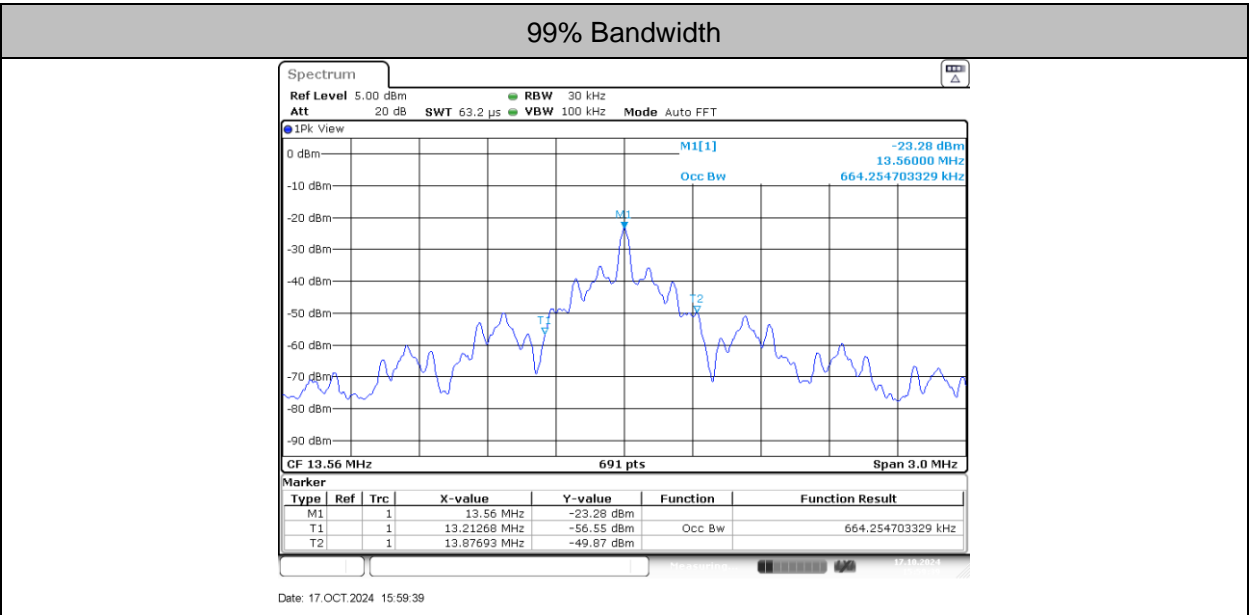
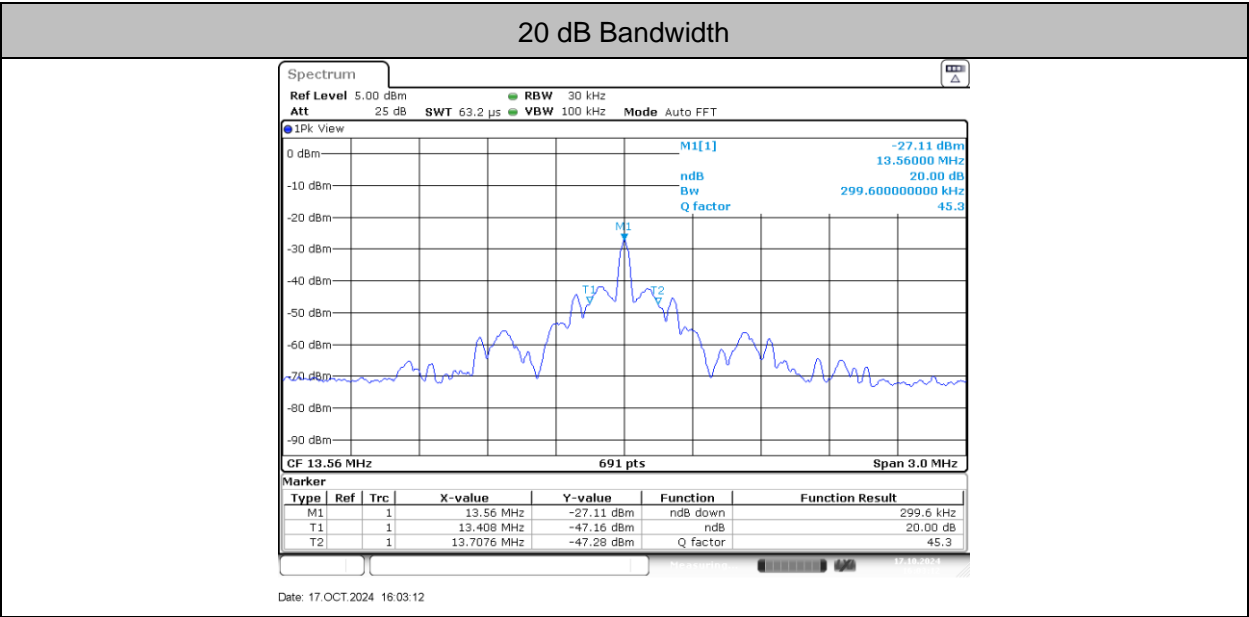
RBW:	30 kHz
VBW:	100 kHz
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, measure the 20 dB bandwidth of signal.

4.4. Test result

Mode	Frequency (MHz)	20 dB bandwidth Result (kHz)	99% bandwidth Result (kHz)	Conclusion
ASK	13.56	299.6	664.255	Pass

4.5. Original test data

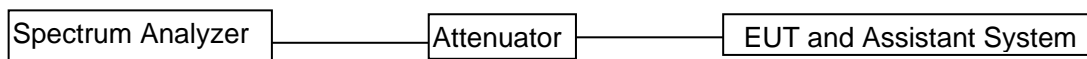


5. Frequency Tolerance

5.1. Limit

As contained in § 15.225 the frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply Voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.2. Block diagram of test setup



5.3. Test procedure

(1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 10 kHz.

Video BW: 10 kHz.

Span: 1 MHz.

Detector: Peak.

Trace Mode: Max Hold.

(2) When the trace is complete, find the peak value of the power envelope and record the frequency.

5.4. Test result

Mode	Condition		Result			Limit
	Temperature (°C)	Voltage (V)	Measured (MHz)	Tolerance (kHz)	Tolerance (ppm)	ppm
Carrier Tx Mode	NT	NV	13.560	0	0	±100
	-20	NV	13.560	0	0	±100
	-10	NV	13.560	0	0	±100
	0	NV	13.560	0	0	±100
	10	NV	13.560	0	0	±100
	30	NV	13.560	0	0	±100
	40	NV	13.560	0	0	±100
	NT	AC 102V	13.560	0	0	±100
	NT	AC 138V	13.560	0	0	±100
Note: NT: 20 °C, NV: AC 120V/60Hz						

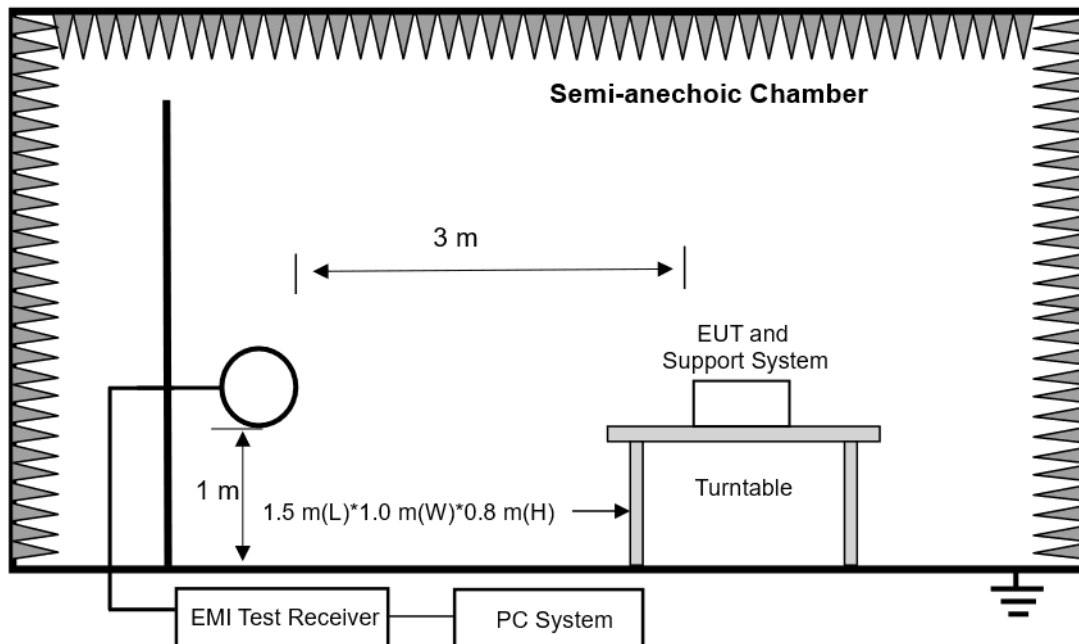
6. Radiated Emission

6.1. Test equipment

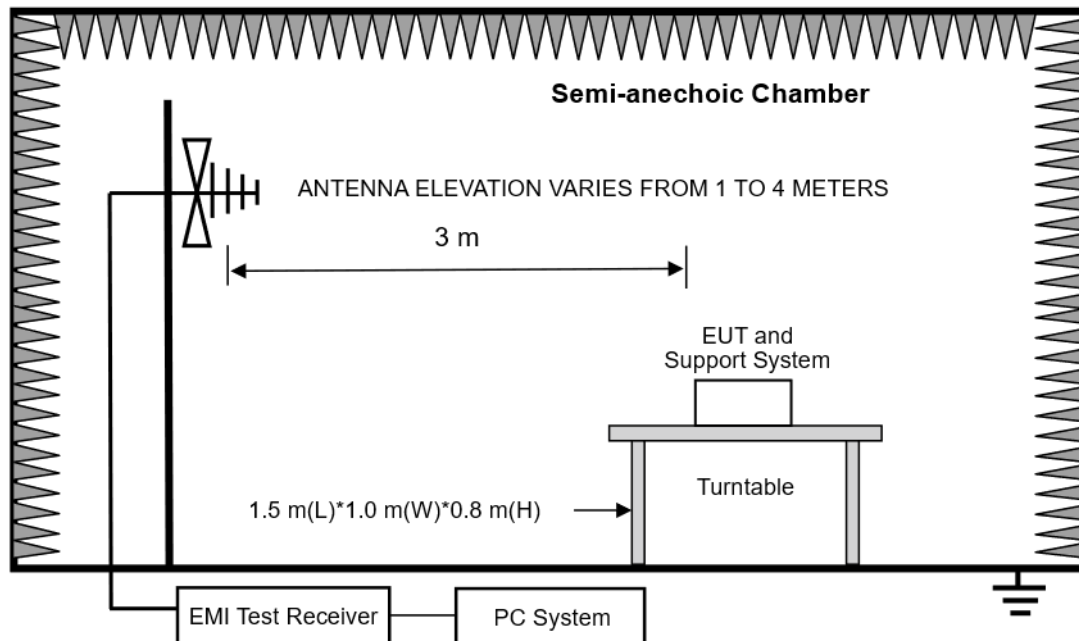
Equipment	Manufacturer	Model No.	Serial No.	Cal Due To
Active Loop Antenna	Schwarzbeck	FMZB1519	DDT-ZC00524	2025/09/11
EMI TEST RECEIVER	R&S	ESU26	DDT-ZC01909	2025/03/31
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2025/04/26
Micro-Tronics filters	REBES	BRM50716	DDT-ZC03240	/
Pre-amplifier	COM-POWER	PAM-118A	DDT-ZC01293	2025/08/25
RF cable	Zhongke Junchuang	JCT26S-NJ-NJ-1.5M	DDT-ZC02762	2025/03/31
High pass filter	Micro-Tronics	HPM50102	DDT-ZC00561	2025/04/22
High pass filter	Micro-Tronics	HPM50108	DDT-ZC00560	2025/04/22
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2025/03/31
RF Cable	N/A	W24.02 HL-562	DDT-ZC04022	2025/03/31
RF cable	Yuhu Technology	ZT26S-SMAJ-SMAJ-1M	DDT-ZC02037	2025/03/31
High Pass filter	Xi'an Xingbo	XBLBQ-GTA67	DDT-ZC02179	2025/04/22
RF Cable	N/A	W13.02 AP1-X2	DDT-ZC04023	2025/03/31
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2025/03/31
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	DDT-ZC02050	2025/07/11
RF cable	Yuhu Technology	JCTB810-NJ-NJ-9M	DDT-ZC02538	2025/03/31
Micro-Tronics filters	REBES	BRM50702	DDT-ZC03242	/
Hochgewinn-Hornantenne	SCHWARZBECK	BBHA 9120 D	DDT-ZC02129	2025/09/18

6.2. Block diagram of test setup

In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



6.3. Limit

Operation within the band 13.110-14.010 MHz as contained in §15.225:

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter

at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at

30 meters.

(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

FREQUENCY (MHz)	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		(μV/m)	dB(μV)/m
0.009 ~ 0.490	300	2400/F(KHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(KHz)	87.6-20log(F)
1.705 ~ 13.110	30	30	29.54
13.110 ~ 13.410	30	106	40.51
13.410~ 13.553	30	334	50.47
13.553~13.567	30	15848	84.00
13.567~13.710	30	334	50.47
13.710~14.010	30	106	40.51
14.010~30	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

Note:

(1)The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer then that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{300m}(\text{dBuV/m}) + 40\text{Log}(300m/3m) = \text{Limit}_{300m}(\text{dBuV/m}) + 80$$

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\text{Log}(30m/3m) = \text{Limit}_{30m}(\text{dBuV/m}) + 40$$

FREQUENCY (MHz)	DISTANCE Meters	FIELD STRENGTHS LIMIT dB(μ V)/m
0.009 ~ 0.490	3	147.6-20log(F)
0.490 ~ 1.705	3	127.6-20log(F)
1.705 ~ 13.110	3	69.54
13.110 ~ 13.410	3	80.51
13.410 ~ 13.553	3	90.47
13.553 ~13.567	3	124.00
13.567 ~13.710	3	90.47
13.710 ~14.010	3	80.51
14.010~30	3	69.54
30 ~88	3	40.00
88 ~216	3	43.50
216 ~960	3	46.00
960 ~ 1000	3	54.00

6.4. Test procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.

(2) Test antenna was located 3m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used	Test antenna distance
9 kHz - 30 MHz	Active Loop antenna	3 m
30 MHz - 1 GHz	Trilog Broadband Antenna	3 m

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also is positioned with its plane horizontal at the specified distance from the EUT. The lowest height of the loop is 1 m above the ground. For measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 1 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions. Spectrum frequency from 9 kHz to 1 GHz (tenth harmonic of fundamental frequency) was investigated.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW.

Frequency band	RBW
9 kHz - 150 kHz	200 Hz
150 kHz - 30 MHz	9 kHz
30 MHz - 1 GHz	120 kHz

6.5. Test result

Pass. (See below detailed test result)

Frequency (MHz)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Detector	Conclusion
13.136	32.92	80.51	QP	Pass
13.347	42.24	80.51	QP	Pass
13.463	40.61	90.47	QP	Pass
13.560	61.58	124.00	QP	Pass
13.682	41.91	90.47	QP	Pass
13.772	41.20	80.51	QP	Pass
13.982	34.27	80.51	QP	Pass

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-10-14

Tested By:

Zhong Nan

EUT:

Bluetooth speaker

Model Number:

Karl

Test Mode:

NFC Working

Power Supply:

Battery

Condition:

Temp:21.5°C;Humi:53.9%

Test Site:

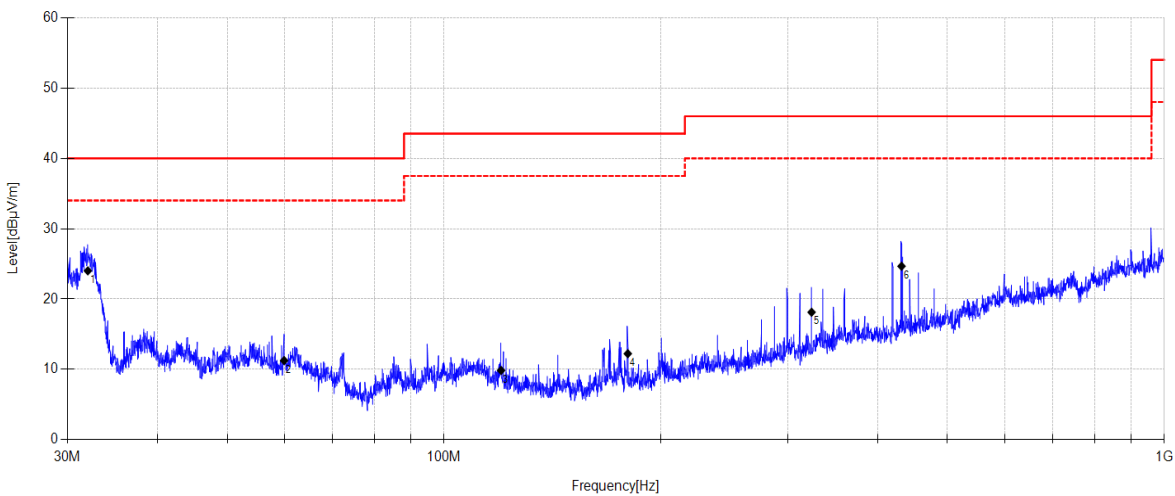
DDT 3# Chamber

File Path:

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Memo:

Sample Number:S24071735-001



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	32.021	41.22	10.12	3.77	24.01	40.00	15.99	QP	Horizontal
2	59.977	25.61	12.79	3.96	11.26	40.00	28.74	QP	Horizontal
3	119.991	26.65	10.00	4.33	9.86	43.50	33.64	QP	Horizontal
4	179.952	29.08	9.69	4.65	12.24	43.50	31.26	QP	Horizontal
5	323.847	30.6	13.62	5.32	18.13	46.00	27.87	QP	Horizontal
6	431.709	34.66	15.74	5.74	24.67	46.00	21.33	QP	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-10-14

Tested By:

Zhong Nan

EUT:

Bluetooth speaker

Model Number:

Karl

Test Mode:

NFC Working

Power Supply:

Battery

Condition:

Temp:21.5°C;Humi:53.9%

Test Site:

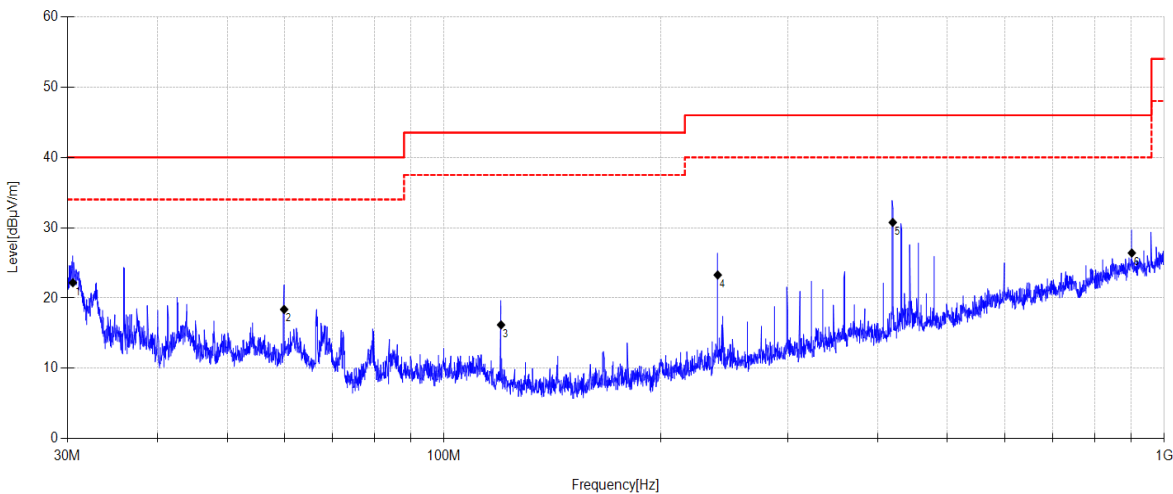
DDT 3# Chamber

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Memo:

Sample Number:S24071735-001



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.531	39.17	10.35	3.76	22.18	40.00	17.82	QP	Vertical
2	59.977	32.74	12.79	3.96	18.39	40.00	21.61	QP	Vertical
3	119.991	32.98	10.00	4.33	16.19	43.50	27.31	QP	Vertical
4	239.888	37.83	11.79	4.94	23.28	46.00	22.72	QP	Vertical
5	419.769	41.23	15.28	5.70	30.75	46.00	15.25	QP	Vertical
6	901.430	27.87	21.90	7.20	26.41	46.00	19.59	QP	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:2024-10-14

Tested By:Zhong Nan

EUT:Bluetooth speaker

Model Number:Karl

Test Mode:NFC Working

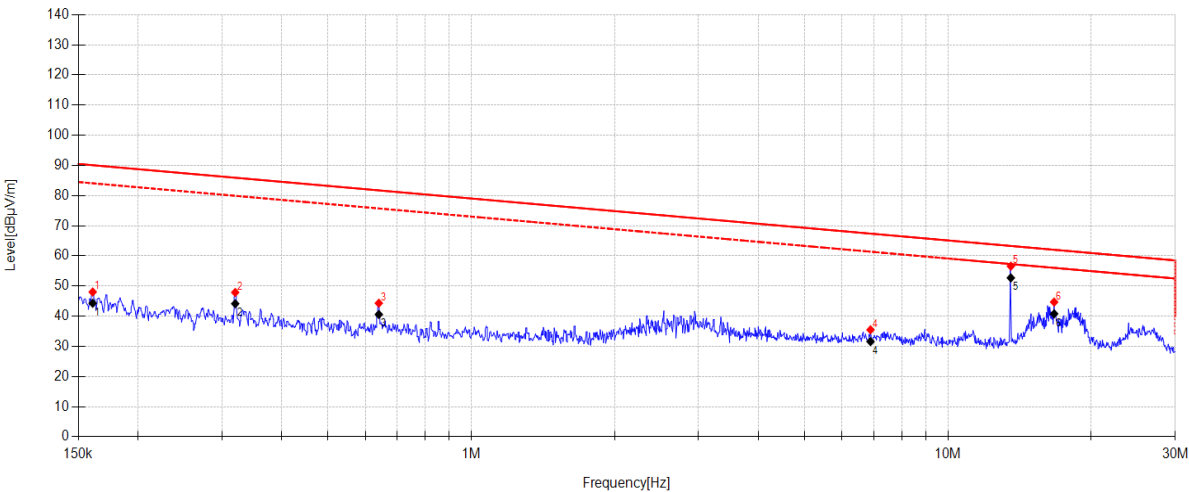
Power Supply:Battery

Condition:Temp:21.5°C;Humi:53.9%

Test Site:DDT 3# Chamber

File Path:d:\ts\2024 report data\Q24071735-4E\FCC\20241014-215215_H

Memo:Sample Number:S24071735-001



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	0.161	55.68	20.11	3.24	-31.00	48.03	90.08	42.05	PK	Horizontal
2	0.320	55.43	20.20	3.25	-31.00	47.88	85.93	38.05	PK	Horizontal
3	0.640	51.72	20.33	3.26	-31.00	44.31	81.74	37.43	PK	Horizontal
4	6.883	42.39	20.59	3.51	-31.00	35.49	67.39	31.90	PK	Horizontal
5	13.556	63.67	20.30	3.65	-31.02	56.60	63.30	6.70	PK	Horizontal
6	16.710	51.92	20.13	3.67	-31.03	44.69	62.03	17.34	PK	Horizontal

Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	0.161	51.95	20.11	3.24	44.30	90.08	45.78	AV	Horizontal
2	0.320	51.7	20.20	3.25	44.15	85.93	41.78	AV	Horizontal
3	0.640	47.99	20.33	3.26	40.58	81.74	41.16	QP	Horizontal
4	6.883	38.49	20.59	3.51	31.59	67.39	35.80	QP	Horizontal
5	13.556	59.77	20.30	3.65	52.70	63.30	10.60	QP	Horizontal
6	16.710	48.02	20.13	3.67	40.79	62.03	21.24	QP	Horizontal

Note:

1. Level = Reading + Factor.

2. Factor = Antenna Factor + Cable Loss - Preamp Gain + Site Loss Factor - 107.

3. Test setup: 9kHz-150kHz RBW: 300Hz, VBW: 1 kHz, Sweep time: auto.

150kHz-30MHz RBW: 10kHz, VBW: 30kHz, Sweep time: auto.

4. $H = E - 51.5$, where H is in dB μ A/m and E in dB μ V/m.

5. Have been tested X, Y, Z directions, only recorded the worst case on this report.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-10-14

Tested By:

Zhong Nan

EUT:

Bluetooth speaker

Model Number:

Karl

Test Mode:

NFC Working

Power Supply:

Battery

Condition:

Temp:21.5°C;Humi:53.9%

Test Site:

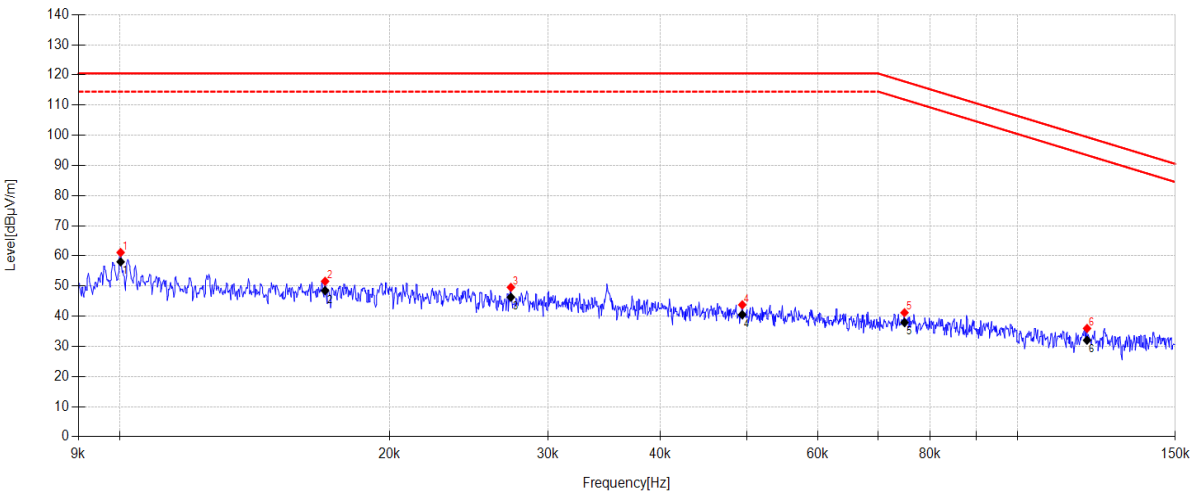
DDT 3# Chamber

File Path:

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Memo:

Sample Number:S24071735-001



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	0.010	67.81	20.50	3.21	-30.40	61.12	120.50	59.38	PK	Horizontal
2	0.017	58.29	20.50	3.22	-30.45	51.56	120.50	68.94	PK	Horizontal
3	0.027	56.42	20.43	3.23	-30.52	49.56	120.50	70.94	PK	Horizontal
4	0.049	50.78	20.40	3.25	-30.66	43.77	120.50	76.73	PK	Horizontal
5	0.075	48.36	20.40	3.23	-30.83	41.16	117.84	76.68	PK	Horizontal
6	0.120	43.47	20.25	3.22	-31.00	35.94	99.41	63.47	PK	Horizontal

Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity	
1	0.010	64.71	20.50	3.21	58.02	120.50	62.48	AV	Horizontal	
2	0.017	55.19	20.50	3.22	48.46	120.50	72.04	AV	Horizontal	
3	0.027	53.15	20.43	3.23	46.29	120.50	74.21	AV	Horizontal	
4	0.049	47.51	20.40	3.25	40.50	120.50	80.00	AV	Horizontal	
5	0.075	45.09	20.40	3.23	37.89	117.84	79.95	AV	Horizontal	
6	0.120	39.56	20.25	3.22	32.03	99.41	67.38	AV	Horizontal	

Note:

1. Level = Reading + Factor.

2. Factor = Antenna Factor + Cable Loss - Preamp Gain + Site Loss Factor - 107.

3. Test setup: 9kHz-150kHz RBW: 300Hz, VBW: 1 kHz, Sweep time: auto.

150kHz-30MHz RBW: 10kHz, VBW: 30kHz, Sweep time: auto.

4. $H = E - 51.5$, where H is in dB μ A/m and E in dB μ V/m.

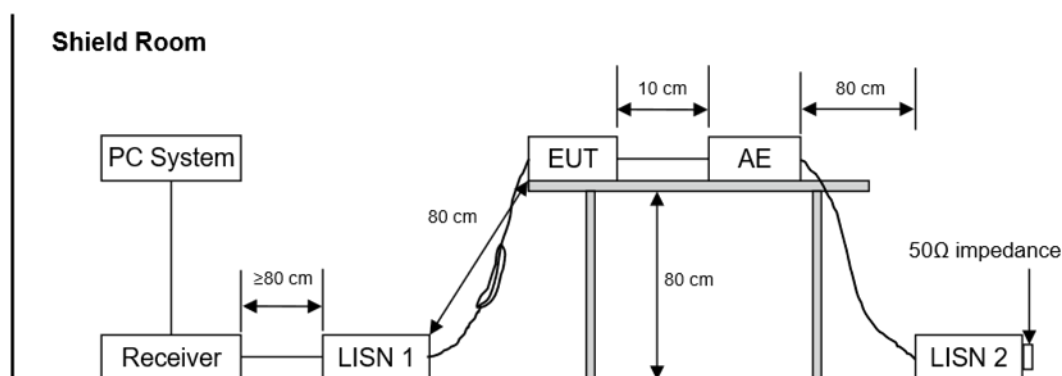
5. Have been tested X, Y, Z directions, only recorded the worst case on this report.

7. Power Line Conducted Emission

7.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal Due To
EMI Test Receiver	R&S	ESCI	DDT-ZC00235	2025/07/08
Artificial mains	R&S	ESH2-Z5	DDT-ZC00538	2025/07/08
EMI Test Software	Audix/TW	e3	DDT-ZC01252	/
Two Line V-Network	R&S	ENV216	DDT-ZC00535	2025/07/08
Pulse Limiter	SCHWARZBECK	ESH3-Z2	DDT-ZC00539	2025/07/08
CE Cable 1	R&S	ESU8/RF2	DDT-ZC00566	2025/07/08

7.2. Block diagram of test setup



7.3. Power line conducted emission limits

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

7.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
Adapter	HUAWEI	HW-100400C01	Huawei Fast Charge 2 #	Input: 100-240V~ 50/60Hz, Output: 5V/2A or 9V/2A or 10V/4A MAX

7.5. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

7.6. Test result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “-----” means Peak detection; “-----” means Average detection

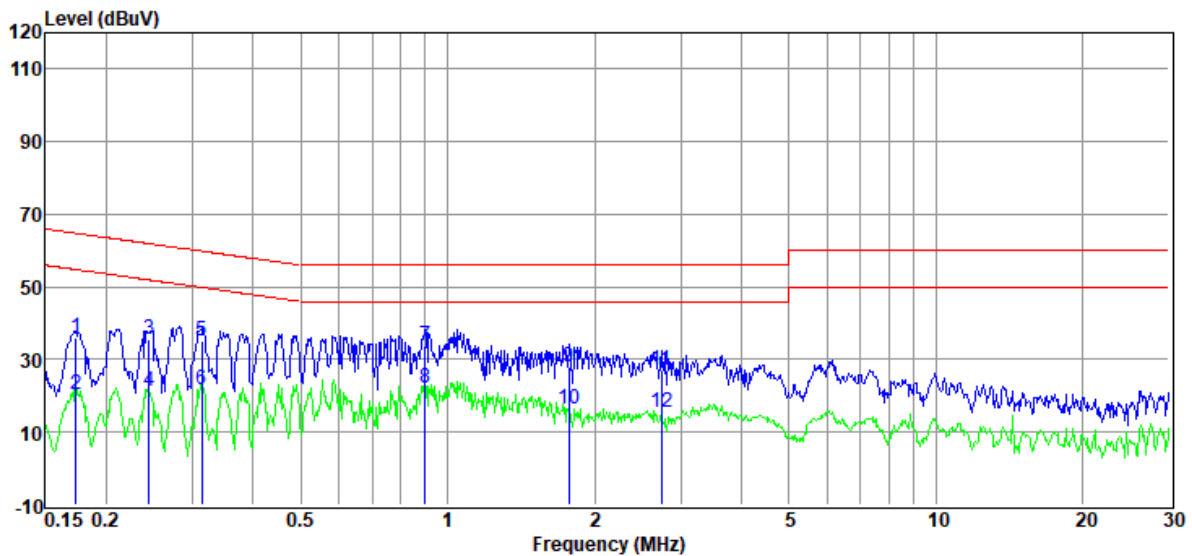
8. Antenna Requirements

For intentional device, according to FCC 47 CFR Section 15.203, 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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room **D:\2024 CE report data\Q24071735-4E\CE-FCC.EM6**
Test Date : 2024-10-15 **Tested By** : Gen Liu
EUT : Bluetooth speaker **Model Number** : Karl
Power Supply : AC 120V/60Hz **Test Mode** : NFC mode
Condition : TEMP:21.5°C, RH:53.6% **LISN** : 2023 1# ENV216/NEUTRAL
Memo : Sample Number:S24071735-001

Data: 2



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.17	15.33	9.87	0.92	9.68	35.80	64.81	-29.01	QP	NEUTRAL
2	0.17	-0.21	9.87	0.92	9.68	20.26	54.81	-34.55	Average	NEUTRAL
3	0.24	15.39	9.75	0.90	9.69	35.73	61.95	-26.22	QP	NEUTRAL
4	0.24	1.12	9.75	0.90	9.69	21.46	51.95	-30.49	Average	NEUTRAL
5	0.31	15.04	9.70	0.88	9.70	35.32	59.88	-24.56	QP	NEUTRAL
6	0.31	1.34	9.70	0.88	9.70	21.62	49.88	-28.26	Average	NEUTRAL
7	0.90	13.54	9.81	0.69	9.73	33.77	56.00	-22.23	QP	NEUTRAL
8	0.90	1.83	9.81	0.69	9.73	22.06	46.00	-23.94	Average	NEUTRAL
9	1.77	7.90	9.79	0.65	9.75	28.09	56.00	-27.91	QP	NEUTRAL
10	1.77	-3.67	9.79	0.65	9.75	16.52	46.00	-29.48	Average	NEUTRAL
11	2.74	6.81	9.72	0.60	9.77	26.90	56.00	-29.10	QP	NEUTRAL
12	2.74	-4.50	9.72	0.60	9.77	15.59	46.00	-30.41	Average	NEUTRAL

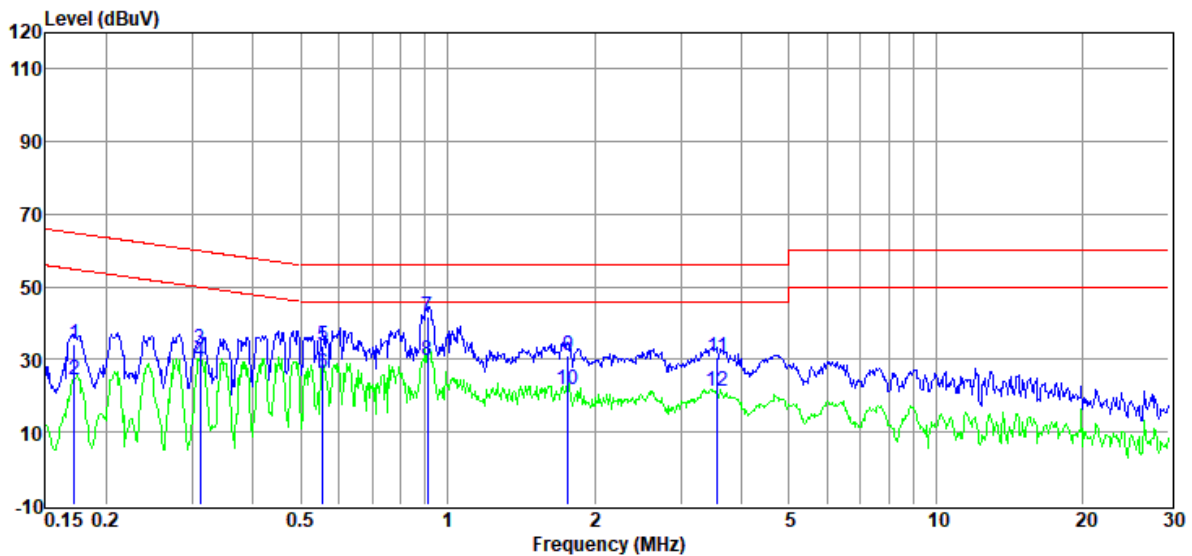
Note:

1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room **D:\2024 CE report data\Q24071735-4E\CE-FCC.EM6**
Test Date : 2024-10-15 **Tested By** : Gen Liu
EUT : Bluetooth speaker **Model Number** : Karl
Power Supply : AC 120V/60Hz **Test Mode** : NFC mode
Condition : TEMP:21.5°C, RH:53.6% **LISN** : 2023 1# ENV216/LINE
Memo : Sample Number:S24071735-001

Data: 4



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.17	13.94	9.74	0.92	9.68	34.28	64.86	-30.58	QP	LINE
2	0.17	4.11	9.74	0.92	9.68	24.45	54.86	-30.41	Average	LINE
3	0.31	12.54	9.79	0.88	9.70	32.91	59.93	-27.02	QP	LINE
4	0.31	8.76	9.79	0.88	9.70	29.13	49.93	-20.80	Average	LINE
5	0.56	13.49	9.80	0.84	9.71	33.84	56.00	-22.16	QP	LINE
6	0.56	6.03	9.80	0.84	9.71	26.38	46.00	-19.62	Average	LINE
7	0.91	21.86	9.59	0.69	9.73	41.87	56.00	-14.13	QP	LINE
8	0.91	9.93	9.59	0.69	9.73	29.94	46.00	-16.06	Average	LINE
9	1.76	11.07	9.75	0.65	9.75	31.22	56.00	-24.78	QP	LINE
10	1.76	1.40	9.75	0.65	9.75	21.55	46.00	-24.45	Average	LINE
11	3.57	10.55	9.64	0.57	9.78	30.54	56.00	-25.46	QP	LINE
12	3.57	1.27	9.64	0.57	9.78	21.26	46.00	-24.74	Average	LINE

Note:

1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

10. Photos of the EUT

Please refer to DDT-Q24071735-3E appendix I

END OF REPORT