

Johnson Health Tech. Co., Ltd.

RF TEST REPORT

Report Type:

FCC Part 15C RF report

Model:

MAX-ONYX-C, XL-ONYX-C

REPORT NUMBER:

2407B0045SHA-001

ISSUE DATE:

October 17, 2024

DOCUMENT CONTROL NUMBER:

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Manufacturer : Same as applicant

Factory 1 : Same as applicant

Factory 2 : Johnson Industries (Shanghai) CO., LTD.
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FCC ID : TN7ONYX02

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2023): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

PREPARED BY:**REVIEWED BY:**

Project Engineer
Eric Li



Reviewer
Wakeyou Wang

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TEST REPORT

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Revision History

Report No.	Version	Description	Issued Date
2407B0045SHA-001	Rev. 01	Initial issue of report	October 17, 2024

Measurement result summary

TEST ITEM	FCC REFERENCE	RESULT
Radiated emissions	15.209	Pass
Conducted emissions	15.207	Pass

Notes: 1: NA =Not Applicable

2: Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

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1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Fitness Equipment TV Console
Type/Model:	MAX-ONYX-C, XL-ONYX-C
Description of EUT:	The EUT is Fitness Equipment TV Console, there are two models, they are the same except model name, display size. We tested MAX-ONYX-C as representative and listed the worst results in this report.
Rating:	12Vdc, 3A
Category of EUT:	Class B
EUT type:	☒ Table top ☐ Floor standing
Software Version:	/
Hardware Version:	/
Sample received date:	July 17, 2024
Date of test:	July 18, 2024 to July 29, 2024

1.2 Technical Specification

Frequency Range:	111kHz – 205kHz
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1.3 Description of Test Facility

Name:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.
Address:	Building 86, No. 1198 Qinzhou Road (North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L21189
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

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2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2023)
ANSI C63.10 (2013)

2.2 Mode of operation during the test

Within this test report, EUT was tested under all available operation modes and tested under its rating voltage and frequency. Other voltage and frequency are specified if used.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Brand and Model	Description
1	Wireless load	KjB/ZS3012	100% power level
2	Wireless load	KjB/ZS3012	50% power level
3	Wireless load	KjB/ZS3012	0% power level
4			

2.5 Test environment condition:

Test items	Temperature	Humidity
Radiated emission	25°C	54% RH
Power line conducted emission	26°C	54% RH

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2.6 Instrument list

Conducted Emission/Disturbance Power/Tri-loop Test/CDN method					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESR7	EC 6194	2025-02-27
☒	Attenuator	Hua Xiang	Ts5-10db-6g	EC 6194-1	2024-12-07
☒	A.M.N.	R&S	ESH2-Z5	EC 3119	2024-11-19
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESIB 26	EC 3045	2025-08-18
☒	Test Receiver	R&S	ESR	EC6501	2024-09-24
☒	TRILOG broadband Antenna	Schwarzbeck	VULB9168	EC6402	2025-03-19
☐	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC 5262	2025-06-15
☐	Pre-amplifier	Tonscend	tap01018050	EC 6432-1	2024-12-07
☐	Horn antenna	Tonscend	bha9120d	EC 6432-2	2025-03-20
☐	Horn antenna	ETS	3117	EC 4792-1	2024-09-15
☐	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2026-09-12
☒	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2025-08-10
☐	Horn antenna	ETS	3116c	EC 5955	2025-08-14
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☐	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2025-03-05
☐	Vector Signal Generator	Agilent	N5182B	EC 5175	2025-03-05
☐	Universal Radio Communication Tester	R&S	CMW500	EC5944	2025-03-05
☐	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2025-03-07
☐	Mobile Test System	Litepoint	lqxel	EC 5176	2025-01-11
☐	Test Receiver	R&S	ESCI 7	EC 4501	2025-03-09
☐	Climate chamber	GWS	MT3065	EC 6021	2025-03-07
☐	Spectrum Analyzer	Keysight	N9030B	EC 6078	2025-03-18
☐	Universal Radio Communication Tester	R&S	CMW500	EC 6209	2025-01-30

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Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Shielded room	Zhongyu	-	EC 2838	2025-01-11
☐	Shielded room	Zhongyu	-	EC 2839	2025-01-11
☒	Semi-anechoic chamber	Albatross project	-	EC 3048	2026-07-11
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Thermo-Hygrograph	Testo	175h1	EC 6640	2025-08-29
☐	Thermo-Hygrograph	Testo	175h1	EC 6641	2025-08-29
☒	Thermo-Hygrograph	Testo	175h1	EC6642	2025-08-29
☐	Thermo-Hygrograph	Testo	175h1	EC 6643	2025-08-29
☐	Thermo-Hygrograph	Testo	175h1	EC 6644	2025-08-29
☐	Pressure meter	YM3	Shanghai Mengde	EC 3320	2025-08-16

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2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Measurement	Frequency	Expanded Uncertainty ($k=2$)
Conducted emission at mains ports	9kHz ~ 150kHz	3.52 dB
	150kHz ~ 30MHz	3.19 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.90 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.02 dB
	6GHz ~ 18GHz	5.28 dB

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3 Radiated emissions

Test result: Pass

3.1 Limit

Frequencies (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

3.2 Measurement Procedure

For Radiated emission below 30MHz:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Both X and Y axes of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

- The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna 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.

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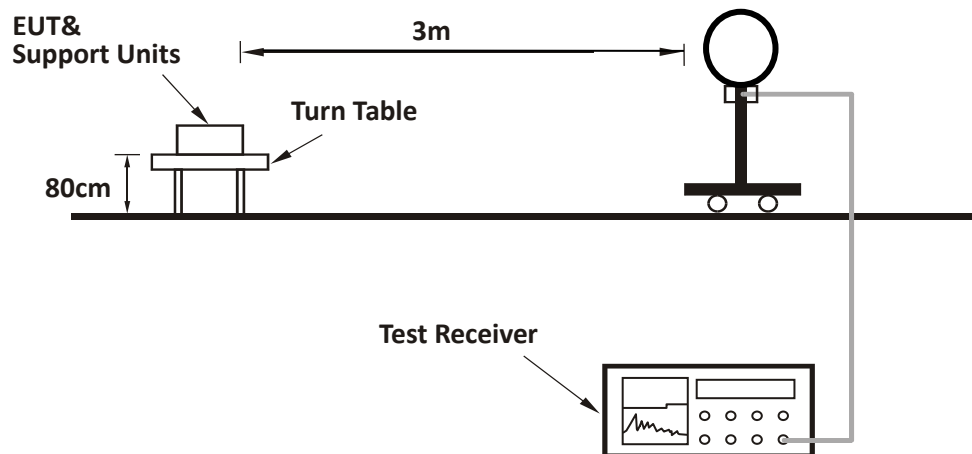
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

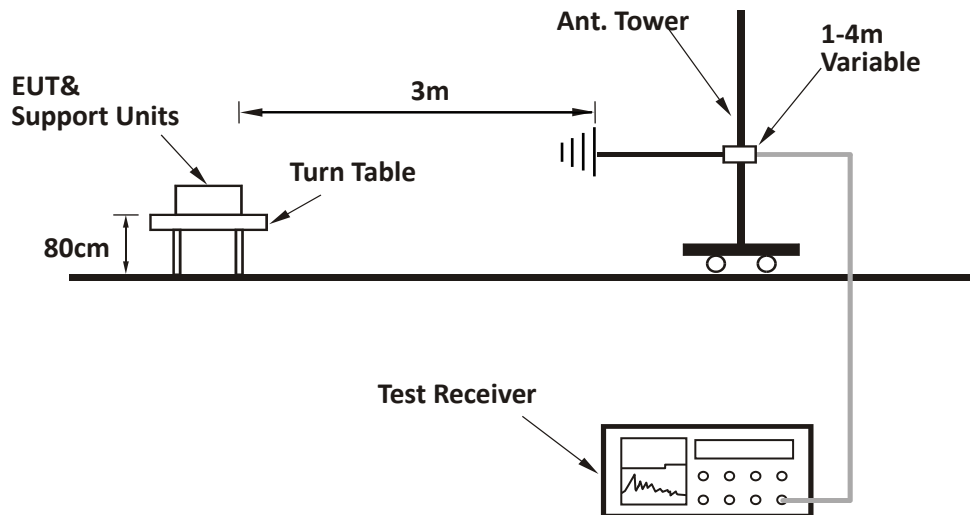
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. All modes of operation were evaluated and the worst-case emissions were reported

3.3 Test Configuration

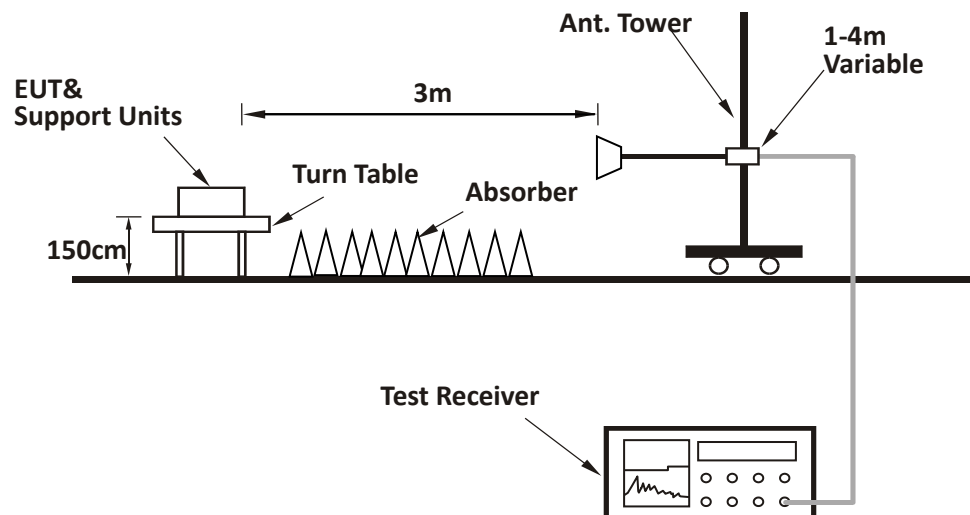
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



For Radiated emission above 1GHz:

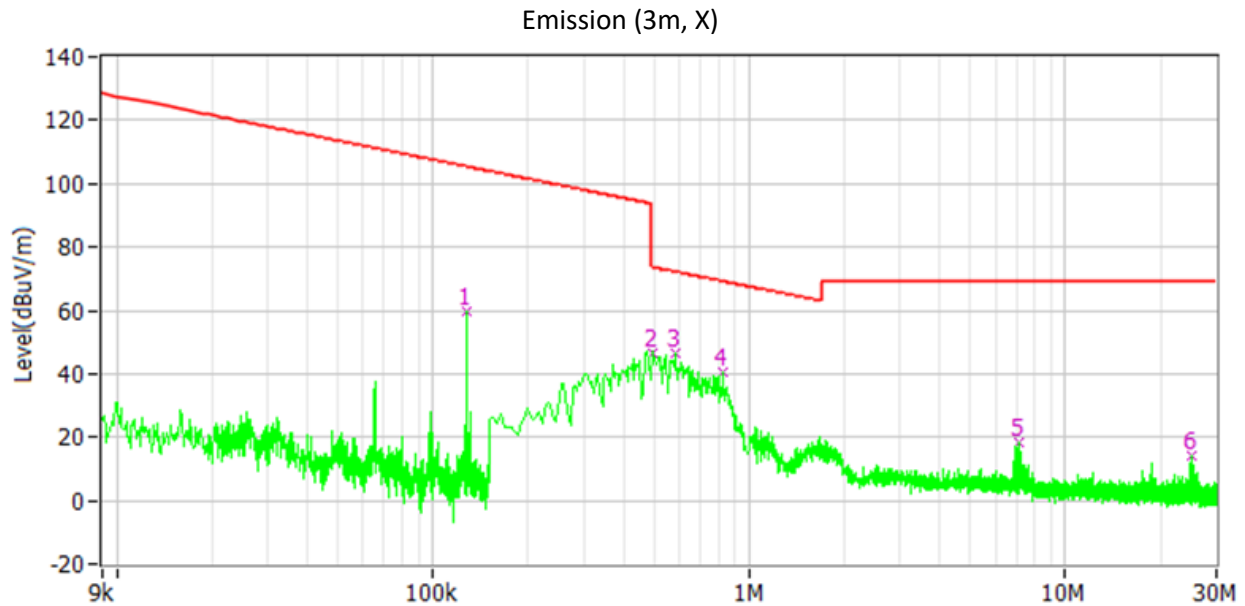


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3.4 Test Results of Radiated Emissions

EUT was tested with empty load, half load and full load, the full load is the worst case and we listed the results in the report.

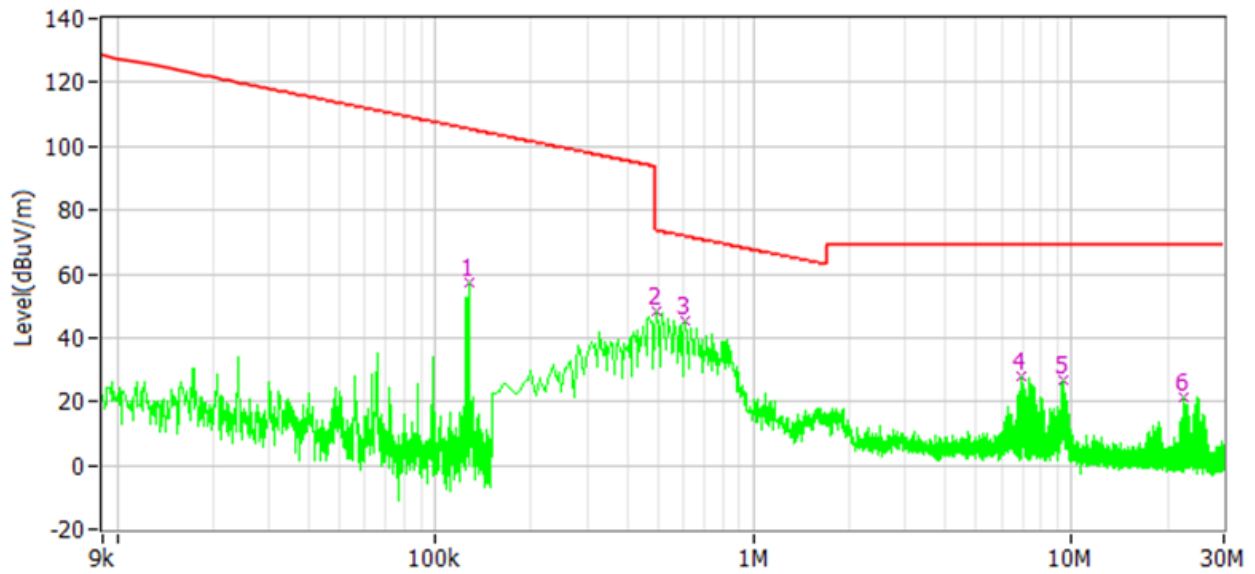
Test data below 30MHz:



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Detector	Polar
1	127.800kHz	105.5	59.6	-45.8	59.6	PK	X
2	496.500kHz	73.7	46.8	-26.9	46.8	PK	X
3	586.500kHz	72.2	46.6	-25.6	46.6	PK	X
4	825.000kHz	69.3	40.6	-28.6	40.6	PK	X
5	7.161MHz	69.5	18.6	-50.9	18.6	PK	X
6	25.179MHz	69.5	14.0	-55.5	14.0	PK	X

TEST REPORT

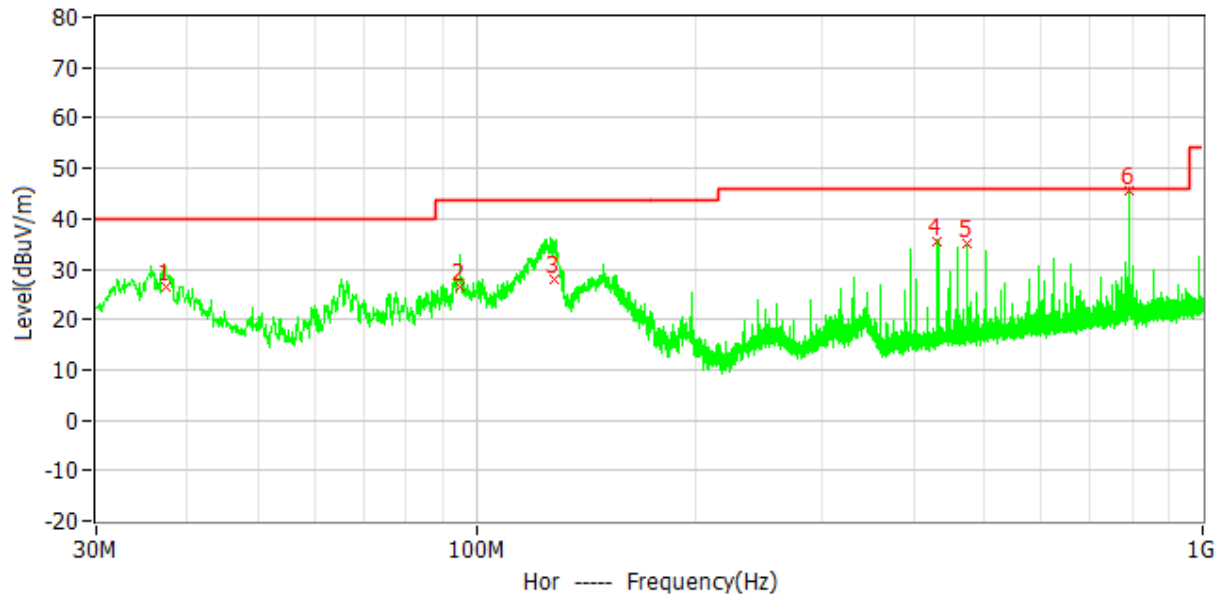
Emission (3m, Y)



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Detector	Polar
1	127.800kHz	105.5	57.2	-48.3	57.2	PK	Y
2	496.500kHz	73.7	48.2	-25.5	48.2	PK	Y
3	609.000kHz	71.9	45.1	-26.8	45.1	PK	Y
4	6.963MHz	69.5	27.7	-41.8	27.7	PK	Y
5	9.411MHz	69.5	26.5	-43.0	26.5	PK	Y
6	22.587MHz	69.5	21.2	-48.3	21.2	PK	Y

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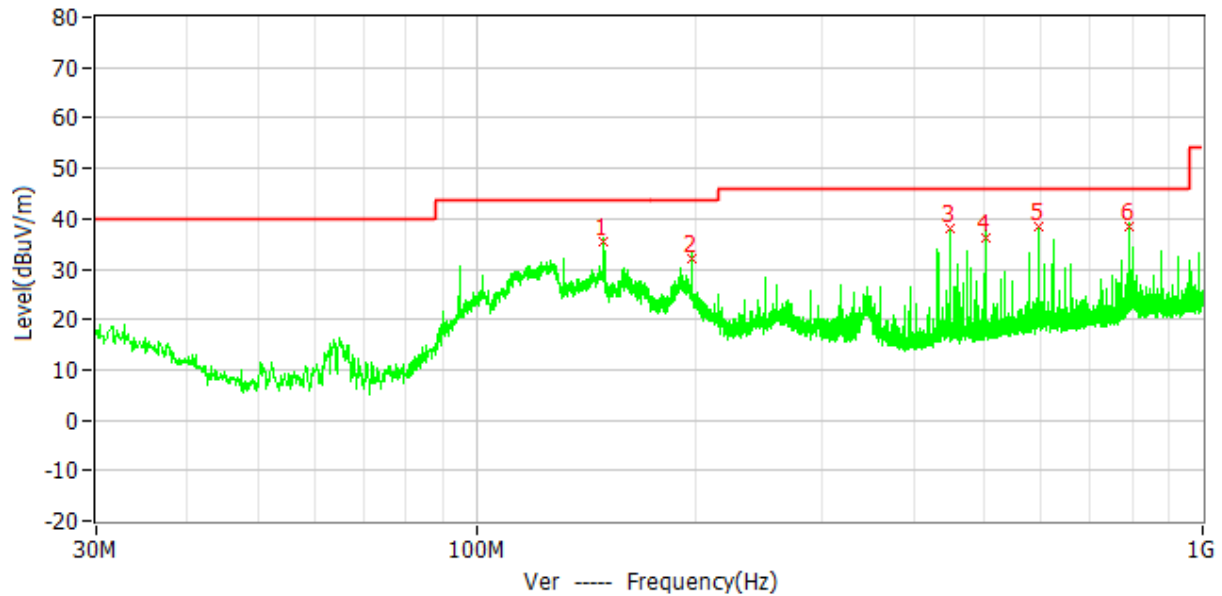
Horizontal



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	37.382MHz	40.0	26.3	-13.7	10.6	15.7	QP	Hor
2	94.942MHz	43.5	26.4	-17.1	15.4	11.0	QP	Hor
3	127.752MHz	43.5	28.1	-15.4	15.0	13.1	QP	Hor
4	431.994MHz	46.0	35.3	-10.7	16.7	18.6	QP	Hor
5	475.201MHz	46.0	35.1	-10.9	15.6	19.5	QP	Hor
6	792.065MHz	46.0	45.5	-0.5	22.8	22.7	QP	Hor

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Vertical



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	150.005MHz	43.5	35.6	-7.9	23.6	12.0	QP	Ver
2	198.008MHz	43.5	32.0	-11.5	21.2	10.8	QP	Ver
3	450.013MHz	46.0	37.9	-8.1	18.9	19.0	QP	Ver
4	504.009MHz	46.0	36.3	-9.7	16.3	20.0	QP	Ver
5	594.020MHz	46.0	38.6	-7.4	17.3	21.3	QP	Ver
6	792.033MHz	46.0	38.4	-7.6	15.7	22.7	QP	Ver

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.

2. Level = Original Receiver Reading + Correct Factor

3. Delta = Level - Limit

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

4 Conducted emissions

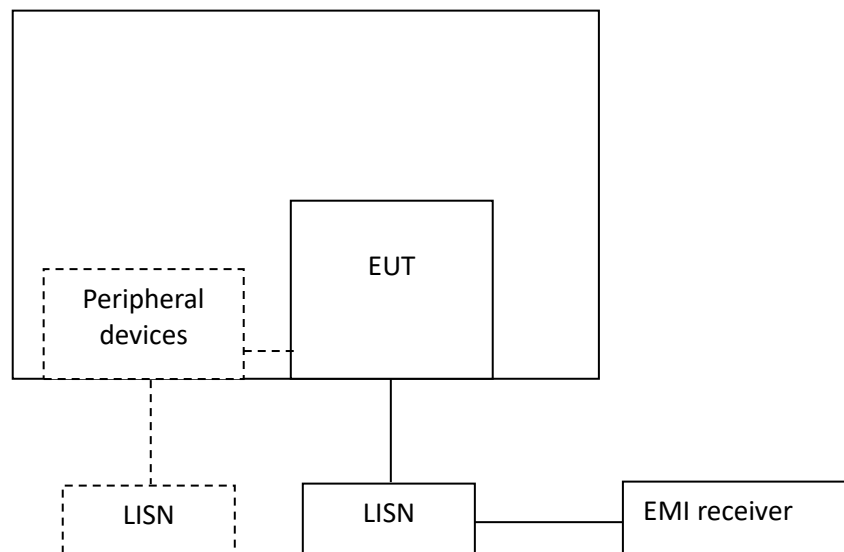
Test result: Pass

4.1 Limit

Frequency of Emission (MHz)	Conducted Emissions Limit (dBuV)	
	QP	AV
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.

4.2 Test Configuration



TEST REPORT**4.3 Measurement Procedure**

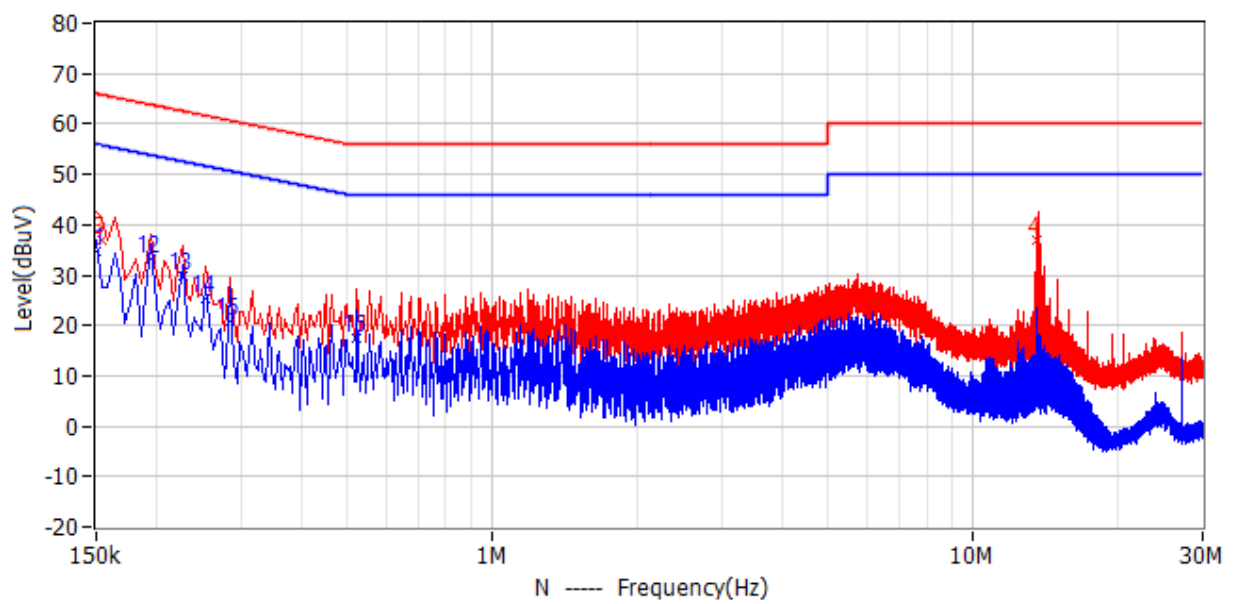
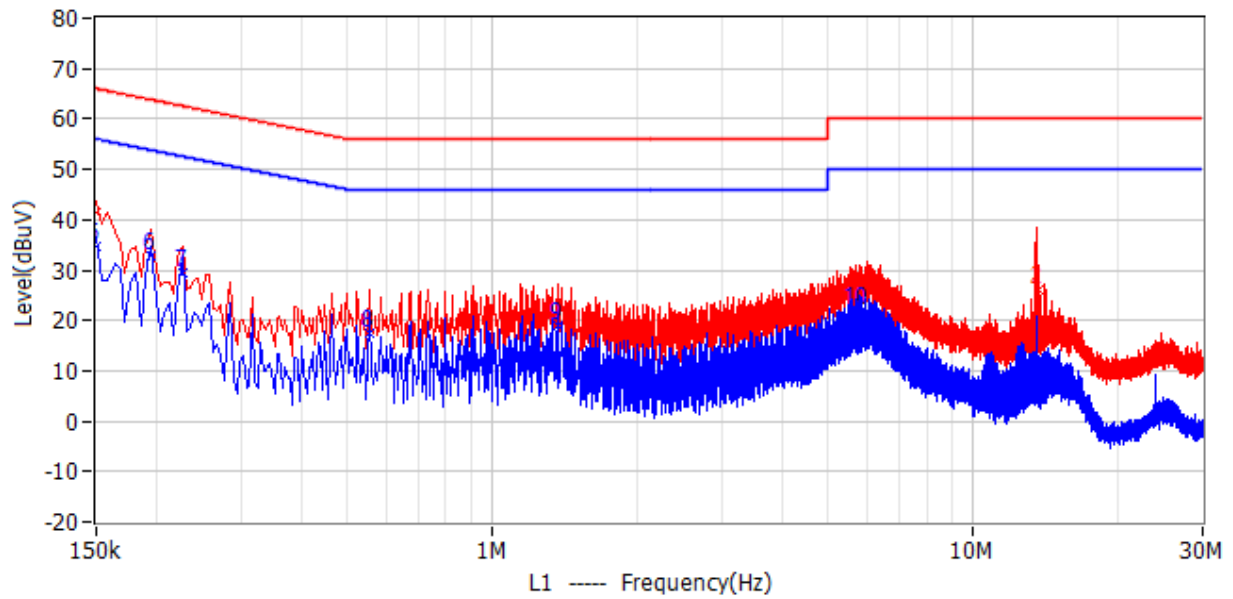
Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

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4.4 Test Results of Conducted Emissions



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Data:

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Phase
1	150.000kHz	66.0	41.5	-24.5	35.3	6.2	QP	L1
2	13.668MHz	60.0	26.0	-34.0	19.5	6.5	QP	L1
3	154.500kHz	65.8	37.0	-28.7	30.7	6.3	QP	N
4	13.569MHz	60.0	36.9	-23.1	30.5	6.4	QP	N
5	150.000kHz	56.0	34.7	-21.3	28.5	6.2	CAV	L1
6	195.000kHz	53.8	32.9	-20.9	26.6	6.3	CAV	L1
7	226.500kHz	52.6	29.6	-23.0	23.3	6.3	CAV	L1
8	555.000kHz	46.0	17.3	-28.7	11.0	6.3	CAV	L1
9	1.365MHz	46.0	19.0	-27.0	12.7	6.3	CAV	L1
10	5.757MHz	50.0	22.1	-27.9	15.7	6.4	CAV	L1
11	150.000kHz	56.0	34.5	-21.5	28.3	6.2	CAV	N
12	195.000kHz	53.8	33.0	-20.8	26.7	6.3	CAV	N
13	226.500kHz	52.6	29.7	-22.9	23.4	6.3	CAV	N
14	253.500kHz	51.6	25.2	-26.5	19.0	6.2	CAV	N
15	285.000kHz	50.7	20.9	-29.7	14.7	6.2	CAV	N
16	523.500kHz	46.0	17.6	-28.4	11.4	6.2	CAV	N

Remark: 1. Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.
 2. Level = Reading + Factor
 3. Delta = Level - Limit
 4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

***** END *****