PRIMST（CHUZHOU）INNOVATION CO.LTD

RF TEST REPORT

Report Type:
FCC Part 15C RF report

Model:
CT51-FRIDGE, TB-135, TB-135EYD, SCT-135EYD, HMCRCT135

REPORT NUMBER:
220602246SHA-002

ISSUE DATE:
March 6, 2023

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TEST REPORT

Report no.: 220602246SHA-002

Applicant	:	PRIMST（CHUZHOU）INNOVATION CO.LTD NO. 588, NORTH SHANGHAI ROAD, CHUZHOU CITY, ANHUI, CHINA
Manufacturer	:	PRIMST（CHUZHOU）INNOVATION CO.LTD NO. 588, NORTH SHANGHAI ROAD, CHUZHOU CITY, ANHUI, CHINA
Manufacturer Site	:	PRIMST（CHUZHOU）INNOVATION CO.LTD NO. 588, NORTH SHANGHAI ROAD, CHUZHOU CITY, ANHUI, CHINA
Type/Model:	:	CT51-FRIDGE, TB-135, TB-135EYD, SCT-135EYD, HMCRCT135
FCC ID	:	2A9LV-CT51FRIDGE

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:
47CFR Part 15 (2019): Radio Frequency Devices (Subpart C) **ANSI C63.10 (2014):** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

PREPARED BY:	**REVIEWED BY:**
Project Engineer Dylan Tang	Reviewer Wakeyou Wang

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Content

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Revision History

Report No.	Version	Description	Issued Date
220602246SHA-002	Rev. 01	Initial issue of report	March 6, 2023

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Measurement result summary

TEST ITEM	FCC REFERANCE	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.

3: Additions, Deviations and Exclusions from Standards: None.

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	SMART COFFEE TABLE(REFRIGERATOR)
Type/Model:	CT51-FRIDGE, TB-135, TB-135EYD, SCT-135EYD, HMCRCT135
Description of EUT:	The EUT is a SMART COFFEE TABLE which supports Wireless Charger and Bluetooth function, there are some series model and they are same except the appearance color. so choose CT51-FRIDGE to test as representative.
Rating:	110-120V ~ 60Hz
Category of EUT:	Class B
EUT type:	☐ Table top ☒ Floor standing
Software Version:	0x0073
Hardware Version:	YZ-TB-CONTROL
Sample received date:	July 26, 2022
Date of test:	July 26, 2022 ~ February 28, 2023
Note：3m AC cable with one core.	

1.2 Technical Specification

Frequency Range:	111kHz – 205kHz
Modulation:	FSK
Antenna:	Coil antenna

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1.3 Description of Test Facility

Name:	Intertek Testing Services Shanghai
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 L0139
	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

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2019)
ANSI C63.10 (2014)

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	Iphone X	100% power level
2	Wireless load	Iphone X	50% power level
3	Wireless load	Iphone X	0% power level

2.5 Test environment condition:

Test items	Temperature	Humidity
Radiated emission	25°C	54% RH
Power line conducted emission	24°C	54% RH

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2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESCS 30	EC 2107	2023-07-18
☑	A.M.N.	R&S	ESH2-Z5	EC 3119	2023-11-09
☐	A.M.N.	R&S	ENV4200	EC 3558	2023-06-04
☐	Attenuator	Huaxiang	TS5-10dB-6G-B	21062303	2023-04-24
☑	Shielded room	Zhongyu	-	EC 2838	2024-01-11
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESIB 26	EC 3045	2023-07-18
☑	Test Receiver	Keysight	N9030A	EC 5338	2023-03-14
☐	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2023-08-23
☐	Horn antenna	R&S	HF 906	EC 3049	2023-01-17
☐	Horn antenna	ETS	3117	EC 4792-1	2023-06-27
☐	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2023-07-29
☑	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC 5262	2023-06-04
☑	Semi-anechoic chamber	Albatross project	-	EC 3048	2023-07-13
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2023-03-24
☑	Pressure meter	YM3	Shanghai Mengde	EC 4620	2023-09-13

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

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:

a) 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.
b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c) Both X and Y axes of the antenna are set to make the measurement.
d) 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.
e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz:

a) 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.

b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c) 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.

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.

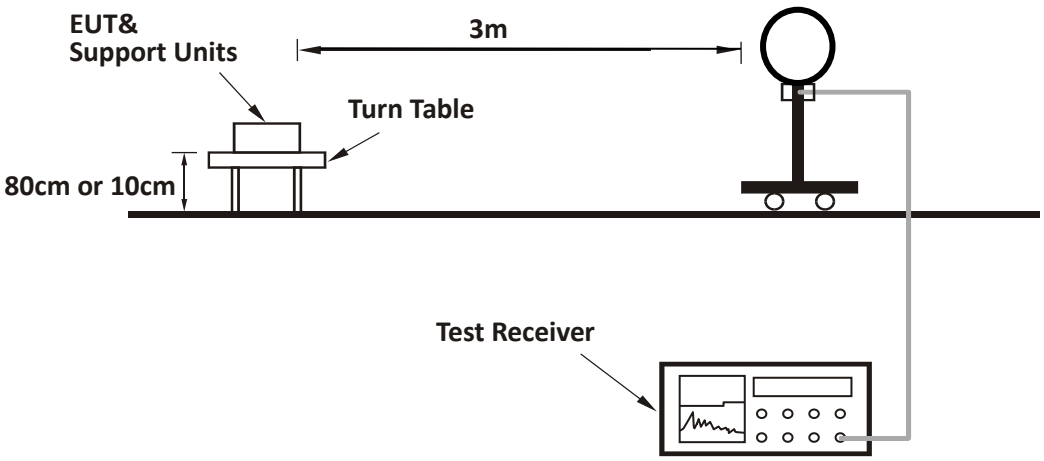
f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

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:



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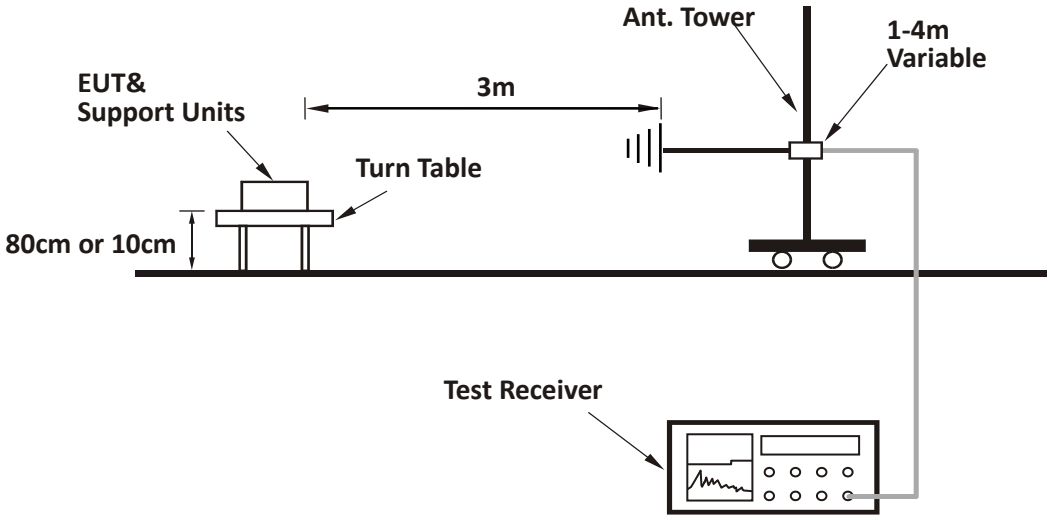
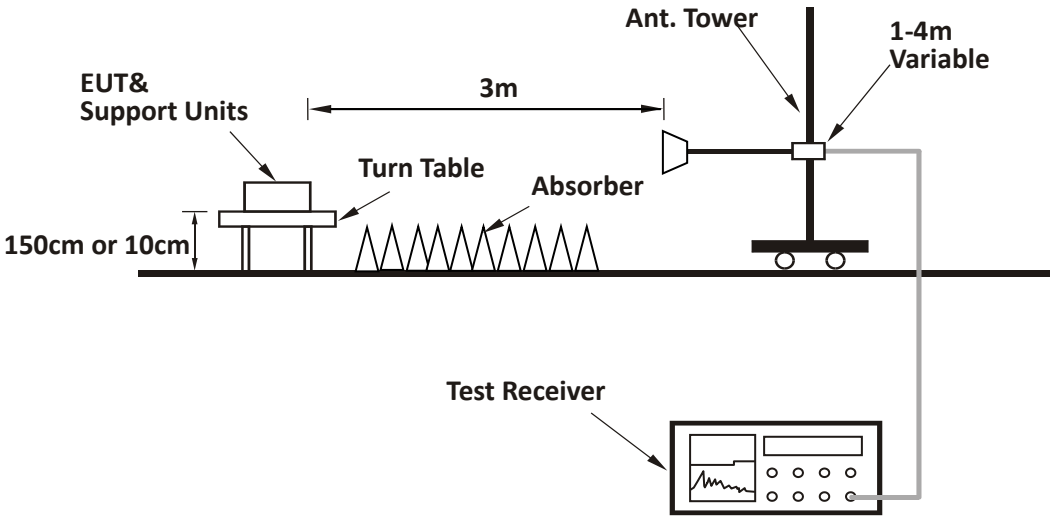
For Radiated emission 30MHz to 1GHz:



For Radiated emission above 1GHz:



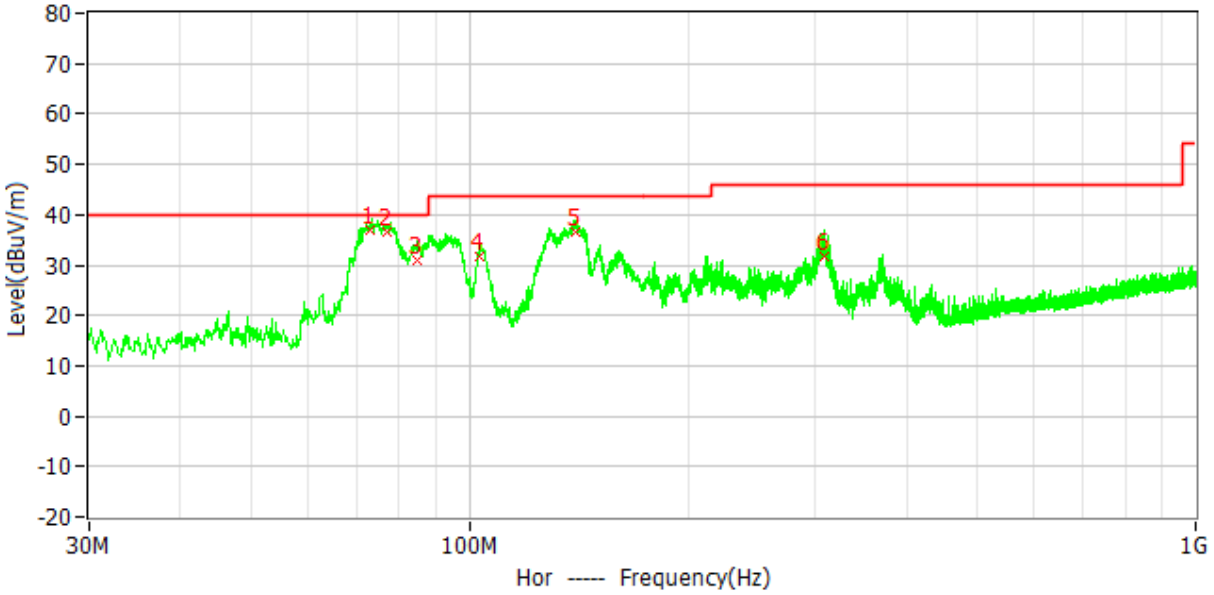
3.4 Test Results of Radiated Emissions

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.

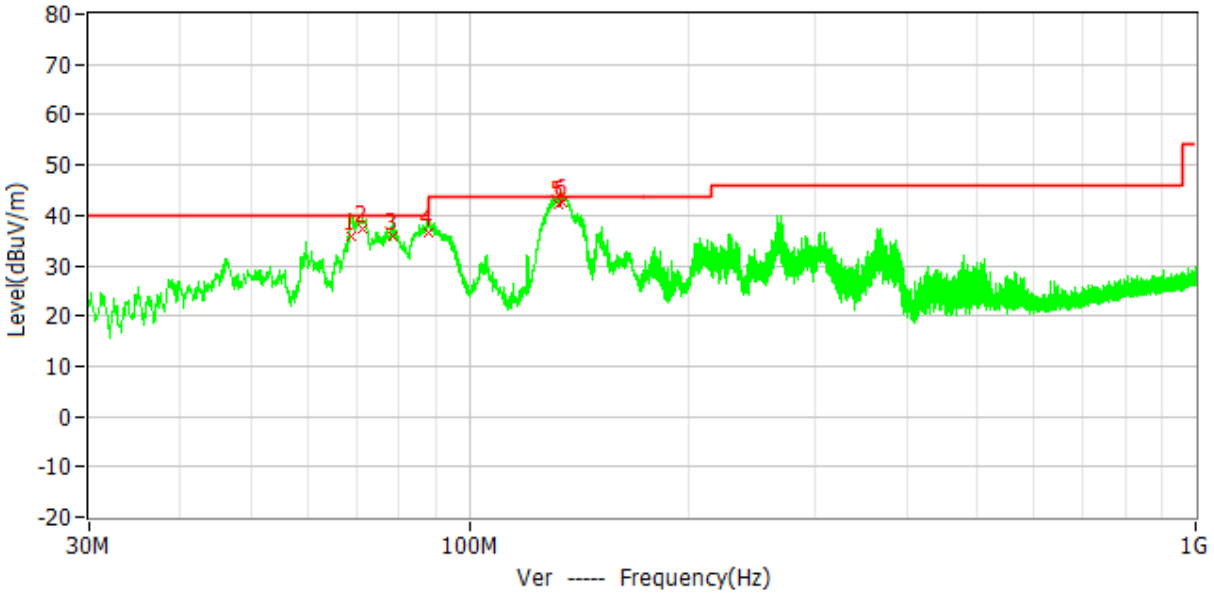
Test data below 30MHz:

Antenna Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin	Detector	Remark
X	0.1282	83.2	20.2	105.4	22.2	PK	Fundamental
X	0.0243	63.6	20.2	119.9	56.3	PK	Spurious
X	0.5055	59.1	20.0	73.5	14.4	PK	Spurious
X	0.6225	58.7	20.1	71.7	13.0	PK	Spurious
X	0.7485	56.4	20.1	70.1	13.7	PK	Spurious
X	10.527	46.1	20.3	69.5	23.4	PK	Spurious
Y	0.1281	78.8	20.2	105.4	26.7	PK	Fundamental
Y	0.285	59.2	20.1	98.5	39.3	PK	Spurious
Y	0.492	59.6	20.0	73.8	14.2	PK	Spurious
Y	0.582	60.1	20.0	72.3	12.2	PK	Spurious
Y	0.681	56.6	20.1	70.9	14.4	PK	Spurious
Y	10.433	47.5	20.3	69.5	22.0	PK	Spurious
Z	0.1281	77.7	20.2	105.4	27.8	PK	Fundamental
Z	0.0245	62.5	20.2	119.8	57.3	PK	Spurious
Z	0.456	60.9	20.0	94.4	33.5	PK	Spurious
Z	0.5235	59.4	20.0	73.2	13.9	PK	Spurious
Z	0.7485	57.4	20.1	70.1	12.7	PK	Spurious
Z	10.532	41.7	20.3	69.5	27.8	PK	Spurious

Horizontal



Vertical



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Test data from 30MHz to 1000MHz:

Antenna Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin	Detector
H	73.187MHz	37.1	11.8	40.0	2.9	QP
H	77.239MHz	36.5	10.7	40.0	3.5	QP
H	85.004MHz	30.9	9.3	40.0	9.1	QP
H	103.503MHz	31.7	10.2	43.5	11.8	QP
H	139.899MHz	36.5	14.1	43.5	7.0	QP
H	307.458MHz	31.6	15.3	46.0	14.4	QP
V	68.899MHz	35.9	12.9	40.0	4.1	QP
V	71.284MHz	37.2	12.3	40.0	2.8	QP
V	78.655MHz	35.9	10.3	40.0	4.1	QP
V	87.750MHz	36.4	9.0	40.0	3.6	QP
V	132.467MHz	42.1	13.1	43.5	1.4	QP
V	134.034MHz	42.4	13.3	43.5	1.1	QP

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. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

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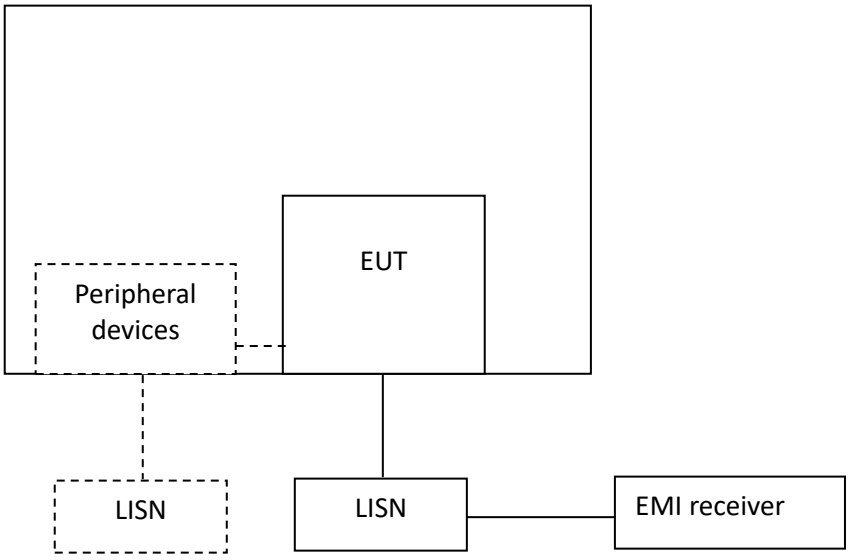
4 Conducted emissions

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



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.

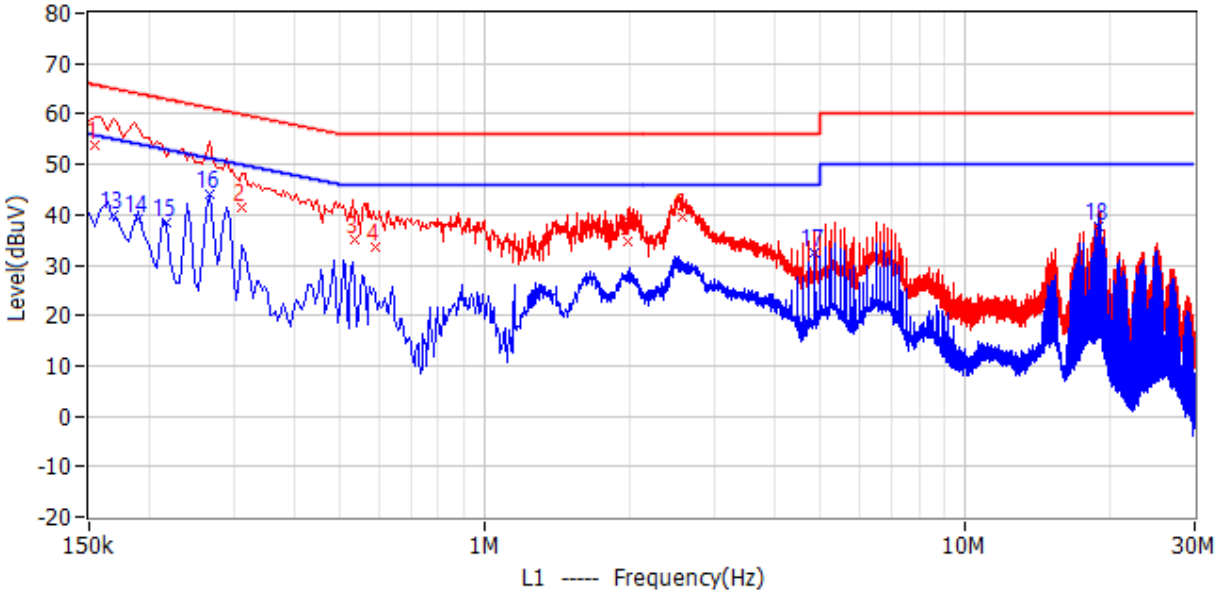
The bandwidth of the test receiver is set at 9 kHz.

4.4 Test Results of Conducted Emissions

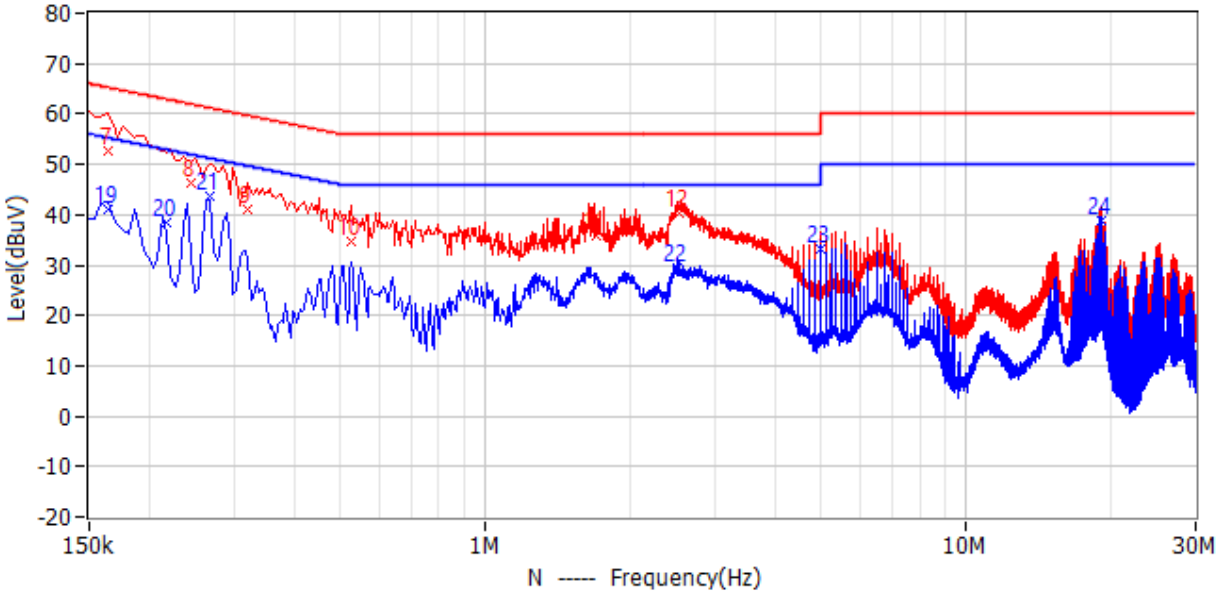
EUT was tested with empty load, half load and full load, the full load is the worst case and we listed the results in the report.

Test Curve:

L Line



N Line



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Test Data:

No.	Frequency	Limit dBuV	Level dBuV	Margin dB	Reading dBuV	Factor dB	Detector	Phase
1	154.500kHz	65.8	53.9	11.8	47.7	6.2	QP	L1
2	312.000kHz	59.9	41.5	18.4	35.3	6.2	QP	L1
3	537.000kHz	56.0	34.9	21.1	28.7	6.2	QP	L1
4	591.000kHz	56.0	33.4	22.6	27.2	6.2	QP	L1
5	1.982MHz	56.0	34.7	21.3	28.5	6.2	QP	L1
6	2.585MHz	56.0	39.6	16.4	33.4	6.2	QP	L1
7	163.500kHz	65.3	52.7	12.6	46.5	6.2	QP	N
8	244.500kHz	61.9	46.3	15.6	40.1	6.2	QP	N
9	321.000kHz	59.7	40.9	18.8	34.7	6.2	QP	N
10	528.000kHz	56.0	34.5	21.5	28.2	6.3	QP	N
11	1.698MHz	56.0	35.7	20.3	29.4	6.3	QP	N
12	2.540MHz	56.0	40.4	15.6	34.1	6.3	QP	N
13	168.000kHz	55.1	40.1	14.9	34.0	6.1	AV	L1
14	190.500kHz	54.0	39.0	15.0	32.8	6.2	AV	L1
15	217.500kHz	52.9	38.3	14.6	32.1	6.2	AV	L1
16	267.000kHz	51.2	44.0	7.2	37.8	6.2	AV	L1
17	4.853MHz	46.0	32.6	13.4	26.3	6.3	AV	L1
18	18.897MHz	50.0	37.8	12.2	31.4	6.4	AV	L1
19	163.500kHz	55.3	41.2	14.1	35.0	6.2	AV	N
20	217.500kHz	52.9	38.6	14.3	32.3	6.3	AV	N
21	267.000kHz	51.2	43.8	7.4	37.6	6.2	AV	N
22	2.517MHz	46.0	29.6	16.4	23.3	6.3	AV	N
23	4.979MHz	46.0	33.1	12.9	26.8	6.3	AV	N
24	19.149MHz	50.0	38.8	11.2	32.3	6.5	AV	N

Remark: 1. Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Reading = Original Receiver Reading + Factor

3. Margin = Limit - Level

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

********** END **********