

IKEA of Sweden AB

TEST REPORT

SCOPE OF WORK:

FCC Part 15 subpart B – EMC report

Model:

B2202 BRUNBÅGE

REPORT NUMBER

211202683SHA-001

ISSUE DATE

May 16, 2022

DOCUMENT CONTROL NUMBER

TTRFFCCPART15b_V1

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Report no. 211202683SHA-001

Applicant : **IKEA of Sweden AB**
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Manufacturer : **Zhe Jiang Hao Ting Lighting Co. Ltd**
Feng Ming Industrial Zone, Tongxiang City, Zhejiang Province,
314505, China

Summary

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

47CFR Part 15 (2020): Radio Frequency Devices (Subpart B)

ANSI C63.4 (2014): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

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Revision History

Report No.	Version	Description	Issued Date
211202683SHA-001	Rev. 01	Initial issue of report	May 16, 2022

Measurement result summary

TEST ITEM	FCC REFERENCE	TEST RESULT	NOTE
Conducted emission	15.107	Pass	
Radiation emission	15.109	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.

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product Name : Table Lamp
Type/Model : B2202 BRUNBÅGE
Description of EUT : We tested it, and listed the worst data.
Rating : 5V DC, Max.2,1W, Class III, IP20
Brand name : IKEA
Category of EUT : Class B
EUT type : ☒ Table top
☐ Floor standing
Sample received date : December 2, 2021
Sample identification No. : 0211202-43
Date of test : December 2, 2021~January 18, 2022

1.2 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 : CNAS Accreditation Lab
recognized, certified, Registration No. CNAS L0139
or accredited by these FCC Accredited Lab
organizations Designation Number: CN0175

IC Registration Lab
CAB identifier.: CN0051

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 (2020): Radio Frequency Device: Subpart B

ANSI C63.4 (2014): Interim Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz.

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 is 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	Band and Model	Description

2.5 Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)
Conducted emission	23	46	NA
Radiated Emission	24	43	NA

Notes: NA =Not Applicable

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	2022-12-9
☒	Attenuator	Hua Xiang	Ts5-10db-6g	EC 6194-1	2022-12-9
☒	A.M.N.	R&S	ESH2-Z5	EC 3119	2022-11-9
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESIB 26	EC 3045	2022-10-19
☒	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2022-8-6
☒	TRILOG broadband Antenna	Schwarzbeck	VULB9168	EC6402	2023-2-10
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Shielded room	Zhongyu	-	EC 2838	2023-1-11
☒	Semi-anechoic chamber	Albatross project	-	EC 3048	2022-8-22
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Thermo-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2023-3-23
☒	Thermo-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3442	2023-1-3

2.7 Measurement Uncertainty

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted emission at mains ports	9kHz ~ 150kHz	3.71 dB
	150kHz ~ 30MHz	3.31 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.04 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.97 dB
	6GHz ~ 18GHz	5.29 dB

3 Conducted emission

Test result: Pass

3.1 Limits

3.1.1 Limits for conducted emission of class A device

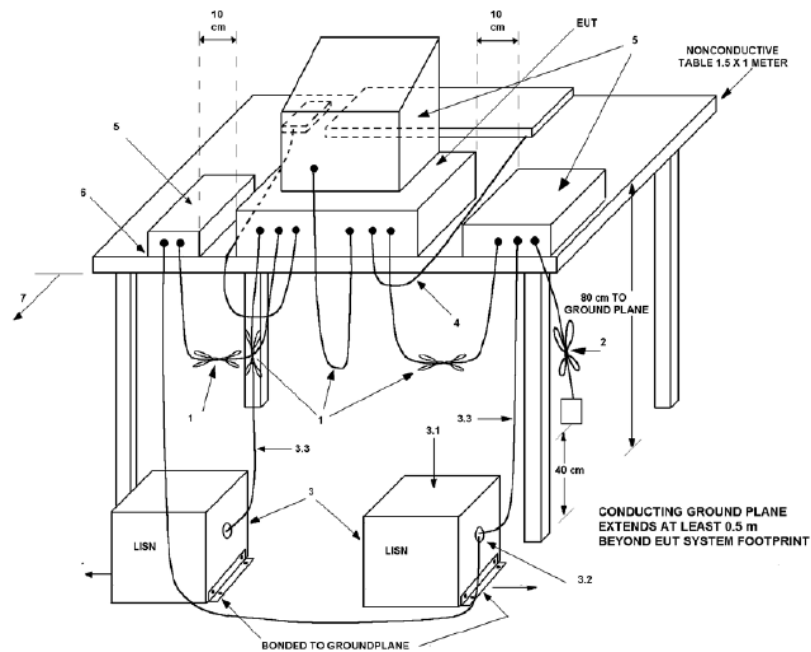
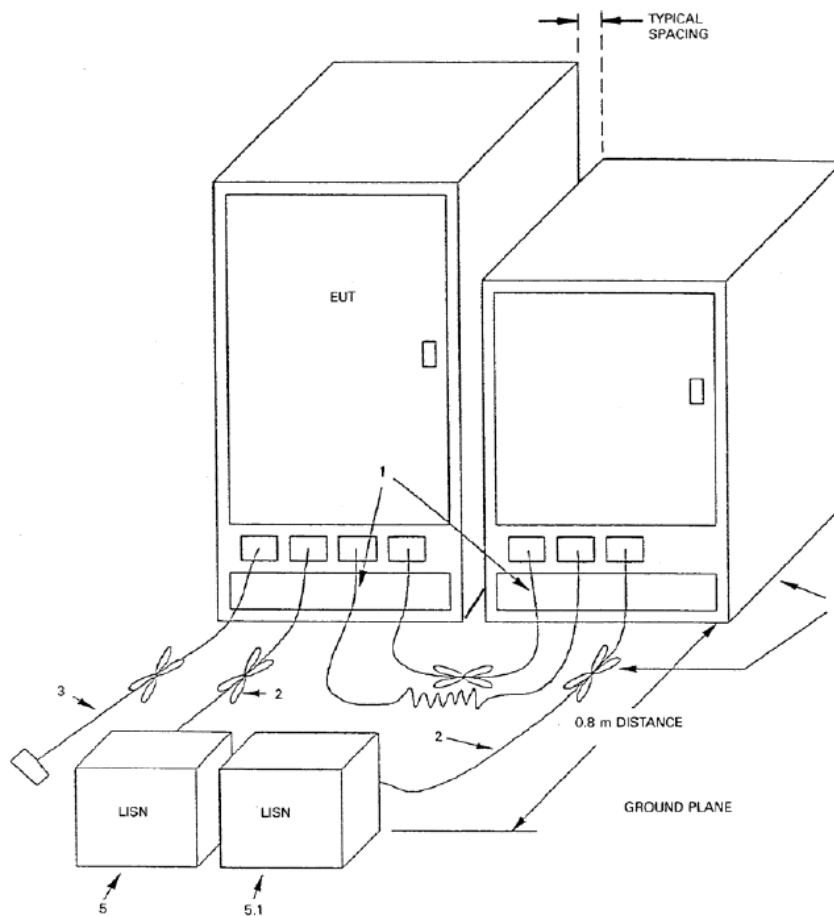
Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.1.2 Limits for conducted emission of class B device

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.2 Test setup

 For table top equipment

☐ For floor standing equipment

3.3 Test Setup and Test Procedure

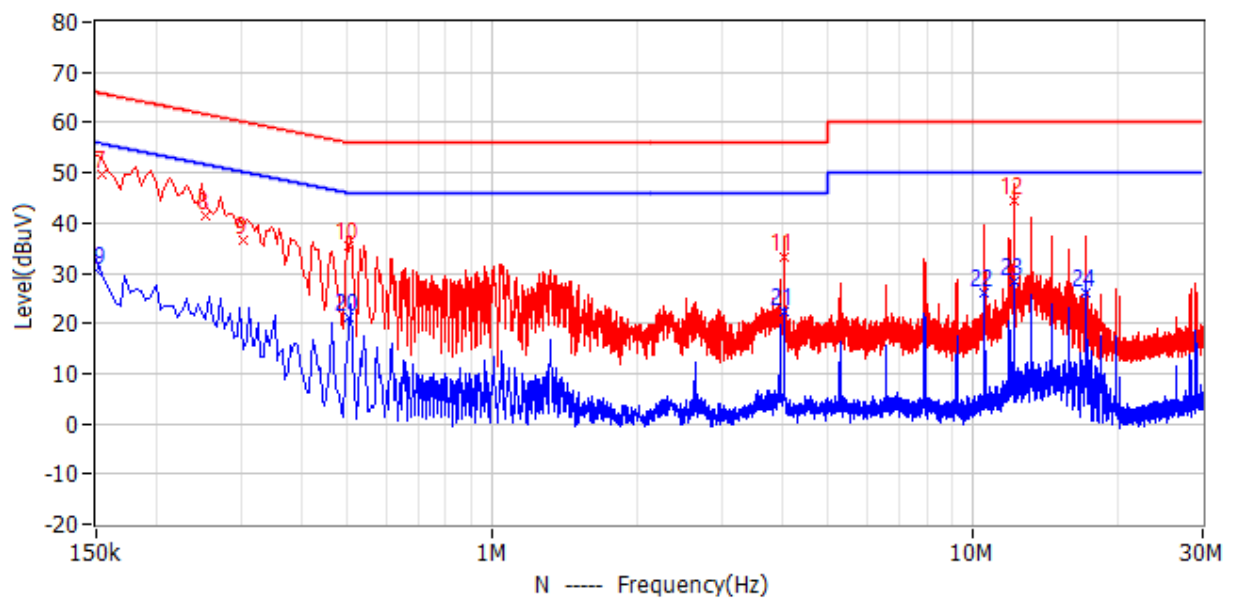
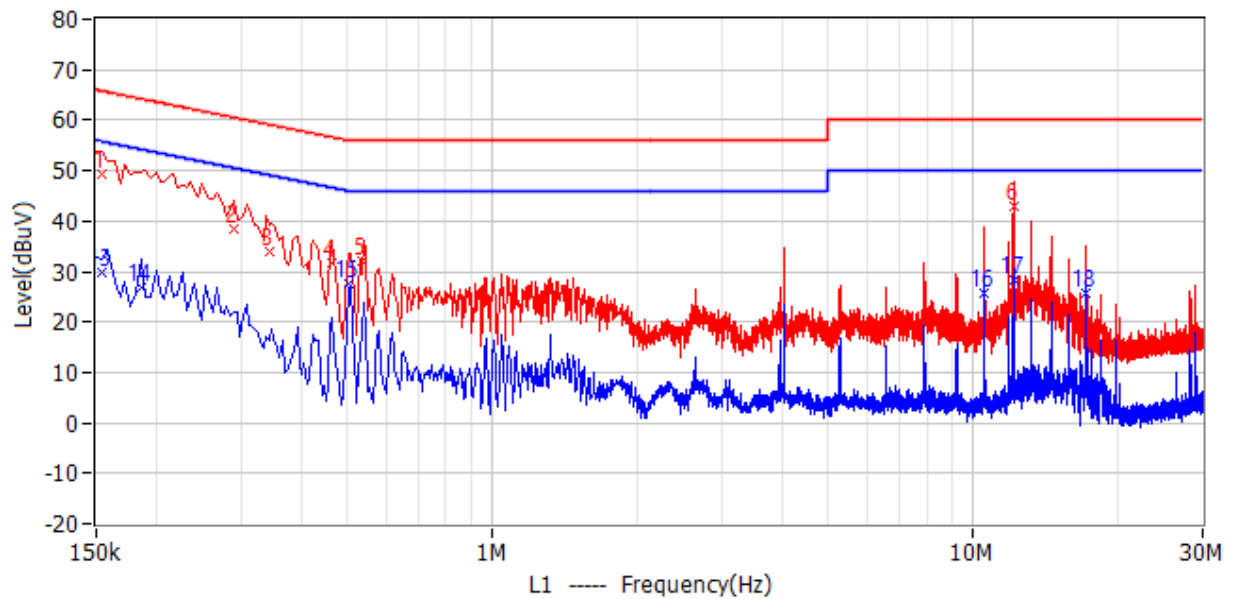
Measurement was performed in shielded room, and instruments used were following clause 4 and clause 5 of ANSI 63.4.

Detailed test procedure was following clause 7.3 of ANSI 63.4.

EUT arrangement and operation conditions were according to clause 6 and clause 7 of ANSI 63.4.

Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

3.4 Test Protocol



No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Phase
1	154.500kHz	65.8	49.2	-16.6	38.8	10.4	QP	L1
2	289.500kHz	60.5	38.5	-22.0	28.2	10.3	QP	L1
3	343.500kHz	59.1	34.0	-25.1	23.7	10.3	QP	L1
4	465.000kHz	56.6	31.6	-25.1	21.3	10.3	QP	L1
5	537.000kHz	56.0	32.1	-23.9	21.7	10.4	QP	L1
6	12.116MHz	60.0	43.0	-17.0	32.1	10.9	QP	L1
7	154.500kHz	65.8	49.7	-16.1	39.3	10.4	QP	N
8	253.500kHz	61.6	41.3	-20.3	31.0	10.3	QP	N
9	303.000kHz	60.2	36.5	-23.7	26.2	10.3	QP	N
10	501.000kHz	56.0	35.5	-20.5	25.2	10.3	QP	N
11	4.038MHz	56.0	33.0	-23.0	22.6	10.4	QP	N

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Phase
12	12.125MHz	60.0	44.3	-15.7	33.5	10.8	QP	N
13	154.500kHz	55.8	29.9	-25.8	19.5	10.4	CAV	L1
14	186.000kHz	54.2	26.8	-27.4	16.5	10.3	CAV	L1
15	501.000kHz	46.0	27.4	-18.6	17.1	10.3	CAV	L1
16	10.568MHz	50.0	25.7	-24.3	14.8	10.9	CAV	L1
17	12.120MHz	50.0	28.2	-21.8	17.3	10.9	CAV	L1
18	17.174MHz	50.0	25.6	-24.4	14.5	11.1	CAV	L1
19	150.000kHz	56.0	30.7	-25.3	20.4	10.3	CAV	N
20	501.000kHz	46.0	21.1	-24.9	10.8	10.3	CAV	N
21	4.043MHz	46.0	22.2	-23.8	11.8	10.4	CAV	N
22	10.568MHz	50.0	26.2	-23.8	15.3	10.9	CAV	N
23	12.120MHz	50.0	28.4	-21.6	17.6	10.8	CAV	N
24	17.169MHz	50.0	26.0	-24.0	15.0	11.0	CAV	N

- Remark: 1. Correct Factor = LISN Factor + Cable Loss, 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.

Example: Assuming LISN Factor = 10.00dB, Cable Loss = 2.00dB,
Original Receiver Reading = 10.00dBuV, Limit = 66.00dBuV.
Then Correct Factor = 10.00 + 2.00 = 12.00dB;
Corrected Reading = 10dBuV + 12.00dB = 22.00dBuV;
Margin = 66.00dBuV – 22.00dBuV = 44.00dB.

4 Radiated emission

Test result: PASS

4.1 Radiated emission limits

4.1.1 Limits for radiated emission of class A device

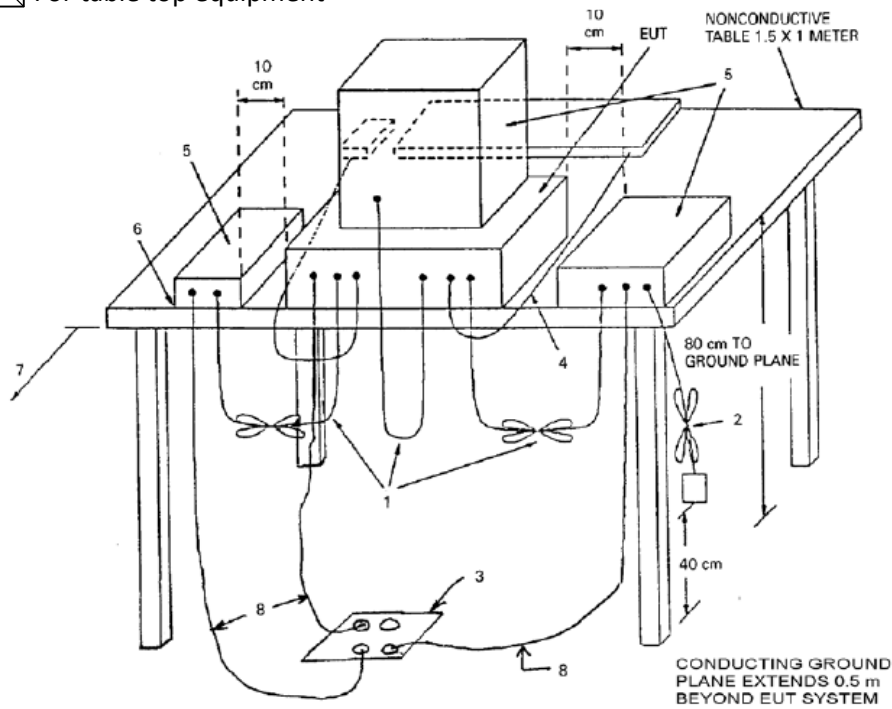
Frequency (MHz)	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 10m
30 ~ 88	39
88 ~ 216	43.5
216 ~ 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.1.2 Limits for radiated emission of class B device

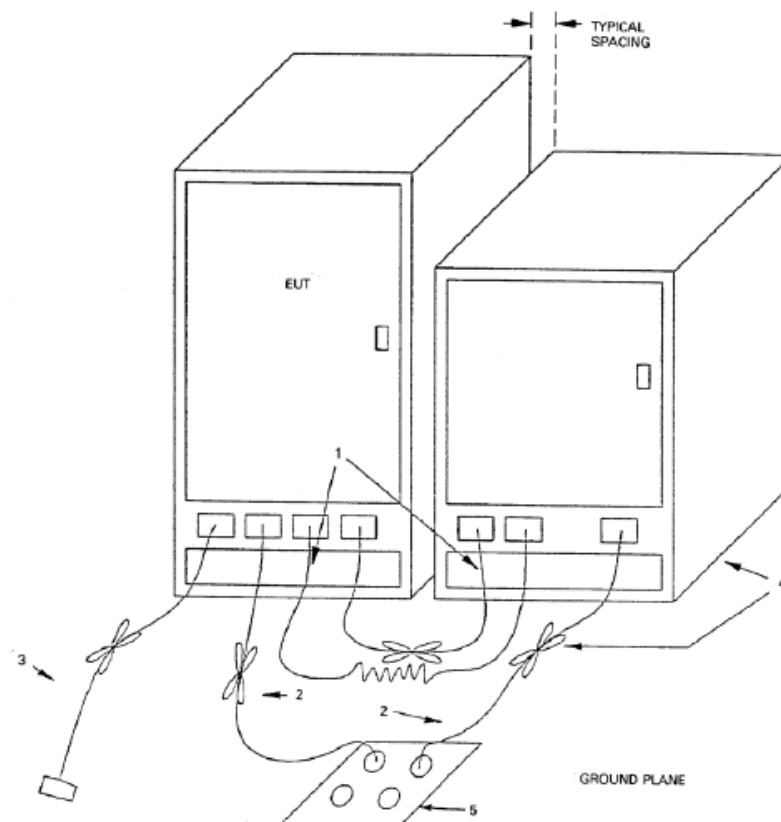
Frequency (MHz)	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 3m
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.2 Block diagram and test set up

☐ For table top equipment



☐ For floor standing equipment



4.3 Test Setup and Test Procedure

The measurement was performed in a semi-anechoic chamber.

The distance from EUT to receiving antenna is 3 meter.

Measurement was performed according to clause 4 and clause 5 of ANSI 63.4.

Test procedure was according to clause 8.3 of ANSI 63.4.

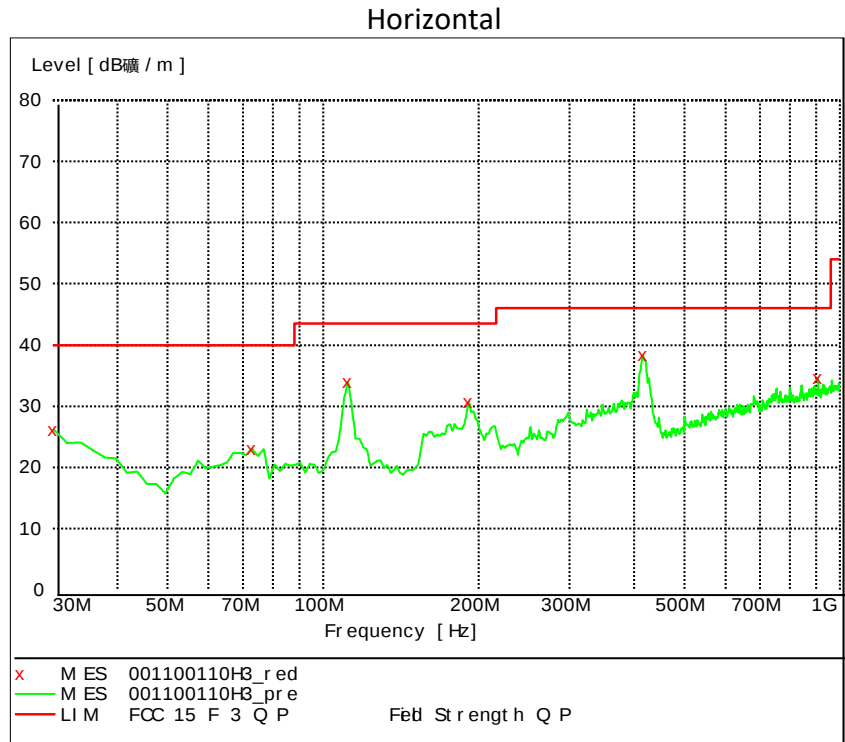
EUT arrangement and operate condition were according to clause 6 and clause 8 of ANSI 63.4.

The bandwidth setting on R&S Test Receiver was 120 kHz.

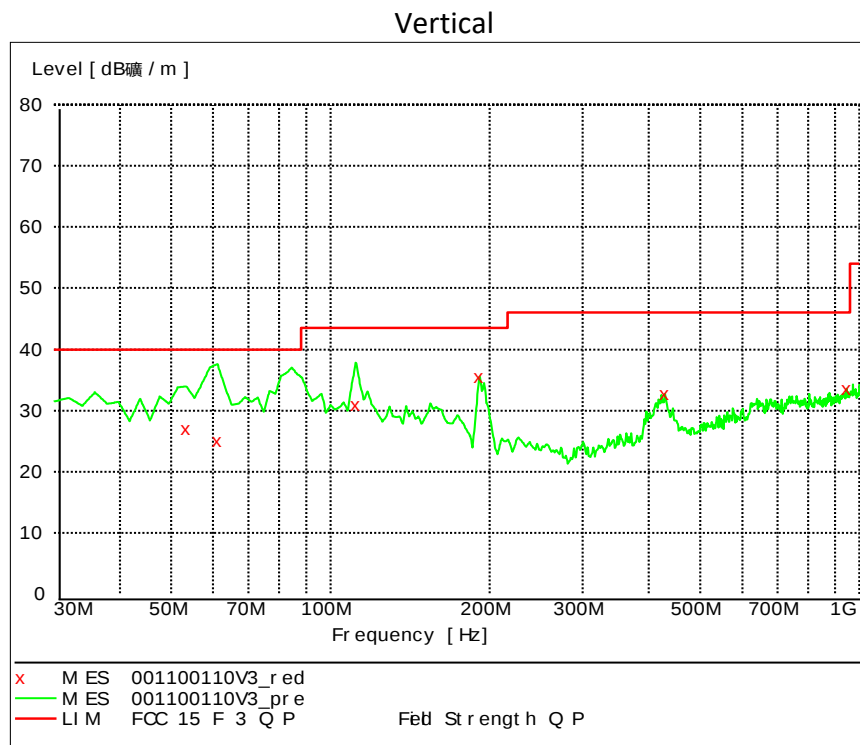
The required measurement frequency range was checked.

4.4 Test Protocol

Test Curve:



Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB
30.000000	26.20	21.4	40.0	13.8
72.765531	23.00	8.3	40.0	17.0
111.643287	34.00	13.3	43.5	9.5
191.342685	30.70	11.2	43.5	12.8
414.889780	38.40	18.7	46.0	7.6
906.693387	34.60	24.4	46.0	11.4



Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB
53.326653	27.00	9.4	40.0	13.0
61.102204	25.00	8.1	40.0	15.0
111.643287	31.00	13.3	43.5	12.5
191.342685	35.50	11.2	43.5	8.0
428.496994	32.70	19.0	46.0	13.3
945.571142	33.60	24.8	46.0	12.4

- Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz)
 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.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
 Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV, limit = 40.00dBuV/m.
 Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV +
 0.20dB/m = 10.20dBuV/m; Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

*****END of the report*****