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TEST REPORT

SCOPE OF WORK:
FCC Part 15 subpart B – EMC report

Model:
ICPSW5-5NA-2

REPORT NUMBER
210601600SHA-001

ISSUE DATE
September 10, 2021

DOCUMENT CONTROL NUMBER
TTRFFCCPART15b_V1

Intertek Testing Services Shanghai,
Building No.86, 1198 Qinzhou Road (North),
Caohejing Development Zone,
Shanghai 200233, China

Telephone: 86 21 6127 8200
www.intertek.com

Report no. 210601600SHA-001

Applicant : **IKEA OF SWEDEN AB**
Box 702, SE-343 81, Älmhult, SWEDEN

Manufacturer : **JiangYin Wonder Electronic Co., Ltd.**
No.129 Yun Gu Road, Gushan Town, Jiangyin City, Jiangsu Province, P.R. China

Summary

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

CFR 47 Part 15 (2019): 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

PREPARED BY:	**REVIEWED BY:**
John Jiang	Star Guo
Project Engineer	Reviewer

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Revision History

Report No.	Version	Description	Issued Date
210601600SHA-001	Rev. 01	Initial issue of report	September 10, 2021

Measurement result summary

TEST ITEM	FCC REFERANCE	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	:	Power Supply
Type/Model	:	ICPSW5-5NA-2
Description of EUT	:	The products covered by this report is Power Supply & LED driver supplied by 100-240VAC, 50/60Hz mains. We tested this model and listed the worst test data as representative in report.
Rating	:	Input: 100-240VAC, 50/60Hz, Max 0.1A; Output: 5VDC, Max 1A, 5W
Brand name	:	(IKEA)
Mains lead	:	None
Data cable	:	None
I/O Port	:	None
Category of EUT	:	Class B
EUT type	:	☒ Table top ☐ Floor standing
Highest operating frequency	:	Less than 1.705MHz
Sample received	:	June 15, 2021
Sample identification No.	:	0210615-72-003
Sample tested date	:	June 15, 2021 to August 27, 2021

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 recognized, certified, or accredited by these organizations	:	CNAS Accreditation Lab Registration No. CNAS L0139 FCC Accredited Lab Designation Number: CN1175 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 (2019): 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(normal work) and tested under its rating voltage and frequency(120V~/60Hz, full load). 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	Description	Brand and Model	S/No
1	Cement resistor	RX21-10W 4R7J	-

2.5 Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)
Conducted emission	21	45	NA
Radiated Emission	21	45	NA

Notes: NA =Not Applicable

2.6 Instrument list

Conducted Emission/ Tri-loop Test/CDNE method					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESCS 30	EC 2107	2022-07-08
☑	A.M.N.	R&S	ESH2-Z5	EC 3119	2021-11-09
☑	Attenuator	Weinschel	68-6-44	EC 3043-9	2022-02-11
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESIB 26	EC 3045	2021-09-15
☑	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2021-10-25
Test Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Shielded room	Zhongyu	-	EC 2838	2022-01-12
☑	Shielded room	Zhongyu	-	EC 2839	2022-01-12
☑	Semi-anechoic chamber	Albatross project	-	EC 3048	2022-07-14
☑	Fully-anechoic chamber	Albatross project	-	EC 3047	2022-07-14
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2022-03-03
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3481	2022-01-05
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3442	2022-01-05
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 5844	2022-03-10
☑	Pressure meter	YM3	Shanghai Mengde	EC 3320	2022-07-20

2.7 Measurement Uncertainty

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 Conducted emission

Test result: PASS

3.1 Limits

3.1.1 Limits for conducted emission of class A device

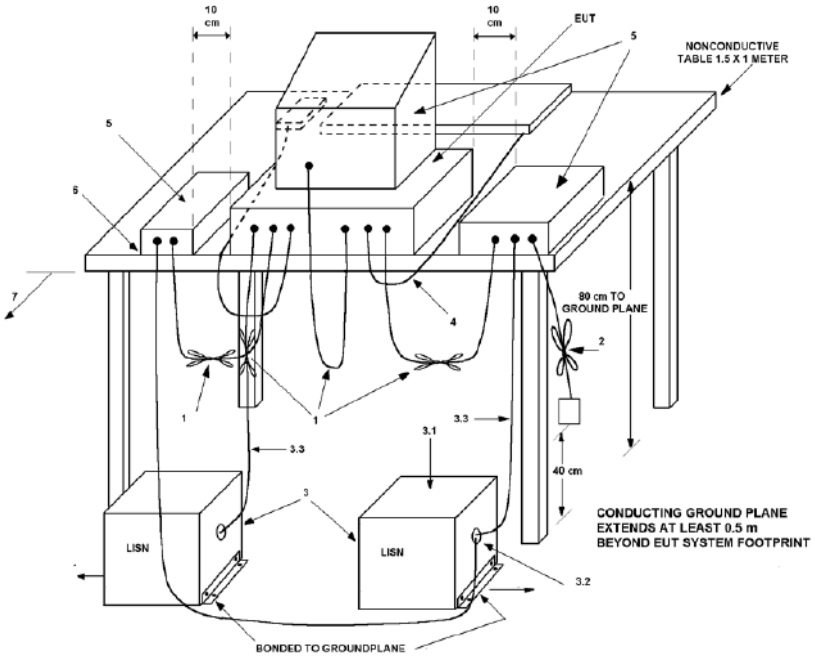
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver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

3.1.2 Limits for conducted emission of class B device

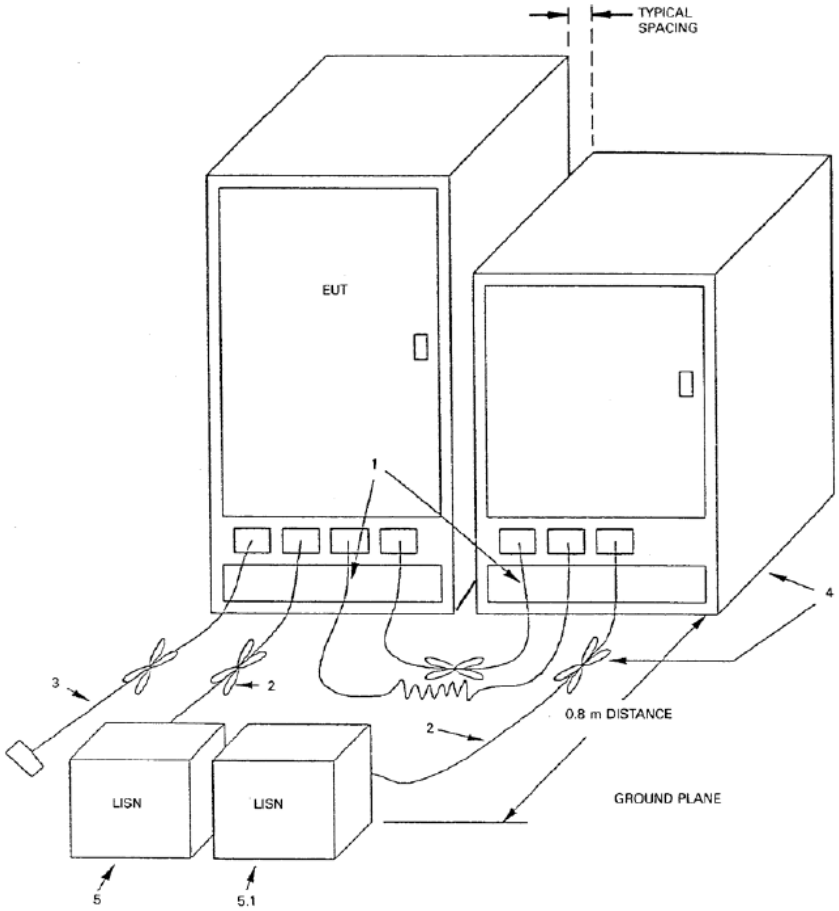
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when 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



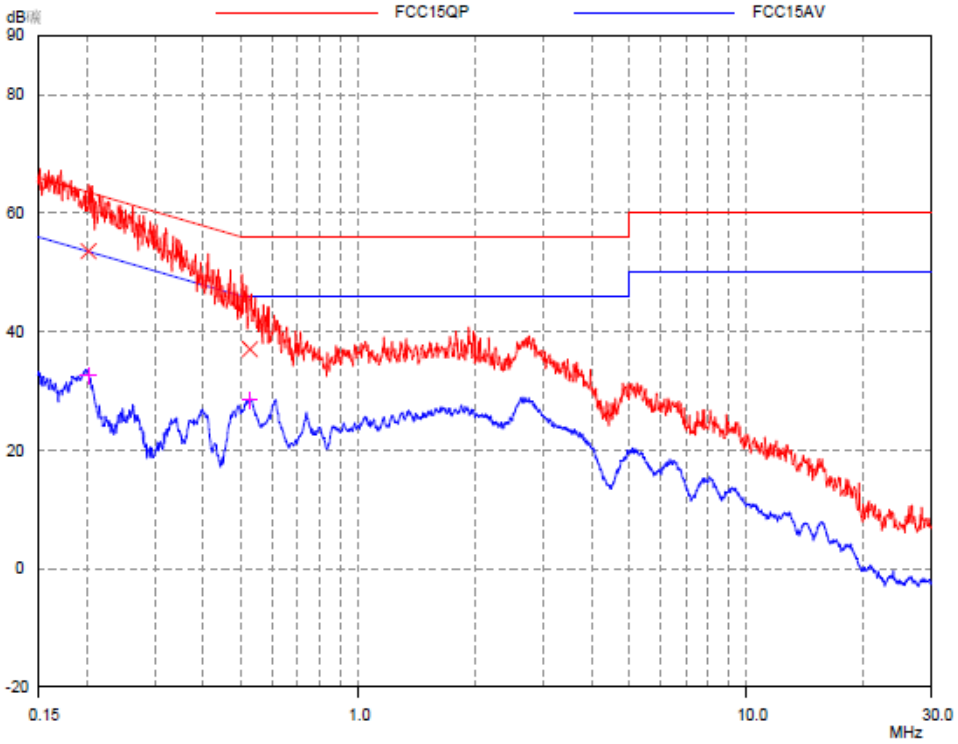
3.3 Test Setup and Test Procedure

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.

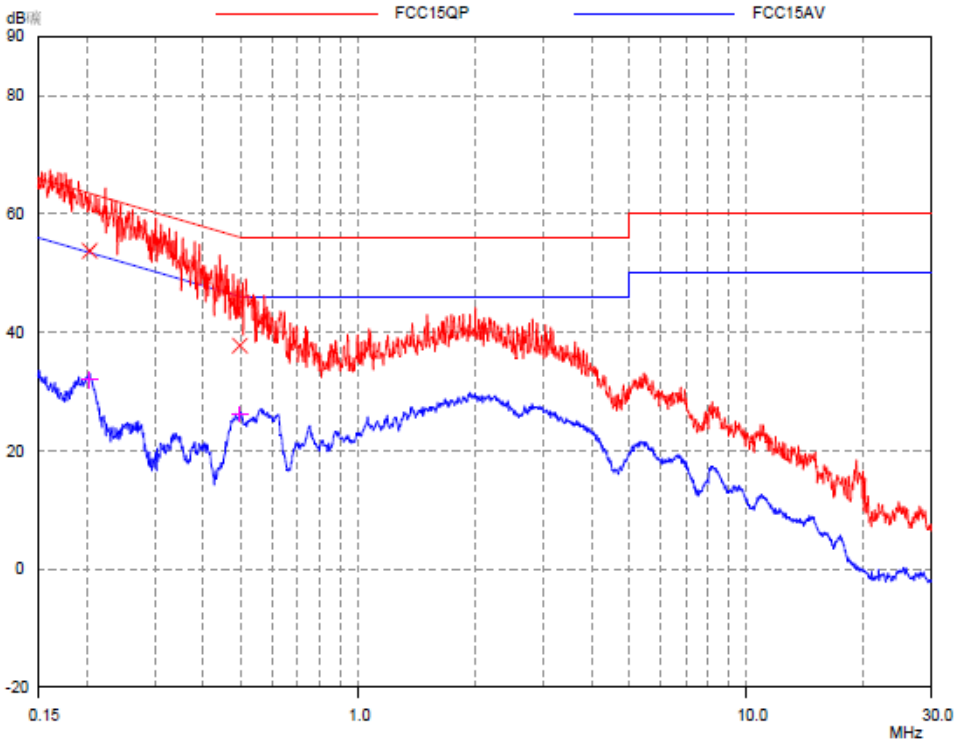
3.4 Test Protocol

Test Curve:

L-Line



N-Line



Test data:

Frequency (MHz)	Quasi-peak			Average			Line
	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)	
0.15	*	65.97	*	*	55.97	*	L
0.20	53.57	63.51	9.94	*	53.51	*	L
0.57	*	56.00	*	*	46.00	*	L
3.43	*	56.00	*	*	46.00	*	L
5.30	*	60.00	*	*	50.00	*	L
6.21	*	60.00	*	*	50.00	*	L
0.15	*	65.97	*	*	55.97	*	N
0.20	53.75	63.45	9.70	*	53.45	*	N
0.42	*	57.31	*	*	47.31	*	N
0.57	*	56.00	*	*	46.00	*	N
5.30	*	60.00	*	*	50.00	*	N
6.21	*	60.00	*	*	50.00	*	N
Note: * means the emission level 10dB below the relevant limit.							

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

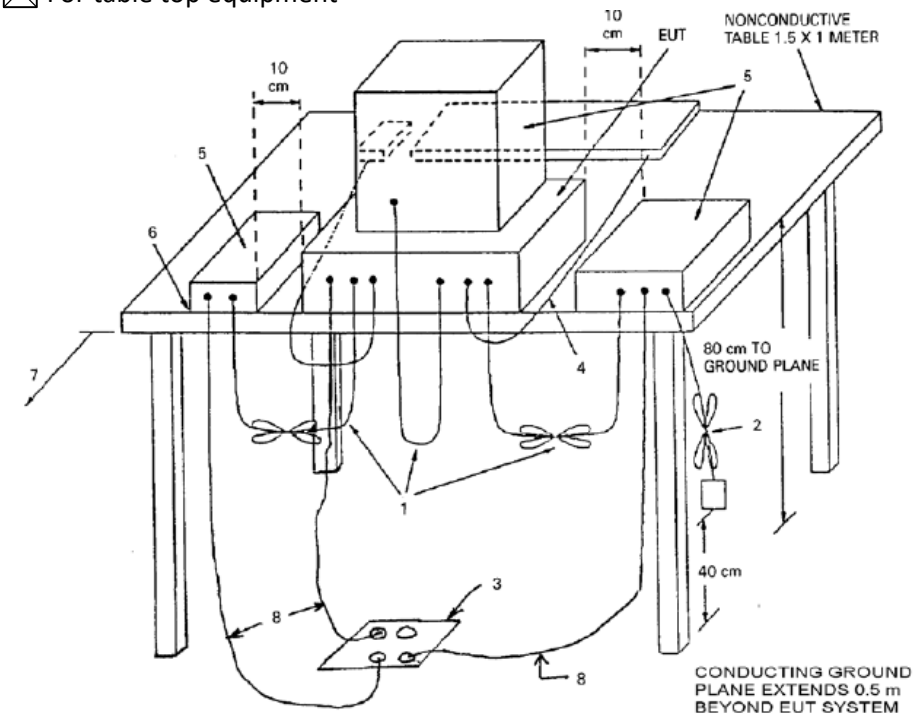
Frequency (MHz)	Permitted limit in dBμV/m (Quasi-peak) of Measurement Distance 10m
30 ~ 88	39
88 ~ 216	43.5
216 ~ 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.1.2 Limits for radiated emission of class B device

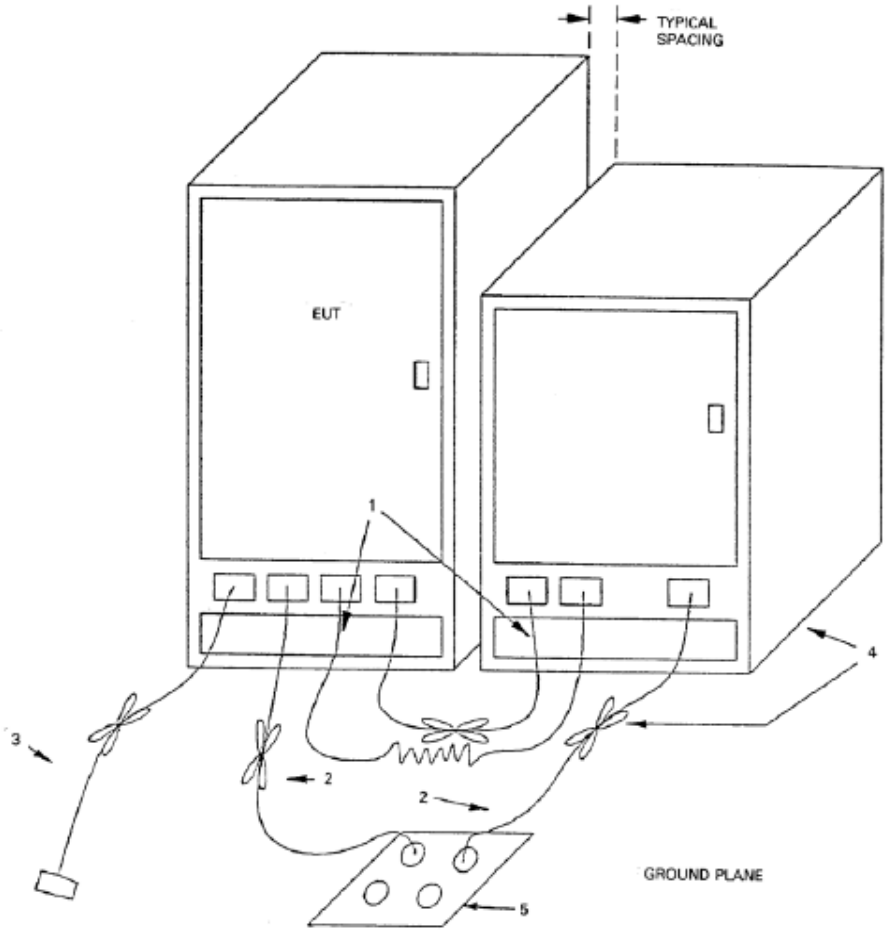
Frequency (MHz)	Permitted limit in dBμV/m (Quasi-peak) of Measurement Distance 3m
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.2 Block diagram and test set up

☒ For table top equipment



☐ For floor standing equipment



4.3 Test Setup and Test Procedure

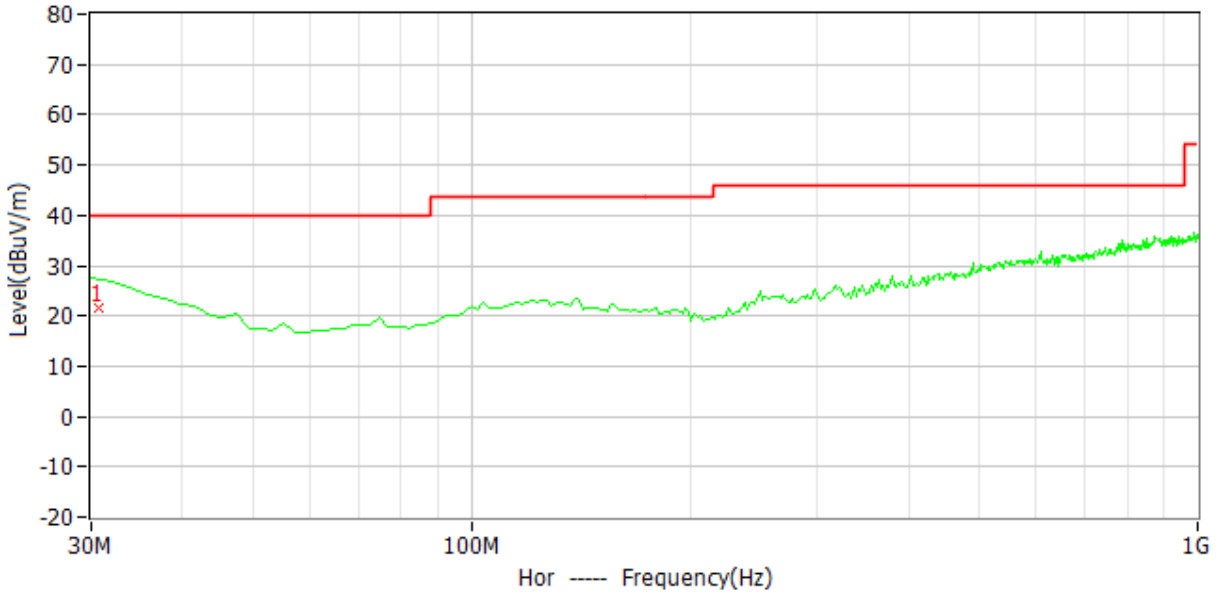
The measurement was performed in a semi-anechoic chamber.

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.

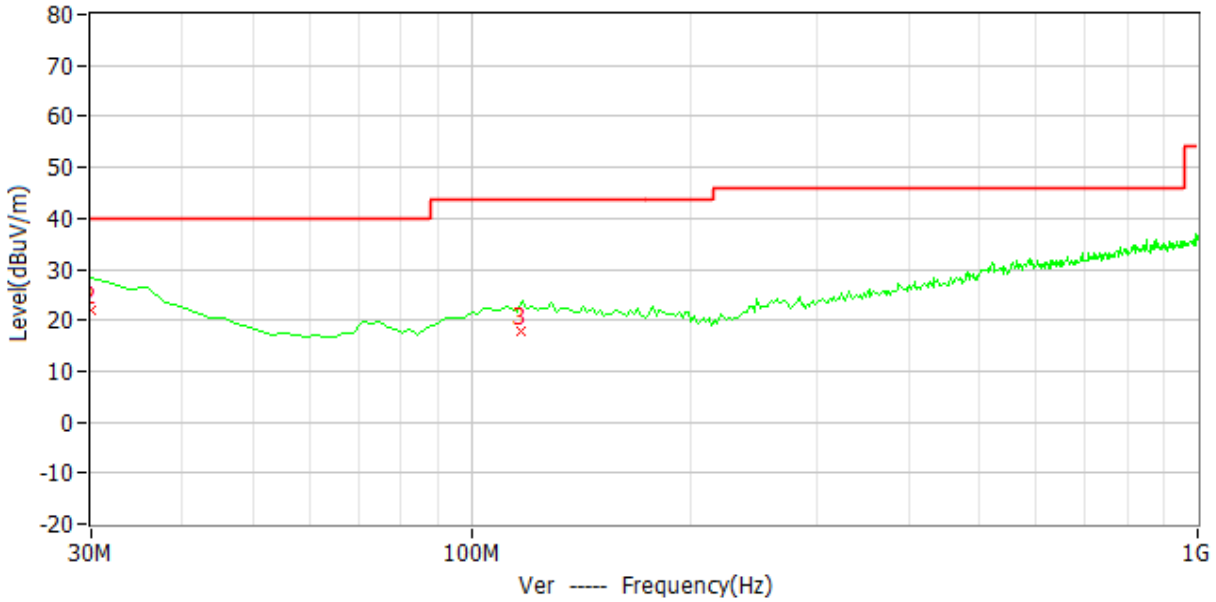
4.4 Test Protocol

Test Curve:

Horizontal



Vertical



Test data:

Antenna Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin	Detector
H	*	*	*	*	*	PK
H	*	*	*	*	*	PK
H	*	*	*	*	*	PK
H	*	*	*	*	*	PK
H	*	*	*	*	*	PK
H	*	*	*	*	*	PK
V	*	*	*	*	*	PK
V	*	*	*	*	*	PK
V	*	*	*	*	*	PK
V	*	*	*	*	*	PK
V	*	*	*	*	*	PK
V	*	*	*	*	*	PK
Note: * means the emission level 10dB below the relevant limit.						

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.

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