

IKEA of Sweden AB
TEST REPORT

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

Model:
L2008 MYRVARV

REPORT NUMBER
200400277SHA-001

ISSUE DATE
September 25, 2020

DOCUMENT CONTROL NUMBER
TTRFFCCPART15b_V1
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Applicant : **IKEA of Sweden AB**
Box 702, SE-343 81 Älmhult, SWEDEN

Manufacturer : **Same as applicant**

Manufacturing site : **LEEDARSON LIGHTING CO.,LTD.**
Xingtai Industrial Park, Economic Development Zone of Changtai
County, Zhangzhou City, Fujian Province, China

Summary

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

47CFR 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

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Reviewer



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Revision History

Report No.	Version	Description	Issued Date
200400277SHA-001	Rev. 01	Initial issue of report	August 21, 2020
200400277SHA-001	Rev. 02	Product Name is changed from "Class 2 Luminaire" to "MYRVARV". Add description of EUT: The EUT is surface mounted luminaire with LED.	September 25, 2020
200400277SHA-001	Rev. 03	tables of Final Measurement Results contain chinese character "礦". Revise it to "dBuV".	October 27, 2020

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 : MYRVARV
Type/Model : L2008 MYRVARV
Description of EUT : The EUT is surface mounted luminaire with LED.
We tested it, and listed the worst data.
Rating : 24V DC, 12W
Brand name : IKEA
Category of EUT : Class B
EUT type : Table top
 Floor standing
Sample received date : April 8, 2020
Sample identification No. : 0200408-64
Date of test : April 8, 2020

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: 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 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
	LED Power supply	ICPSHC24-30EU-IL-1	

2.5 Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)
Conducted emission	24	42	101
Radiated Emission	24	42	101

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
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCS 30	EC 2107	2021-07-8
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2020-11-10
<input checked="" type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2021-01-12
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2020-09-16
<input checked="" type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2020-9-25
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2021-07-14
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2021-03-3
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3481	2021-01-05
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 4620	2020-09-9

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.

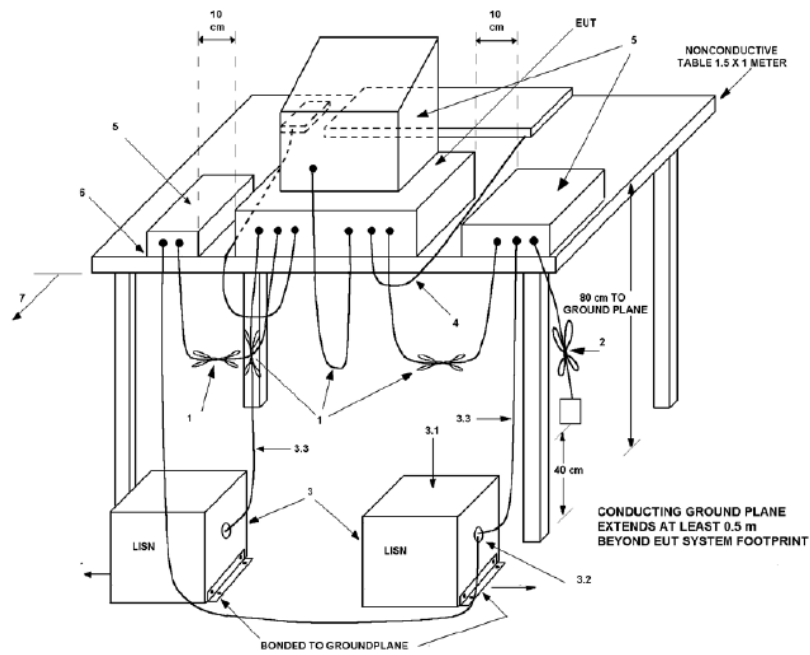
3.1.2 Limits for conducted emission of class B device

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

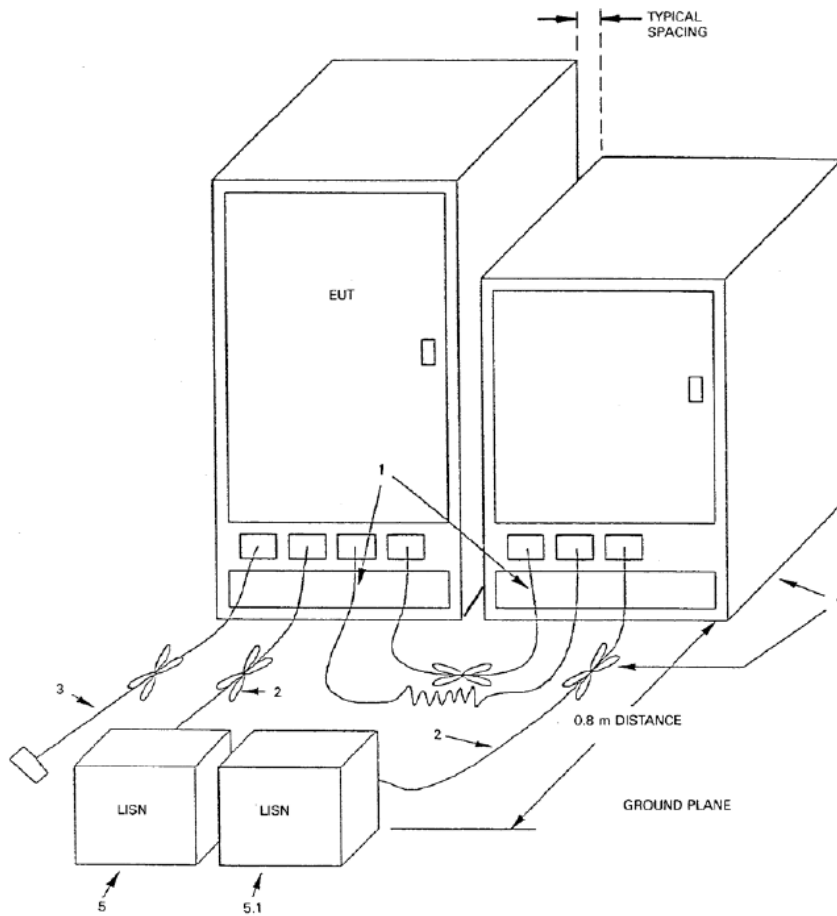
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz
2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the 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.

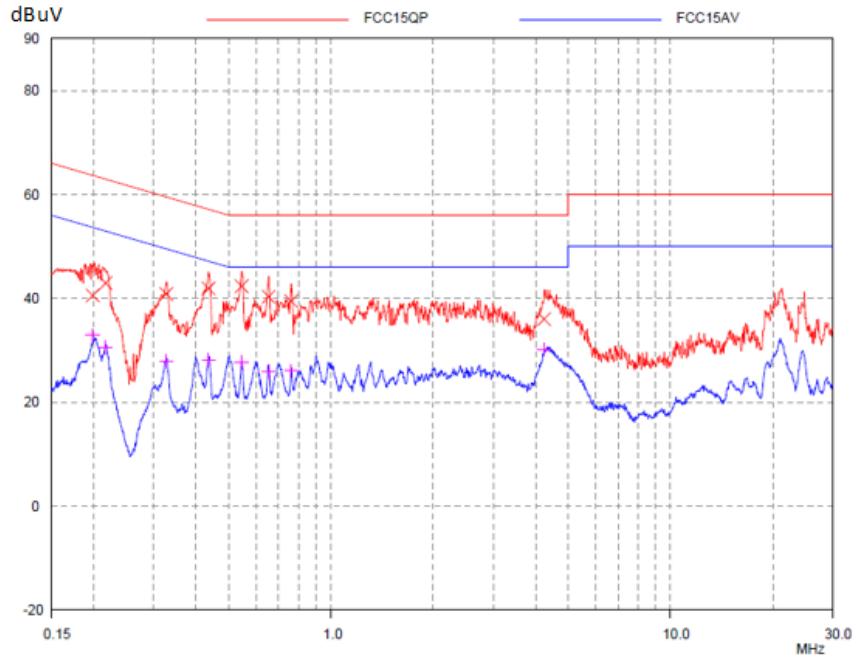
Detailed test procedure was following clause 7.3 of ANSI 63.4.

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

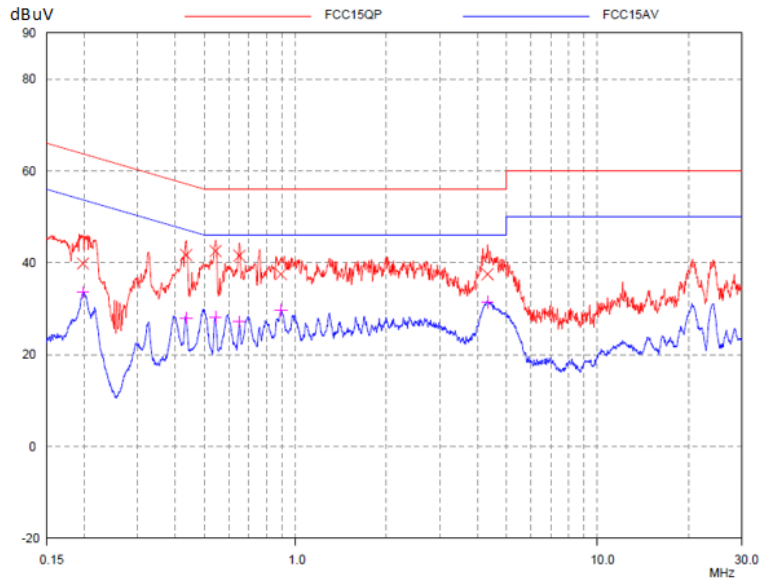
L line:



Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dBuV
0.19835	40.57	63.68	23.11
0.21656	42.95	62.95	20.00
0.32671	40.84	59.53	18.69
0.4355	41.92	57.15	15.23
0.5446	42.34	56.00	13.66
0.65438	40.33	56.00	15.67
0.76157	39.48	56.00	16.52
4.23846	36.01	56.00	19.99

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dBuV
0.19835	32.95	53.68	20.73
0.21656	30.55	52.95	22.40
0.32671	27.88	49.53	21.65
0.4355	28.12	47.15	19.03
0.5446	27.74	46.00	18.26
0.65438	25.95	46.00	20.05
0.76157	26.05	46.00	19.95
4.23846	30.20	46.00	15.80

N line:



Final Measurement Results

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dBuV
0.19756	39.85	63.71	23.86
0.43376	41.69	57.18	15.49
0.54243	42.56	56.00	13.44
0.65177	41.52	56.00	14.48
0.89343	37.53	56.00	18.47
4.32391	37.52	56.00	18.48

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.

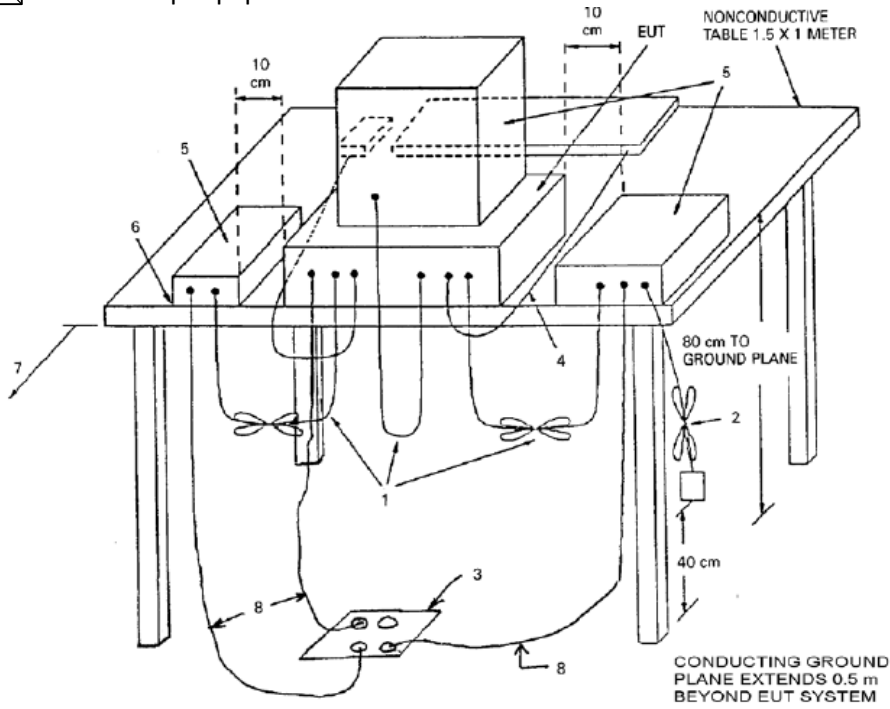
4.1.2 Limits for radiated emission of class B device

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

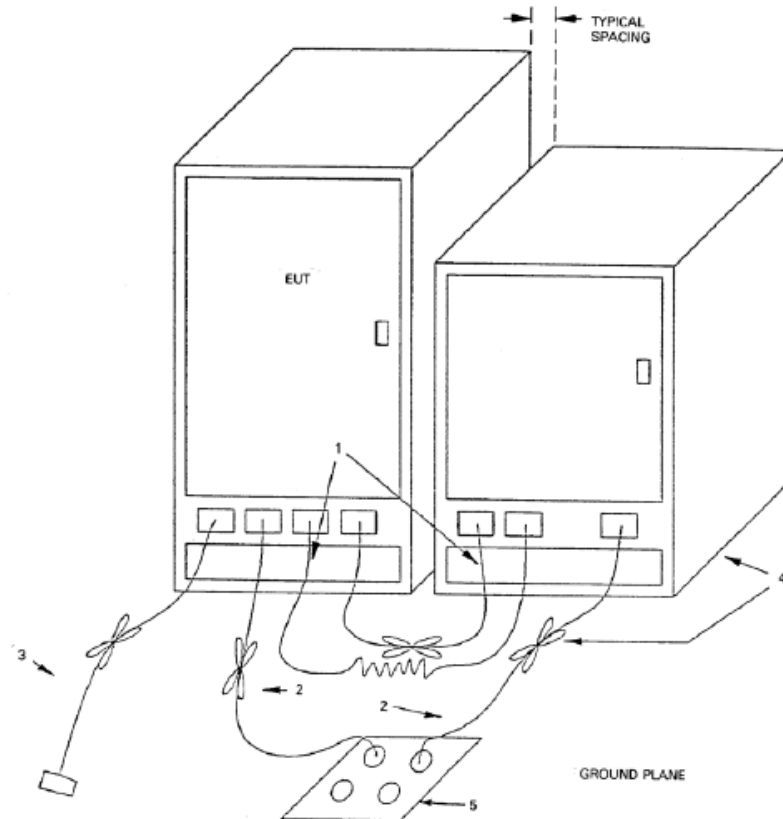
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.

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.

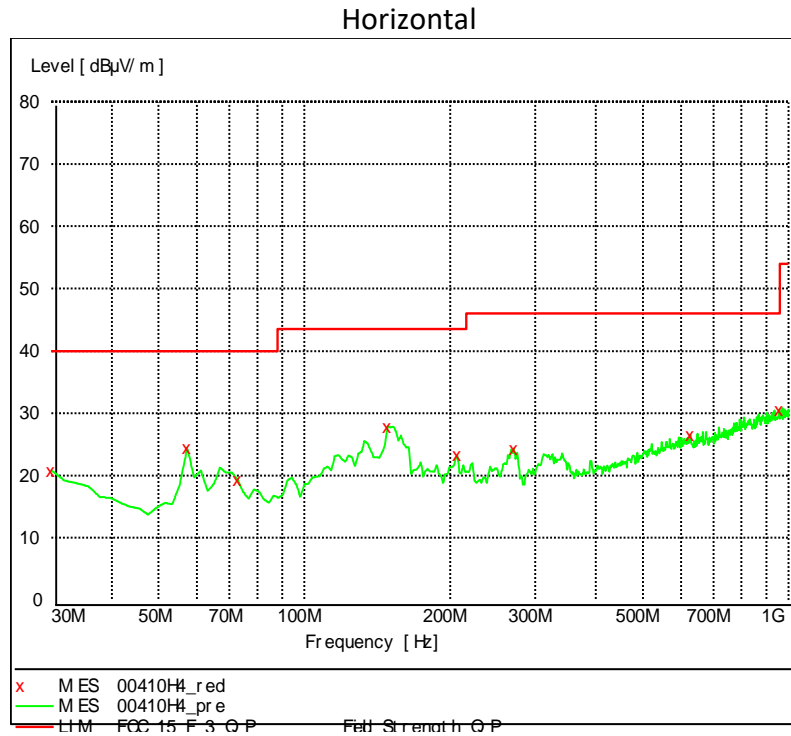
EUT arrangement and operate condition were according to clause 6 and clause 8 of ANSI 63.4.

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

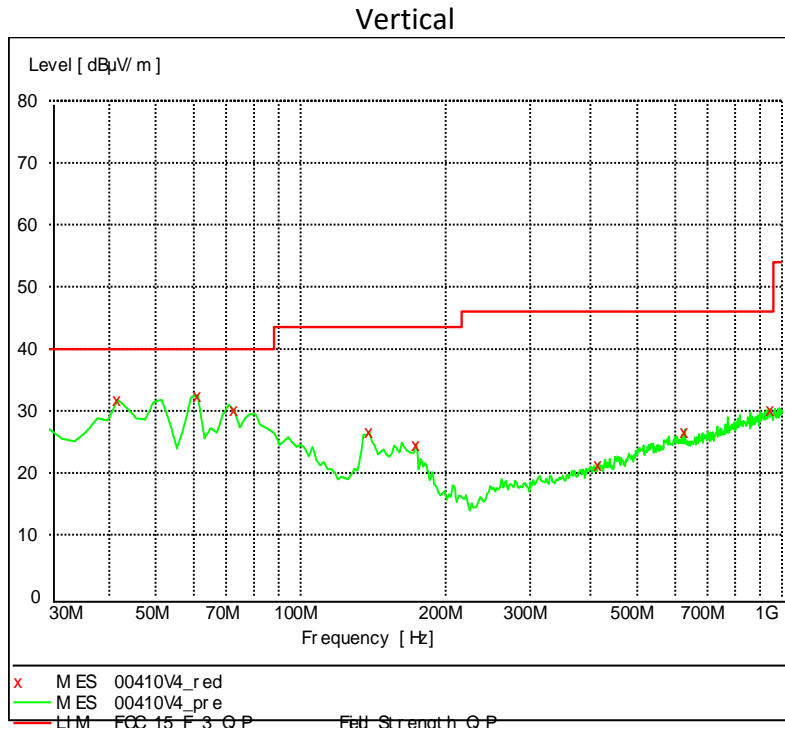
The required measurement frequency range was checked.

4.4 Test Protocol

Test Curve:



Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB
30.000000	20.80	18.8	40.0	19.2
57.214429	24.50	7.5	40.0	15.5
72.765531	19.40	7.5	40.0	20.6
148.577154	27.90	12.0	43.5	15.6
206.893788	23.30	11.0	43.5	20.2
271.042084	24.30	15.0	46.0	21.7
626.773547	26.60	21.1	46.0	19.4
957.234469	30.60	24.3	46.0	15.4



Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB
41.663327	31.80	12.6	40.0	8.2
61.102204	32.50	7.1	40.0	7.5
72.765531	30.10	7.5	40.0	9.9
138.857715	26.60	12.6	43.5	16.9
173.847695	24.60	10.8	43.5	18.9
414.889780	21.30	18.0	46.0	24.7
628.717435	26.60	21.1	46.0	19.4
947.515030	30.20	24.2	46.0	15.8

- 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*****