

IKEA of Sweden AB  
**TEST REPORT**

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

**Model:**  
L1321F MAGLEHULT

**REPORT NUMBER**  
190301944SHA-001

**ISSUE DATE**  
May 31, 2019

**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** : **Zhe Jiang Hao Ting Lighting Co. Ltd**  
**Feng Ming Industrial Zone, Tongxiang City, Zhejiang Province,**  
**314505, P.R.China**

**Summary**

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

**47CFR Part 15 (2017):** 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:**

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Project Engineer

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Reviewer

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### Revision History

Report No.	Version	Description	Issued Date
190301944SHA-001	Rev. 01	Initial issue of report	May 31, 2019

## 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 : Class 2 luminaire  
Type/Model : L1321F MAGLEHULT  
Description of EUT : We tested it, and listed the worst data.  
Rating : 5VDC; Max. 3.6W  
Brand name : IKEA  
Category of EUT : Class B  
EUT type :  Table top  
 Floor standing  
Sample received date : March 22, 2019  
Sample identification No. : 0190322-14  
Date of test : March 25, 2019

## 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 (2017):** 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 driver	KMV-050-050-NA-U	

### 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	2019-07-15
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2019-11-29
<input checked="" type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2020-01-13
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2019-09-12
<input checked="" type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2019-06-10
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2019-07-31
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3326	2020-03-28
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2020-02-28
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 3320	2019-07-01

## 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.

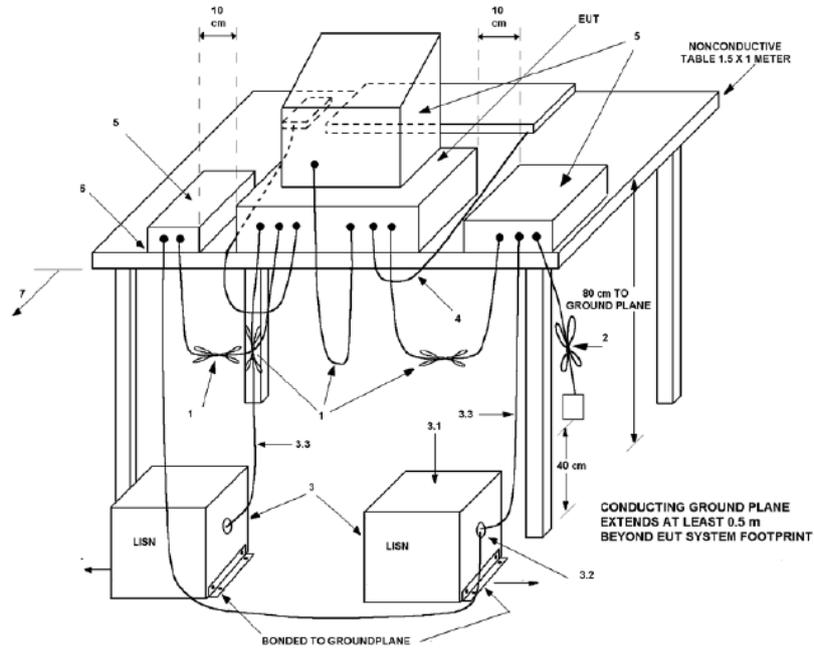
##### 3.1.2 Limits for conducted emission of class B device

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

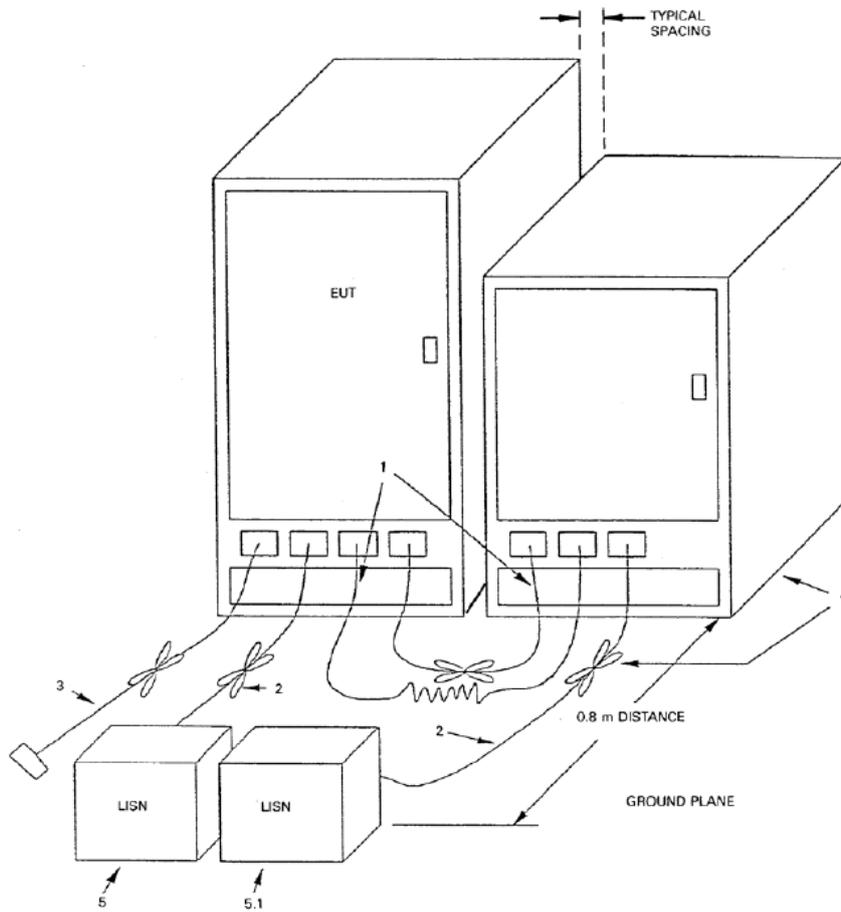
Note: 1. \* Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz  
2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and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

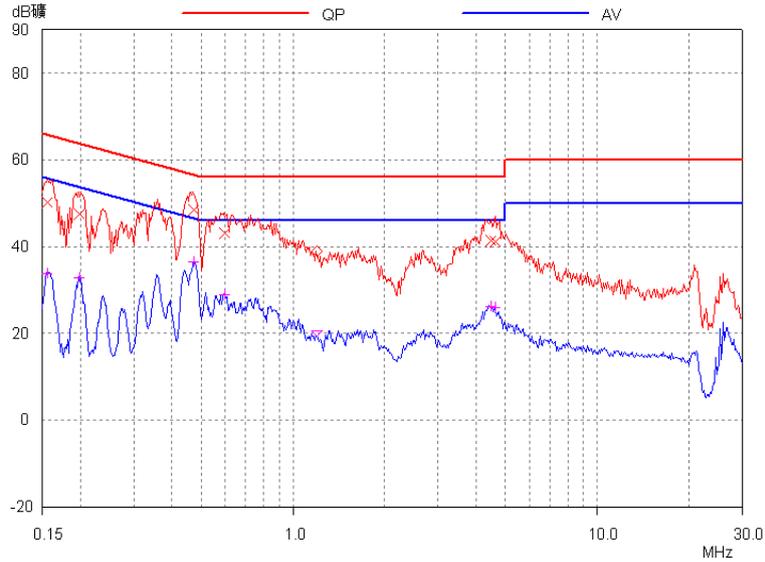
Detailed test procedure was following clause 7.3 of ANSI 63.4.

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

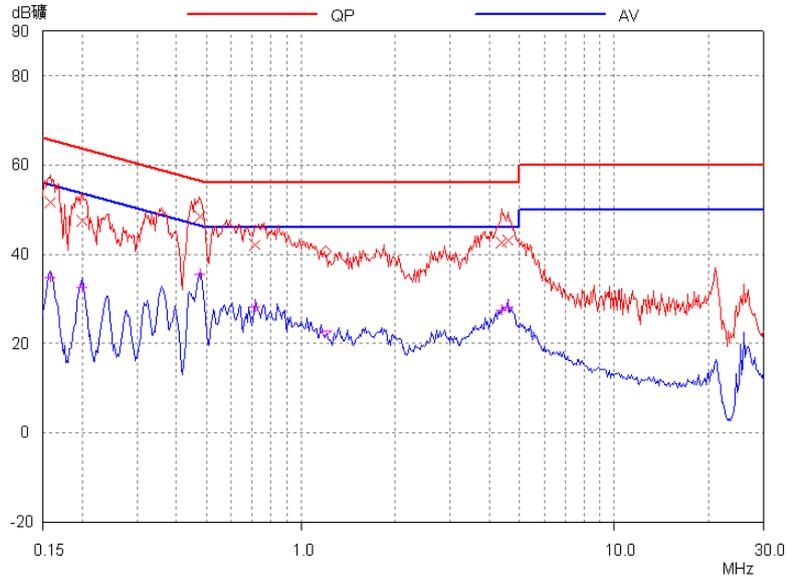
L line:



Frequency (MHz)	Quasi-peak			Average		
	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)
0.15	50.10	65.67	15.57	33.67	55.67	22.00
0.19	47.45	63.68	16.23	32.74	53.68	20.94
0.47	48.51	56.47	7.96	36.58	46.47	9.89
0.59	43.05	56.00	12.95	28.93	46.00	17.07
4.46	41.37	56.00	14.63	26.18	46.00	19.82
4.61	41.22	56.00	14.78	25.88	46.00	20.12

Note: \* means the emission level 20dB below the relevant limit.

N line:



Frequency (MHz)	Quasi-peak			Average		
	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)
0.15	51.55	65.54	13.99	34.78	55.54	20.76
0.20	47.59	63.62	16.03	32.63	53.62	20.99
0.47	48.52	56.40	7.88	35.56	46.40	10.84
0.71	42.18	56.00	13.82	28.11	46.00	17.89
4.32	42.65	56.00	13.35	27.37	46.00	18.63
4.57	42.99	56.00	13.01	28.04	46.00	17.96

Note: \* means the emission level 20dB 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

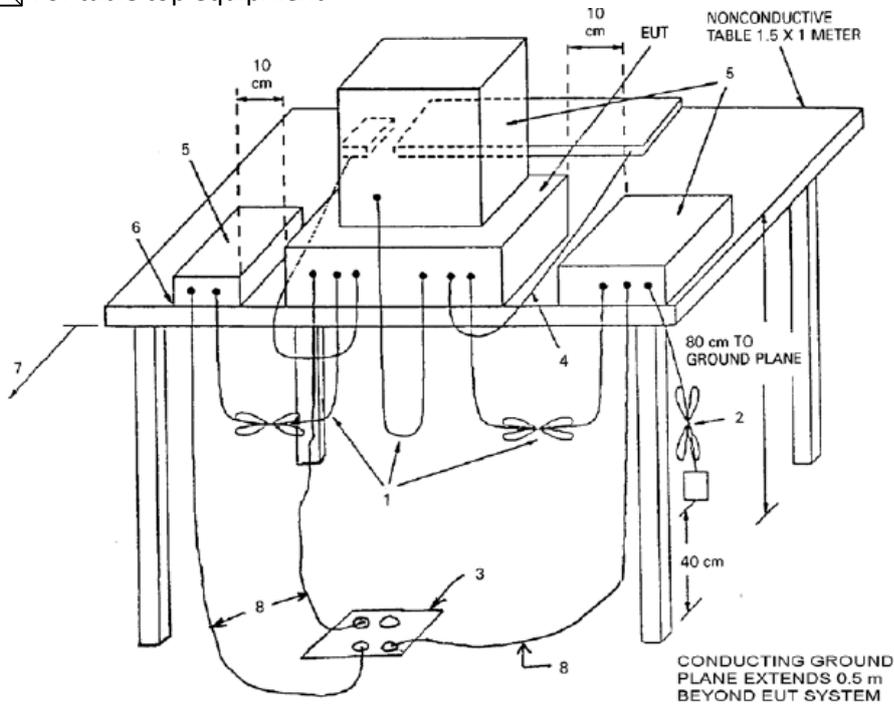
Frequency (MHz)	Permitted limit in dB $\mu$ V/m (Quasi-peak) of Measurement Distance 10m
30 ~ 88	39
88 ~ 216	43.5
216 ~ 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

#### 4.1.2 Limits for radiated emission of class B device

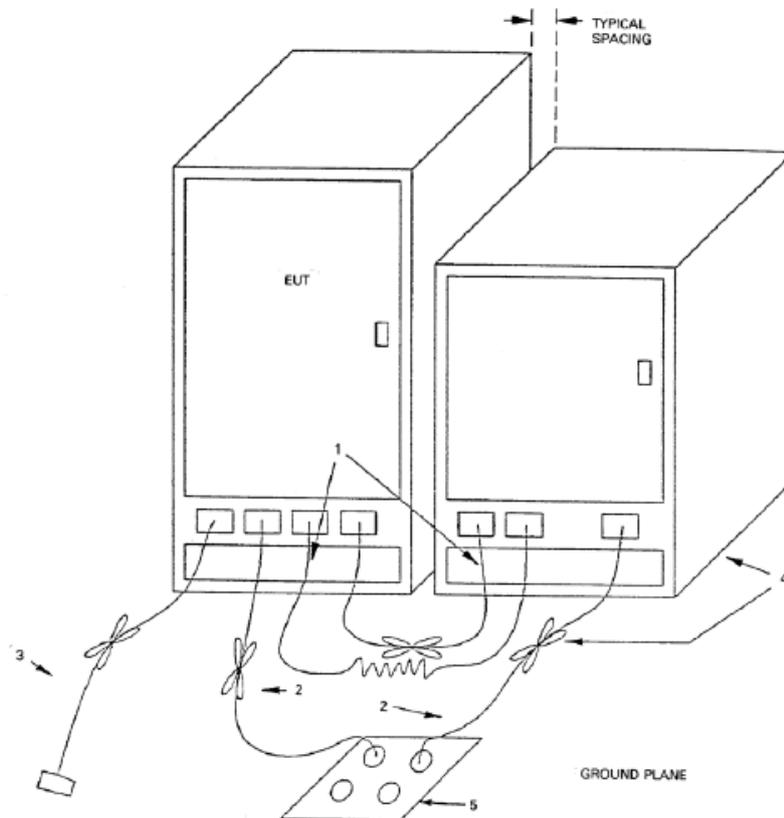
Frequency (MHz)	Permitted limit in dB $\mu$ V/m (Quasi-peak) of Measurement Distance 3m
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

## 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.

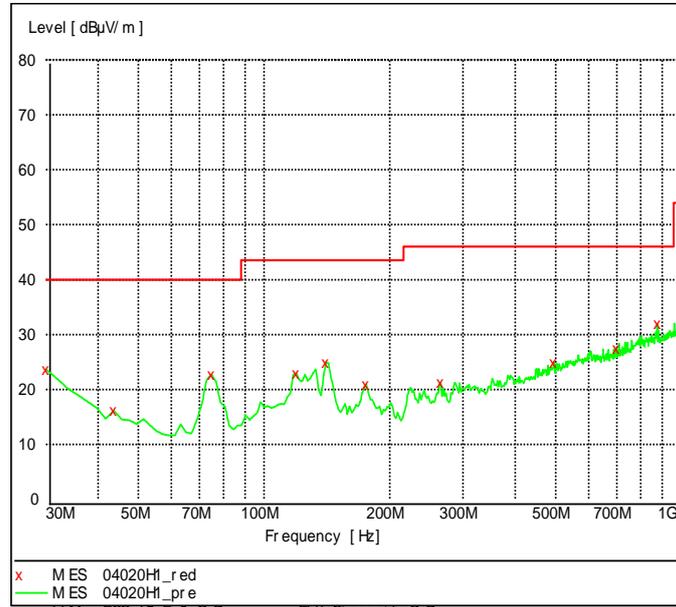
The bandwidth setting on R&S Test Receiver was 120 kHz.

The required measurement frequency range was checked.

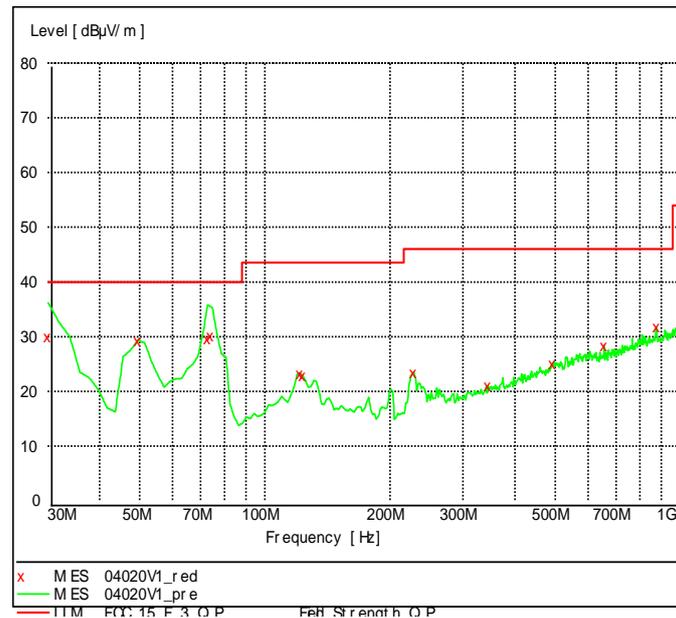
#### 4.4 Test Protocol

Test Curve:

#### Horizontal



#### Vertical



Antenna Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin	Detector
H	30.00	23.6	18.6	40.0	16.4	QP
H	74.71	22.8	7.5	40.0	17.2	QP
H	140.80	24.9	12.4	43.5	18.6	QP
H	700.64	27.4	21.3	46.0	18.6	QP
H	877.53	32.0	23.3	46.0	14.0	QP
V	30.00	30.0	18.6	40.0	10.0	QP
V	49.43	29.3	8.8	40.0	10.7	QP
V	72.76	29.5	7.4	40.0	10.5	QP
V	655.93	28.4	21.1	46.0	17.6	QP
V	877.53	31.7	23.3	46.0	14.3	QP

Note: \* means the emission level 20dB below the relevant limit.

- 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\*\*\***