

EMC Test Report for FCC**No. 130200692SHA-002**

Applicant : HONG KONG CHINA ELECTRIC APPLIANCE
MANUFACTURE CO.,LTD.
12/F., Mongkok Harbour Centre 638 Shanghai Street,
Mongkok, Kowloon, Hongkong

Manufacturing site : HONG KONG CHINA ELECTRIC APPLIANCE
MANUFACTURE CO.,LTD.
12/F., Mongkok Harbour Centre 638 Shanghai Street,
Mongkok, Kowloon, Hongkong

Product Name : Ceiling Fan with remote control

Type/Model : KXY-AB/CLTDCO
(K=O, D or blank; X=H, M or N; Y=80-40; A=3, 4,
5 or 6; C=1, 2, ...6; T=E, C or I; DC=DC-L15 or
DC-L20; O=M, E)

SUMMARY

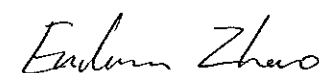
The equipment complies with the requirements according to the following standard(s):

47CFR Part 15 (2011): Radio Frequency Device

ANSI C63.4 (2003): 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.

Date of issue: June 26, 2013

Prepared by:


Endman Zhao (Project engineer)

Approved by:


Teddy Yin (Reviewer)

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1. GENERAL INFORMATION

1.1 Description of equipment under Test (EUT)

Product Name : Ceiling Fan with remote control
Description of EUT : All models share same electrical construction and components, the difference is the motor type, lamp type and fan blade shape, see details below:

Code representation:

K=O, D or blank; "O" means can be used outdoor, "D" means can be used in damp location but not suitable for outdoor, blank means can be used indoor only.

X=H, M or N, represents different hanging method.

Y=80-40 , represents the diameter (inch) of the ceiling fan.

A=3, 4, 5 or 6, represents the number of the blades.

B means blade.

CLT represents information of light kights, when no light was equipped, CLT=blank.

C=1, 2, 3...6, represents the number of the lamps

L means lamp.

T=E, C or I, E means led Lamp, C means CFL lamp while I means incandescent lamp. (These lamps are installed by the end users and not provided by the manufacturer.)

DC=DC-L15 or DC-L20; represents the motor model.(Both motors are identical except for different lamination)

O=M or E; "M" means mechanical type while "E" means electronic type which can be controlled by remote.

We tested the sample which is electronic type with incandescent lamp and listed the worst data in the report.

Model number : KXY-AB/CLTDCO
(K=O, D or blank; X=H, M or N; Y=80-40; A=3, 4, 5 or 6; C=1, 2, ...6; T=E, C or I; DC=DC-L15 or DC-L20; O=M, E)

Category of EUT : Class B

Rating : 120V~, 60Hz, Fan motor power: 40W

EUT type : ☒ Table top
☐ Floor standing

Operating frequency : 315MHz

Sample received date : April 22, 2013

Sample Identification No : 0130422-51-001

Date of test : April 22 ~ May 20, 2013

1.2 Description of Client

Applicant : HONG KONG CHINA ELECTRIC APPLIANCE
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12/F., Mongkok Harbour Centre 638 Shanghai Street,
Mongkok, Kowloon, Hongkong



1.3 Description of Test Facility

<input checked="" type="checkbox"/>	Name	Intertek Testing Service Shanghai
	Address	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
	Telephone	86 21 61278200
	Telefax	86 21 64956263
Subcontractor:		
<input type="checkbox"/>	Name	Shanghai Institute of Measurement Technology
	Address	716 Yishan Road, Shanghai 200233, P.R. China
	Telephone	86 21 64700066

2. TEST SPECIFICATIONS

2.1 Standards

47CFR Part 15 (2011): Radio Frequency Device

ANSI C63.4 (2003): 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 / Test peripherals used

2.2.1 Description of operation

Within this test report, EUT was tested under all available operation modes and tested under its rating voltage and frequency (120V~, 60Hz). Other voltage and frequency is specified if used.

2.3 Instrument list

Selected	Instrument	EC no.	Model	Valid until date
<input checked="" type="checkbox"/>	EMI test receiver	EC 2107	ESCS 30	2014-4-9
<input checked="" type="checkbox"/>	A.M.N.	EC 3119	ESH2-Z5	2014-1-11
<input type="checkbox"/>	A.M.N.	EC 3394	ENV 216	2013-10-26
<input type="checkbox"/>	Voltage probe	EC 3405	ESH2-Z3	2014-1-11
<input type="checkbox"/>	Lum. Meter	EC 2451	TES 1332	2014-6-3
<input type="checkbox"/>	Signal generator	EC 3044-1	SMR20	2013-8-20
<input type="checkbox"/>	EMI test receiver	EC 3045	ESIB26	2014-4-9
<input type="checkbox"/>	Broadband antenna	EC 3046-1	HL562	2014-4-9
<input checked="" type="checkbox"/>	Broadband antenna	EC 4206	CBL 6112D	2014-6-1
<input type="checkbox"/>	Fully anechoic chamber	EC 3047	-	2013-7-23
<input checked="" type="checkbox"/>	Semi anechoic chamber	EC 3048	-	2014-4-23
<input type="checkbox"/>	Horn antenna	EC 3049	HF906	2014-4-9
<input type="checkbox"/>	Pre-amplifier	EC 3222	pre-amp 18	2013-6-28
<input checked="" type="checkbox"/>	Shielded room	EC 2838	GB88	2014-1-11
<input type="checkbox"/>	Shielded room	EC 2839	GB88	2014-1-11
<input type="checkbox"/>	Oscilloscope	EC 3515	DPO 4504	2014-1-19
<input type="checkbox"/>	TV generator	EC 3555	TG39	2013-9-26



2.4. Test Summary

This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai.

TEST ITEM	RESULT	NOTE
Disturbance voltage at a.c. mains terminal	Pass	
Radiated emission	Pass	

Notes: 1: NA =Not Applicable

3. Conducted disturbance voltage at mains terminals

Test result: PASS

3.1 Limits

3.1.1 Limits for conducted disturbance voltage at the mains ports of class A device

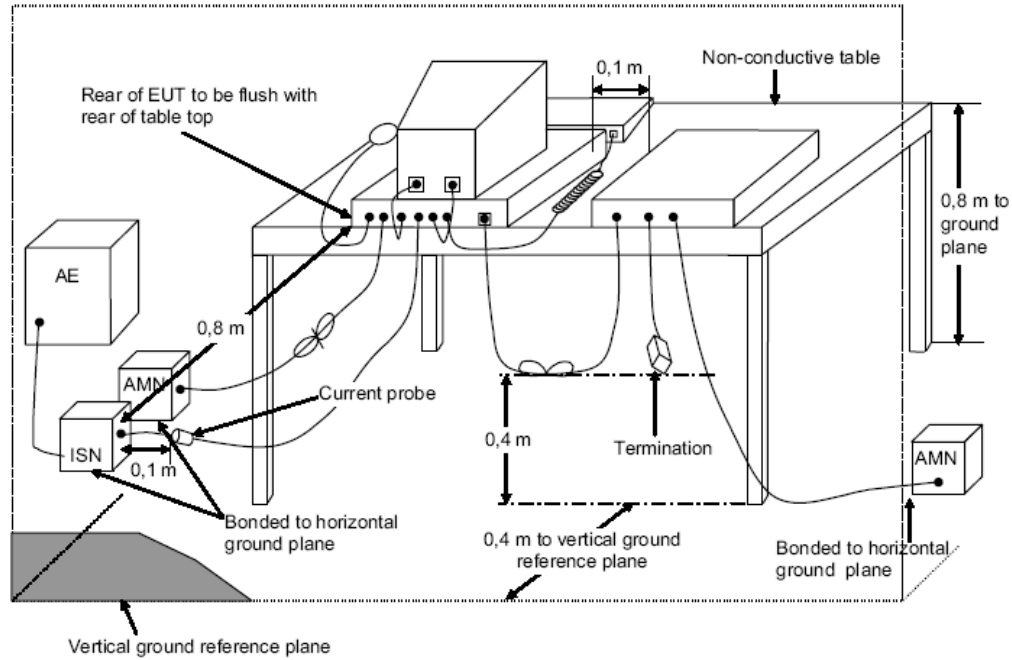
Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the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

3.1.2 Limits for conducted disturbance voltage at the mains ports of class B device

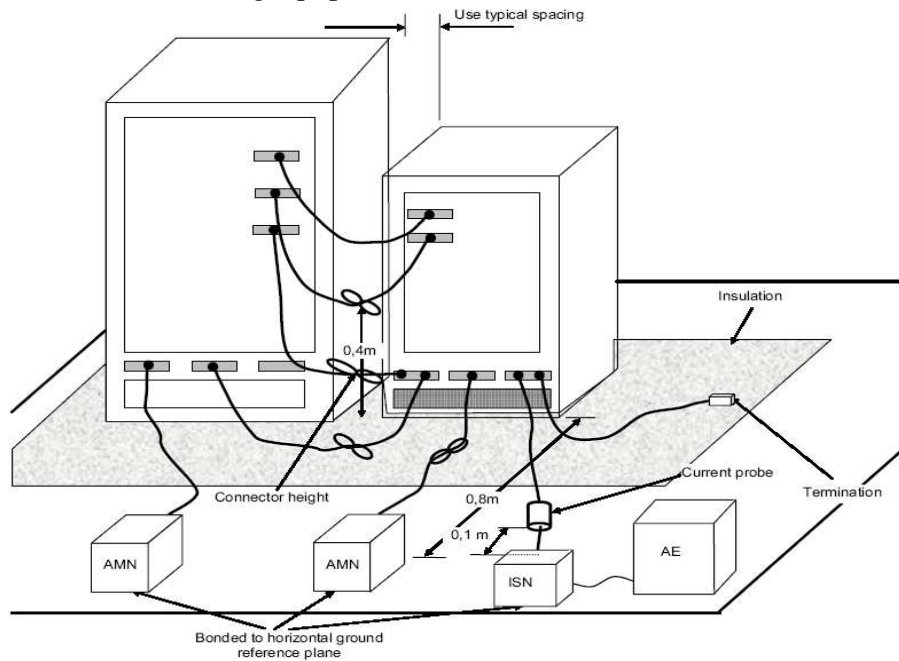
Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when 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 7.2 of ANSI 63.4.

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

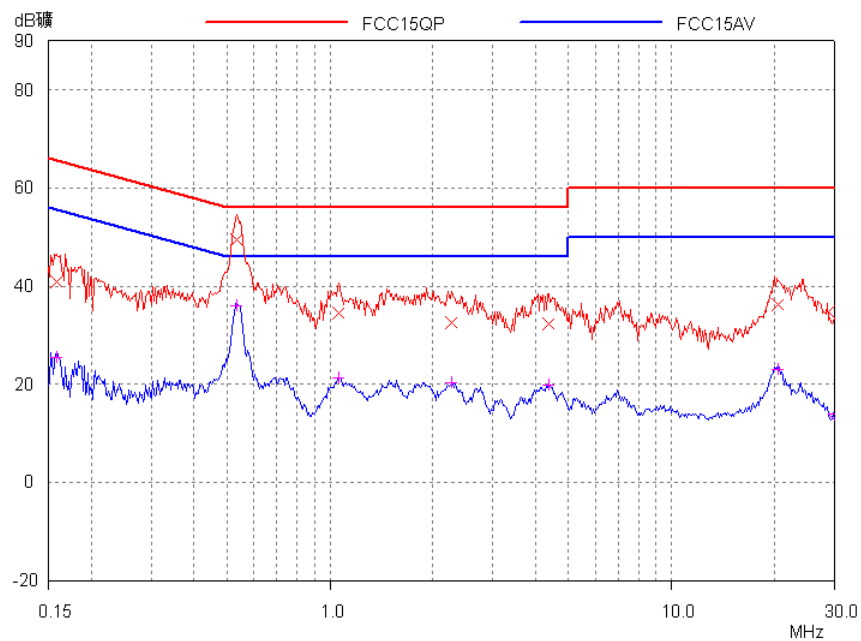
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

3.4 Test Protocol

Temperature : 24°C
Relative Humidity : 48%

Test Curve:

Phase L:

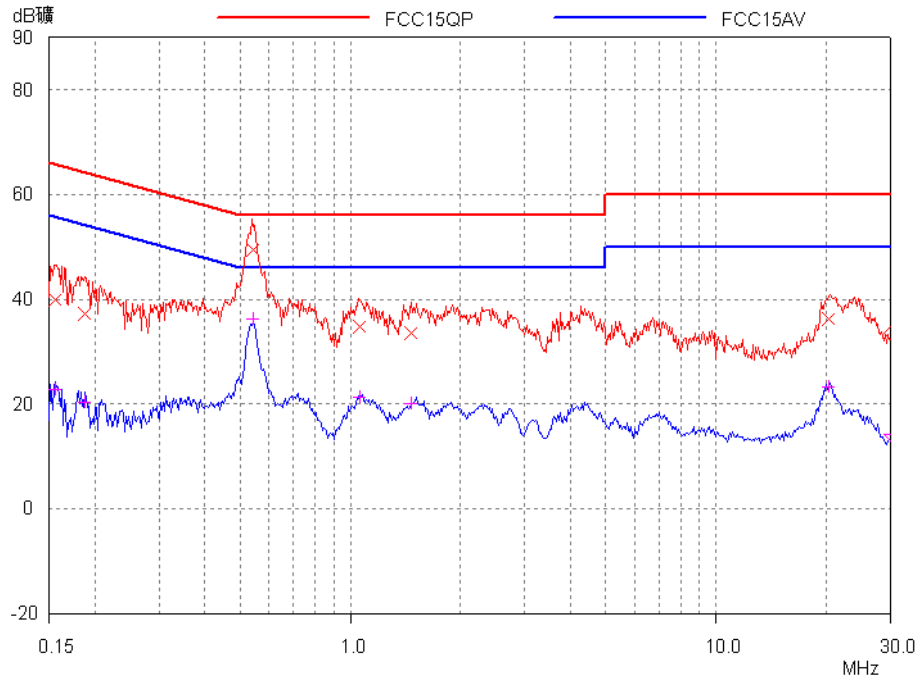


Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.16	*	65.5	*	*	55.5	*
0.53	49.4	56.0	6.6	36.0	46.0	10.0
1.07	*	56.0	*	*	46.0	*
2.25	*	56.0	*	*	46.0	*
4.32	*	56.0	*	*	46.0	*
20.48	*	60.0	*	*	50.0	*

Note: * means the emission level 10dB below the relevant limit.

Phase N:



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.16	*	65.7	*	*	55.7	*
0.19	*	64.5	*	*	54.2	*
0.54	49.5	56.0	6.5	36.2	46.0	9.8
1.07	*	56.0	*	*	46.0	*
1.46	*	56.0	*	*	46.0	*
20.31	*	60.0	*	*	50.0	*

Note: * means the emission level 10dB below the relevant limit.

1. All possible modes of operation were investigated. Only the worst case emissions measured.

4. Radiated emission

Test result: PASS

4.1 Radiated emission limits

4.1.1 Limits for radiated disturbance of class A device

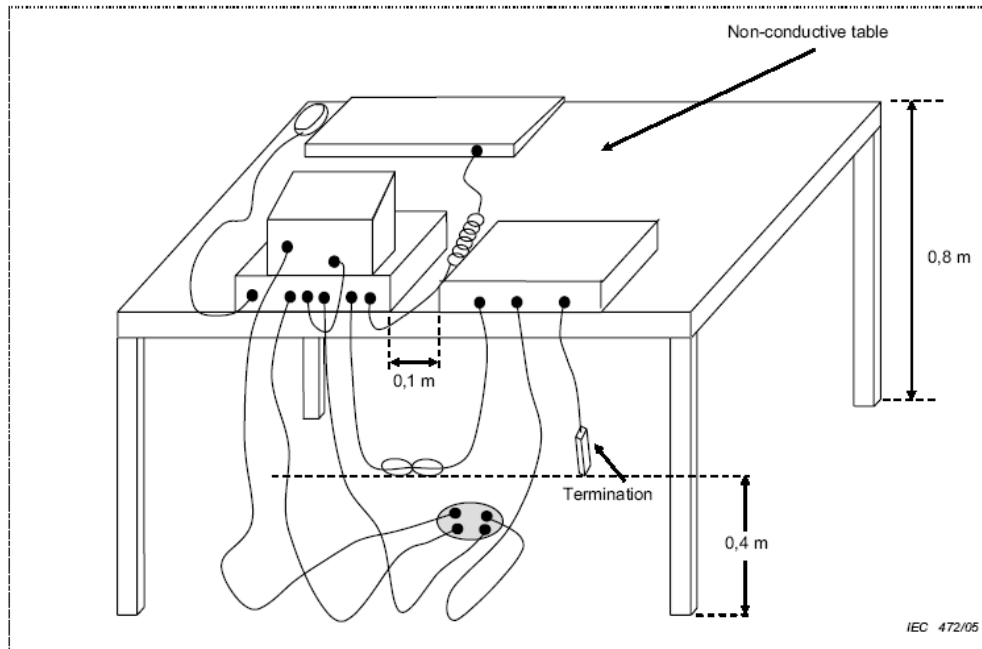
Frequency (MHz)	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 10m
30 – 88	39
88 – 216	43.5
216 – 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.1.1 Limits for radiated disturbance of class B device

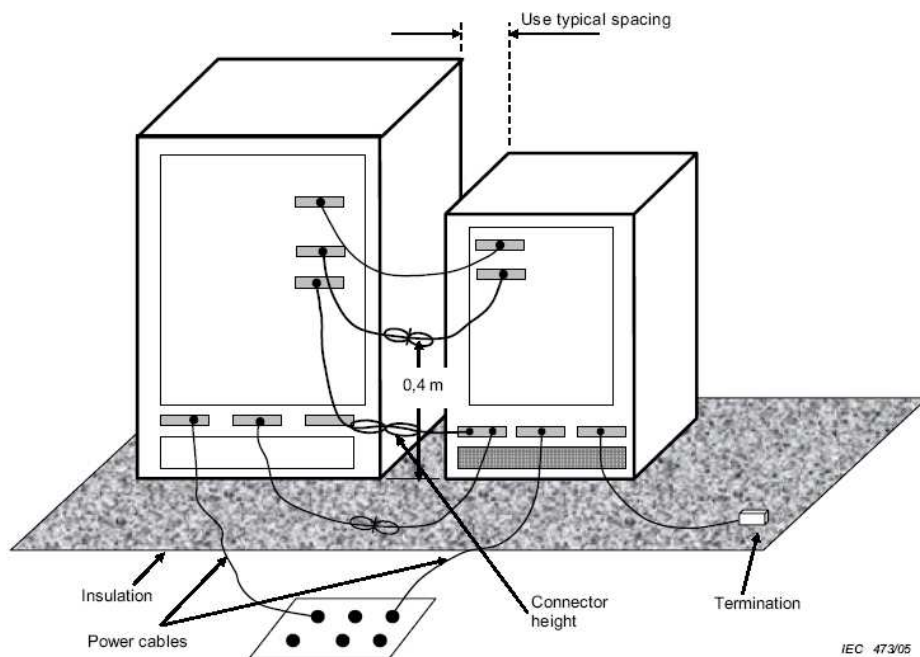
Frequency (MHz)	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 3m
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

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 ESI26 was 120 kHz.

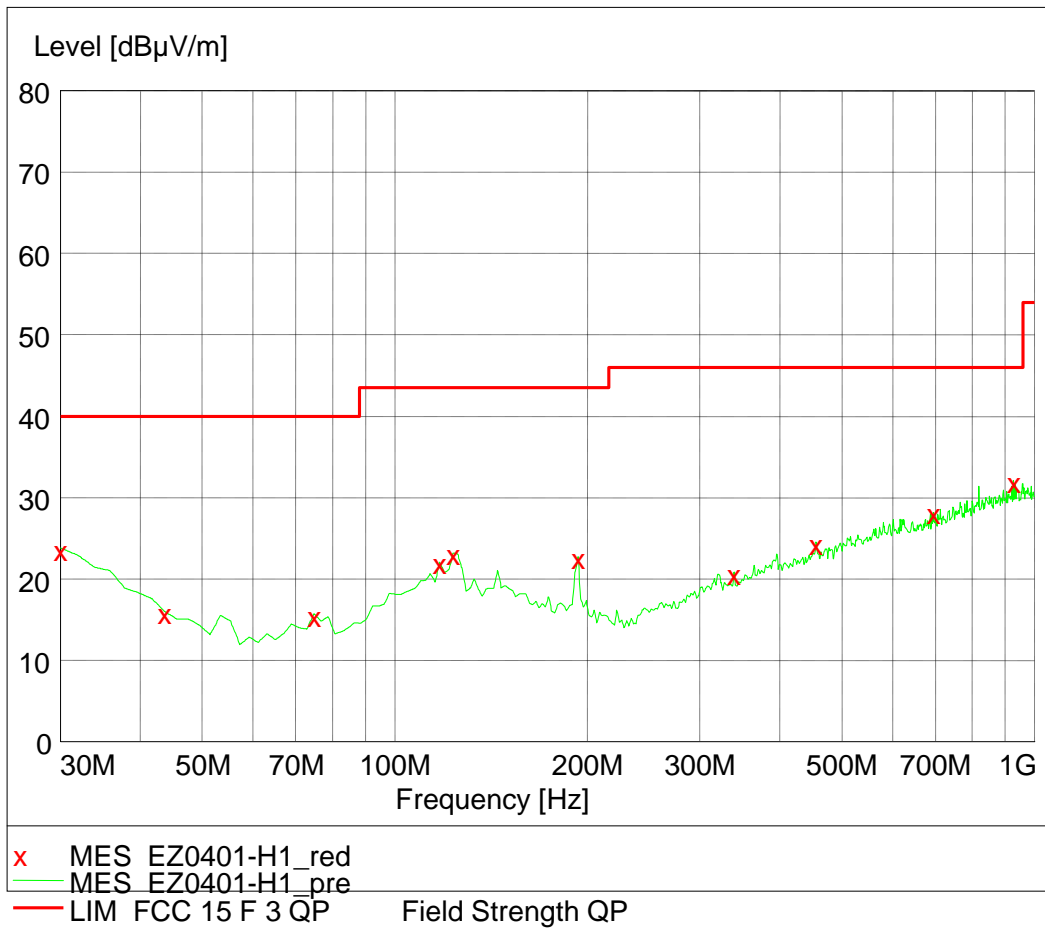
The required measurement frequency range was checked.

4.4 Test Protocol

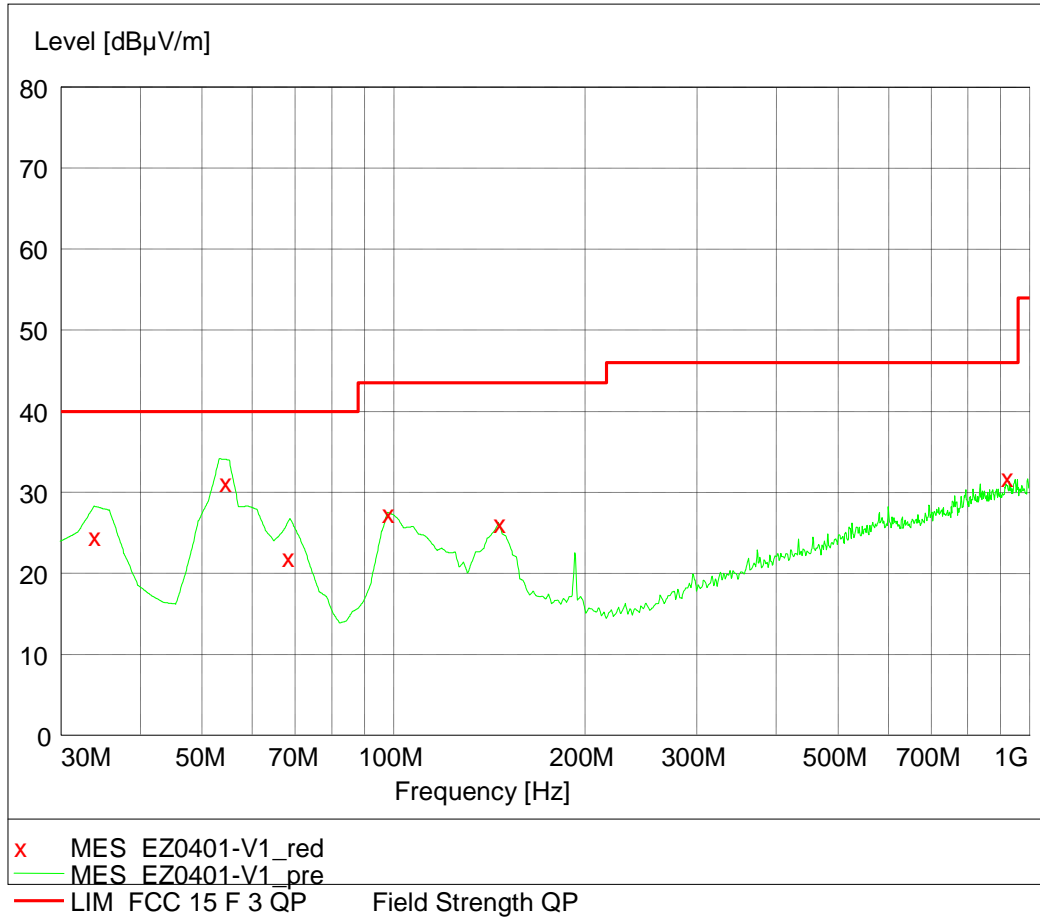
Temperature : 24°C
Relative Humidity : 51%

Test Curve:

30MHz – 1000MHz
Horizontal



Vertical



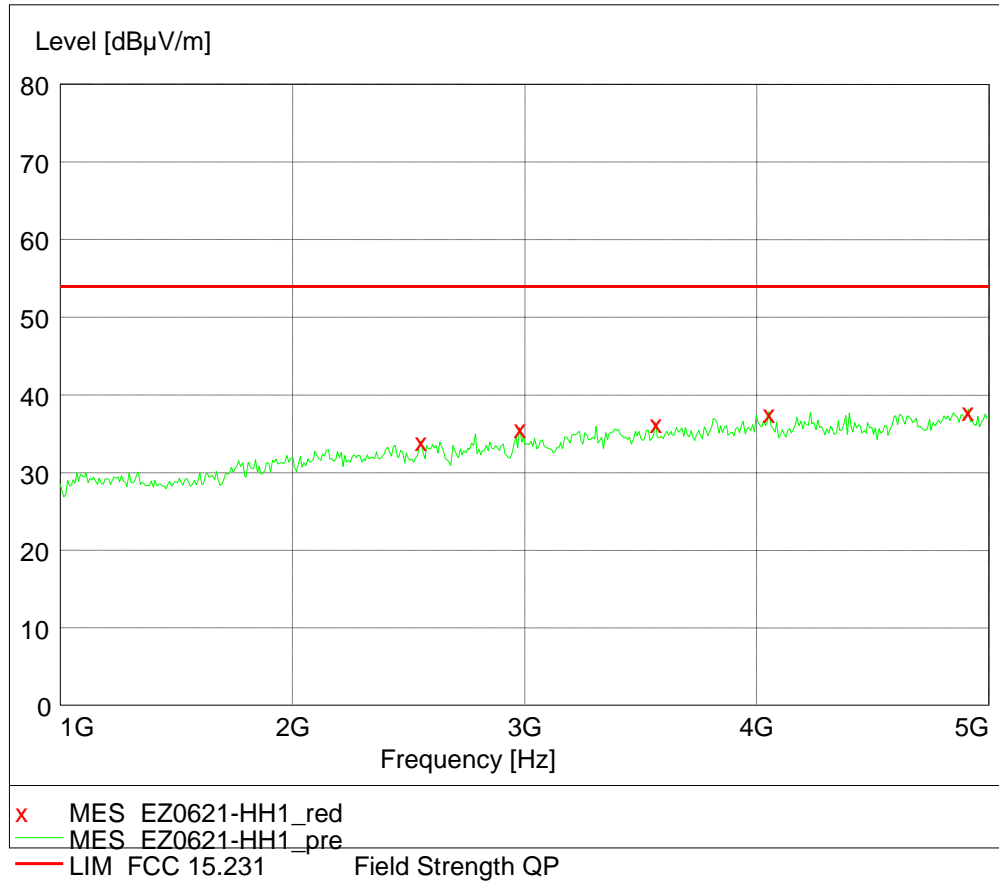
Test data:

Frequency (MHz)	Correct Factor (dB/m)	Emission level (dBμV/m)	Limits (dBμV/m)	Margin	Height (cm)	Polarization (H/V)
30.00	21.0	23.8	40.0	16.2	200	H
43.60	13.7	16.0	40.0	24.0	100	H
694.81	22.2	28.2	46.0	17.8	200	H
33.15	19.3	24.8	40.0	15.2	100	V
50.61	9.8	31.3	40.0	8.7	100	V
68.74	9.3	21.9	40.0	18.1	100	V
98.40	15.6	27.1	43.5	16.4	100	V
151.41	13.8	26.5	43.5	17.0	100	V

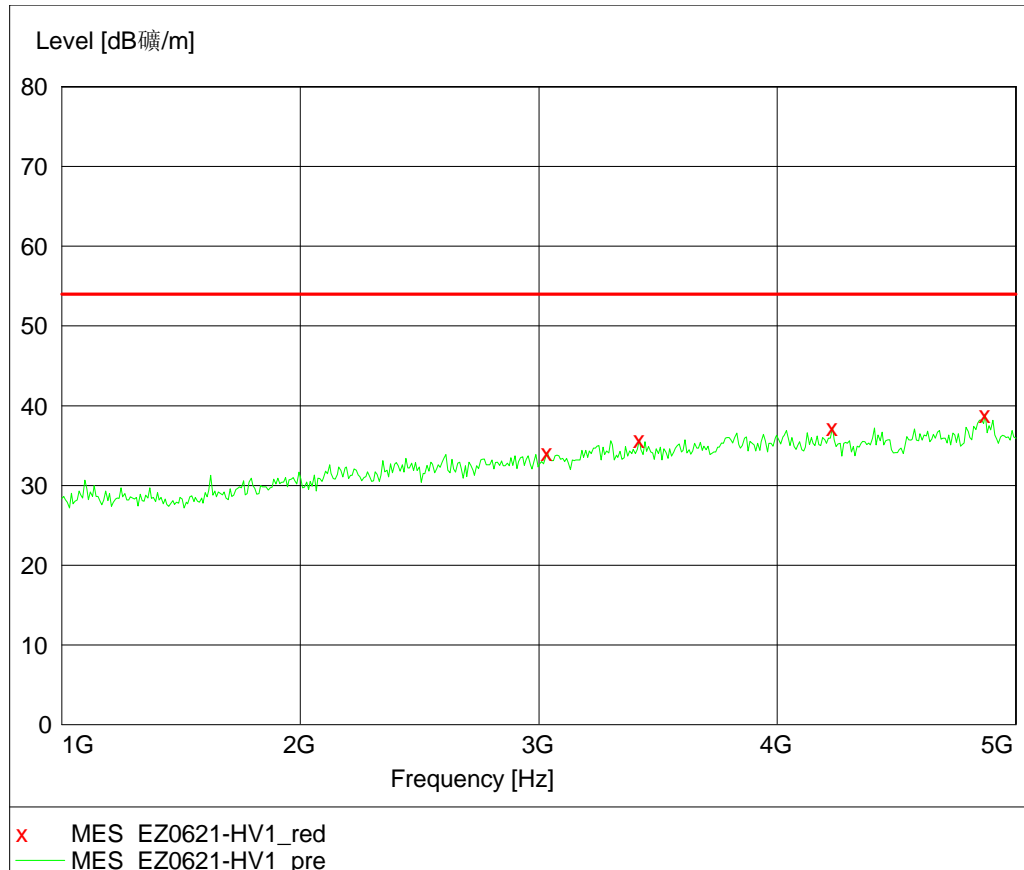
Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz)
 2. Corrected Reading = Original Receiver Reading + Correct Factor
 3. Margin = limit - Corrected Reading

Above 1GHz

Horizontal



Vertical



Test data:

Frequency (MHz)	Correct Factor (dB/m)	Emission level (dBμV/m)	Limits (dBμV/m)	Margin (dBμV/m)	Height (cm)	Polarization (H/V)
2555.11	-7.2	34.1	54.0	19.9	200	H
2979.96	-6.4	35.8	54.0	18.2	200	H
3565.13	-4.2	36.5	54.0	17.5	200	H
4054.11	-2.3	37.8	54.0	16.2	200	H
4911.82	-0.4	38.1	54.0	15.9	200	H
3036.07	-6.2	34.2	54.0	19.8	100	V
3420.46	-4.7	37.8	54.0	18.2	100	V
4230.46	-2.1	37.3	54.0	16.7	100	V
4871.74	-0.5	38.9	54.0	15.1	100	V

- 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 PK reading is less than AV limit, the AV test can be elided.