

Westinghouse Fireplaces (Ningbo) Co., Ltd.

EMC TEST REPORT

Report Type:

FCC Part 15B EMC report

Model:

WTH-50EF12A1,
WTH-60EF12A1,
WTH-74EF12A1,
WTH-28EF09A2

REPORT NUMBER:

2305A1102SHA-001

ISSUE DATE:

July 7, 2023

DOCUMENT CONTROL NUMBER:

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Applicant: Westinghouse Fireplaces (Ningbo) Co., Ltd.
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Manufacturer: Ningbo Gengmei Electric Appliance Tech Co.,Ltd
Guangxi Industrial Estate ,Yinjiang Town,Haishu District,Ningbo,China

FCC ID: 2BBO2-WTH1886EFA

SUMMARY:

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

47CFR Part 15 (2021): Radio Frequency Devices (Subpart B)

ANSI C63.4 (2014)+A1(2017): 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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TEST REPORT

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Revision History

Report No.	Version	Description	Issued Date
2305A1102SHA-001	Rev. 01	Initial issue of report	July 7, 2023

Measurement result summary

TEST ITEM	FCC REFERENCE	IC REFERENCE	RESULT
Power line conducted emission	15.107	3.2.1	Pass
Radiated emission	15.109	3.2.2	Pass

Notes: 1: NA =Not Applicable

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Electric fireplace
Type/Model:	WTH-50EF12A1, WTH-60EF12A1, WTH-74EF12A1, WTH-28EF09A2
Description of EUT:	<p>The products covered by this report are household and indoor use electric fireplace, provided with permanently attached flexible power supply cord which is terminated in a grounding plug. All models share the same electrical constructions, except the appearance.</p> <p>The contains module has been approved with FCC ID: 2ANDL-WBR2. All models are same except for the appearance. we test IF-50S-AGM-XW as representative and list the worst results in this report.</p>
Rating:	120V,60Hz,1500W
Category of EUT:	Class B
EUT type:	<input type="checkbox"/> Tabletop <input checked="" type="checkbox"/> Floor standing
Highest operating frequency	2480MHz
Software Version:	/
Hardware Version:	/
Sample received date:	July 1, 2023
Date of test:	July 1, 2023~ July 7, 2023

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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: 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 (2021)

ANSI C63.4 (2014)+A1(2017)

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	SKET Auto EMC Test Software	Keleto	V3.0
Radiated emission	SKET Auto EMC Test Software	Keleto	V3.0

2.4 Test peripherals list

Item No.	Name	Band and Model	Description

2.5 Test environment condition:

Test items	Temperature	Humidity
Power line conducted emission	23°C	53% RH
Radiated Emissions	23°C	55% RH

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2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCS 30	EC 2107	2023-07-07
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2023-11-08
<input checked="" type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2024-01-10
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2023-09-15
<input checked="" type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2023-09-24
<input checked="" type="checkbox"/>	Horn antenna	R&S	HF 906	EC 3049	2024-01-16
<input checked="" type="checkbox"/>	Pre-amplifier	R&S	Pre-amp 18	EC5262	2024-06-08
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2023-07-13
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2024-03-01
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 4620	2023-09-08

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2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Radiated Emissions in restricted frequency bands below 1GHz	$\pm 4.90\text{dB}$
Radiated Emissions in restricted frequency bands above 1GHz	$\pm 5.02\text{dB}$
Power line conducted emission	$\pm 3.19\text{dB}$

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3 Radiated Emissions

Test result: Pass

3.1 Limit

3.1.1 Limits for radiated disturbance of class A device

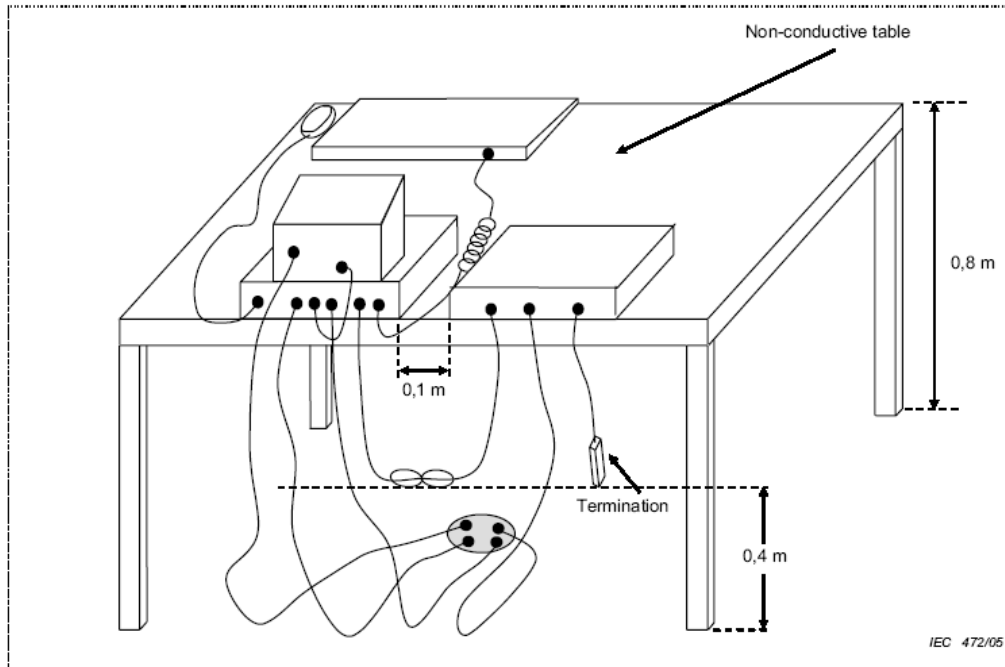
Frequency (MHz)	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 10m
30 – 88	39
88 – 216	43.5
216 – 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

3.1.2 Limits for radiated disturbance of class B device

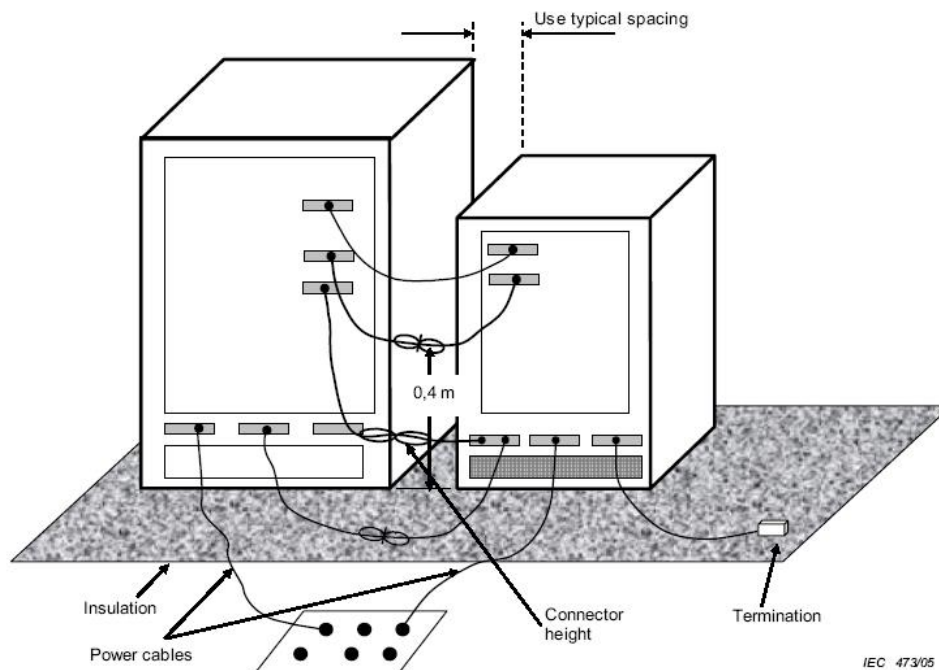
Frequency (MHz)	Permitted limit in dB μ V/m (Quasi-peak) of Measurement Distance 3m
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

3.2 Block diagram and test set up

For table top equipment



For floor standing equipment



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3.3 Measurement Procedure

The measurement was performed in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, the pre-amplifier (and high pass filter if necessary) is equipped just at the output terminal of the antenna.

The distance from EUT to receiving antenna is **3** meters.

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 radiated emission was measured using the test receiver with the resolutions bandwidth set as:

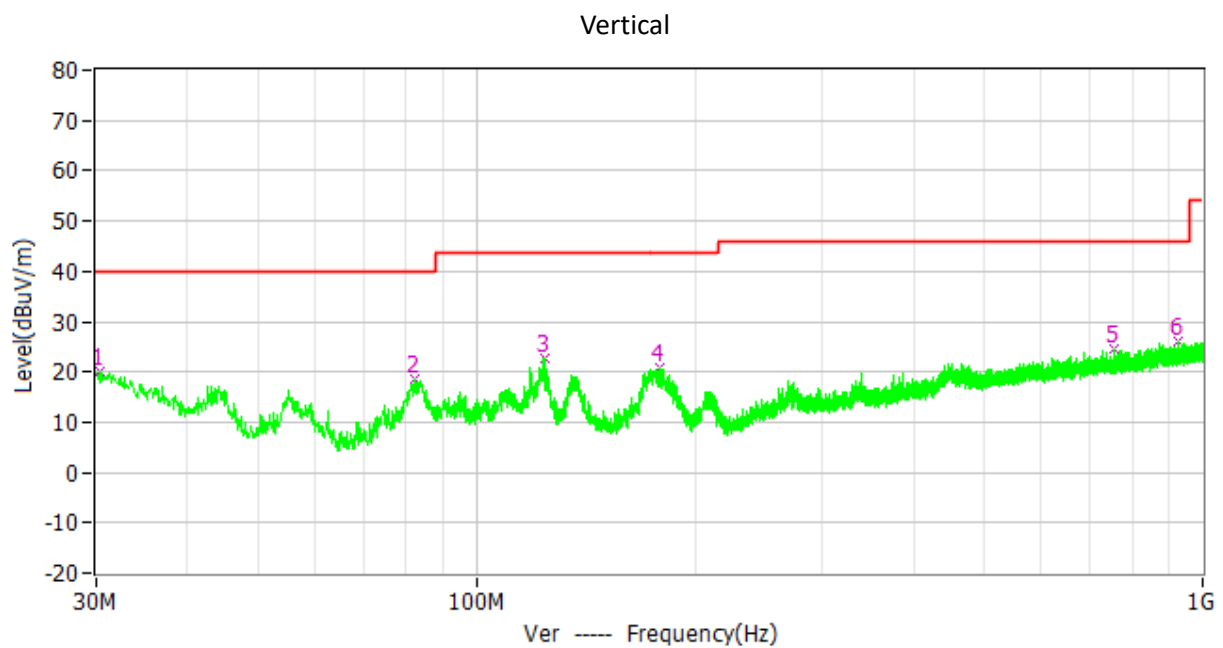
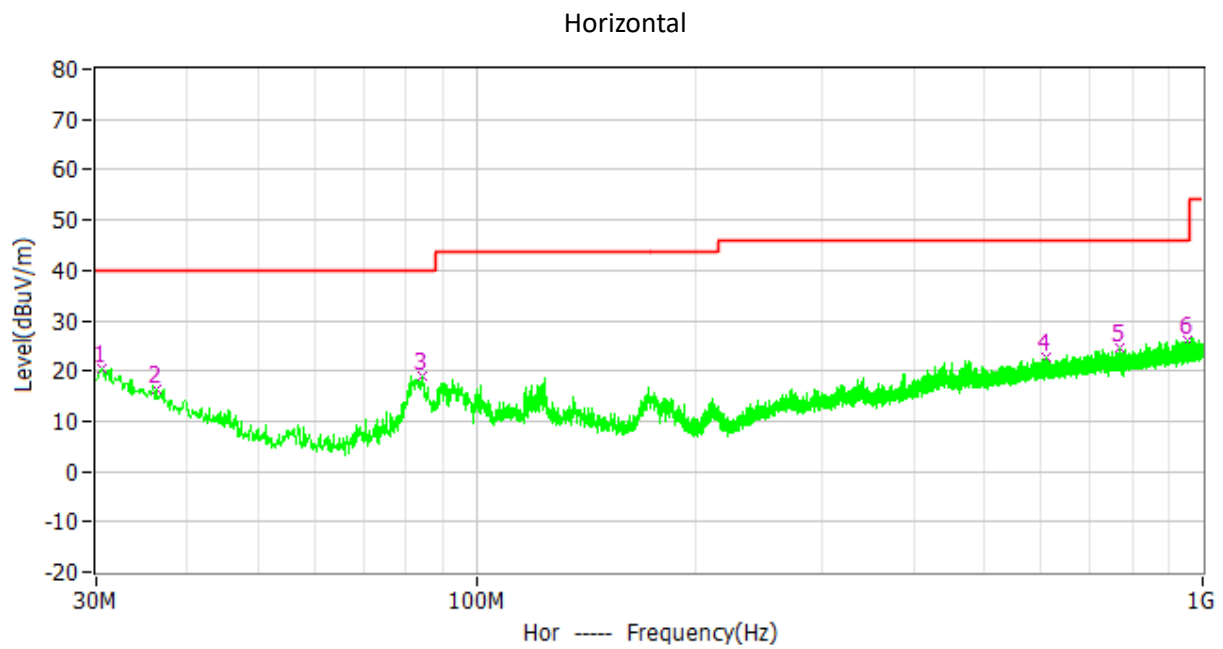
RBW = 100kHz, VBW = 300kHz (30MHz~1GHz)

RBW = 1MHz, VBW = 3MHz (>1GHz for PK)

Highest internal frequency (F _x)	Highest measured frequency F _M for radiated measurement	Measured Bandwidth
F _x ≤ 108 MHz	1 GHz	120kHz
108 MHz < F _x ≤ 500 MHz	2 GHz	1MHz
500 MHz < F _x ≤ 1 GHz	5 GHz	1MHz
F _x > 1 GHz	5 × F _x up to a maximum of 40 GHz	1MHz
Note: 1. F _x is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.		

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3.4 Test Results of Radiated Emissions



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Test data 30MHz~1GHz:

Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector
H	30.58	20.60	40.00	19.40	PK
	36.30	16.40	40.00	23.60	PK
	84.41	18.80	40.00	21.20	PK
	609.28	22.60	46.00	23.40	PK
	770.30	24.40	46.00	21.60	PK
	953.34	26.10	46.00	19.90	PK
V	30.38	19.90	40.00	20.10	PK
	82.38	18.40	40.00	21.60	PK
	124.28	22.60	43.50	20.90	PK
	178.70	20.70	43.50	22.80	PK
	754.97	24.60	46.00	21.40	PK
	927.15	26.10	46.00	19.90	PK

Test data of 1G~25GHz:

Antenna Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin	Detector
H	1000.00	*	74.00	*	PK
	5000.00	*	74.00	*	PK
	10000.00	*	74.00	*	PK
	15000.00	*	74.00	*	PK
	20000.00	*	74.00	*	PK
	25000.00	*	74.00	*	PK
V	1000.00	*	74.00	*	PK
	5000.00	*	74.00	*	PK
	10000.00	*	74.00	*	PK
	15000.00	*	74.00	*	PK
	20000.00	*	74.00	*	PK
	25000.00	*	74.00	*	PK

Note: * means the emission level is 20dB or more lower than 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.

4 Power line conducted emission

Test result: Pass

4.1 Limit

4.1.1 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.		

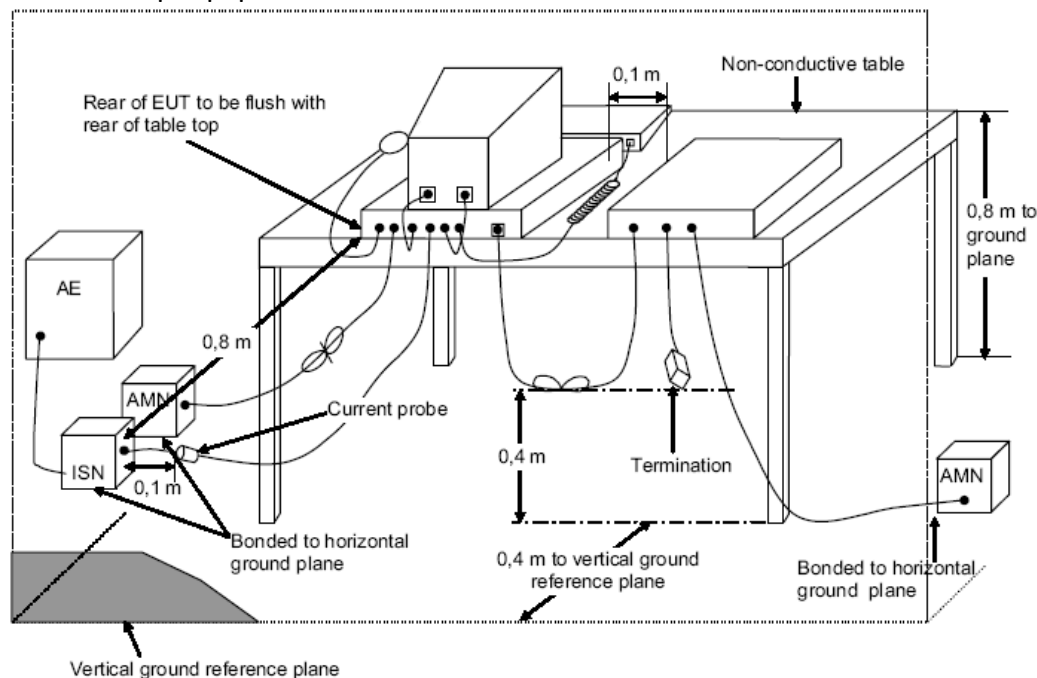
4.1.2 Limits for conducted disturbance voltage at the mains ports of class B device

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.		

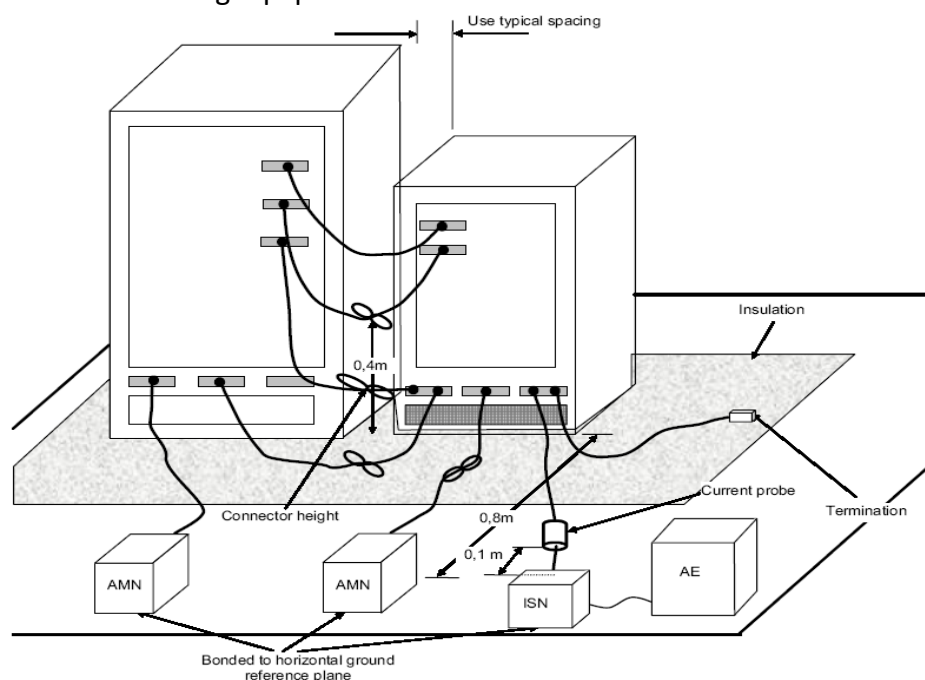
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4.2 Block diagram and test set up

For table top equipment



For floor standing equipment



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Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

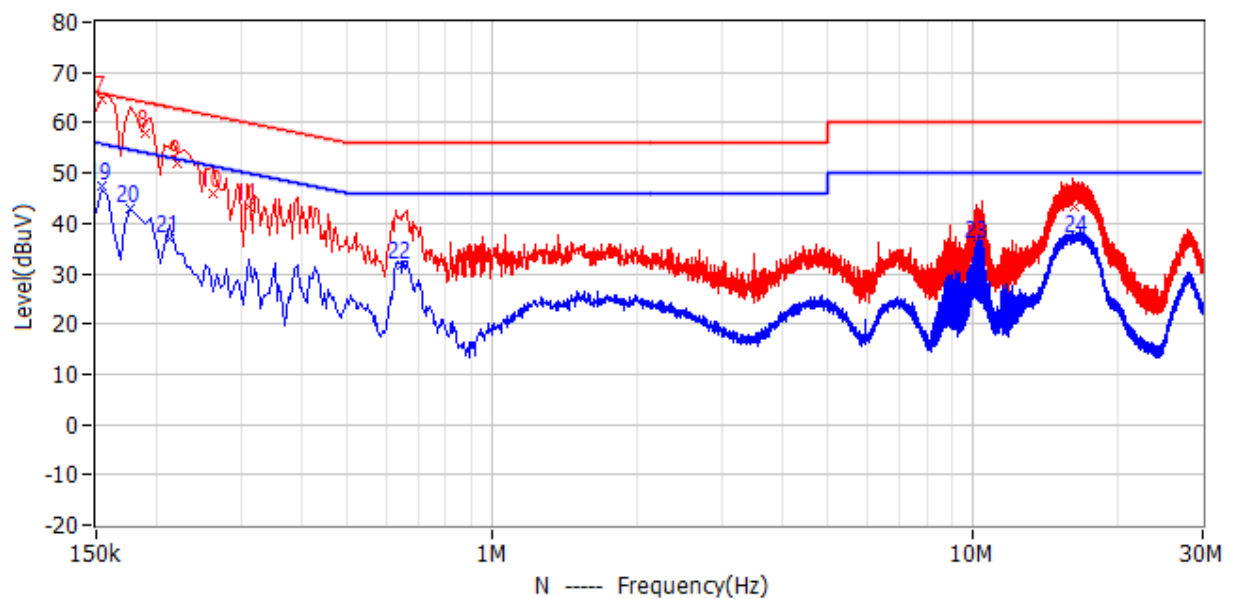
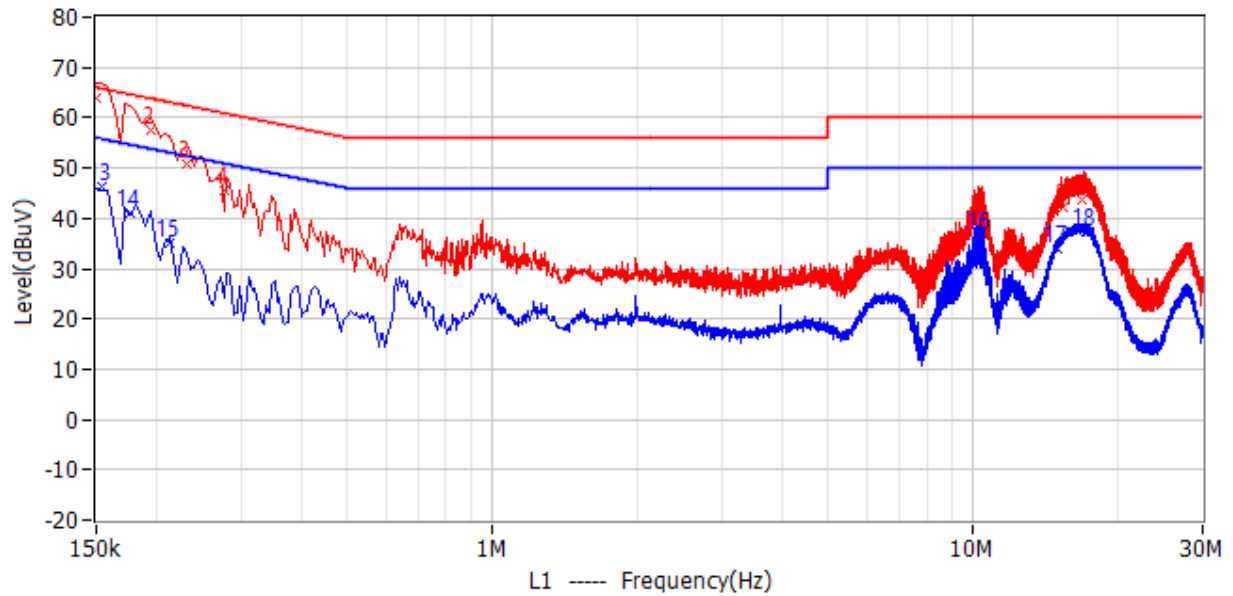
Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

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4.4 Test Results of Power line conducted emission

Test Curve:



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Test Curve:

Test Data:

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Phase
1	150.000kHz	66.0	64.0	-2.0	57.8	6.2	QP	L1
2	195.000kHz	63.8	57.6	-6.2	51.4	6.2	QP	L1
3	231.000kHz	62.4	50.7	-11.7	44.5	6.2	QP	L1
4	276.000kHz	60.9	45.6	-15.3	39.4	6.2	QP	L1
5	15.387MHz	60.0	42.0	-18.0	35.6	6.4	QP	L1
6	16.881MHz	60.0	43.8	-16.2	37.4	6.4	QP	L1
7	154.500kHz	65.8	64.7	-1.1	58.4	6.3	QP	N
8	190.500kHz	64.0	58.0	-6.0	51.8	6.2	QP	N
9	222.000kHz	62.7	51.8	-10.9	45.5	6.3	QP	N
10	262.500kHz	61.4	45.9	-15.5	39.7	6.2	QP	N
11	312.000kHz	59.9	43.3	-16.6	37.1	6.2	QP	N
12	16.193MHz	60.0	43.3	-16.7	36.8	6.5	QP	N
13	154.500kHz	55.8	46.2	-9.5	40.0	6.2	CAV	L1
14	177.000kHz	54.6	41.2	-13.4	35.1	6.1	CAV	L1
15	213.000kHz	53.1	34.9	-18.2	28.7	6.2	CAV	L1
16	10.298MHz	50.0	36.4	-13.6	30.1	6.3	CAV	L1
17	14.937MHz	50.0	34.0	-16.0	27.6	6.4	CAV	L1
18	17.111MHz	50.0	37.3	-12.7	30.9	6.4	CAV	L1
19	154.500kHz	55.8	47.4	-8.3	41.1	6.3	CAV	N
20	177.000kHz	54.6	43.0	-11.6	36.8	6.2	CAV	N
21	213.000kHz	53.1	36.9	-16.2	30.6	6.3	CAV	N
22	645.000kHz	46.0	31.5	-14.5	25.2	6.3	CAV	N
23	10.293MHz	50.0	35.9	-14.1	29.5	6.4	CAV	N
24	16.481MHz	50.0	37.0	-13.0	30.5	6.5	CAV	N

Remark: 1. Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Level = Original Receiver Reading + Correct Factor

3. Delta = Level - Limit

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Appendix I: Photograph of equipment under test

WTH-74EF12A1



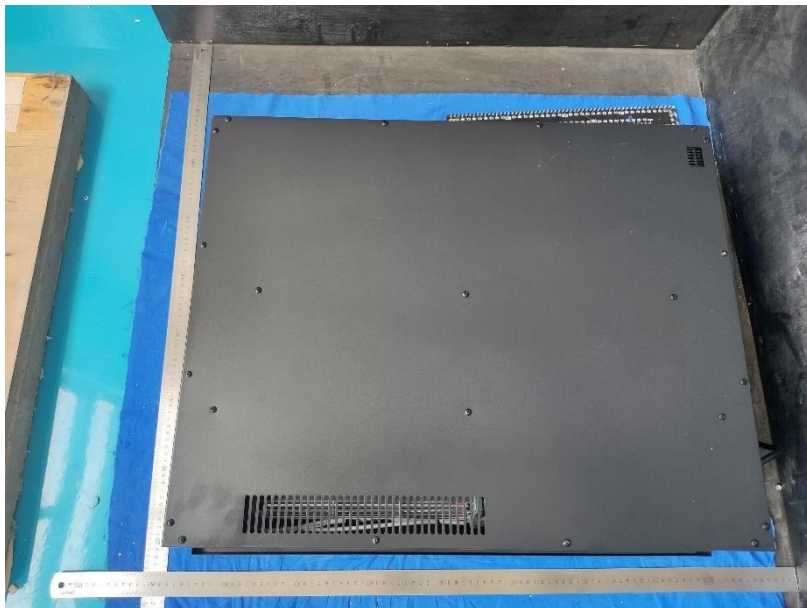
WTH-60EF12A1

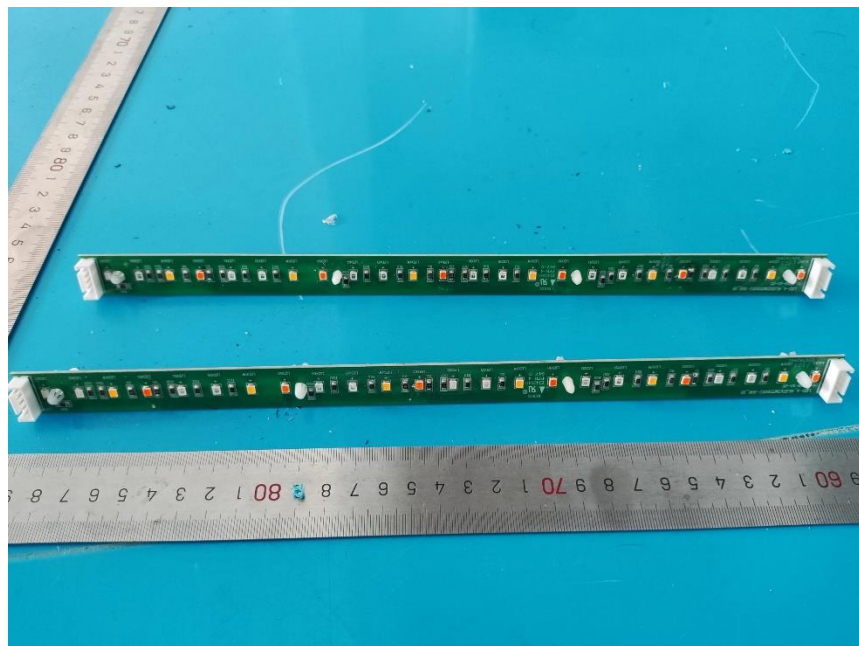
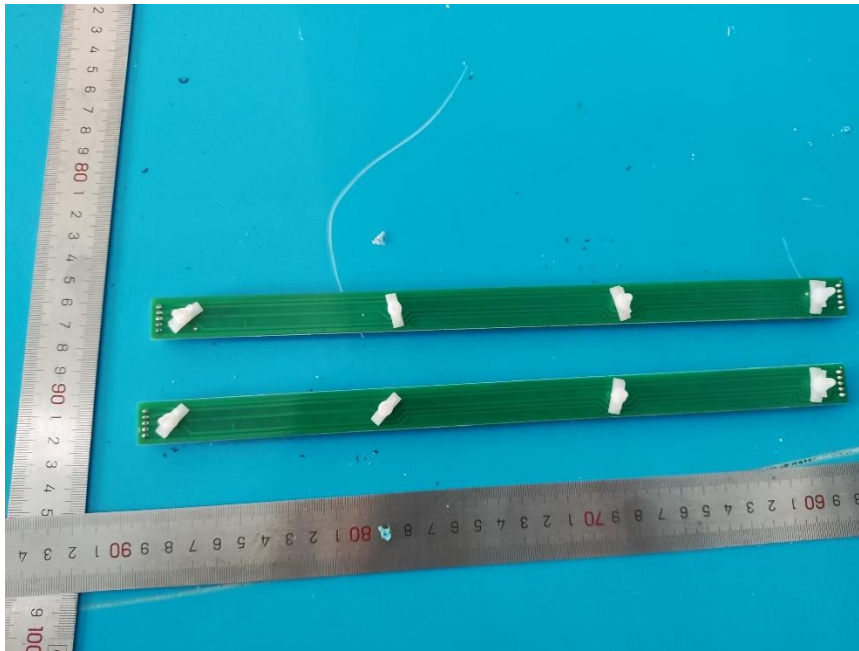


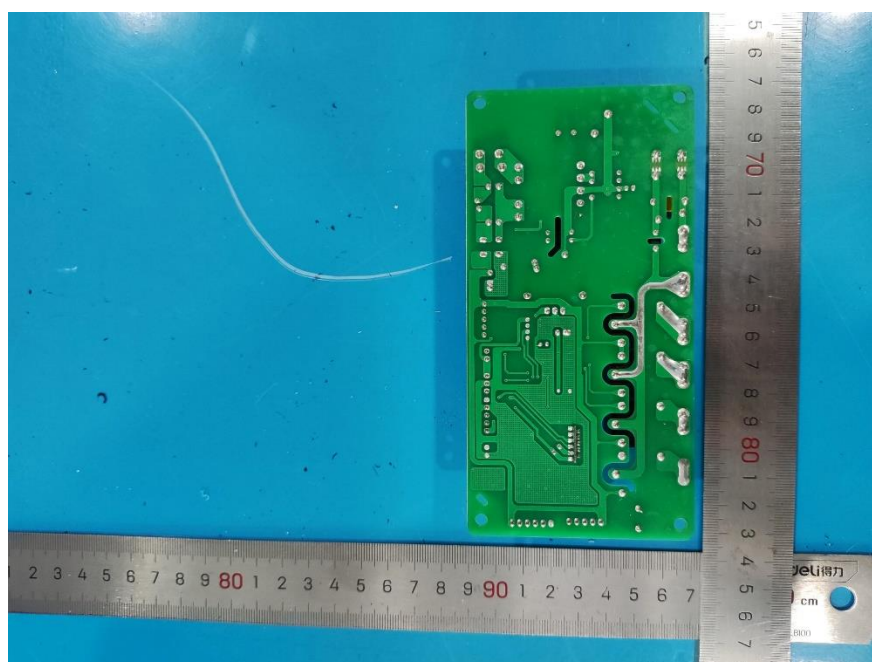
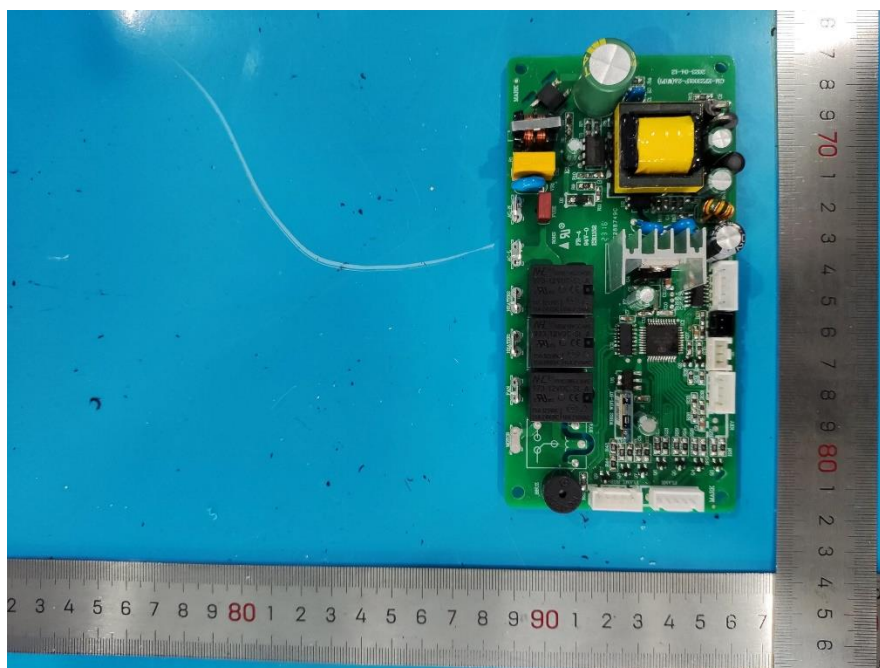
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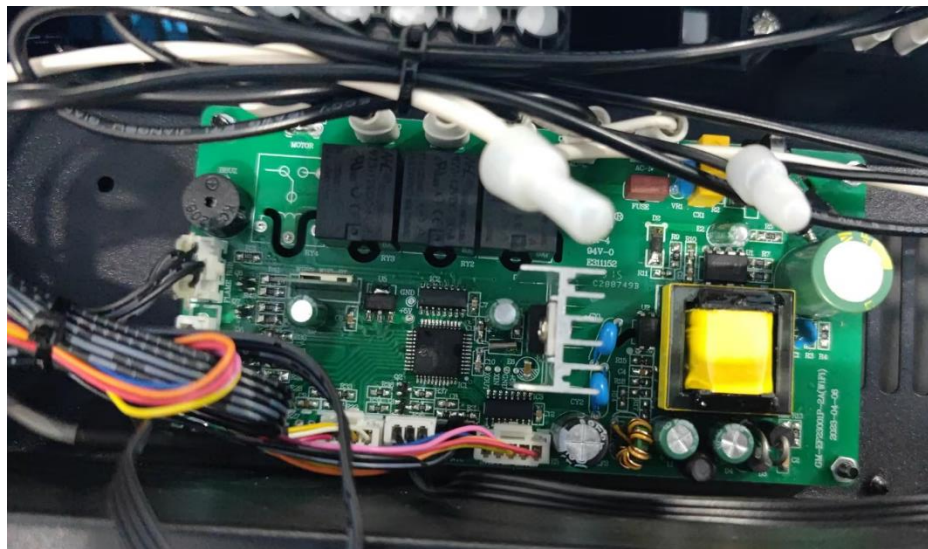
WTH-28EF09A2

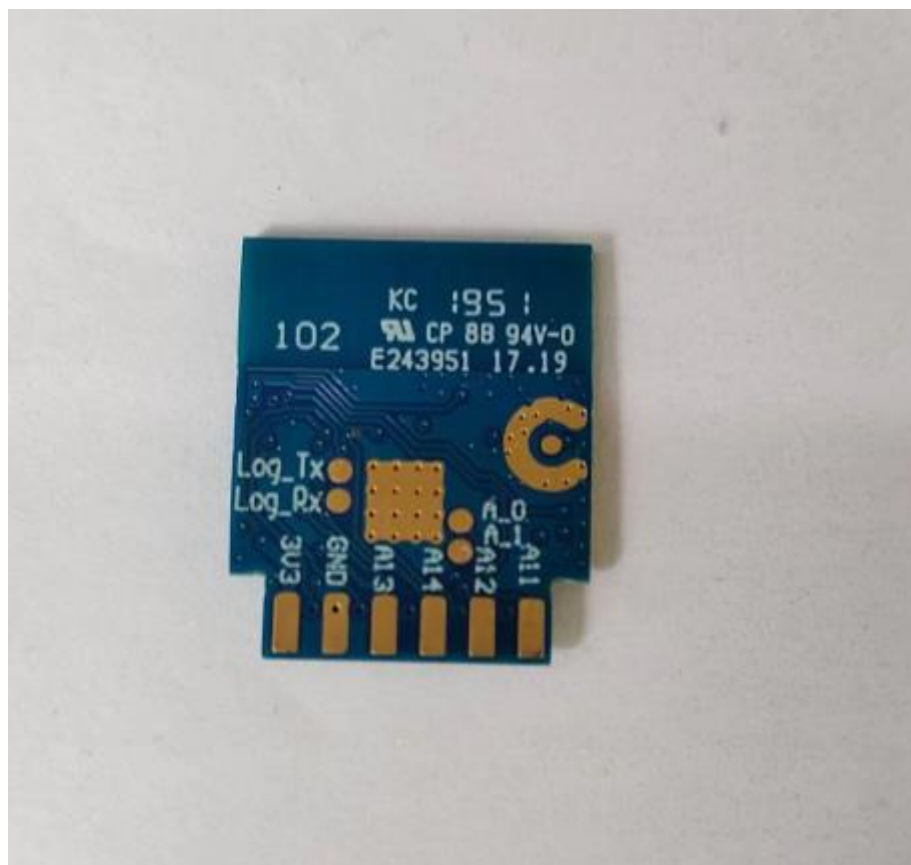














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