EMC TEST REPORT

Applicant	:	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	:	Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Manufacturer	:	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	:	Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Factory	:	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	:	Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Product Name	:	2.1 computer multimedia speaker
Brand Name	:	F&D
Model No.	:	HT-350, HT-360, HT-380, HT-390(For model difference refer to section 2)
Measurement Standard	:	ETSI EN 301 489-1 V2.2.3: 2019 ETSI EN 301 489-17 V3.2.4: 2020
Receipt Date of Samples	:	July 02, 2021
Date of Tested	:	July 02, 2021 to August 20, 2021
Date of Report	:	December 28, 2021

This report shows that above equipment is technically compliant with the requirements of the standards above. All test results in this report apply only to the tested sample(s). Without prior written approval of Dongguan Nore Testing Center Co., Ltd, this report shall not be reproduced except in full.

Prepared by

Jenny Liu / Project Engineer

Approved by

Iori Fan / Authorized Signatory

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Revision History

Report Number	Description	Issued Date
NTC2112026EV00	Initial Issue	2021-12-28

1. Summary of Test Result

ETSI EN 301 489-1 V2.2.3: 2019 ETSI EN 301 489-17 V3.2.4: 2020			
EMISSION			
Standard	**Test Item**	**Result**	**Remarks**
EN 55032: 2015	Conducted Emission (AC Mains)	PASS	---
	Conducted Emission (Wired network port)	N/A	---
	Radiated Emission	PASS	---
EN 61000-3-2: 2014	Harmonic Current Emission	PASS	---
EN 61000-3-3: 2013	Voltage Fluctuations & Flicker	PASS	---
IMMUNITY			
Standard	**Test Item**	**Result**	**Remarks**
EN 61000-4-2: 2009	Electrostatic Discharges (ESD)	PASS	---
EN 61000-4-3: 2006+A1: 2008+A2: 2010	Continuous RF Electromagnetic Field Disturbances	PASS	---
EN 61000-4-4: 2012	Electrical Fast Transients/Burst (EFT/B)	PASS	---
EN 61000-4-5: 2014	Surges	PASS	---
EN 61000-4-6: 2014	Continuous Induced RF Disturbances	PASS	---
IEC 61000-4-11: 2004	Voltage Dips and Interruptions	PASS	---

2. General Description of EUT

Product Information	
Product name:	2.1 computer multimedia speaker
Main Model Name:	HT-350
Additional Model Name:	HT-360, HT-380, HT-390
Model Difference:	These models have the same circuit schematic, construction, PCB layout and critical components. Their differences are model number and the size of enclosure.
S/N:	2107-3437 for Soundbar; 2107-3437-1 for Subwoofer
Brand Name:	F&D
Hardware version:	V1.0
Software version:	V1.0
Temperature Range:	0 – 40 ℃
Rating:	For Soundbar: AC 100-240V 50/60Hz, 0.5A For Subwoofer: AC 100-240V 50/60Hz, 0.5A
Classification:	Class B
Typical Arrangement:	Table-top
I/O Port:	For Soundbar: AC Port*1, USB Port*1, Optical Port*1, AUX Port*1, HDMI ARC*1 For Subwoofer: AC Port*1

Accessories Information	
Adapter:	N/A
Cable:	Power cord 1: 1.63m unshielded; Power cord 2: 1.63m unshielded
Other:	IR Remote * 1
Additional Information	
Note:	1. According to the model difference, all tests were performed on model HT-350. 2. The EUT consists of Soundbar and Subwoofer two units. 3. The manufacturer declared that length of Audio line/ Signal line is less than 3m.
Remark:	This report was an additional report based on NTC2107051EV00. Comparing with the original report NTC2107051EV00, this report changed the information of the applicant, manufacturer, product name, and model name, brand name. According to the manufacturer, all the original test data continue to be referenced but the changed information.

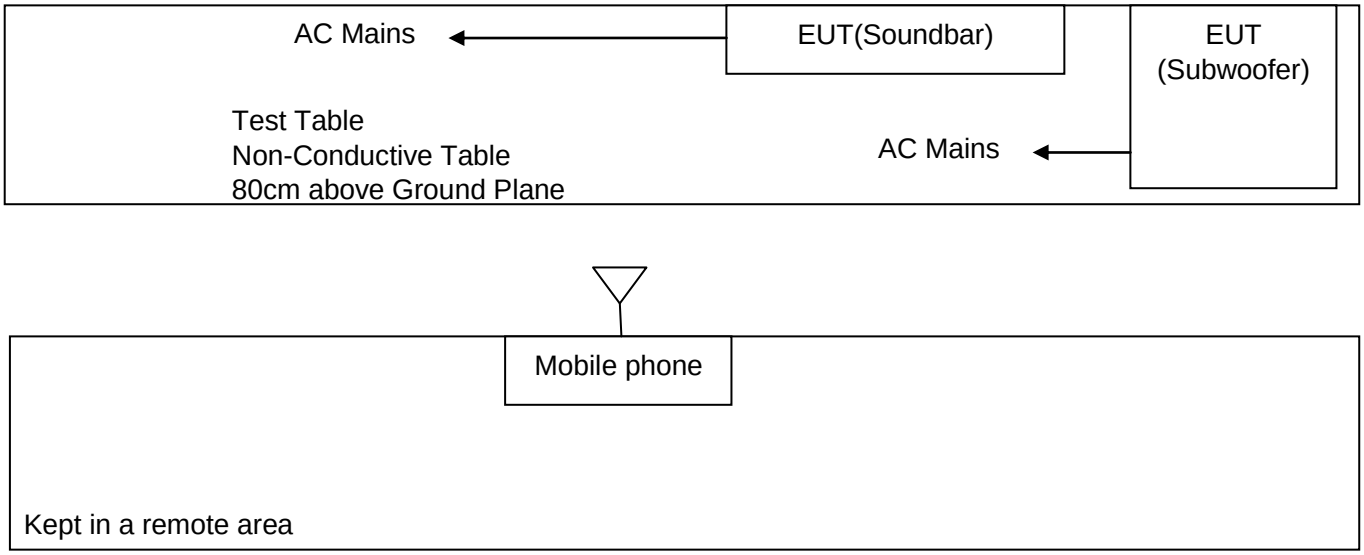
Technical Specification	
Bluetooth Function For Soundbar unit & Subwoofer unit:	
BT Version:	V5.3
Frequency Range:	2402-2480MHz
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK
Number of Channel:	79
Channel space:	1MHz
Antenna Type:	PCB antenna
Antenna Gain:	0 dBi (Declared by manufacturer)
Note: The EUT does not support Bluetooth Low Energy feature. The manufacturer declared that Bluetooth specification change will not change the Bluetooth Chip and it' s related circuit.	

3. Configuration of EUT

Description of Test Modes

Test Mode		Description
1.	BT Link	Turn on the EUT and connect EUT(Soundbar) to mobile phone by Bluetooth function to make it work normally, then paired the EUT(Subwoofer) to EUT(Soundbar) to make it work normally.

Block Diagram of Configuration



4. Description of Support Device

No.	Equipment	Brand	M/N	S/N	Cable Specification	Remarks
1.	Mobile Phone	HUAWEI	H60-L01	DU2SSE1 478007958	---	Provided by the laboratory
2.	Mobile Phone	HUAWEI	PCT-AL10	5EN02193 01002260	---	Provided by the laboratory
3.	iPhone	APPLE	MD298CH/A	DNQK31H EDTWF	---	Provided by the laboratory

5. Test Facility

Test Site	:	Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Accreditations and Authorizations	:	The Laboratory has been assessed and proved to be in compliance with CNAS/CL01 Listed by CNAS, August 13, 2018 The Certificate Registration Number is L5795. The Certificate is valid until August 13, 2024 The Laboratory has been assessed and proved to be in compliance with ISO17025 Listed by A2LA, November 01, 2017 The Certificate Registration Number is 4429.01 The Certificate is valid until December 31, 2021 Listed by FCC, November 06, 2017 Test Firm Registration Number: 907417 Listed by Industry Canada, June 08, 2017 The Certificate Registration Number. Is 46405-9743A
Test Site Location	:	Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong Province, China

6. Test Conditions

No.	Test Item	Test Mode	Test Voltage	Tested by	Remarks
1.	Conducted Emission (AC Mains)	1	AC 110V 60Hz AC 230V 50Hz	Alvin	See note 1
2.	Conducted Emission (Wired network Port)	---	---	---	---
3.	Radiated Emission	1	AC 110V 60Hz AC 230V 50Hz	Loki	See note 1
4.	Harmonic Current Emission	1	AC 230V 50Hz	Rick	See note 1
5.	Voltage Fluctuations & Flicker	1	AC 230V 50Hz	Rick	See note 1
6.	Electrostatic Discharges (ESD)	1	AC 230V 50Hz	Rick	See note 2
7.	Continuous RF Electromagnetic Field Disturbances	1	AC 230V 50Hz	Alvin	See note 1
8.	Electrical Fast Transients/Burst (EFT/B)	1	AC 230V 50Hz	Rick	See note 1
9.	Surges	1	AC 230V 50Hz	Rick	See note 1
10.	Continuous Induced RF Disturbances	1	AC 230V 50Hz	Alvin	See note 1
11.	Voltage Dips and Interruptions	1	AC 230V 50Hz	Rick	See note 1

Note:

1. The testing climatic conditions for temperature, humidity, and atmospheric pressure are within: 15~35℃, 30~70%, 86~106kPa.
2. The testing climatic conditions for temperature, humidity, and atmospheric pressure are within: 15~35℃, 30~60%, 86~106kPa.
3. Only the worst case was recorded in the report.

7. Measurement Uncertainty

No.	Test Item	Frequency	Uncertainty	Remarks
1.	Conducted Emission (AC mains)	9KHz ~ 150KHz	± 3.04 dB	---
		150KHz ~ 30MHz	± 2.52 dB	---
2.	Conducted Emission (Wired network Port)	150KHz ~ 30MHz	± 2.52 dB	---
3.	Radiated Emission	30MHz ~ 1GHz	± 4.68 dB	---
		1GHz ~ 6GHz	± 5.14 dB	---

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The measurement uncertainly levels above are estimated and calculated according to CISPR 16-4-2.

8. Measurement Bandwidths

No.	Frequency Range (MHz)	Peak Level (kHz)	Quasi-Peak Level (kHz)	Average Level (kHz)
1.	0.01 ~ 0.15	0.3	0.2	0.2
2.	0.15 ~30.0	10.0	9.0	9.0
3.	30 ~ 1000	100.0	120.0	120.0
4.	Above 1000	1000.0	N/A	1000.0

Note: Measurements were made using the bandwidths and detectors specified by the standard. No video filter was used.

9. Deviations and Abnormalities from Standard Conditions

No additions, deviations and exclusions from the standard.

10. Sample Calculations

Conducted Emission						
Freq. (MHz)	**Reading Level (dBuV)**	**Correct Factor (dB)**	**Measurement (dBuV)**	**Limit (dBuV)**	**Over (dB)**	**Detector**
0.1500	41.80	10.60	52.40	66.00	-13.60	QP

Where,

Freq.	= Emission frequency in MHz
Reading Level	= Spectrum Analyzer/Receiver Reading
Corrector Factor	= Insertion loss of LISN + Cable Loss + RF Switching Unit attenuation
Measurement	= Reading + Corrector Factor
Limit	= Limit stated in standard
Margin	= Measurement - Limit
Detector	= Reading for Quasi-Peak / Average / Peak

Radiated Emission						
Freq. (MHz)	**Reading Level (dBuV)**	**Correct Factor (dB/m)**	**Measurement (dBuV/m)**	**Limit (dBuV/m)**	**Over (dB)**	**Detector**
159.9800	46.94	-10.44	36.40	40.00	-3.50	QP

Where,

Freq.	= Emission frequency in MHz
Reading Level	= Spectrum Analyzer/Receiver Reading
Corrector Factor	= Antenna Factor + Cable Loss - Pre-amplifier
Measurement	= Reading + Corrector Factor
Limit	= Limit stated in standard
Over	= Margin, which calculated by Measurement - Limit
Detector	= Reading for Quasi-Peak / Average / Peak

11. Conducted Emission Measurement

LIMITS

Limits for conducted disturbance for the AC mains power ports:

Frequency (MHz)	☐Class A (dBuV)		☒Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.5	79	66	66 to 56	56 to 46
0.5 to 5	73	60	56	46
5 to 30	73	60	60	50

Note:
1. If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurements with the average detector are considered to be met.
2. The higher value measured with and without the outer conductor screen of the antenna terminal connected to earth is considered.
3. Television receivers with teletext facilities should be tested in teletext mode with teletext Picture.
4. The lower limit shall apply at the transition frequencies.
5. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.

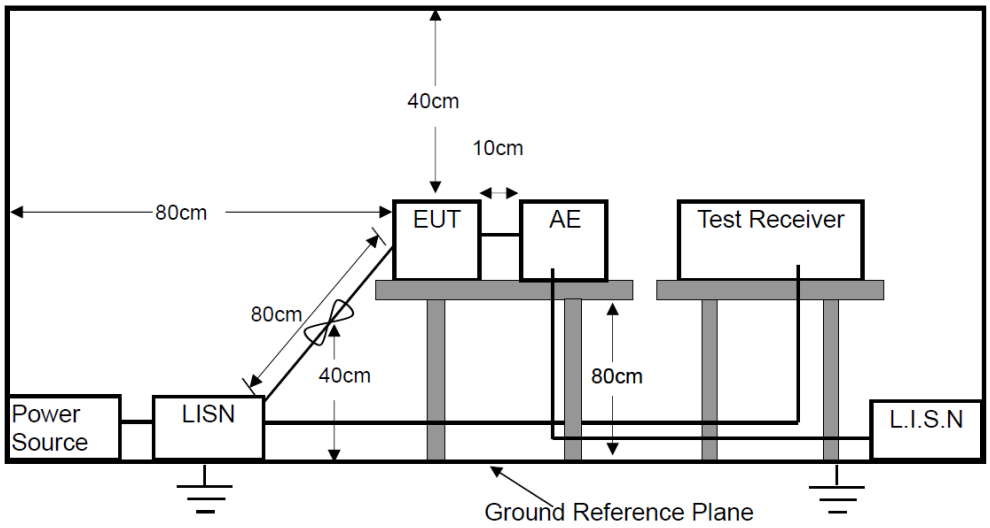
Limits for conducted disturbance for asymmetric mode (Wired network Port):

Frequency (MHz)	Voltage limits			
	☐Class A (dB(uV))		☒Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.5	97 to 87	84 to 74	84 to 74	74 to 64
0.5 to 30	87	74	74	64

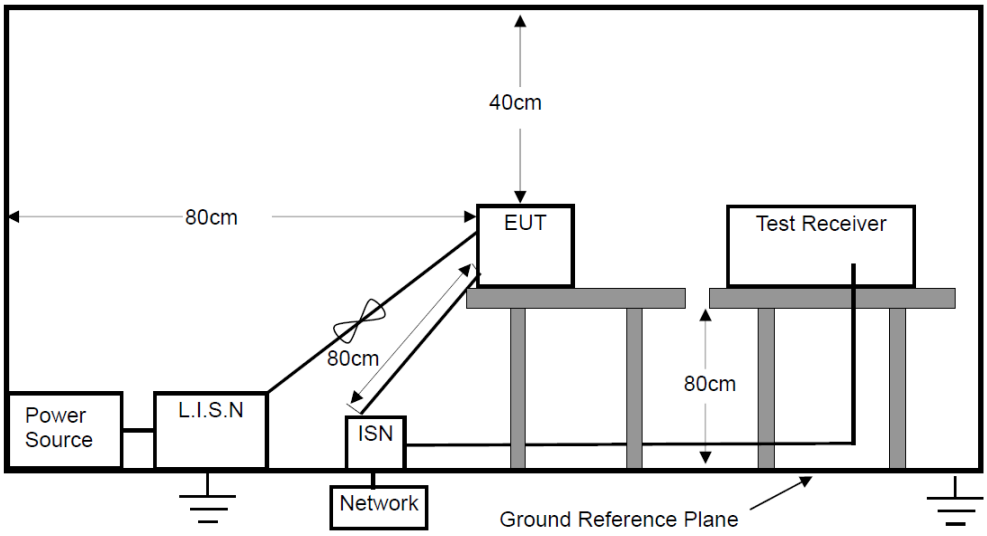
Note:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.

BLOCK DIAGRAM OF TEST SETUP

Conducted Disturbance at the Mains power Ports



Conducted Disturbance for asymmetric mode at the wired network ports



TEST PROCEDURES

a. The EUT was placed on a wooden table 0.8m height from the metal ground plan and 0.4m from the conducting wall of the shielding room and it was kept at 0.8m from any other grounded conducting surface.

b. Configure the EUT and support devices as per section 3.

c. All I/O cables and support devices were positioned as per EN 55032.

d. Connect mains power port of the EUT to a line impedance stabilization network (LISN) and wired network port to Asymmetric Artificial Network (AAN).

e. Connect all support devices to the other LISN and AAN, if needed.

f. Turn on the EUT and all support devices, and make it run stably.

g. Set the detector and measurement bandwidth of test-receiver system as per EN 55032.

h. Scan the frequency range from 150KHz to 30MHz at both sides of AC line for conducted interference checking

i. Repeat the above scans in each mode and record the test data.

TEST RESULTS

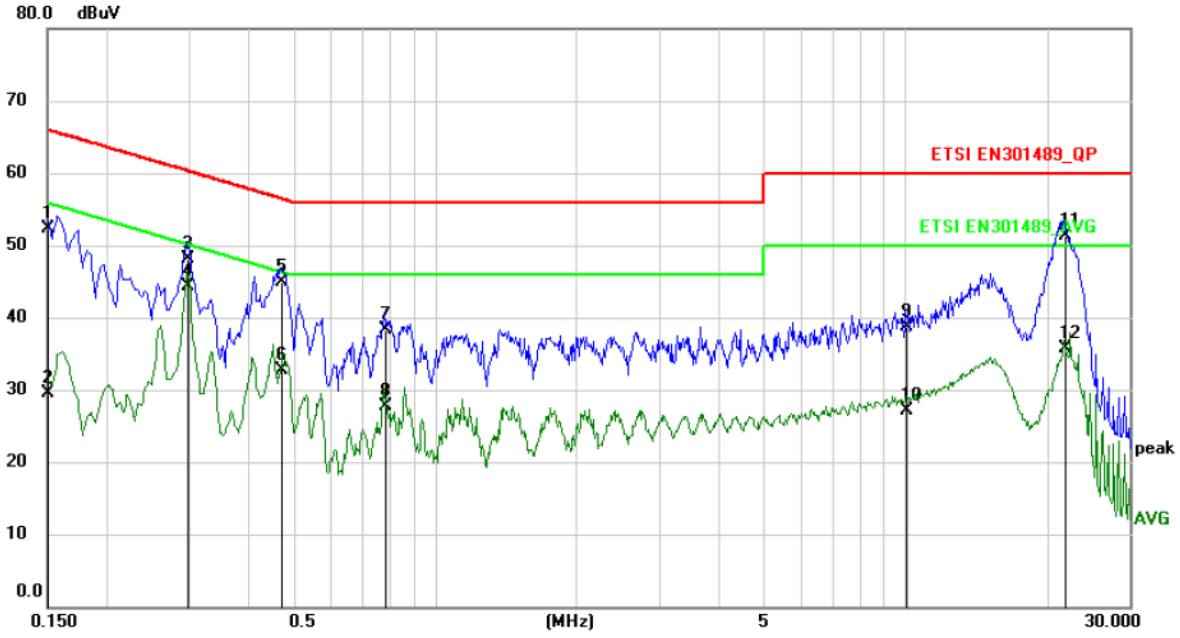
PASS

Please refer to the following pages of the worst case.

M/N: HT-350(Soundbar unit)	Testing Voltage: AC 230V 50Hz
Phase: L1	Detector: QP & AVG
Test Mode: 1	

Conducted Emission Measurement

Date: 2021/8/10 Time: 17:09:17

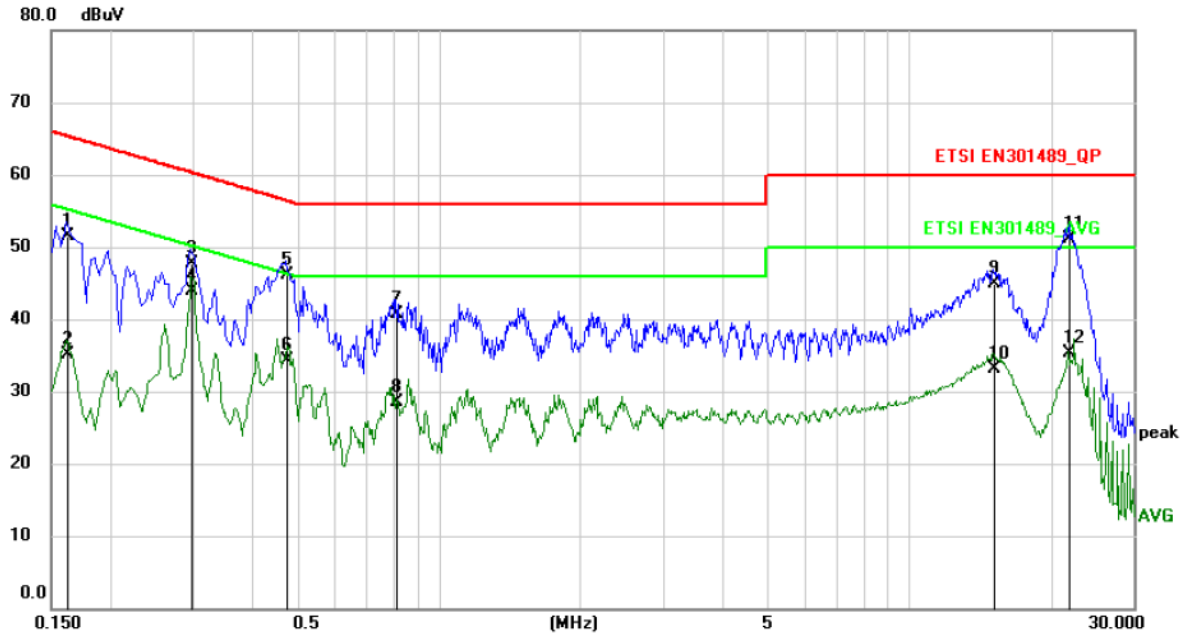


No. Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	41.80	10.60	52.40	66.00	-13.60	QP	
2	0.1500	18.90	10.60	29.50	56.00	-26.50	AVG	
3	0.2979	37.60	10.60	48.20	60.30	-12.10	QP	
4 *	0.2979	33.70	10.60	44.30	50.30	-6.00	AVG	
5	0.4700	34.28	10.62	44.90	56.51	-11.61	QP	
6	0.4700	22.18	10.62	32.80	46.51	-13.71	AVG	
7	0.7820	27.73	10.67	38.40	56.00	-17.60	QP	
8	0.7820	17.13	10.67	27.80	46.00	-18.20	AVG	
9	10.0338	28.07	10.73	38.80	60.00	-21.20	QP	
10	10.0338	16.37	10.73	27.10	50.00	-22.90	AVG	
11	21.7740	40.63	10.77	51.40	60.00	-8.60	QP	
12	21.7740	25.03	10.77	35.80	50.00	-14.20	AVG	

M/N: HT-350 (Soundbar unit)	Testing Voltage: AC 230V 50Hz
Phase: N	Detector: QP & AVG
Test Mode:1	

Conducted Emission Measurement

Date: 2021/8/10 Time: 17:14:41

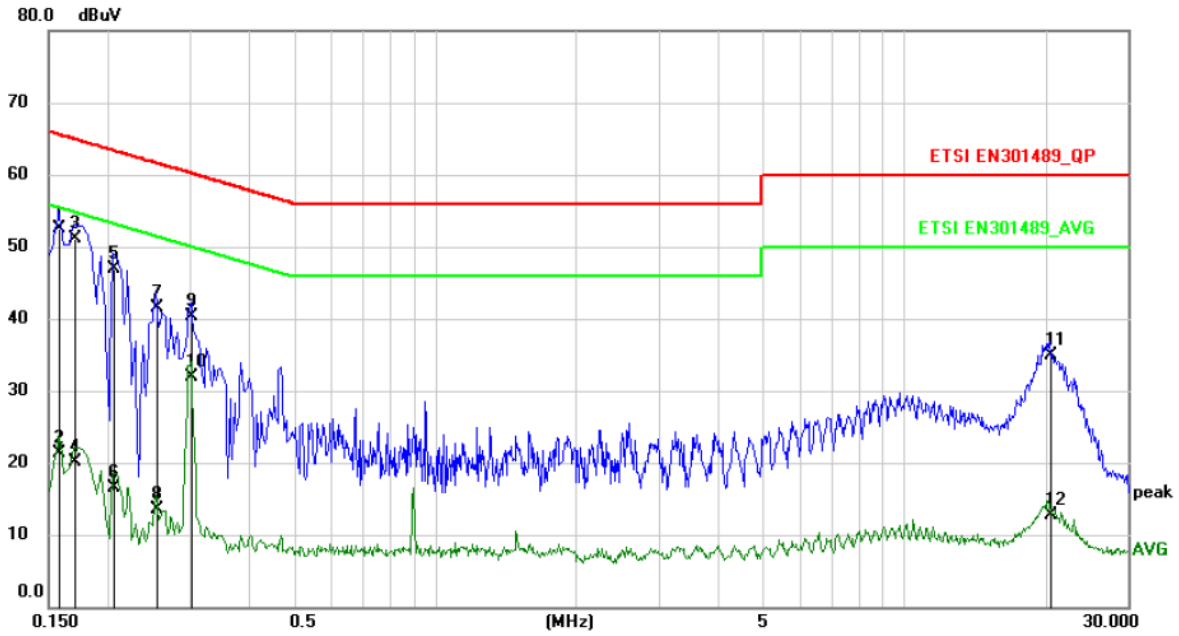


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	40.90	10.60	51.50	65.36	-13.86	QP	
2		0.1620	24.60	10.60	35.20	55.36	-20.16	AVG	
3		0.2980	37.20	10.60	47.80	60.30	-12.50	QP	
4	*	0.2980	33.30	10.60	43.90	50.30	-6.40	AVG	
5		0.4740	35.48	10.62	46.10	56.44	-10.34	QP	
6		0.4740	23.68	10.62	34.30	46.44	-12.14	AVG	
7		0.8100	30.13	10.67	40.80	56.00	-15.20	QP	
8		0.8100	17.83	10.67	28.50	46.00	-17.50	AVG	
9		15.0979	34.15	10.75	44.90	60.00	-15.10	QP	
10		15.0979	22.45	10.75	33.20	50.00	-16.80	AVG	
11		21.8860	40.43	10.77	51.20	60.00	-8.80	QP	
12		21.8860	24.53	10.77	35.30	50.00	-14.70	AVG	

M/N: HT-350 (Subwoofer unit)	Testing Voltage: AC 230V 50Hz
Phase: L1	Detector: QP & AVG
Test Mode: 1	

Conducted Emission Measurement

Date: 2021/8/10 Time: 17:20:34

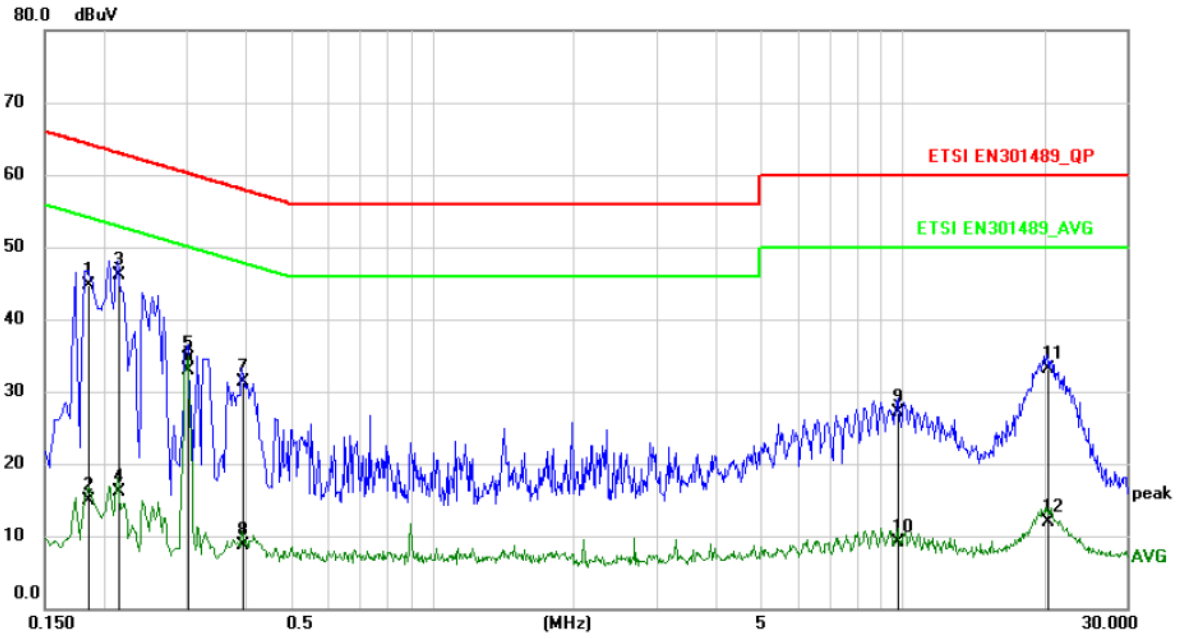


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1581	41.90	10.60	52.50	65.56	-13.06	QP	
2		0.1581	10.80	10.60	21.40	55.56	-34.16	AVG	
3		0.1700	40.60	10.60	51.20	64.96	-13.76	QP	
4		0.1700	9.50	10.60	20.10	54.96	-34.86	AVG	
5		0.2060	36.40	10.60	47.00	63.37	-16.37	QP	
6		0.2060	5.90	10.60	16.50	53.37	-36.87	AVG	
7		0.2540	31.00	10.60	41.60	61.63	-20.03	QP	
8		0.2540	2.90	10.60	13.50	51.63	-38.13	AVG	
9		0.3020	29.70	10.60	40.30	60.19	-19.89	QP	
10		0.3020	21.40	10.60	32.00	50.19	-18.19	AVG	
11		20.3900	24.13	10.77	34.90	60.00	-25.10	QP	
12		20.3900	1.93	10.77	12.70	50.00	-37.30	AVG	

M/N: HT-350 (Subwoofer unit)	Testing Voltage: AC 230V 50Hz
Phase: N	Detector: QP & AVG
Test Mode:1	

Conducted Emission Measurement

Date: 2021/8/10 Time: 17:26:03



No. Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1860	34.20	10.60	44.80	64.21	-19.41	QP	
2	0.1860	4.30	10.60	14.90	54.21	-39.31	AVG	
3 *	0.2140	35.60	10.60	46.20	63.05	-16.85	QP	
4	0.2140	5.60	10.60	16.20	53.05	-36.85	AVG	
5	0.3020	24.00	10.60	34.60	60.19	-25.59	QP	
6	0.3020	22.30	10.60	32.90	50.19	-17.29	AVG	
7	0.3940	20.69	10.61	31.30	57.98	-26.68	QP	
8	0.3940	-1.81	10.61	8.80	47.98	-39.18	AVG	
9	9.7779	16.37	10.73	27.10	60.00	-32.90	QP	
10	9.7779	-1.53	10.73	9.20	50.00	-40.80	AVG	
11	20.3020	22.43	10.77	33.20	60.00	-26.80	QP	
12	20.3020	1.13	10.77	11.90	50.00	-38.10	AVG	

12. Radiated Emission Measurement

LIMITS

Below 1GHz:

Frequency (MHz)	☐ Class A		☒ Class B	
	Quasi-peak dB(uV/m)		Quasi-peak dB(uV/m)	
	At 3m	At 10m	At 3m	At 10m
30 to 230	50	40	40	30
230 to 1000	57	47	47	37
Note 1. The lower limit shall apply at the transition frequency.				
2. Additional provisions may be required for cases where interference occurs.				

Above 1GHz:

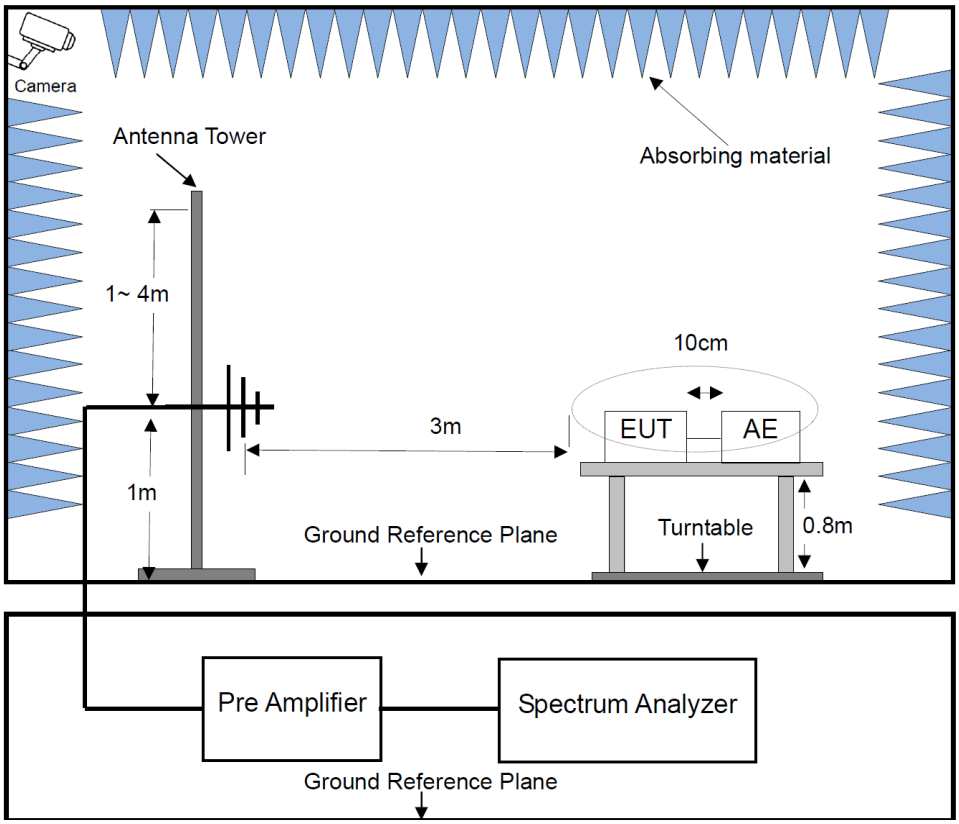
Frequency (GHz)	☐ Class A at 3m		☒ Class B at 3m	
	Peak dB(uV/m)	Average dB(uV/m)	Peak dB(uV/m)	Average dB(uV/m)
1 ~ 3	76	56	70	50

Required highest frequency for radiated measurement

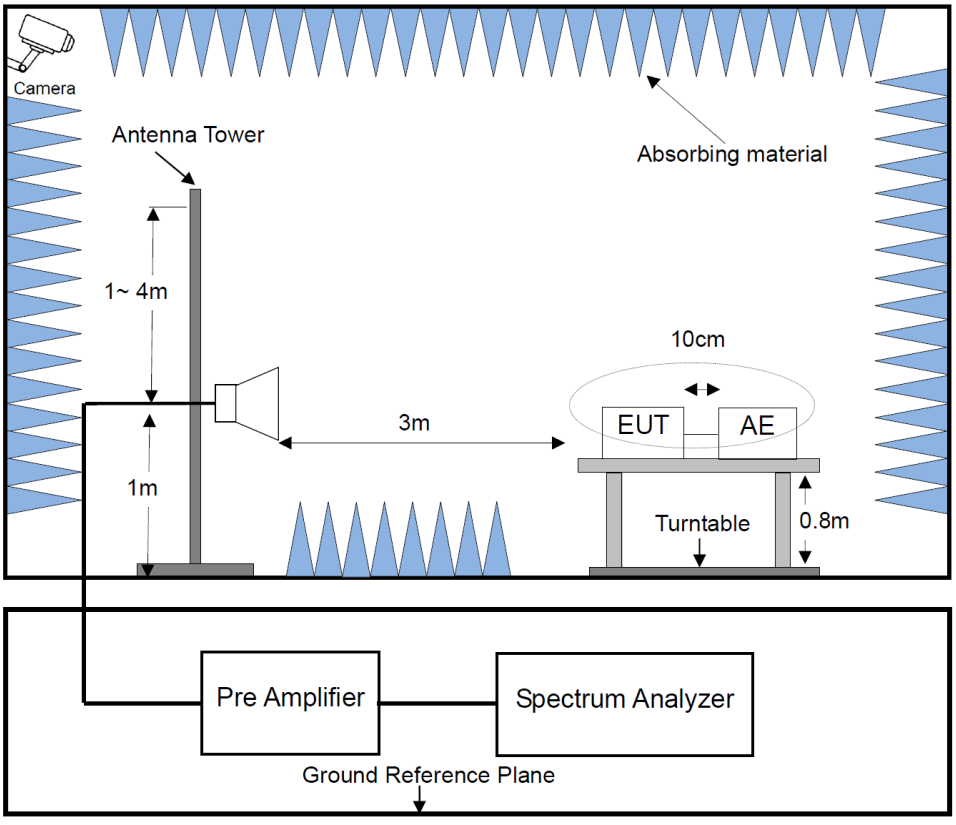
Highest internal frequency* (F_x)	Highest measured frequency
$F_x \leq 108$ MHz	1 GHz
108 MHz < $F_x \leq$ 500 MHz	2 GHz
500 MHz < $F_x \leq$ 1 GHz	5 GHz
F_x > 1 GHz	5 × F_x up to a maximum of 6 GHz
Note 1. Highest fundamental frequency generated or used within the EUT or highest frequency at which it operates.	
2. Where F_x is unknown, the radiated emission measurements shall be performed up to 6 GHz.	

BLOCKDIAGRAM OF TEST SETUP

Below 1GHz:



Above 1GHz



TEST PROCEDURES

a. The EUT was placed on a rotatable wooden table top 0.8m above ground.

b. The EUT was set 3m away from the receiving antenna which was mounted on the top of a variable height antenna tower.

c. Configure the EUT and support devices as per section 3.

d. All I/O cables and support devices were positioned as per EN 55032.

e. Connect mains power port of the EUT to the outlet socket under the turntable and connect all other support devices to other outlet socket under the turntable.

f. Turn on the EUT and all support devices, and make it run stably.

g. Set the detector and measurement bandwidth of test-receiver system as per EN 55032.

h. Scan the frequency range from 30MHz to 6000MHz for radiation emissions checking.

i. Emissions were scanned and measured rotating the EUT from 0 to 360 degrees and positioning the antenna from 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

j. Repeat the above scans in each mode and channel and record the test data.

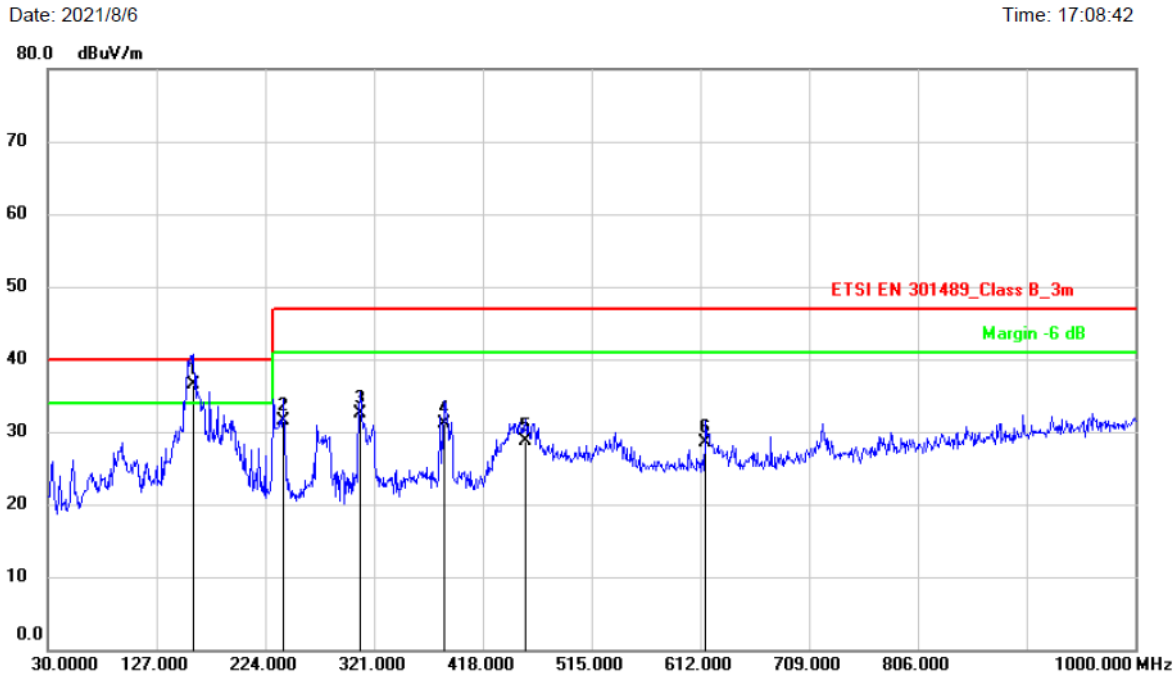
TEST RESULTS

PASS

Please refer to the following pages of the worst case.

M/N: HT-350	Testing Voltage: AC 230V 50Hz
Polarization: Horizontal	Detector: QP
Test Mode: 1	Distance: 3m

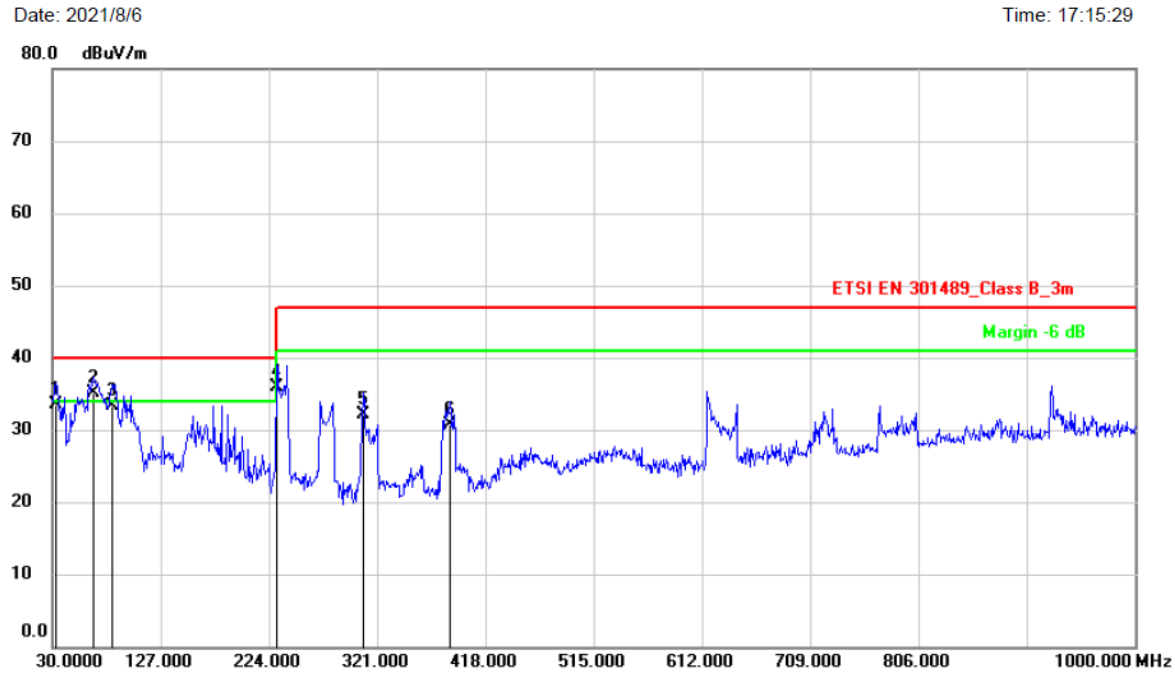
Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	159.9800	46.94	-10.44	36.50	40.00	-3.50	QP	
2		240.4900	38.11	-6.61	31.50	47.00	-15.50	QP	
3		308.3900	37.89	-5.29	32.60	47.00	-14.40	QP	
4		384.0500	34.87	-3.67	31.20	47.00	-15.80	QP	
5		455.8300	31.16	-2.46	28.70	47.00	-18.30	QP	
6		616.8500	27.61	0.89	28.50	47.00	-18.50	QP	

M/N: HT-350	Testing Voltage: AC 230V 50Hz
Polarization: Vertical	Detector: QP
Test Mode: 1	Distance: 3m

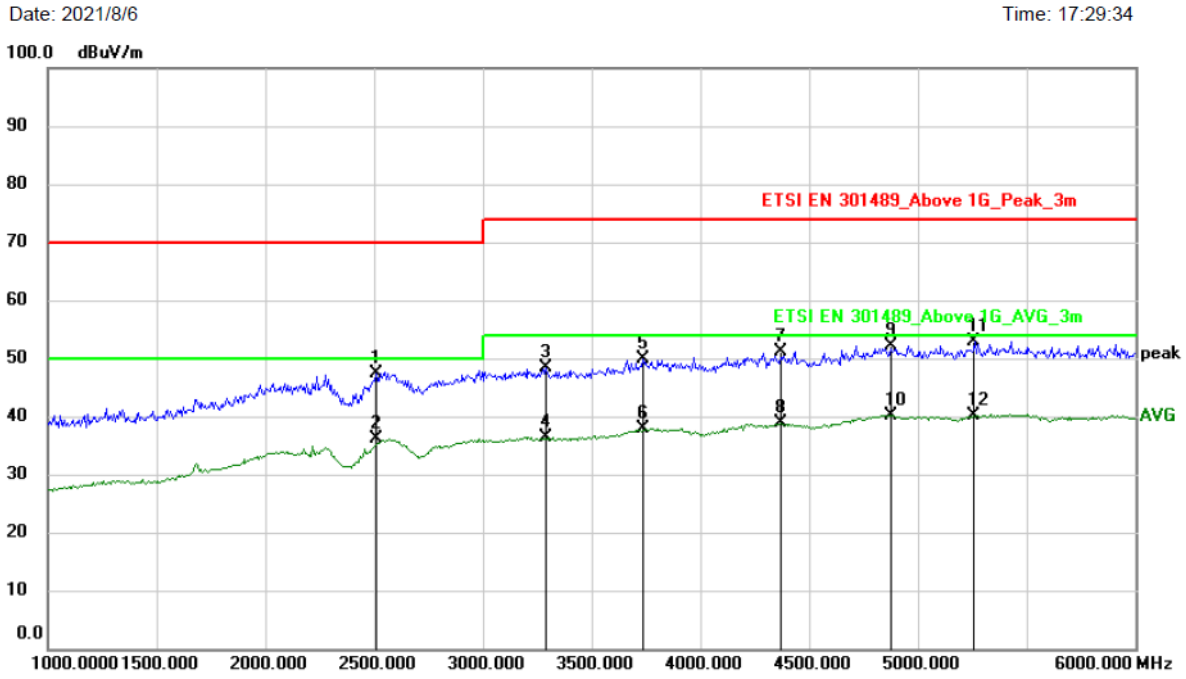
Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.9100	42.99	-9.49	33.50	40.00	-6.50	QP	
2	*	66.8600	44.95	-9.85	35.10	40.00	-4.90	QP	
3		83.3500	44.57	-11.27	33.30	40.00	-6.70	QP	
4		230.7900	43.93	-7.93	36.00	47.00	-11.00	QP	
5		308.3900	38.49	-6.29	32.20	47.00	-14.80	QP	
6		385.9900	35.32	-4.62	30.70	47.00	-16.30	QP	

M/N: HT-350	Testing Voltage: AC 230V 50Hz
Polarization: Horizontal	Detector: Peak & AVG
Test Mode: 1	Distance: 3m

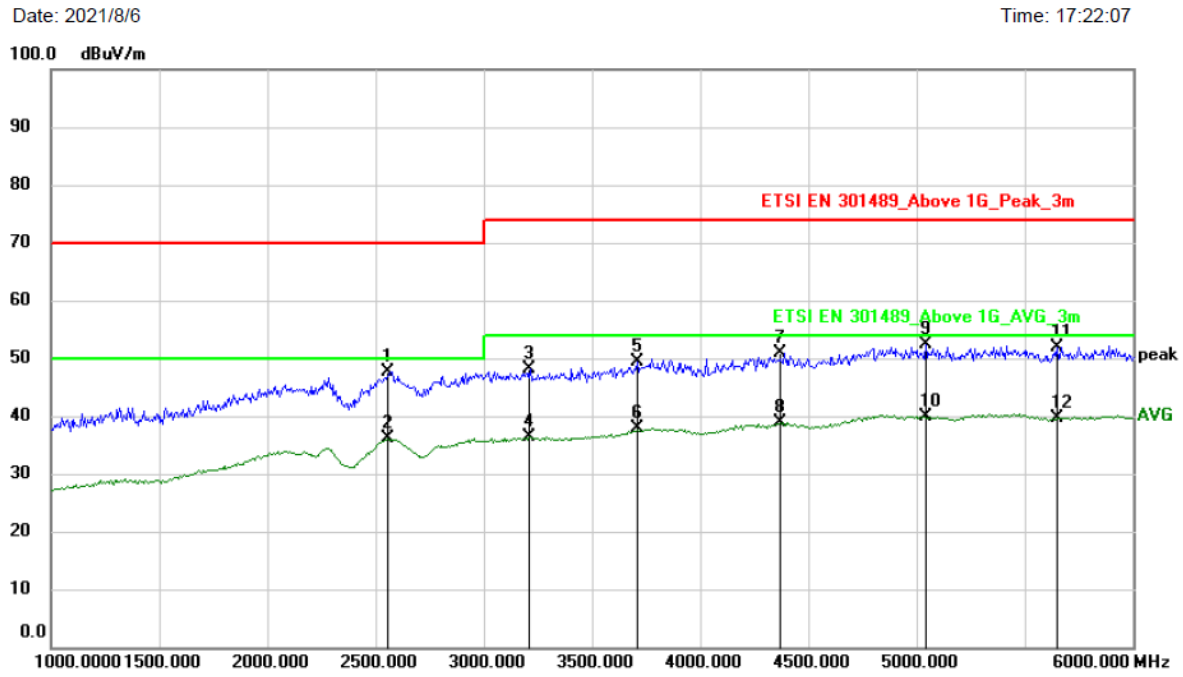
Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2512.500	46.93	0.44	47.37	70.00	-22.63	peak	
2		2512.500	35.58	0.44	36.02	50.00	-13.98	AVG	
3		3287.500	46.10	2.18	48.28	74.00	-25.72	peak	
4		3287.500	34.13	2.18	36.31	54.00	-17.69	AVG	
5		3737.500	46.64	3.22	49.86	74.00	-24.14	peak	
6		3737.500	34.74	3.22	37.96	54.00	-16.04	AVG	
7		4368.750	46.23	4.81	51.04	74.00	-22.96	peak	
8		4368.750	34.01	4.81	38.82	54.00	-15.18	AVG	
9		4875.000	45.58	6.57	52.15	74.00	-21.85	peak	
10	*	4875.000	33.60	6.57	40.17	54.00	-13.83	AVG	
11		5256.250	46.08	6.81	52.89	74.00	-21.11	peak	
12		5256.250	33.32	6.81	40.13	54.00	-13.87	AVG	

M/N: HT-350	Testing Voltage: AC 230V 50Hz
Polarization: Vertical	Detector: Peak & AVG
Test Mode: 1	Distance: 3m

Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		2556.250	47.08	0.60	47.68	70.00	-22.32	peak	
2	*	2556.250	35.50	0.60	36.10	50.00	-13.90	AVG	
3		3212.500	46.11	2.05	48.16	74.00	-25.84	peak	
4		3212.500	34.41	2.05	36.46	54.00	-17.54	AVG	
5		3712.500	46.17	3.17	49.34	74.00	-24.66	peak	
6		3712.500	34.76	3.17	37.93	54.00	-16.07	AVG	
7		4368.750	46.09	4.81	50.90	74.00	-23.10	peak	
8		4368.750	34.05	4.81	38.86	54.00	-15.14	AVG	
9		5043.750	45.32	7.00	52.32	74.00	-21.68	peak	
10		5043.750	32.83	7.00	39.83	54.00	-14.17	AVG	
11		5650.000	45.12	6.86	51.98	74.00	-22.02	peak	
12		5650.000	32.87	6.86	39.73	54.00	-14.27	AVG	

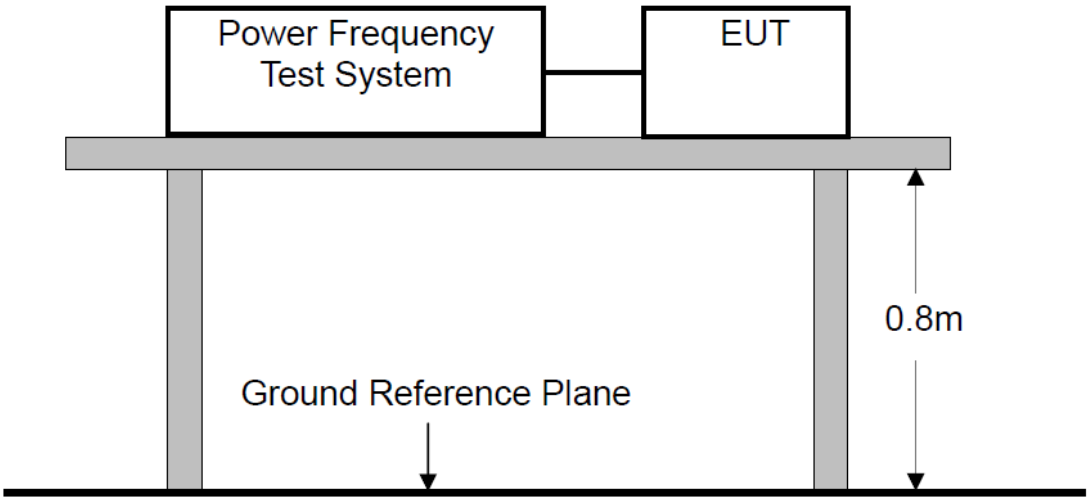
13. Harmonic Current Emission Measurement

LIMITS

Limit of Harmonic Current Emission

Limits for Class A equipment		Limits for Class D equipment		
Harmonics order h	Maximum permissible harmonics Current A	Harmonics order n	Maximum permissible harmonics current per watt mA/W	Maximum permissible harmonics current A
Odd harmonics		Odd harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
15≤h≤39	0.15×15/h	15≤h≤39	3.85/n	0.15×15/h
Even harmonics		-	-	-
2	1.08	-	-	-
4	0.43	-	-	-
6	0.30	-	-	-
8≤h≤40	0.23×8/h	-	-	-
Note: The limits above are not specified for equipment with a rated input power of 75W or less (other than lighting equipment).				

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

a. The EUT was placed on a wooden table 0.8m above ground.

b. Configure the EUT and support devices as per section 3.

c. Turn on the EUT and all support devices, and make it run stably.

d. Set the EUT to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

e. Classify the EUT as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment ,equipment not specified in one of the three other classes.

Class B: Portable tools; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600W of the Personal computers and personal computer monitors and television receivers

f. Set correspondent test program and measurement time of the test system to measure the current harmonics emanated from EUT, and then record the test data.

TEST RESULTS

Pass

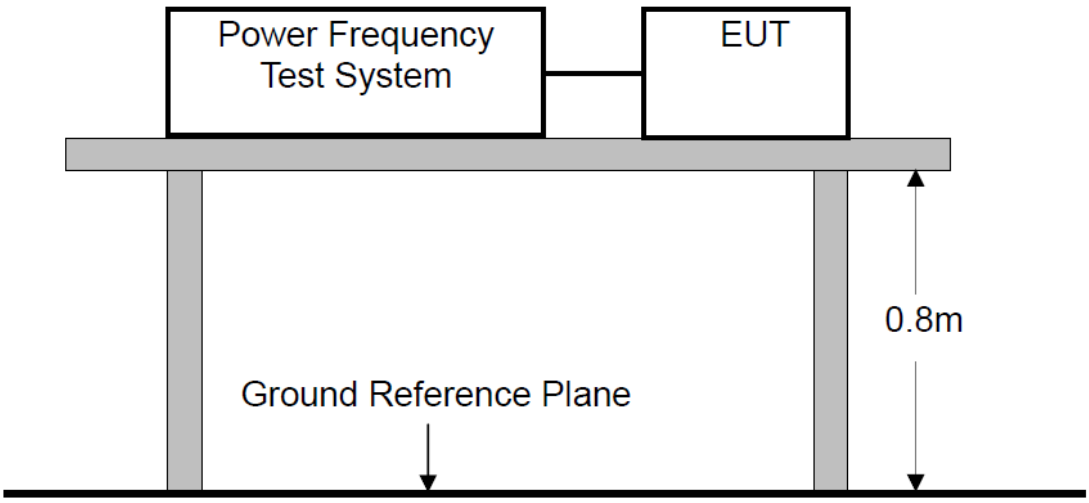
According to clause 7 of EN 61000-3-2, equipment with a rated power of 75W or less, no limits apply. It is considered to meet the requirements of the standard.

14. Voltage Fluctuations & Flicker Measurement

LIMITS

Test Item	Limit	Remarks
P_{st}	1.0	P_{st} = Short-term flicker indicator
P_{lt}	0.65	P_{lt} = Long-term flicker indicator
T_{dt}	500ms	T_{dt} = Maximum accumulated time that dt with a deviation exceeding 3,3 %
d_{max}(%)	4%	d_{max} = Maximum relative voltage change
d_c(%)	3.3%	d_c = Maximum relative steady-state voltage change

BLOCK DIAGRAM OF TEST SETUP



Test Procedure

a. The EUT was placed on a wooden table 0.8m above ground.

b. Configure the EUT and support devices as per section 3.

c. Turn on the EUT and all support devices, and make it run stably.

d. Set the EUT to produce the most unfavorable sequence of voltage changes under normal operating conditions.

e. Set correspondent test program and measurement time of the test system to measure the most unfavorable sequence of voltage changes from EUT, and then record the test data.

TEST RESULTS

Pass.

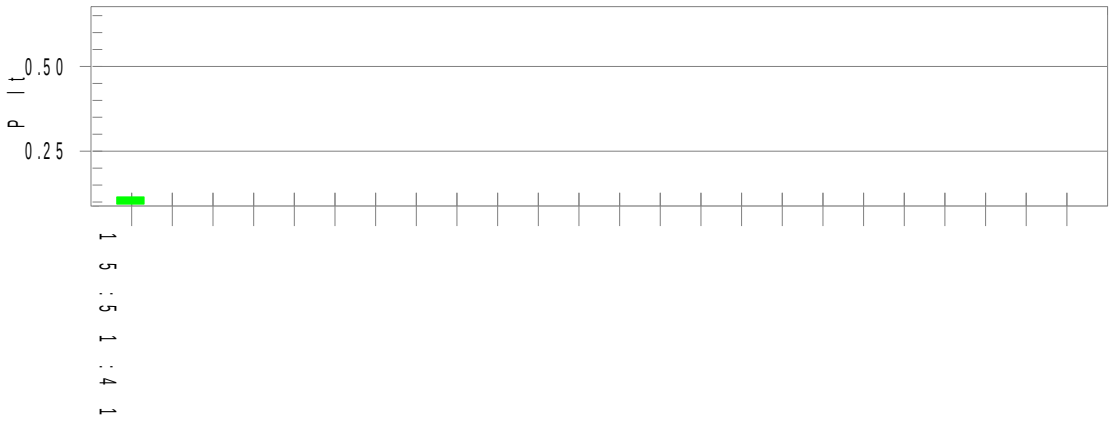
Please refer to the following pages of the worst case.

Flicker Test Summary per IEC61000-3-3:2013/AMD1:2017 (Run time)

EUT: TV Soundbar **Tested by: Loki**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2021/8/12 **Start time: 15:41:20** **End time: 15:51:47**
Test duration (min): 10 **Data file name: F-000014.cts_data**
Comment: BT
Customer: HC
M/N: HT-350 (Soundbar unit)
Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**

Plt and limit line



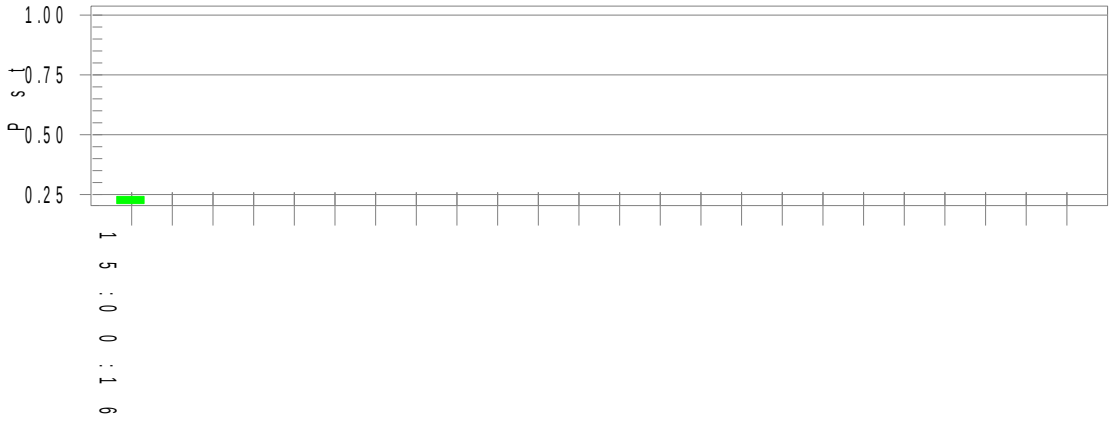
Parameter values recorded during the test:

Vrms at the end of test (Volt):	**230.51**			
Highest dt (%):		**Test limit (%):**		
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.263**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.115**	**Test limit:**	**0.650**	**Pass**

Flicker Test Summary per IEC61000-3-3:2013/AMD1:2017 (Run time)

EUT: TV Soundbar **Tested by: Loki**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2021/8/12 **Start time: 14:49:55** **End time: 15:00:23**
Test duration (min): 10 **Data file name: F-000011.cts_data**
Comment: BT
Customer: HC
M/N: HT-350 (Subwoofer unit)
Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Plt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	**230.46**			
Highest dt (%):		**Test limit (%):**		
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.242**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.106**	**Test limit:**	**0.650**	**Pass**

15. Performance Criteria for Immunity

The performance criteria are referred to the test standard: **ETSI EN 301 489-17**

Criteria	During Test	After Test
A	Shall operate as intended. (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 3). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3).

NOTE1: Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE2: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE3: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

Performance Criteria For Continuous Phenomena (CT & CR)

At the conclusion of the test the EUT shall operated as intended with no loss of user control functions or stored data, the communication link shall have been maintained during the test.

Performance Criteria For Transient Phenomena (TT & TR)

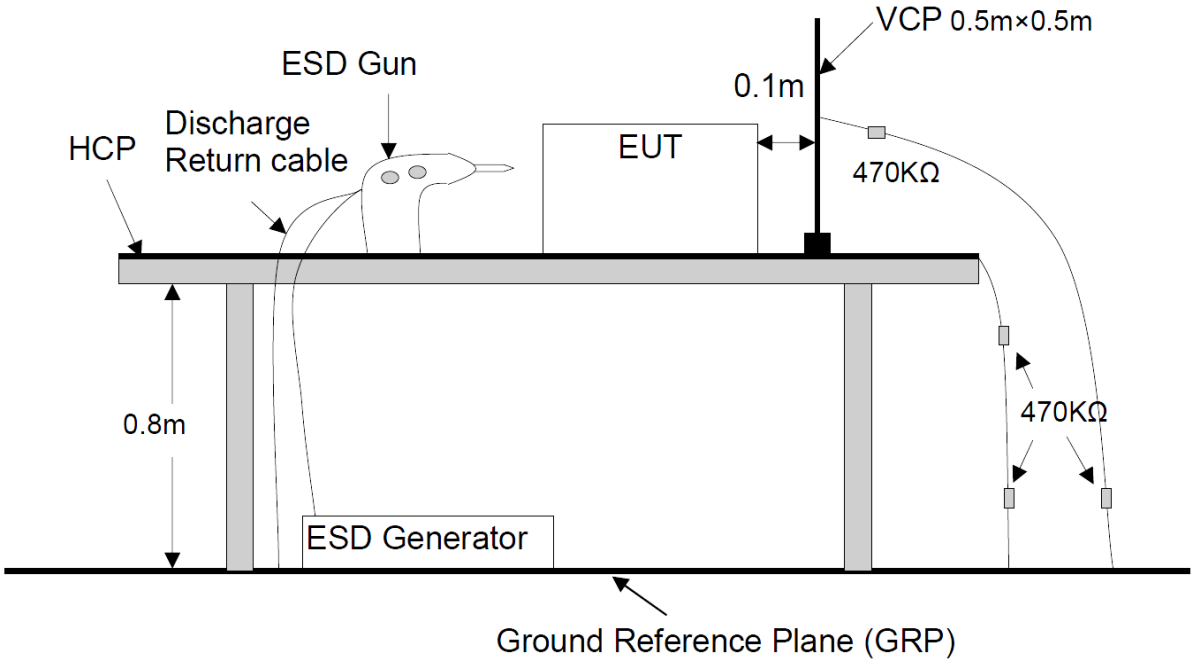
At the conclusion of each exposure the EUT shall operated with no user noticeable loss of communication link.

16. Electrostatic Discharge Measurement

TEST LEVEL

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	±2.0	±2.0
2	±4.0	±4.0
3	±6.0	±8.0
4	±8.0	±15.0
X	Special	Special
Note:	“x” is an open level.	

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

Air Discharge:

Air discharges at slots and apertures and insulating surfaces. On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

Contact Discharge:

Contact discharges to the conductive surfaces and coupling planes. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 20 indirect discharges to the center of the front edge of the Horizontal Coupling Plane (HCP). The remaining three test points shall each receive at least 20 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

a. The EUT was placed on a wooden table 0.8m height from the ground.

b. The EUT was located 0.1m minimum from all side of the HCP (dimensions 1.6m x0.8m).

c. Configure the EUT and support devices as per section 3.

d. The support units were located 30cm away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10cm with EUT.

e. Turn on the EUT and all support devices, and make it run stably.

f. The time interval between two successive single discharges was at least 1 second. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

g. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

h. At least ten single discharges (in the most sensitive polarity) were applied at the front edge of each HCP opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge electrode was in the plane of the HCP and perpendicular to its front edge during the discharges.

i. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane (VCP) in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

j. Repeat the above steps in each mode and record the test result.

MINIMUM REQUIREMENT:

Description	Level	Performance Criterion
Contact Discharge	±4.0KV	B
Air Discharge	±8.0KV	B

TEST RESUSLT

PASS

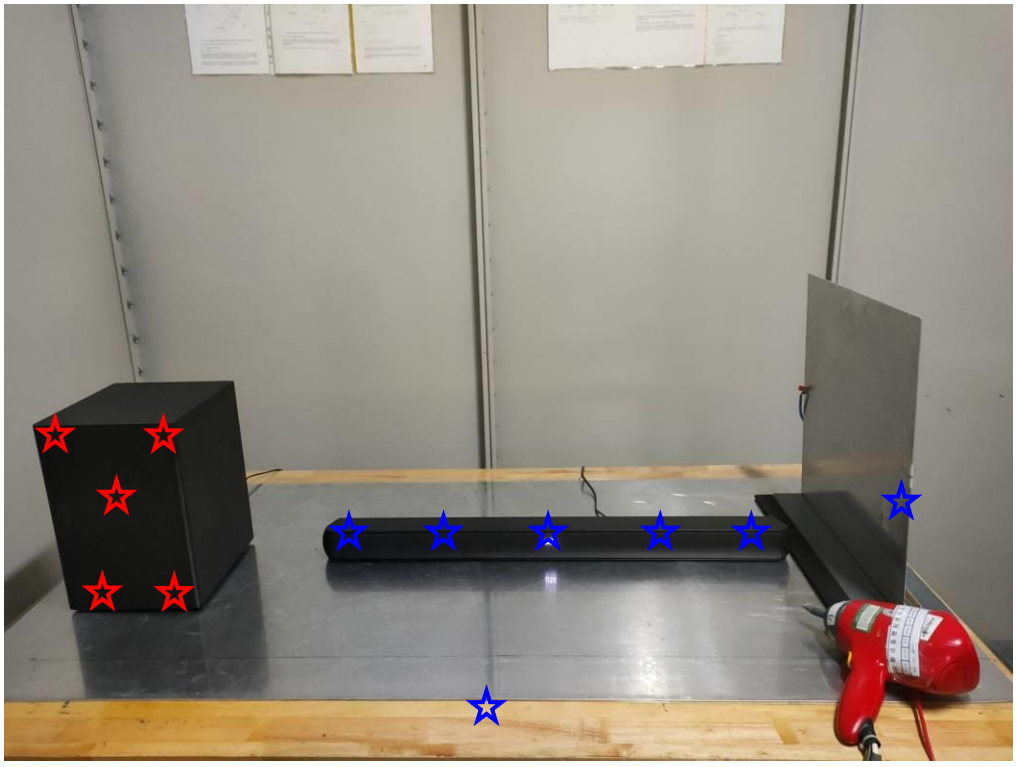
Please refer to the following pages.

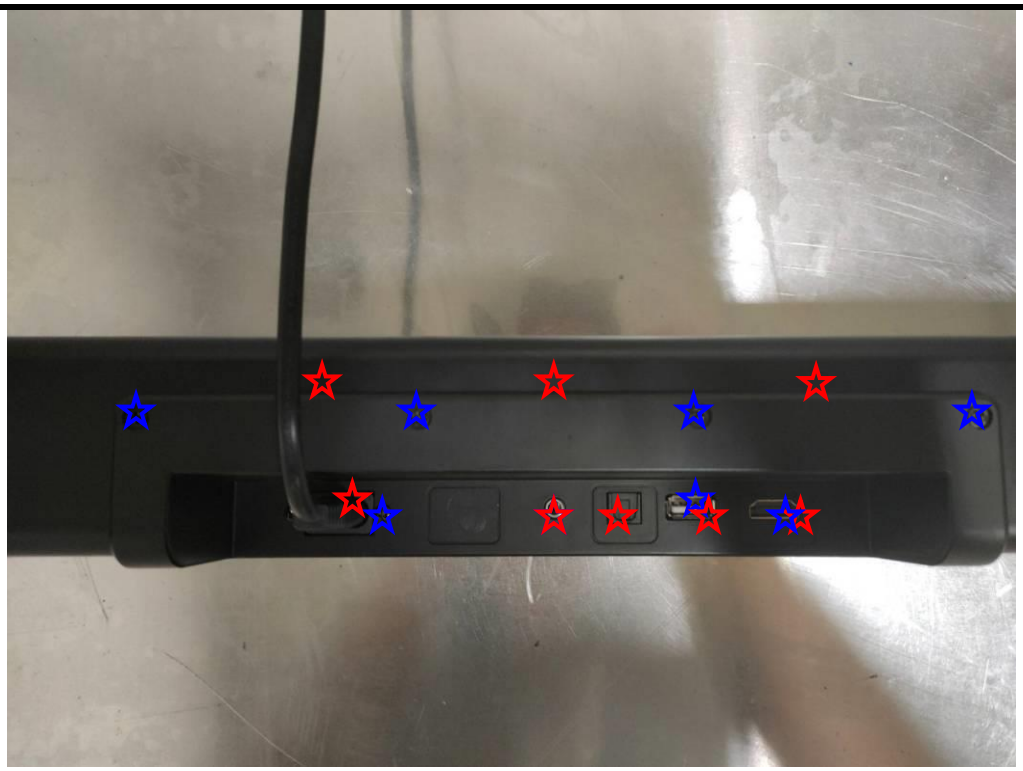
Electrostatic Discharge Test Results			
Ambient Condition:	Temp.: 22℃	R.H.: 51%	Air Pressure : 101 kPa
Test Specifications	Test Level:	±2, 4 KV for Contact Discharge ±2, 4, 8 KV for Air Discharge	
	Discharge Impedance:	330ohm / 150pF	
	NO. Of Discharges:	10 times at each test point for each polarity at least	
	Polarity:	Positive / Negative	
	Discharge Mode:	Single	
	Interval Time Of Discharges:	≥1s	
Required Performance Criterion	B		
Tested Mode	1		

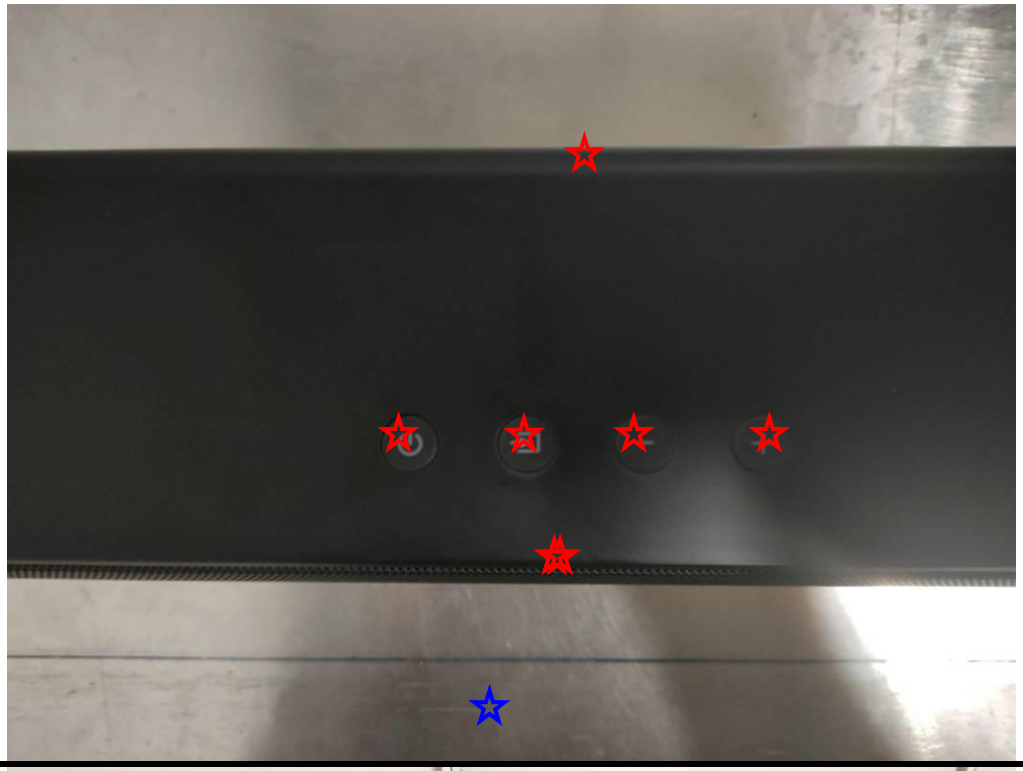
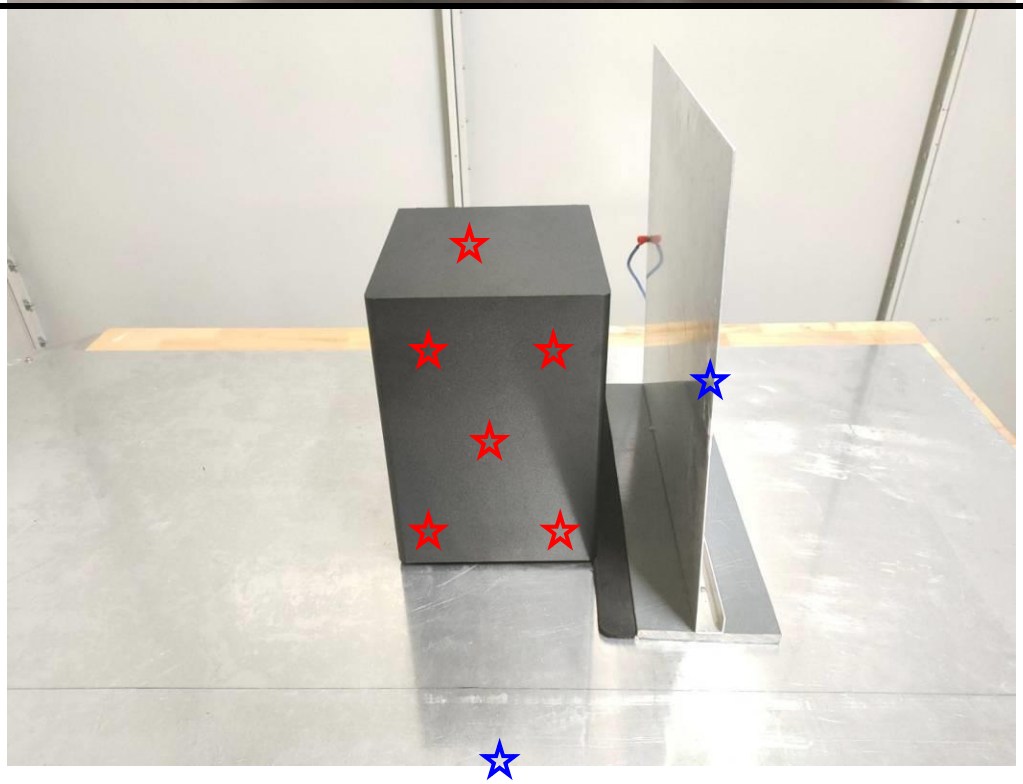
Test Point	Kind A-Air Discharge C-Contact Discharge	Result (Performance Criterion)
Metal	C	A
(Line IN, USB, HDMI) Port	C	A
Optical Port, Button	A	A
Slot of EUT, AC Port	A	A
Indirect Discharge (VCP)	C	A
Indirect Discharge (HCP)	C	A

Note: During the test, the EUT did not show any abnormality.

ESD TEST POINT
(☆Air Discharge; ☆Contact Discharge)





ESD TEST POINT
(☆Air Discharge; ☆Contact Discharge)



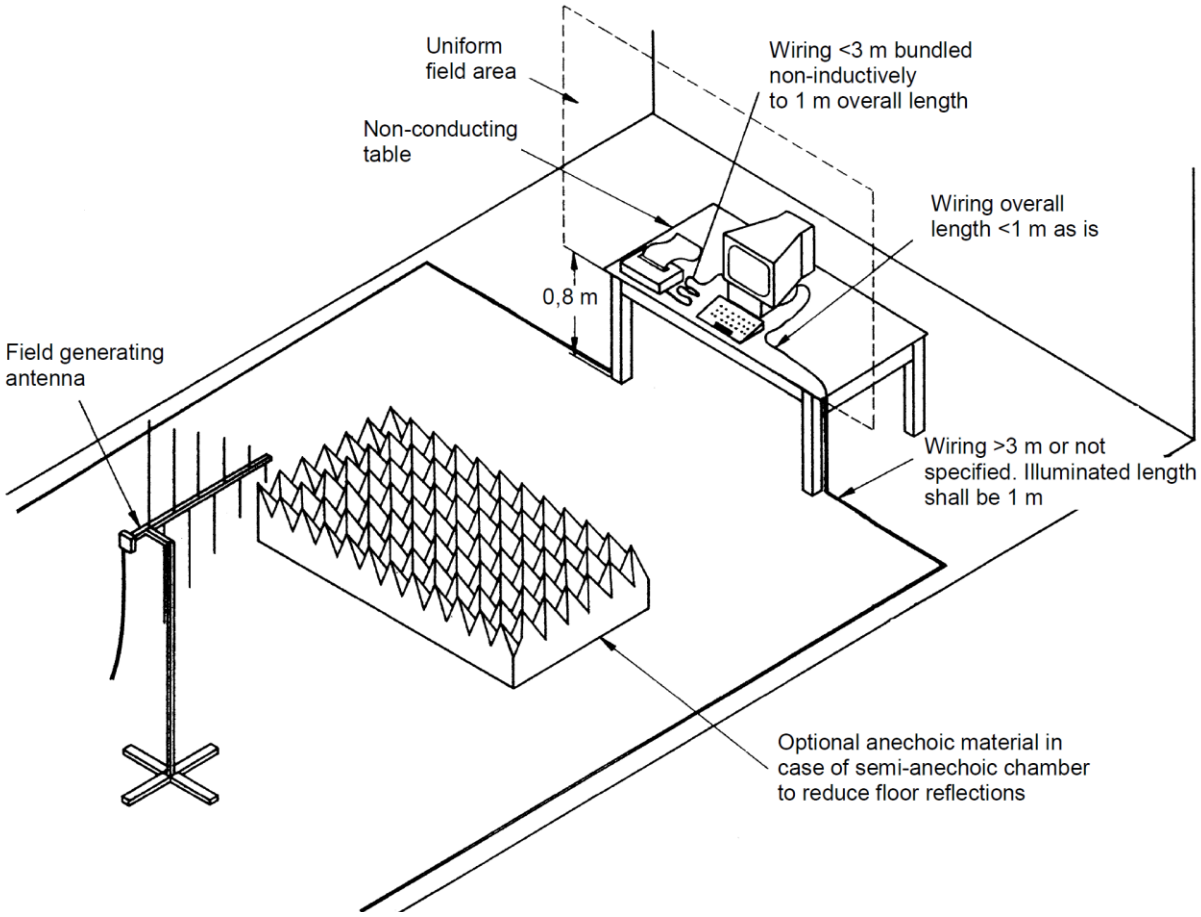
17. Continuous RF Electromagnetic Field Disturbances Measurement

TEST LEVEL

Level	Field Strength V/m
1	1
2	3
3	10
X*	Special
Note: “x” is an open test level and the associated field strength may be any value.	

BLOCK DIAGRAM OF TEST SETUP

Normal Test:



TEST PROCEDURES

a. The testing was performed in a fully anechoic chamber.

b. The EUT and necessary support devices were placed on a turn table which is 0.8 meter above ground.

c. EUT was set 3 meter away from the transmitting antenna which is mounted on an antenna tower.

d. Configure the EUT and support devices as per section 3.

e. Turn on the EUT and all support devices, and make it run stably.

f. Set horizontal and vertical polarization of the antenna to test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.

g. All the scanning conditions are as follows:

h. Repeat the above steps in each mode and record the test result.

MINIMUM REQUIREMENT

Description	Level	Frequency	Performance Criterion
RF Field Strength Susceptibility	3V/m	80~6000MHz	A

TEST RESULTS

PASS

Please refer to the following page.

RF Field Strength Susceptibility Test Results				
Ambient Condition	Temp.: 24℃		R.H.: 52%	Air Pressure: 101 kPa
Test Specifications	Fielded Strength:		3V/m	
	Modulation:		1kHz sine wave, 80%AM	
	Frequency Size:		1% of preceding frequency value	
	Dwell Time:		1s	
	Mode:		Swept test	
Required Performance Criterion	A			
Tested Mode	1			
Frequency (MHz)	Level (V/m)	Antenna polarity	Side	Result (Performance Criterion)
80-6000	3	Horizontal	Front	A
			Left	A
			Right	A
			Back	A
		Vertical	Front	A
			Left	A
			Right	A
			Back	A
Note: During the test, the EUT did not show any abnormality.				

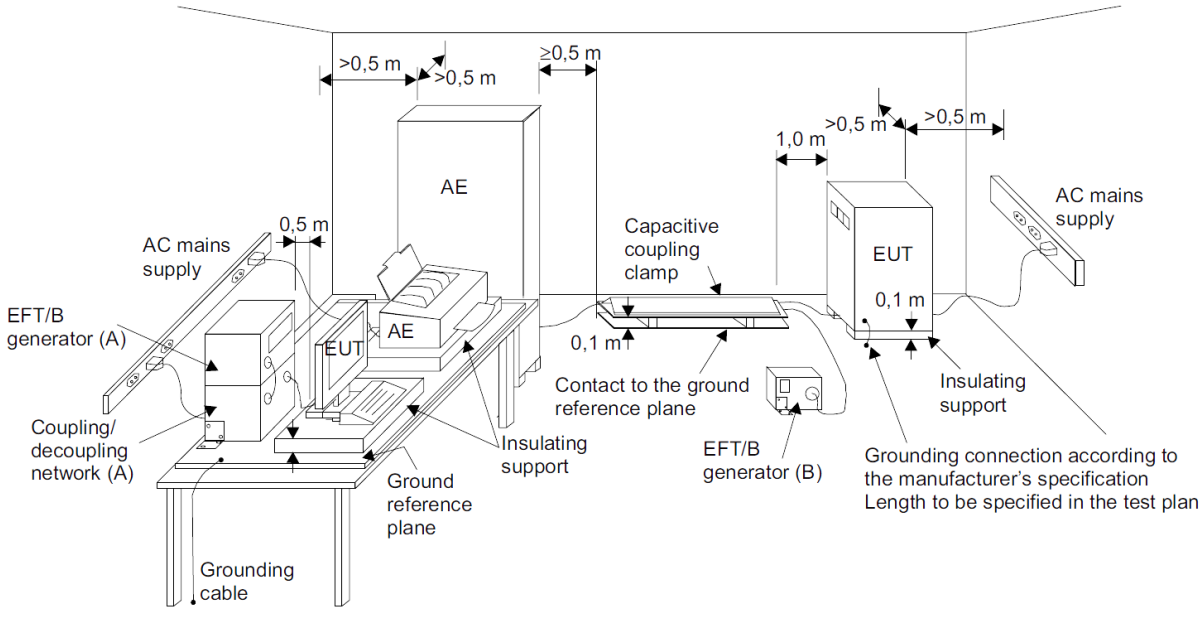
18. Electrical Fast Transient/Burst Measurement

TEST LEVEL

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, Earth port (PE)		Signal and control ports	
	Voltage peak (KV)	Repetition rate (KHz)	Voltage peak (KV)	Repetition rate (KHz)
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X	Special	Special	Special	Special

Note
1. The use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.
2. With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.
3. “X” is an open level. The level has to be specified in the dedicated equipment specification.

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

a. The EUT was placed on the insulating support 0.1m above the reference ground plane.

b. Configure the EUT and support devices as per section 3.

c. Turn on the EUT and all support devices, and make it run stably.

d. For input and output AC power port of the EUT, the EUT was connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. The coaxial output of the EFT generator to the terminals on the EUT should not exceed 0.5 meter. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 minutes.

e. For signal ports of the EUT, the EUT was connected to the power mains, and the signal line through a coupling device which couples the EUT interference signal to signal line. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 minutes.

f. Repeat the above steps in each mode and record the test result.

MINIMUM REQUIREMENT

Description	AC Mains power ports	Analogue/digital data ports
Test Level	1.0KV	0.5KV
Repetition frequency	5kHz	5kHz
Impulse Wave-shape	5/50ns (Tr/Th)	5/50ns (Tr/Th)
Performance Criterion	B	B

TEST RESULTS

PASS

Please refer to the following page.

Electrical Fast Transient/Burst Test Results			
Ambient Condition	Temp.: 22℃	R.H.: 52%	Air Pressure: 101 kPa
Test Specifications	Test Level:	1.0 kV for power port 0.5 kV for signal port	
	Repetition Frequency:	5kHz;	
	Duration:	15ms	
	Period:	300ms	
	Impulse Wave Shape:	5/50ns (Tr/Th)	
	Test Duration:	≥1min	
Required Performance Criterion	TT & TR & B		
Test Mode	1		
Coupling mode and port	☒ AC Mains ☒ Direct Coupling ☐ Signal line ☐ Capacitive ☐ DC line		

Test Line	Test Voltage	Result (Performance Criterion)
L	±1KV	A
N	±1KV	A
PE	-	-
L、N	±1KV	A
L、PE	-	-
N、PE	-	-
L、N、PE	-	-
Signal port (RJ- 45)	-	-
DC line	-	-

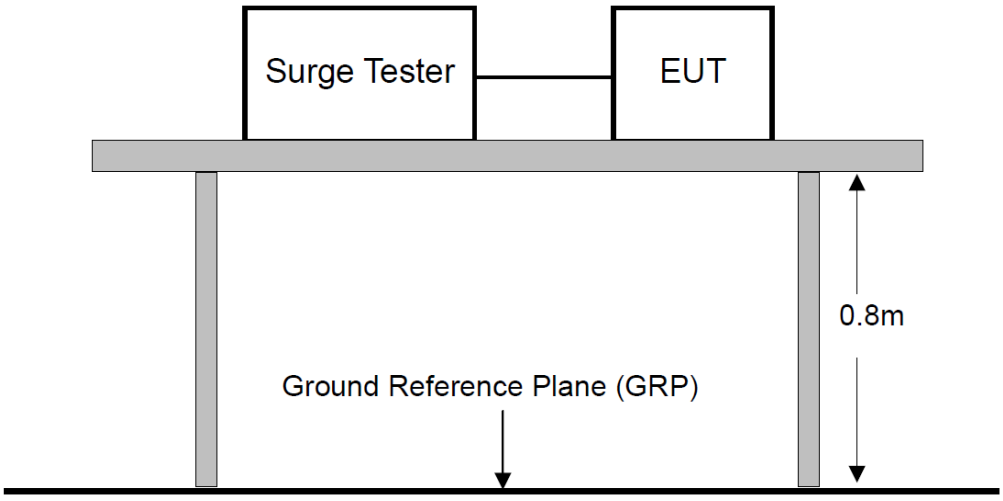
Note : During the test, the EUT did not show any abnormality.

19. Surge Measurement

TEST LEVEL

Level	Open-Circuit Test Voltage (kV)	
	Line to Line	Line to Earth
1	-	0.5
2	0.5	1
3	1	2
4	2	4
X	Special	Special
Note: "X" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification.		

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

a. The EUT was placed on the wooden table 0.8m above the ground.

b. Configure the EUT and support devices as per section 3.

c. Turn on the EUT and all support devices, and make it run stably.

d. The surge is applied to the EUT power supply terminals via the capacitive coupling network Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

e. For test applied to unshielded un-symmetrically operated interconnection lines of EUT, the surge was applied to the lines via the capacitive coupling. The coupling / decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

f. For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT, the surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

g. Five positive and five negative (polarity) pulses at specified phase angles with a 1min repetition rate are conducted during test.

h. Repeat the above steps in each mode and record the test result.

MINIMUM REQUIREMENT

Description	AC Mains power ports		Analogue/digital data ports	
	Line to Line	Line to Earth	Unshielded Symmetrical	Coaxial or Shielded
Test Level	1.0kV	2.0kV	1.0 and 4.0Kv*	0.5kV
Wave-Shape	1.2/50(8/20)us	1.2/50(8/20)us	10/700 (5/320)us	1.2/50(8/20)us
Performance Criterion	B	B	C	B
Note: *: Surges are applied with primary protection fitted. Where possible, use the actual primary protector intended to be used in the installation. Where the surge coupling network for the 10/700 (5/320)μs waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20)us waveform and appropriate coupling network.				

TEST RESULTS

PASS

Please refer to the following page.

Surge Immunity Test Results			
Ambient Condition	Temp.: 22℃	R.H.: 52%	Air Pressure: 101 kPa
Test Specifications	Wave-Shape:	1.2/50 us (Tr/Th) / 8/20 us (Tr/Th) for input power port 10/700 us (Tr/Th) / 5/320 us (Tr/Th) for Signal port	
	Test Level:	±0.5, 1.0kV for Line to Line ±1.0, 2.0kV for Line to Earth	
	Phase Angle:	0°, 90°, 180° and 270°	
	Polarity	Positive / Negative	
	NO. Of Pulse :	5 positive / 5 negative	
	Pulse Repetition Rate :	1 time per minute / maximum	
	Generator Source Impedance :	2 ohm / power supply network 12 ohm / power supply network to ground 42 ohm / other lines to ground /	
Required Performance Criterion	TT & TR & B		
Test Mode	1		

Test Line	Phase Angle	Test Voltage	Result (Performance Criterion)
L-N	0°, 90°, 180°, 270°	±0.5KV, ±1KV	A
L-PE	-	-	-
N-PE	-	-	-
Signal port (RJ -45)	-	-	-
Signal port (RJ -11)	-	-	-
DC line	-	-	-

Note : During the test, the EUT did not show any abnormality.

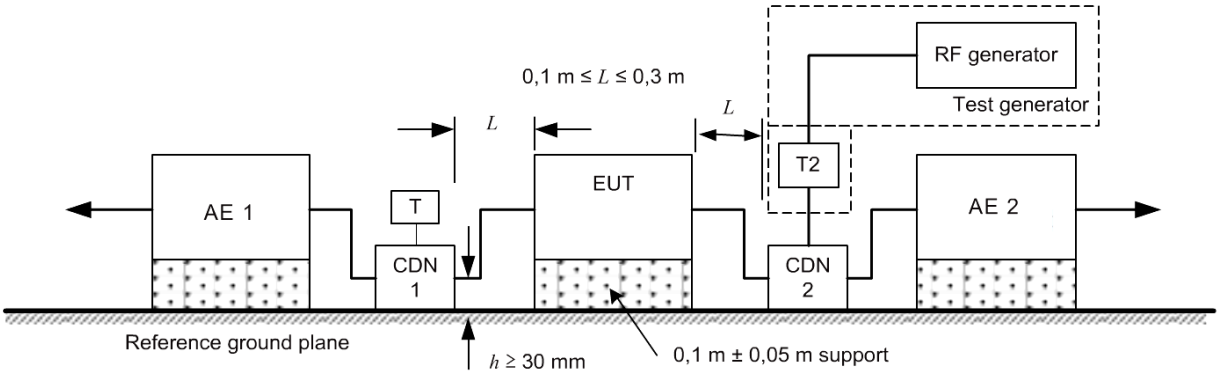
20. Continuous Induced RF Disturbances Measurement

TEST LEVEL

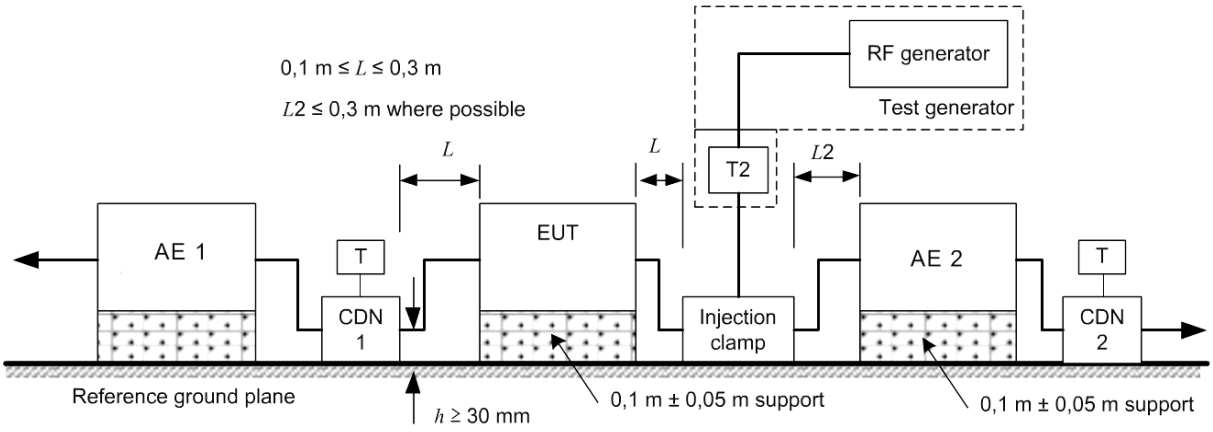
Level	Field Strength V
1	1
2	3
3	10
X	Special
Note*: Where the amplitude of a test level varies over a given frequency range, it changes linearly with respect to the logarithm of the frequency.	

BLOCK DIAGRAM OF TEST SETUP

CDN Test:



Clamp Test:



TEST PROCEDURES

a. The EUT was placed on the insulating support 0.1m above the ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

b. Configure the EUT and support devices as per section 3.

c. Turn on the EUT and all support devices, and make it run stably.

d. The disturbance signal described below is injected to EUT through CDN.

e. The frequency range is swept from 150 KHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep shall not exceed 1.5*10-3decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

f. Repeat the above steps in each mode and record the test result.

MINIMUM REQUIREMENT

AC Mains power ports			Analogue/digital data ports		
Frequency ranges (MHz)	Test Level V(r.m.s)	Performance Criterion	Frequency ranges (MHz)	Test Level V(r.m.s)	Performance Criterion
0.15 to 80	3	A	0.15 to 80	3	A

TEST RESULTS

PASS

Please refer to the following page.

Injected Currents Susceptibility Test Results			
Ambient Condition	Temp.: 25℃	R.H.:50%	Air Pressure:101 kPa
Test Specifications	Test Level:	3V (r.m.s), 3 to 1V (r.m.s), 1V (r.m.s)	
	Modulation:	1kHz sine wave, 80%AM	
	Step Size:	1% of preceding frequency value	
	Dwell Time:	1s	
	Mode:	Swept test	
Required Performance Criterion	CT & CR & A		
Test Mode	1		
Test Port	Frequency (MHz)	Level(V)	Result (Performance Criterion)
AC Mains	0.15~10	3	A
	10~30	3 to 1	A
	30-80	1	A
Signal port (RJ -45)	---	---	---
	---	---	---
	---	---	---
Note : During the test, the EUT did not show any abnormality.			

21. Voltage Dips and Interruptions Measurement

TEST LEVEL

Class	Test level and durations for voltage dips (t_s)(50Hz/60Hz)				
Class 1	Case-by-case according to the equipment requirements				
Class 2	0 % during ½ cycle	0 % during 1 cycle	70 % during 25/30[b] cycles		
Class 3	0 % during ½ cycle	0 % during 1 cycle	40 % during 10/12[b] cycles	70 % during 25/30[b] cycles	80 % during 250/300[c] cycles
Class X[a]	X	X	X	X	X

Note: a. To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.

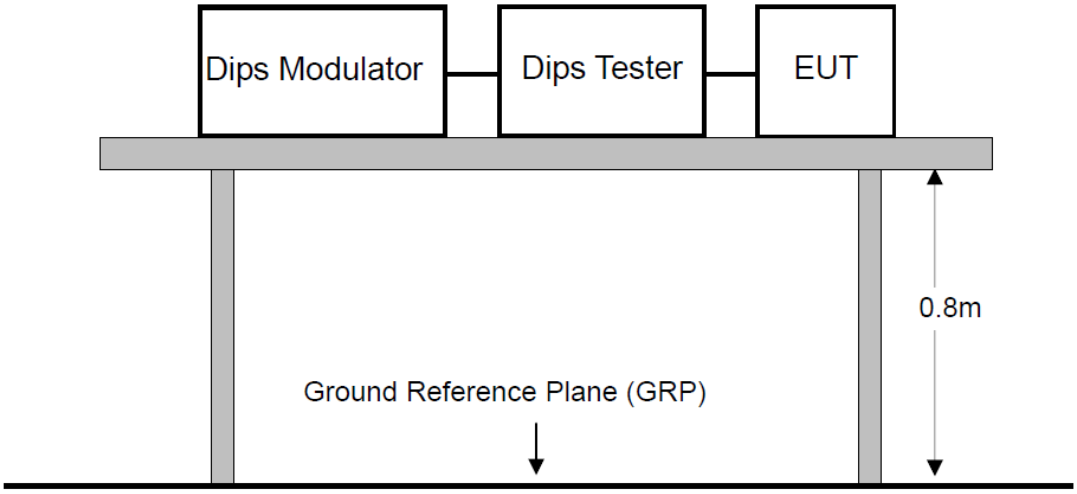
b. "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test".

Class	Test level and durations for short interruptions (t_s) (50 Hz/60 Hz)				
Class 1	Case-by-case according to the equipment requirements				
Class 2	0 % during 250/300b cycles				
Class 3	0 % during 250/300b cycles				
Class X[a]	X	X	X	X	X

Note: a. To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.

b. "250/300 cycles" means "250 cycles for 50 Hz test" and "300 cycles for 60 Hz test".

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

a. The EUT was placed on the wooded table 0.8m above the ground.

b. Configure the EUT and support devices as per section 3.

c. Setting the parameter of tests and then perform the test software of test simulator.

d. Conditions changes to occur at 0 and 180 degree crossover point of the voltage waveform.

e. Repeat the above steps in each mode and record the test result.

MINIMUM REQUIREMENT

Description	Level	Cycle	Performance Criterion
Voltage Dips	Residual voltage <5%	0.5	B
Voltage Dips	Residual voltage <5%	1	B
Voltage Dips	Residual voltage 70%	25 for 50Hz	B
Voltage Dips	Residual voltage 70%	30 for 60Hz	B
Voltage Interruptions	Residual voltage <5%	250 for 50Hz	C
Voltage Interruptions	Residual voltage <5%	300 for 60Hz	C

TEST RESULTS

PASS

Please refer to the following page.

Voltage Dips and Interruptions Test Results			
Ambient Condition:	Temp.: 22℃	R.H.: 52%	Air Pressure: 101 kPa
Test Specifications:	Residual Voltage:	0%, 70%	
	Duration (Periods):	☒ 0.5 ☒ 25 for 50Hz ☒ 250 for 50Hz	☒ 1 ☐ 30 for 60Hz ☐ 300 for 60Hz
	Phase Angle:	0° and 180°	
	Interval Between Tests:	10s	
	NO. Of Tests:	3 times	
Required Performance Criterion	TT & TR & B & C		
Test Mode:	1		

Test Level (Residual voltage) %	Duration (periods)		Result (Performance Criterion)
	50Hz	60Hz	
0	0.5P	-	A
0	1P	-	A
70	25P	-	A
0	250P	-	C

Note : Criterion A: During the test, the EUT did not show any abnormality.
Criterion C: The EUT powered off during the test, but it can be recovered by user after test.

22. Measuring Devices and Test Equipment

☒ For Conducted Emission Measurement (AC Mains)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101152	Mar. 13, 2021	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 13, 2021	1 Year
3.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	893606/014	Mar. 13, 2021	1 Year
4.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar. 13, 2021	1 Year
5.	Test Software	EZ	EZ_EMC	N/A	N/A	N/A

☐ For Conducted Emission Measurement (Wired Network Port)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101152	Mar. 13, 2021	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 13, 2021	1 Year
3.	AAN	Schwarzbeck	NTFM 8158	CAT5-8158-0006	Mar. 13, 2021	1 Year
4.	AAN	Schwarzbeck	NTFM 8158	CAT6-8158-0009	Mar. 13, 2021	1 Year
5.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar. 13, 2021	1 Year
6.	Test Software	EZ	EZ_EMC	N/A	N/A	N/A

☒ For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Mar. 13, 2021	1 Year
2.	Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	Mar. 13, 2021	1 Year
3.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 23, 2021	1 Year
4.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	Mar. 23, 2021	1 Year
5.	Horn Antenna	COM-Power	AH-118	071078	Mar. 23, 2021	1 Year
6.	Pre-Amplifier	HP	HP 8447D	1145A00203	Mar. 13, 2021	1 Year
7.	Pre-Amplifier	HP	HP 8449B	3008A00964	Mar. 13, 2021	1 Year
8.	Chamber	SAEMC	9*7*7m	N/A	April 21, 2021	2 Year
9.	Test Software	EZ	EZ_EMC	N/A	N/A	N/A

☒ For Harmonic / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Analyzer	California Instruments	PACS-1	72846	Mar. 13, 2021	1 Year
2.	5KVA AC Power Source	California Instruments	5001iX	60137	Mar. 13, 2021	1 Year
3.	Software	California Instruments	CTS 4.2.5	N/A	N/A	N/A

☒ For Electrostatic Discharge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG 437	432	Mar. 23, 2021	1 Year

☒ For RF Electromagnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY47070160	Mar. 13, 2021	1 Year
2.	RF Switch	SKET	N/A	N/A	N/A	N/A
3.	Power Amplifier	SKET	HAP801000M_250W	201804008	N/A	N/A
4.	Power Amplifier	SKET	HAP0103G_75W	201804009	N/A	N/A
5.	Power Amplifier	SKET	HAP0306G_50W	201804010	N/A	N/A
6.	Power Meter	Agilent	E4419B	GB40201469	Mar. 13, 2021	1 Year
7.	Power Sensor	Agilent	E9304A	MY41498919	Mar. 13, 2021	1 Year
8.	Power Sensor	Agilent	E9300A	US39211259	Mar. 13, 2021	1 Year
9.	E-Field Probe	Narda	EP-601	N/A	Mar. 23, 2021	1 Year
10.	Antenna	Schwarzbeck	STLP 9129	9129071	N/A	N/A
11.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 13, 2021	1 Year
12.	Chamber	Chengyu	7*5*3.5m	N/A	April 25, 2021	3 Year
13.	Test Software	SKET	SKET_RS	N/A	N/A	N/A

☒ For Electrical Fast Transient /Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	EM TEST	UCS 500N7	V1104108683	Mar. 13, 2021	1 Year
2.	Coupling Clamp	EM TEST	HFK	0311-94	Mar. 13, 2021	1 Year
3.	Test Soft	EM TEST	lec. control	N/A	N/A	N/A

☒ For Surge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	EM TEST	UCS 500N7	V1104108683	Mar. 13, 2021	1 Year
2.	Test Soft	EM TEST	lec. control	N/A	N/A	N/A

☒ For Injected Currents Immunity Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal generator	IFR	2023A	2023051280	Mar. 13, 2021	1 Year
2.	Power Amplifier	SCHAFFNER	CBA9425	1022	Mar. 13, 2021	1 Year
3.	6dB 50Watt Attenuator	SCHAFFNER	ATN6025	N/A	Mar. 13, 2021	1 Year
4.	CDN	Lioncel	CDN-M3-16	0170703	Mar. 13, 2021	1 Year
5.	CDN	Lioncel	CDN-M2-16	0170708	Mar. 13, 2021	1 Year
6.	CDN	CDSI	ADN-M5/AF5	8105001	Mar. 13, 2021	1 Year
7.	EM Clamp	CDSI	EMCL-22	8192007	Mar. 13, 2021	1 Year
8.	Directional Coupler	SCHAFFNER	255	19184	Mar. 13, 2021	1 Year
9.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 13, 2021	1 Year
10.	Test Software	EZ	EZ_CS	N/A	N/A	N/A

☒ For Voltage Dips and Interruptions Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	EM TEST	UCS500N	V1104108683	Mar. 13, 2021	1 Year
2.	Dips Modulator	EM TEST	V4780S2	0111-11	Mar. 13, 2021	1 Year
3.	Test Soft	EM TEST	lec.control	N/A	N/A	N/A

23. Photographs of Test Configuration

Photo of Conducted Emission Measurement

Photo of Radiated Emission Measurement

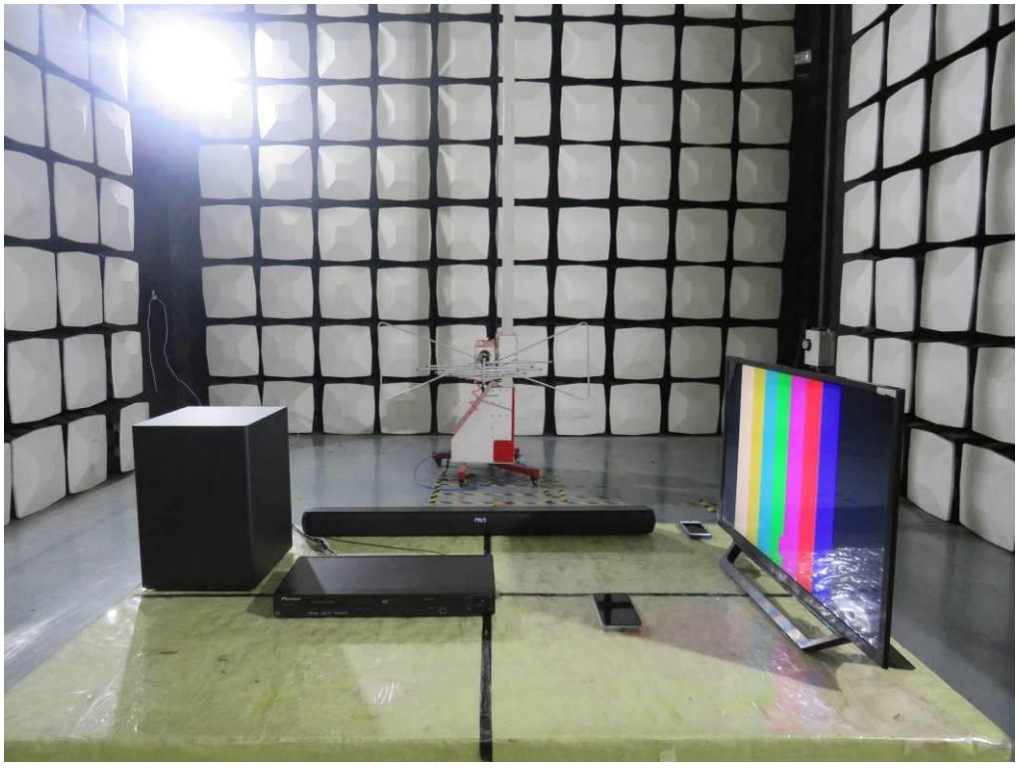


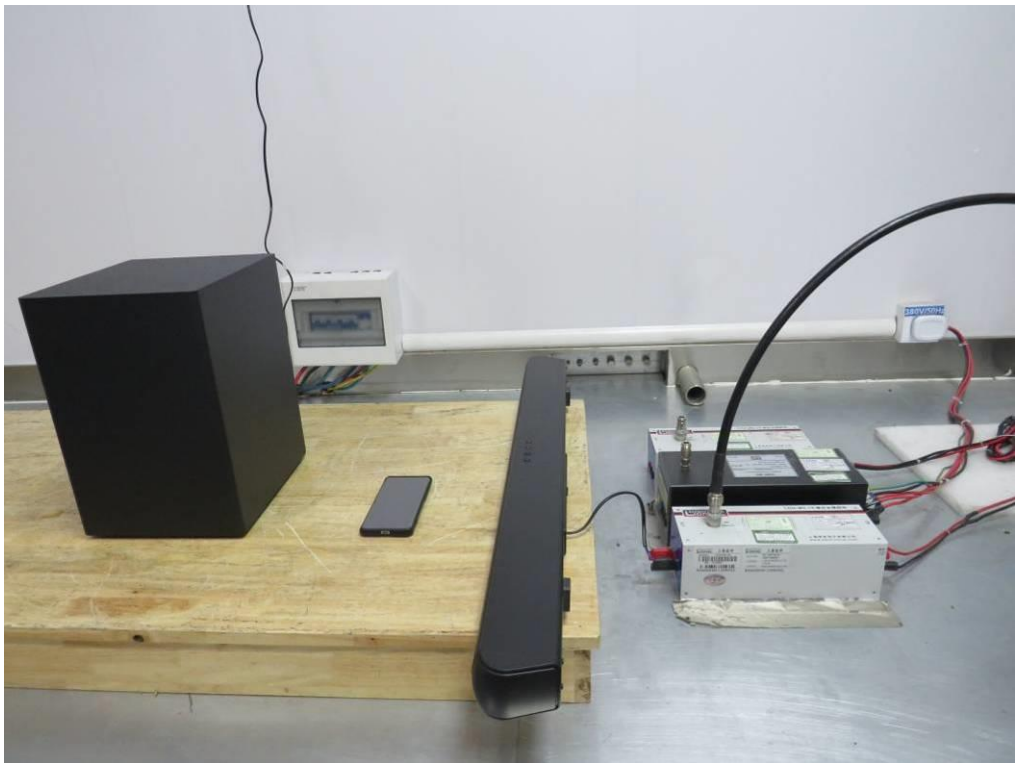
Photo of Harmonic/Flicker Measurement

Photo of Electrostatic Discharge Measurement

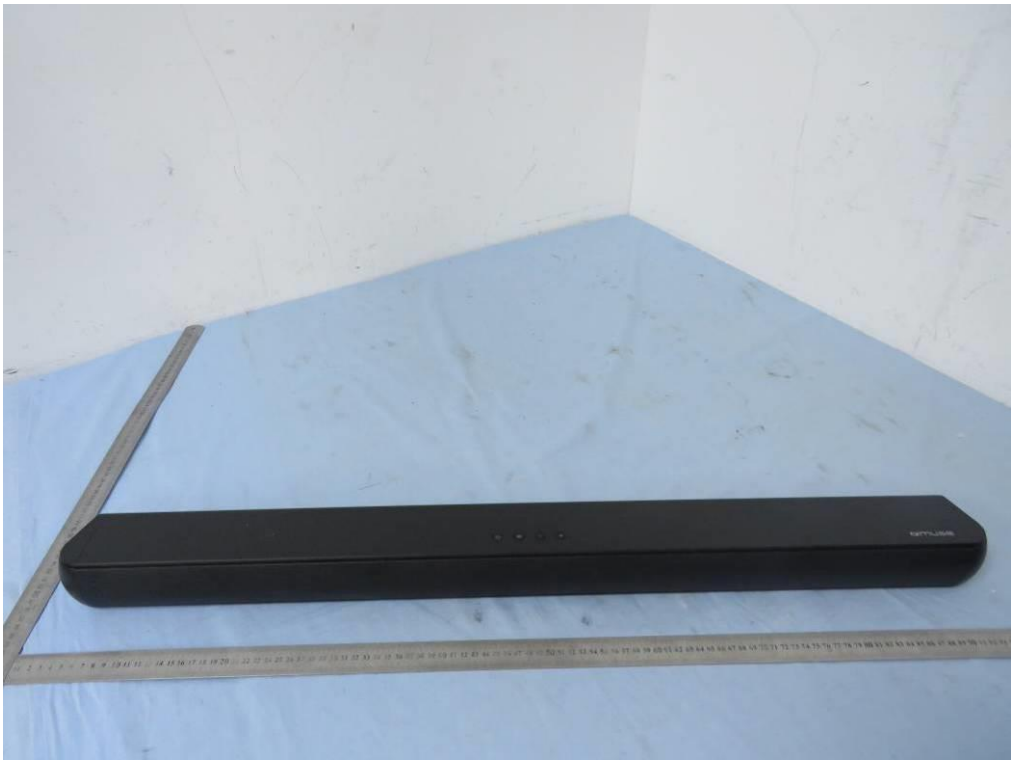
Photo of Continuous RF Electromagnetic Field Disturbances Measurement

Photo of Electrical Fast Transients / Burst /Surge / Voltage Dips and Interruptions Measurement

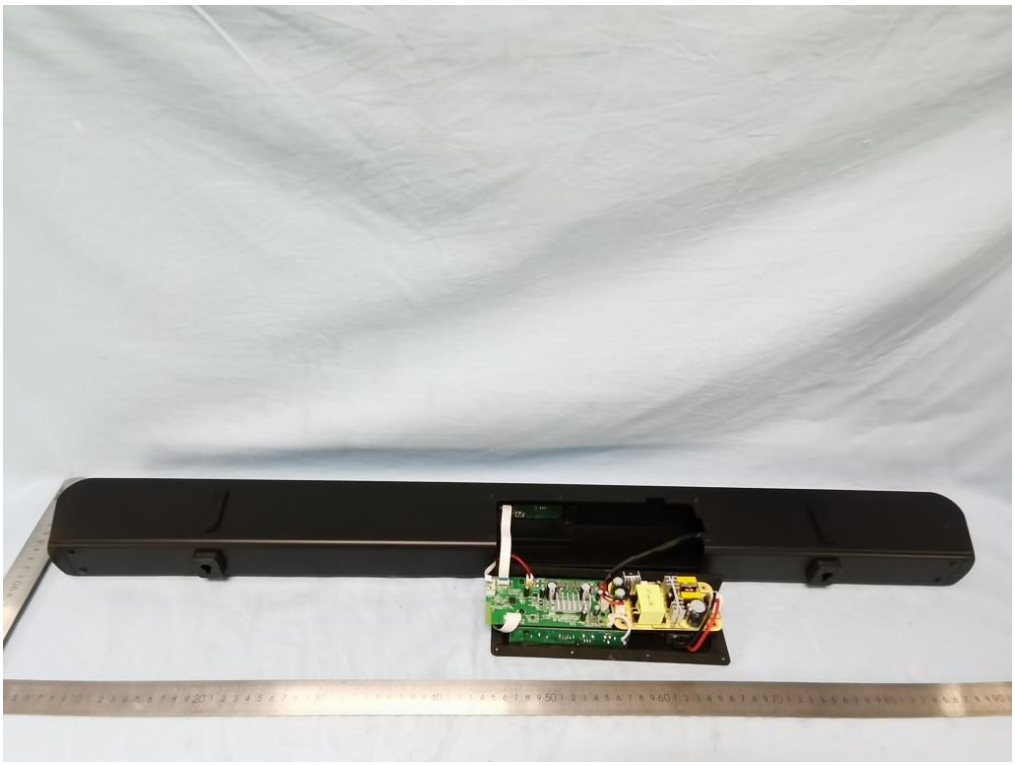
Photo of Continuous Induced RF Disturbances Measurement

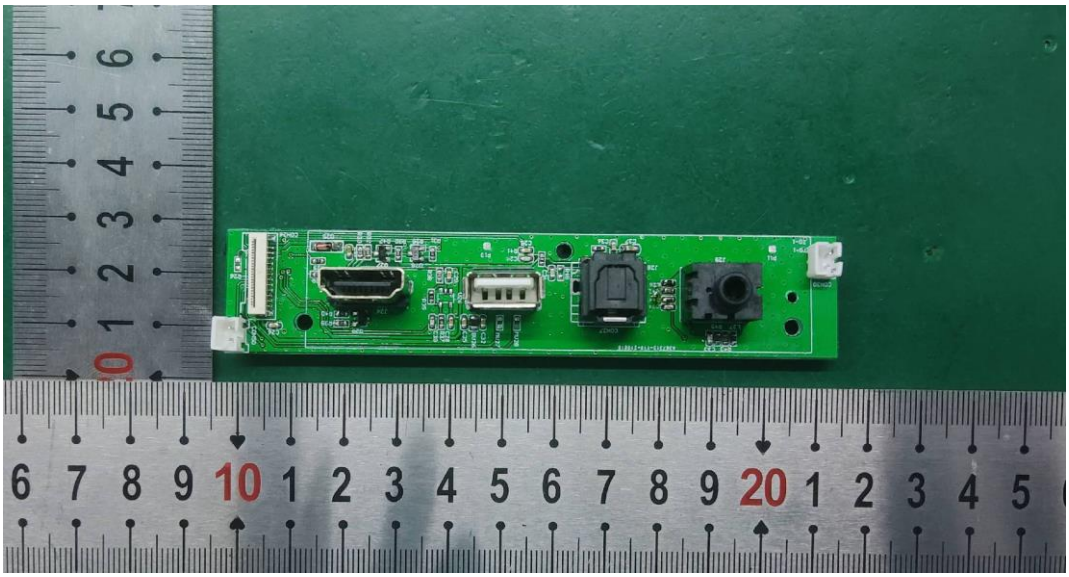


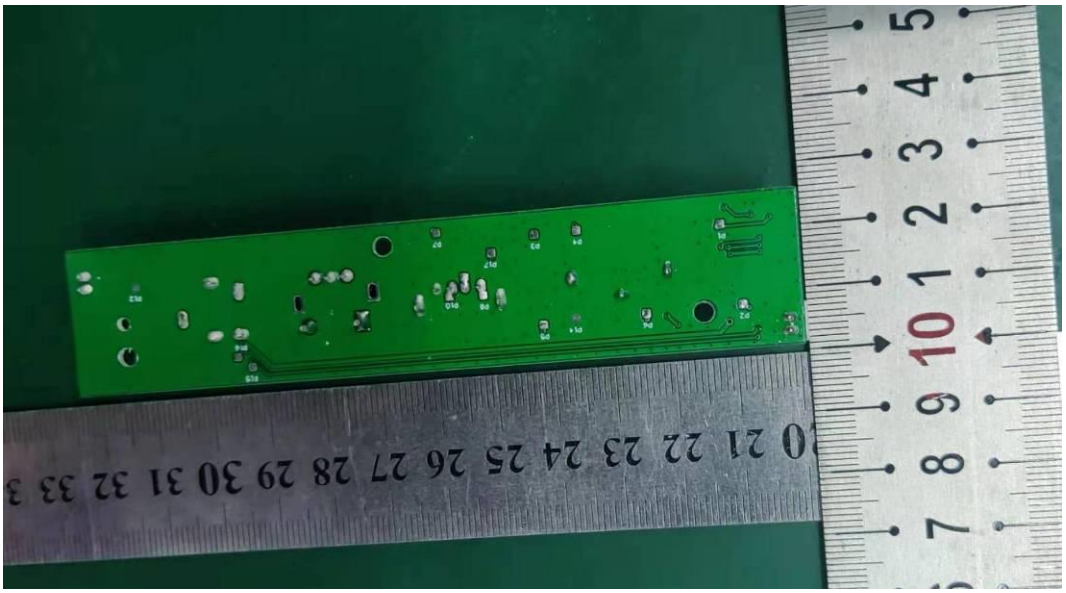
24. Photographs of the EUT

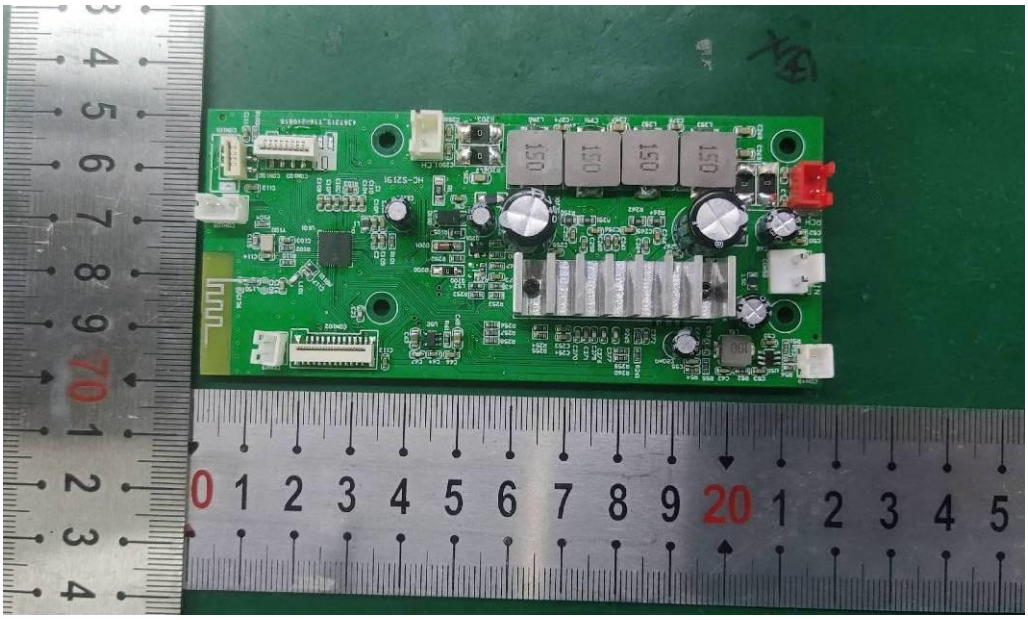


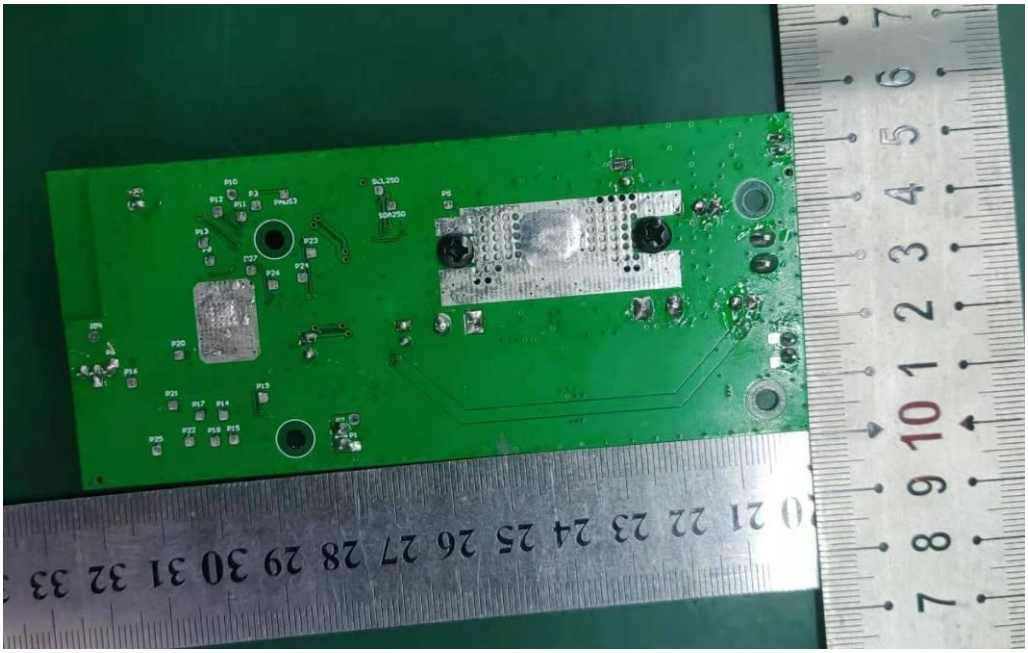

~AC IN
ARC

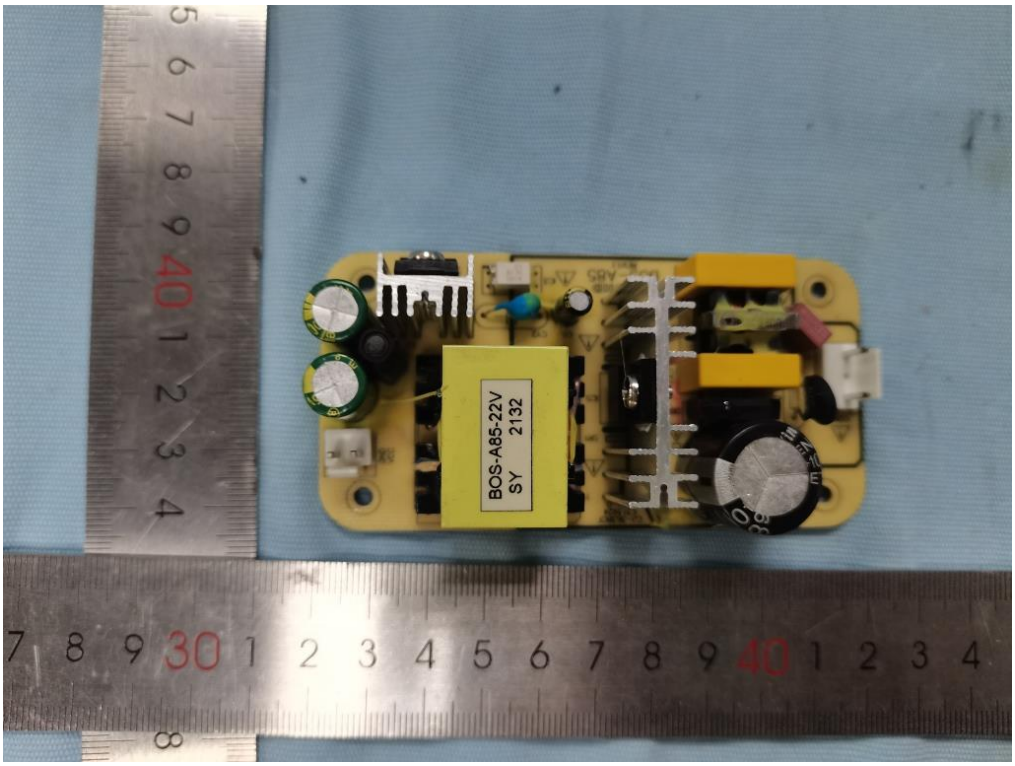








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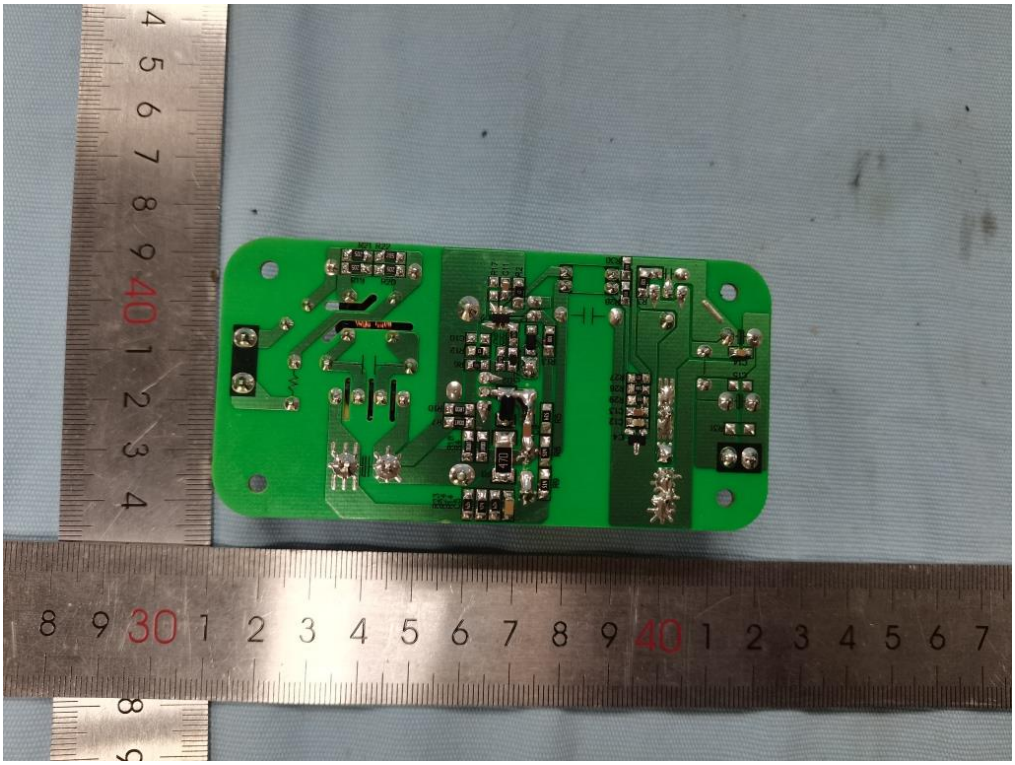
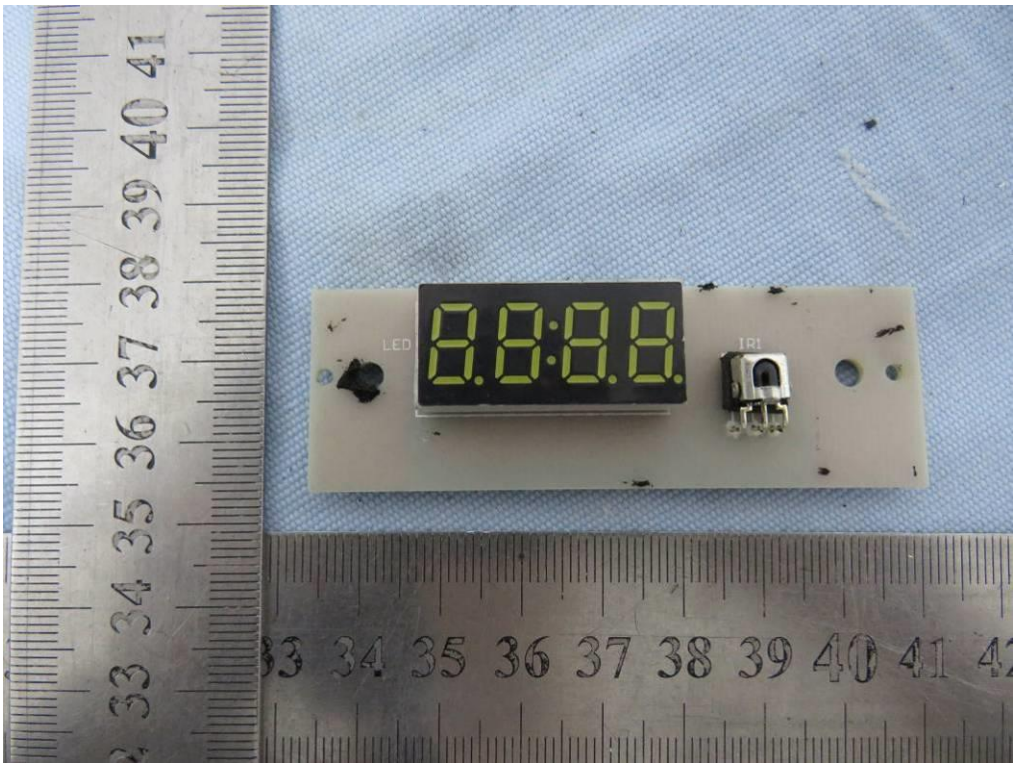
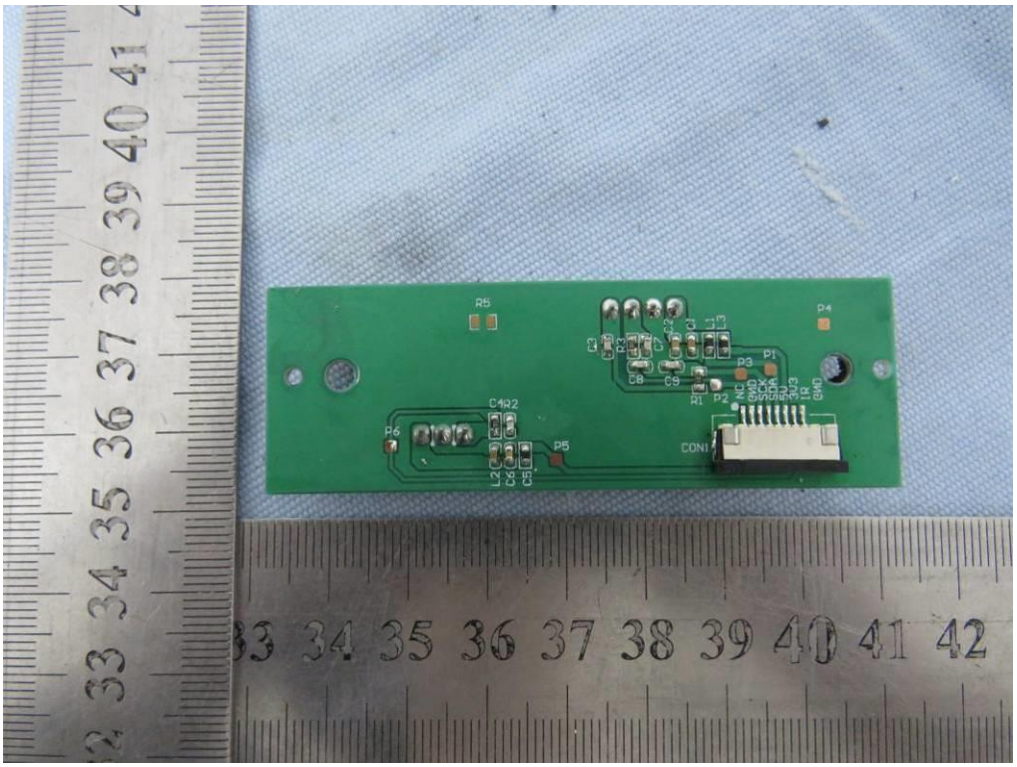
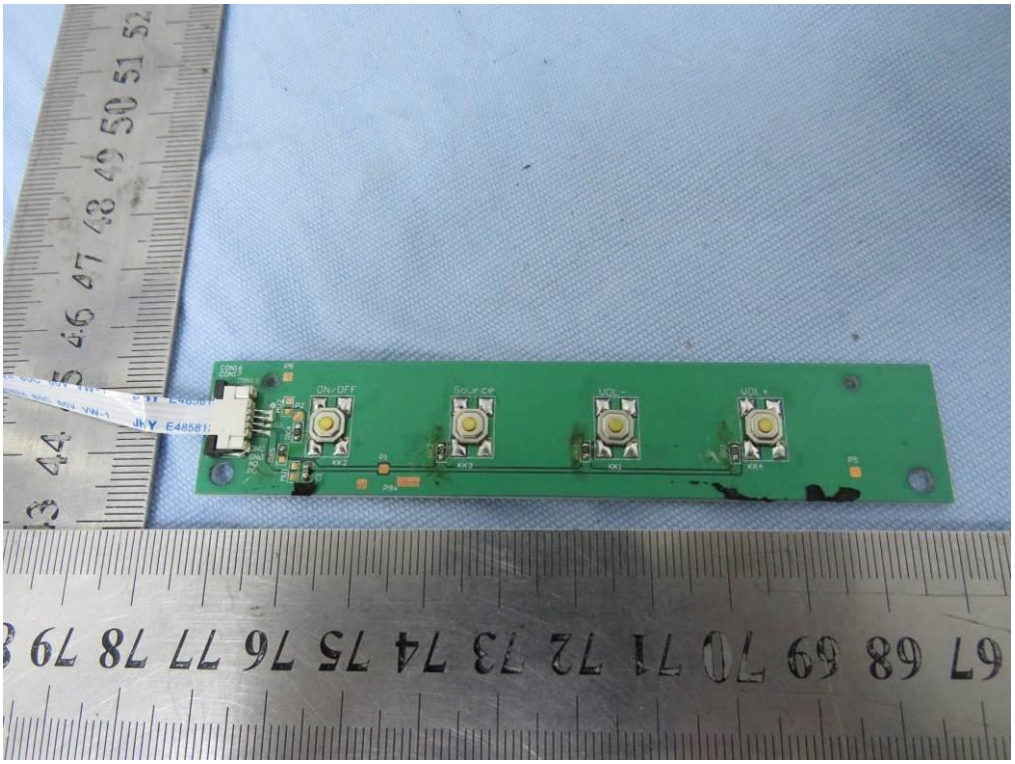
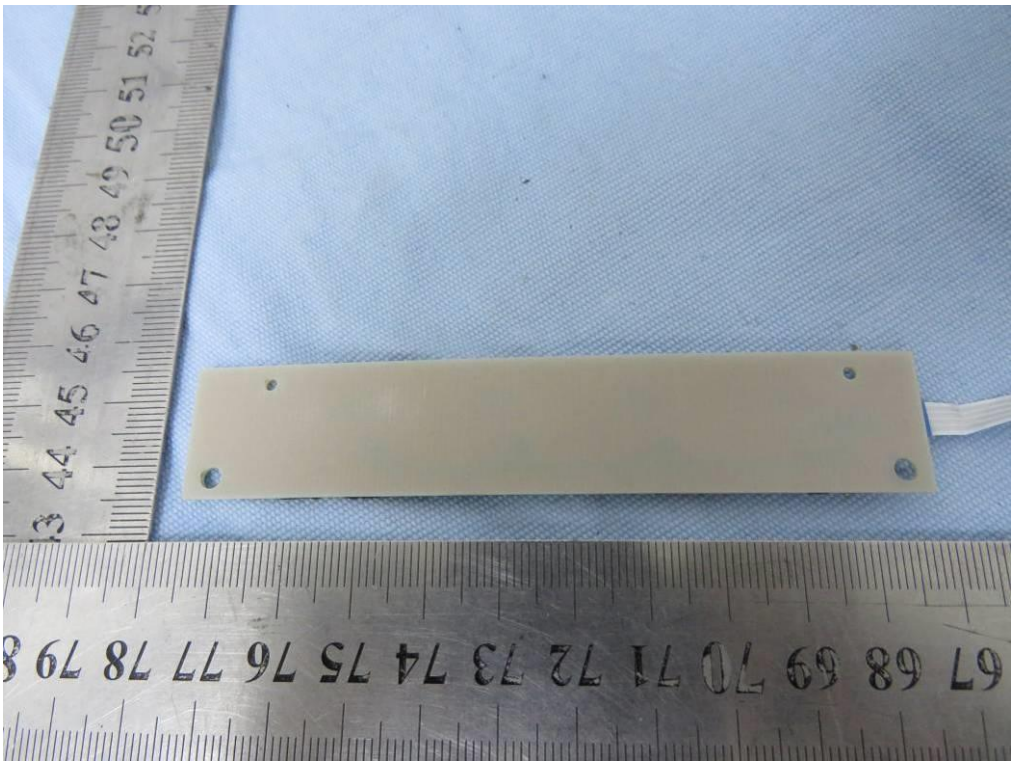
SY 2132




LED
IR1


R5
P4
P1
P3
P2
R1
C8
C9
C4R2
P6
P5
CON1


ON/OFF
Source
VOL-
VOL+

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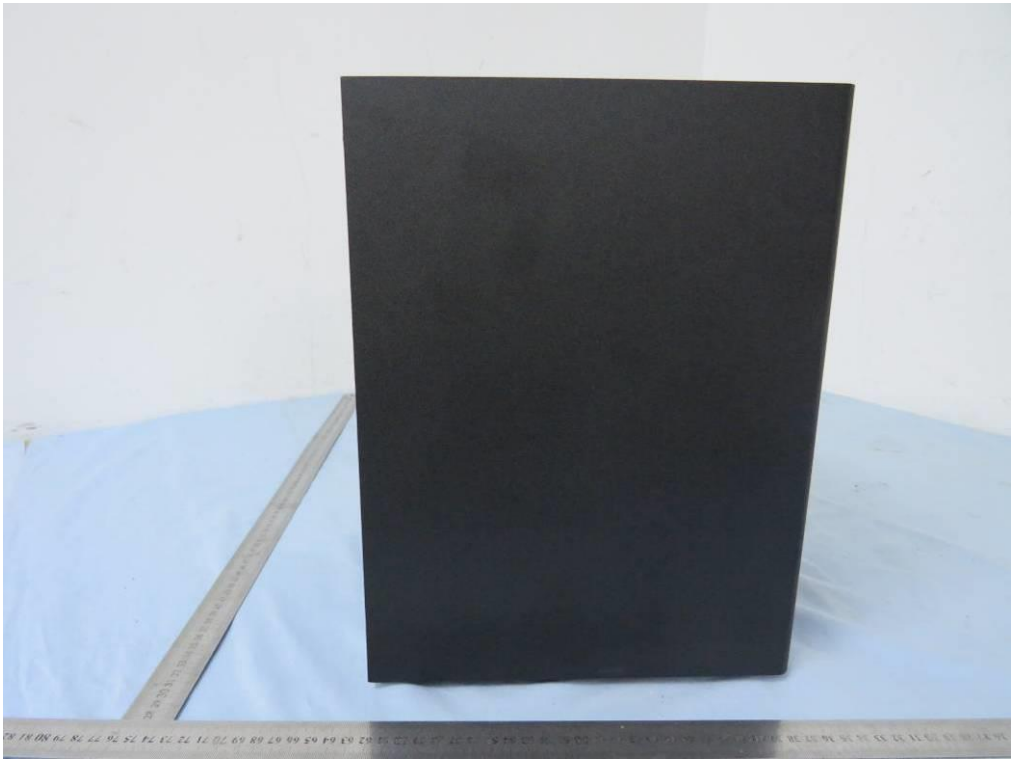
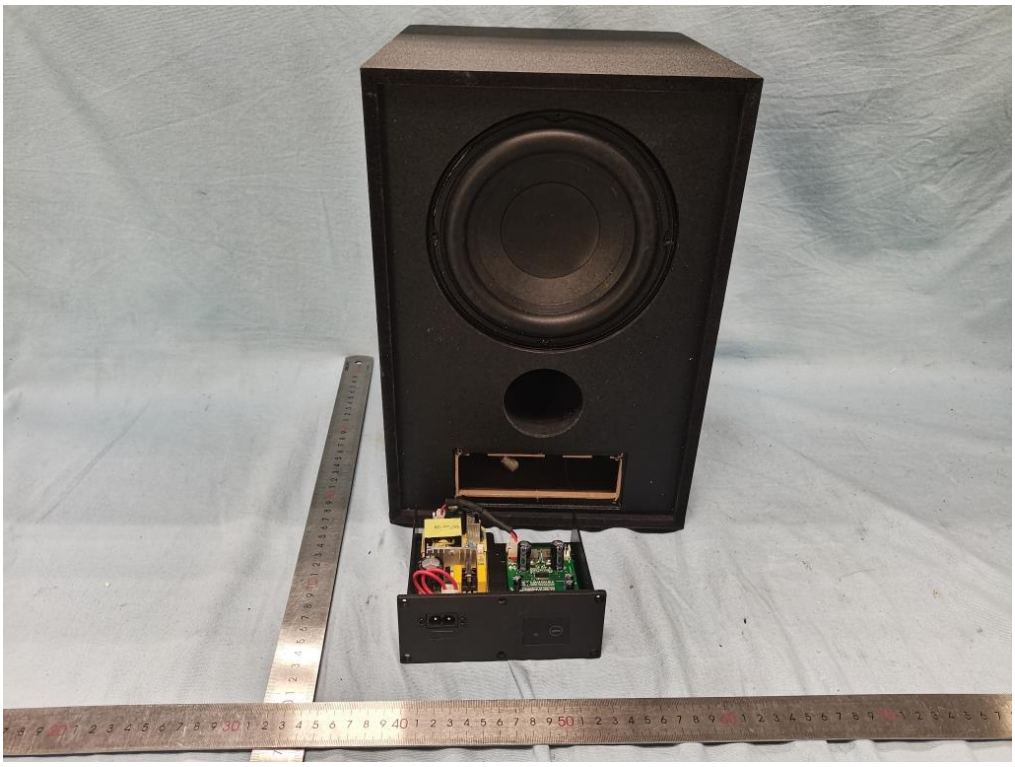
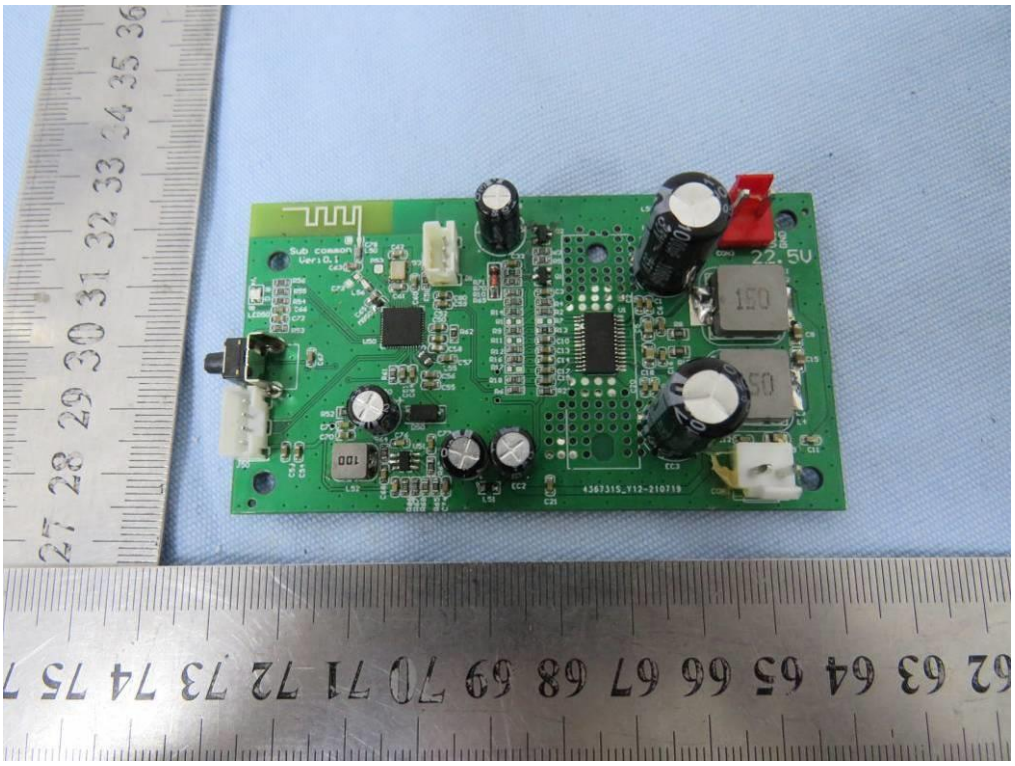
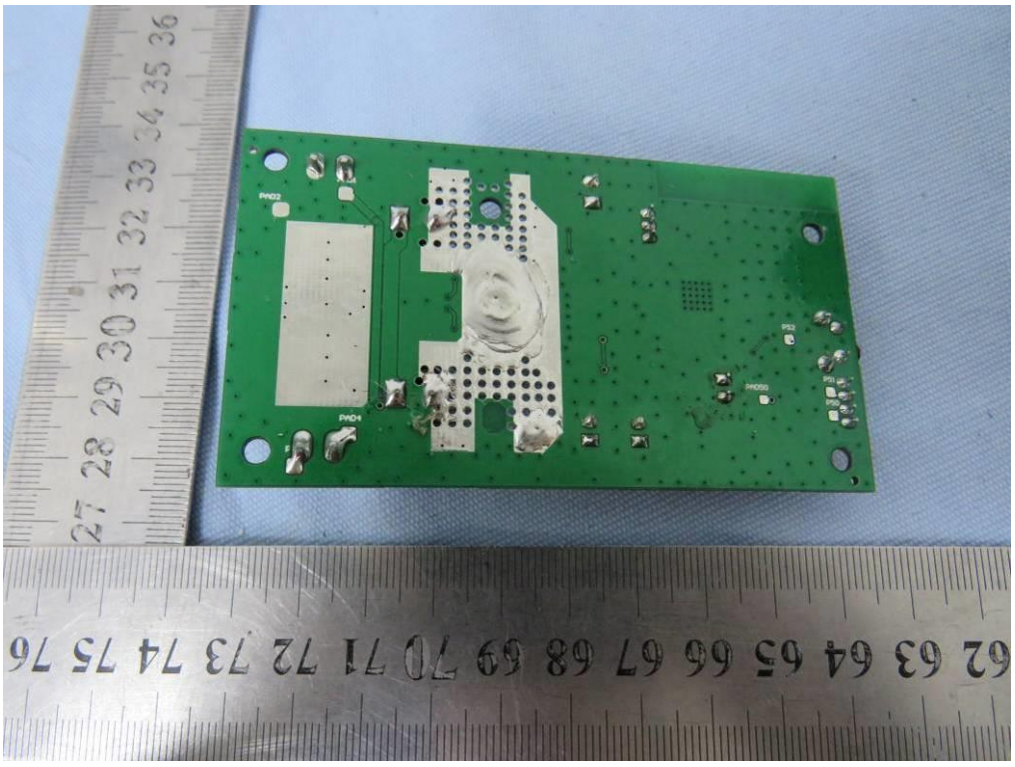


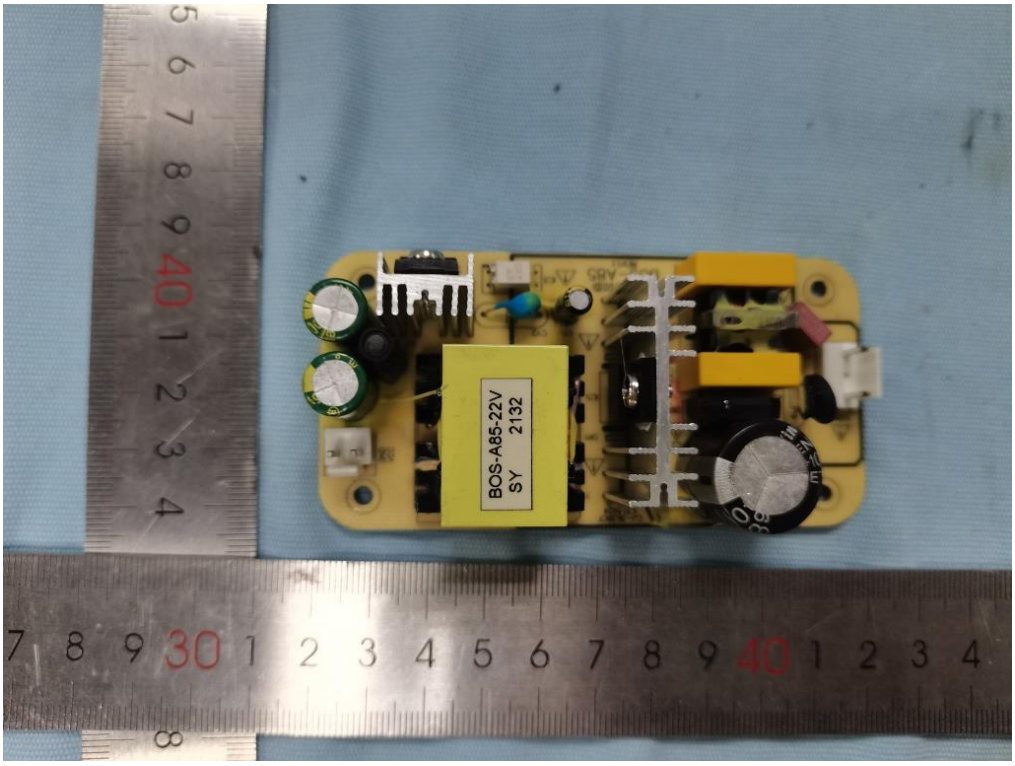

PAIR








Sub common
Ver1.0.1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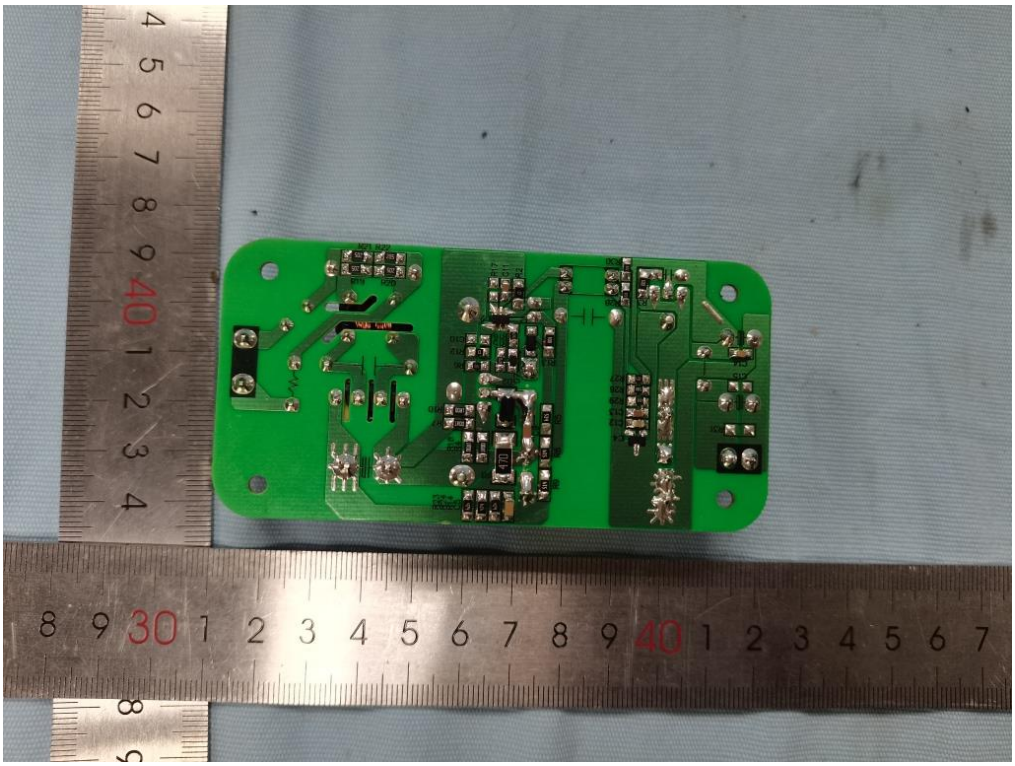
SY 2132



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