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	:	Computer Multimedia Speaker
Brand Name	:	F&D
Model No.	:	PA300, PA200, PA928, PA948, PA310, PA100, PA388 (For model difference refer to section 2)
Measurement Standard	:	ETSI EN 301 489-1 V2.2.3: 2019 Draft ETSI EN 301 489-17 V3.2.2: 2019
Receipt Date of Samples	:	November 11, 2020
Date of Tested	:	November 12, 2020 to December 18, 2020
Date of Report	:	December 22, 2020

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

Alina Guo / Project Engineer

Approved by

Iori Fan / Authorized Signatory

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Revision History

Report Number	Description	Issued Date
NTC2011115EV00	Initial Issue	2020-12-22

1. Summary of Test Result

ETSI EN 301 489-1 V2.2.3: 2019 Draft ETSI EN 301 489-17 V3.2.2: 2019			
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 IEC 61000-3-2: 2019	Harmonic Current Emission	PASS	---
EN 61000-3-3: 2013+A1:2019	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:	Computer Multimedia Speaker
Main Model Name:	PA300
Additional Model Name:	PA200, PA928, PA948, PA310, PA100, PA388
Model Difference:	These models have the same circuit schematic, construction, PCB Layout and critical components. The difference is model number only due to trading purpose.
S/N:	PA300EF204000001
Brand Name:	F&D
Hardware version:	V1.0
Software version:	V1.0
Rating:	AC 100-240V 50/60Hz DC 12V from internal battery
Classification:	Class B
Typical arrangement:	Table-top
I/O Port:	USB Port*1, MIC Port*2, AC Port*1, Optical Port*1, AUX Port*1
Accessories Information	
Adapter:	N/A
Cable:	AC Mains: 1.5m unshielded Audio Line: 1.2m unshielded
Other:.	IR Remote * 1
Additional information	
Note:	According to these model difference, all tests were carried on model PA300
Remark:	All the information above are provided by the manufacturer. More detailed feature of the EUT please refers to the user manual.

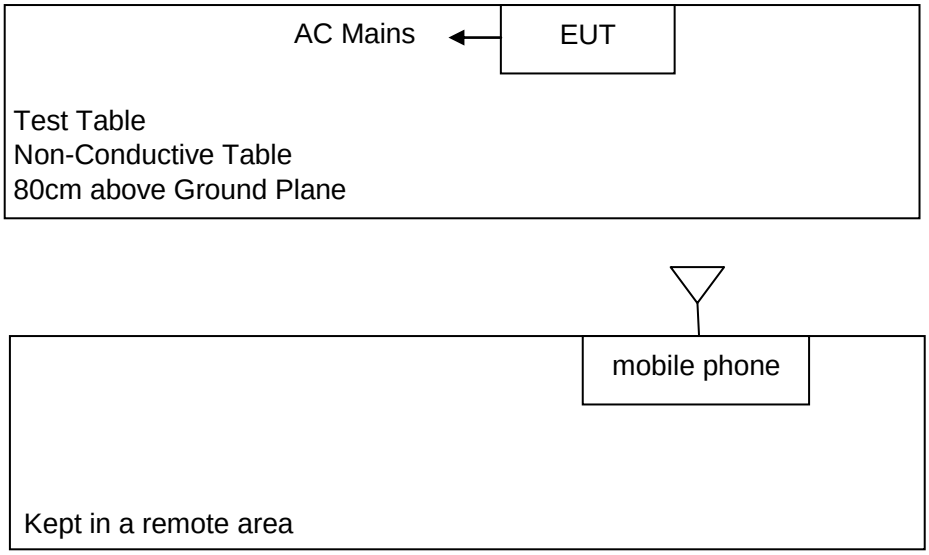
Technical Specification	
Bluetooth Function:	
BT Version:	V5.0
Frequency Range:	2402-2480MHz
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK
Number of Channel:	79
Channel space:	1MHz
Antenna Type:	PCB antenna
Antenna Gain:	0dBi (Declared by manufacturer)

3. Configuration of EUT

Description of Test Modes

Test Mode		Description
1.	BT Link	Turn on the EUT and connect to mobile phone via Bluetooth function, and make the EUT work.

Block Diagram of Configuration



4. Description of Support Device

No.	Equipment	Brand	M/N	S/N	Cable Specification	Remarks
1.	DVD Player	Pioneer	DV-310NC-K	0JTL030411CN	1.8m Unshielded, with core	---
2.	Mobile Phone	Huawei	PCT-AL10	5EN0219301002260	---	---
3.	Microphone*2	Sony	USB 3.0 8GB	---	---	Provided by the laboratory
4.	USB DISK	Sony	USB 3.0 8GB	---	---	Provided by the laboratory
5.	Mobile Phone	HUAWEI	TAG-TL00	TAG-TL00C01B166	---	---

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	Hancock	See note 1
2.	Conducted Emission (Wired network Port)	---	---	---	---
3.	Radiated Emission	1	AC 110V / 60Hz AC 230V / 50Hz DC 12V	Alvin	See note 1
4.	Harmonic Current Emission	1	AC 230V / 50Hz	Loki	See note 1
5.	Voltage Fluctuations & Flicker	1	AC 230V / 50Hz	Loki	See note 1
6.	Electrostatic Discharges (ESD)	1	AC 110V / 60Hz AC 230V / 50Hz DC 12V	Loki	See note 2
7.	Continuous RF Electromagnetic Field Disturbances	1	AC 110V / 60Hz AC 230V / 50Hz DC 12V	Ivan	See note 1
8.	Electrical Fast Transients/Burst (EFT/B)	1	AC 110V / 60Hz AC 230V / 50Hz	Loki	See note 2
9.	Surges	1	AC 110V / 60Hz AC 230V / 50Hz	Loki	See note 2
10.	Continuous Induced RF Disturbances	1	AC 110V / 60Hz AC 230V / 50Hz	Ivan	See note 2
11.	Voltage Dips and Interruptions	1	AC 100V / 60Hz AC 230V / 50Hz AC 240V / 50Hz	Loki	See note 2

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 voltage 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 Test	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	1.0	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**
0.1900	30.10	10.60	40.70	79.00	-38.30	QP

Where,

Freq.	=Emission frequency in MHz
Reading Level	=Uncorrected 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**
60.0700	45.88	-18.38	27.50	49.00	-21.50	QP

Where,

Freq.	= Emission frequency in MHz
Reading Level	= Uncorrected 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

LIMIT

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.

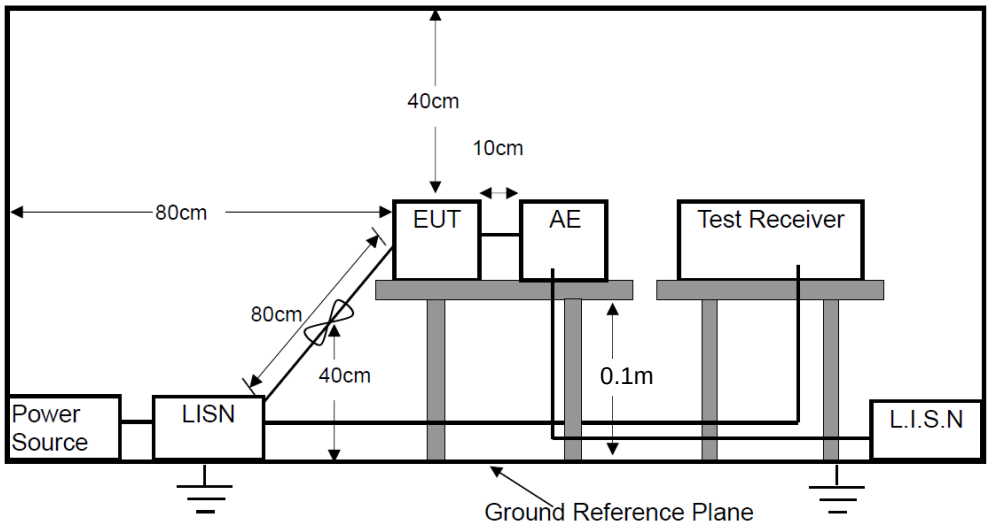
Limits for conducted disturbance for asymmetric mode (Wired network Port):

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

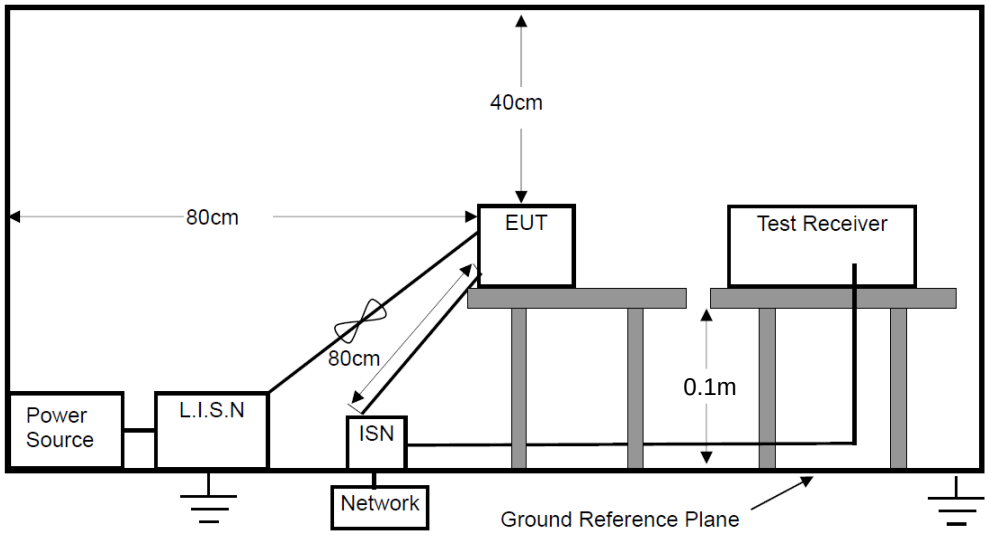
Note:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.

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 0.1m 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.

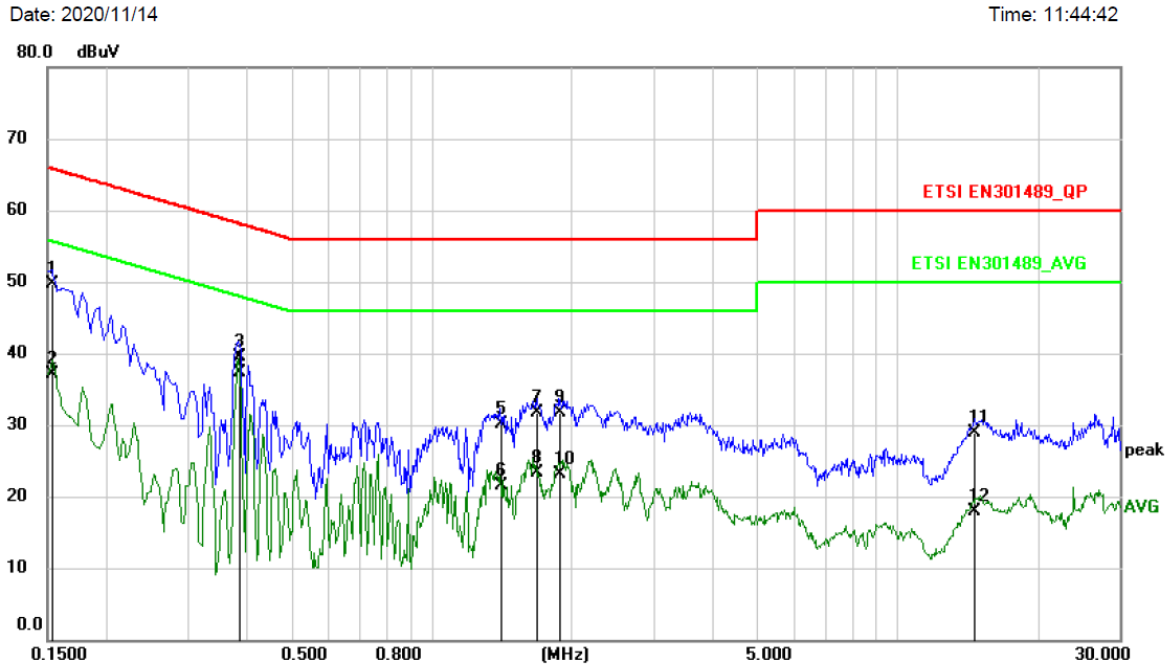
TEST RESULTS

PASS

Please refer to the following pages.

M/N: PA300	Testing Voltage: AC 230V/50Hz
Phase: L1	Detector: QP & AVG
Test Mode: 1	

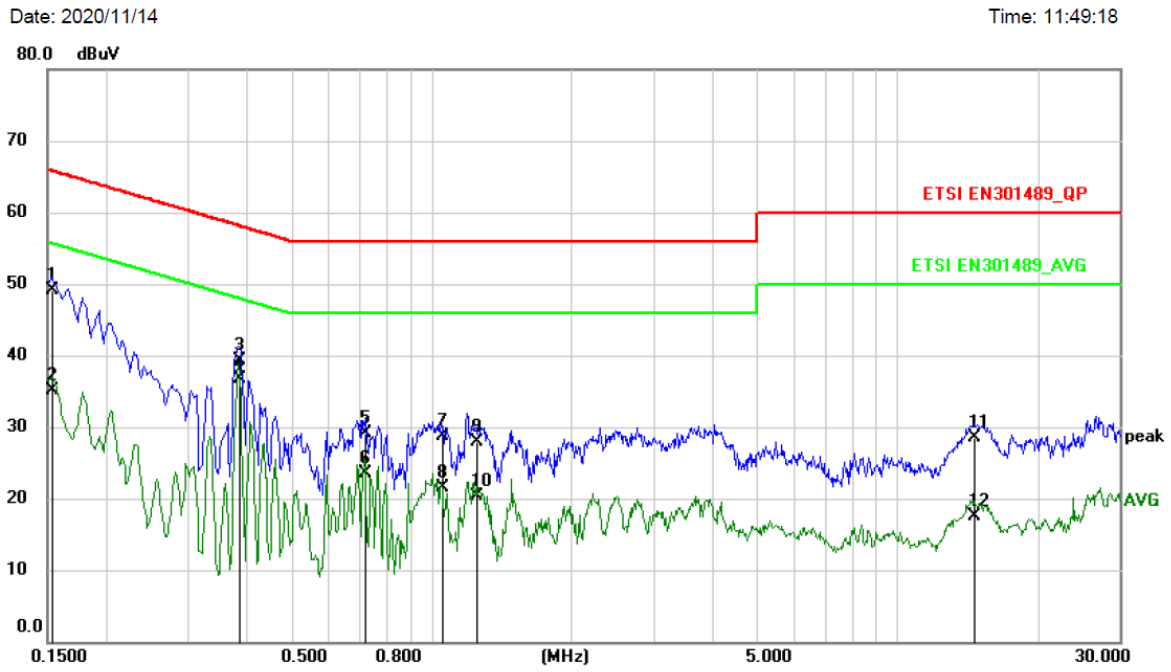
Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	39.20	10.60	49.80	65.79	-15.99	QP	
2		0.1539	26.60	10.60	37.20	55.79	-18.59	AVG	
3		0.3860	28.99	10.61	39.60	58.15	-18.55	QP	
4	*	0.3860	26.69	10.61	37.30	48.15	-10.85	AVG	
5		1.4100	19.50	10.70	30.20	56.00	-25.80	QP	
6		1.4100	10.90	10.70	21.60	46.00	-24.40	AVG	
7		1.6818	21.10	10.70	31.80	56.00	-24.20	QP	
8		1.6818	12.60	10.70	23.30	46.00	-22.70	AVG	
9		1.8818	21.00	10.70	31.70	56.00	-24.30	QP	
10		1.8818	12.40	10.70	23.10	46.00	-22.90	AVG	
11		14.6219	18.15	10.75	28.90	60.00	-31.10	QP	
12		14.6219	7.25	10.75	18.00	50.00	-32.00	AVG	

M/N: PA300	Testing Voltage: AC 230V/50Hz
Phase: N	Detector: QP & AVG
Test Mode:1	

Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	38.50	10.60	49.10	65.79	-16.69	QP	
2		0.1539	24.60	10.60	35.20	55.79	-20.59	AVG	
3		0.3860	28.69	10.61	39.30	58.15	-18.85	QP	
4	*	0.3860	26.19	10.61	36.80	48.15	-11.35	AVG	
5		0.7217	18.54	10.66	29.20	56.00	-26.80	QP	
6		0.7217	12.94	10.66	23.60	46.00	-22.40	AVG	
7		1.0500	18.10	10.70	28.80	56.00	-27.20	QP	
8		1.0500	10.90	10.70	21.60	46.00	-24.40	AVG	
9		1.2459	17.20	10.70	27.90	56.00	-28.10	QP	
10		1.2459	9.70	10.70	20.40	46.00	-25.60	AVG	
11		14.6577	17.75	10.75	28.50	60.00	-31.50	QP	
12		14.6577	6.85	10.75	17.60	50.00	-32.40	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:

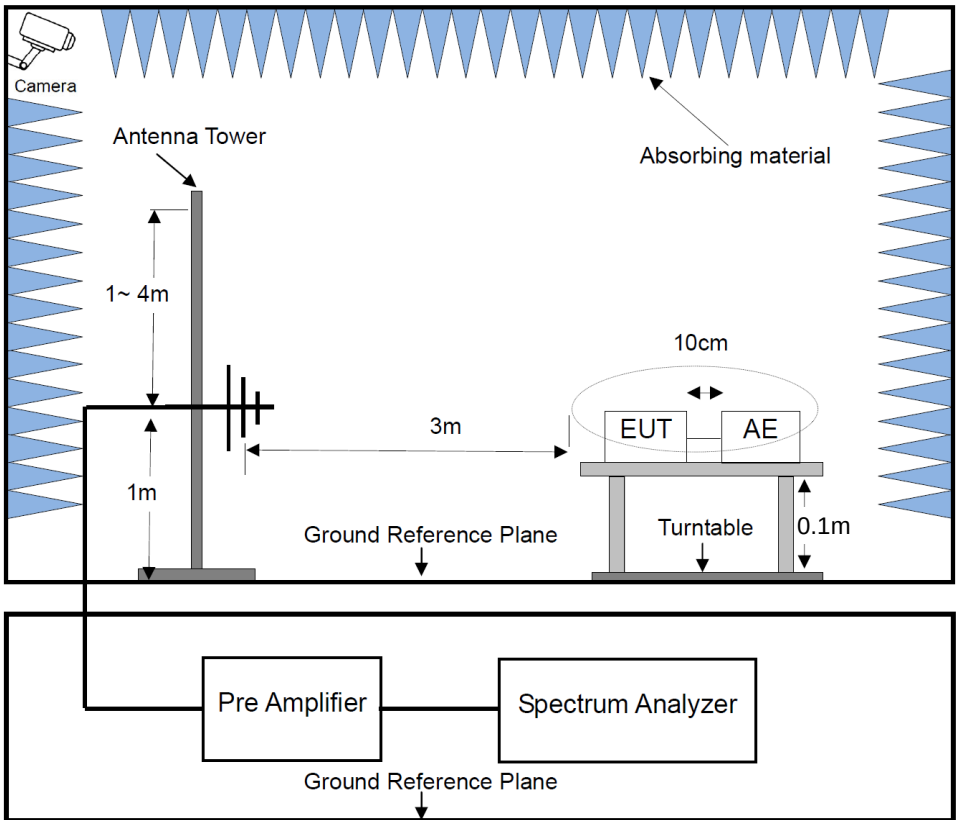
Frequency (GHz)	☐ Class A at 3m		☒ Class B at 3m	
	Peak dB(uV/m)	Average dB(uV/m)	Peak dB(uV/m)	Average dB(uV/m)
1 ~ 3	76	56	70	50

Required highest frequency for radiated measurement

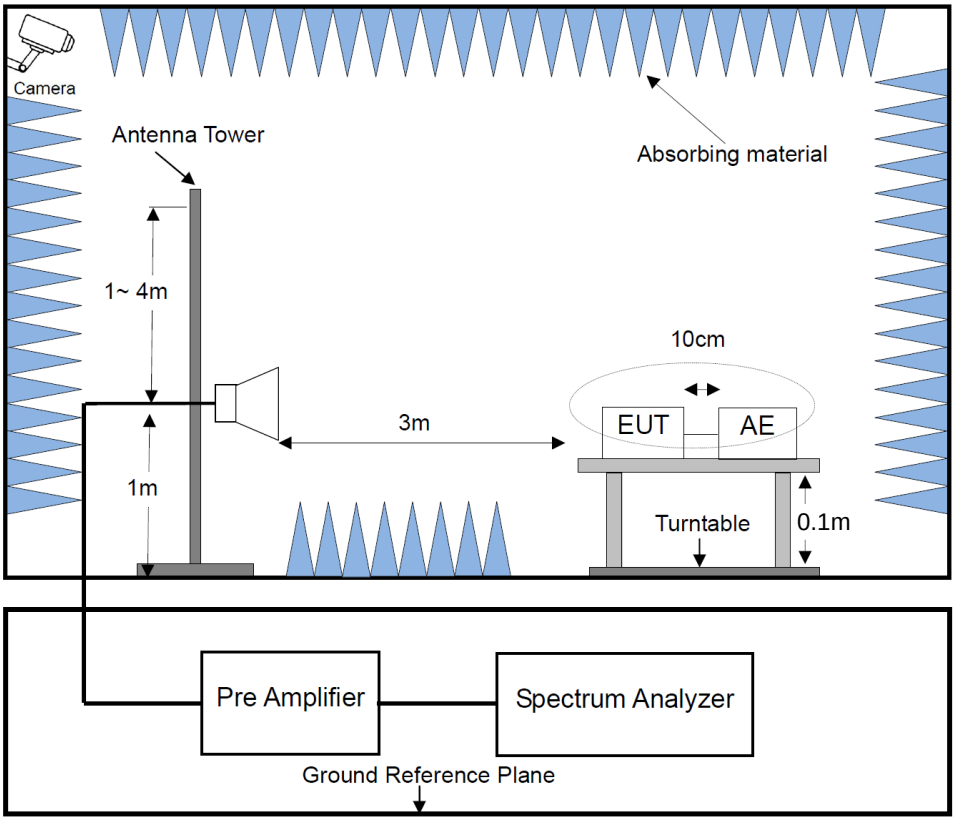
Highest internal frequency* (F_x)	Highest measured frequency
$F_x \leq 108$ MHz	1 GHz
108 MHz < $F_x \leq$ 500 MHz	2 GHz
500 MHz < $F_x \leq$ 1 GHz	5 GHz
F_x > 1 GHz	5 × F_x up to a maximum of 6 GHz
Note 1. Highest fundamental frequency generated or used within the EUT or highest frequency at which it 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 0.1m 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.

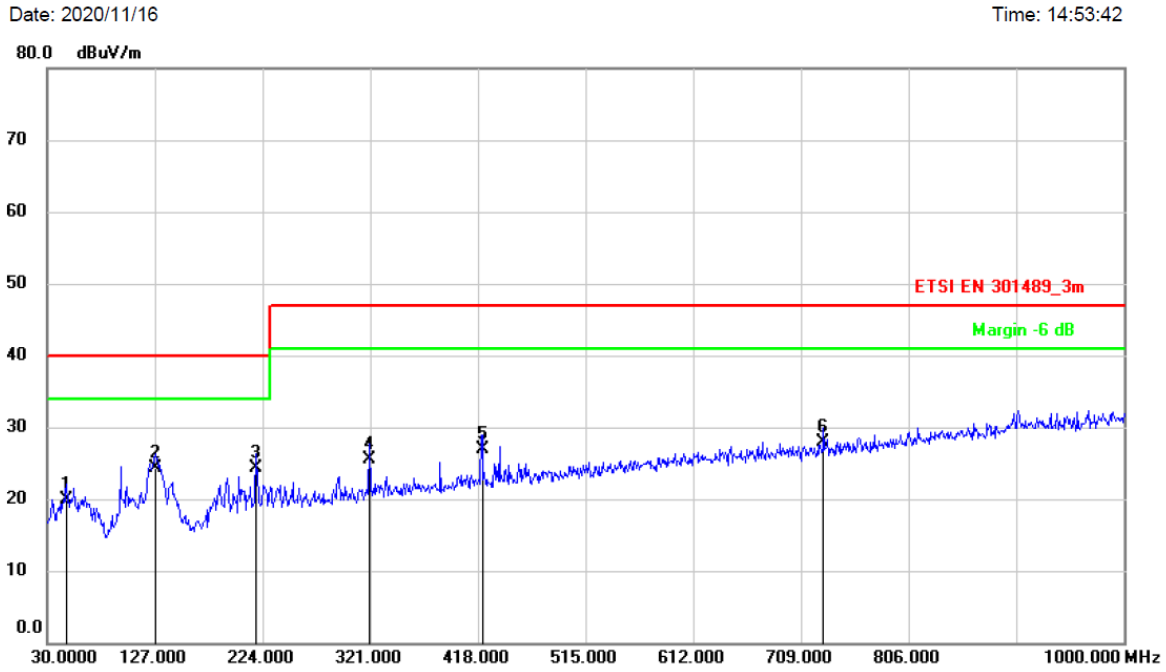
TEST RESULTS

PASS

Please refer to the following pages of the worst case.

M/N: PA300	Testing Voltage: AC 230V/50Hz
Polarization: Horizontal	Detector: QP
Test Mode: 1	Distance: 3m

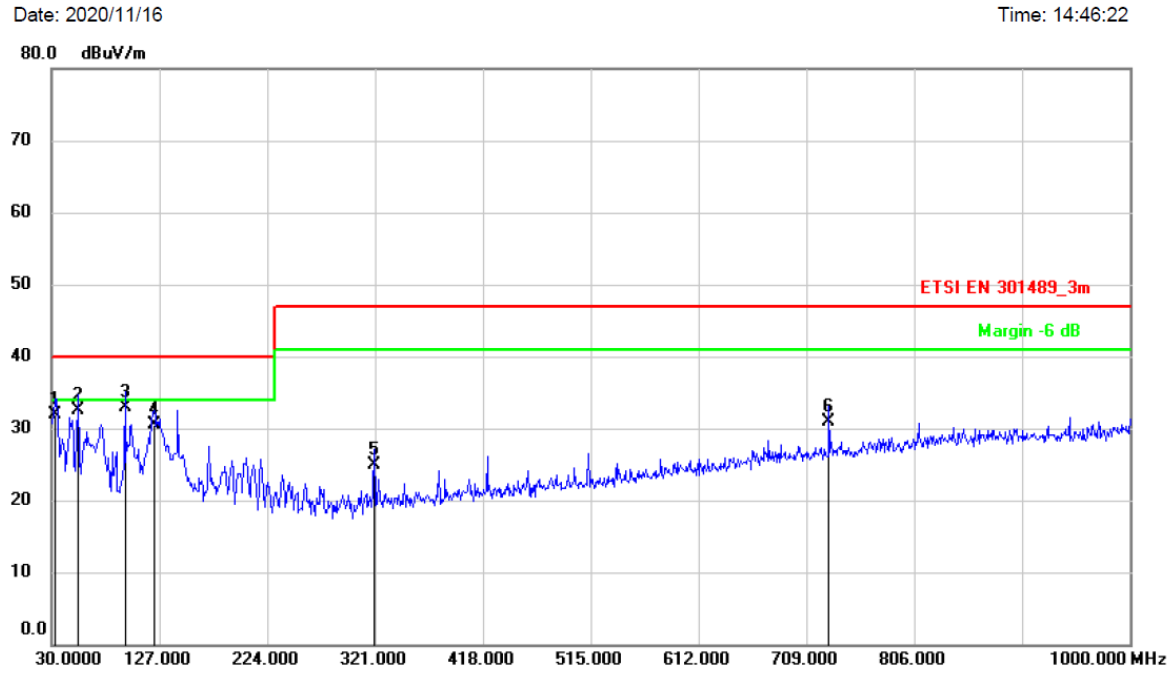
Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		47.4600	27.45	-7.45	20.00	40.00	-20.00	QP	
2	*	127.0000	34.50	-10.20	24.30	40.00	-15.70	QP	
3		218.1800	31.74	-7.44	24.30	40.00	-15.70	QP	
4		320.0300	30.58	-4.98	25.60	47.00	-21.40	QP	
5		421.8800	29.88	-2.98	26.90	47.00	-20.10	QP	
6		729.3700	25.20	2.70	27.90	47.00	-19.10	QP	

M/N: PA300	Testing Voltage: AC 230V/50Hz
Polarization: Vertical	Detector: QP
Test Mode: 1	Distance: 3m

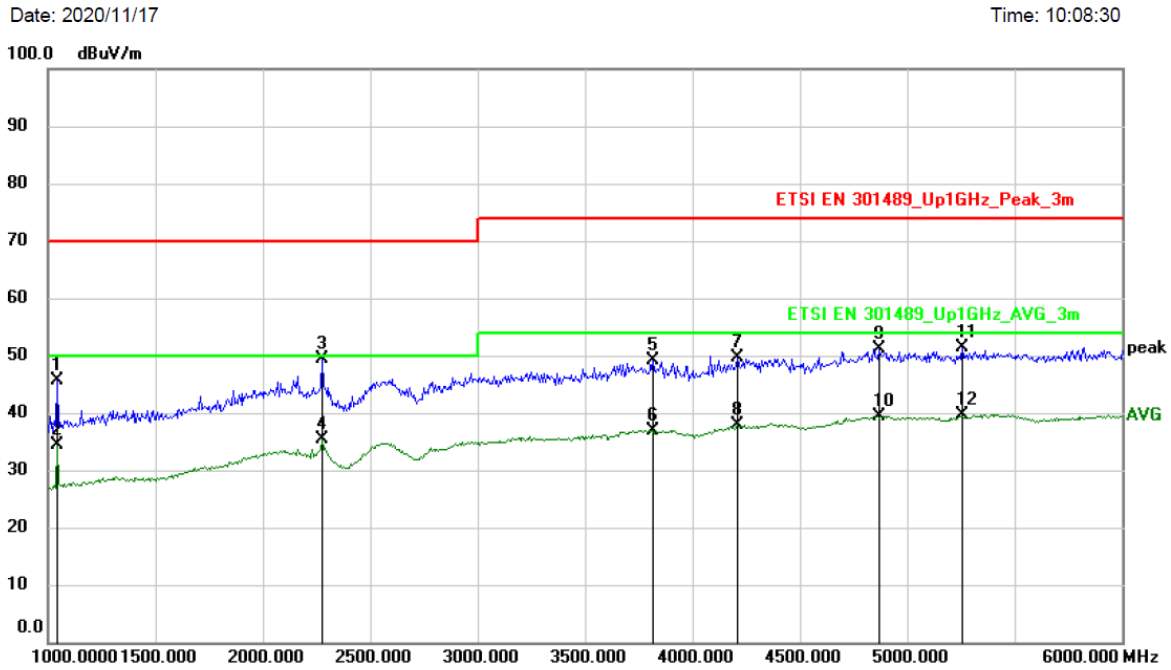
Radiated Emission Measurement



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	41.49	-9.49	32.00	40.00	-8.00	QP	
2		54.2500	40.24	-7.64	32.60	40.00	-7.40	QP	
3	*	95.9600	42.05	-9.05	33.00	40.00	-7.00	QP	
4		122.1500	41.65	-11.15	30.50	40.00	-9.50	QP	
5		320.0300	30.98	-5.98	25.00	47.00	-22.00	QP	
6		729.3700	28.30	2.70	31.00	47.00	-16.00	QP	

M/N: PA300	Testing Voltage: AC 230V/50Hz
Polarization: Horizontal	Detector: Peak & AVG
Test Mode: 1	Distance: 3m

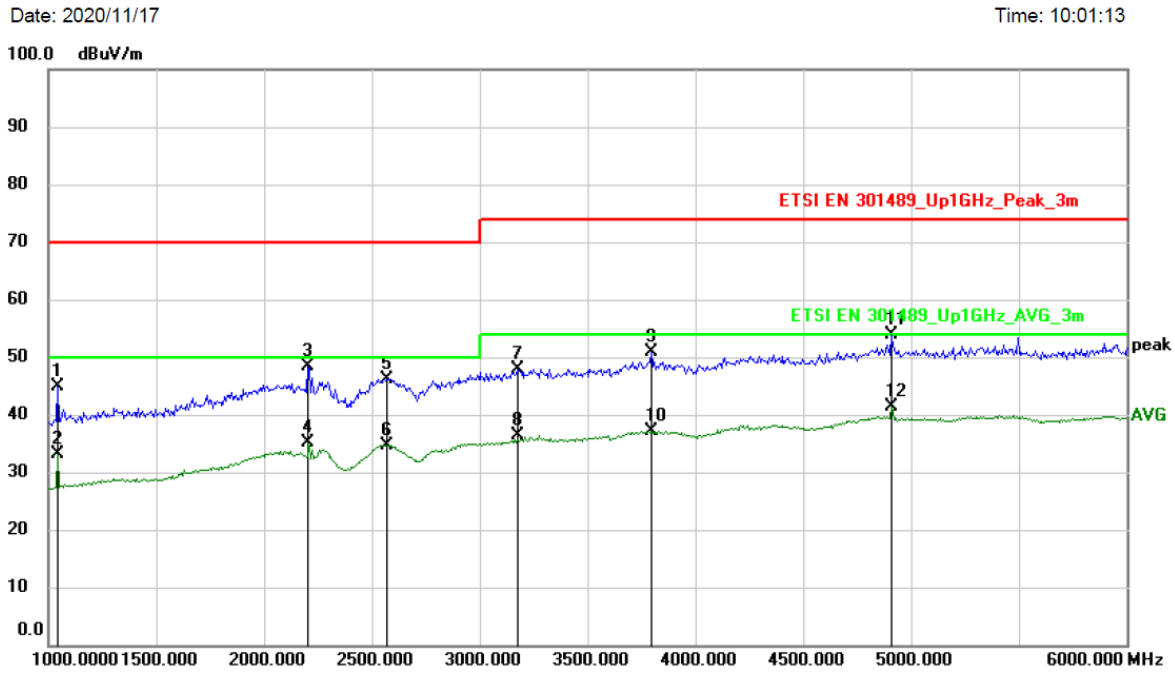
Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		1043.750	55.23	-9.50	45.73	70.00	-24.27	peak	
2		1043.750	43.87	-9.50	34.37	50.00	-15.63	AVG	
3		2275.000	49.50	-0.22	49.28	70.00	-20.72	peak	
4		2275.000	35.54	-0.22	35.32	50.00	-14.68	AVG	
5		3818.750	45.69	3.46	49.15	74.00	-24.85	peak	
6		3818.750	33.51	3.46	36.97	54.00	-17.03	AVG	
7		4212.500	45.20	4.47	49.67	74.00	-24.33	peak	
8		4212.500	33.45	4.47	37.92	54.00	-16.08	AVG	
9		4868.750	44.63	6.55	51.18	74.00	-22.82	peak	
10		4868.750	32.86	6.55	39.41	54.00	-14.59	AVG	
11		5256.250	44.53	6.81	51.34	74.00	-22.66	peak	
12	*	5256.250	32.74	6.81	39.55	54.00	-14.45	AVG	

M/N: PA300	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		1043.750	54.39	-9.50	44.89	70.00	-25.11	peak	
2		1043.750	42.55	-9.50	33.05	50.00	-16.95	AVG	
3		2200.000	48.85	-0.40	48.45	70.00	-21.55	peak	
4		2200.000	35.63	-0.40	35.23	50.00	-14.77	AVG	
5		2568.750	45.51	0.64	46.15	70.00	-23.85	peak	
6		2568.750	34.06	0.64	34.70	50.00	-15.30	AVG	
7		3175.000	45.90	2.00	47.90	74.00	-26.10	peak	
8		3175.000	34.33	2.00	36.33	54.00	-17.67	AVG	
9		3793.750	47.53	3.39	50.92	74.00	-23.08	peak	
10		3793.750	33.72	3.39	37.11	54.00	-16.89	AVG	
11		4912.500	47.04	6.72	53.76	74.00	-20.24	peak	
12	*	4912.500	34.57	6.72	41.29	54.00	-12.71	AVG	

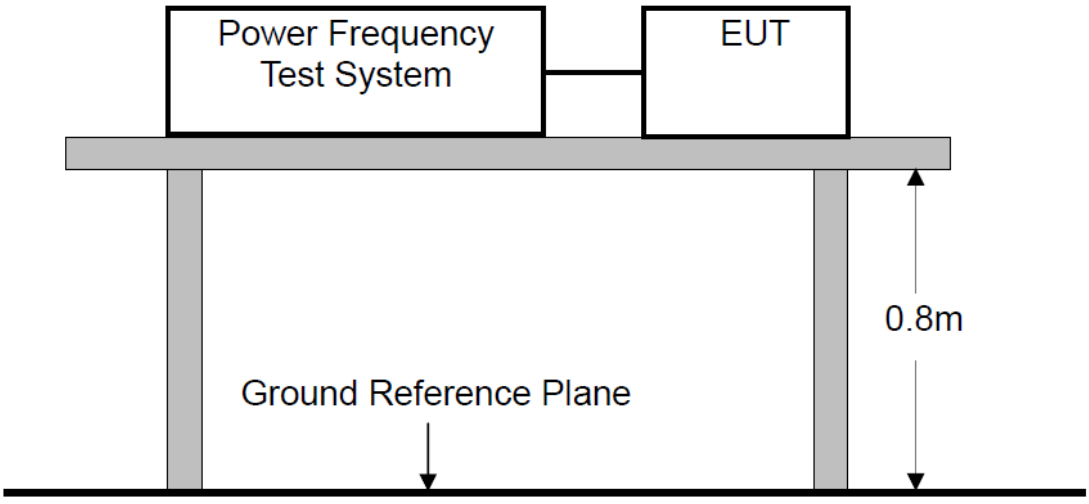
13. Harmonic Current Emission Measurement

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

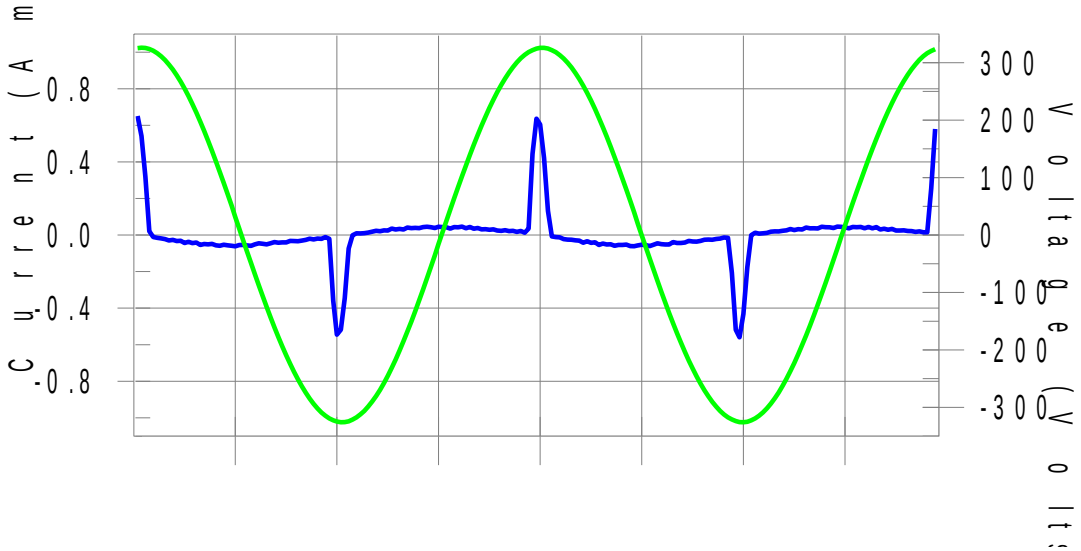
Please refer to the following pages of the worst case.

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.

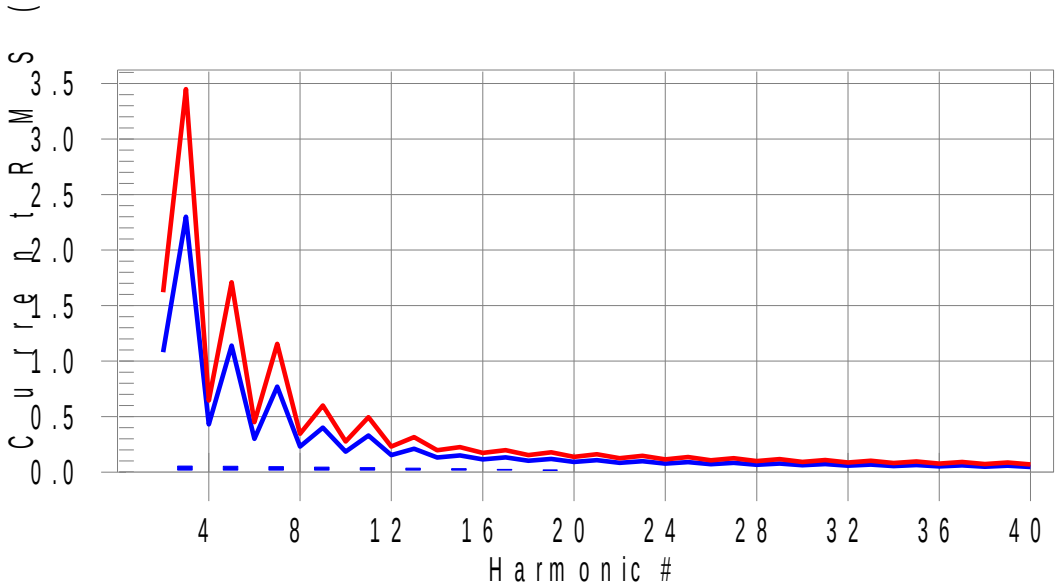
Harmonics – Class-A per Ed. Ed. 5.0 (2018)(Run time)

EUT: Cumputer Multimedia Speaker **Tested by: Loki**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2020/11/23 **Start time: 5:09:55** **End time: 5:12:36**
Test duration (min): 2.5 **Data file name: H-000427.cts_data**
Comment: BT Link
Customer: FENDA
M/N:PA300
Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H15-13.4% of 150% limit, H15-20.1% of 100% limit

Current Test Result Summary (Run time)

EUT: Cumputer Multimedia Speaker **Tested by: Loki**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2020/11/23 **Start time: 5:09:55** **End time: 5:12:36**
Test duration (min): 2.5 **Data file name: H-000427.cts_data**
Comment: BT Link
Customer: FENDA
M/N:PA300
Test Result: Pass **Source qualification: Normal**
THC(A): 0.126 **I-THD(%): 183.3** **POHC(A): 0.021** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	**230.48**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.658**	**I_RMS (Amps):**	**0.144**
I_Fund (Amps):	**0.069**	**Crest Factor:**	**4.621**
Power (Watts):	**13.1**	**Power Factor:**	**0.399**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	1.080	0.5	0.006	1.620	0.4	Pass
3	0.055	2.300	2.4	0.056	3.450	1.6	Pass
4	0.005	0.430	1.2	0.006	0.645	0.9	Pass
5	0.053	1.140	4.6	0.053	1.710	3.1	Pass
6	0.005	0.300	N/A	0.005	0.450	N/A	Pass
7	0.050	0.770	6.4	0.050	1.155	4.3	Pass
8	0.004	0.230	N/A	0.005	0.345	N/A	Pass
9	0.045	0.400	11.4	0.046	0.600	7.6	Pass
10	0.004	0.184	N/A	0.004	0.276	N/A	Pass
11	0.041	0.330	12.4	0.041	0.495	8.3	Pass
12	0.003	0.153	N/A	0.004	0.230	N/A	Pass
13	0.036	0.210	16.9	0.036	0.315	11.3	Pass
14	0.003	0.131	N/A	0.003	0.197	N/A	Pass
15	0.030	0.150	20.1	0.030	0.225	13.4	Pass
16	0.003	0.115	N/A	0.003	0.173	N/A	Pass
17	0.025	0.132	18.7	0.025	0.198	12.5	Pass
18	0.002	0.102	N/A	0.002	0.153	N/A	Pass
19	0.019	0.118	16.3	0.019	0.178	10.9	Pass
20	0.002	0.092	N/A	0.002	0.138	N/A	Pass
21	0.014	0.107	13.3	0.014	0.161	9.0	Pass
22	0.002	0.084	N/A	0.002	0.125	N/A	Pass
23	0.010	0.098	10.0	0.010	0.147	6.8	Pass
24	0.002	0.077	N/A	0.002	0.115	N/A	Pass
25	0.006	0.090	6.7	0.006	0.135	4.6	Pass
26	0.002	0.071	N/A	0.002	0.107	N/A	Pass
27	0.003	0.083	N/A	0.003	0.125	N/A	Pass
28	0.001	0.066	N/A	0.002	0.099	N/A	Pass
29	0.002	0.078	N/A	0.002	0.116	N/A	Pass
30	0.001	0.061	N/A	0.002	0.092	N/A	Pass
31	0.003	0.073	N/A	0.003	0.109	N/A	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.004	0.068	N/A	0.004	0.102	N/A	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.004	0.064	N/A	0.005	0.096	N/A	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.004	0.061	N/A	0.005	0.091	N/A	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.004	0.058	N/A	0.004	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

Note: The EUT power level is below 75.0 Watts and therefore has no defined limits

Voltage Source Verification Data (Run time)

EUT: Cumputer Multimedia Speaker **Tested by: Loki**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2020/11/23 **Start time: 5:09:55** **End time: 5:12:36**
Test duration (min): 2.5 **Data file name: H-000427.cts_data**
Comment: BT Link
Customer: FENDA
M/N:PA300
Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	**230.48**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.658**	**I_RMS (Amps):**	**0.144**
I_Fund (Amps):	**0.069**	**Crest Factor:**	**4.621**
Power (Watts):	**13.1**	**Power Factor:**	**0.399**

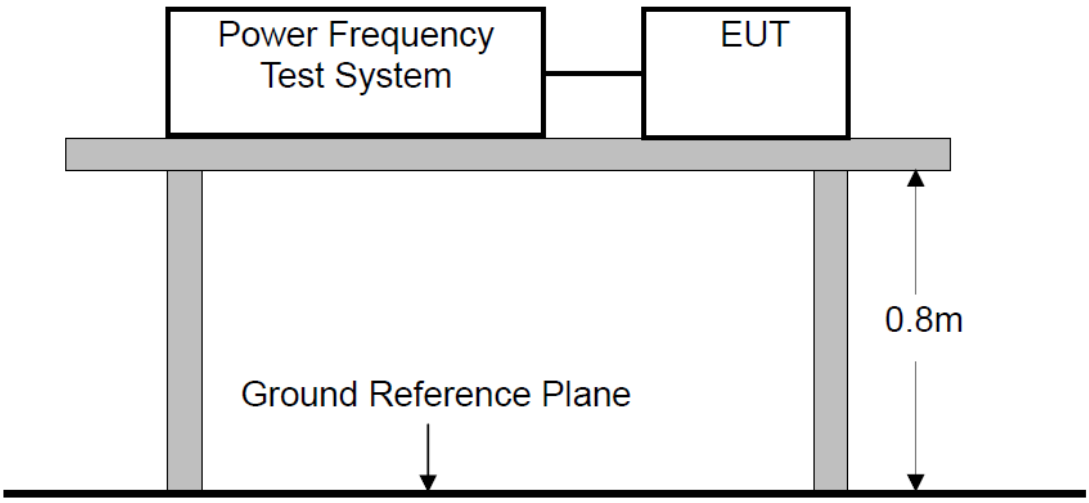
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.077	0.461	16.67	OK
3	0.526	2.074	25.34	OK
4	0.073	0.461	15.74	OK
5	0.042	0.922	4.52	OK
6	0.037	0.461	8.08	OK
7	0.046	0.691	6.66	OK
8	0.013	0.461	2.73	OK
9	0.038	0.461	8.30	OK
10	0.012	0.461	2.56	OK
11	0.039	0.230	16.72	OK
12	0.012	0.230	5.40	OK
13	0.025	0.230	10.77	OK
14	0.004	0.230	1.67	OK
15	0.026	0.230	11.07	OK
16	0.008	0.230	3.35	OK
17	0.023	0.230	9.91	OK
18	0.013	0.230	5.59	OK
19	0.024	0.230	10.29	OK
20	0.021	0.230	8.97	OK
21	0.020	0.230	8.53	OK
22	0.004	0.230	1.86	OK
23	0.013	0.230	5.57	OK
24	0.004	0.230	1.75	OK
25	0.009	0.230	3.88	OK
26	0.004	0.230	1.65	OK
27	0.003	0.230	1.40	OK
28	0.004	0.230	1.55	OK
29	0.006	0.230	2.60	OK
30	0.003	0.230	1.40	OK
31	0.005	0.230	2.21	OK
32	0.004	0.230	1.56	OK
33	0.006	0.230	2.66	OK
34	0.003	0.230	1.34	OK
35	0.007	0.230	2.95	OK
36	0.003	0.230	1.24	OK
37	0.007	0.230	3.06	OK
38	0.002	0.230	1.00	OK
39	0.007	0.230	3.20	OK
40	0.011	0.230	4.70	OK

14. Voltage Fluctuations & Flicker Measurement

LIMIT

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

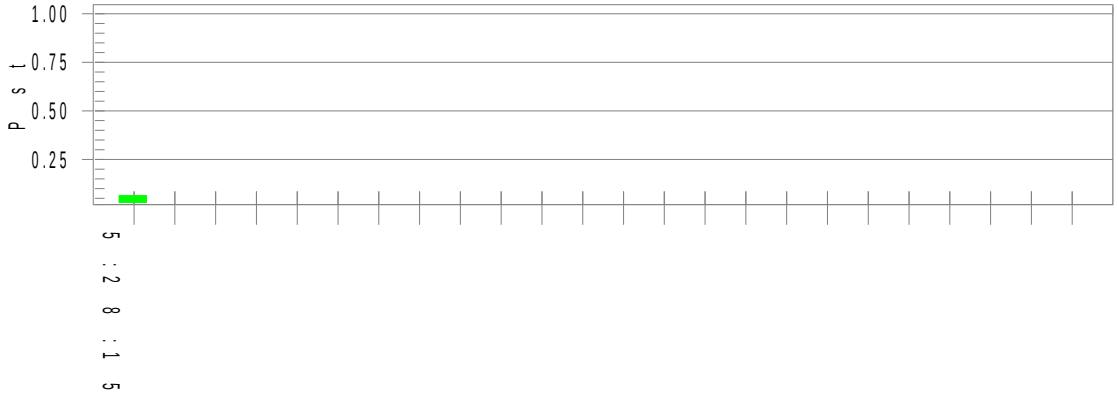
Pass.

Please refer to the following page.

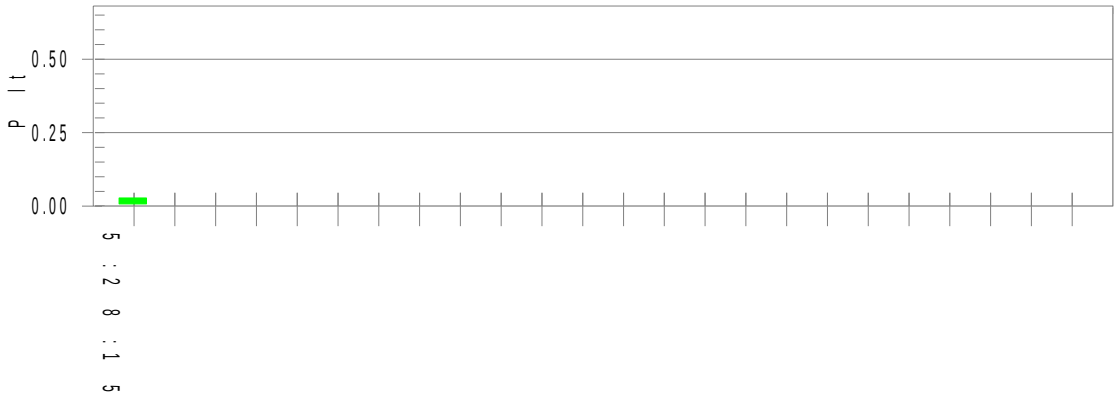
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT: Cumputer Multimedia Speaker **Tested by: Loki**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2020/11/23 **Start time: 5:17:54** **End time: 5:28:22**
Test duration (min): 10 **Data file name: F-000428.cts_data**
Comment: BT Link
Customer: FENDA
M/N: PA300
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):	**230.47**			
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):	**0.064**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.028**	**Test limit:**	**0.650**	**Pass**

15. Performance Criteria for Immunity

The performance criteria are referred to the test standard: **Draft 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)

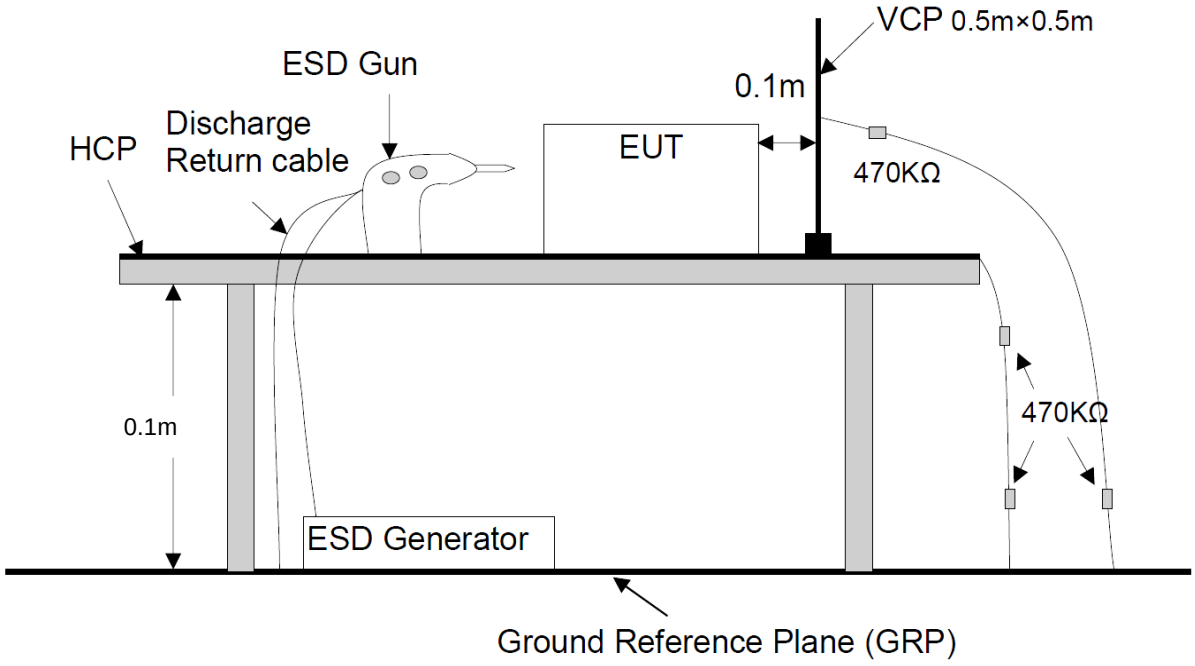
At the conclusion of each exposure the EUT shall operated with no user noticeable loss of communication link.

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 0.1m 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.: 26℃	R.H.: 48%	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, MIC Port, Optical	C	A
USB Port	C	B
MIC Port, AUX Port	A	B
AC Port, Button, Screen	A	A
Indirect Discharge (VCP)	C	A
Indirect Discharge (HCP)	---	---

Note: The noise phenomenon occurred during the test, but the EUT can be resumed to normal operation after the test.

ESD TEST POINT

(☆Direct Air Discharge,☆Direct Contact Discharge)

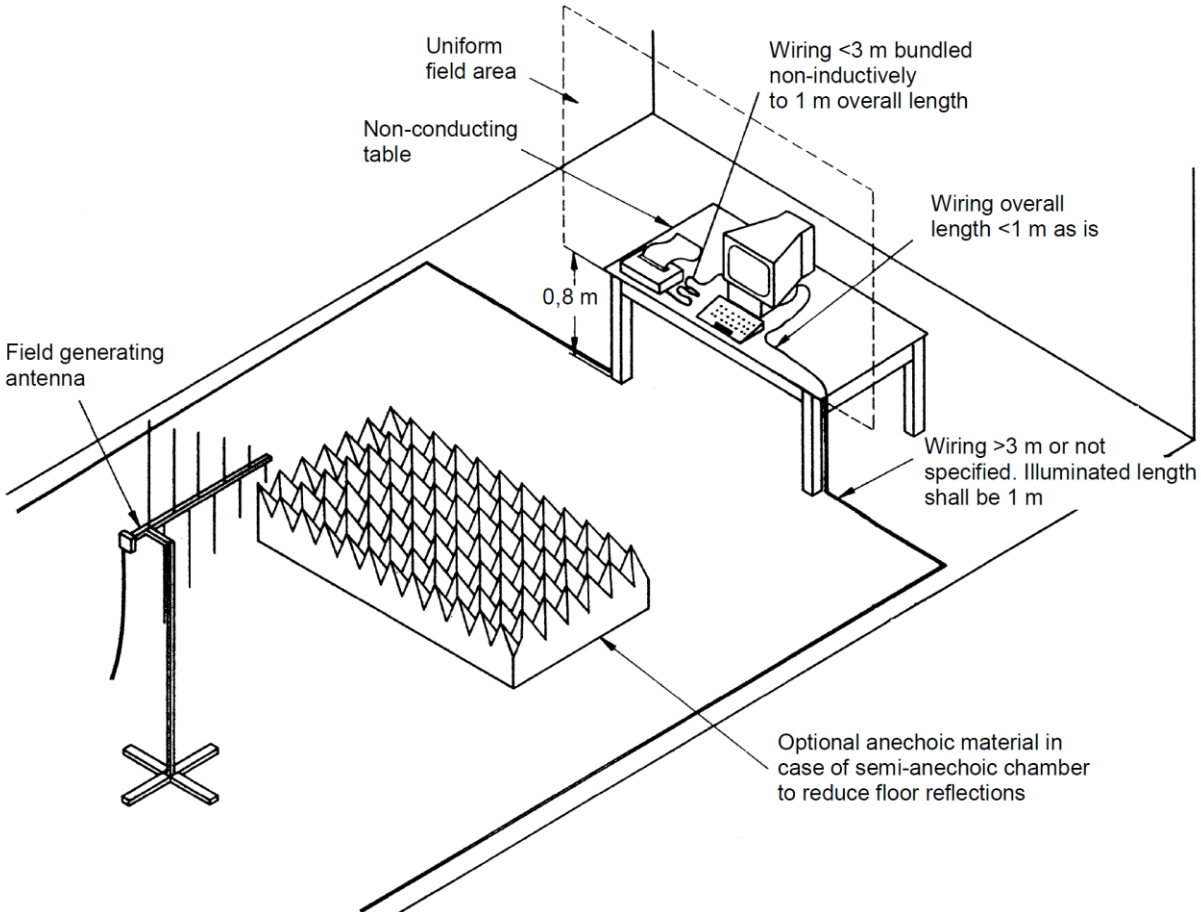
17. Continuous RF Electromagnetic Field Disturbances Measurement

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 0.1 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 pages.

RF Field Strength Susceptibility Test Results				
Ambient Condition	Temp.: 25 ℃		R.H.: 50 %	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 / Spot 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.				

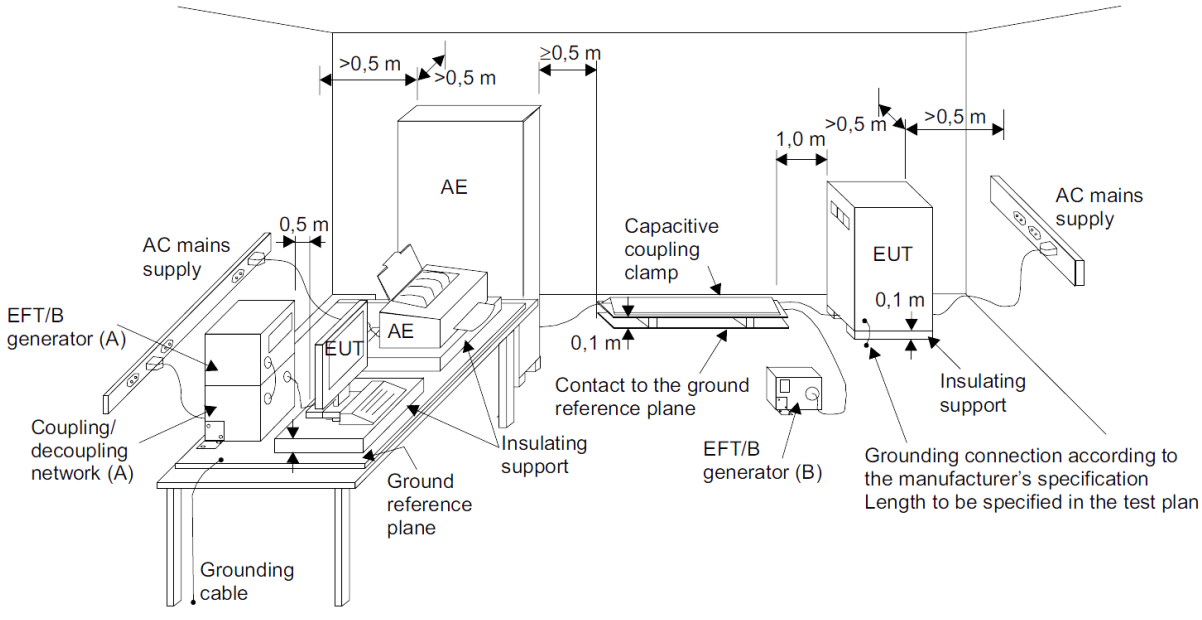
18. Electrical Fast Transient/Burst Measurement

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 pages.

Electrical Fast Transient/Burst Test Results			
Ambient Condition	Temp.: 26 ℃	R.H.: 48 %	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	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	B
N	±1KV	B
PE	-	-
L、N	±1KV	B
L、PE	-	-
N、PE	-	-
L、N、PE	-	-
Signal port (RJ- 45)	-	-
DC line	-	-

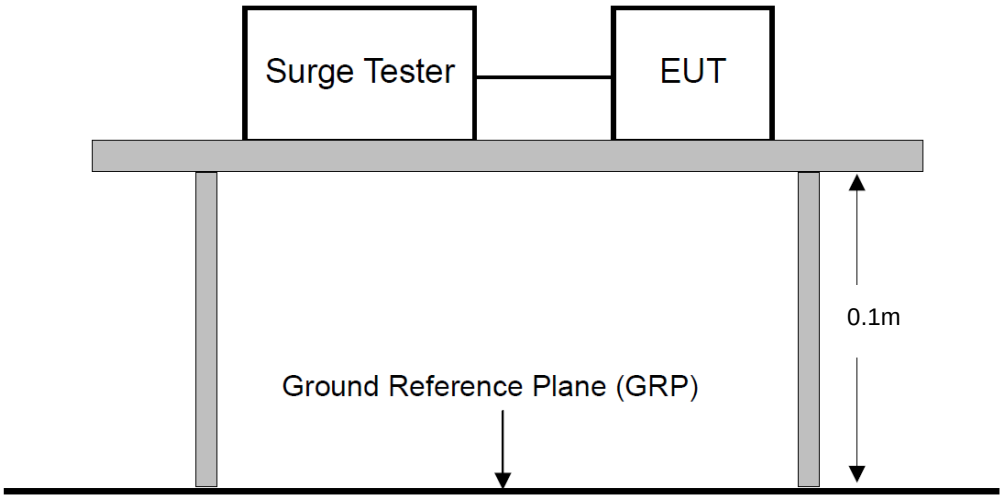
Note : The lamp flickered during the test, but the EUT can be manually resumed to normal operation.

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 0.1m 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 pages.

Surge Immunity Test Results			
Ambient Condition	Temp.: 27 ℃	R.H.: 37 %	Air Pressure: 101 kPa
Test Specifications	Wave-shape:	1.2/50 us (Tr/Th) / 8/20 us (Tr/Th) for input poewr 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	
	Generagor source impendence :	2 ohm / power supply network 12 ohm / power supply network to ground 42 ohm / other lines to ground /	
Required Performance Criterion	B		
Test mode	1		

Test Line	Phase Angle	Test Voltage	Result (Performance Criterion)
L-N	0°, 90°, 180°, 270°	±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.

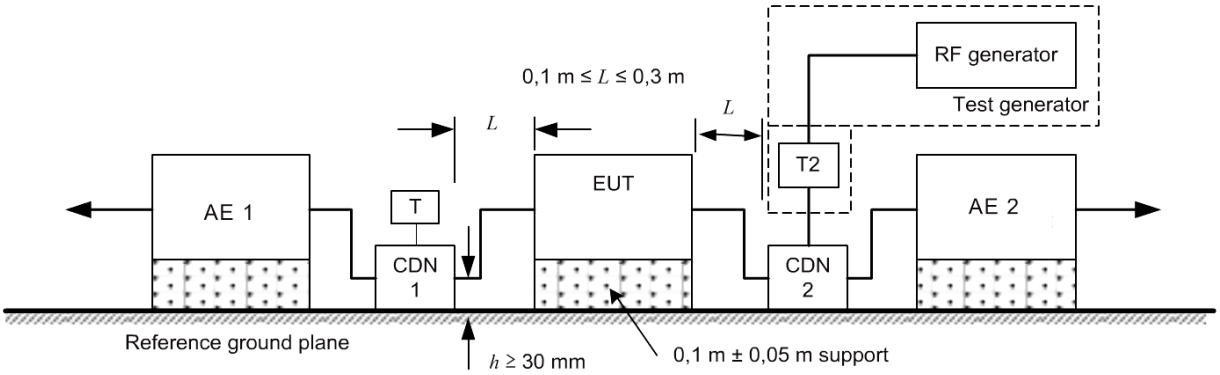
20. Continuous Induced RF Disturbances Measurement

TEST LEVEL

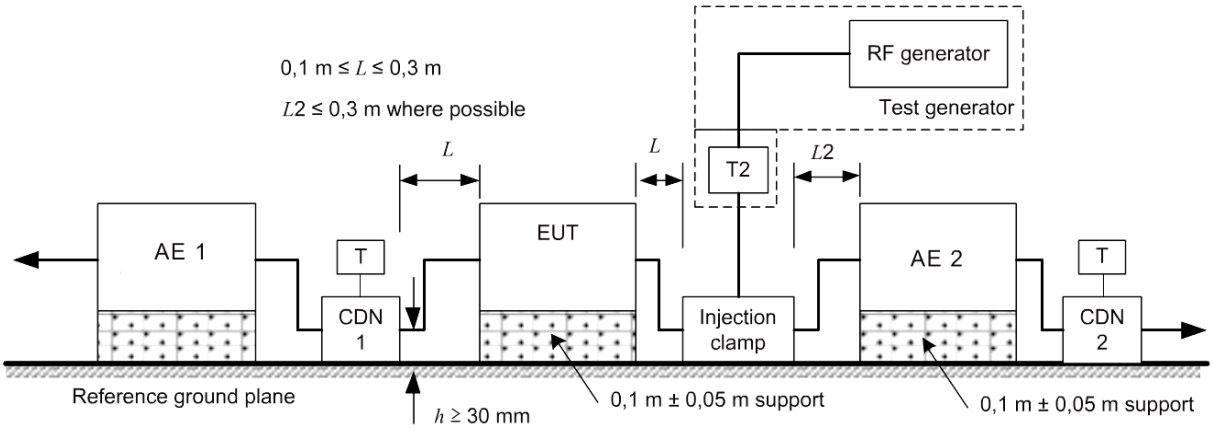
Level	Field Strength V
1	1
2	3
3	10
X	Special
Note*: Where the amplitude of a test level varies over a given frequency range, it changes linearly with respect to the logarithm of the frequency.	

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 pages.

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	A		
Test mode	1		
Test Port	Frequency (MHz)	Level(V)	Result (Performance Criterion)
AC Mains	0.15~80	3	A
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.

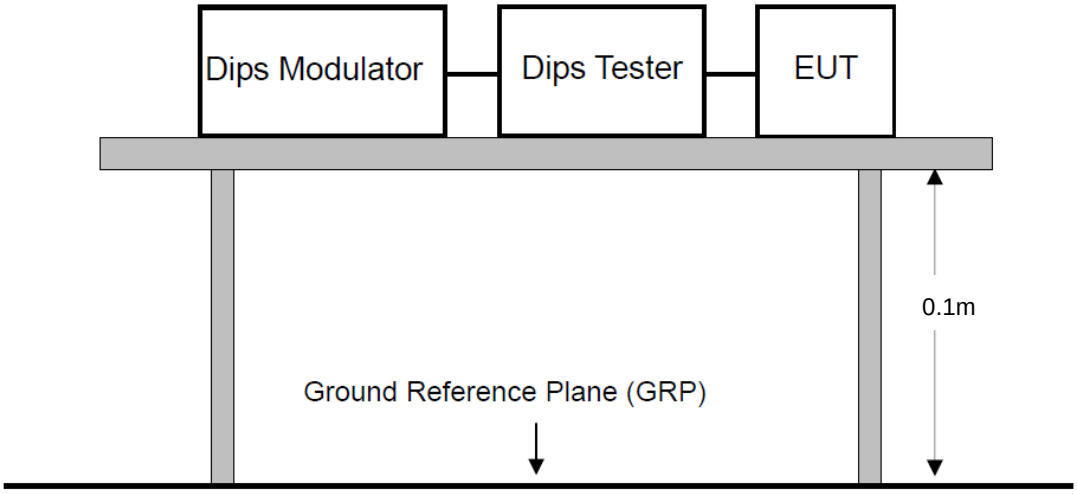
b. "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test".

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 0.1m 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.: 25℃	R.H.: 48 %	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	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	-	B

Note : The charging was stopped during the test, but the EUT can be resumed to normal operation after the 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, 2020	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 13, 2020	1 Year
3.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	893606/014	Mar. 13, 2020	1 Year
4.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar. 13, 2020	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, 2020	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 13, 2020	1 Year
3.	AAN	Schwarzbeck	NTFM 8158	CAT5-8158-0006	Mar. 13, 2020	1 Year
4.	AAN	Schwarzbeck	NTFM 8158	CAT6-8158-0009	Mar. 13, 2020	1 Year
5.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar. 13, 2020	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, 2020	1 Year
2.	Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	Mar. 13, 2020	1 Year
3.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 23, 2020	1 Year
4.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	Mar. 23, 2020	1 Year
5.	Horn Antenna	COM-Power	AH-118	071078	Mar. 23, 2020	1 Year
6.	Pre-Amplifier	HP	HP 8447D	1145A00203	Mar. 13, 2020	1 Year
7.	Pre-Amplifier	HP	HP 8449B	3008A00964	Mar. 13, 2020	1 Year
8.	Chamber	SAEMC	9*7*7m	N/A	Jun. 20, 2019	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, 2020	1 Year
2.	5KVA AC Power Source	California Instruments	5001iX	60137	Mar. 13, 2020	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, 2020	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, 2020	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, 2020	1 Year
7.	Power Sensor	Agilent	E9304A	MY41498919	Mar. 13, 2020	1 Year
8.	Power Sensor	Agilent	E9300A	US39211259	Mar. 13, 2020	1 Year
9.	E-Field Probe	Narda	EP-601	N/A	Mar. 23, 2020	1 Year
10.	Antenna	Schwarzbeck	STLP 9129	9129071	N/A	N/A
11.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 13, 2020	1 Year
12.	Chamber	Chengyu	7*5*3.5m	N/A	Mar. 26, 2018	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, 2020	1 Year
2.	Coupling Clamp	EM TEST	HFK	0311-94	Mar. 13, 2020	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, 2020	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, 2020	1 Year
2.	Power Amplifier	SCHAFFNER	CBA9425	1022	Mar. 13, 2020	1 Year
3.	6dB 50Watt Attenuator	SCHAFFNER	ATN6025	N/A	Mar. 13, 2020	1 Year
4.	CDN	Lioncel	CDN-M3-16	0170703	Mar. 13, 2020	1 Year
5.	CDN	Lioncel	CDN-M2-16	0170708	Mar. 13, 2020	1 Year
6.	CDN	CDSI	ADN-M5/AF5	8105001	Mar. 13, 2020	1 Year
7.	EM Clamp	CDSI	EMCL-22	8192007	Mar. 13, 2020	1 Year
8.	Directional Coupler	SCHAFFNER	255	19184	Mar. 13, 2020	1 Year
9.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 13, 2020	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, 2020	1 Year
2.	Dips Modulator	EM TEST	V4780S2	0111-11	Mar. 13, 2020	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

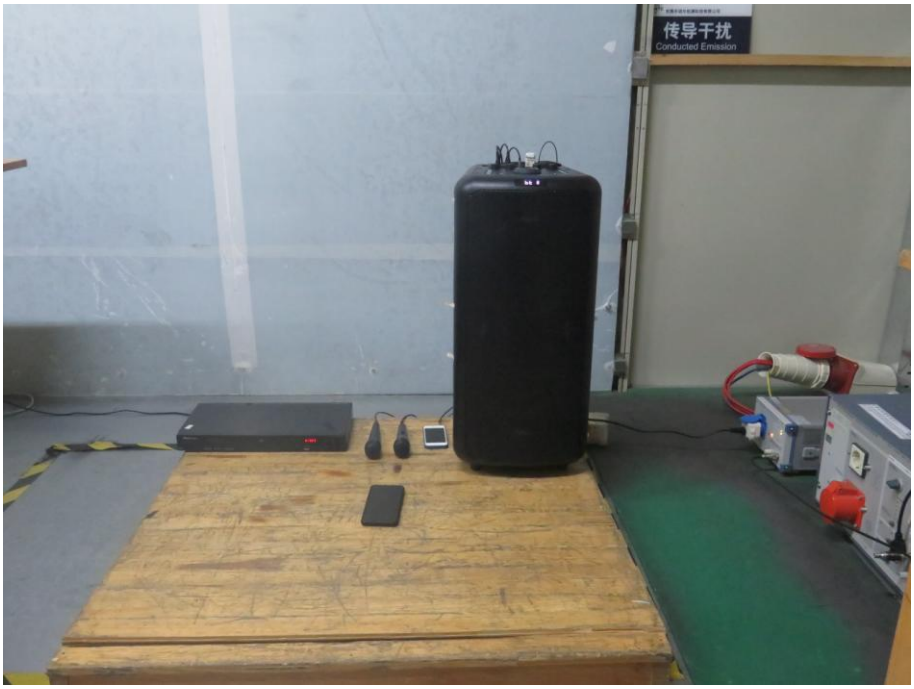


Photo of Radiated Emission Measurement

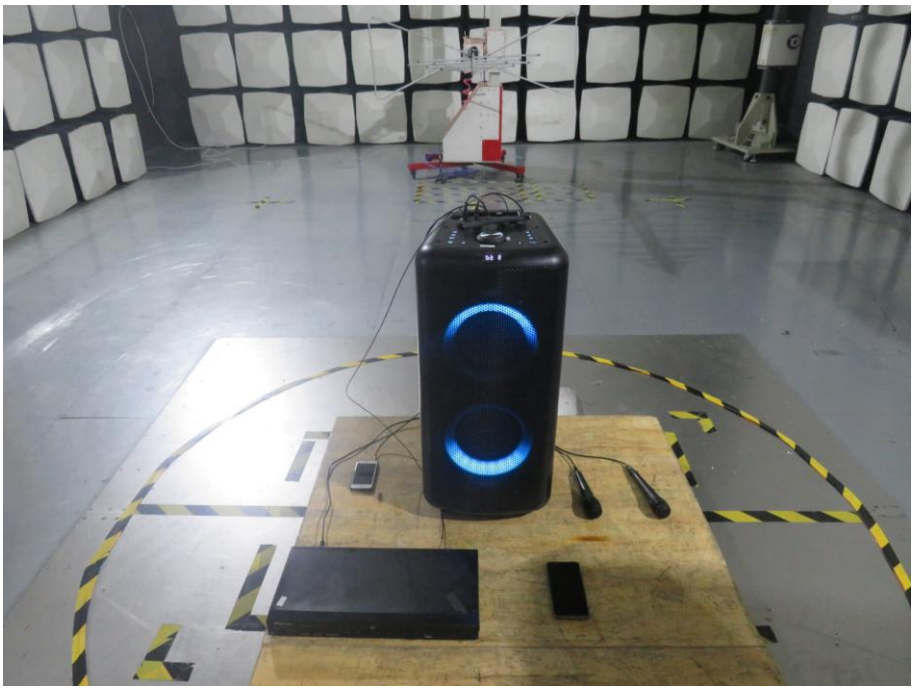


Photo of Harmonic/Flicker Measurement

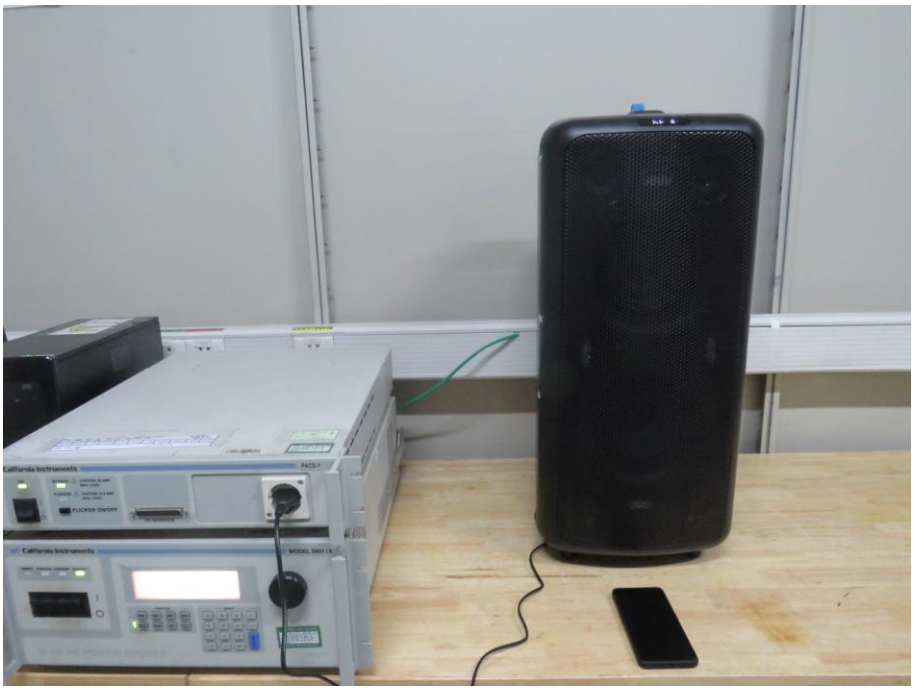


Photo of Electrostatic Discharge Measurement

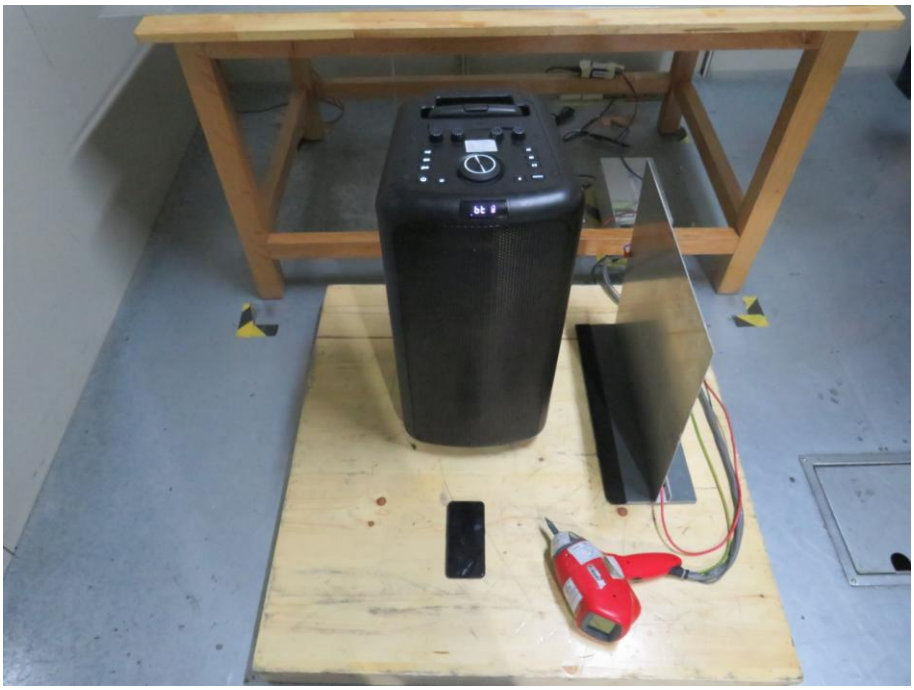


Photo of Continuous RF Electromagnetic Field Disturbances Measurement

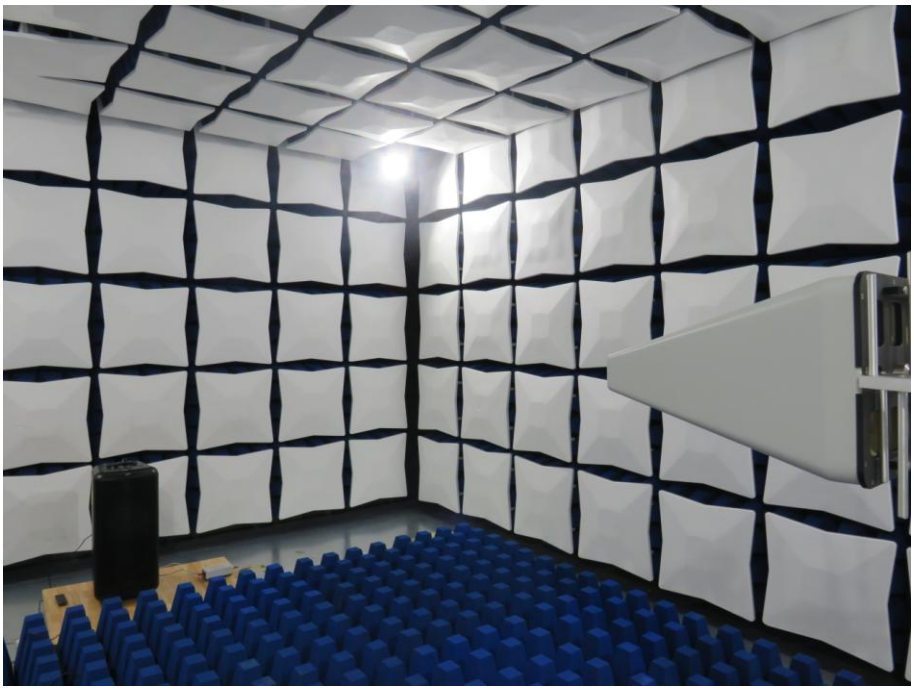


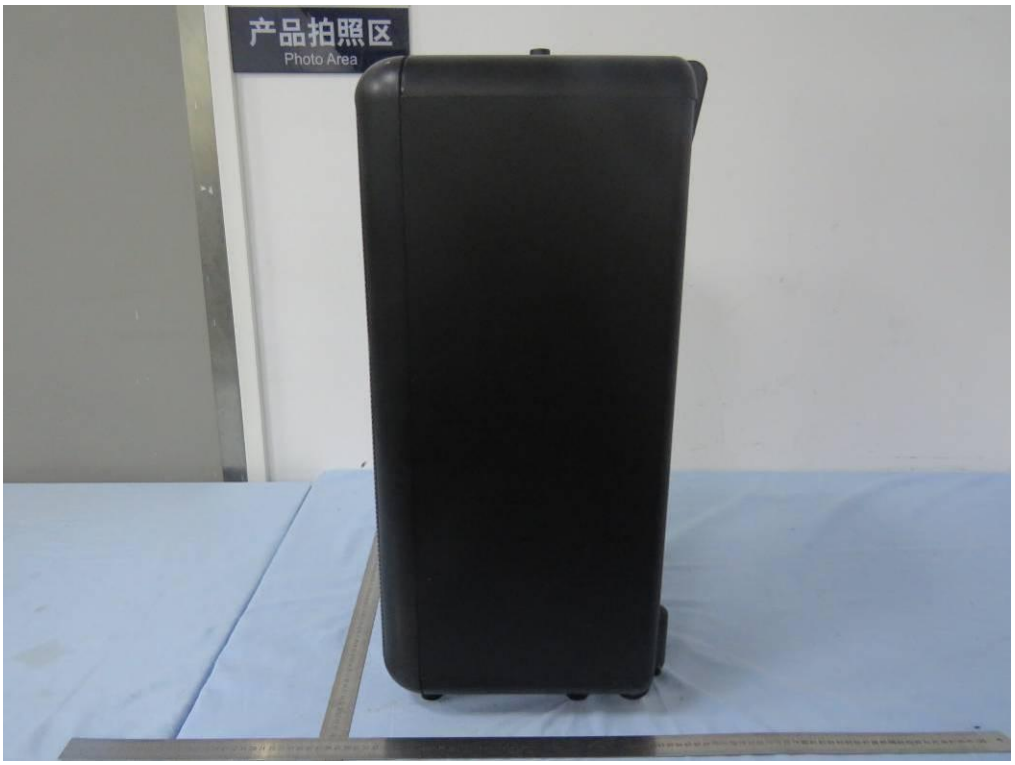
Photo of Electrical Fast Transients / Burst /Surge / Voltage Dips and Interruptions Measurement

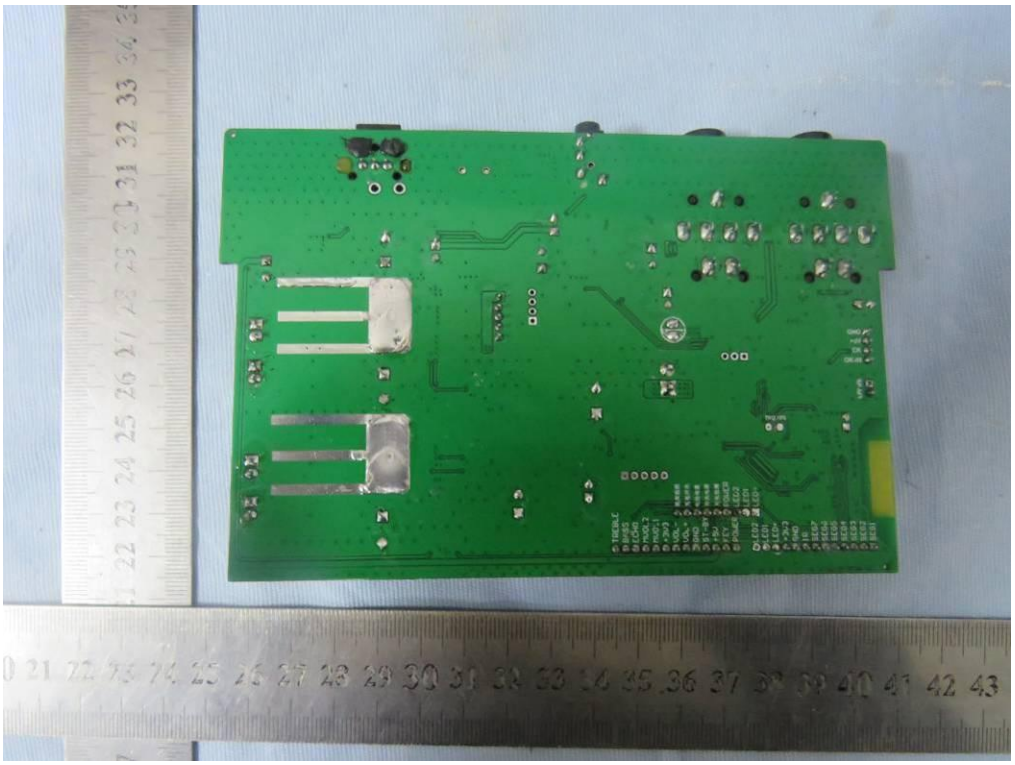
Photo of Continuous Induced RF Disturbances Measurement

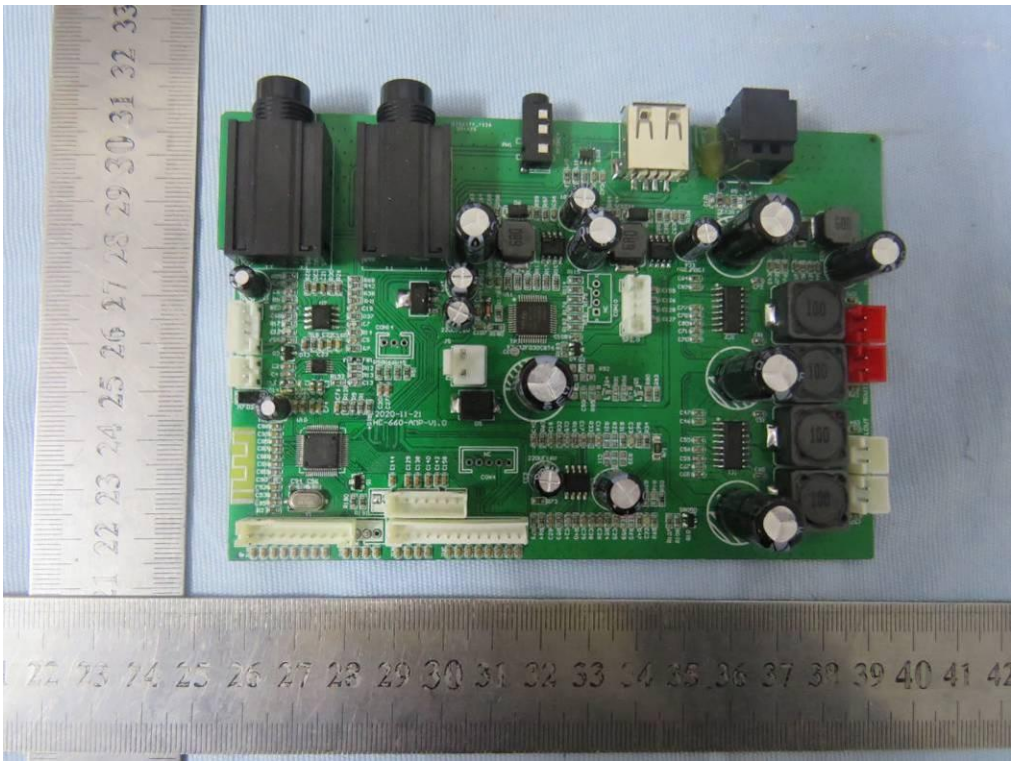
24. Photographs of the EUT

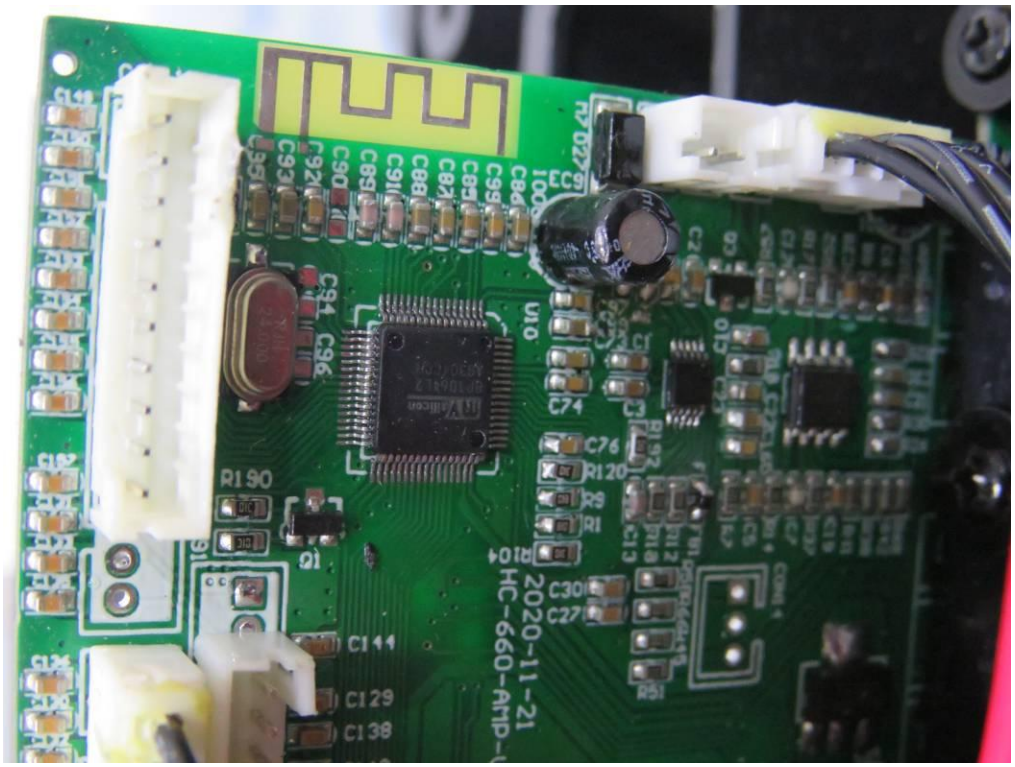

Photo Area


产品拍照区
Photo Area


产品拍照区
Photo Area



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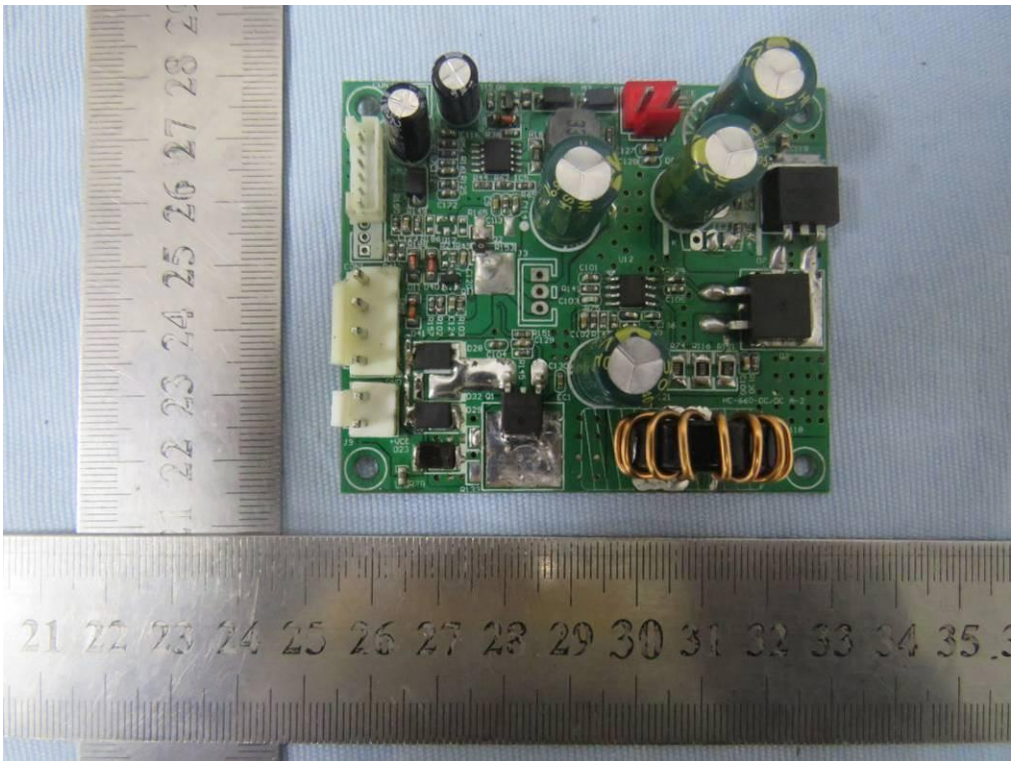

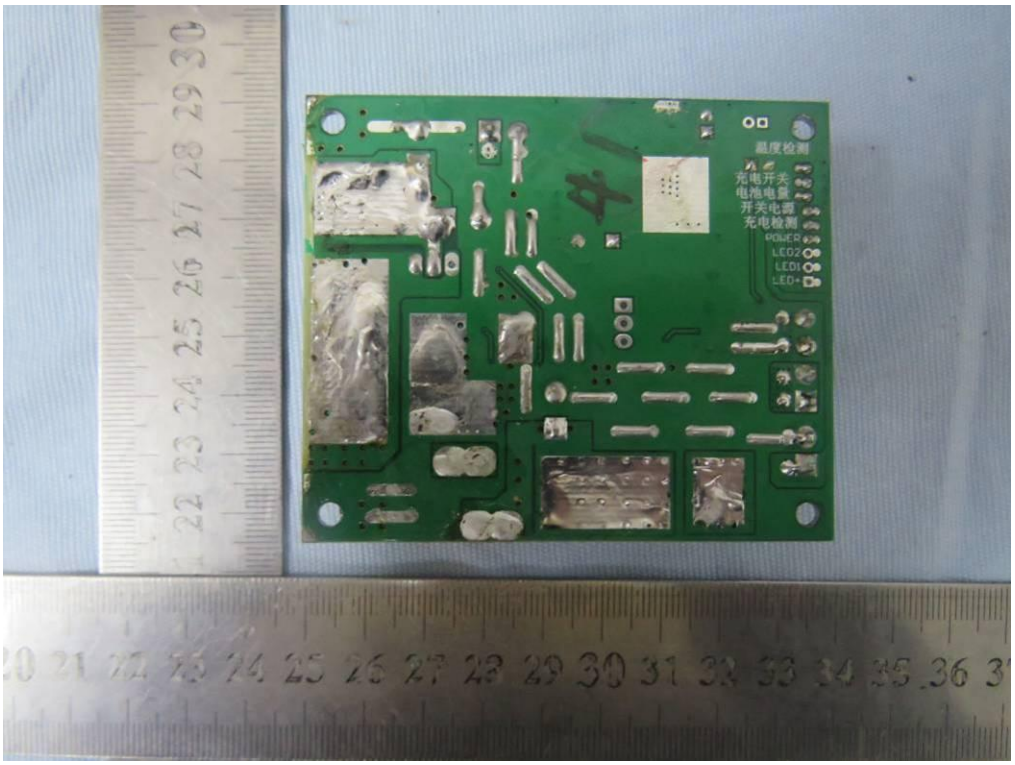
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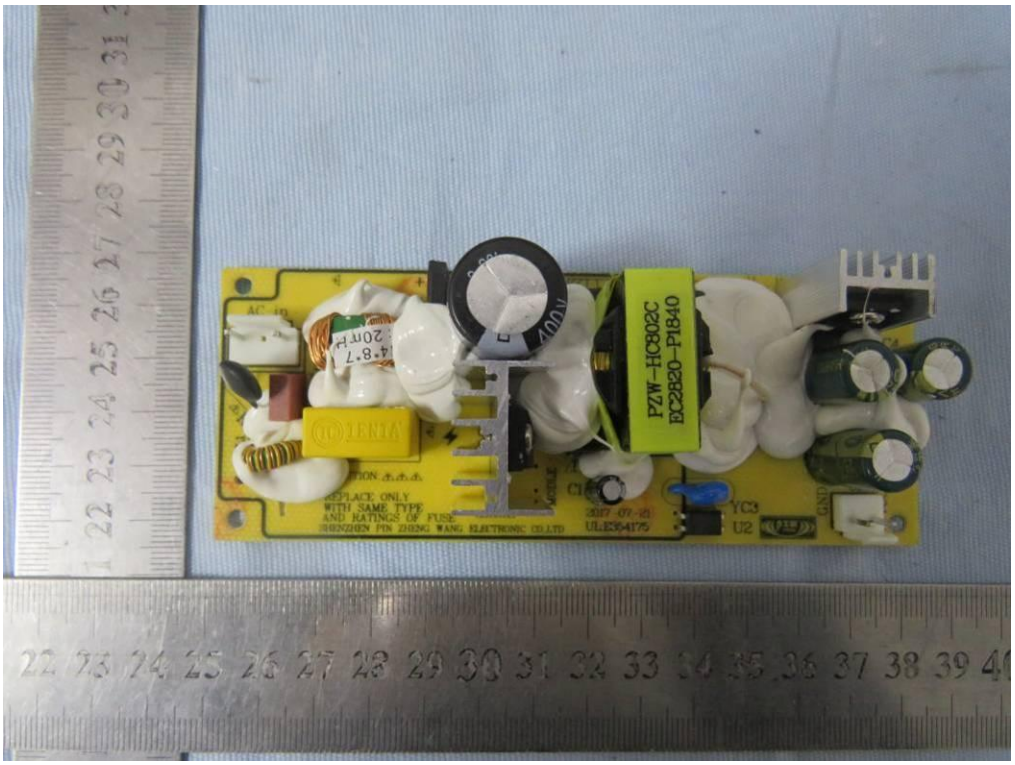
电池电量
开关电源
充电检测
POWER
LED2
LED1
LED+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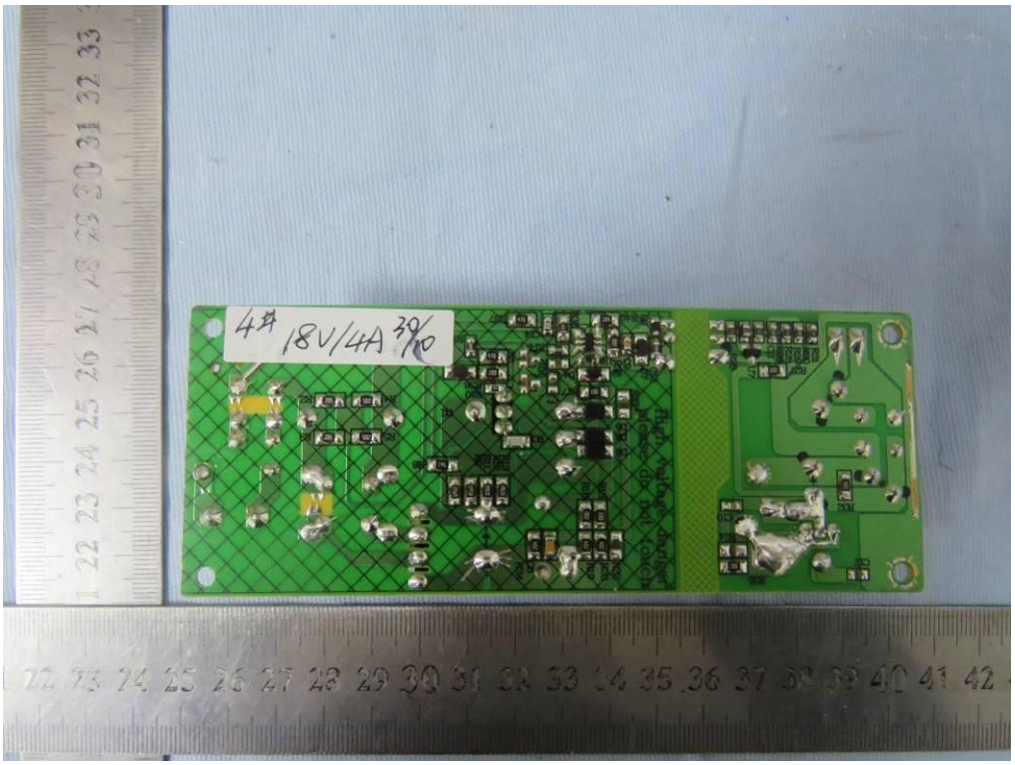
U2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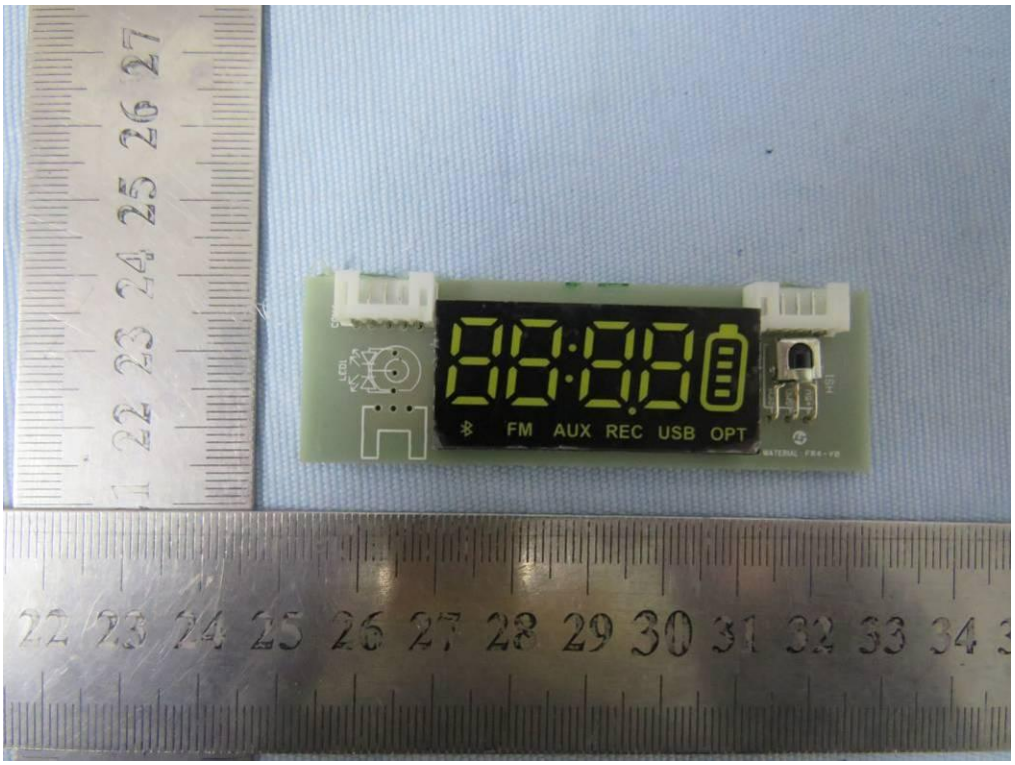
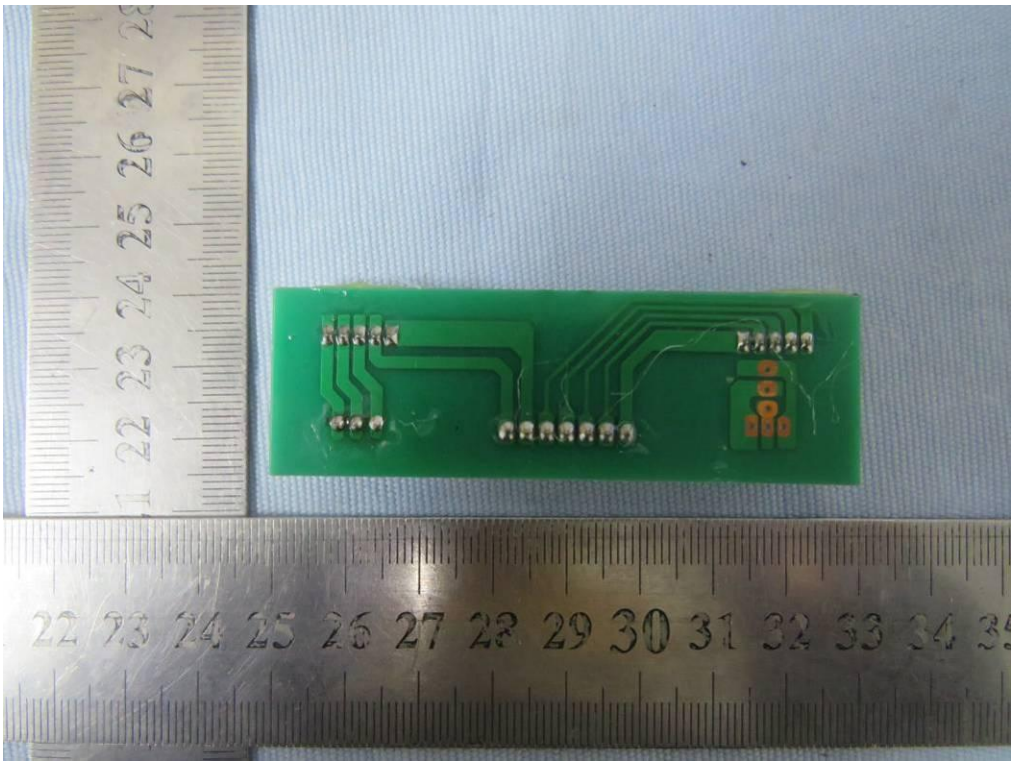
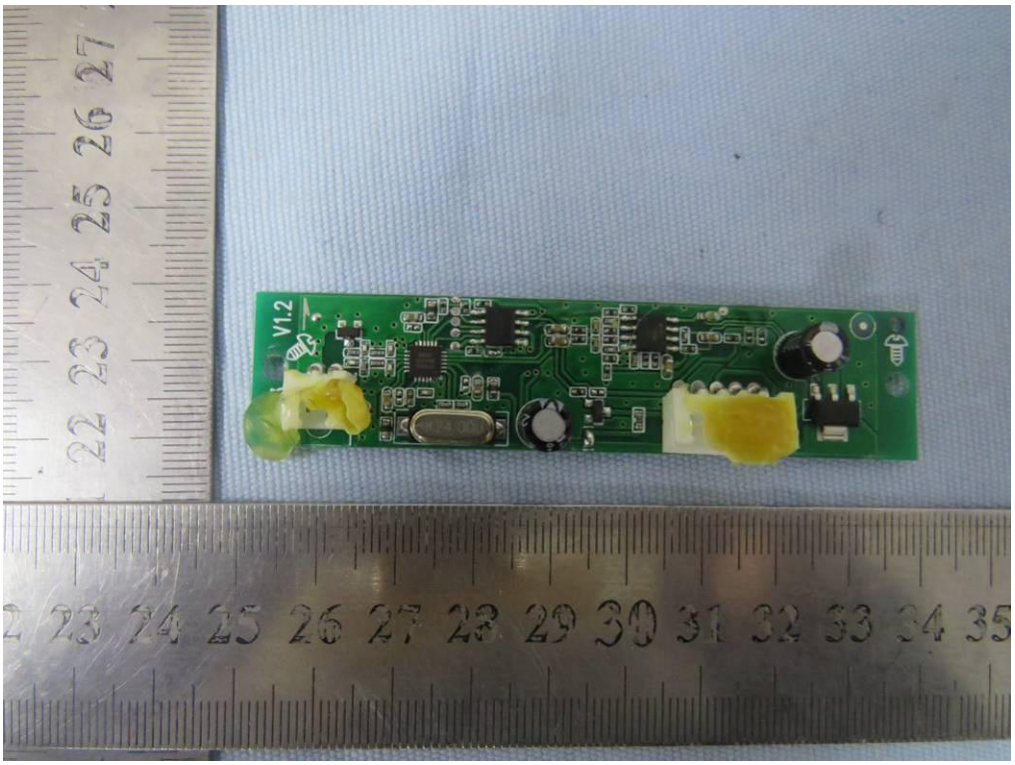

FM AUX REC USB OPT

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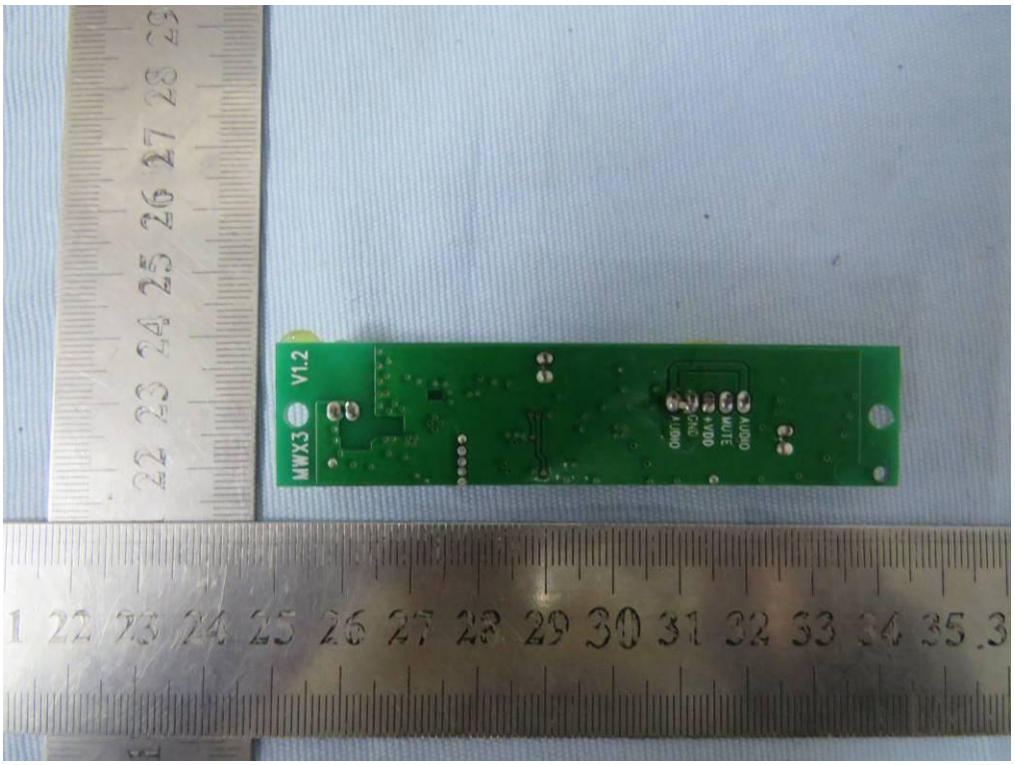
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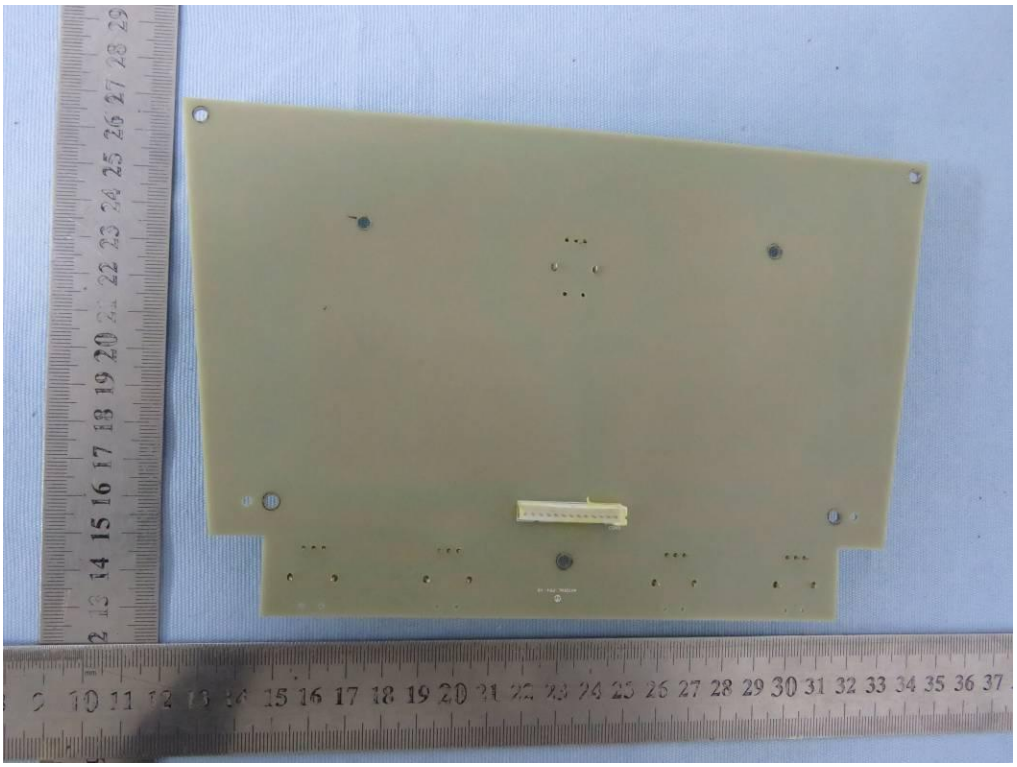

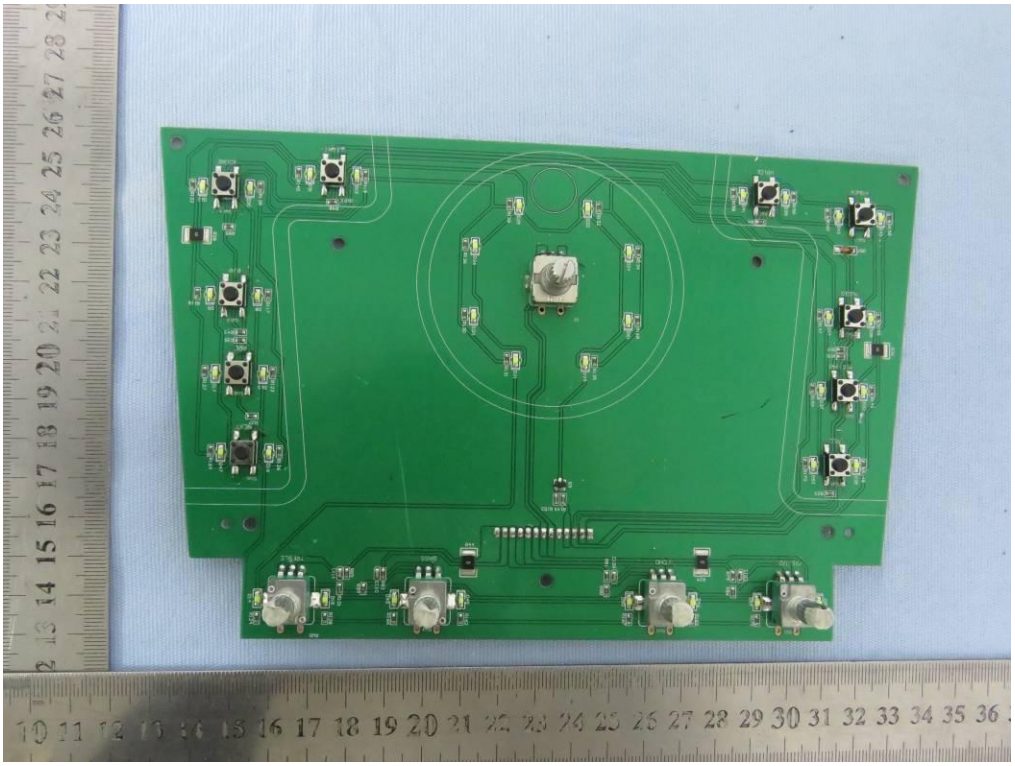

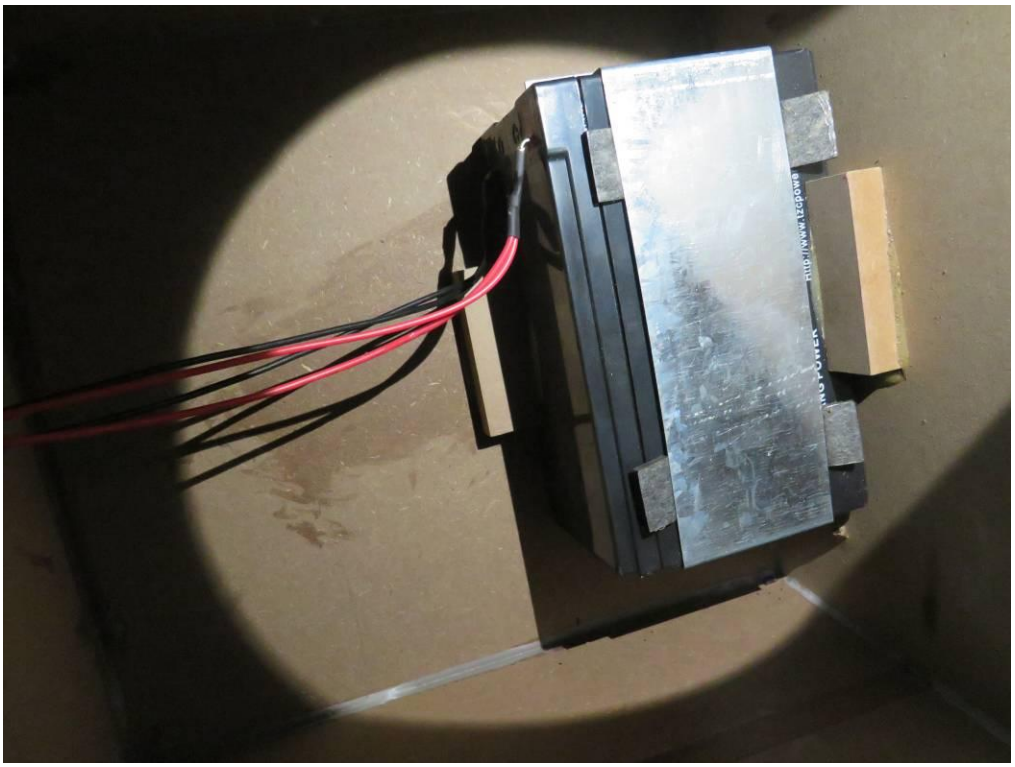

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