EMC TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the RED directive 2014/53/EU.

Applicant	:	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	:	Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Manufacturer /Factory	:	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	:	Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
E.U.T.	:	Computer Multimedia Speaker
Brand Name	:	F&D
Model No.	:	F7700X, F770X, F780X, F770UZ, F440X, F610X, F650X, F4400X, F7700, F7700BT, F6600X, F3000X (For model difference refer to section 1)
Measurement Standard	:	Draft ETSI EN 301 489-1 v 2.2.1: 2019 Draft ETSI EN 301 489-17 v 3.2.0: 2017
Date of Receiver	:	September 21, 2019
Date of Test	:	September 23, 2019 to October 28, 2019
Date of Report	:	October 28, 2019

This Test Report is Issued Under the Authority of :

Prepared by

Alina Guo / Engineer

Approved & Authorized Signer

Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

TEL: +86-769-22022444 FAX: +86-769-22022799 Web: www.ntc-c.com
Address: Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong, China

TABLE OF CONTENTS

Revision History of This Test Report

Report Number	Description	Issued Date
NTC1909259EV00	Initial Issue	2019-10-28

1. GENERAL INFORMATION

PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST

E.U.T.	:	Computer Multimedia Speaker
Main Model Name	:	F7700X
Additional Model name	:	F770X, F780X, F770UZ, F440X, F610X, F650X, F4400X, F7700, F7700BT, F6600X, F3000X
Brand Name	:	F&D
Rating	:	AC 100-240V 50/60Hz
Adapter	:	N/A
Test Voltage	:	AC 230V 50Hz
Cable	:	Audio Line: 1 to 1: 1.20m unshielded AC Mains: 1.50m unshielded
Hardware version	:	V1.0
Software version	:	V1.0
Operating Temperature Range	:	0°C to 35°C (Declaration by manufacturer)
Description of 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.
Note	:	According to the model difference, all tests were performed on model F7700X.

Technical Specification:

Item	:	**Description**
BT Version	:	V5.0 (BDR+EDR)
Frequency	:	2402-2480MHz
Modulation	:	GFSK, π/4-DQPSK
Number of Channel	:	79
Channel space	:	1MHz
Antenna Type	:	PCB antenna
Antenna Gain	:	2dBi (declared by manufacturer)

2. SUMMARY OF TEST RESULTS

The E.U.T. has been tested according to the following specifications:

Draft ETSI EN 301 489-1 v 2.2.1: 2019/ Draft ETSI EN 301 489-17 v 3.2.0: 2017			
EMISSION			
Standard	**Test Type**	**Result**	**Remarks**
EN 55032: 2015	Mains Terminal Disturbance Voltage Test	PASS	Uncertainty: ±2.52dB
	Radiated Emission Test	PASS	Uncertainty: below 1G: ±4.6 dB Above 1G: ±5.02 dB
EN 61000-3-2: 2014	Harmonic current emission	PASS	Meets the requirements.
EN 61000-3-3: 2013	Voltage fluctuations & flicker	PASS	Meets the requirements.
IMMUNITY			
Standard	**Test Type**	**Result**	**Remarks**
EN 61000-4-2: 2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-3: 2006+A2: 2010	Radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-4: 2012	Electrical fast transient/ burst immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-5: 2014	Surge immunity test	PASS	Meets the requirements of Performance Criterion B
EN 61000-4-6: 2014	Injected Currents immunity test	PASS	Meets the requirements of Performance Criterion A
EN 61000-4-11: 2004	Voltage Dips and Interruptions	PASS	Meets the requirements of Performance Criterion B&C

3. TEST METHODOLOGY

As per table 2 of clause 7.1 of Draft ETSI EN 301 489-1 V2.2.1, the measurement was performed under EUT combined condition during the tests. The ports on the ancillary left empty during the measurement in this report.

4. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

5. TEST FACILITY

Site Description

EMC Lab : Listed by CNAS, August 13, 2018
The certificate is valid until August 13, 2024
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01
The Certificate Registration Number is L5795.

Listed by A2LA, November 01, 2017
The certificate is valid until December 31, 2019
The Laboratory has been assessed and proved to be in compliance with ISO17025
The Certificate Registration Number is 4429.01

Listed by FCC, November 06, 2017
The Designation Number is CN1214
Test Firm Registration Number: 907417

Listed by Industry Canada, June 08, 2017
The Certificate Registration Number. Is 46405-9743

Name of Firm : Dongguan Nore Testing Center Co., Ltd.
(Dongguan NTC Co., Ltd.)

Site Location : Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong Province, China

6. SUPPORT EQUIPMENT

Mobile Phone	:	Manufacturer: HUAWEI M/N: HWI-AL00 S/N: TAG-TL00C01B166
Mobile Phone	:	Manufacturer: Xiaomi M/N: MI8
DVD Player	:	Manufacturer: Ploneer M/N: DV-310NC-K S/N: 0JTL030411CN
Mobile Phone	:	Manufacturer: MEIZU M/N: PRO 6 Plus S/N: M960BDQA22ATE
Mobile Phone	:	Manufacturer: HUAWEI M/N: HUAWEI TAG-TL00

7. DEVIATIONS AND ABNORMALITIES FROM STANDARD CONDITIONS

No additions, deviations and exclusions from the standard.

8. PERFORMANCE CRITERIA

Draft ETSI EN301489-17 v 3.2.0: 2017		
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).

NOTE 1: 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.

NOTE 2: 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.

NOTE 3: 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 Transitent Phenomena (TT & TR)

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

9. ETSI EN 301 489-1/-17 REQUIREMENTS

9.1 RADIATED EMISSION LIMIT

According standard Draft ETSI EN 301 489-1 v 2.2.1 Clause 8.2.3, Table 3 and EN 55032: 2015 Clause 6, Table 6, Class B

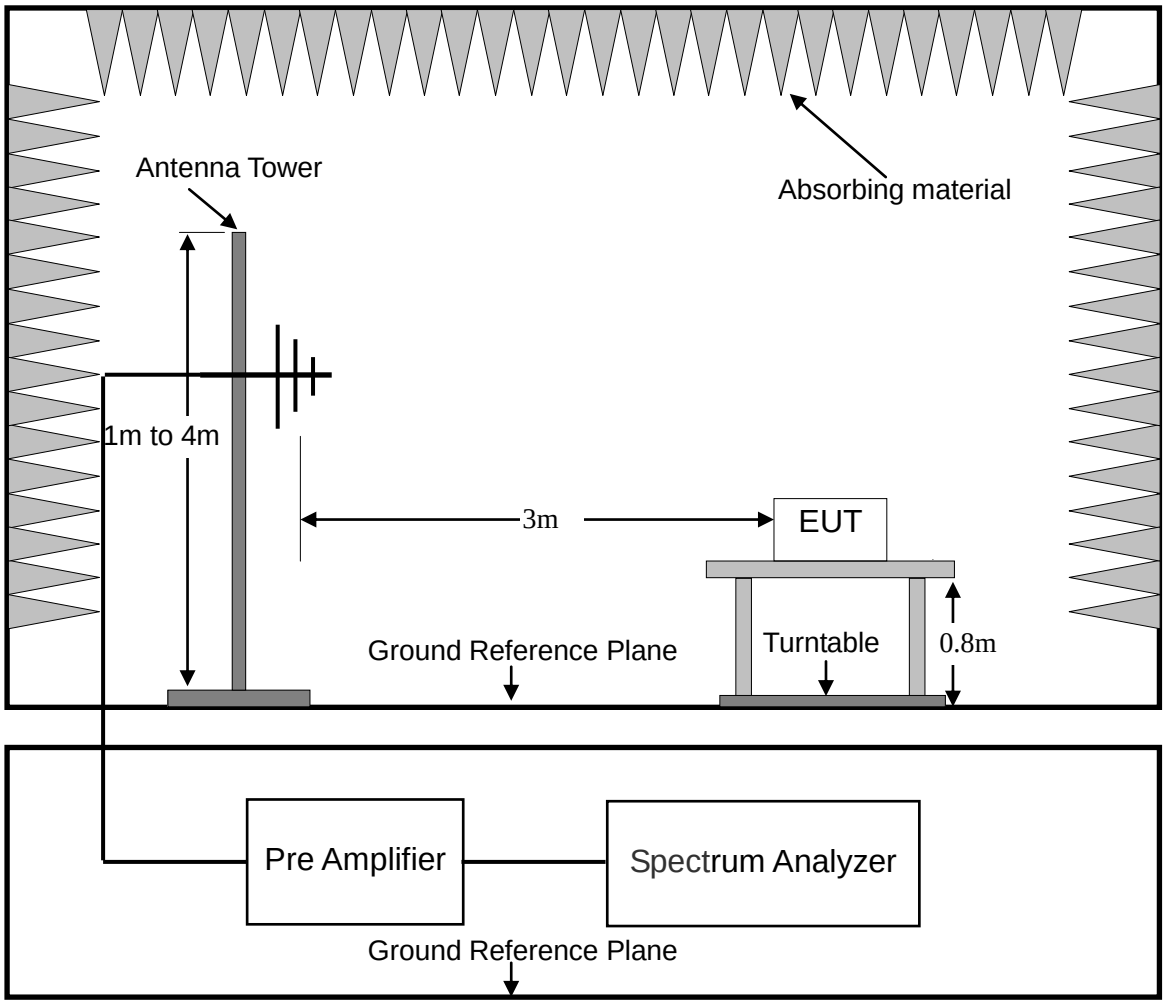
Limits for radiated disturbance Blow 1GHz

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47
Note: (1) The smaller limit shall apply at the combination point between two frequency bands. (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.		

Limits for radiated disturbance Above 1GHz

FREQUENCY (MHz)	DISTANCE (Meters)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
1000 ~ 3000	3	50	70
3000 ~ 6000	3	54	74
Note: The lower limit applies at the transition frequency.			

TEST CONFIGURATION



TEST PROCEDURE

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 8.2.3 and EN 55032: 2015 Clause 6 for the measurement methods.

TEST RESULT

PASS

Please refer to following data tables.

Dongguan NTC Co., Ltd.
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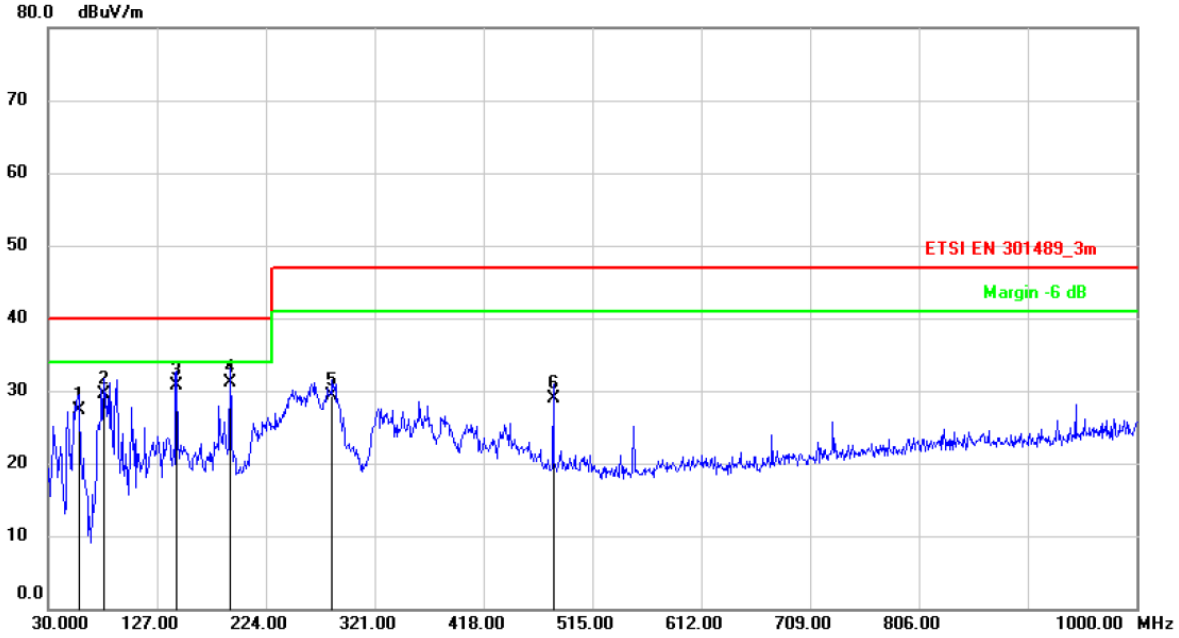
Web: Http://www.ntc-c.com

Radiated Emission Measurement

File :F7700X Data :#5 Date: 2019/10/23 Time: 13:39:31



Site: 3m Chamber
Limit: ETSI EN 301489_3m
EUT: Computer multimedia speaker
M/N: F7700X
Mode: BT Link
Note:

Polarization: ***Horizontal***
Power: AC230V/50Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		57.1600	45.38	-17.98	27.40	40.00	-12.60	QP			
2		79.4700	46.25	-16.65	29.60	40.00	-10.40	QP			
3		144.4600	46.30	-15.60	30.70	40.00	-9.30	QP			
4	*	191.9900	44.61	-13.51	31.10	40.00	-8.90	QP			
5		283.1700	40.31	-10.91	29.40	47.00	-17.60	QP			
6		480.0800	36.11	-7.21	28.90	47.00	-18.10	QP			

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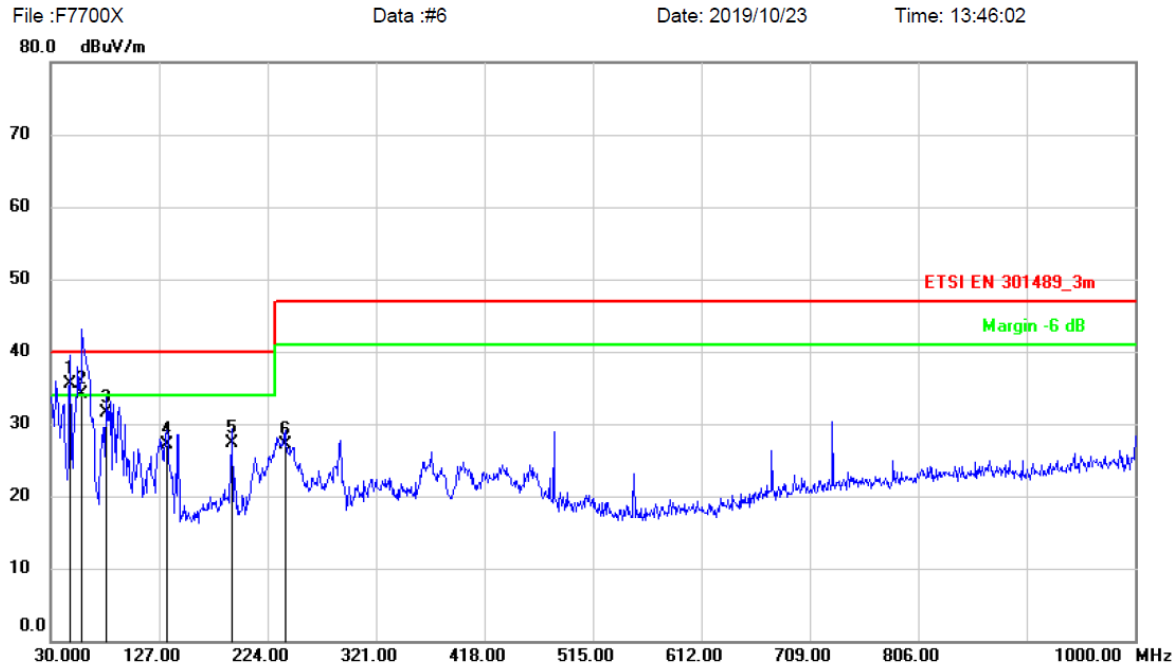
Web: Http://www.ntc-c.com

Radiated Emission Measurement



Site: 3m Chamber
Limit: ETSI EN 301489_3m
EUT: Computer multimedia speaker
M/N: F7700X
Mode: BT Link
Note:

Polarization: *Vertical*
Power: AC230V/50Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	47.4600	49.00	-13.50	35.50	40.00	-4.50	QP			
2	!	58.1300	48.21	-14.11	34.10	40.00	-5.90	QP			
3		79.4700	50.72	-19.12	31.60	40.00	-8.40	QP			
4		133.7899	45.42	-18.32	27.10	40.00	-12.90	QP			
5		191.9900	43.81	-16.51	27.30	40.00	-12.70	QP			
6		239.5200	42.16	-15.06	27.10	47.00	-19.90	QP			

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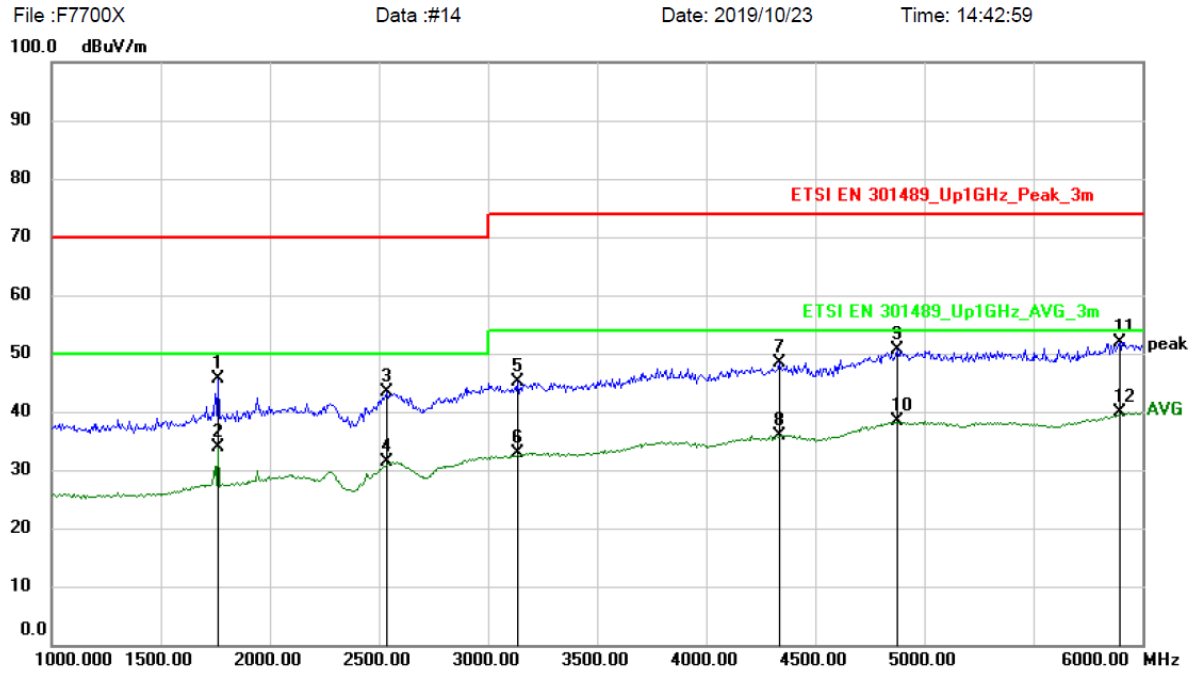
Radiated Emission Measurement



Site: 3m Chamber
Limit: ETSI EN 301489_Up1GHz_Peak_3m
EUT: Computer multimedia speaker
M/N: F7700X
Mode: BT Link
Note:

Polarization: ***Horizontal***
Power: AC230V/50Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1762.500	52.87	-7.31	45.56	70.00	-24.44	peak			
2		1762.500	41.27	-7.31	33.96	50.00	-16.04	AVG			
3		2537.500	47.05	-3.73	43.32	70.00	-26.68	peak			
4		2537.500	35.00	-3.73	31.27	50.00	-18.73	AVG			
5		3137.500	46.50	-1.34	45.16	74.00	-28.84	peak			
6		3137.500	34.25	-1.34	32.91	54.00	-21.09	AVG			
7		4337.500	46.58	1.80	48.38	74.00	-25.62	peak			
8		4337.500	34.14	1.80	35.94	54.00	-18.06	AVG			
9		4875.000	46.04	4.51	50.55	74.00	-23.45	peak			
10		4875.000	33.89	4.51	38.40	54.00	-15.60	AVG			
11		5893.750	45.34	6.43	51.77	74.00	-22.23	peak			
12	*	5893.750	33.35	6.43	39.78	54.00	-14.22	AVG			

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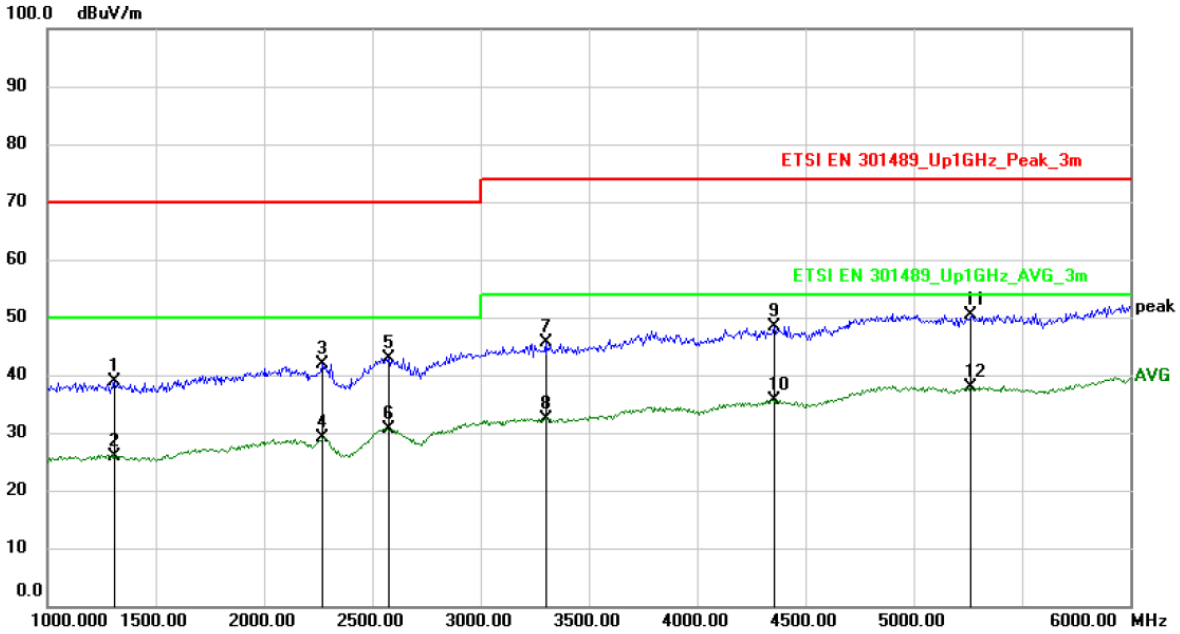
Radiated Emission Measurement

File :F7700X Data :#13 Date: 2019/10/23 Time: 14:35:04



Site: 3m Chamber
Limit: ETSI EN 301489_Up1GHz_Peak_3m
EUT: Computer multimedia speaker
M/N: F7700X
Mode: BT Link
Note:

Polarization: *Vertical*
Power: AC230V/50Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1312.500	48.86	-10.00	38.86	70.00	-31.14	peak			
2		1312.500	35.90	-10.00	25.90	50.00	-24.10	AVG			
3		2268.750	46.56	-4.63	41.93	70.00	-28.07	peak			
4		2268.750	33.76	-4.63	29.13	50.00	-20.87	AVG			
5		2575.000	46.38	-3.51	42.87	70.00	-27.13	peak			
6		2575.000	34.17	-3.51	30.66	50.00	-19.34	AVG			
7		3300.000	46.63	-1.10	45.53	74.00	-28.47	peak			
8		3300.000	33.40	-1.10	32.30	54.00	-21.70	AVG			
9		4356.250	46.62	1.83	48.45	74.00	-25.55	peak			
10		4356.250	33.85	1.83	35.68	54.00	-18.32	AVG			
11		5262.500	45.61	4.76	50.37	74.00	-23.63	peak			
12	*	5262.500	33.06	4.76	37.82	54.00	-16.18	AVG			

9.2 AC POWER CONDUCTED EMISSION

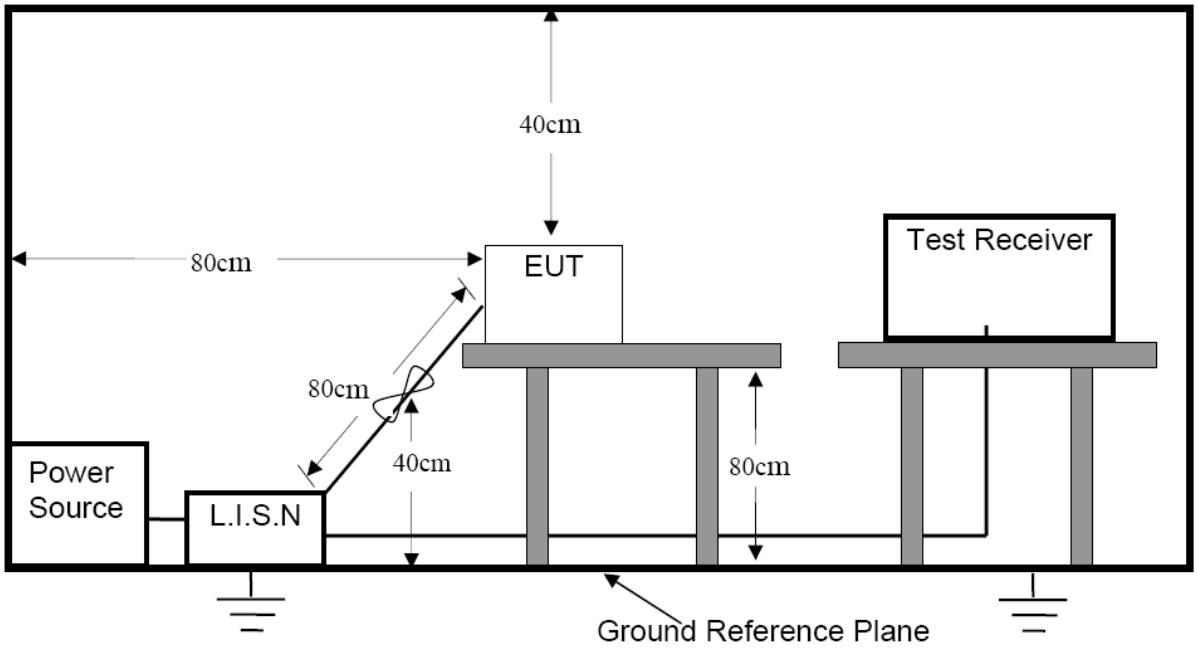
LIMIT

According to standard Draft ETSI EN 301 489-1 V2.2.1 Clause 8.3.3, Table 8 and EN 55032: 2015 Clause 5, Table 2, Class B

Limits for conducted disturbance at the mains ports of class B ITE.

Frequency range	Limits (dB(uV))	
(MHz)	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

TEST CONFIGURATION



TEST PROCEDURE

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 8.3.3 and EN 55032: 2015Clause 5 for the measurement methods.

TEST RESULTS

PASS

Please refer to following data tables.

Dongguan NTC Co., Ltd.
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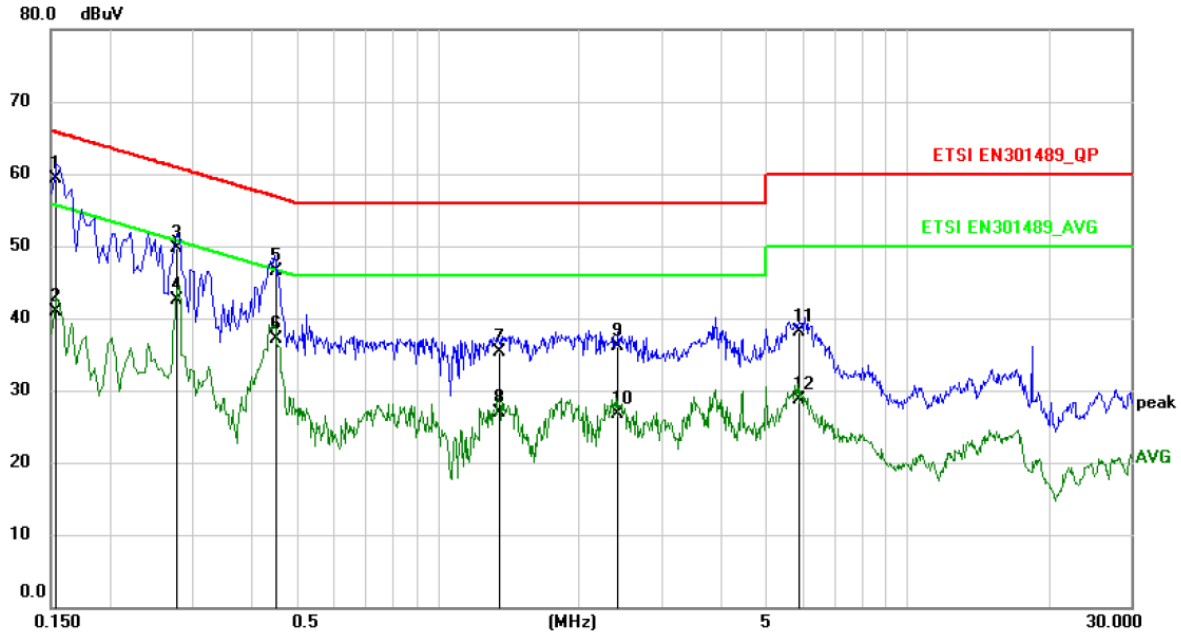
Conducted Emission Measurement

File :F7700X Data :#9 Date: 2019/10/21 Time: 14:22:29



Site
Limit: ETSI EN301489_QP
EUT: Computer multimedia speaker
M/N: F7700X
Mode: BT Link
Note:

Phase: *L1*
Power: AC230V/50Hz

Temperature: 26
Humidity: 50 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1539	48.80	10.60	59.40	65.79	-6.39	QP	
2		0.1539	30.30	10.60	40.90	55.79	-14.89	AVG	
3		0.2779	39.20	10.60	49.80	60.88	-11.08	QP	
4		0.2779	31.90	10.60	42.50	50.88	-8.38	AVG	
5		0.4500	35.98	10.62	46.60	56.88	-10.28	QP	
6		0.4500	26.48	10.62	37.10	46.88	-9.78	AVG	
7		1.3500	24.70	10.70	35.40	56.00	-20.60	QP	
8		1.3500	16.20	10.70	26.90	46.00	-19.10	AVG	
9		2.3980	25.40	10.70	36.10	56.00	-19.90	QP	
10		2.3980	16.10	10.70	26.80	46.00	-19.20	AVG	
11		5.8539	27.38	10.72	38.10	60.00	-21.90	QP	
12		5.8539	18.08	10.72	28.80	50.00	-21.20	AVG	

Dongguan NTC Co., Ltd.
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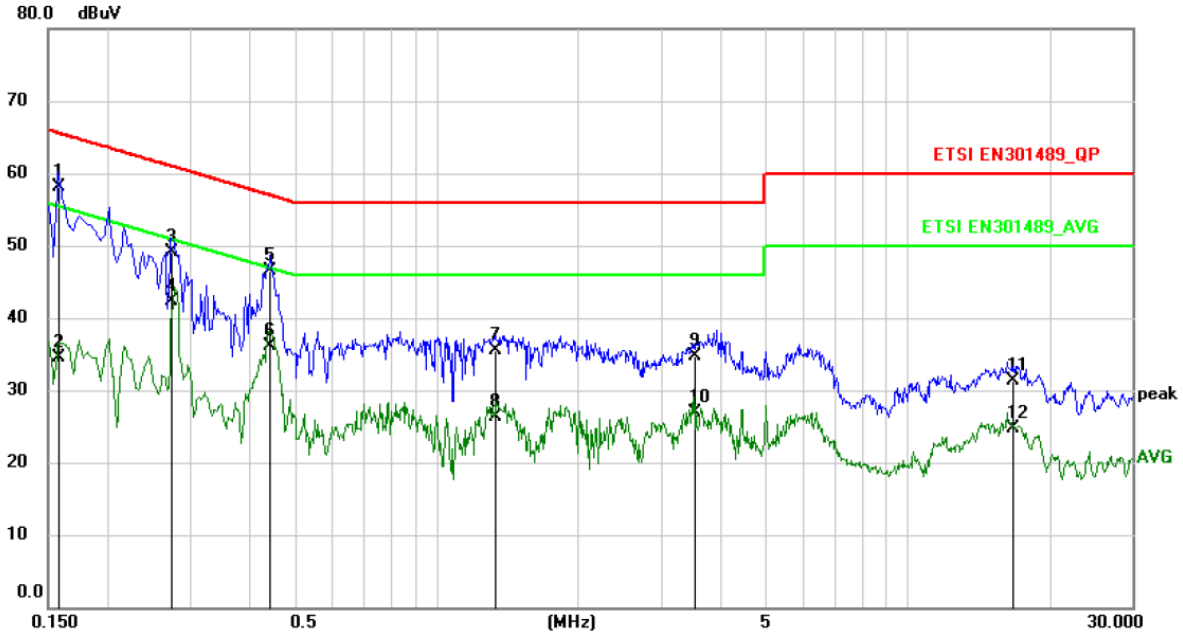
Conducted Emission Measurement

File :F7700X Data :#10 Date: 2019/10/21 Time: 14:29:00



Site
Limit: ETSI EN301489_QP
EUT: Computer multimedia speaker
M/N: F7700X
Mode: BT Link
Note:

Phase: N
Power: AC230V/50Hz

Temperature: 26
Humidity: 50 %

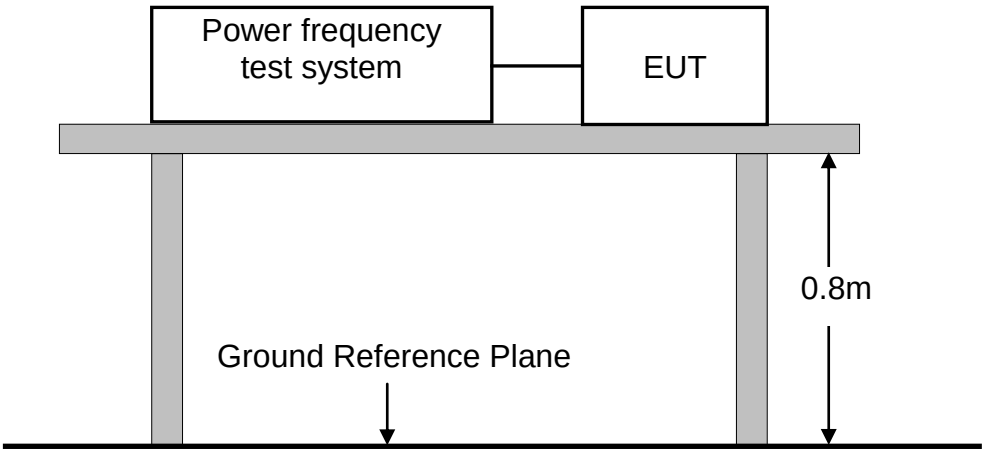
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1580	47.50	10.60	58.10	65.57	-7.47	QP	
2		0.1580	23.90	10.60	34.50	55.57	-21.07	AVG	
3		0.2740	38.50	10.60	49.10	61.00	-11.90	QP	
4		0.2740	31.70	10.60	42.30	51.00	-8.70	AVG	
5		0.4420	35.98	10.62	46.60	57.02	-10.42	QP	
6		0.4420	25.48	10.62	36.10	47.02	-10.92	AVG	
7		1.3340	24.90	10.70	35.60	56.00	-20.40	QP	
8		1.3340	15.70	10.70	26.40	46.00	-19.60	AVG	
9		3.5100	23.99	10.71	34.70	56.00	-21.30	QP	
10		3.5100	16.29	10.71	27.00	46.00	-19.00	AVG	
11		16.6900	20.65	10.75	31.40	60.00	-28.60	QP	
12		16.6900	14.05	10.75	24.80	50.00	-25.20	AVG	

9.3 AC MAINS HARMONIC CURRENT EMISSION

LIMIT

Please refer to EN 61000-3-2

TEST CONFIGURATION



Ambient Condition of the Test Site			
Temperature	22°C	**Test Voltage**	AC 230V/50Hz
Humidity	49%RH	**Tested by**	Rick
Pressure	1022mbar		

TEST PROCEDURE

Please refer to EN 61000-3-2 for the measurement methods.

TEST RESULTS

Pass

Test Mode: BT Link

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.

9.4 AC MAINS VOLTAGE FLUCTUATION AND FLICKER

LIMIT

Please refer to EN 61000-3-3

TEST CONFIGURATION

(Same as the configuration of the AC MAINS HARMONIC CURRENT EMISSIONS TEST)

Ambient Condition of the Test Site			
Temperature	22°C	**Test Voltage**	AC 230V/50Hz
Humidity	49%RH	**Tested by**	Rick
Pressure	1022mbar		

TEST PROCEDURE

Please refer to EN 61000-3-3 for the measurement methods.

TEST RESULTS

Pass

Test Mode: BT Link

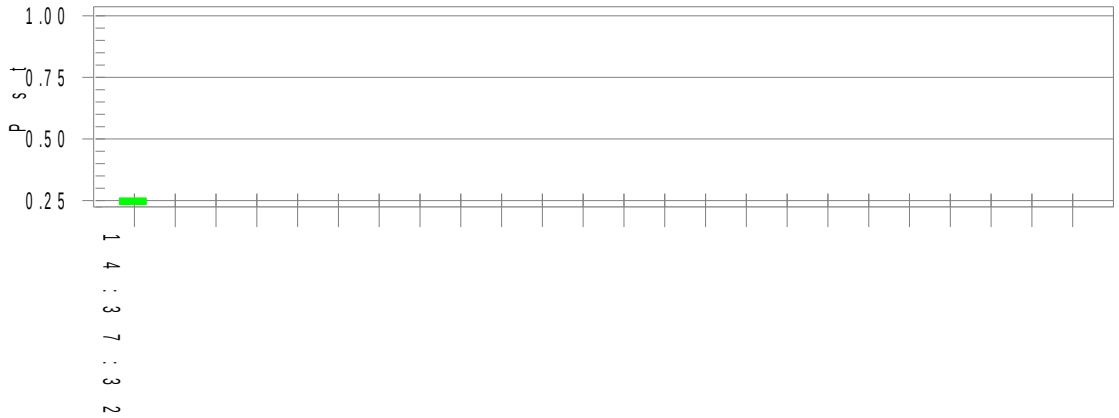
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT: Computer multimedia speaker
Test category: All parameters (European limits)
Test date: 2019/10/21
Test duration (min): 10
Comment: BT Link
Customer: FENDA
M/N: F7700X
Test Result: Pass

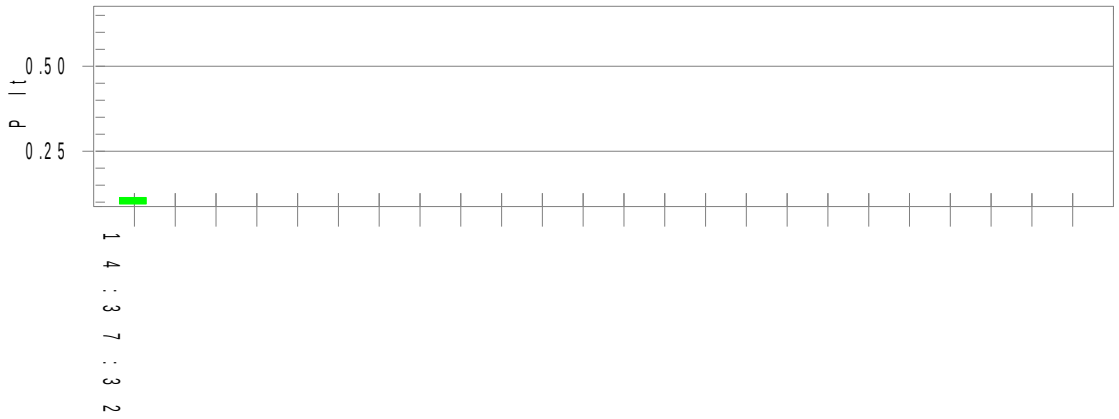
Tested by: Rick
Test Margin: 100
Start time: 14:27:02 End time: 14:37:34
Data file name: F-000265.cts_data

Status: Test Completed

Psti and limit line **European Limits**



Plt and limit line

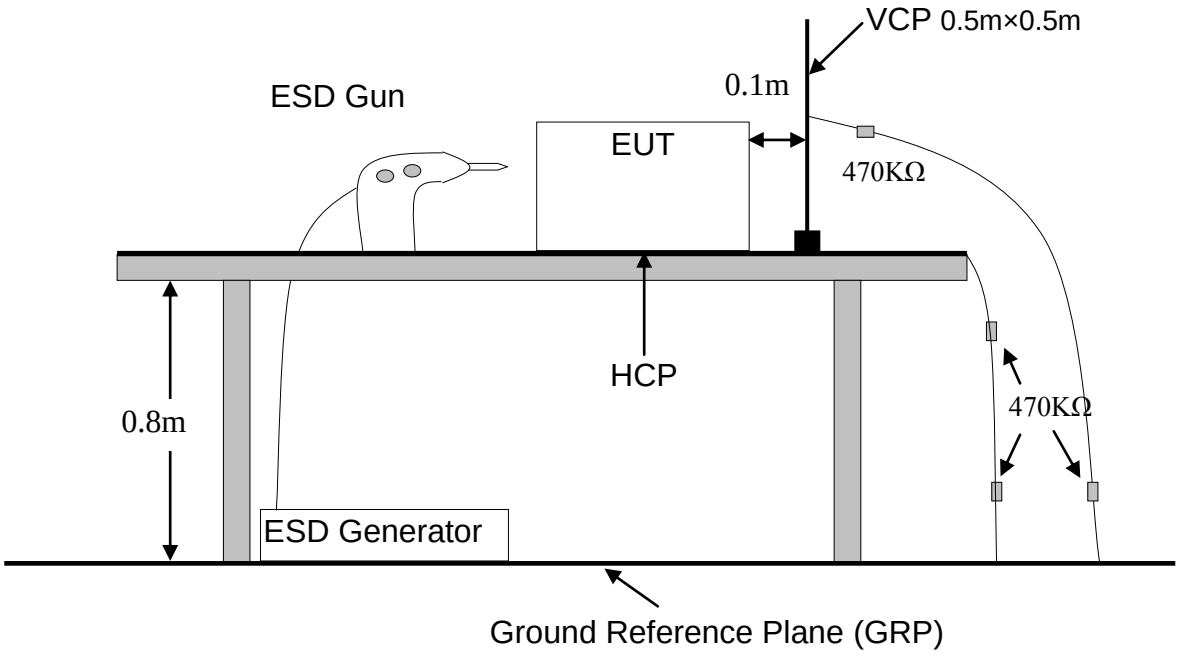


Parameter values recorded during the test:

Vrms at the end of test (Volt):	**230.30**			
Highest dt (%):	**0.00**	**Test limit (%):**	**N/A**	**N/A**
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**-0.04**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.261**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.114**	**Test limit:**	**0.650**	**Pass**

9.5 ELECTROSTATIC DISCHARGE

TEST CONFIGURATION



TEST PROCEDURE:

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

TEST RESULT

PASS

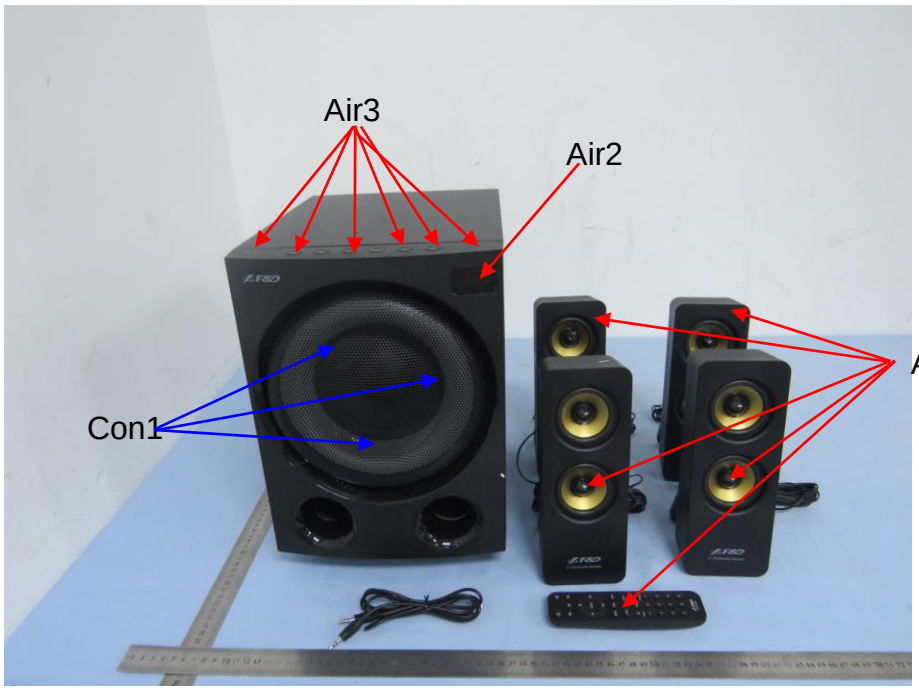
Please refer to following data table.

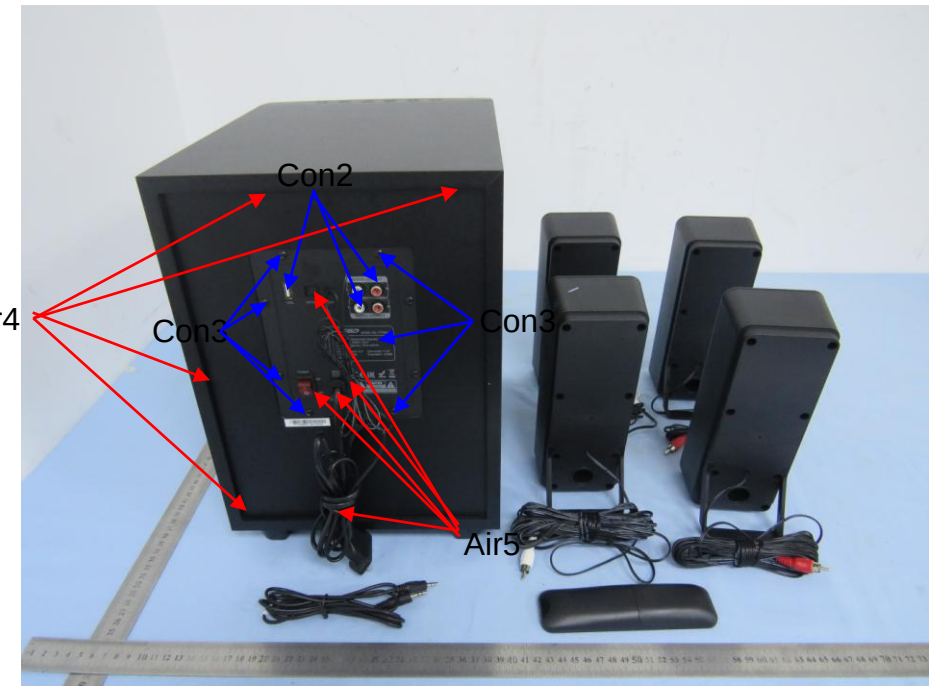
Test Condition								
Ambient Condition:	Temp.: 25℃		R.H.: 50 %		Air Pressure: 101 kPa			
Power Supply:	AC 230V 50Hz,							
Tested mode:	BT Link							
Ground Bond Resistance: 0.2 Ω								
Required Performance Criterion: CR & CT & B								
Direct Discharge								
-	Air discharge (KV)				Contact discharge (KV)			
Test Point	±2	±4	±6	±8	±2	±4	-	-
1	A	A	A	A	A	A	-	-
2	A	A	A	A	A	A	-	-
3	A	A	A	A	A	A	-	-
4.	A	A	A	A	-	-	-	-
5.	A	A	A	A	-	-	-	-
Indirect Discharge								
-	HCP (KV)				VCP (KV)			
Test Point	±2	±4	-	-	±2	±4	-	-
Front	A	A	-	-	A	A	-	-
Left	A	A	-	-	A	A	-	-
Right	A	A	-	-	A	A	-	-
Back	A	A	-	-	A	A	-	-
Test result					PASS			

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

Engineer : Rick

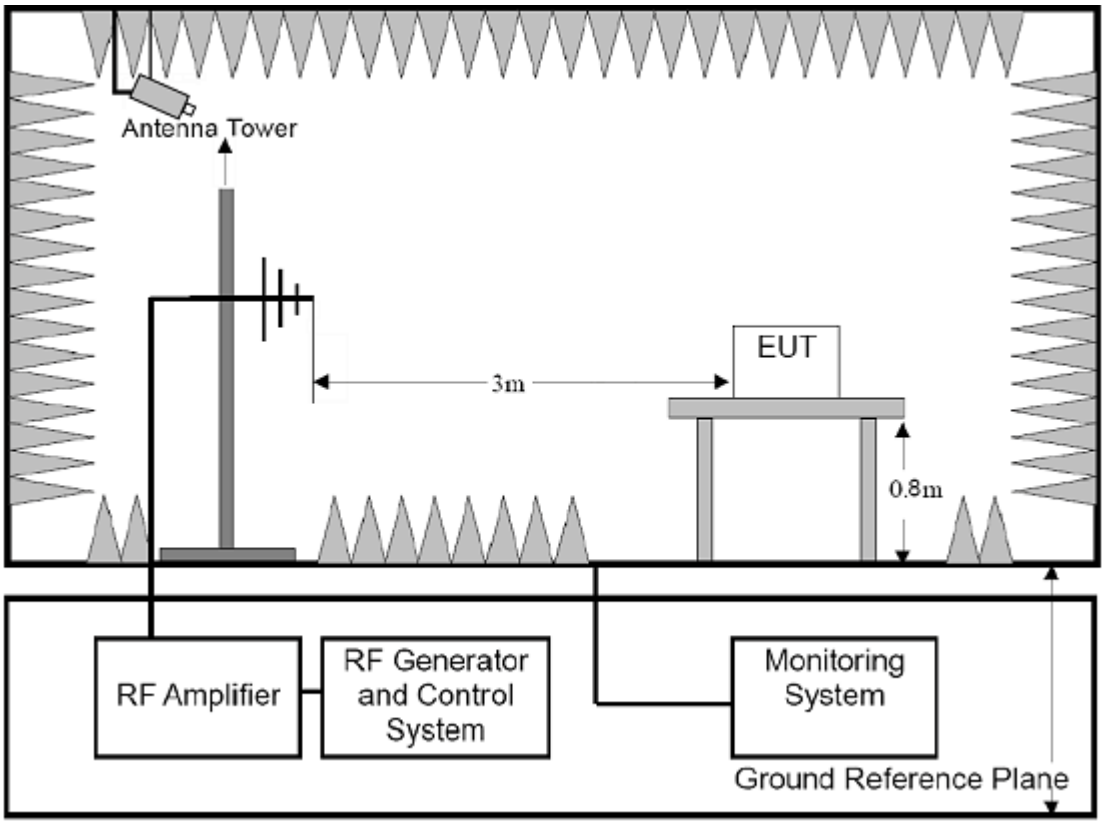
Electrostatic discharge immunity test- Appendix I





9.6 RF ELECTROMAGNETIC FIELD

TEST CONFIGURATION



TEST PROCEDURE

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 9.2.2 and EN61000-4-3 for the measurement methods.

TEST RESULT

PASS

Please refer to following data table.

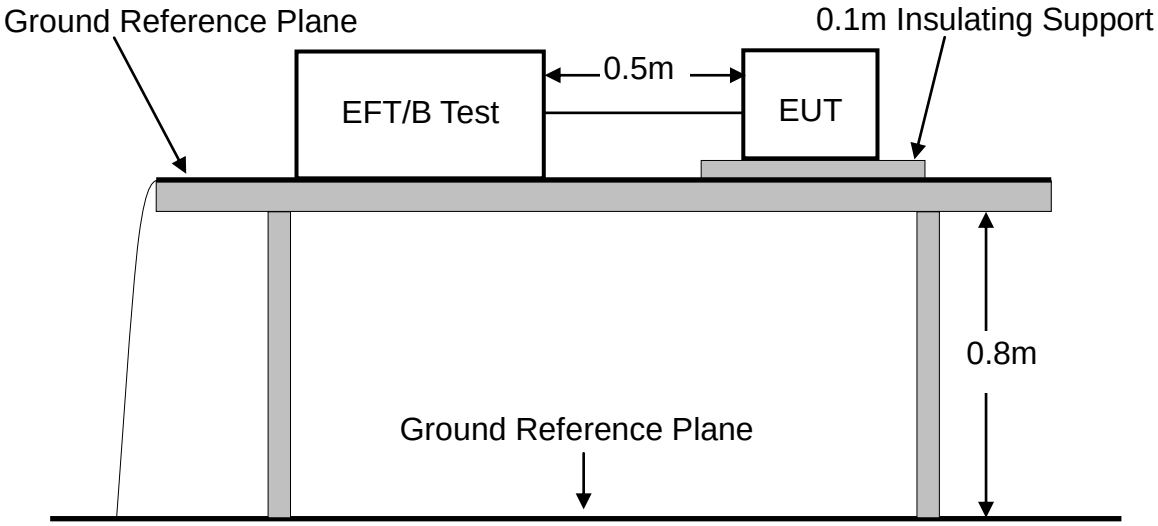
Test Condition			
Temperature	25°C	Test Voltage	AC 230V/50Hz
Humidity	50%RH	Tested by	Elias
Pressure	1010mbar	Performance Criterion	CR & CT & A
Frequency Range		80-6000 MHz	
Test Modulation		1kHz, 80% AM	
Dwell time		1 second	
Frequency Step		1%	
Antenna Polarization		Horizontal and Vertical	
Test Mode		BT Link	
Test Level		3V/m	

Test Result		
Frequency (MHz)	Exposed Side	Result
80 to 6000	Front	Pass
80 to 6000	Left	Pass
80 to 6000	Rear	Pass
80 to 6000	Right	Pass

Note: 1. The exclusion band for 2,40 GHZ equipment falling within the scope of the present document extends from 2 280 MHz to 2 603,50 MHz.
2. During the test, the EUT did not show any abnormality.

9.7 AC MAINS FAST TRANSIENTS COMMON MODE

TEST CONFIGURATION



TEST PROCEDURE

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

TEST RESULT

PASS

Please refer to following data table.

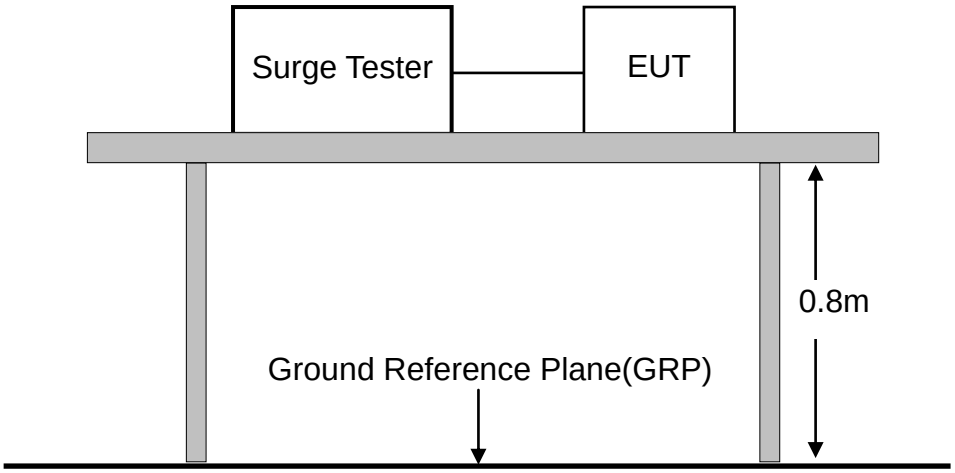
Test Condition			
Temperature	25°C	Test Voltage	AC 230V/50Hz
Humidity	50%RH	Tested by	Rick
Pressure	1010mbar	Performance Criterion	CR & CT & B
Impulse Frequency		5kHz	
Tr/Th		5/50ns	
Burst Duration		15ms	
Burst Period		300ms	
Port		AC Power	
Test Mode		BT Link	
Test Level		±1.0kV	

Test Result		
Injection Line	Level	Result
Line	±1.0kV	Pass
Neutral	±1.0kV	Pass
PE	-	-
Line + Neutral	±1.0kV	Pass
Line + PE	-	-
Neutral + PE	-	-
DC Power Line	-	-
Signal Line	-	-

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

9.8 AC MAINS SURGE

TEST CONFIGURATION



TEST PROCEDURE:

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

TEST RESULT

PASS

Please refer to following data table.

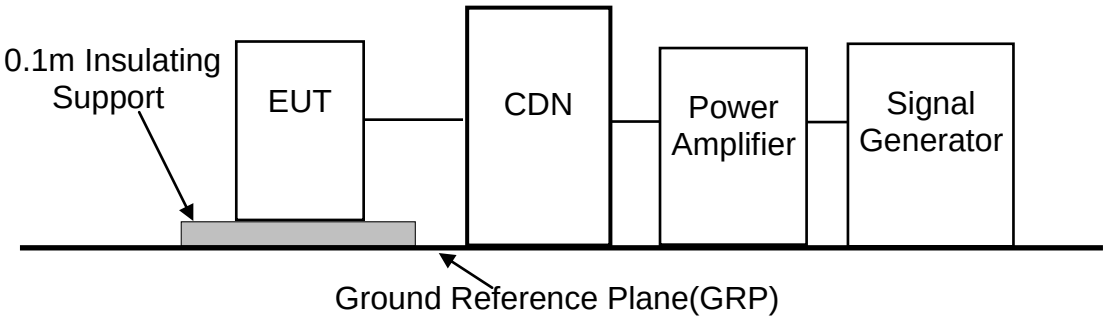
Test Condition			
Temperature	25°C	Test Voltage	AC 230V/50Hz
Humidity	50%RH	Tested by	Rick
Pressure	1010mbar	Performance Criterion	CR & CT & B
Voltage Waveform		1.2/50 us	
Current Waveform		8/20 us	
Polarity		Positive/Negative	
Phase angle		0°, 90°, 180 °, 270°	
Repetition Rate		1 minute	
Test Mode		BT Link	
Test Level		±1.0kV / 5 Positive And 5 Negative Surges	

Test Result		
Coupling Line	Level	Result
Line + Neutral	±1.0kV	Pass
Line + PE	-	-
Neutral + PE	-	-
T, R-Ground	-	-
L1, 2, 3, 4-G (LAN)	-	-

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

9.9 RADIO FREQUENCY COMMON MODE

TEST CONFIGURATION



TEST PROCEDURE

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 9.5.2, EN61000-4-6 for the measurement methods.

TEST RESULT

PASS

Please refer to following data table.

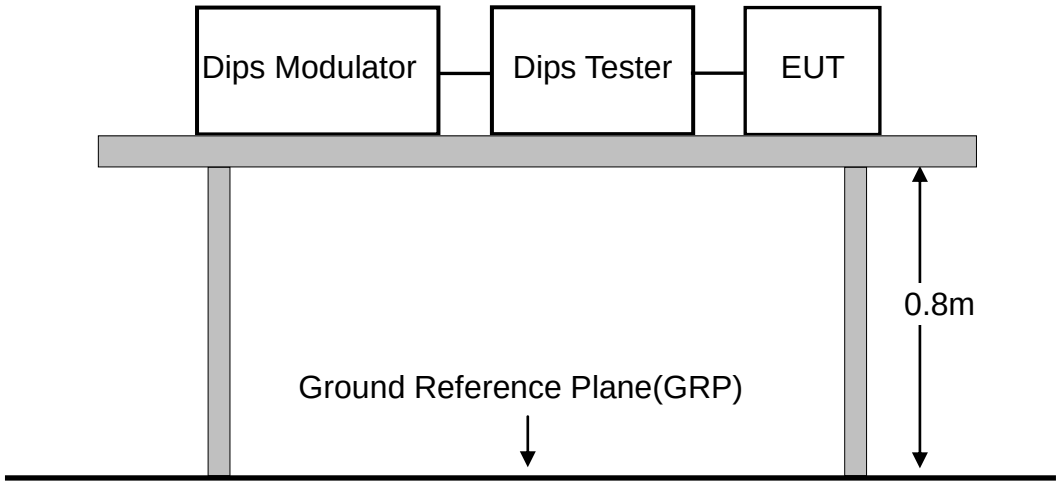
Test Condition			
Temperature	25°C	Test Voltage	AC 230V/50Hz
Humidity	50%RH	Tested by	Rick
Pressure	1010mbar	Performance Criterion	CR & CT & A
Frequency Range		0.15MHz~80MHz	
Frequency Step		1%	
Dwell time		1s	
Test Modulation		1 kHz, 80% AM	
Source Impedance		150Ω	
Test Mode		BT Link	
Test Level		3V(r.m.s)	

Test Result		
Injection Line	Level	Result
AC Power Line	3V(r.m.s)	Pass
Telecommunication Line	-	-
DC Line	-	-
Signal Line	-	-
Control Line	-	-

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

9.10 VOLTAGE DIPS AND INTERRUPTION

TEST CONFIGURATION



TEST PROCEDURE

Please refer to Draft ETSI EN 301 489-1 V2.2.1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods.

TEST RESULT

PASS

Please refer to following data table.

Test Condition			
Temperature	25°C	Test Voltage	AC 230V 50Hz
Humidity	50%RH	Tested by	Rick
Pressure	1010mbar	Performance Criterion	B&C
Phase angles		0°, 45°, 90°, 135°, 180°, 225°, 270 °, 315°	
Number of Dips/Interruptions :		3 times	
Repetition Rate		10s	
Test Mode		BT Link	

Test Level				
	Test Level (% U_T)	Reduction (%)	Duration (ms)	Criterion
Voltage Dips	70	30%	500	B
	0	100%	20	B
	0	100%	10	B
Voltage Interruption	0	100%	5000	C

Test Result			
Test Level (% U_T)	Reduction (%)	Duration (ms)	Result
70	30%	500	Pass
0	100%	20	Pass
0	100%	10	Pass
0	100%	5000	Pass*

Note*: During the test, the EUT power off, but it can be recovered by user after test.

9.11 TEST EQUIPMENT LIST

FOR MAINS TERMINALS DISTURBANCE VOLTAGE TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101152	Mar. 14, 2019	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 14, 2019	1 Year
3.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	893606/014	Mar. 14, 2019	1 Year
4.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar.14, 2019	1 Year
5.	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. 14, 2019	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 23, 2019	1 Year
3.	Positioning Controller	UC	UC 3000	N/A	N/A	N/A
4.	Color Monitor	SUNSPO	SP-140A	N/A	N/A	N/A
5.	Single Phase Power Line Filter	SAEMC	PF201A-32	110210	N/A	N/A
6.	3 Phase Power Line Filter	SAEMC	PF401A-200	110318	N/A	N/A
7.	DC Power Filter	SAEMC	PF301A-200	110245	N/A	N/A
8.	Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	Mar. 14, 2019	1 Year
9.	Horn Antenna	COM-Power	AH-118	071078	Mar. 23, 2019	1 Year
10.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	Apr. 24, 2019	1 Year
11.	Pre-Amplifier	HP	HP 8449B	3008A00964	Mar. 14, 2019	1 Year
12.	Pre-Amplifier	HP	HP 8447D	1145A00203	Mar. 14, 2019	1 Year
13.	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 Analyser	California Instruments	PACS-1	72846	Mar. 14, 2019	1 Year
2.	5KVA AC Power Source	California Instruments	500liX	60137	Mar. 14, 2019	1 Year
3.	Software	California Instruments	CTS30	N/A	N/A	N/A

FOR ELECTROSTATIC DISCHARGE TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG 437	432	Mar. 23, 2019	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	Apr. 24, 2019	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	Apr.24,2019	1 Year
7.	Power Sensor	Agilent	E9300A	MY41498919	Apr.24,2019	1 Year
8.	Power Sensor	Agilent	E9300A	US39211259	Apr.24,2019	1 Year
9.	E-Field Probe	Narda	EP-601	N/A	Apr.24,2019	1 Year
10.	Antenna	Schwarzbeck	STLP 9129	9129071	Apr.24,2018	2 Year
11.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 23, 2019	1 Year
12.	Chamber	Chengyu	7*5*3.5m	N/A	Mar.26,2018	2 Year
13.	Test Software	SKET	SKIT_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 500N	V1104108683	Mar. 14, 2019	1 Year
2.	Coupling Clamp	EM TEST	HFK	0311-94	Mar. 14, 2019	1 Year
3.	Test Soft	EM TEST	lec. control	N/A	N/A	N/A

FOR SURGE IMMUNITY TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	EM TEST	UCS 500N	V1104108683	Mar. 14, 2019	1 Year
2.	Test Soft	EM TEST	lec. control	N/A	N/A	N/A

FOR INJECTED CURRENTS IMMUNITY MEASUREMENT

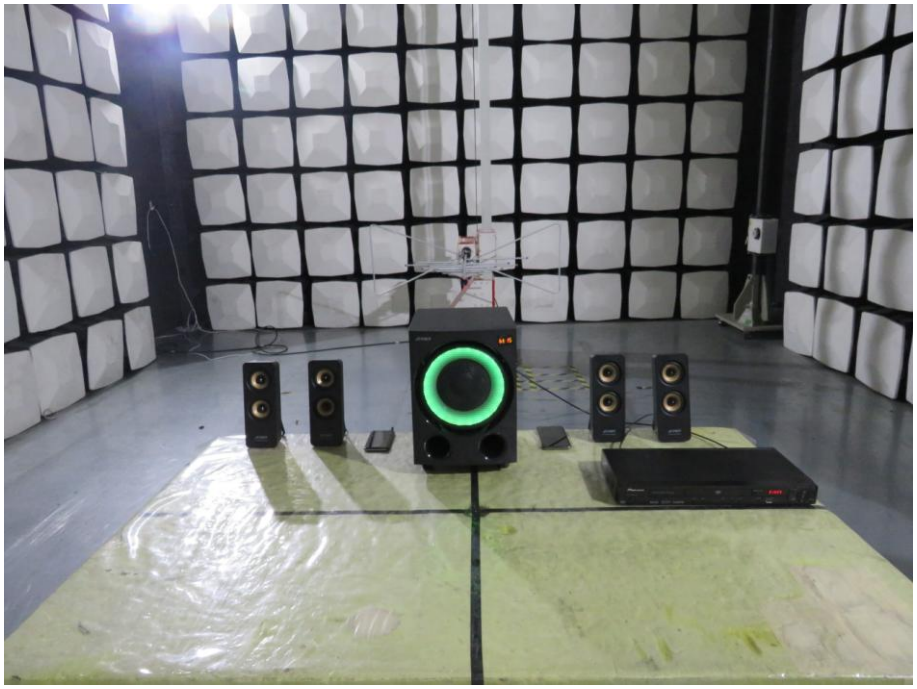
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2023A	N/A	Mar. 14, 2019	1 Year
2.	Power Amplifier	SCHAFFNER	CBA9425	1022	Mar. 14, 2019	1 Year
3.	6dB 50Watt Attenuator	SCHAFFNER	ATN6025	N/A	Mar. 14, 2019	1 Year
4.	CDN	Lioncel	CDN-M3-16	0170708	Mar. 14, 2019	1 Year
5.	CDN	Lioncel	CDN-M2-16	0170723	Mar. 14, 2019	1 Year
6.	Directional Coupler	SCHAFFNER	255	19184	Mar. 14, 2019	1 Year
7.	Dips Modulator	EM TEST	V4780S2	0111-11	Mar. 14, 2019	1 Year
8.	Audio Analyzer	Rohde & Schwarz	UPV	100894	Mar. 23, 2019	1 Year
9.	Test Software	EZ	EZ_CS	N/A	N/A	N/A

FOR VOLTAGE DIPS AND INTERRUPTIONS MEASUREMENT

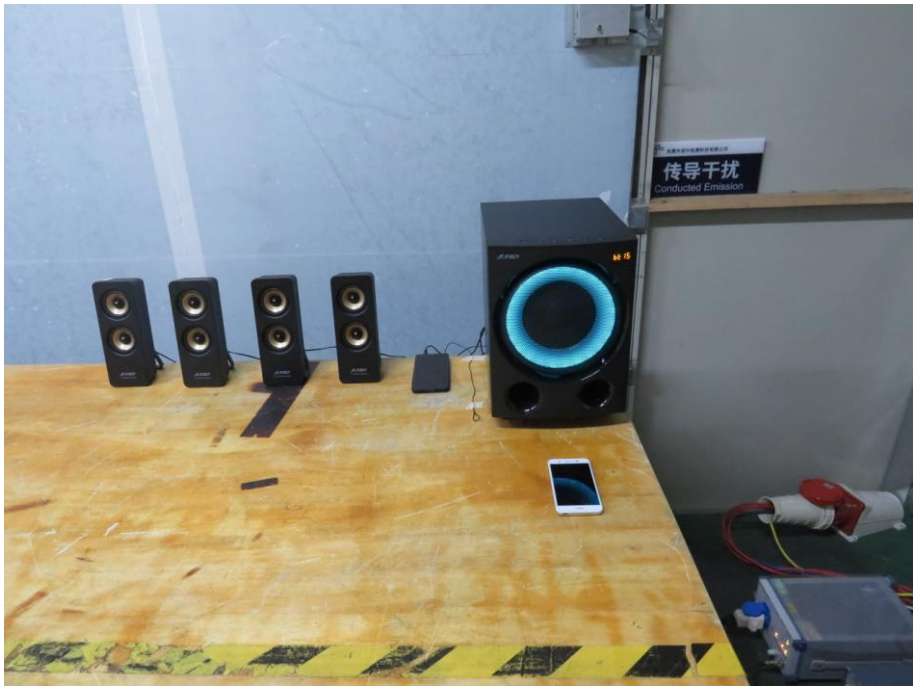
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	EM TEST	UCS500N	V1104108683	Mar. 14, 2019	1 Year
2.	Test Soft	EM TEST	lec.control	N/A	N/A	N/A
3.	Dips Modulator	EM TEST	V4780S2	0111-11	Mar. 14, 2019	1 Year

APPENDIX 1
PHOTOGRPHS OF TEST SETUP

RADIATED EMISSION TEST



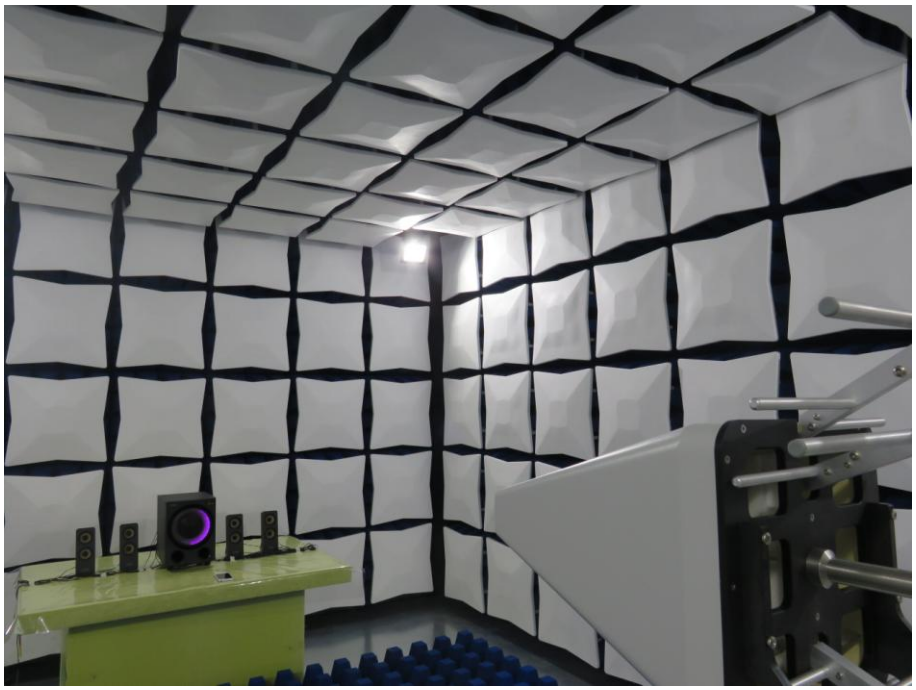
LINE CONDUCTED EMISSION TEST



POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST

ELECTROSTATIC DISCHARGE TEST

RADIATED ELECTROMAGNETIC FIELD TEST

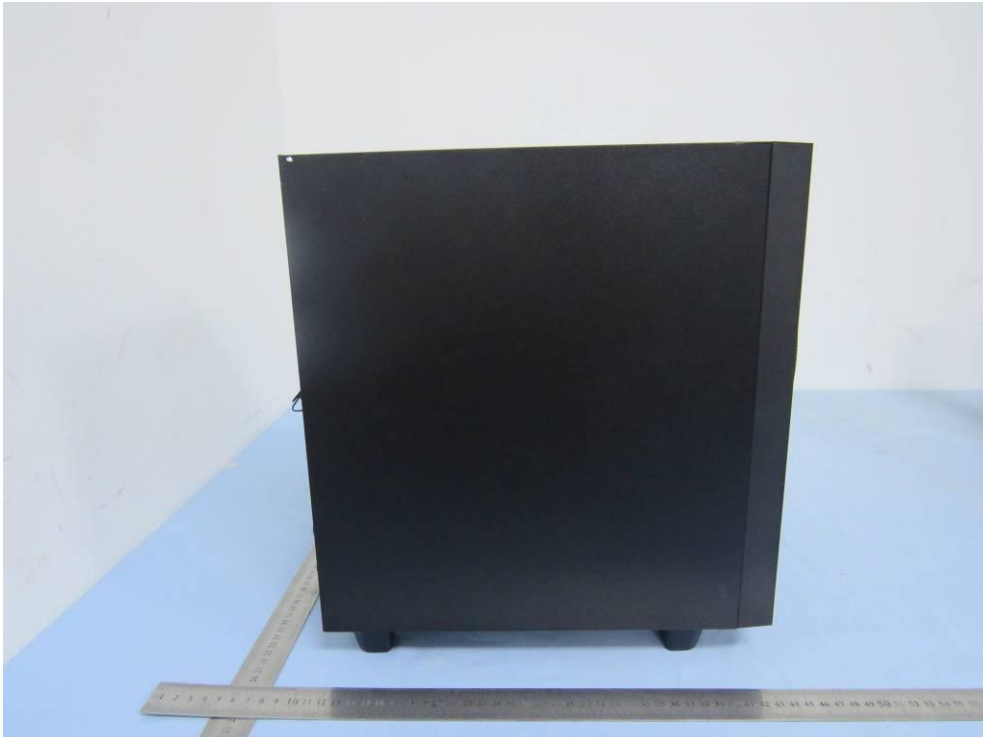


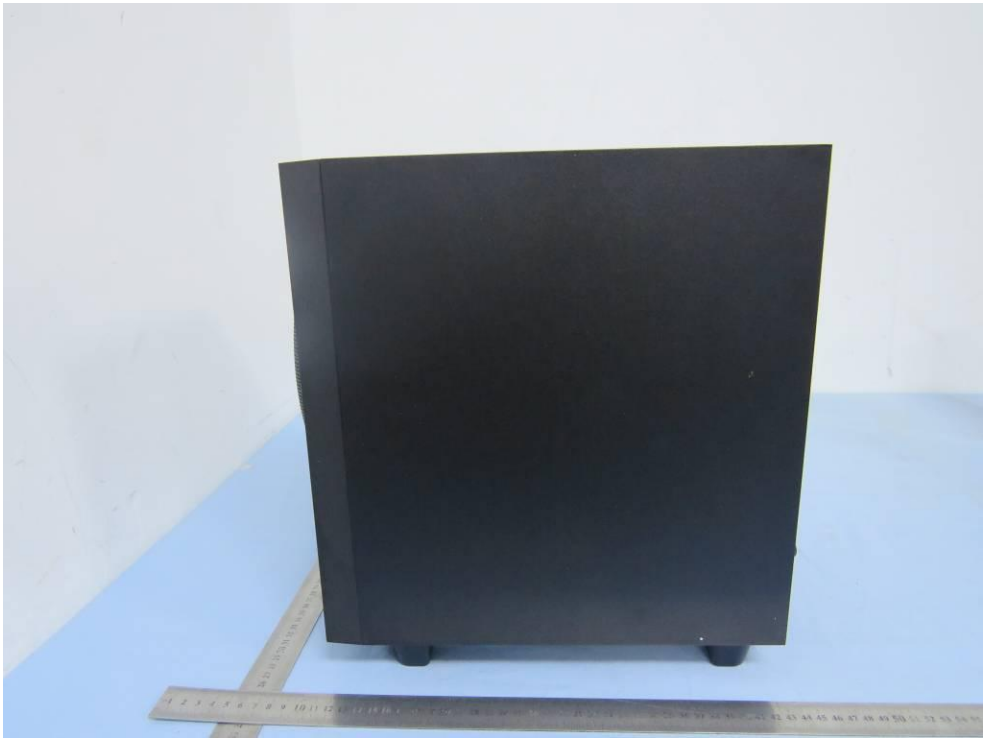
ELECTRICAL FAST TRANSIENTS/BURST/ SURGE/ VOLTAGE DIPS TEST

RADIO FREQUENCY COMMON MODE TEST

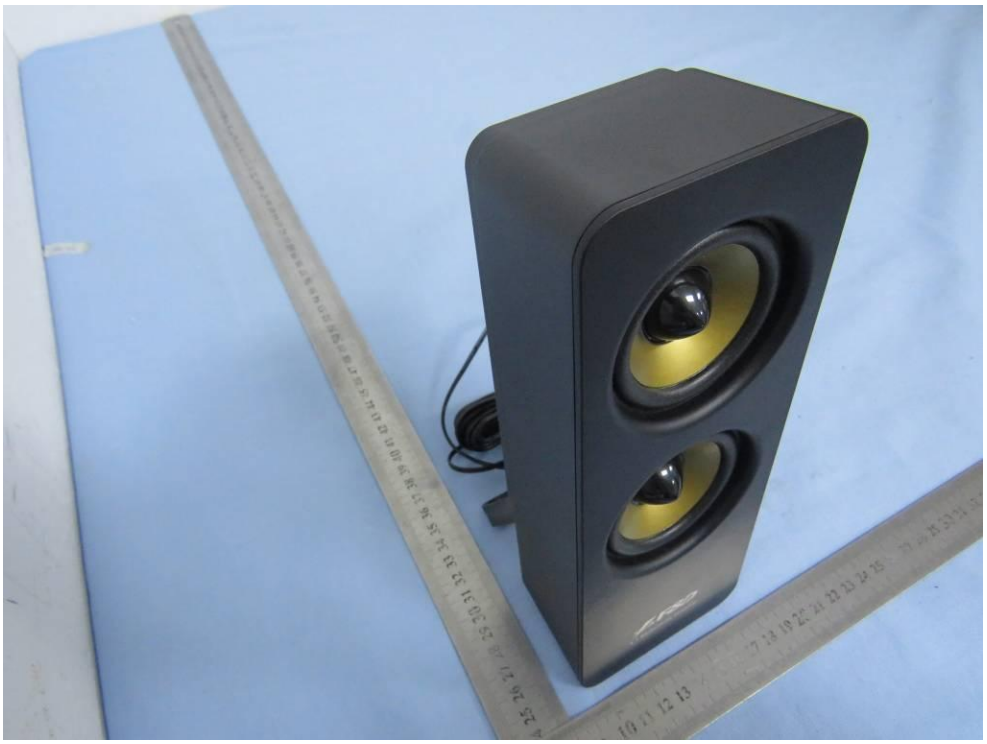
General Appearance of the E.U.T.

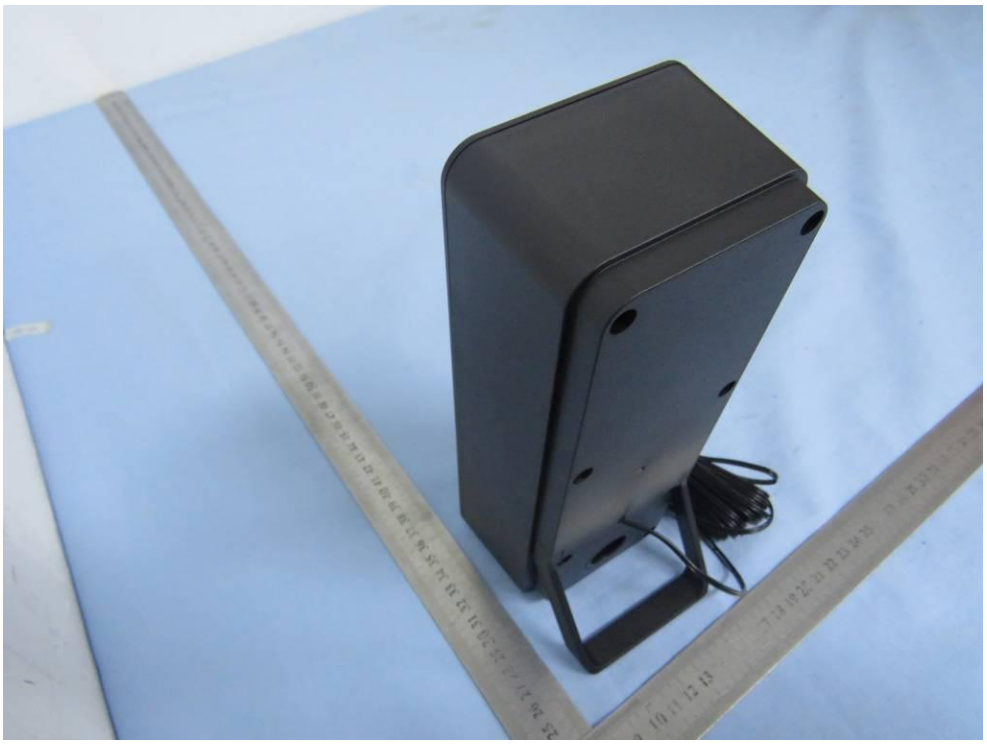

F&D

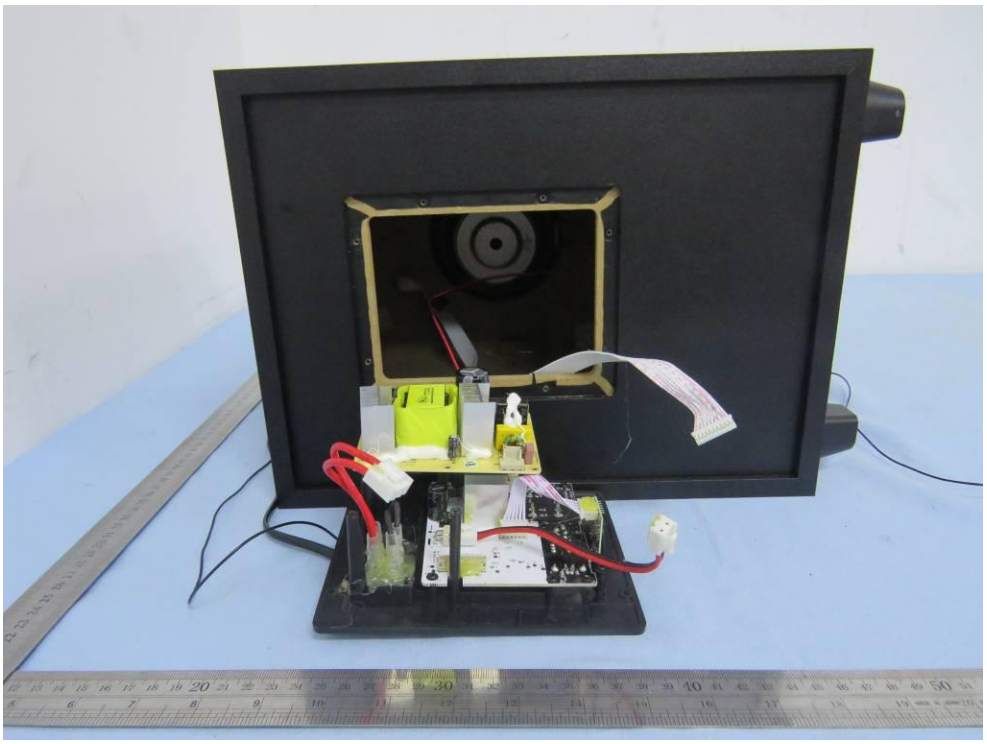


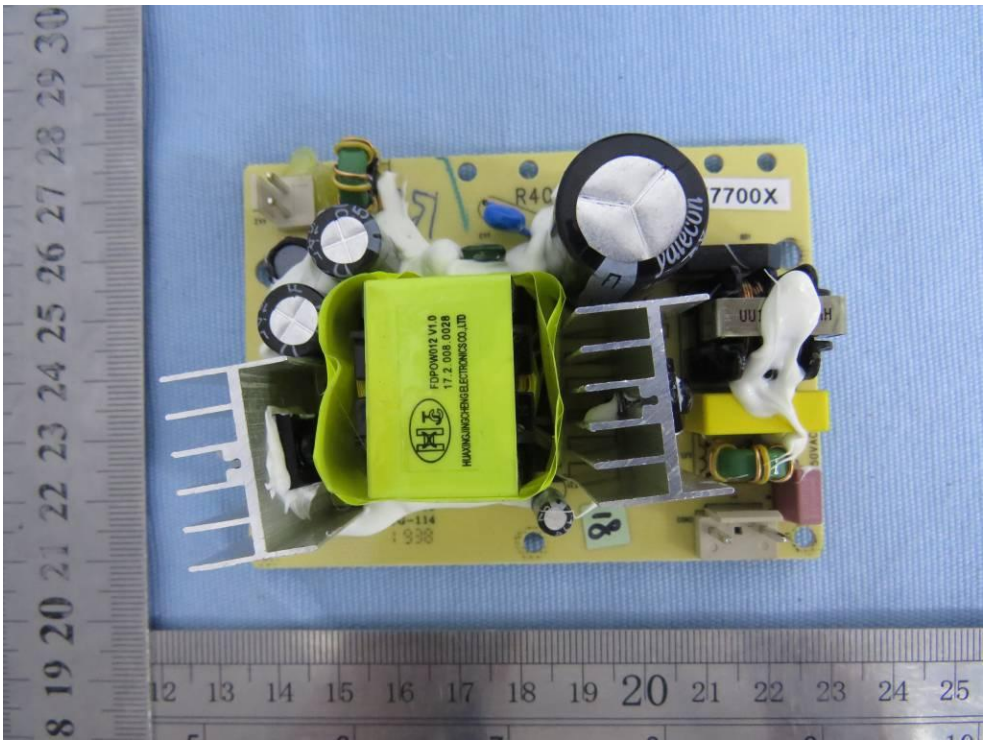



USB
OPTICAL
AUX
AUDIO OUTPUT
AUDIO OUTPUT
MODEL NO.: F7700X
OFF
CAUTION





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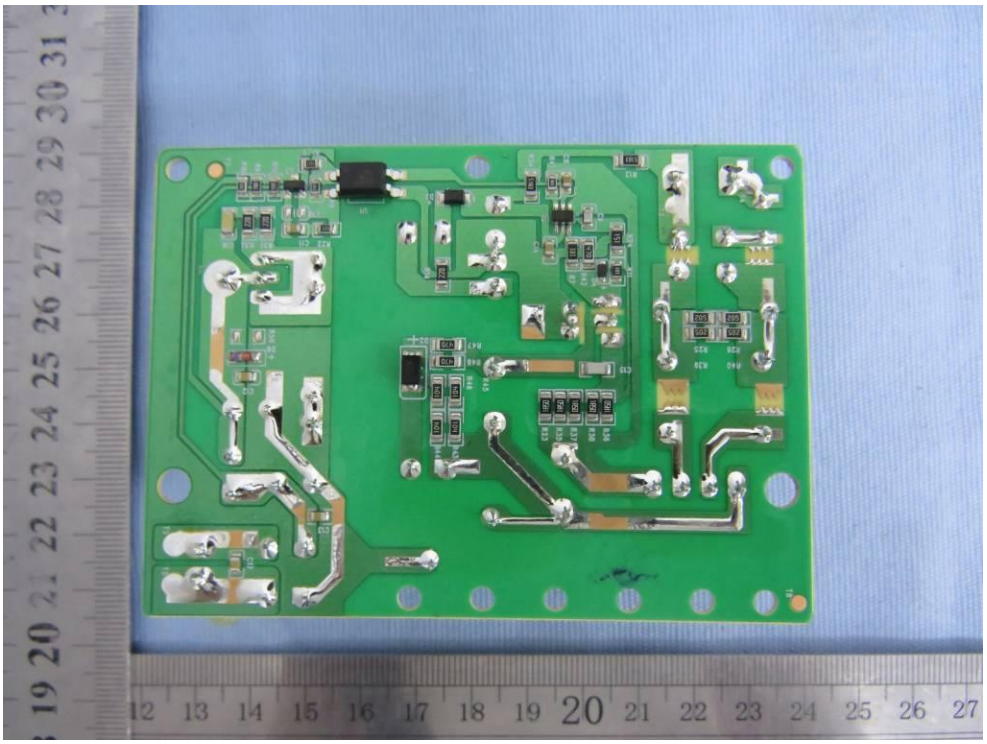
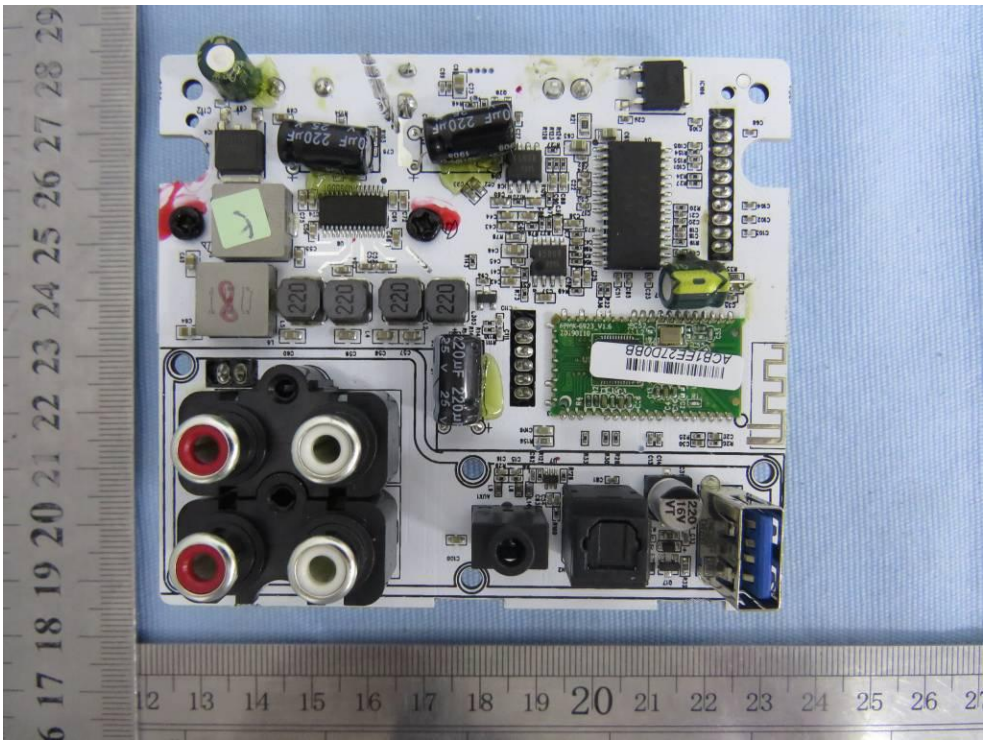
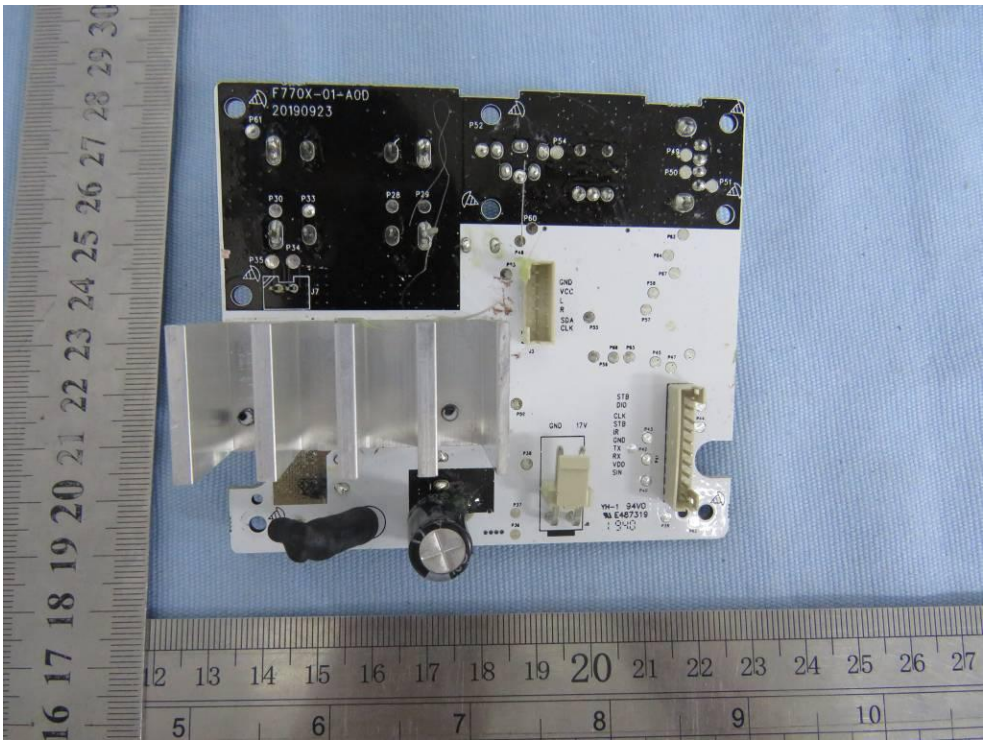
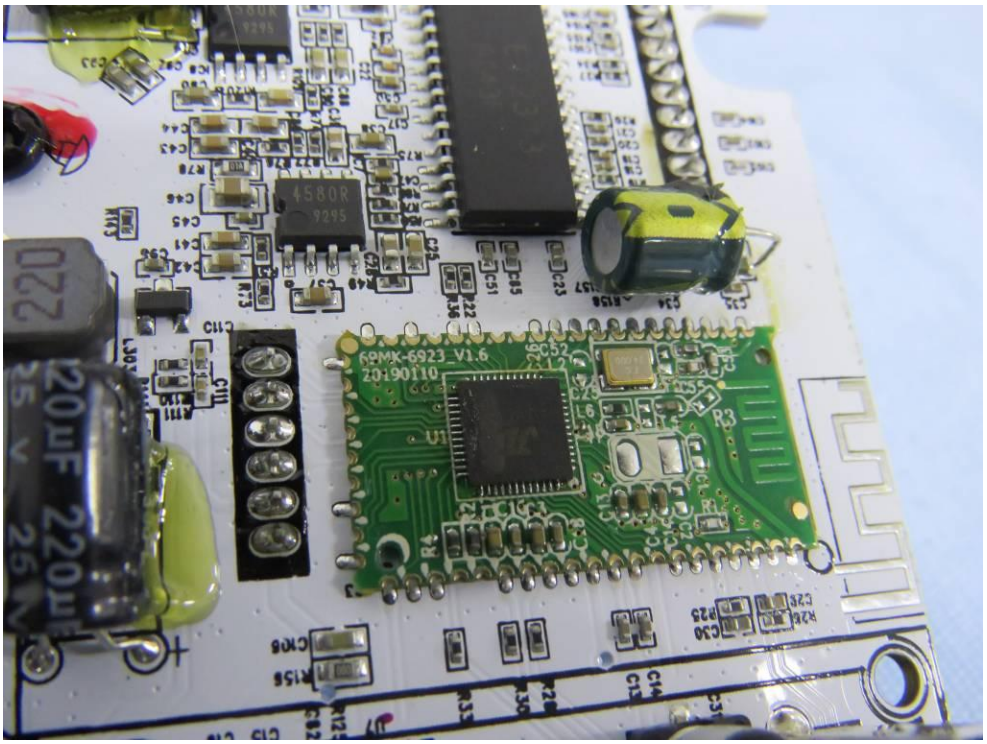
FDPOWN12V1.0
17.2.008.0028
HUAYANGJINZHENGELECTRONICSCO.,LTD






F770X-01-A00
20190923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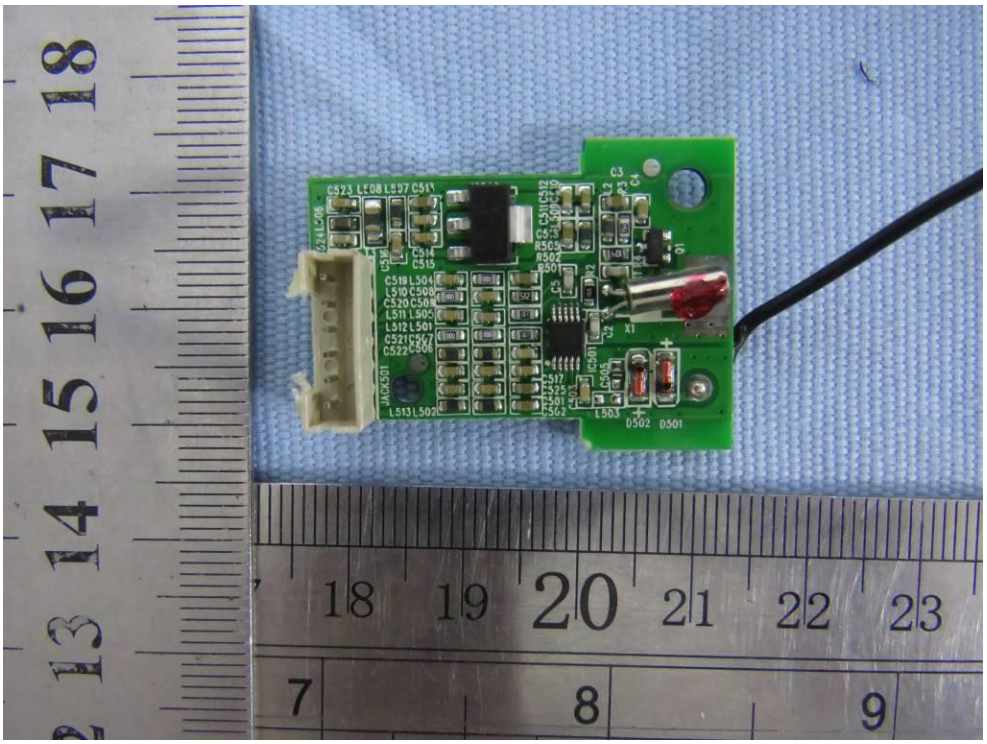
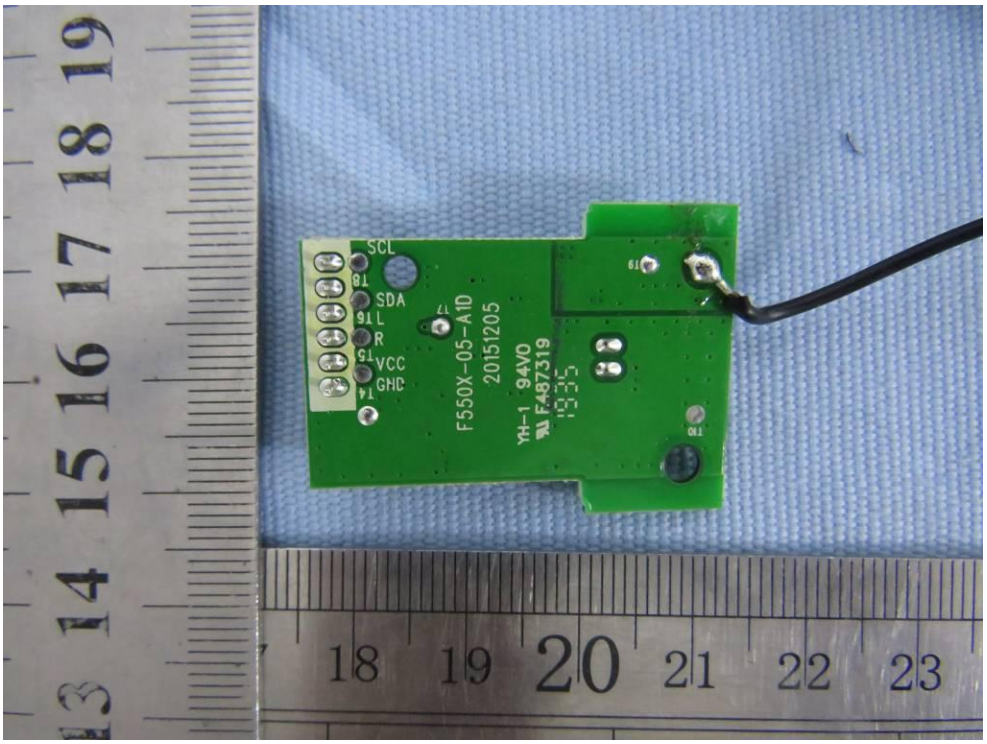
ZD190110
220uF 25V
4580R
9295

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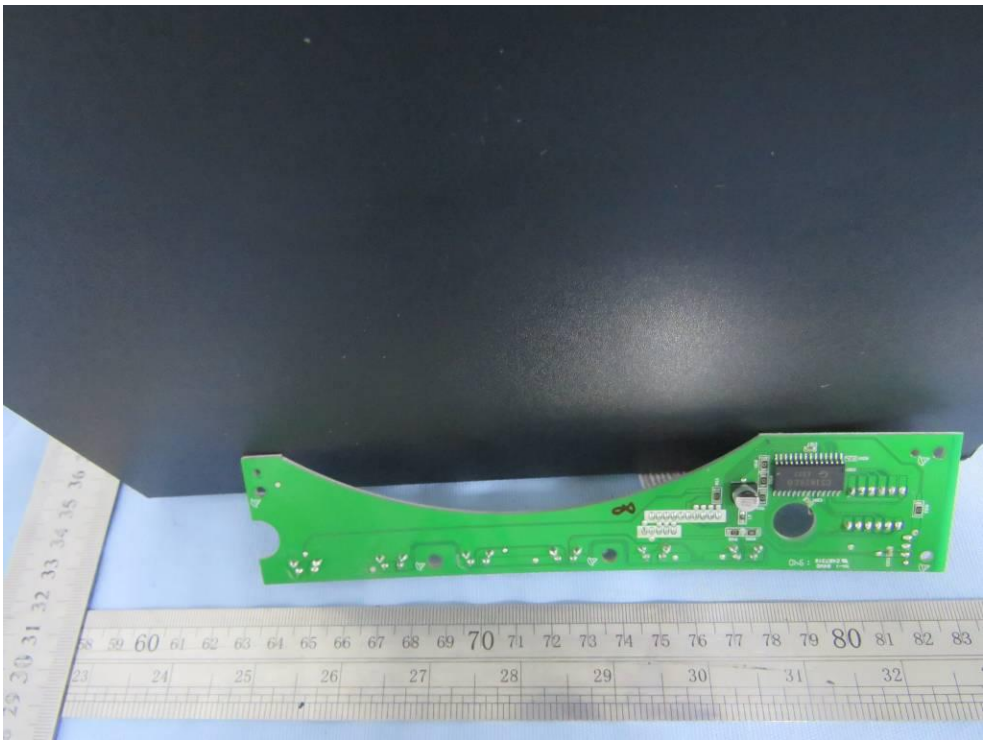
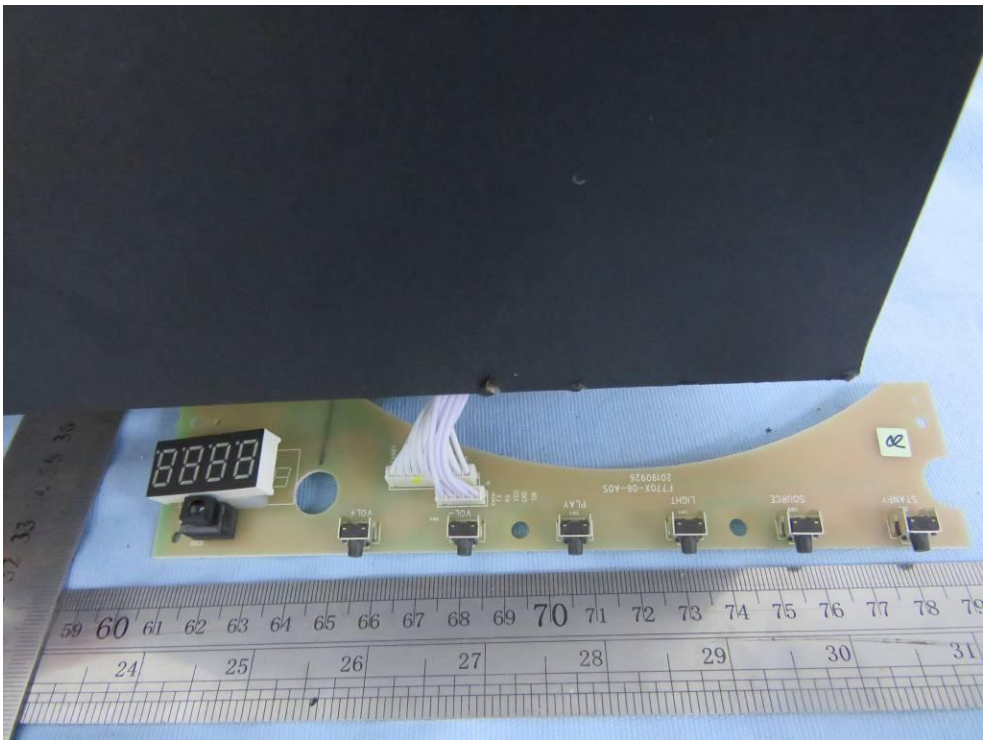
SDA
L
R
VCC
GND
F550X-05-A1D
20151205
94V0
18 19 20 21 22 23




8888
VOL+
VOL-
PLAY
LIGHT
SOURCE
STANBY
59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78
24 25 26 27 28 29 30 31

---End---