

ETSI EN 301 489-1 v 1.9.2: 2011/ ETSI EN 301 489-17 v 2.2.1: 2012

MEASUREMENT AND TEST REPORT

For

Shenzhen Fenda Technology Co., Ltd.

**Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District,
Shenzhen City, Guangdong, China**

E.U.T.: 2.1 Computer Multimedia Speaker

Model Name: A150X, A150U, A150BTU, A150, A160X, A160U, A160BTU, A160

Brand name: F&D

Report Number: NTC1504126E

Test Date(s): April 28, 2015 to May 13, 2015

Report Date(s): May 13, 2015

Prepared by

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Approved & Authorized Signer



Rose Hu / Engineer



Iori Fan / EMC Debug Leader

Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Dongguan Nore Testing Center Co., Ltd. The test results referenced from this report are relevant only to the sample tested.

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1. GENERAL INFORMATION

PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST

Manufacturer	: F&D Technology (Shenzhen) Co., Ltd
Address	: Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Factory Address	: F&D Technology (Shenzhen) Co., Ltd Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Product Name	: 2.1 Computer Multimedia Speaker
Model Name	: A150X, A150U, A150BTU, A150, A160X, A160U, A160BTU, A160
Model Difference Description	: These models have the same circuitry, electrical mechanical, PCB layout and physical construction. Their differences in model name for trading purpose.
Power Supply	: AC 220-240V 50/60Hz
Test Voltage	: AC 230V 50Hz AC 207V and AC 253V for Extreme voltage (The voltage range provide by manufacturer)
Operating Temperature Range	: 0°C to +35°C (Declaration by manufacturer)
Bluetooth Version	: 3.0+EDR
Frequency Range	: 2402-2480MHz
Modulation Type	: GFSK, $\pi/4$ -DQPSK, 8DPSK
Modulation Technology	: FHSS
Number of Channel	: 79
Channel Space	: 1MHz
Antenna Type	: PCB
Antenna Gain	: 0dBi (Declaration by manufacturer)
Max RF Output Power	: 0.56 dBm (E.I.R.P.)
Adaptive/Non-Adaptive Equipment	: Adaptive equipment
Note	: None

2. TEST METHODOLOGY

As per table 2 of clause 7.1 of ETSI EN 301 489-1 V1.9.2, the measurement was performed under EUT combined condition during the tests. The ports on the ancillary left empty during the measurement in this report.

3. 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.

4. TEST FACILITY

Site Description

EMC Lab : Listed by FCC, August. 02, 2011
The Certificate Number is 665078.

Listed by Industry Canada, July 01, 2011
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 & Technology
Park, Zhouxi Longxi Road, Nancheng
District, Dongguan City, Guangdong, China

5. SUPPORT EQUIPMENT

iPod : Manufacturer: Apple
M/N: A1446
S/N: DCYK12V6F0GV

6. PERFORMANCE CRITERIA

ETSI EN301489-17 v 2.2.1: 2012		
Criteria	During Test	After Test
A	Shall operate as intended May show degradation of performance (note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance(note 2) 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 (note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (note 2) 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(note 2)

NOTE 1: 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 2: 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.

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

7.1 RADIATED EMISSION LIMIT

According standard ETSI EN 301 489-1 v 1.9.2 Clause 8.2.3, Table 3 and EN 55022: 2010+AC: 2011 Clause 6, Table 6, Class B

Limits for radiated disturbance Blow 1GHz

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

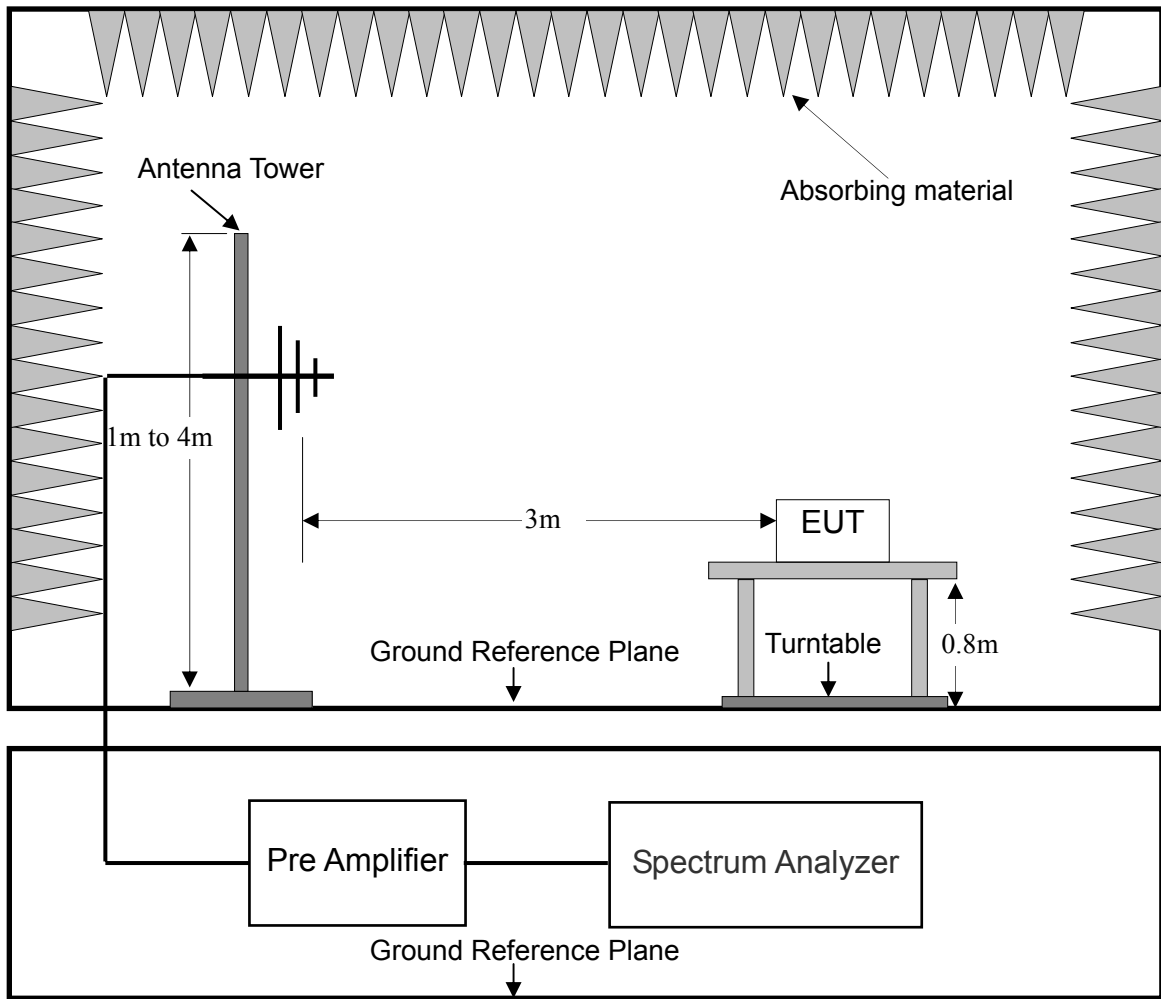
Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

Limits for radiated disturbance Above 1GHz

FREQUENCY (MHz)	DISTANCE (Meters)	Average Limit (dB μ V/m)	Peak Limit
1000 ~ 3000	3	50	70
3000 ~ 6000	3	54	74

Note: The lower limit applies at the transition frequency.

TEST CONFIGURATION



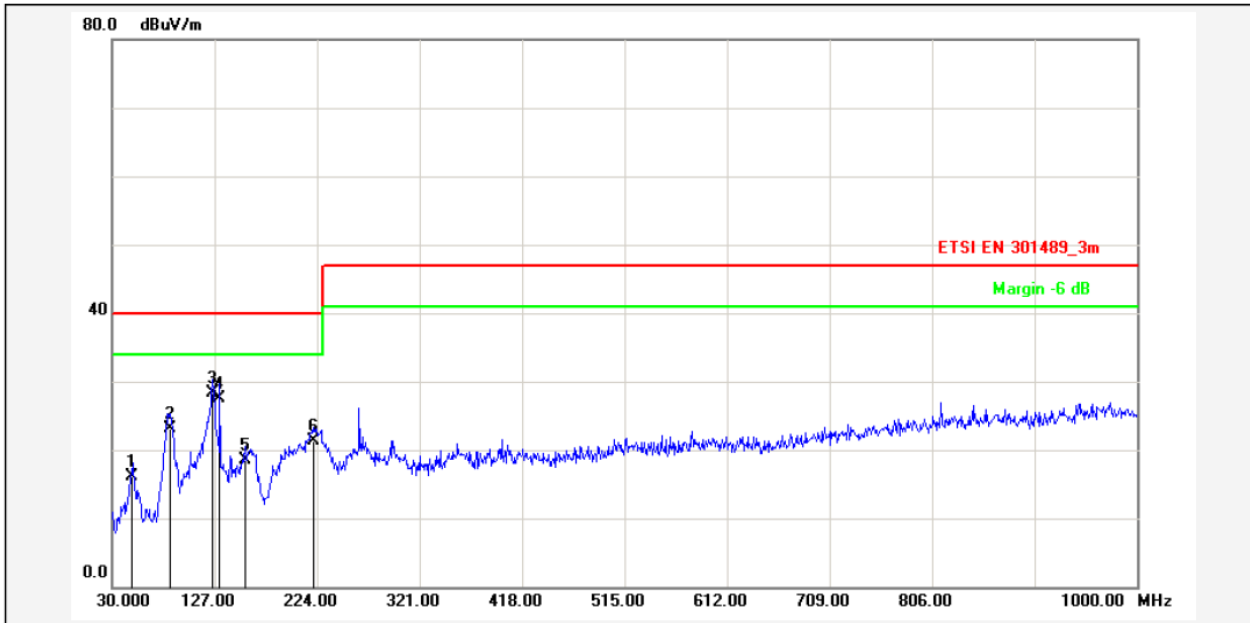
TEST PROCEDURE

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 8.2.3 and EN 55022: 2010+AC: 2011 Clause 6 for the measurement methods.

TEST RESULT

PASS

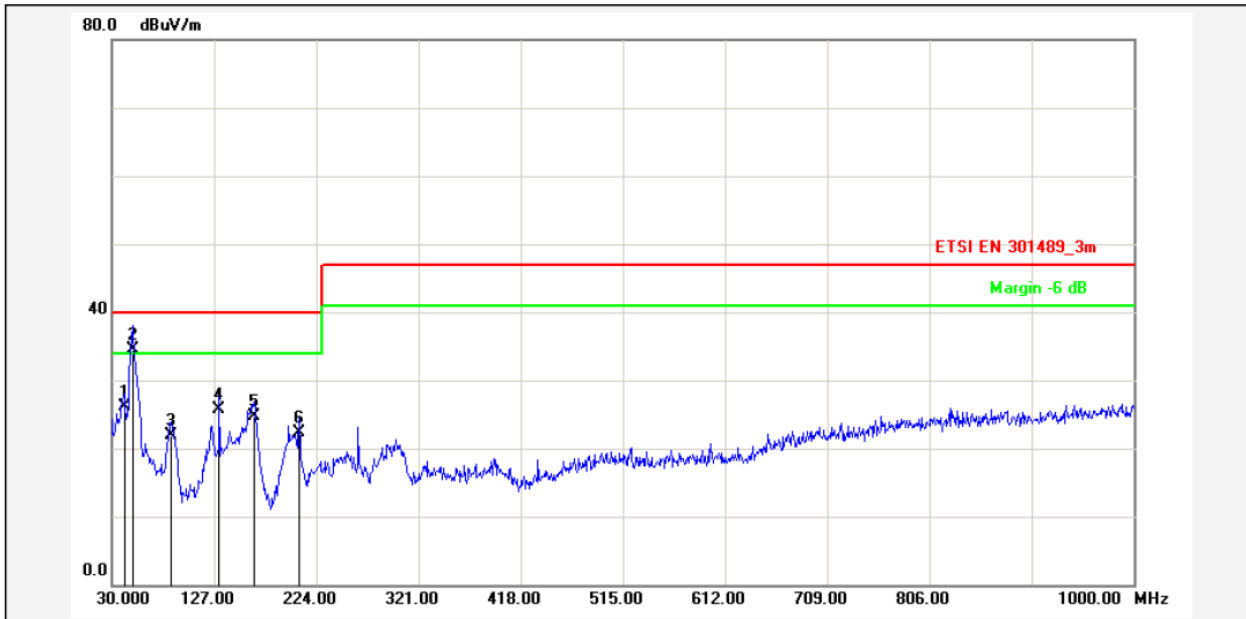
Please refer to following data tables.



Report No.:	A150X		
Test Standard:	ETSI EN 301489_3m	Test Distance:	
Test item:	Radiation Emission	Ant. Polarization:	Horizontal
Applicant:	FENDA	Temp.(C)/Hum.(%):	21(C) / 55 %
Product:	2.1 Computer Multimedia Speaker	Power Rating:	AC 230V/50Hz
Model No.:	A150X	Test Engineer:	Lecdon
Test Mode:	TX+RX(BT Link)		
Remark:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	49.3998	-17.99	34.09	16.10	40.00	-23.90	QP			P	
2	85.2900	-15.11	38.21	23.10	40.00	-16.90	QP			P	
3	125.0600	-14.62	43.02	28.40	40.00	-11.60	QP			P	
4	131.8497	-15.24	42.84	27.60	40.00	-12.40	QP			P	
5	156.0997	-15.32	33.82	18.50	40.00	-21.50	QP			P	
6	220.1200	-12.97	34.27	21.30	40.00	-18.70	QP			P	

Note: Level=Reading+Factor.
Margin=Limit-Level.



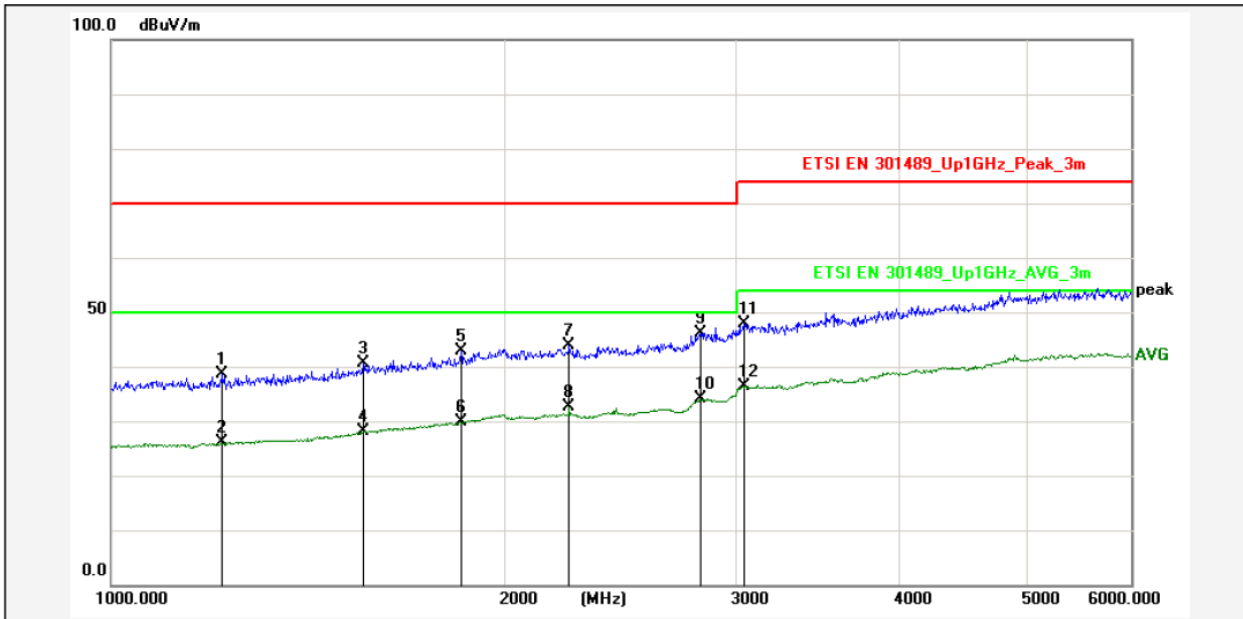
Report No.: A150X
 Test Standard: ETSI EN 301489_3m
 Test item: Radiation Emission
 Applicant: FENDA
 Product: 2.1 Computer Multimedia Speaker
 Model No.: A150X

Test Distance:
 Ant. Polarization: Vertical
 Temp.(C)/Hum.(%): 21(C) / 55 %
 Power Rating: AC 230V/50Hz
 Test Engineer: Lecdon

Test Mode: TX+RX(BT Link)
 Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	41.6400	-14.69	40.89	26.20	40.00	-13.80	QP			P	
2	50.3700	-13.41	47.91	34.50	40.00	-5.50	QP			P	
3	86.2600	-17.87	39.77	21.90	40.00	-18.10	QP			P	
4	131.8497	-18.24	43.94	25.70	40.00	-14.30	QP			P	
5	164.8300	-17.98	42.78	24.80	40.00	-15.20	QP			P	
6	207.5098	-16.29	38.69	22.40	40.00	-17.60	QP			P	

Note: Level=Reading+Factor.
 Margin=Limit-Level.



Report No.: A150X	Test Standard: ETSI EN 301489_Up1GHz_Peak_3m	Test Distance:
Test item: Radiation Emission	Applicant: FENDA	Ant. Polarization: Horizontal
Product: 2.1 Computer Multimedia Speaker	Model No.: A150X	Temp.(C)/Hum.(%): 21(C) / 55 %
		Power Rating: AC 230V/50Hz
		Test Engineer: Lecdon

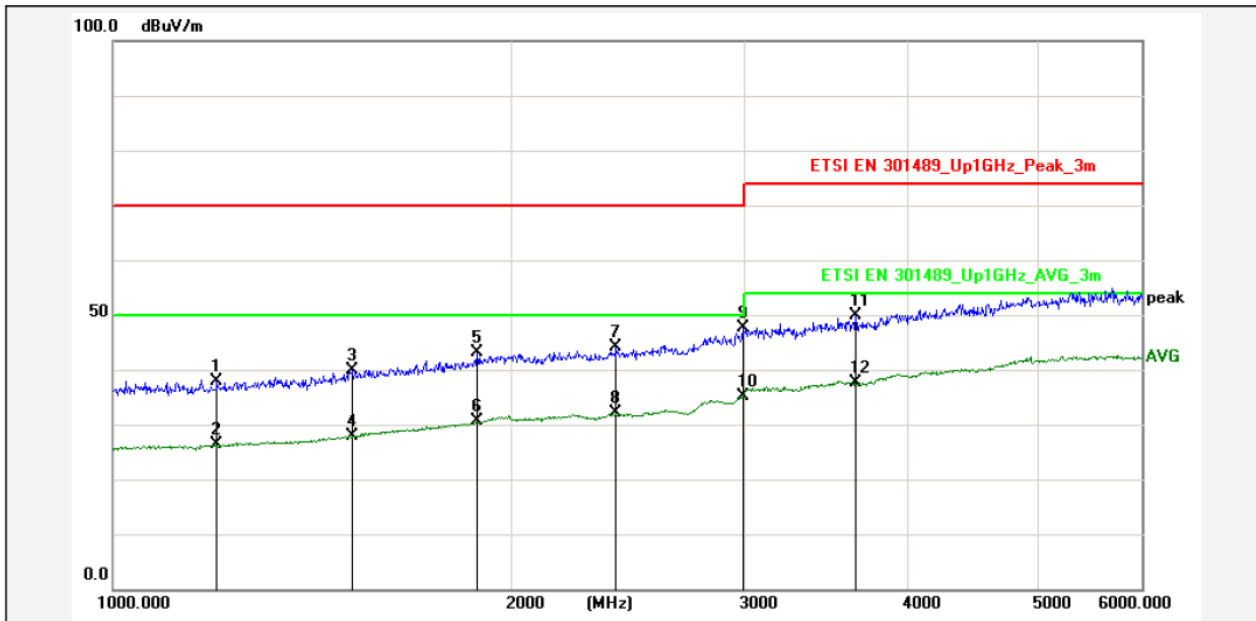
Test Mode: TX+RX(BT Link)

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1215.678	2.17	36.43	38.60	70.00	-31.40	peak			P	
2	1215.678	2.17	23.91	26.08	50.00	-23.92	AVG			P	
3	1556.694	4.08	36.47	40.55	70.00	-29.45	peak			P	
4	1556.694	4.08	24.11	28.19	50.00	-21.81	AVG			P	
5	1848.868	6.08	36.80	42.88	70.00	-27.12	peak			P	
6	1848.868	6.08	23.74	29.82	50.00	-20.18	AVG			P	
7	2235.578	7.55	36.28	43.83	70.00	-26.17	peak			P	
8	2235.578	7.55	25.09	32.64	50.00	-17.36	AVG			P	
9	2816.900	8.86	37.38	46.24	70.00	-23.76	peak			P	
10	2816.900	8.86	25.16	34.02	50.00	-15.98	AVG			P	
11	3037.063	9.35	38.50	47.85	74.00	-26.15	peak			P	
12	3037.063	9.35	27.11	36.46	54.00	-17.54	AVG			P	

Note: Level=Reading+Factor.

Margin=Limit-Level.



Report No.: A150X
 Test Standard: ETSI EN 301489_Up1GHz_Peak_3m
 Test item: Radiation Emission
 Applicant: FENDA
 Product: 2.1 Computer Multimedia Speaker
 Model No.: A150X
 Test Distance:
 Ant. Polarization: Vertical
 Temp.(C)/Hum.(%): 21(C) / 55 %
 Power Rating: AC 230V/50Hz
 Test Engineer: Lecdon

Test Mode: TX+RX(BT Link)

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1198.376	2.11	35.82	37.93	70.00	-32.07	peak			P	
2	1198.376	2.11	24.16	26.27	50.00	-23.73	AVG			P	
3	1518.131	3.80	35.97	39.77	70.00	-30.23	peak			P	
4	1518.131	3.80	24.10	27.90	50.00	-22.10	AVG			P	
5	1885.669	6.30	36.75	43.05	70.00	-26.95	peak			P	
6	1885.669	6.30	24.23	30.53	50.00	-19.47	AVG			P	
7	2401.684	8.09	36.03	44.12	70.00	-25.88	peak			P	
8	2401.684	8.09	23.92	32.01	50.00	-17.99	AVG			P	
9	2993.840	9.24	38.37	47.61	70.00	-22.39	peak			P	
10	2993.840	9.24	25.95	35.19	50.00	-14.81	AVG			P	
11	3646.072	10.89	38.88	49.77	74.00	-24.23	peak			P	
12	3646.072	10.89	26.82	37.71	54.00	-16.29	AVG			P	

Note: Level=Reading+Factor.

Margin=Limit-Level.

7.2 AC POWER CONDUCTED EMISSION

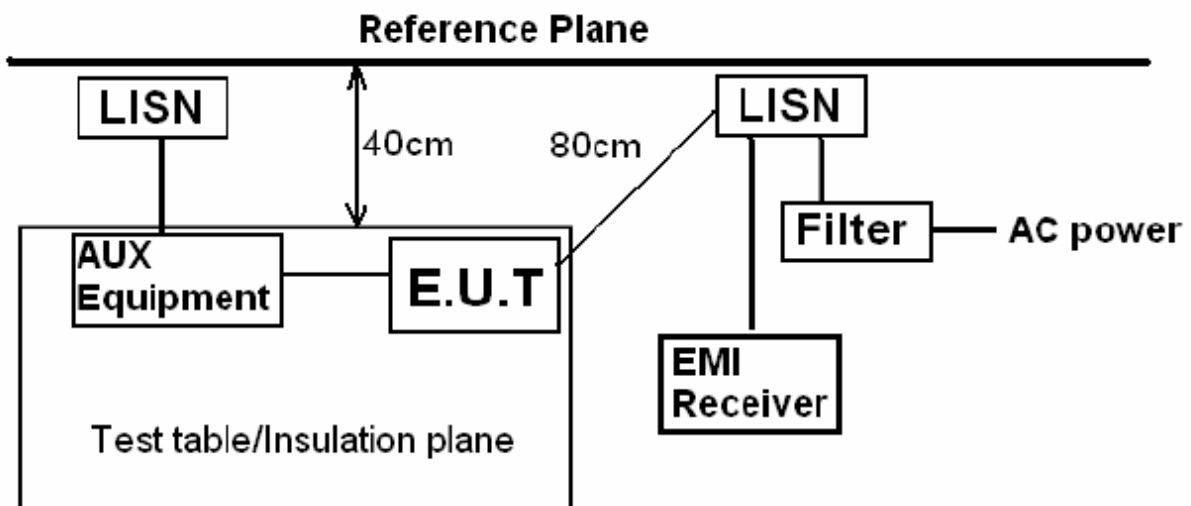
LIMIT

According to standard ETSI EN 301 489-1 v1.9.2 Clause 8.3.3, Table 8 and EN 55022: 2010+AC: 2011 Clause 5, Table 2, Class B

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

Frequency range (MHz)	Limits (dB(uV))	
	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



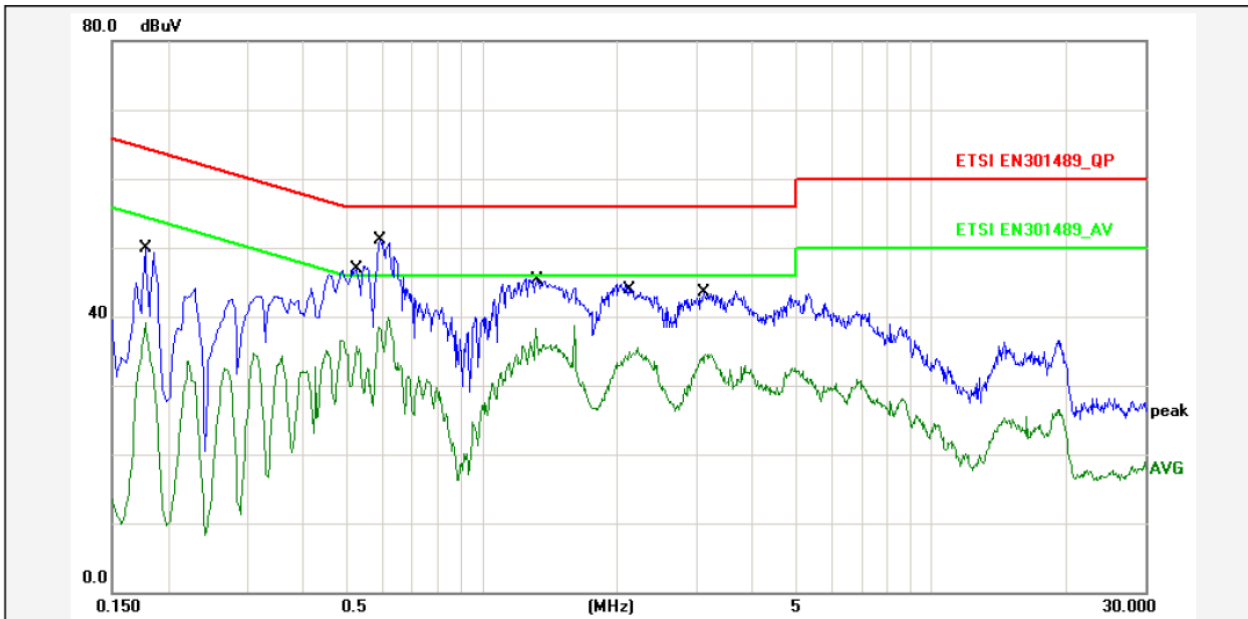
TEST PROCEDURE

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 8.3.3 and EN 55022: 2010+AC: 2011 Clause 5 for the measurement methods.

TEST RESULTS

PASS

Please refer to following data.

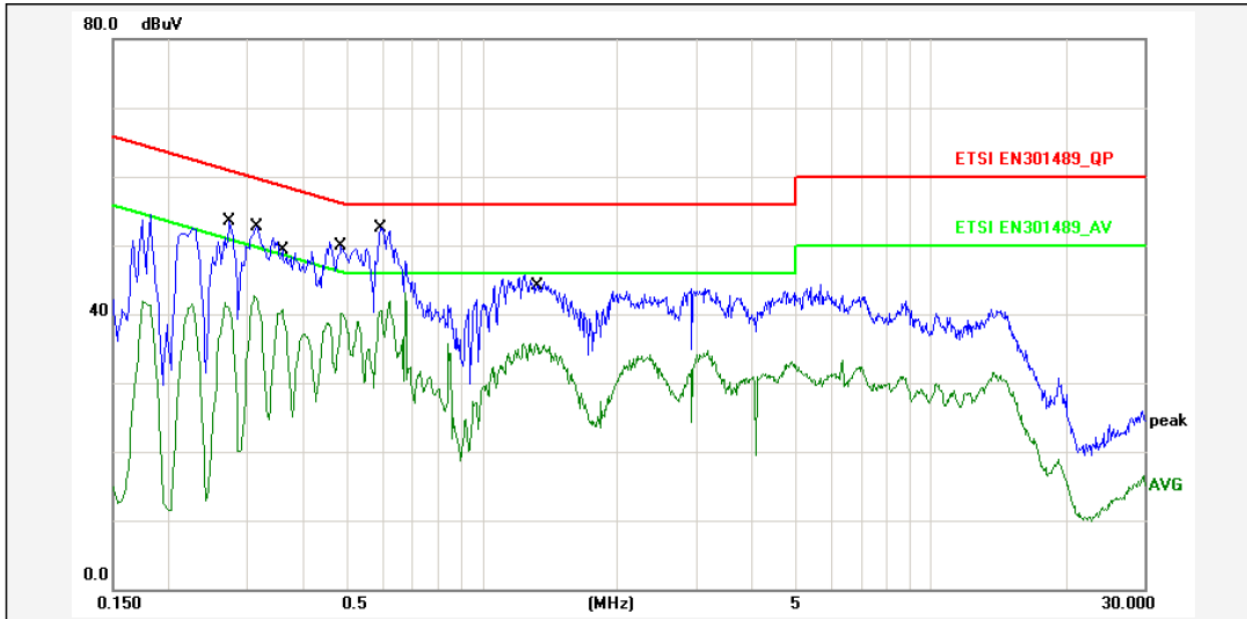


Report No.: A150X
 Test Standard: ETSI EN301489_QP
 Test item: Conducted Emission Phase: L1
 Applicant: FENDA Temp.()/Hum.(%): 24(C) / 58 %
 Product: 2.1 Computer Multimedia Speaker Power Rating: AC 230V/50Hz
 Model No.: A150X Test Engineer: Jess

Test Mode: TX+RX(BT Link)
 Remark:

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1780	10.80	37.00	47.80	64.57	-16.77	QP	P	
2	0.1780	10.80	26.30	37.10	54.57	-17.47	AVG	P	
3	0.5260	10.80	36.00	46.80	56.00	-9.20	QP	P	
4	0.5260	10.80	23.70	34.50	46.00	-11.50	AVG	P	
5	0.5940	10.80	38.30	49.10	56.00	-6.90	QP	P	
6	0.5940	10.80	27.10	37.90	46.00	-8.10	AVG	P	
7	1.3180	10.80	32.70	43.50	56.00	-12.50	QP	P	
8	1.3180	10.80	25.50	36.30	46.00	-9.70	AVG	P	
9	2.1339	10.80	30.10	40.90	56.00	-15.10	QP	P	
10	2.1339	10.80	22.10	32.90	46.00	-13.10	AVG	P	
11	3.1500	10.80	30.70	41.50	56.00	-14.50	QP	P	
12	3.1500	10.80	21.70	32.50	46.00	-13.50	AVG	P	

Note: Level=Reading+Factor.
 Margin=Limit-Level.



Report No.: A150X
 Test Standard: ETSI EN301489_QP
 Test item: Conducted Emission
 Applicant: FENDA
 Product: 2.1 Computer Multimedia Speaker
 Model No.: A150X
 Phase: N
 Temp.()/Hum.(%): 24(C) / 58 %
 Power Rating: AC 230V/50Hz
 Test Engineer: Jess

Test Mode: TX+RX(BT Link)
 Remark:

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2740	10.80	40.60	51.40	60.99	-9.59	QP	P	
2	0.2740	10.80	28.90	39.70	50.99	-11.29	AVG	P	
3	0.3140	10.80	39.80	50.60	59.86	-9.26	QP	P	
4	0.3140	10.80	29.80	40.60	49.86	-9.26	AVG	P	
5	0.3580	10.80	37.70	48.50	58.77	-10.27	QP	P	
6	0.3580	10.80	27.80	38.60	48.77	-10.17	AVG	P	
7	0.4860	10.80	37.10	47.90	56.24	-8.34	QP	P	
8	0.4860	10.80	27.30	38.10	46.24	-8.14	AVG	P	
9	0.5940	10.80	39.20	50.00	56.00	-6.00	QP	P	
10	0.5940	10.80	27.60	38.40	46.00	-7.60	AVG	P	
11	1.3220	10.80	32.80	43.60	56.00	-12.40	QP	P	
12	1.3220	10.80	22.90	33.70	46.00	-12.30	AVG	P	

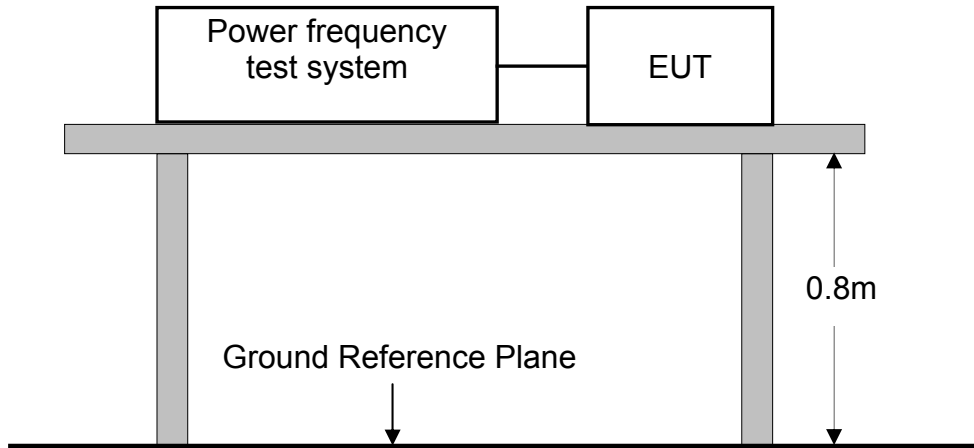
Note: Level=Reading+Factor.
 Margin=Limit-Level.

7.3 AC MAINS HARMONIC CURRENT EMISSION

LIMIT

Please refer to EN 61000-3-2

TEST CONFIGURATION



Ambient Condition of the Test Site			
Temperature	24°C	Test Voltage	AC 230V/50Hz
Humidity	52%RH	Tested by	Sance
Pressure	1022mbar		

TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted.

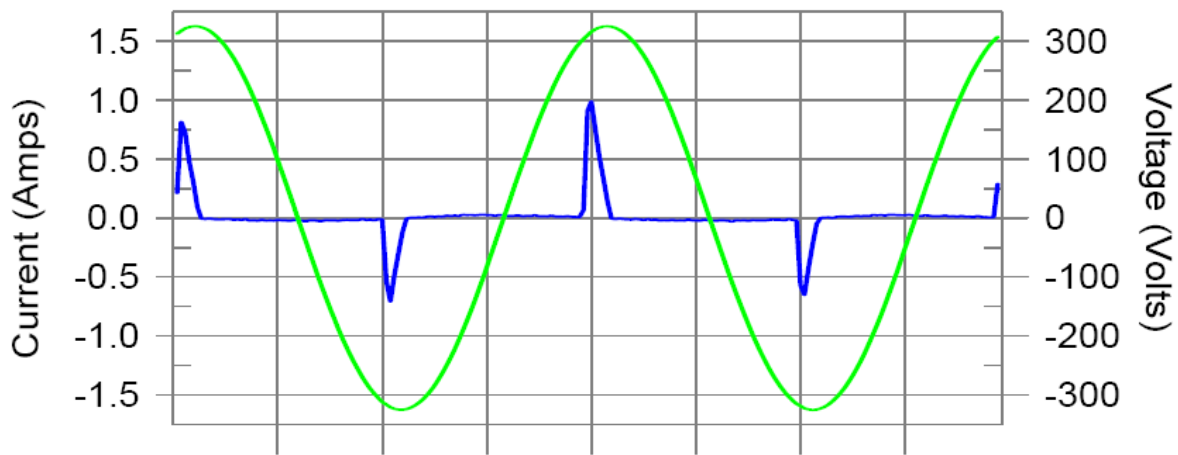
Test Mode: TX+RX

Harmonics – Class-A per Ed. 3.2 (2009)(Run time)

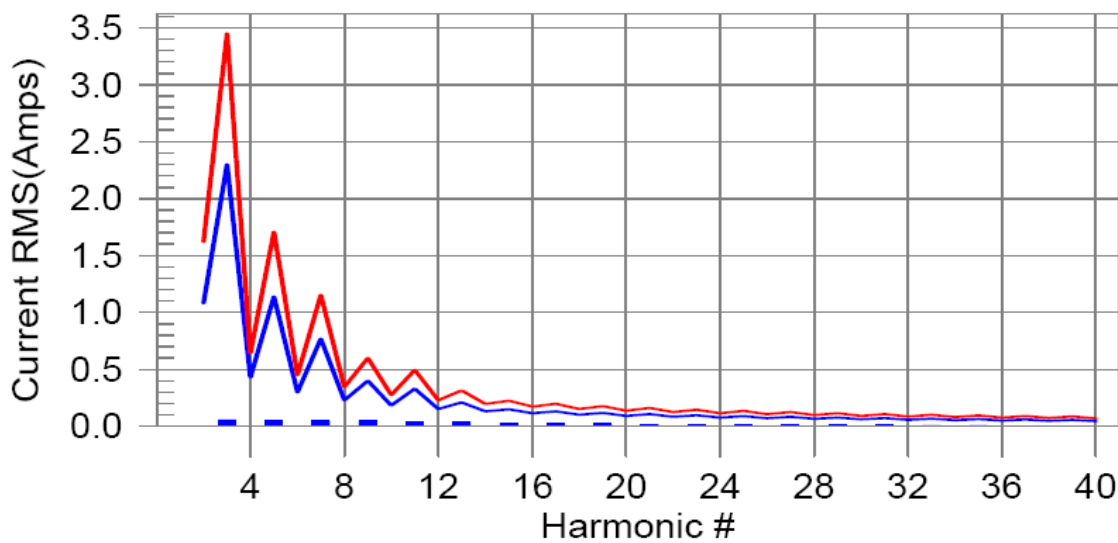
EUT: 2.1 Computer Multimedia Speaker
Test category: Class-A per Ed. 3.2 (2009) (European limits)
Test date: 2015-5-8
Test duration (min): 2.5
Comment: TX+RX
Customer: FENDA
Model:A150X
Test Result: Pass
Source qualification: Normal

Tested by: Sance
Test Margin: 100
Start time: 19:59:13
End time: 20:02:04
Data file name: H-000136.cts_data

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #15 with 17.13% of the limit.

Current Test Result Summary (Run time)

EUT: 2.1 Computer Multimedia Speaker Tested by: Sance
 Test category: Class-A per Ed. 3.2 (2009) (European limits) Test Margin: 100
 Test date: 2015-5-8 Start time: 19:59:13 End time: 20:02:04
 Test duration (min): 2.5 Data file name: H-000136.cts_data
 Comment: TX+RX
 Customer: FENDA
 Model:A150X
 Test Result: Pass Source qualification: Normal
 THC(A): 0.10 I-THD(%): 216.69 POHC(A): 0.028 POHC Limit(A): 0.265
 Highest parameter values during test:

V_RMS (Volts): 230.22	Frequency(Hz): 50.00
I_Peak (Amps): 1.044	I_RMS (Amps): 0.184
I_Fund (Amps): 0.061	Crest Factor: 9.598
Power (Watts): 12.8	Power Factor: 0.407

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.003	1.080	0.0	0.005	1.620	0.29	Pass
3	0.040	2.300	1.7	0.056	3.450	1.61	Pass
4	0.003	0.430	0.0	0.004	0.645	0.62	Pass
5	0.038	1.140	3.4	0.053	1.710	3.12	Pass
6	0.003	0.300	0.0	0.004	0.450	0.88	Pass
7	0.037	0.770	4.8	0.050	1.155	4.31	Pass
8	0.003	0.230	0.0	0.004	0.345	1.21	Pass
9	0.034	0.400	8.6	0.046	0.600	7.63	Pass
10	0.003	0.184	0.0	0.004	0.276	1.55	Pass
11	0.032	0.330	9.6	0.041	0.495	8.31	Pass
12	0.003	0.153	0.0	0.004	0.230	1.87	Pass
13	0.029	0.210	13.7	0.036	0.315	11.45	Pass
14	0.003	0.131	0.0	0.004	0.197	2.14	Pass
15	0.026	0.150	17.1	0.031	0.225	13.78	Pass
16	0.003	0.115	0.0	0.004	0.173	2.38	Pass
17	0.023	0.132	17.1	0.026	0.199	13.11	Pass
18	0.003	0.102	0.0	0.004	0.153	2.63	Pass
19	0.019	0.118	16.4	0.022	0.178	12.10	Pass
20	0.003	0.092	0.0	0.004	0.138	2.85	Pass
21	0.016	0.107	15.3	0.018	0.161	10.92	Pass
22	0.003	0.084	0.0	0.004	0.125	3.03	Pass
23	0.014	0.098	14.0	0.014	0.147	9.79	Pass
24	0.003	0.077	0.0	0.004	0.115	3.15	Pass
25	0.011	0.090	12.5	0.012	0.135	8.95	Pass
26	0.003	0.071	0.0	0.003	0.106	3.19	Pass
27	0.009	0.083	11.1	0.011	0.125	8.44	Pass
28	0.002	0.066	0.0	0.003	0.099	3.32	Pass
29	0.008	0.078	9.9	0.010	0.116	8.20	Pass
30	0.002	0.061	0.0	0.003	0.092	3.26	Pass
31	0.007	0.073	9.0	0.009	0.109	7.93	Pass
32	0.002	0.058	0.0	0.003	0.086	3.24	Pass
33	0.006	0.068	8.3	0.008	0.102	7.71	Pass
34	0.002	0.054	0.0	0.003	0.081	3.15	Pass
35	0.005	0.064	7.8	0.007	0.096	7.34	Pass
36	0.002	0.051	0.0	0.002	0.077	3.06	Pass
37	0.005	0.061	7.5	0.006	0.091	6.81	Pass
38	0.002	0.048	0.0	0.002	0.073	2.94	Pass
39	0.004	0.058	7.2	0.005	0.087	6.22	Pass
40	0.002	0.046	0.0	0.002	0.069	2.86	Pass

Voltage Source Verification Data (Run time)

EUT: 2.1 Computer Multimedia Speaker Tested by: Sance
 Test category: Class-A per Ed. 3.2 (2009) (European limits) Test Margin: 100
 Test date: 2015-5-8 Start time: 19:59:13 End time: 20:02:04
 Test duration (min): 2.5 Data file name: H-000136.cts_data
 Comment: TX+RX
 Customer: FENDA
 Model:A150X
 Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 230.22	Frequency(Hz): 50.00
I_Peak (Amps): 1.044	I_RMS (Amps): 0.184
I_Fund (Amps): 0.061	Crest Factor: 9.598
Power (Watts): 12.8	Power Factor: 0.407

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.081	0.460	17.52	OK
3	0.547	2.072	26.39	OK
4	0.075	0.460	16.29	OK
5	0.059	0.921	6.39	OK
6	0.035	0.460	7.63	OK
7	0.042	0.691	6.15	OK
8	0.019	0.460	4.12	OK
9	0.047	0.460	10.14	OK
10	0.013	0.460	2.81	OK
11	0.028	0.230	12.32	OK
12	0.018	0.230	7.75	OK
13	0.028	0.230	12.34	OK
14	0.007	0.230	2.96	OK
15	0.017	0.230	7.43	OK
16	0.008	0.230	3.57	OK
17	0.022	0.230	9.74	OK
18	0.014	0.230	5.97	OK
19	0.028	0.230	12.00	OK
20	0.026	0.230	11.48	OK
21	0.022	0.230	9.45	OK
22	0.007	0.230	2.98	OK
23	0.017	0.230	7.53	OK
24	0.006	0.230	2.73	OK
25	0.016	0.230	6.89	OK
26	0.006	0.230	2.65	OK
27	0.017	0.230	7.41	OK
28	0.007	0.230	2.86	OK
29	0.014	0.230	6.10	OK
30	0.005	0.230	2.00	OK
31	0.013	0.230	5.85	OK
32	0.006	0.230	2.65	OK
33	0.013	0.230	5.52	OK
34	0.005	0.230	2.05	OK
35	0.013	0.230	5.74	OK
36	0.005	0.230	2.17	OK
37	0.012	0.230	5.26	OK
38	0.005	0.230	2.08	OK
39	0.013	0.230	5.51	OK
40	0.013	0.230	5.74	OK

7.4 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	24°C	Test Voltage	AC 230V/50Hz
Humidity	52%RH	Tested by	Sance
Pressure	1022mbar		

TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted.

Test Mode : TX+RX

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

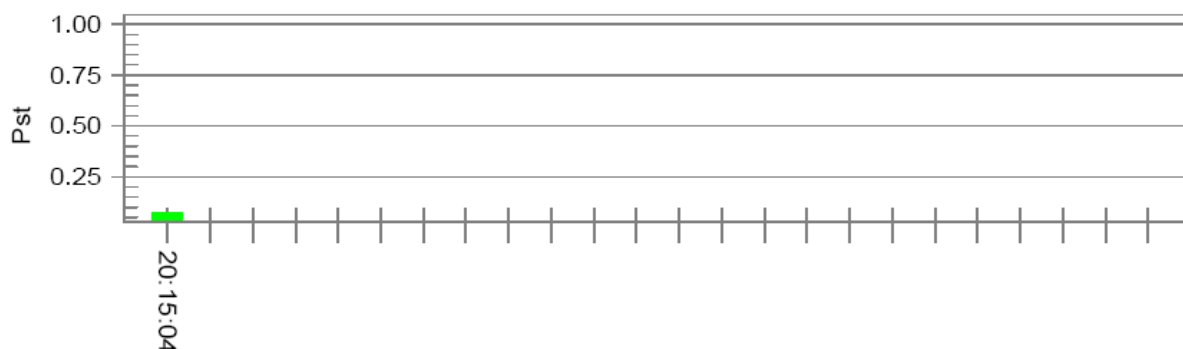
EUT: 2.1 Computer Multimedia Speaker
 Test category: All parameters (European limits)
 Test date: 2015-5-8
 Test duration (min): 10
 Comment: TX+RX
 Customer: FENDA
 Model:A150X
 Test Result: Pass

Tested by: Sance
 Test Margin: 100
 End time: 20:15:06
 Start time: 20:04:34
 Data file name: F-000106.cts_data

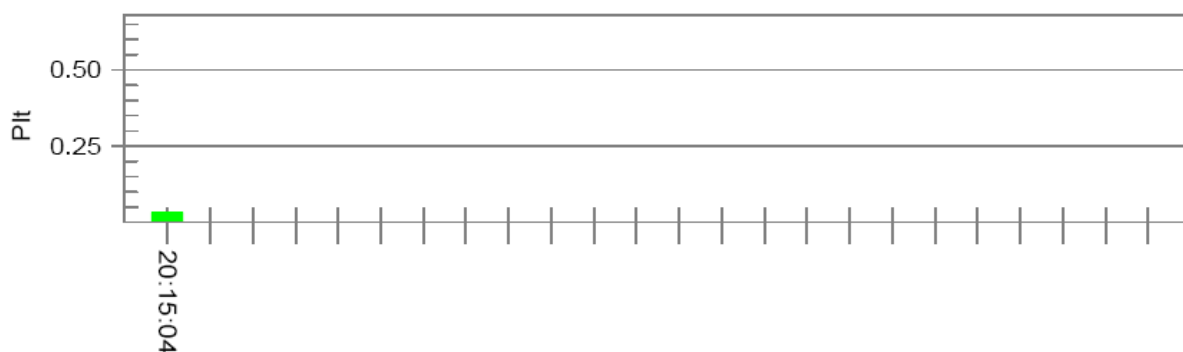
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line

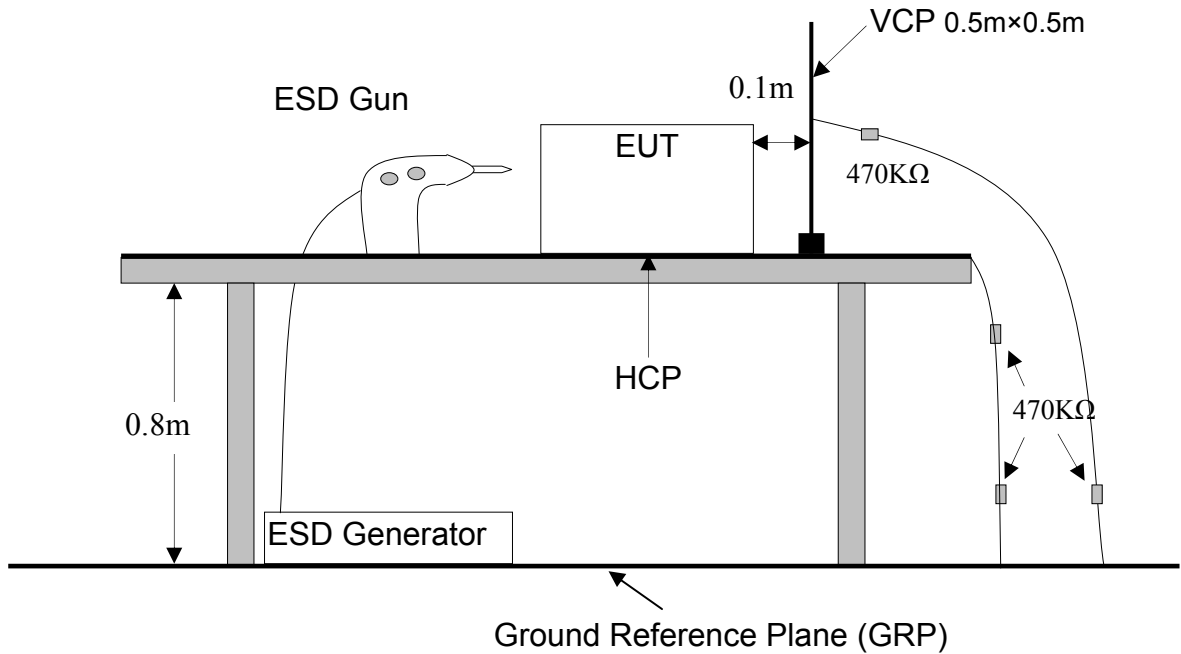


Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.19		
Highest dt (%):	0.21	Test limit (%):	3.30 Pass
Tmax(mS) > dt:	0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.20	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.073	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.032	Test limit:	0.650 Pass

7.5 ELECTROSTATIC DISCHARGE

TEST CONFIGURATION



TEST PROCEDURE:

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

TEST RESULT

PASS

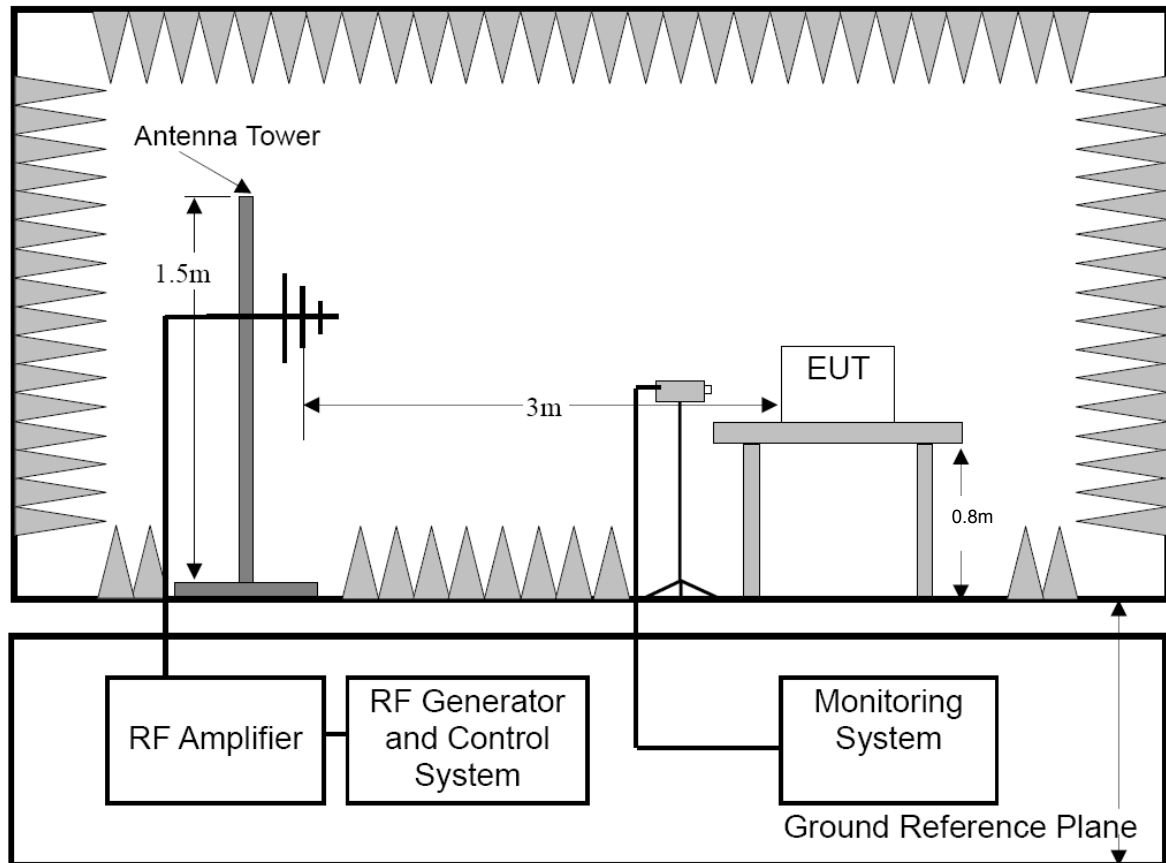
please refer to following data table.

Test Condition			
Temperature	24°C	Test Voltage	AC 230V/50Hz
Humidity	52%RH	Tested by	Sance
Pressure	1022mbar	Performance Criterion :	CR & CT & B
Ground Bond Resistance		0.2 Ω	
Time Between Each Discharge :		1 second	
Test Mode		TX+RX	
Test Level		±2.0, 4.0, 8.0 kV (Air Discharge) ±2.0, 4.0 kV (Contact Discharge) ± 2.0, ±4.0 kV (Indirect Contact Discharge)	
Test Result			
Discharge Type	Level	Result	
Contact Discharge	±2, 4kV	Pass*	
Air Discharge	±2, 4, 6, 8kV	Pass*	
Indirect HCP Discharge	± 2, ± 4kV	Pass*	
Indirect VCP Discharge	± 2, ± 4kV	Pass*	

Note: “*”: During the test the EUT stops working, and it should be recovered by users after test. This test result was performed based on the client's product specifications and user's manual

7.6 RF ELECTROMAGNETIC FIELD

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 9.2.2 and EN61000-4-3 for the measurement methods.

TEST RESULT

PASS

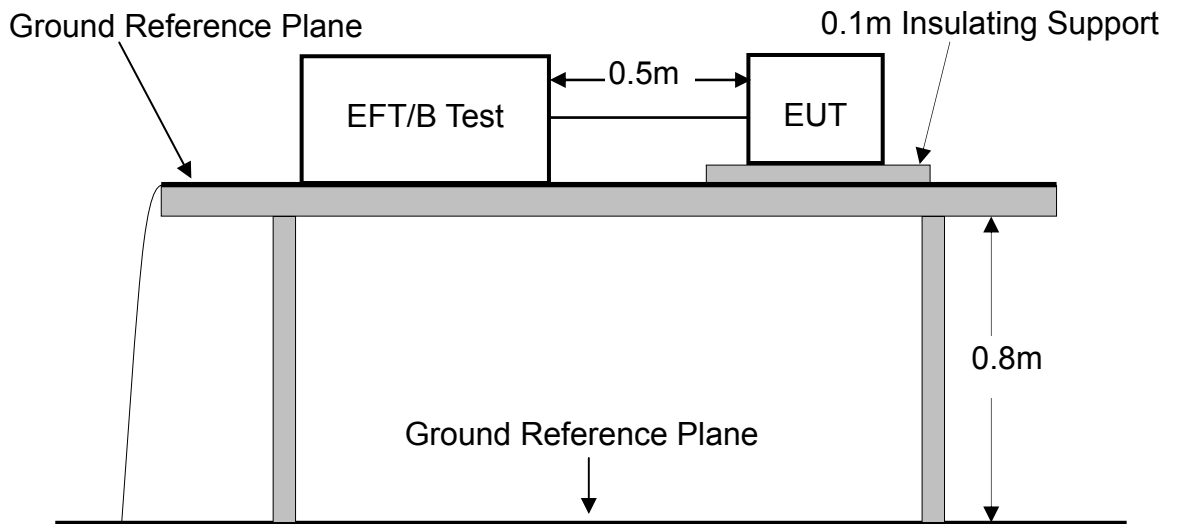
please refer to following data table.

Test Condition			
Temperature	24°C	Test Voltage	AC 230V 50Hz
Humidity	52%RH	Tested by	Sance
Pressure	1022mbar	Performance Criterion	CR & CT & A
Frequency Range		80-1000MHz and 1400-2700 MHz	
Test Modulation		1kHz, 80% AM	
Dwell time		1 second	
Frequency Step		1%	
Antenna Polarization		Horizontal and Vertical	
Test Mode		TX+RX	
Test Level		3V/m	
Test Result			
Frequency (MHz)	Exposed Side		Result
80 to 1000 1400 to 2700	Front		Pass
80 to 1000 1400 to 2700	Left		Pass
80 to 1000 1400 to 2700	Rear		Pass
80 to 1000 1400 to 2700	Right		Pass

Note: The exclusion band for 2,45 GHZ equipment falling within the scope of the present document extends from 2 280 MHz to 2 607,675 MHz.

7.7 AC MAINS FAST TRANSIENTS COMMON MODE

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

TEST RESULT

PASS

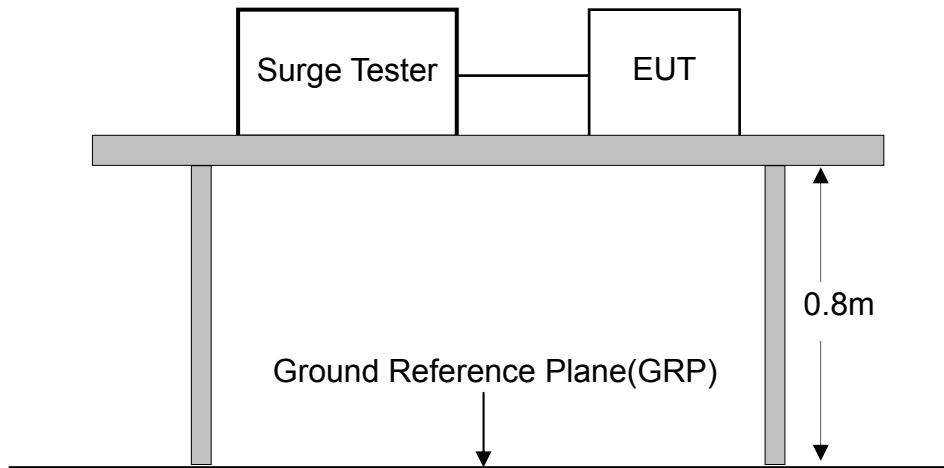
please refer to following data table.

Test Condition			
Temperature	24°C	Test Voltage	AC 230V/50Hz
Humidity	52%RH	Tested by	Sance
Pressure	1022mbar	Performance Criterion	CR & CT & B
Impulse Frequency		5kHz	
Tr/Th		5/50ns	
Burst Duration		15ms	
Burst Period		300ms	
Port		AC Power	
Test Mode		TX+RX	
Test Level		±1.0kV	
Test Result			
Injection Line	Level		Result
Line	±1.0kV		Pass**
Neutral	±1.0kV		Pass**
PE	N/A		N/A
Line + Neutral	±1.0kV		Pass**
Line + PE	N/A		N/A
Neutral + PE	N/A		N/A
DC Power Line	N/A		N/A
Signal Line	N/A		N/A

Note: “**”: During the test, the sound of EUT muting occurs during test, but it can be resumed by itself after test.

7.8 AC MAINS SURGE

TEST CONFIGURATION



TEST PROCEDURE:

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

TEST RESULT

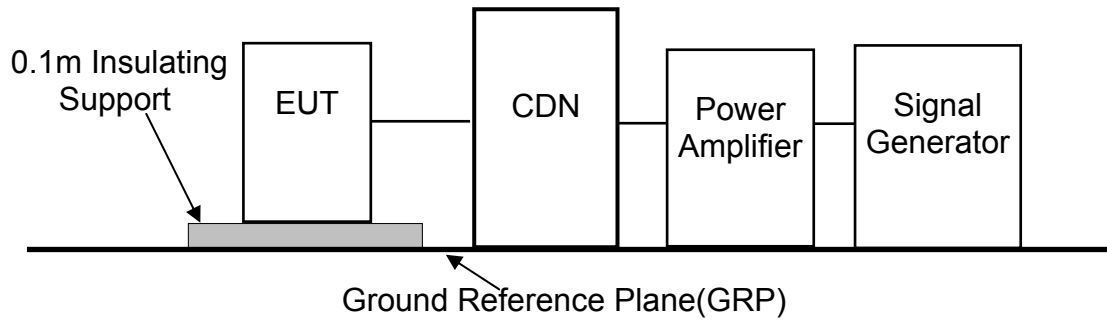
PASS

please refer to following data table.

Test Condition			
Temperature	24°C	Test Voltage	AC 230V/50Hz
Humidity	52%RH	Tested by	Sance
Pressure	1022mbar	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		TX+RX	
Test Level		±1.0kV / 5 Positive And 5 Negative Surges	
Test Result			
Coupling Line	Level	Result	
Line + Neutral	±1.0kV	Pass	
Line + PE	N/A	N/A	
Neutral + PE	N/A	N/A	
T, R-Ground	N/A	N/A	
L1, 2, 3, 4-G (LAN)	N/A	N/A	

7.9 RADIO FREQUENCY COMMON MODE

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 v1.9.2 Clause 9.5.2, EN61000-4-6 for the measurement methods.

TEST RESULT

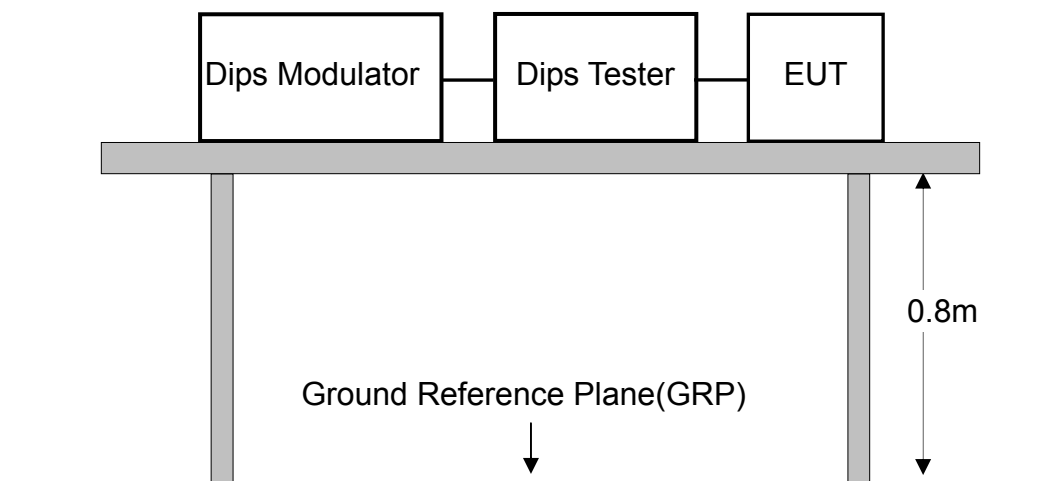
PASS

please refer to following data table.

Test Condition			
Temperature	24°C	Test Voltage	AC 230V/50Hz
Humidity	52%RH	Tested by	Sance
Pressure	1022mbar	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	TX+RX		
Test Level	3V(r.m.s)		
Test Result			
Injection Line	Level	Result	
AC Power Line	3V(r.m.s)	Pass	
Telecommunication Line	N/A	N/A	
DC Line	N/A	N/A	
Signal Line	N/A	N/A	
Control Line	N/A	N/A	

7.10 VOLTAGE DIPS AND INTERRUPTION

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 V1.9.2 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	24°C	Test Voltage	AC 230V 50Hz	
Humidity	52%RH	Tested by	Sance	
Pressure	1022mbar	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		TX+RX		
Test Level				
	Test Level (% U _T)	Reduction (%)	Duration (ms)	Criterion
Voltage Dips	70	30%	500	A
	0	100%	20	A
	0	100%	10	A
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 stops working, and it should be recovered by users after test.

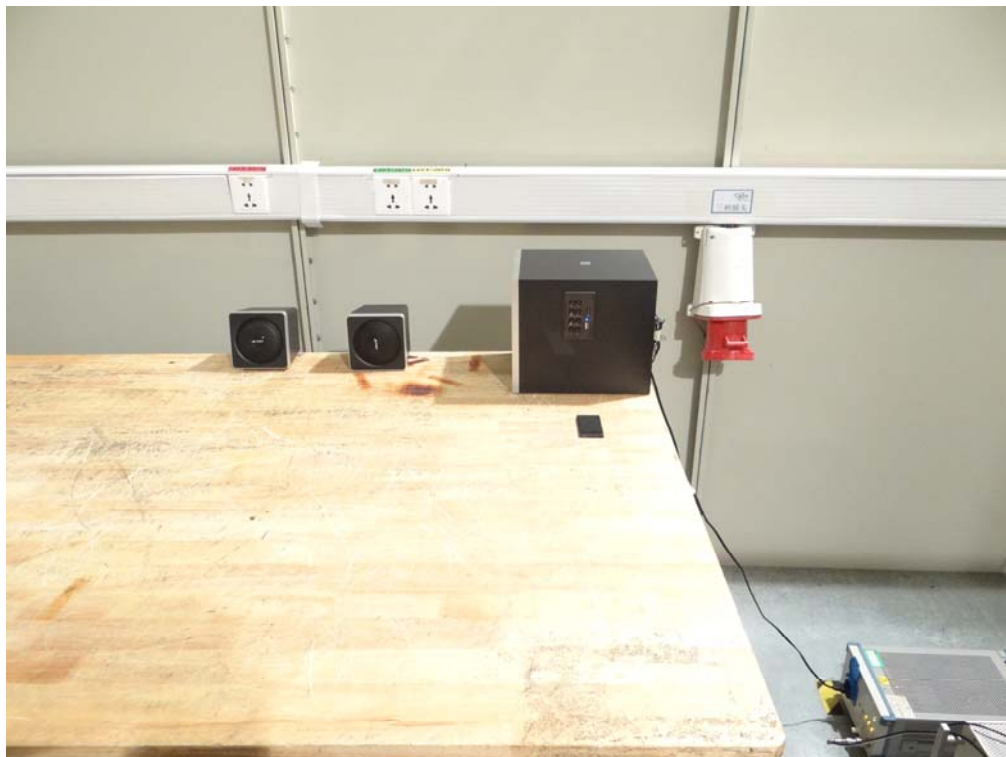
7.11 TEST EQUIPMENT LIST

Description	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due Date
Receiver	Rohde & Schwarz	ESCI7	100837	Nov.24,2014	Nov.23, 2015
Receiver	Rohde & Schwarz	ESCI	101152	Nov.24,2014	Nov.23, 2015
Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	Sep.02, 2014	Sep.01, 2015
Pre-Amplifier	HP	8447D	2944A07999	Nov.08, 2014	Nov.07, 2015
Broadband Antenna	Schwarzbeck	VULB9162	9162-010	Nov.27,2014	Nov. 26,2015
Horn Antenna	COM-Power	AH-118	071078	Nov. 06,2014	Nov. 05, 2015
Pre-Amplifier	COM-Power	PAM-118	443007	Nov. 05, 2014	Nov. 04, 2015
Cable	Huber+Suhner	CIL02	N/A	Nov.08,2014	Nov.07,2015
RF Switching Unit	Compliance Direction Systems Inc	RSU-M2	38311	Nov.05,2014	Nov.04,2015
Pulse Limiter	MTS-systemtechnik	MTS-IMP-136	261115-010-002 2	Nov.05,2014	Nov.04,2015
RF Power Meter	ESE	4242	13984	Sep.01,2014	Aug.31,2015
Power Amplifier	TESEQ	CBA 1G-150	T44029	Sep.01,2014	Aug.31,2015
Signal Generator	Agilent	N5181A	MY50142530	Sep.01,2014	Aug.31,2015
Antenna Log-Periodic	CORAD	ATR80M6G	0337307	Sep.01,2014	Aug.31,2015
Switch Controller	CORAD	SC1000	0337343	Sep.01,2014	Aug.31,2015
Power Sensor	ESE	51011EMC	35716	Sep.01,2014	Aug.31,2015
Power Amplifier	TESEQ	CBA 3G-100	T44030	Sep.01,2014	Aug.31,2015

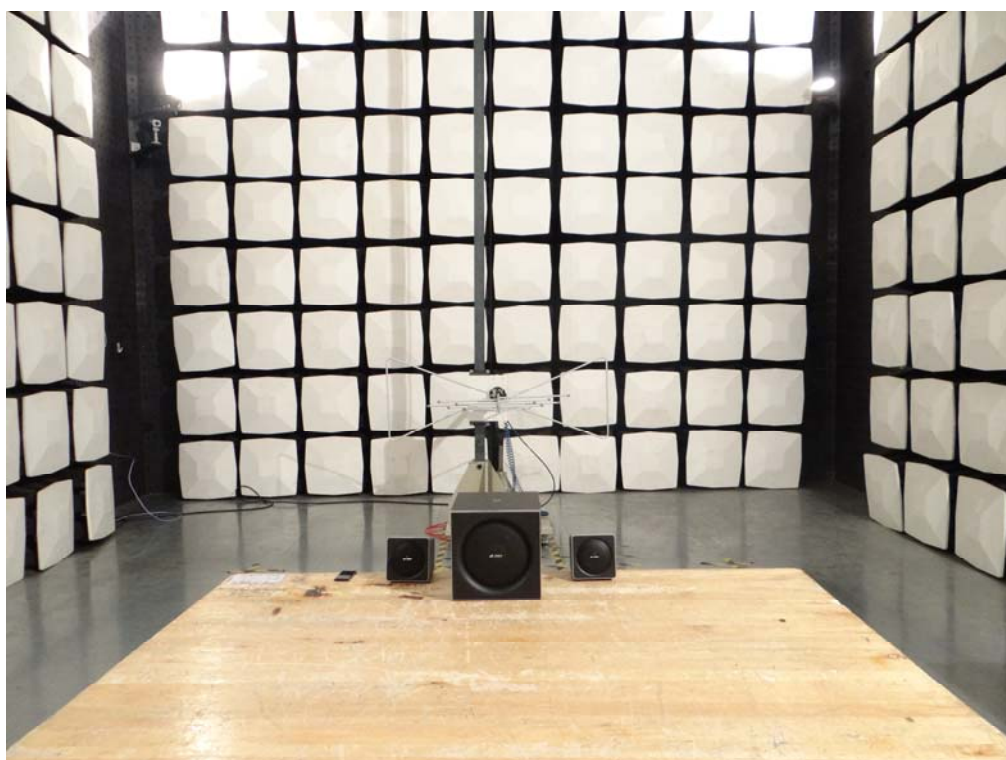
Description	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due Date
Dual Directional Coupler	TESEQ	C5982	95208	Sep.01,2014	Aug.31,2015
Dual Directional Coupler	TESEQ	C6187	95175	Sep.01,2014	Aug.31,2015
Signal Generator	HP	8648A	3426A01263	Oct.19,2014	Oct.18,2015
CDN	Luthi	L-801M2/M3	2015	Oct.19,2014	Oct.18,2015
CDN(AUX)	TESEQ	CDN M016	27452	Oct.19,2014	Oct.18,2015
6dB 50Watt Attenuator	HUBER+SUHNER	5906.17.0005	303688	Oct.19,2014	Oct.18,2015
Signal Amplifier	HAEFELY	PAMP250	149594	Oct.19,2014	Oct.18,2015
Electromagnetic Injection Clamp	Luthi	EM101	35640	Oct.19,2014	Oct.18,2015
C/S Test System	HAEFELY	WinPAMP	NSEMC002	Oct.19,2014	Oct.18,2015
Power Frequency Test System	CI	CTS	72846	Nov. 05,2014	Nov. 04,2015
Software	CI	CTS30	N/A	N/A	N/A
ESD Tester	TESEQ	NSG 437	432	Nov. 09, 2014	Nov. 08, 2015
EMS Test System	EM TEST	UCS 500N	V1104108683	Nov. 20, 2014	Nov. 19, 2015
Dips Modulator	EM TEST	V4780S2	0111-11	Nov. 20, 2014	Nov. 19, 2015
Test Soft	EM TEST	lec.control	N/A	N/A	N/A
L.I.S.N	Rohde & Schwarz	ENV 216	101317	Nov. 08, 2014	Nov. 07, 2015

APPENDIX 1 PHOTOGRPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST



RADIATED EMISSION TEST



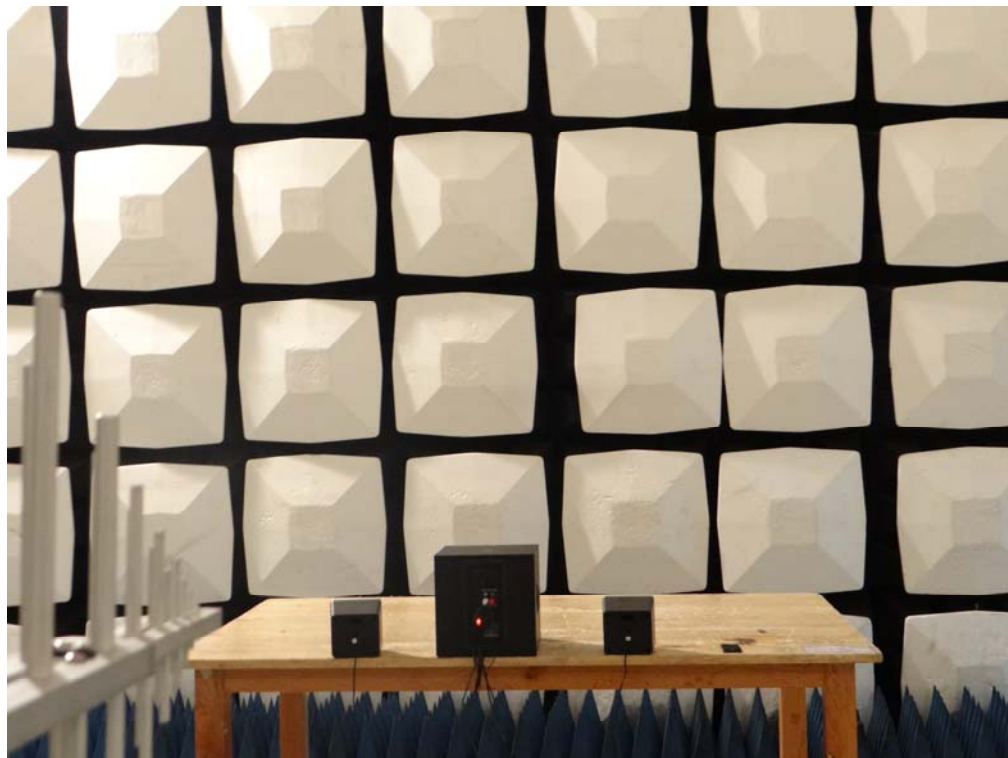
POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST



ELECTROSTATIC DISCHARGE TEST



RADIATED ELECTROMAGNETIC FIELD TEST



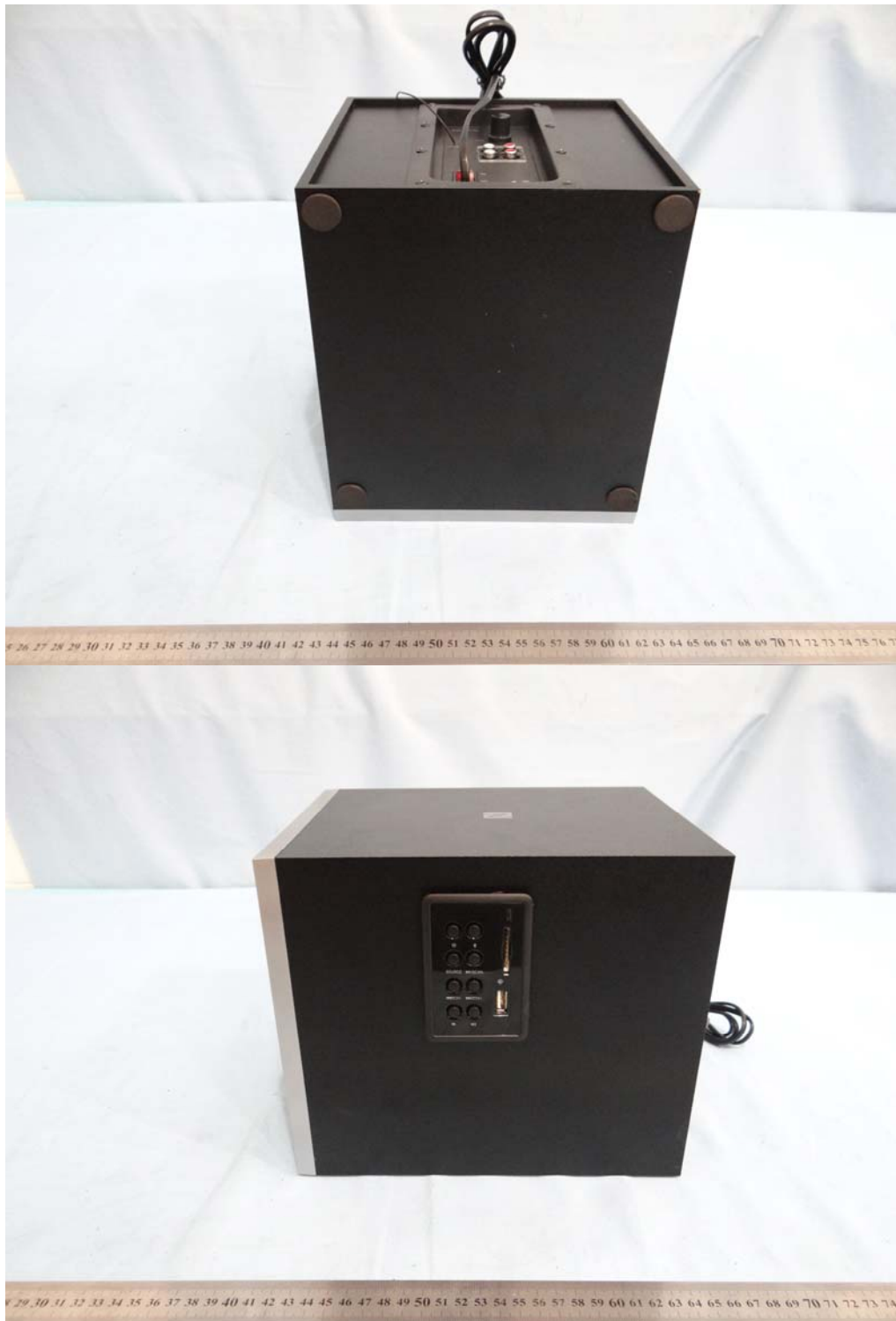
ELECTRICAL FAST TRANSIENTS/BURST/ SURGE/ VOLTAGE DIPS TEST



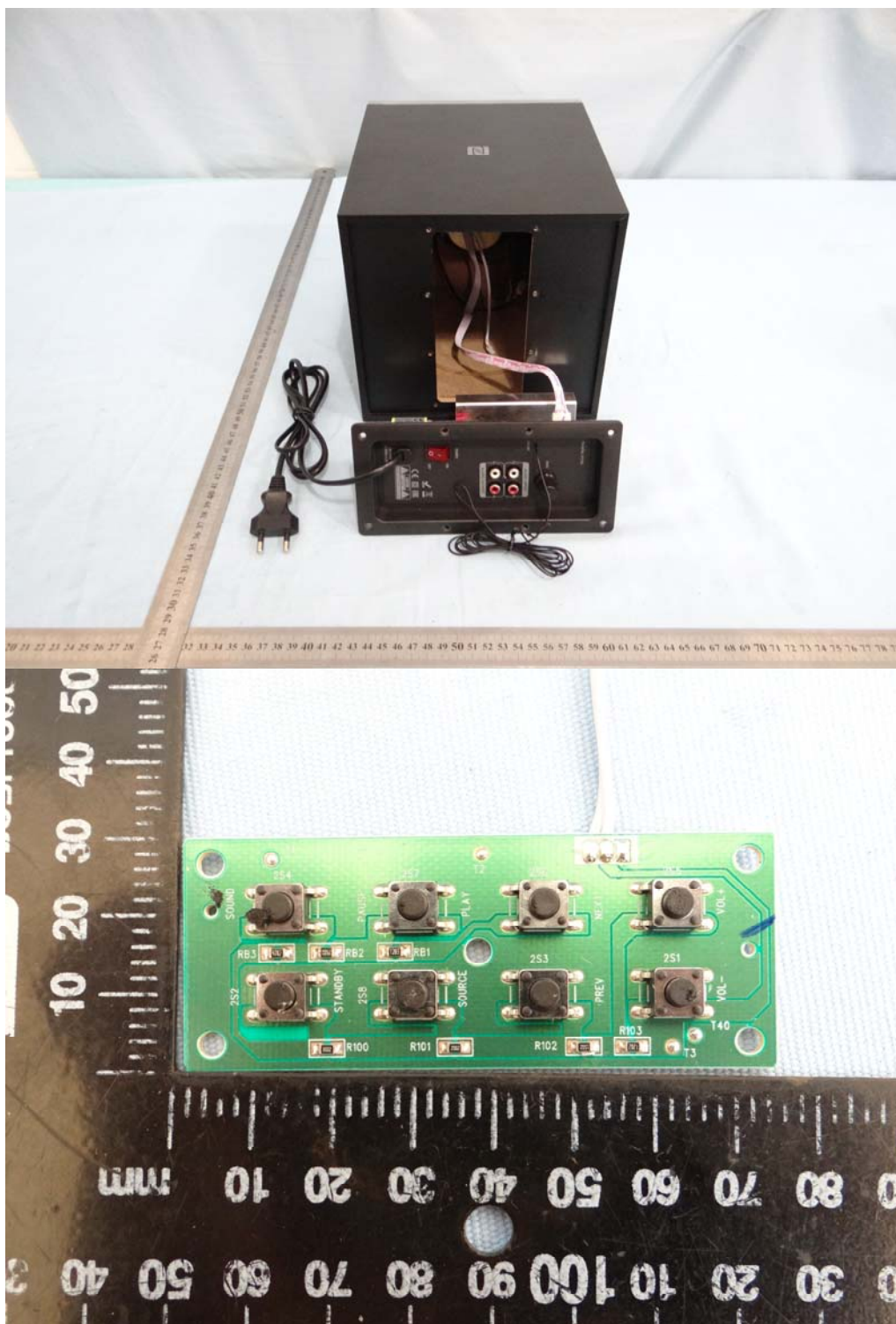
General Appearance of the EUT

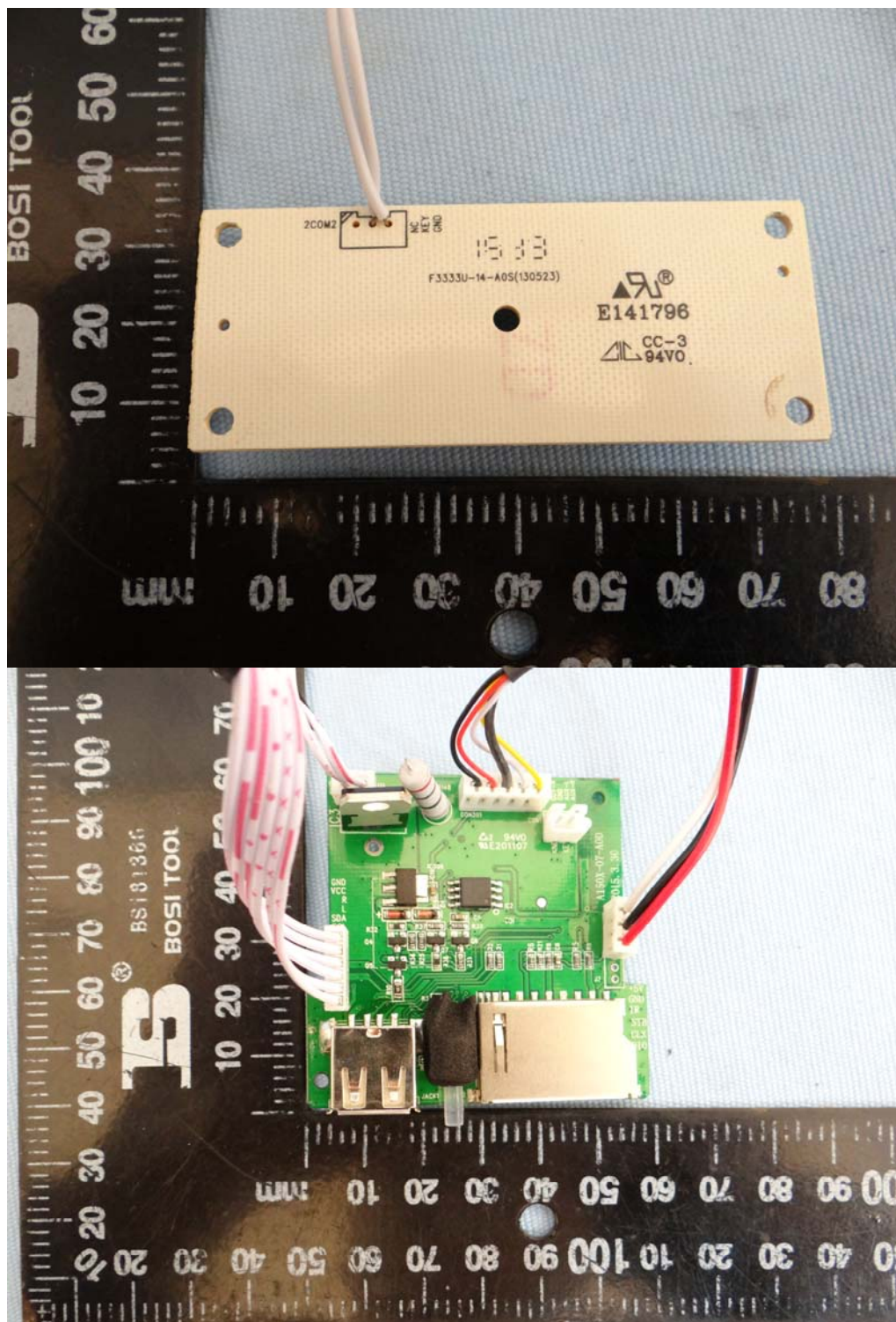


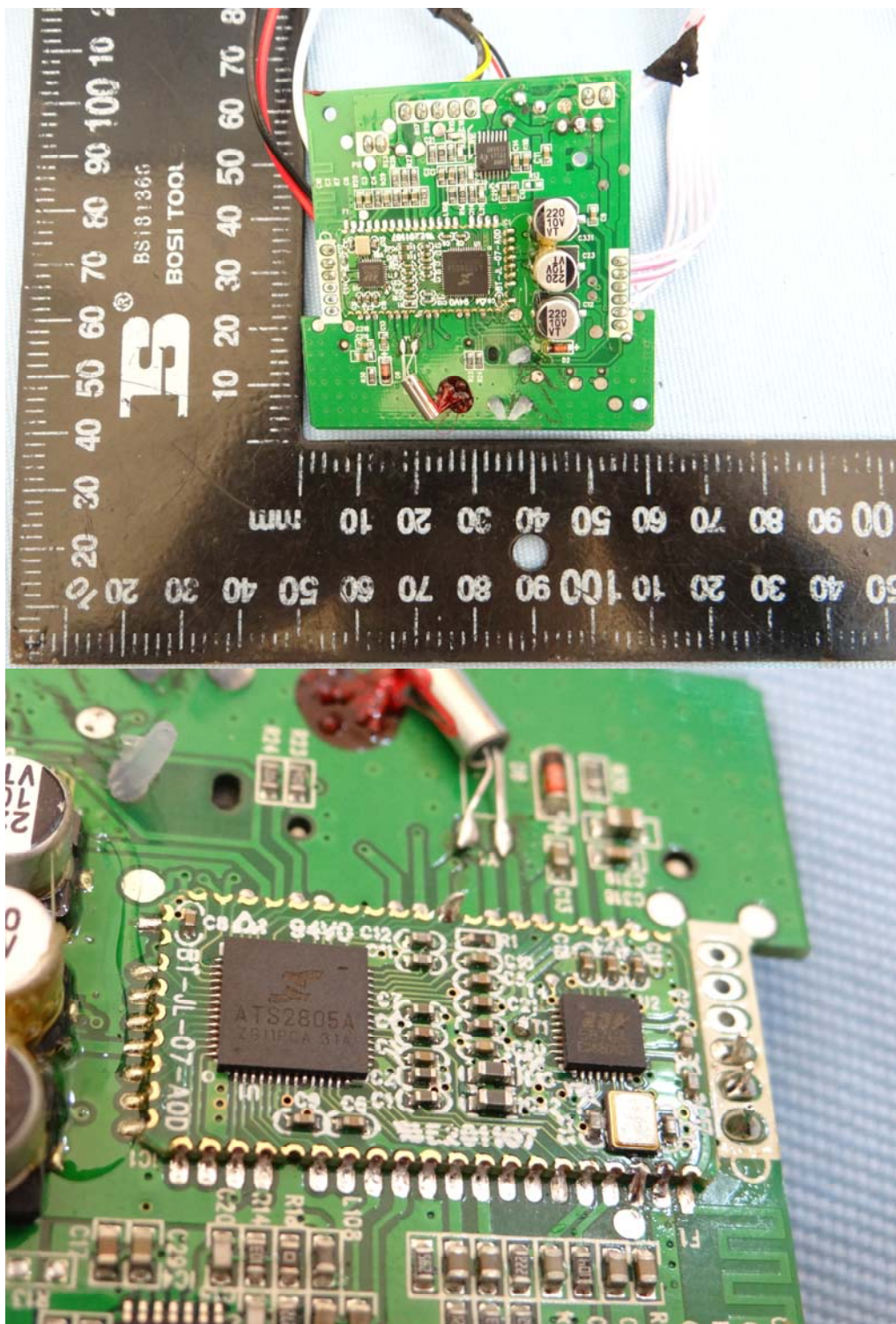


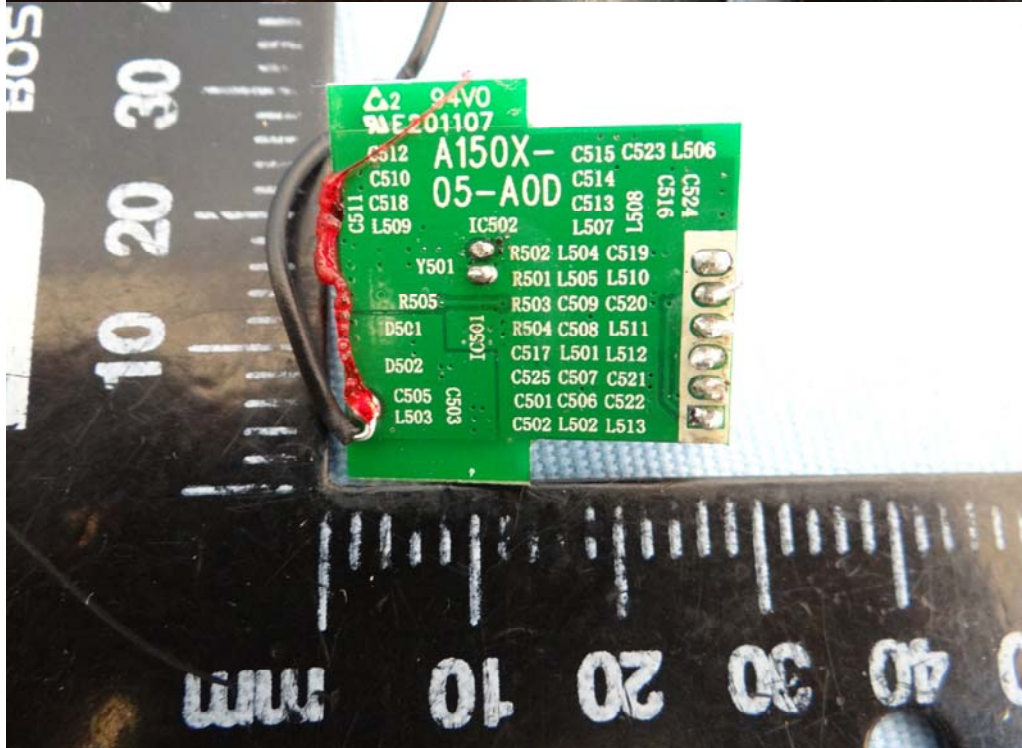
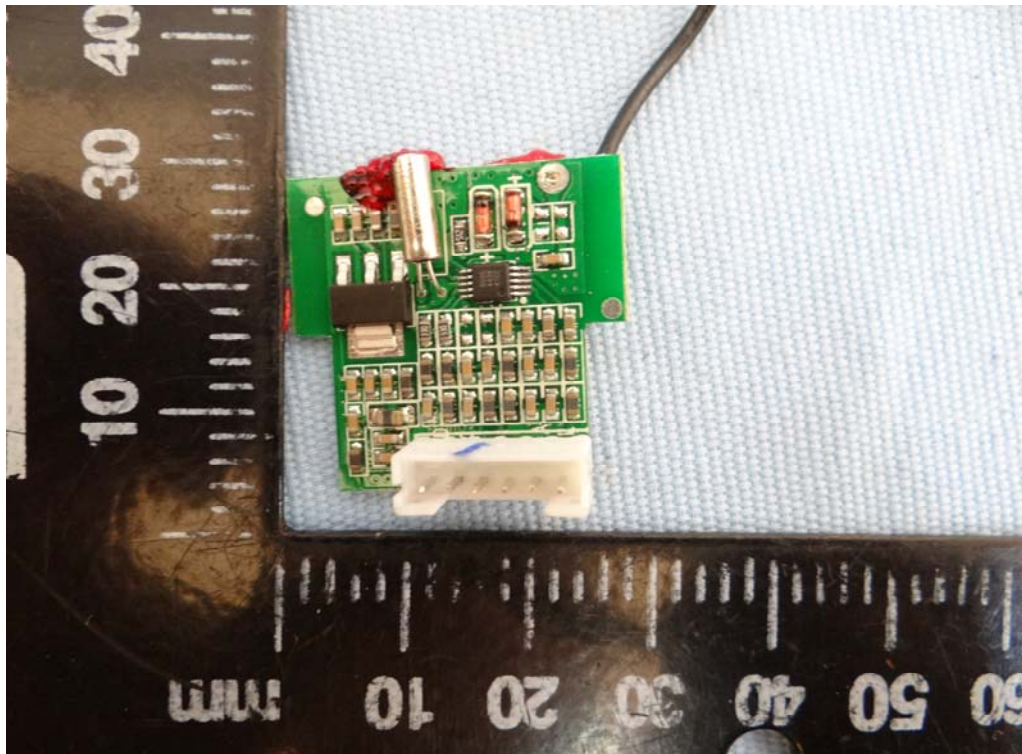


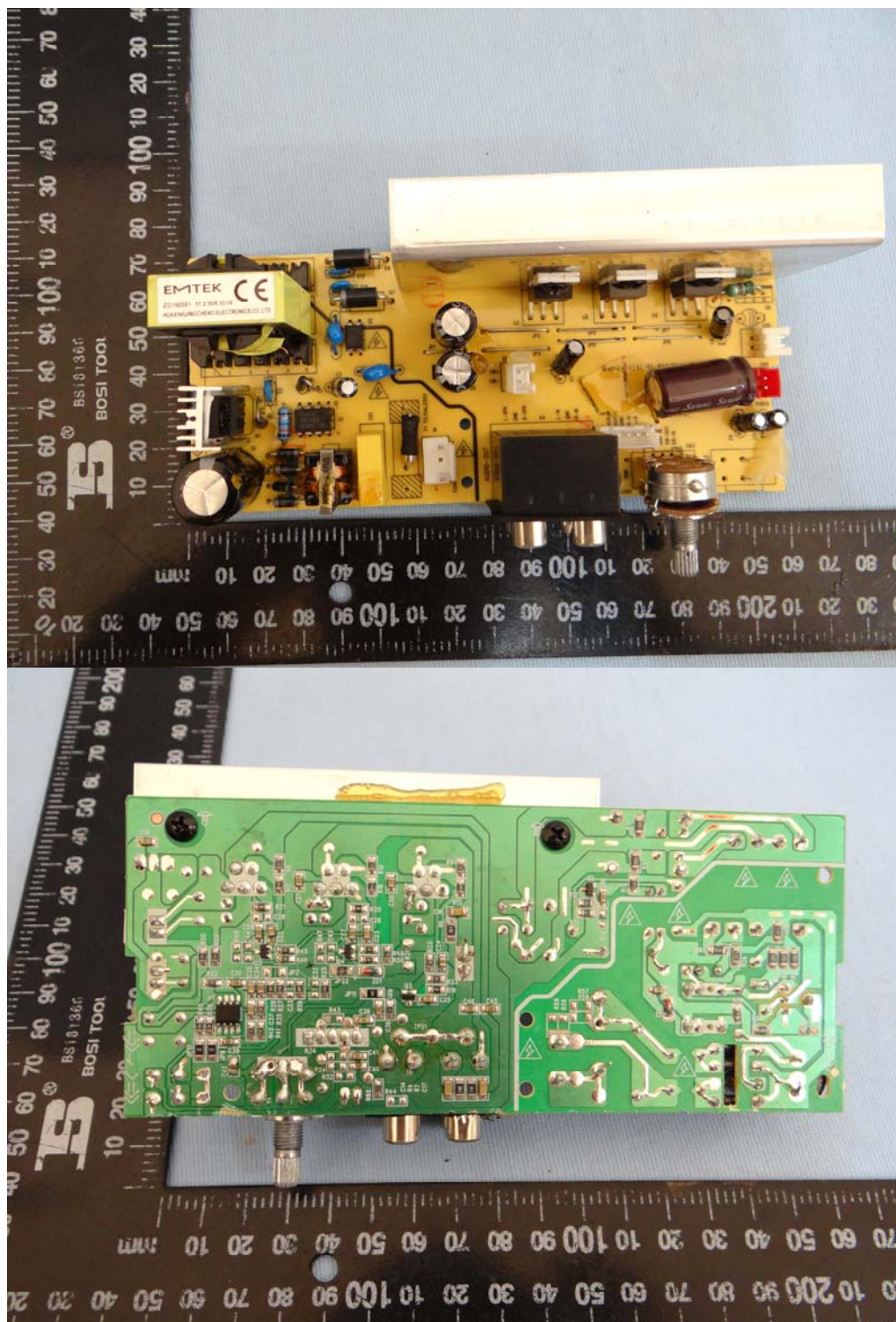












--- End ---