

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. : T-70X, T-77X, T-70BT, T-80X, T-68X, T-60X Plus
(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 : May 08, 2019; November 20, 2019
Date of Test : May 09, 2019 to July 07, 2019;
November 20, 2019 to December 04, 2019
Date of Report : December 05, 2019

This Test Report is Issued Under the Authority of :

Prepared by

Approved & Authorized Signer


Alina Guo / Engineer
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.

TABLE OF CONTENTS

| | |
|--|-----------|
| 1. GENERAL INFORMATION | 4 |
| PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST | 4 |
| 2. SUMMARY OF TEST RESULTS | 6 |
| 3. TEST METHODOLOGY | 7 |
| 4. MEASURING INSTRUMENT CALIBRATIONA | 7 |
| 5. TEST FACILITY | 7 |
| 6. SUPPORT EQUIPMENT | 8 |
| 7. PERFORMANCE CRITERIA | 9 |
| 8. ETSI EN 301 489-1/-17 REQUIREMENTS | 10 |
| 8.1 RADIATED EMISSION LIMIT | 10 |
| 8.2 AC POWER CONDUCTED EMISSION | 16 |
| 8.3 AC MAINS HARMONIC CURRENT EMISSION | 19 |
| 8.4 AC MAINS VOLTAGE FLUCTUATION AND FLICKER | 20 |
| 8.5 ELECTROSTATIC DISCHARGE | 22 |
| 8.6 RF ELECTROMAGNETIC FIELD | 26 |
| 8.7 AC MAINS FAST TRANSIENTS COMMON MODE | 28 |
| 8.8 AC MAINS SURGE | 30 |
| 8.9 RADIO FREQUENCY COMMON MODE | 32 |
| 8.10 VOLTAGE DIPS AND INTERRUPTION | 34 |
| 8.11 TEST EQUIPMENT LIST | 36 |
| FOR MAINS TERMINALS DISTURBANCE VOLTAGE TEST | 36 |
| FOR RADIATED EMISSION MEASUREMENT | 36 |
| FOR HARMONIC / FLICKER MEASUREMENT | 36 |
| FOR ELECTROSTATIC DISCHARGE TEST | 37 |
| FOR RF ELECTROMAGNETIC FIELD IMMUNITY TEST | 37 |
| FOR ELECTRICAL FAST TRANSIENT /BURST IMMUNITY TEST | 37 |
| FOR SURGE IMMUNITY TEST | 38 |
| FOR INJECTED CURRENTS IMMUNITY MEASUREMENT | 38 |
| FOR VOLTAGE DIPS AND INTERRUPTIONS MEASUREMENT | 38 |



Revision History of This Test Report

| Report Number | Description | Issued Date |
|----------------|---|-------------|
| NTC1905054EV00 | Initial Issue | 2019-07-10 |
| NTC1905054EV01 | Updated the electrolytic capacitor voltage from 35V change 50V at PCB output circuit. | 2019-12-05 |
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1. GENERAL INFORMATION

PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST

| | | |
|---------------------------------|---|---|
| E.U.T. | : | Computer Multimedia Speaker |
| Main Model Name | : | T-70X |
| Additional Model name | : | T-77X, T-70BT, T-80X, T-68X, T-60X Plus |
| Brand Name | : | F&D |
| Rating | : | AC 100-240V 50/60Hz, 1A |
| Adapter | : | N/A |
| Test Voltage | : | AC 230V 50Hz, AC 110V 60Hz Only the worst case was recorded in the report. |
| Cable | : | Audio Line: 1 to 1: 1.54m unshielded 1 to 2: 1.54m unshielded Speaker Line: 2.94m 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 | : | Those 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 T-70X. |
| Remark | : | <ol style="list-style-type: none">1. This report was an additional report based on report NTC1905054EV00.2. Compared with original report, this report has updated the electrolytic capacitor voltage from 35V change 50V at PCB output circuit.3. According to the changes, we re-tests items CE and RE(below 1G), other items test data were continued to be referenced. Details refer to the report. |

Technical Specification:

| Item | : | Description |
|-------------------|----------|-----------------------------------|
| BT Version | : | 4.2 |
| Frequency | : | 2402-2480MHz |
| Modulation | : | GFSK, $\pi/4$ -DQPSK, 8DPSK |
| Number of Channel | : | 79 |
| Channel space | : | 1MHz |
| Antenna Type | : | PCB antenna |
| Antenna Gain | : | 0.5dBi (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: 2.7dB |
| | Radiated Emission Test | PASS | Uncertainty: 3.4dB |
| 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, 2021
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

| | | |
|------------------------|---|---|
| iPhone | : | Manufacturer: Apple M/N: MD235CH/A S/N: DX3K5T1FDTC0 |
| Mobile Phone | : | Manufacturer: HUAWEI M/N: HWI-AL00 S/N: TAG-TL00C01B166 |
| USB DISK | : | Manufacturer: Sony M/N: USB 3.0 8GB |
| FM Signal Generator | : | Manufacturer: LEADER M/N: 3214 S/N: 1100164 |
| DVD Player | : | Manufacturer: Pioneer M/N: DV-310NC-K S/N: 0JTL030411CN |
| TV | : | Manufacturer: SONY M/N: KDL-32W600D DC Input:19.5V,45W S/N: 2044564 |
| Adapter(For TV) | : | Manufacturer: SONY M/N: ACDP-045S03 Input: AC100V-240V,50Hz/60Hz,1.1A Output:DC19.5V2.35A S/N:149314521 0095830 |

7. 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). |
| <p>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.</p> <p>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.</p> <p>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.</p> | | |

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.

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

8.1 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 (dB μ V/m) |
|--------------------|----------------------|---|
| 30 ~ 230 | 3 | 40 |
| 230 ~ 1000 | 3 | 47 |

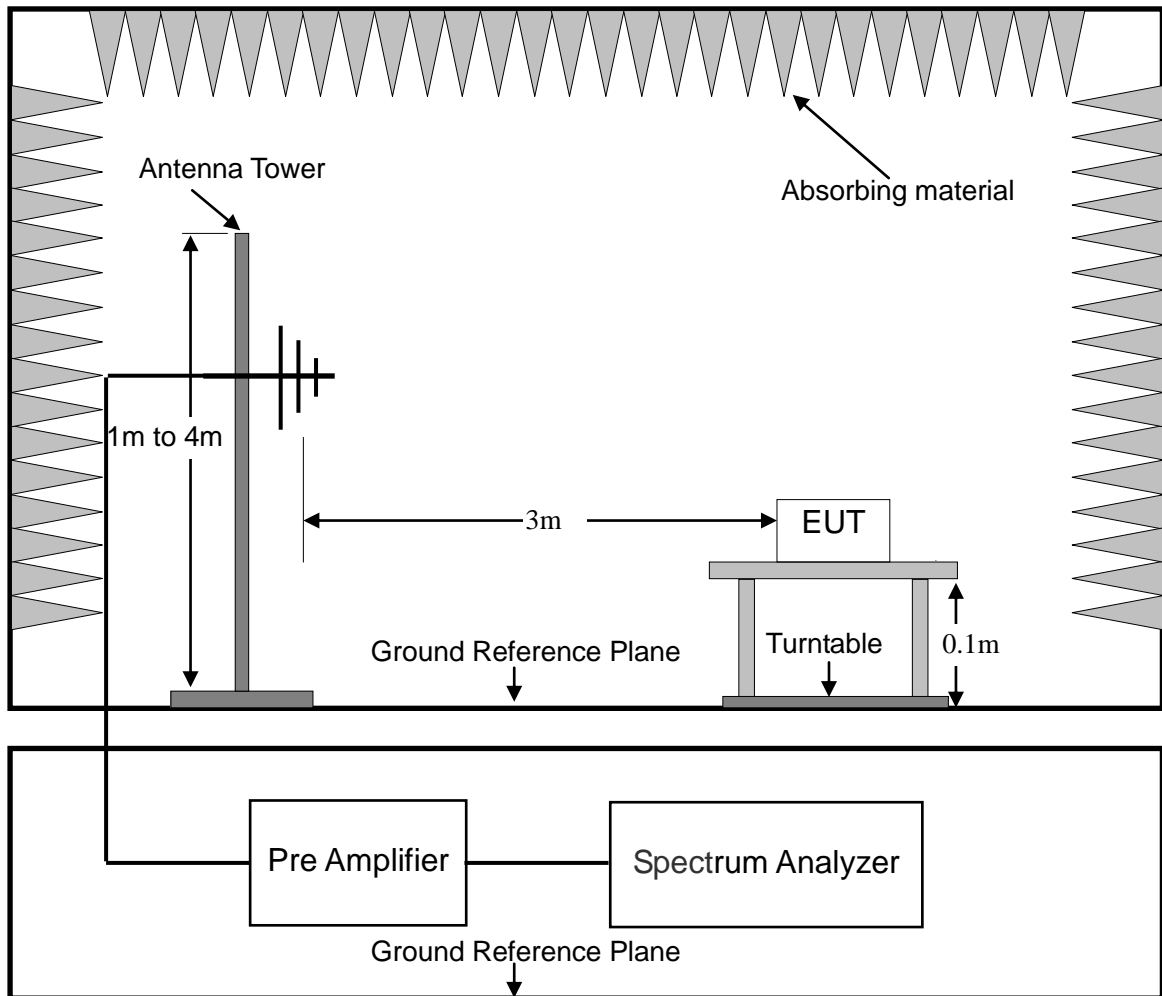
Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
 (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

Limits for radiated disturbance Above 1GHz

| FREQUENCY (MHz) | DISTANCE (Meters) | Average Limit (dB μ V/m) | Peak Limit (dB μ V/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

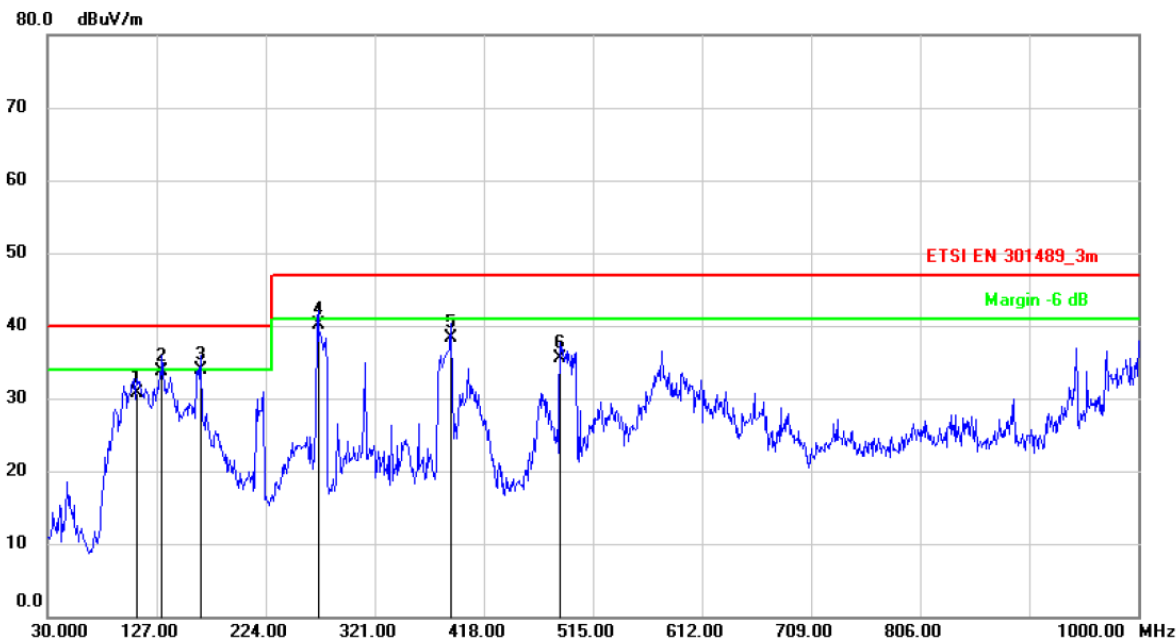
PASS

Please refer to following data tables.



Radiated Emission Measurement

File :T-70X Data :#2 Date: 2019/11/20 Time: 20:16:13



Site Polarization: *Horizontal* Temperature: 26
 Limit: ETSI EN 301489_3m Power: AC230V/50Hz Humidity: 47 %
 EUT: Computer Multimedia Speaker Distance: 3m
 M/N: T-70X
 Mode: BT Link
 Note:

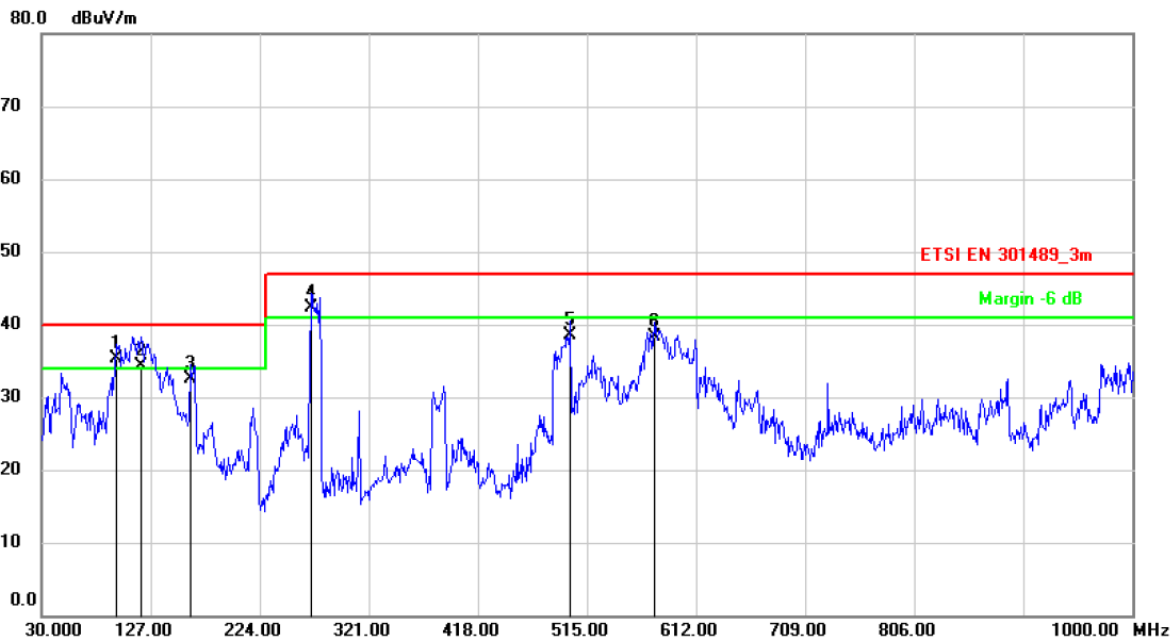
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV/m | Limit dBuV/m | Over dB | Antenna Height cm | Table Degree degree | Comment |
|-----|-----|--------------|-----------------------|----------------------|-----------------------|-----------------|------------|-------------------------|---------------------------|---------|
| 1 | | 109.5400 | 42.97 | -12.17 | 30.80 | 40.00 | -9.20 | QP | | |
| 2 | | 131.8500 | 49.04 | -15.24 | 33.80 | 40.00 | -6.20 | QP | | |
| 3 | * | 165.8000 | 48.95 | -14.95 | 34.00 | 40.00 | -6.00 | QP | | |
| 4 | | 270.5600 | 51.28 | -11.18 | 40.10 | 47.00 | -6.90 | QP | | |
| 5 | | 388.9000 | 47.46 | -9.16 | 38.30 | 47.00 | -8.70 | QP | | |
| 6 | | 485.9000 | 42.67 | -7.07 | 35.60 | 47.00 | -11.40 | QP | | |



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Radiated Emission Measurement

File :T-70X Data :#1 Date: 2019/11/20 Time: 20:10:04



Site Polarization: **Vertical** Temperature: 26
 Limit: ETSI EN 301489_3m Power: AC230V/50Hz Humidity: 47 %
 EUT: Computer Multimedia Speaker Distance: 3m
 M/N: T-70X
 Mode: BT Link
 Note:

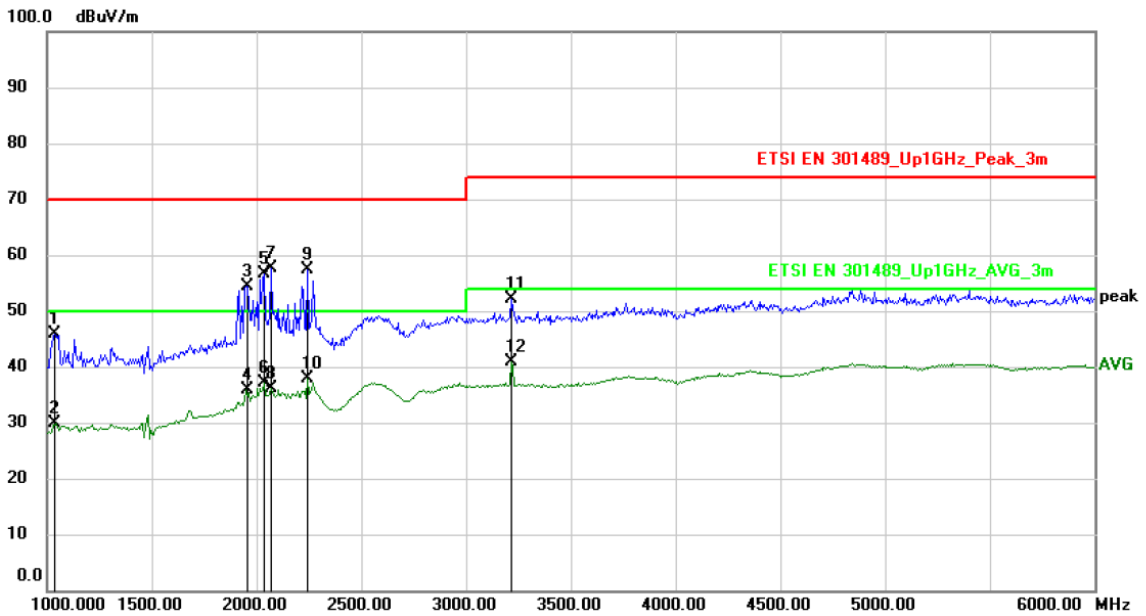
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Antenna Height cm | Table Degree degree | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|-------------------------|---------------------------|---------|
| 1 | * | 95.9600 | 51.15 | -15.85 | 35.30 | 40.00 | -4.70 | QP | | | |
| 2 | ! | 118.2700 | 51.08 | -16.68 | 34.40 | 40.00 | -5.60 | QP | | | |
| 3 | | 161.9200 | 50.58 | -18.08 | 32.50 | 40.00 | -7.50 | QP | | | |
| 4 | ! | 269.5900 | 55.50 | -13.20 | 42.30 | 47.00 | -4.70 | QP | | | |
| 5 | | 500.4500 | 47.36 | -8.76 | 38.60 | 47.00 | -8.40 | QP | | | |
| 6 | | 575.1400 | 46.03 | -7.73 | 38.30 | 47.00 | -8.70 | QP | | | |



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Radiated Emission Measurement

File :T-70X Data :#28 Date: 2019/6/26 Time: 1:45:36



Site: 3m Chamber Polarization: **Horizontal** Temperature: 26
 Limit: ETSI EN 301489_Up1GHz_Peak_3m Power: AC230V/50Hz Humidity: 47 %
 EUT: Computer Multimedia Speaker Distance: 3m
 M/N: T-70X
 Mode: BT Link
 Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | Antenna Height | Table Degree | |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | cm | degree | Comment |
| 1 | | 1037.500 | 55.38 | -9.56 | 45.82 | 70.00 | -24.18 | | | peak |
| 2 | | 1037.500 | 39.42 | -9.56 | 29.86 | 50.00 | -20.14 | | | AVG |
| 3 | | 1956.250 | 55.78 | -1.43 | 54.35 | 70.00 | -15.65 | | | peak |
| 4 | | 1956.250 | 37.20 | -1.43 | 35.77 | 50.00 | -14.23 | | | AVG |
| 5 | | 2037.500 | 57.52 | -0.77 | 56.75 | 70.00 | -13.25 | | | peak |
| 6 | | 2037.500 | 37.81 | -0.77 | 37.04 | 50.00 | -12.96 | | | AVG |
| 7 | | 2068.750 | 58.23 | -0.70 | 57.53 | 70.00 | -12.47 | | | peak |
| 8 | | 2068.750 | 36.92 | -0.70 | 36.22 | 50.00 | -13.78 | | | AVG |
| 9 | | 2243.750 | 57.72 | -0.30 | 57.42 | 70.00 | -12.58 | | | peak |
| 10 | * | 2243.750 | 38.12 | -0.30 | 37.82 | 50.00 | -12.18 | | | AVG |
| 11 | | 3218.750 | 50.03 | 2.05 | 52.08 | 74.00 | -21.92 | | | peak |
| 12 | | 3218.750 | 38.85 | 2.05 | 40.90 | 54.00 | -13.10 | | | AVG |

*:Maximum data x:Over limit !:over margin

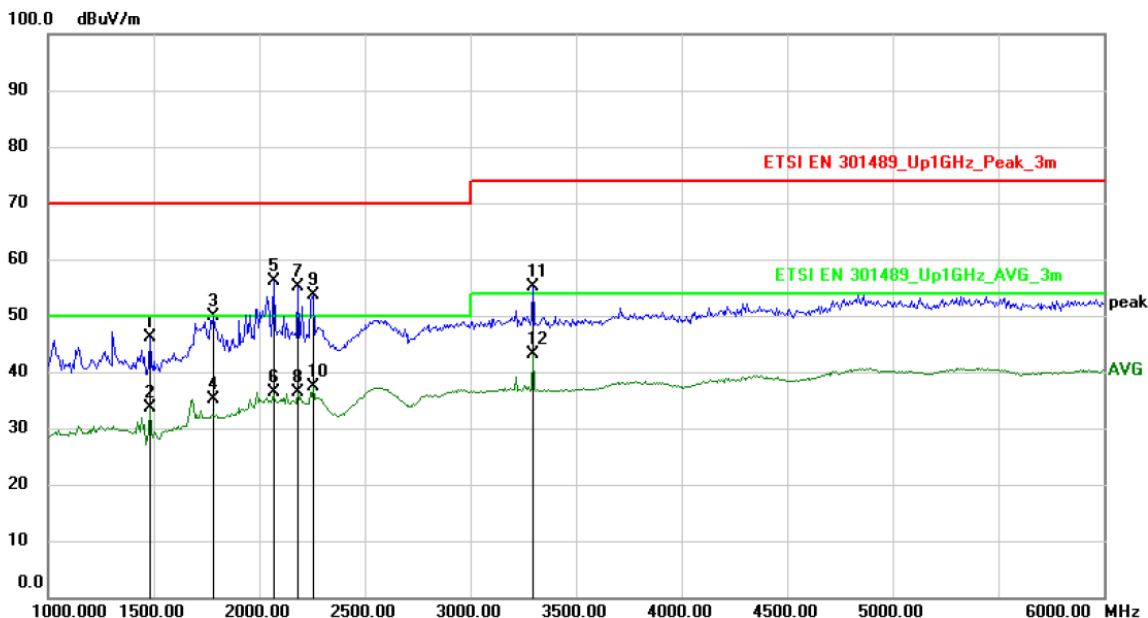
(Reference Only)



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Radiated Emission Measurement

File :T-70X Data :#27 Date: 2019/6/26 Time: 1:37:59



Site: 3m Chamber Polarization: **Vertical** Temperature: 26
 Limit: ETSI EN 301489_Up1GHz_Peak_3m Power: AC230V/50Hz Humidity: 47 %
 EUT: Computer Multimedia Speaker Distance: 3m
 M/N: T-70X
 Mode: BT Link
 Note:

| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB/m | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Antenna Height cm | Table Degree degree | Detector | Comment |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|-------------------------|---------------------------|----------|---------|
| 1 | | 1481.250 | 52.66 | -6.64 | 46.02 | 70.00 | -23.98 | | | peak | |
| 2 | | 1481.250 | 40.30 | -6.64 | 33.66 | 50.00 | -16.34 | | | AVG | |
| 3 | | 1781.250 | 53.53 | -3.74 | 49.79 | 70.00 | -20.21 | | | peak | |
| 4 | | 1781.250 | 38.98 | -3.74 | 35.24 | 50.00 | -14.76 | | | AVG | |
| 5 | | 2068.750 | 56.87 | -0.70 | 56.17 | 70.00 | -13.83 | | | peak | |
| 6 | | 2068.750 | 37.11 | -0.70 | 36.41 | 50.00 | -13.59 | | | AVG | |
| 7 | | 2181.250 | 55.61 | -0.44 | 55.17 | 70.00 | -14.83 | | | peak | |
| 8 | | 2181.250 | 36.84 | -0.44 | 36.40 | 50.00 | -13.60 | | | AVG | |
| 9 | | 2256.250 | 54.02 | -0.27 | 53.75 | 70.00 | -16.25 | | | peak | |
| 10 | | 2256.250 | 37.56 | -0.27 | 37.29 | 50.00 | -12.71 | | | AVG | |
| 11 | | 3293.750 | 52.94 | 2.21 | 55.15 | 74.00 | -18.85 | | | peak | |
| 12 | * | 3293.750 | 40.81 | 2.21 | 43.02 | 54.00 | -10.98 | | | AVG | |

*:Maximum data x:Over limit !:over margin

⟨Reference Only

8.2 AC POWER CONDUCTED EMISSION

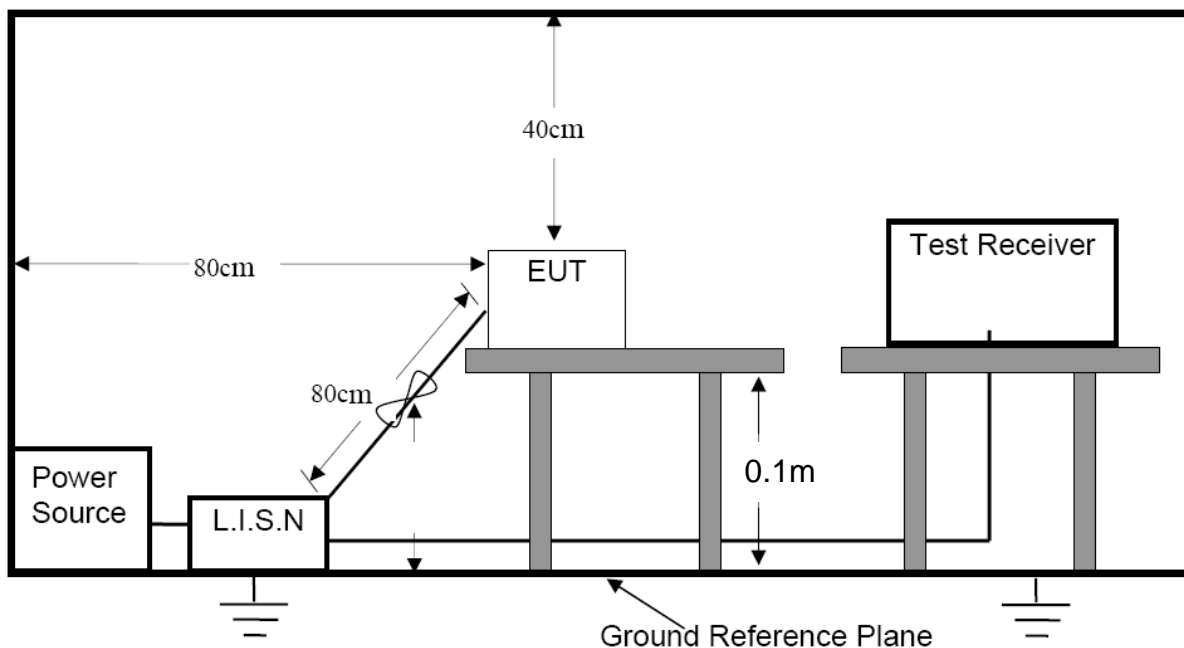
LIMIT

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

TEST RESULTS

PASS

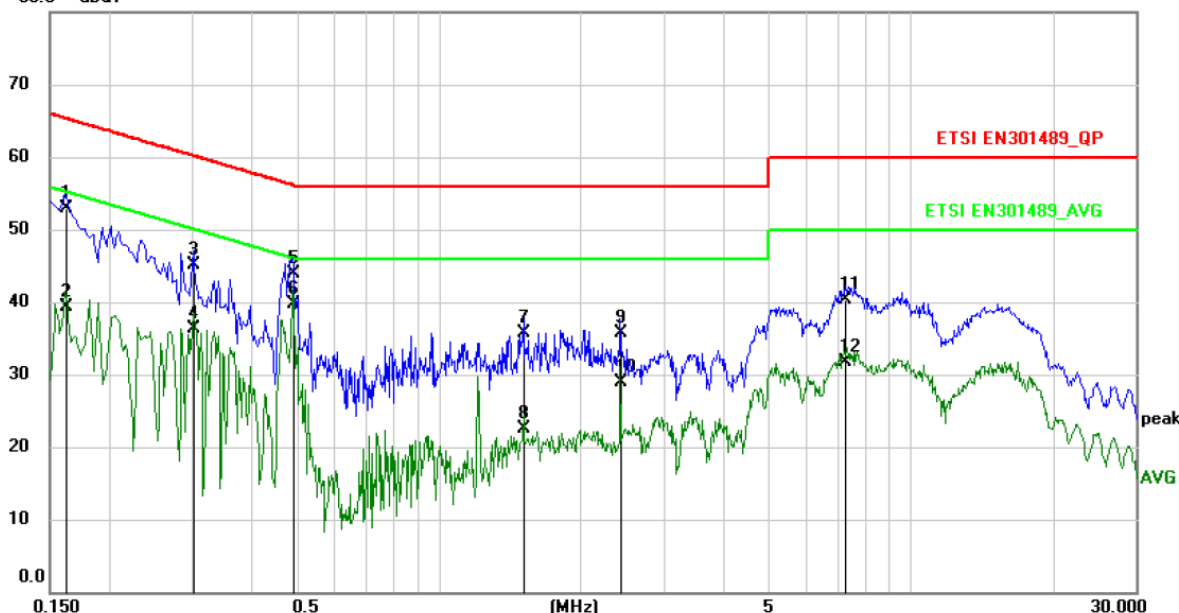
Please refer to following data tables.



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Conducted Emission Measurement

File :T-70X Data :#4 Date: 2019/11/20 Time: 21:22:53



Site: Phase: **L1** Temperature: 26
 Limit: ETSI EN301489_QP Power: AC230V/50Hz Humidity: 50 %
 EUT: Computer Multimedia Speaker
 M/N: T-70X
 Mode: BT Link
 Note:

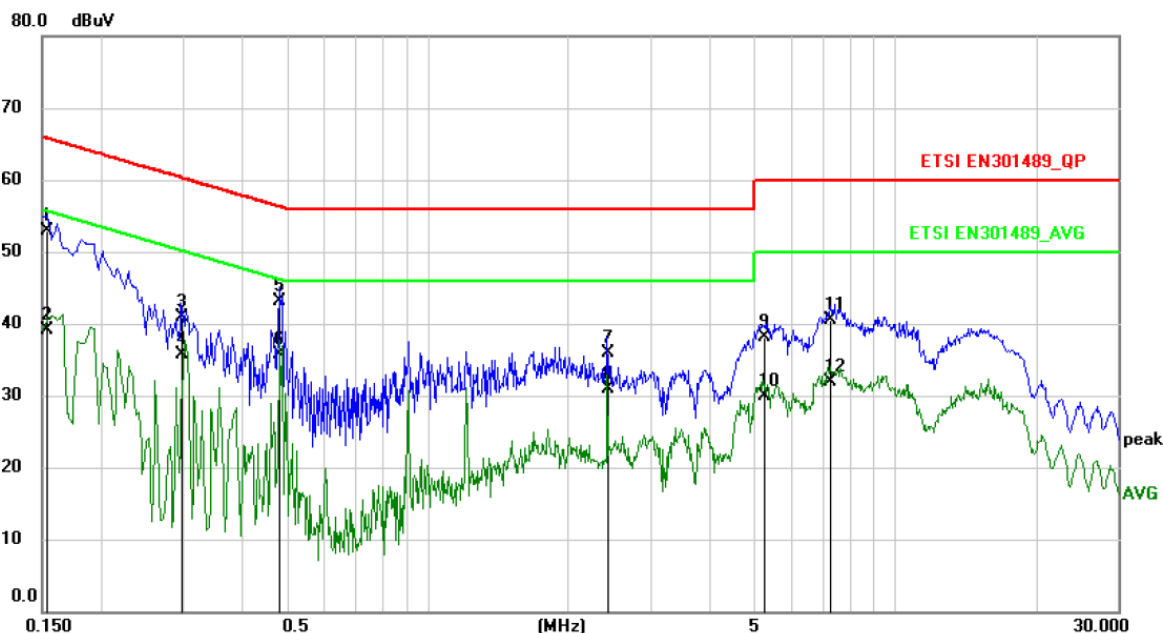
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | | 0.1620 | 42.30 | 10.60 | 52.90 | 65.36 | -12.46 | QP | |
| 2 | | 0.1620 | 28.80 | 10.60 | 39.40 | 55.36 | -15.96 | AVG | |
| 3 | | 0.3020 | 34.50 | 10.60 | 45.10 | 60.19 | -15.09 | QP | |
| 4 | | 0.3020 | 25.80 | 10.60 | 36.40 | 50.19 | -13.79 | AVG | |
| 5 | | 0.4900 | 33.37 | 10.63 | 44.00 | 56.17 | -12.17 | QP | |
| 6 | * | 0.4900 | 29.07 | 10.63 | 39.70 | 46.17 | -6.47 | AVG | |
| 7 | | 1.5180 | 25.10 | 10.70 | 35.80 | 56.00 | -20.20 | QP | |
| 8 | | 1.5180 | 11.80 | 10.70 | 22.50 | 46.00 | -23.50 | AVG | |
| 9 | | 2.4260 | 25.00 | 10.70 | 35.70 | 56.00 | -20.30 | QP | |
| 10 | | 2.4260 | 18.30 | 10.70 | 29.00 | 46.00 | -17.00 | AVG | |
| 11 | | 7.2779 | 29.58 | 10.72 | 40.30 | 60.00 | -19.70 | QP | |
| 12 | | 7.2779 | 20.98 | 10.72 | 31.70 | 50.00 | -18.30 | AVG | |



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Conducted Emission Measurement

File :T-70X Data :#3 Date: 2019/11/20 Time: 21:15:20



Site Phase: **N** Temperature: 26
 Limit: ETSI EN301489_QP Power: AC230V/50Hz Humidity: 50 %
 EUT: Computer Multimedia Speaker
 M/N: T-70X
 Mode: BT Link
 Note:

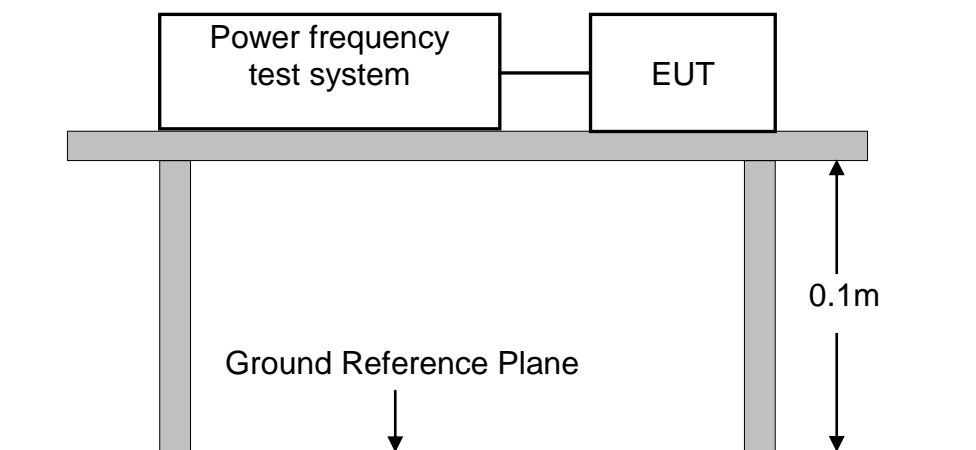
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | | 0.1539 | 42.40 | 10.60 | 53.00 | 65.79 | -12.79 | QP | |
| 2 | | 0.1539 | 28.60 | 10.60 | 39.20 | 55.79 | -16.59 | AVG | |
| 3 | | 0.2979 | 30.30 | 10.60 | 40.90 | 60.30 | -19.40 | QP | |
| 4 | | 0.2979 | 25.10 | 10.60 | 35.70 | 50.30 | -14.60 | AVG | |
| 5 | | 0.4820 | 32.47 | 10.63 | 43.10 | 56.30 | -13.20 | QP | |
| 6 | * | 0.4820 | 25.07 | 10.63 | 35.70 | 46.30 | -10.60 | AVG | |
| 7 | | 2.4260 | 25.30 | 10.70 | 36.00 | 56.00 | -20.00 | QP | |
| 8 | | 2.4260 | 20.20 | 10.70 | 30.90 | 46.00 | -15.10 | AVG | |
| 9 | | 5.2218 | 27.49 | 10.71 | 38.20 | 60.00 | -21.80 | QP | |
| 10 | | 5.2218 | 19.29 | 10.71 | 30.00 | 50.00 | -20.00 | AVG | |
| 11 | | 7.2778 | 29.88 | 10.72 | 40.60 | 60.00 | -19.40 | QP | |
| 12 | | 7.2778 | 21.28 | 10.72 | 32.00 | 50.00 | -18.00 | AVG | |

8.3 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 | Sance |
| 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.

8.4 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 | Sance |
| 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)

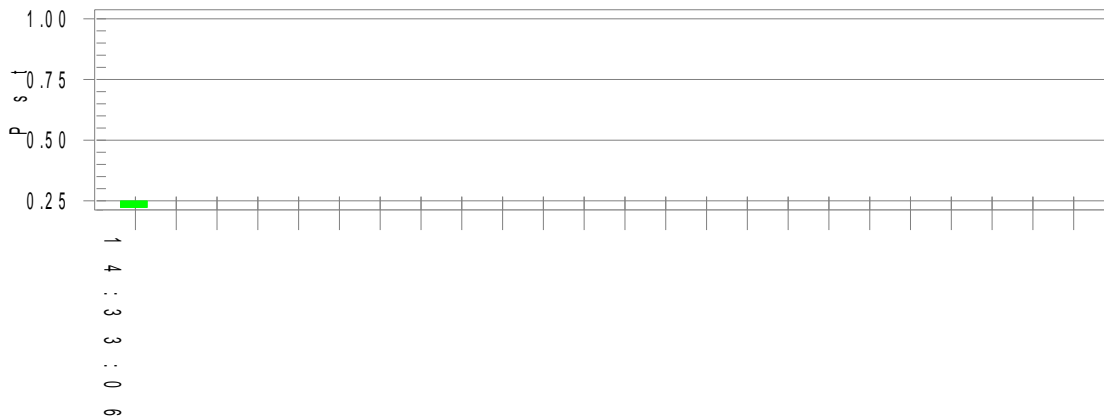
EUT: Computer Multimedia Speaker
 Test category: All parameters (European limits)
 Test date: 2019/5/15
 Test duration (min): 10
 Comment: BT Link
 Customer: FENDA
 M/N:T-70X
 Test Result: Pass

Tested by: Alvin
 Test Margin: 100
 Start time: 14:22:36 End time: 14:33:07
 Data file name: F-000426.cts_data

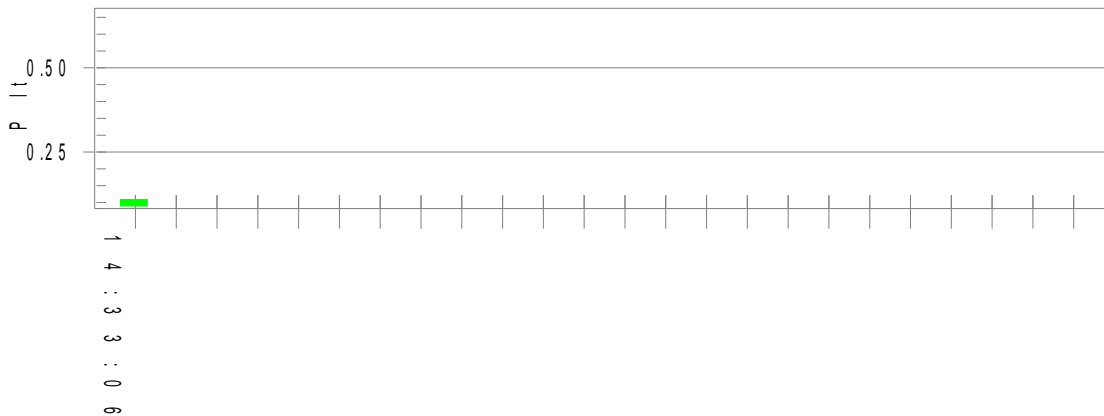
Status: Test Completed

Psti and limit line

European Limits



Plt and limit line

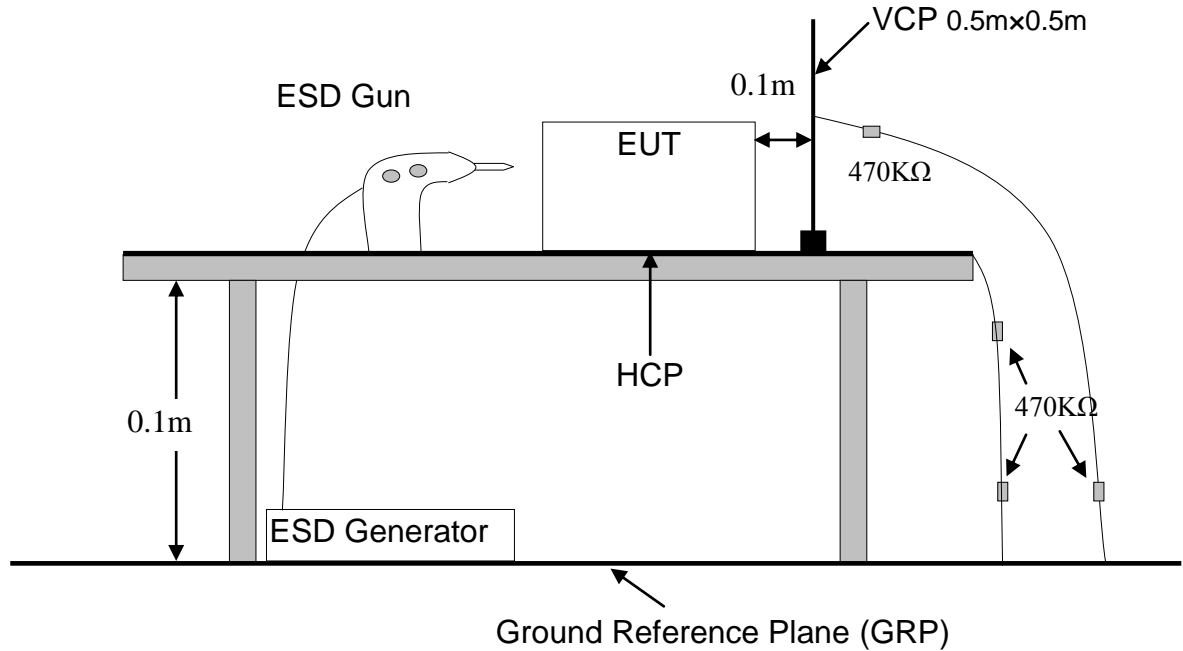


Parameter values recorded during the test:

| | | | |
|---------------------------------|--------|------------------|---------------|
| Vrms at the end of test (Volt): | 230.40 | | |
| 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 (%): | 0.10 | Test limit (%): | 4.00 Pass |
| Highest Pst (10 min. period): | 0.250 | Test limit: | 1.000 Pass |
| Highest Plt (2 hr. period): | 0.109 | Test limit: | 0.650 Pass |

8.5 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.

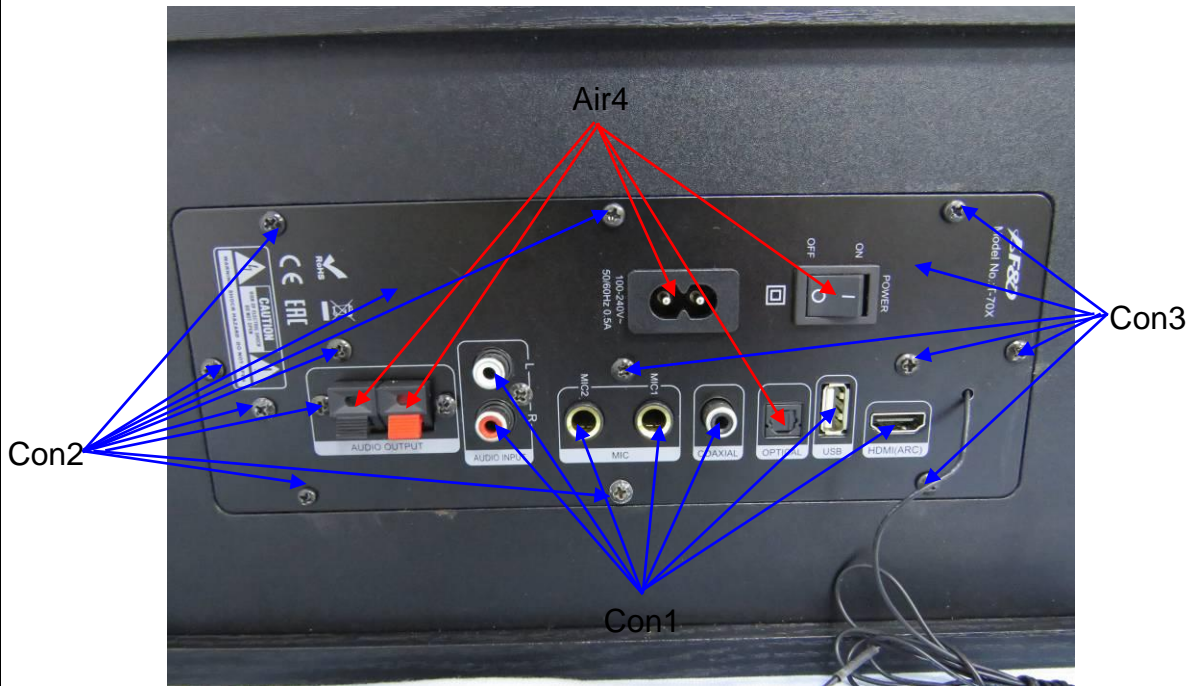
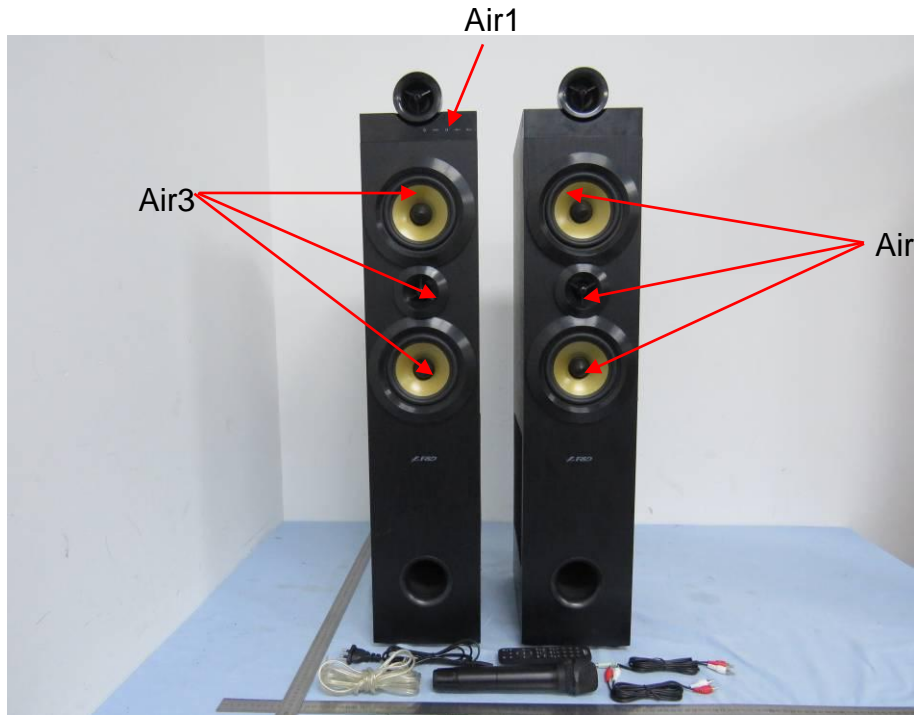
TEST RESULT

PASS

Please refer to following data table.

| Test Condition | | | | | | | | |
|--|--------------------|--------------|----|------------|------------------------|-----------------------|---|---|
| Ambient Condition: | | Temp.: 25°C | | 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 | - | - |
| Front | - | - | - | - | A | A | - | - |
| Left | - | - | - | - | A | A | - | - |
| Right | - | - | - | - | A | A | - | - |
| Back | - | - | - | - | A | A | - | - |
| Test result | | | | | PASS | | | |
| Note: During the test, the EUT did not show any abnormality. | | | | | | | | |
| Test Engineer : Alvin | | | | | | | | |

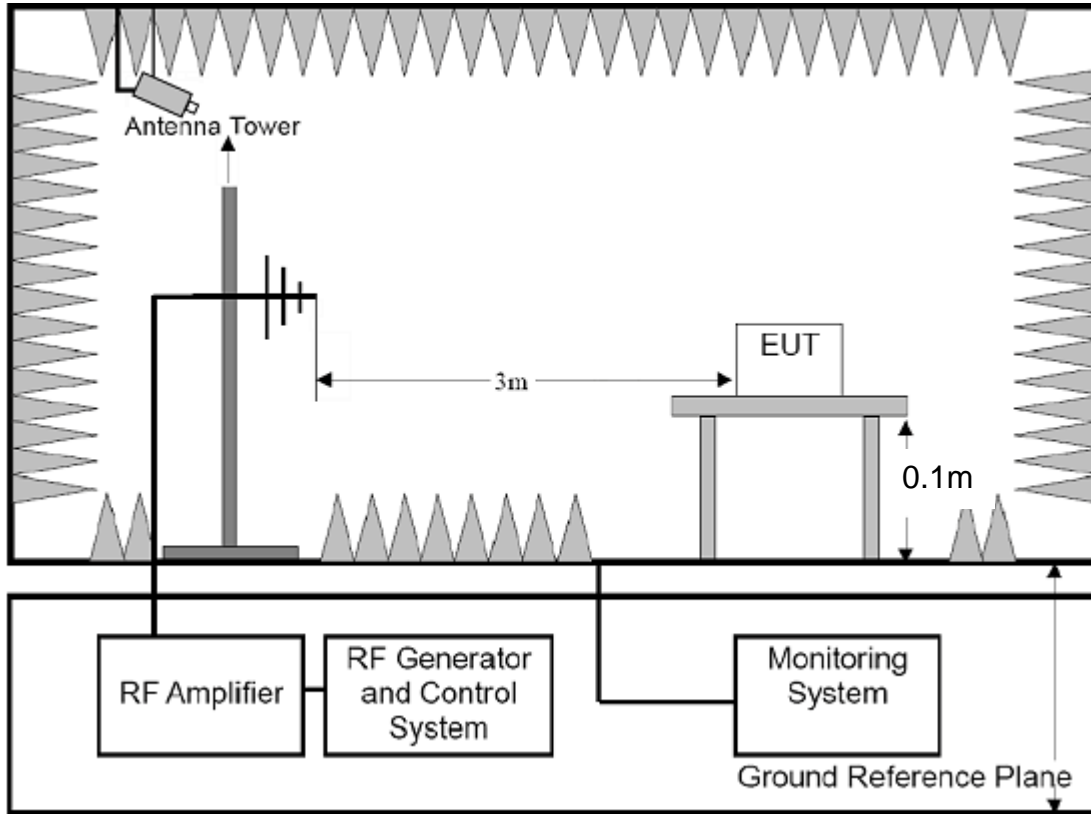
Electrostatic discharge immunity test- Appendix I





8.6 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

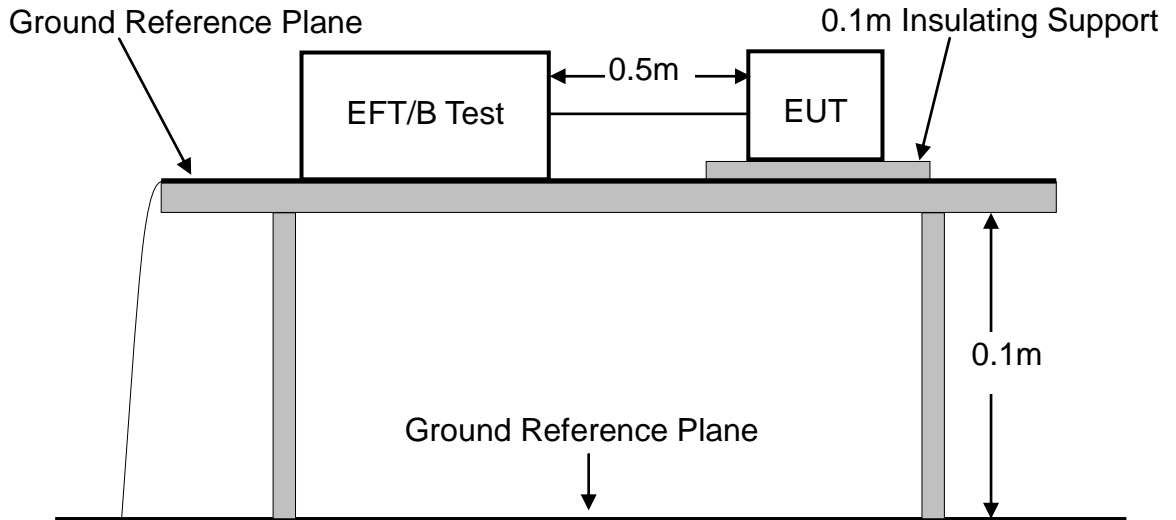
Please refer to following data table.

| Test Condition | | | |
|----------------------|-------------------------|-----------------------|--------------|
| Temperature | 25°C | Test Voltage | AC 230V/50Hz |
| Humidity | 50%RH | Tested by | Sean |
| 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.

8.7 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

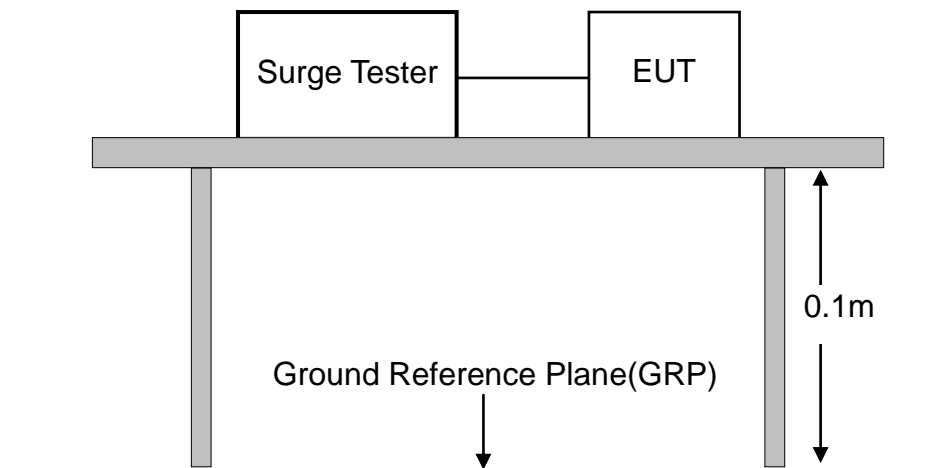
Please refer to following data table.

| Test Condition | | | |
|-------------------|----------|-----------------------|--------------|
| Temperature | 25°C | Test Voltage | AC 230V/50Hz |
| Humidity | 50%RH | Tested by | Alvin |
| 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.

8.8 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

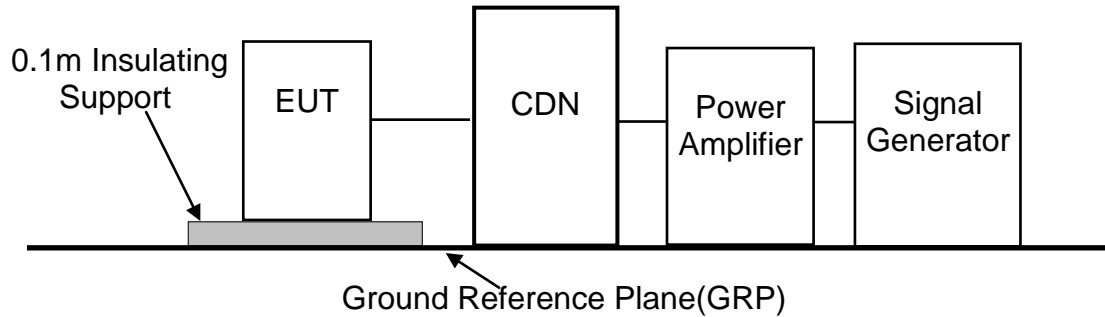
Please refer to following data table.

| Test Condition | | | |
|---------------------|----------|---|--------------|
| Temperature | 25°C | Test Voltage | AC 230V/50Hz |
| Humidity | 55%RH | Tested by | Alvin |
| 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.

8.9 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

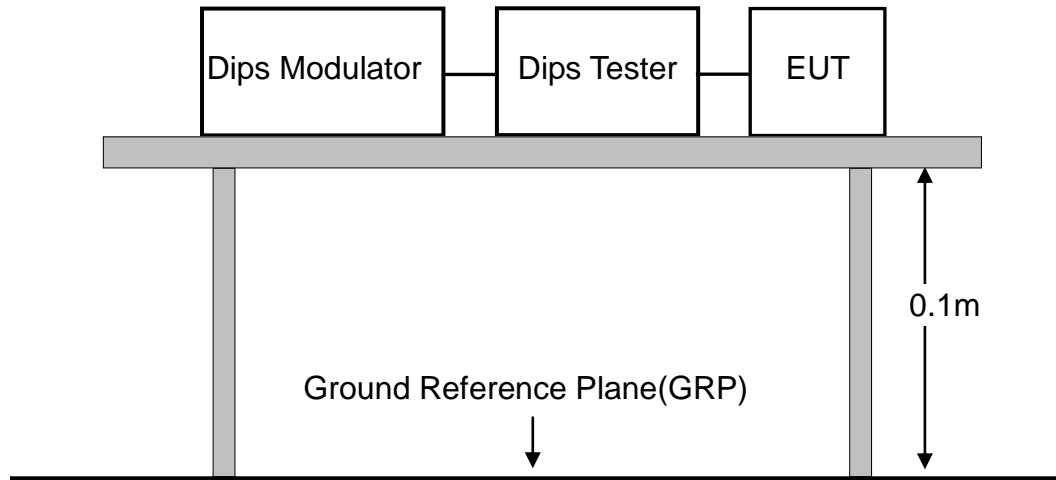
Please refer to following data table.

| Test Condition | | | |
|------------------------|-----------|-----------------------|--------------|
| Temperature | 25°C | Test Voltage | AC 230V/50Hz |
| Humidity | 50%RH | Tested by | Loki |
| 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.

8.10 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 | 55%RH | Tested by | Alvin | |
| 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.

8.11 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 | 893606/01 4 | 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 | SUNSP0 | 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 | MY470701 60 | Apr. 24, 2019 | 1 Year |
| 2. | RF Switch | SKET | N/A | N/A | N/A | N/A |
| 3. | Power Amplifier | SKET | HAP801000 M_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 | GB402014 69 | Apr.24,2019 | 1 Year |
| 7. | Power Sensor | Agilent | E9300A | MY414989 19 | Apr.24,2019 | 1 Year |
| 8. | Power Sensor | Agilent | E9300A | US392112 59 | 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

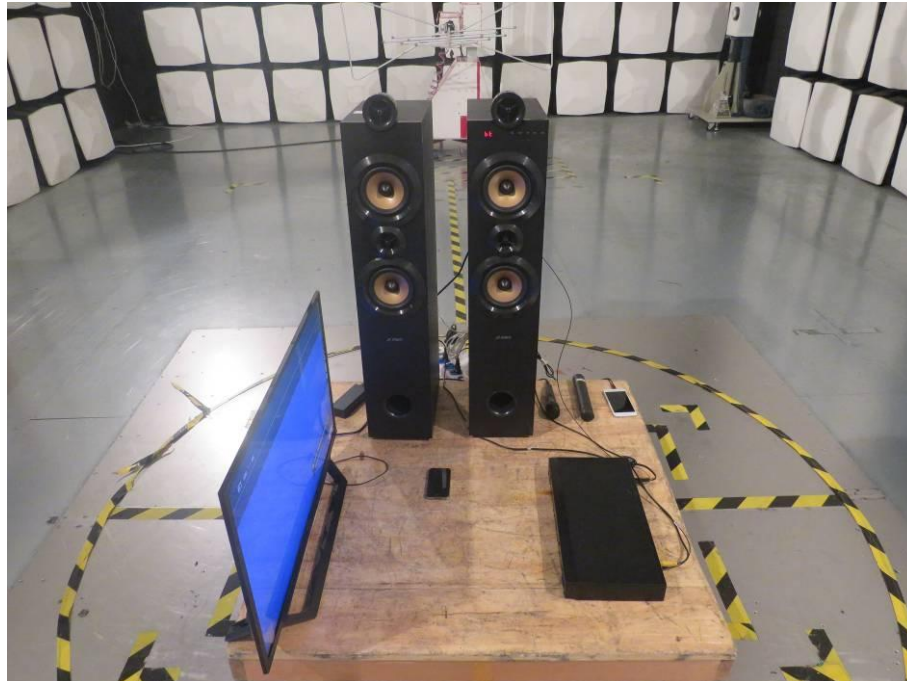
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-----------------------|-----------------|-----------|------------|---------------|---------------|
| 1. | Signal Generator | IFR | 2023A | N/A | Mar. 14, 2019 | 1 Year |
| 2. | Power Amplifier | SCHAFFNER | 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

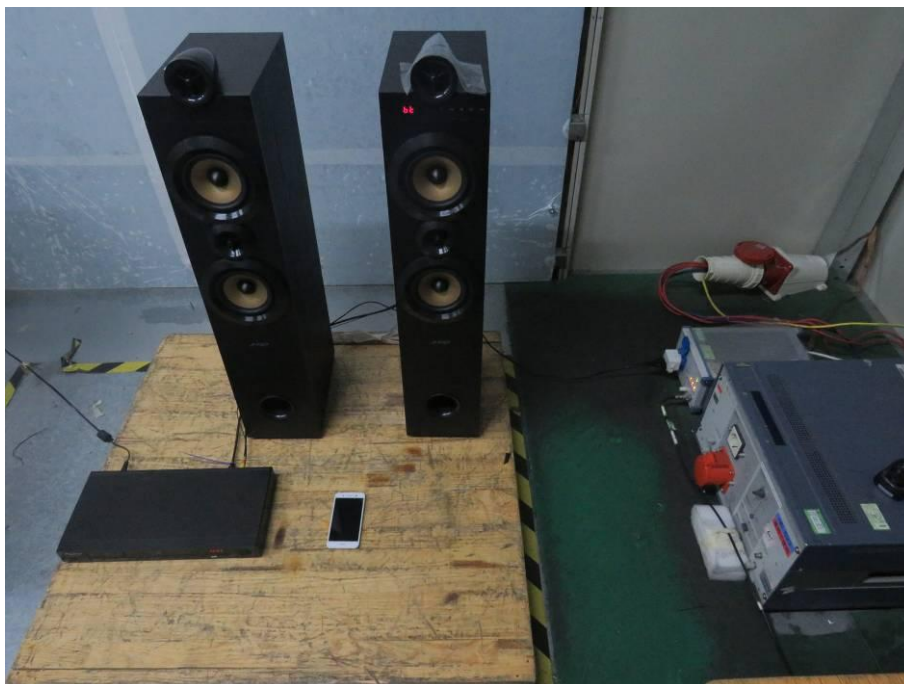
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|----------------|--------------|-------------|-------------|---------------|---------------|
| 1. | Dips Tester | EM TEST | UCS500N | V1104108683 | Mar. 14, 2019 | 1 Year |
| 2. | Test Soft | EM TEST | lec.control | 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



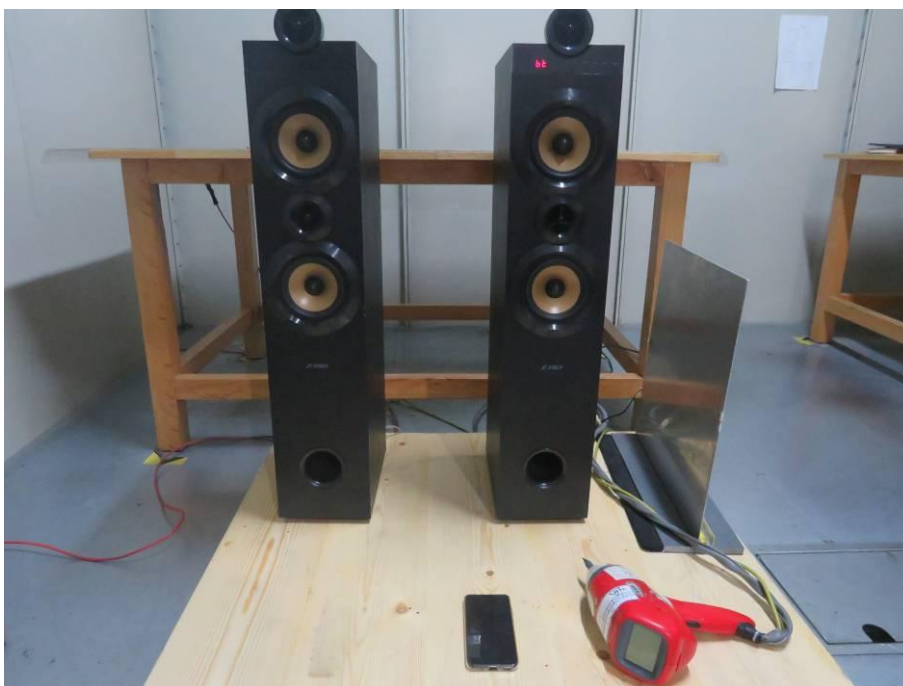
LINE CONDUCTED EMISSION TEST



POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST



ELECTROSTATIC DISCHARGE TEST



RADIATED ELECTROMAGNETIC FIELD TEST



ELECTRICAL FAST TRANSIENTS/BURST/ SURGE/ VOLTAGE DIPS TEST



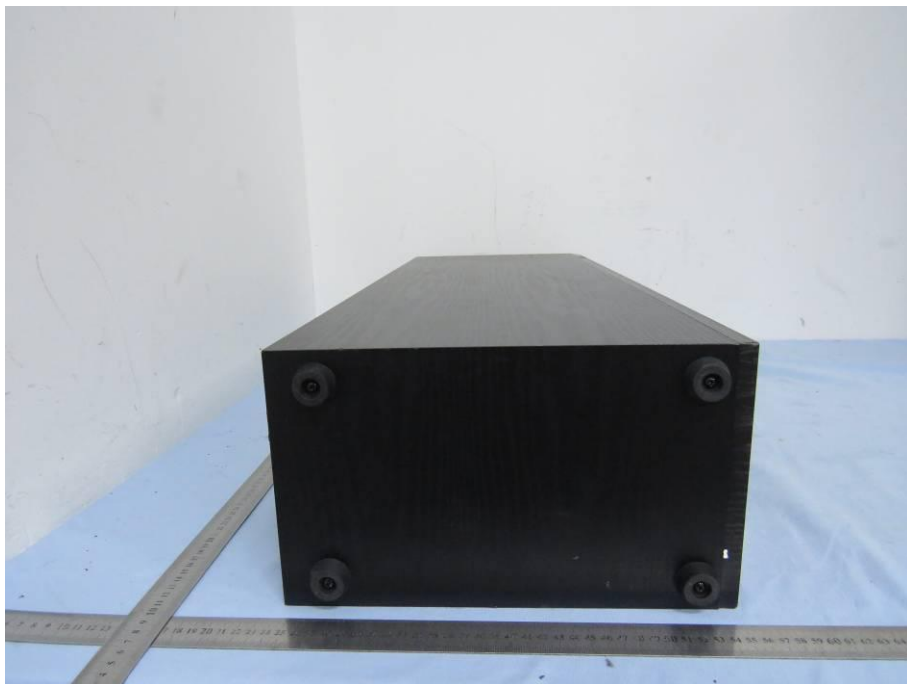
RADIO FREQUENCY COMMON MODE TEST



General Appearance of the E.U.T.



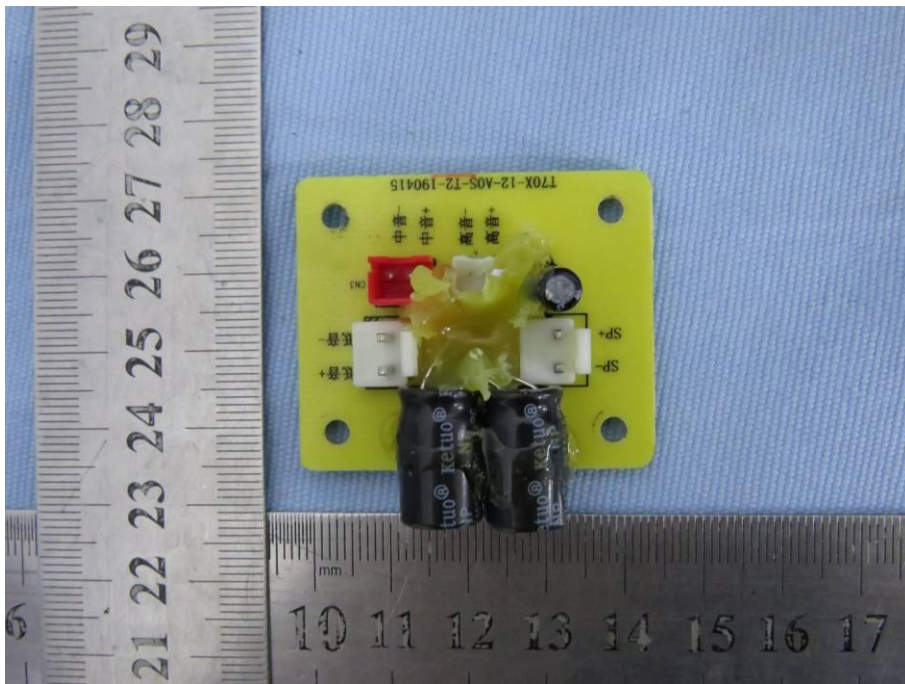
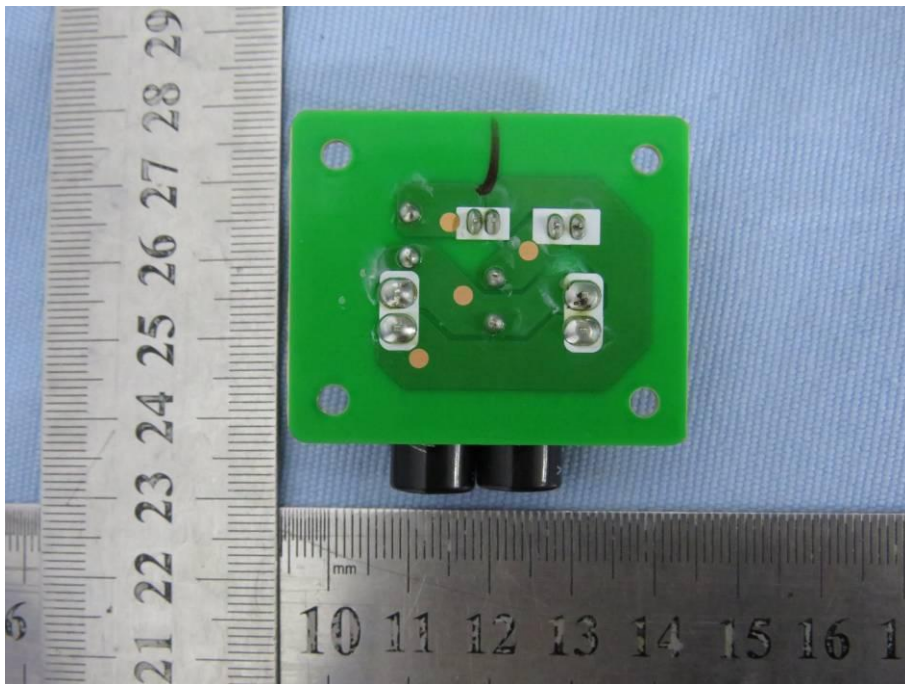


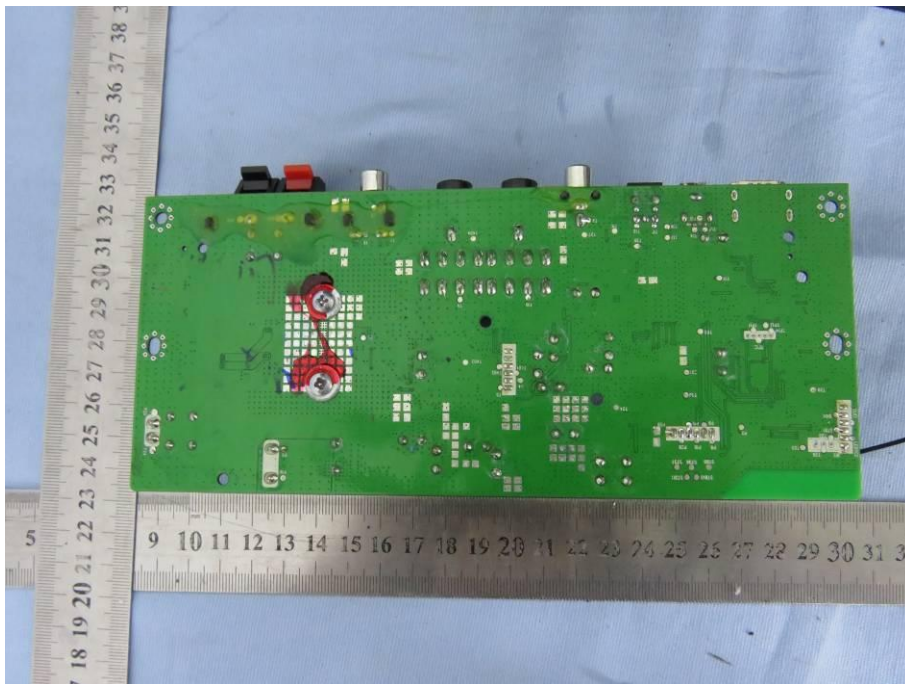
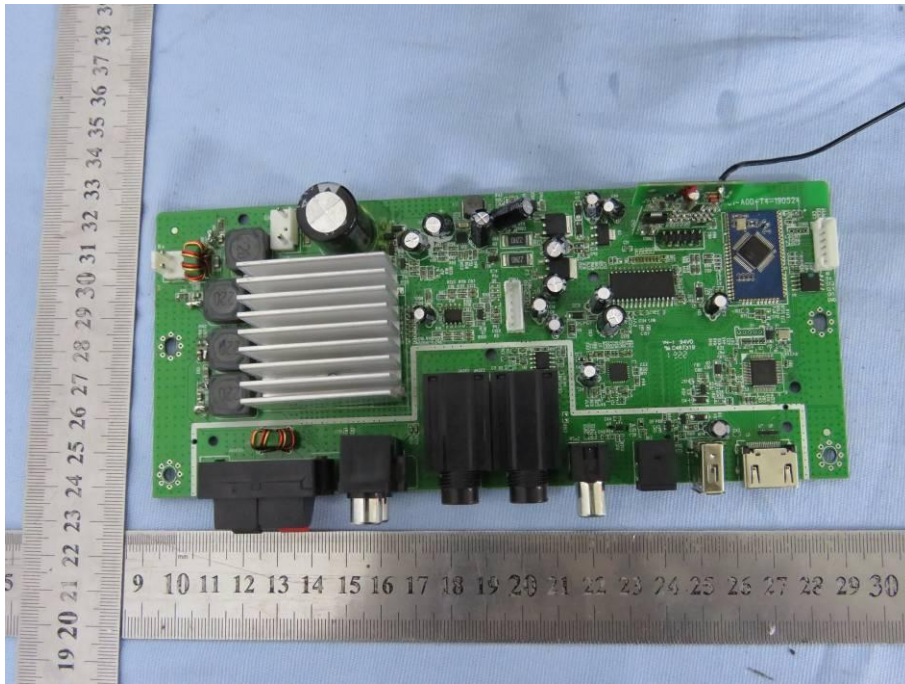


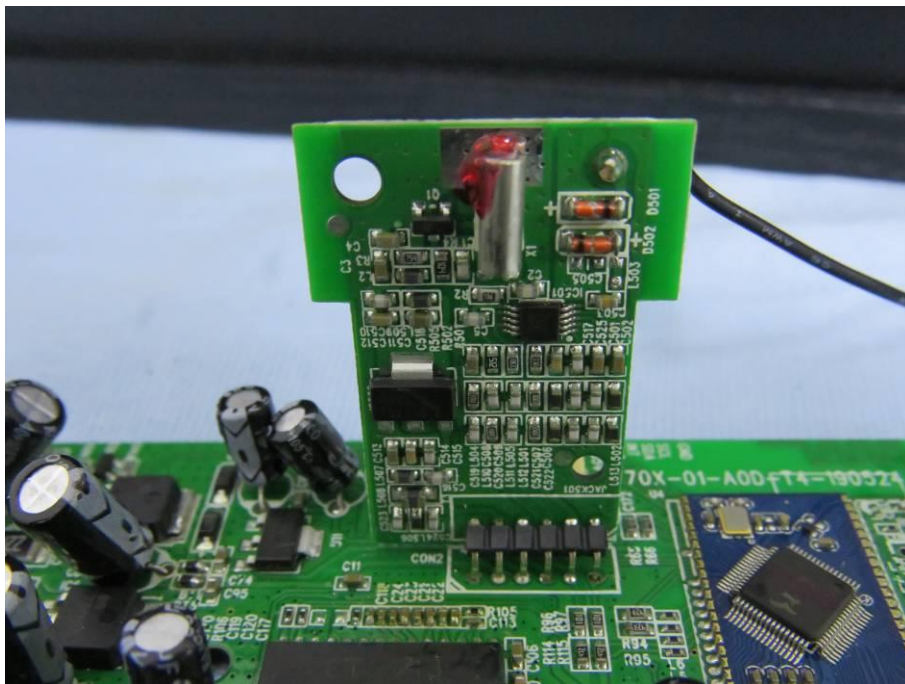
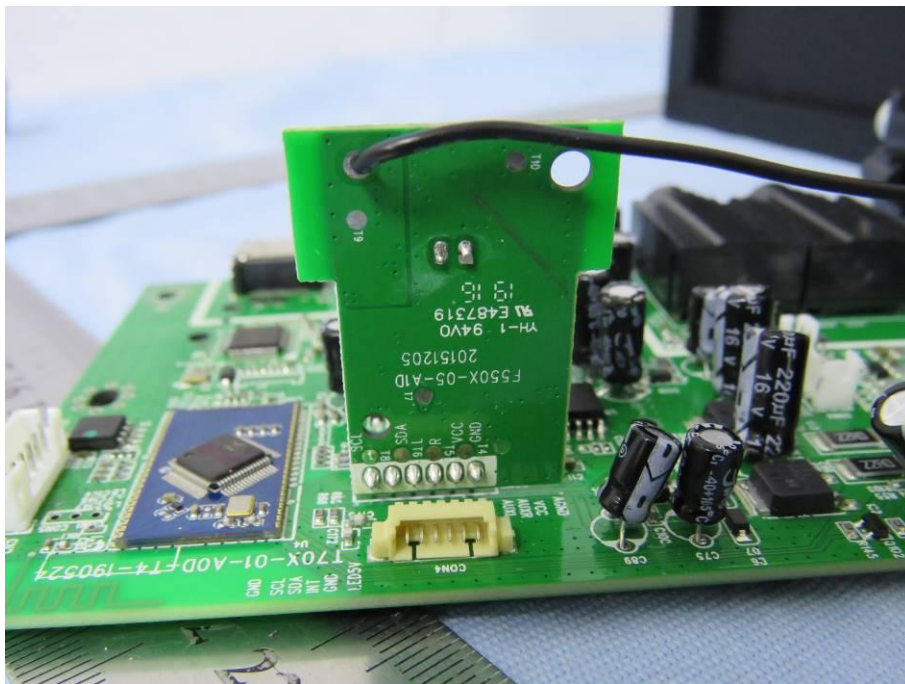


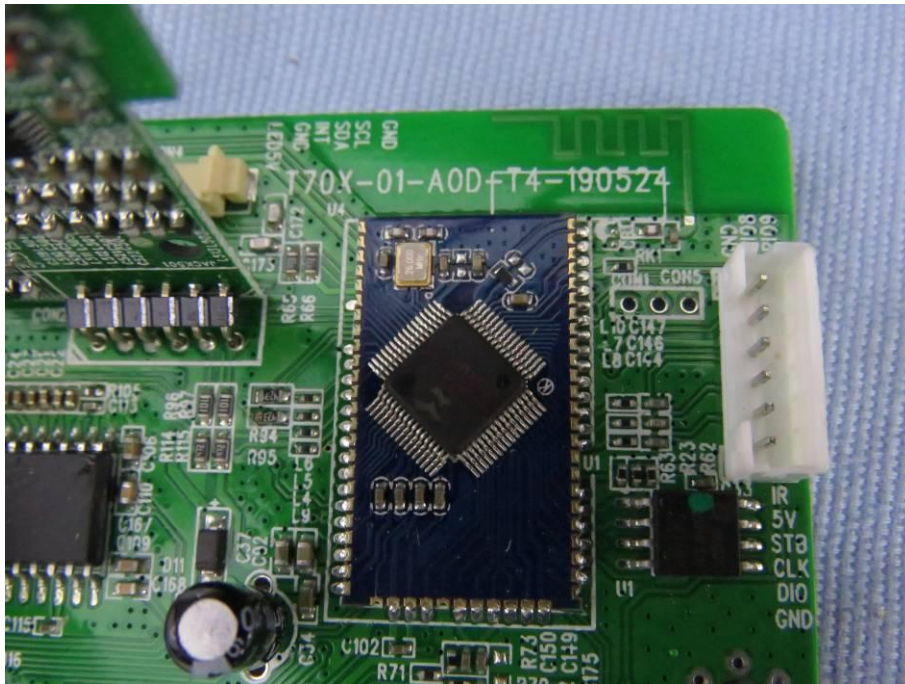


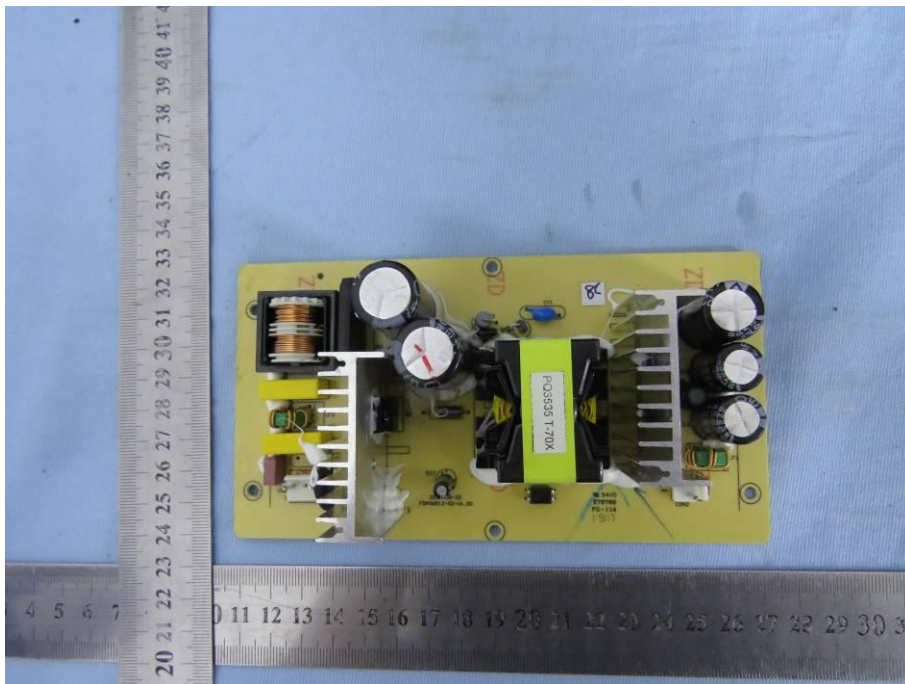
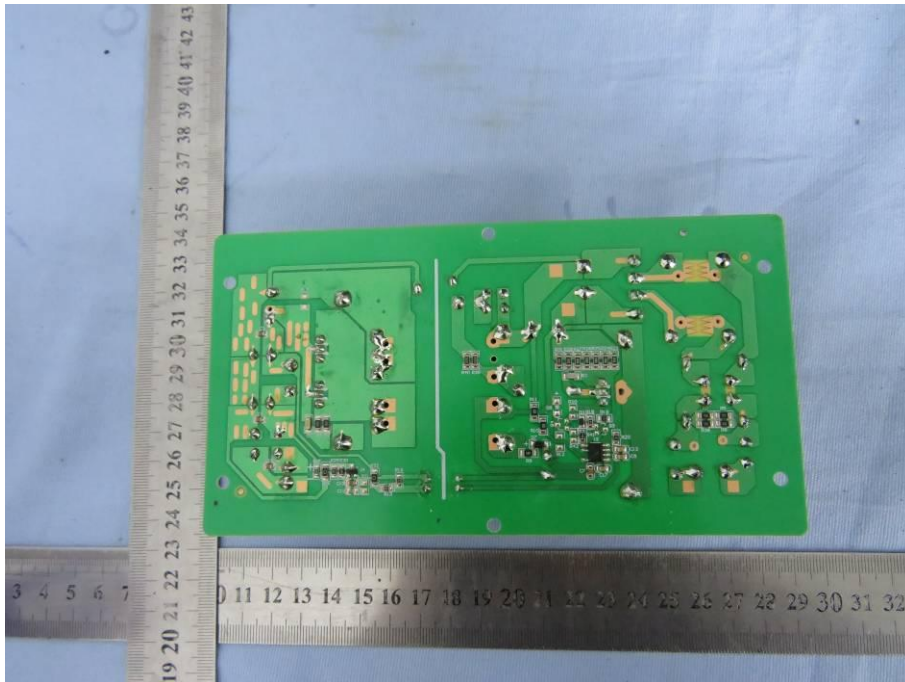












---End---