# EMC TEST REPORT

Authorized under **D**eclaration **o**f **C**onformity

**According to**

**EN 55032: 2012+AC 2013**
**EN 61000-3-2 : 2014**
**EN 61000-3-3 : 2013**
**CISPR 32 : 2015**
**AS/NZS CISPR 32 : 2013**

| | | |
|---|---|---|
| Applicant | : | TPV Electronics (Fujian) Co., Ltd. |
| Address | : | Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R. China |
| Equipment | : | LCD Monitor |
| Model No. | : | 240LM00016, *2460*** (The "*" could be any alphanumeric character including blank for marketing differentiation.) |

**I HEREBY CERTIFY THAT :**

**The sample was received on Mar 09, 2017 and the testing was carried out on Mar 29, 2017 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.**

# EMC TEST REPORT

Issued by:

**Cerpass Technology (Suzhou) Co.,Ltd**

**No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China**

**Tel:86-512-6917-5888**

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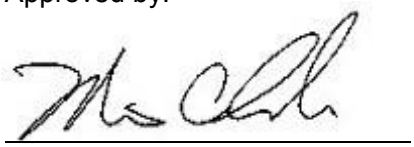
The test record, data evaluation & Equipment Under Test configurations represented herein are true and accurate accounts of the measurements of the samples EMC characteristics under the conditions specified in this report.

The above equipment was tested by Cerpass Technology Corp. for compliance with the requirements of technical standards specified above under the EMC Directive. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties

Approved by:



Miro Chueh
EMC/RF B.U. Manager

Laboratory Accreditation:

☐ Cerpass Technology Corporation Test Laboratory

| | |
|---|---|
| **NVLAP LAB Code:** | **200954-0** |
| **TAF LAB Code:** | **1439** |

☒ Cerpass Technology(SuZhou) Co., Ltd.

| | |
|---|---|
| **NVLAP LAB Code:** | **200814-0** |
| **CNAS LAB Code:** | **L5515** |

# Contents

## History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

| Report No | Version | Date | Description |
|---|---|---|---|
| SECE1703102 | Rev 01 | Apr 01, 2017 | Initial Issue |
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# 1. Summary of Test Procedure and Test Results

| EMISSION [EN55032: 2012+AC 2013] | | | |
|---|---|---|---|
| **Standard** | **Item** | **Result** | **Remarks** |
| EN55032: 2012+AC 2013<br>AS/NZS CISPR 32 : 2013<br>CISPR 32 : 2015 | Conducted (Power Port) | PASS | Meet Class B Limit<br>Minimum passing margin(QP) is -10.63 dB at 0.1740 MHz |
| | Conducted (Telecom port) | N/A | N/A |
| | Radiated | PASS | Meets Class B Limit<br>Minimum passing margin(Peak) is -4.00 dB at 211.3899 MHz |
| EN 61000-3-2: 2014 | Harmonic current emissions | PASS | Meet Class D Limit |
| EN61000-3-3:2013 | Voltage fluctuations & flicker | PASS | Meets the requirements |

# 2. Test Configuration of Equipment under Test

## 2.1. Feature of Equipment under Test

| | |
|---|---|
| **Product Name:** | LCD Monitor |
| **Model Name:** | 240LM00016, *2460***<br>(The "*" could be any alphanumeric character including blank for marketing differentiation.) |
| **Model Discrepancy:** | Different sales market. |
| **Housing material:** | Plastic case |
| **EUT Highest Frequency:** | 148.5MHz |
| **EUT Power Rating:** | Input:100-240V,50-60Hz<br>3Pin Power Port |
| **AC Power Cord Type:** | Non-shielded, 1.2m&1.5m&1.8m |

Note: Please refer to user manual.

**I/O PORT:**

| I/O PORT TYPE | Quantity |
|---|---|
| A. VGA Port | 1 |
| B. HDMI Port | 1 |
| C. DISPLAY Port | 1 |
| D. Audio Port | 2 |

## 2.2. Test Mode and Test Manner

**Test Manner**

a During testing, the interface cables and equipment positions were varied according to Europe Standard.

b Running "H" pattern and Colour bars.

c During the test, connect the PC, USB Keyboard, USB Mouse and EUT, make the EUT at the test mode.

d Adjust the EUT, then test.

The pre-test for CE modes

Mode 1: Full system (Display mode 1920*1080@75Hz) (110V/60Hz)

Mode 2: Full system (Display mode 1920*1080@75Hz) (230V/50Hz)

“Test mode 1, 2” were reported as final data.

The pre-test for RE(Below 1GHz) modes

Mode 1: Full system (VGA mode 1920*1080@60Hz) (110V/60Hz)

Mode 2: Full system (VGA mode 1920*1080@60Hz) (230V/50Hz)

“Test mode 1, 2” were reported as final data.

The pre-test for RE(Above 1GHz) modes

Mode 1: Full system (Display mode 1920*1080@75Hz) (110V/60Hz)

Mode 2: Full system (Display mode 1920*1080@75Hz) (230V/50Hz)

“Test mode 1, 2” were reported as final data.

The pre-test for Harmonic/Flicker modes

Mode 1: Full system (VGA mode 1920*1080@60Hz)

Mode 2: Full system (HDMI mode 1920*1080@60Hz)

Mode 3: Full system (Display mode 1920*1080@75Hz)

“Test mode 1, 2,3” were reported as final data.

Remark: The SECE1703102 test pattern is evaluated in the worst mode of SECE1505118.

## 2.3. Description of Support Unit

| Device | Manufacturer | Model No. | Description |
|---|---|---|---|
| PC | HP | HP Compaq Elite 8200 MTPC | Non-Shielded ,1.8m(R33001) |
| USB Keyboard | DELL | SK-8115 | T3A002 |
| USB Mouse | DELL | G0K02XYK | R41108 |
| Earphone | SALAR | V18 | N/A |

Use Cable:

| Cable | Quantity | Description |
|---|---|---|
| USB Cable | 1 | Shielded, 1.8m, with one ferrite core bonded |
| USB Cable | 1 | Shielded, 1.2m |
| Audio Cable | 1 | No-Shielded, 1.8m, |
| VGA Cable | 1 | Shielded, 1.2m&1.5m&1.8m, with two ferrite core bonded |
| HDMI Cable | 1 | Shielded, 1.2m&1.5m&1.8m |
| Display Cable | 1 | Shielded, 1.2m&1.5m&1.8m |
| Audio Cable | 1 | Shielded, 1.2m&1.5m&1.8m |

## 2.4. General Information of Test

| | | |
|---|---|---|
| ☐ | Test Site | **Cerpass Technology Corporation Test Laboratory**<br>Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.)<br>Tel:+886-3-3226-888<br>Fax:+886-3-3226-881<br>Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C.<br>Tel: +886-2-2663-8582 |
| | FCC | TW1079, TW1061,390316, 228391, 641184 |
| | IC | 4934B-1, 4934E-1, 4934E-2 |
| | VCCI | T-2205 for Telecommunication Test<br>C-4663 for Conducted emission test<br>R-3428, R-4218 for Radiated emission test<br>G-812, G-813 for radiated disturbance above 1GHz |
| ☒ | Test Site | **Cerpass Technology (Suzhou) Co.,Ltd**<br>Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China<br>Tel: +86-512-6917-5888<br>Fax: +86-512-6917-5666 |
| | FCC | 331395 |
| | IC | 7290A-1, 7290A-2 |
| | VCCI | T-1945 for Telecommunication Test<br>C-2919 for Conducted emission test<br>R-2670 for Radiated emission test<br>G-227 for radiated disturbance above 1GHz |
| Frequency Range Investigated: | | Conducted: from 150kHz to 30 MHz<br>Radiation: from 30 MHz to 6000MHz |
| Test Distance : | | The test distance of radiated emission below 1GHz from antenna to EUT is 10 M.<br>The test distance of radiated emission above 1GHz from antenna to EUT is 3 M. |

## 2.5. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Uncertainty |
|---|---|---|
| Conducted emissions(LINE) | 9KHz-30MHz | +/- 0.7738 dB |
| Conducted emissions(NEUTRAL) | 9KHz-30MHz | +/- 0.7886 dB |

| Measurement | Polarity | Frequency | Uncertainty |
|---|---|---|---|
| Radiated emissions (below 1GHz) | H | 30MHz ~ 200MHz | +/- 3.8909dB |
| | | 200MHz ~1000MHz | +/- 3.6555dB |
| | V | 30MHz ~ 200MHz | +/- 3.8948dB |
| | | 200MHz ~1000MHz | +/- 3.6538dB |
| Radiated emissions (above 1GHz) | H | 1000MHz ~18000MHz | +/- 3.8948 dB |
| | | 18000MHz ~40000MHz | +/-3.8844dB |
| | V | 1000MHz ~18000MHz | +/- 3.8906dB |
| | | 18000MHz ~40000MHz | +/- 3.8744dB |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2008, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

# 3. Test of Conducted Emission

## 3.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 55032.

**Table A.8 – Requirements for conducted emissions from the AC mains power ports of Class A equipment**

| **Applicable to**<br>1. AC mains power ports (3.1.1) | | | | |
|---|---|---|---|---|
| **Table clause** | **Frequency range** MHz | **Coupling device** (see Table A.7) | **Detector type / bandwidth** | **Class A limits dB(μV)** |
| A8.1 | 0,15 – 0,5 | AMN | Quasi Peak / 9 kHz | 79 |
| | 0,5 – 30 | | | 73 |
| A8.2 | 0,15 – 0,5 | AMN | Average / 9 kHz | 66 |
| | 0,5 – 30 | | | 60 |
| NOTE Apply A8.1 and A8.2 across the entire frequency range. | | | | |

**Table A.9 – Requirements for conducted emissions from the AC mains power ports of Class B equipment**

| **Applicable to**<br>1. AC mains power ports (3.1.1) | | | | |
|---|---|---|---|---|
| **Table clause** | **Frequency range** MHz | **Coupling device** (see Table A.7) | **Detector type / bandwidth** | **Class B limits dB(μV)** |
| A9.1 | 0,15 – 0,5 | AMN | Quasi Peak / 9 kHz | 66 – 56 |
| | 0,5 – 5 | | | 56 |
| | 5 – 30 | | | 60 |
| A9.2 | 0,15 – 0,5 | AMN | Average / 9 kHz | 56 – 46 |
| | 0,5 – 5 | | | 46 |
| | 5 – 30 | | | 50 |
| NOTE Apply A9.1 and A9.2 across the entire frequency range. | | | | |

## Table A.10 – Requirements for asymmetric mode conducted emissions from Class A equipment

**Applicable to**

1. wired network ports (3.1.30)
2. optical fibre ports (3.1.24) with metallic shield or tension members
3. antenna ports (3.1.3)

| Table clause | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class A voltage limits dB(µV) | Class A current limits dB(µA) |
|---|---|---|---|---|---|
| A10.1 | 0,15 – 0,5 | AAN | Quasi Peak / 9 kHz | 97 – 87 | n/a |
| | 0,5 – 30 | | | 87 | |
| | 0,15 – 0,5 | AAN | Average / 9 kHz | 84 – 74 | |
| | 0,5 – 30 | | | 74 | |
| A10.2 | 0,15 – 0,5 | CVP and current probe | Quasi Peak / 9 kHz | 97 – 87 | 53 – 43 |
| | 0,5 – 30 | | | 87 | 43 |
| | 0,15 – 0,5 | CVP and current probe | Average / 9 kHz | 84 – 74 | 40 – 30 |
| | 0,5 – 30 | | | 74 | 30 |
| A10.3 | 0,15 – 0,5 | Current Probe | Quasi Peak / 9 kHz | n/a | 53 – 43 |
| | 0,5 – 30 | | | | 43 |
| | 0,15 – 0,5 | Current Probe | Average / 9 kHz | | 40 – 30 |
| | 0,5 – 30 | | | | 30 |

NOTE 1 The choice of coupling device and measurement procedure is defined in Annex C.

NOTE 2 AC mains power ports shall meet the limits given in Table A.8.

NOTE 3 The test shall cover the entire frequency range.

NOTE 4 The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability.

NOTE 5 Testing is required at only one EUT supply voltage and frequency.

NOTE 6 Applicable to ports listed above and intended to connect to cables longer than 3 m.

## Table A.11 – Requirements for asymmetric mode conducted emissions from Class B equipment

**Applicable to**

1. wired network ports (3.1.30)
2. optical fibre ports (3.1.24) with metallic shield or tension members
3. broadcast receiver tuner ports (3.1.8)
4. antenna ports (3.1.3)

| Table clause | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class B voltage limits dB(µV) | Class B current limits dB(µA) |
|---|---|---|---|---|---|
| A11.1 | 0,15 – 0,5 | AAN | Quasi Peak / 9 kHz | 84 – 74 | n/a |
| | 0,5 – 30 | | | 74 | |
| | 0,15 – 0,5 | AAN | Average / 9 kHz | 74 – 64 | |
| | 0,5 – 30 | | | 64 | |
| A11.2 | 0,15 – 0,5 | CVP and current probe | Quasi Peak / 9 kHz | 84 – 74 | 40 – 30 |
| | 0,5 – 30 | | | 74 | 30 |
| | 0,15 – 0,5 | CVP and current probe | Average / 9 kHz | 74 – 64 | 30 – 20 |
| | 0,5 – 30 | | | 64 | 20 |
| A11.3 | 0,15 – 0,5 | Current Probe | Quasi Peak / 9 kHz | n/a | 40 – 30 |
| | 0,5 – 30 | | | | 30 |
| | 0,15 – 0,5 | Current Probe | Average / 9 kHz | | 30 – 20 |
| | 0,5 – 30 | | | | 20 |

NOTE 1 The choice of coupling device and measurement procedure is defined in Annex C.

NOTE 2 Screened ports including TV broadcast receiver tuner ports are tested with a common-mode impedance of 150 Ω. This is typically accomplished with the screen terminated by 150 Ω to earth.

NOTE 3 AC mains power ports shall meet the limits given in Table A.**9**.

NOTE 4 The test shall cover the entire frequency range.

NOTE 5 The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability.

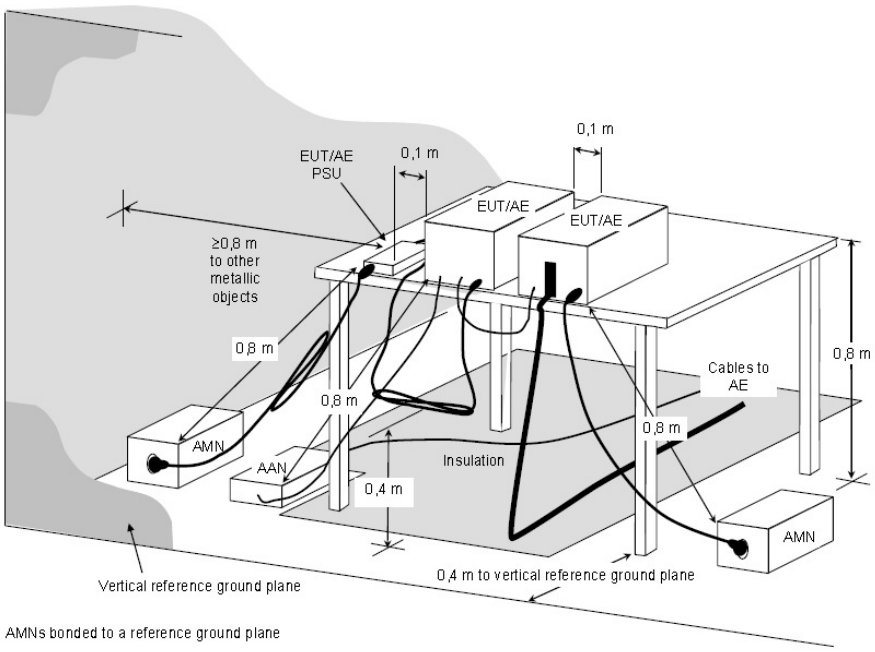
NOTE 6 Testing is required at only one EUT supply voltage and frequency.

NOTE 7 Applicable to ports listed above and intended to connect to cables longer than 3 m.

## 3.2. Test Procedures

a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
b. Connect EUT to the power mains through a Artificial Mains Network (AMN).
c. All the support units are connecting to the other AMN.
d. The AMN provides 50 ohm coupling impedance for the measuring instrument.
e. The CISPR states that a 50 ohm, 50 micro-Henry AMN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

## 3.3. Typical Test Setup




NOTE The 0,8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be ≥0,8 m.

**Figure D.2 – Example measurement arrangement for table-top EUT (Conducted emission measurement – alternative 1)**

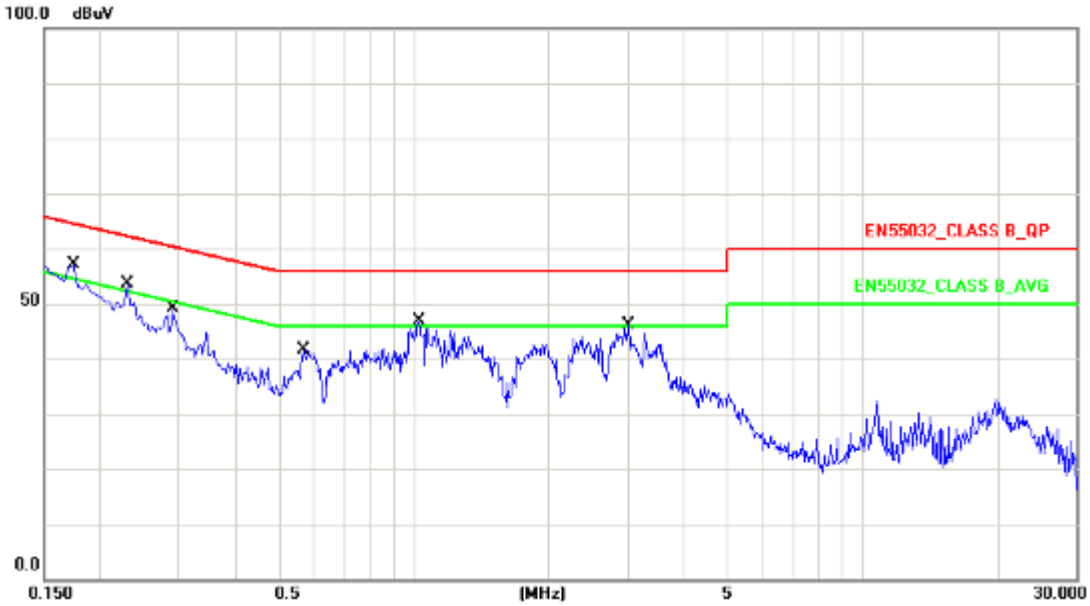
## 3.4. Measurement Equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|---|---|---|---|---|---|
| Test Receiver | R&S | ESCI | 100565 | 2016.07.07 | 2017.07.06 |
| AMN | R&S | ESH2-Z5 | 100182 | 2016.08.31 | 2017.08.30 |
| Two-Line V-Network | R&S | ENV216 | 100325 | / | / |
| ISN | FCC | FCC-TLISN-T2-02 | 20379 | 2017.03.22 | 2018.03.22 |
| ISN | FCC | FCC-TLISN-T4-02 | 20380 | 2016.06.24 | 2017.06.24 |
| ISN | FCC | FCC-TLISN-T8-02 | 20381 | 2016.11.29 | 2017.11.29 |
| ISN | TESEQ | ISN ST08 | 30175 | 2016.08.31 | 2017.08.30 |
| Current Probe | R&S | EZ-17 | 100303 | 2017.03.22 | 2018.03.22 |
| Passive Voltage Probe | R&S | ESH2-Z3 | 100026 | 2017.03.22 | 2018.03.22 |
| Pulse Limiter | R&S | ESH3-Z2 | 100529 | 2017.03.22 | 2018.03.22 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-004 | 2017.03.28 | 2018.03.28 |
| EZ-EMC | Fala | Ver CT3A1 | N/A | N/A | N/A |

## 3.5. Test Data and Result

### 3.5.1 Conducted Emission for Power Port Test Data

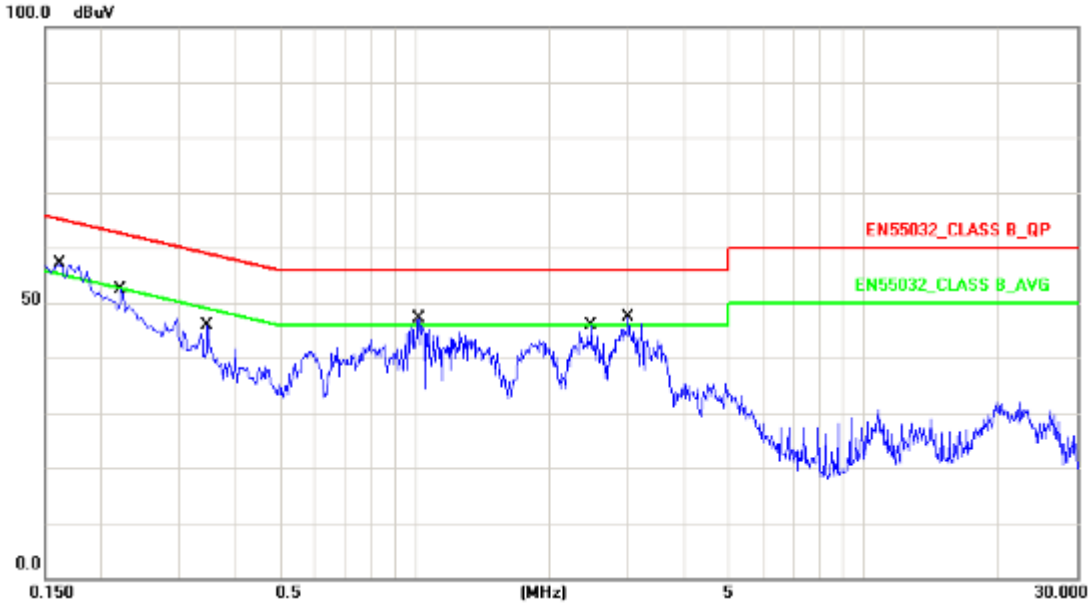
| | | | |
|---|---|---|---|
| Test Mode : | Mode 1: Full system (Display mode 1920*1080@75Hz) (110V/60Hz) | | |
| AC Power : | AC 110V/60Hz | Phase : | LINE |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.1740 | 10.13 | 40.68 | 50.81 | 64.76 | -13.95 | QP |
| 2 | 0.1740 | 10.13 | 34.00 | 44.13 | 54.76 | -10.63 | AVG |
| 3 | 0.2300 | 10.13 | 35.90 | 46.03 | 62.45 | -16.42 | QP |
| 4 | 0.2300 | 10.13 | 29.14 | 39.27 | 52.45 | -13.18 | AVG |
| 5 | 0.2900 | 10.14 | 30.70 | 40.84 | 60.52 | -19.68 | QP |
| 6 | 0.2900 | 10.14 | 24.35 | 34.49 | 50.52 | -16.03 | AVG |
| 7 | 0.5700 | 10.15 | 28.21 | 38.36 | 56.00 | -17.64 | QP |
| 8 | 0.5700 | 10.15 | 22.87 | 33.02 | 46.00 | -12.98 | AVG |
| 9 | 1.0300 | 10.18 | 30.67 | 40.85 | 56.00 | -15.15 | QP |
| 10 | 1.0300 | 10.18 | 17.72 | 27.90 | 46.00 | -18.10 | AVG |
| 11 | 3.0140 | 10.20 | 28.57 | 38.77 | 56.00 | -17.23 | QP |
| 12 | 3.0140 | 10.20 | 20.84 | 31.04 | 46.00 | -14.96 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

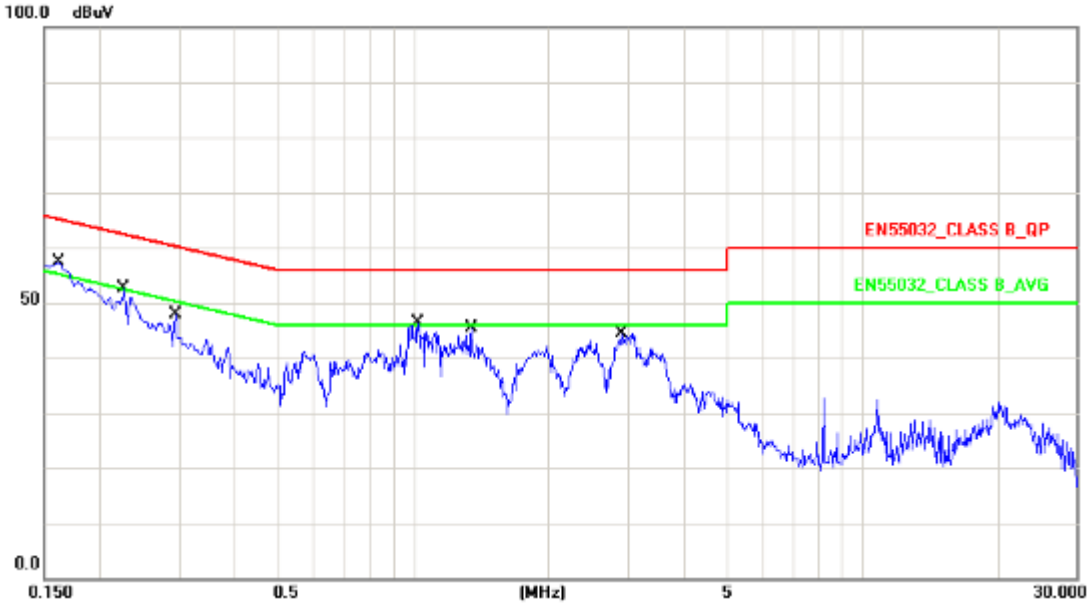
| | | | |
|---|---|---|---|
| Test Mode : | Mode 1: Full system (Display mode 1920*1080@75Hz) (110V/60Hz) | | |
| AC Power : | AC 110V/60Hz | Phase : | NEUTRAL |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.1620 | 10.13 | 39.08 | 49.21 | 65.36 | -16.15 | QP |
| 2 | 0.1620 | 10.13 | 25.37 | 35.50 | 55.36 | -19.86 | AVG |
| 3 | 0.2220 | 10.13 | 34.89 | 45.02 | 62.74 | -17.72 | QP |
| 4 | 0.2220 | 10.13 | 26.26 | 36.39 | 52.74 | -16.35 | AVG |
| 5 | 0.3460 | 10.14 | 27.86 | 38.00 | 59.06 | -21.06 | QP |
| 6 | 0.3460 | 10.14 | 22.19 | 32.33 | 49.06 | -16.73 | AVG |
| 7 | 1.0260 | 10.18 | 31.04 | 41.22 | 56.00 | -14.78 | QP |
| 8 | 1.0260 | 10.18 | 18.51 | 28.69 | 46.00 | -17.31 | AVG |
| 9 | 2.4820 | 10.19 | 28.09 | 38.28 | 56.00 | -17.72 | QP |
| 10 | 2.4820 | 10.19 | 21.27 | 31.46 | 46.00 | -14.54 | AVG |
| 11 | 2.9940 | 10.20 | 29.79 | 39.99 | 56.00 | -16.01 | QP |
| 12 | 2.9940 | 10.20 | 21.72 | 31.92 | 46.00 | -14.08 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

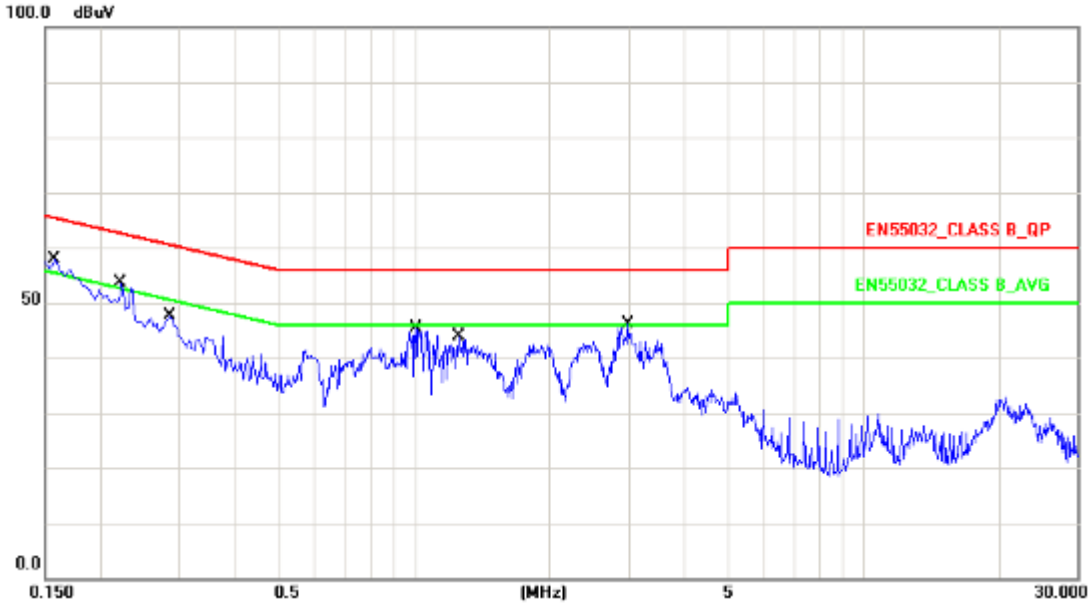
| | | | |
|---|---|---|---|
| Test Mode : | Mode 2: Full system (Display mode 1920*1080@75Hz) (230V/50Hz) | | |
| AC Power : | AC 230V/50Hz | Phase : | LINE |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.1620 | 10.13 | 39.79 | 49.92 | 65.36 | -15.44 | QP |
| 2 | 0.1620 | 10.13 | 27.85 | 37.98 | 55.36 | -17.38 | AVG |
| 3 | 0.2260 | 10.13 | 35.65 | 45.78 | 62.59 | -16.81 | QP |
| 4 | 0.2260 | 10.13 | 29.02 | 39.15 | 52.59 | -13.44 | AVG |
| 5 | 0.2940 | 10.14 | 29.53 | 39.67 | 60.41 | -20.74 | QP |
| 6 | 0.2940 | 10.14 | 21.88 | 32.02 | 50.41 | -18.39 | AVG |
| 7 | 1.0220 | 10.18 | 29.92 | 40.10 | 56.00 | -15.90 | QP |
| 8 | 1.0220 | 10.18 | 17.37 | 27.55 | 46.00 | -18.45 | AVG |
| 9 | 1.3460 | 10.18 | 28.23 | 38.41 | 56.00 | -17.59 | QP |
| 10 | 1.3460 | 10.18 | 20.72 | 30.90 | 46.00 | -15.10 | AVG |
| 11 | 2.9100 | 10.20 | 28.10 | 38.30 | 56.00 | -17.70 | QP |
| 12 | 2.9100 | 10.20 | 20.45 | 30.65 | 46.00 | -15.35 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

| | | | |
|---|---|---|---|
| Test Mode : | Mode 2: Full system (Display mode 1920*1080@75Hz) (230V/50Hz) | | |
| AC Power : | AC 230V/50Hz | Phase : | NEUTRAL |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.1580 | 10.13 | 39.38 | 49.51 | 65.56 | -16.05 | QP |
| 2 | 0.1580 | 10.13 | 22.47 | 32.60 | 55.56 | -22.96 | AVG |
| 3 | 0.2220 | 10.13 | 35.86 | 45.99 | 62.74 | -16.75 | QP |
| 4 | 0.2220 | 10.13 | 27.70 | 37.83 | 52.74 | -14.91 | AVG |
| 5 | 0.2860 | 10.14 | 31.34 | 41.48 | 60.64 | -19.16 | QP |
| 6 | 0.2860 | 10.14 | 25.54 | 35.68 | 50.64 | -14.96 | AVG |
| 7 | 1.0100 | 10.18 | 26.80 | 36.98 | 56.00 | -19.02 | QP |
| 8 | 1.0100 | 10.18 | 16.58 | 26.76 | 46.00 | -19.24 | AVG |
| 9 | 1.2540 | 10.18 | 28.25 | 38.43 | 56.00 | -17.57 | QP |
| 10 | 1.2540 | 10.18 | 21.03 | 31.21 | 46.00 | -14.79 | AVG |
| 11 | 2.9860 | 10.20 | 29.79 | 39.99 | 56.00 | -16.01 | QP |
| 12 | 2.9860 | 10.20 | 21.54 | 31.74 | 46.00 | -14.26 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

Test engineer: Sun. Zhang

### 3.5.2 Conducted Emission for Telecommunication Port Test Data

Note: The EUT doesn't have the telecommunication port.

## 3.6. Test Photographs

Front View

Rear View

# 4. Test of Radiated Emission

## 4.1. Test Limit

The EUT shall meet the limits of below Table when measured at the measuring distance R in accordance with the methods described in European Standard EN 55032. If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the highest reading shall be recorded, with the exception of any brief isolated high reading, which shall be ignored.

**Table 1 – Required highest frequency for radiated measurement**

| Highest internal frequency ($F_x$) | Highest measured frequency |
|---|---|
| $F_x \leq 108$ MHz | 1 GHz |
| 108 MHz $< F_x \leq$ 500 MHz | 2 GHz |
| 500 MHz $< F_x \leq$ 1 GHz | 5 GHz |
| $F_x >$ 1 GHz | $5 \times F_x$ up to a maximum of 6 GHz |
| NOTE 1 For FM and TV broadcast receivers, $F_x$ is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.<br>NOTE 2 $F_x$ is defined in 3.1.19. | |

Where the $F_x$ is unknown, the radiated emission measurements shall be performed up to 6 GHz.

**Table A.2 – Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment**

| Table clause | Frequency range MHz | Measurement | | Class A limits dB(μV/m) |
|---|---|---|---|---|
| | | Distance m | Detector type/ bandwidth | OATS/SAC (see Table A.1) |
| A2.1 | 30 – 230 | 10 | Quasi Peak / 120 kHz | 40 |
| | 230 – 1 000 | | | 47 |
| A2.2 | 30 – 230 | 3 | | 50 |
| | 230 – 1 000 | | | 57 |
| NOTE Apply only A2.1 or A2.2 across the entire frequency range. | | | | |

**Table A.3 – Requirements for radiated emissions at frequencies above 1 GHz for Class A equipment**

| Table clause | Frequency range MHz | Measurement | | Class A limits dB(μV/m) |
|---|---|---|---|---|
| | | Distance m | Detector type/ bandwidth | FSOATS (see Table A.1) |
| A3.1 | 1 000 – 3 000 | 3 | Average / 1 MHz | 56 |
| | 3 000 – 6 000 | | | 60 |
| A3.2 | 1 000 – 3 000 | | Peak / 1 MHz | 76 |
| | 3 000 – 6 000 | | | 80 |
| NOTE Apply A3.1 and A3.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1. | | | | |

**Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for Class B equipment**

| Table clause | Frequency range MHz | Measurement | | Class B limits dB(μV/m) |
|---|---|---|---|---|
| | | Distance m | Detector type/ bandwidth | OATS/SAC (see Table A.1) |
| A4.1 | 30 – 230 | 10 | Quasi Peak / 120 kHz | 30 |
| | 230 – 1 000 | | | 37 |
| A4.2 | 30 – 230 | 3 | | 40 |
| | 230 – 1 000 | | | 47 |
| NOTE Apply only table clause A4.1 or A4.2 across the entire frequency range. | | | | |

**Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for Class B equipment**

| Table clause | Frequency range MHz | Measurement | | Class B limits dB(μV/m) |
|---|---|---|---|---|
| | | Distance m | Detector type/ bandwidth | FSOATS (see Table A.1) |
| A5.1 | 1 000 – 3 000 | 3 | Average/ 1 MHz | 50 |
| | 3 000 – 6 000 | | | 54 |
| A5.2 | 1 000 – 3 000 | | Peak/ 1 MHz | 70 |
| | 3 000 – 6 000 | | | 74 |
| NOTE Apply A5.1 and A5.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1. | | | | |

**Table A.6 – Requirements for radiated emissions from FM receivers**

| Table clause | Frequency range MHz | Measurement | | Class B limit dB(μV/m) | |
|---|---|---|---|---|---|
| | | Distance m | Detector type/ bandwidth | Fundamental | Harmonics |
| | | | | OATS/SAC (see Table A.1) | OATS/SAC (see Table A.1) |
| A6.1 | 30 – 230 | 10 | Quasi peak/ 120 kHz | 50 | 42 |
| | 230 – 300 | | | | 42 |
| | 300 – 1 000 | | | | 46 |
| A6.2 | 30 – 230 | 3 | | 60 | 52 |
| | 230 – 300 | | | | 52 |
| | 300 – 1 000 | | | | 56 |
| NOTE 1 Apply only A.6.1 or A.6.2 across the entire frequency range.<br>NOTE 2 These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the local oscillator. Signals at all other frequencies shall be compliant with the limits given in Table A.4. | | | | | |

## Table A.12 – Requirements for conducted differential voltage emissions from Class B equipment

**Applicable to**
1. TV broadcast receiver tuner ports (3.1.8) with an accessible connector
2. RF modulator output ports (3.1.27)
3. FM broadcast receiver tuner ports (3.1.8) with an accessible connector

| Table clause | Frequency range MHz | Detector type/ bandwidth | Class B limits dB(µV) 75 Ω | | | Applicability |
|---|---|---|---|---|---|---|
| | | | Other | Local Oscillator Fundamental | Local Oscillator Harmonics | |
| A12.1 | 30 – 950 | For frequencies ≤1 GHz Quasi Peak/ 120 kHz | 46 | 46 | 46 | See NOTE 1 |
| | 950 – 2 150 | | 46 | 54 | 54 | |
| A12.2 | 950 – 2 150 | | 46 | 54 | 54 | See NOTE 2 |
| A12.3 | 30 – 300 | | 46 | 54 | 50 | See NOTE 3 |
| | 300 – 1 000 | | | | 52 | |
| A12.4 | 30 – 300 | For frequencies ≥1 GHz Peak/ 1 MHz | 46 | 66 | 59 | See NOTE 4 |
| | 300 – 1 000 | | | | 52 | |
| A12.5 | 30 – 950 | | 46 | 76 | 46 | See NOTE 5 |
| | 950 – 2 150 | | | n/a | 54 | |

NOTE 1 Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers.

NOTE 2 Tuner units (not the LNB) for satellite signal reception.

NOTE 3 Frequency modulation audio receivers and PC tuner cards.

NOTE 4 Frequency modulation car radios.

NOTE 5 Applicable to EUTs with RF modulator output ports (for example DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports.

NOTE 6 Testing is required at only one EUT supply voltage and frequency.

NOTE 7 The term 'other' refers to all emissions other than the fundamental and the harmonics of the local oscillator.

NOTE 8 The test shall be performed with the device operating at each reception channel.

NOTE 9 The test shall cover the entire frequency range.

## 4.2. Test Procedures

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

The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

The table was rotated 360 degrees to determine the position of the highest radiation.

The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

## 4.3. Typical Test Setup

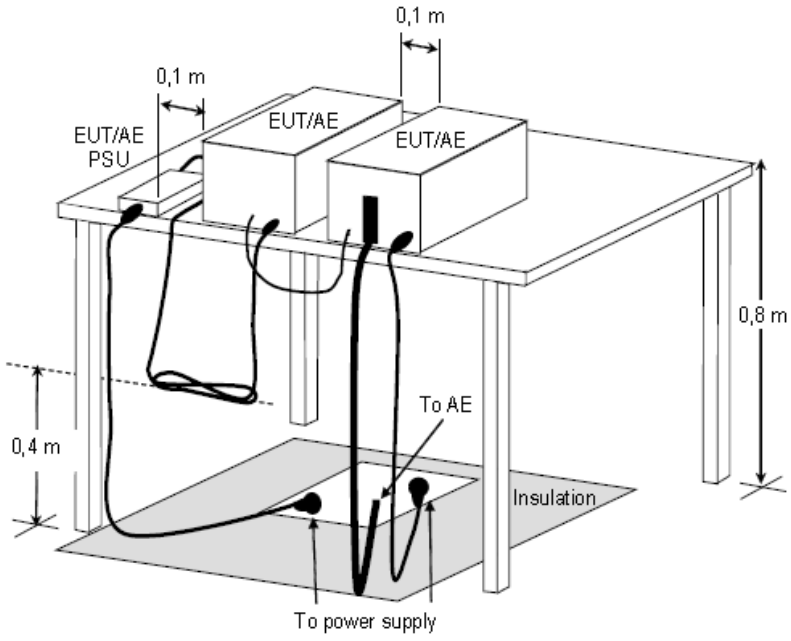


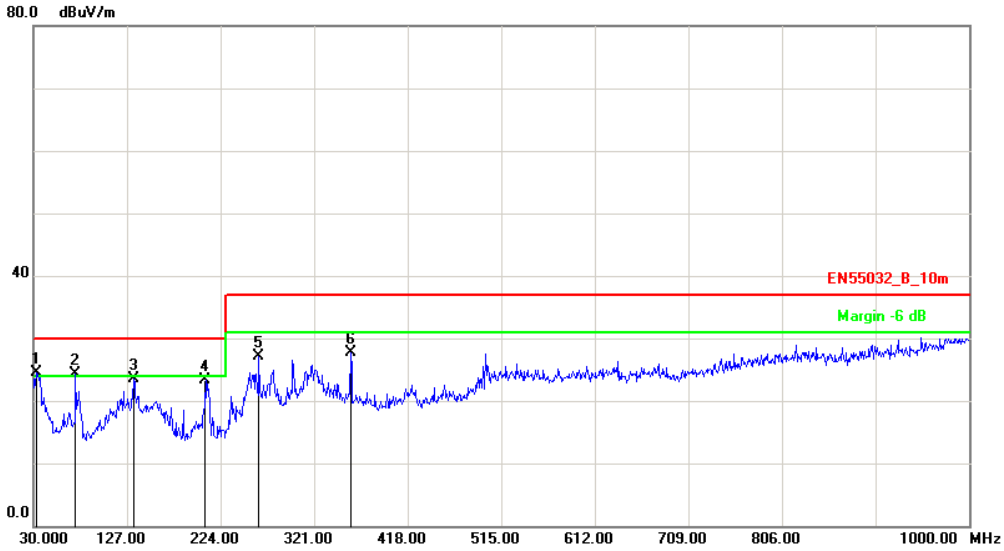

**Figure D.8 – Example measurement arrangement for table-top EUT (Radiated emission measurement)**

## 4.4. Measurement Equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESCI7 | 100968 | 2016.07.21 | 2017.07.20 |
| Preamplifier | Agilent | 87405B | My39500554 | 2017.03.22 | 2018.03.22 |
| Preamplifier | Agilent | 8449B | 3008A02342 | 2017.03.22 | 2018.03.22 |
| Bilog Antenna | Sunol Science | JB1 | A072414-1 | 2016.04.16 | 2017.04.15 |
| Broad-Band Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-618 | 2016.04.16 | 2017.04.15 |
| Spectrum Analyzer | R&S | FSP40 | 100324 | 2016.08.02 | 2017.08.01 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-001 | 2017.03.28 | 2018.03.28 |
| EZ-EMC | Fala | Ver CT3A1 | N/A | N/A | N/A |

## 4.5. Test Result and Data (30MHz ~ 1000MHz)

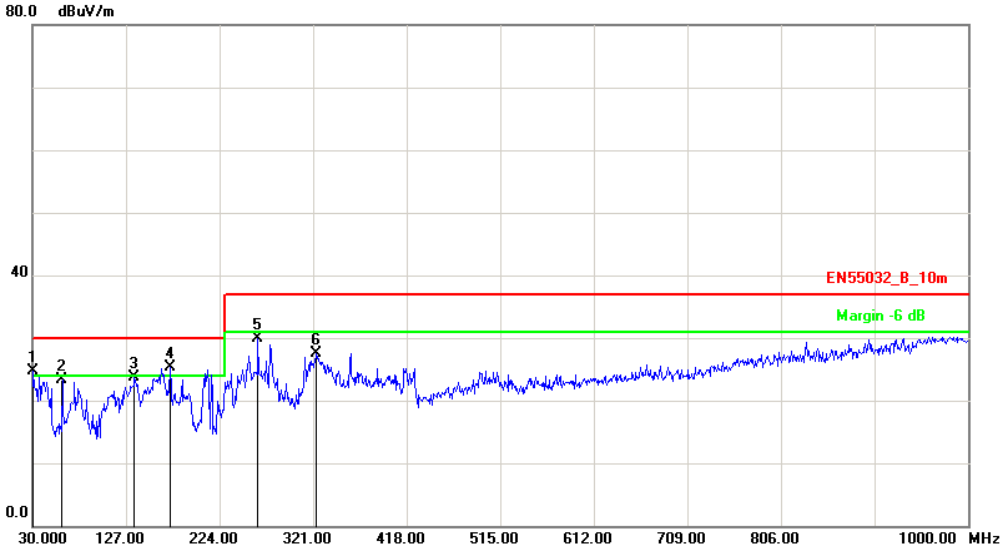
| Test Mode : | Mode 1: Full system (VGA mode 1920*1080@60Hz) (110V/60Hz) | | |
|---|---|---|---|
| AC Power : | AC 110V/60Hz | Ant. Polarization: | Horizontal |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 32.9099 | -5.36 | 29.87 | 24.51 | 30.00 | -5.49 | peak | 400 | 329 |
| 2 | 73.6500 | -15.91 | 40.24 | 24.33 | 30.00 | -5.67 | peak | 100 | 61 |
| 3 | 133.7899 | -10.15 | 33.64 | 23.49 | 30.00 | -6.51 | peak | 100 | 0 |
| 4 | 208.4798 | -10.77 | 34.00 | 23.23 | 30.00 | -6.77 | peak | 400 | 241 |
| 5 | 263.7699 | -9.81 | 36.91 | 27.10 | 37.00 | -9.90 | peak | 400 | 52 |
| 6 | 358.8299 | -6.89 | 34.54 | 27.65 | 37.00 | -9.35 | peak | 400 | 157 |

Note: Measurement Level = Reading Level + Correct Factor

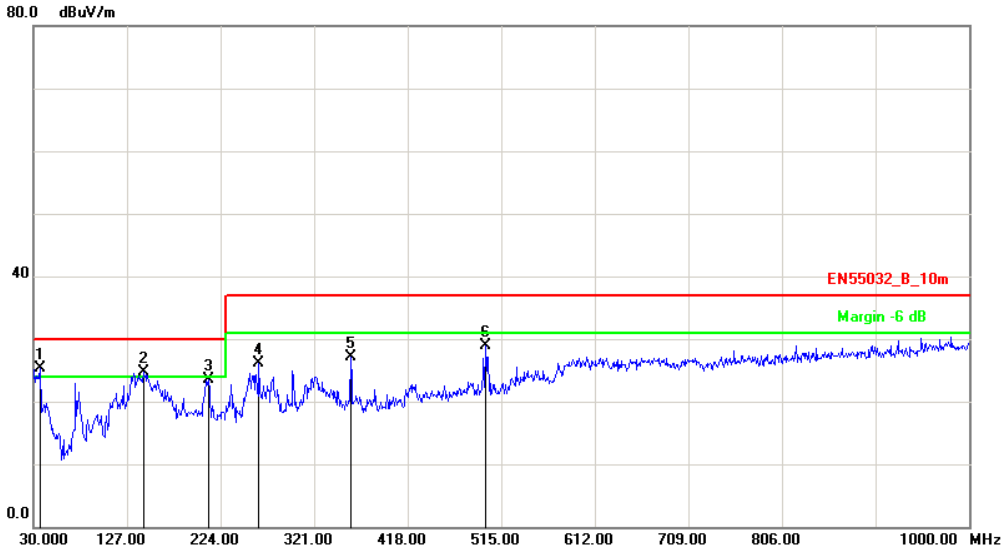
| Test Mode : | Mode 1: Full system (VGA mode 1920*1080@60Hz) (110V/60Hz) | | |
|---|---|---|---|
| AC Power : | AC 110V/60Hz | Ant. Polarization: | Vertical |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.9699 | -3.96 | 28.74 | 24.78 | 30.00 | -5.22 | peak | 100 | 218 |
| 2 | 61.0399 | -16.57 | 39.90 | 23.33 | 30.00 | -6.67 | peak | 400 | 116 |
| 3 | 135.7298 | -10.23 | 33.87 | 23.64 | 30.00 | -6.36 | peak | 100 | 39 |
| 4 | 172.5900 | -11.25 | 36.54 | 25.29 | 30.00 | -4.71 | peak | 100 | 210 |
| 5 | 263.7699 | -9.81 | 39.81 | 30.00 | 37.00 | -7.00 | peak | 400 | 48 |
| 6 | 323.9100 | -7.98 | 35.41 | 27.43 | 37.00 | -9.57 | peak | 100 | 41 |

Note: Measurement Level = Reading Level + Correct Factor

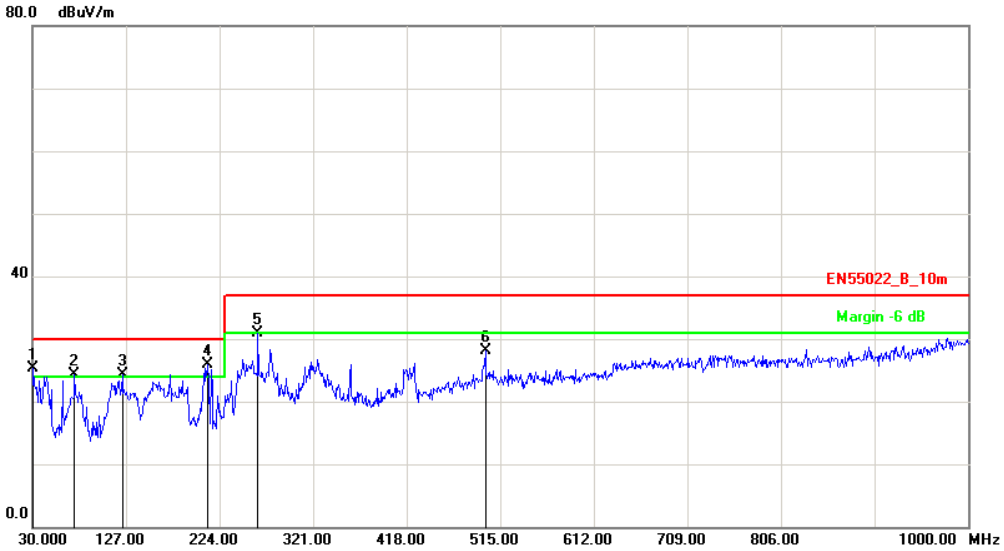
| Test Mode : | Mode 2: Full system (VGA mode 1920*1080@60Hz) (230V/50Hz) | | |
|---|---|---|---|
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Horizontal |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 36.7899 | -8.16 | 33.41 | 25.25 | 30.00 | -4.75 | peak | 100 | 0 |
| 2 | 144.4600 | -10.52 | 35.20 | 24.68 | 30.00 | -5.32 | peak | 400 | 228 |
| 3 | 211.3899 | -11.06 | 34.60 | 23.54 | 30.00 | -6.46 | peak | 100 | 115 |
| 4 | 263.7699 | -9.81 | 35.91 | 26.10 | 37.00 | -10.90 | peak | 400 | 61 |
| 5 | 358.8299 | -6.89 | 34.04 | 27.15 | 37.00 | -9.85 | peak | 100 | 357 |
| 6 | 498.5099 | -3.06 | 32.05 | 28.99 | 37.00 | -8.01 | peak | 400 | 49 |

Note: Measurement Level = Reading Level + Correct Factor

| Test Mode : | Mode 2: Full system (VGA mode 1920*1080@60Hz) (230V/50Hz) | | |
|---|---|---|---|
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Vertical |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |

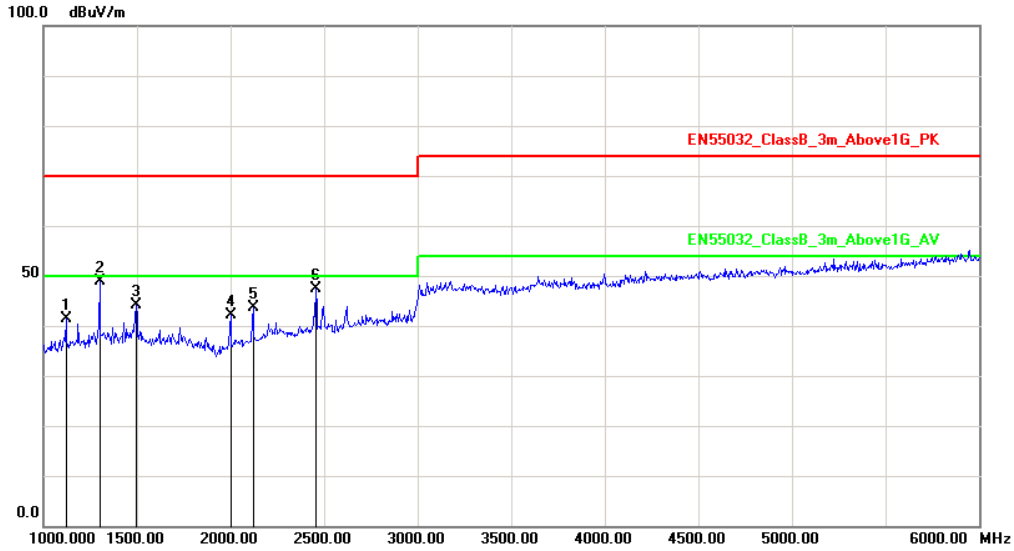



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.9699 | -3.96 | 29.24 | 25.28 | 30.00 | -4.72 | peak | 400 | 95 |
| 2 | 73.6500 | -15.91 | 40.24 | 24.33 | 30.00 | -5.67 | peak | 100 | 188 |
| 3 | 123.1200 | -9.69 | 34.02 | 24.33 | 30.00 | -5.67 | peak | 100 | 24 |
| 4 | 211.3899 | -11.06 | 37.06 | 26.00 | 30.00 | -4.00 | peak | 400 | 326 |
| 5 | 263.7699 | -9.81 | 40.81 | 31.00 | 37.00 | -6.00 | peak | 100 | 152 |
| 6 | 499.4800 | -3.03 | 31.14 | 28.11 | 37.00 | -8.89 | peak | 100 | 0 |

Note: Measurement Level = Reading Level + Correct Factor

## 4.6. Test Result and Data (1000MHz ~ 6000MHz)

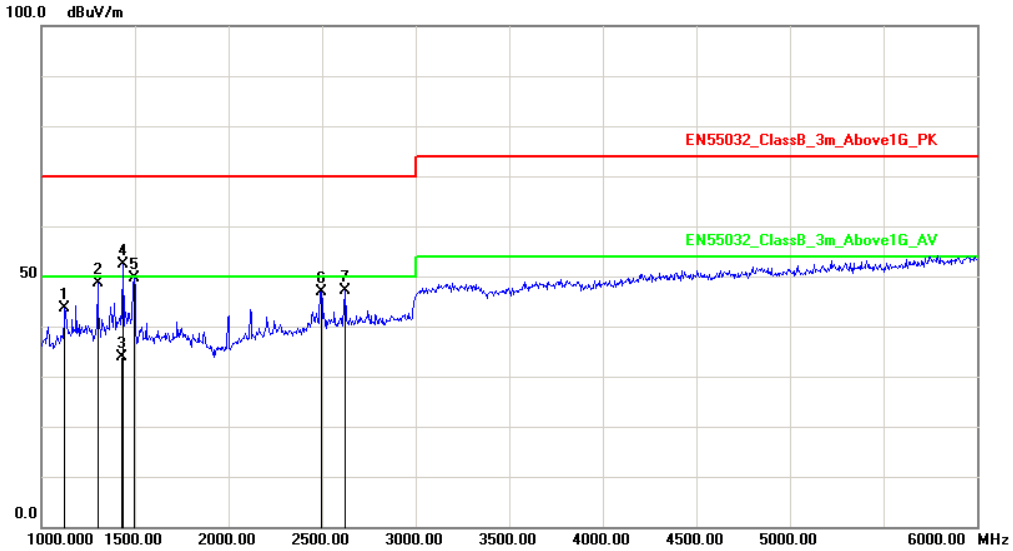
| Test Mode : | Mode 1: Full system (Display mode 1920*1080@75Hz) (110V/60Hz) | | |
|---|---|---|---|
| AC Power : | AC 110V/60Hz | Ant. Polarization: | Horizontal |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1120.000 | -5.18 | 46.52 | 41.34 | 70.00 | -28.66 | peak | 100 | 116 |
| 2 | 1300.000 | -3.98 | 52.88 | 48.90 | 70.00 | -21.10 | peak | 100 | 0 |
| 3 | 1495.000 | -2.67 | 46.78 | 44.11 | 70.00 | -25.89 | peak | 200 | 306 |
| 4 | 2000.000 | -1.20 | 43.31 | 42.11 | 70.00 | -27.89 | peak | 100 | 148 |
| 5 | 2120.000 | -0.59 | 44.32 | 43.73 | 70.00 | -26.27 | peak | 100 | 228 |
| 6 | 2455.000 | 1.12 | 46.34 | 47.46 | 70.00 | -22.54 | peak | 100 | 0 |

Note: Measurement Level = Reading Level + Correct Factor

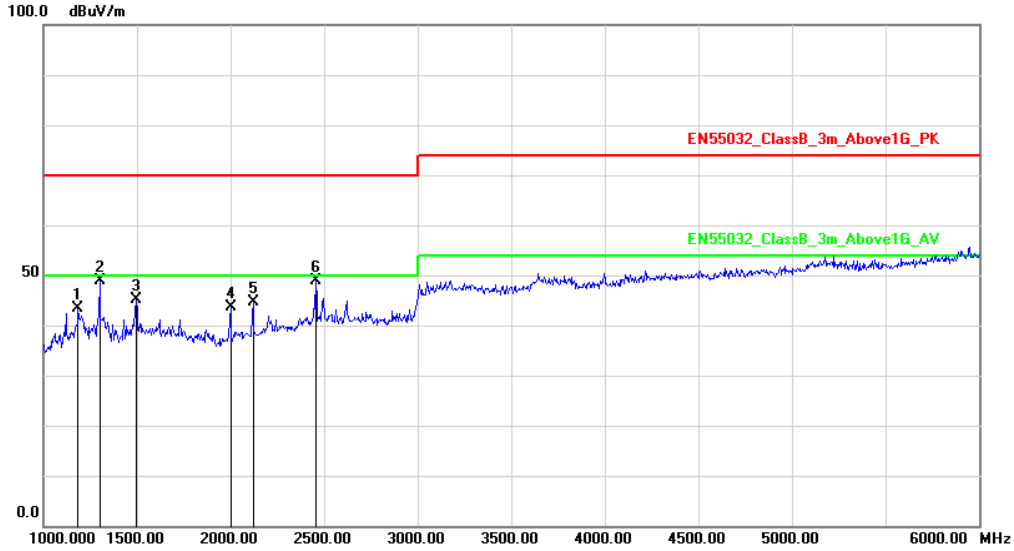
| Test Mode : | Mode 1: Full system (Display mode 1920*1080@75Hz) (110V/60Hz) | | |
|---|---|---|---|
| AC Power : | AC 110V/60Hz | Ant. Polarization: | Vertical |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1125.000 | -5.15 | 48.73 | 43.58 | 70.00 | -26.42 | peak | 200 | 360 |
| 2 | 1300.000 | -3.98 | 52.56 | 48.58 | 70.00 | -21.42 | peak | 100 | 11 |
| 3 | 1432.000 | -3.09 | 36.87 | 33.78 | 50.00 | -16.22 | AVG | 200 | 0 |
| 4 | 1435.000 | -3.07 | 55.48 | 52.41 | 70.00 | -17.59 | peak | 200 | 0 |
| 5 | 1495.000 | -2.67 | 52.26 | 49.59 | 70.00 | -20.41 | peak | 100 | 211 |
| 6 | 2495.000 | 1.32 | 45.61 | 46.93 | 70.00 | -23.07 | peak | 100 | 9 |
| 7 | 2625.000 | 2.04 | 45.08 | 47.12 | 70.00 | -22.88 | peak | 200 | 360 |

Note: Measurement Level = Reading Level + Correct Factor

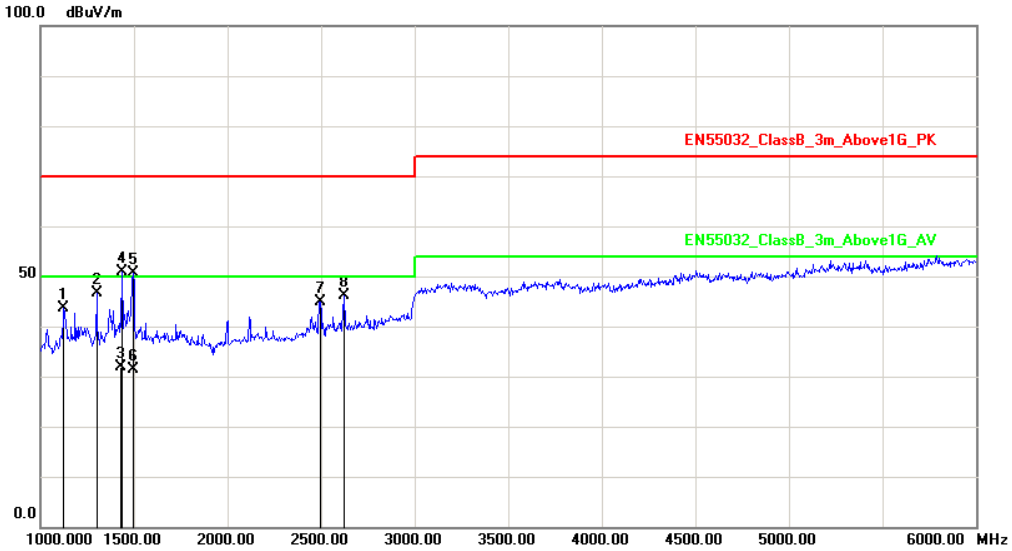
| | | | |
|---|---|---|---|
| Test Mode : | Mode 2: Full system (Display mode 1920*1080@75Hz) (230V/50Hz) | | |
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Horizontal |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |




| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1185.000 | -4.74 | 48.23 | 43.49 | 70.00 | -26.51 | peak | 190 | 251 |
| 2 | 1300.000 | -3.98 | 52.88 | 48.90 | 70.00 | -21.10 | peak | 100 | 112 |
| 3 | 1495.000 | -2.67 | 47.78 | 45.11 | 70.00 | -24.89 | peak | 200 | 360 |
| 4 | 2000.000 | -1.20 | 44.81 | 43.61 | 70.00 | -26.39 | peak | 100 | 360 |
| 5 | 2120.000 | -0.59 | 45.32 | 44.73 | 70.00 | -25.27 | peak | 100 | 297 |
| 6 | 2455.000 | 1.12 | 47.84 | 48.96 | 70.00 | -21.04 | peak | 100 | 23 |

Note: Measurement Level = Reading Level + Correct Factor

| Test Mode : | Mode 2: Full system (Display mode 1920*1080@75Hz) (230V/50Hz) | | |
|---|---|---|---|
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Vertical |
| Equipment : | LCD Monitor | Model No : | 240LM00016 |
| Temperature : | 24°C | Humidity : | 52% |
| Pressure(mbar) : | 1001 | Date: | 2017/03/29 |



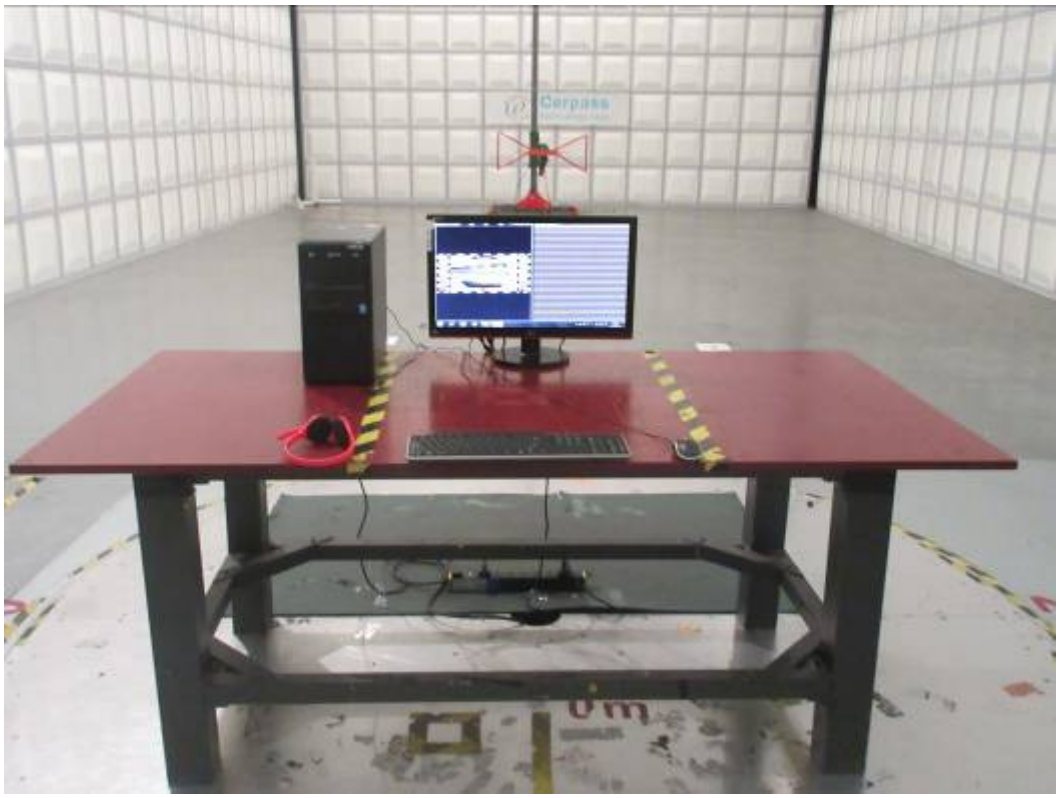

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1125.000 | -5.15 | 48.73 | 43.58 | 70.00 | -26.42 | peak | 200 | 360 |
| 2 | 1300.000 | -3.98 | 50.56 | 46.58 | 70.00 | -23.42 | peak | 100 | 11 |
| 3 | 1432.000 | -3.09 | 35.02 | 31.93 | 50.00 | -18.07 | AVG | 200 | 0 |
| 4 | 1435.000 | -3.07 | 53.98 | 50.91 | 70.00 | -19.09 | peak | 200 | 0 |
| 5 | 1495.000 | -2.67 | 53.26 | 50.59 | 70.00 | -19.41 | peak | 100 | 211 |
| 6 | 1497.000 | -2.66 | 33.98 | 31.32 | 50.00 | -18.68 | AVG | 100 | 211 |
| 7 | 2495.000 | 1.32 | 43.61 | 44.93 | 70.00 | -25.07 | peak | 200 | 9 |
| 8 | 2625.000 | 2.04 | 44.08 | 46.12 | 70.00 | -23.88 | peak | 100 | 360 |

Note: Measurement Level = Reading Level + Correct Factor

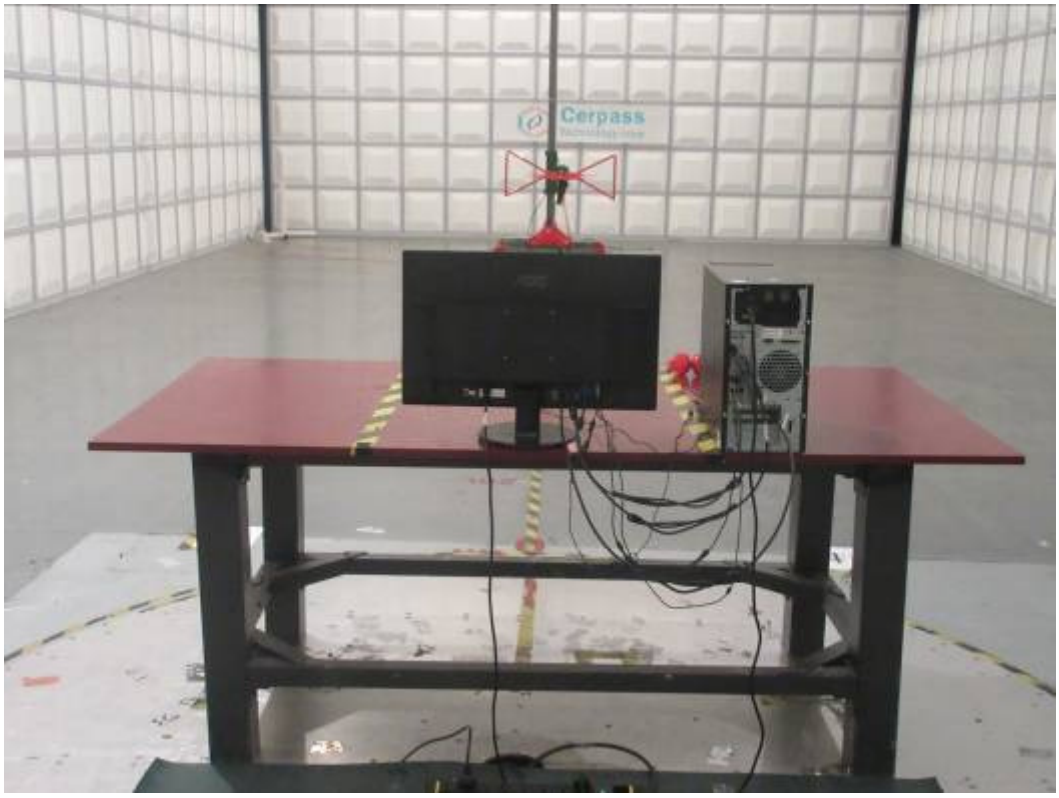
Test engineer: Sun. Zhang

## 4.7. Test Photographs (30MHz ~ 1000MHz)

Front View

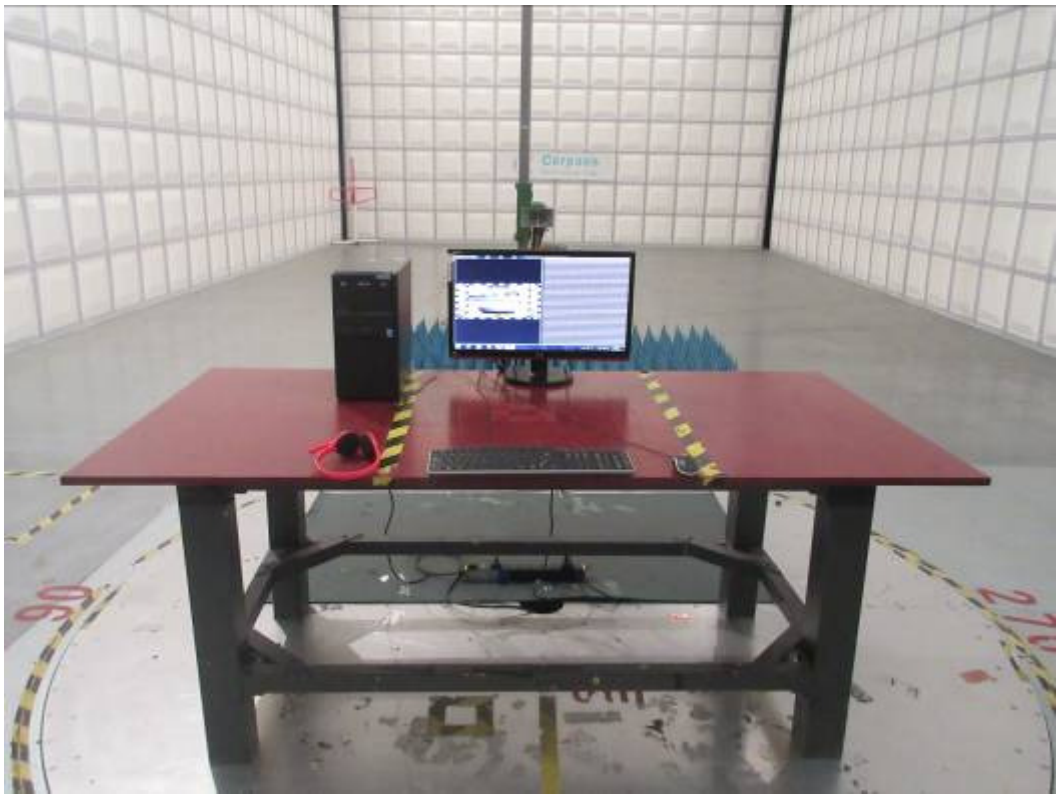


Rear View



## 4.8. Test Photographs (1000MHz ~ 6000MHz)

Front View



Rear View

# 5. Harmonics Test

## 5.1. Limits of Harmonics Current Measurement

**Limits for Class A equipment**

| Harmonics Order n | Max. permissible harmonics current A | Harmonics Order n | Max. permissible harmonics current A |
|---|---|---|---|
| Odd harmonics | | Even harmonics | |
| 3 | 2.30 | 2 | 1.08 |
| 5 | 1.14 | 4 | 0.43 |
| 7 | 0.77 | 6 | 0.30 |
| 9 | 0.40 | 8<=n<=40 | 0.23x8/n |
| 11 | 0.33 | | |
| 13 | 0.21 | | |
| 15<=n<=39 | 0.15x15/n | | |

**(b) Limits for Class B equipment**

For Class B equipment, the harmonics of the input current shall not exceed the values given in Table that is the limit of Class A multiplied by a factor of 1,5.

**(c) Limits for Class C equipment**

| Harmonics Order n | Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency % |
|---|---|
| 2 | 2 |
| 3 | $30 \cdot \lambda^*$ |
| 5 | 10 |
| 7 | 7 |
| 9 | 5 |
| 11<n<39 (odd harmonics only) | 3 |
| * λ is the circuit power factor | |

**(d) Limits for Class D equipment**

| Harmonics Order n | Maximum permissible harmonic current per watt mA/W | Maximum permissible harmonic current A |
|---|---|---|
| 3 | 3.4 | 2.30 |
| 5 | 1.9 | 1.14 |
| 7 | 1.0 | 0.77 |
| 9 | 0.5 | 0.40 |
| 11 | 0.35 | 0.33 |
| 11 < n < 39 (odd harmonics only) | 3.85/n | See limit of Class A |

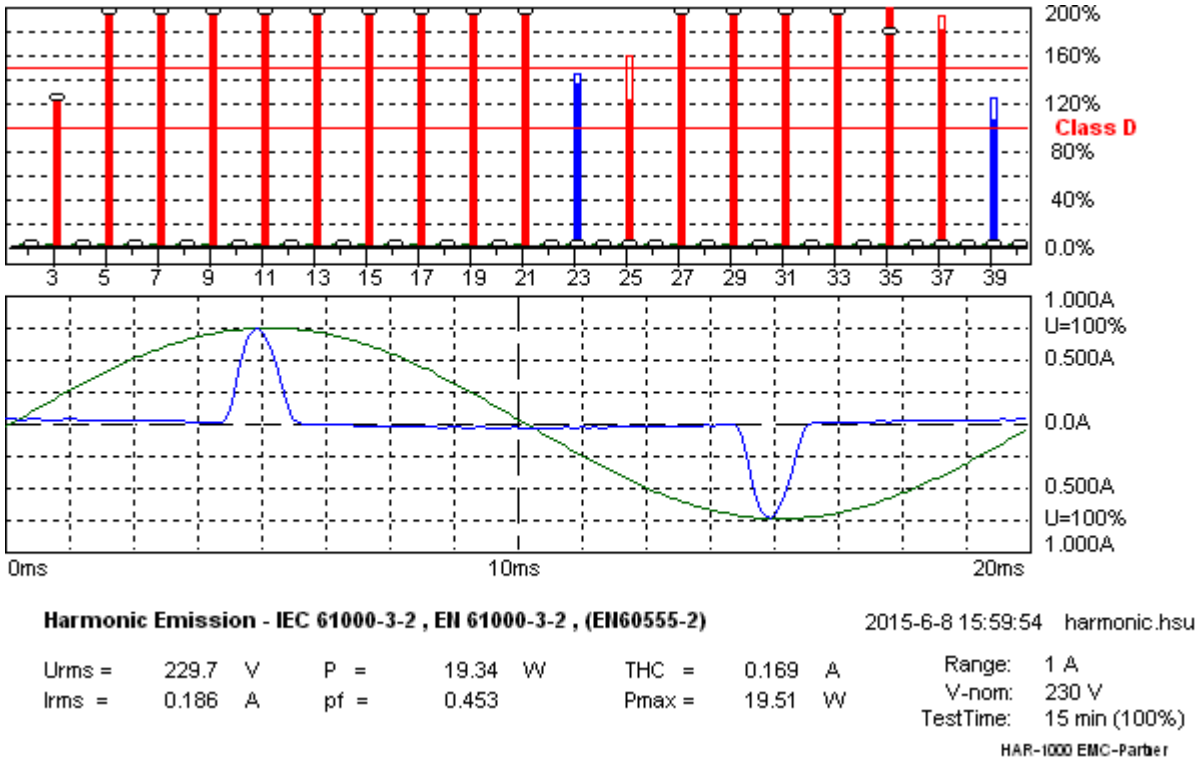
**NOTE:** According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

## 5.2. Measurement Equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|---|---|---|---|---|---|
| EMC Emission Tester | EMCPARTNER | Harmonics-1000 | 159 | 2015.04.02 | 2016.04.01 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-004 | 2015.04.02 | 2016.04.01 |
| POWER SOURCE | Pacific | 140AMX-UP12/S | 1792 | 2014.09.04 | 2015.09.03 |
| HARCS | EMC Partner AG | Ver 4.18 | N/A | N/A | N/A |

## 5.3. Test Result and Data

| | | |
|---|---|---|
| Basic Standard | : | EN 61000-3-2 |
| Final Test Result | : | PASS |
| Test Mode | : | Mode 1,2,3 |
| Model No. | : | 240LM00016 |
| Temperature | : | 22℃ |
| Humidity | : | 51% |
| Atmospheric Pressure | : | 100 kPa |
| Test Date | : | Jun 08,2015 |




**Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2)** 2015-6-8 15:59:54 harmonic.hsu

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Urms = | 229.7 | V | P = | 19.34 | W | THC = | 0.169 | A | Range: | 1 A |
| Irms = | 0.186 | A | pf = | 0.453 | | Pmax = | 19.51 | W | V-nom: | 230 V |
| | | | | | | | | | TestTime: | 15 min (100%) |

HAR-1000 EMC-Parker

Full Bar : Actual Values

Empty Bar : Maximum Values

Blue : Current , Green : Voltage , Red : Failed

Urms = 229.7V Freq = 50.000 Range: 1 A

Irms = 0.186A Ipk = 0.740A cf = 3.979

P = 19.34W S = 42.74VA pf = 0.453

THDi = 88.6 % THDu = 0.20 % Class D

Test - Time : 15min ( 100 %)

Limit Reference: Pmax = 19.511W

Test completed, Result: N/L

| Order | Freq. [Hz] | Irms [A] | Irms%L [%] | Imax [A] | Imax%L [%] | Limit [A] | Status |
|---|---|---|---|---|---|---|---|
| 1 | 50 | 0.0886 | | 0.0893 | | | |
| 2 | 100 | 0.0004 | | 0.0005 | | | |
| 3 | 150 | 0.0814 | 122.74 | 0.0820 | 123.66 | 0.00 | N/L |
| 4 | 200 | 0.0005 | | 0.0006 | | | |
| 5 | 250 | 0.0770 | 207.62 | 0.0775 | 209.10 | 0.00 | N/L |
| 6 | 300 | 0.0004 | | 0.0006 | | | |
| 7 | 350 | 0.0706 | 361.62 | 0.0710 | 363.81 | 0.00 | N/L |
| 8 | 400 | 0.0004 | | 0.0007 | | | |
| 9 | 450 | 0.0625 | 640.66 | 0.0629 | 644.42 | 0.00 | N/L |
| 10 | 500 | 0.0005 | | 0.0007 | | | |
| 11 | 550 | 0.0535 | 782.95 | 0.0537 | 786.53 | 0.00 | N/L |
| 12 | 600 | 0.0005 | | 0.0008 | | | |
| 13 | 650 | 0.0439 | 759.47 | 0.0441 | 762.64 | 0.00 | N/L |
| 14 | 700 | 0.0004 | | 0.0007 | | | |
| 15 | 750 | 0.0341 | 680.09 | 0.0341 | 681.31 | 0.00 | N/L |
| 16 | 800 | 0.0004 | | 0.0006 | | | |
| 17 | 850 | 0.0247 | 559.43 | 0.0248 | 562.19 | 0.00 | N/L |
| 18 | 900 | 0.0003 | | 0.0005 | | | |
| 19 | 950 | 0.0164 | 413.74 | 0.0165 | 418.37 | 0.00 | N/L |
| 20 | 1000 | 0.0002 | | 0.0004 | | | |
| 21 | 1050 | 0.0094 | 262.77 | 0.0098 | 273.01 | 0.00 | N/L |
| 22 | 1100 | 0.0002 | | 0.0002 | | | |
| 23 | 1150 | 0.0044 | 134.55 | 0.0047 | 143.90 | 0.00 | N/L |
| 24 | 1200 | 0.0001 | | 0.0002 | | | |
| 25 | 1250 | 0.0036 | 119.85 | 0.0047 | 156.41 | 0.00 | N/L |
| 26 | 1300 | 0.0002 | | 0.0002 | | | |
| 27 | 1350 | 0.0054 | 193.06 | 0.0063 | 225.96 | 0.00 | N/L |
| 28 | 1400 | 0.0002 | | 0.0003 | | | |
| 29 | 1450 | 0.0067 | 256.84 | 0.0070 | 270.98 | 0.00 | N/L |
| 30 | 1500 | 0.0002 | | 0.0003 | | | |
| 31 | 1550 | 0.0069 | 284.63 | 0.0071 | 292.19 | 0.00 | N/L |
| 32 | 1600 | 0.0002 | | 0.0003 | | | |
| 33 | 1650 | 0.0063 | 278.86 | 0.0065 | 284.22 | 0.00 | N/L |
| 34 | 1700 | 0.0002 | | 0.0003 | | | |
| 35 | 1750 | 0.0051 | 238.88 | 0.0052 | 244.57 | 0.00 | N/L |
| 36 | 1800 | 0.0002 | | 0.0003 | | | |
| 37 | 1850 | 0.0036 | 177.38 | 0.0038 | 189.40 | 0.00 | N/L |
| 38 | 1900 | 0.0002 | | 0.0002 | | | |
| 39 | 1950 | 0.0020 | 104.57 | 0.0024 | 123.59 | 0.00 | N/L |
| 40 | 2000 | 0.0002 | | 0.0002 | | | |

The power of EUT is less than 75W after the testing. According the standard, the equipment with a rated power of 75W or less, other than lighting equipment, limits are not specified in this standard. So the test data needn't list.

Test engineer: Steven

## 5.4. Test Photographs

# Voltage Fluctuations Test

## 5.5. Test Procedure

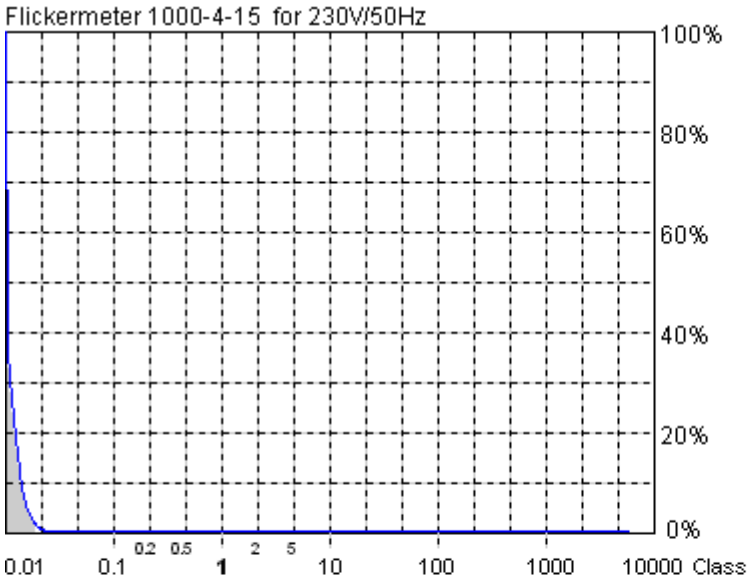
The equipment shall be tested under the conditions of **Clause 5.**
The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance.
The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of ±8% is achieved during the whole assessment procedure.

## 5.6. Measurement Equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|---|---|---|---|---|---|
| EMC Emission Tester | EMCPARTNER | Harmonics-1000 | 159 | 2015.04.02 | 2016.04.01 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-004 | 2015.04.02 | 2016.04.01 |
| POWER SOURCE | Pacific | 140AMX-UP12/S | 1792 | 2014.09.04 | 2015.09.03 |
| HARCS | EMC Partner AG | Ver 4.18 | N/A | N/A | N/A |

## 5.7. Test Result and Data

| | | |
|---|---|---|
| Basic Standard | : | EN 61000-3-3 |
| Final Test Result | : | PASS |
| Test Mode | : | Mode 1,2,3 |
| Model No. | : | 240LM00016 |
| Temperature | : | 22℃ |
| Humidity | : | 51% |
| Atmospheric Pressure | : | 100 kPa |
| Test Date | : | Jun 08,2015 |




| | |
|---|---|
| **Actual Flicker (Fli):** | **0.01** |
| **Short-term Flicker (Pst):** | **0.09** |
| Limit (Pst): | 1.00 |
| **Long-term Flicker (Plt):** | **0.09** |
| Limit (Plt): | 0.65 |
| **Maximum Relative Volt. Change (dmax):** | **0.00%** |
| Limit (dmax): | 4.00% |
| **Relative Steady-state Voltage Change (dc):** | **0.07%** |
| Limit (dc): | 3.30% |
| **Maximum Interval exceeding 3.30% (dt):** | **0.00ms** |
| Limit (dt>Lim): | 500ms |

**Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (EN60555-3)**

2015-6-8 16:12:07 harmonic.hsu

Urms = 229.7 V P = 19.39 W
Irms = 0.188 A pf = 0.450

Range: 1 A
V-nom: 230 V
TestTime: 10 min (100%)

**Test completed, Result: PASSED**

HAR-1000 EMC-Partner

Full Bar : Actual Values

Empty Bar : Maximum Values

Circles : Average Values

Blue : Current , Green : Voltage , Red : Failed

| | | | | | |
|---|---|---|---|---|---|
| Urms = | 229.7V | Freq = | 50.000 | Range: | 1 A |
| Irms = | 0.188A | Ipk = | 0.746A | cf = | 3.979 |
| P = | 19.39W | S = | 43.07VA | pf = | 0.450 |

Test - Time : 1 x 10min = 10min ( 100 %)

LIN (Line Impedance Network) : No LIN

| | | | | | |
|---|---|---|---|---|---|
| Limits : | Plt : | 0.65 | Pst : | 1.00 | |
| | | dmax : | 4.00 % | dc : | 3.30 % |
| | | dtLim: | 3.30 % | dt>Lim: | 500ms |

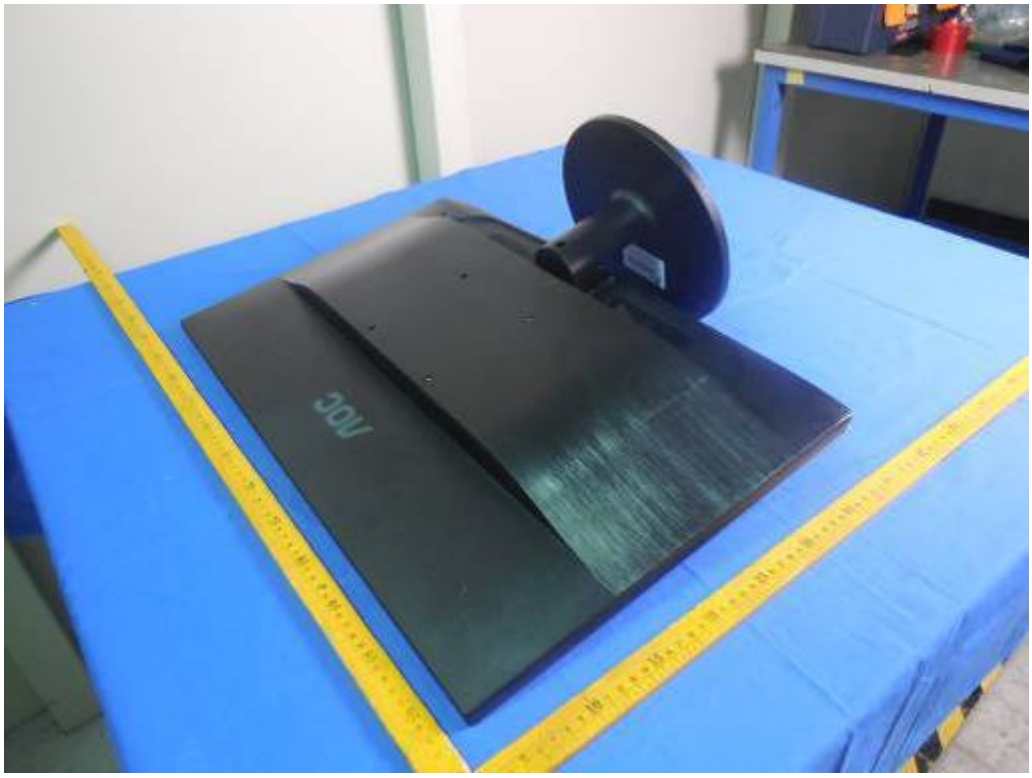
Test completed, Result: PASSED

Test engineer:

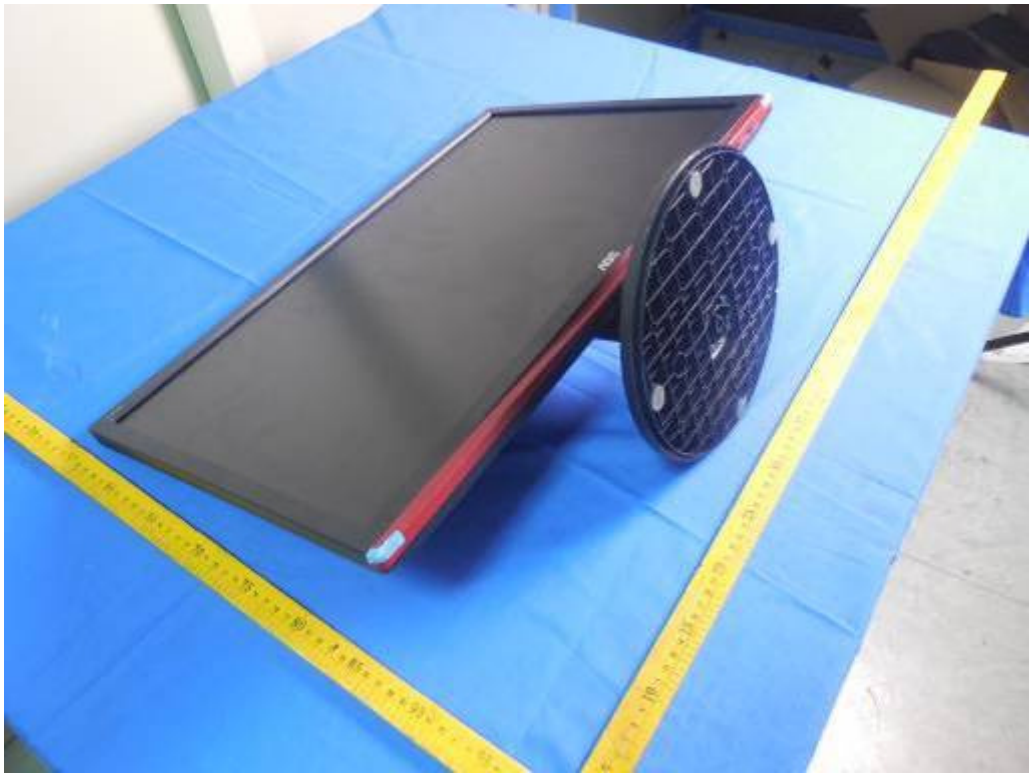
## 5.8. Test Photographs

# 6. Photographs of EUT

1) EUT Photo




2) EUT Photo



3) EUT Photo


4) EUT Photo

5) EUT Photo

6) EUT Photo