

Technical Compliance Statement

CE EMC Test Report

For the following information

Ref. File No.: C1M1702156

Product : LCD Monitor

Model Number : (1)238LM00020 (2)PDS241*** (*= alphabetic or blank)

Brand Name : AOC

Applicant : TPV Electronics (FuJian) Co., Ltd

Standards :

Emission : EN 55032:2012 +AC:2013 (CISPR 32:2012), Class B
AS/NZS CISPR 32:2013 (CISPR 32:2012)
EN 61000-3-2:2014 and EN 61000-3-3:2013

Immunity: EN 55024:2010 +A1:2015
(IEC 61000-4-2:2008, IEC 61000-4-3:2010, IEC 61000-4-4:2012,
IEC 61000-4-5:2014, IEC 61000-4-6:2013, IEC 61000-4-8:2009,
IEC 61000-4-11:2004)

We hereby certify that the above product has been tested by us with the listed standards and found in compliance with the council EMC directive 2014/30/EU. The test data & results are issued on the EMC test report no. **EM-E170188**.

Signature


Alex Deng/Deputy Manager
Date: 2017. 02. 16

Test Laboratory:
AUDIX Technology Corporation, EMC Department
TAF Accreditation No.: 1724
Web Site: www.audixtech.com



The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.

TEST REPORT

Product: LCD Monitor
Model: (1)238LM00020 (2)PDS241***
Brand: AOC

Applicant:
TPV Electronics (FuJian) Co., Ltd
Rongqiao Economic and Technological Development Zone,
Fuqing City, Fujian Province, P.R. China

Prepared by:
AUDIX Technology Corporation, EMC Department
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan



File No. : C1M1702156
Report No. : EM-E170188
Date of Report : 2017. 02. 16

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Test Report

Applicant : TPV Electronics (FuJian) Co., Ltd
EUT Description
(1) Product : LCD Monitor
(2) Model : (1)238LM00020 (2)PDS241***
(3) Brand : AOC
(4) Power Supply : AC 100-240V, 50/60Hz

Applicable Standards:

EN 55032:2012 +AC:2013 (CISPR 32:2012)

AS/NZS CISPR 32:2013 (CISPR 32:2012)

EN 61000-3-2:2014 and EN 61000-3-3:2013

EN 55024:2010 +A1:2015

(IEC 61000-4-2:2008, IEC 61000-4-3:2010, IEC 61000-4-4:2012,
IEC 61000-4-5:2014, IEC 61000-4-6:2013, IEC 61000-4-8:2009,
IEC 61000-4-11:2004)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device, its ensured severity levels, and performance criterion. This test report contains the measurement results, and AUDIX Technology Corporation assumes full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT is technically compliance with the requirements of EN 55032、 EN 61000-3-2, -3 and EN 55024 standards.

This report applies to above tested sample only and shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Report: 2017. 02. 16

Reviewed by:



(Kitty Ni/Section Manager)

Approved by:



(Alex Deng/Deputy Manager)

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1. Revision of Test Report

Issued Date	Revision Summary	Report Number
2017. 02. 16	Original Report.	EM-E170188

2. Summary of Test Result

2.1. Test Result

Emissions			
Test Item	Referred Standard	Limit	Result
Conducted emissions at AC mains power port	EN 55032:2012 +AC:2013 (CISPR 32:2012)	Class B	Pass
			Margin 6.72dB at 2.474MHz
Asymmetric mode conducted emissions at wired network port	EN 55032:2012 +AC:2013 (CISPR 32:2012)	Class B	N/A
Asymmetric mode conducted emissions at broadcast receiver tuner port	EN 55032:2012 +AC:2013 (CISPR 32:2012)	Class B	N/A
Conducted differential voltage emissions at broadcast receiver tuner port	EN 55032:2012 +AC:2013 (CISPR 32:2012)	Class B	N/A
Radiated emissions (30 – 1000MHz)	EN 55032:2012 +AC:2013 (CISPR 32:2012)	Class B	Pass
			Margin 1.21dB at 890.962MHz
Radiated emissions (1 – 6GHz)	EN 55032:2012 +AC:2013 (CISPR 32:2012)	Class B	Pass
			Margin 11.44dB at 1780.22MHz
Harmonic current emissions	EN 61000-3-2:2014	Class D	Pass
Voltage fluctuations & flicker	EN 61000-3-3:2013	Section 5	Pass
Note : 1. N/A is an abbreviation for Not Applicable. 2. Special measures None 3. Decision and justification not to measure None			

Immunity				
Test Item	Basic Standard	Standard Criteria	EUT Criteria	Result
Electrostatic discharge	IEC 61000-4-2:2008	B	B	Pass
Radiated, Radio-frequency, electromagnetic field	IEC 61000-4-3:2010	A	A	Pass
Electrical fast transient/burst	IEC 61000-4-4:2012	B	A	Pass
Surge at AC power port	IEC 61000-4-5:2014	B	A	Pass
Surge at Telecommunication port	IEC 61000-4-5:2014	C	N/A	N/A
Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6:2013	A	A	Pass
Power frequency magnetic field	IEC 61000-4-8:2009	A	A	Pass
Voltage dips, >95% reduction	IEC 61000-4-11:2004	B	A	Pass
Voltage dips, 30% reduction		C	A	Pass
Voltage interruptions, >95% reduction		C	C	Pass
<p>Note :</p> <ol style="list-style-type: none"> 1. N/A is an abbreviation for Not Applicable 2. Special measures: None 3. Decision and justification not to measure: None 				

2.2. Description of Performance Criteria

Performance criterion A

During the test, when seen from the normal viewing distance, the EUT shall operate with no change beyond the manufacturer's specification, in flicker, colour, focus and jitter (except for the power frequency magnetic field test).

Power frequency magnetic field test

For CRT monitors, the following also applies:

The jitter shall be measured when the CRT monitor is immersed in a continuous magnetic field of 1 A/m (r.m.s.) at one of the power frequencies of 50 Hz or 60 Hz.

For displays with pixels having continuous luminance distributions only, jitter may be measured using a measuring microscope of at least 20 power. The movement is determined by visual alignment of the microscope cursor or comparator reticle with the extreme positions of the centroid or edge of a character or test object during the observation period.

For any display type, a special display-measuring device may be used. This device shall determine, on a scan-by-scan basis, the relative location of a character or test object. If a device is used that determines movement along the horizontal and vertical axes only, the extent of the jitter shall be defined as the square root of the sum of the squares of the maximum horizontal and vertical differences.

Observations shall extend for periods of at least 4 s. Measuring devices that sample scans shall accumulate a number of scans equivalent to at least 4 s of continuous observation.

The maximum jitter permitted is given by:

$$J \leq \frac{(C + 0,3) \times 2,5}{33,3}$$

where

J is the jitter (in mm);

C is the character height (in mm).

Alternatively, a field of 50 A/m may be applied, and a transparent graduated mask used to assess the jitter. In this case, the jitter shall not exceed 50 times the value in the above formula.

The EUT shall be tested in two positions, both perpendicular to the magnetic field.

Performance criterion B

Screen disturbances during the application of the test are permissible if they self-recover after removal of the external disturbance.

Performance criterion C

Failures during the test that cannot self-recover after removal of the external disturbance, but which can be recovered after the test to normal operation by reset or reboot are permissible.

2.3. Description of Test Firm

<p>Name of Test Firm</p>	<p>Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099301 Website : www.audixtech.com Contact e-mail: sales@audixtech.com</p>
<p>Accreditations</p>	<p>The laboratory is accredited by following organizations under ISO/IEC 17025:2005</p> <ul style="list-style-type: none"> (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724
<p>Test Facilities</p>	<ul style="list-style-type: none"> (1) No. 7 Shielding Room (2) No. 3 Open Area Test Site (3) No. 1 10m Semi-Anechoic Chamber (4) No. 2 EMS Test Room (5) No. 3 EMS Test Room

3. General Information

3.1. Description of Application

Applicant	TPV Electronics (FuJian) Co., Ltd Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R. China
Product	LCD Monitor
Brand	AOC
Model	(1)238LM00020 (2)PDS241*** (The “*” could be any alphanumeric character including blank for marketing differentiation.) The difference of above models is in sales marketing

3.2. Description of the EUT

Test Model	238LM00020
Serial Number	N/A
Power Rating	AC 100-240V, 50/60Hz
Firmware Version	N/A
Sample Status	Production
Date of Receipt	2017. 02. 10
Data of Test	2017. 02. 13 ~ 15
I/O Ports List	View of Monitor <ul style="list-style-type: none"> • One Connection Port • One Earphone Port View of External Power <ul style="list-style-type: none"> • Two HDMI Ports • One AC Port
Accessories	<ul style="list-style-type: none"> • HDMI Cable • Connection Cable • AC Power Cord (2C)

3.3. List of Key Components of EUT

None

3.4. Highest Frequency within EUT

The highest frequency is 170MHz of EUT.

3.5. Determination of Worse Case Operating Modes

According to the specification, the EUT was estimated to determine the highest emissions by following configurations:

Test Item	Test Voltage	Input Port	Connection Cable	HDMI Cable	Power Cord	Resolution & Frequency
Conducted emissions at AC mains power port	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	640*480/60Hz
						1280*1024/75Hz
	110V/60Hz					1920*1080/60Hz
	230V/50Hz	Connection	0.7m (w/ core)	1.8m (w/o core)	1.8m	1920*1080/60Hz
	230V/50Hz	Connection	0.7m (w/o core)	1.8m (w/ core)	1.8m	1920*1080/60Hz
	230V/50Hz	Connection	0.7m (w/o core)	1.8m (w/ core)	1.5m	1920*1080/60Hz
Radiated emission (30 – 1000MHz)	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	640*480/60Hz
						1280*1024/75Hz
	110V/60Hz					1920*1080/60Hz
	230V/50Hz	Connection	0.7m (w/ core)	1.8m (w/o core)	1.8m	1920*1080/60Hz
	230V/50Hz	Connection	0.7m (w/o core)	1.8m (w/ core)	1.8m	1920*1080/60Hz
230V/50Hz	Connection	0.7m (w/o core)	1.8m (w/ core)	1.5m	1920*1080/60Hz	
Radiated emission (1 – 6GHz)	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
	110V/60Hz					1920*1080/60Hz
Harmonics current emission	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
Voltage fluctuations & flicker	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
All Immunity tests	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz

3.6. Final Test Configuration

The worst showed as following configuration was tested and recorded in the report.

Test Item	Test Voltage	Input Port	Connection Cable	HDMI Cable	Power Cord	Resolution & Frequency
Conducted emissions at AC mains power port	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
Radiated emission (30 – 1000MHz)	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
Radiated emission (1 – 6GHz)	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
Harmonics current emission	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
Voltage fluctuations & flicker	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz
All Immunity tests	230V/50Hz	Connection	0.5m (w/ core)	1.8m (w/o core)	1.5m	1920*1080/60Hz

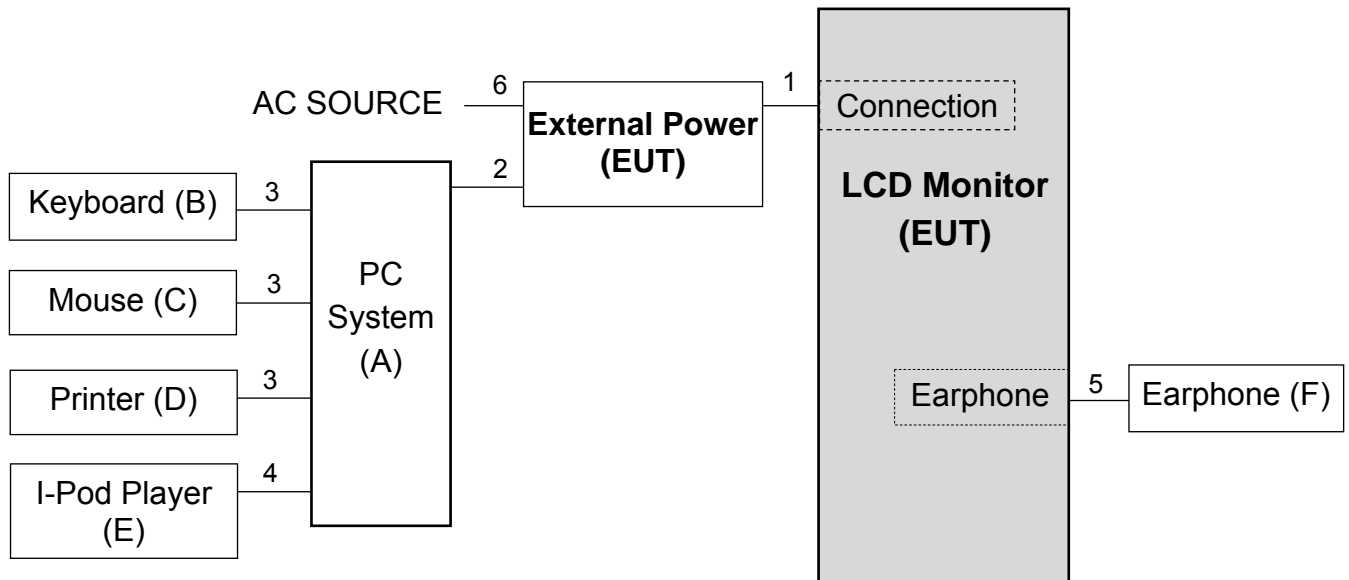
4. Measurement Arrangement

4.1. Equipment and cables arrangement

- Connection Diagram of EUT and Peripheral Devices

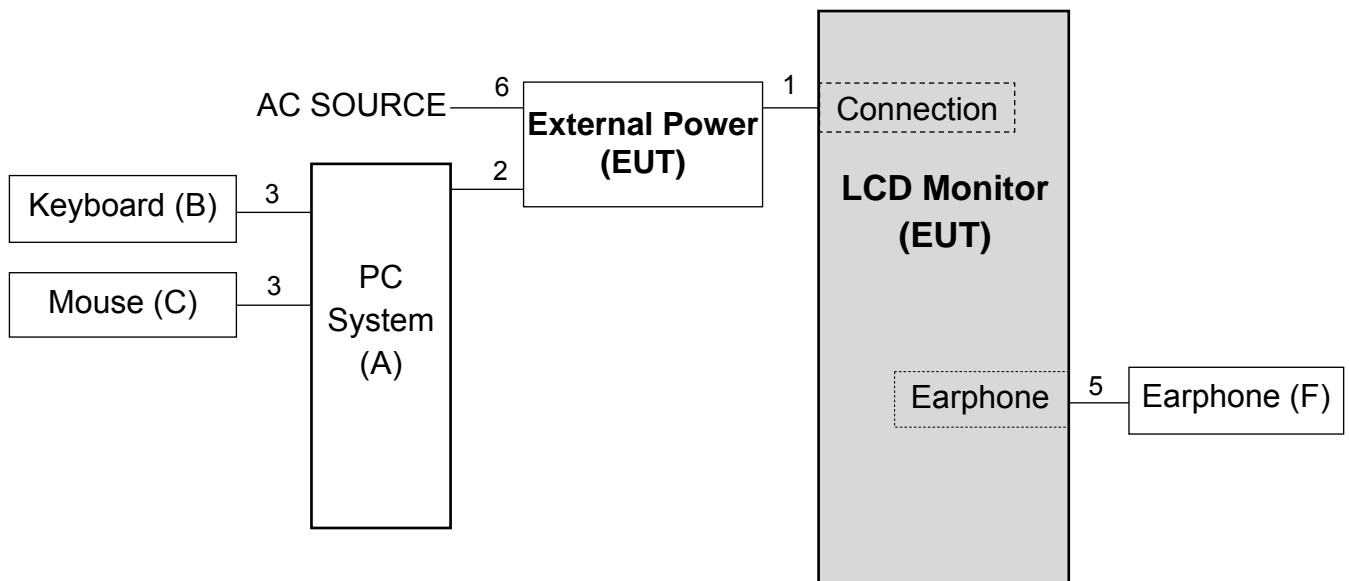
For conducted and radiated test

The EUT and peripherals were arranged as the requirement of CISPR 32 Annex D.



- Connection Diagram of EUT and Peripheral Devices

For harmonics, flicker and immunity test



4.2. Method of Exercising EUT

The methods for exercising the EUT during the measurement specified in EN 55032 (CISPR 32) Annex B were used.

Operating System	Windows 7 of PC system
Test Program	“ITU-R BT 1729”, “Win FCC”, “Windows Media Player”
Video Signal (Display Image)	Standard Color bars with moving picture element
Audio controller	Play 1kHz audio signal
Other	Other peripheral devices were driven and operated in turn

The methods for exercising the EUT during the measurement specified in EN 55024 were used.

Operating System	Windows 7 of PC system
Test Program	“Win FCC”, “Windows Media Player”
Video Signal (Display Image)	Scrolling H characters
Audio controller	Play 1kHz audio signal
Other	Other peripheral devices were driven and operated in turn

Display and video parameters

Function	Setting
Hardware acceleration	Maximum
Screen settings	High/Middle/Low effective resolution (including the settings for pixel and frame rate)
Colour quality	Highest colour bit depth
Brightness, contrast, colour saturation	Use either the factory default settings or typical settings
Other	Adjusted to obtain a typical picture using settings giving the highest performance

4.3. List of Supported Units under Test

Item	Product	Brand	Model No.	Serial No.	Approval
A	PC System	Lenovo	RK4	PBFK911	By DoC
B	USB Keyboard	Lenovo	KU-0225	3630	By DoC
C	USB Mouse	Lenovo	45J4886	N/A	By DoC
D	Laser Printer	SAMSUNG	ML-1630	4561B1CP600023X	FCC ID: A3LML1630
E	I-Pod Player	APPLE	A1204	4H722TFEVTE	By DoC
F	Earphone	LGITON	FS-99	N/A	N/A

4.4. List of Used Cables under Test

Item	Type	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remark
1	Connection Cable	1	0.5	Y	2	Provided by LAB
		1	0.7	Y	2	Provided by LAB
		1	0.7	Y	0	Accessory of EUT
2	HDMI Cable	1	1.8	Y	2	Accessory of EUT
		1	1.8	Y	0	Provided by LAB
3	USB Cable	3	1.8	Y	0	Provided by LAB
4	USB Cable	1	1.0	Y	0	Provided by LAB
5	Earphone Cable	1	1.1	N	0	Provided by LAB
6	AC Power Cord (2C)	1	1.5	N	0	Accessory of EUT
		1	1.8	N	0	Accessory of EUT
7	AC Power Cord	2	1.8	N	0	Provided by LAB for above supported units

5. Measurement of Conducted Emissions

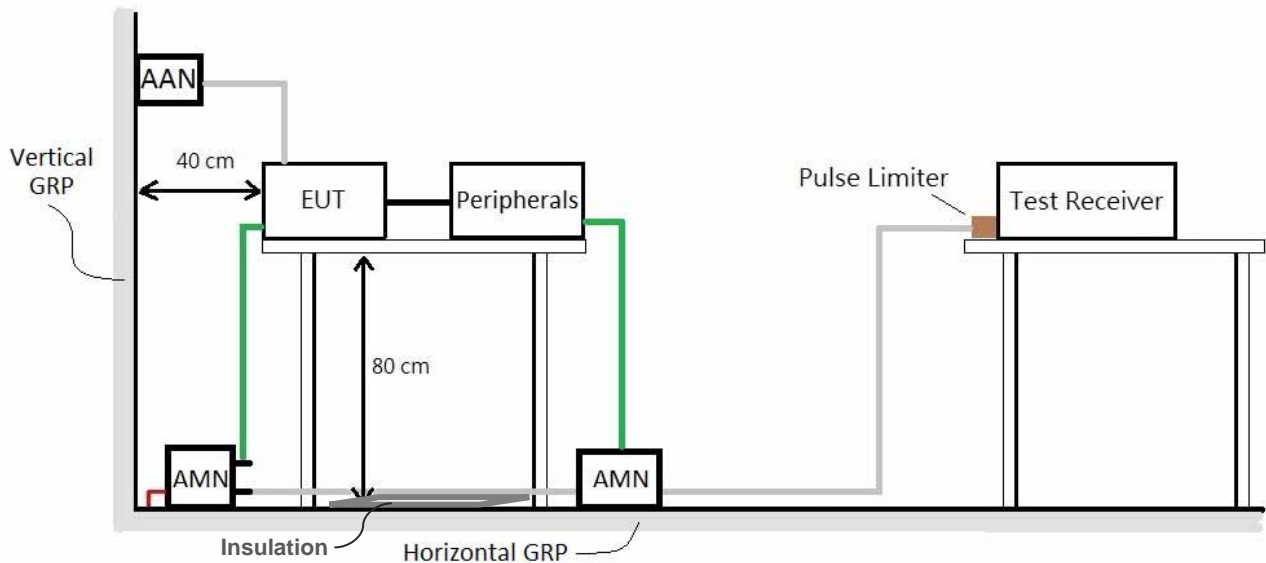
5.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Test Receiver	R&S	ESCI	101276	2016. 03. 31	1 Year
2	A.M.N.	R&S	ESH2-Z5	100366	2016. 07. 27	1 Year
3	L.I.S.N.	Kyoritsu	KNW-407	8-1539-3	2017. 01. 13	1 Year
4	Pulse Limiter	R&S	ESH3-Z2	101495	2017. 01. 16	1 Year
5	Signal Cable	Thermax/CDT	RG-142	CE-07	2016. 05. 25	1 Year
6	Test Software	Audix	e3	V.120619C	N.C.R.	N.C.R.

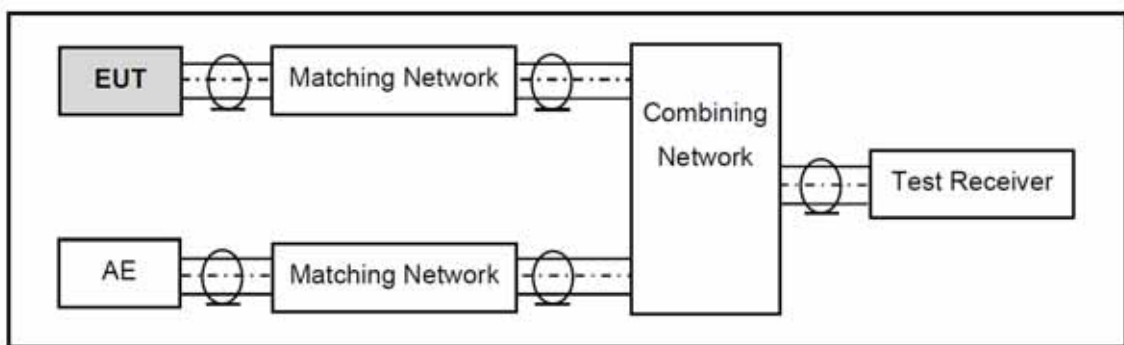
5.2. Test Setup

The EUT and test equipment were configured in accordance with the requirement of EN 55032 (CISPR 32) Annex C, D:

- For AC mains power port
- For wired network port
- For TV broadcast receiver tuner port, asymmetric mode
- EUT, local AE and associated cabling; and metal surfaces other than the RGP 80cm



- For TV broadcast receiver tuner port, differential voltage



5.3. Applicable Limits

- For conducted emissions from the AC mains power ports (Class B)

Frequency Range (MHz)	Quasi Peak dB(μ V)	Average dB(μ V)
0.15 – 0.50	66 – 56	56 – 46
0.50 – 5.0	56	46
5.0 – 30	60	50

- For asymmetric mode conducted emissions (Class B)

Applicable to:

- (1) Wired network ports
- (2) Optical fibre ports with metallic shield or tension members
- (3) Broadcast receiver tuner ports
- (4) Antenna ports

Frequency Range (MHz)	Voltage limits Quasi Peak dB(μ V)	Voltage limits Average dB(μ V)
0.15 – 0.50	84 – 74	74 – 64
0.50 – 30	74	64

- For conducted differential voltage emissions (Class B)

Applicable to:

- (1) TV broadcast receiver tuner ports with an accessible connector
- (2) RF modulator output ports
- (3) FM broadcast receiver tuner ports with an accessible connector

Frequency Range (MHz)	Limits, dB(μ V) 75 Ω		
	Other	Local Oscillator Fundamental	Local Oscillator Harmonics
30 – 950	46	46	46
950 – 2150	46	54	54

Note:

- The measurement shall cover the entire frequency range.
- Testing is required at only one EUT supply voltage and frequency.
- Applicable to ports listed above and intended to connect to cables longer than 3 m (for asymmetric mode conducted emissions).

5.4. Measurement Procedure

For AC mains power port

The measurement procedure specified in EN 55032 (CISPR 32) clause 6.3 was used.

- Setup the EUT and associated equipment described as clause 4.1, and they were located 40cm from the vertical conducting plane.
- Connect the EUT power cord to the main A.M.N and associated equipment to the second A.M.N. All ports of the A.M.N not connecting to the measuring equipment was terminated into 50 ohm resistive load.
- Connect receiver tuner port to an AAN that is bonded to the RGP.
- Setup the resolution bandwidth of the test receiver at 9kHz (while testing within 0.15 to 30MHz).
- Operate the EUT system as described in clause 4.2.
- For the exploratory measurement, determine the highest emission amplitude relative to the limit on each of the EUT power cord with the peak detector by each of the EUT operation over the specified frequency range and record it, and then
- For final measurement, select the EUT operation mode that produced the highest amplitude in the exploratory measurement to determine the highest emissions with each specified detector and record it. All of the current-carrying conductors of each of the EUT power cords, except the ground conductor, must be measured over the specified frequency range.
- The measurement result was calculated by following formula :
- Emission Level = Reading (Receiver) + Factor (A.M.N) + Insertion Loss (Pulse Limiter) + Cable Loss
- If the average limit is met when using a Quasi-Peak detector receiver, the EUT is deemed to meet both limits and measurement with the average detector is unnecessary.

For Wired network port

The method of EN 55032 (CISPR 32) Annex C 4.1.6.2 was used.

- Setup the EUT and associated equipment described as clause 4.1, and they were located 40cm from the vertical conducting plane.
- Connect wired network port between EUT and AE through the AAN.
- Setup the resolution bandwidth of the test receiver at 9kHz (while testing within 0.15 to 30MHz).
- Operate the EUT system as described in clause 4.2.
- For the exploratory measurement, determine the highest emission amplitude relative to the limit on each of the EUT LAN port with the peak detector by each of the transmission rate over the specified frequency range and record it, and then
- For final measurement, select the worst network port that produced the highest amplitude in the exploratory measurement to determine the highest emissions with each specified detector and record it. All of the transmission rates must be measured over the specified frequency range.
- The measurement result was calculated by following formula :
- Emission Level = Reading (Receiver) + Factor (AAN) + Insertion Loss (Pulse Limiter) + Cable Loss
- If the average limit is met when using a Quasi-Peak detector receiver, the EUT is deemed to meet both limits and measurement with the average detector is unnecessary.

For TV broadcast receiver tuner port, Asymmetric mode

The method of EN 55032 (CISPR 32) Annex C 4.1.6.2 was used.

- Setup the EUT and associated equipment described as clause 4.1, and they were located 40cm from the vertical conducting plane.
- Connect TV broadcast receiver tuner port between EUT and S.G. through the AAN.
- Setup the resolution bandwidth of the test receiver at 9kHz (while testing within 0.15 to 30MHz).
- Operate the EUT system as described in clause 4.2.
- For the exploratory measurement, determine the highest emission amplitude relative to the limit on TV broadcast receiver tuner port with the peak detector by the TV channel over the specified frequency range and record it, and then
- For final measurement, the TV channel that produced the highest amplitude in the exploratory measurement to determine the highest emissions with each specified detector and record it. All of the transmission rates must be measured over the specified frequency range.
- The measurement result was calculated by following formula:
Emission Level =
Reading (Receiver) + Factor (AAN) + Insertion Loss (Pulse Limiter) + Cable Loss
- If the average limit is met when using a Quasi-Peak detector receiver, the EUT is deemed to meet both limits and measurement with the average detector is unnecessary.

For TV broadcast receiver tuner port, Differential voltage

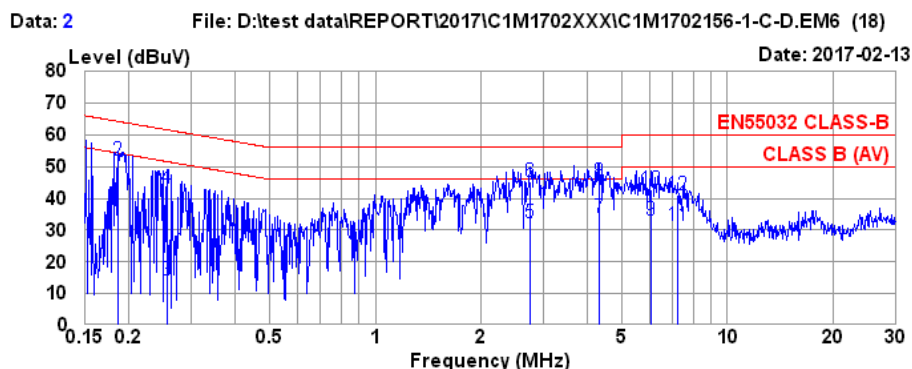
The method of EN 55032 (CISPR 32) Annex C 4.1.6.2 was used.

- The EUT and test equipment was set-up as section 4.1 and 5.2.
- The resolution bandwidth of the test receiver was at 120kHz (Quasi Peak) for frequencies below 1GHz or 1MHz (Peak) for frequencies above 1GHz.
- The antenna input terminal of EUT was connected to the test receiver via 75-50 ohm matching pad and T-Pad. The EUT and TV Pattern Generator or DVB-T signal card (inside PC system) were set to one of the same frequency (channel) specified in following test channel and frequency list, measuring both radiated frequency and disturbance voltage present at antenna input terminal over the frequency range from 30MHz up to at last the second harmonic of the highest local oscillator frequency (2150MHz).
- Record the final readings from test receiver with Quasi-Peak detector.
- The measurement result was calculated by following formula:
Measurement Level =
Factor (Matching Pad Loss + Cable Loss) + Test Receiver Reading

5.5. Measurement Result

● Result for AC Mains Power Port

Test Date	2017. 02. 13	Environment	21°C, 45%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Nick Du



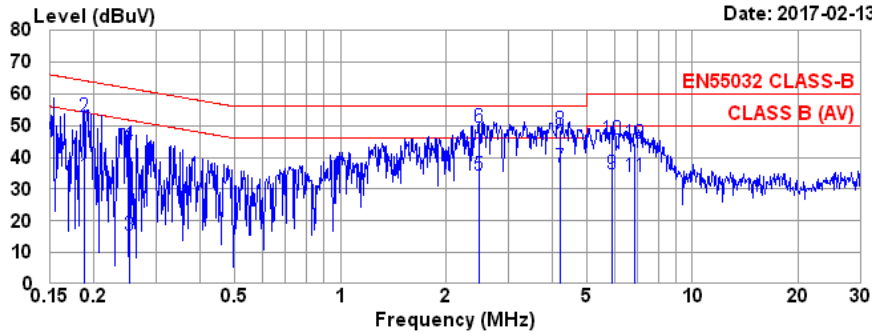
Site no. : No.7 Shielded Room Data no. : 2
 Condition : ESH2-Z5 366(ADAPTER) Phase : NEUTRAL
 Limit : EN55032 CLASS-B
 Env. / Ins. : 21°C / 45% ESCI (1276) Engineer : Nick Du
 EUT : 238LM00020
 Power Rating : 230Vac/50Hz
 Test Mode : 1920*1080/60Hz

	AMN	Cable	Pulse	Emission			Margin	Remark	
Freq. (MHz)	Factor (dB)	Loss (dB)	Att. (dB)	Reading (dBμV)	Level (dBμV)	Limits (dBμV)	(dB)		
1	0.186	0.17	0.04	9.85	22.48	32.54	54.20	21.66	Average
2	0.186	0.17	0.04	9.85	41.81	51.87	64.20	12.33	QP
3	0.256	0.18	0.04	9.85	4.32	14.39	51.56	37.17	Average
4	0.256	0.18	0.04	9.85	33.14	43.21	61.56	18.35	QP
5	2.750	0.28	0.09	9.93	21.92	32.22	46.00	13.78	Average
6	2.750	0.28	0.09	9.93	34.97	45.27	56.00	10.73	QP
7	4.338	0.34	0.11	9.88	23.53	33.86	46.00	12.14	Average
8	4.338	0.34	0.11	9.88	35.09	45.42	56.00	10.58	QP
9	6.056	0.41	0.13	9.87	22.72	33.13	50.00	16.87	Average
10	6.056	0.41	0.13	9.87	32.22	42.63	60.00	17.37	QP
11	7.252	0.46	0.15	9.87	21.14	31.62	50.00	18.38	Average
12	7.252	0.46	0.15	9.87	30.44	40.92	60.00	19.08	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

Test Date	2017. 02. 13	Environment	21°C, 45%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Nick Du

Data: 1 File: D:\test data\REPORT\2017\IC1M1702XXX\IC1M1702156-1-C-D.EM6 (18) Date: 2017-02-13



Site no. : No.7 Shielded Room Data no. : 1
 Condition : ESH2-Z5 366(ADAPTER) Phase : LINE
 Limit : EN55032 CLASS-B
 Env. / Ins. : 21°C / 45% ESCI (1276) Engineer : Nick Du
 EUT : 238LM00020
 Power Rating : 230Vac/50Hz
 Test Mode : 1920*1080/60Hz

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.187	0.16	0.04	9.85	23.87	33.92	54.15	20.23	Average
2	0.187	0.16	0.04	9.85	42.70	52.75	64.15	11.40	QP
3	0.252	0.17	0.04	9.85	5.48	15.54	51.69	36.15	Average
4	0.252	0.17	0.04	9.85	33.78	43.84	61.69	17.85	QP
5	2.474	0.27	0.08	9.94	23.88	34.17	46.00	11.83	Average
6	2.474	0.27	0.08	9.94	38.99	49.28	56.00	6.72	QP
7	4.224	0.34	0.11	9.88	26.65	36.98	46.00	9.02	Average
8	4.224	0.34	0.11	9.88	38.36	48.69	56.00	7.31	QP
9	5.929	0.43	0.13	9.87	24.41	34.84	50.00	15.16	Average
10	5.929	0.43	0.13	9.87	35.21	45.64	60.00	14.36	QP
11	6.878	0.47	0.14	9.87	23.33	33.81	50.00	16.19	Average
12	6.878	0.47	0.14	9.87	33.85	44.33	60.00	15.67	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

6. Measurement of Radiated Emissions

6.1. List of Test Instruments

- For measurement of 30 to 1000MHz frequency range

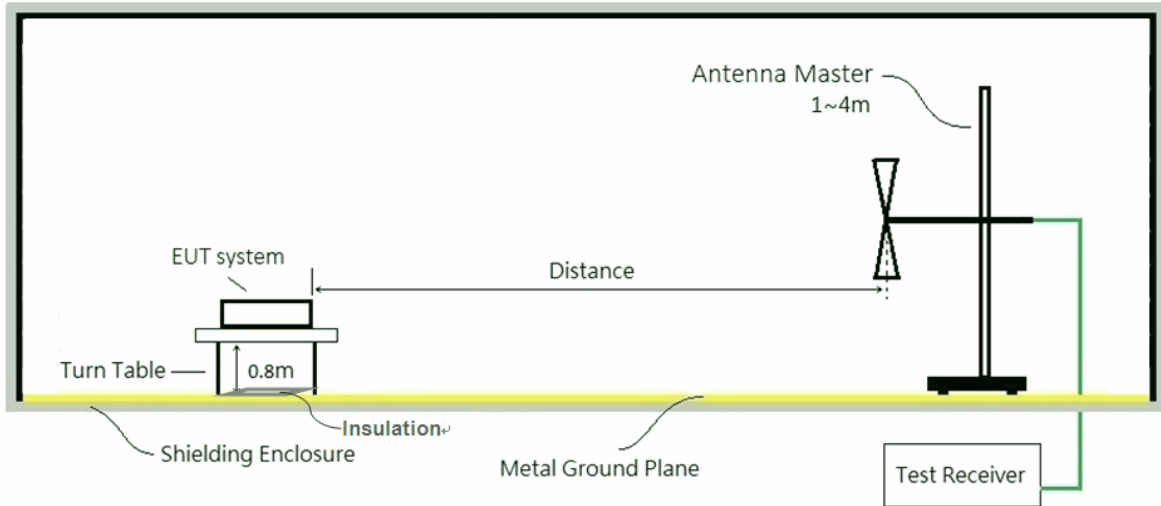
Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-503	MY51120074	2016. 10. 24	1 Year
2	Test Receiver	R&S	ESCI	100558	2016. 10. 26	1 Year
3	Amplifier	HP	8447D	2443A03938	N.C.R.	N.C.R.
4	Bilog Antenna	CHASE	UPA6109	1031	2016. 02. 26	1 Year
5	Bilog Antenna	CHASE	VBA6106A	1227	2016. 02. 26	1 Year
6	Signal Cable	HUBER+SUHNER	RG217U	RE-05	2016. 02. 15	1 Year
7	Test Software	Audix	e3	V.5.04507	N.C.R.	N.C.R.

- For measurement of above 1GHz frequency range

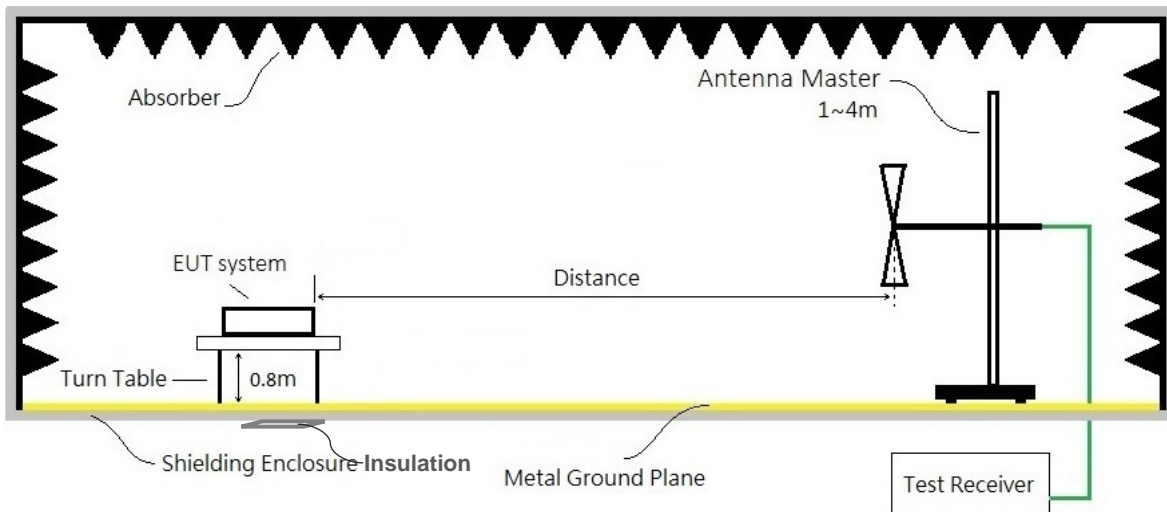
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-526	MY51250943	2016. 02. 24	1 Year
2	Amplifier	Agilent	8449B	3008A02681	2016. 03. 24	1 Year
3	Horn Antenna	ETS-Lindgren	3117	00114403	2016. 03. 31	1 Year
4	Signal Cable	HUBER+SUHNER	SUCOFLEX 104	10m ACCL 1-18G	2016. 04. 23	1 Year
5	Test Software	Audix	e3	V.60110601	N.C.R.	N.C.R.

6.2. Test Setup

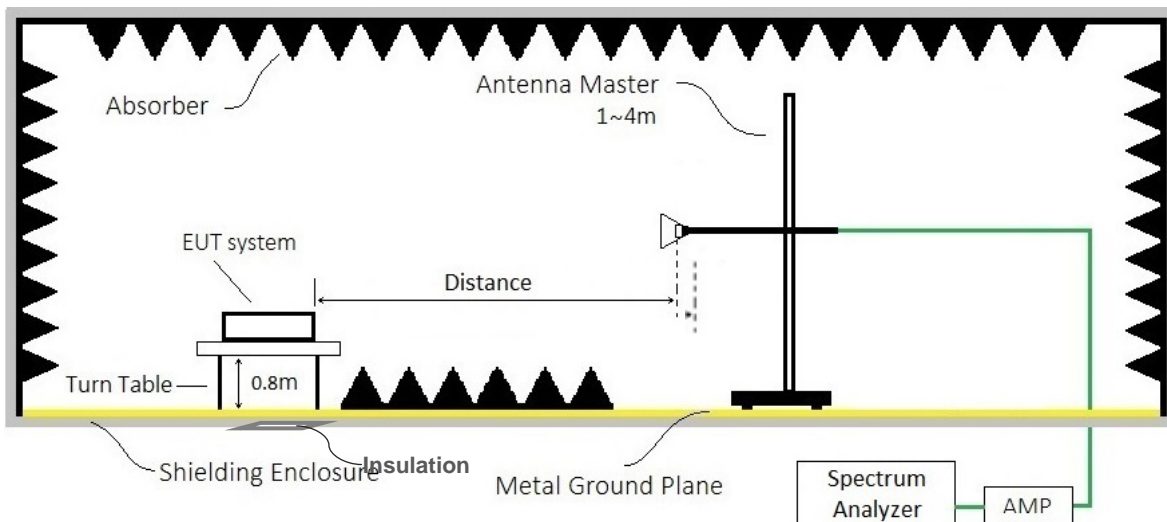
- For frequency range 30 to 1000MHz
Open Area Test Site



At Semi-Anechoic Chamber



- For frequency range 1 to 6GHz



6.3. Applicable Limits

- For radiated emissions at frequencies up to 1GHz (Class B)

Frequency Range (MHz)	Distance (meter)	Quasi-Peak [dB(μV/m)] (OATS/SAC)
30 – 230	10	30
230 – 1000		37
30 – 230	3	40
230 – 1000		47

- For radiated emissions at frequencies above 1GHz (Class B)

Frequency Range (MHz)	Distance (meter)	Peak [dB(μV/m)] (FSOATS)	Average [dB(μV/m)] (FSOATS)
1000 – 3000	3	70	50
3000 – 6000		74	54

- For radiated emissions at frequencies from FM receivers (Class B)

Frequency Range (MHz)	Distance (meter)	Fundamental Quasi-Peak [dB(μV/m)] (FSOATS)	Harmonics Quasi-Peak [dB(μV/m)] (FSOATS)
30 – 230	10	50	42
230 – 300			42
300 – 1000			46
30 – 230	3	60	52
230 – 300			52
300 – 1000			56

Required highest frequency for radiated measurement

Highest frequency generated or used in the EUT or on which the EUT operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	Up to 5 times of the highest frequency or 6GHz, whichever is less

- For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.
- For outdoor units of home satellite receiving systems highest measured frequency shall be 18 GHz.

6.4. Measurement Procedure

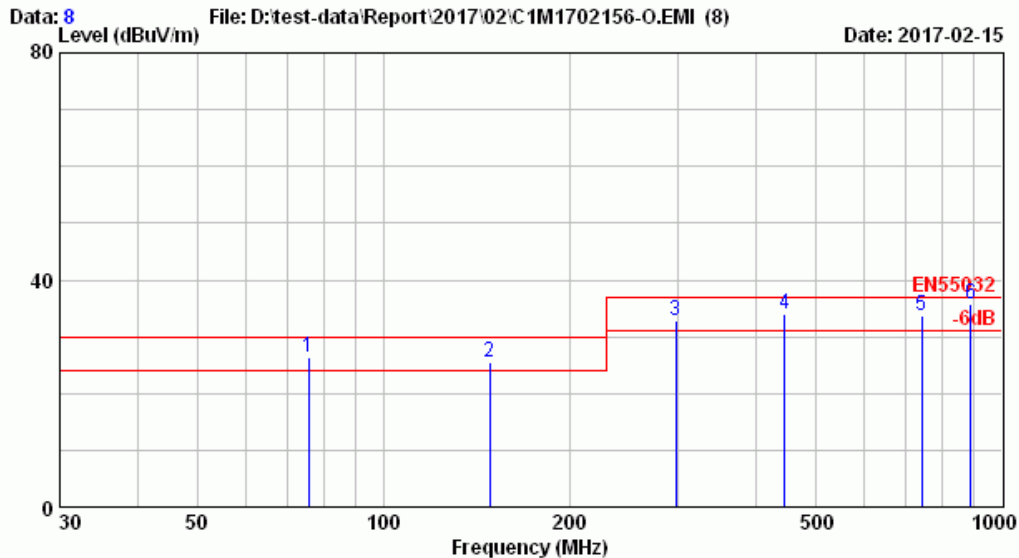
The measurement procedure specified in EN 55032 (CISPR 32) clause was performed.

- The EUT and peripherals were placed on the rotatable non-conduction table, which is 0.8meters above the ground reference plane at the semi-anechoic chamber as described in section 4.1 and 6.2.
- The measurement distance is set as specified in section 6.3. The specified distance is between the horizontal projection onto the ground plane of the closest periphery of the EUT and the projection onto the ground plane of the center of the axis of the elements of the receiving antenna.
- The resolution bandwidth of the test receiver was at 120kHz (testing from 30 to 1000MHz) or 1MHz (testing above 1000MHz).
- For the exploratory measurement, determine the highest emission amplitude relative to the limit on each of antenna polarization with the peak detector by each of the EUT operations over the specified frequency range and record it, and then
- For final measurement, select the EUT operation mode that produced the highest amplitude in the exploratory measurement to determine the highest emissions with each specified detector and record it.
- In order to determine the maximum emission level, must rotate the table in 360 degree and move the receiving antenna between 1~4m height above the ground reference plane.
- Both polarizations of receiving antenna were determined.
- The measurement result was calculated by following formulas:
(30 – 1000MHz)
Emission Level = Reading (Receiver) + Cable Loss + Antenna Factor – Pre-Amp Factor
(Above 1GHz)
Emission Level = Reading (Spectrum) + Cable Loss + Antenna Factor – Pre-Amp Factor
- The 3dB bandwidth of the horn antenna is minimum 52 degree (or w=2.93m at 3m distance) for 1~6 GHz.

6.5. Measurement Result

- For frequency range 30 – 1000MHz

Test Date	2017. 02. 15	Environment	20°C, 51%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Roy Hong

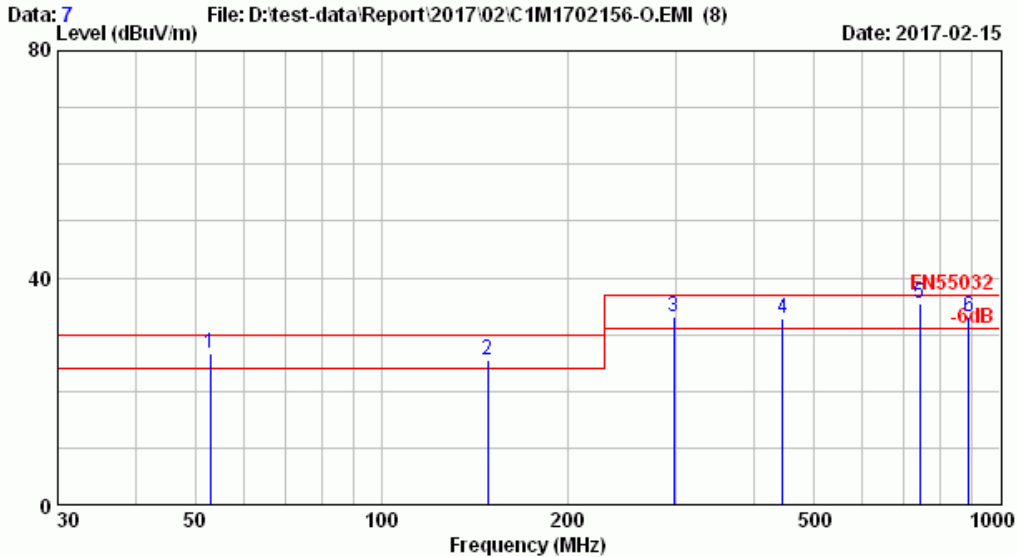


Site no. : OATS NO.3 Data no. : 8
 Dis. / Ant. : 10m VBA6106A/UPA6109 Ant. pol. : HORIZONTAL
 Limit : EN55032
 Env. / Ins. : 20°C/51% ESCI (558) Engineer : Roy
 EUT : 2381M00020
 Power Rating : 230Vac/50Hz
 Test Mode : 1920*1080/60Hz

	Ant.	Cable	Emission		Limits	Margin	Remark
Freq. (MHz)	Factor (dB/m)	Loss (dB)	Reading (dBuV)	Level (dBuV/m)	(dBuV/m)	(dB)	
1	75.830	13.77	1.04	11.50	26.32	30.00	3.68 QP
2	148.498	21.67	1.56	2.20	25.44	30.00	4.56 QP
3	296.984	26.15	2.82	3.70	32.68	37.00	4.32 QP
4	445.492	17.58	3.07	13.30	33.95	37.00	3.05 QP
5	742.473	22.88	4.02	6.80	33.70	37.00	3.30 QP
6	890.962	24.44	4.44	6.92	35.79	37.00	1.21 QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emissions not reported are 20 dB lower than the specified limit.

Test Date	2017. 02. 15	Environment	20°C, 51%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Roy Hong



Site no. : OATS NO.3
 Dis. / Ant. : 10m VBA6106A/UPA6109
 Limit : EN55032
 Env. / Ins. : 20°C/51% ESCI (558)
 EUT : 238LM00020
 Power Rating : 230Vac/50Hz
 Test Mode : 1920*1080/60Hz
 Data no. : 7
 Ant. pol. : VERTICAL
 Engineer : Roy

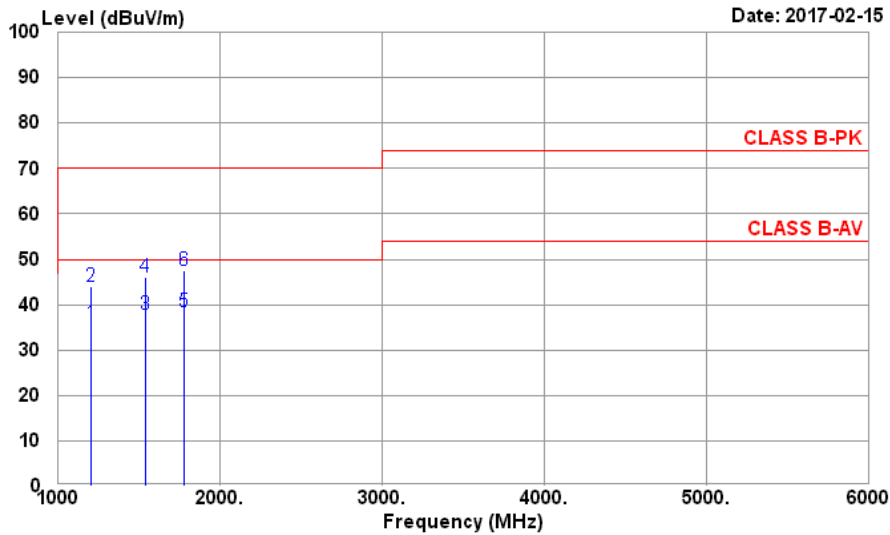
	Ant. Factor	Cable Loss	Emission		Limits	Margin	Remark
Freq. (MHz)	(dB/m)	(dB)	Reading (dBµV)	Level (dBµV/m)	(dBµV/m)	(dB)	
1	52.940	16.85	0.85	9.10	26.81	30.00	3.19 QP
2	148.485	21.67	1.56	2.30	25.54	30.00	4.46 QP
3	296.985	26.15	2.82	4.20	33.18	37.00	3.82 QP
4	445.495	17.58	3.07	12.10	32.75	37.00	4.25 QP
5	742.485	22.88	4.02	8.70	35.60	37.00	1.40 QP
6	890.986	24.44	4.44	4.20	33.07	37.00	3.93 QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emissions not reported are 20 dB lower than the specified limit.

- For frequency range 1 – 6 GHz

Test Date	2017. 02. 15	Environment	21°C, 53%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Mike Yu

Data: 6 File: D:\TEST DATA\REPORT\2017\1C1M1702XXX\1C1M1702156\1C1M1702156-10M-1G.EM



Site no. : NO.1 10M Chamber
 Dis. / Ant. : 3m 3117 14403
 Limit : CLASS B-PK
 Env. / Ins. : 21°C / 53% N9010A(0943)
 EUT : 238LM00020
 Power Rating : 230Vac/50Hz
 Test Mode : 1920*1080/60Hz
 1729 Pattern

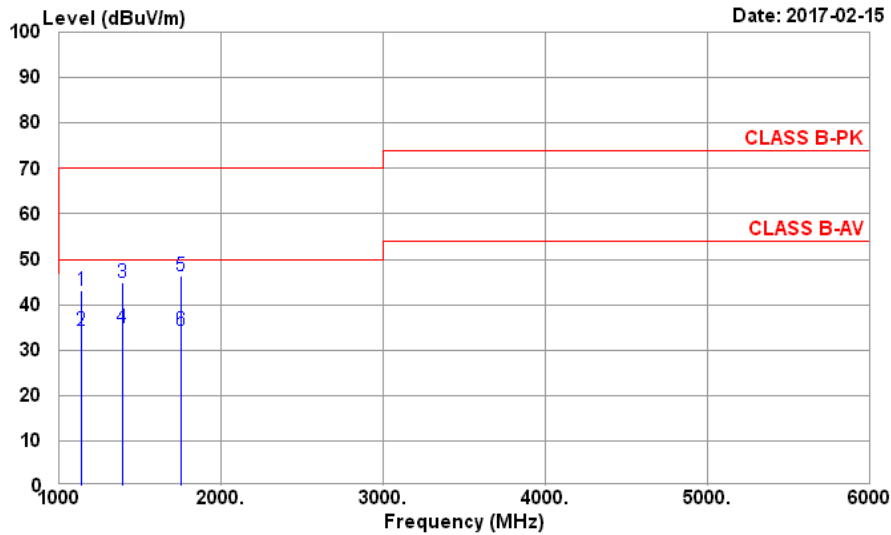
Data no. : 6
 Ant. pol. : HORIZONTAL
 Engineer : Mike Yu

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1200.32	27.95	2.01	35.57	41.35	35.74	50.00	14.26	Average
2	1200.98	27.90	2.15	34.70	48.52	43.87	70.00	26.13	Peak
3	1540.20	28.22	2.18	34.76	42.35	37.99	50.00	12.01	Average
4	1540.50	31.07	2.40	35.34	47.95	46.08	70.00	23.92	Peak
5	1780.22	30.06	2.31	35.13	41.32	38.56	50.00	11.44	Average
6	1780.50	32.05	2.72	35.53	48.35	47.59	70.00	22.41	Peak

Remarks: 1.Emission Level= Antenna Factor + Cable Loss + Reading - Preamp.
 2.The emission levels that are 20dB below the official limit are not reported

Test Date	2017. 02. 15	Environment	21°C, 53%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Mike Yu

Data: 5 File: D:\TEST DATA\REPORT\2017\1M1702XXX\1C1M1702156\1C1M1702156-10M-1G.EMF



Site no. : NO.1 10M Chamber Data no. : 5
 Dis. / Ant. : 3m 3117 14403 Ant. pol. : VERTICAL
 Limit : CLASS B-PK
 Env. / Ins. : 21°C / 53% N9010A(0943) Engineer : Mike Yu
 EUT : 238LM00020
 Power Rating : 230Vac/50Hz
 Test Mode : 1920*1080/60Hz
 1729 Pattern

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	1140.02	27.93	2.08	35.24	48.35	43.12	70.00	26.88	Peak
2	1140.22	27.97	1.90	35.78	40.34	34.43	50.00	15.57	Average
3	1395.50	28.91	2.23	34.89	48.71	44.96	70.00	25.04	Peak
4	1395.82	27.92	2.14	34.98	39.94	35.02	50.00	14.98	Average
5	1755.30	30.96	2.39	35.31	48.39	46.43	70.00	23.57	Peak
6	1755.75	29.88	2.30	35.09	37.31	34.40	50.00	15.60	Average

Remarks: 1.Emission Level= Antenna Factor + Cable Loss + Reading - Preamp.
 2.The emission levels that are 20dB below the official limit are not reported

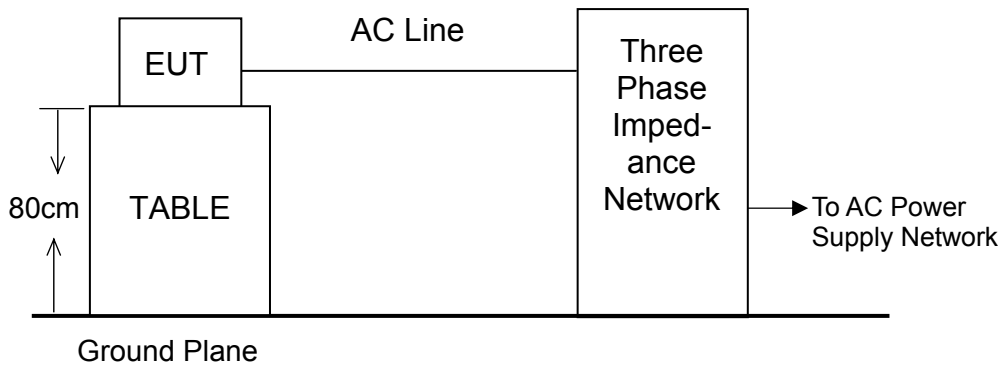
7. Measurement of Harmonics Current Emissions

7.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	AC Power Source	TESEQ	NSG 1007-45	1248A04038	2016. 01. 29	2 Years
2	Signal Conditioning Unit	TESEQ	CCN 1000-3	1234A03680	2016. 01. 29	2 Years
3	Three Phase Impedance Network	TESEQ	INA 2197	1234A03681	2016. 01. 29	2 Years
4	Proflin AC Switching Unit	TESEQ	NSG 2200-3	EK 22713	2016. 07. 01	2 Years

7.2. Test Setup

The EUT and test equipment were configured in accordance with the requirement of EN 61000-3-2.



7.3. Applicable Standard and Limits

Limits for Class D Equipment

Class D is classified according to section 5 of EN 61000-3-2

Harmonic order n	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
Odd Harmonics Only		
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
13	0.30	0.21
15 ≤ n ≤ 39	3.85/n	0.15x15/n

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.

7.4. Measurement Procedure

The measurement procedure specified in EN 61000-3-2 clause 6.2 was used.

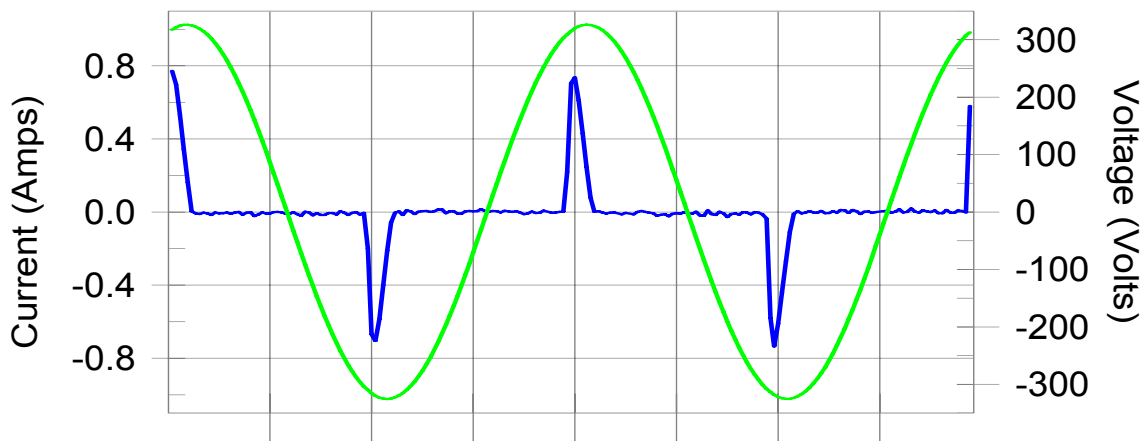
- Setup the EUT and associated equipment described as clause 4.1.
- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- Apply a 230V/50Hz rated test voltage which shall be maintained within ±2.0% and the frequency within ±0.5% of the nominal value to EUT.
- Let EUT work as stated and through three phase impedance network to measure the EUT to get the harmonic current for Odd & Even harmonics up to 40th.

7.5. Measurement Result

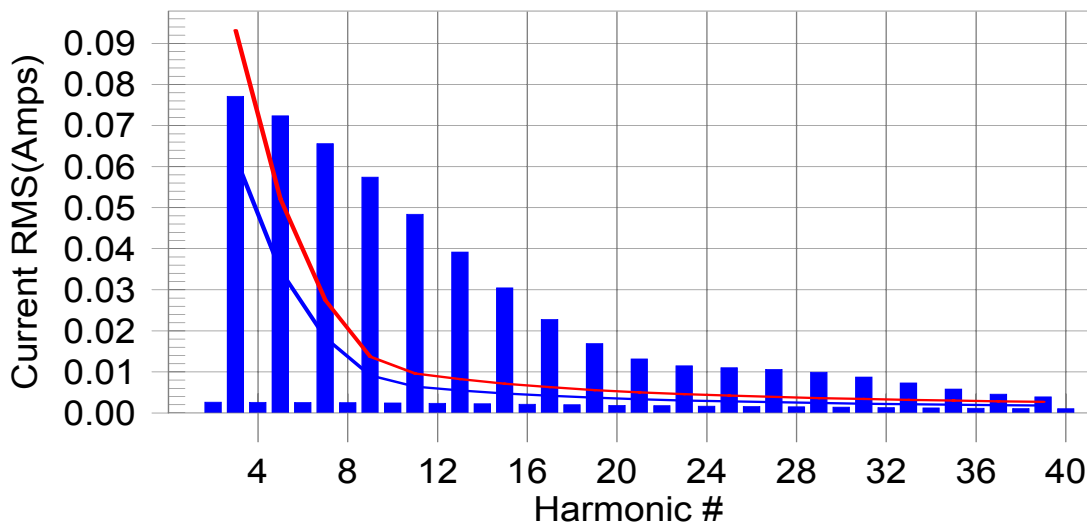
Test Date	2017. 02. 14	Environment	21°C, 50%
Input Power	AC 230V, 50Hz	Result	Pass (Class D)
Test Mode	Connection, 1920*1080/60Hz	Tested By	Jacky Chen

Test Result: N/L Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line European Limits



Test result: N/L Worst harmonic was #11 with 506.6% of the limit.

Test Result: N/L Source qualification: Normal
 THC(A): 0.000 I-THD(%): 0.0 POHC(A): 0.000 POHC Limit(A): 0.000

Highest parameter values during test:

V_RMS (Volts):	230.282	Frequency(Hz):	50.00
I_Peak (Amps):	0.812	I_RMS (Amps):	0.179
I_Fund (Amps):	0.081	Crest Factor:	4.544
Power (Watts):	18.3	Power Factor:	0.444

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.003	0.000	N/A	0.003	0.000	N/A	Pass
3	0.077	0.062	N/A	0.077	0.093	N/A	Pass
4	0.003	0.000	N/A	0.003	0.000	N/A	Pass
5	0.072	0.035	N/A	0.073	0.052	N/A	Pass
6	0.003	0.000	N/A	0.003	0.000	N/A	Pass
7	0.066	0.018	N/A	0.066	0.027	N/A	Pass
8	0.003	0.000	N/A	0.003	0.000	N/A	Pass
9	0.057	0.009	N/A	0.058	0.014	N/A	Pass
10	0.002	0.000	N/A	0.003	0.000	N/A	Pass
11	0.048	0.006	N/A	0.049	0.010	N/A	Pass
12	0.002	0.000	N/A	0.003	0.000	N/A	Pass
13	0.039	0.005	N/A	0.039	0.008	N/A	Pass
14	0.002	0.000	N/A	0.002	0.000	N/A	Pass
15	0.030	0.005	N/A	0.031	0.007	N/A	Pass
16	0.002	0.000	N/A	0.002	0.000	N/A	Pass
17	0.023	0.004	N/A	0.023	0.006	N/A	Pass
18	0.002	0.000	N/A	0.002	0.000	N/A	Pass
19	0.017	0.004	N/A	0.017	0.006	N/A	Pass
20	0.002	0.000	N/A	0.002	0.000	N/A	Pass
21	0.013	0.003	N/A	0.013	0.005	N/A	Pass
22	0.002	0.000	N/A	0.002	0.000	N/A	Pass
23	0.011	0.003	N/A	0.012	0.005	N/A	Pass
24	0.002	0.000	N/A	0.002	0.000	N/A	Pass
25	0.011	0.003	N/A	0.012	0.004	N/A	Pass
26	0.002	0.000	N/A	0.002	0.000	N/A	Pass
27	0.011	0.003	N/A	0.011	0.004	N/A	Pass
28	0.002	0.000	N/A	0.002	0.000	N/A	Pass
29	0.010	0.002	N/A	0.010	0.004	N/A	Pass
30	0.001	0.000	N/A	0.002	0.000	N/A	Pass
31	0.009	0.002	N/A	0.009	0.003	N/A	Pass
32	0.001	0.000	N/A	0.001	0.000	N/A	Pass
33	0.007	0.002	N/A	0.008	0.003	N/A	Pass
34	0.001	0.000	N/A	0.001	0.000	N/A	Pass
35	0.006	0.002	N/A	0.007	0.003	N/A	Pass
36	0.001	0.000	N/A	0.001	0.000	N/A	Pass
37	0.005	0.002	N/A	0.005	0.003	N/A	Pass
38	0.001	0.000	N/A	0.001	0.000	N/A	Pass
39	0.004	0.002	N/A	0.004	0.003	N/A	Pass
40	0.001	0.000	N/A	0.001	0.000	N/A	Pass

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

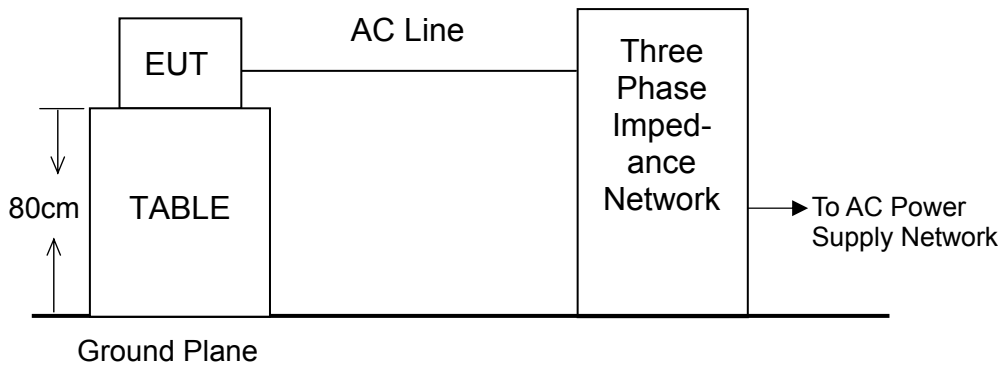
8. Measurement of Voltage Fluctuations and Flicker Emissions

8.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	AC Power Source	TESEQ	NSG 1007-45	1248A04038	2016. 01. 29	2 Years
2	Signal Conditioning Unit	TESEQ	CCN 1000-3	1234A03680	2016. 01. 29	2 Years
3	Three Phase Impedance Network	TESEQ	INA 2197	1234A03681	2016. 01. 29	2 Years
4	Proflin AC Switching Unit	TESEQ	NSG 2200-3	EK 22713	2016. 07. 01	2 Years

8.2. Test Setup

The EUT and test equipment were configured in accordance with the requirement of EN 61000-3-3.



8.3. Applicable Standard and Limits

(1) Limits is according to section 5 of EN 61000-3-3

Tested Items	Description	Limit
P_{st}	Short-term Flicker Indicator	≤ 1.0
P_{lt}	Long-term Flicker Indicator	≤ 0.65
$d_{(t)}$	Voltage change more than 500ms	$\leq 3.3\%$
T_{max}	Maximum time duration during the observation period that the voltage deviation $d_{(t)}$ exceeds the limit for d_c	500ms
d_c	Relative steady-state voltage change	$\leq 3.3\%$
d_{max}	Maximum relative voltage change	$\leq 4\%$
	Maximum relative voltage change	$\leq 6\%$
	Maximum relative voltage change	$\leq 7\%$

8.4. Measurement Procedure

The measurement procedure specified in EN 61000-3-3 clause 6 was used.

- Setup the EUT and associated equipment described as clause 4.1.
- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.
- Apply a 230V/50Hz rated test voltage which shall be maintained within $\pm 2.0\%$ and the frequency within $\pm 0.5\%$ of the nominal value to EUT.

8.5. Measurement Result

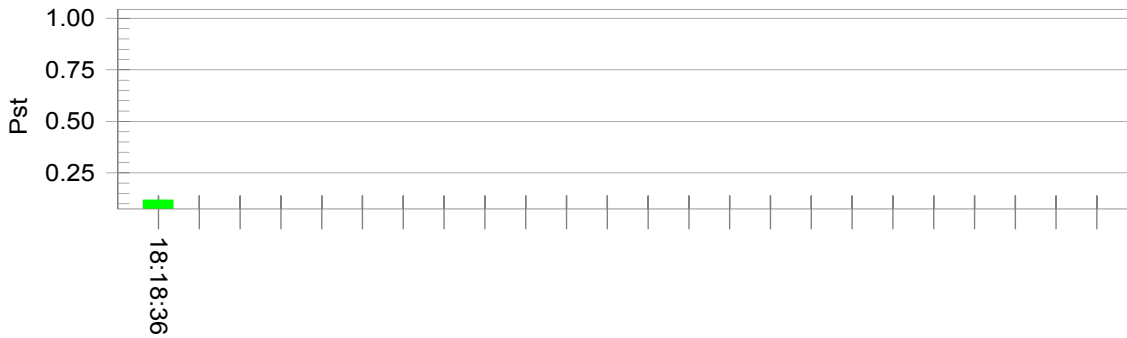
Test Date	2017. 02. 14	Environment	21°C, 50%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Jacky Chen

Test Result: Pass

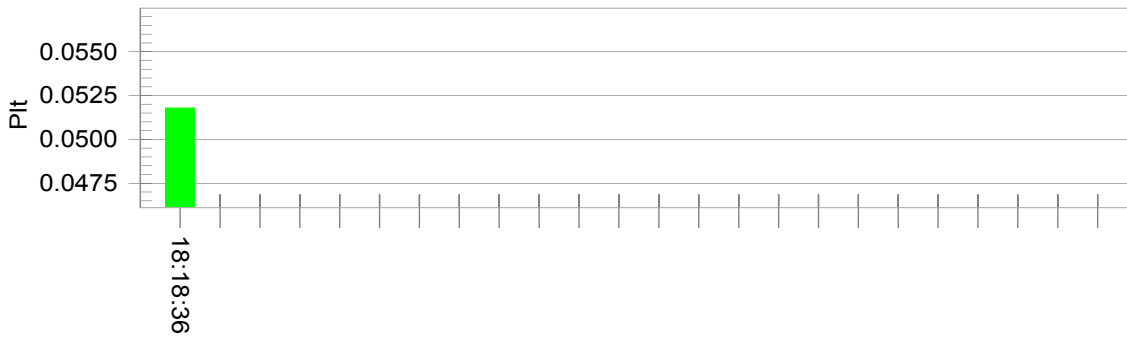
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.21		
Highest dt (%):	0.00	Test limit (%):	N/A N/A
T-max (mS):	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.04	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.119	Test limit:	1.000 Pass

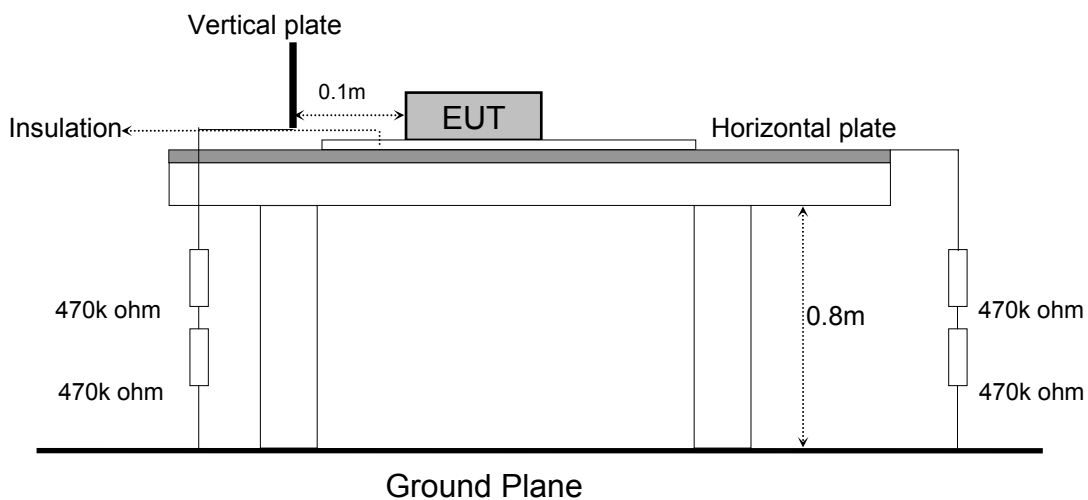
9. Electrostatic Discharge Immunity Test

9.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	ESD Simulator	TESEQ	NSG 437	1057	2016. 11. 07	1 Year

9.2. Test Setup

The EUT and test equipment were configured in accordance with the basic standard requirement of IEC 61000-4-2.



9.3. Applicable Standard and Test Specification

Immunity requirement is in accordance with EN 55024 clause 4.2.1

Test specification is in accordance with EN 55024 Table 1.3

Basic standard is in accordance with IEC 61000-4-2

Test Specification		Performance Criterion
Contact Discharge Voltage	$\pm 2\text{kV}$ and $\pm 4\text{kV}$	B
Air Discharge Voltage	$\pm 2\text{kV}$, $\pm 4\text{kV}$ and $\pm 8\text{kV}$	

9.4. Measurement Procedure

The measurement procedure specified in IEC 61000-4-2 clause 8.3.1 and A.5 was used.

- Setup the EUT and associated equipment described as clause 4.1.
- Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the ESD generator discharge electrode shall be removed from the EUT. The generator is then retriggered for a new single discharge and repeated 10 discharges each at positive and negative polarity for each preselected test point. This procedure shall be repeated until all the air discharge completed.
- Contact Discharge

All the procedure shall be same as above (3) except that the tip of the discharge electrode shall touch the EUT conductive surfaces & repeated 25 discharges each discharges each at positive and negative polarity for each test point before the discharge switch is operated.
- Indirect discharge for horizontal coupling plane

At least 25 discharges each at positive and negative polarity shall be applied to the horizontal coupling plane, at points on each side of the EUT. The ESD generator positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.
- Indirect discharge for vertical coupling plane

At least 25 discharges each at positive and negative polarity shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.
- For above tests, the voltage was increased from the minimum to the selected test level.

9.5. Test Result

Test Date	2017. 02. 15	Environment	23°C, 49%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	MinXiang Yang

Air Discharge	Voltage Level kV / Discharge per polarity 10 / Observation Criterion										
Test Location	+2	-2	+4	-4	+8	-8					Comments
Screen*4(1~4)	ND	ND	ND	ND	B	A					Note
LED*1 (5)	ND	ND	ND	ND	A	A					
Seam*6(6~11)	ND	ND	ND	ND	A	A					
Audio*1 (12)	ND	ND	ND	ND	A	A					
HDMI*1 (13)	ND	ND	ND	ND	A	A					
AC IN*1 (14)	ND	ND	ND	ND	ND	ND					
HDMI*1 (15)	ND	ND	ND	ND	A	ND					
Button*1 (19)	ND	ND	ND	ND	ND	ND					
Contact Discharge	Voltage Level kV / Discharge per polarity 25 / Observation Criterion										
Test Location	+2	-2	+4	-4							Comments
Metal*2 (16~17)	A	A	A	A							
Connection (18)	A	A	A	A							
Indirect Contact	Voltage kV Level / Discharge per polarity 25 / Observation Criterion										
Test Location	+2	-2	+4	-4							Comments
VCP Front	A	A	A	A							
VCP Right	A	A	A	A							
VCP Left	A	A	A	A							
VCP Back	A	A	A	A							
HCP Bottom	A	A	A	A							
Additional Notes											
Measurement Points	Please refer to the Photos of ESD Test Points										
ND=No Discharge; Meets criteria but unable to obtain an electrostatic discharge (ESD) at this test point. Note: Criterion B: The EUT fluttered operating during the test, but it's self-recoverable after test.											

10. Radiated, Radio-frequency, Electromagnetic Field Immunity Test

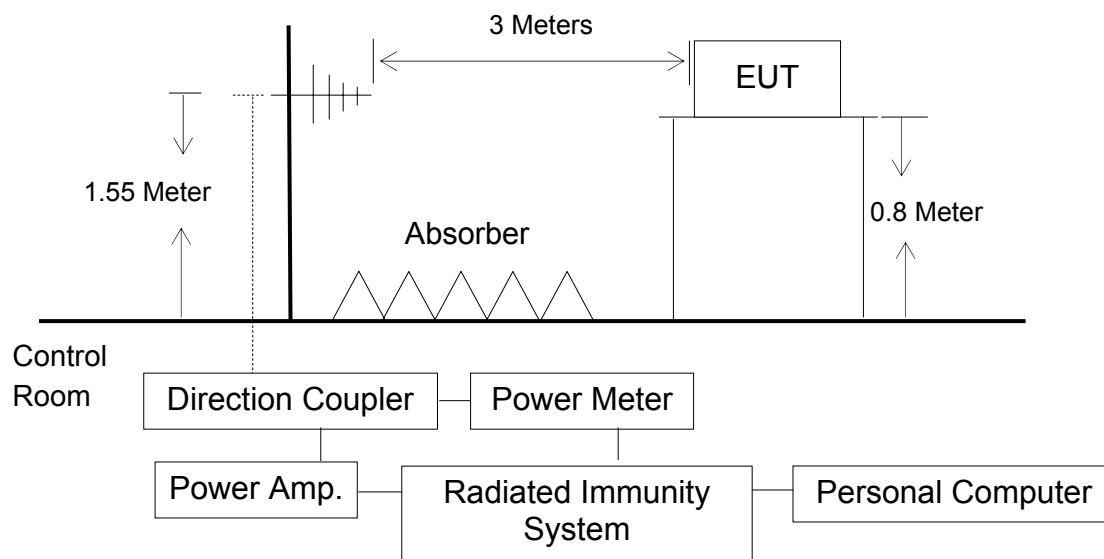
10.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Radiated Immunity System	TESEQ	ITS 6006	033009	2016. 09. 21	1 Year
2.	Power Amplifier	TESEQ	CBA 1G-275	T44214	N.C.R.	N.C.R.
3.	Power Meter	TESEQ	PM 6006	073364	2016. 09. 21	1 Year
4.	Power Antenna	Schwarzbeck	STLP 9128 E	9128E084	N.C.R.	N.C.R.
5.	Direction Coupler	TESEQ	C5982-10	98618	2016. 08. 11	1 Year

10.2. Test Setup

The EUT and test equipment were configured in accordance with the basic standard requirement of IEC 61000-4-3.

Anechoic Chamber



10.3.Applicable Standard and Test Specification

Immunity requirement is in accordance with EN 55024 clause 4.2.3 and 4.2.3.2

Test specification is in accordance with EN 55024 Table 1.2

Basic standard is in accordance with IEC 61000-4-3

Test Specification		Performance Criterion
Frequency Range	80-1000MHz	A
Field Strength	3V/m (unmodulated, r.m.s)	
Amplitude Modulated	80%, 1kHz AM	

10.4.Measurement Procedure

The measurement procedure specified in IEC 61000-4-3 clause 8 was used.

- Setup the EUT and associated equipment described as clause 4.1.
- The EUT was placed on a non-conductive table 0.8 meter above the ground, the EUT and its simulators on the turn table and keep them 3 meters away from the transmitting antenna which is mounted on an antenna tower and fixes at 1.55 meter height.
- The test was performed with the EUT exposed to both horizontally and vertically polarized fields on each of the four sides.
- All the scanning conditions are as follows:

Field Strength: 3 V/m (r.m.s, Unmodulated)
 Scanning Frequency: 80-1000MHz
 Amplitude Modulated: AM 1kHz, 80%
 Step Size: 1% increments
 The Rate of Sweep: 0.0015 decade/s
 Dwell Time: 3 sec.
 Test Position Angle: 0°, 90°, 180° and 270°
 Polarity of Antenna: H: Horizontal, V: Vertical

10.5. Test Result

Test Date	2017. 02. 13	Environment	21°C, 42%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Fans Lee

Frequency Range (MHz)	Position Angle (°)	Polarity (H or V)	Field Strength (V/m)	Observation Criterion
80 - 1000	0	H	3V/m +Modulated	A
80 - 1000	90	H	3V/m +Modulated	A
80 - 1000	180	H	3V/m +Modulated	A
80 - 1000	270	H	3V/m +Modulated	A
80 - 1000	0	V	3V/m +Modulated	A
80 - 1000	90	V	3V/m +Modulated	A
80 - 1000	180	V	3V/m +Modulated	A
80 - 1000	270	V	3V/m +Modulated	A

Remark 1: Modulation Signal: 1kHz 80% AM.
 Remark 2: No error occurred.

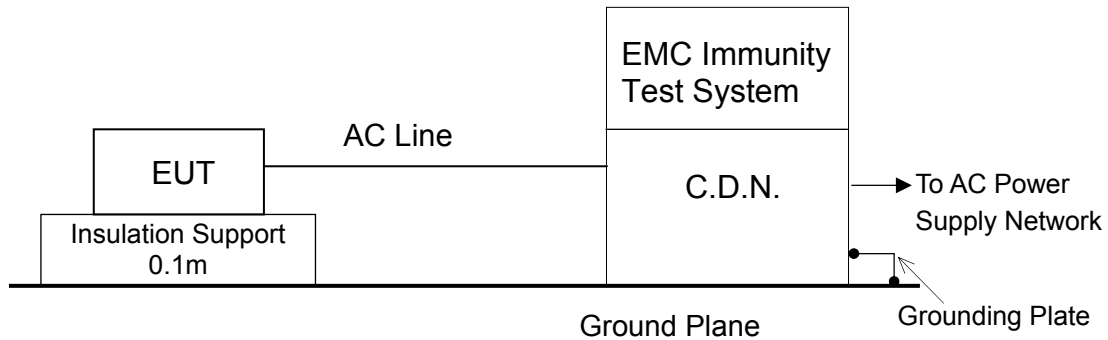
11. Electrical fast transient/burst Immunity Test

11.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	EMS Immunity Test System	TESEQ	NSG 3060	1519	2016. 07. 26	1 Year
2	3Phase Burst Coupler	TESEQ	CDN 3063	2074	2016. 07. 26	1 Year

11.2. Test Setup

The EUT and test equipment were configured in accordance with the basic standard requirement of IEC 61000-4-4.



11.3. Applicable Standard and Test Specification

Immunity requirement is in accordance with EN 55024 clause 4.2.2

Test specification is in accordance with EN 55024 Table 2.3 and 4.3

Basic standard is in accordance with IEC 61000-4-4

Test Specification		Performance Criterion
Signal and Telecommunication Ports, Voltage Peak	$\pm 0.5\text{kV}$	B
Input AC Power Ports, Voltage Peak	$\pm 1\text{kV}$	
Wave Shape of Pulse	5/50 Tr/Th ns	
Repetition Frequency	5kHz	

11.4.Measurement Procedure

The measurement procedure specified in IEC 61000-4-4 clause 8 was used.

- Setup the EUT and associated equipment described as clause 4.1.
- The EUT and its simulators was placed 0.1m high above the ground reference plane which was a min. 1m*1m metallic sheet with 0.65mm minimum thickness.
- This reference ground plane is project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.
- For input and output AC power ports
The EUT was connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines, and the length of the power line between the coupling device and the EUT shall be 0.5m or less. Both polarities of the test voltage should be applied during compliance test and the duration of the test can't less than 1min.
- For signal lines and control lines ports
The interface cables' length is less than 3m, therefore, it's unnecessary to measure.
- For DC input and DC output power ports
No DC ports. It's unnecessary to measure.

11.5. Test Result

Test Date	2017. 02. 13	Environment	20°C, 51%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Sam Yan

Input AC Power Port					
Inject Line	Polarity (+/-)	Test Voltage Peak (kV)	Inject Time (s)	Inject Method	Observation Criterion
L	+	0.5, 1	60	Direct	A
L	-	0.5, 1	60	Direct	A
N	+	0.5, 1	60	Direct	A
N	-	0.5, 1	60	Direct	A
L, N	+	0.5, 1	60	Direct	A
L, N	-	0.5, 1	60	Direct	A
Remark: No error occurred.					

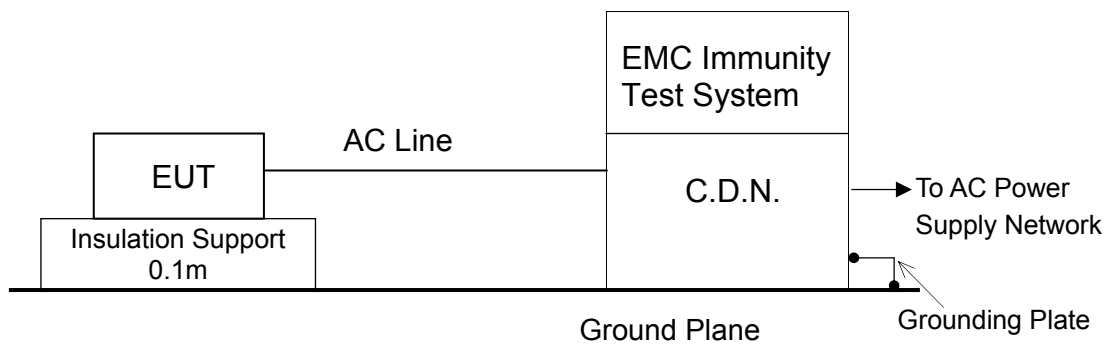
12. Surge Immunity Test

12.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	EMS Immunity Test System	TESEQ	NSG 3060	1519	2016. 07. 26	1 Year
2	3Phase Burst Coupler	TESEQ	CDN 3063	2074	2016. 07. 26	1 Year

12.2. Test Setup

The EUT and test equipment were configured in accordance with the basic standard requirement of IEC 61000-4-5.



12.3.Applicable Standard and Test Specification

Immunity requirement is in accordance with EN 55024 clause 4.2.5

Test specification is in accordance with EN 55024 Table 2.2 and 4.4

Basic standard is in accordance with IEC 61000-4-5

Test Specification		Performance Criterion
Signal and Telecom- munication Ports, Open Circuit Voltage	Voltage Peak: $\pm 1\text{kV}$ Voltage Peak (primary protection): $\pm 4\text{kV}$	B
	Waveform: 10/700 Tr/Th μs	
Input AC Power Ports, Open Circuit Voltage	Voltage Peak (line to line): $\pm 1\text{kV}$ Voltage Peak (line to earth or ground): $\pm 2\text{kV}$	
	Waveform: 1.2/50 (8/20) Tr/Th μs	

12.4.Measurement Procedure

The measurement procedure specified in IEC 61000-4-5 clause 8 was used.

- Setup the EUT and associated equipment described as clause 4.1.
- For line to line coupling mode, provided a 0.5/1kV 1.2/50 μs current surge (at open-circuit condition) and 8/20 μs current surge to EUT selected points.
- At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate.
- Different phase angles (at 0°, 90°, 180° and 270°) were done individually.
- Repeat above procedure except the open-circuit test voltages 0.5kV/1kV/2kV for line to earth coupling mode test.

12.5. Test Result

Test Date	2017. 02. 13	Environment	20°C, 51%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Sam Yan

Input AC Power Port, Open Circuit Voltage					
Location	Polarity (+/-)	Phase Angle (°)	Test Voltage Peak (kV)	No of Pulse	Observation Criterion
L-N	+	0	0.5, 1	5	A
	+	90	0.5, 1	5	A
	+	180	0.5, 1	5	A
	+	270	0.5, 1	5	A
	-	0	0.5, 1	5	A
	-	90	0.5, 1	5	A
	-	180	0.5, 1	5	A
	-	270	0.5, 1	5	A
Remark: No error occurred.					

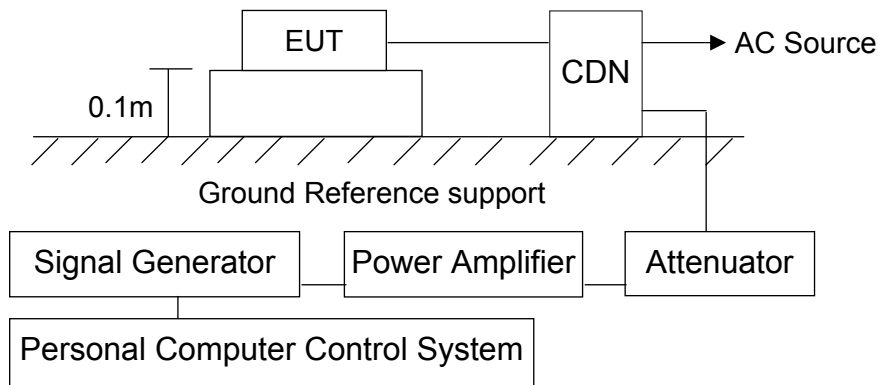
13. Immunity to Conducted Disturbances, Induced by Radio-Frequency Field Immunity Test

13.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Signal Generator	R & S	SMC100A	101402	2016. 05. 04	1 Year
2	Power Amplifier	A / R	100A250A	0330351	N.C.R.	N.C.R.
3	Power Meter	Agilent	N1913A	MY52070009	2017. 01. 18	1 Year
4	Power Sensor	HP	8482B	3318A05483	N.C.R.	N.C.R.
5	Attenuator	Weinschel	40-6-34	NB538	2016. 04. 24	1 Year
6	CDN-M3	Fischer	FCC-801-M3-25A	9961	2016. 03. 07	1 Year

13.2. Test Setup

The EUT and test equipment were configured in accordance with the basic standard requirement of IEC 61000-4-6.



13.3.Applicable Standard and Test Specification

Immunity requirement is in accordance with EN 55024 clause 4.2.3 and 4.2.3.3

Test specification is in accordance with EN 55024 Table 2.1 and 4.1

Basic standard is in accordance with IEC 61000-4-6

Test Specification		Performance Criterion
Signal and Telecommunication Ports and Input AC Power Port		
Frequency Range	0.15-80MHz	A
Voltage Level	3V (unmodulated, r.m.s)	
Amplitude Modulated	80%, 1kHz AM	

13.4.Measurement Procedure

The measurement procedure specified in IEC 61000-4-6 clause 8 was used.

- Setup the EUTs and associated equipment described as clause 4.1.
- The EUT and supporting equipment were placed on an insulating support 0.1m high. above a ground reference plane. CDN (coupling and decoupling device) was placed on the ground plane making direct contact with it at about 0.1-0.3m from EUT. Cables between CDN and EUT were as short as possible.
- The disturbance signal described below was injected to EUT through CDN.
- One CDN shall be connected to the port intended to be tested and one CDN with 50 Ω termination shall be connected to another port. Decoupling networks shall be installed on all other ports to which cables are attached.
- The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value.
- The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0,5 s. The sensitive frequencies (e.g. clock frequencies) shall be analyzed separately.
- Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

13.5. Test Result

Test Date	2017. 02. 14	Environment	18°C, 41%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Xar Zhuo

Frequency Range (MHz)	Injected Position	Voltage Level	Observation Criterion
0.15 - 80MHz	Main (Input AC Power Line)	3V(rms) + Modulated	A

Remark 1: Modulation Signal: 1kHz 80% AM.
 Remark 2: No error occurred.

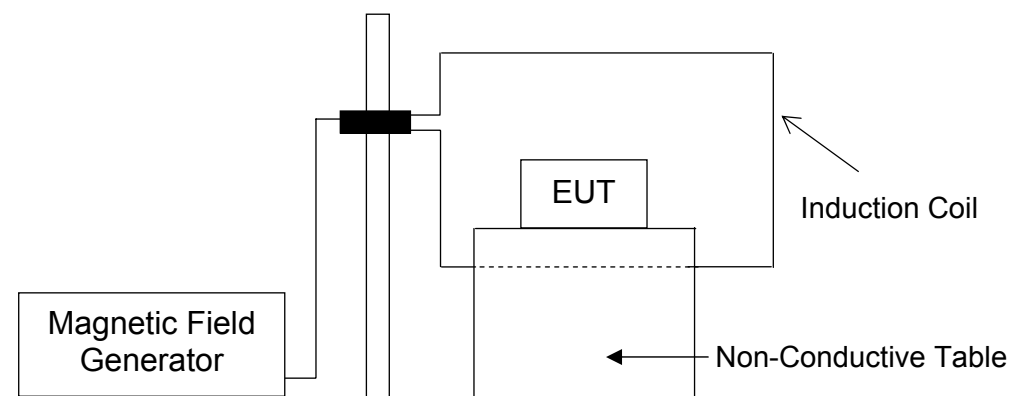
14. Power Frequency Magnetic Field Immunity Test

14.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Magnetic Field Generator	NARDA	PMM1008	0100X30101	2016. 11. 18	1 Year

14.2. Test Setup

The EUT and test equipment were configured in accordance with the basic standard requirement of IEC 61000-4-8.



14.3. Applicable Standard and Test Specification

Immunity requirement is in accordance with EN 55024 clause 4.2.4

Test specification is in accordance with EN 55024 Table 1.1

Basic standard is in accordance with IEC 61000-4-8

Test Specification		Performance Criterion
Power Frequency	50Hz or 60Hz	A
Magnetic Field Strength	1A/m (rms)	

14.4.Measurement Procedure

The measurement procedure specified in IEC 61000-4-8 clause 8 was used.

- Setup the EUT and associated equipment described as clause 4.1.
- The equipment cabinets which can be earthed shall be connected to the safety earth directly on the GRP or via the earth terminal to PE.
- The EUT was placed on 0.8m high table, and subjected to the test magnetic field by using the induction coil of standard dimensions (1m x 2.6m).
- The induction coil rotated by 90 degrees in order to expose the EUT to the test field with different orientations (at X-axis, Y-axis and X-axis).
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- All cables of EUT exposed to magnetic field for 1m of their length.
- The preferential range of test levels, respectively for continuous of the magnetic field, applicable to distribution networks at 50 Hz or 60 Hz.

14.5. Test Result

Test Date	2017. 02. 14	Environment	20°C, 45%
Input Power	AC 230V, 50Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Jason Chen

Power Frequency	Magnetic Field Strength	Coil Orientation	Testing Duration	Observation Criterion
50Hz	1A/m	X-axis	1 Min	A
50Hz	1A/m	Y-axis	1 Min	A
50Hz	1A/m	Z-axis	1 Min	A

Remark: No error occurred.

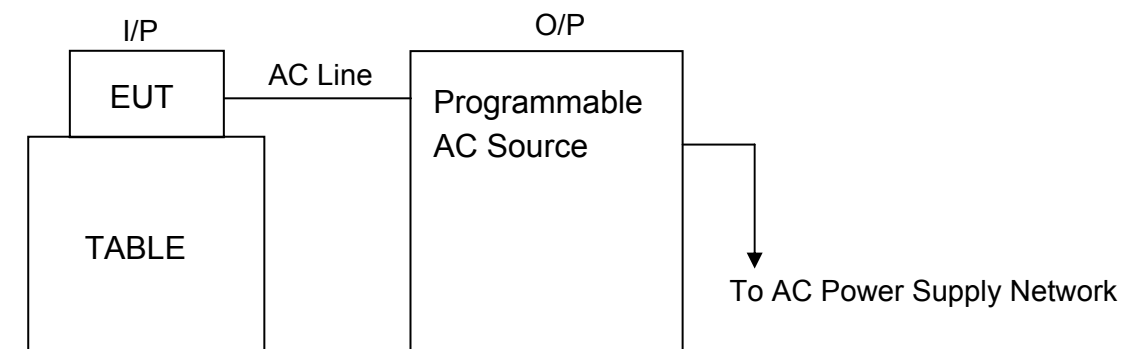
15. Voltage Dips and Interruptions Immunity Test

15.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	AC Power Source	TESEQ	NSG 1007-45	1248A04038	2016. 01. 29	2 Years

15.2. Test Setup

The EUT and test equipment were configured in accordance with the basic standard requirement of IEC 61000-4-11.



15.3. Applicable Standard and Test Specification

Immunity requirement is in accordance with EN 55024 clause 4.2.6

Test specification is in accordance with EN 55024 Table 4.2 and 4.3

Basic standard is in accordance with IEC 61000-4-11

Test Specification		Performance Criterion
Voltage Dips	>95% reduction, 0.5period	B
Voltage Dips	30% reduction , 25period	C
Voltage Interruptions	>95% reduction , 250period	C

15.4.Measurement Procedure

The measurement procedure specified in IEC 61000-4-11 clause 8 was used.

- Setup the EUT and associated equipment described as clause 4.1.
- During the tests, the mains voltage for testing shall be monitored within an accuracy of 2 %.
- The EUT shall be tested for each selected combination of test level and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested.
- For voltage dips, changes in supply voltage shall occur at zero crossings of the voltage, and at additional angles considered critical by product committees or individual product specifications preferably selected from 45°, 90°, 135°, 180°, 225°, 270° and 315° on each phase.
- For short interruptions, the angle shall be defined by the product committee as the worst case. In the absence of definition, it is recommended to use 0° for one of the phases.
- For each test, any degradation of performance shall be recorded. The monitoring equipment should be capable of displaying the status of the operational mode of the EUT during and after the tests. After each group of tests, a full functional check shall be performed.

15.5. Test Result

Test Date	2017. 02. 14	Environment	21°C, 50%
Input Power	AC 100-240V, 50/60Hz	Result	Pass
Test Mode	Connection, 1920*1080/60Hz	Tested By	Jacky Chen

Type of Test	Test Voltage	Phase Angle (°)	Voltage Reduction (%)	Duration (Period)	Observation Criterion
Voltage Interruptions	100V 240V	0	> 95	250	C (Note)
		45	> 95	250	C (Note)
		90	> 95	250	C (Note)
		135	> 95	250	C (Note)
		180	> 95	250	C (Note)
		225	> 95	250	C (Note)
		270	> 95	250	C (Note)
Voltage Dips	100V 240V	315	> 95	250	C (Note)
		0	30	25	A
		45	30	25	A
		90	30	25	A
		135	30	25	A
		180	30	25	A
		225	30	25	A
		270	30	25	A
		315	30	25	A
		0	> 95	0.5	A
		45	> 95	0.5	A
		90	> 95	0.5	A
		135	> 95	0.5	A
		180	> 95	0.5	A
		225	> 95	0.5	A
		270	> 95	0.5	A
		315	> 95	0.5	A

Note: Criterion C: The EUT was stopped operating during the test, but it's self-recoverable after test.

16. Measurement Uncertainty List

The measurement uncertainty was estimated for test on the EUT according to CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage of K=2.

The uncertainties value is not used in determining the PASS/FAIL results.

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Conducted emissions at AC mains power port	9kHz-150kHz	±3.7dB
	150kHz-30MHz	±3.5dB
Conducted emissions at wired network port	150kHz-30MHz	±3.5dB
Conducted emissions at broadcast receiver tuner port	150kHz-30MHz	±3.5dB
Conducted emissions Power Clamp	30MHz-300MHz	±4.4dB
Radiated electromagnetic	9kHz-30MHz	±0.5dB
Radiated emissions (10m Chamber)	30MHz-200MHz, 3m, Horizontal	±4.3dB
	200MHz-1000MHz, 3m, Horizontal	±4.3dB
	30MHz-200MHz, 3m, Vertical	±4.4dB
	200MHz-1000MHz, 3m, Vertical	±3.9dB
	30MHz-200MHz, 10m, Horizontal	±4.3dB
	200MHz-1000MHz, 10m, Horizontal	±4.1dB
	30MHz-200MHz, 10m, Vertical	±4.3dB
	200MHz-1000MHz, 10m, Vertical	±3.8dB
	1GHz-6GHz, 3m	±5.5dB
	6GHz-18GHz, 3m	±4.8dB
Radiated emissions (No.1 3m Chamber)	30MHz-200MHz, 3m, Horizontal	±3.9dB
	200MHz-1000MHz, 3m, Horizontal	±4.3dB
	30MHz-200MHz, 3m, Vertical	±4.5dB
	200MHz-1000MHz, 3m, Vertical	±4.1dB
	1GHz-6GHz, 3m	±5.1dB
	6GHz-18GHz, 3m	±5.5dB
Radiated emissions (No.2 3m Chamber)	30MHz-200MHz, 3m, Horizontal	±4.3dB
	200MHz-1000MHz, 3m, Horizontal	±4.3dB
	30MHz-200MHz, 3m, Vertical	±4.4dB
	200MHz-1000MHz, 3m, Vertical	±3.9dB
	1GHz-6GHz, 3m	±5.2dB
	6GHz-18GHz, 3m	±5.2dB
Radiated emissions (No.3 3m Chamber)	30MHz-200MHz, 3m, Horizontal	±4.7dB
	200MHz-1000MHz, 3m, Horizontal	±4.5dB
	30MHz-200MHz, 3m, Vertical	±4.3dB
	200MHz-1000MHz, 3m, Vertical	±4.1dB

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Radiated emissions (No.3 OATS)	30MHz-200MHz, 3m, Horizontal	±4.5dB
	200MHz-1000MHz, 3m, Horizontal	±4.4dB
	30MHz-200MHz, 3m, Vertical	±4.4dB
	200MHz-1000MHz, 3m, Vertical	±4.0dB
	30MHz-200MHz, 10m, Horizontal	±4.5dB
	200MHz-1000MHz, 10m, Horizontal	±4.2dB
	30MHz-200MHz, 10m, Vertical	±4.3dB
	200MHz-1000MHz, 10m, Vertical	±4.0dB
Radiated emissions (No.5 OATS)	30MHz-200MHz, 3m, Horizontal	±4.2dB
	200MHz-1000MHz, 3m, Horizontal	±4.7dB
	30MHz-200MHz, 3m, Vertical	±4.4dB
	200MHz-1000MHz, 3m, Vertical	±4.4dB
	30MHz-200MHz, 10m, Horizontal	±4.2dB
	200MHz-1000MHz, 10m, Horizontal	±4.6dB
	30MHz-200MHz, 10m, Vertical	±4.4dB
	200MHz-1000MHz, 10m, Vertical	±4.4dB
Radiated emissions (No.6 OATS)	30MHz-200MHz, 3m, Horizontal	±4.3dB
	200MHz-1000MHz, 3m, Horizontal	±4.4dB
	30MHz-200MHz, 3m, Vertical	±4.5dB
	200MHz-1000MHz, 3m, Vertical	±4.1dB
	30MHz-200MHz, 10m, Horizontal	±4.3dB
	200MHz-1000MHz, 10m, Horizontal	±4.2dB
	30MHz-200MHz, 10m, Vertical	±4.4dB
	200MHz-1000MHz, 10m, Vertical	±4.1dB
Radiated emissions (No.7 OATS)	30MHz-200MHz, 3m, Horizontal	±3.9dB
	200MHz-1000MHz, 3m, Horizontal	±4.5dB
	30MHz-200MHz, 3m, Vertical	±4.6dB
	200MHz-1000MHz, 3m, Vertical	±4.5dB
	30MHz-200MHz, 10m, Horizontal	±3.9dB
	200MHz-1000MHz, 10m, Horizontal	±4.3dB
	30MHz-200MHz, 10m, Vertical	±4.6dB
	200MHz-1000MHz, 10m, Vertical	±4.5dB
Radiated emissions (No.8 OATS)	30MHz-200MHz, 3m, Horizontal	±4.5dB
	200MHz-1000MHz, 3m, Horizontal	±4.3dB
	30MHz-200MHz, 3m, Vertical	±4.6dB
	200MHz-1000MHz, 3m, Vertical	±4.1dB
	30MHz-200MHz, 10m, Horizontal	±4.7dB
	200MHz-1000MHz, 10m, Horizontal	±4.2dB
	30MHz-200MHz, 10m, Vertical	±4.6dB
	200MHz-1000MHz, 10m, Vertical	±4.0dB

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Harmonic current	NSG 1007-45	±0.7%
Voltage fluctuations & flicker	NSG 1007-45	±0.2%
Electrostatic discharge (ESD)	NSG 437	Ucurrent= 7.3% Uvoltage= 1.0% Utime = 9.0%
	Ditto	Ucurrent = 4.0% Uvoltage = 2.0% Utime = 3.0%
	MZ-15/EC	Ucurrent = 10.0% Uvoltage = 1.8% Utime = 20.0%
Radio-frequency electromagnetic field, Continuous radiated disturbances (RS)	80MHz-200MHz	±1.7dB
	200MHz-1000MHz	±1.8dB
	1GHz-6GHz	±1.7dB
Electrical fast transient/burst (EFT)	AC power port	Uvoltage = 1.0% Utime = 4.0%
	Signal port	Uvoltage = 4.0% Utime = 3.0%
Surge	Open-circuit output voltage 0.5kV-6kV (1.2us/50us)	Uvoltage = 4.0%
	Open-circuit output voltage 0.5kV-6kV (10us/700us)	Uvoltage = 4.0%
	Rise time (30%-90%) x 1.67: 0.5kV-6kV (1.2us/50us)	Utime = 3.0%
	Rise time (30%-90%) x 1.67: 0.5kV-6kV (10us/700us)	Utime = 3.0%
	Duration time: 0.5kV-6kV (1.2us/50us)	Utime = 3.0%
	Duration time: 0.5kV-6kV (10us/700us)	Utime = 3.0%
	Short-circuit output current 0.25KA-3KA (8us / 20us)	Ucurrent = 3.0%
	Rise time (10%-90%) x 1.25: (8us/20us)	Utime = 3.0%
	Duration time: (8us/20us)	Utime = 3.0%
Radio-frequency, continuous conducted disturbances (CS)	CDN (AC power port)	1.5 dB
	EM-Clamp (Signal port)	3.3 dB
Power-frequency magnetic field (PFMF)	MAG100.1	4%
	PMM1008	2%
Voltage dips	TESEQ	Uvoltage = 0.1% Ucurrent = 0.2%

17. Photographs

17.1. Conducted Emissions Measurement



Front View of Conducted Measurement



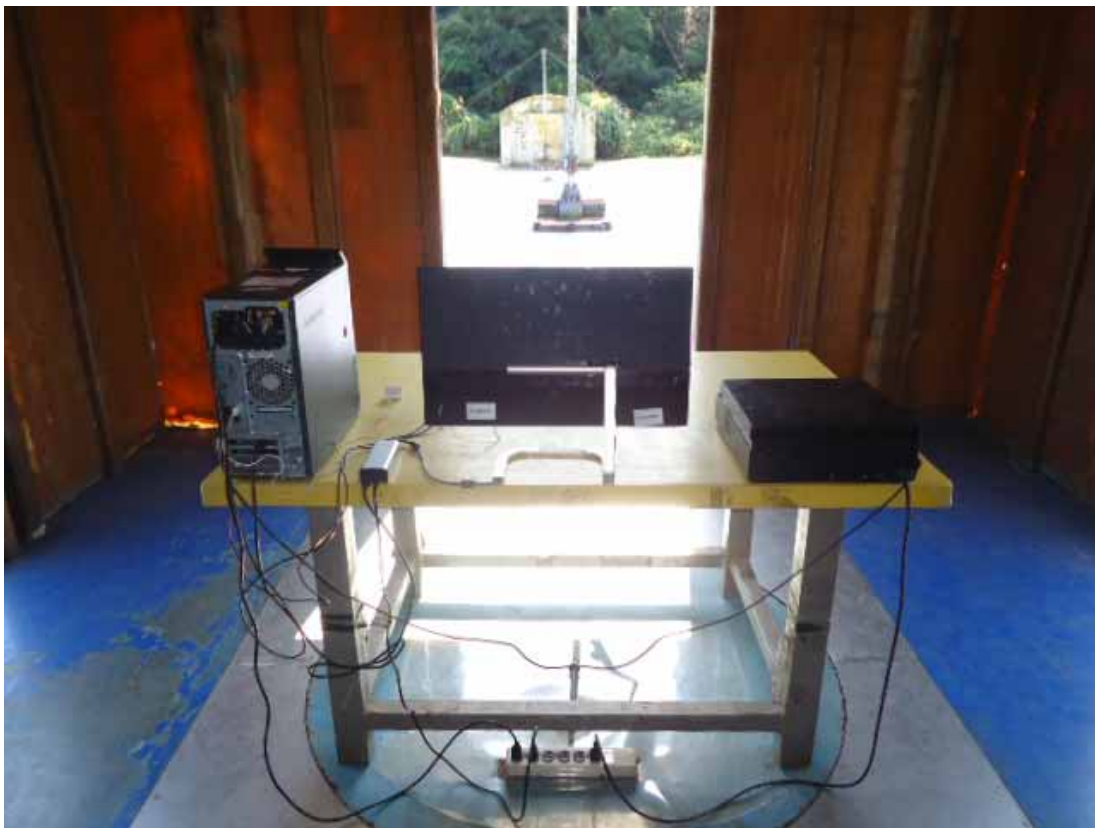
Back View of Conducted Measurement

17.2. Radiated Emissions Measurement

- For Frequency Range 30 – 1000MHz

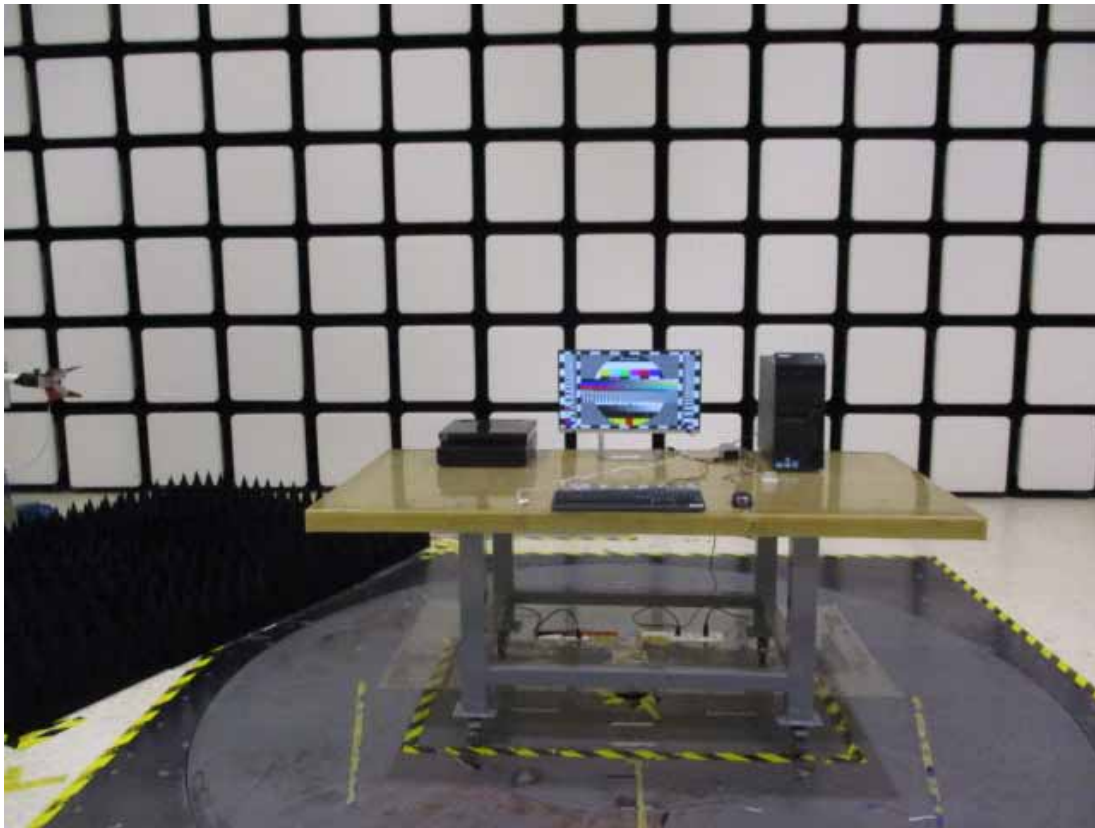


Front View of Radiated Measurement

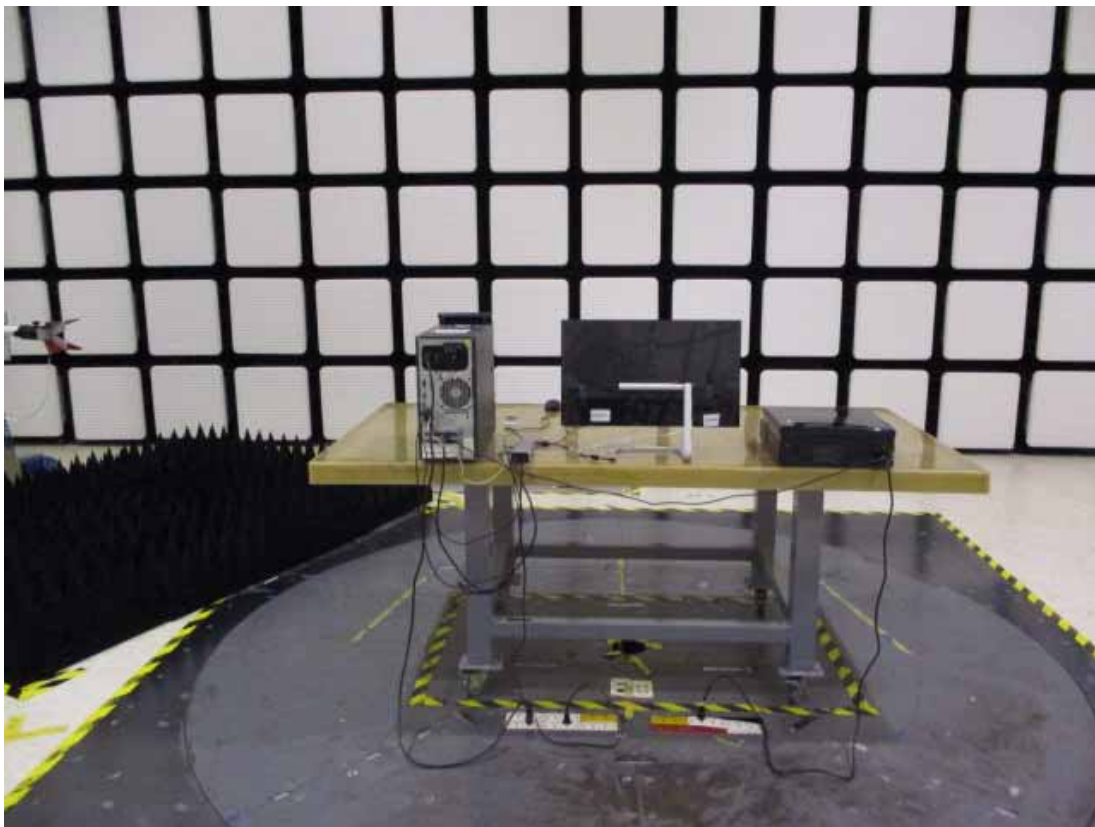


Back View of Radiated Measurement

- For Frequency Rang 1 – 6GHz



Front View of Radiated Measurement



Back View of Radiated Measurement

17.3. Harmonics Current Measurement



17.4. Voltage Fluctuation and Flicks Measurement



17.5. Electrostatic Discharge Immunity Test

- Air & Contact Discharge



- HCP & VCP



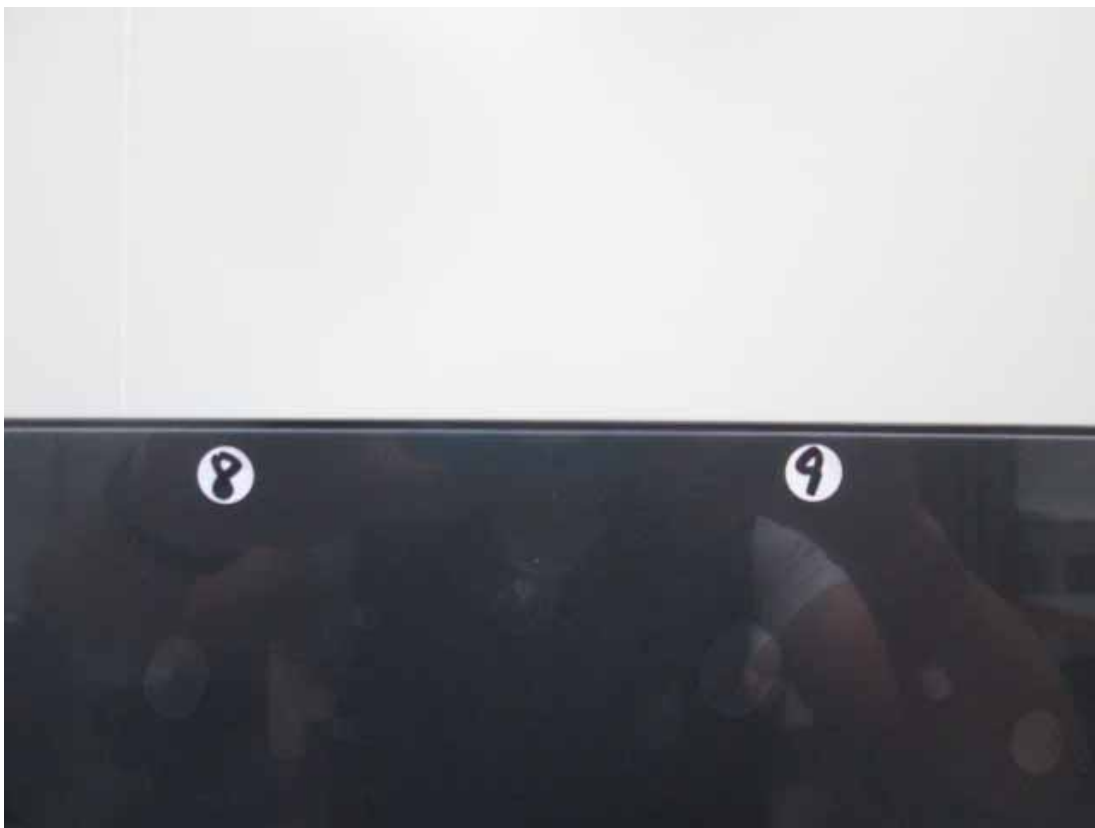
- ESD Test Points



- ESD Test Points



- ESD Test Points



- ESD Test Points



- ESD Test Points



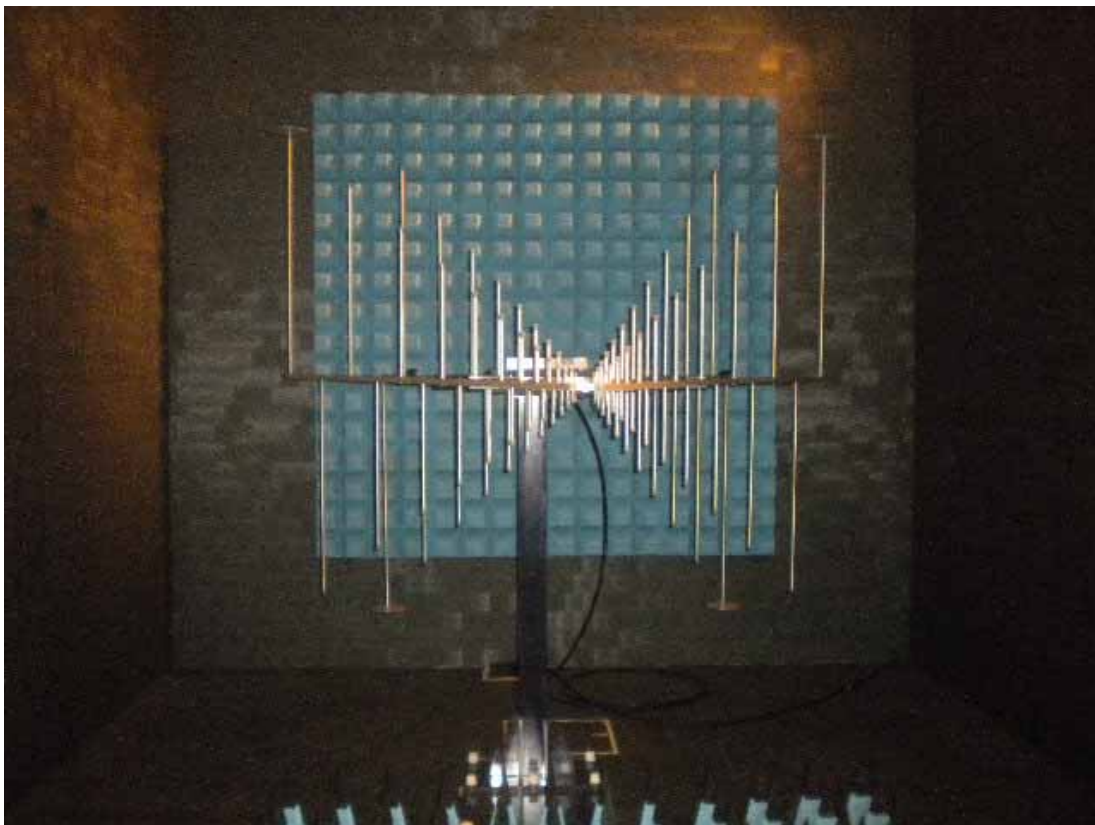
- ESD Test Points



- ESD Test Points



17.6. Radiated, Radio-Frequency, Electromagnetic Field Immunity Test



17.7. Electrical Fast Transient/Burst Immunity Test



17.8. Surge Immunity Test



17.9. Immunity to Conducted Disturbances Induced by RF Fields



17.10. Power Frequency Magnetic Field Immunity Test



17.11.Voltage Dips and Interruptions Immunity Test

