Technical Compliance Statement
EMC Test Report

For the following information **Ref. File No.: C1M1907194**

Product	:	LCD Monitor
Model Number	:	VG259*******
Brand Name	:	ASUS
Qisda Ref. No	:	JL-25322
Applicant	:	ASUSTeK COMPUTER INC.
Factory #1	:	Qisda Corporation
Factory #2	:	Qisda (Suzhou) Co., Ltd.
Factory #3	:	Qisda Optronics (Suzhou) Co., Ltd.

EN 55032:2012 +AC:2013 (CISPR 32:2012), Class B
AS/NZS CISPR 32:2013
EN 61000-3-2:2014 and EN 61000-3-3:2013
EN 55024:2010 +A1:2015 (CISPR 24: 2010 +A1:2015)
(IEC 61000-4-2:2008, IEC 61000-4-3:2010,
IEC 61000-4-4:2012, IEC 61000-4-5:2014 +A1:2017,
IEC 61000-4-6:2013, IEC 61000-4-8:2009,
IEC 61000-4-11:2004 +A1:2017)

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 and results are issued on the EMC test report no. **EM-E190384**.

Signature

Alex Deng/Deputy Manager
Date: 2019. 08. 02

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

LCD Monitor
Model Number: VG259*******
Brand: ASUS
REF. No.: JL-25322

Applicant for:
ASUSTeK COMPUTER INC.
No.15, Li-Te Rd, Peitou, Taipei, Taiwan

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

TESTING
NVLAP LAB CODE 200077-0

File No.	:	C1M1907194
Report No.	:	EM-E190384
Date of Report	:	2019. 08. 02

The test report 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 U.S. Government.

Test Report

Applicant	:	ASUSTeK COMPUTER INC.
Factory #1	:	Qisda Corporation
Factory #2	:	Qisda (Suzhou) Co., Ltd.
Factory #3	:	Qisda Optronics (Suzhou) Co., Ltd.
EUT Description		
(1) Product	:	LCD Monitor
(2) Model Number	:	VG259*******
(3) Brand	:	ASUS
(4) Ref. No.	:	JL-25322
(5) Power Rating	:	DC 19V

Applicable Standards:

EN 55032:2012 +AC:2013 (CISPR 32:2012), Class B
AS/NZS CISPR 32:2013
EN 61000-3-2:2014 and EN 61000-3-3:2013
EN 55024:2010 +A1:2015 (CISPR 24: 2010 +A1:2015)
(IEC 61000-4-2:2008, IEC 61000-4-3:2010,
IEC 61000-4-4:2012, IEC 61000-4-5:2014 +A1:2017,
IEC 61000-4-6:2013, IEC 61000-4-8:2009,
IEC 61000-4-11:2004 +A1:2017)

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. All of the tests were requested by the applicant and the results thereof based upon the information that the applicant provided to us. We, 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: 2019. 08. 02

Reviewed by: Harper Lee (Harper Lee/Administrator)

Approved by: Ben Cheng for (Alex Deng/Deputy Manager)

Table of Content

1. Revision of Test Report

Issued Date	Revision Summary	Report Number
2019. 08. 02	Original Report.	EM-E190384

2. Summary of Test Result

2.1. Test Result

Emission			
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 14.70dB at 0.176MHz
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**
Asymmetric mode conducted 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 7.13dB at 627.592MHz
Radiated emissions (1 – 6GHz)	EN 55032:2012 +AC:2013 (CISPR 32:2012)	Class B	**Pass** Margin 7.86dB at 1065.84MHz
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
4. The EN 55032 emission measurement results are deemed satisfactory evidence of compliance with AS/NZS CISPR 32 regulations.

Immunity				
Test Item	**Basic Standard**	**Standard Criteria**	**EUT Criteria**	**Result**
Electrostatic discharge	IEC 61000-4-2:2008	B	B	**Pass (Note 2)**
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 +A1:2017	B	A	**Pass**
Surge at Telecommunication port	IEC 61000-4-5:2014 +A1:2017	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 +A1:2017	B	A	**Pass**
Voltage dips, 30% reduction		C	A	**Pass**
Voltage interruptions, >95% reduction		C	B	**Pass**

Note :

1. N/A is an abbreviation for Not Applicable
2. Special measures: The ESD test level is up to ±6kV (Contact Discharge Voltage), ±10kV (Air Discharge Voltage) by ASUS requirement.
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

Name of Test Firm	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: attemc_report@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP (USA) NVLAP Lab Code 200077-0 (2) TAF (Taiwan) No. 1724
Test Facilities	(1) No. 4 Shielding Room (2) No. 8 Open Area Test Site (3) No. 2 3m Semi-Anechoic Chamber (4) No. 2 EMS Test Room

3. General Information

3.1. Description of Application

Applicant	ASUSTeK COMPUTER INC. No.15, Li-Te Rd, Peitou, Taipei, Taiwan
Factory #1	Qisda Corporation 157 & 159 Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan.
Factory #2	Qisda (Suzhou) Co., Ltd. No. 169, Zhujiang Road, New District, Suzhou, Jiangsu Province, P.R. China
Factory #3	Qisda Optronics (Suzhou) Co., Ltd. No. 169, Zhujiang Road, New District, Suzhou, Jiangsu Province, P.R. China
Product	LCD Monitor
Brand	ASUS
Model	VG259******* (The "*" may be any alphanumeric character or blank for different sales area.)

Table: Model different list

Model	VG259	
Version no.	VG259Q	Same as test model VG259 and VG259Q is version no. of VG259
	VG259Q-P	Same as test model VG259, named by different sales territory
	VG259Q-J	Same as test model VG259, named by different sales territory
	VG259QE	Same as test model VG259, named by different sales territory
	VG259QG	Same as test model VG259, named by different sales territory
	VG259QR	Same as test model VG259, named by different sales territory
	VG259QY	Same as test model VG259, named by different sales territory
	VG259QZ	Same as test model VG259, named by different sales territory

3.2. Description of the EUT

Test Model	VG259Q
Serial Number	N/A
Power Rating	DC 19V
Firmware Version	N/A
Sample Status	Production
Date of Receipt	2019. 07. 10
Date of Test	2019. 07. 18 ~ 30
I/O Ports List	• DC In x1 • HDMI In x2 • DP In x1 • Line out x1
Accessories Supplied	• HDMI Cable • DP Cable • AC/DC Adapter • AC Power Cord (2C)

3.3. Highest Frequency within EUT

The highest frequency is above 108MHz of EUT.

3.4. List of Key Components of EUT

Item	Supplier/Brand	Model	Specification
LCD Panel	Qisda	Q250HAA00	Max. Resolution: 1920*1080/144Hz
AC/DC Adapter	ASUS	ADP-40KD-BB	I/P: AC 100-240V, 1.2A, 50-60Hz O/P: DC 19V, 2.1A

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	Panel Angle	Resolution/Frequency
Conducted Emission Measurement	AC 110V/60Hz	DP	0°	"H Pattern", 1920*1080/144Hz
		HDMI 1		"H Pattern", 1920*1080/120Hz
		HDMI 2		"H Pattern", 1920*1080/120Hz
		DP		"H Pattern", 1280*1024/75Hz
				"H Pattern", 640*480/60Hz
		DP	90°	"H Pattern", 1080*1920/144Hz
		DP		"1729", 1920*1080/144Hz
	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Radiated Emission Measurement (30 – 1000MHz) & (Above 1GHz)	AC 110V/60Hz	DP	0°	"H Pattern", 1920*1080/144Hz
		HDMI 1		"H Pattern", 1920*1080/120Hz
		HDMI 2		"H Pattern", 1920*1080/120Hz
		DP		"H Pattern", 1280*1024/75Hz
				"H Pattern", 640*480/60Hz
		DP	90°	"H Pattern", 1080*1920/144Hz
	AC 230V/50Hz	DP	0°	"H Pattern", 1080*1920/144Hz
				"1729", 1920*1080/144Hz
Harmonics current emission	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Voltage fluctuations & flicker		DP	0°	"H Pattern", 1920*1080/144Hz
Electrostatic dis-charge & Radiated, Radio-frequency, electromagnetic field		DP	0°	"H Pattern", 1920*1080/144Hz
		HDMI 1		"H Pattern", 1920*1080/120Hz
		HDMI 2		"H Pattern", 1920*1080/120Hz
Other Immunity tests		DP	0°	"H Pattern", 1920*1080/144Hz

3.6. Final Test Configuration

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

Test Item	Test Voltage	Input Port	Panel Angle	Resolution/Frequency
Conducted Emission Measurement	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Radiated Emission Measurement (30 – 1000MHz)	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Radiated Emission Measurement (Above 1GHz)	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Harmonics current emission	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Voltage fluctuations & flicker	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Electrostatic dis-charge & Radiated, Radio-frequency, electromagnetic field	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz
Other Immunity tests	AC 230V/50Hz	DP	0°	"H Pattern", 1920*1080/144Hz

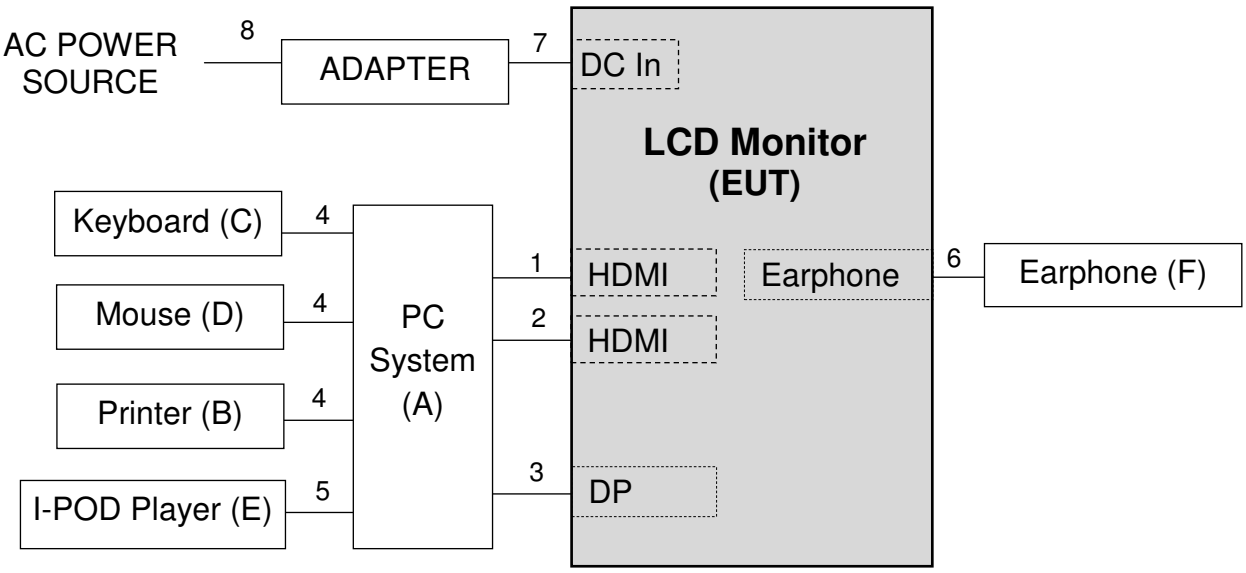
4. Measurement Arrangement

4.1. Equipment and cables arrangement

- Connection Diagram of EUT and Peripheral Devices

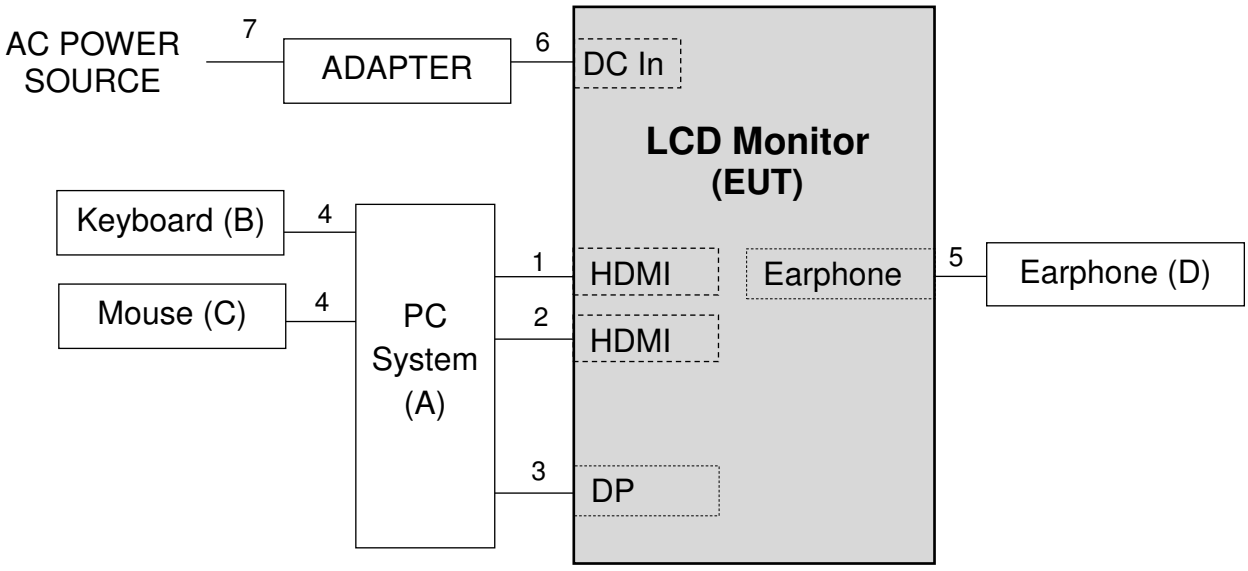
  The EUT and peripherals were arranged as the requirement of CISPR 32 Annex D.

  For Conducted & Radiated



- Connection Diagram of EUT and Peripheral Devices

  For harmonics, flicker and immunity tests



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.

PC operating system	Windows 7 of PC system
Test program	“IBM Test”, “Mediaplayer”, “ITU-R BT 1729”
Video Signal (Display Image)	1. Scrolling H characters (Arial, 10) 2. Standard Color bars with moving picture element.
Audio Signal	Play 1kHz sinusoidal signal
Other	Other peripheral devices were driven and operated in turn

- The methods for exercising the EUT during the measurement specified in EN 55024 and EN 61000-3-2/-3 were used.

Operating System	Windows XP of PC system
Test Program	“IBM Test”, “Mediaplayer”
Video Signal (Display Image)	Scrolling H characters (Arial, 10)
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, co-lour saturation	Use either the factory default 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
For Conducted and Radiated test					
A	PC System	LENOVO	MT-M 7611-PV2	R82RT29	By DoC
B	Printer	SAMSUNG	ML-1630	4561B1CP600023X	FCC ID: A3LML1630
C	USB Keyboard	LENOVO	KU-0225	0904489	By DoC
D	USB Mouse	LENOVO	45J4886	N/A	By DoC
E	I-POD Player	APPLE	A1204	4H722TL7VTE	By DoC
F	Earphone	LGITON	FS-99	N/A	N/A
For Harmonic、Flicker and Immunity Tests					
A	PC System	HP	HP ProDesk 490 G1 MT Business PC	SGH437TNKC	By DoC
B	USB Keyboard	HP	KB-0316	N/A	By DoC
C	USB Mouse	HP	M-UAE96	FATSK0K8FYKADW	By DoC
D	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
For Conducted and Radiated test						
1	HDMI Cable	1	1.8	Yes	0	Accessory of EUT
2	DP Cable	1	1.8	Yes	0	Accessory of EUT
3	USB Cable	1	1.8	Yes	0	Accessory of EUT
4	USB Cable	3	1.8	Yes	0	Provided by LAB
5	USB Cable	1	1.0	Yes	0	Provided by LAB
6	Earphone Cable	1	1.1	No	0	Provided by LAB
7	DC Power Cord	1	1.8	No	1	Accessory of EUT
8	AC Power Cord (3C)	1	1.0	No	0	Accessory of EUT
9	AC Power Cord	2	1.8	No	0	Provided by LAB for above supported units
For Harmonic、Flicker and Immunity Tests						
1	HDMI Cable	1	1.8	Yes	0	Accessory of EUT
2	DP Cable	1	1.8	Yes	0	Accessory of EUT
3	USB Cable	1	1.8	Yes	0	Accessory of EUT
4	USB Cable	3	1.8	Yes	0	Provided by LAB
5	Earphone Cable	1	1.1	No	0	Provided by LAB
6	DC Power Cord	1	1.8	No	1	Accessory of EUT
7	AC Power Cord (3C)	1	1.0	No	0	Accessory of EUT
8	AC Power Cord	1	1.8	No	0	Provided by LAB for above supported units

5. Measurement of Conducted Emissions

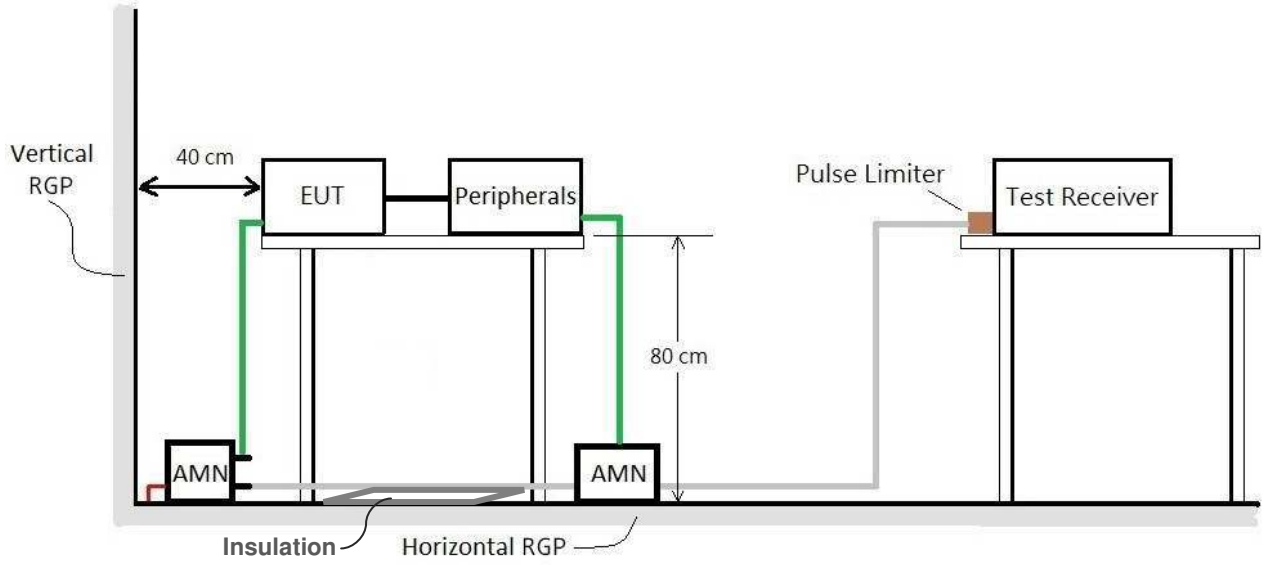
5.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Test Receiver	R&S	ESCS30	100039	2019. 06. 05	1 Year
2	A.M.N.	R&S	ESH3-Z5	861189/008	2018. 12. 17	1 Year
3	L.I.S.N.	Kyoritsu	KNW-407	8-1430-5	2019. 01. 22	1 Year
4	Pulse Limiter	R&S	ESH3-Z2	100356	2019. 01. 12	1 Year
5	Signal Cable	MIYAZAKI	5D2W	CE-03	2019. 02. 01	1 Year
6	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.4 S/R	2019. 04. 20	1 Year
7	Test Software	Audix	e3	V6.120703a	N.C.R.	N.C.R.

5.2. Test Setup

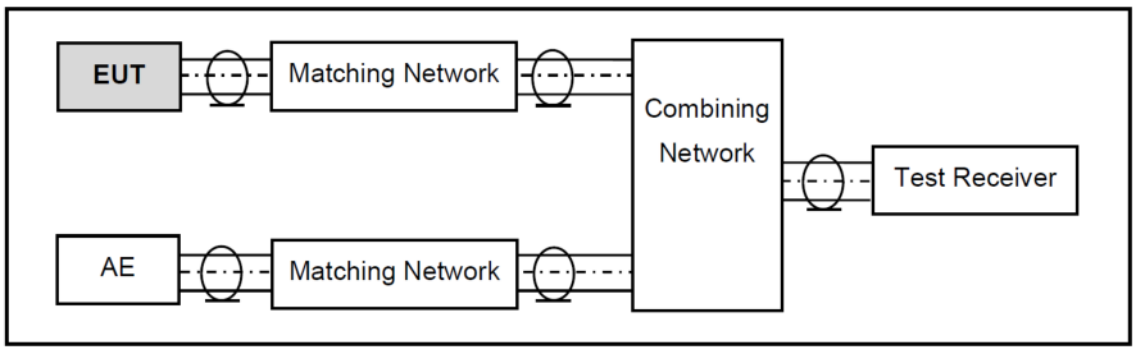
The EUTs and test equipment were configured in accordance with the requirement of EN 55032 (CISPR 32) Annex C, D:

- 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

Frequency Range (MHz)	Coupling Device	Detector Type / Bandwidth	Class A Limit dB(μV)	Class B Limit dB(μV)
0.15 – 0.5	AMN	Quasi Peak / 9 kHz	79	66 – 56
0.5 – 5.0			73	56
5.0 – 30			73	60
0.15 – 0.5	AMN	Average / 9 kHz	66	56 – 46
0.5 – 5.0			60	46
5.0 – 30			60	50

- For asymmetric mode conducted emissions

  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)	Coupling Device	Detector Type / Bandwidth	Class A Voltage Limit dB(μV)	Class A Current Limit dB(μA)
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	
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
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

Frequency Range (MHz)	Coupling Device	Detector Type / Bandwidth	Class B Voltage Limit dB(μV)	Class B Current Limit dB(μA)
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	
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
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

- For conducted differential voltage emissions

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)	Detector Type / Bandwidth	Class B Limit dB(μV) 75Ω			Applica-bility
		Other	Local Oscillator Fundamental	Local Oscillator Harmonics	
30 – 950	For frequencies ≤1 GHz Quasi Peak / 120 k	46	46	46	See [a]
950 – 2150		46	54	54	
950 – 2150		46	54	54	See [b]
30 – 300		46	54	50	See [c]
300 – 1000				52	
30 – 300	For frequencies ≥1 GHz Peak / 1MHz	46	66	59	See [d]
300 – 1000				52	
30 – 950		46	76	46	See [e]
950 – 2150			n/a	54	

[a] 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.
[b] Tuner units (not the LNB) for satellite signal reception
[c] Frequency modulation audio receivers and PC tuner cards.
[d] Frequency modulation car radio.
[e] 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. Limits specified for the LO are for the RF modulator carrier signal and harmonics.

5.4. Measurement Procedure

For AC mains power port

The method of EN 55032 (CISPR 32) clause 6.3 was used.

- Setup the EUTs 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 as section 5.3 defined.
- 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 EUTs 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 as section 5.3 defined.
- 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 EUTs 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

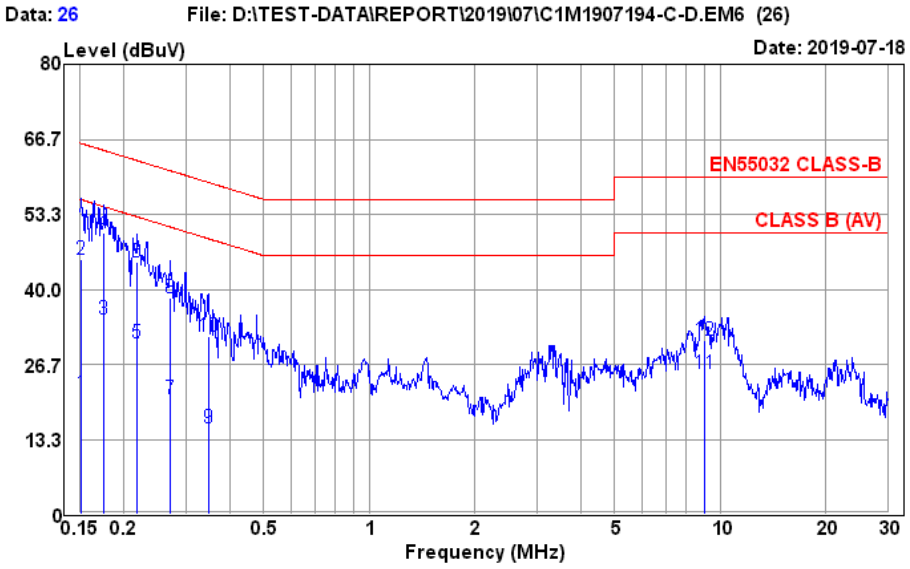
The method of EN 55032 (CISPR 32) Annex C 4.1.6.2 was used.

- 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 USB Compact Modulator 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

The following data are the worst emissions based on the prescan measurement result.

Test Date	2019. 07. 18	Environment	23ºC, 44%
Input Power	AC 230V, 50Hz	Test Phase	Neutral
Tested By	Gary Tsai	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP		

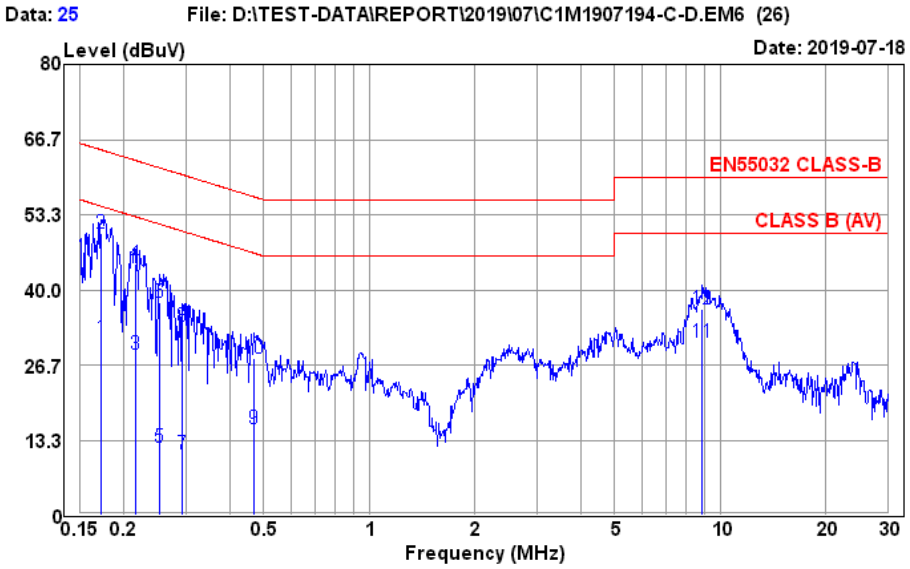



```
Site no.      : No.4 Shielded Room          Data no.  : 26
Condition     : ESH3-Z5 861189/008          LISN Phase : NEUTRAL
Limit         : EN55032 CLASS-B
Env. / Ins.   : 23*C / 44%  ESCS30 (100039) Engineer  : Gary Tsai
EUT           : VG259Q
Power Rating  : 230Vac / 50Hz
Test Mode     : 1920*1080/144Hz DP
```

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.152	0.02	0.02	9.86	11.61	21.51	55.91	34.40	Average
2	0.152	0.02	0.02	9.86	35.40	45.30	65.91	20.61	QP
3	0.176	0.02	0.02	9.86	24.79	34.69	54.68	19.99	Average
4	0.176	0.02	0.02	9.86	40.08	49.98	64.68	14.70	QP
5	0.219	0.02	0.02	9.86	20.54	30.44	52.88	22.44	Average
6	0.219	0.02	0.02	9.86	34.94	44.84	62.88	18.04	QP
7	0.270	0.02	0.02	9.86	10.67	20.57	51.12	30.55	Average
8	0.270	0.02	0.02	9.86	28.48	38.38	61.12	22.74	QP
9	0.350	0.03	0.02	9.86	5.40	15.31	48.96	33.65	Average
10	0.350	0.03	0.02	9.86	21.72	31.63	58.96	27.33	QP
11	9.011	0.31	0.11	9.89	14.72	25.03	50.00	24.97	Average
12	9.011	0.31	0.11	9.89	20.60	30.91	60.00	29.09	QP

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

Test Date	2019. 07. 18	Environment	23ºC, 44%
Input Power	AC 230V, 50Hz	Test Phase	Line
Tested By	Gary Tsai	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP		




```
Site no.      : No.4 Shielded Room          Data no.  : 25
Condition     : ESH3-Z5 861189/008          LISN Phase : LINE
Limit         : EN55032 CLASS-B
Env. / Ins.   : 23*C / 44%  ESCS30 (100039) Engineer  : Gary Tsai
EUT           : VG259Q
Power Rating  : 230Vac / 50Hz
Test Mode     : 1920*1080/144Hz DP
```

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.172	0.03	0.02	9.86	21.49	31.40	54.86	23.46	Average
2	0.172	0.03	0.02	9.86	40.14	50.05	64.86	14.81	QP
3	0.215	0.03	0.02	9.86	18.60	28.51	53.01	24.50	Average
4	0.215	0.03	0.02	9.86	34.68	44.59	63.01	18.42	QP
5	0.253	0.03	0.02	9.86	2.21	12.12	51.64	39.52	Average
6	0.253	0.03	0.02	9.86	27.74	37.65	61.64	23.99	QP
7	0.292	0.04	0.02	9.86	0.87	10.79	50.46	39.67	Average
8	0.292	0.04	0.02	9.86	23.58	33.50	60.46	26.96	QP
9	0.469	0.04	0.02	9.86	5.50	15.42	46.54	31.12	Average
10	0.469	0.04	0.02	9.86	18.02	27.94	56.54	28.60	QP
11	8.869	0.36	0.11	9.89	20.40	30.76	50.00	19.24	Average
12	8.869	0.36	0.11	9.89	26.22	36.58	60.00	23.42	QP

```
Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
         2. If the average limit is met when useing 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

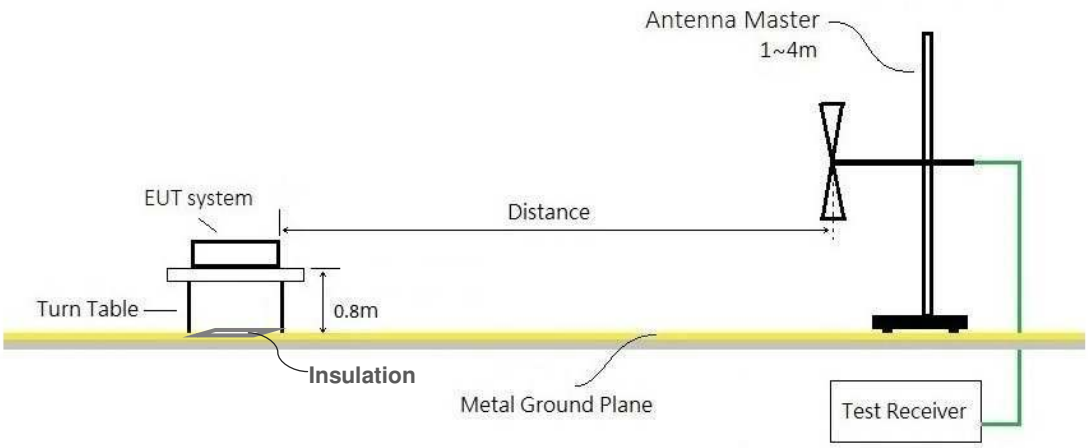
Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-507	MY51250907	2019. 04. 12	1 Year
2	Test Receiver	R&S	ESCI	100558	2018. 10. 26	1 Year
3	Amplifier	HP	8447D	2944A06891	2019. 01. 12	1 Year
4	Bilog Antenna	Schaffner	CBL6112B	2828	2019. 01. 19	1 Year
5	Signal Cable	HUBER + SUHNER	RG217U	RE-10	2019. 02. 01	1 Year
6	Test Software	Audix	e3	V.5.04507	N.C.R.	N.C.R.
7	Digital Ther-mo-Hygro Meter	WISEWIND	5330	No.8 O/S	2019. 04. 20	1 Year

- For measurement of above 1GHz frequency range

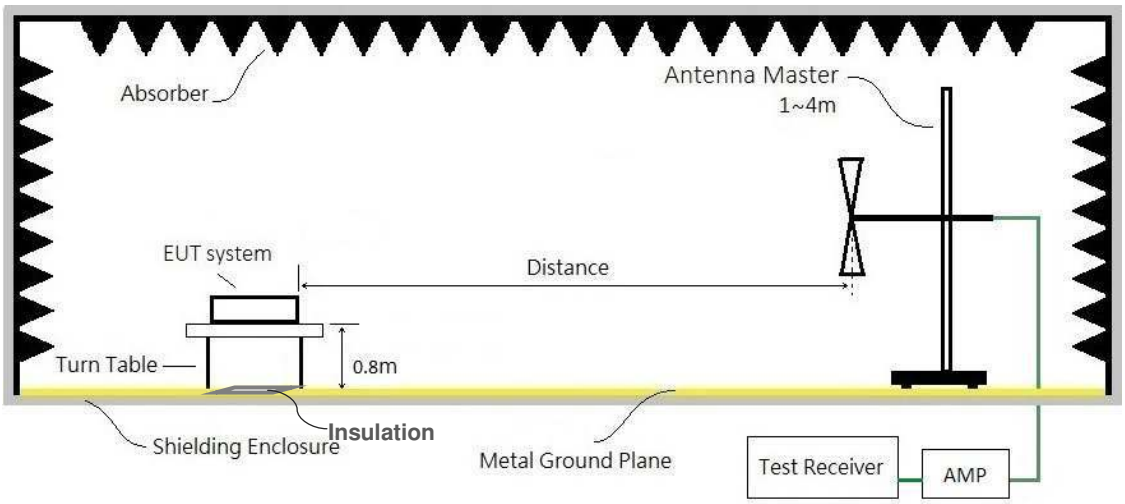
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Keysight	N9010B-526	MY57410128	2019. 01. 04	1 Year
2	Microwave Preamplifier	Agilent	8449B	3008A02596	2018. 12. 22	1 Year
3	Double-Ridged Waveguide Horn	EMCO	3115	9112-3775	2019. 05. 15	1 Year
4	Signal Cable	HUBER + SUHNER	RG214	RE-13	2019. 02. 01	1 Year
5	Test Software	Audix	e3	V.6.2009-10-22	N.C.R.	N.C.R.
6	Digital Ther-mo-Hygro Meter	WISEWIND	5330	No.2 3m A/C	2019. 04. 20	1 Year

6.2. Test Setup

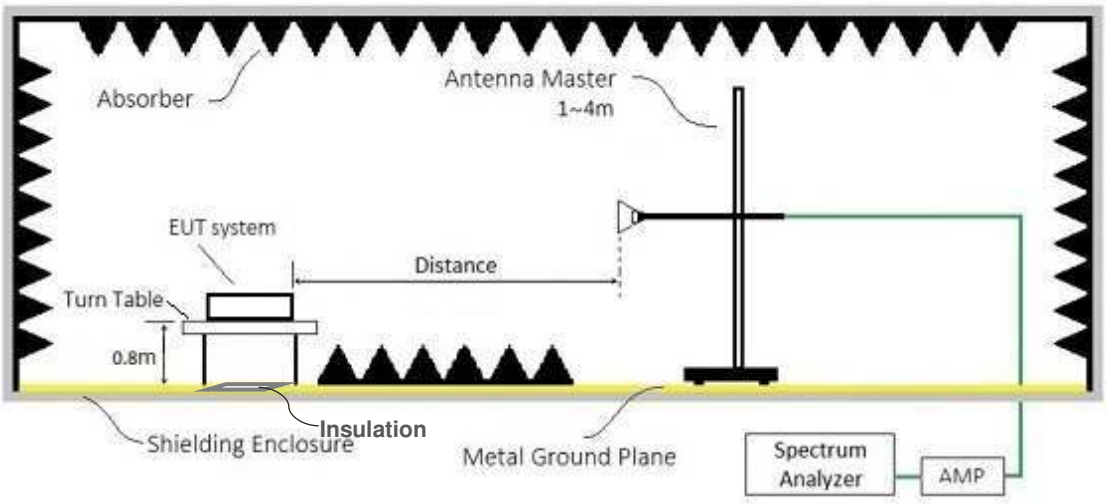
- For frequency range 30 to 1000MHz (at Open Area Test Site)



- For frequency range 30 to 1000MHz (at Semi-Anechoic Chamber)



- For frequency range 1 to 6GHz (at Semi-Anechoic Chamber)



6.3. Applicable Limits

- For radiated emissions at frequencies up to 1GHz

Frequency Range (MHz)	Measurement			Class A Limits dB(μV/m)	Class B Limits dB(μV/m)
	Facility	Distance (m)	Detector Type/ Bandwidth		
30 – 230	OATS/ SAC	10	Quasi Peak/ 120 kHz	40	30
230 – 1000				47	37
30 – 230		3		50	40
230 – 1000				57	47

- For radiated emissions at frequencies above 1GHz

Frequency Range (MHz)	Measurement			Class A Limits dB(μV/m)	Class B Limits dB(μV/m)
	Facility	Distance (m)	Detector Type/ Bandwidth		
1000 – 3000	FSOATS	3	Average/ 1 MHz	56	50
3000 – 6000				60	54
1000 – 3000			Peak/ 1 MHz	76	70
3000 – 6000				80	74

- For radiated emissions at frequencies from FM receivers

Frequency Range (MHz)	Measurement			Class B Limits dB(μV/m)	
	Facility	Distance (m)	Detector Type/ Bandwidth	Fundamental	Harmonics
30 – 230	OATS/ SAC	10	Quasi Peak/ 120 kHz	50	42
230 – 300					42
300 – 1000					46
30 – 230	OATS/ SAC	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 6.3 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 or OATS 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 set as section 6.3 defined.
- 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 – Preamp Gain

  (Above 1GHz)

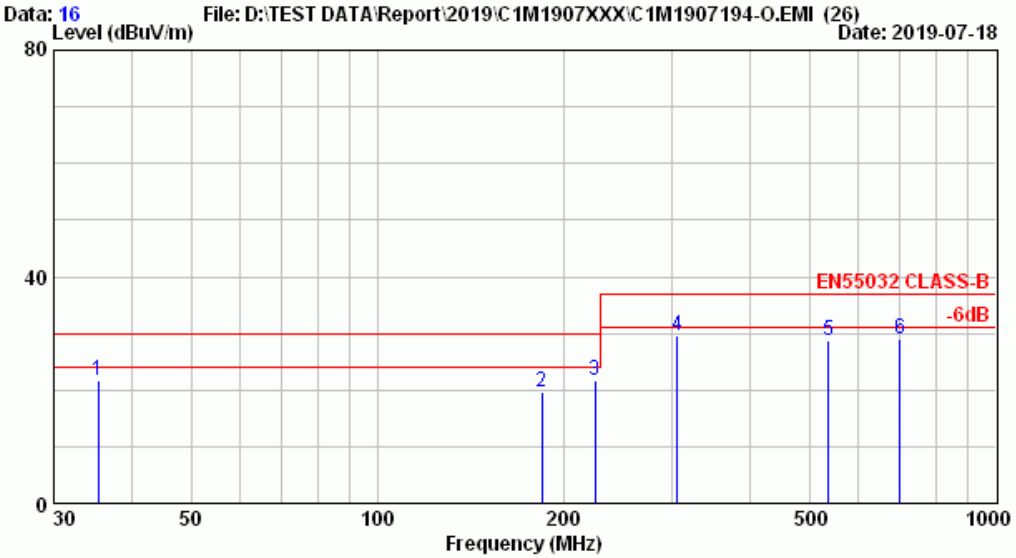
  Emission Level = Reading (Spectrum) + Cable Loss + Antenna Factor – Preamp Gain
- The 3dB bandwidth of the horn antenna is minimum 52 degree (w=2.93m at 3m distance) for 1~6 GHz.

6.5. Measurement Result

The following data are the worst emissions based on the prescan measurement result.

- For frequency range 30 – 1000MHz

Test Date	2019. 07. 18	Environment	26ºC, 54%
Input Power	AC 230V, 50Hz	Test Phase	Horizontal
Tested By	Garry Chao	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP		

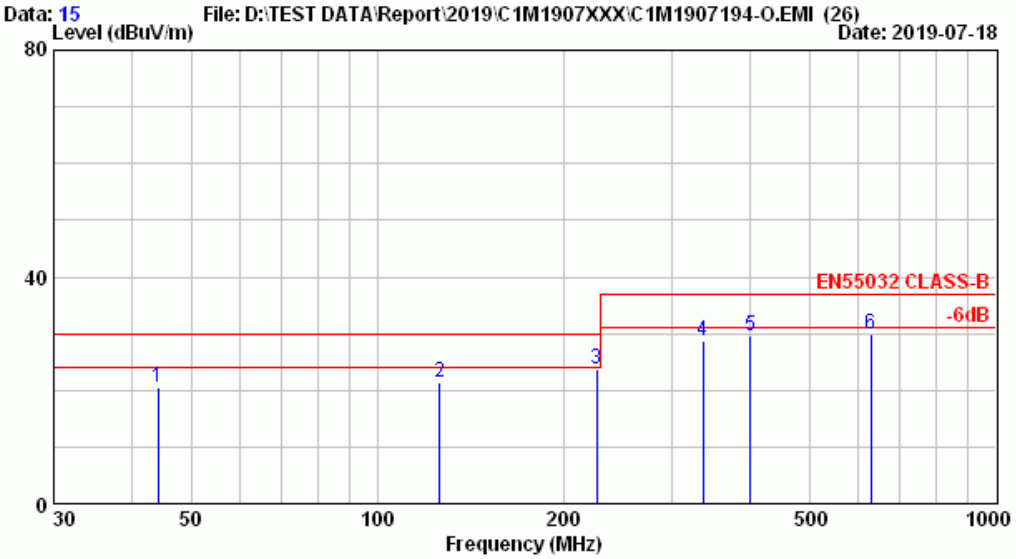



```
Site no.      : OATS NO.8                    Data no.   : 16
Dis. / Ant.   : 10m  CBL6112B 2828(PAD)      Ant. pol.  : HORIZONTAL
Limit         : EN55032 CLASS-B
Env. / Ins.   : 26*C / 54%   ESCI (558)      Engineer   : Garry Chao
EUT           : VG259Q
Power Rating  : 230Vac/50Hz
Test Mode     : 1920*1080/144Hz DP
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	35.438	21.56	1.07	-0.84	21.79	30.00	8.21	QP 4m160
2	184.624	15.05	3.14	1.39	19.58	30.00	10.42	QP 4m250
3	224.832	16.99	3.84	0.82	21.65	30.00	8.35	QP 4m110
4	305.245	19.39	4.19	6.14	29.72	37.00	7.28	QP 4m80
5	535.813	23.97	4.99	-0.36	28.60	37.00	8.40	QP 2.1m110
6	699.725	24.83	5.99	-1.74	29.08	37.00	7.92	QP 1.2m250

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

Test Date	2019. 07. 18	Environment	26ºC, 54%
Input Power	AC 230V, 50Hz	Test Phase	Vertical
Tested By	Garry Chao	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP		



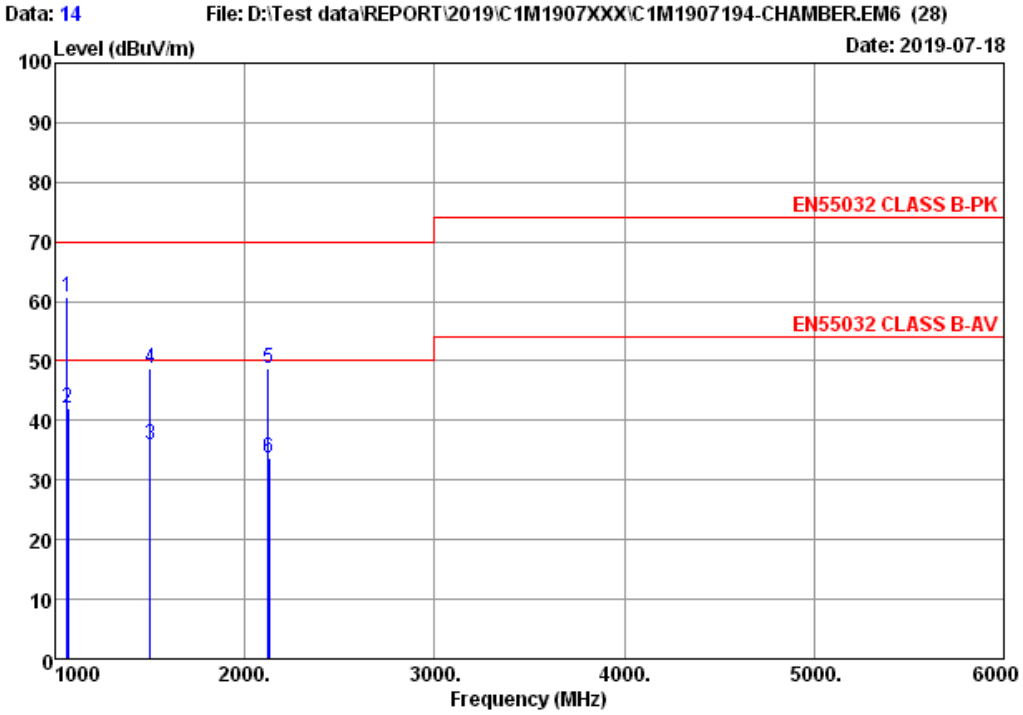

```
Site no.      : OATS NO.8                    Data no.   : 15
Dis. / Ant.   : 10m  CBL6112B 2828(PAD)      Ant. pol.  : VERTICAL
Limit         : EN55032 CLASS-B
Env. / Ins.   : 26*C / 54%   ESCI (558)      Engineer   : Garry Chao
EUT           : VG259Q
Power Rating  : 230Vac/50Hz
Test Mode     : 1920*1080/144Hz DP
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	44.164	17.08	1.22	2.08	20.38	30.00	9.62	QP 1m50
2	126.296	17.86	2.29	1.33	21.48	30.00	8.52	QP 1m170
3	226.458	17.09	3.86	2.69	23.64	30.00	6.36	QP 1m250@
4	336.290	20.39	4.24	4.17	28.80	37.00	8.20	QP 1m330
5	400.717	22.23	4.33	3.08	29.65	37.00	7.35	QP 1.3m210
6	627.592	24.75	5.54	-0.43	29.87	37.00	7.13	QP 1.7m40

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

- For frequency range above 1GHz

Test Date	2019. 07. 18	Environment	27ºC, 49%
Input Power	AC 230V, 50Hz	Test Phase	Horizontal
Tested By	Eason Hsu	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP		

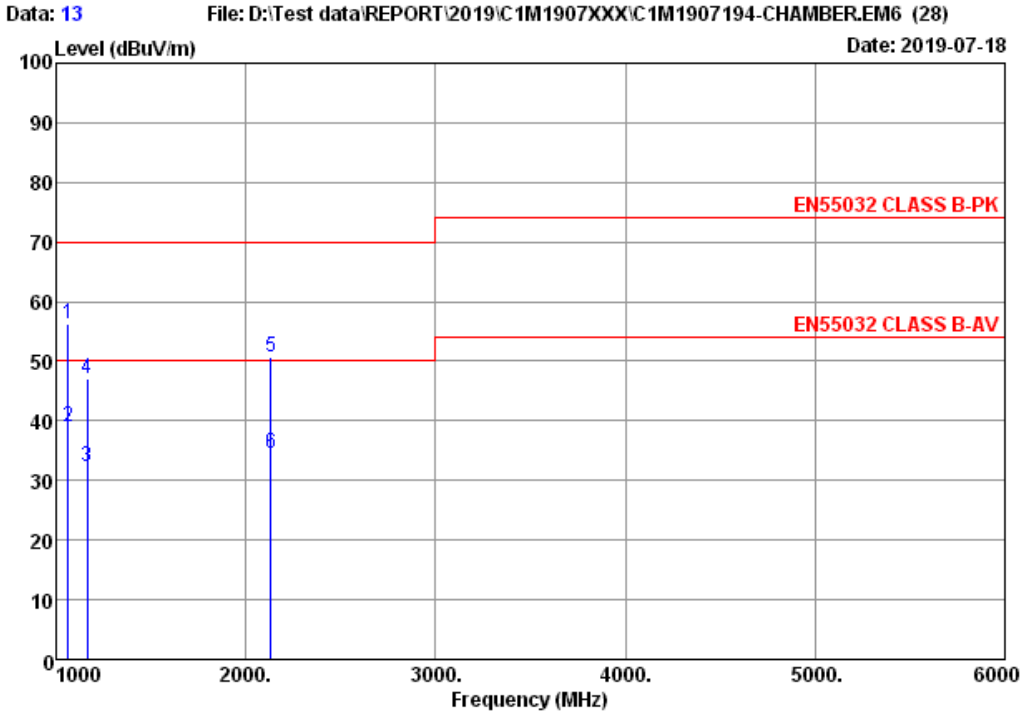


Site no. : Audix No.2 Chamber Data no. : 14
Dis. / Ant. : 3m HORN3115-3775 Ant. pol. : HORIZONTAL
Limit : EN55032 CLASS B-PK
Env. / Ins. : 27*C / 49% N9010B (128) Engineer : Eason Hsu
EUT : VG259Q
Power Rating : 230Vac/50Hz
Test Mode : 1920*1080/144Hz DP

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	PREAMP Gain (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark	Antenna Table Pos (cm)	Pos (Deg.)
1	1065.00	25.42	3.54	36.57	68.35	60.74	70.00	9.26	Peak	180	350
2	1065.84	25.42	3.54	36.57	49.75	42.14	50.00	7.86	Average	185	355
3	1499.46	25.81	4.23	36.02	41.82	35.84	50.00	14.16	Average	100	65
4	1500.00	25.80	4.23	36.02	54.62	48.63	70.00	21.37	Peak	100	70
5	2125.00	27.85	5.25	35.85	51.49	48.74	70.00	21.26	Peak	150	245
6	2126.39	27.85	5.25	35.85	36.52	33.77	50.00	16.23	Average	155	245

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

Test Date	2019. 07. 18	Environment	27ºC, 49%
Input Power	AC 230V, 50Hz	Test Phase	Vertical
Tested By	Eason Hsu	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP		



Site no. : Audix No.2 Chamber Data no. : 13
Dis. / Ant. : 3m HORN3115-3775 Ant. pol. : VERTICAL
Limit : EN55032 CLASS B-PK
Env. / Ins. : 27*C / 49% N9010B (128) Engineer : Eason Hsu
EUT : VG259Q
Power Rating : 230Vac/50Hz
Test Mode : 1920*1080/144Hz DP

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	PREAMP Gain (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark	Antenna Table Pos (cm)	Pos (Deg.)
1	1065.00	25.42	3.54	36.57	63.84	56.23	70.00	13.77	Peak	150	60
2	1065.42	25.42	3.54	36.57	46.70	39.09	50.00	10.91	Average	150	65
3	1164.51	27.09	3.74	36.44	37.82	32.21	50.00	17.79	Average	110	340
4	1165.00	27.09	3.75	36.44	52.61	47.01	70.00	22.99	Peak	110	350
5	2130.00	27.86	5.26	35.85	53.42	50.69	70.00	19.31	Peak	135	95
6	2131.66	27.86	5.26	35.85	37.25	34.52	50.00	15.48	Average	130	90

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

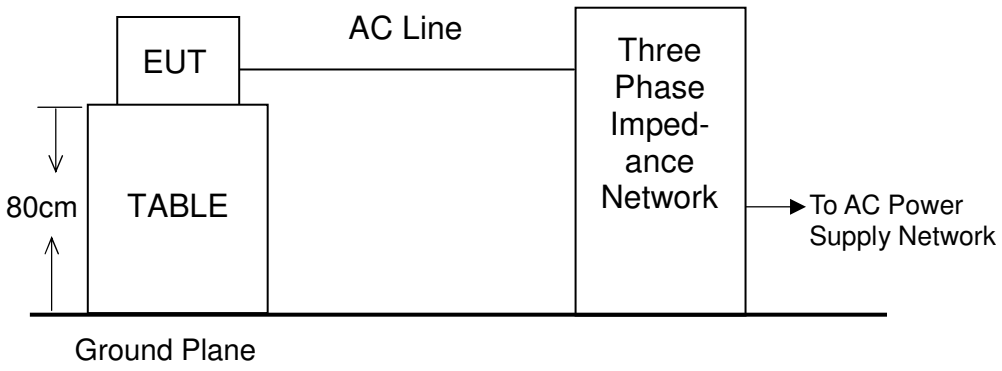
7. Measurement of Harmonics Current Emissions

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	2017. 11. 28	2 Years
2	Signal Conditioning Unit	TESEQ	CCN 1000-3	1234A03680	2017. 11. 28	2 Years
3	Three Phase Im-pedance Network	TESEQ	INA 2197	1234A03681	2017. 11. 28	2 Years
4	Profline AC Switching Unit	TESEQ	NSG 2200-3	EK 22713	2017. 11. 28	2 Years
5	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.2 Harmon-ics Room	2019. 04. 20	1 Year

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 A Equipment

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

Harmonic order n	Maximum permissible harmonic current A
Odd Harmonics Only	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15 ≤ n ≤ 39	0.15x15/n
Even Harmonics	
2	1.08
4	0.43
6	0.30
8 ≤ n ≤ 40	0.23x8/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.

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.

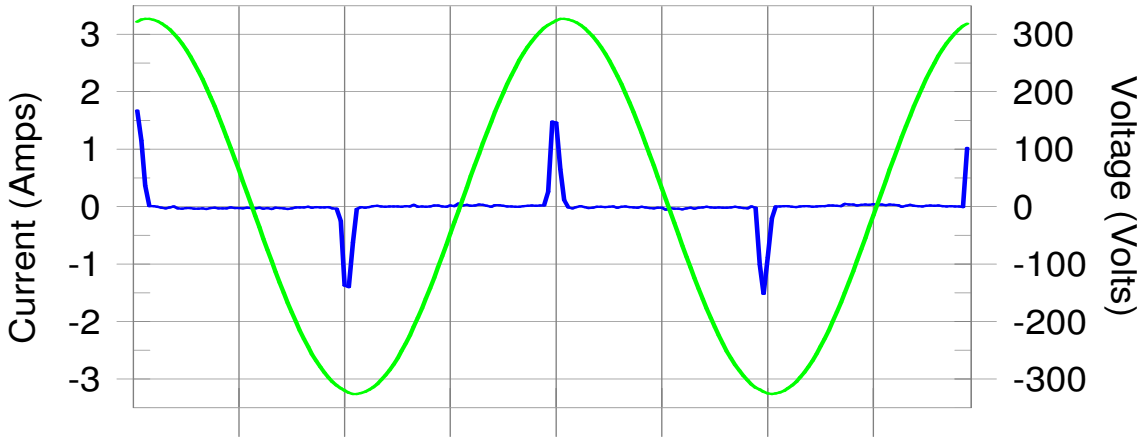
- Setup the EUT and associated equipment described as clause 4.1.
- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- Apply a 230V/50Hz 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

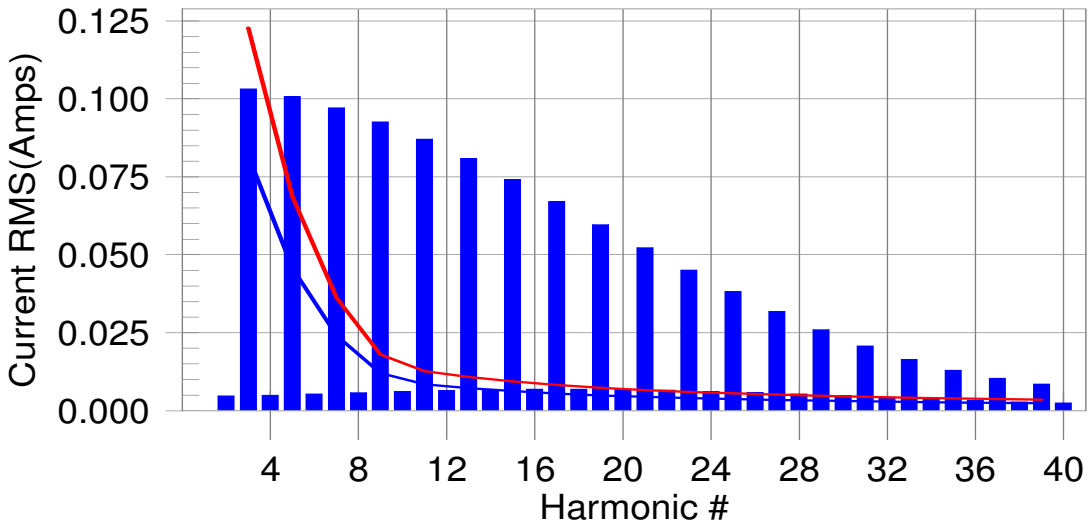
Test Date	2019. 07. 25	Environment	27ºC, 37%
Input Power	AC 230V, 50Hz	Test Result	Pass (Class D)
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Rex Wang

Test Result: N/L **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class D limit line **European Limits**



Test result: N/L **Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit.**

Test Result: N/L **Source qualification: Normal**

THC(A): 0.276 **I-THD(%): 252.4** **POHC(A): 0.095** **POHC Limit(A): 0.010**

Highest parameter values during test:

V_RMS (Volts):	**230.498**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**1.694**	**I_RMS (Amps):**	**0.297**
I_Fund (Amps):	**0.109**	**Crest Factor:**	**5.706**
Power (Watts):	**24.1**	**Power Factor:**	**0.353**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	0.000	N/A	0.005	0.000	N/A	Pass
3	0.103	0.082	N/A	0.103	0.123	N/A	Pass
4	0.005	0.000	N/A	0.005	0.000	N/A	Pass
5	0.101	0.046	N/A	0.101	0.069	N/A	Pass
6	0.005	0.000	N/A	0.006	0.000	N/A	Pass
7	0.097	0.024	N/A	0.097	0.036	N/A	Pass
8	0.006	0.000	N/A	0.006	0.000	N/A	Pass
9	0.093	0.012	N/A	0.093	0.018	N/A	Pass
10	0.006	0.000	N/A	0.006	0.000	N/A	Pass
11	0.087	0.008	N/A	0.087	0.013	N/A	Pass
12	0.006	0.000	N/A	0.007	0.000	N/A	Pass
13	0.081	0.007	N/A	0.081	0.011	N/A	Pass
14	0.007	0.000	N/A	0.007	0.000	N/A	Pass
15	0.074	0.006	N/A	0.074	0.009	N/A	Pass
16	0.007	0.000	N/A	0.007	0.000	N/A	Pass
17	0.067	0.006	N/A	0.067	0.008	N/A	Pass
18	0.007	0.000	N/A	0.007	0.000	N/A	Pass
19	0.060	0.005	N/A	0.060	0.007	N/A	Pass
20	0.007	0.000	N/A	0.007	0.000	N/A	Pass
21	0.052	0.004	N/A	0.053	0.007	N/A	Pass
22	0.007	0.000	N/A	0.007	0.000	N/A	Pass
23	0.045	0.004	N/A	0.046	0.006	N/A	Pass
24	0.006	0.000	N/A	0.007	0.000	N/A	Pass
25	0.038	0.004	N/A	0.039	0.006	N/A	Pass
26	0.006	0.000	N/A	0.006	0.000	N/A	Pass
27	0.032	0.003	N/A	0.032	0.005	N/A	Pass
28	0.005	0.000	N/A	0.006	0.000	N/A	Pass
29	0.026	0.003	N/A	0.026	0.005	N/A	Pass
30	0.005	0.000	N/A	0.005	0.000	N/A	Pass
31	0.021	0.003	N/A	0.021	0.004	N/A	Pass
32	0.004	0.000	N/A	0.005	0.000	N/A	Pass
33	0.017	0.003	N/A	0.017	0.004	N/A	Pass
34	0.004	0.000	N/A	0.004	0.000	N/A	Pass
35	0.013	0.003	N/A	0.013	0.004	N/A	Pass
36	0.003	0.000	N/A	0.004	0.000	N/A	Pass
37	0.010	0.003	N/A	0.011	0.004	N/A	Pass
38	0.003	0.000	N/A	0.003	0.000	N/A	Pass
39	0.009	0.002	N/A	0.009	0.004	N/A	Pass
40	0.002	0.000	N/A	0.003	0.000	N/A	Pass

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

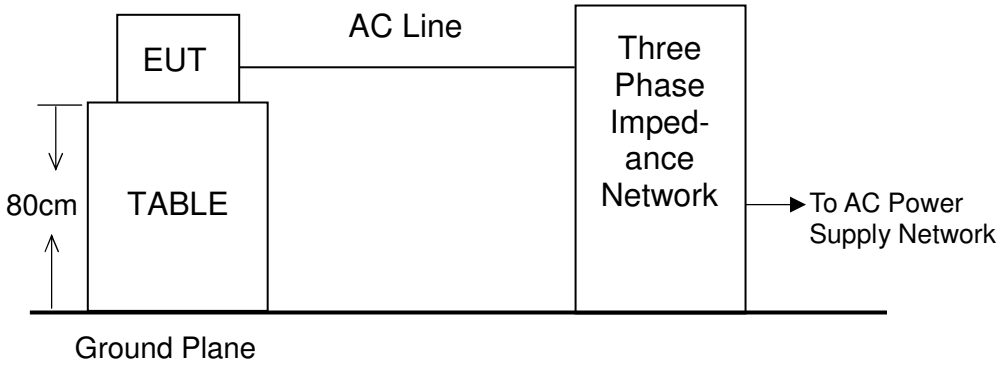
8. Measurement of Voltage Fluctuations and Flicker Emissions

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	2017. 11. 28	2 Years
2	Signal Condition-ing Unit	TESEQ	CCN 1000-3	1234A03680	2017. 11. 28	2 Years
3	Three Phase Im-pedance Network	TESEQ	INA 2197	1234A03681	2017. 11. 28	2 Years
4	Profline AC Switching Unit	TESEQ	NSG 2200-3	EK 22713	2017. 11. 28	2 Years
5	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.2 Harmon-ics Room	2019. 04. 20	1 Year

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	≤ 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	≤ 3.3%
d_{max}	Maximum relative voltage change	≤ 4%
	Maximum relative voltage change	≤ 6%
	Maximum relative voltage change	≤ 7%

8.4. Measurement Procedure

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

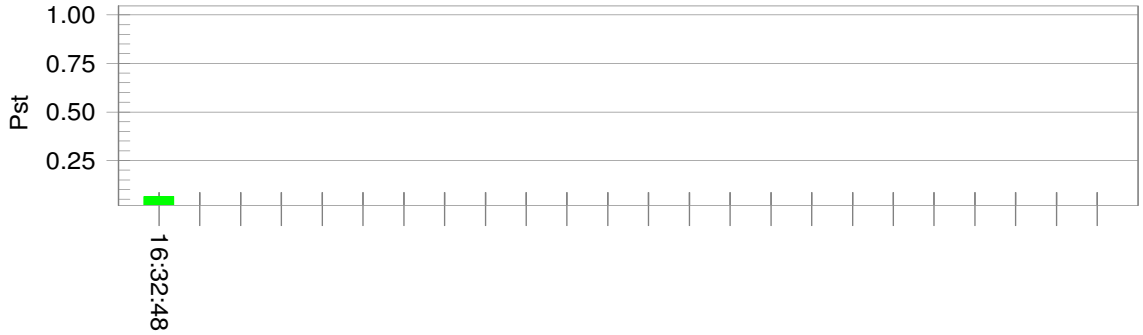
- Setup the EUT and associated equipment described as clause 4.1.
- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- The observation period for short-term flicker indicator 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 ±2.0% and the frequency within ±0.5% of the nominal value to EUT.
- If the maximum r.m.s input current (including inrush current) does not exceed 20A, and the supply current after inrush is within a variation band of 1.5A, it's not applicable to test the manual switching.

8.5. Measurement Result

Test Date	2019. 07. 25	Environment	27ºC, 37%
Input Power	AC 230V, 50Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Rex Wang

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):	**230.41**			
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):	**0.064**	**Test limit:**	**1.000**	**Pass**

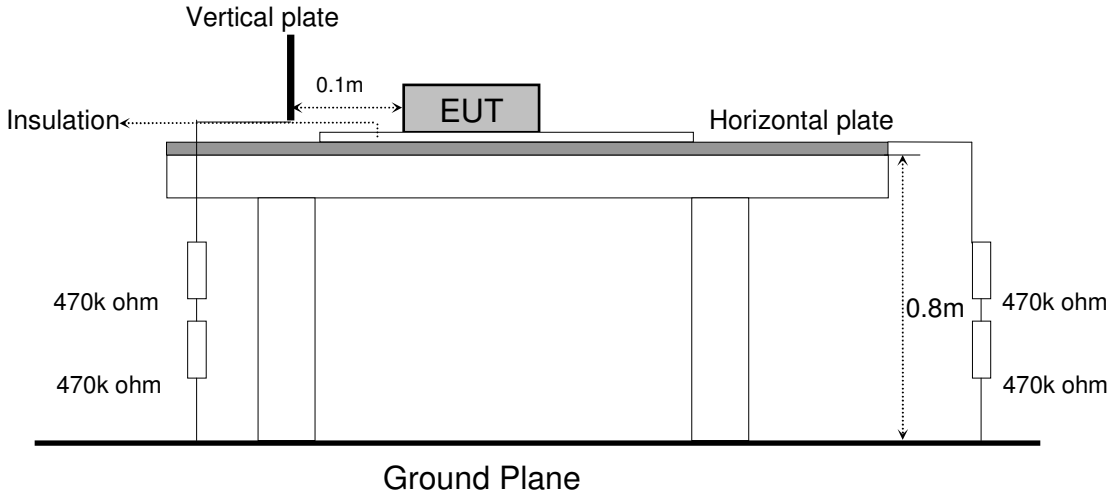
9. Electrostatic Discharge Immunity Test

9.1. List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	ESD Simulator	TESEQ	NSG 438	1497	2018. 11. 16	1 Year
2	Digital Ther-mo-Hygrometer	CUSTOM	WF-301	01780	2018. 10. 19	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	±2kV and ±4kV	B
Air Discharge Voltage	±2kV, ±4kV and ±8kV	

- Deviation from applicable standard
  Test Specification by ASUS requirement.
  Contact Discharge Voltage level is up to ±6kV.
  Air Discharge Voltage level is up to ±10kV.

9.4. Measurement Procedure

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

- Setup the EUTs 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 retrigged 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 is same as foregoing subclause. 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	2019. 07. 22	Environment	24ºC, 41%, 99kPa
Input Power	AC 230V, 50Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Rex Wang

Air Discharge	**Voltage kV Level / Discharge per polarity 10 / Result**								
Test Location	+2	-2	+4	-4	+8	-8	+10	-10	**Comments**
SCREEN*4(1~4)	ND	ND	A	A	B	B	B	B	**Note**
BUTTON*5(5~9)	ND	ND	ND	ND	ND	ND	ND	ND	
LED*1(10)	ND	ND	ND	ND	ND	ND	ND	ND	
SEAM*3(11~13)	ND	ND	ND	ND	ND	ND	ND	ND	
EAR*1(14)	ND	ND	ND	ND	A	A	B	B	**Note**
HDMI*2(15,16)	ND	ND	ND	ND	A	A	B	B	**Note**
DP*1(17)	ND	ND	ND	ND	A	A	B	B	**Note**
DC IN*1(18)	ND	ND	ND	ND	ND	ND	B	B	**Note**

Contact Discharge	**Voltage kV Level / Discharge per polarity 25 / Result**						
Test Location	+2	-2	+4	-4	+6	-6	**Comments**
Screw*2(19,20)	B	B	B	B	B	B	**Note**
Screw*2(21,22)	A	A	B	B	B	B	**Note**
METAL*1(23)	A	A	B	B	B	B	**Note**

Indirect Contact	**Voltage kV Level / Discharge per polarity 25 / Result**						
Test Location	+2	-2	+4	-4	+6	-6	**Comments**
VCP Front	A	A	A	A	A	A	
VCP Right	A	A	A	A	A	A	
VCP Left	A	A	A	A	A	A	
VCP Back	A	A	A	A	A	A	
HCP Bottom	A	A	A	A	A	A	
Additional Notes							
Measurement Points	**Please refer to the Photos of ESD Test Points**						

ND=No Discharge after test.

Note: The EUT had be interference and the image was twinkling during the test , but it's self-recoverable after testing.

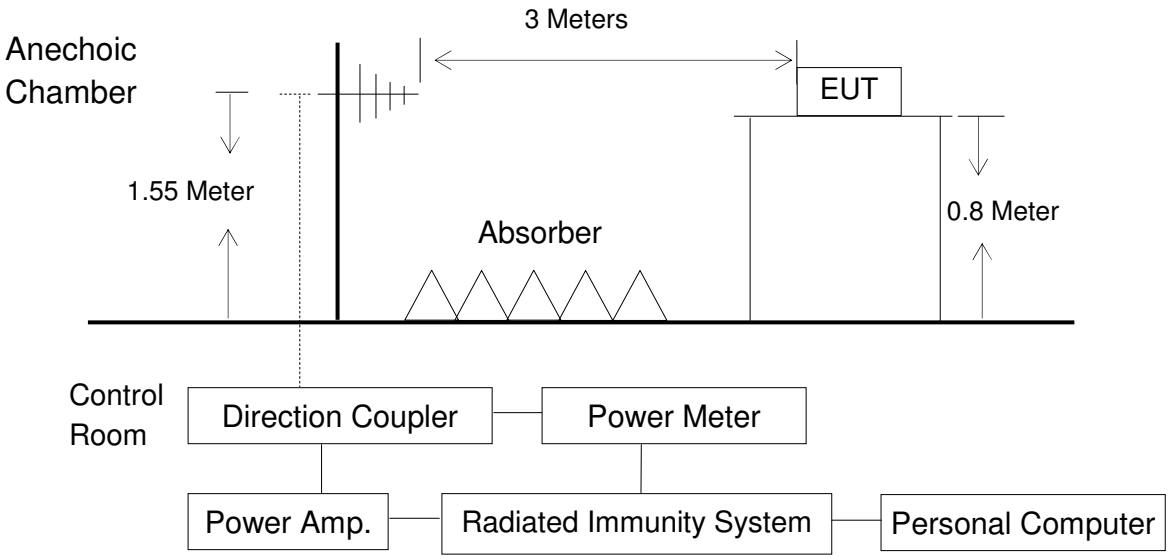
10. Radiated, Radio-frequency, Electromagnetic Field Immunity Test

10.1.List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Radiated Immun-ity System	TESEQ	ITS 6006	033009	2018. 09. 13	1 Year
2	Power Amplifier	TESEQ	CBA 1G-275	T44214	N.C.R.	N.C.R.
3	Power Meter	TESEQ	PM 6006	073364	2018. 09. 13	1 Year
4	Power Antenna	Schwarzbeck	STLP 9128 E	9128E084	N.C.R.	N.C.R.
5	Direction Coupler	WERLATONE	C5982-10	98618	2018. 08. 09	1 Year
6	Digital Ther-mo-Hygro Meter	YICHUN	TFC-9606	RS Room	2019. 04. 20	1 Year

10.2.Test Setup

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



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 (Test Level)		Performance Criteria
Frequency Range	80-1000MHz	A
Field Strength	3V/m (unmodulated, r.m.s)	
Modulation & Signal	80%, 1kHz AM	

- Deviation from applicable standard

  No deviation

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	2019. 07. 23	Environment	25ºC, 47%
Input Power	AC 230V, 50Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Joe Huang

Frequency Range (MHz)	Position Angle (º)	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.				

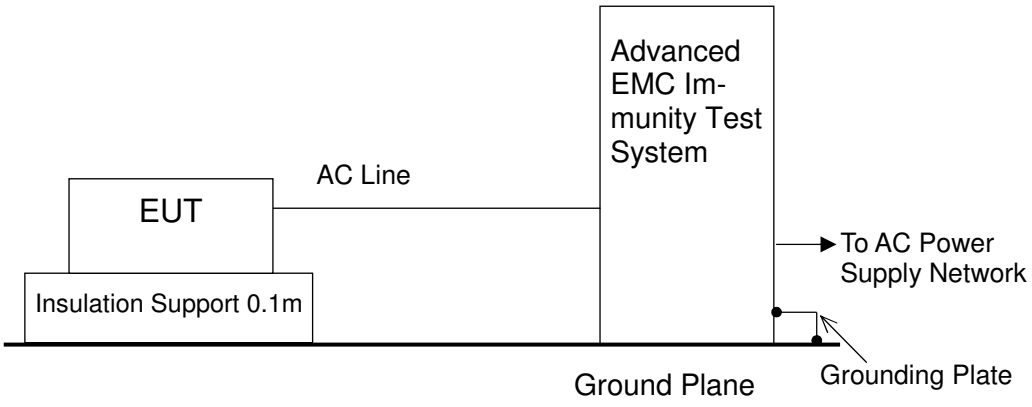
11. Electrical fast transient/burst Immunity Test

11.1.List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Advanced EMC Immunity Test System	Keytek	EMCPro Plus	1005199	2019. 05. 07	1 Year
2	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.2 EFT/SURGE	2019. 04. 20	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 (Test Level)	Performance Criteria
Signal and control ports : ±0.5kV AC mains power input ports : ±1kV	B
Tr/Th : 5/50ns	
Repetition frequency : 5kHz	

- Deviation from applicable standard

  No deviation

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 I/O interface cable of the EUT is connected to its simulator through a capacitive coupling clamp that is 1 meter long. The capacitive coupling clamp is impressed with burst noise for 1min and indirectly couples burst to I/O interface cable.

  [Remark: Applicable only to cables which according to the manufacturer’s specification supports communication on cable lengths greater than 3 m.]

- For DC input and DC output power ports

  The DC power cable of the EUT is connected to the DC power source by using a coupling device which couples the EFT interference signal to DC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test can‘t less than 2min

  [Remark: Applicable only to DC power ports when the EUT supports this ports.]

11.5.Test Result

Test Date	2019. 07. 30	Environment	22ºC, 48%
Input Power	AC 230V, 50Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Jacky Chen

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
PE	+	0.5; 1	60	Direct	A
PE	-	0.5; 1	60	Direct	A
L,N,PE	+	0.5; 1	60	Direct	A
L,N,PE	-	0.5; 1	60	Direct	A
Remark: No error occurred.					

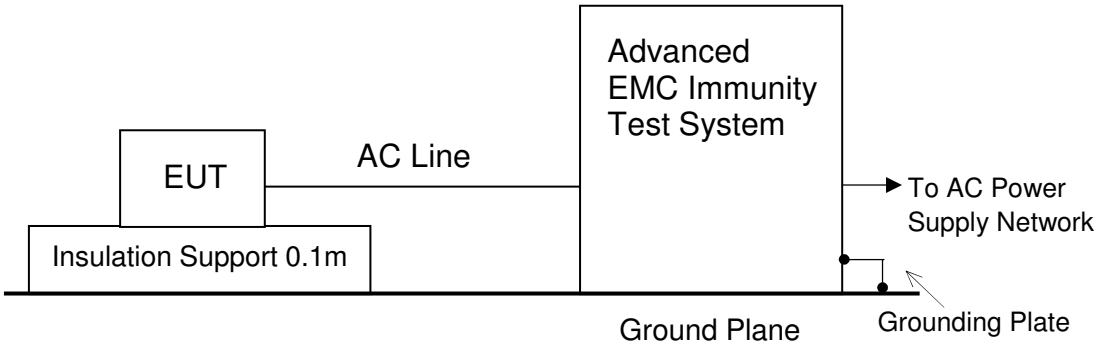
12. Surge Immunity Test

12.1.List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Advanced EMC Immunity Test System	Keytek	EMCPro Plus	1005199	2019. 05. 07	1 Year
2	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.2 EFT/SURGE	2019. 04. 20	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 (Test Level)	Performance Criteria
Telecommunication ports : ±1kV	C
AC input and output power ports --line to line : ±1kV --line to earth: ±2kV	B
Power port: 1.2/50 (8/20) Tr/Th μs Wired network ports: 10/700Tr/Th μs (*) or 1.2/50 (8/20) Tr/Th μs.	
(*)Where the coupling network for the 10/700 μs waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20) μs waveform and appropriate coupling network.	

- Deviation from applicable standard

  No deviation

12.4.Measurement Procedure

For Input and Output AC Power Port

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

- Setup the EUTs 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 0º, 90º, 180º and 270º) were done individually.
- Repeat above procedure except the open-circuit test voltages 0.5kV/1kV/2kV for line to earth coupling mode test.

For Telecommunication Port

- Setup the EUTs and associated equipment described as clause 4.1.
- For Off Line Mode: The waveform is an open-circuit voltage front time of 10 μs, and an open-circuit voltage time to half value of 700 μs.
- For On Line mode: The waveform is an open-circuit voltage front time of 1.2 μs, and an open-circuit voltage time to half value of 50 μs.
- In the case of shielded line, the surge is applied to direct application.

12.5.Test Result

Test Date	2019. 07. 30	Environment	22ºC, 48%
Input Power	AC 230V, 50Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Jacky Chen

Input AC Power Port, Open Circuit Voltage					
Location	Polarity (+/-)	Phase Angle (º)	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
L-PE	+	0	0.5, 1, 2	5	A
	+	90	0.5, 1, 2	5	A
	+	180	0.5, 1, 2	5	A
	+	270	0.5, 1, 2	5	A
	-	0	0.5, 1, 2	5	A
	-	90	0.5, 1, 2	5	A
	-	180	0.5, 1, 2	5	A
	-	270	0.5, 1, 2	5	A
N-PE	+	0	0.5, 1, 2	5	A
	+	90	0.5, 1, 2	5	A
	+	180	0.5, 1, 2	5	A
	+	270	0.5, 1, 2	5	A
	-	0	0.5, 1, 2	5	A
	-	90	0.5, 1, 2	5	A
	-	180	0.5, 1, 2	5	A
	-	270	0.5, 1, 2	5	A
Remark: No error occurred.					

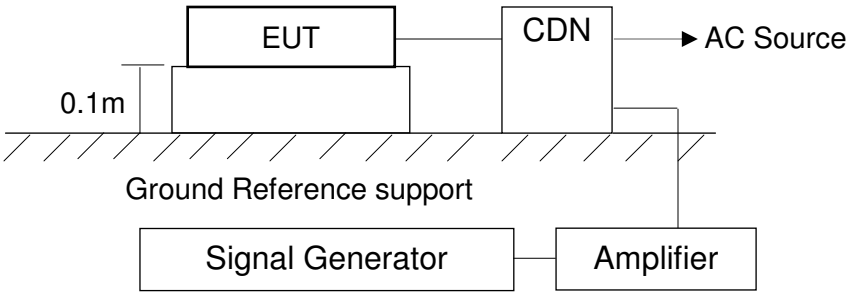
13. Immunity to Conducted Disturbances, Induced by Radio-Frequency Field Immunity Test

13.1.List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Signal Generator	R & S	SMC100A	101402	2019. 05. 01	1 Year
2	Power Amplifier	A/R	100A250A	0330351	N.C.R.	N.C.R.
3	CDN	Fischer	FCC-801-M3-25A	9961	2019. 03. 06	1 Year
4.	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.2 CS Room	2019. 04. 20	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 (Test Level)		Performance Criteria
Signal and telecommunication ports, AC Input and Output Power Ports		
Frequency Range	0.15-80MHz	A
Field Strength	3V (unmodulated, r.m.s)	
Modulation	80% AM (1kHz)	

- Deviation from applicable standard
  No deviation

13.4.Measurement Procedure

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

**** For AC Power Line ****

- Setup the EUT 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 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.
- The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- The frequency range was swept from 0.15 to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- The rate of sweep shall not exceed 1.5*10^3decades/s. Where the frequency was swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

**** For Signal Port ****

- The EUT and supporting equipment were placed on an insulating support 0.1m high above a ground reference plane. EM Injection Clamp (coupling and decoupling device) was placed on the ground plane making contact with it at about 0.1-0.3m from EUT. Cables between EM Injection Clamp and EUT were as short as possible.
- The CDN was placed on between AE and EUT. The EUT and AE of power through CDN, CDN terminated with 50Ω at the RF disturbance input port.
- The disturbance signal described below was injected to EUT through EM Injection Clamp.

13.5.Test Result

Test Date	2019. 07. 29	Environment	26ºC, 41%
Input Power	AC 230V, 50Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Fans Lee

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.			

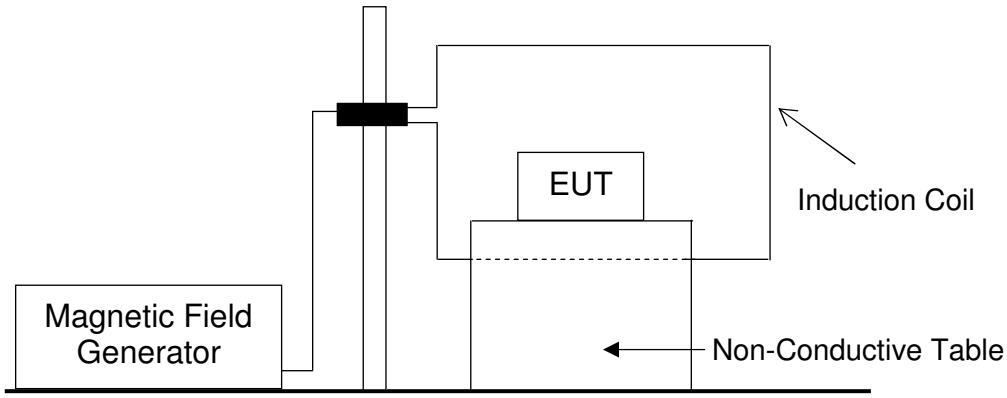
14. Power Frequency Magnetic Field Immunity Test

14.1.List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Magnetic Field Generator	Narda S.T.S. / PMM	PMM1008	0100X30101	2018. 11. 18	1 Year
2	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.2 Magnetic Room	2019. 04. 20	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 (Test Level)		Performance Criteria
Power Frequency	50Hz or 60Hz	A
Magnetic Field Strength	1A/m (rms)	

- Deviation from applicable standard
  No deviation

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	2019. 07. 25	Environment	24ºC, 43%
Input Power	AC 230V, 50Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Rex Wang

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.				

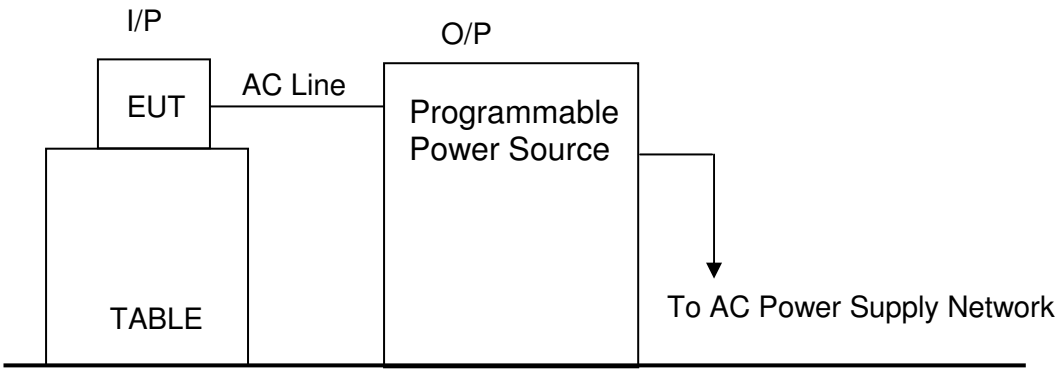
15. Voltage Dips and Interruptions Immunity Test

15.1.List of Test Instruments

Item	Equipment	Manufacture	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Programmable Power Source	TESEQ	NSG1007-45	1248A04038	2017. 11. 28	2 Years
2	Digital Ther-mo-Hygro Meter	iMax	HTC-1	No.2 Har-monics Room	2019. 04. 20	1 Year

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 (Test Level)		Performance Criteria
Voltage dips	>95% reduction, 0.5period	B
	30% reduction , 25period	C
Voltage interruptions	>95% reduction , 250period	C

- Deviation from applicable standard

  No deviation

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	2019. 07. 25	Environment	26ºC, 39%
Input Power	AC 100-240V, 50/60Hz	Test Result	Pass
Test Mode	Panel Angle : 0°, 1920*1080/144Hz, DP	Tested By	Rex Wang

Type of Test	Test Voltage	Phase Angle (°)	Reduction (%)	Cycle	Results & Performance Criterion
Voltage Dips	100V / 240V	0, 45, 90, 135, 180, 225, 270, 315	>95	0.5	Pass, A
		0, 45, 90, 135, 180, 225, 270, 315	30	25	Pass, A
Voltage Interruptions	100V / 240V	0, 45, 90, 135, 180, 225, 270, 315	>95	250	Pass B, Note
Note : During the test, the EUT was stopped working, 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
Radiated emissions (No.4 3m Chamber)	30MHz-200MHz, 3m, Horizontal	±4.1dB
	200MHz-1000MHz, 3m, Horizontal	±4.4dB
	30MHz-200MHz, 3m, Vertical	±4.2dB
	200MHz-1000MHz, 3m, Vertical	±5.0dB
	1GHz-6GHz, 3m	±4.4dB
	6GHz-18GHz, 3m	±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

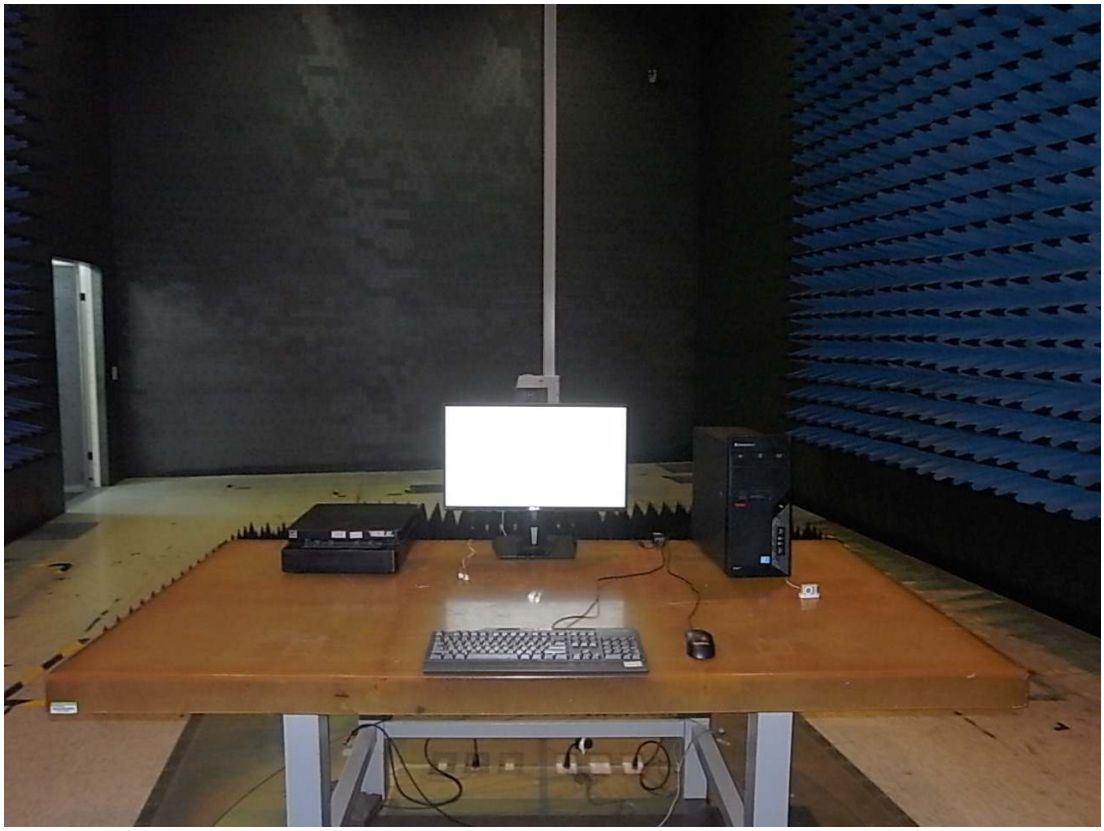
17.2.Radiated Emissions Measurement

- For Frequency Range 30 – 1000MHz

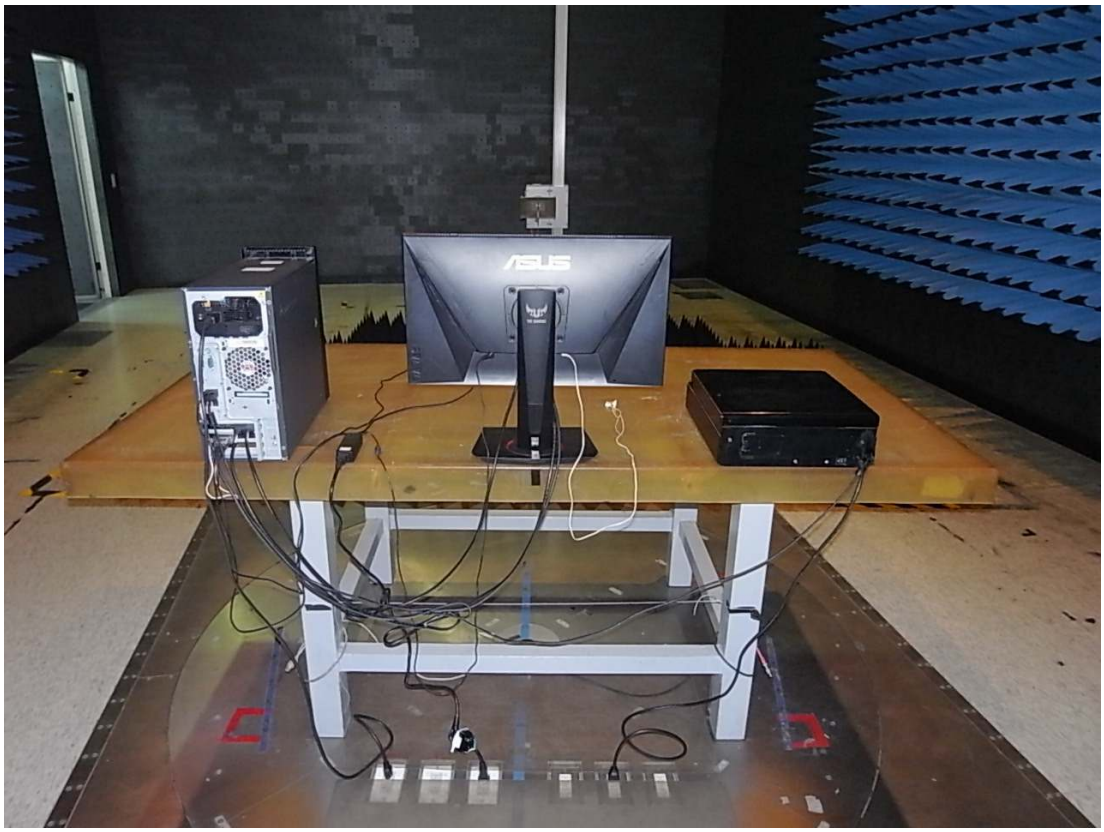
Front View of Radiated Measurement

Back View of Radiated Measurement

- For Frequency Range 1 – 6GHz



Front View of Radiated Measurement



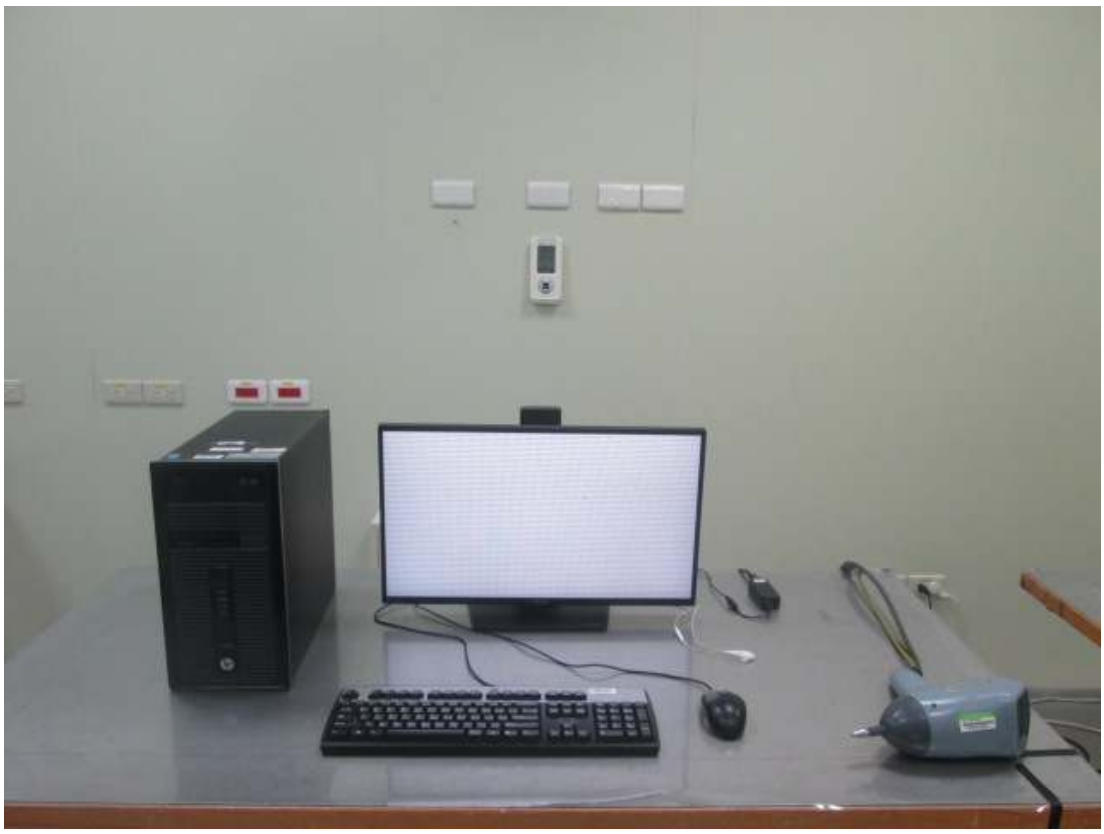
Back View of Radiated Measurement

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

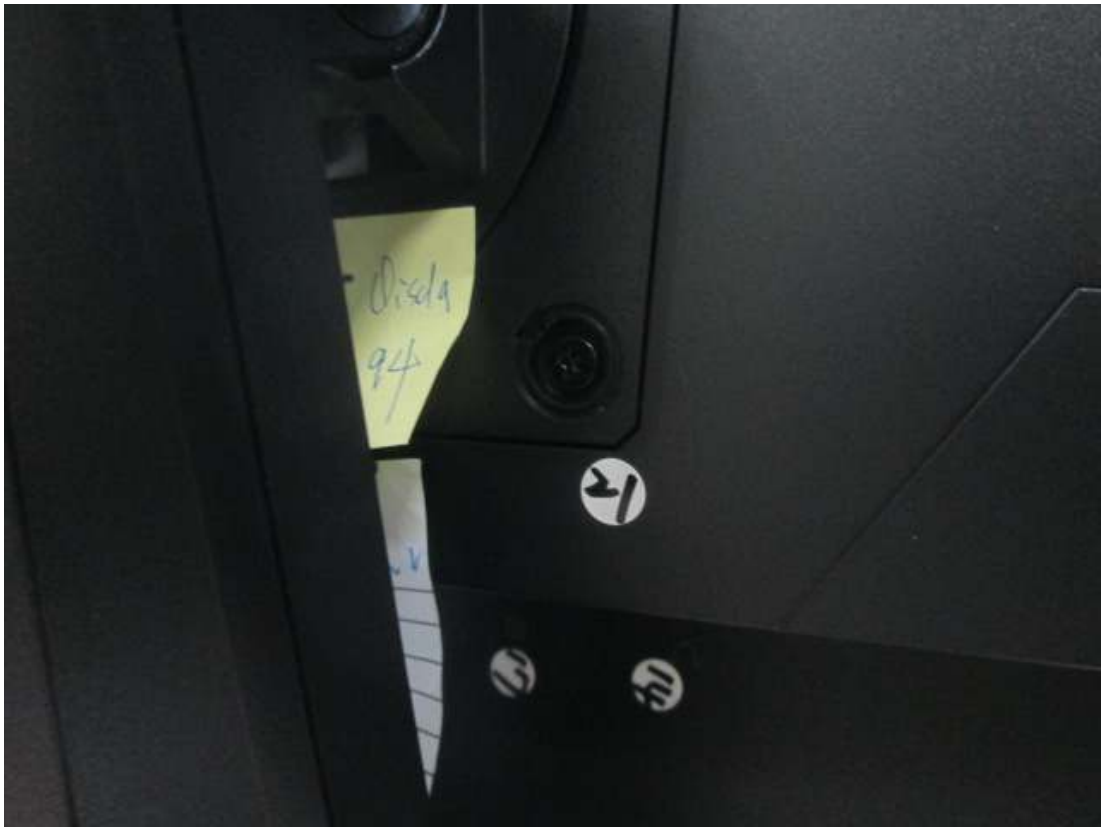
- ESD Test Points

- ESD Test Points

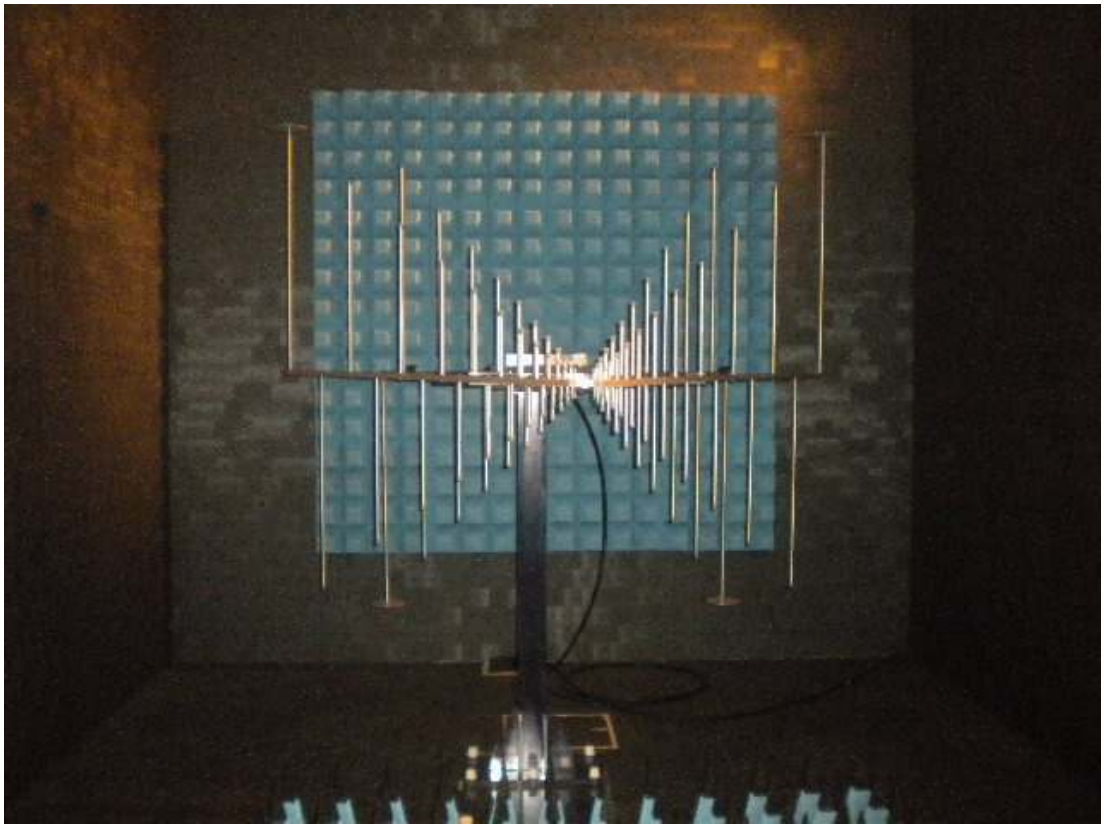
- ESD Test Points

- 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

APPENDIX I

(Photos of EUT)

Figure 1
General Appearance 0° (Front View)

Figure 2
General Appearance 0° (Back View)

Figure 3
General Appearance 90° (Front View)

Figure 4
General Appearance 90° (Back View)

Figure 5
General Appearance (Removed Back Cover)

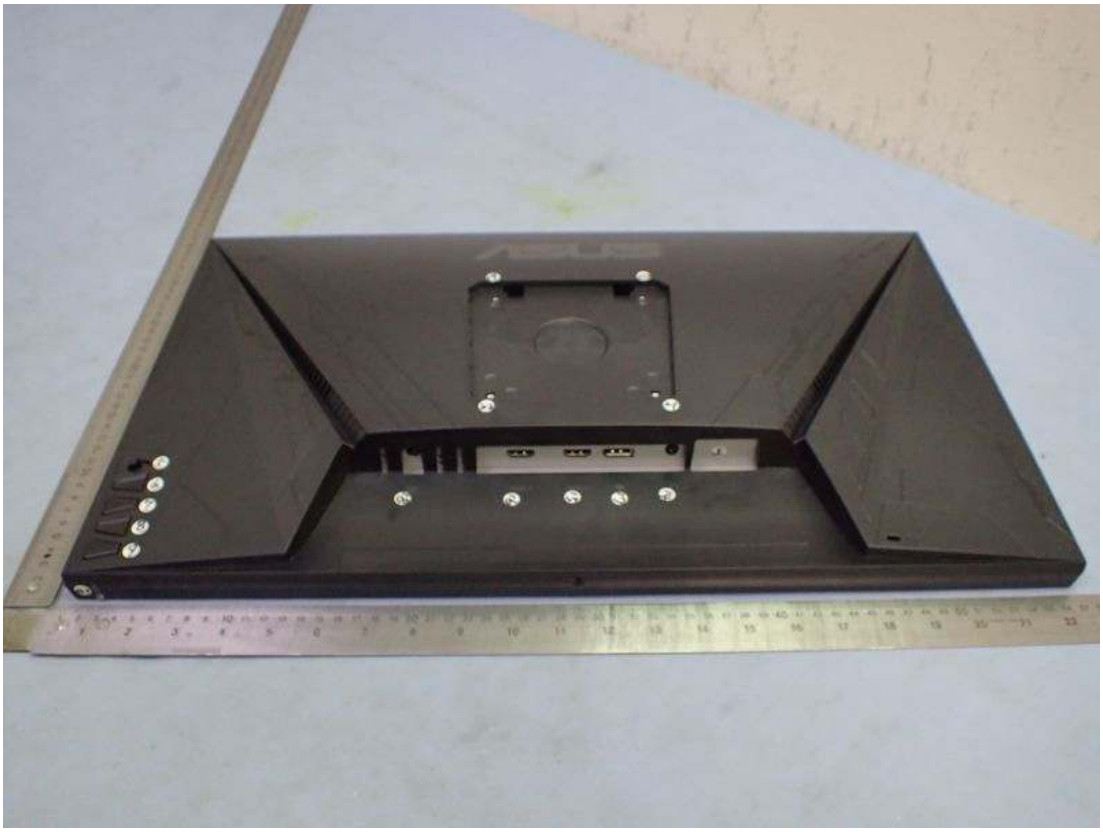


Figure 6
General Appearance (I/O Ports View)

Figure 7
Internal View (Removed Back Cover)

Figure 8
Internal View

Figure 9
Internal View

Figure 10
Internal View

Figure 11
Internal View (Main Board, Front View)

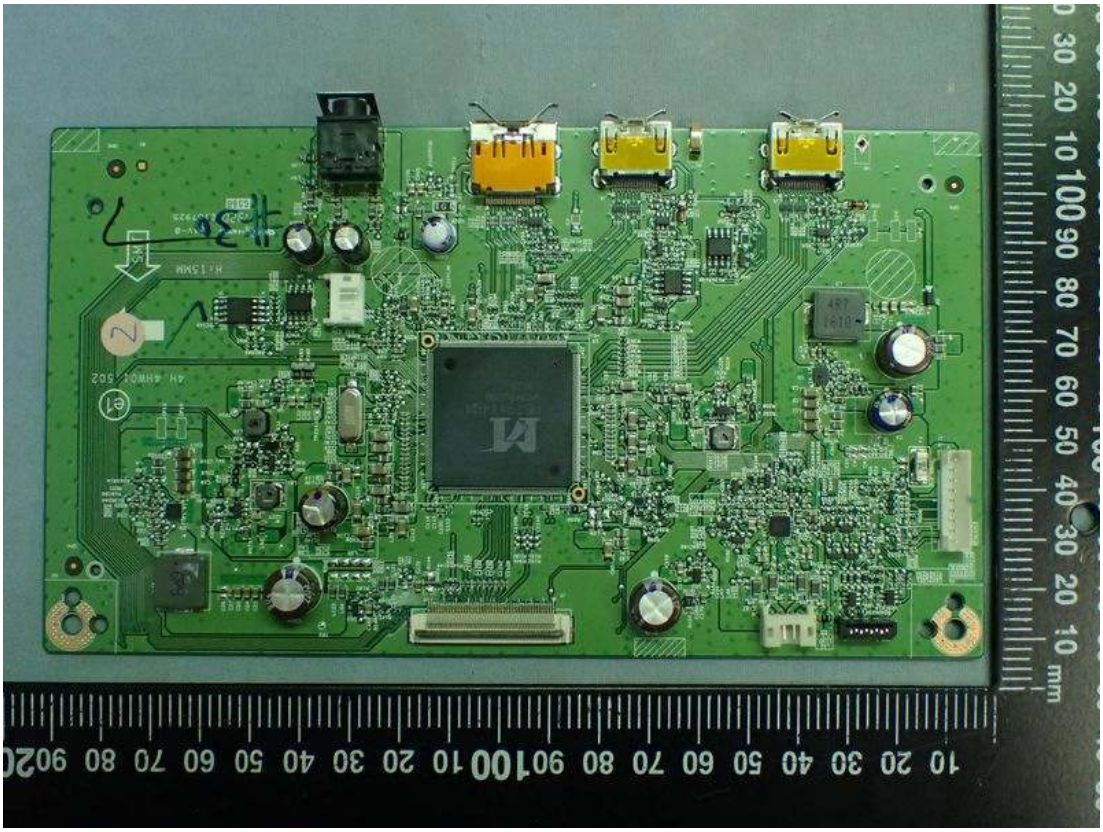


Figure 12
Internal View (Main Board, Back View)

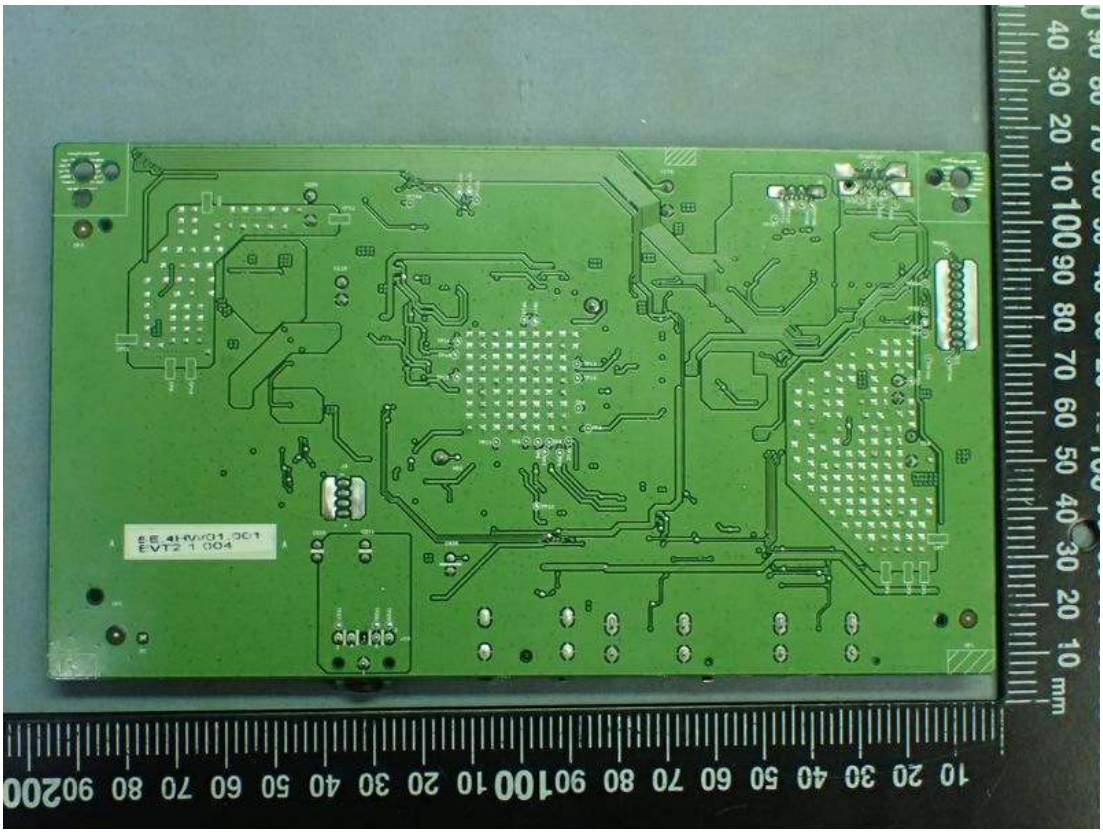


Figure 13
Internal View, Internal Board (Front View)

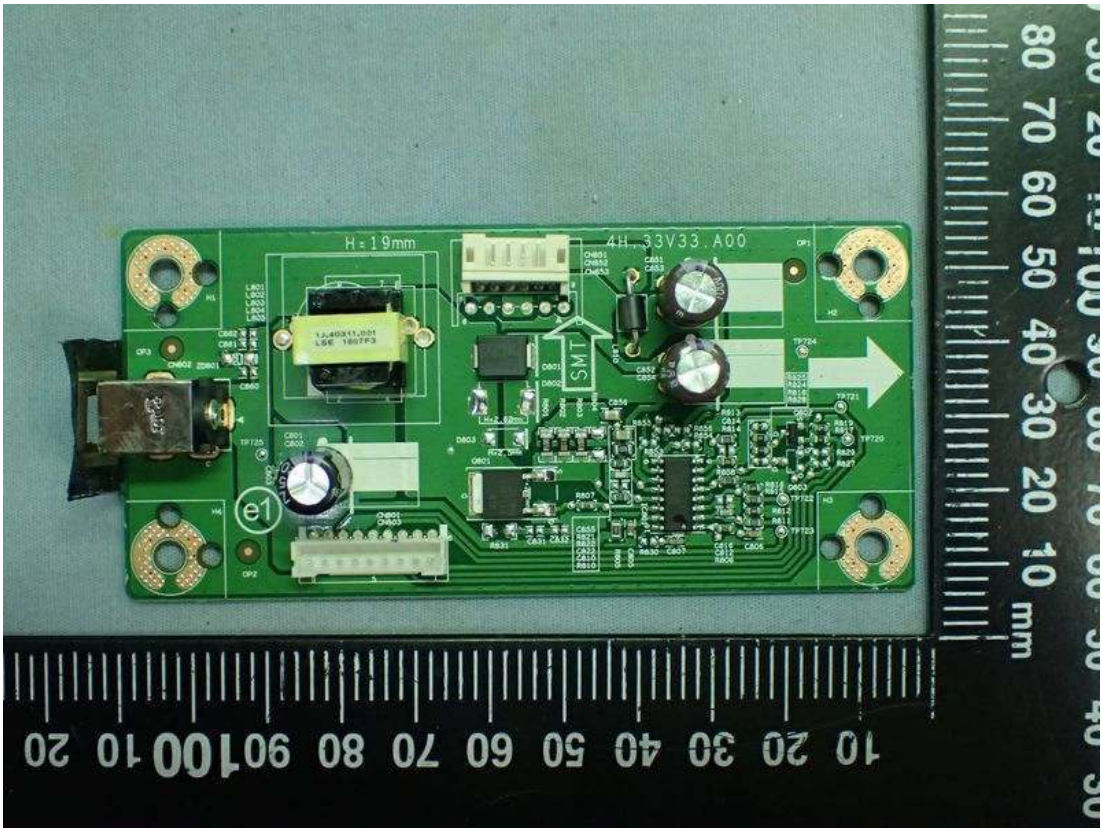


Figure 14
Internal View, Internal Board (Back View)

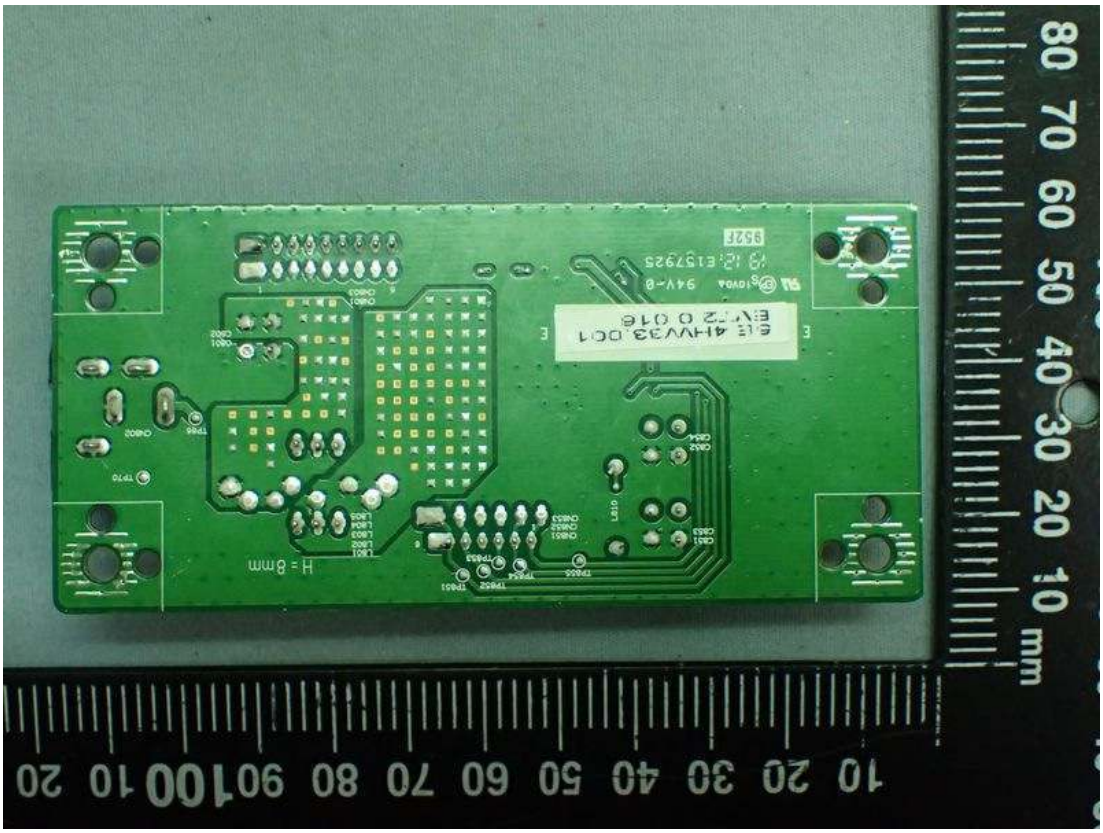


Figure 15
Internal View (Control Board, Front View)

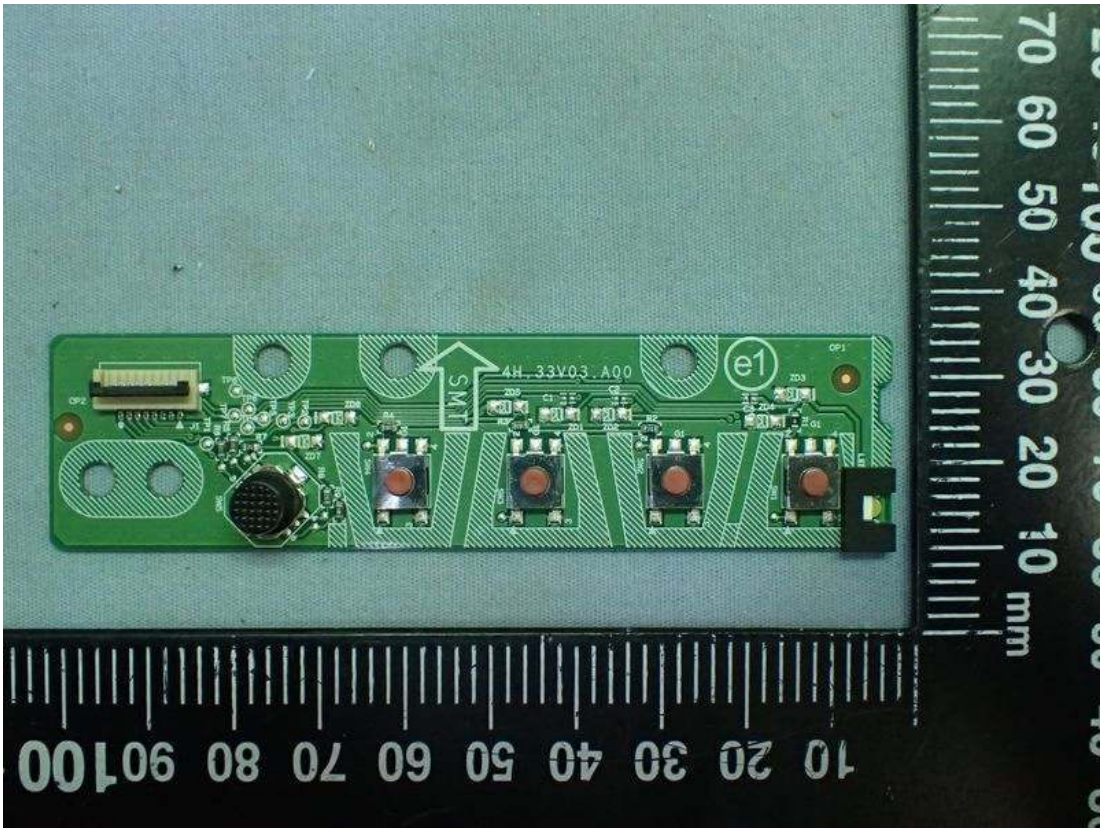


Figure 16
Internal View (Control Board, Back View)

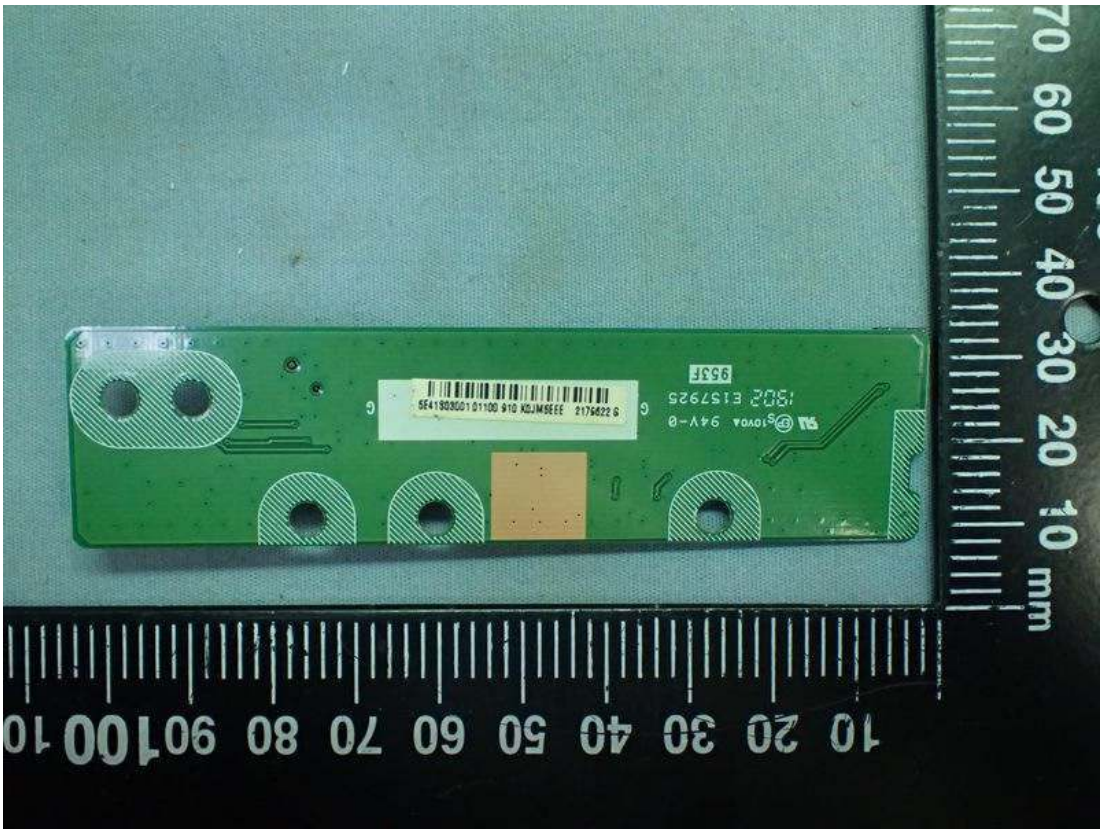


Figure 17
Internal View (Panel, Front View)

Figure 18
Internal View (Panel, Back View)

Figure 19
Internal View (Panel, Product Label)

Figure 20
Internal View (Adaptor, Front View)

Figure 21
Internal View (Adaptor, Back View)

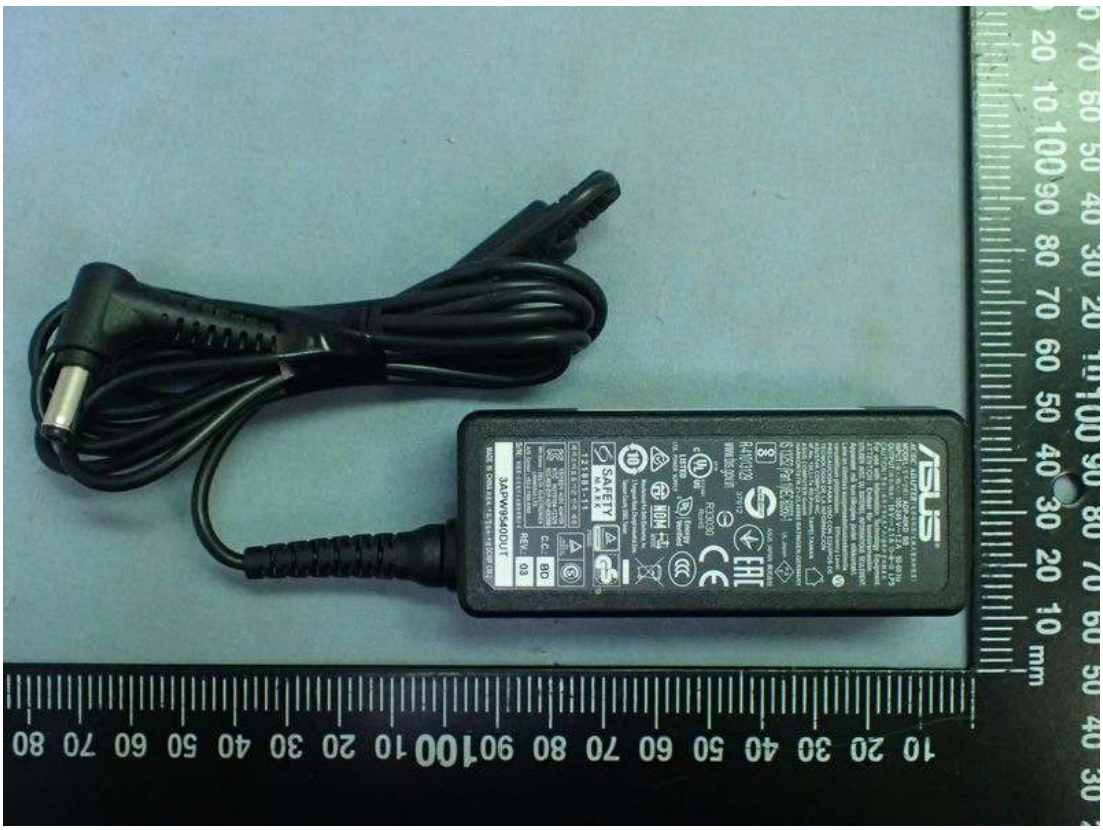


Figure 22
Internal View (Adaptor, AC Inlet View)

Figure 23
Internal View (Adaptor, Label)

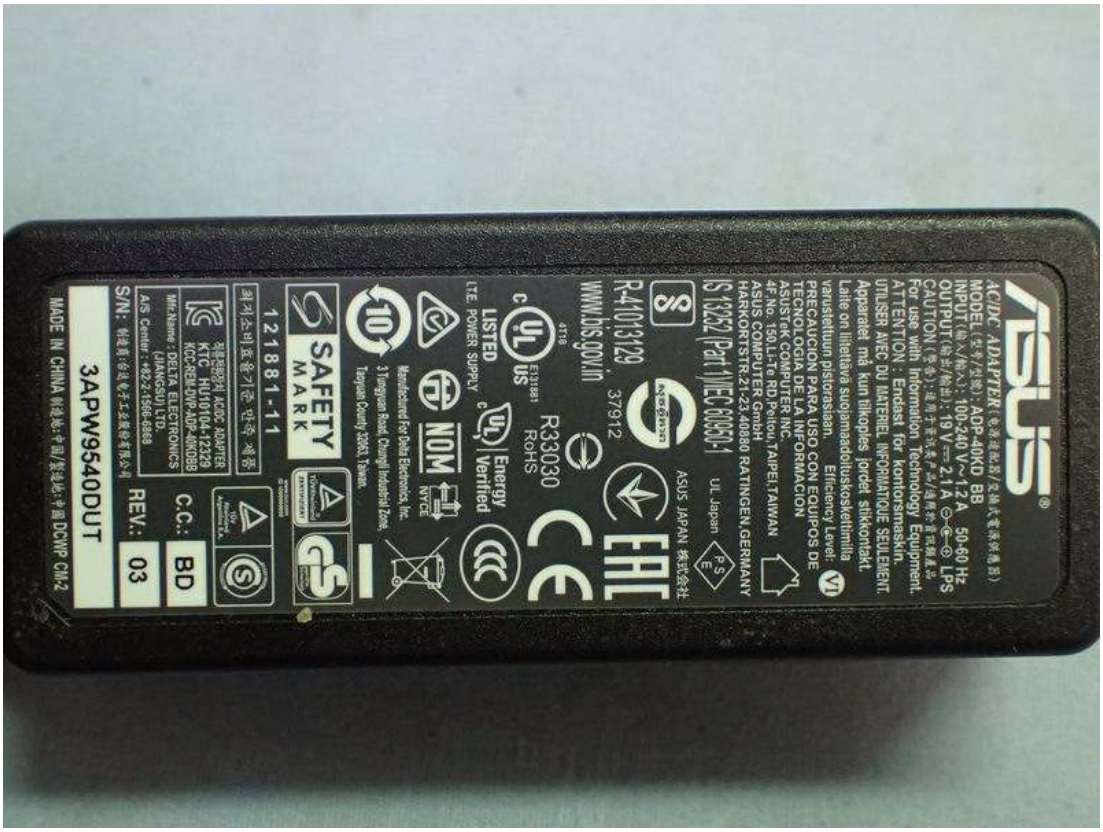


Figure 24
HDMI Cable

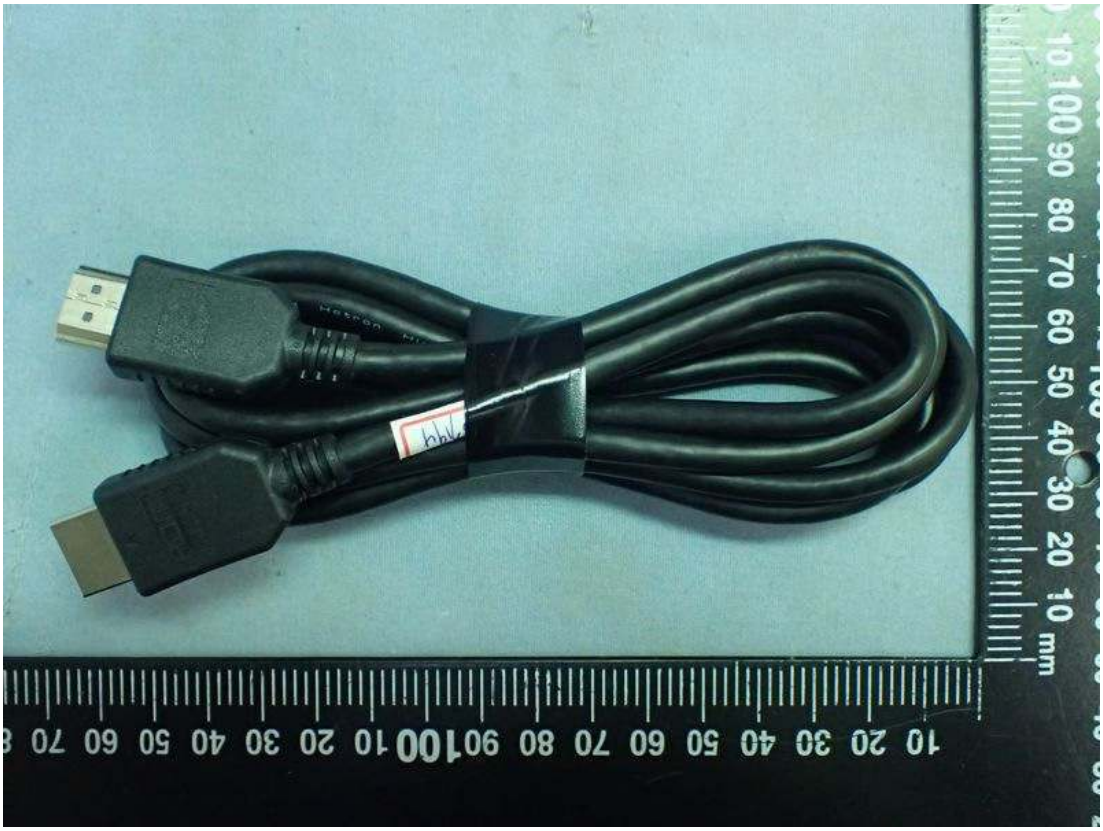
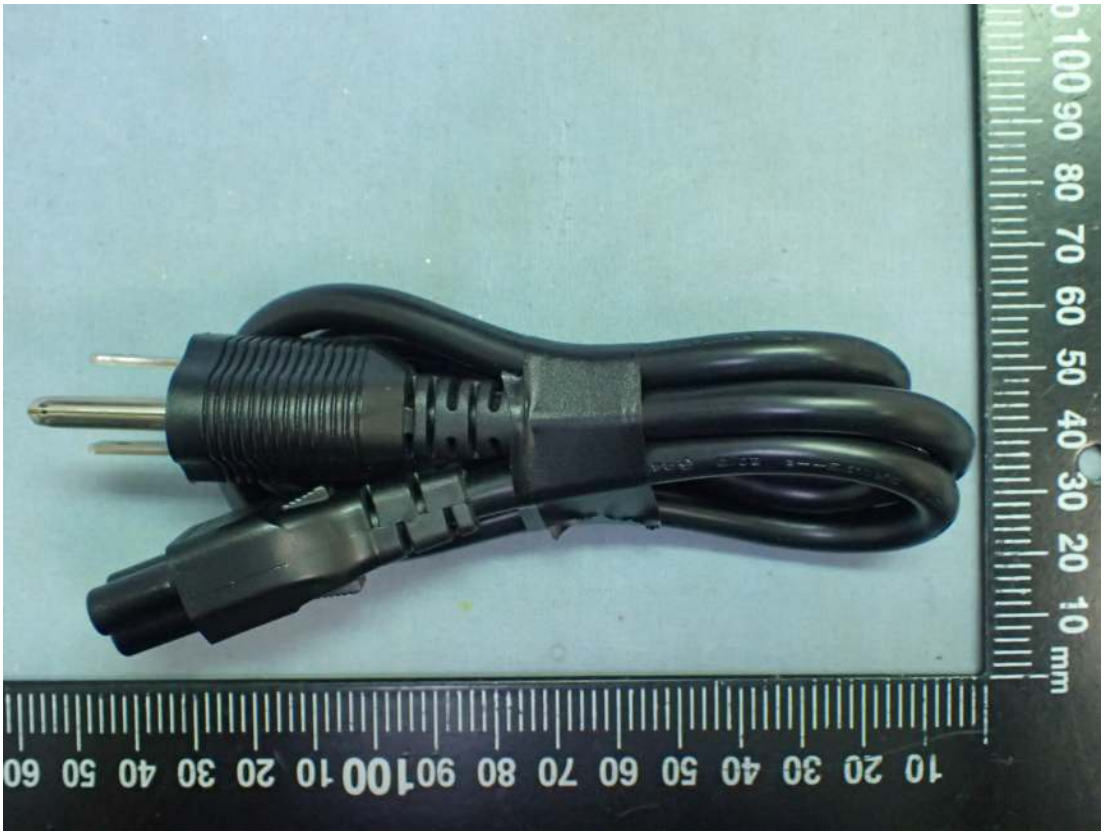


Figure 25
Display Cable

Figure 26
AC Power Cord



APPENDIX II

(Lab. Certificate)

Certificate No. : L1724-190628

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Audix Technology Corporation
EMC Department
No.53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan (R.O.C.)

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2017;CNS 17025:2018
Accreditation Number	:	1724
Originally Accredited	:	November 27, 2006
Effective Period	:	November 27, 2018 to November 26, 2021
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Communication Equipment Laboratories Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Chung-Lin Wang

Chung-Lin Wang
President, Taiwan Accreditation Foundation
Date: June 28, 2019

P1, total 30 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200077-0

Audix Technology Corporation EMC Department

New Taipei City
Taiwan

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2019-06-04 through 2019-12-31
Effective Dates

For the National Voluntary Laboratory Accreditation Program